



# Solar-Geophysical Data prompt reports

Data for June and July 2004

Explanation of Data Reports Issued as Number 515 (Supplement) July 1987

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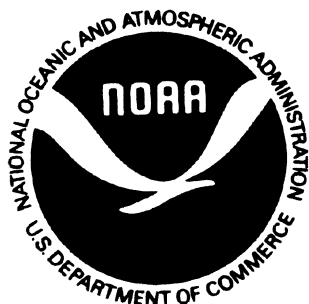
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NATIONAL OCEANIC AND  
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NATIONAL ENVIRONMENTAL SATELLITE,  
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NATIONAL GEOPHYSICAL  
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AUGUST 2004 NUMBER 720 - Part I

# **Solar-Geophysical Data prompt reports**

Data for June and July 2004

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## **NATIONAL GEOPHYSICAL DATA CENTER**

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# SOLAR-GEOPHYSICAL DATA

Number 720

(Issued in Two Parts)

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The entry "714A 46" under Dec 03, for example, means that the sunspot drawings for Dec 03 appear in SOLAR-GEOPHYSICAL DATA No. 714, Part I, and that they begin on page 46. "A" denotes Part I and "B", Part II. Blanks indicate data not yet received and dashes mark unavailable data.

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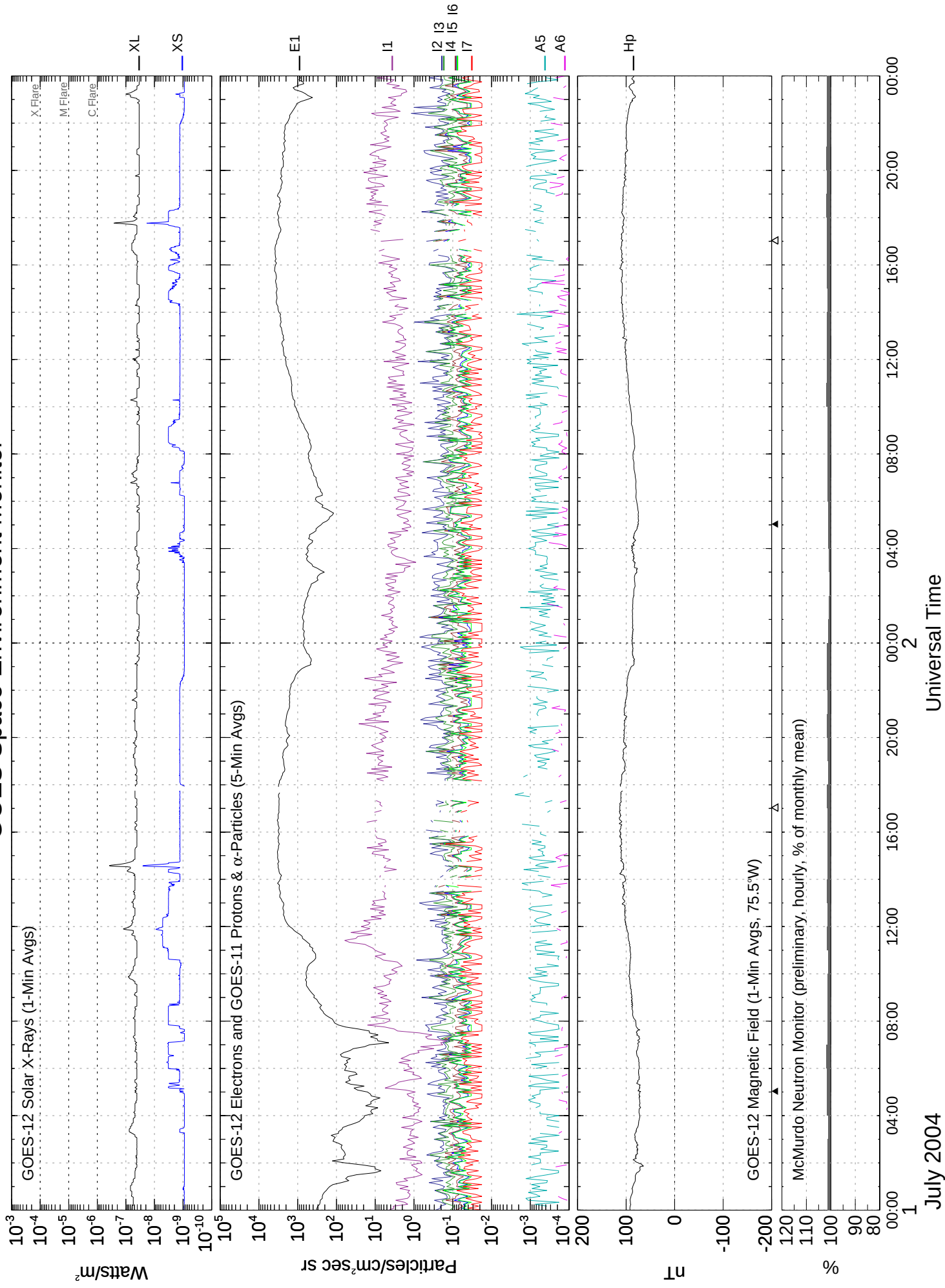
Prompt Reports

Number 720 Part I

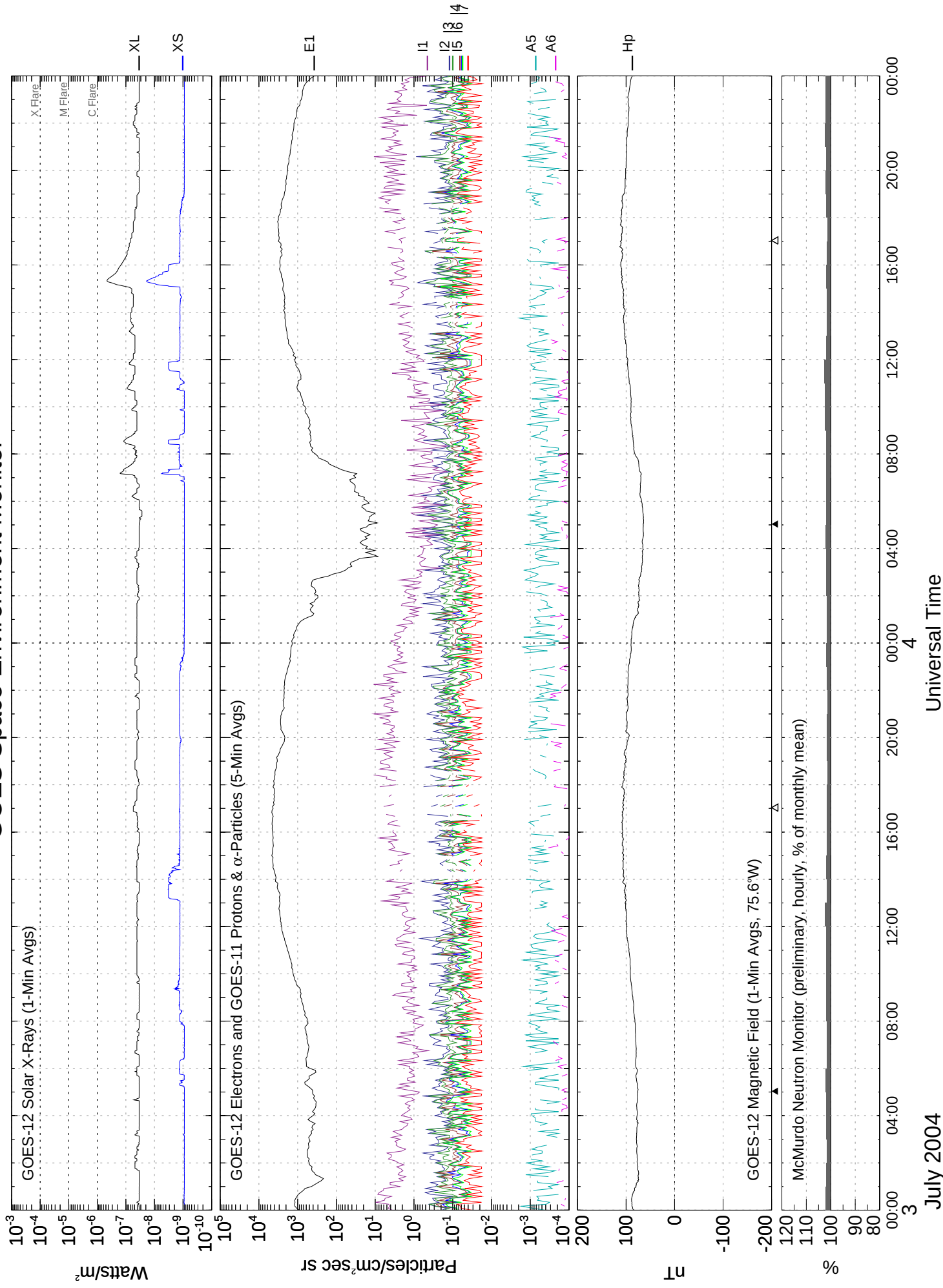
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# GOES Space Environment Monitor



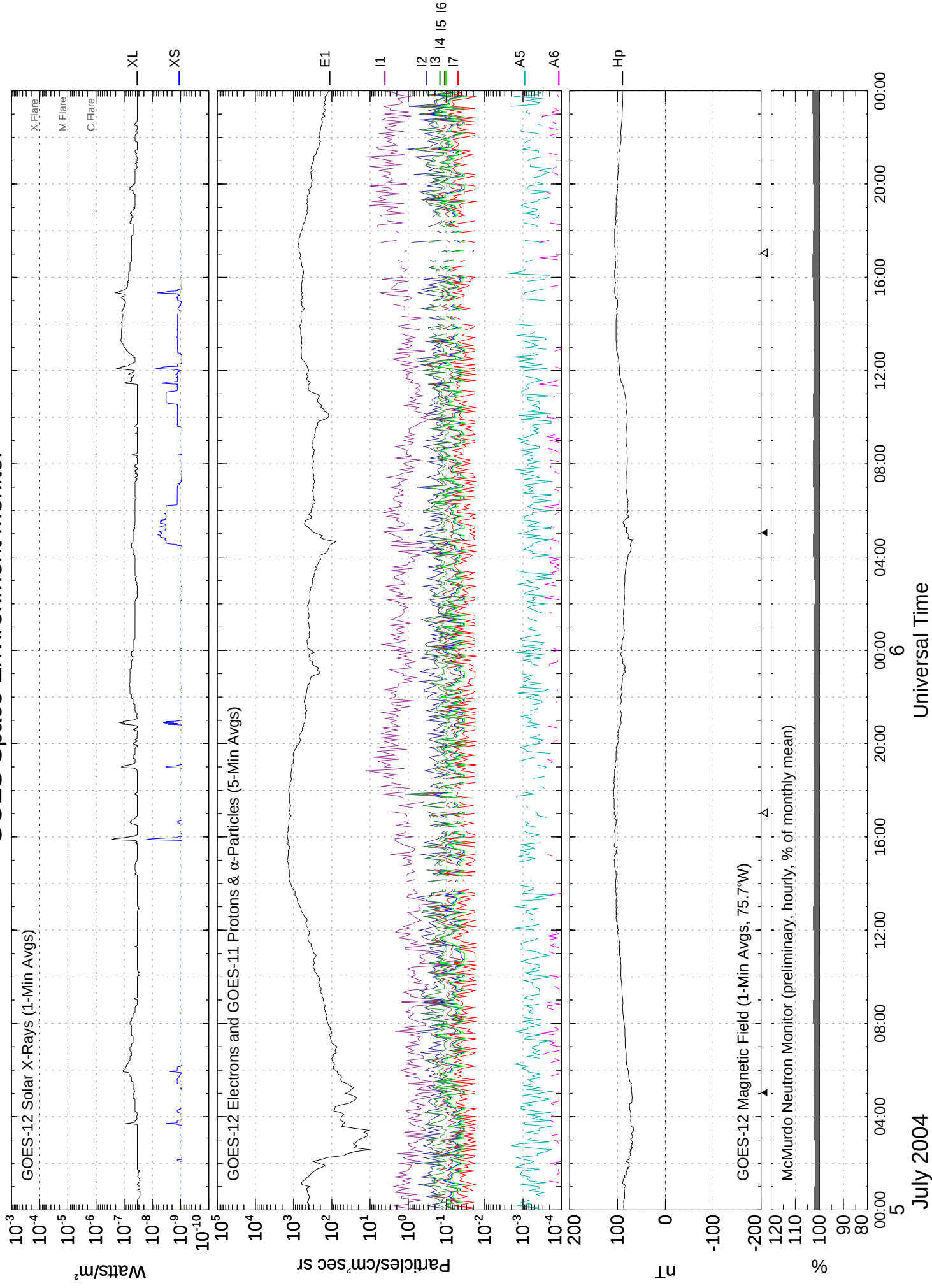
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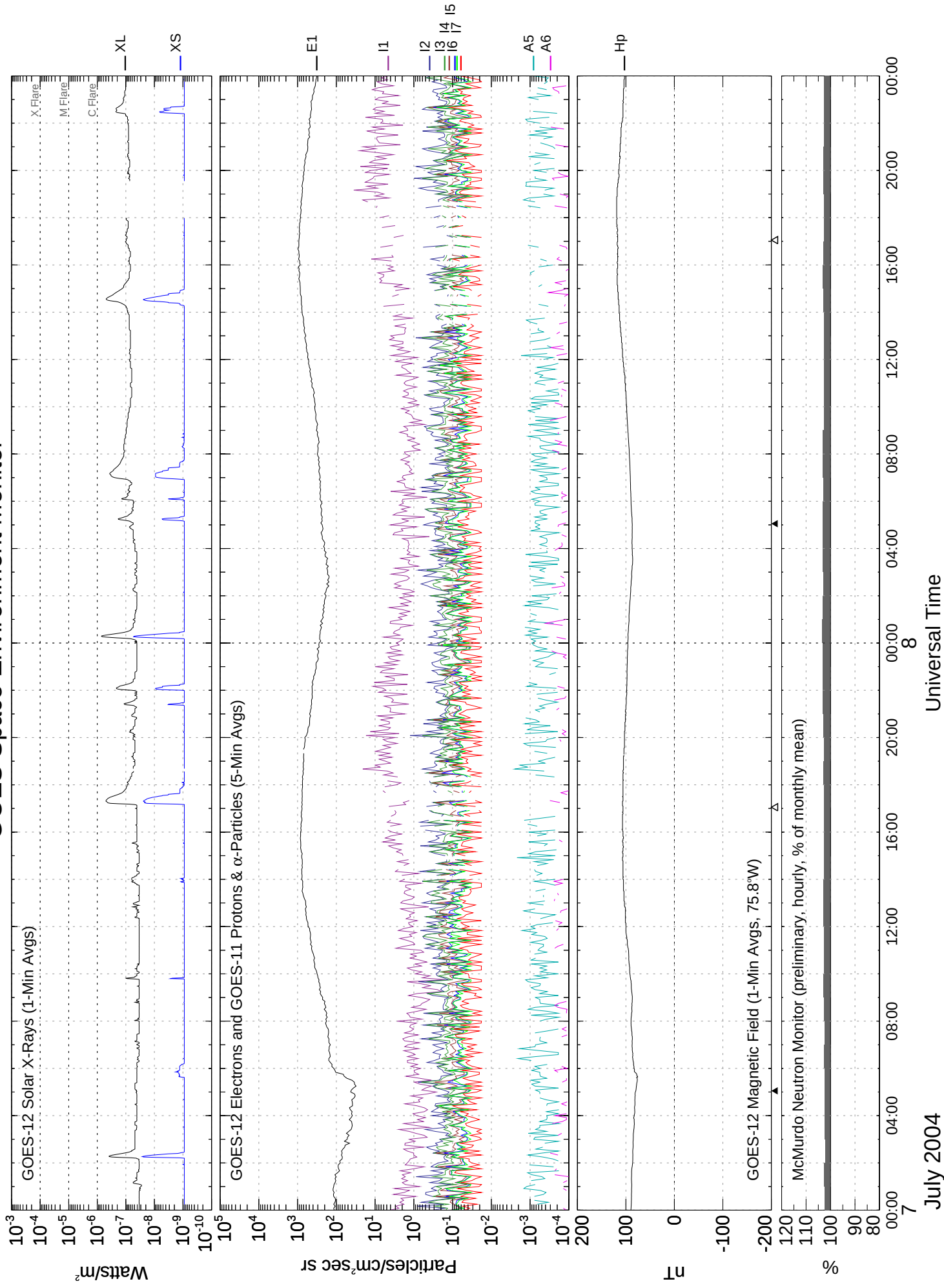
July 2004

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# GOES Space Environment Monitor



# GOES Space Environment Monitor

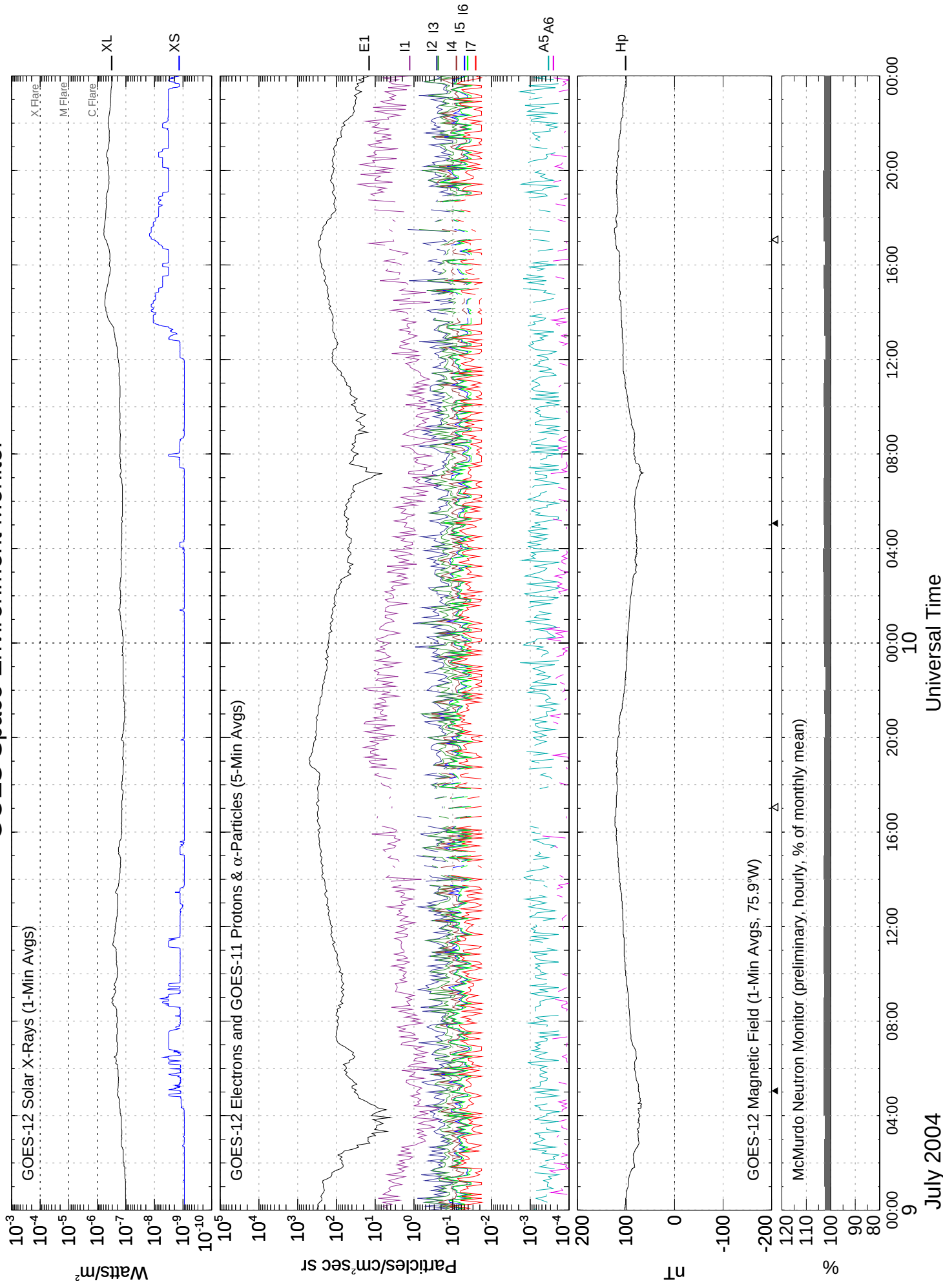


July 2004

Universal Time

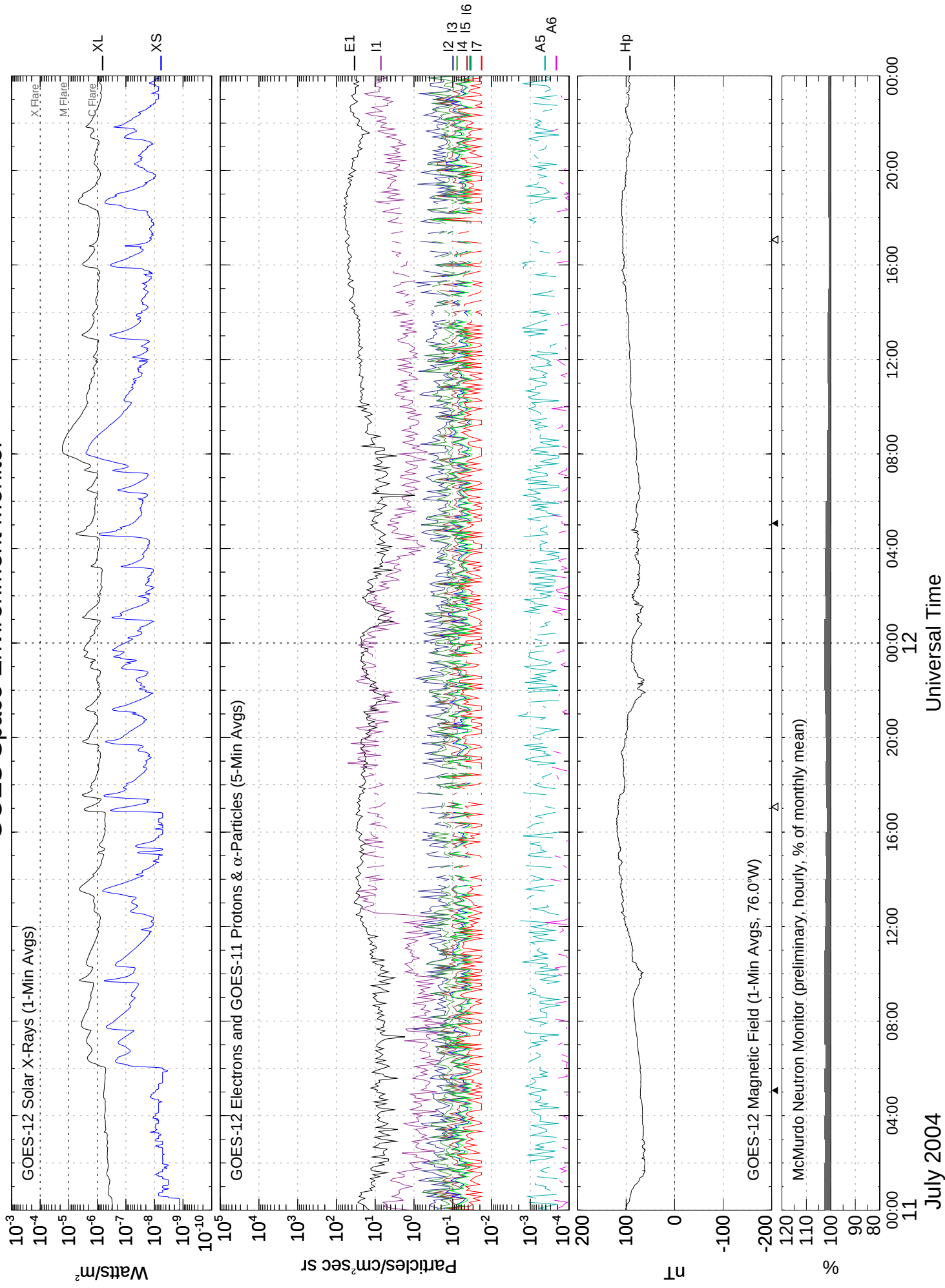


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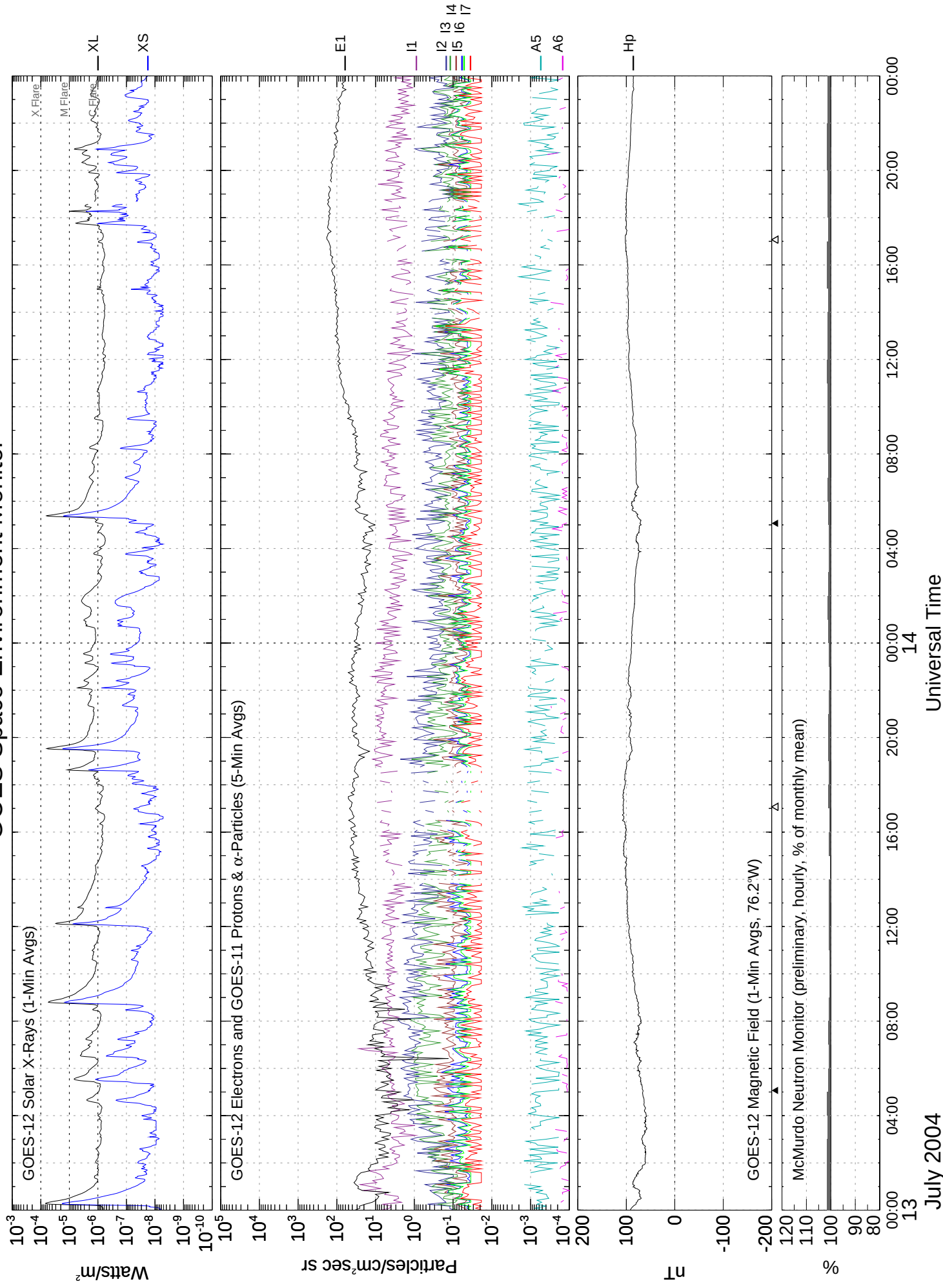




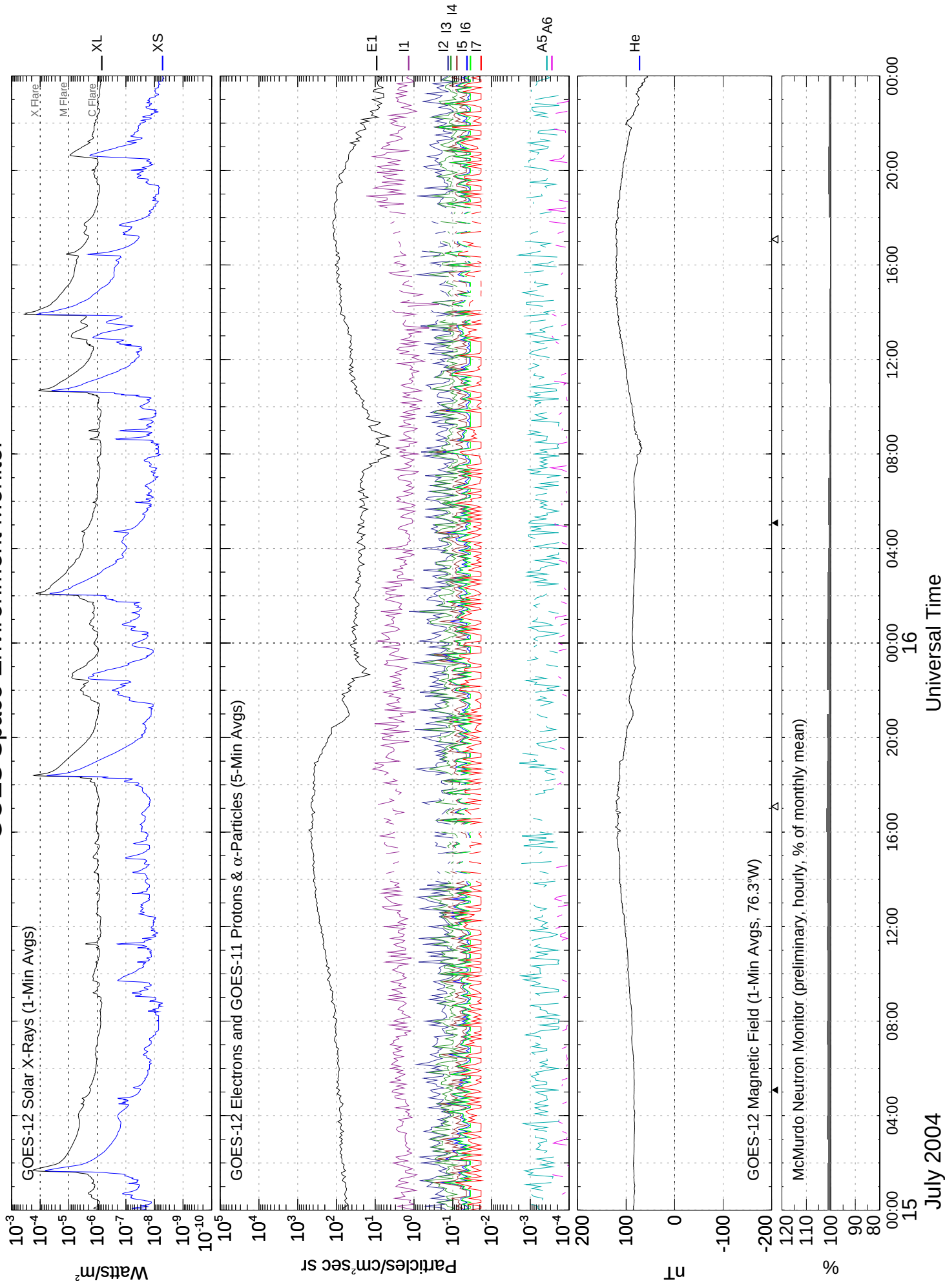
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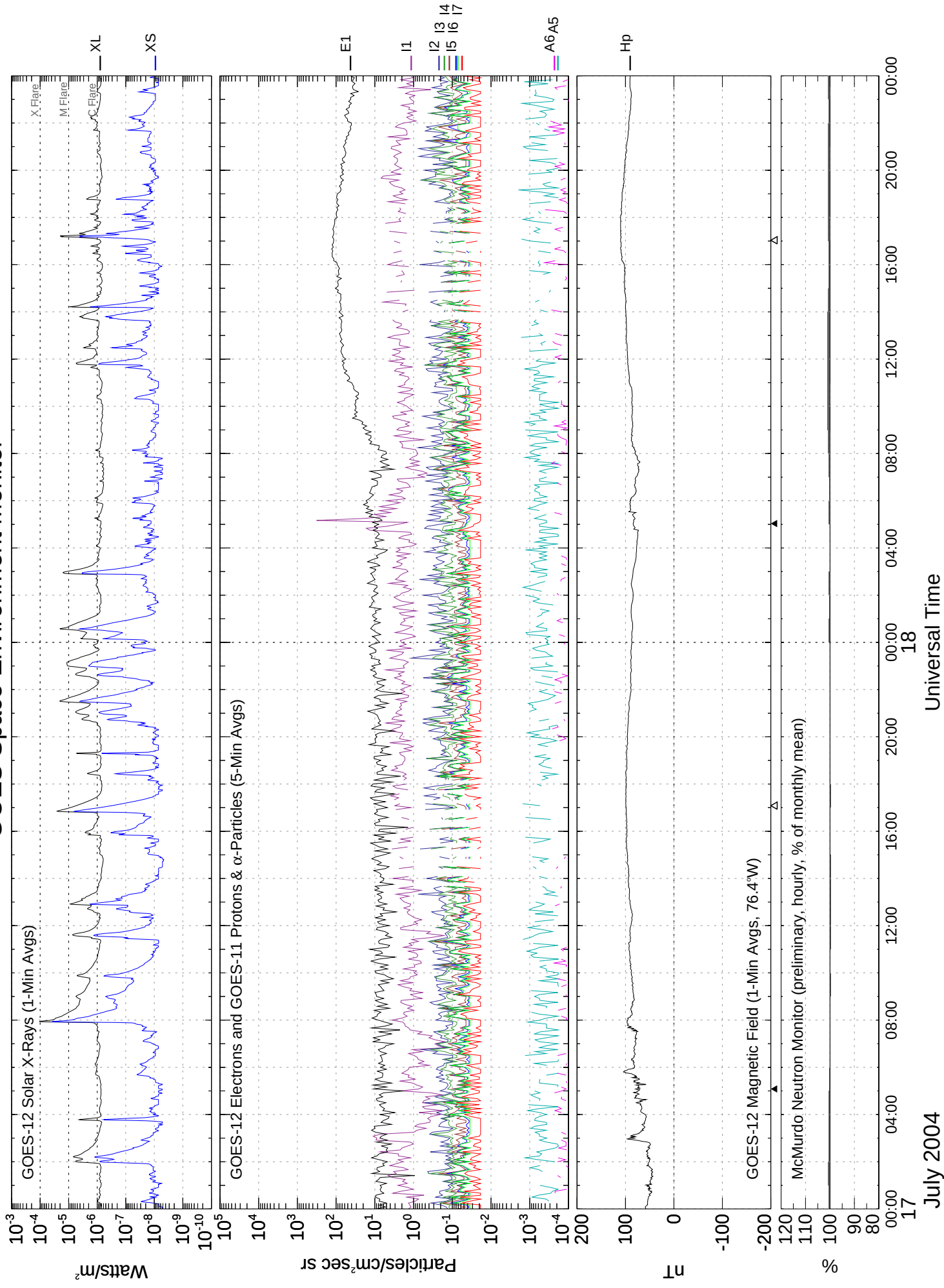
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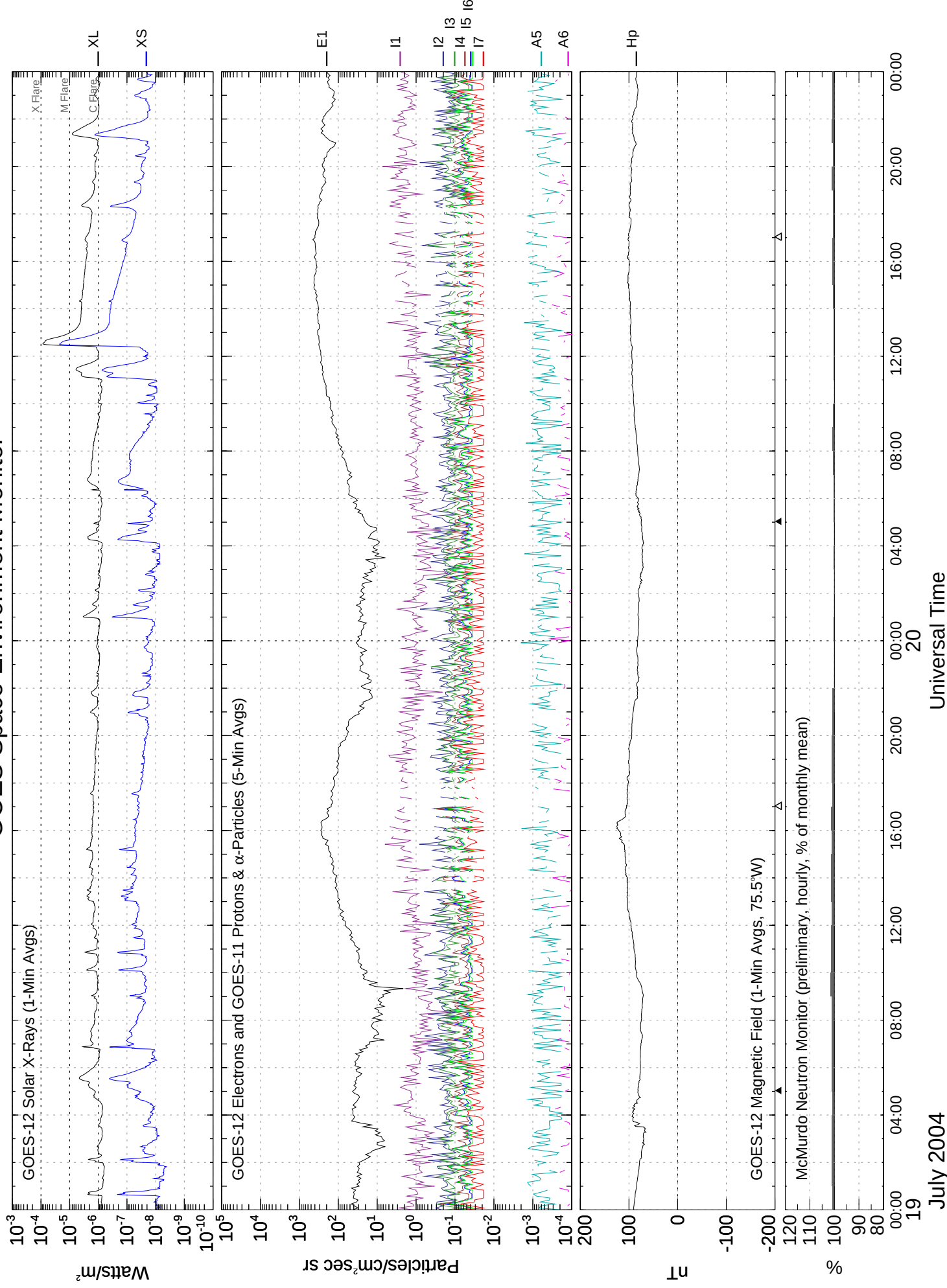
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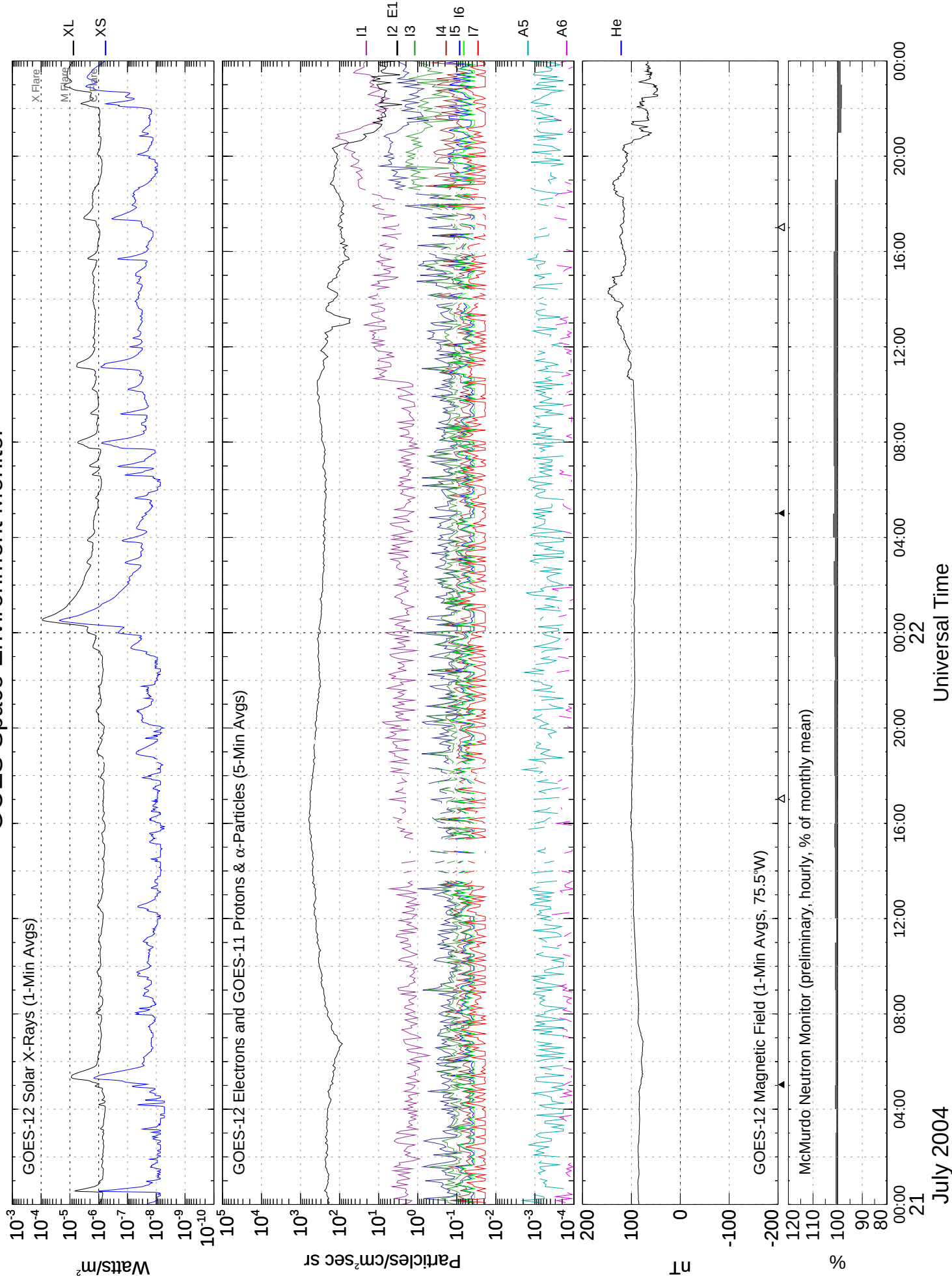


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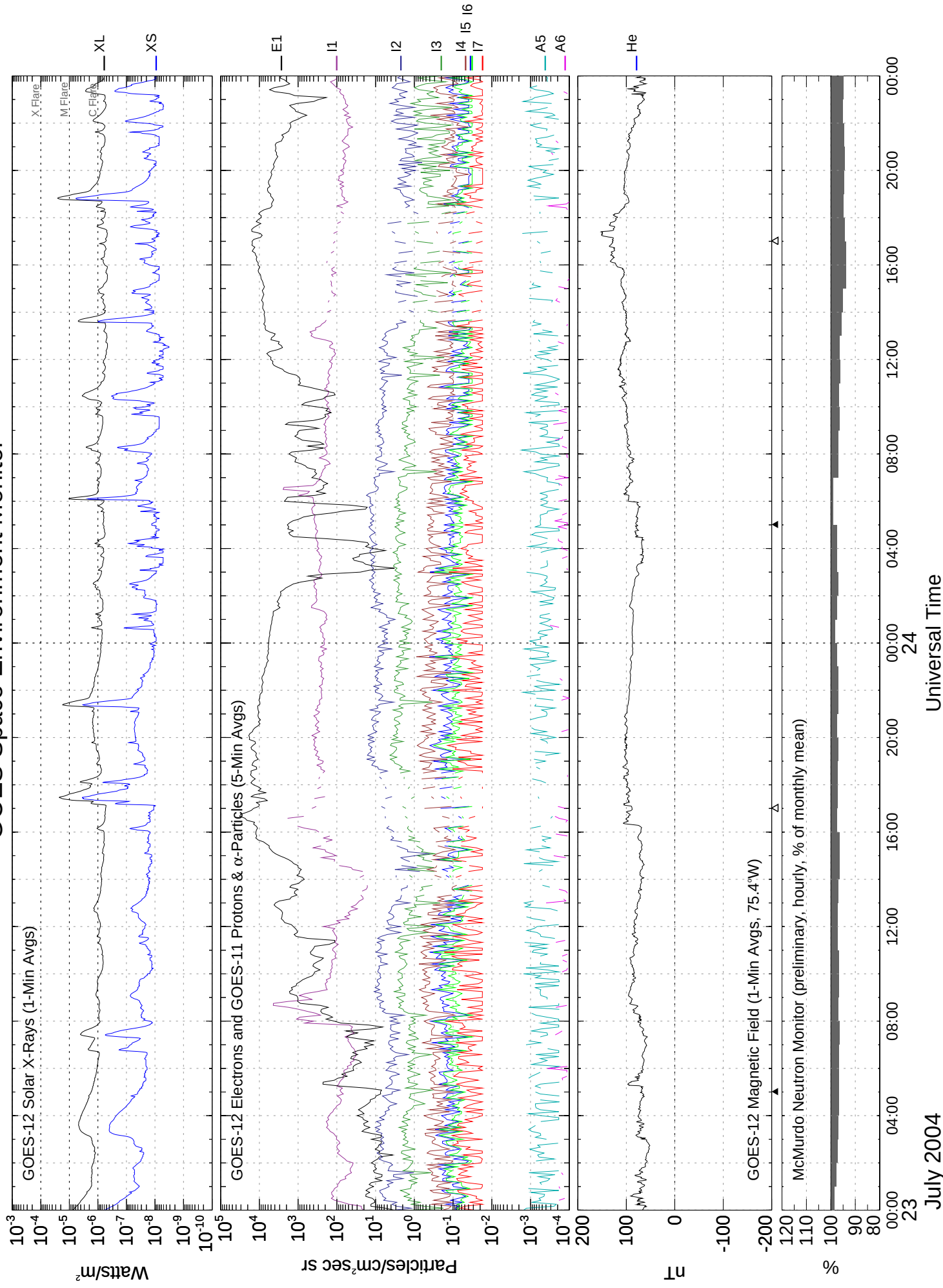
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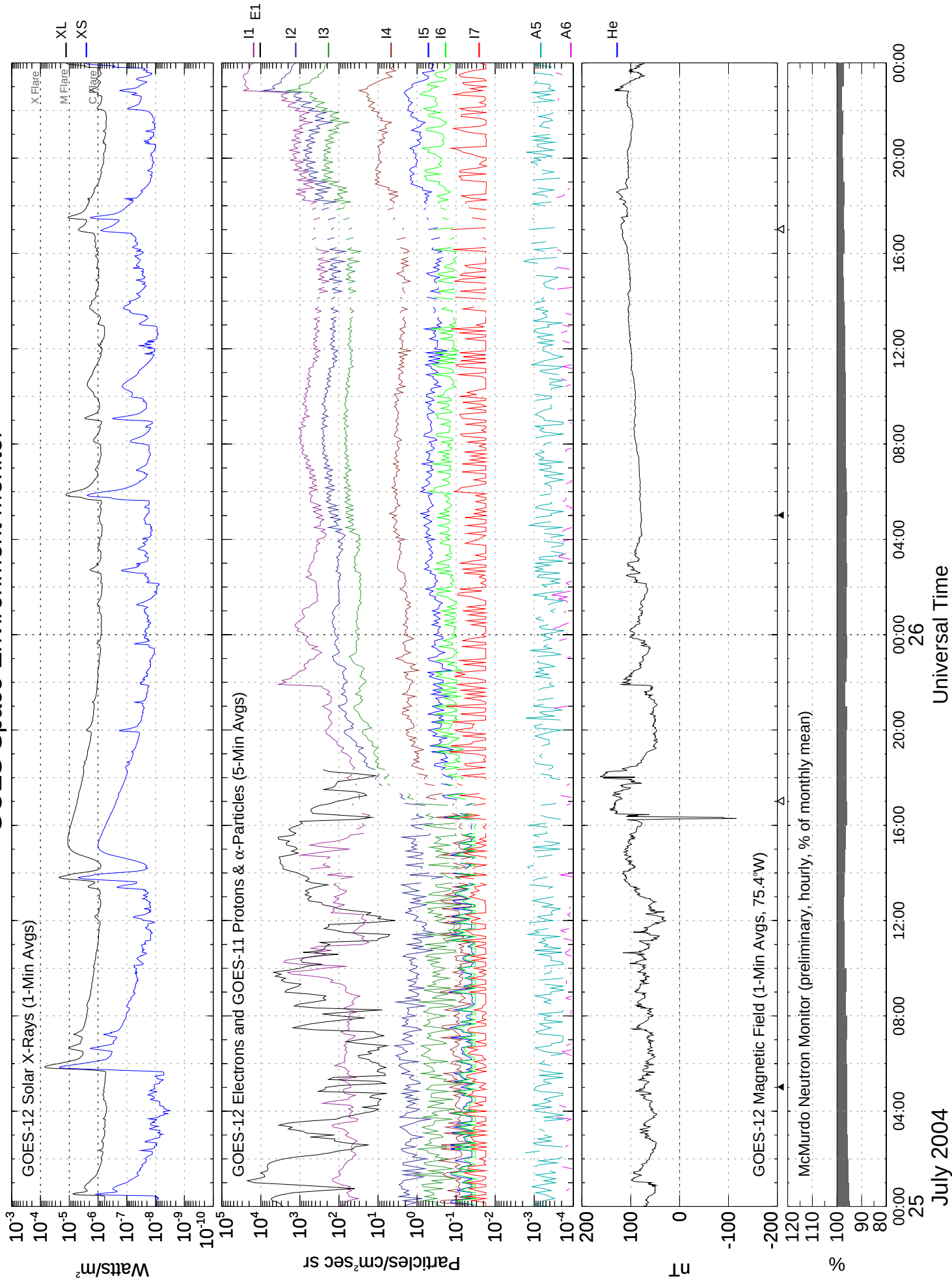
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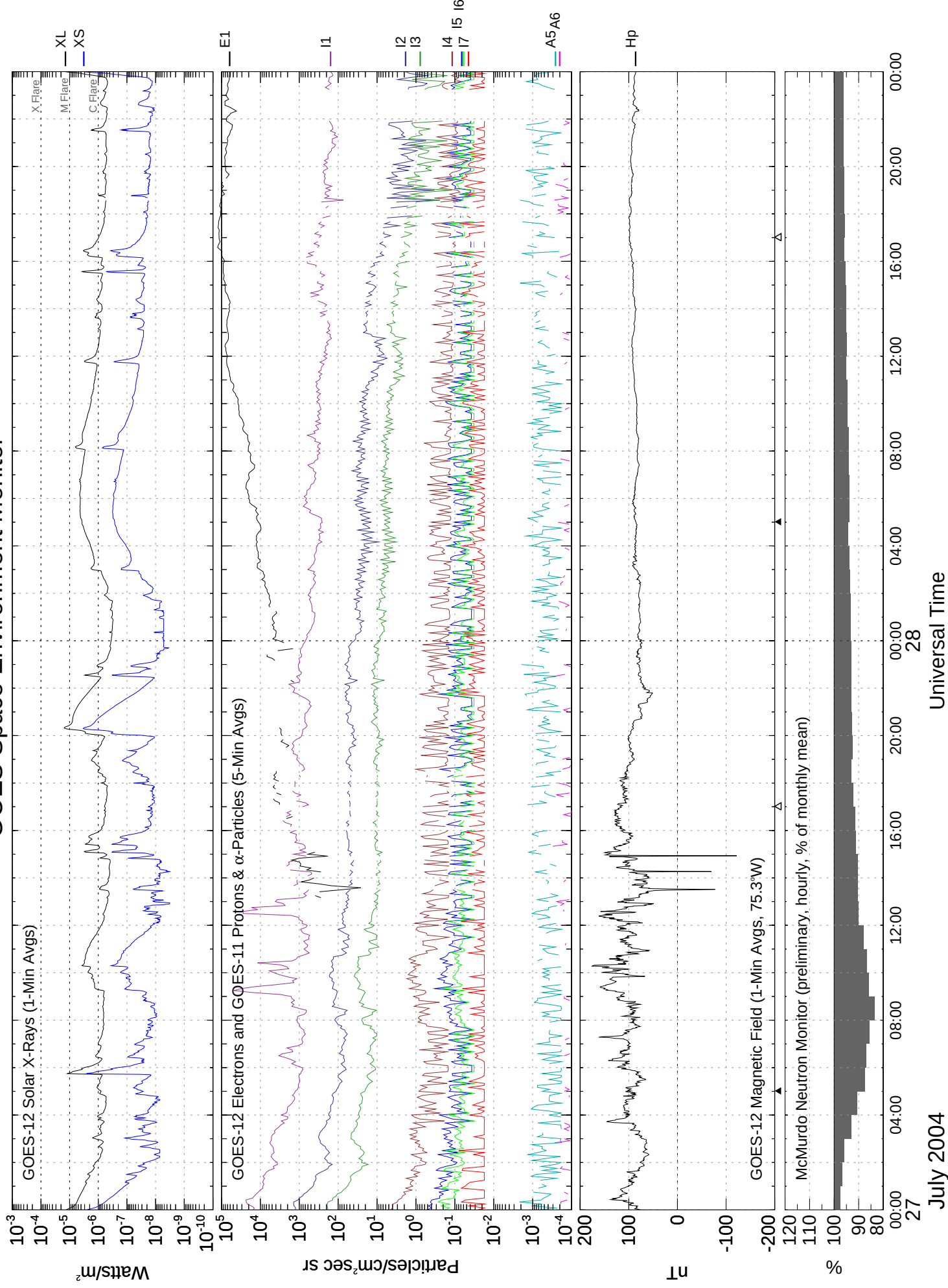


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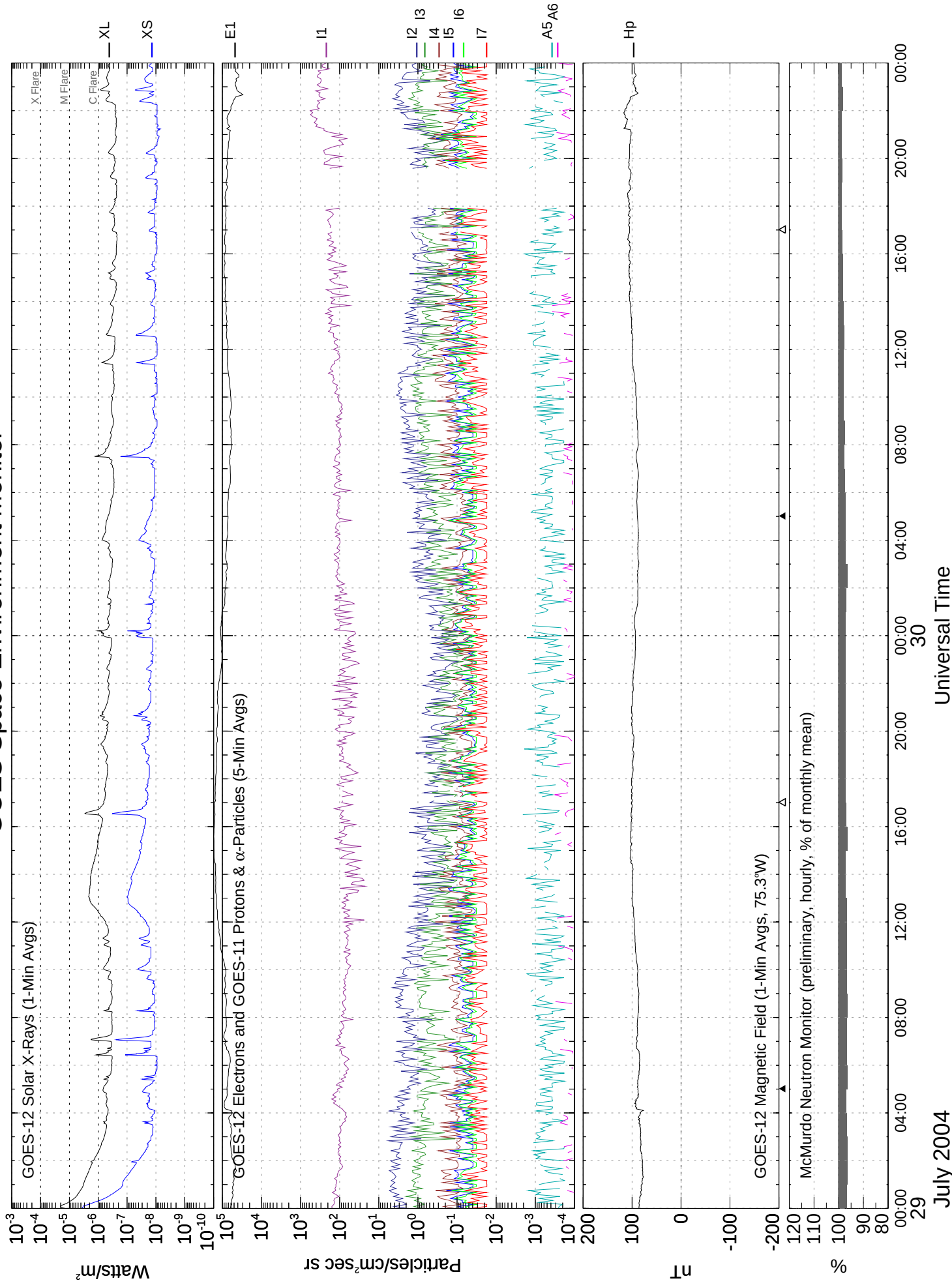




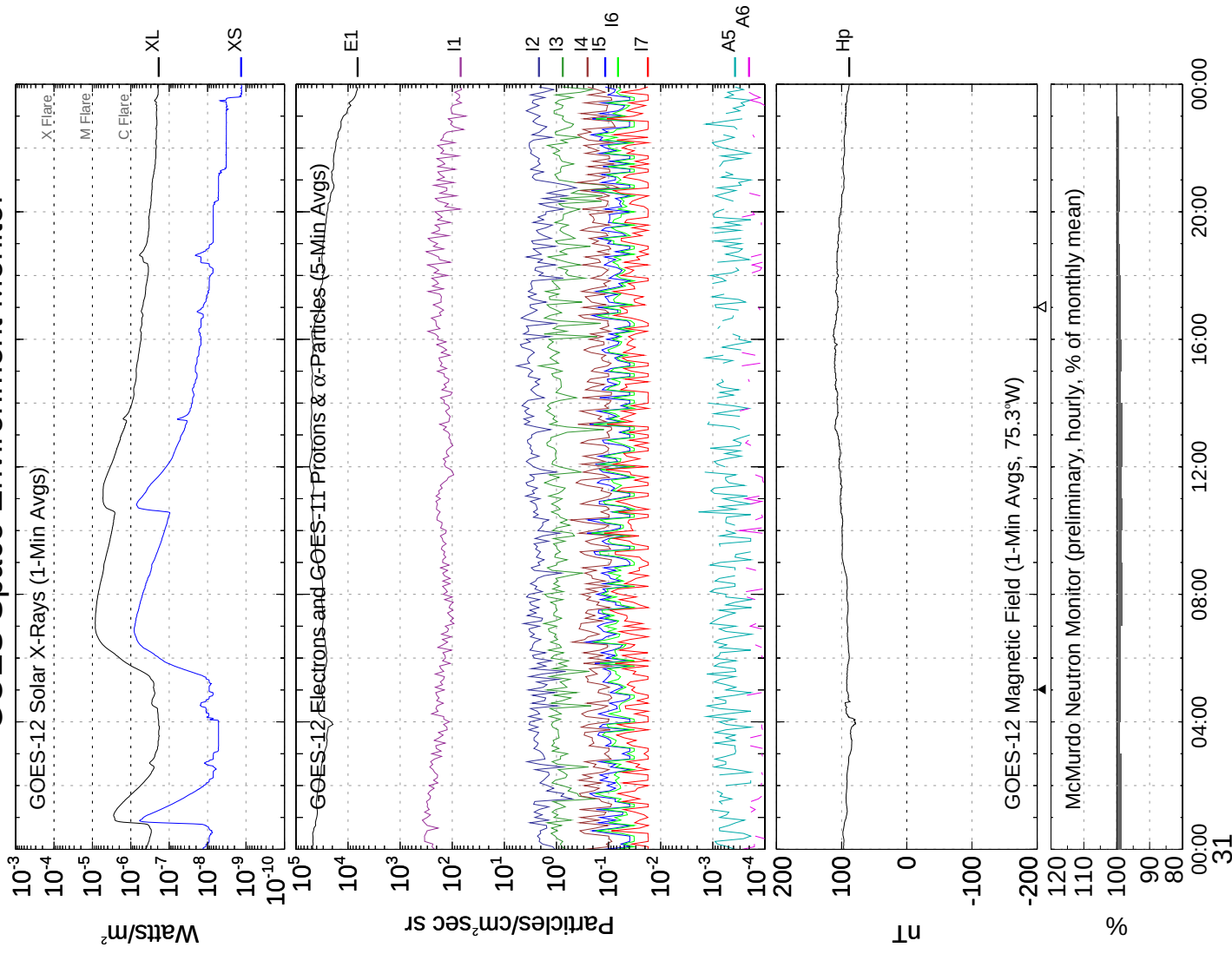
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July 2004

Universal Time

20  
Jul 04

# A L E R T P E R I O D S The International Space Environment Service

JULY                      2004

| Julian Day | Date of Issue | Date of Obs | Wolf No. | 10-cm Solar Flux | A-index | Rgn No. | Location |     | Flares |   |   | Date of Fcst | Region Fcst(1) | Geoadvice(1)  |
|------------|---------------|-------------|----------|------------------|---------|---------|----------|-----|--------|---|---|--------------|----------------|---------------|
|            |               |             |          |                  |         |         | Lat      | Lon | Opt    | M | X |              |                |               |
| 183        | 01            | 30          | 42       | 82               | 14      | 10637   | N08      | W58 | 0      | 0 | 0 | 01           | Q              | SOL: Quiet    |
|            |               |             |          |                  |         | 10639   | N09      | E31 | 0      | 0 | 0 | 01           | Q              | MAG: Quiet    |
|            |               |             |          |                  |         | 10640   | S08      | E28 | 2      | 0 | 0 | 01           | Q              | PRO: Quiet    |
| 184        | 02            | 01          | 26       | 81               | 19      | 10640   | N10      | E19 | 0      | 0 | 0 | 02           | Q              | SOL: Quiet    |
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| 185        | 03            | 02          | 33       | 81               | 8       | 10640   | N09      | E06 | 0      | 0 | 0 | 03           | Q              | SOL: Quiet    |
|            |               |             |          |                  |         | 10640   | S09      | E02 | 0      | 0 | 0 | 03           | Q              | MAG: Quiet    |
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| 186        | 04            | 03          | 31       | 80               | 10      | 10640   | N08      | W10 | 0      | 0 | 0 | 04           | Q              | SOL: Quiet    |
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|            |               |             |          |                  |         | 10643   | S08      | W07 | 0      | 0 | 0 | 10           | Q              | MAG: Quiet    |
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|            |               |             |          |                  |         | 10644   | N11      | E69 | 0      | 0 | 0 | 11           | Q              | PRO: Quiet    |
|            |               |             |          |                  |         | 10645   | N12      | W11 | 0      | 0 | 0 | 11           | Q              |               |
| 194        | 12            | 11          | 98       | 104              | 15      | 10642   | S07      | E12 | 0      | 0 | 0 | 12           | Q              | SOL: Eruptive |
|            |               |             |          |                  |         | 10643   | S08      | W37 | 0      | 0 | 0 | 12           | Q              | MAG: Active   |
|            |               |             |          |                  |         | 10644   | N12      | E58 | 0      | 0 | 0 | 12           | Q              | PRO: Quiet    |
|            |               |             |          |                  |         | 10645   | N11      | W18 | 0      | 0 | 0 | 12           | Q              |               |
|            |               |             |          |                  |         | 10646   | N13      | W33 | 0      | 0 | 0 | 12           | Q              |               |
|            |               |             |          |                  |         | 10647   | S14      | E61 | 0      | 0 | 0 | 12           | Q              |               |
| 195        | 13            | 12          | 118      | 125              | 17      | 10642   | S07      | W01 | 0      | 0 | 0 | 13           | Q              | SOL: Active   |
|            |               |             |          |                  |         | 10644   | N11      | E44 | 0      | 0 | 0 | 13           | Q              | MAG: Active   |
|            |               |             |          |                  |         | 10645   | N11      | W32 | 0      | 0 | 0 | 13           | Q              | PRO: Quiet    |
|            |               |             |          |                  |         | 10646   | N12      | W46 | 1      | 0 | 0 | 13           | Q              |               |
|            |               |             |          |                  |         | 10648   | N14      | W08 | 0      | 0 | 0 | 13           | Q              |               |
|            |               |             |          |                  |         | 10649   | S10      | E76 | 0      | 0 | 0 | 13           | E              |               |
| 196        | 14            | 13          | 129      | 127              | 16      | 10642   | S07      | W16 | 0      | 0 | 0 | 14           | Q              | SOL: Active   |
|            |               |             |          |                  |         | 10644   | N11      | E30 | 0      | 0 | 0 | 14           | Q              | MAG: Active   |
|            |               |             |          |                  |         | 10646   | N13      | W60 | 8      | 3 | 0 | 14           | E              | PRO: Quiet    |
|            |               |             |          |                  |         | 10648   | N16      | W22 | 0      | 0 | 0 | 14           | Q              |               |
|            |               |             |          |                  |         | 10649   | S10      | E64 | 2      | 2 | 0 | 14           | E              |               |
| 197        | 15            | 14          | 149      | 138              | 11      | 10642   | S08      | W28 | 0      | 0 | 0 | 15           | Q              | SOL: Active   |
|            |               |             |          |                  |         | 10644   | N11      | E17 | 0      | 0 | 0 | 15           | Q              | MAG: Quiet    |

# A L E R T P E R I O D S

## The International Space Environment Service

### JULY 2004

| Julian Day | Date of Issue | Date of Obs | Wolf No. | 10-cm Solar Flux | A-index | Rgn No. | Location |     | Flares |   |   | Date of Fcst | Region Fcst(1) | Geoadvice(1)                            |
|------------|---------------|-------------|----------|------------------|---------|---------|----------|-----|--------|---|---|--------------|----------------|-----------------------------------------|
|            |               |             |          |                  |         |         | Lat      | Lon | Opt    | M | X |              |                |                                         |
|            |               |             |          |                  |         | 10646   | N12      | W72 | 3      | 1 | 0 | 15           | E              | PRO: Quiet                              |
|            |               |             |          |                  |         | 10648   | N16      | W35 | 0      | 0 | 0 | 15           | Q              |                                         |
|            |               |             |          |                  |         | 10649   | S10      | E53 | 2      | 1 | 0 | 15           | E              |                                         |
|            |               |             |          |                  |         | 10650   | S08      | E31 | 0      | 0 | 0 | 15           | Q              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | E44 | 0      | 0 | 0 | 15           | Q              |                                         |
| 198        | 16            | 15          | 146      | 146              | 10      | 10642   | S08      | W42 | 0      | 0 | 0 | 16           | Q              | SOL: Active<br>MAG: Quiet<br>PRO: Quiet |
|            |               |             |          |                  |         | 10644   | N12      | E04 | 0      | 0 | 0 | 16           | Q              |                                         |
|            |               |             |          |                  |         | 10646   | N14      | W84 | 1      | 0 | 0 | 16           | Q              |                                         |
|            |               |             |          |                  |         | 10648   | N15      | W51 | 0      | 0 | 0 | 16           | Q              |                                         |
|            |               |             |          |                  |         | 10649   | S10      | E40 | 0      | 0 | 2 | 16           | E              |                                         |
|            |               |             |          |                  |         | 10650   | S08      | E18 | 0      | 0 | 0 | 16           | Q              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | E29 | 0      | 0 | 0 | 16           | Q              |                                         |
| 199        | 17            | 16          | 142      | 147              | 11      | 10642   | S07      | W56 | 0      | 0 | 0 | 17           | Q              | SOL: Major<br>MAG: Active<br>PRO: Quiet |
|            |               |             |          |                  |         | 10644   | N13      | W07 | 0      | 0 | 0 | 17           | Q              |                                         |
|            |               |             |          |                  |         | 10649   | S10      | E26 | 5      | 1 | 3 | 17           | E              |                                         |
|            |               |             |          |                  |         | 10650   | S08      | E08 | 0      | 0 | 0 | 17           | Q              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | E14 | 0      | 0 | 0 | 17           | Q              |                                         |
|            |               |             |          |                  |         | 10652   | N05      | E84 | 1      | 0 | 0 | 17           | Q              |                                         |
| 200        | 18            | 17          | 165      | 149              | 23      | 10642   | S07      | W69 | 0      | 0 | 0 | 18           | Q              | SOL: Major<br>MAG: Active<br>PRO: Quiet |
|            |               |             |          |                  |         | 10644   | N13      | W20 | 0      | 0 | 0 | 18           | Q              |                                         |
|            |               |             |          |                  |         | 10649   | S10      | E13 | 9      | 3 | 1 | 18           | E              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | E01 | 0      | 0 | 0 | 18           | Q              |                                         |
|            |               |             |          |                  |         | 10652   | N05      | E71 | 2      | 0 | 0 | 18           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S14      | E71 | 0      | 0 | 0 | 18           | Q              |                                         |
| 201        | 19            | 18          | 169      | 155              | 7       | 10642   | S07      | W82 | 0      | 0 | 0 | 19           | Q              | SOL: Major<br>MAG: Quiet<br>PRO: Quiet  |
|            |               |             |          |                  |         | 10644   | N13      | W33 | 0      | 0 | 0 | 19           | Q              |                                         |
|            |               |             |          |                  |         | 10649   | S10      | E00 | 10     | 3 | 0 | 19           | E              |                                         |
|            |               |             |          |                  |         | 10650   | S12      | W15 | 0      | 0 | 0 | 19           | Q              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | W10 | 0      | 0 | 0 | 19           | Q              |                                         |
|            |               |             |          |                  |         | 10652   | N05      | E58 | 3      | 0 | 0 | 19           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S14      | E58 | 0      | 0 | 0 | 19           | Q              |                                         |
| 202        | 20            | 19          | 176      | 170              | 12      | 10644   | N13      | W46 | 0      | 0 | 0 | 20           | Q              | SOL: Active<br>MAG: Quiet<br>PRO: Quiet |
|            |               |             |          |                  |         | 10649   | S10      | W13 | 5      | 0 | 0 | 20           | E              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | W23 | 0      | 0 | 0 | 20           | Q              |                                         |
|            |               |             |          |                  |         | 10652   | N05      | E45 | 2      | 0 | 0 | 20           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S14      | E45 | 1      | 0 | 0 | 20           | Q              |                                         |
| 203        | 21            | 20          | 147      | 175              | 9       | 10644   | N13      | W61 | 0      | 0 | 0 | 21           | Q              | SOL: Major<br>MAG: Quiet<br>PRO: Quiet  |
|            |               |             |          |                  |         | 10649   | S10      | W27 | 1      | 0 | 0 | 21           | E              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | W37 | 0      | 0 | 0 | 21           | Q              |                                         |
|            |               |             |          |                  |         | 10652   | N10      | E32 | 4      | 1 | 0 | 21           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S14      | E32 | 0      | 0 | 0 | 21           | Q              |                                         |
| 204        | 22            | 21          | 162      | 172              | 4       | 10644   | N12      | W73 | 0      | 0 | 0 | 22           | Q              | SOL: Major<br>MAG: Quiet<br>PRO: Quiet  |
|            |               |             |          |                  |         | 10649   | S10      | W41 | 1      | 0 | 0 | 22           | E              |                                         |
|            |               |             |          |                  |         | 10651   | S16      | W48 | 0      | 0 | 0 | 22           | Q              |                                         |
|            |               |             |          |                  |         | 10652   | N08      | E19 | 2      | 0 | 0 | 22           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S12      | E20 | 0      | 0 | 0 | 22           | Q              |                                         |
| 205        | 23            | 22          | 117      | 173              | 16      | 10644   | N11      | W88 | 0      | 0 | 0 | 23           | Q              | SOL: Major<br>MAG: Active<br>PRO: Quiet |
|            |               |             |          |                  |         | 10649   | S11      | W56 | 0      | 0 | 0 | 23           | Q              |                                         |
|            |               |             |          |                  |         | 10652   | N08      | E06 | 4      | 2 | 0 | 23           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S12      | E05 | 0      | 0 | 0 | 23           | E              |                                         |
| 206        | 24            | 23          | 86       | 165              | 40      | 10649   | S11      | W74 | 0      | 0 | 0 | 24           | Q              | SOL: Major<br>MAG: Active<br>PRO: Quiet |
|            |               |             |          |                  |         | 10652   | N08      | W10 | 3      | 2 | 0 | 24           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S13      | W09 | 0      | 0 | 0 | 24           | Q              |                                         |
| 207        | 25            | 24          | 109      | 147              | 26      | 10649   | S11      | W87 | 0      | 0 | 0 | 25           | Q              | SOL: Major<br>MAG: Active<br>PRO: Quiet |
|            |               |             |          |                  |         | 10652   | N08      | W21 | 5      | 2 | 0 | 25           | E              |                                         |
|            |               |             |          |                  |         | 10653   | S12      | W24 | 0      | 0 | 0 | 25           | Q              |                                         |

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Jul 04

A L E R T P E R I O D S  
The International Space Environment Service

JULY                      2004

| Julian<br>Day | Date<br>of<br>Issue | Date<br>of<br>Obs | Wolf<br>No. | 10-cm<br>Solar<br>Flux | A-<br>index | Rgn<br>No. | Location |     | Flares |   |   | Date<br>of<br>Fcst | Region<br>Fcst(1) | Geoadvice(1)  |
|---------------|---------------------|-------------------|-------------|------------------------|-------------|------------|----------|-----|--------|---|---|--------------------|-------------------|---------------|
|               |                     |                   |             |                        |             |            | Lat      | Lon | Opt    | M | X |                    |                   |               |
| 208           | 26                  | 25                | 130         | 145                    | 91          | 10652      | N08      | W35 | 5      | 4 | 0 | 26                 | P                 | SOL: Active   |
|               |                     |                   |             |                        |             | 10653      | S12      | W37 | 0      | 0 | 0 | 26                 | A                 | MAG: Major    |
|               |                     |                   |             |                        |             | 10654      | N08      | E52 | 0      | 0 | 0 | 26                 | A                 | PRO: IP       |
| 209           | 27                  | 26                | 113         | 128                    | 30          | 10652      | N08      | W47 | 5      | 3 | 0 | 27                 | A                 | SOL: Active   |
|               |                     |                   |             |                        |             | 10653      | S12      | W50 | 0      | 0 | 0 | 27                 | A                 | MAG: Major    |
|               |                     |                   |             |                        |             | 10654      | N07      | E38 | 0      | 0 | 0 | 27                 | A                 | PRO: IP       |
| 210           | 28                  | 27                | 66          | 118                    | 131         | 10652      | N07      | W62 | 5      | 2 | 0 | 28                 | P                 | SOL: Active   |
|               |                     |                   |             |                        |             | 10653      | S14      | W65 | 0      | 0 | 0 | 28                 | A                 | MAG: Major    |
|               |                     |                   |             |                        |             | 10654      | N07      | E25 | 0      | 0 | 0 | 28                 | A                 | PRO: IP       |
| 211           | 29                  | 28                | 66          | 101                    | 13          | 10652      | N08      | W76 | 7      | 1 | 0 | 29                 | E                 | SOL: Active   |
|               |                     |                   |             |                        |             | 10653      | S12      | W76 | 0      | 0 | 0 | 29                 | Q                 | MAG: Quiet    |
|               |                     |                   |             |                        |             | 10654      | N08      | E11 | 1      | 0 | 0 | 29                 | Q                 | PRO: Quiet    |
| 212           | 30                  | 29                | 32          | 100                    | 12          | 10654      | N08      | W89 | 1      | 0 | 0 | 30                 | E                 | SOL: Eruptive |
|               |                     |                   |             |                        |             | 10654      | N08      | W02 | 0      | 0 | 0 | 30                 | Q                 | MAG: Active   |
|               |                     |                   |             |                        |             |            |          |     | 0      | 0 | 0 | 30                 |                   | PRO: Quiet    |
| 213           | 31                  | 30                | 33          | 89                     | 7           | 10655      | N08      | W15 | 0      | 0 | 0 | 31                 | Q                 | SOL: Eruptive |
|               |                     |                   |             |                        |             | 10655      | S09      | E71 | 0      | 0 | 0 | 31                 | Q                 | MAG: Active   |
|               |                     |                   |             |                        |             |            |          |     | 0      | 0 | 0 | 31                 |                   | PRO: Quiet    |

(1) Region Forecast and Flare (SOL) Advice

Q = Quiet (<50% probability of C-class flares)  
E = Eruptive (C-class flares expected, probability >=50%)  
A = Active (M-class flares expected, probability >=50%)  
M = Major (X-class flares expected, probability >=50%)  
P = Proton (Proton flares expected, probability >=50%)  
W = Warning (activity levels are expected to increase, but no numerical forecast given)  
/ = No forecast available

Magnetic (MAG) Geoadvice

'Quiet'  
'Active' conditions expected (A>=20 or K=4)  
'Minor' storm expected (A>=30 or K=5)  
'Major' storm expected (A>=50 or K>=6)  
'Severe' storm expected (A>=100 or K>=7)  
'IP' magstorm in progress (A>=30 or K>=4)  
'Warning' (activity levels are expected to increase, but no numerical forecast given)  
'/' no forecast available

Proton (PRO) Geoadvice

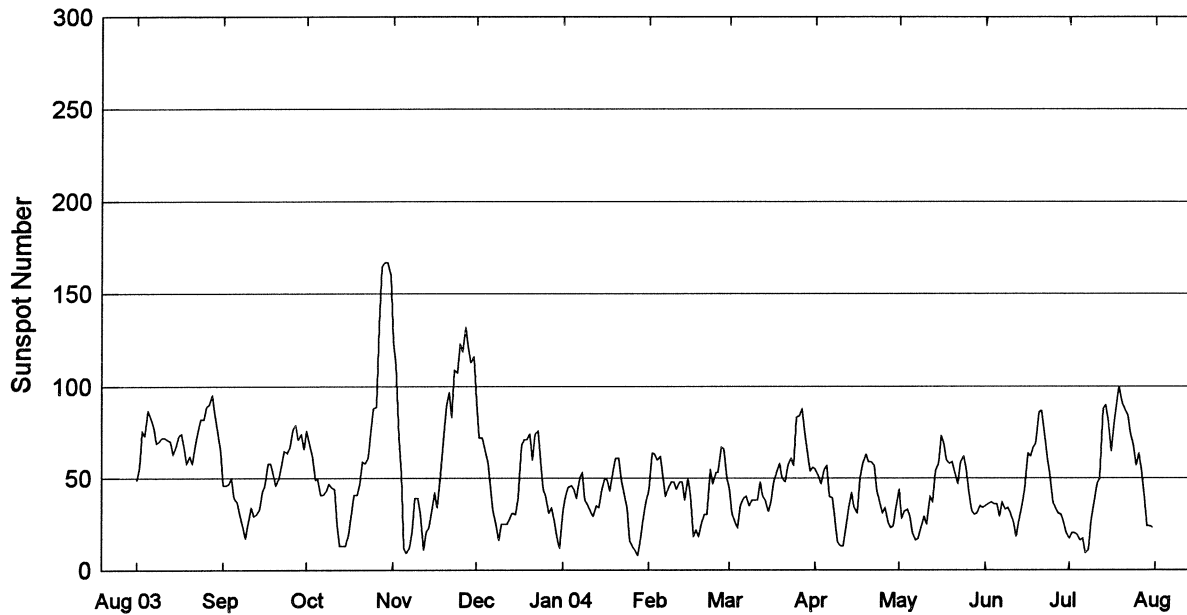
'Quiet'  
'Proton' event expected (10pfu at >10MeV)  
'Major' proton event expected (100pfu at >100 MeV)  
'IP' proton event in progress (>10 MeV)  
'Warning' (activity levels are expected to increase, but no numerical forecast given)  
'/' no forecast available

STRATWARM ALERTS - NONE



# International Relative Sunspot Numbers Aug 2003- Jul 2004

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Jul 04

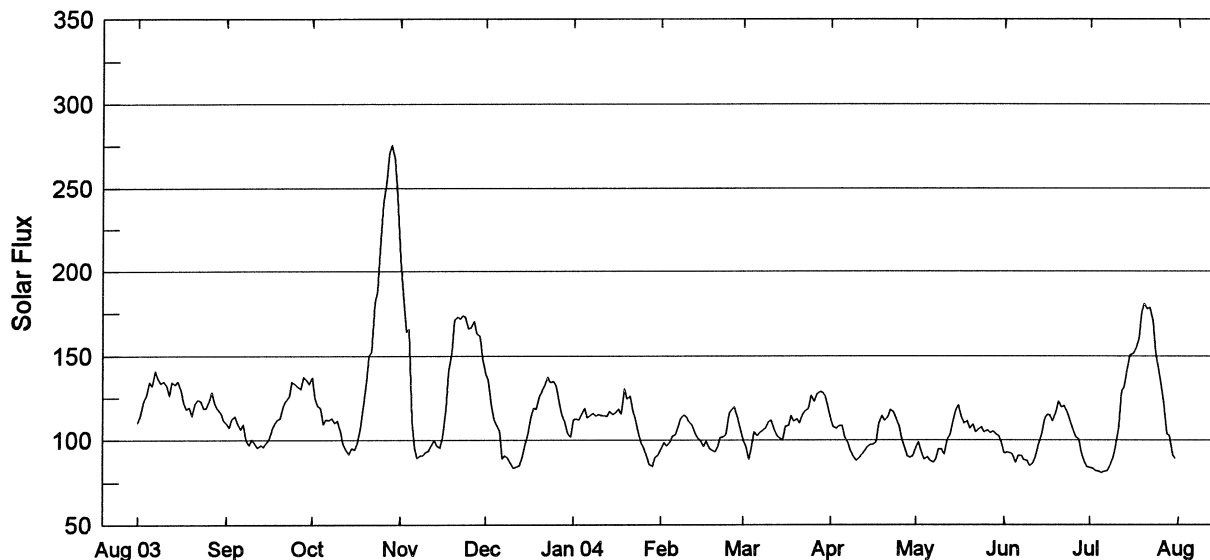


| Day  | Aug 03 | Sep  | Oct  | Nov  | Dec  | Jan 04 | Feb  | Mar  | Apr* | May* | Jun* | Jul* |
|------|--------|------|------|------|------|--------|------|------|------|------|------|------|
| 1    | 49     | 46   | 76   | 124  | 92   | 32     | 43   | 44   | 55   | 44   | 35   | 17   |
| 2    | 56     | 46   | 68   | 112  | 72   | 40     | 64   | 31   | 51   | 28   | 36   | 20   |
| 3    | 76     | 47   | 62   | 72   | 72   | 45     | 63   | 26   | 47   | 32   | 37   | 20   |
| 4    | 73     | 50   | 49   | 52   | 66   | 46     | 60   | 23   | 55   | 33   | 36   | 19   |
| 5    | 87     | 39   | 50   | 12   | 59   | 44     | 62   | 35   | 57   | 29   | 36   | 16   |
| 6    | 83     | 37   | 41   | 9    | 45   | 39     | 51   | 39   | 40   | 20   | 29   | 17   |
| 7    | 78     | 30   | 41   | 12   | 32   | 50     | 40   | 40   | 39   | 16   | 37   | 9    |
| 8    | 69     | 25   | 43   | 21   | 26   | 53     | 45   | 35   | 27   | 17   | 33   | 11   |
| 9    | 70     | 17   | 47   | 39   | 16   | 38     | 48   | 38   | 15   | 24   | 34   | 27   |
| 10   | 72     | 25   | 45   | 39   | 25   | 36     | 48   | 38   | 13   | 29   | 31   | 38   |
| 11   | 72     | 34   | 44   | 30   | 25   | 32     | 44   | 38   | 13   | 25   | 26   | 47   |
| 12   | 71     | 29   | 25   | 11   | 25   | 29     | 48   | 48   | 25   | 40   | 18   | 50   |
| 13   | 70     | 30   | 13   | 21   | 28   | 35     | 48   | 40   | 35   | 37   | 28   | 88   |
| 14   | 63     | 33   | 13   | 23   | 31   | 34     | 38   | 38   | 42   | 54   | 35   | 90   |
| 15   | 67     | 42   | 13   | 33   | 30   | 43     | 50   | 32   | 34   | 58   | 44   | 82   |
| 16   | 73     | 46   | 19   | 42   | 39   | 50     | 41   | 37   | 31   | 73   | 64   | 65   |
| 17   | 74     | 58   | 30   | 34   | 68   | 49     | 18   | 48   | 50   | 69   | 62   | 79   |
| 18   | 67     | 58   | 41   | 52   | 71   | 43     | 22   | 54   | 58   | 60   | 67   | 93   |
| 19   | 58     | 52   | 41   | 70   | 71   | 54     | 18   | 58   | 63   | 58   | 69   | 100  |
| 20   | 62     | 46   | 47   | 90   | 74   | 61     | 26   | 50   | 59   | 59   | 86   | 91   |
| 21   | 58     | 50   | 59   | 97   | 60   | 61     | 30   | 48   | 59   | 52   | 87   | 88   |
| 22   | 69     | 57   | 58   | 83   | 74   | 49     | 30   | 57   | 57   | 47   | 76   | 84   |
| 23   | 76     | 65   | 61   | 109  | 76   | 42     | 55   | 61   | 43   | 59   | 61   | 74   |
| 24   | 82     | 64   | 75   | 107  | 59   | 34     | 47   | 57   | 38   | 62   | 52   | 69   |
| 25   | 82     | 67   | 88   | 123  | 44   | 16     | 53   | 83   | 31   | 55   | 37   | 57   |
| 26   | 89     | 77   | 89   | 119  | 40   | 13     | 53   | 84   | 34   | 43   | 34   | 64   |
| 27   | 90     | 79   | 133  | 132  | 31   | 11     | 67   | 88   | 26   | 32   | 31   | 55   |
| 28   | 95     | 71   | 165  | 121  | 34   | 8      | 66   | 76   | 23   | 30   | 30   | 39   |
| 29   | 85     | 74   | 167  | 113  | 26   | 16     | 50   | 66   | 24   | 31   | 26   | 24   |
| 30   | 74     | 66   | 167  | 116  | 17   | 27     |      | 54   | 34   | 35   | 20   | 24   |
| 31   | 65     |      | 160  |      | 12   | 38     |      | 56   |      | 34   |      | 23   |
| Mean | 72.7   | 48.7 | 65.5 | 67.3 | 46.5 | 37.7   | 45.8 | 49.1 | 39.3 | 41.5 | 43.2 | 51.0 |

\* = Provisional.

# Penticton 2800 MHz (10.7cm) Solar Flux Aug 2003 - Jul 2004

Adjusted to 1 AU



| Day  | Aug 03 | Sep   | Oct    | Nov    | Dec    | Jan 04 | Feb   | Mar   | Apr   | May   | Jun   | Jul    |
|------|--------|-------|--------|--------|--------|--------|-------|-------|-------|-------|-------|--------|
| 1    | 110.6  | 110.1 | 137.1  | 207.2  | 139.3  | 112.2  | 94.5  | 100.0 | 112.6 | 95.7  | 92.5  | 84.0   |
| 2    | 114.7  | 107.6 | 125.0  | 187.4  | 135.4  | 112.6  | 98.5  | 97.1  | 108.1 | 99.1  | 93.0  | 83.4   |
| 3    | 123.6  | 112.4 | 120.3  | 164.2  | 120.3  | 112.3  | 96.6  | 88.9  | 107.4 | 92.8  | 92.6  | 82.2   |
| 4    | 126.0  | 114.1 | 119.0  | 165.6# | 112.5  | 115.5  | 98.6  | 95.9  | 109.0 | 88.9  | 92.0  | 82.1   |
| 5    | 134.4  | 109.8 | 109.6  | 112.1  | 108.5  | 119.0  | 102.5 | 105.0 | 108.9 | 90.1  | 87.0  | 80.9   |
| 6    | 132.4  | 106.6 | 112.0  | 96.1   | 105.7  | 113.4  | 103.7 | 102.9 | 101.6 | 88.0  | 91.0  | 81.6   |
| 7    | 140.9  | 109.4 | 111.8  | 89.4   | 89.3   | 114.9  | 108.1 | 104.6 | 98.4  | 86.8  | 91.2  | 81.9   |
| 8    | 136.6  | 100.3 | 113.1  | 91.0   | 90.9   | 116.1  | 113.1 | 106.3 | 93.8  | 88.9  | 88.6  | 84.6   |
| 9    | 133.6  | 97.3  | 110.5  | 91.2   | 89.4   | 114.4  | 114.7 | 107.2 | 90.3  | 95.0  | 87.9  | 89.6   |
| 10   | 134.7  | 100.6 | 111.4  | 92.8   | 86.5   | 115.3  | 113.5 | 111.1 | 88.1  | 94.8  | 85.0  | 96.4   |
| 11   | 132.7  | 98.0  | 105.4  | 93.7   | 83.4   | 114.6  | 111.2 | 111.7 | 90.0  | 92.0  | 86.5  | 107.9  |
| 12   | 126.6  | 95.6  | 97.4   | 96.7   | 84.5   | 114.4  | 109.3 | 106.2 | 91.8  | 100.9 | 90.7  | 129.2  |
| 13   | 134.3  | 97.3  | 94.0   | 100.0  | 85.0   | 114.1  | 105.1 | 102.6 | 93.6  | 103.0 | 98.2  | 131.6# |
| 14   | 133.1  | 95.8  | 91.9   | 96.8   | 89.5   | 117.1  | 101.1 | 101.3 | 95.8  | 112.1 | 103.1 | 142.6  |
| 15   | 134.7  | 98.4  | 95.3   | 95.6   | 97.7   | 115.2  | 99.6  | 100.3 | 97.4  | 117.9 | 112.9 | 150.5  |
| 16   | 130.1  | 100.4 | 94.6   | 102.0  | 103.0  | 116.4  | 96.3  | 108.5 | 97.6  | 121.0 | 115.1 | 151.3  |
| 17   | 122.3  | 107.0 | 98.1   | 118.2  | 113.8  | 118.6  | 99.5  | 108.8 | 99.0  | 113.7 | 114.9 | 154.1  |
| 18   | 118.7  | 110.2 | 107.8  | 141.0  | 119.1  | 115.6  | 95.4  | 114.4 | 110.0 | 110.4 | 111.3 | 160.2  |
| 19   | 119.5  | 112.1 | 119.4  | 151.5  | 118.6  | 130.3  | 94.2  | 111.3 | 114.5 | 111.4 | 116.4 | 175.8  |
| 20   | 114.5  | 112.9 | 133.9  | 171.0  | 125.9  | 124.8  | 93.2  | 112.7 | 111.8 | 107.2 | 123.0 | 180.8  |
| 21   | 122.0  | 120.9 | 150.2  | 172.8  | 129.1  | 126.0  | 96.0  | 110.4 | 113.9 | 109.6 | 119.6 | 177.7  |
| 22   | 123.7  | 123.5 | 152.0# | 171.9  | 133.2  | 117.9  | 101.7 | 115.6 | 118.4 | 105.0 | 120.5 | 178.4  |
| 23   | 122.9  | 125.7 | 181.3# | 173.8  | 137.4  | 111.6  | 102.1 | 117.6 | 116.6 | 106.6 | 116.2 | 170.4  |
| 24   | 119.0  | 134.3 | 188.5  | 172.8  | 134.4  | 104.1  | 103.4 | 119.0 | 112.9 | 107.9 | 111.9 | 151.8  |
| 25   | 119.0  | 133.4 | 219.0  | 166.3  | 134.6  | 99.1   | 116.1 | 126.4 | 108.4 | 105.1 | 106.3 | 143.9* |
| 26   | 123.4  | 131.8 | 240.6* | 166.5  | 132.7  | 95.0   | 118.4 | 123.2 | 100.9 | 106.1 | 102.2 | 132.0  |
| 27   | 128.3  | 130.3 | 254.0  | 170.1  | 122.4# | 90.8   | 119.8 | 127.2 | 96.4  | 104.6 | 100.4 | 121.8  |
| 28   | 121.1  | 137.6 | 270.9  | 163.2  | 115.1  | 85.9   | 113.6 | 128.6 | 90.7  | 105.2 | 92.4  | 103.8  |
| 29   | 118.7  | 135.6 | 275.4# | 161.4  | 110.7  | 84.8   | 108.0 | 128.3 | 89.8  | 104.0 | 87.9  | 102.8  |
| 30   | 116.2  | 133.3 | 267.6  | 148.6  | 104.2  | 89.9   |       | 126.4 | 90.8  | 102.4 | 84.5  | 91.4   |
| 31   | 111.8  |       | 245.2  |        | 102.1  | 91.6   |       | 121.0 |       | 98.1  |       | 89.0   |
| Mean | 125.2  | 113.4 | 150.1  | 137.7  | 111.4  | 110.4  | 104.4 | 111.0 | 101.9 | 102.1 | 100.5 | 122.4  |

NOTE: # - 1700 or 1800UT reading, burst in progress at 2000UT. \*-2300UT reading, burst in progress.

DAILY SOLAR INDICES  
July 2004

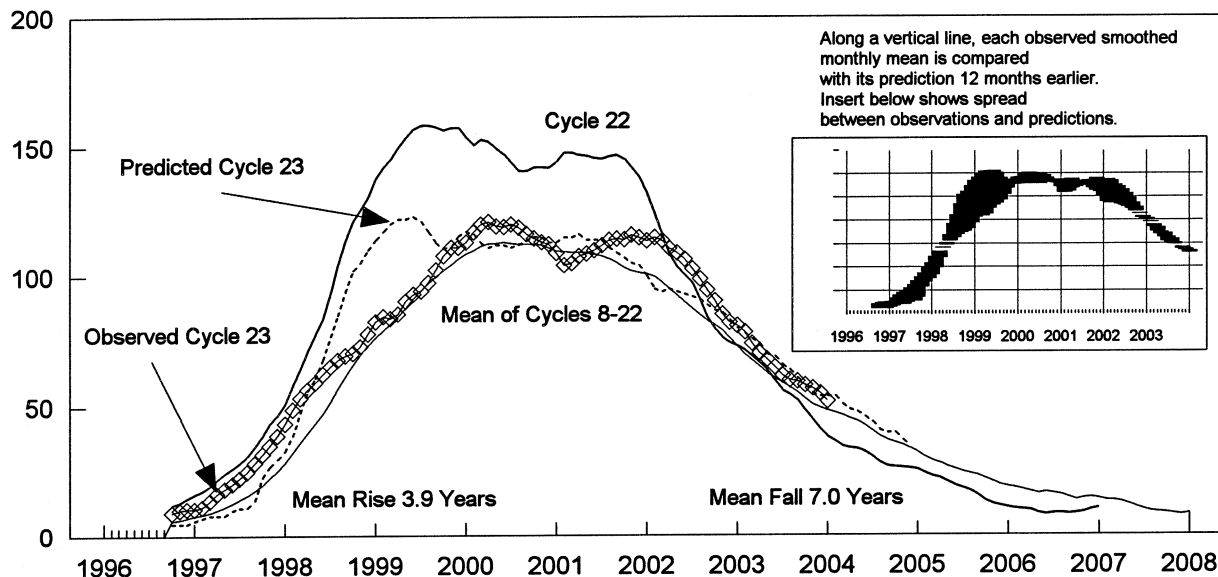
| Day  | Day of Year | Bartels Cycle | Sunspot Numbers |      | Obs Flux         |              | ——Solar Flux Adjusted to 1 Astronomical Unit—— |             |                  |             |             |            |            |            |
|------|-------------|---------------|-----------------|------|------------------|--------------|------------------------------------------------|-------------|------------------|-------------|-------------|------------|------------|------------|
|      |             |               | Int             | Amer | Penticton (2800) | SGMR (15400) | SGMR (8800)                                    | SGMR (4995) | Penticton (2800) | SGMR (2695) | SGMR (1415) | SGMR (610) | SGMR (410) | SGMR (245) |
| 1    | 183         | 3             | 17              | 19   | 81.3             | 522          | 220                                            | 136         | 84.0             | 89          | 54          | 36         | 27         | 12         |
| 2    | 184         | 4             | 20              | 22   | 80.7             | 507          | 217                                            | 133         | 83.4             | 89          | 53          | 37         | 28         | 20         |
| 3    | 185         | 5             | 20              | 23   | 79.5             | 516          | 217                                            | 132         | 82.2             | 90          | 53          | 33         | 25         | 14         |
| 4    | 186         | 6             | 19              | 18   | 79.4             | 528          | 217                                            | 132         | 82.1             | 88          | 54          | 37         | 28         | 12         |
| 5    | 187         | 7             | 16              | 14   | 78.2             | 472          | 209                                            | 143         | 80.9             | 84          | 52          | 33         | 26         | 12         |
| 6    | 188         | 8             | 17              | 16   | 78.9             | 506          | 222                                            | 136         | 81.6             | 87          | 51          | 35         | 26         | 11         |
| 7    | 189         | 9             | 9               | 11   | 79.3             | 530          | 222                                            | 134         | 81.9             | 102         | 52          | 36         | 28         | 14         |
| 8    | 190         | 10            | 11              | 16   | 81.8             | 517          | 216                                            | 133         | 84.6             | 91          | 53          | 35         | 27         | 12         |
| 9    | 191         | 11            | 27              | 28   | 86.7             | 520          | 229                                            | 144         | 89.6             | 93          | 56          | 37         | 34         | 13         |
| 10   | 192         | 12            | 38              | 46   | 93.3             | 522          | 230                                            | 149         | 96.4             | 98          | 58          | 35         | 25         | 8          |
| 11   | 193         | 13            | 47              | 53   | 104.4            | 536          | 236                                            | 164         | 107.9            | 112         | 63          | 37         | 30         | 13         |
| 12   | 194         | 14            | 50              | 74   | 125.0            | 546          | 253                                            | 183         | 129.2            | 130         | 73          | 41         | 30         | 28         |
| 13   | 195         | 15            | 88              | 96   | 127.3#           | 488          | 259                                            | 195         | 131.6#           | 141         | 74          | 38         | 33         | 13         |
| 14   | 196         | 16            | 90              | 95   | 138.1            | 506          | 264                                            | 201         | 142.6            | 147         | 80          | 39         | 30         | 14         |
| 15   | 197         | 17            | 82              | 81   | 145.7            | 547          | 252                                            | 198         | 150.5            | 153         | 84          | 44         | 36         | 20         |
| 16   | 198         | 18            | 65              | 73   | 146.5            | 562          | 278                                            | 224         | 151.3            | 166         | 94          | 47         | 136        | 24         |
| 17   | 199         | 19            | 79              | 88   | 149.2            | 562          | 285                                            | 223         | 154.1            | 164         | 90          | 47         | 39         | 26         |
| 18   | 200         | 20            | 93              | 99   | 155.1            | 559          | 289                                            | 232         | 160.2            | 166         | 92          | 50         | 49         | 62         |
| 19   | 201         | 21            | 100             | 106  | 170.2            | 535          | 309                                            | 272         | 175.8            | 191         | 102         | 52         | 64         | 89         |
| 20   | 202         | 22            | 91              | 103  | 175.2            | 573          | 304                                            | 269         | 180.8            | 196         | 101         | 49         | 62         |            |
| 21   | 203         | 23            | 88              | 93   | 172.2            | 563          | 296                                            | 266         | 177.7            | 183         | 94          | 49         | 41         | 56         |
| 22   | 204         | 24            | 84              | 91   | 172.9            | 588          | 335                                            | 318         | 178.4            | 220         | 112         | 83         | 74         |            |
| 23   | 205         | 25            | 74              | 85   | 165.1            | 557          | 298                                            | 250         | 170.4            | 170         | 86          | 46         | 40         |            |
| 24   | 206         | 26            | 69              | 80   | 147.2            | 506          | 275                                            | 239         | 151.8            | 153         | 77          | 45         | 41         | 63         |
| 25   | 207         | 27            | 57              | 68   | 139.5*           | 579          | 294                                            | 269         | 143.9*           | 193         | 100         | 51         | 64         | 65         |
| 26   | 208         | 1             | 64              | 66   | 128.0            | 545          | 269                                            | 214         | 132.0            | 146         | 74          | 41         | 32         | 15         |
| 27   | 209         | 2             | 55              | 56   | 118.1            | 533          | 245                                            | 198         | 121.8            | 126         | 66          | 38         | 31         | 20         |
| 28   | 210         | 3             | 39              | 33   | 100.7            | 522          | 237                                            | 169         | 103.8            | 106         | 62          | 37         | 29         | 22         |
| 29   | 211         | 4             | 24              | 24   | 99.7             | 529          | 238                                            | 161         | 102.8            | 107         | 62          | 34         | 26         | 14         |
| 30   | 212         | 5             | 24              | 26   | 88.7             | 525          | 230                                            | 145         | 91.4             | 98          | 56          | 35         | 31         | 22         |
| 31   | 213         | 6             | 23              | 26   | 86.4             | 531          | 225                                            | 146         | 89.0             | 95          | 56          | 34         | 27         | 26         |
| MEAN |             |               | 51.0            | 55.9 | 118.5            | 533          | 253                                            | 190         | 122.4            | 131         | 72          | 41         | 39         | 26         |

NOTE: Radio flux values are from Sagamore Hill, Massachusetts, USA.

# - 1800UT Reading, burst in progress at 2000UT.

\* - 2300UT Reading with burst in progress.

## Cycle 23 Smoothed Sunspot Numbers: Observed and Predicted



Smoothed Sunspot Numbers (Observed and Predicted) for Parts of Solar Cycles 22 and 23

| Year           | Jan  | Feb  | Mar  | Apr            | May  | Jun  | Jul  | Aug                       | Sep  | Oct  | Nov  | Dec  | Avg  |
|----------------|------|------|------|----------------|------|------|------|---------------------------|------|------|------|------|------|
| 1995           | 24   | 23   | 22   | 21             | 19   | 18   | 17   | 15                        | 13   | 12   | 11   | 11   | 17   |
| 1996           | 10   | 10   | 10   | 9              | 8*   | 9    | 8    | 8                         | 8    | 9**  | 10   | 10   | 8    |
| 1997           | 11   | 11   | 14   | 17             | 18   | 20   | 23   | 25                        | 28   | 32   | 35   | 39   | 23   |
| 1998           | 44   | 49   | 53   | 57             | 59   | 63   | 65   | 68                        | 69   | 71   | 73   | 78   | 62   |
| 1999           | 83   | 85   | 84   | 85             | 90   | 93   | 94   | 98                        | 102  | 108  | 111  | 111  | 95   |
| 2000           | 113  | 117  | 120  | 120.8+         | 119  | 119  | 120  | 119                       | 116  | 115  | 113  | 112  | 107  |
| 2001           | 109  | 104  | 105  | 108            | 109  | 110  | 112  | 114                       | 114  | 114  | 115  | 115  | 111  |
| 2002           | 114  | 115  | 113  | 111            | 109  | 106  | 103  | 99                        | 95   | 91   | 85   | 82   | 102  |
| 2003           | 81   | 79   | 74   | 70             | 68   | 65   | 62   | 60                        | 60   | 58   | 57   | 57   | 66   |
| 2004           | 53   |      |      |                |      |      |      |                           |      |      |      |      |      |
|                |      | (2)  | (4)  | (5)            | (6)  | (7)  | (9)  | (12)                      | (14) | (15) | (16) | (17) | (9)  |
| 2005           | 34   | 33   | 31   | 30             | 29   | 27   | 26   | 26                        | 25   | 24   | 23   | 22   | 28   |
|                | (18) | (19) | (19) | (19)           | (20) | (19) | (19) | (19)                      | (19) | (19) | (18) | (17) | (19) |
| 2006           | 21   | 20   | 19   | 18             | 18   | 17   | 17   | 16                        | 15   | 14   | 13   | 13   | 17   |
|                | (17) | (17) | (17) | (18)           | (18) | (18) | (18) | (17)                      | (16) | (15) | (15) | (15) | (17) |
| Solar Cycle 22 |      |      |      | Solar Cycle 23 |      |      |      | Min, Max, and Predictions |      |      |      |      |      |

\* May 1996 marks Cycle 22's mathematical minimum. \*\* October 1996 marks the consensus minimum NGDC is now using.

+ April 2000 marks Cycle 23 maximum.

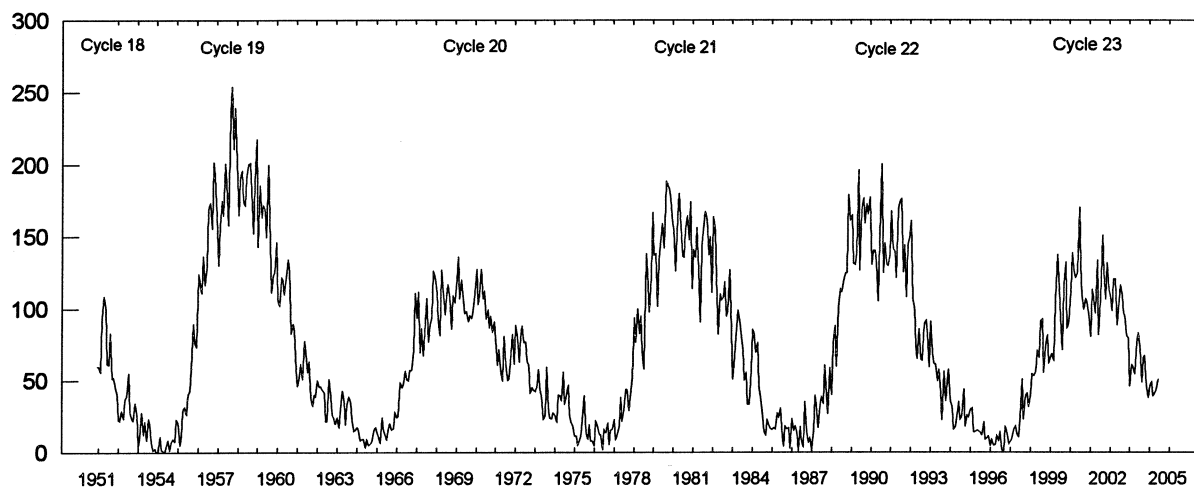
**Observed and Predicted Numbers.** For the end of Cycle 22, and the rise and decline of Cycle 23, the table above lists observed smoothed sunspot numbers up to the one that includes the most recent monthly mean. We based these smoothed values on final monthly means through Mar 2004 and on provisional numbers thereafter. Table entries with numbers in parentheses below them denote predictions by the McNish-Lincoln method. (See page 9 in the Jul 1987 supplement to *Solar-Geophysical Data*.) Adding the number in parentheses to the predicted value generates the upper limit of the 90% confidence interval. Subtracting the number from the predicted value generates the lower limit. Consider, for example, the January 2005 prediction. There exists a 90% chance that in January, the actual smoothed number will fall somewhere between 16 and 52.

**Points to Ponder.** The McNish-Lincoln prediction method generates useful estimates of smoothed, monthly mean sunspot numbers for no more than 12 months ahead. Beyond 12 months, the predictions regress toward the mean of all 15 cycles of observations used in the computation. Moreover, the method remains very sensitive to the date defining the onset of the current cycle, that is, to the date of the most recent sunspot minimum. The new cycle predictions tabulated above are based on the consensus minimum value of 8.8 that occurred in October 1996.

**Note:** Please visit <http://www.sec.noaa.gov> for solar minimum and Cycle 23 discussions.

# Mean Monthly Sunspot Numbers Jan 1951 - Jul 2004

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Jul 04



| Year | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   | Mean    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| 1951 | 59.9  | 59.9  | 55.9  | 92.9  | 108.5 | 100.6 | 61.5  | 61.0  | 83.1  | 51.6  | 52.4  | 45.8  | 69.4    |
| 1952 | 40.7  | 22.7  | 22.0  | 29.1  | 23.4  | 36.4  | 39.3  | 54.9  | 28.2  | 23.8  | 22.1  | 34.3  | 31.5    |
| 1953 | 26.5  | 3.9   | 10.0  | 27.8  | 12.5  | 21.8  | 8.6   | 23.5  | 19.3  | 8.2   | 1.6   | 2.5   | 13.9    |
| 1954 | 0.2   | 0.5   | 10.9  | 1.8   | 0.8   | 0.2   | 4.8   | 8.4   | 1.5   | 7.0   | 9.2   | 7.6   | 4.4 m   |
| 1955 | 23.1  | 20.8  | 4.9   | 11.3  | 28.9  | 31.7  | 26.7  | 40.7  | 42.7  | 58.5  | 89.2  | 76.9  | 38.0    |
| 1956 | 73.6  | 124.0 | 118.4 | 110.7 | 136.6 | 116.6 | 129.1 | 169.6 | 173.2 | 155.3 | 201.3 | 192.1 | 141.7   |
| 1957 | 165.0 | 130.2 | 157.4 | 175.2 | 164.6 | 200.7 | 187.2 | 158.0 | 235.8 | 253.8 | 210.9 | 239.4 | 190.2 M |
| 1958 | 202.5 | 164.9 | 190.7 | 196.0 | 175.3 | 171.5 | 191.4 | 200.2 | 201.2 | 181.5 | 152.3 | 187.6 | 184.8   |
| 1959 | 217.4 | 143.1 | 185.7 | 163.3 | 172.0 | 168.7 | 149.6 | 199.6 | 145.2 | 111.4 | 124.0 | 125.0 | 159.0   |
| 1960 | 146.3 | 106.0 | 102.2 | 122.0 | 119.6 | 110.2 | 121.7 | 134.1 | 127.2 | 82.8  | 89.6  | 85.6  | 122.3   |
| 1961 | 57.9  | 46.1  | 53.0  | 61.4  | 51.0  | 77.4  | 70.2  | 55.8  | 63.6  | 37.7  | 32.6  | 39.9  | 53.9    |
| 1962 | 38.7  | 50.3  | 45.6  | 46.4  | 43.7  | 42.0  | 21.8  | 21.8  | 51.3  | 39.5  | 26.9  | 23.2  | 37.6    |
| 1963 | 19.8  | 24.4  | 17.1  | 29.3  | 43.0  | 35.9  | 19.6  | 33.2  | 38.8  | 35.3  | 23.4  | 14.9  | 27.9    |
| 1964 | 15.3  | 17.7  | 16.5  | 8.6   | 9.5   | 9.1   | 3.1   | 9.3   | 4.7   | 6.1   | 7.4   | 15.1  | 10.2 m  |
| 1965 | 17.5  | 14.2  | 11.7  | 6.8   | 24.1  | 15.9  | 11.9  | 8.9   | 16.8  | 20.1  | 15.8  | 17.0  | 15.1    |
| 1966 | 28.2  | 24.4  | 25.3  | 48.7  | 45.3  | 47.7  | 56.7  | 51.2  | 50.2  | 57.2  | 57.2  | 70.4  | 47.0    |
| 1967 | 110.9 | 93.6  | 111.8 | 69.5  | 86.5  | 67.3  | 91.5  | 107.2 | 76.8  | 88.2  | 94.3  | 126.4 | 93.8    |
| 1968 | 121.8 | 111.9 | 92.2  | 81.2  | 127.2 | 110.3 | 96.1  | 109.3 | 117.2 | 107.7 | 86.0  | 109.8 | 105.9 M |
| 1969 | 104.4 | 120.5 | 135.8 | 106.8 | 120.0 | 106.0 | 96.8  | 98.0  | 91.3  | 95.7  | 93.5  | 97.9  | 105.5   |
| 1970 | 111.5 | 127.8 | 102.9 | 109.5 | 127.5 | 106.8 | 112.5 | 93.0  | 99.5  | 86.6  | 95.2  | 83.5  | 104.5   |
| 1971 | 91.3  | 79.0  | 60.7  | 71.8  | 57.5  | 49.8  | 81.0  | 61.4  | 50.2  | 51.7  | 63.2  | 82.2  | 66.6    |
| 1972 | 61.5  | 88.4  | 80.1  | 63.2  | 80.5  | 88.0  | 76.5  | 76.8  | 64.0  | 61.3  | 41.6  | 45.3  | 68.9    |
| 1973 | 43.4  | 42.9  | 46.0  | 57.7  | 42.4  | 39.5  | 23.1  | 25.6  | 59.3  | 30.7  | 23.9  | 23.3  | 38.0    |
| 1974 | 27.6  | 26.0  | 21.3  | 40.3  | 39.5  | 36.0  | 55.8  | 33.6  | 40.2  | 47.1  | 25.0  | 20.5  | 34.5    |
| 1975 | 18.9  | 11.5  | 11.5  | 5.1   | 9.0   | 11.4  | 28.2  | 39.7  | 13.9  | 9.1   | 19.4  | 7.8   | 15.5    |
| 1976 | 8.1   | 4.3   | 21.9  | 18.8  | 12.4  | 12.2  | 1.9   | 16.4  | 13.5  | 20.6  | 5.2   | 15.3  | 12.6 m  |
| 1977 | 16.4  | 23.1  | 8.7   | 12.9  | 18.6  | 38.5  | 21.4  | 30.1  | 44.0  | 43.8  | 29.1  | 43.2  | 27.5    |
| 1978 | 51.9  | 93.6  | 76.5  | 99.7  | 82.7  | 95.1  | 70.4  | 58.1  | 138.2 | 125.1 | 97.9  | 122.7 | 92.5    |
| 1979 | 166.6 | 137.5 | 138.0 | 101.5 | 134.4 | 149.5 | 159.4 | 142.2 | 188.4 | 186.2 | 183.3 | 176.3 | 155.4 M |
| 1980 | 159.6 | 155.0 | 126.2 | 164.1 | 179.9 | 157.3 | 136.3 | 135.4 | 155.0 | 164.7 | 147.9 | 174.4 | 154.6   |
| 1981 | 114.0 | 141.3 | 135.5 | 156.4 | 127.5 | 90.9  | 143.8 | 158.7 | 167.3 | 162.4 | 137.5 | 150.1 | 140.4   |
| 1982 | 111.2 | 163.6 | 153.8 | 122.0 | 82.2  | 110.4 | 106.1 | 107.6 | 118.8 | 94.7  | 98.1  | 127.0 | 115.9   |
| 1983 | 84.3  | 51.0  | 66.5  | 80.7  | 99.2  | 91.1  | 82.2  | 71.8  | 50.3  | 55.8  | 33.3  | 33.4  | 66.6    |
| 1984 | 57.0  | 85.4  | 83.5  | 69.7  | 76.4  | 46.1  | 37.4  | 25.5  | 15.7  | 12.0  | 22.8  | 18.7  | 45.9    |
| 1985 | 16.5  | 15.9  | 17.2  | 16.2  | 27.5  | 24.2  | 30.7  | 11.1  | 3.9   | 18.6  | 16.2  | 17.3  | 17.9    |
| 1986 | 2.5   | 23.2  | 15.1  | 18.5  | 13.7  | 1.1   | 18.1  | 7.4   | 3.8   | 35.4  | 15.2  | 6.8   | 13.4 m  |
| 1987 | 10.4  | 2.4   | 14.7  | 39.6  | 33.0  | 17.4  | 33.0  | 38.7  | 33.9  | 60.6  | 39.9  | 27.1  | 29.4    |
| 1988 | 59.0  | 40.0  | 76.2  | 88.0  | 60.1  | 101.8 | 113.8 | 111.6 | 120.1 | 125.1 | 125.1 | 179.2 | 100.2   |
| 1989 | 161.3 | 165.1 | 131.4 | 130.6 | 138.5 | 196.2 | 126.9 | 168.9 | 176.7 | 159.4 | 173.0 | 165.5 | 157.6 M |
| 1990 | 177.3 | 130.5 | 140.3 | 140.3 | 132.2 | 105.4 | 149.4 | 200.3 | 125.2 | 145.5 | 131.4 | 129.7 | 142.6   |
| 1991 | 136.9 | 167.5 | 141.9 | 140.0 | 121.3 | 169.7 | 173.7 | 176.3 | 125.3 | 144.1 | 108.2 | 144.4 | 145.7   |
| 1992 | 150.0 | 161.1 | 106.7 | 99.8  | 73.8  | 65.2  | 85.7  | 64.5  | 63.9  | 88.7  | 91.8  | 82.6  | 94.3    |
| 1993 | 59.3  | 91.0  | 69.8  | 62.2  | 61.3  | 49.8  | 57.9  | 42.2  | 22.4  | 56.4  | 35.6  | 48.9  | 54.6    |
| 1994 | 57.8  | 35.5  | 31.7  | 16.1  | 17.8  | 28.0  | 35.1  | 22.5  | 25.7  | 44.0  | 18.0  | 26.2  | 29.9    |
| 1995 | 24.2  | 29.9  | 31.1  | 14.0  | 14.5  | 15.6  | 14.5  | 14.3  | 11.8  | 21.1  | 9.0   | 10.0  | 17.5    |
| 1996 | 11.5  | 4.4   | 9.2   | 4.8   | 5.5   | 11.8  | 8.2   | 14.4  | 1.6   | 0.9   | 17.9  | 13.3  | 8.6 m   |
| 1997 | 5.7   | 7.6   | 8.7   | 15.5  | 18.5  | 12.7  | 10.4  | 24.4  | 51.3  | 22.8  | 39.0  | 41.2  | 21.5    |
| 1998 | 31.9  | 40.3  | 54.8  | 53.4  | 56.3  | 70.7  | 66.6  | 92.2  | 92.9  | 55.5  | 74.0  | 81.9  | 64.3    |
| 1999 | 62.0  | 66.3  | 68.8  | 63.7  | 106.4 | 137.7 | 113.5 | 93.7  | 71.5  | 116.7 | 133.2 | 84.6  | 93.2    |
| 2000 | 90.1  | 112.9 | 138.5 | 125.5 | 121.6 | 124.9 | 170.1 | 130.5 | 109.7 | 99.4  | 106.8 | 104.4 | 119.6 M |
| 2001 | 95.6  | 80.6  | 113.5 | 107.7 | 96.6  | 134.0 | 81.8  | 106.4 | 150.7 | 125.5 | 106.5 | 132.2 | 111.0   |
| 2002 | 114.1 | 107.4 | 98.4  | 120.7 | 120.8 | 88.3  | 99.9  | 116.4 | 109.3 | 97.5  | 95.5  | 80.8  | 104.0   |
| 2003 | 79.7  | 46.0  | 61.1  | 60.0  | 54.6  | 77.4  | 83.3  | 72.7  | 48.7  | 65.5  | 67.3  | 46.5  | 63.9    |
| 2004 | 37.7  | 45.8  | 49.1  | 39.3  | 41.5  | 43.2  | 51.0  |       |       |       |       |       | 43.9    |

Values are preliminary after March, 2004. For the yearly means, each 'M' marks a sunspot cycle maximum and each 'm' a minimum.

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# H $\alpha$ S O L A R F L A R E S

JULY 2004

| Sta  | Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Lat | CMD | NOAA/<br>USAF |    | CMP<br>Mo | Day | Dur<br>(Min) | Imp |       | Obs<br>See | Type | Area Measurement |                                     |                  | Remarks |
|------|-----|---------------|-------------|-------------|-----|-----|---------------|----|-----------|-----|--------------|-----|-------|------------|------|------------------|-------------------------------------|------------------|---------|
|      |     |               |             |             |     |     | Region        |    |           |     |              | Opt | Xray  |            |      | Time<br>(UT)     | Apparent<br>(10 <sup>-6</sup> Disk) | Corr<br>(Sq Deg) |         |
| GOES | 01  | 1150          | 1154        | 1158        |     |     |               |    |           |     | 8            | B   | 1.2   |            |      |                  |                                     |                  | 4.7E-05 |
| GOES |     | 1430          | 1435        | 1438        |     |     |               |    |           |     | 8            | B   | 3.7   |            |      |                  |                                     |                  | 1.1E-04 |
| GOES | 02  | 1742          | 1746        | 1749        |     |     |               |    |           |     | 7            | B   | 2.6   |            |      |                  |                                     |                  | 6.5E-05 |
| GOES |     | 2311          | 2314        | 2316        |     |     |               |    |           |     | 5            | B   | 1.0   |            |      |                  |                                     |                  | 2.6E-05 |
| GOES | 04  | 0706          | 0711        | 0723        |     |     |               |    |           |     | 17           | B   | 1.6   |            |      |                  |                                     |                  | 1.3E-04 |
| GOES |     | 0825          | 0831        | 0837        |     |     |               |    |           |     | 12           | B   | 1.1   |            |      |                  |                                     |                  | 7.6E-05 |
| GOES |     | 1503          | 1520        | 1536        |     |     | 10641         |    |           |     | 33           | B   | 4.5   |            |      |                  |                                     |                  | 6.1E-04 |
| GOES | 05  | 0553          | 0557        | 0603        |     |     | 10639         |    |           |     | 10           | B   | 1.1   |            |      |                  |                                     |                  | 6.0E-05 |
| GOES |     | 1550          | 1554        | 1557        | N07 | W34 | 10639         |    |           |     | 7            | SF  | B 2.6 |            |      |                  |                                     |                  | 7.0E-05 |
| HOLL |     | 1553          | 1554        | 1558        | N07 | W34 | 10639         | 07 | 3.1       |     | 5            | SF  |       | 3          | E    |                  | 19                                  |                  | FH      |
| GOES |     | 1856          | 1900        | 1904        |     |     | 10639         |    |           |     | 8            | B   | 1.2   |            |      |                  |                                     |                  | 4.6E-05 |
| GOES |     | 2047          | 2054        | 2059        |     |     | 10639         |    |           |     | 12           | B   | 1.3   |            |      |                  |                                     |                  | 7.0E-05 |
| GOES | 06  | 1201          | 1206        | 1210        |     |     |               |    |           |     | 9            | B   | 1.7   |            |      |                  |                                     |                  | 6.8E-05 |
| GOES |     | 1231          | 1320        | 1531        |     |     |               |    |           |     | 180          | B   | 1.3   |            |      |                  |                                     |                  | 1.1E-03 |
| GOES |     | 1516          | 1520        | 1524        |     |     |               |    |           |     | 8            | B   | 1.9   |            |      |                  |                                     |                  | 7.2E-05 |
| GOES | 07  | 0211          | 0217        | 0222        |     |     | 10639         |    |           |     | 11           | B   | 3.8   |            |      |                  |                                     |                  | 1.7E-04 |
| GOES |     | 1709          | 1719        | 1732        | N15 | E17 | 10641         |    |           |     | 23           | SF  | B 4.9 |            |      |                  |                                     |                  | 5.1E-04 |
| HOLL |     | 1712          | 1713        | 1725        | N15 | E17 | 10641         | 07 | 9.0       |     | 13           | SF  |       | 3          | E    |                  | 35                                  |                  | UF      |
| SVTO |     | 1713          | 1713        | 1716        | N14 | E17 | 10641         | 07 | 9.0       |     | 3            | SF  |       | 3          | E    |                  | 21                                  |                  |         |
| GOES |     | 2121          | 2126        | 2129        |     |     | 10642         |    |           |     | 8            | B   | 1.1   |            |      |                  |                                     |                  | 4.5E-05 |
| GOES |     | 2158          | 2206        | 2213        |     |     | 10642         |    |           |     | 15           | B   | 2.1   |            |      |                  |                                     |                  | 1.4E-04 |
| GOES | 08  | 0009          | 0017        | 0022        | S05 | E65 | 10642         |    |           |     | 13           | SF  | B 7.1 |            |      |                  |                                     |                  | 3.1E-04 |
| HOLL |     | 0014          | 0016        | 0025        | S05 | E65 | 10642         | 07 | 12.9      |     | 11           | SF  |       | 3          | E    |                  | 15                                  |                  | F       |
| GOES |     | 0509          | 0515        | 0519        |     |     | 10642         |    |           |     | 10           | B   | 1.8   |            |      |                  |                                     |                  | 8.4E-05 |
| GOES |     | 0602          | 0606        | 0610        |     |     | 10639         |    |           |     | 8            | B   | 1.3   |            |      |                  |                                     |                  | 5.2E-05 |
| GOES |     | 0654          | 0710        | 0725        |     |     | 10642         |    |           |     | 31           | B   | 3.6   |            |      |                  |                                     |                  | 5.1E-04 |
| GOES |     | 1425          | 1433        | 1442        |     |     | 10642         |    |           |     | 17           | B   | 4.8   |            |      |                  |                                     |                  | 3.9E-04 |
| GOES |     | 2223          | 2229        | 2244        |     |     | 10642         |    |           |     | 21           | B   | 2.2   |            |      |                  |                                     |                  | 2.4E-04 |
| GOES | 11  | 0603          | 0753        | 0834        |     |     |               |    |           |     | 151          | C   | 3.6   |            |      |                  |                                     |                  | 2.1E-02 |
| GOES |     | 0937          | 0944        | 0951        |     |     |               |    |           |     | 14           | C   | 4.2   |            |      |                  |                                     |                  | 2.7E-03 |
| GOES |     | 1017          | 1029        | 1046        |     |     |               |    |           |     | 29           | C   | 2.4   |            |      |                  |                                     |                  | 3.8E-03 |
| GOES |     | 1316          | 1335        | 1350        |     |     |               |    |           |     | 34           | C   | 4.2   |            |      |                  |                                     |                  | 6.2E-03 |
| GOES |     | 1503          | 1508        | 1511        |     |     |               |    |           |     | 8            | B   | 8.9   |            |      |                  |                                     |                  | 3.7E-04 |
| GOES |     | 1649          | 1658        | 1706        |     |     |               |    |           |     | 17           | C   | 2.8   |            |      |                  |                                     |                  | 2.1E-03 |
| GOES |     | 1724          | 1734        | 1741        |     |     |               |    |           |     | 17           | C   | 3.3   |            |      |                  |                                     |                  | 2.4E-03 |
| GOES |     | 1940          | 1950        | 1958        |     |     |               |    |           |     | 18           | C   | 3.2   |            |      |                  |                                     |                  | 2.5E-03 |
| GOES |     | 2104          | 2112        | 2121        |     |     |               |    |           |     | 17           | C   | 2.5   |            |      |                  |                                     |                  | 2.2E-03 |
| GOES |     | 2251          | 2259        | 2314        |     |     |               |    |           |     | 23           | C   | 1.7   |            |      |                  |                                     |                  | 2.1E-03 |
| GOES |     | 2317          | 2343        | 2401        |     |     |               |    |           |     | 44           | C   | 3.0   |            |      |                  |                                     |                  | 6.5E-03 |
| GOES | 12  | 0057          | 0105        | 0120        |     |     |               |    |           |     | 23           | C   | 3.2   |            |      |                  |                                     |                  | 3.2E-03 |
| GOES |     | 0310          | 0315        | 0323        |     |     |               |    |           |     | 13           | C   | 1.6   |            |      |                  |                                     |                  | 1.0E-03 |
| GOES |     | 0428          | 0438        | 0444        |     |     |               |    |           |     | 16           | C   | 5.5   |            |      |                  |                                     |                  | 3.6E-03 |
| GOES |     | 0621          | 0629        | 0637        |     |     |               |    |           |     | 16           | C   | 2.2   |            |      |                  |                                     |                  | 1.8E-03 |
| GOES |     | 0711          | 0719        | 0726        |     |     |               |    |           |     | 15           | C   | 2.8   |            |      |                  |                                     |                  | 1.9E-03 |
| GOES |     | 0736          | 0808        | 0859        |     |     |               |    |           |     | 83           | M   | 1.6   |            |      |                  |                                     |                  | 6.0E-02 |
| GOES |     | 1249          | 1302        | 1312        |     |     | 10649         |    |           |     | 23           | C   | 3.4   |            |      |                  |                                     |                  | 3.4E-03 |
| GOES |     | 1550          | 1602        | 1615        |     |     | 10649         |    |           |     | 25           | C   | 3.2   |            |      |                  |                                     |                  | 3.8E-03 |
| GOES |     | 1645          | 1648        | 1650        |     |     |               |    |           |     | 5            | C   | 1.8   |            |      |                  |                                     |                  | 4.7E-04 |
| GOES |     | 1831          | 1843        | 1854        |     |     | 10649         |    |           |     | 23           | C   | 4.5   |            |      |                  |                                     |                  | 5.5E-03 |
| HOLL |     | 1833          | 1840        | 1856        | N10 | W42 | 10646         | 07 | 9.6       |     | 23           | SF  |       | 3          | E    |                  | 17                                  |                  | H       |
| GOES |     | 2119          | 2128        | 2138        |     |     | 10649         |    |           |     | 19           | C   | 1.7   |            |      |                  |                                     |                  | 1.8E-03 |
| GOES |     | 2146          | 2151        | 2159        |     |     | 10649         |    |           |     | 13           | C   | 2.5   |            |      |                  |                                     |                  | 1.7E-03 |
| GOES | 13  | 0009          | 0017        | 0023        |     |     | 10646         |    |           |     | 14           | M   | 6.7   |            |      |                  |                                     |                  | 2.9E-02 |
| GOES |     | 0431          | 0440        | 0446        |     |     | 10649         |    |           |     | 15           | C   | 2.4   |            |      |                  |                                     |                  | 1.7E-03 |
| GOES |     | 0521          | 0533        | 0540        | N15 | W49 | 10646         |    |           |     | 19           | SF  | C 6.7 |            |      |                  |                                     |                  | 4.6E-03 |
| SVTO |     | 0524          | 0532        | 0549        | N13 | W49 | 10646         | 07 | 9.5       |     | 25           | SF  |       | 3          | E    |                  | 68                                  |                  | F       |
| LEAR |     | 0527          | 0534        | 0550        | N15 | W49 | 10646         | 07 | 9.5       |     | 23           | SF  |       | 3          | E    |                  | 31                                  |                  | F       |
| GOES |     | 0626          | 0633        | 0648        |     |     | 10649         |    |           |     | 22           | C   | 4.1   |            |      |                  |                                     |                  | 4.2E-03 |
| SVTO |     | 0630          | 0631        | 0650        | N13 | W51 | 10646         | 07 | 9.4       |     | 20           | SF  |       | 3          | E    |                  | 78                                  |                  |         |

H $\alpha$  SOLAR FLARES

JULY 2004

| Sta  | Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Lat | CMD | NOAA/<br>USAF<br>Region | CMP<br>Mo | Dur<br>Day | (Min) | Imp<br>Opt | Xray     | Obs<br>See | Type | Time<br>(UT) | Area Measurement                    |                  | Remarks |
|------|-----|---------------|-------------|-------------|-----|-----|-------------------------|-----------|------------|-------|------------|----------|------------|------|--------------|-------------------------------------|------------------|---------|
|      |     |               |             |             |     |     |                         |           |            |       |            |          |            |      |              | Apparent<br>(10 <sup>-6</sup> Disk) | Corr<br>(Sq Deg) |         |
| LEAR | 13  | 0630          | 0632        | 0651        | N16 | W50 | 10646                   | 07        | 9.5        | 21    | SF         |          | 3          | E    |              | 23                                  |                  |         |
| GOES |     | 0710          | 0714        | 0719        |     |     | 10649                   |           |            | 9     |            | C 2.6    |            |      |              |                                     |                  | 1.3E-03 |
| GOES |     | 0825          | 0829        | 0834        |     |     | 10649                   |           |            | 9     |            | C 1.5    |            |      |              |                                     |                  | 7.1E-04 |
| GOES |     | 0840          | 0848        | 0855        | N12 | W52 | 10646                   |           |            | 15    |            | 1N M 5.4 |            |      |              |                                     |                  | 2.5E-02 |
| SVTO |     | 0843          | 0852        | 0916        | N12 | W52 | 10646                   | 07        | 9.4        | 33    |            | 1N       | 3          | E    |              | 225                                 |                  |         |
| LEAR |     | 0844          | 0848        | 0915        | N15 | W52 | 10646                   | 07        | 9.4        | 31    |            | 1N       | 3          | E    |              | 108                                 |                  |         |
| GOES |     | 1159          | 1208        | 1212        |     |     | 10649                   |           |            | 13    |            | M 2.9    |            |      |              |                                     |                  | 1.0E-02 |
| GOES |     | 1245          | 1249        | 1252        |     |     | 10649                   |           |            | 7     |            | C 5.0    |            |      |              |                                     |                  | 1.8E-03 |
| HOLL |     | 1655          | 1700        | 1705        | N14 | W56 | 10646                   | 07        | 9.5        | 10    | SF         |          | 3          | E    |              | 28                                  |                  | F       |
| HOLL |     | 1818          | 1826        | 1831        | N14 | W56 | 10646                   | 07        | 9.5        | 13    | SF         |          | 3          | E    |              | 22                                  |                  | F       |
| HOLL |     | 1833          | 1834        | 1843        | N14 | W57 | 10646                   | 07        | 9.5        | 10    | SF         |          | 3          | E    |              | 20                                  |                  |         |
| GOES |     | 1833          | 1838        | 1842        |     |     | 10649                   |           |            | 9     |            | M 1.1    |            |      |              |                                     |                  | 3.6E-03 |
| HOLL |     | 1836          | 1837        | 1846        | S10 | E65 | 10649                   | 07        | 18.6       | 10    |            | 1N       | 3          | E    |              | 149                                 |                  | FH      |
| GOES |     | 1924          | 1932        | 1936        | N13 | W56 | 10646                   |           |            | 12    |            | 1B M 6.2 |            |      |              |                                     |                  | 1.9E-02 |
| HOLL |     | 1927          | 1932        | 1953        | N13 | W56 | 10646                   | 07        | 9.6        | 26    |            | 1B       | 3          | E    |              | 184                                 |                  | FE      |
| GOES |     | 2117          | 2124        | 2136        | N14 | W59 | 10646                   |           |            | 19    |            | SF C 2.2 |            |      |              |                                     |                  | 2.3E-03 |
| HOLL |     | 2122          | 2123        | 2128        | N14 | W59 | 10646                   | 07        | 9.4        | 6     |            | SF       | 3          | E    |              | 11                                  |                  |         |
| GOES |     | 2201          | 2206        | 2209        | S11 | E64 | 10649                   |           |            | 8     |            | SN C 5.1 |            |      |              |                                     |                  | 1.6E-03 |
| HOLL |     | 2203          | 2206        | 2212        | S11 | E64 | 10649                   | 07        | 18.7       | 9     |            | SN       | 3          | E    |              | 86                                  |                  | F       |
| GOES |     | 2304          | 2309        | 2314        |     |     | 10646                   |           |            | 10    |            | C 2.8    |            |      |              |                                     |                  | 1.3E-03 |
| GOES |     | 2327          | 2333        | 2337        |     |     | 10646                   |           |            | 10    |            | C 3.2    |            |      |              |                                     |                  | 1.6E-03 |
| GOES | 14  | 0039          | 0058        | 0105        | N14 | W61 | 10646                   |           |            | 26    | SF         | C 3.1    |            |      |              |                                     |                  | 4.0E-03 |
| HOLL |     | 0040          | 0043        | 0052        | N14 | W61 | 10646                   | 07        | 9.4        | 12    |            | SF       | 3          | E    |              | 15                                  |                  |         |
| GOES |     | 0130          | 0147        | 0203        |     |     |                         |           |            | 33    |            | C 3.7    |            |      |              |                                     |                  | 6.2E-03 |
| GOES |     | 0341          | 0348        | 0353        |     |     | 10646                   |           |            | 12    |            | C 1.3    |            |      |              |                                     |                  | 8.7E-04 |
| GOES |     | 0502          | 0523        | 0527        | N12 | W62 | 10646                   |           |            | 25    |            | 1N M 6.2 |            |      |              |                                     |                  | 2.0E-02 |
| SVTO |     | 0518          | 0525        | 0540        | N12 | W62 | 10646                   | 07        | 9.5        | 22    |            | 1N       | 3          | E    |              | 219                                 |                  | F       |
| GOES |     | 0811          | 0816        | 0822        |     |     | 10646                   |           |            | 11    |            | C 1.9    |            |      |              |                                     |                  | 1.1E-03 |
| GOES |     | 0924          | 0931        | 0938        |     |     | 10649                   |           |            | 14    |            | C 1.3    |            |      |              |                                     |                  | 9.4E-04 |
| GOES |     | 1455          | 1459        | 1501        |     |     | 10649                   |           |            | 6     |            | C 1.0    |            |      |              |                                     |                  | 3.3E-04 |
| GOES |     | 1739          | 1746        | 1751        | S11 | E56 | 10649                   |           |            | 12    |            | SF C 5.8 |            |      |              |                                     |                  | 2.5E-03 |
| HOLL |     | 1745          | 1749        | 1800        | S11 | E56 | 10649                   | 07        | 18.9       | 15    |            | SF       | 3          | E    |              | 24                                  |                  | F       |
| GOES |     | 1812          | 1816        | 1818        | S11 | E56 | 10649                   |           |            | 6     |            | SF M 1.0 |            |      |              |                                     |                  | 1.9E-03 |
| HOLL |     | 1815          | 1817        | 1827        | S11 | E56 | 10649                   | 07        | 19.0       | 12    |            | SF       | 3          | E    |              | 32                                  |                  | F       |
| GOES |     | 1826          | 1830        | 1834        |     |     | 10649                   |           |            | 8     |            | C 2.8    |            |      |              |                                     |                  | 1.2E-03 |
| GOES |     | 1950          | 1955        | 2001        |     |     | 10646                   |           |            | 11    |            | C 2.0    |            |      |              |                                     |                  | 1.1E-03 |
| GOES |     | 2010          | 2020        | 2029        |     |     | 10646                   |           |            | 19    |            | C 3.6    |            |      |              |                                     |                  | 3.0E-03 |
| GOES |     | 2036          | 2043        | 2050        |     |     | 10646                   |           |            | 14    |            | C 3.5    |            |      |              |                                     |                  | 2.5E-03 |
| GOES |     | 2051          | 2054        | 2058        |     |     | 10646                   |           |            | 7     |            | C 6.6    |            |      |              |                                     |                  | 2.1E-03 |
| HOLL |     | 2150          | 2150        | 2201        | N13 | W73 | 10646                   | 07        | 9.4        | 11    |            | SF       | 3          | E    |              | 16                                  |                  |         |
| GOES | 15  | 0130          | 0141        | 0148        |     |     | 10649                   |           |            | 18    |            | X 1.8    |            |      |              |                                     |                  | 8.5E-02 |
| SVTO |     | 0428          | 0430        | 0436        | N11 | W77 | 10646                   | 07        | 9.4        | 8     |            | SF       | 3          | E    |              | 39                                  |                  |         |
| GOES |     | 1111          | 1116        | 1119        |     |     | 10651                   |           |            | 8     |            | C 2.5    |            |      |              |                                     |                  | 8.1E-04 |
| GOES |     | 1451          | 1456        | 1504        |     |     | 10649                   |           |            | 13    |            | C 1.4    |            |      |              |                                     |                  | 1.0E-03 |
| GOES |     | 1815          | 1824        | 1828        |     |     | 10649                   |           |            | 13    |            | X 1.6    |            |      |              |                                     |                  | 4.9E-02 |
| GOES |     | 2125          | 2201        | 2218        |     |     | 10649                   |           |            | 53    |            | C 3.9    |            |      |              |                                     |                  | 7.9E-03 |
| GOES |     | 2224          | 2233        | 2252        |     |     |                         |           |            | 28    |            | C 7.9    |            |      |              |                                     |                  | 1.1E-02 |
| GOES | 16  | 0143          | 0206        | 0212        |     |     | 10649                   |           |            | 29    |            | X 1.3    |            |      |              |                                     |                  | 6.2E-02 |
| GOES |     | 0834          | 0838        | 0842        |     |     |                         |           |            | 8     |            | C 1.7    |            |      |              |                                     |                  | 6.3E-04 |
| GOES |     | 0855          | 0859        | 0902        |     |     |                         |           |            | 7     |            | C 1.9    |            |      |              |                                     |                  | 6.2E-04 |
| GOES |     | 1032          | 1041        | 1046        | S10 | E36 | 10649                   |           |            | 14    |            | 1F X 1.1 |            |      |              |                                     |                  | 4.0E-02 |
| SVTO |     | 1037          | 1042        | 1058        | S10 | E36 | 10649                   | 07        | 19.1       | 21    |            | 1F       | 3          | E    |              | 129                                 |                  | F       |
| GOES |     | 1232          | 1259        | 1314        |     |     |                         |           |            | 42    |            | C 8.2    |            |      |              |                                     |                  | 1.2E-02 |
| HOLL |     | 1329          | 1330        | 1338        | S10 | E33 | 10649                   | 07        | 19.0       | 9     |            | 1N       | 4          | E    |              | 92                                  |                  | F       |
| GOES |     | 1349          | 1355        | 1401        | S11 | E35 | 10649                   |           |            | 12    |            | 3B X 3.6 |            |      |              |                                     |                  | 1.4E-01 |
| HOLL |     | 1350          | 1357        | 1532        | S11 | E35 | 10649                   | 07        | 19.2       | 102   |            | 3B       | 3          | E    |              | 787                                 |                  | UF      |
| SVTO |     | 1352          | 1354        | 1458        | S07 | E33 | 10649                   | 07        | 19.0       | 66    |            | 3B       | 3          | E    |              | 710                                 |                  | FE      |
| GOES |     | 1622          | 1628        | 1631        | S11 | E30 | 10649                   |           |            | 9     |            | SF M 1.2 |            |      |              |                                     |                  | 4.7E-03 |
| HOLL |     | 1624          | 1627        | 1637        | S11 | E30 | 10649                   | 07        | 18.9       | 13    |            | SF       | 3          | E    |              | 26                                  |                  | F       |
| HOLL |     | 1928          | 1933        | 1943        | N10 | E91 |                         | 07        | 23.6       | 15    |            | SF       | 3          | E    |              | 24                                  |                  |         |
| GOES |     | 2029          | 2039        | 2052        | S09 | E27 | 10649                   |           |            | 23    |            | SF C 9.0 |            |      |              |                                     |                  | 8.1E-03 |
| HOLL |     | 2031          | 2038        | 2102        | S09 | E27 | 10649                   | 07        | 18.9       | 31    |            | SF       | 3          | E    |              | 48                                  |                  | F       |
| HOLL |     | 2114          | 2115        | 2119        | N11 | E89 | 10652                   | 07        | 23.6       | 5     |            | SF       | 3          | E    |              | 13                                  |                  |         |
| GOES | 17  | 0154          | 0201        | 0206        |     |     | 10649                   |           |            | 12    |            | C 5.7    |            |      |              |                                     |                  | 2.6E-03 |



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Jul 04

# H $\alpha$ SOLAR FLARES

JULY 2004

| Sta  | Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Lat | CMD | NOAA/<br>USAF<br>Region | CMP<br>Mo | Dur<br>Day | (Min) | Imp<br>Opt | Xray  | Obs<br>See | Type | Time<br>(UT) | Area Measurement                    |                  | Remarks |
|------|-----|---------------|-------------|-------------|-----|-----|-------------------------|-----------|------------|-------|------------|-------|------------|------|--------------|-------------------------------------|------------------|---------|
|      |     |               |             |             |     |     |                         |           |            |       |            |       |            |      |              | Apparent<br>(10 <sup>-6</sup> Disk) | Corr<br>(Sq Deg) |         |
| GOES | 17  | 0207          | 0213        | 0216        |     |     | 10649                   |           |            | 9     | C          | 6.8   |            |      |              |                                     |                  | 2.9E-03 |
| GOES |     | 0342          | 0347        | 0349        |     |     | 10652                   |           |            | 7     | C          | 4.2   |            |      |              |                                     |                  | 9.6E-04 |
| GOES |     | 0751          | 0757        | 0759        | S10 | E24 | 10649                   |           |            | 8     | 1F         | X 1.0 |            |      |              |                                     |                  | 2.2E-02 |
| SVTO |     | 0755          | 0758        | 0826        | S10 | E24 | 10649                   | 07        | 19.1       | 31    | 1F         |       | 3          | E    |              | 129                                 |                  | F       |
| GOES |     | 0946          | 0953        | 0957        |     |     | 10649                   |           |            | 11    | C          | 5.0   |            |      |              |                                     |                  | 2.4E-03 |
| GOES |     | 1124          | 1137        | 1142        |     |     | 10649                   |           |            | 18    | C          | 7.2   |            |      |              |                                     |                  | 4.2E-03 |
| GOES |     | 1231          | 1255        | 1301        | S11 | E21 | 10649                   |           |            | 30    | SF         | C 8.8 |            |      |              |                                     |                  | 5.4E-03 |
| SVTO |     | 1254          | 1254        | 1300        | S11 | E22 | 10649                   | 07        | 19.2       | 6     | SF         |       | 3          | E    |              | 23                                  |                  | F       |
| HOLL |     | 1300          | 1308        | 1321        | S11 | E21 | 10649                   | 07        | 19.1       | 21    | SF         |       | 3          | E    |              | 84                                  |                  | FH      |
| SVTO |     | 1307          | 1308        | 1311        | S11 | E21 | 10649                   | 07        | 19.1       | 4     | SF         |       | 3          | E    |              | 12                                  |                  | F       |
| GOES |     | 1548          | 1557        | 1603        | S11 | E19 | 10649                   |           |            | 15    | SF         | C 2.6 |            |      |              |                                     |                  | 1.8E-03 |
| HOLL |     | 1550          | 1551        | 1608        | S11 | E19 | 10649                   | 07        | 19.1       | 18    | SF         |       | 3          | E    |              | 38                                  |                  | FH      |
| GOES |     | 1645          | 1651        | 1657        | S10 | E18 | 10649                   |           |            | 12    | 1N         | M 2.5 |            |      |              |                                     |                  | 9.8E-03 |
| HOLL |     | 1649          | 1652        | 1722        | S10 | E18 | 10649                   | 07        | 19.0       | 33    | 1N         |       | 3          | E    |              | 139                                 |                  | FH      |
| SVTO |     | 1650          | 1653        | 1702        | S10 | E16 | 10649                   | 07        | 18.9       | 12    | SF         |       | 3          | E    |              | 48                                  |                  | F       |
| HOLL |     | 1724          | 1726        | 1730        | S09 | E15 | 10649                   | 07        | 18.8       | 6     | SF         |       | 3          | E    |              | 18                                  |                  | F       |
| GOES |     | 1821          | 1827        | 1831        |     |     |                         |           |            | 10    | C          | 2.2   |            |      |              |                                     |                  | 9.7E-04 |
| GOES |     | 1915          | 1918        | 1920        | N08 | E71 | 10652                   |           |            | 5     | SF         | C 5.3 |            |      |              |                                     |                  | 9.1E-04 |
| HOLL |     | 1917          | 1920        | 1923        | N08 | E71 | 10652                   | 07        | 23.1       | 6     | SF         |       | 3          | E    |              | 37                                  |                  | H       |
| GOES |     | 2036          | 2045        | 2051        |     |     | 10649                   |           |            | 15    | C          | 3.4   |            |      |              |                                     |                  | 2.2E-03 |
| HOLL |     | 2039          | 2039        | 2050        | N08 | E65 | 10652                   | 07        | 22.7       | 11    | SF         |       | 3          | E    |              | 28                                  |                  |         |
| HOLL |     | 2042          | 2059        | 2112        | S09 | E14 | 10649                   | 07        | 18.9       | 30    | SF         |       | 3          | E    |              | 70                                  |                  | F       |
| GOES |     | 2054          | 2103        | 2110        |     |     | 10649                   |           |            | 16    | C          | 5.7   |            |      |              |                                     |                  | 4.2E-03 |
| HOLL |     | 2113          | 2113        | 2122        | S09 | E14 | 10649                   | 07        | 18.9       | 9     | SF         |       | 3          | E    |              | 36                                  |                  |         |
| GOES |     | 2124          | 2131        | 2138        | S09 | E13 | 10649                   |           |            | 14    | 1F         | M 2.0 |            |      |              |                                     |                  | 1.0E-02 |
| HOLL |     | 2124          | 2134        | 2203        | S09 | E13 | 10649                   | 07        | 18.9       | 39    | 1F         |       | 3          | E    |              | 200                                 |                  |         |
| GOES |     | 2228          | 2239        | 2246        |     |     | 10649                   |           |            | 18    | C          | 5.7   |            |      |              |                                     |                  | 4.0E-03 |
| GOES |     | 2254          | 2308        | 2316        |     |     | 10649                   |           |            | 22    | M          | 1.1   |            |      |              |                                     |                  | 1.2E-02 |
| GOES | 18  | 0005          | 0035        | 0040        | S09 | E12 | 10649                   |           |            | 35    | 1F         | M 2.0 |            |      |              |                                     |                  | 1.2E-02 |
| LEAR |     | 0012          | 0012        | 0111        | S09 | E12 | 10649                   | 07        | 18.9       | 59    | 1F         |       | 3          | E    |              | 112                                 |                  | FZ      |
| HOLL |     | 0058          | 0059        | 0113        | S09 | E11 | 10649                   | 07        | 18.9       | 15    | SF         |       | 3          | E    |              | 32                                  |                  |         |
| GOES |     | 0251          | 0257        | 0303        | S12 | E12 | 10649                   |           |            | 12    | SF         | M 1.5 |            |      |              |                                     |                  | 7.2E-03 |
| LEAR |     | 0254          | 0258        | 0324        | S12 | E12 | 10649                   | 07        | 19.0       | 30    | SF         |       | 3          | E    |              | 91                                  |                  | F       |
| GOES |     | 0552          | 0607        | 0611        | S09 | E09 | 10649                   |           |            | 19    | SF         | C 1.2 |            |      |              |                                     |                  | 1.1E-03 |
| LEAR |     | 0606          | 0607        | 0615        | S09 | E09 | 10649                   | 07        | 18.9       | 9     | SF         |       | 3          | E    |              | 17                                  |                  | F       |
| LEAR |     | 0807          | 0809        | 0817        | N08 | E65 | 10652                   | 07        | 23.2       | 10    | SF         |       | 3          | E    |              | 43                                  |                  |         |
| GOES |     | 1135          | 1139        | 1142        | N09 | E58 | 10652                   |           |            | 7     | SF         | C 1.6 |            |      |              |                                     |                  | 5.8E-04 |
| SVTO |     | 1138          | 1141        | 1143        | N09 | E58 | 10652                   | 07        | 22.8       | 5     | SF         |       | 3          | E    |              | 15                                  |                  |         |
| SVTO |     | 1147          | 1151        | 1201        | S11 | E08 | 10649                   | 07        | 19.1       | 14    | SF         |       | 3          | E    |              | 77                                  |                  | F       |
| GOES |     | 1225          | 1229        | 1233        | S12 | E09 | 10649                   |           |            | 8     | SF         | C 2.9 |            |      |              |                                     |                  | 1.0E-03 |
| SVTO |     | 1228          | 1229        | 1237        | S12 | E09 | 10649                   | 07        | 19.2       | 9     | SF         |       | 3          | E    |              | 13                                  |                  |         |
| GOES |     | 1337          | 1348        | 1355        | S11 | E07 | 10649                   |           |            | 18    | SF         | C 4.0 |            |      |              |                                     |                  | 2.8E-03 |
| SVTO |     | 1343          | 1348        | 1401        | S11 | E07 | 10649                   | 07        | 19.1       | 18    | SF         |       | 3          | E    |              | 48                                  |                  | F       |
| GOES |     | 1409          | 1413        | 1416        | S10 | E07 | 10649                   |           |            | 7     | SF         | C 9.4 |            |      |              |                                     |                  | 2.0E-03 |
| SVTO |     | 1412          | 1414        | 1427        | S10 | E07 | 10649                   | 07        | 19.1       | 15    | SF         |       | 3          | E    |              | 63                                  |                  | F       |
| GOES |     | 1625          | 1629        | 1632        |     |     | 10649                   |           |            | 7     | C          | 1.4   |            |      |              |                                     |                  | 4.9E-04 |
| GOES |     | 1643          | 1647        | 1650        |     |     | 10649                   |           |            | 7     | C          | 1.6   |            |      |              |                                     |                  | 5.3E-04 |
| GOES |     | 1704          | 1713        | 1715        | S11 | E05 | 10649                   |           |            | 11    | 1F         | M 1.9 |            |      |              |                                     |                  | 4.9E-03 |
| SVTO |     | 1709          | 1711        | 1731        | S11 | E05 | 10649                   | 07        | 19.1       | 22    | 1F         |       | 3          | E    |              | 152                                 |                  | F       |
| GOES |     | 1717          | 1720        | 1722        |     |     | 10649                   |           |            | 5     | C          | 4.1   |            |      |              |                                     |                  | 1.1E-03 |
| GOES |     | 1749          | 1754        | 1757        |     |     | 10649                   |           |            | 8     | C          | 1.2   |            |      |              |                                     |                  | 5.2E-04 |
| GOES |     | 1805          | 1809        | 1811        |     |     | 10649                   |           |            | 6     | C          | 1.7   |            |      |              |                                     |                  | 5.0E-04 |
| GOES |     | 1843          | 1847        | 1853        | S10 | E03 | 10649                   |           |            | 10    | SF         | C 2.3 |            |      |              |                                     |                  | 1.1E-03 |
| HOLL |     | 1845          | 1847        | 1855        | S10 | E03 | 10649                   | 07        | 19.0       | 10    | SF         |       | 3          | E    |              | 59                                  |                  | F       |
| HOLL |     | 2043          | 2046        | 2050        | N09 | E49 | 10652                   | 07        | 22.5       | 7     | SF         |       | 3          | E    |              | 15                                  |                  | H       |
| GOES |     | 2139          | 2142        | 2149        |     |     | 10649                   |           |            | 10    | C          | 1.3   |            |      |              |                                     |                  | 6.9E-04 |
| GOES |     | 2208          | 2215        | 2218        |     |     | 10652                   |           |            | 10    | C          | 1.7   |            |      |              |                                     |                  | 9.2E-04 |
| GOES | 19  | 0034          | 0039        | 0047        | S09 | W02 | 10649                   |           |            | 13    | SF         | C 2.3 |            |      |              |                                     |                  | 1.4E-03 |
| HOLL |     | 0038          | 0045        | 0049        | S09 | W02 | 10649                   | 07        | 18.9       | 11    | SF         |       | 3          | E    |              | 21                                  |                  |         |
| GOES |     | 0158          | 0208        | 0211        | N08 | E48 |                         |           |            | 13    | 1F         | C 2.1 |            |      |              |                                     |                  | 1.1E-03 |
| GOES |     | 0524          | 0533        | 0542        | S12 | W02 | 10649                   |           |            | 18    | SF         | C 4.6 |            |      |              |                                     |                  | 4.2E-03 |
| SVTO |     | 0527          | 0530        | 0543        | S12 | W02 | 10649                   | 07        | 19.1       | 16    | SF         |       | 3          | E    |              | 18                                  |                  | F       |
| GOES |     | 0646          | 0653        | 0655        | N09 | E47 | 10652                   |           |            | 9     | SF         | C 3.4 |            |      |              |                                     |                  | 1.0E-03 |
| SVTO |     | 0650          | 0653        | 0659        | N09 | E47 | 10652                   | 07        | 22.8       | 9     | SF         |       | 3          | E    |              | 70                                  |                  | F       |
| GOES |     | 1003          | 1007        | 1012        | S10 | W05 | 10649                   |           |            | 9     | SF         | C 2.5 |            |      |              |                                     |                  | 1.1E-03 |
| SVTO |     | 1006          | 1006        | 1011        | S10 | W05 | 10649                   | 07        | 19.0       | 5     | SF         |       | 3          | E    |              | 15                                  |                  |         |

H $\alpha$  SOLAR FLARES

JULY 2004

| Sta  | Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Lat | CMD | NOAA/<br>USAF |    | CMP<br>Mo | Day | Dur<br>(Min) | Imp<br>Opt | Xray  | Obs<br>See | Type | Area Measurement |                                     |                  | Remarks |
|------|-----|---------------|-------------|-------------|-----|-----|---------------|----|-----------|-----|--------------|------------|-------|------------|------|------------------|-------------------------------------|------------------|---------|
|      |     |               |             |             |     |     | Region        |    |           |     |              |            |       |            |      | Time<br>(UT)     | Apparent<br>(10 <sup>-6</sup> Disk) | Corr<br>(Sq Deg) |         |
| GOES | 19  | 1047          | 1052        | 1055        | N09 | E44 | 10652         |    |           |     | 8            | 1F         | C 2.9 |            |      |                  |                                     |                  | 1.1E-03 |
| SVTO |     | 1050          | 1053        | 1058        | N09 | E44 | 10652         | 07 | 22.7      |     | 8            | 1F         |       | 3          | E    |                  | 194                                 |                  | F       |
| GOES |     | 1300          | 1314        | 1322        |     |     | 10649         |    |           |     | 22           |            | C 2.5 |            |      |                  |                                     |                  | 2.9E-03 |
| HOLL |     | 1419          | 1419        | 1424        | S09 | W05 | 10649         | 07 | 19.2      |     | 5            | SF         |       | 3          | E    |                  | 11                                  |                  |         |
| GOES |     | 1508          | 1512        | 1517        | S09 | W05 | 10649         |    |           |     | 9            | SF         | C 2.5 |            |      |                  |                                     |                  | 1.2E-03 |
| SVTO |     | 1511          | 1512        | 1522        | S09 | W05 | 10649         | 07 | 19.2      |     | 11           | SF         |       | 3          | E    |                  | 28                                  |                  | F       |
| GOES |     | 1729          | 1733        | 1736        | S13 | E51 | 10653         |    |           |     | 7            | SF         | C 1.8 |            |      |                  |                                     |                  | 7.3E-04 |
| HOLL |     | 1731          | 1733        | 1744        | S13 | E51 | 10653         | 07 | 23.6      |     | 13           | SF         |       | 3          | E    |                  | 27                                  |                  | FH      |
| GOES |     | 2054          | 2059        | 2103        |     |     | 10652         |    |           |     | 9            |            | C 1.8 |            |      |                  |                                     |                  | 9.0E-04 |
| GOES |     | 2137          | 2150        | 2155        | N04 | E42 | 10652         |    |           |     | 18           | SF         | C 1.7 |            |      |                  |                                     |                  | 1.7E-03 |
| HOLL |     | 2138          | 2138        | 2141        | N04 | E42 | 10652         | 07 | 23.0      |     | 3            | SF         |       | 3          | E    |                  | 17                                  |                  | F       |
| HOLL |     | 2143          | 2144        | 2149        | N08 | E38 | 10652         | 07 | 22.7      |     | 6            | SF         |       | 3          | E    |                  | 24                                  |                  | FH      |
| GOES | 20  | 0055          | 0101        | 0110        | S07 | W13 | 10649         |    |           |     | 15           | 1F         | C 3.3 |            |      |                  |                                     |                  | 2.2E-03 |
| LEAR |     | 0059E         | 0059U       | 0115D       | S08 | W14 | 10649         | 07 | 19.0      |     | 16D          | SF         |       | 3          | E    |                  | 68                                  |                  | UF      |
| GOES |     | 0411          | 0423        | 0430        |     |     | 10652         |    |           |     | 19           |            | C 2.3 |            |      |                  |                                     |                  | 2.2E-03 |
| GOES |     | 0453          | 0457        | 0500        |     |     | 10652         |    |           |     | 7            |            | C 1.4 |            |      |                  |                                     |                  | 5.1E-04 |
| GOES |     | 0618          | 0622        | 0624        |     |     |               |    |           |     | 6            |            | C 1.6 |            |      |                  |                                     |                  | 4.2E-04 |
| GOES |     | 0631          | 0648        | 0702        |     |     |               |    |           |     | 31           |            | C 2.3 |            |      |                  |                                     |                  | 3.7E-03 |
| GOES |     | 1101          | 1126        | 1137        | N05 | E35 | 10652         |    |           |     | 36           | SF         | C 6.0 |            |      |                  |                                     |                  | 8.7E-03 |
| SVTO |     | 1106          | 1108        | 1142        | N05 | E35 | 10652         | 07 | 23.1      |     | 36           | SF         |       | 3          | E    |                  | 34                                  |                  | H       |
| GOES |     | 1222          | 1232        | 1245        | N11 | E34 | 10652         |    |           |     | 23           | 3B         | M 8.6 |            |      |                  |                                     |                  | 7.3E-02 |
| SVTO |     | 1226          | 1232        | 1303        | N11 | E34 | 10652         | 07 | 23.1      |     | 37           | 3B         |       | 3          | E    |                  | 744                                 |                  | FH      |
| GOES |     | 1815          | 1821        | 1828        | N03 | E32 | 10652         |    |           |     | 13           | SF         | C 3.8 |            |      |                  |                                     |                  | 2.6E-03 |
| HOLL |     | 1817          | 1823        | 1842        | N03 | E32 | 10652         | 07 | 23.1      |     | 25           | SF         |       | 3          | E    |                  | 35                                  |                  | FH      |
| GOES |     | 2109          | 2123        | 2134        | N04 | E28 | 10652         |    |           |     | 25           | SF         | C 8.1 |            |      |                  |                                     |                  | 8.1E-03 |
| HOLL |     | 2112          | 2118        | 2150        | N04 | E28 | 10652         | 07 | 23.0      |     | 38           | SF         |       | 3          | E    |                  | 87                                  |                  | FH      |
| GOES | 21  | 0029          | 0034        | 0039        | S11 | W27 | 10649         |    |           |     | 10           | 1F         | C 6.6 |            |      |                  |                                     |                  | 2.3E-03 |
| HOLL |     | 0032          | 0033        | 0048D       | S11 | W28 | 10649         | 07 | 18.9      |     | 16D          | 1F         |       | 3          | E    |                  | 104                                 |                  | F       |
| GOES |     | 0407          | 0412        | 0414        |     |     | 10649         |    |           |     | 7            |            | B 9.9 |            |      |                  |                                     |                  | 3.5E-04 |
| GOES |     | 0453          | 0458        | 0503        |     |     | 10652         |    |           |     | 10           |            | C 1.3 |            |      |                  |                                     |                  | 6.7E-04 |
| GOES |     | 0505          | 0521        | 0533        | N05 | E24 | 10652         |    |           |     | 28           | 1F         | C 8.9 |            |      |                  |                                     |                  | 9.4E-03 |
| HOLL |     | 1756          | 1759        | 1809        | N07 | E21 | 10652         | 07 | 23.3      |     | 13           | SF         |       | 3          | E    |                  | 12                                  |                  | FH      |
| GOES | 22  | 0014          | 0032        | 0043        |     |     | 10652         |    |           |     | 29           |            | M 9.1 |            |      |                  |                                     |                  | 7.9E-02 |
| GOES |     | 0633          | 0638        | 0644        |     |     | 10652         |    |           |     | 11           |            | C 1.6 |            |      |                  |                                     |                  | 9.0E-04 |
| GOES |     | 0654          | 0700        | 0707        |     |     | 10652         |    |           |     | 13           |            | C 2.0 |            |      |                  |                                     |                  | 1.3E-03 |
| GOES |     | 0741          | 0759        | 0808        |     |     | 10652         |    |           |     | 27           |            | C 5.3 |            |      |                  |                                     |                  | 5.6E-03 |
| GOES |     | 0907          | 0912        | 0919        |     |     | 10652         |    |           |     | 12           |            | C 1.8 |            |      |                  |                                     |                  | 1.2E-03 |
| GOES |     | 1102          | 1111        | 1124        | N04 | E11 | 10652         |    |           |     | 22           | SF         | C 5.8 |            |      |                  |                                     |                  | 6.1E-03 |
| SVTO |     | 1107          | 1107        | 1129        | N04 | E11 | 10652         | 07 | 23.3      |     | 22           | SF         |       | 3          | E    |                  | 19                                  |                  | F       |
| GOES |     | 1537          | 1543        | 1549        |     |     | 10652         |    |           |     | 12           |            | C 2.3 |            |      |                  |                                     |                  | 1.4E-03 |
| GOES |     | 1717          | 1724        | 1737        | N04 | E07 | 10652         |    |           |     | 20           | SF         | C 3.2 |            |      |                  |                                     |                  | 3.2E-03 |
| HOLL |     | 1718          | 1721        | 1749        | N04 | E07 | 10652         | 07 | 23.2      |     | 31           | SF         |       | 3          | E    |                  | 91                                  |                  |         |
| HOLL |     | 1756          | 1800        | 1836D       | N04 | E07 | 10652         | 07 | 23.3      |     | 40D          | SF         |       | 3          | E    |                  | 18                                  |                  |         |
| GOES |     | 2201          | 2212        | 2218        |     |     | 10652         |    |           |     | 17           |            | C 4.1 |            |      |                  |                                     |                  | 2.7E-03 |
| HOLL |     | 2233          | 2256        | 2333D       | N05 | E04 | 10652         | 07 | 23.2      |     | 60D          | 2N         |       | 3          | E    |                  | 254                                 |                  | MZ      |
| GOES |     | 2240          | 2258        | 2307        | N05 | E04 | 10652         |    |           |     | 27           | 2N         | M 1.6 |            |      |                  |                                     |                  | 1.6E-02 |
| GOES |     | 2310          | 2324        | 2343        |     |     |               |    |           |     | 33           |            | M 1.2 |            |      |                  |                                     |                  | 2.3E-02 |
| GOES | 23  | 0303          | 0336        | 0413        |     |     | 10652         |    |           |     | 70           |            | C 4.7 |            |      |                  |                                     |                  | 1.6E-02 |
| GOES |     | 0641          | 0649        | 0706        |     |     | 10652         |    |           |     | 25           |            | C 2.1 |            |      |                  |                                     |                  | 2.6E-03 |
| SVTO |     | 0644          | 0645        | 0652        | N03 | W04 | 10652         | 07 | 23.0      |     | 8            | SF         |       | 3          | E    |                  | 35                                  |                  | F       |
| GOES |     | 0717          | 0727        | 0737        | N03 | W04 | 10652         |    |           |     | 20           | SF         | C 4.1 |            |      |                  |                                     |                  | 3.7E-03 |
| SVTO |     | 0722          | 0723        | 0739        | N03 | W04 | 10652         | 07 | 23.0      |     | 17           | SF         |       | 3          | E    |                  | 34                                  |                  | F       |
| GOES |     | 1603          | 1609        | 1615        |     |     | 10652         |    |           |     | 12           |            | C 1.0 |            |      |                  |                                     |                  | 6.8E-04 |
| GOES |     | 1707          | 1728        | 1735        | N03 | W04 | 10652         |    |           |     | 28           | SF         | M 2.2 |            |      |                  |                                     |                  | 1.5E-02 |
| SVTO |     | 1723E         | 1725U       | 1735D       | N03 | W04 | 10652         | 07 | 23.4      |     | 12D          | SF         |       | 2          | E    |                  | 161                                 |                  | F       |
| GOES |     | 1802          | 1807        | 1811        |     |     | 10652         |    |           |     | 9            |            | C 4.1 |            |      |                  |                                     |                  | 1.7E-03 |
| GOES |     | 2115          | 2123        | 2130        |     |     | 10652         |    |           |     | 15           |            | M 1.7 |            |      |                  |                                     |                  | 9.0E-03 |
| GOES | 24  | 0034          | 0039        | 0041        |     |     |               |    |           |     | 7            |            | C 1.6 |            |      |                  |                                     |                  | 5.3E-04 |
| GOES |     | 0110          | 0114        | 0116        |     |     | 10649         |    |           |     | 6            |            | C 1.1 |            |      |                  |                                     |                  | 3.7E-04 |
| GOES |     | 0410          | 0413        | 0416        |     |     |               |    |           |     | 6            |            | C 1.2 |            |      |                  |                                     |                  | 4.0E-04 |
| GOES |     | 0601          | 0606        | 0610        | N07 | W20 | 10652         |    |           |     | 9            | 1F         | M 1.0 |            |      |                  |                                     |                  | 3.3E-03 |
| SVTO |     | 0604          | 0605        | 0616        | N07 | W20 | 10652         | 07 | 22.7      |     | 12           | 1F         |       | 3          | E    |                  | 124                                 |                  | F       |
| GOES |     | 0807          | 0817        | 0821        | N03 | W14 | 10652         |    |           |     | 14           | SF         | C 2.5 |            |      |                  |                                     |                  | 1.7E-03 |

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# H $\alpha$ SOLAR FLARES

JULY 2004

| Sta  | Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Lat | CMD | NOAA/<br>USAF<br>Region | CMP<br>Mo | Dur<br>Day | (Min) | Imp<br>Opt | Xray | Obs<br>See | Type | Area Measurement |                                     |                  | Remarks  |
|------|-----|---------------|-------------|-------------|-----|-----|-------------------------|-----------|------------|-------|------------|------|------------|------|------------------|-------------------------------------|------------------|----------|
|      |     |               |             |             |     |     |                         |           |            |       |            |      |            |      | Time<br>(UT)     | Apparent<br>(10 <sup>-6</sup> Disk) | Corr<br>(Sq Deg) |          |
| SVTO | 24  | 0810          | 0815        | 0824        | N03 | W14 | 10652                   | 07        | 23.3       | 14    | SF         |      | 3          | E    |                  | 17                                  |                  |          |
| GOES |     | 0937          | 0941        | 0949        |     |     |                         |           |            | 12    | C 1.1      |      |            |      |                  |                                     |                  | 7.2E-04  |
| GOES |     | 1014          | 1028        | 1038        | N08 | W15 | 10652                   |           |            | 24    | SF C 3.5   |      |            |      |                  |                                     |                  | 3.6E-03  |
| SVTO |     | 1024          | 1025        | 1037        | N08 | W15 | 10652                   | 07        | 23.3       | 13    | SF         |      | 3          | E    |                  | 12                                  |                  | F        |
| GOES |     | 1331          | 1337        | 1345        | N04 | W16 | 10652                   |           |            | 14    | SF C 4.8   |      |            |      |                  |                                     |                  | 2.8E-03  |
| SVTO |     | 1335          | 1335        | 1347        | N04 | W16 | 10652                   | 07        | 23.4       | 12    | SF         |      | 3          | E    |                  | 40                                  |                  |          |
| GOES |     | 1446          | 1455        | 1501        |     |     | 10652                   |           |            | 15    | B 9.7      |      |            |      |                  |                                     |                  | 8.0E-04  |
| GOES |     | 1651          | 1654        | 1656        |     |     | 10650                   |           |            | 5     | B 8.6      |      |            |      |                  |                                     |                  | 2.2E-04  |
| GOES |     | 1732          | 1738        | 1742        |     |     |                         |           |            | 10    | C 1.0      |      |            |      |                  |                                     |                  | 5.7E-04  |
| GOES |     | 1823          | 1828        | 1834        | N08 | W22 | 10652                   |           |            | 11    | SF C 1.1   |      |            |      |                  |                                     |                  | 6.3E-04  |
| HOLL |     | 1827          | 1827        | 1836        | N08 | W22 | 10652                   | 07        | 23.1       | 9     | SF         |      | 3          | E    |                  | 19                                  |                  | F        |
| GOES |     | 1840          | 1850        | 1856        |     |     | 10652                   |           |            | 16    | M 2.5      |      |            |      |                  |                                     |                  | 1.4E-02  |
| GOES |     | 2134          | 2138        | 2140        |     |     | 10652                   |           |            | 6     | C 1.2      |      |            |      |                  |                                     |                  | 3.6E-04  |
| GOES |     | 2159          | 2207        | 2215        |     |     | 10652                   |           |            | 16    | C 1.4      |      |            |      |                  |                                     |                  | 1.2E-03  |
| GOES |     | 2311          | 2322        | 2332        |     |     | 10652                   |           |            | 21    | C 2.7      |      |            |      |                  |                                     |                  | 2.4E-03  |
| GOES | 25  | 0025          | 0032        | 0036        | N09 | W26 | 10652                   |           |            | 11    | SF C 7.4   |      |            |      |                  |                                     |                  | 2.9E-03  |
| LEAR |     | 0030          | 0031        | 0036        | N09 | W26 | 10652                   | 07        | 23.1       | 6     | SF         |      | 3          | E    |                  | 52                                  |                  |          |
| GOES |     | 0539          | 0551        | 0558        | N10 | W31 | 10652                   |           |            | 19    | 2B M 7.1   |      |            |      |                  |                                     |                  | 3.8E-02  |
| LEAR |     | 0543          | 0548        | 0623        | N10 | W31 | 10652                   | 07        | 22.9       | 40    | 2B         |      | 3          | E    |                  | 287                                 |                  | FE       |
| GOES |     | 0630          | 0639        | 0645        | N03 | W27 | 10652                   |           |            | 15    | 1F M 1.0   |      |            |      |                  |                                     |                  | 6.8E-03  |
| SVTO |     | 0632E         | 0636        | 0659D       | N04 | W25 | 10652                   | 07        | 23.4       | 27D   | 1F         |      | 2          | E    |                  | 148                                 |                  | F        |
| LEAR |     | 0632          | 0636        | 0701        | N03 | W27 | 10652                   | 07        | 23.2       | 29    | 1F         |      | 3          | E    |                  | 115                                 |                  | FE       |
| GOES |     | 0707          | 0714        | 0717        | N09 | W34 | 10652                   |           |            | 10    | SF C 6.9   |      |            |      |                  |                                     |                  | 3.2E-03  |
| LEAR |     | 0708          | 0714        | 0725        | N09 | W34 | 10652                   | 07        | 22.7       | 17    | SF         |      | 3          | E    |                  | 84                                  |                  | FE       |
| GOES |     | 1318          | 1325        | 1332        |     |     | 10652                   |           |            | 14    | C 2.1      |      |            |      |                  |                                     |                  | 1.5E-03  |
| GOES |     | 1337          | 1349        | 1355        |     |     | 10652                   |           |            | 18    | M 2.2      |      |            |      |                  |                                     |                  | 1.3E-02  |
| GOES |     | 1419          | 1514        | 1643        | N08 | W33 | 10652                   |           |            | 144   | 1F M 1.1   |      |            |      |                  |                                     |                  | 6.5E-02  |
| HOLL |     | 1433          | 1448        | 1643        | N08 | W33 | 10652                   | 07        | 23.1       | 130   | 1F         |      | 3          | E    |                  | 156                                 |                  | F        |
| HOLL |     | 1625          | 1627        | 1634        | N08 | E54 |                         | 07        | 29.7       | 9     | SF         |      | 3          | E    |                  | 12                                  |                  | H        |
| GOES | 26  | 0234          | 0243        | 0250        |     |     |                         |           |            | 16    | C 1.9      |      |            |      |                  |                                     |                  | 1.5E-03  |
| GOES |     | 0536          | 0552        | 0601        | N02 | W41 | 10652                   |           |            | 25    | SF M 1.3   |      |            |      |                  |                                     |                  | 1.1E-02  |
| LEAR |     | 0805          | 0809        | 0822        | N09 | W44 | 10652                   | 07        | 23.0       | 17    | SF         |      | 3          | E    |                  | 14                                  |                  |          |
| GOES |     | 0857          | 0905        | 0912        | N09 | W44 | 10652                   |           |            | 15    | SF C 2.9   |      |            |      |                  |                                     |                  | 1.8E-03  |
| LEAR |     | 0900          | 0901        | 0912        | N09 | W44 | 10652                   | 07        | 23.1       | 12    | SF         |      | 3          | E    |                  | 20                                  |                  |          |
| GOES |     | 1650          | 1659        | 1711        |     |     | 10652                   |           |            | 21    | C 4.7      |      |            |      |                  |                                     |                  | 4.6E-03  |
| GOES |     | 1723          | 1730        | 1737        | N03 | W45 | 10652                   |           |            | 14    | 2N M 1.1   |      |            |      |                  |                                     |                  | 6.3E-03  |
| HOLL |     | 1726          | 1736        | 1752        | N03 | W45 | 10652                   | 07        | 23.4       | 26    | 2N         |      | 3          | E    |                  | 345                                 |                  | EF       |
| HOLL |     | 1818          | 1818        | 1822        | N08 | W48 | 10652                   | 07        | 23.2       | 4     | SF         |      | 3          | E    |                  | 11                                  |                  |          |
| GOES |     | 2200          | 2207        | 2216        |     |     | 10652                   |           |            | 16    | C 1.0      |      |            |      |                  |                                     |                  | 9.1E-04  |
| HOLL |     | 2238          | 2239U       | 2322D       | N11 | W47 | 10652                   | 07        | 23.4       | 44D   | SF         |      | 2          | E    |                  | 16                                  |                  | F        |
| GOES |     | 2245          | 2251        | 2255        | N11 | W47 | 10652                   |           |            | 10    | SF C 1.8   |      |            |      |                  |                                     |                  | 9.3E-04  |
| GOES |     | 2346          | 2401        | 2411        | N10 | W54 | 10652                   |           |            | 25    | 1F M 1.2   |      |            |      |                  |                                     |                  | 1.1E-02  |
| HOLL |     | 2349          |             | 2511D       | N10 | W54 | 10652                   | 07        | 22.9       | 82D   | 1F         |      | 3          | E    |                  | 130                                 |                  | FHT      |
| GOES | 27  | 0256          | 0302        | 0307        |     |     | 10652                   |           |            | 11    | C 1.5      |      |            |      |                  |                                     |                  | 8.3E-04  |
| GOES |     | 0541          | 0545        | 0552        | N02 | W53 | 10652                   |           |            | 11    | 1N M 1.1   |      |            |      |                  |                                     |                  | 4.6E-03  |
| SVTO |     | 0544          | 0545        | 0609        | N02 | W53 | 10652                   | 07        | 23.3       | 25    | 1N         |      | 3          | E    |                  | 219                                 |                  | F        |
| GOES |     | 0623          | 0629        | 0638        |     |     | 10652                   |           |            | 15    | C 1.2      |      |            |      |                  |                                     |                  | 9.8E-04  |
| GOES |     | 0914          | 1018        | 1105        |     |     | 10652                   |           |            | 111   | C 3.7      |      |            |      |                  |                                     |                  | 1.4E-02  |
| SVTO |     | 1017          | 1017        | 1021        | N08 | W58 | 10652                   | 07        | 23.1       | 4     | SF         |      | 3          | E    |                  | 17                                  |                  | F        |
| GOES |     | 1327          | 1332        | 1340        |     |     |                         |           |            | 13    | B 9.0      |      |            |      |                  |                                     |                  | 6.0E-04  |
| GOES |     | 1446          | 1450        | 1454        |     |     | 10652                   |           |            | 8     | B 8.7      |      |            |      |                  |                                     |                  | 3.1E-04  |
| GOES |     | 1501          | 1507        | 1511        | N01 | W58 | 10652                   |           |            | 10    | 1F C 3.0   |      |            |      |                  |                                     |                  | 1.1E-03  |
| SVTO |     | 1504          | 1506        | 1513        | N01 | W58 | 10652                   | 07        | 23.3       | 9     | 1F         |      | 3          | E    |                  | 116                                 |                  |          |
| GOES |     | 1521          | 1525        | 1536        | N06 | W57 | 10652                   |           |            | 15    | SF C 2.8   |      |            |      |                  |                                     |                  | 1.9E-03  |
| SVTO |     | 1524          | 1526        | 1529        | N06 | W57 | 10652                   | 07        | 23.4       | 5     | SF         |      | 3          | E    |                  | 95                                  |                  |          |
| GOES |     | 1959          | 2020        | 2037        | N09 | W65 | 10652                   |           |            | 38    | 1F M 1.5   |      |            |      |                  |                                     |                  | 1.7E-02  |
| HOLL |     | 2003          | 2017        | 2112        | N09 | W65 | 10652                   | 07        | 22.9       | 69    | 1F         |      | 3          | E    |                  | 114                                 |                  | F        |
| GOES |     | 2227          | 2233        | 2236        |     |     | 10652                   |           |            | 9     | C 2.9      |      |            |      |                  |                                     |                  | 9.8E-04  |
| GOES |     | 2252          | 2257        | 2302        |     |     | 10652                   |           |            | 10    | C 1.1      |      |            |      |                  |                                     |                  | 5.9E-04  |
| GOES | 28  | 0232          | 0609        | 0803        |     |     |                         |           |            | 331   | C 4.4      |      |            |      |                  |                                     |                  | 6.0E-02T |
| SVTO |     | 0647          | 0648        | 0650        | N01 | W68 | 10652                   | 07        | 23.2       | 3     | SF         |      | 3          | E    |                  | 87                                  |                  |          |
| GOES |     | 0803          | 0811        | 0815        | N06 | W70 | 10652                   |           |            | 12    | SF C 6.3   |      |            |      |                  |                                     |                  | 3.6E-03  |
| SVTO |     | 0806E         | 0807U       | 0821D       | N06 | W70 | 10652                   | 07        | 23.1       | 15D   | SF         |      | 3          | E    |                  | 33                                  |                  |          |
| GOES |     | 1141          | 1147        | 1153        |     |     | 10652                   |           |            | 12    | C 3.0      |      |            |      |                  |                                     |                  | 1.7E-03  |

H $\alpha$  SOLAR FLARES

JULY 2004

| Sta  | Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Lat | CMD | NOAA/<br>USAF<br>Region | CMP<br>Mo | Dur<br>Day | (Min) | Imp<br>Opt | Xray  | Obs<br>See | Type | Time<br>(UT) | Area Measurement        |                  | Remarks  |
|------|-----|---------------|-------------|-------------|-----|-----|-------------------------|-----------|------------|-------|------------|-------|------------|------|--------------|-------------------------|------------------|----------|
|      |     |               |             |             |     |     |                         |           |            |       |            |       |            |      |              | Apparent<br>(10-6 Disk) | Corr<br>(Sq Deg) |          |
| GOES | 28  | 1335          | 1338        | 1346        | N04 | W68 | 10652                   |           |            | 11    | SF         | C 1.2 |            |      |              |                         |                  | 7.8E-04  |
| HOLL |     | 1337          | 1338        | 1341        | N04 | W68 | 10652                   | 07        | 23.5       | 4     | SF         |       | 3          | E    |              | 20                      |                  |          |
| GOES |     | 1528          | 1534        | 1536        | N01 | W72 | 10652                   |           |            | 8     | SF         | C 3.6 |            |      |              |                         |                  | 1.0E-03  |
| HOLL |     | 1531          | 1532        | 1539        | N04 | W69 | 10652                   | 07        | 23.5       | 8     | SF         |       | 3          | E    |              | 82                      |                  | H        |
| SVTO |     | 1532          | 1534        | 1538        | N01 | W72 | 10652                   | 07        | 23.3       | 6     | SF         |       | 3          | E    |              | 39                      |                  |          |
| GOES |     | 1608          | 1627        | 1633        | N03 | W65 | 10652                   |           |            | 25    | SF         | C 3.3 |            |      |              |                         |                  | 3.4E-03  |
| SVTO |     | 1624          | 1625        | 1627        | N00 | W67 | 10652                   | 07        | 23.7       | 3     | SF         |       | 3          | E    |              | 15                      |                  | F        |
| HOLL |     | 1624          | 1625        | 1635        | N03 | W65 | 10652                   | 07        | 23.8       | 11    | SF         |       | 3          | E    |              | 28                      |                  | F        |
| HOLL |     | 1842          | 1846        | 1850        | N04 | W71 | 10652                   | 07        | 23.5       | 8     | SF         |       | 3          | E    |              | 64                      |                  | HR       |
| GOES |     | 1843          | 1847        | 1849        |     |     | 10652                   |           |            | 6     |            | B 9.6 |            |      |              |                         |                  | 2.8E-04  |
| GOES |     | 2127          | 2133        | 2136        | N04 | W72 | 10652                   |           |            | 9     | 1F         | C 1.6 |            |      |              |                         |                  | 6.7E-04  |
| HOLL |     | 2130          | 2131        | 2138        | N04 | W72 | 10652                   | 07        | 23.5       | 8     | 1F         |       | 3          | E    |              | 107                     |                  | H        |
| HOLL |     | 2233          | 2233        | 2237        | N07 | E13 | 10654                   | 07        | 29.9       | 4     | SF         |       | 3          | E    |              | 11                      |                  | F        |
| GOES |     | 2345          | 2406        | 2416        |     |     | 10652                   |           |            | 31    |            | M 2.0 |            |      |              |                         |                  | 1.9E-02  |
| GOES | 29  | 0622          | 0626        | 0628        |     |     | 10652                   |           |            | 6     |            | C 1.1 |            |      |              |                         |                  | 2.5E-04  |
| GOES |     | 0658          | 0705        | 0709        |     |     | 10652                   |           |            | 11    |            | C 1.7 |            |      |              |                         |                  | 7.2E-04  |
| GOES |     | 0813          | 0817        | 0820        |     |     | 10652                   |           |            | 7     |            | B 6.2 |            |      |              |                         |                  | 2.0E-04  |
| GOES |     | 0956          | 1004        | 1015        |     |     | 10652                   |           |            | 19    |            | B 6.8 |            |      |              |                         |                  | 6.9E-04  |
| GOES |     | 1142          | 1304        | 1402        |     |     | 10652                   |           |            | 140   |            | C 2.1 |            |      |              |                         |                  | 1.2E-02  |
| GOES |     | 1628          | 1633        | 1638        | N03 | W86 | 10652                   |           |            | 10    | SF         | C 2.8 |            |      |              |                         |                  | 1.3E-03  |
| HOLL |     | 1631          | 1631        | 1636        | N03 | W86 | 10652                   | 07        | 23.3       | 5     | SF         |       | 4          | E    |              | 22                      |                  | F        |
| GOES |     | 2036          | 2039        | 2041        |     |     |                         |           |            | 5     |            | B 9.0 |            |      |              |                         |                  | 2.4E-04  |
| GOES |     | 2354          | 2412        | 2414        |     |     | 10652                   |           |            | 20    |            | C 1.0 |            |      |              |                         |                  | 8.2E-04  |
| GOES | 30  | 0727          | 0731        | 0734        |     |     | 10652                   |           |            | 7     |            | C 1.2 |            |      |              |                         |                  | 3.8E-04  |
| GOES |     | 1121          | 1127        | 1132        |     |     | 10654                   |           |            | 11    |            | B 7.5 |            |      |              |                         |                  | 3.7E-04  |
| GOES |     | 1232          | 1238        | 1251        |     |     | 10652                   |           |            | 19    |            | B 5.2 |            |      |              |                         |                  | 5.1E-04  |
| GOES |     | 1454          | 1512        | 1516        |     |     | 10654                   |           |            | 22    |            | B 4.4 |            |      |              |                         |                  | 5.0E-04  |
| GOES |     | 1908          | 1914        | 1925        |     |     | 10652                   |           |            | 17    |            | B 3.8 |            |      |              |                         |                  | 3.6E-04  |
| GOES |     | 2220          | 2228        | 2236        |     |     | 10652                   |           |            | 16    |            | B 5.4 |            |      |              |                         |                  | 4.6E-04  |
| GOES |     | 2248          | 2253        | 2259        |     |     | 10654                   |           |            | 11    |            | B 8.2 |            |      |              |                         |                  | 4.6E-04  |
| GOES | 31  | 0046          | 0104        | 0129        |     |     | 10652                   |           |            | 43    |            | C 2.8 |            |      |              |                         |                  | 5.6E-03  |
| GOES |     | 0516          | 0657        | 0914        |     |     | 10652                   |           |            | 238   |            | C 8.4 |            |      |              |                         |                  | 7.6E-02T |
| GOES |     | 1035          | 1101        | 1149        |     |     | 10652                   |           |            | 74    |            | C 5.3 |            |      |              |                         |                  | 2.1E-02  |
| GOES |     | 1834          | 1839        | 1844        |     |     |                         |           |            | 10    |            | B 5.9 |            |      |              |                         |                  | 3.3E-04  |

## "Remarks"

A = Eruptive prominence whose base is less than 90 degrees from central meridian.  
 B = Probably the end of a more important flare.  
 C = Invisible 10 minutes before.  
 D = Brilliant point.  
 E = Two or more brilliant points.  
 F = Several eruptive centers.  
 G = No visible spots in the neighborhood.  
 H = Flare accompanied by high-speed dark filament.  
 I = Active region very extended.  
 J = Distinct variations of plage intensity before or after the flare.  
 K = Several intensity maxima.  
 L = Existing filaments show signs of sudden activity.  
 M = White-light flare.  
 N = Continuous spectrum shows effects of polarization.

O = Observations have been made in the H and K lines of Ca II.  
 P = Flare shows Helium D3 in emission.  
 Q = Flare shows Balmer continuum in emission.  
 R = Marked asymmetry in H-alpha line suggests ejection of high-velocity material.  
 S = Brightness follows disappearance of filament in same position.  
 T = Region active all day.  
 U = Two bright branches, parallel or converging.  
 V = Occurrence of an explosive phase; important, expansion within roughly 1 minute that often includes a significant intensity increase.  
 W = Great increase in area after time of maximum intensity.  
 X = Unusually wide H-alpha line.  
 Y = System of loop-type prominences.  
 Z = Major sunspot umbra covered by flare.

Observation Type: C=Cinematographic, E=Electronic, P=Photographic, V=Visual

NOTE: Beginning July 1997, the times of all GOES X-ray events are now included in this table.

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# SOLAR RADIO EMISSION

## Selected Fixed Frequency Events

JULY 2004

| Day | Freq | Sta  | Type  | Start<br>(UT) | Time of<br>Maximum<br>(UT) | Duration<br>(Min) | Flux Density              |                           | Int | Remarks         |
|-----|------|------|-------|---------------|----------------------------|-------------------|---------------------------|---------------------------|-----|-----------------|
|     |      |      |       |               |                            |                   | Peak<br>(10 -22 W/m 2 Hz) | Mean<br>(10 -22 W/m 2 Hz) |     |                 |
| 11  | 2695 | SVTO | 8 S   | 0738.0        | 0738.0                     | U                 | 49.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 0738.0        | 0738.0                     | U                 | 46.0                      |                           |     | QL=4 ST=2 TYP=3 |
| 12  | 8800 | SVTO | 4 S/F | 0752.0        | 0755.0                     | 7.0               | 87.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S   | 0755.0        | 0756.0                     | 1.0               | 55.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 0755.0        | 0755.0                     | 1.0               | 52.0                      |                           |     | QL=4 ST=2 TYP=3 |
| 13  | 2695 | LEAR | 4 S/F | 0013.0        | 0015.0                     | 6.0               | 350.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 49 GB | 0013.0        | 0017.0                     | 9.0               | 820.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | PALE | 49 GB | 0013.0        | 0016.0                     | 9.0               | 870.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 2695 | PALE | 4 S/F | 0013.0        | 0015.0                     | 6.0               | 400.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 0630.0        | 0630.0                     | 1.0               | 48.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 4 S/F | 0844.0        | 0847.0                     | 4.0               | 87.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F | 0844.0        | 0847.0                     | 5.0               | 89.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 0844.0        | 0847.0                     | 7.0               | 140.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0847.0        | 0847.0                     | U                 | 56.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 0858.0        | 0858.0                     | U                 | 21.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 4 S/F | 1202.0        | 1205.0                     | 11.0              | 260.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 4 S/F | 1204.0        | 1205.0                     | 7.0               | 380.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 1204.0        | 1205.0                     | 10.0              | 390.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F | 1205.0        | 1205.0                     | 6.0               | 260.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1836.0        | 1836.0                     | U                 | 77.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 48 C  | 1927.0        | 1930.0                     | 5.0               | 270.0                     |                           |     | QL=4 ST=2 TYP=8 |
|     | 8800 | SGMR | 48 C  | 1927.0        | 1930.0                     | 6.0               | 230.0                     |                           |     | QL=2 ST=2 TYP=8 |
|     | 2695 | PALE | 4 S/F | 1929.0        | 1930.0                     | 3.0               | 170.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 4 S/F | 1929.0        | 1930.0                     | 4.0               | 140.0                     |                           |     | QL=2 ST=2 TYP=3 |
| 14  | 8800 | LEAR | 8 S   | 0520.0        | 0521.0                     | 1.0               | 94.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S   | 0520.0        | 0521.0                     | 1.0               | 46.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 0520.0        | 0521.0                     | 1.0               | 62.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F | 0520.0        | 0521.0                     | 3.0               | 52.0                      |                           |     | QL=4 ST=2 TYP=3 |
| 15  | 2695 | LEAR | 4 S/F | 0136.0        | 0138.0                     | 4.0               | 310.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 4 S/F | 0137.0        | 0139.0                     | 3.0               | 330.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 49 GB | 0137.0        | 0138.0                     | 11.0              | 550.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | PALE | 49 GB | 0138.0        | 0139.0                     | 13.0              | 700.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SGMR | 8 S   | 1816.0        | 1817.0                     | 2.0               | 25.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 49 GB | 1821.0        | 1823.0                     | 9.0               | 700.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SGMR | 49 GB | 1821.0        | 1823.0                     | 13.0              | 970.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 2695 | PALE | 49 GB | 1822.0        | 1824.0                     | 5.0               | 680.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | PALE | 49 GB | 1822.0        | 1824.0                     | 4.0               | 900.0                     |                           |     | QL=4 ST=2 TYP=6 |
| 16  | 2695 | LEAR | 4 S/F | 0202.0        | 0203.0                     | 3.0               | 450.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 49 GB | 0202.0        | 0203.0                     | 4.0               | 1000.0                    |                           |     | QL=4 ST=2 TYP=6 |
|     | 2695 | PALE | 4 S/F | 0203.0        | 0204.0                     | 3.0               | 460.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 49 GB | 0203.0        | 0203.0                     | 3.0               | 930.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SVTO | 4 S/F | 1037.0        | 1039.0                     | 4.0               | 220.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 49 GB | 1038.0        | 1040.0                     | 4.0               | 500.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SGMR | 8 S   | 1038.0        | 1039.0                     | 2.0               | 200.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 49 GB | 1038.0        | 1040.0                     | 3.0               | 600.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SVTO | 49 GB | 1352.0        | 1353.0                     | 17.0              | 7100.0                    |                           |     | QL=4 ST=2 TYP=6 |
|     | 2695 | SVTO | 49 GB | 1353.0        | 1354.0                     | 7.0               | 2900.0                    |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SGMR | 49 GB | 1353.0        | 1353.0                     | 15.0              | 6100.0                    |                           |     | QL=4 ST=2 TYP=6 |
|     | 2695 | SGMR | 49 GB | 1353.0        | 1354.0                     | 35.0              | 2900.0                    |                           |     | QL=4 ST=2 TYP=6 |
| 17  | 2695 | LEAR | 4 S/F | 0345.0        | 0346.0                     | 3.0               | 51.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0346.0        | 0346.0                     | U                 | 67.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 4 S/F | 0755.0        | 0756.0                     | 4.0               | 380.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 49 GB | 0755.0        | 0756.0                     | 4.0               | 580.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 2695 | SVTO | 49 GB | 0755.0        | 0756.0                     | 10.0              | 670.0                     |                           |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SVTO | 4 S/F | 0755.0        | 0756.0                     | 10.0              | 470.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0803.0        | 0803.0                     | U                 | 57.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 1253.0        | 1253.0                     | U                 | 43.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1253.0        | 1253.0                     | 1.0               | 90.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 1253.0        | 1253.0                     | 1.0               | 80.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 1254.0        | 1254.0                     | U                 | 36.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F | 1649.0        | 1649.0                     | 3.0               | 120.0                     |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S   | 1649.0        | 1649.0                     | U                 | 61.0                      |                           |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 1649.0        | 1649.0                     | U                 | 52.0                      |                           |     | QL=4 ST=2 TYP=3 |

# S O L A R   R A D I O   E M I S S I O N

## Selected Fixed Frequency Events

35  
Jul 04

JULY                      2004

| Day | Freq | Sta  | Type  | Start<br>(UT) | Time of<br>Maximum<br>(UT) | Duration<br>(Min) | Flux Density              |                | Int | Remarks         |
|-----|------|------|-------|---------------|----------------------------|-------------------|---------------------------|----------------|-----|-----------------|
|     |      |      |       |               |                            |                   | Peak<br>(10 -22 W/m 2 Hz) | Mean<br>(2 Hz) |     |                 |
| 17  | 8800 | SGMR | 8 S   | 1649.0        | 1650.0                     | 1.0               | 79.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 1649.0        | 1650.0                     | 4.0               | 72.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 1649.0        | 1649.0                     | 1.0               | 51.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S   | 1917.0        | 1917.0                     | 1.0               | 160.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S   | 1917.0        | 1917.0                     | 1.0               | 240.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 1917.0        | 1917.0                     | 1.0               | 140.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1917.0        | 1917.0                     | U                 | 200.0                     |                |     | QL=4 ST=2 TYP=3 |
| 18  | 8800 | SGMR | 4 S/F | 1146.0        | 1146.0                     | 3.0               | 380.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 1146.0        | 1146.0                     | U                 | 25.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 1146.0        | 1146.0                     | 1.0               | 360.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 1146.0        | 1146.0                     | U                 | 59.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1412.0        | 1412.0                     | 1.0               | 48.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 1412.0        | 1413.0                     | 1.0               | 39.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 1412.0        | 1412.0                     | U                 | 52.0                      |                |     | QL=4 ST=2 TYP=3 |
| 19  | 8800 | SVTO | 8 S   | 0652.0        | 0652.0                     | U                 | 62.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 0652.0        | 0652.0                     | 1.0               | 58.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 2056.0        | 2057.0                     | 1.0               | 170.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S   | 2057.0        | 2058.0                     | 1.0               | 160.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 2057.0        | 2057.0                     | U                 | 24.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 2137.0        | 2138.0                     | 1.0               | 41.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 2138.0        | 2138.0                     | U                 | 29.0                      |                |     | QL=4 ST=2 TYP=3 |
| 20  | 2695 | LEAR | 8 S   | 0058.0        | 0058.0                     | 1.0               | 86.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S   | 0059.0        | 0059.0                     | 1.0               | 100.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1106.0        | 1107.0                     | 1.0               | 80.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 1106.0        | 1107.0                     | 2.0               | 90.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1125.0        | 1125.0                     | U                 | 27.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 49 GB | 1226.0        | 1228.0                     | 49.0              | 3000.0                    |                |     | QL=4 ST=3 TYP=6 |
|     | 8800 | SVTO | 49 GB | 1226.0        | 1228.0                     | 42.0              | 4900.0                    |                |     | QL=4 ST=3 TYP=6 |
|     | 8800 | SGMR | 49 GB | 1226.0        | 1229.0                     | 51.0              | 4700.0                    |                |     | QL=4 ST=2 TYP=6 |
|     | 2695 | SGMR | 49 GB | 1226.0        | 1229.0                     | 81.0              | 2800.0                    |                |     | QL=4 ST=2 TYP=6 |
|     | 8800 | SGMR | 4 S/F | 2109.0        | 2110.0                     | 3.0               | 53.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 4 S/F | 2112.0        | 2116.0                     | 6.0               | 66.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F | 2114.0        | 2117.0                     | 4.0               | 66.0                      |                |     | QL=4 ST=2 TYP=3 |
| 21  | 8800 | LEAR | 8 S   | 0032.0        | 0032.0                     | U                 | 180.0                     |                |     | QL=2 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S   | 0033.0        | 0033.0                     | U                 | 210.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 0505.0        | 0516.0                     | 14.0              | 200.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F | 0506.0        | 0516.0                     | 13.0              | 320.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 4 S/F | 0512.0        | 0514.0                     | 7.0               | 190.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 4 S/F | 0514.0        | 0516.0                     | 3.0               | 250.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 0758.0        | 0758.0                     | 1.0               | 42.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 4 S/F | 2354.0        | 2355.0                     | 3.0               | 37.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F | 2354.0        | 2355.0                     | 5.0               | 40.0                      |                |     | QL=4 ST=2 TYP=3 |
| 22  | 8800 | PALE | 48 C  | 0018.0        | 0031.0                     | 51.0              | 360.0                     |                |     | QL=4 ST=2 TYP=8 |
|     | 8800 | LEAR | 48 C  | 0018.0        | 0031.0                     | 66.0              | 360.0                     |                |     | QL=4 ST=2 TYP=8 |
|     | 2695 | PALE | 4 S/F | 0021.0        | 0027.0                     | 48.0              | 360.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 48 C  | 0021.0        | 0027.0                     | 54.0              | 300.0                     |                |     | QL=4 ST=2 TYP=8 |
|     | 2695 | PALE | 4 S/F | 0109.0        | 0110.0                     | 7.0               | 120.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F | 0109.0        | 0110.0                     | 16.0              | 130.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S   | 0214.0        | 0215.0                     | 2.0               | 100.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 4 S/F | 0214.0        | 0215.0                     | 3.0               | 120.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0215.0        | 0215.0                     | 1.0               | 80.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S   | 0215.0        | 0215.0                     | 1.0               | 87.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0635.0        | 0636.0                     | 1.0               | 72.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 0635.0        | 0636.0                     | 1.0               | 63.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 48 C  | 0743.0        | 0744.0                     | 20.0              | 180.0                     |                |     | QL=4 ST=2 TYP=8 |
|     | 8800 | SVTO | 48 C  | 0743.0        | 0755.0                     | 20.0              | 680.0                     |                |     | QL=4 ST=2 TYP=8 |
|     | 2695 | LEAR | 8 S   | 0744.0        | 0744.0                     | 1.0               | 150.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0744.0        | 0744.0                     | U                 | 230.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 48 C  | 0755.0        | 0755.0                     | 4.0               | 400.0                     |                |     | QL=4 ST=2 TYP=8 |
|     | 2695 | LEAR | 8 S   | 0755.0        | 0755.0                     | 2.0               | 110.0                     |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 4 S/F | 0907.0        | 0909.0                     | 6.0               | 76.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 0908.0        | 0909.0                     | 2.0               | 94.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0909.0        | 0909.0                     | U                 | 79.0                      |                |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F | 0909.0        | 0909.0                     | 3.0               | 42.0                      |                |     | QL=4 ST=2 TYP=3 |

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Jul 04

# S O L A R   R A D I O   E M I S S I O N

## Selected Fixed Frequency Events

JULY                      2004

| Day | Freq | Sta  | Type  | Start<br>(UT) | Time of<br>Maximum<br>(UT) | Duration<br>(Min) | Flux Density              |      | Int | Remarks         |
|-----|------|------|-------|---------------|----------------------------|-------------------|---------------------------|------|-----|-----------------|
|     |      |      |       |               |                            |                   | Peak<br>(10 -22 W/m 2 Hz) | Mean |     |                 |
| 22  | 8800 | SGMR | 4 S/F | 1003.0        | 1005.0                     | 13.0              | 71.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 4 S/F | 1003.0        | 1009.0                     | 55.0              | 210.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 49 GB | 1103.0E       | 1105.0U                    | 12.0D             | 700.0                     |      |     | QL=4 ST=2 TYP=6 |
|     | 2695 | SGMR | 4 S/F | 1104.0E       | 1105.0U                    | 6.0D              | 200.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1539.0        | 1539.0                     | 1.0               | 140.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 1539.0        | 1539.0                     | 1.0               | 130.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 1539.0        | 1539.0                     | U                 | 31.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S   | 1719.0        | 1719.0                     | 1.0               | 58.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 4 S/F | 2244.0        | 2247.0                     | 11.0              | 68.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F | 2244.0        | 2255.0                     | 43.0              | 380.0                     |      |     | QL=4 ST=2 TYP=3 |
| 23  | 8800 | LEAR | 8 S   | 0643.0        | 0644.0                     | 2.0               | 88.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F | 0643.0        | 0644.0                     | 3.0               | 83.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 0643.0        | 0644.0                     | 3.0               | 79.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S   | 0644.0        | 0644.0                     | U                 | 65.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 48 C  | 0707.0        | 0731.0                     | 26.0              | 110.0                     |      |     | QL=4 ST=2 TYP=8 |
|     | 8800 | SVTO | 4 S/F | 0722.0        | 0731.0                     | 11.0              | 78.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S   | 0731.0        | 0731.0                     | U                 | 83.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0731.0        | 0731.0                     | U                 | 64.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1604.0        | 1604.0                     | 1.0               | 35.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S   | 1710.0        | 1710.0                     | 1.0               | 160.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 1710.0        | 1710.0                     | U                 | 21.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 1710.0        | 1710.0                     | 2.0               | 170.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 48 C  | 1718.0        | 1720.0                     | 15.0              | 210.0                     |      |     | QL=2 ST=2 TYP=8 |
|     | 8800 | PALE | 48 C  | 1719.0        | 1720.0                     | 9.0               | 1100.0                    |      |     | QL=4 ST=2 TYP=8 |
|     | 2695 | PALE | 48 C  | 1719.0        | 1720.0                     | 9.0               | 170.0                     |      |     | QL=4 ST=2 TYP=8 |
|     | 8800 | SGMR | 48 C  | 1719.0        | 1720.0                     | 11.0              | 1100.0                    |      |     | QL=4 ST=2 TYP=8 |
|     | 2695 | SGMR | 48 C  | 1719.0        | 1720.0                     | 11.0              | 180.0                     |      |     | QL=4 ST=2 TYP=8 |
|     | 8800 | SVTO | 48 C  | 1719.0        | 1720.0                     | 11.0              | 1400.0                    |      |     | QL=2 ST=2 TYP=8 |
|     | 8800 | SGMR | 4 S/F | 2116.0        | 2119.0                     | 14.0              | 340.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F | 2118.0        | 2119.0                     | 6.0               | 290.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 4 S/F | 2118.0        | 2119.0                     | 7.0               | 120.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S   | 2119.0        | 2119.0                     | 1.0               | 110.0                     |      |     | QL=4 ST=2 TYP=3 |
| 24  | 2695 | SVTO | 4 S/F | 0603.0        | 0604.0                     | 6.0               | 230.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 0603.0        | 0604.0                     | 5.0               | 380.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0604.0        | 0604.0                     | 2.0               | 360.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S   | 0604.0        | 0604.0                     | 2.0               | 170.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 0814.0        | 0814.0                     | 1.0               | 43.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 0814.0        | 0814.0                     | 1.0               | 110.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 8 S   | 1017.0        | 1018.0                     | 1.0               | 30.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S   | 1017.0        | 1018.0                     | 1.0               | 44.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S   | 1334.0E       | 1334.0                     | 1.0D              | 140.0                     |      |     | QL=2 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S   | 1334.0E       | 1334.0                     | U                 | 480.0                     |      |     | QL=2 ST=2 TYP=3 |
|     | 8800 | SVTO | 49 GB | 1334.0        | 1334.0                     | 6.0               | 1000.0                    |      |     | QL=4 ST=2 TYP=6 |
|     | 2695 | SVTO | 4 S/F | 1334.0        | 1334.0                     | 4.0               | 200.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 4 S/F | 1843.0        | 1844.0                     | 9.0               | 100.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 48 C  | 1843.0        | 1845.0                     | 13.0              | 420.0                     |      |     | QL=4 ST=2 TYP=8 |
|     | 8800 | SGMR | 48 C  | 1843.0        | 1844.0                     | 12.0              | 370.0                     |      |     | QL=4 ST=2 TYP=8 |
| 25  | 2695 | PALE | 8 S   | 1845.0        | 1845.0                     | 1.0               | 110.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S   | 2314.0        | 2314.0                     | 1.0               | 62.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S   | 0028.0        | 0029.0                     | 2.0               | 200.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 4 S/F | 0028.0        | 0029.0                     | 3.0               | 290.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S   | 0029.0        | 0030.0                     | 1.0               | 220.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F | 0029.0        | 0029.0                     | 3.0               | 250.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0033.0        | 0033.0                     | U                 | 52.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 49 GB | 0543.0        | 0548.0                     | 16.0              | 1800.0                    |      |     | QL=4 ST=2 TYP=6 |
|     | 2695 | SVTO | 48 C  | 0543.0        | 0548.0                     | 15.0              | 810.0                     |      |     | QL=2 ST=2 TYP=8 |
|     | 8800 | LEAR | 49 GB | 0544.0        | 0547.0                     | 48.0              | 2100.0                    |      |     | QL=4 ST=2 TYP=6 |
|     | 2695 | LEAR | 49 GB | 0545.0        | 0548.0                     | 10.0              | 660.0                     |      |     | QL=4 ST=2 TYP=6 |
|     | 8800 | LEAR | 4 S/F | 0632.0        | 0636.0                     | 23.0              | 150.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 0633.0        | 0636.0                     | 6.0               | 100.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 0708.0        | 0712.0                     | 10.0              | 100.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S   | 0712.0        | 0712.0                     | U                 | 63.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F | 1320.0        | 1322.0                     | 5.0               | 120.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 4 S/F | 1322.0        | 1322.0                     | 3.0               | 110.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 48 C  | 1339.0        | 1354.0                     | 18.0              | 140.0                     |      |     | QL=4 ST=2 TYP=8 |
|     | 8800 | SVTO | 48 C  | 1342.0        | 1354.0                     | 13.0              | 150.0                     |      |     | QL=4 ST=2 TYP=8 |



# S O L A R   R A D I O   E M I S S I O N

## Selected Fixed Frequency Events

### JULY                      2004

37  
Jul 04

| Day | Freq | Sta  | Type   | Start<br>(UT) | Time of<br>Maximum<br>(UT) | Duration<br>(Min) | Flux Density              |      | Int | Remarks         |
|-----|------|------|--------|---------------|----------------------------|-------------------|---------------------------|------|-----|-----------------|
|     |      |      |        |               |                            |                   | Peak<br>(10 -22 W/m 2 Hz) | Mean |     |                 |
| 25  | 2695 | SGMR | 4 S/F  | 1349.0        | 1354.0                     | 6.0               | 65.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F  | 1349.0        | 1355.0                     | 6.0               | 69.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 20 GRF | 1424.0        | 1506.0                     | 99.0              | 120.0                     |      |     | QL=4 ST=2 TYP=2 |
|     | 2695 | SVTO | 20 GRF | 1424.0        | 1506.0                     | 143.0             | 110.0                     |      |     | QL=4 ST=2 TYP=2 |
|     | 8800 | SGMR | 20 GRF | 1436.0        | 1543.0                     | 87.0              | 76.0                      |      |     | QL=4 ST=2 TYP=2 |
|     | 8800 | SVTO | 48 C   | 1441.0        | 1519.0                     | 126.0             | 88.0                      |      |     | QL=4 ST=2 TYP=8 |
|     | 2695 | PALE | 4 S/F  | 1638.0        | 1639.0                     | 8.0               | 170.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S    | 1641.0        | 1641.0                     | U                 | 78.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S    | 1658.0        | 1658.0                     | U                 | 53.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S    | 1704.0        | 1704.0                     | U                 | 53.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S    | 1704.0        | 1704.0                     | U                 | 59.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 4 S/F  | 1955.0        | 1956.0                     | 3.0               | 140.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F  | 1956.0        | 1957.0                     | 3.0               | 150.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S    | 1956.0        | 1957.0                     | 1.0               | 63.0                      |      |     | QL=4 ST=2 TYP=3 |
| 26  | 8800 | LEAR | 4 S/F  | 0539.0        | 0551.0                     | 13.0              | 230.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 4 S/F  | 0539.0        | 0551.0                     | 15.0              | 220.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F  | 0546.0        | 0551.0                     | 5.0               | 65.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S    | 0550.0        | 0551.0                     | 1.0               | 61.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 8 S    | 1652.0        | 1652.0                     | U                 | 39.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S    | 1655.0        | 1655.0                     | 1.0               | 58.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 4 S/F  | 1725.0        | 1729.0                     | 5.0               | 180.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F  | 1726.0        | 1730.0                     | 5.0               | 190.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SGMR | 8 S    | 1727.0        | 1728.0                     | 2.0               | 38.0                      |      |     | QL=4 ST=2 TYP=3 |
|     |      |      |        |               |                            |                   |                           |      |     |                 |
| 27  | 2695 | LEAR | 8 S    | 0544.0        | 0545.0                     | 2.0               | 100.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S    | 0544.0        | 0544.0                     | 2.0               | 400.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S    | 0544.0        | 0545.0                     | 2.0               | 340.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F  | 0544.0        | 0545.0                     | 3.0               | 120.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SGMR | 4 S/F  | 2013.0        | 2016.0                     | 3.0               | 53.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 4 S/F  | 2353.0        | 2355.0                     | 6.0               | 190.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 4 S/F  | 2354.0        | 2356.0                     | 4.0               | 190.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | LEAR | 4 S/F  | 2355.0        | 2356.0                     | 3.0               | 170.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 4 S/F  | 2355.0        | 2356.0                     | 4.0               | 190.0                     |      |     | QL=4 ST=2 TYP=3 |
|     |      |      |        |               |                            |                   |                           |      |     |                 |
| 28  | 2695 | SVTO | 8 S    | 0805.0        | 0805.0                     | 1.0               | 25.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S    | 0806.0        | 0806.0                     | U                 | 27.0                      |      |     | QL=4 ST=2 TYP=3 |
| 29  | 8800 | SGMR | 8 S    | 1632.0        | 1632.0                     | U                 | 25.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S    | 1632.0        | 1632.0                     | U                 | 24.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | LEAR | 8 S    | 2356.0        | 2356.0                     | U                 | 53.0                      |      |     | QL=2 ST=2 TYP=3 |
|     | 2695 | LEAR | 8 S    | 2356.0        | 2356.0                     | U                 | 80.0                      |      |     | QL=2 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S    | 2356.0        | 2356.0                     | U                 | 97.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | PALE | 8 S    | 2356.0        | 2356.0                     | U                 | 92.0                      |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 8 S    | 2358.0        | 2358.0                     | 1.0               | 53.0                      |      |     | QL=4 ST=2 TYP=3 |
| 31  | 2695 | LEAR | 8 S    | 0050.0        | 0050.0                     | 2.0               | 150.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | PALE | 4 S/F  | 0050.0        | 0051.0                     | 3.0               | 170.0                     |      |     | QL=2 ST=2 TYP=3 |
|     | 2695 | SGMR | 4 S/F  | 1037.0        | 1039.0                     | 8.0               | 220.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 2695 | SVTO | 4 S/F  | 1038.0        | 1039.0                     | 6.0               | 220.0                     |      |     | QL=4 ST=2 TYP=3 |
|     | 8800 | SVTO | 8 S    | 1039.0        | 1040.0                     | 2.0               | 36.0                      |      |     | QL=4 ST=2 TYP=3 |

Reports are received routinely from the following observatories:

LEAR = Learmonth

PALE = Palehua

SGMR = Sagamore Hill

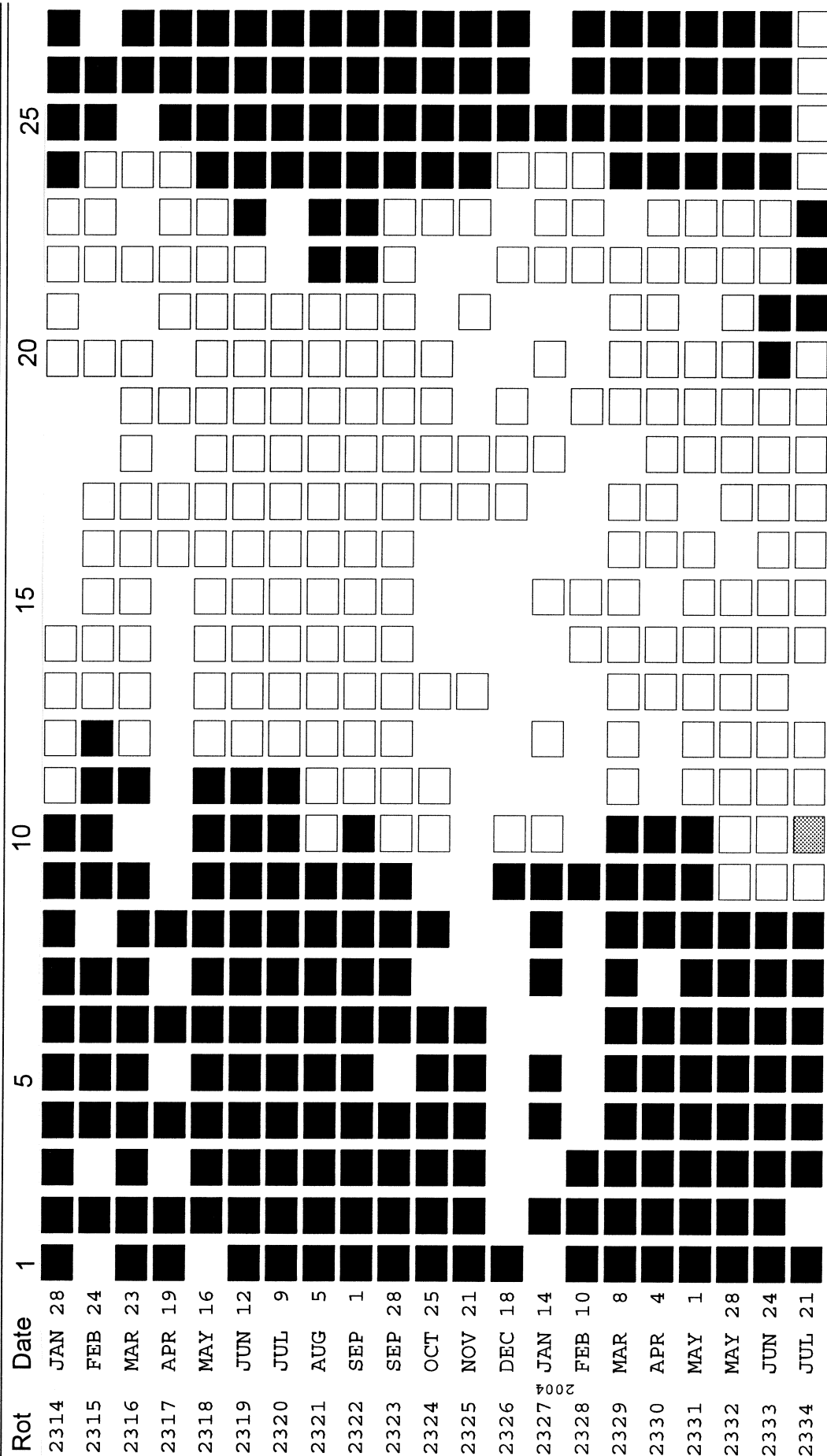
SVTO = San Vito

#### Explanation of Type Code:

|                   |                 |                        |                           |                            |
|-------------------|-----------------|------------------------|---------------------------|----------------------------|
| 1 Simple 1        | 7 Minor +       | 24 Rise                | 30 Post Burst Increase A  | 43 Onset of Noise Storm    |
| 2 Simple 1F       | 8 Spike         | 25 Rise A              | 31 Post Burst Decrease    | 44 Noise Storm in Progress |
| 3 Simple 2        | 20 Simple 3     | 26 Fall                | 33 Absorption             | 45 Complex                 |
| 4 Simple 2F       | 21 Simple 3A    | 27 Rise and Fall       | 40 Fluctuation            | 46 Complex F               |
| 5 Simple          | 22 Simple 3F    | 28 Precursor           | 41 Group of Bursts        | 47 Great Burst             |
| 6 Minor           | 23 Simple 3AF   | 29 Post Burst Increase | 42 Series of Bursts       | 48 Major                   |
| 1A Simple 1A      | 4A Simple 2AF   | 24PF Post Rise F       | 27F Rise and Fall F       |                            |
| 3A Simple 2A      | 40 Rise Only    | 16A Fall A             | 27AF Rise and Fall AF     |                            |
| 21A Simple 3A GRF | 40F Rise Only F | 260 Fall Only          | 31A Post Burst Decrease A |                            |
| 2A Simple 1AF     | 4P Post Rise    | 26F Fall F             | 32A Absorption A          |                            |

RSTN Site Information: Beginning in April 1986, the RSTN sites LEAR, PALE, SGMR, and SVTO fixed frequency solar radio data are periodically adjusted to several world standard stations. These world standard stations include: Kislovodsk, USSR 15,500 MHz; Penticton, Canada 2800 MHz; and Hiraiso, Japan 500 and 200 MHz.

STANFORD MEAN SOLAR MAGNETIC FIELD



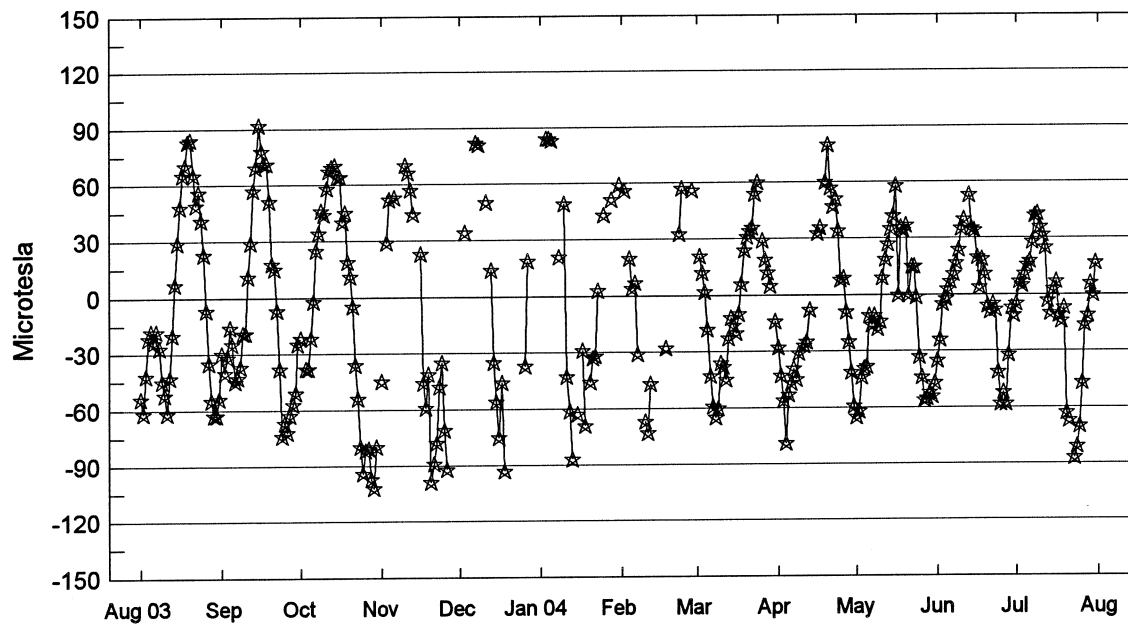
Mean Solar Magnetic Field Polarity: = field > 2 microT; = -2 microT ≤ field ≤ 2 microT

= field < -2 microT; No box = no data available

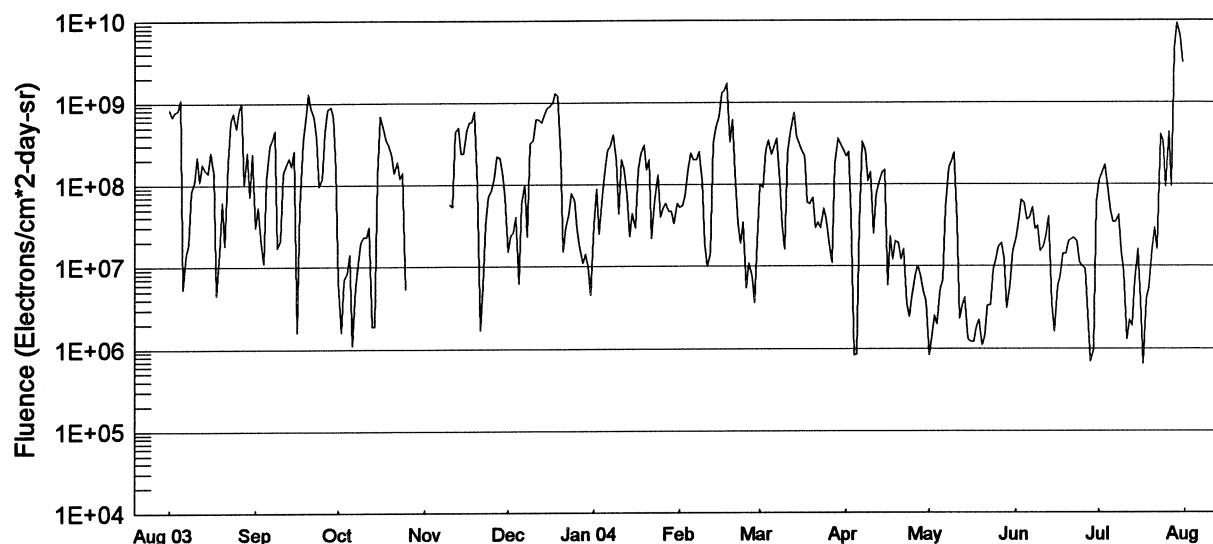
Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates are five days earlier, to mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

# Stanford Mean Solar Magnetic Field (Microtesla) "Sun-As-A-Star"

39  
Jul 04



| Day | Aug 03 | Sep | Oct  | Nov | Dec | Jan 04 | Feb | Mar | Apr | May | Jun | Jul |
|-----|--------|-----|------|-----|-----|--------|-----|-----|-----|-----|-----|-----|
| 1   | -54    | -30 | -22  | -45 | —   | —      | —   | —   | -28 | -65 | -35 | -5  |
| 2   | -62    | -40 | —    | —   | —   | —      | 56  | 21  | -43 | -62 | -24 | 7   |
| 3   | -42    | -32 | -38  | 29  | 34  | 84     | —   | 12  | -56 | -44 | -5  | 5   |
| 4   | -22    | -16 | -38  | 52  | —   | 84     | 20  | 2   | -79 | -39 | -2  | 11  |
| 5   | -18    | -25 | -22  | —   | —   | 83     | 4   | -18 | -53 | -38 | 3   | 16  |
| 6   | -24    | -45 | -2   | 53  | —   | —      | 7   | -43 | -47 | -11 | 7   | 18  |
| 7   | -18    | -43 | 25   | —   | 82  | —      | -31 | -59 | -39 | -16 | 11  | 28  |
| 8   | -27    | -37 | 34   | —   | 81  | 21     | —   | -65 | -45 | -11 | 17  | 42  |
| 9   | -45    | -19 | 46   | —   | —   | —      | —   | -60 | -31 | -18 | 24  | 43  |
| 10  | -52    | -19 | 44   | 70  | —   | 49     | -67 | -36 | —   | -14 | 35  | 36  |
| 11  | -62    | 11  | 58   | 66  | 50  | -43    | -73 | -38 | -27 | 9   | 40  | 32  |
| 12  | -43    | 29  | 67   | 57  | —   | -61    | -47 | -45 | -25 | 19  | —   | 25  |
| 13  | -20    | 57  | 69   | 44  | 14  | -87    | —   | -23 | -8  | 27  | 53  | -3  |
| 14  | 7      | 69  | 70   | —   | -35 | —      | —   | -12 | —   | 35  | 35  | -10 |
| 15  | 29     | 92  | 64   | —   | -56 | -63    | —   | -16 | —   | 42  | 34  | 3   |
| 16  | 48     | 78  | 64   | 23  | -75 | —      | —   | -20 | 33  | 58  | 20  | 7   |
| 17  | 65     | 71  | 40   | -46 | -46 | -29    | —   | -10 | 36  | —   | 4   | -11 |
| 18  | 70     | 71  | 45   | -59 | -93 | -69    | -28 | 6   | —   | 36  | 19  | -14 |
| 19  | 83     | 51  | 19   | -41 | —   | —      | —   | 24  | 60  | 34  | 11  | -7  |
| 20  | 84     | 18  | 11   | -99 | —   | -46    | —   | 31  | 80  | 37  | -6  | -63 |
| 21  | 65     | 15  | -5   | -89 | —   | -33    | —   | 34  | 57  | —   | -9  | -67 |
| 22  | 49     | -7  | -36  | -78 | —   | -32    | —   | 36  | 47  | 15  | -5  | —   |
| 23  | 56     | -38 | -54  | -48 | —   | 3      | 33  | 54  | 51  | 15  | -8  | -87 |
| 24  | 41     | -74 | -80  | -35 | —   | —      | 57  | 60  | 34  | -1  | -41 | -81 |
| 25  | 23     | -67 | -94  | -71 | —   | 43     | —   | —   | 8   | -33 | -58 | -70 |
| 26  | -7     | -72 | -82  | -92 | -37 | —      | —   | 29  | 9   | -44 | -52 | -47 |
| 27  | -35    | -63 | -81  | —   | 19  | —      | —   | 19  | -9  | -56 | -58 | -16 |
| 28  | -55    | -57 | -97  | —   | —   | 51     | 56  | 12  | -25 | -55 | -32 | -11 |
| 29  | -63    | -51 | -102 | —   | —   | —      | —   | 5   | -41 | -52 | -7  | 6   |
| 30  | -63    | -25 | -80  | —   | —   | —      | —   | —   | -59 | -54 | -11 | 0   |
| 31  | -54    | —   | —    | —   | —   | 59     | —   | -14 | —   | -47 | —   | 17  |

GOES Daily Electron Fluence  
Jul 2003 - Jun 2004

| Day | Aug 03  | Sep     | Oct     | Nov     | Dec     | Jan 04  | Feb     | Mar     | Apr     | May     | Jun     | Jul     |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1   | 8.1E+08 | 3.0E+07 | 6.7E+06 | -999    | 1.5E+07 | 3.3E+07 | 5.3E+07 | 9.9E+07 | 2.2E+08 | 8.3E+05 | 2.1E+07 | 1.1E+08 |
| 2   | 6.8E+08 | 5.4E+07 | 1.6E+06 | -999    | 2.4E+07 | 8.8E+07 | 5.5E+07 | 9.2E+07 | 2.5E+08 | 1.4E+06 | 3.4E+07 | 1.4E+08 |
| 3   | 7.7E+08 | 1.9E+07 | 6.9E+06 | -999    | 2.6E+07 | 2.5E+07 | 7.1E+07 | 2.6E+08 | 4.1E+07 | 2.5E+06 | 6.4E+07 | 1.7E+08 |
| 4   | 8.2E+08 | 1.1E+07 | 8.2E+06 | -999    | 4.0E+07 | 7.2E+07 | 1.6E+08 | 3.4E+08 | 8.3E+05 | 2.0E+06 | 5.8E+07 | 1.0E+08 |
| 5   | 1.1E+09 | 1.2E+08 | 1.4E+07 | -999    | 6.2E+06 | 1.5E+08 | 2.4E+08 | 2.3E+08 | 8.5E+05 | 5.4E+06 | 3.7E+07 | 4.7E+07 |
| 6   | 5.4E+06 | 3.0E+08 | 1.1E+06 | -999    | 5.9E+07 | 2.6E+08 | 2.0E+08 | 2.9E+08 | 3.3E+07 | 6.6E+06 | 3.9E+07 | 3.4E+07 |
| 7   | 1.4E+07 | 3.6E+08 | 5.7E+06 | -999    | 1.0E+08 | 2.9E+08 | 2.0E+08 | 3.6E+08 | 3.3E+08 | 5.2E+07 | 5.2E+07 | 3.4E+07 |
| 8   | 1.9E+07 | 4.5E+08 | 1.1E+07 | -999    | 2.3E+07 | 4.0E+08 | 2.5E+08 | 1.1E+08 | 2.6E+08 | 1.6E+08 | 2.8E+07 | 4.2E+07 |
| 9   | 8.3E+07 | 1.7E+07 | 2.0E+07 | -999    | 3.2E+08 | 2.0E+08 | 1.1E+08 | 3.1E+07 | 1.1E+08 | 1.9E+08 | 3.1E+07 | 1.5E+07 |
| 10  | 1.1E+08 | 2.1E+07 | 2.3E+07 | 5.6E+07 | 3.5E+08 | 4.4E+07 | 1.9E+07 | 1.6E+07 | 1.4E+08 | 2.4E+08 | 1.5E+07 | 8.4E+06 |
| 11  | 2.2E+08 | 1.4E+08 | 2.3E+07 | 5.4E+07 | 6.2E+08 | 2.0E+08 | 1.0E+07 | 2.5E+08 | 2.5E+07 | 3.4E+07 | 1.7E+07 | 1.3E+06 |
| 12  | 1.1E+08 | 1.7E+08 | 3.0E+07 | 4.4E+08 | 6.3E+08 | 1.6E+08 | 1.4E+07 | 4.7E+08 | 7.8E+07 | 2.3E+06 | 2.4E+07 | 2.2E+06 |
| 13  | 1.8E+08 | 2.1E+08 | 1.9E+06 | 5.0E+08 | 5.7E+08 | 7.3E+07 | 3.2E+08 | 7.4E+08 | 1.1E+08 | 3.3E+06 | 4.0E+07 | 1.9E+06 |
| 14  | 1.5E+08 | 1.7E+08 | 1.9E+06 | 2.4E+08 | 7.1E+08 | 2.3E+07 | 5.0E+08 | 3.8E+08 | 1.4E+08 | 4.1E+06 | 3.5E+06 | 6.6E+06 |
| 15  | 1.4E+08 | 2.6E+08 | 1.3E+08 | 2.4E+08 | 8.4E+08 | 4.5E+07 | 6.7E+08 | 3.2E+08 | 1.5E+08 | 1.3E+06 | 1.6E+06 | 1.6E+07 |
| 16  | 2.5E+08 | 1.6E+06 | 6.8E+08 | 4.6E+08 | 9.0E+08 | 2.9E+07 | 1.3E+09 | 2.6E+08 | 5.9E+06 | 1.2E+06 | 5.6E+06 | 3.8E+06 |
| 17  | 1.4E+08 | 5.5E+07 | 5.0E+08 | 5.7E+08 | 1.0E+09 | 1.5E+08 | 1.4E+09 | 2.2E+08 | 2.3E+07 | 1.2E+06 | 7.6E+06 | 6.5E+05 |
| 18  | 4.5E+06 | 3.5E+08 | 3.6E+08 | 5.8E+08 | 1.3E+09 | 2.4E+08 | 1.7E+09 | 6.0E+07 | 1.2E+07 | 1.8E+06 | 1.4E+07 | 4.0E+06 |
| 19  | 1.5E+07 | 6.5E+08 | 3.1E+08 | 7.7E+08 | 1.2E+09 | 3.0E+08 | 3.3E+08 | 5.7E+07 | 2.0E+07 | 2.2E+06 | 1.4E+07 | 5.5E+06 |
| 20  | 6.2E+07 | 1.3E+09 | 2.3E+08 | 9.6E+07 | 2.3E+08 | 1.5E+08 | 6.1E+08 | 6.9E+07 | 1.9E+07 | 1.1E+06 | 2.0E+07 | 1.6E+07 |
| 21  | 1.8E+07 | 8.7E+08 | 1.4E+08 | 1.7E+06 | 1.5E+07 | 2.0E+08 | 1.4E+08 | 2.9E+07 | 1.2E+07 | 1.4E+06 | 2.1E+07 | 2.9E+07 |
| 22  | 1.9E+08 | 6.8E+08 | 1.9E+08 | 5.8E+06 | 2.9E+07 | 2.2E+07 | 3.3E+07 | 3.4E+07 | 1.6E+07 | 3.3E+06 | 2.2E+07 | 1.6E+07 |
| 23  | 6.0E+08 | 3.7E+08 | 1.2E+08 | 3.3E+07 | 4.4E+07 | 6.6E+07 | 1.9E+07 | 2.9E+07 | 3.5E+06 | 3.4E+06 | 2.0E+07 | 4.0E+08 |
| 24  | 7.5E+08 | 9.7E+07 | 1.4E+08 | 7.1E+07 | 7.8E+07 | 1.3E+08 | 3.4E+07 | 5.1E+07 | 2.4E+06 | 8.9E+06 | 1.1E+07 | 3.3E+08 |
| 25  | 4.9E+08 | 1.2E+08 | 5.3E+06 | 8.7E+07 | 6.5E+07 | 4.0E+07 | 5.5E+06 | 3.7E+07 | 4.3E+06 | 1.2E+07 | 1.0E+07 | 9.3E+07 |
| 26  | 8.2E+08 | 4.5E+08 | -999    | 1.2E+08 | 2.8E+07 | 5.1E+07 | 1.1E+07 | 2.0E+07 | 7.5E+06 | 1.7E+07 | 9.2E+06 | 4.3E+08 |
| 27  | 1.0E+09 | 8.3E+08 | -999    | 2.2E+08 | 1.7E+07 | 5.9E+07 | 7.7E+06 | 1.1E+07 | 1.0E+07 | 1.9E+07 | 2.6E+06 | 9.4E+07 |
| 28  | 1.0E+08 | 8.9E+08 | -999    | 2.1E+08 | 1.1E+07 | 4.7E+07 | 3.6E+06 | 1.8E+08 | 7.9E+06 | 1.2E+07 | 7.0E+05 | 4.5E+09 |
| 29  | 2.5E+08 | 7.0E+08 | -999    | 1.4E+08 | 1.4E+07 | 4.7E+07 | 2.0E+07 | 3.6E+08 | 4.8E+06 | 3.1E+06 | 9.5E+05 | 9.3E+09 |
| 30  | 7.2E+07 | 1.6E+08 | -999    | 7.1E+07 | 1.0E+07 | 3.3E+07 |         | 3.1E+08 | 3.8E+06 | 5.9E+06 | 6.0E+07 | 6.4E+09 |
| 31  | 2.4E+08 |         | -999    |         | 4.5E+06 | 5.9E+07 |         | 2.7E+08 |         | 1.5E+07 |         | 3.0E+09 |

NOTE: The electron detector responds significantly to protons above 32 MeV; therefore, electron data are contaminated when a proton event is in progress. These days are indicated with '-999' in the table and are not plotted. '-' indicates data not available.

NOTE: GOES9 data began April, 1996 and ended on 26 July, 1998. GOES12 is primary satellite as of 15 May 2003.

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Prompt Reports

Number 720 Part I

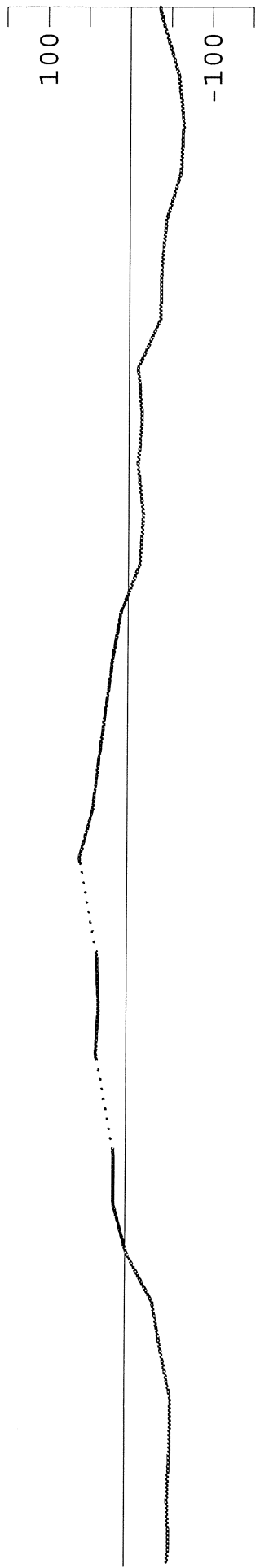
## DATA FOR JUNE 2004

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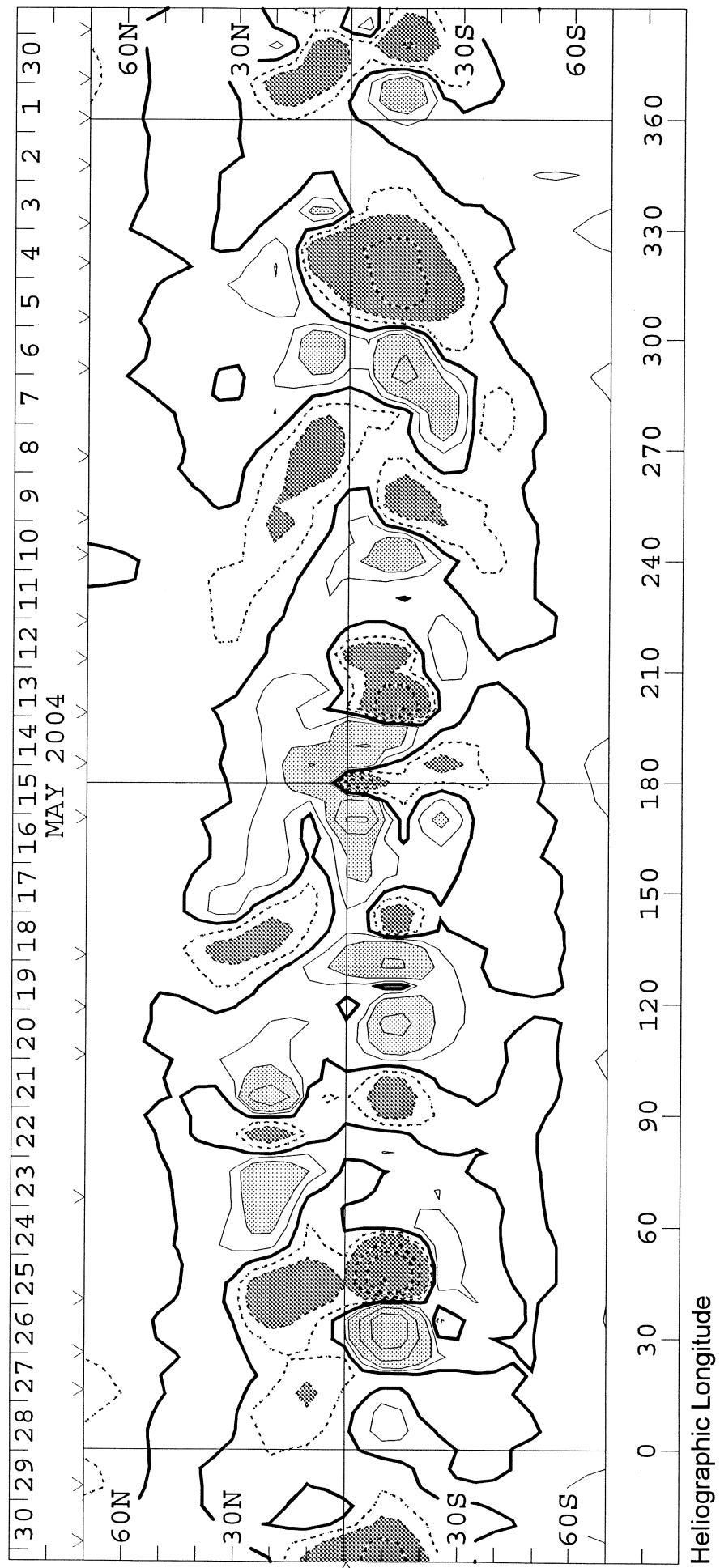
SOLAR MAGNETIC FIELD SYNOPTIC CHART  
CARRINGTON ROTATION NUMBER 2016  
(1 to 28 May 2004)

WILCOX SOLAR OBSERVATORY

Mean Field



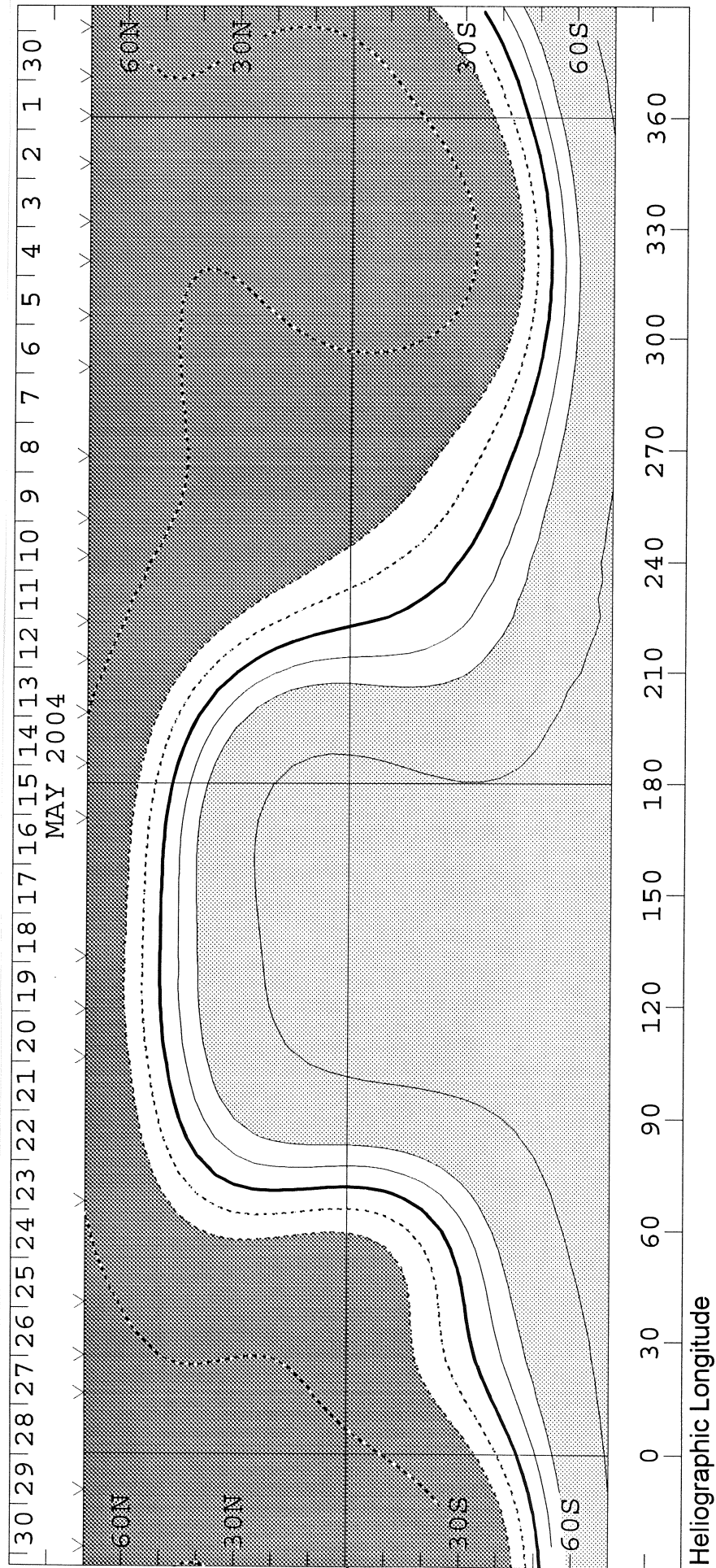
WSO - Photospheric Magnetic Field 0, +100, 200, 500, 1000, 2000 MicroTesla



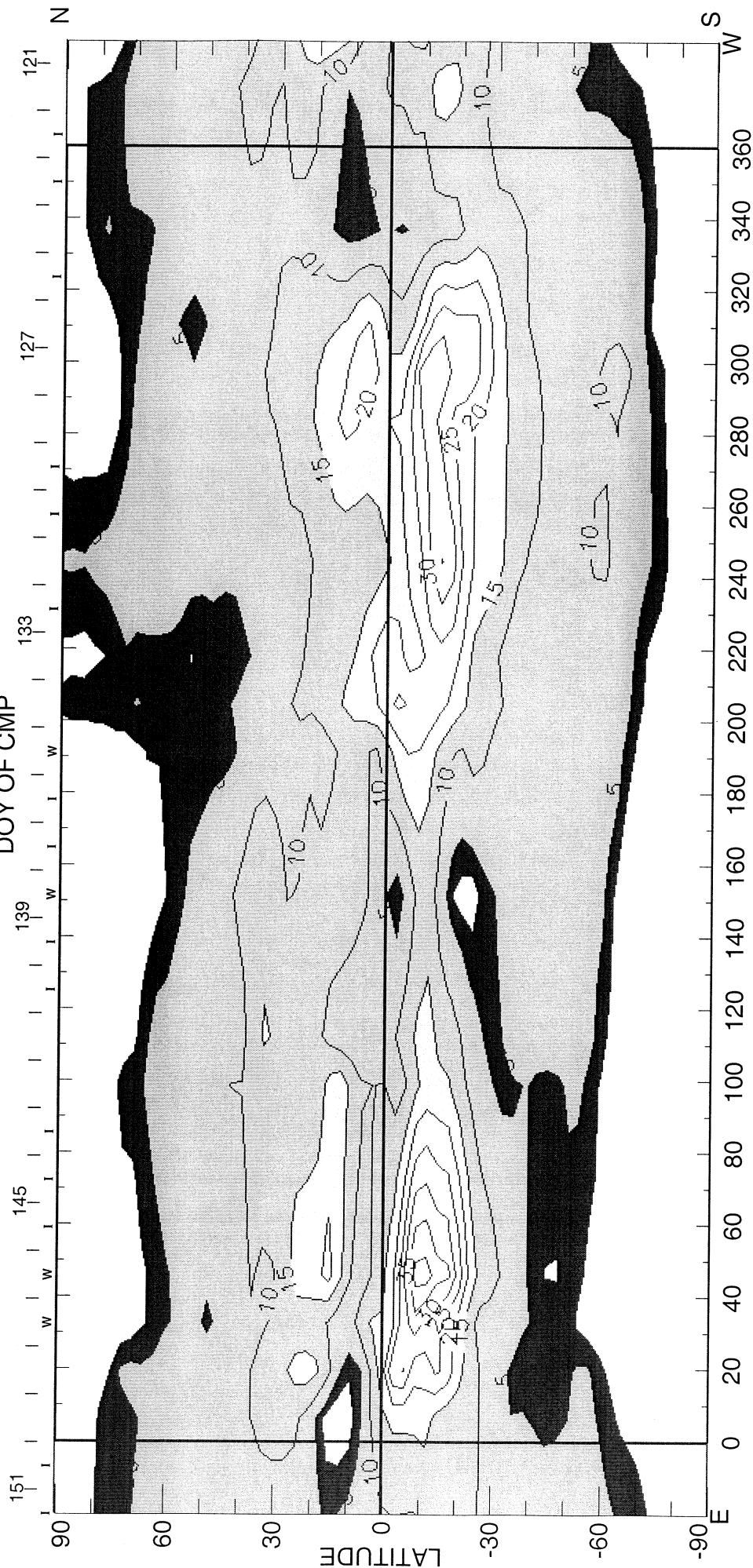
# **SOLAR MAGNETIC FIELD SYNOPSIS CHART** **SOURCE SURFACE FIELD** CARRINGTON ROTATION NUMBER 2016 (1 to 28 May 2004)

**Wilcox Solar Observatory**

0,  $\pm 1$ , 2, 5, 10, 20 microTesla



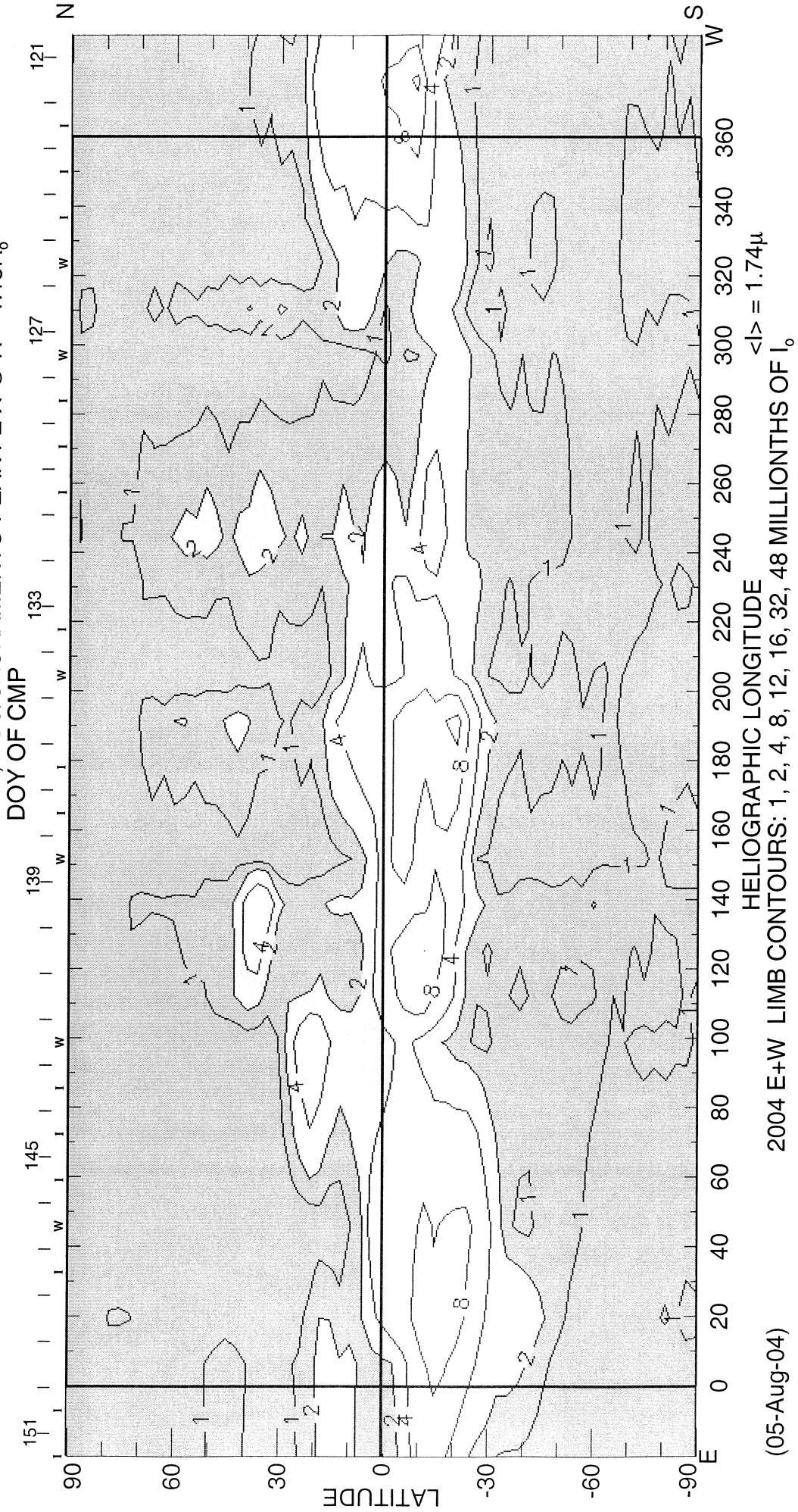
CARRINGTON ROTATION NUMBER 2016; NSO/SACRAMENTO PEAK FE XIV @  $R = 1.15R_{\odot}$   
DOY OF CMP



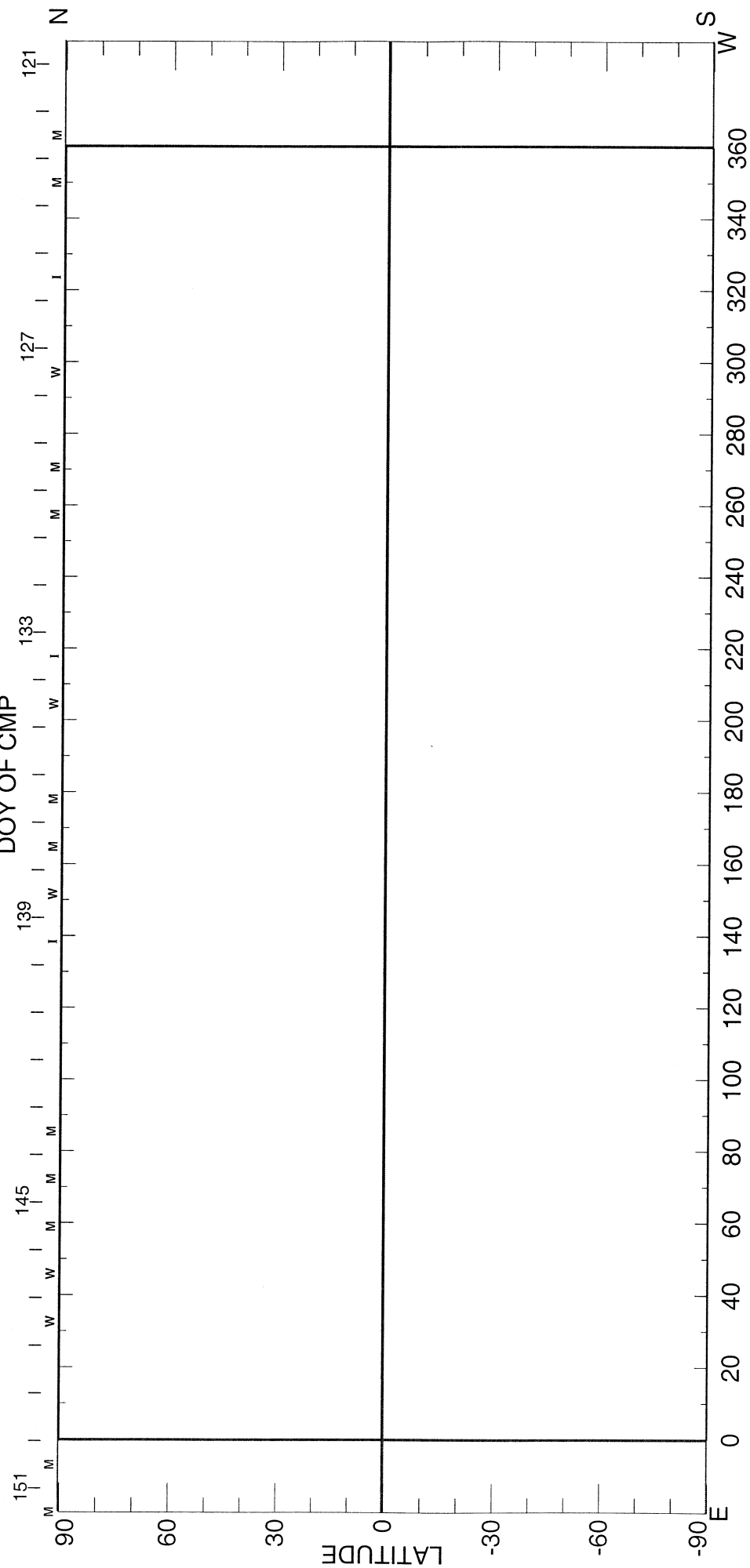
(18-Aug-04) 2004 E+W LIMB CONTOURS: 3, 5, 10, 15, 20, 25, 30, 35, 40, 100, 120 MILLIONTHS OF  $I_{\odot}$   
CORONAL HOLES ARE SHOWN AS WHITE BORDERED BY BLACK  
 $\langle I \rangle = 7.94 \mu$



CARRINGTON ROTATION NUMBER 2016 ; NSO/SACRAMENTO PEAK FE X @  $R = 1.15R_{\odot}$



(05-Aug-04)



2004 E+W LIMB CONTOURS: YELMIN, 1, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20 MILLIONTHS OF  $1_{\odot}$   
(05-Aug-04) HELIOGRAPHIC LONGITUDE

**SOLAR MAGNETIC FIELD SYNOPTIC CHART**  
**CARRINGTON ROTATION NUMBER 2016**  
(1 to 28 May 2004)

National Solar Observatory/Kitt Peak

No charts are available for Carrington Rotations 2015 and 2016 because no SOLIS data are available.

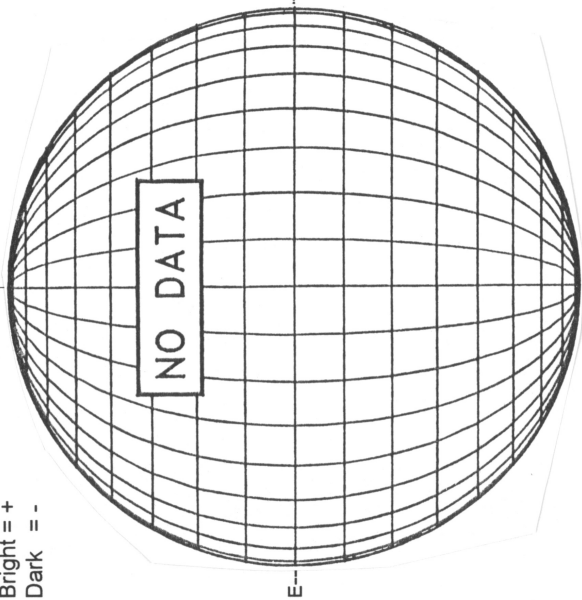
JUNE 1, 2004 (P = -15.32, Bo = -0.63, Lo = 319.71)

KITT PEAK MAGNETOGRAM--SOLIS

\*\*854.2 nm\*\*

Bright = +  
Dark = -

N



STANFORD MAGNETOGRAM

N

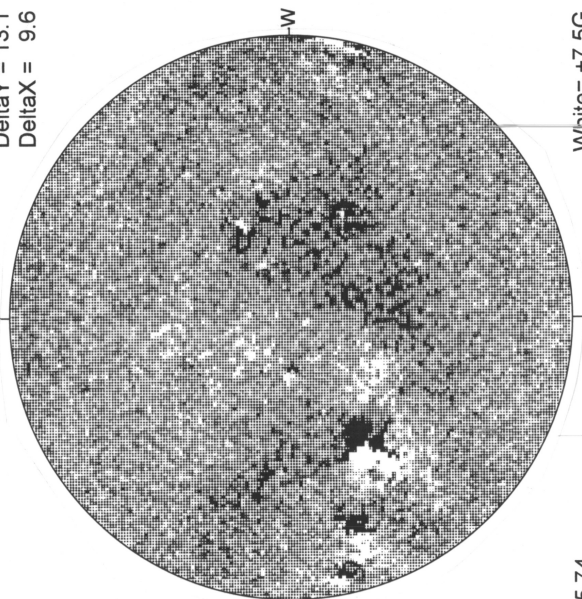
Solid = +  
Dashed = -



MT. WILSON MAGNETOGRAM

N

Delta Y = 13.1  
Delta X = 9.6

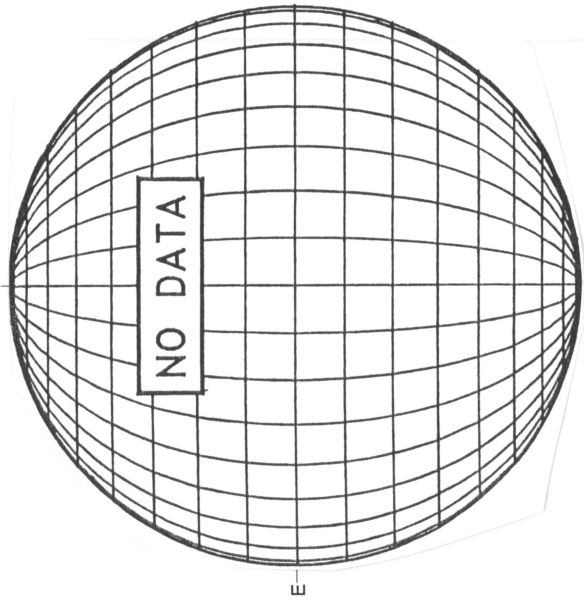


15.74 -  
16.66 UT

White = +7.5G  
Black = -7.5G

BIG BEAR H-ALPHA

-----

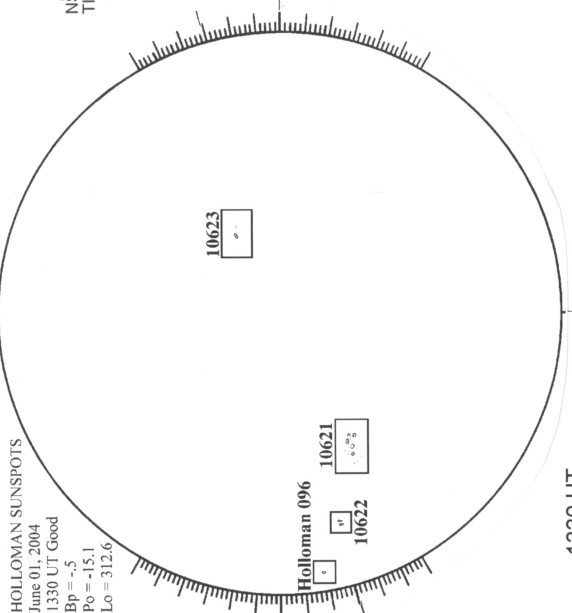


S

HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS

June 01, 2004  
1330 UT Good  
Bp = -5  
Po = +15.1  
Lo = 312.6



1330 UT

SACRAMENTO PEAK CORONA (1.15 Radii)-----

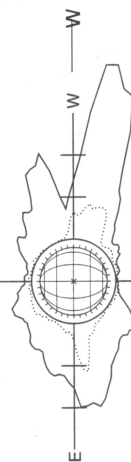
N50 / SACRAMENTO PEAK CORONAL DATA  
TICK MARKS EVERY 10 MILLIONTHS

N<sub>0</sub>

S

E

W

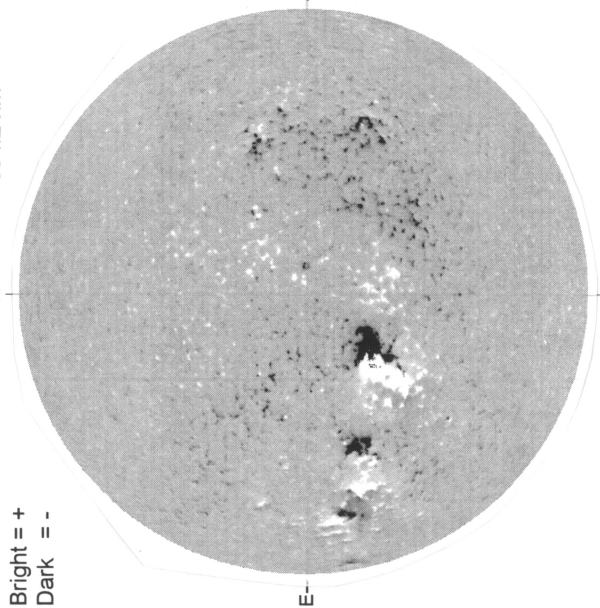


06/01/04  
(DOY 153)

FE XIV 14:50 UT 1.15 R<sub>0</sub>  
FE X 16:37 UT 1.15 R<sub>0</sub>  
CA XV 16:05 UT 1.15 R<sub>0</sub>  
NO CA XV ACTIVITY TODAY

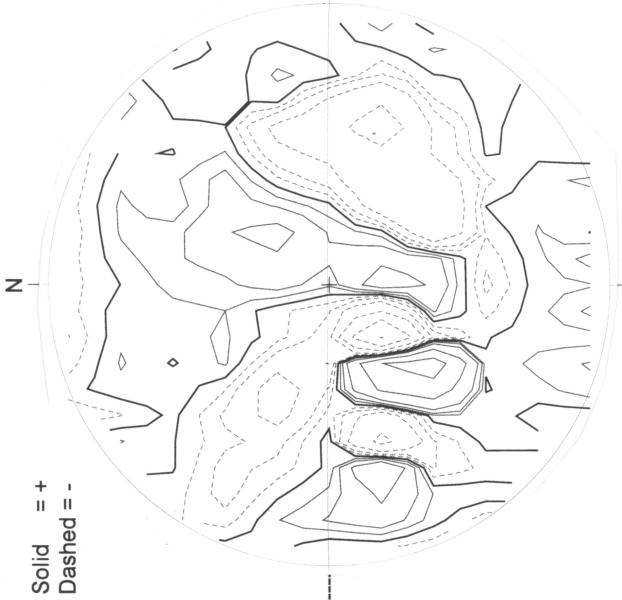
JUNE 2, 2004 ( P= -14.94, Bo = -0.51, Lo = 306.47)

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



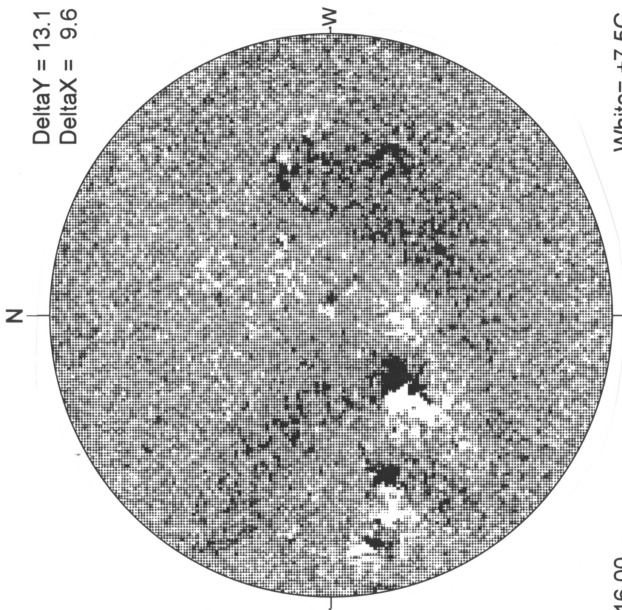
1753 UT

STANFORD MAGNETOGRAM



1828 UT

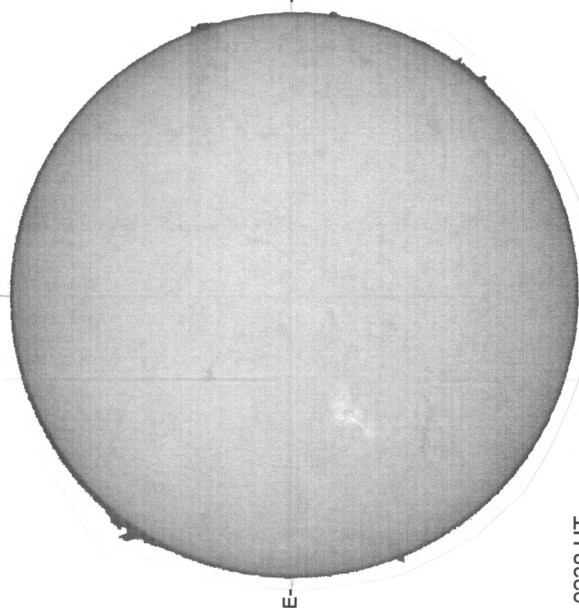
MT. WILSON MAGNETOGRAM



16.00 -  
16.93 UT

Delta Y = 13.1  
Delta X = 9.6

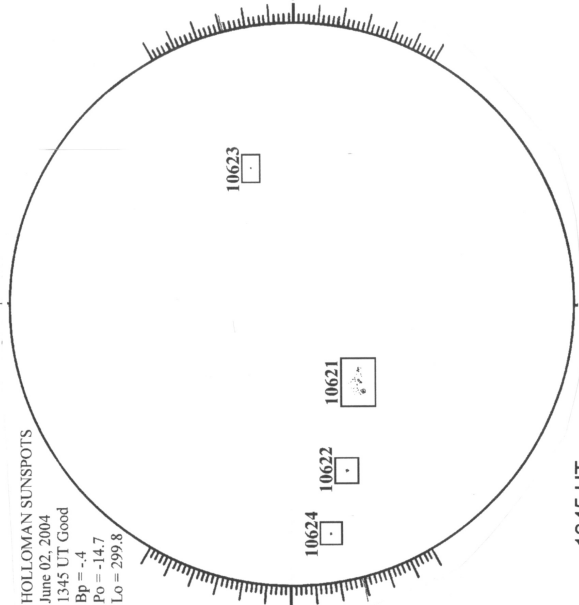
YUNNAN H-ALPHA



0238 UT

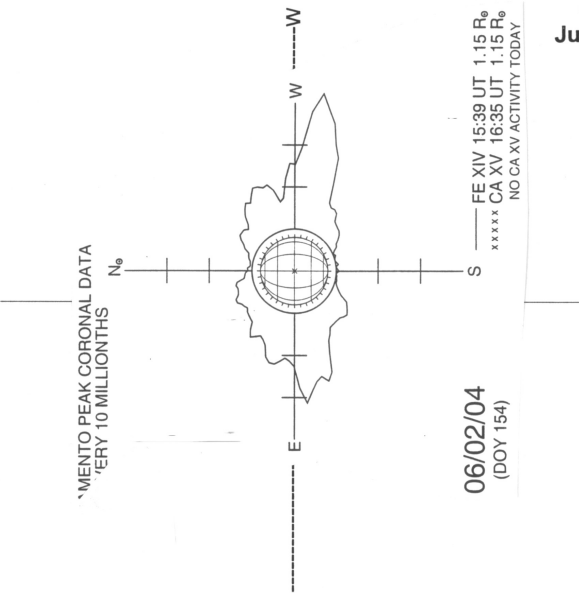
HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS  
June 02, 2004  
1345 UT Good  
Bp = -4  
Po = -14.7  
Lo = 299.8



1345 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

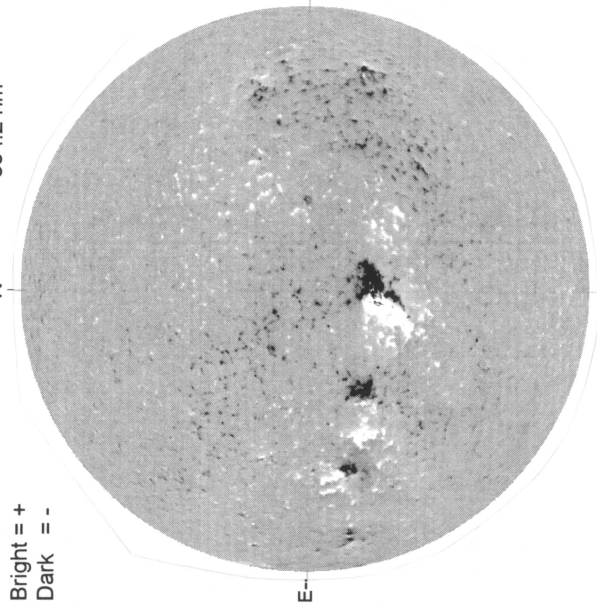


06/02/04  
(DOY 154)

FE XIV 15:39 UT 1.15 R<sub>o</sub>  
CA XV 16:35 UT 1.15 R<sub>o</sub>  
NO CA XV ACTIVITY TODAY

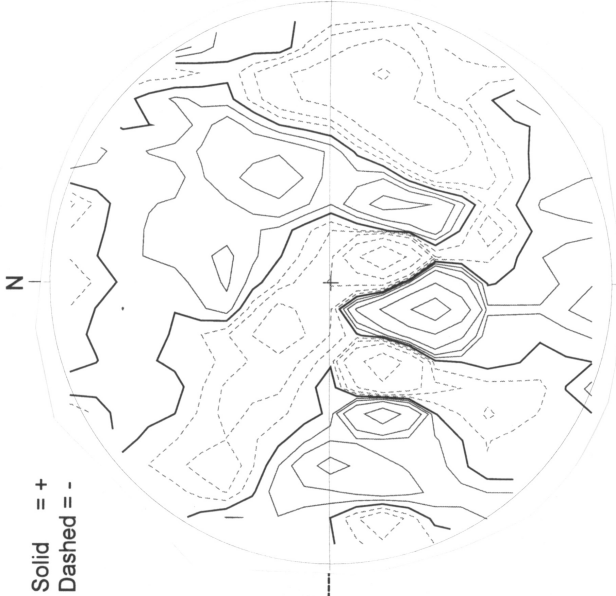
JUNE 3, 2004 ( P = -14.56, Bo = -0.39, Lo = 293.24 )

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



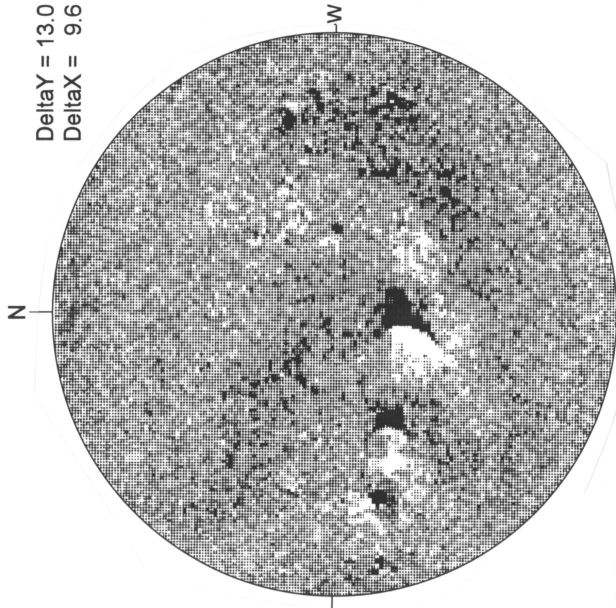
1710 UT

STANFORD MAGNETOGRAM



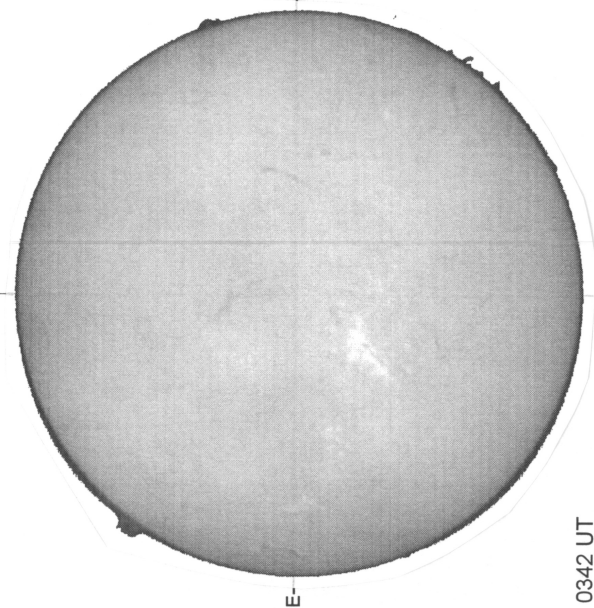
2113 UT

MT. WILSON MAGNETOGRAM



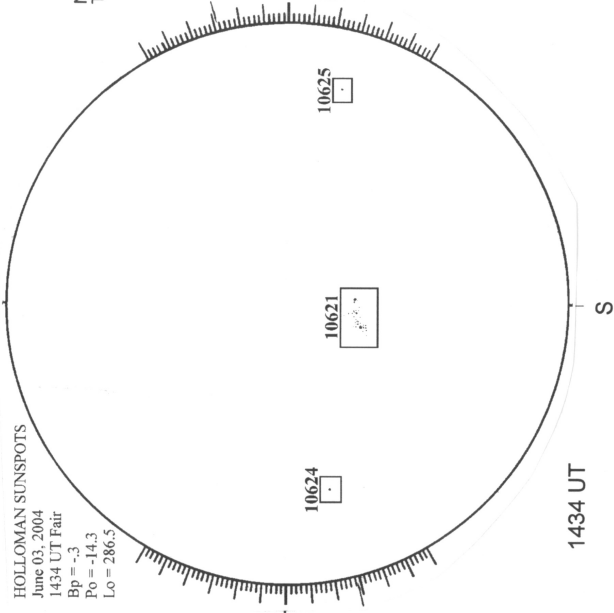
16.40 -  
17.33 UT

YUNNAN H-ALPHA



0342 UT

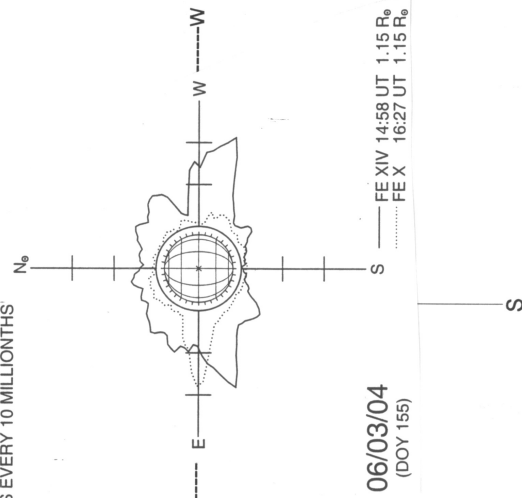
HOLLOMAN SUNSPOTS



1434 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA  
TICK MARKS EVERY 10 MILLIONTHS



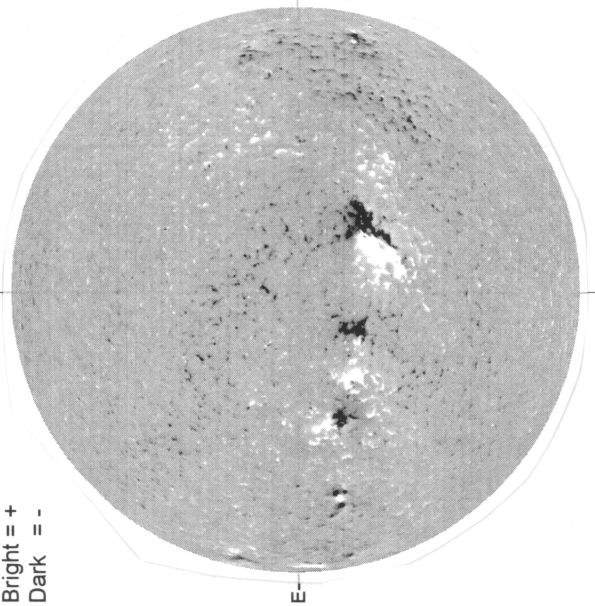
06/03/04  
(DOY 155)



JUNE 4, 2004 ( P= -14.18, Bo = -0.26, Lo = 280.00)

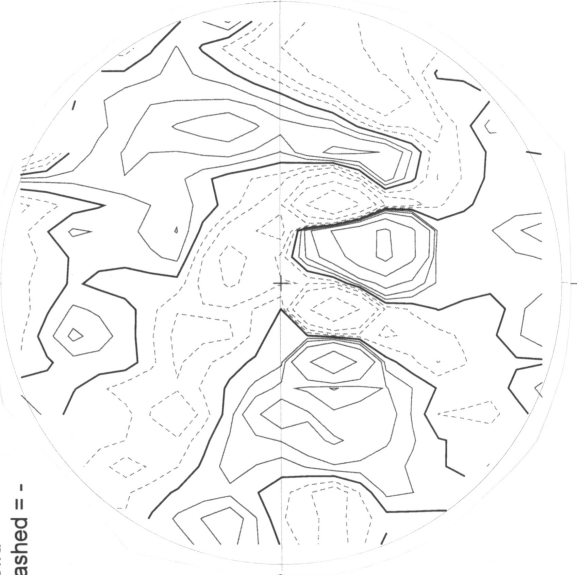
KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

Bright = +  
Dark = -



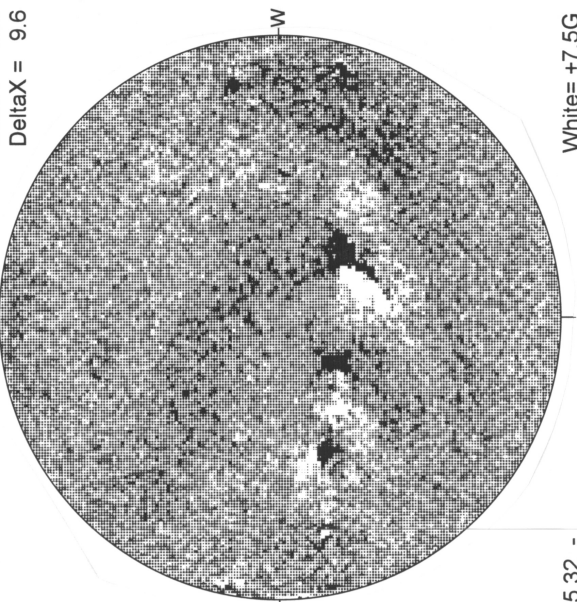
STANFORD MAGNETOGRAM

Solid = +  
Dashed = -



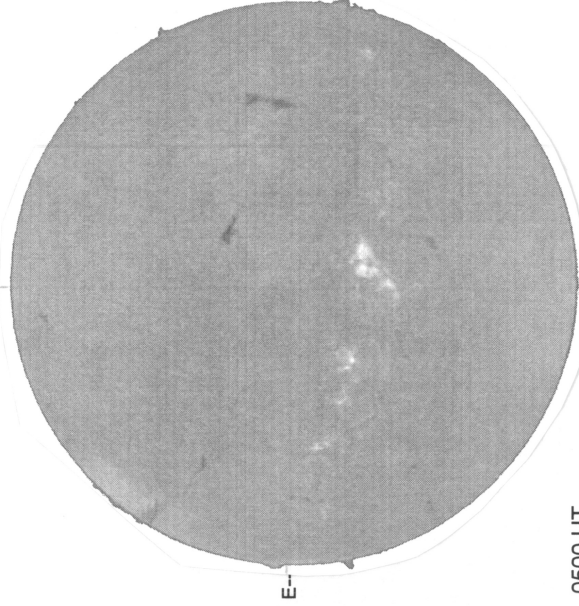
MT. WILSON MAGNETOGRAM

Delta Y = 13.0  
Delta X = 9.6



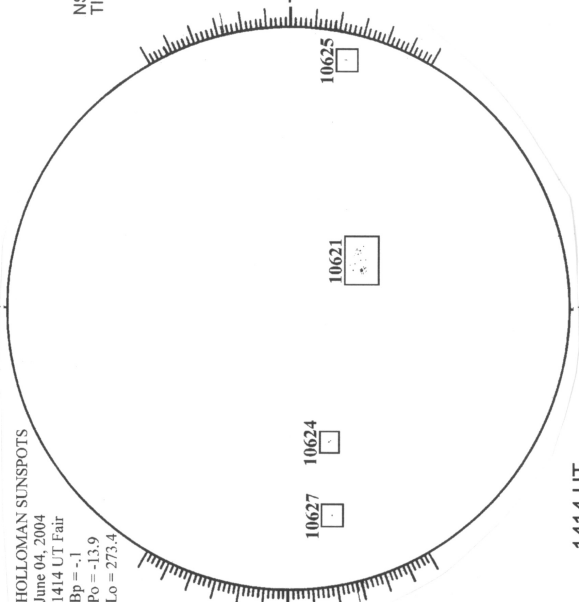
White = +7.5G  
Black = -7.5G

YUNNAN H-ALPHA



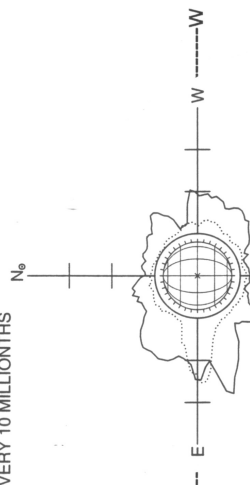
HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS  
June 04, 2004  
1414 UT Fair  
Bp = -1  
Po = -13.9  
Lo = 273.4



SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA  
TICK MARKS EVERY 10 MILLIONTHS



06/04/04  
(DOY 156)

----- EE XIV 14:16 UT 1.15 R<sub>0</sub>  
..... EE X 15:47 UT 1.15 R<sub>0</sub>  
xxxxx CA XV 15:29 UT 1.15 R<sub>0</sub>  
NO CA XV ACTIVITY TODAY

0500 UT

1414 UT

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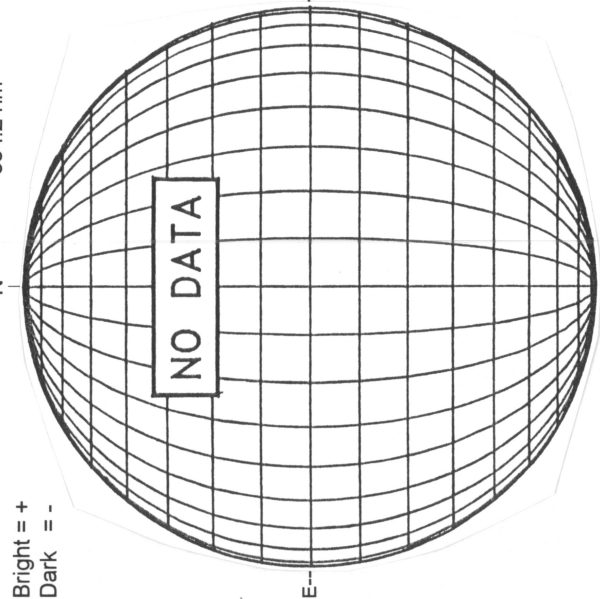
S

S

52  
Jun 04

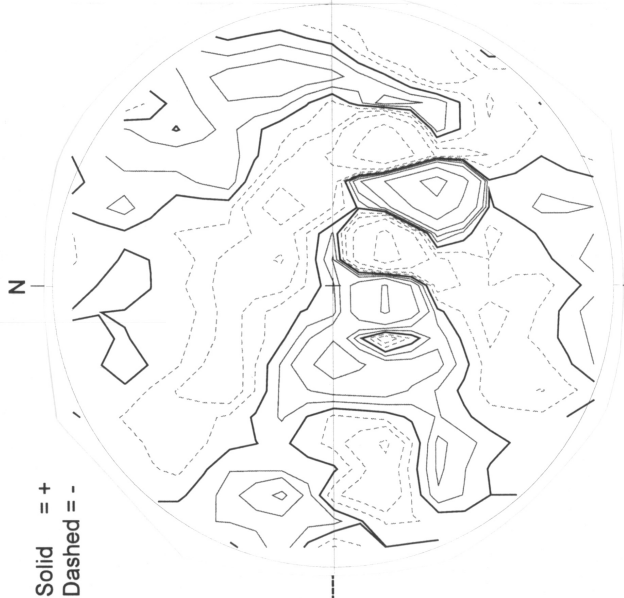
JUNE 5, 2004 ( P= -13.79, Bo = -0.14, Lo = 266.77)

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



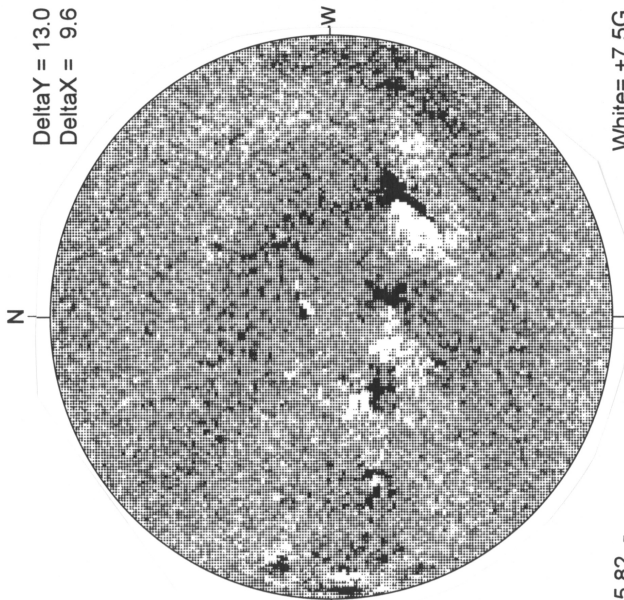
Bright = +  
Dark = -

STANFORD MAGNETOGRAM



Solid = +  
Dashed = -

MT. WILSON MAGNETOGRAM

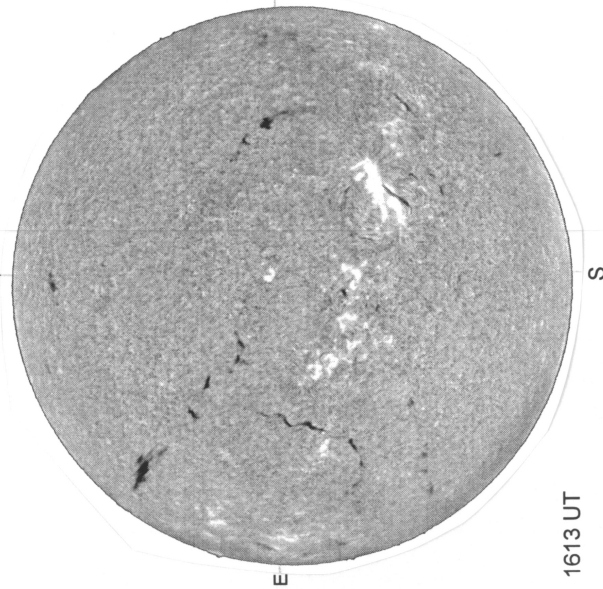


DeltaY = 13.0  
DeltaX = 9.6

15.82 -  
16.74 UT

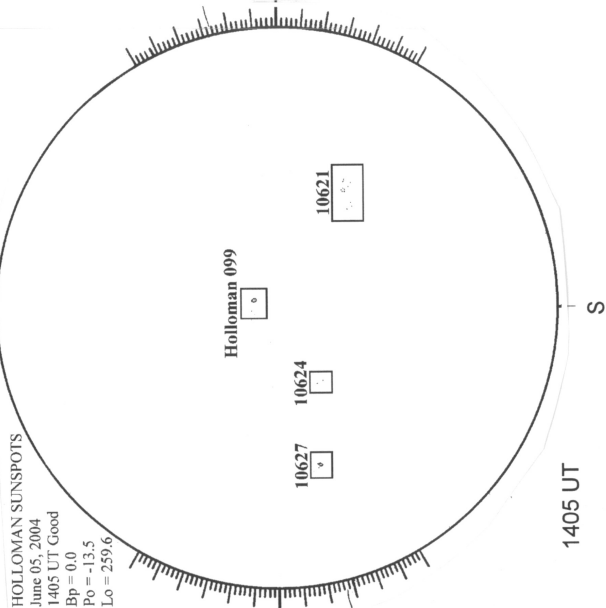
White= +7.5G  
Black = -7.5G

KANZELHOHE H-ALPHA



1613 UT

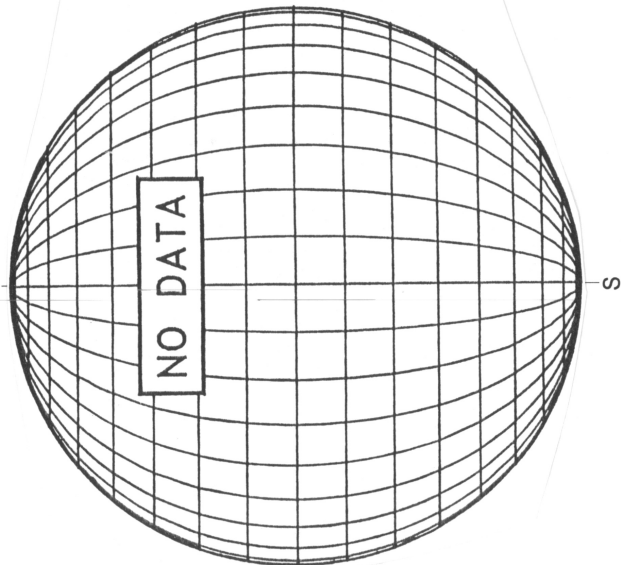
HOLLOMAN SUNSPOTS



HOLLOMAN SUNSPOTS  
June 05, 2004  
1405 UT Good  
Bp = 0.0  
Po = -13.5  
Lo = 259.6

1405 UT

SACRAMENTO PEAK CORONA (1.15 Radii)-----



NO DATA

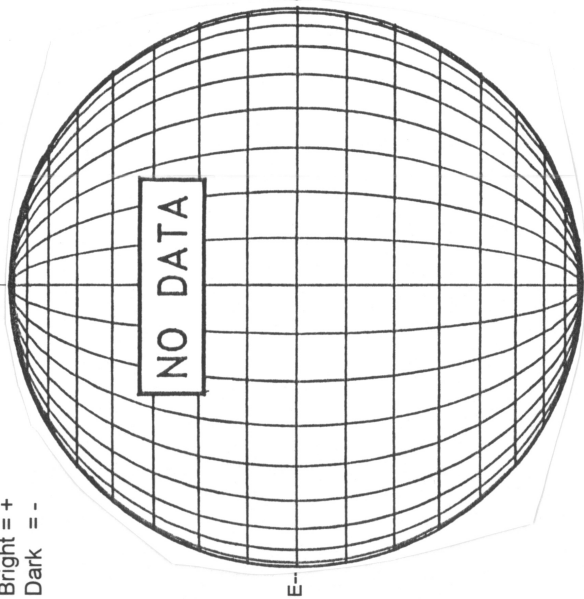


JUNE 6, 2004 (P= -13.39, Bo = -0.02, Lo = 253.53)

KITT PEAK MAGNETOGRAM--SOLIS

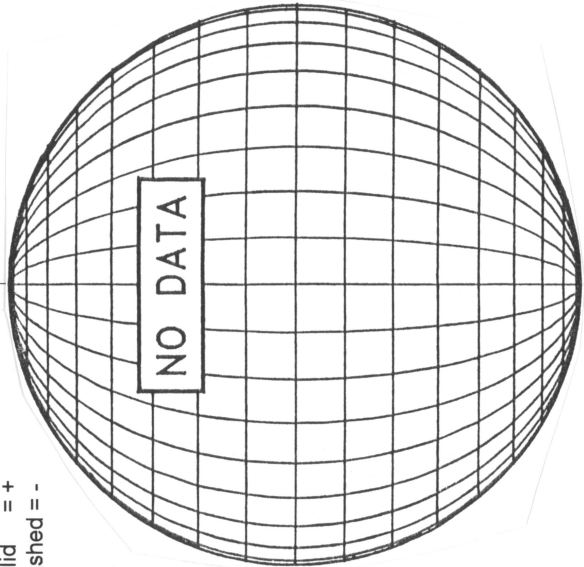
\*\*854.2 nm\*\*

Bright = +  
Dark = -



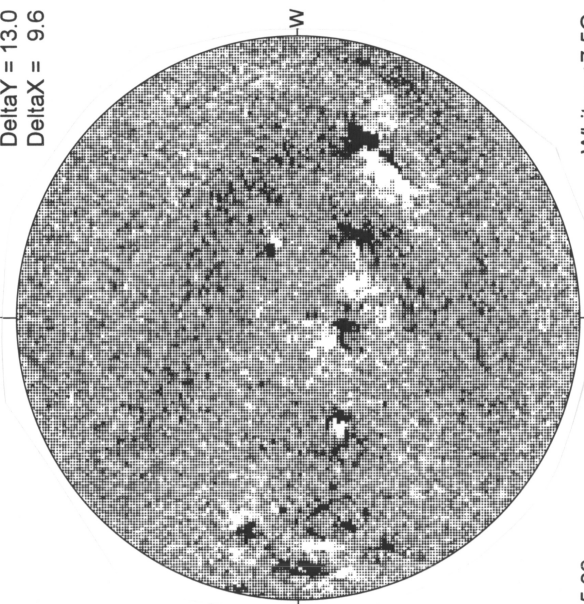
STANFORD MAGNETOGRAM

Solid = +  
Dashed = -



MT. WILSON MAGNETOGRAM

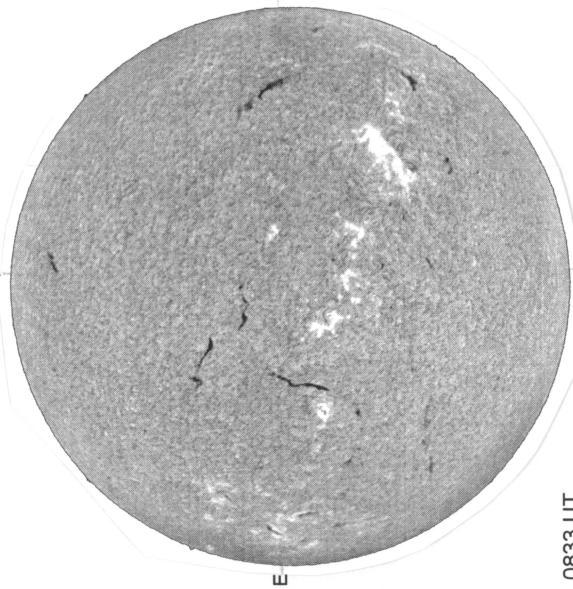
DeltaY = 13.0  
DeltaX = 9.6



15.32 -  
16.24 UT

White = +7.5G  
Black = -7.5G

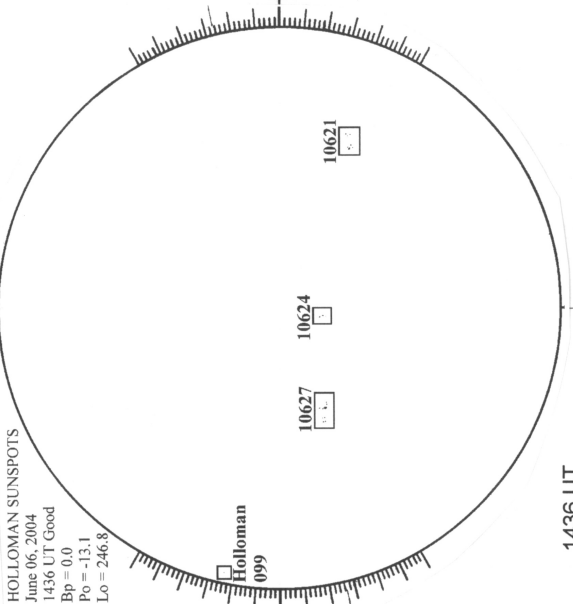
KANZELHOHE H-ALPHA



0833 UT

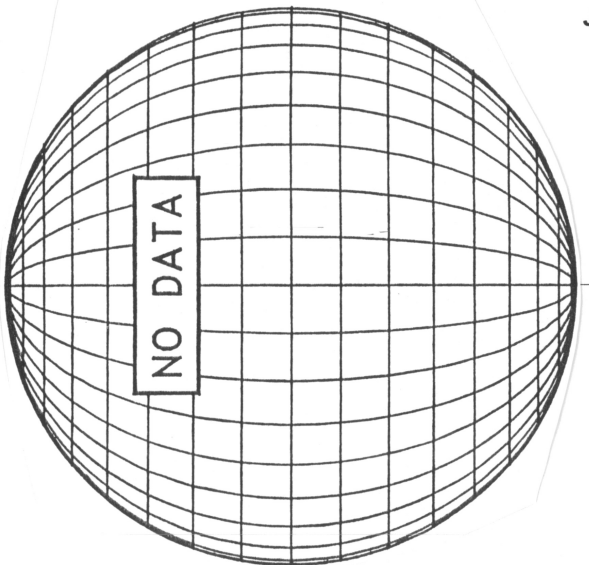
HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS  
June 06, 2004  
1436 UT Good  
Bp = 0.0  
Po = -13.1  
Lo = 246.8



1436 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



**JUNE 7, 2004 ( P= -12.99, Bo = 0.10, Lo = 240.30)**

Bright = +  
Dark = -

KITT PEAK MAGNETOGRAM--SOLIS  
N  
\*\*854.2 nm\*\*

STANFORD MAGNETOGRAM

MT. WILSON MAGNETOGRAM

 $z$  $z$ 

Solid = +  
Dashed = -

**Z-**

$$\begin{aligned}\Delta Y &= 13.1 \\ \Delta X &= 9.6\end{aligned}$$

Bright = +  
Dark = -

NO DATA

三

W

15.49 -  
16.42 UT

2105 UT

White = +7.5G  
Black = -7.5G

KANZELHOHE H-ALPHA

HOLLOMAN SUNSPOTS

SACRAMENTO PEAK CORONA (1.15 Radii)----

HOLLOMAN SUNSPOTS  
June 07, 2004  
1423 UT Poor  
Bp = .1  
Po = -12.7  
Lo = 233.7

HOLLOMAN S  
June 07, 2004  
1423 UT Poor  
Bp = .1  
Po = -12.7  
Lo = 233.7

Holloman 099

Hollow ☐

10627

10624

10621

0629

29

1

[illegible][illegible][illegible][illegible]

0651 UT

1423 UT

8

8

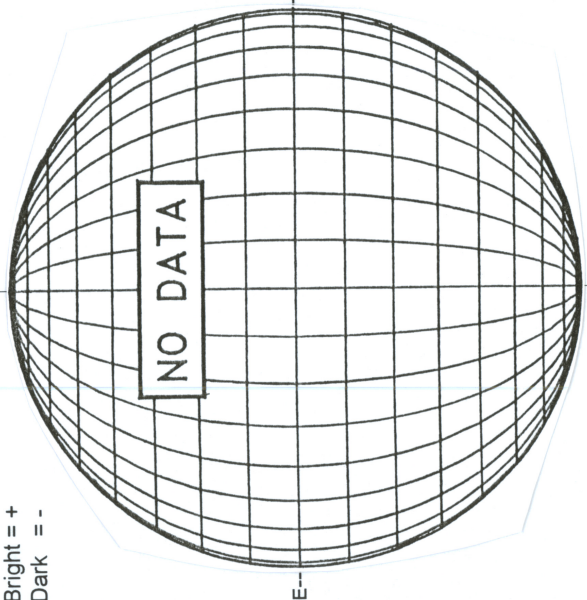
5

NO DATA

JUNE 8, 2004 ( P= -12.59, Bo = 0.22, Lo = 227.06)

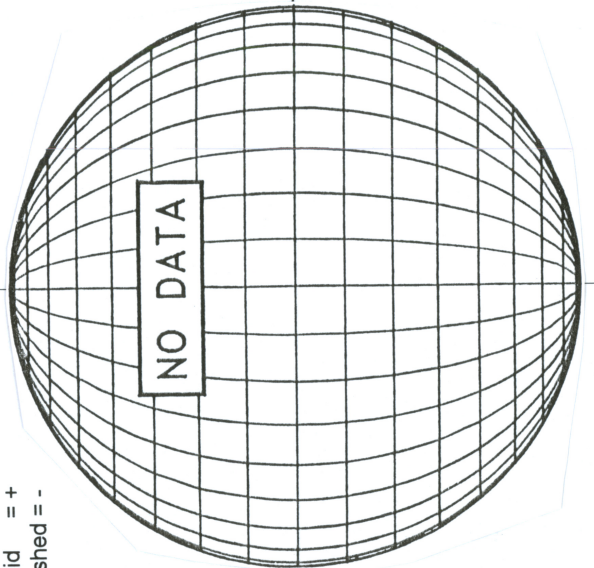
KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

Bright = +  
Dark = -



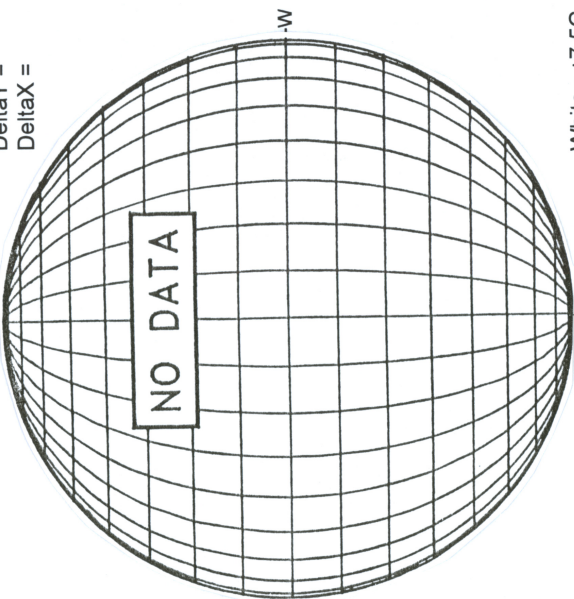
STANFORD MAGNETOGRAM

Solid = +  
Dashed = -



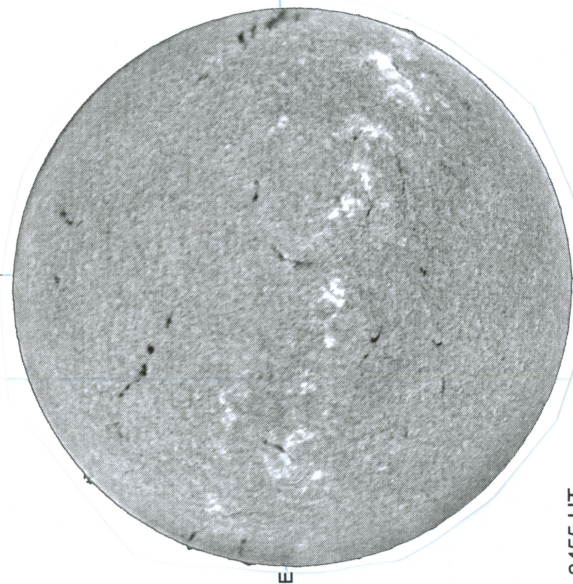
MT. WILSON MAGNETOGRAM

Delta Y =  
Delta X =



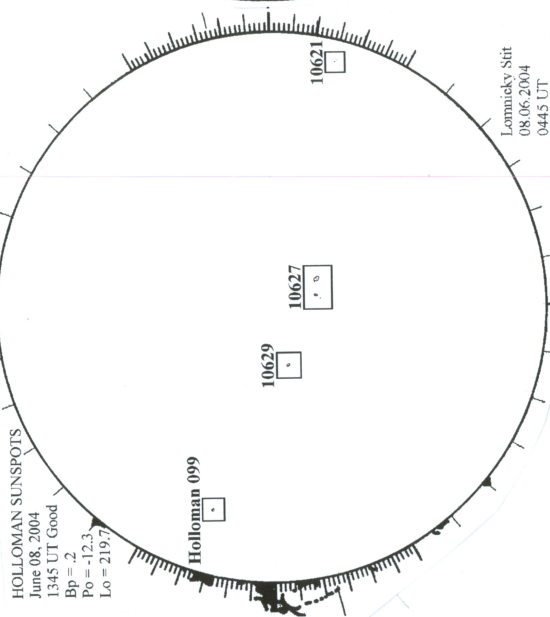
White= +7.5G  
Black = -7.5G

KANZELHOHE H-ALPHA



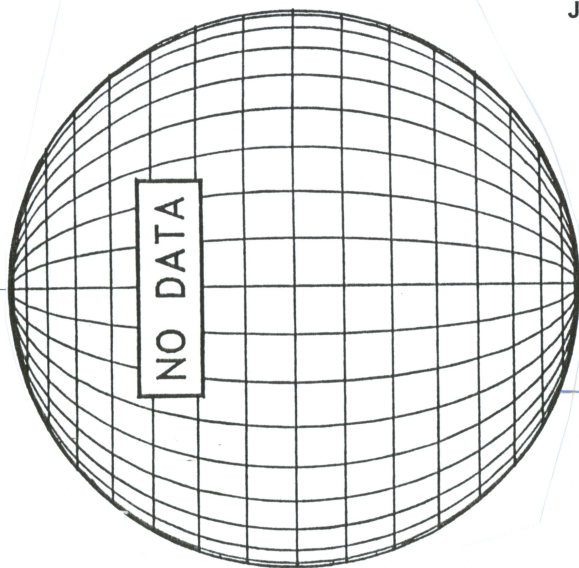
0455 UT

HOLLOMAN SUNSPOTS



1345 UT  
0445 UT LOMN Prom S

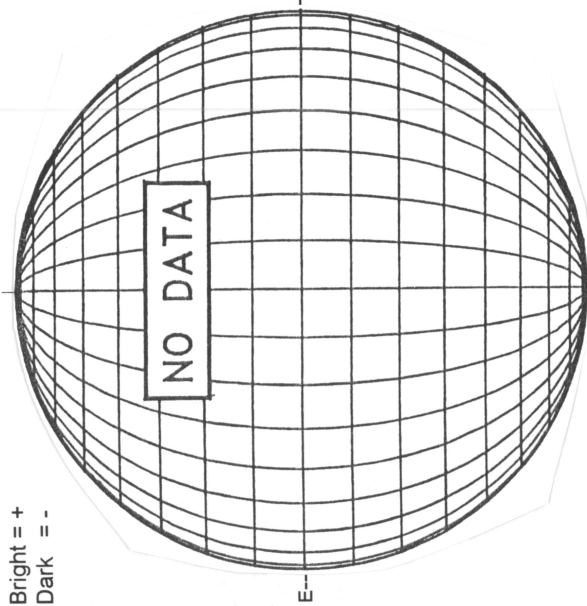
SACRAMENTO PEAK CORONA (1.15 Radii)----



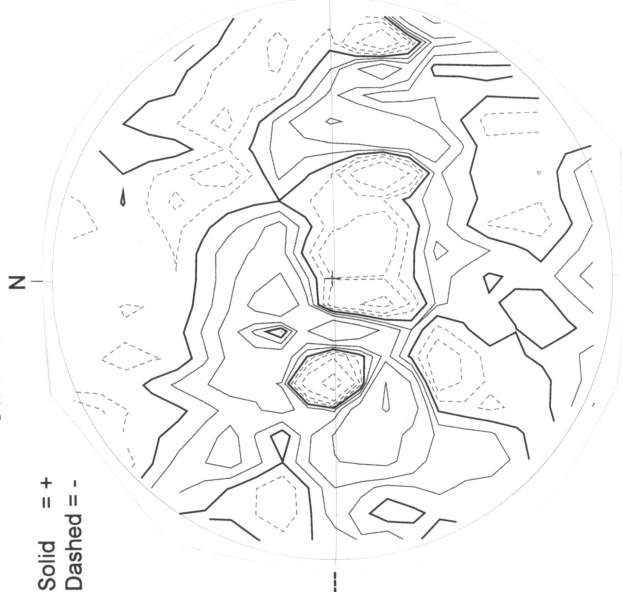


56  
Jun 04

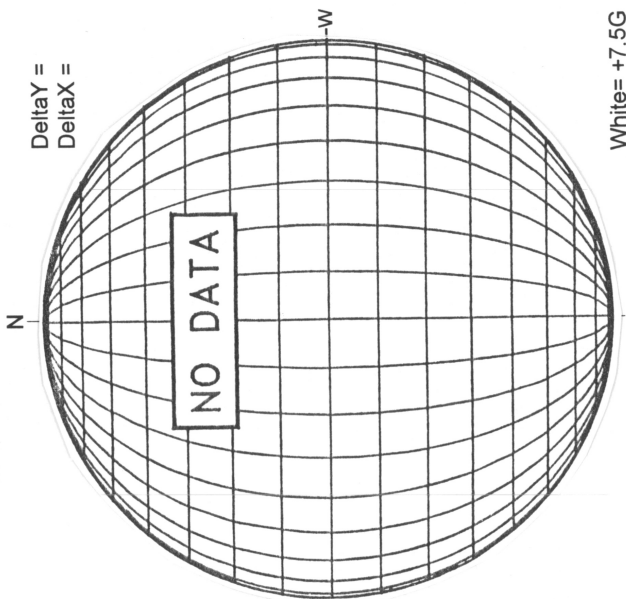
KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm



STANFORD MAGNETOGRAM

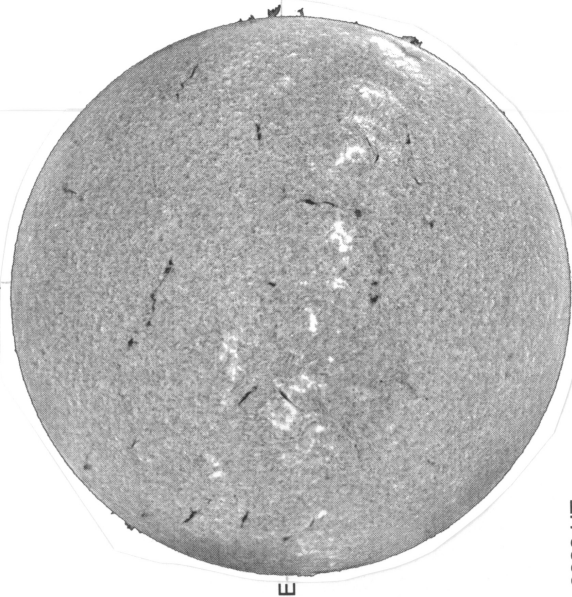


MT. WILSON MAGNETOGRAM



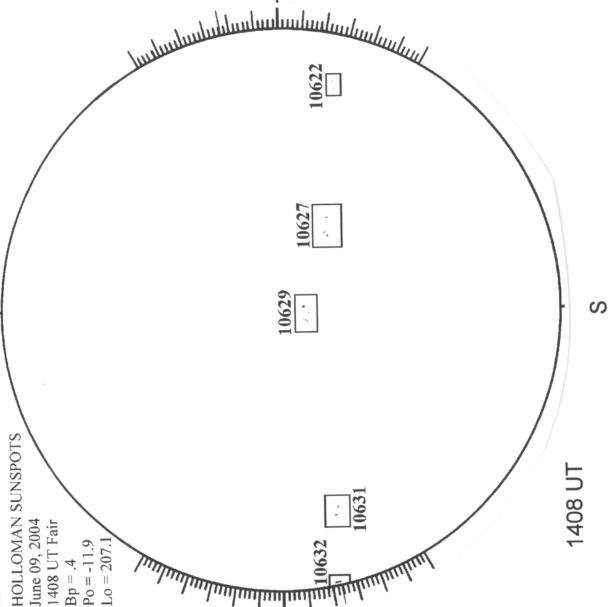
JUNE 9, 2004 ( P = -12.18, Bo = 0.34, Lo = 213.83)

KANZELHOHE H-ALPHA



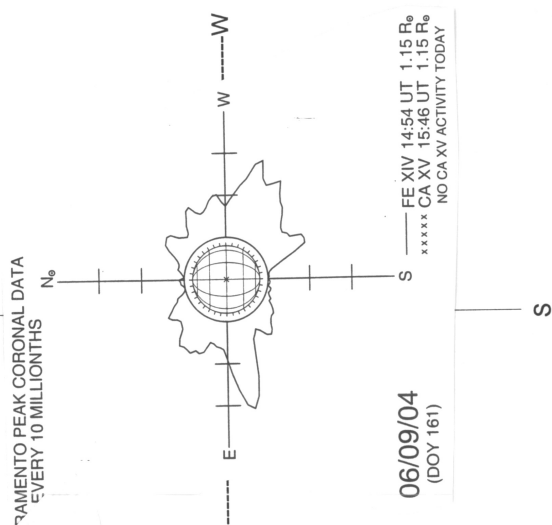
0622 UT

HOLLOMAN SUNSPOTS



HOLLOMAN SUNSPOTS  
June 09, 2004  
1408 UT Fair  
Bp = .4  
Po = -11.9  
Lo = 207.1

SACRAMENTO PEAK CORONA (1.15 Radii)-----

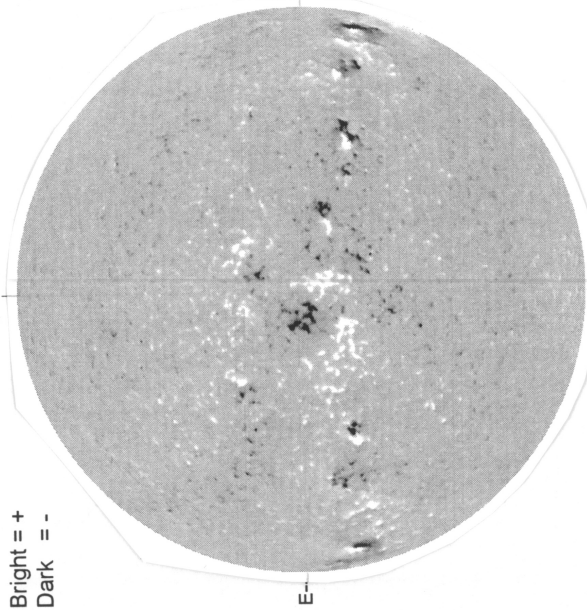


JUNE 10, 2004 (P = -11.77, Bo = 0.46 Lo = 200.59)

KITT PEAK MAGNETOGRAM--SOLIS

\*\*854.2 nm\*\*

Bright = +  
Dark = -



1759 UT

STANFORD MAGNETOGRAM

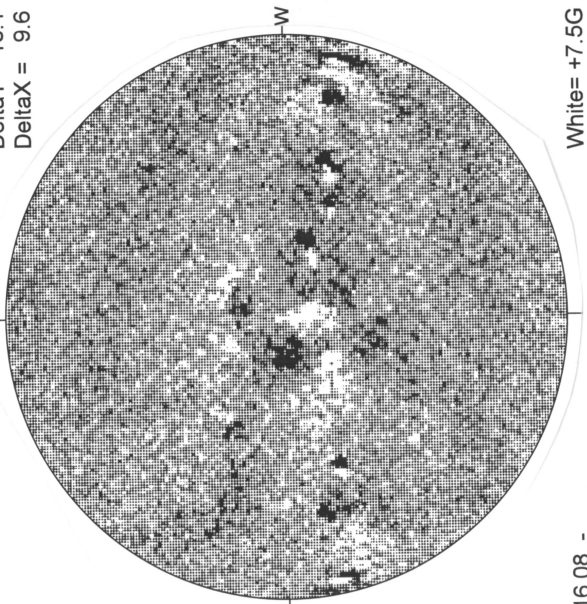
Solid = +  
Dashed = -



2042 UT

MT. WILSON MAGNETOGRAM

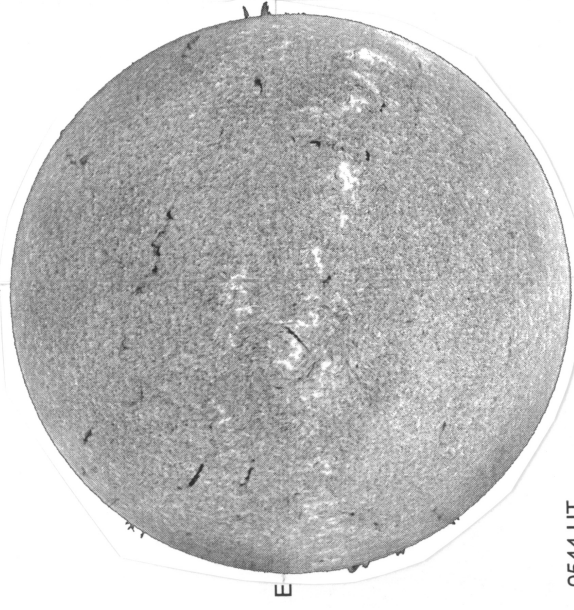
Delta Y = 13.1  
Delta X = 9.6



16.08 -  
17.00 UT

White = +7.5G  
Black = -7.5G

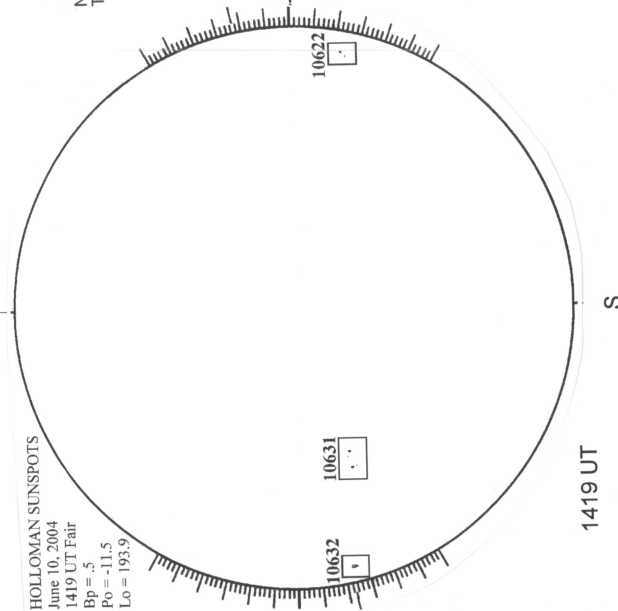
KANZELHOHE H-ALPHA



0544 UT

HOLLOMAN SUNSPOTS

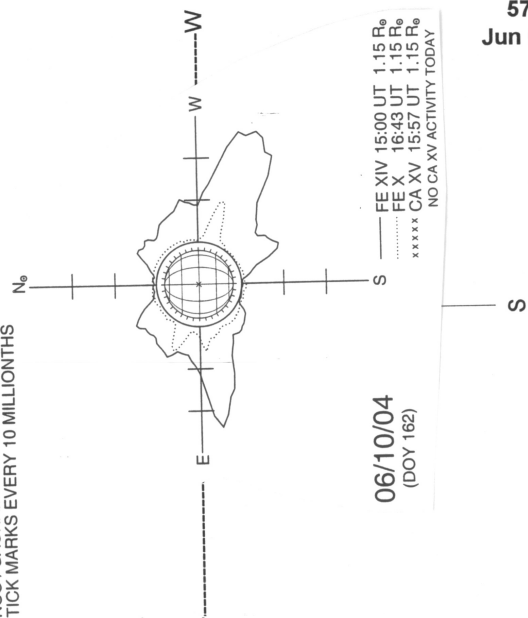
HOLLOMAN SUNSPOTS  
June 10, 2004  
1419 UT Fair  
Bp = 5  
Po = -11.5  
Lo = 193.9



1419 UT

SACRAMENTO PEAK CORONA (1.15 Radii)-----

NSO / SACRAMENTO PEAK CORONAL DATA  
TICK MARKS EVERY 10 MILLIONTHS



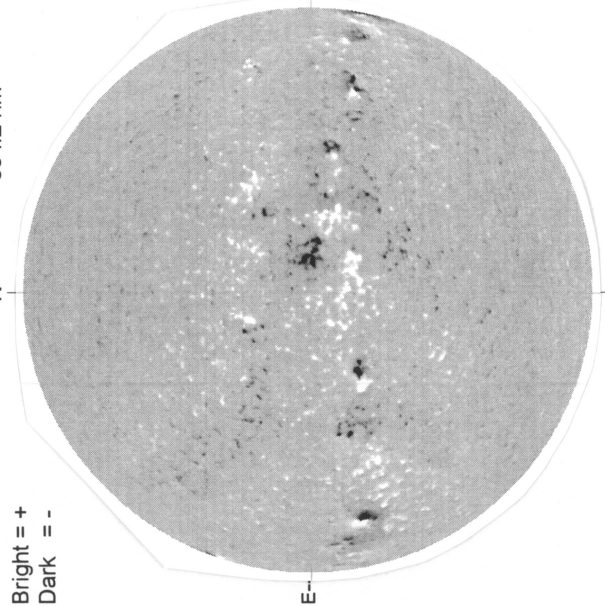
06/10/04  
(DOY 162)

FE XIV 15:00 UT 1.15 R<sub>o</sub>  
FE X 16:43 UT 1.15 R<sub>o</sub>  
xxxxx CA XV 15:57 UT 1.15 R<sub>o</sub>  
NO CA XV ACTIVITY TODAY

58  
Jun 04

JUNE 11, 2004 (P = -11.36, Bo = 0.58, Lo = 187.35)

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



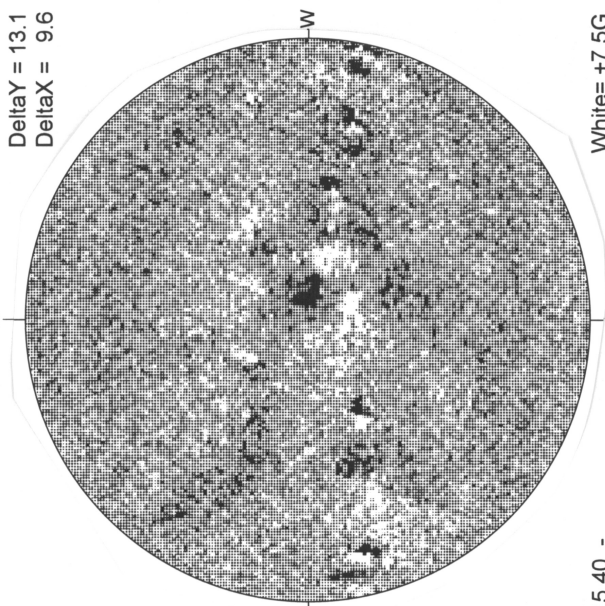
1745 UT

STANFORD MAGNETOGRAM



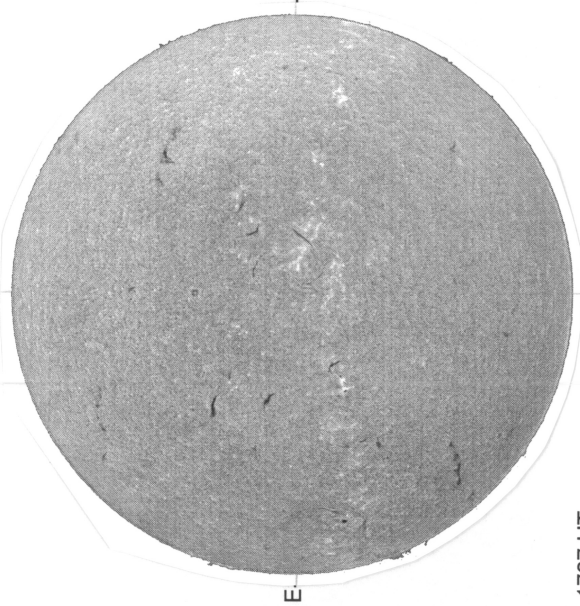
1923 UT

MT. WILSON MAGNETOGRAM



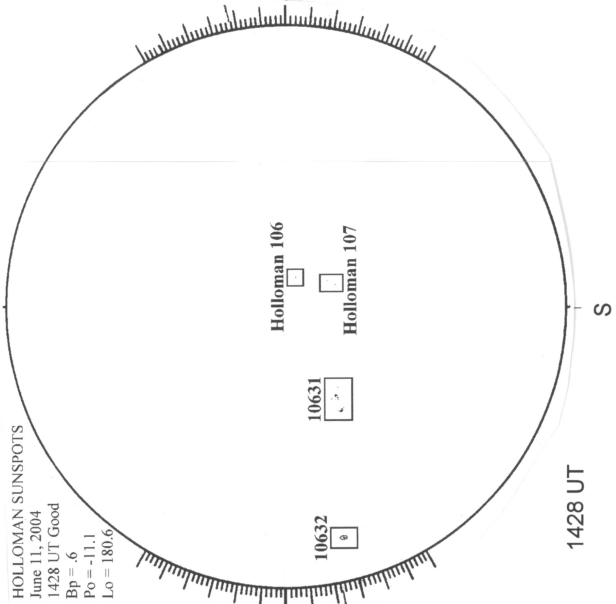
15.40 -  
16.32 UT

BIG BEAR H-ALPHA



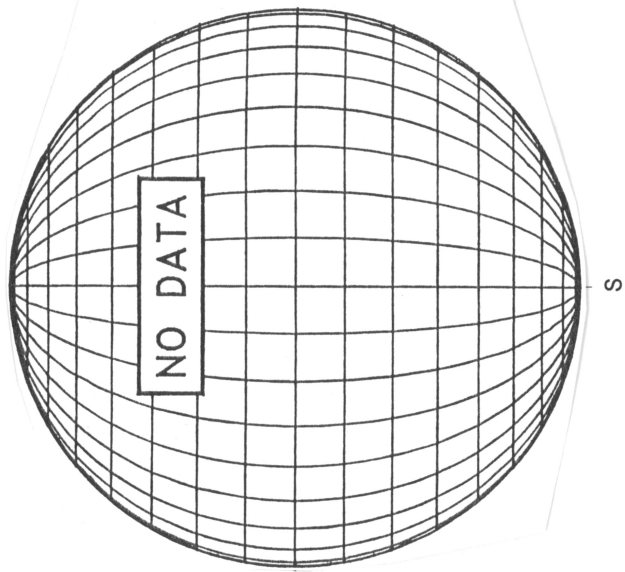
1737 UT

HOLLOMAN SUNSPOTS



1428 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

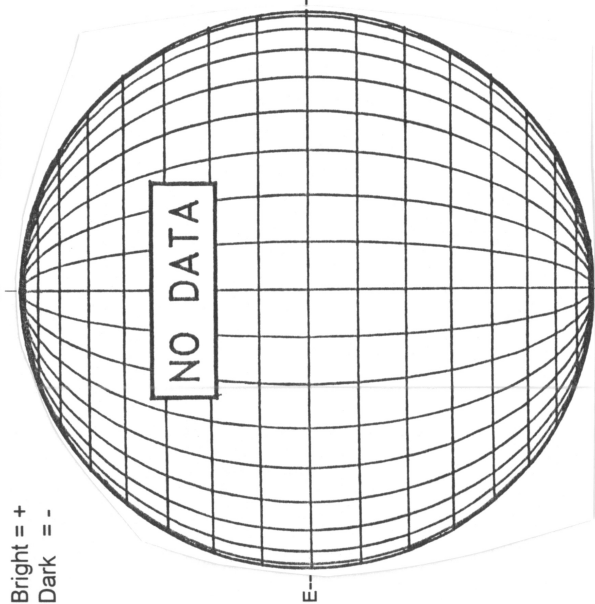


JUNE 12, 2004 ( P= -10.94, Bo = 0.70, Lo = 174.12)

KITT PEAK MAGNETOGRAM--SOLIS

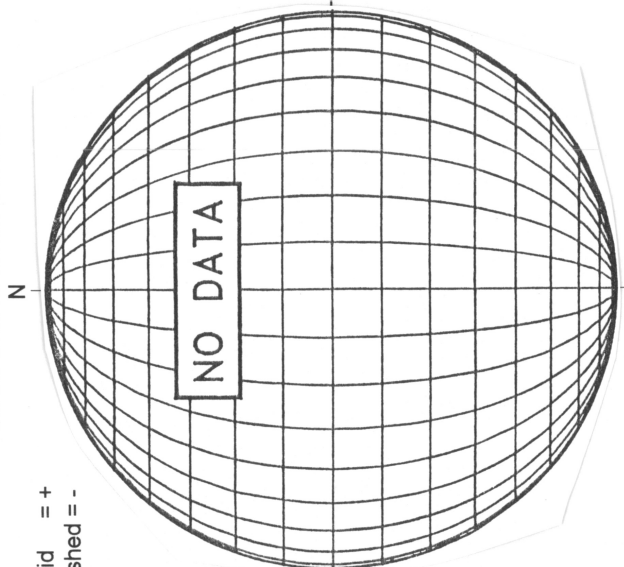
\*\*854.2 nm\*\*

Bright = +  
Dark = -



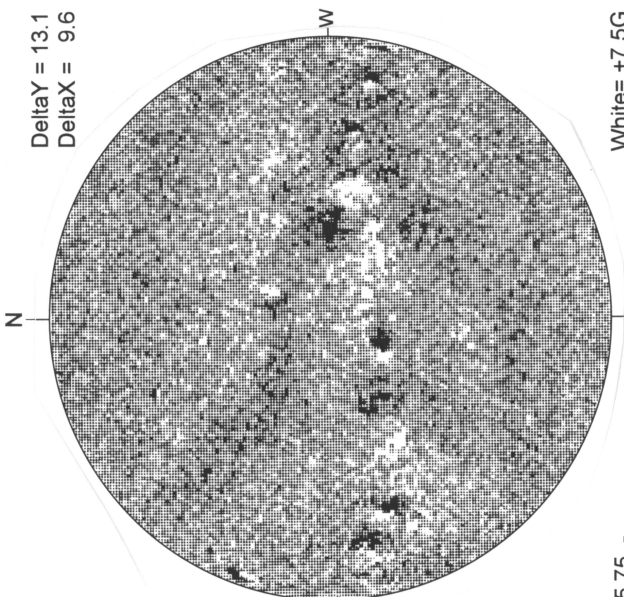
STANFORD MAGNETOGRAM

Solid = +  
Dashed = -



MT. WILSON MAGNETOGRAM

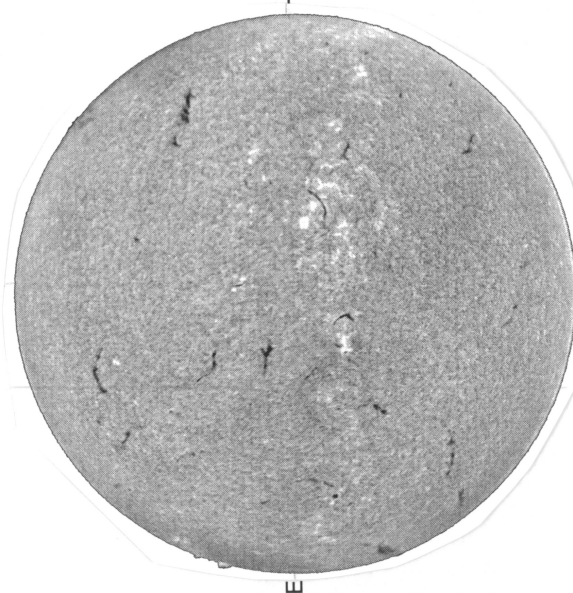
Delta Y = 13.1  
Delta X = 9.6



15.75 -  
16.67 UT

White = +7.5G  
Black = -7.5G

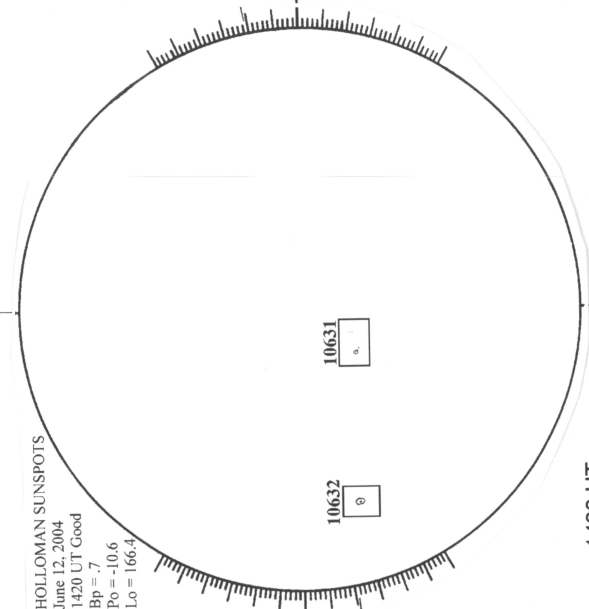
KANZELHOHE H-ALPHA



1007 UT

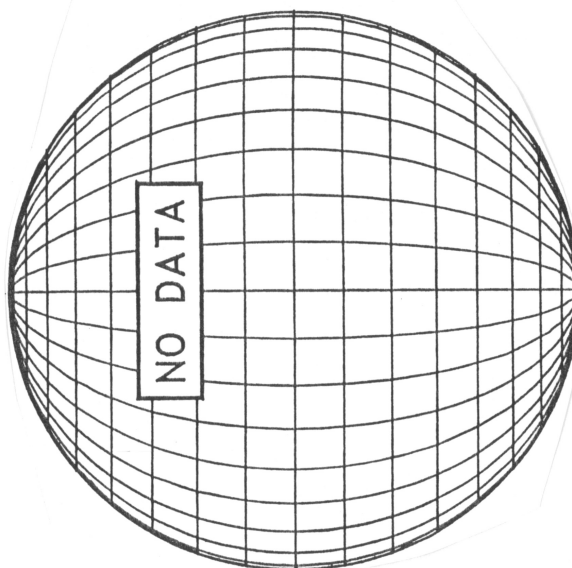
HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS  
June 12, 2004  
1420 UT Good  
Bp = .7  
Po = -10.6  
Lo = 166.4



1420 UT

SACRAMENTO PEAK CORONA (1.15 Radii)-----



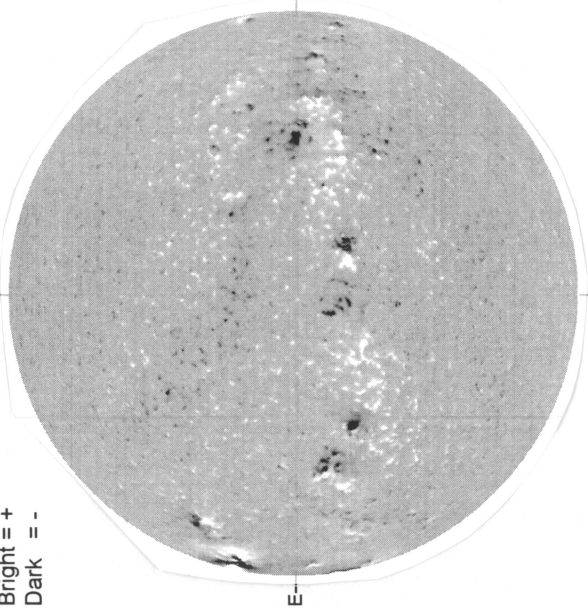


JUNE 13, 2004 ( P= -10.52, Bo = 0.82, Lo = 160.88)

60  
Jun 04

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

Bright = +  
Dark = -



1743 UT

STANFORD MAGNETOGRAM

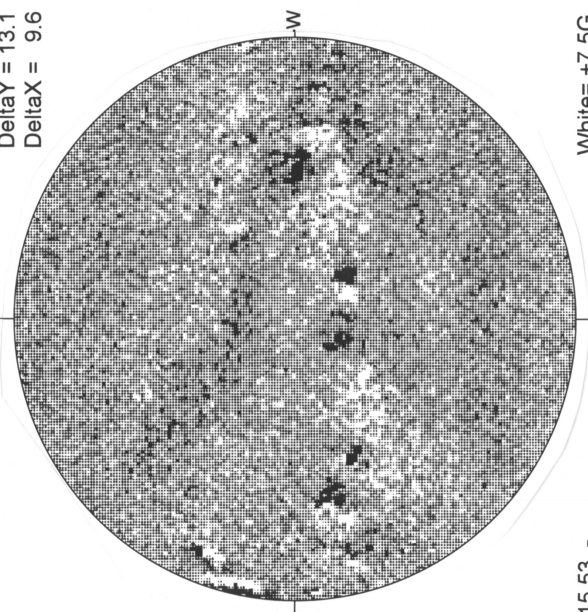
Solid = +  
Dashed = -



Jun 14  
0036 UT

MT. WILSON MAGNETOGRAM

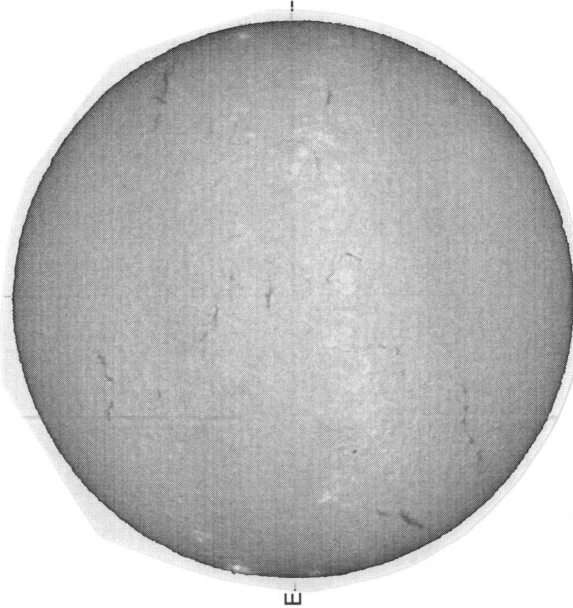
Delta Y = 13.1  
Delta X = 9.6



15.53 -  
16.46 UT

White= +7.5G  
Black = -7.5G

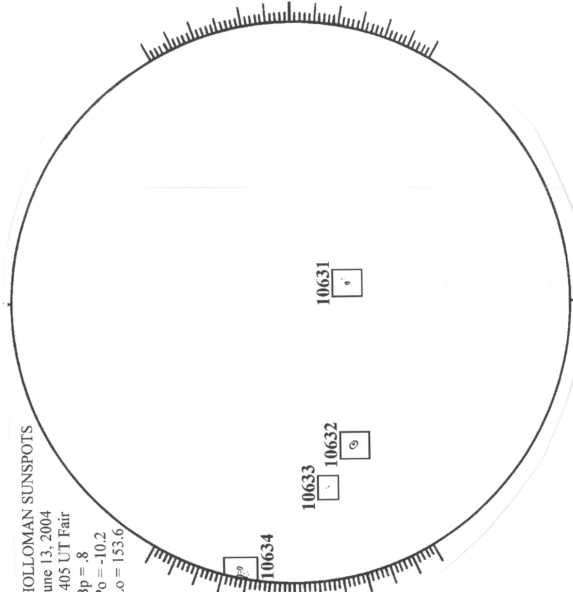
MEUDON H-ALPHA



0854 UT

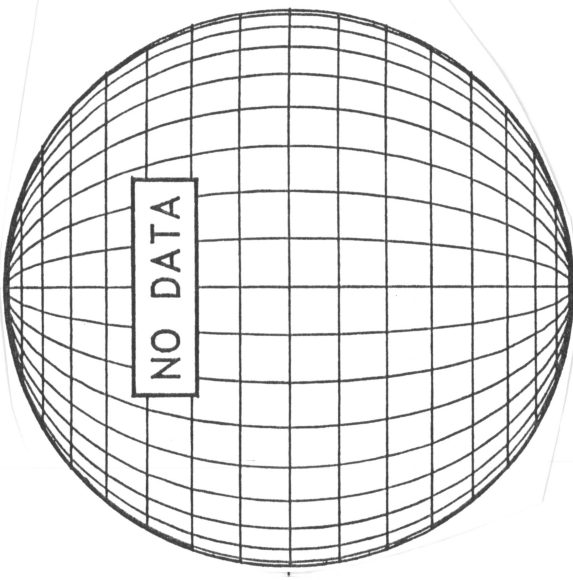
HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS  
June 13, 2004  
1405 UT Fair  
Bp = .8  
Po = -10.2  
Lo = 153.6



1405 UT

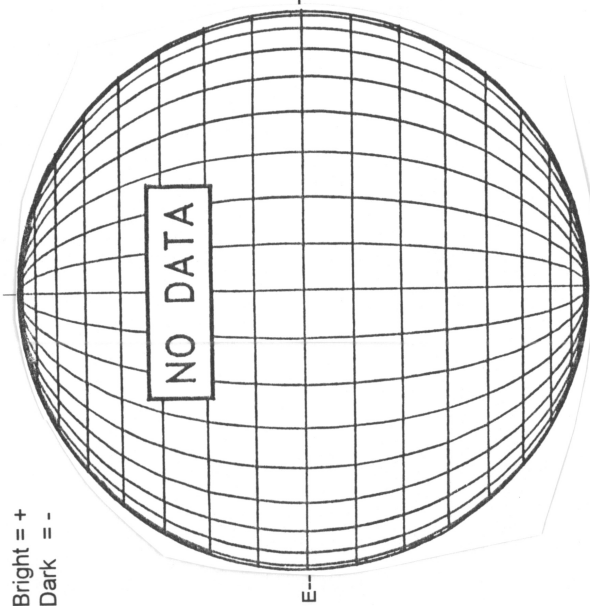
SACRAMENTO PEAK CORONA (1.15 Radii)----



S

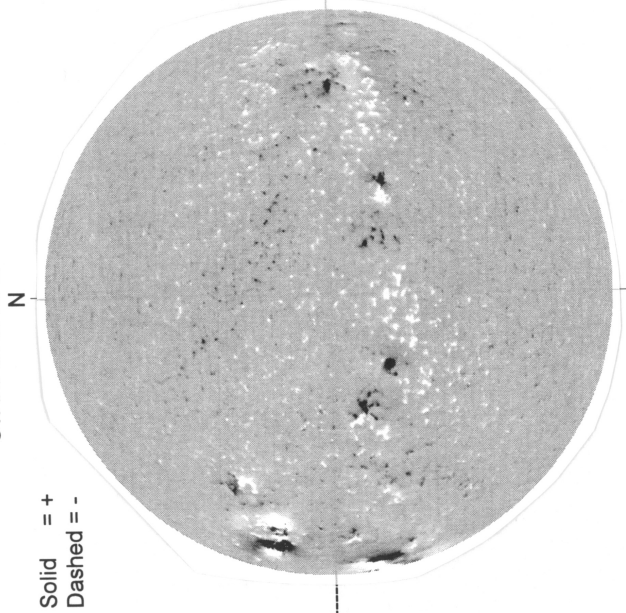
JUNE 14, 2004 ( P= -10.09, Bo = 0.94, Lo = 147.65)

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

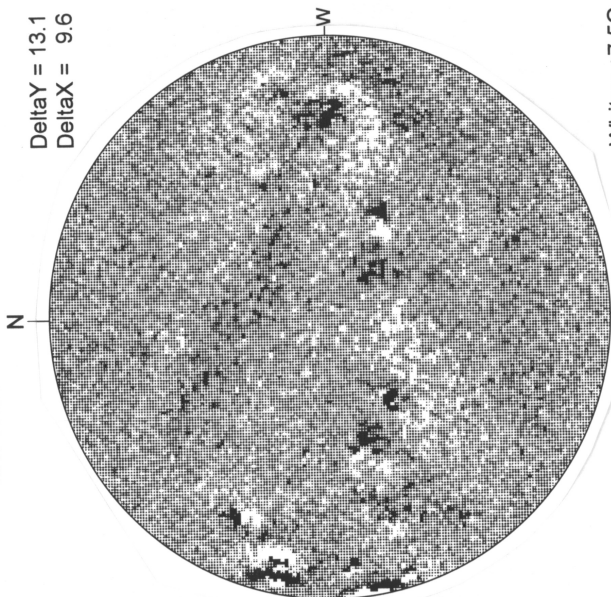


1802 UT

STANFORD MAGNETOGRAM



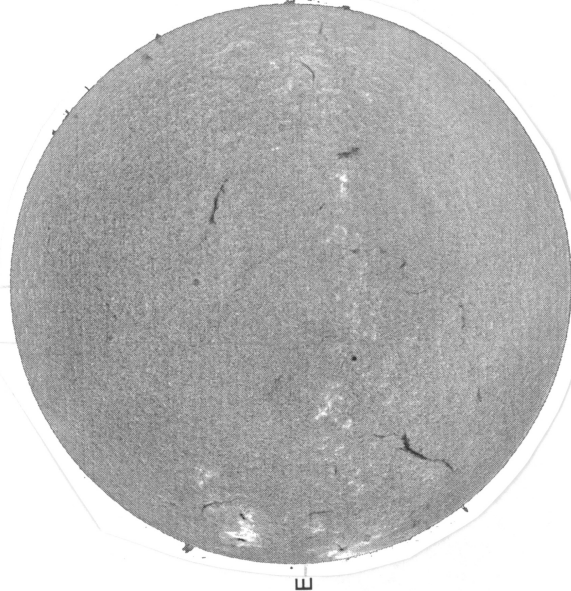
MT. WILSON MAGNETOGRAM



White = +7.5G  
Black = -7.5G

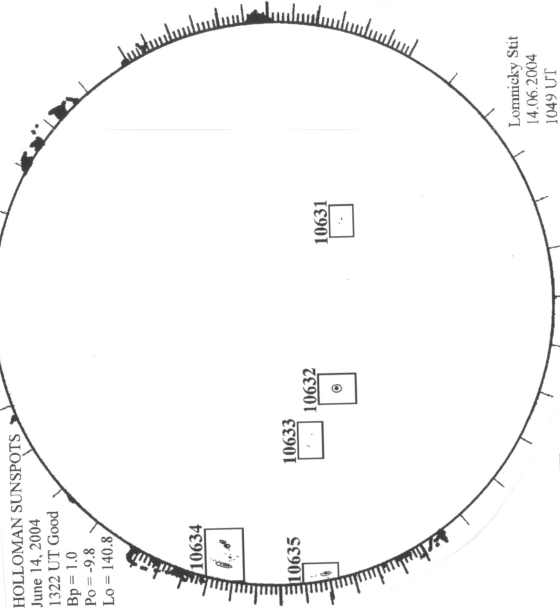
15.33 -  
16.25 UT

BIG BEAR H-ALPHA

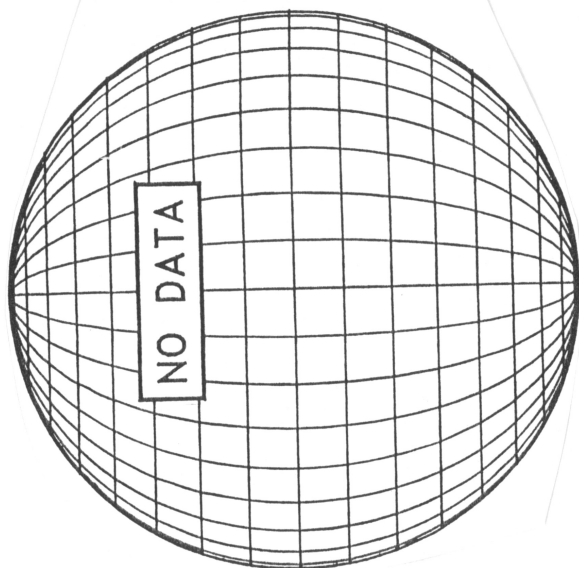


1653 UT

HOLLOMAN SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)----



61  
Jun 04

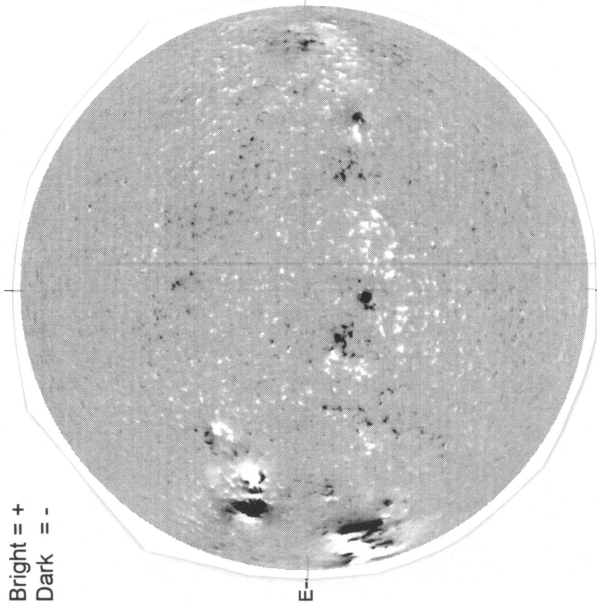
62  
Jun 04

JUNE 15, 2004 (P = -9.67, Bo = 1.06, Lo = 134.41)

KITT PEAK MAGNETOGRAM--SOLIS

\*\*854.2 nm\*\*

N



Bright = +  
Dark = -

1805 UT

STANFORD MAGNETOGRAM

N

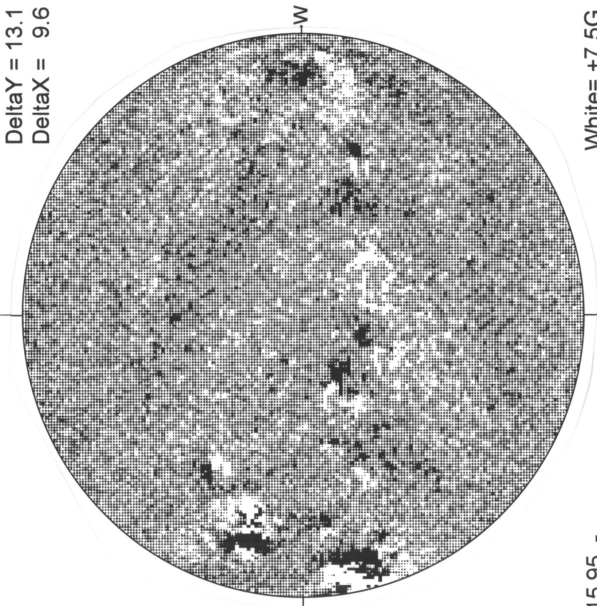


Solid = +  
Dashed = -

1856 UT

MT. WILSON MAGNETOGRAM

N

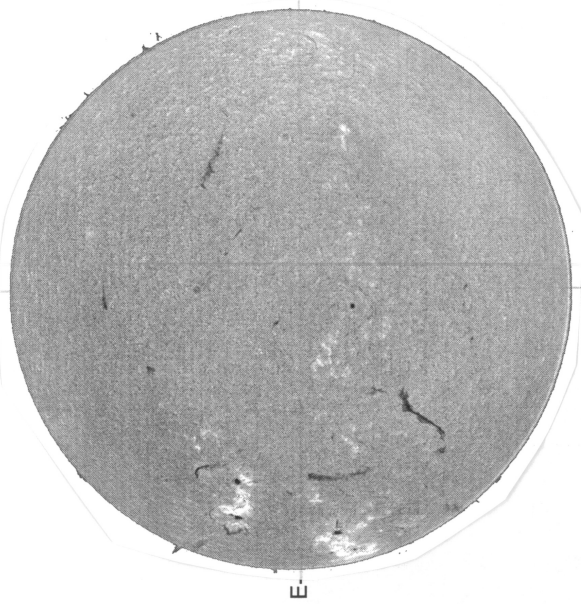


Delta Y = 13.1  
Delta X = 9.6

15.95 -  
16.87 UT

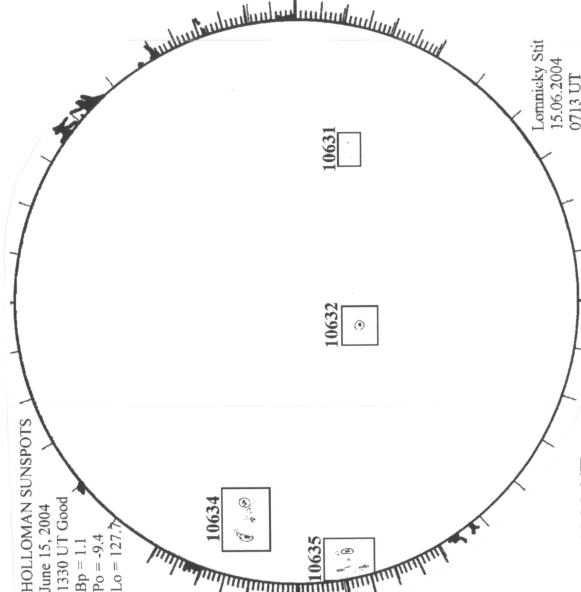
White = +7.5G  
Black = -7.5G

BIG BEAR H-ALPHA



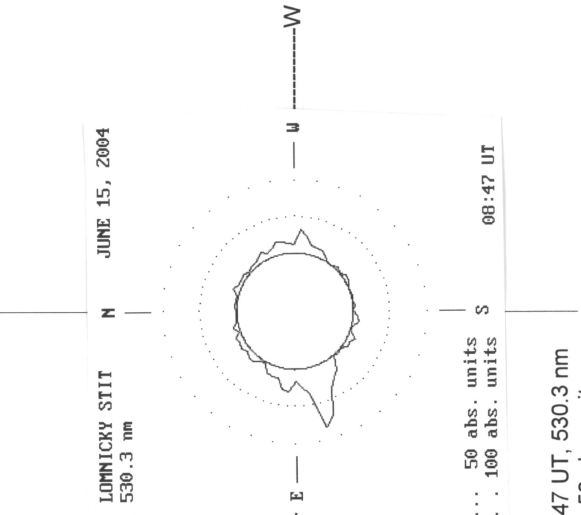
1602 UT

HOLLOMAN SUNSPOTS



1330 UT  
0713 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----



... 50 abs. units  
.. 100 abs. units

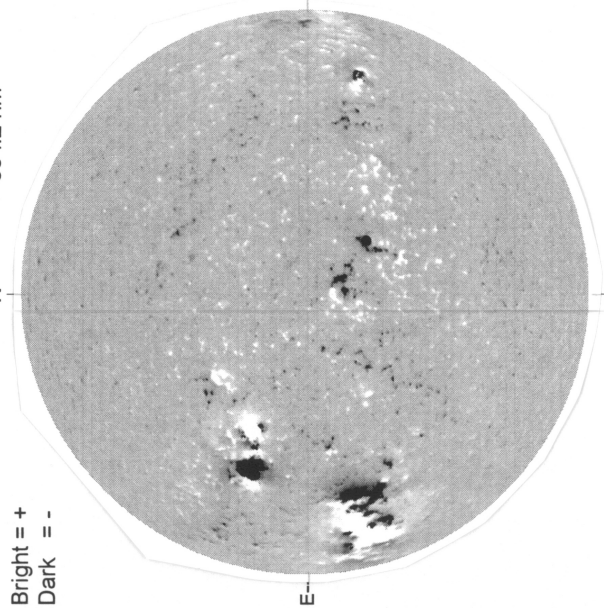
0847 UT, 530.3 nm  
... 50 abs. units  
.. 100 abs. units

Lomnický Stit  
15.06.2004  
0713 UT

JUNE 16, 2004 (P = -9.24, Bo = 1.18, Lo = 121.17)

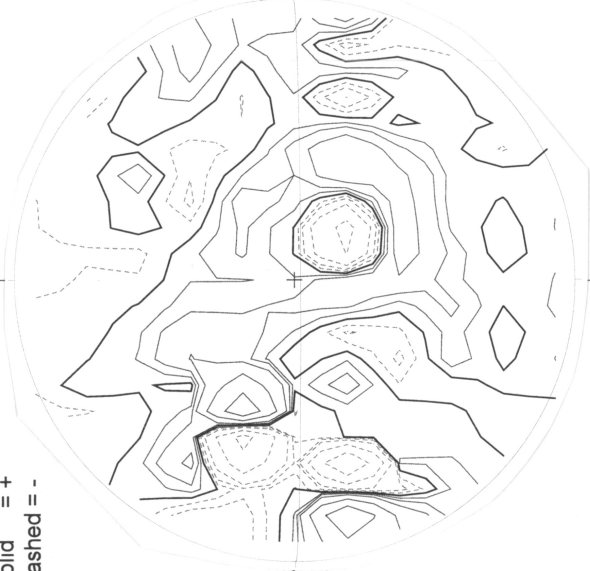
KITT PEAK MAGNETOGRAM--SOLIS

\*\*854.2 nm\*\*



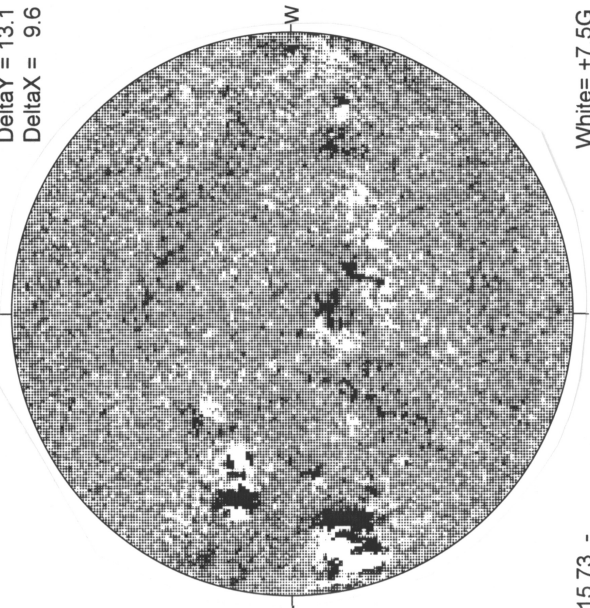
STANFORD MAGNETOGRAM

Solid = +  
Dashed = -

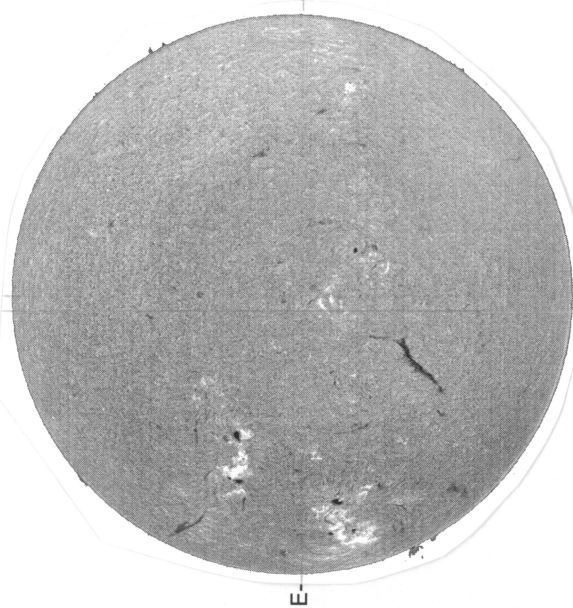


MT. WILSON MAGNETOGRAM

Delta Y = 13.1  
Delta X = 9.6

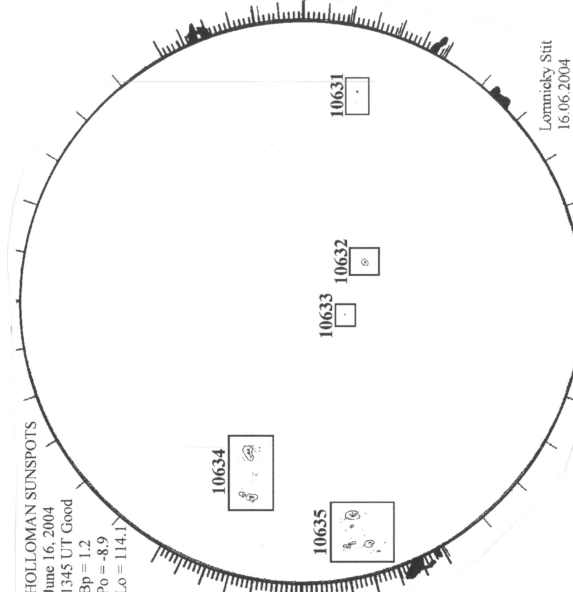


BIG BEAR H-ALPHA

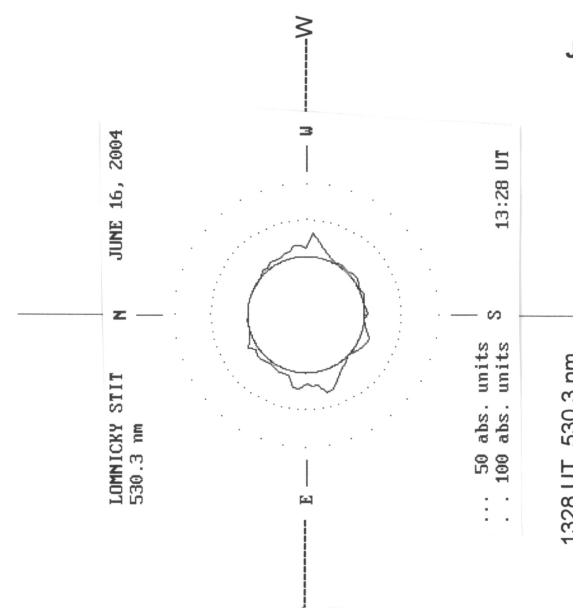


HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS  
June 16, 2004  
1345 UT Good  
Bp = 1.2  
Po = -8.9  
Lo = 114.1



LOMNICKY PEAK CORONA (1.04 Radii)-----

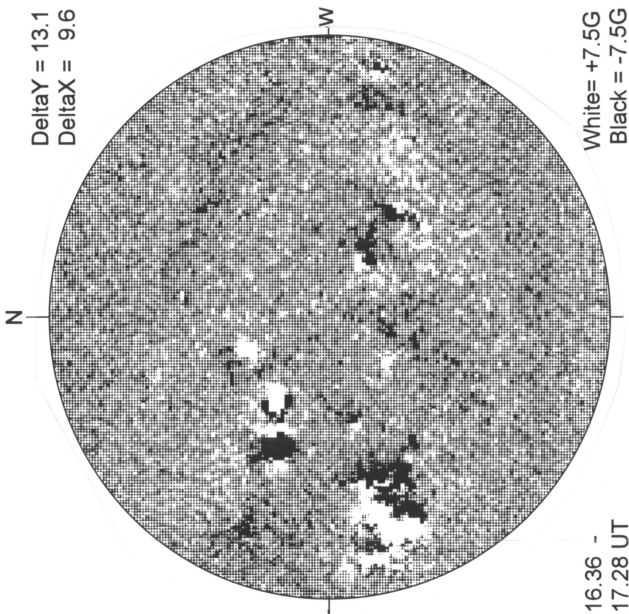




64  
Jun 04

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

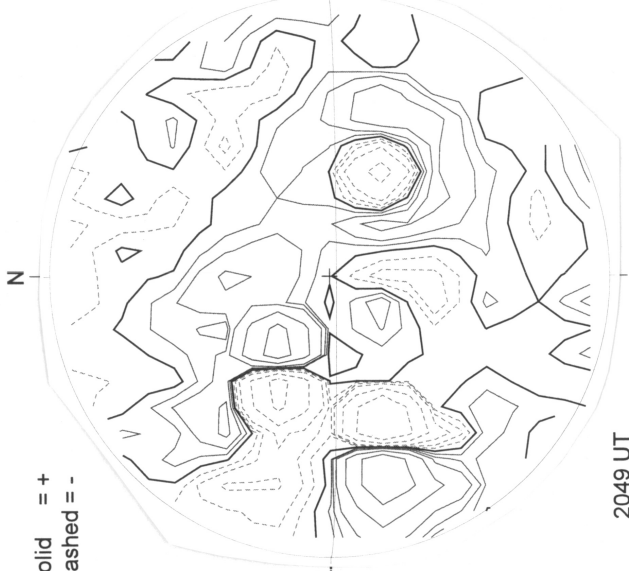
Bright = +  
Dark = -



1839 UT

STANFORD MAGNETOGRAM

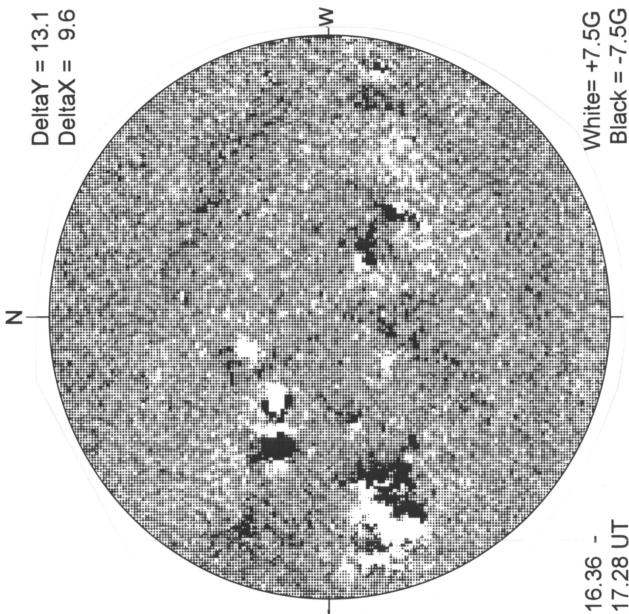
Solid = +  
Dashed = -



2049 UT

MT. WILSON MAGNETOGRAM

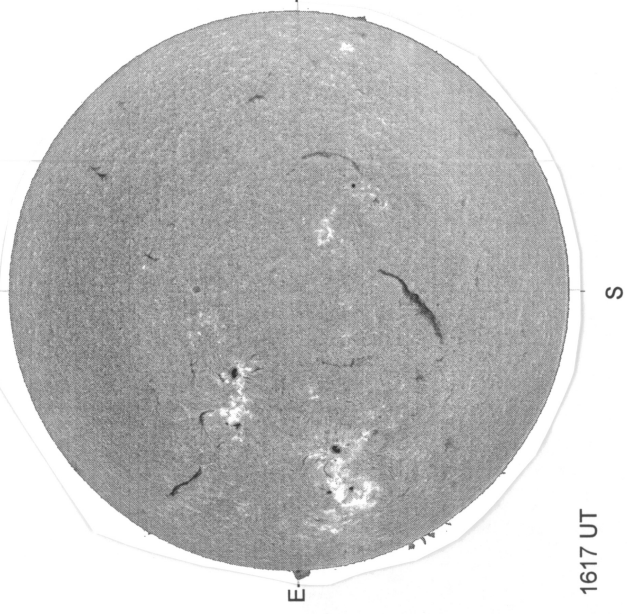
Delta Y = 13.1  
Delta X = 9.6



16.36 -  
17.28 UT

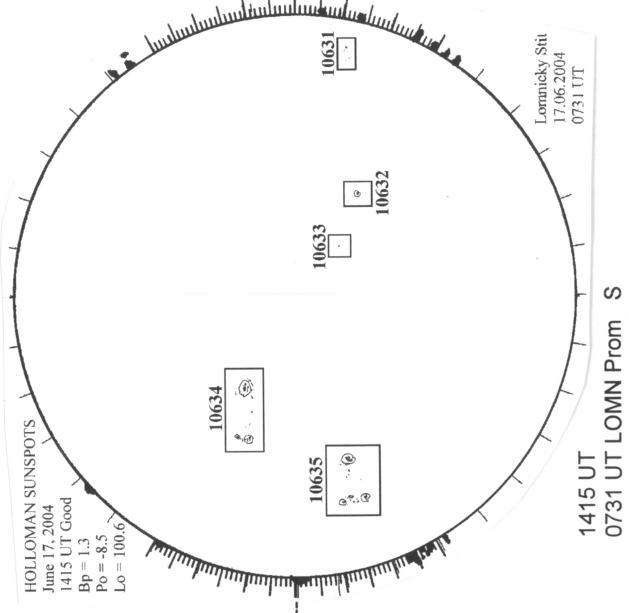
White = +7.5G  
Black = -7.5G

BIG BEAR H-ALPHA



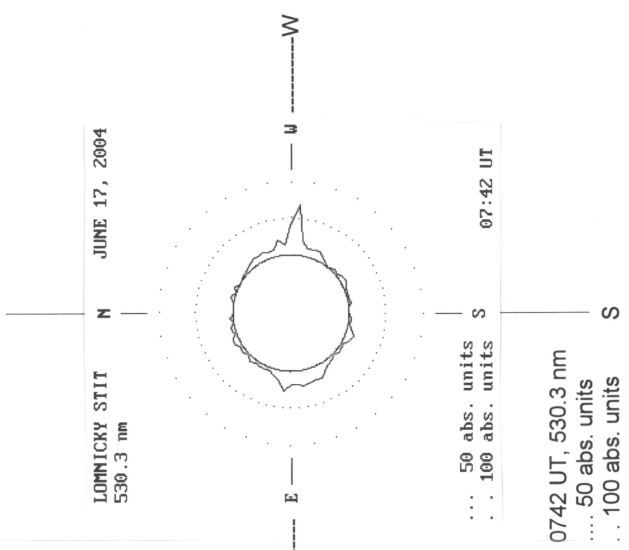
1617 UT

HOLLOMAN SUNSPOTS



1415 UT  
0731 UT LOMN Prom S

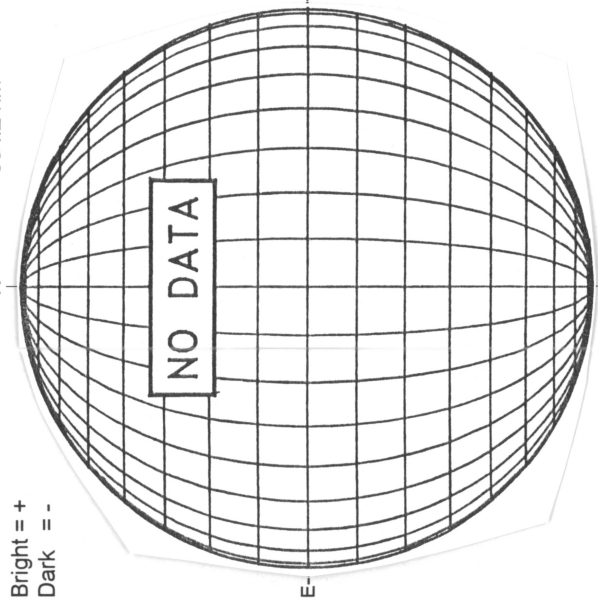
LOMNICKY PEAK CORONA (1.04 Radii)----



0742 UT, 530.3 nm  
... 50 abs. units  
... 100 abs. units

JUNE 18, 2004 (P = -8.37, Bo = 1.42, Lo = 94.70)

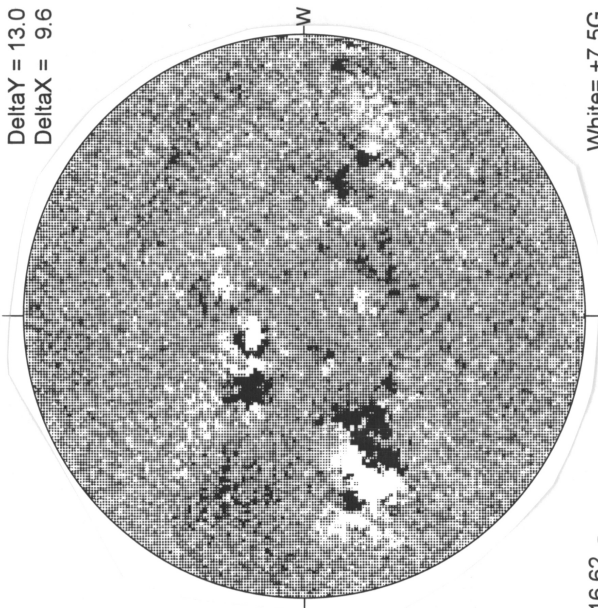
KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



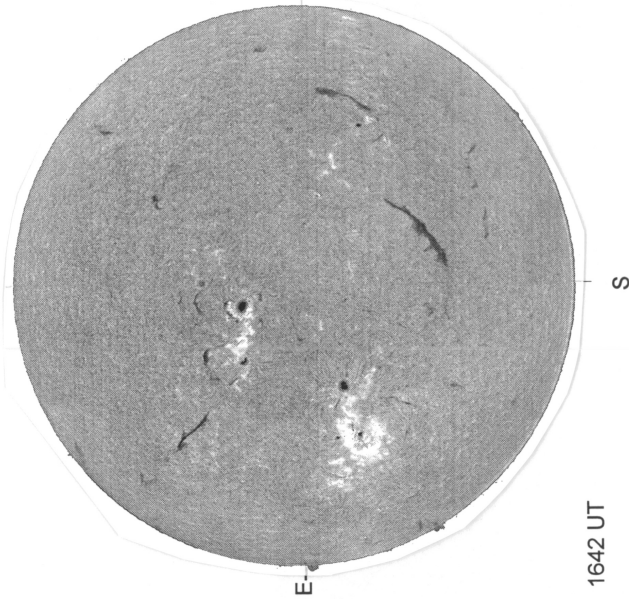
STANFORD MAGNETOGRAM



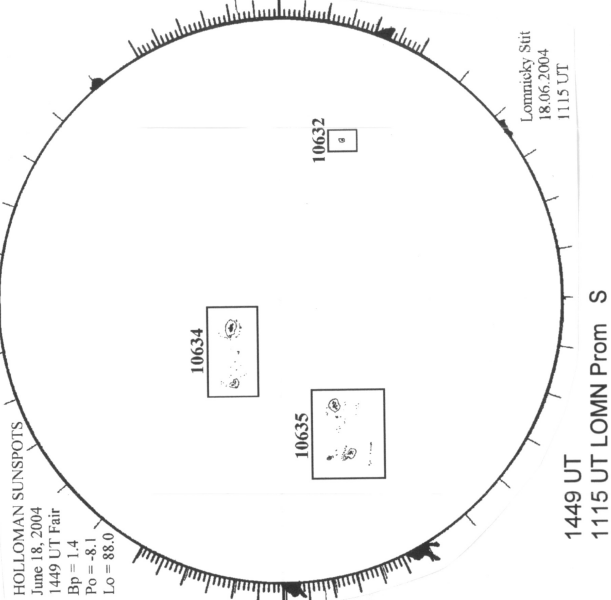
MT. WILSON MAGNETOGRAM



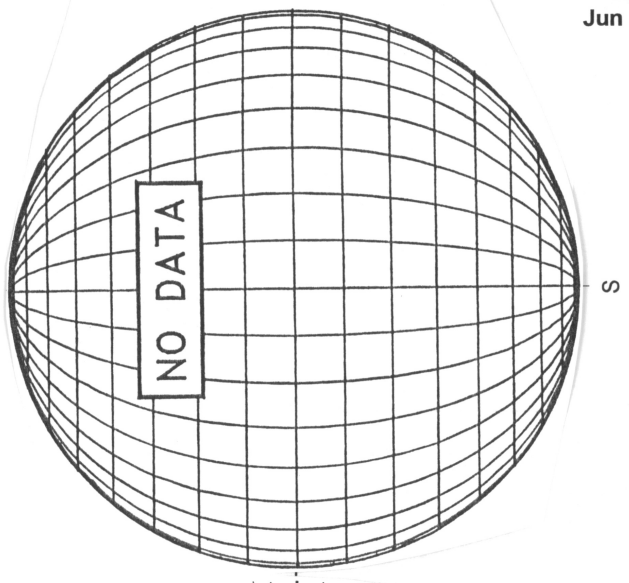
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



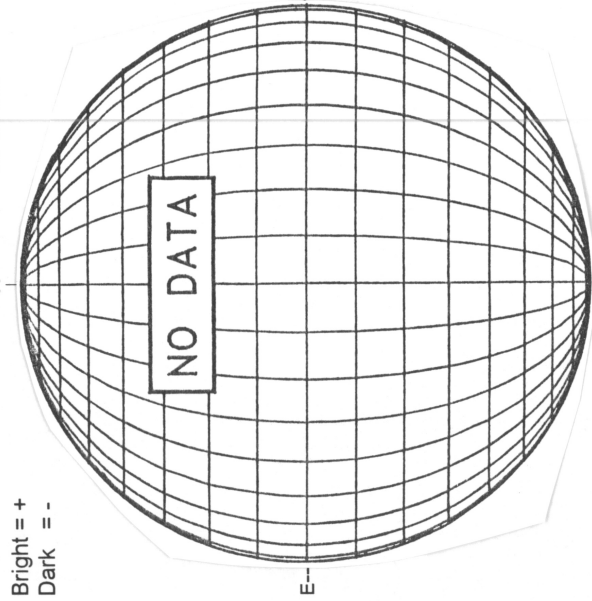
LOMNICKY PEAK CORONA (1.04 Radii) -----



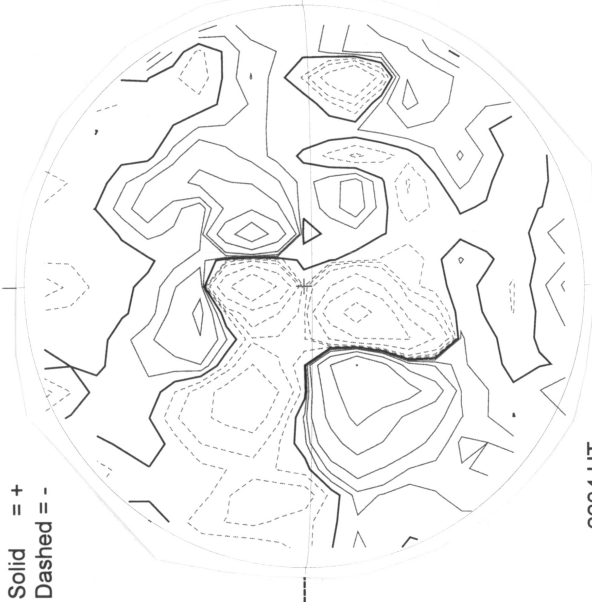
JUNE 19, 2004 (P = -7.93, Bo = 1.53, Lo = 81.46)

66  
Jun 04

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

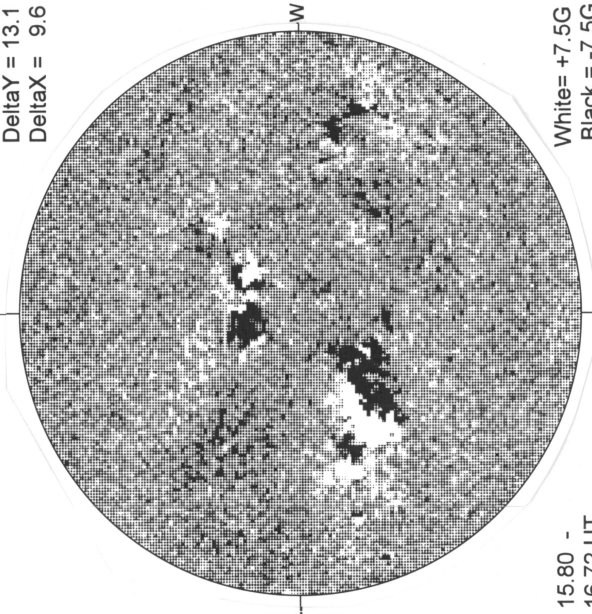


STANFORD MAGNETOGRAM

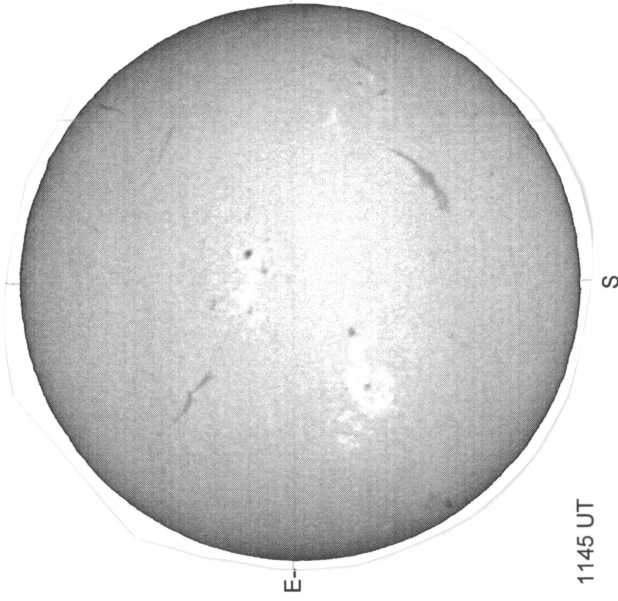


MT. WILSON MAGNETOGRAM

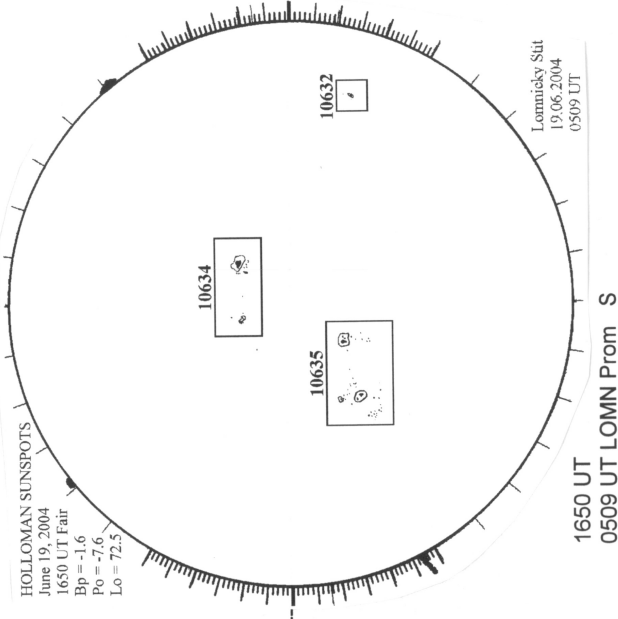
DeltaY = 13.1  
DeltaX = 9.6



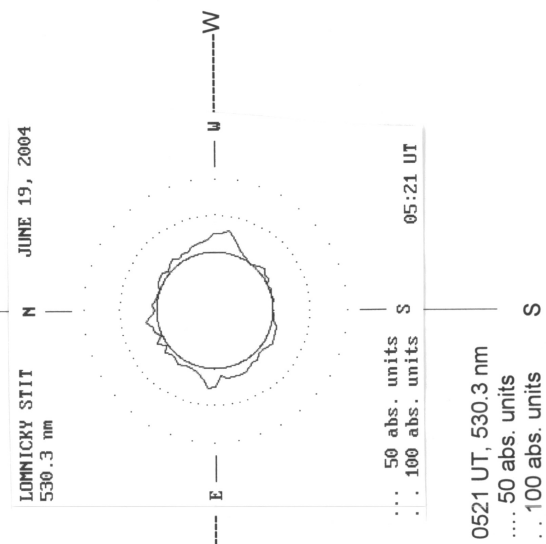
MEUDON H-ALPHA



HOLLOMAN SUNSPOTS



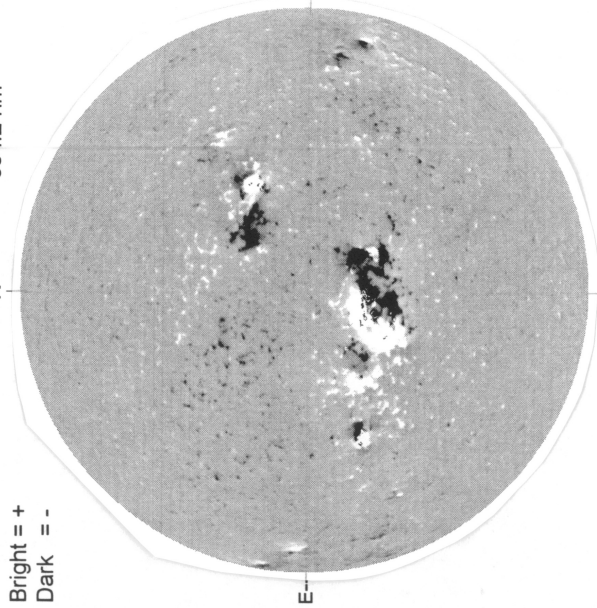
LOMNICKY PEAK CORONA (1.04 Radii)----





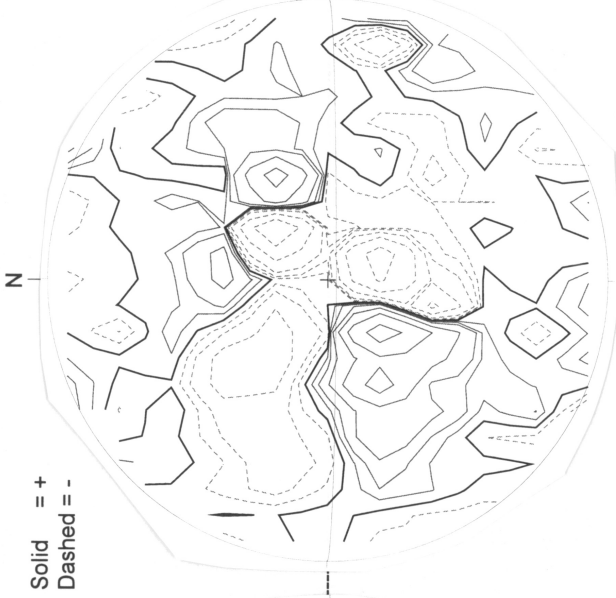
JUNE 20, 2004 ( P= -7.49, Bo = 1.65, Lo = 68.23)

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



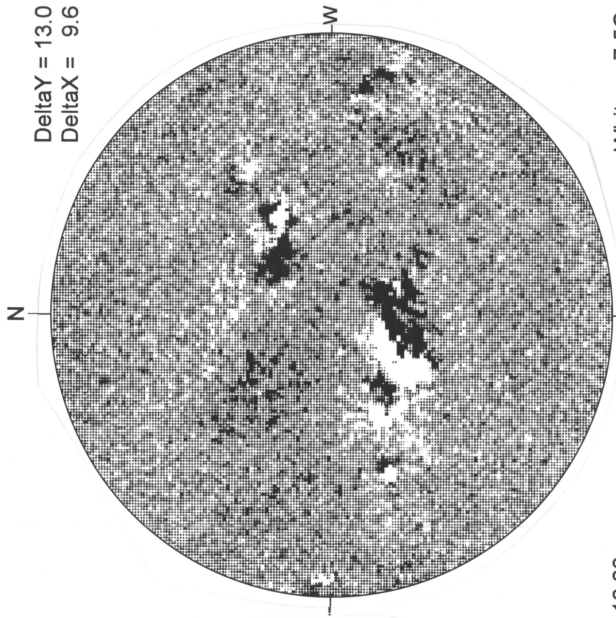
1853 UT

STANFORD MAGNETOGRAM



1450 UT

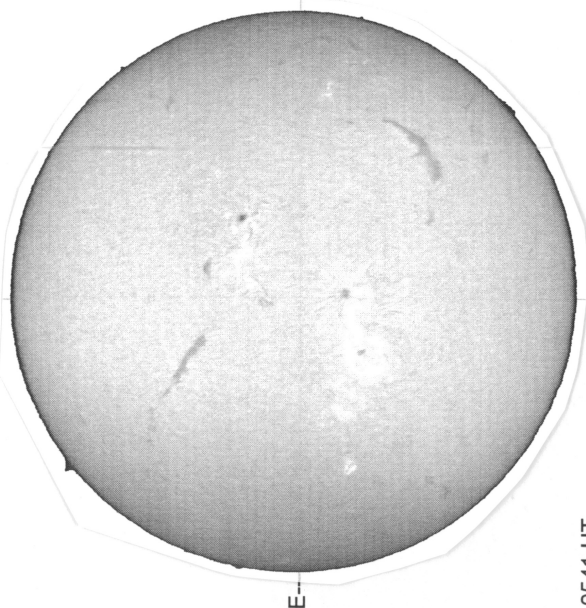
MT. WILSON MAGNETOGRAM



16.00 -  
16.92 UT

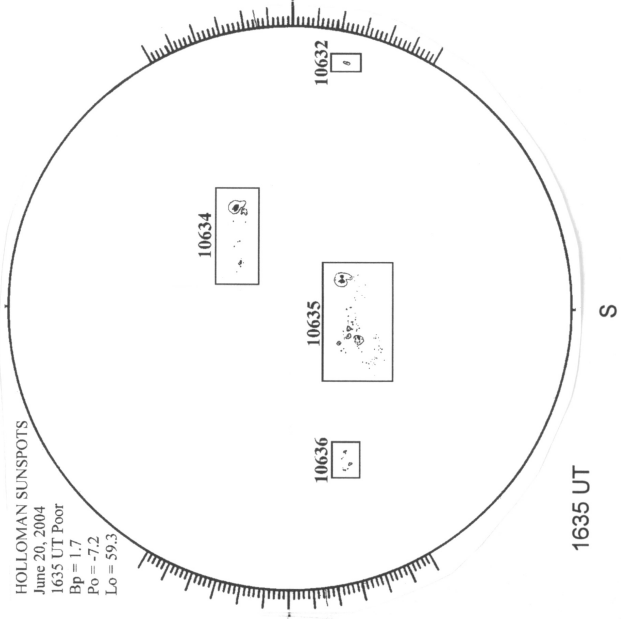
White= +7.5G  
Black = -7.5G

MEUDON H-ALPHA



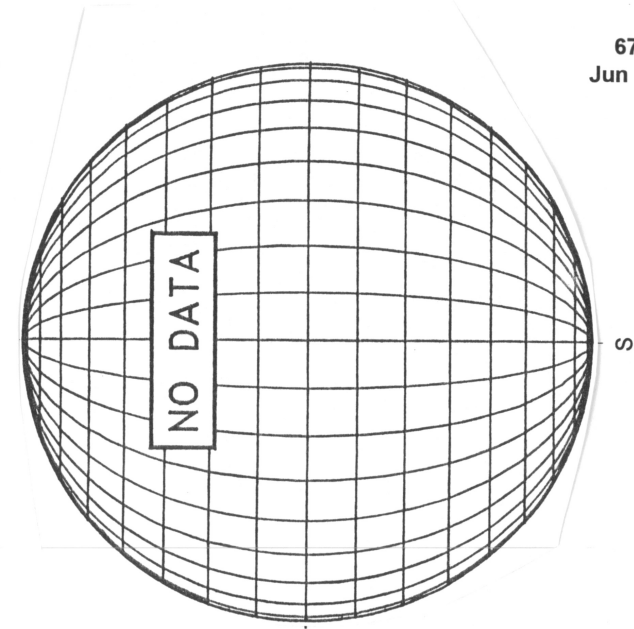
0541 UT

HOLLOMAN SUNSPOTS



1635 UT

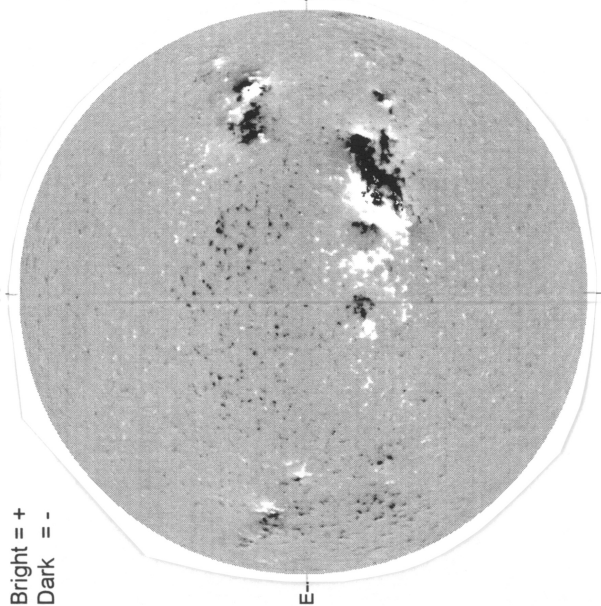
SACRAMENTO PEAK CORONA (1.15 Radii)-----





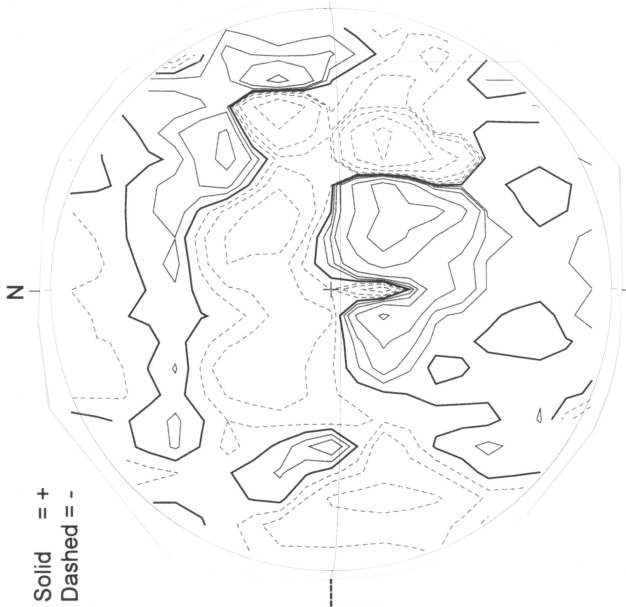
JUNE 22, 2004 ( P= -6.60, Bo = 1.88, Lo = 41.75)

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



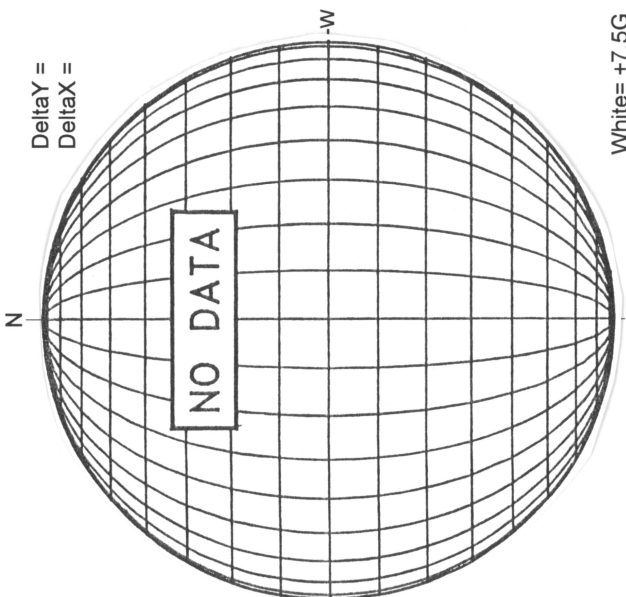
1714 UT

STANFORD MAGNETOGRAM



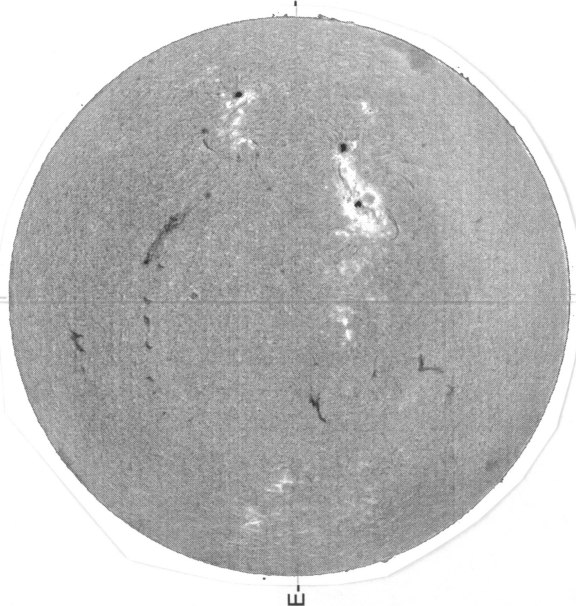
2310 UT

MT. WILSON MAGNETOGRAM



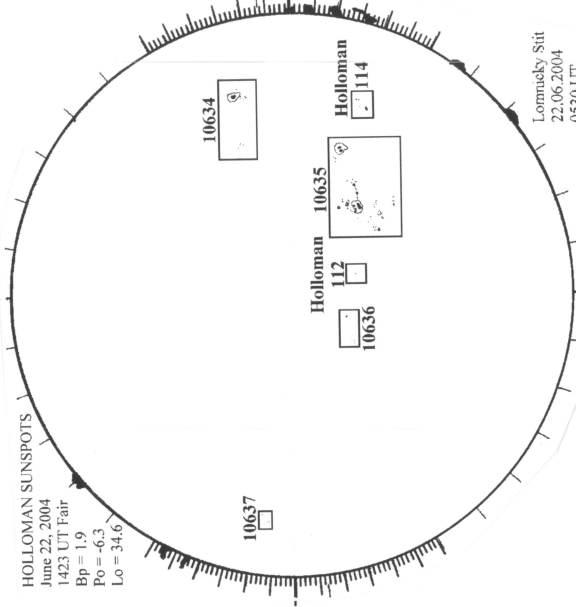
White= +7.5G  
Black = -7.5G

BIG BEAR H-ALPHA

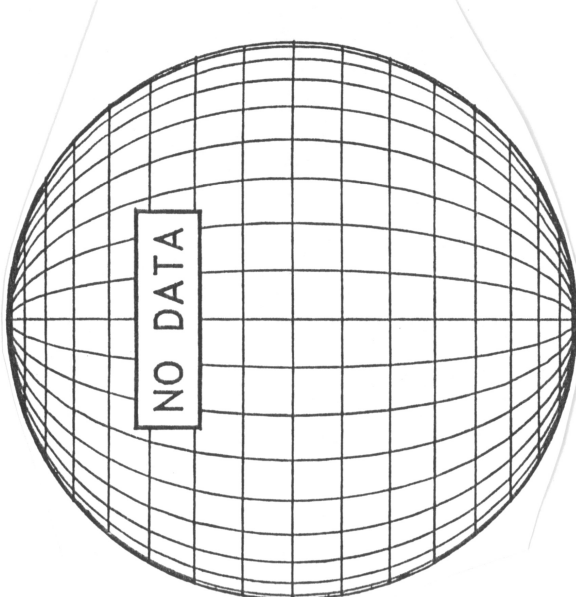


1648 UT

HOLLOMAN SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)----



69  
Jun 04

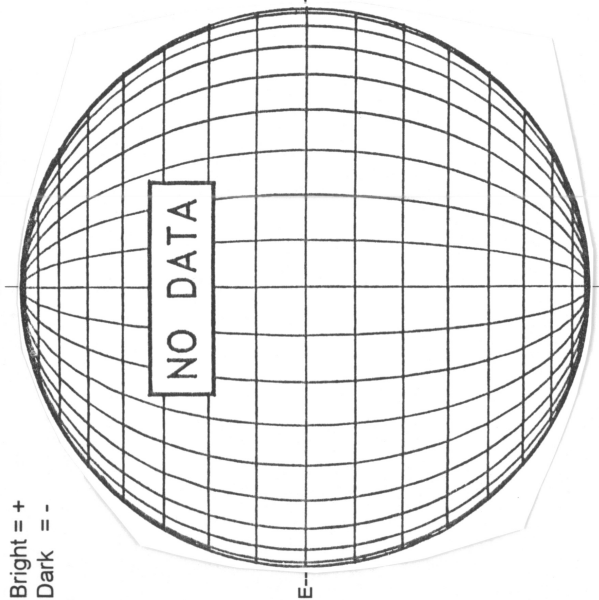
JUNE 23, 2004 ( P= - 6.16, Bo = 2.00, Lo = 28.52)

70  
Jun 04

KITT PEAK MAGNETOGRAM--SOLIS

\*\*854.2 nm\*\*

N



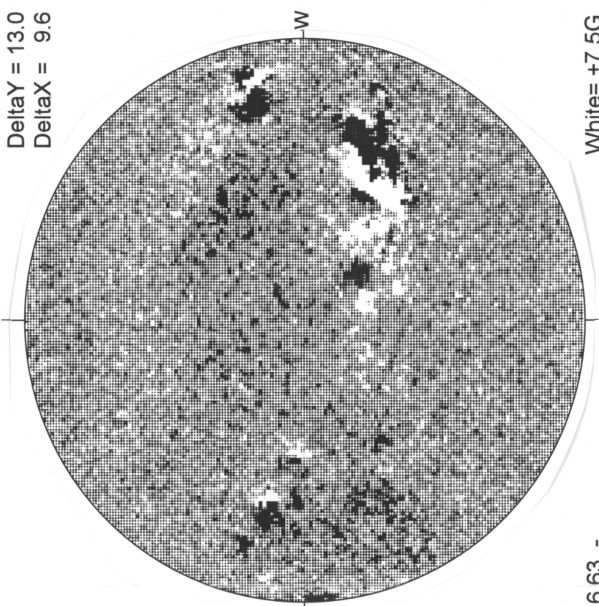
STANFORD MAGNETOGRAM

N

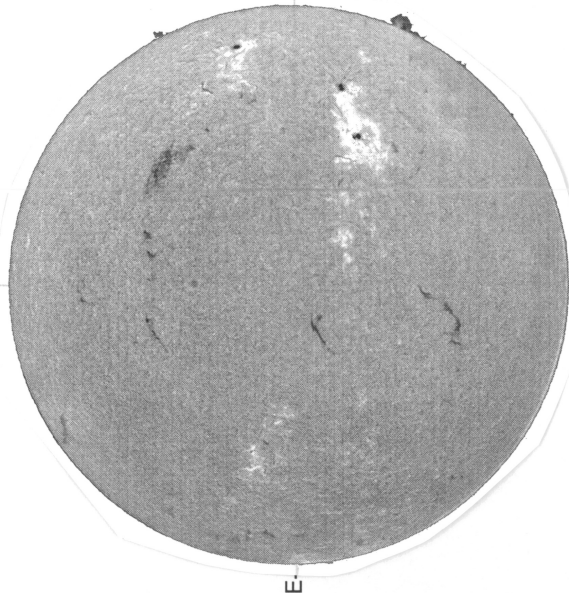


MT. WILSON MAGNETOGRAM

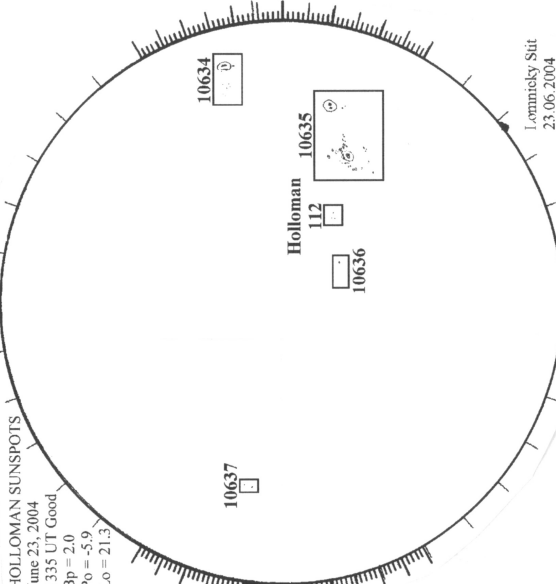
N



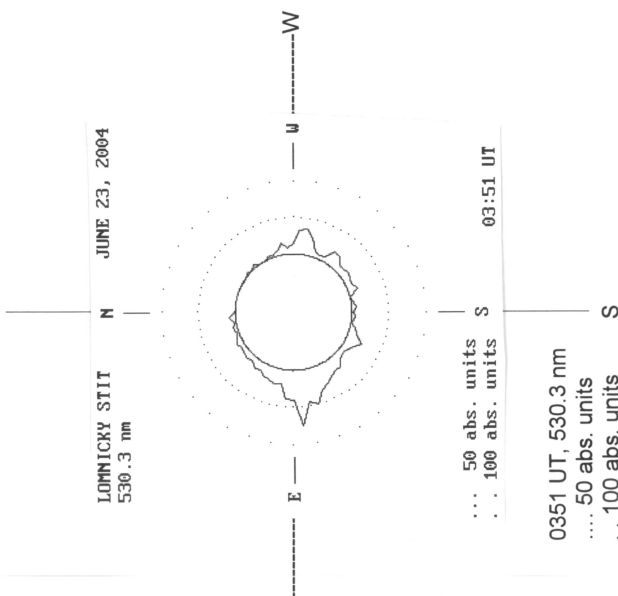
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



LOMNICKY PEAK CORONA (1.04 Radii)-----



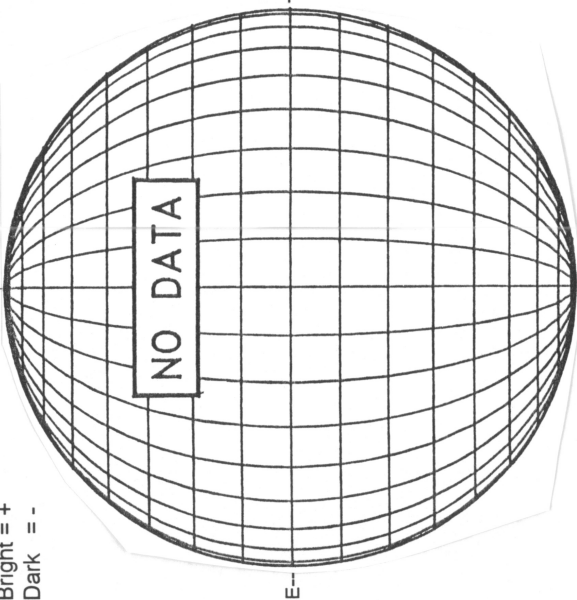


JUNE 24, 2004 (P = -5.71, B<sub>0</sub> = 2.12, L<sub>0</sub> = 15.28)

KITT PEAK MAGNETOGRAM--SOLIS

\*\*854.2 nm\*\*

Bright = +  
Dark = -



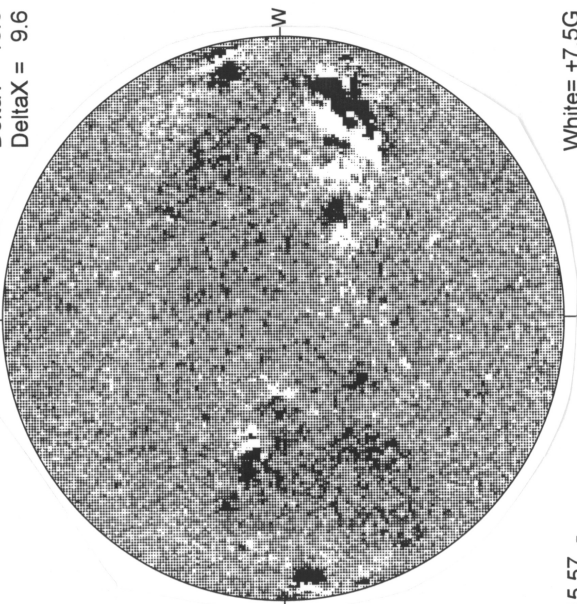
STANFORD MAGNETOGRAM

Solid = +  
Dashed = -



MT. WILSON MAGNETOGRAM

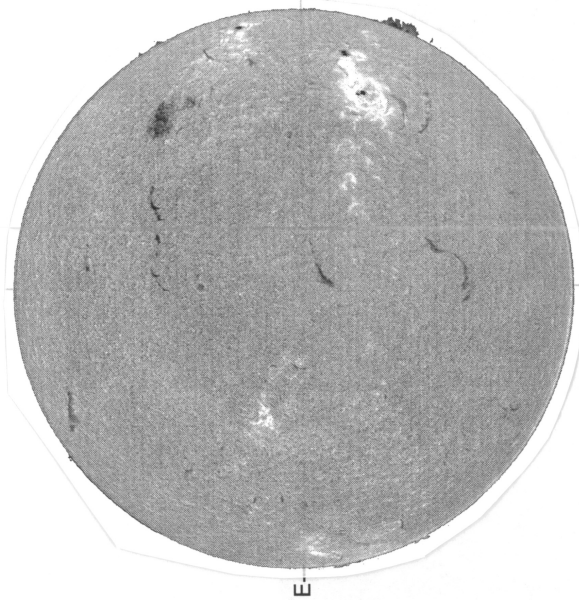
Delta Y = 13.0  
Delta X = 9.6



15.57 -  
16.49 UT

White = +7.5G  
Black = -7.5G

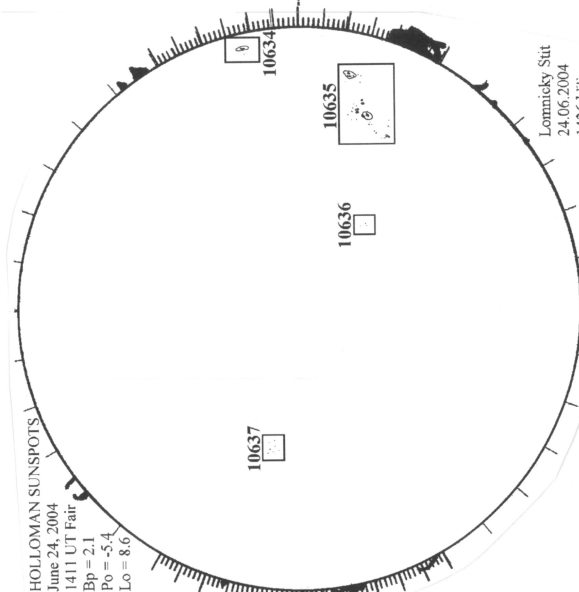
BIG BEAR H-ALPHA



1602 UT

HOLLOMAN SUNSPOTS

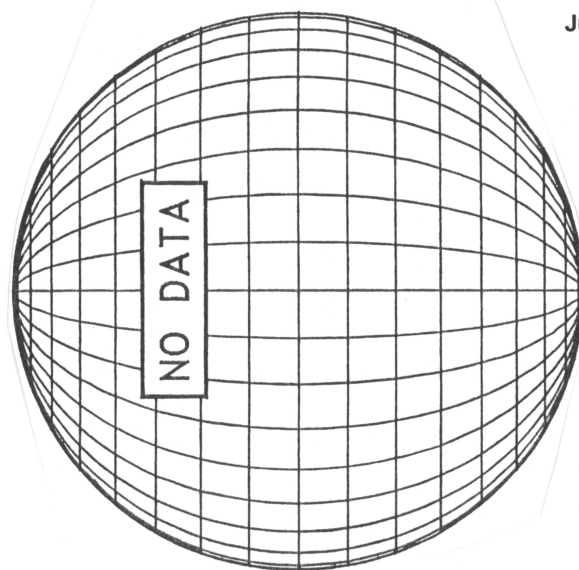
HOLLOMAN SUNSPOTS  
June 24, 2004  
1411 UT Fair  
B<sub>0</sub> = 2.1  
P<sub>0</sub> = -5.4  
L<sub>0</sub> = 8.6



1411 UT  
1436 UT LOMN Prom S

Lomnický štít  
24.06.2004  
1436 UT

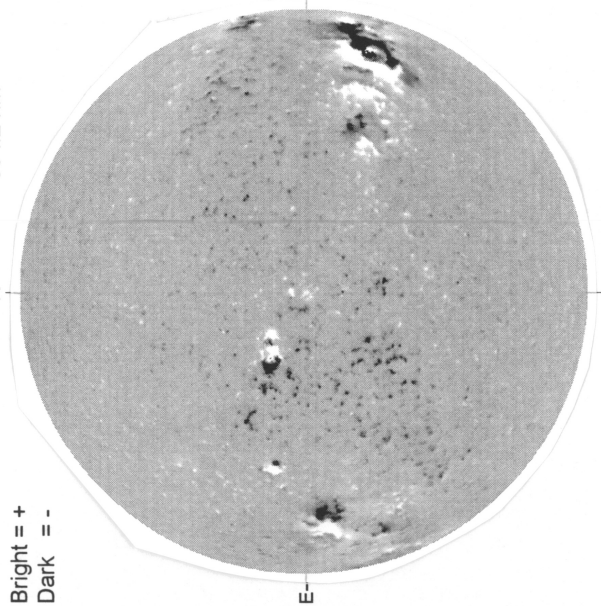
SACRAMENTO PEAK CORONA (1.15 Radii)-----



71  
Jun 04

72  
Jun 04

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



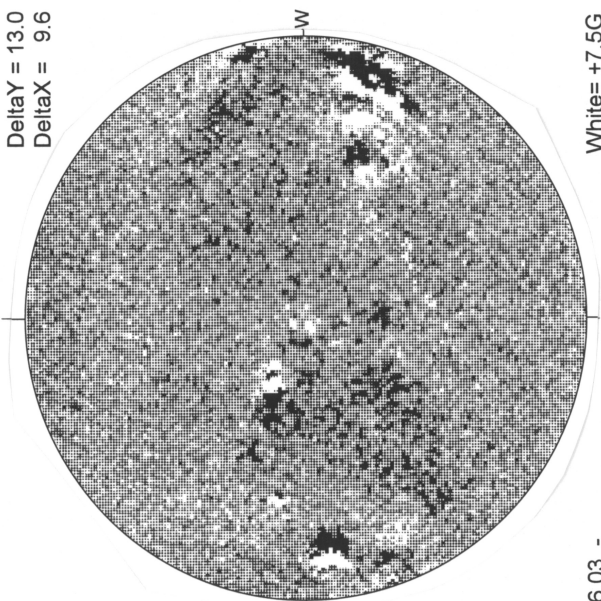
1646 UT

STANFORD MAGNETOGRAM



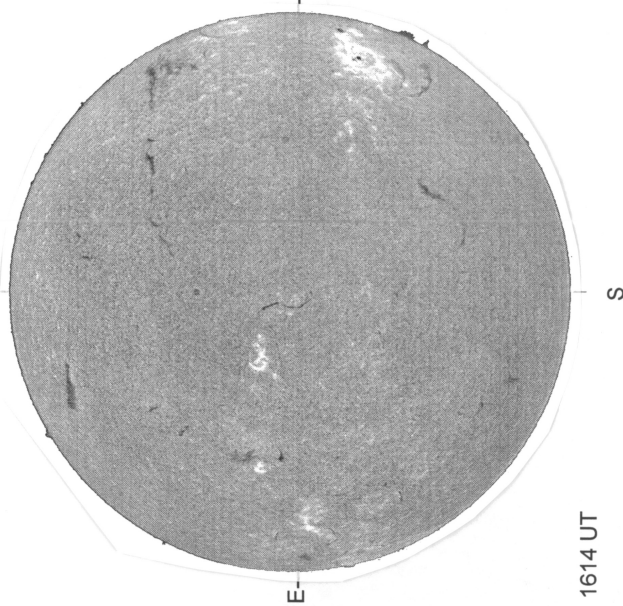
2018 UT

MT. WILSON MAGNETOGRAM



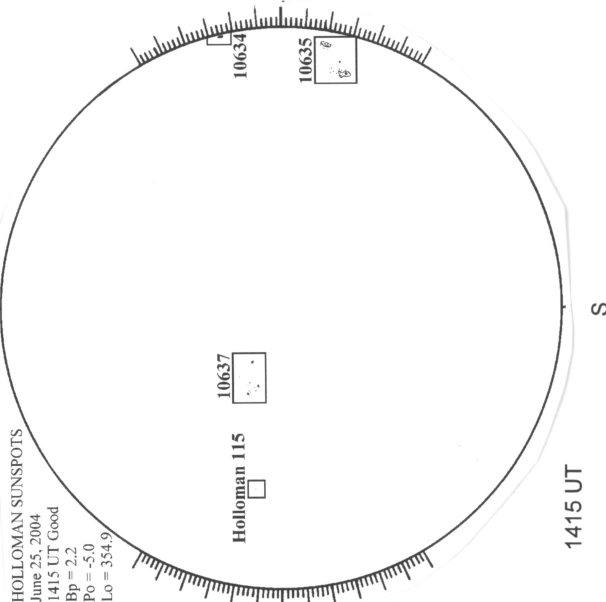
16.03 -  
16.96 UT

BIG BEAR H-ALPHA



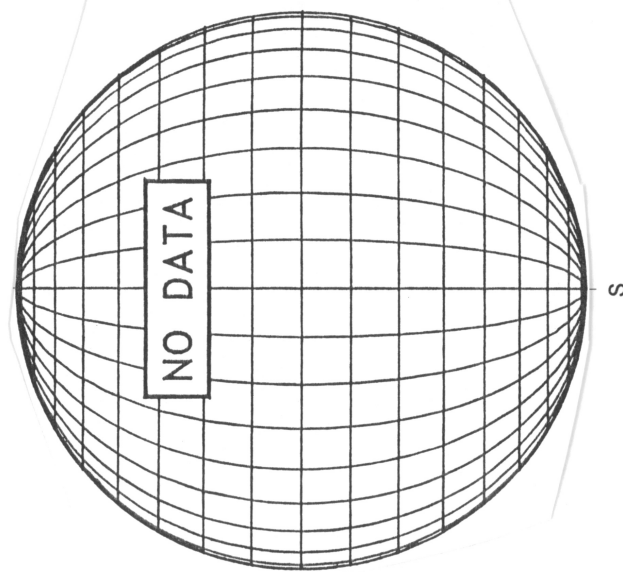
1614 UT

HOLLOMAN SUNSPOTS



1415 UT

SACRAMENTO PEAK CORONA (1.15 Radii)-----





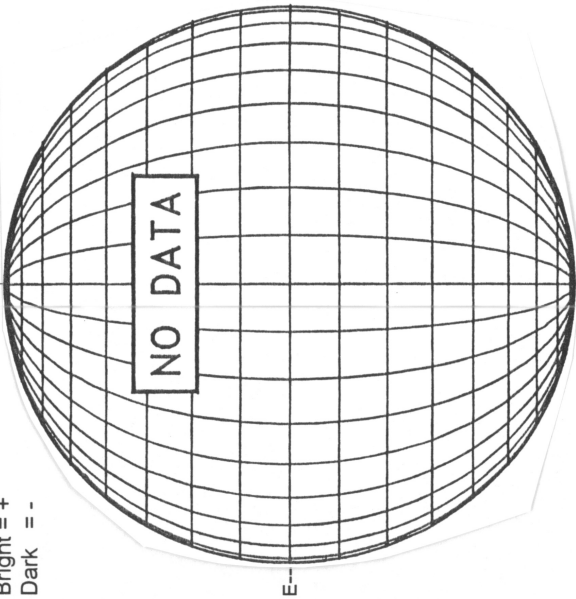
JUNE 26, 2004 (P = -4.81, Bo = 2.35, Lo = 348.81)

KITT PEAK MAGNETOGRAM--SOLIS

\*\*854.2 nm\*\*

Bright = +  
Dark = -

N

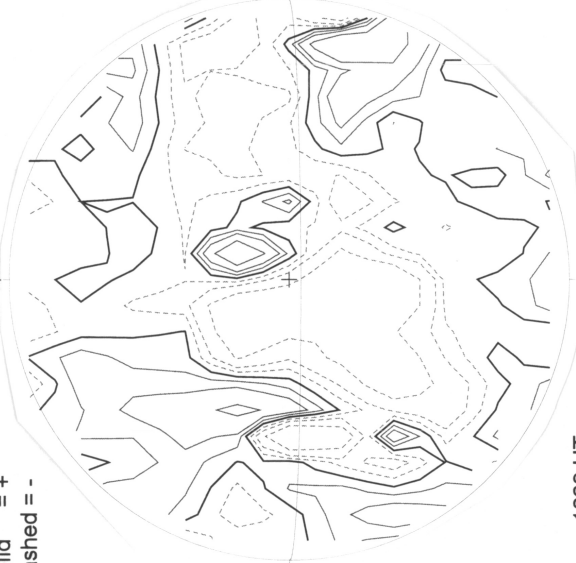


E

STANFORD MAGNETOGRAM

N

Solid = +  
Dashed = -

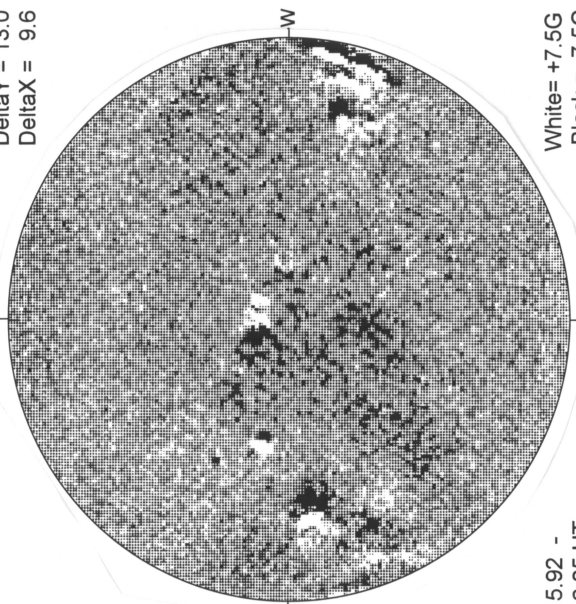


1829 UT

MT. WILSON MAGNETOGRAM

N

Delta Y = 13.0  
Delta X = 9.6



W

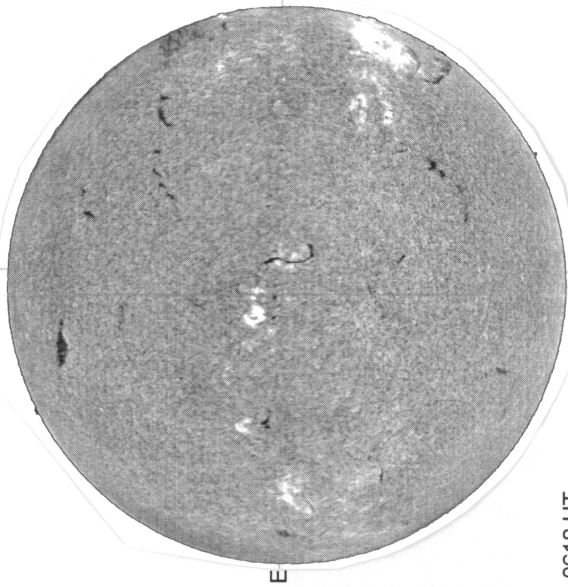
15.92 -  
16.85 UT

White = +7.5G  
Black = -7.5G

KANZELHOHE H-ALPHA

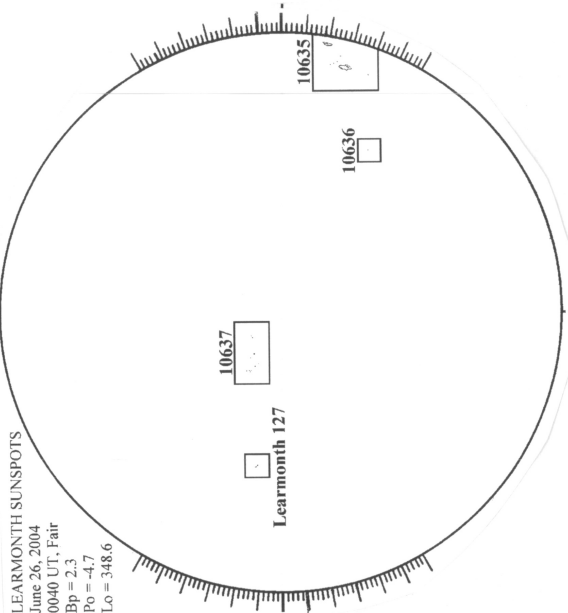
LEARMONTH SUNSPOTS

SACRAMENTO PEAK CORONA (1.15 Radii)

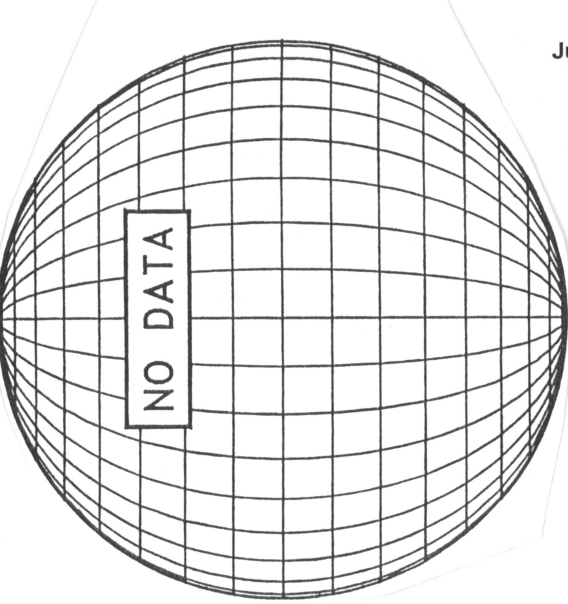


E

0618 UT



S

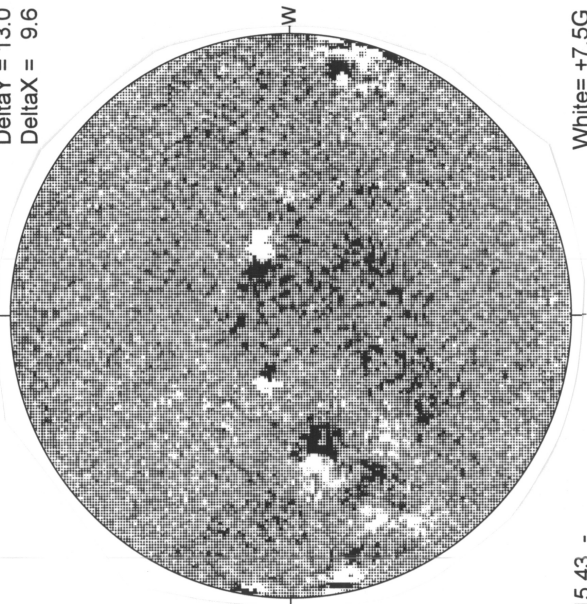


S

74  
Jun 04

DeltaY = 13.0  
DeltaX = 9.6

MT. WILSON MAGNETOGRAM



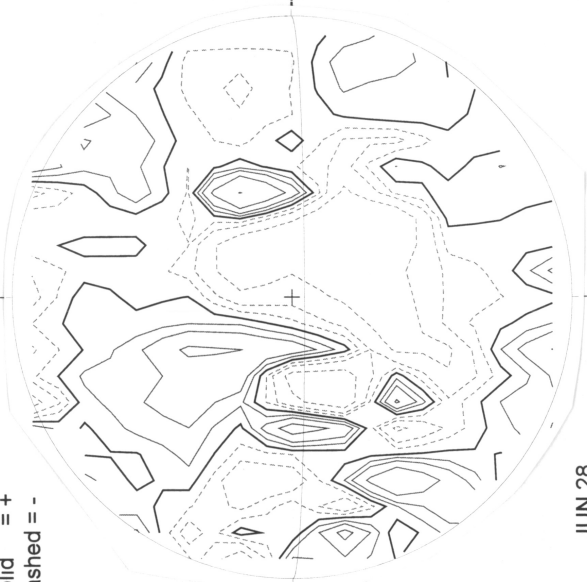
White= +7.5G  
Black = -7.5G

15.43 -  
16.36 UT

JUNE 27, 2004 (P= -4.36, Bo = 2.46, Lo = 335.57)

STANFORD MAGNETOGRAM

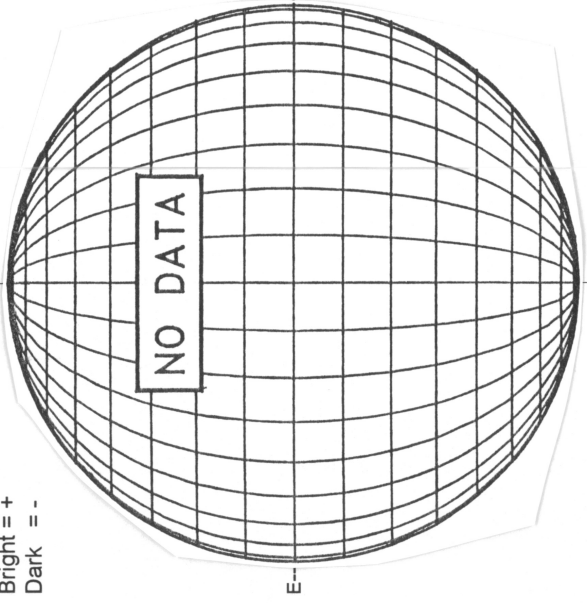
Solid = +  
Dashed = -



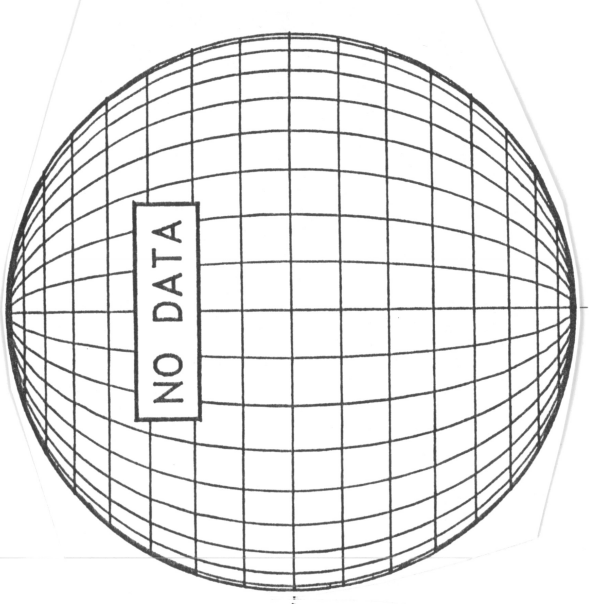
JUN 28  
0115 UT

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

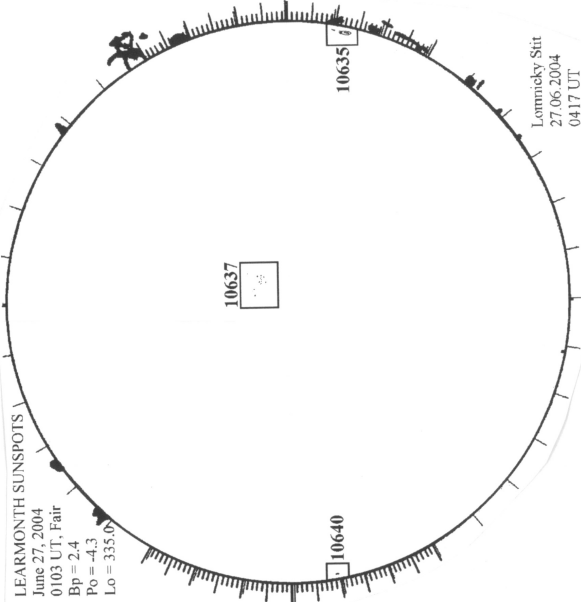
Bright = +  
Dark = -



SACRAMENTO PEAK CORONA (1.15 Radii)----

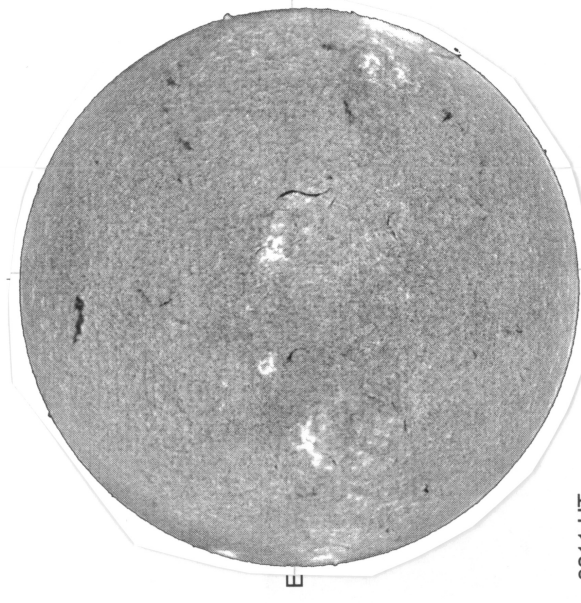


HOLLOMAN SUNSPOTS



0417 UT LOMN Prom S

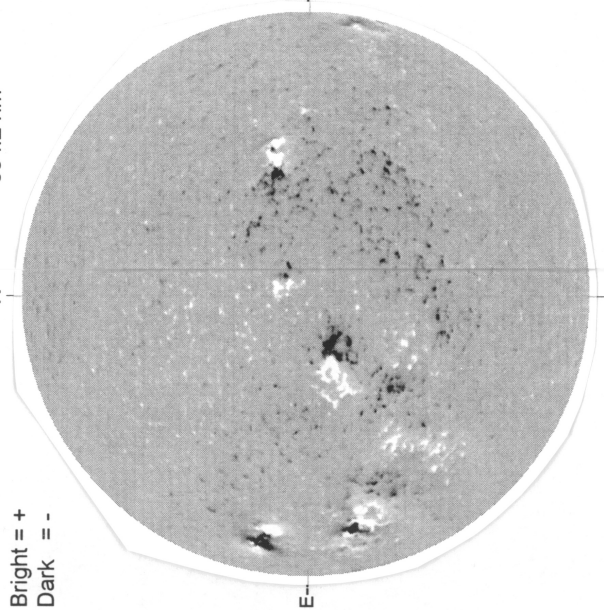
KANZELHOHE H-ALPHA



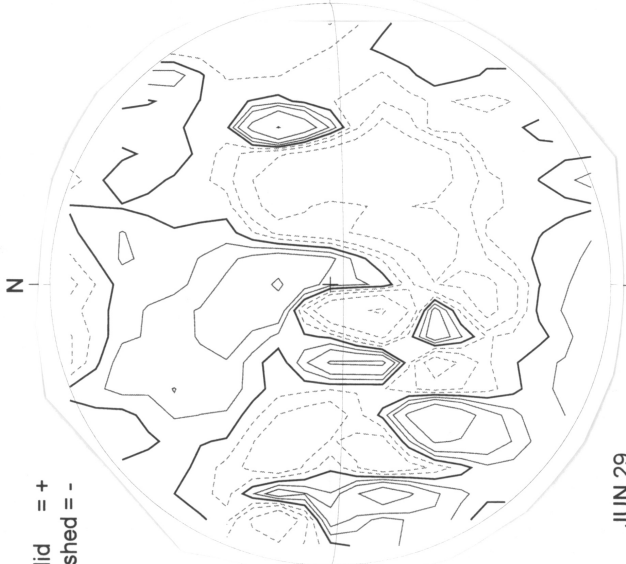
0811 UT

JUNE 28, 2004 ( P= -3.91, Bo = 2.57, Lo = 322.33)

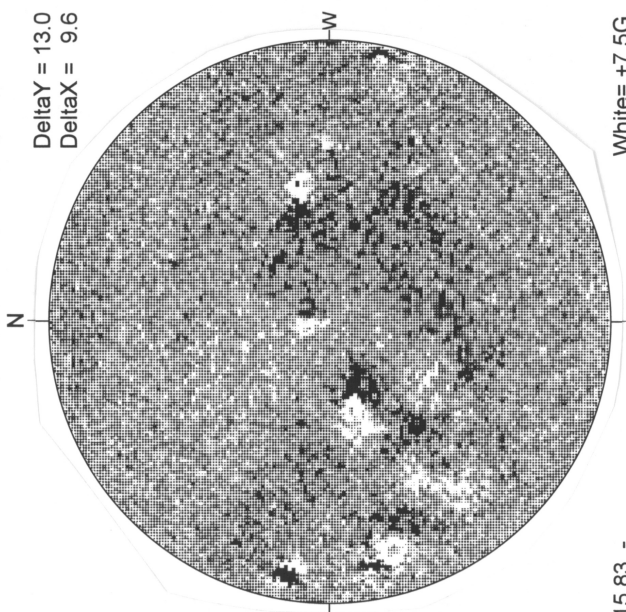
KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*



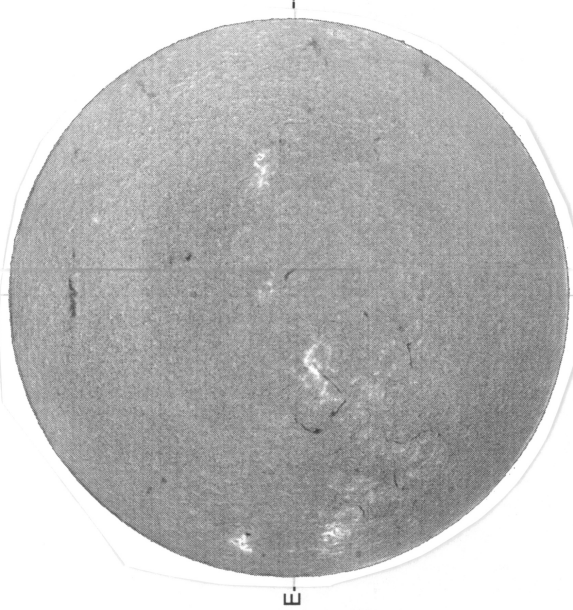
STANFORD MAGNETOGRAM



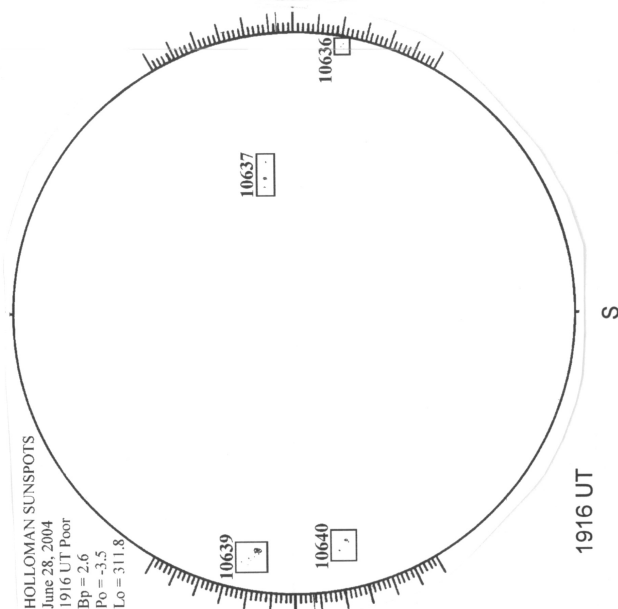
MT. WILSON MAGNETOGRAM



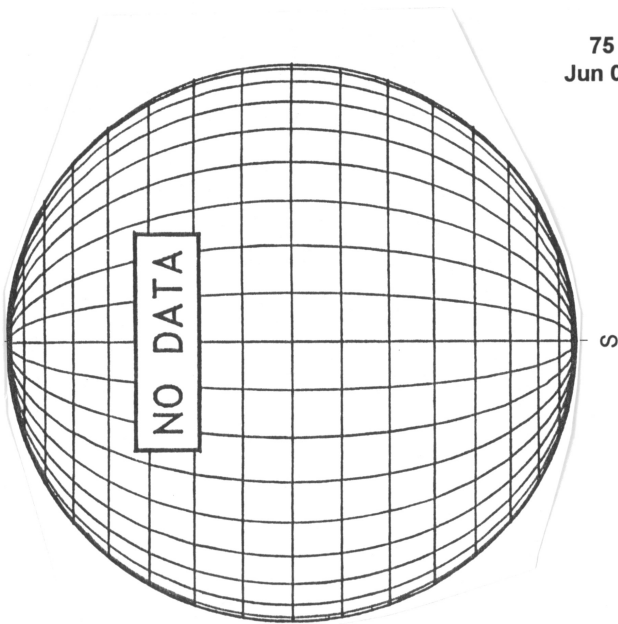
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)----

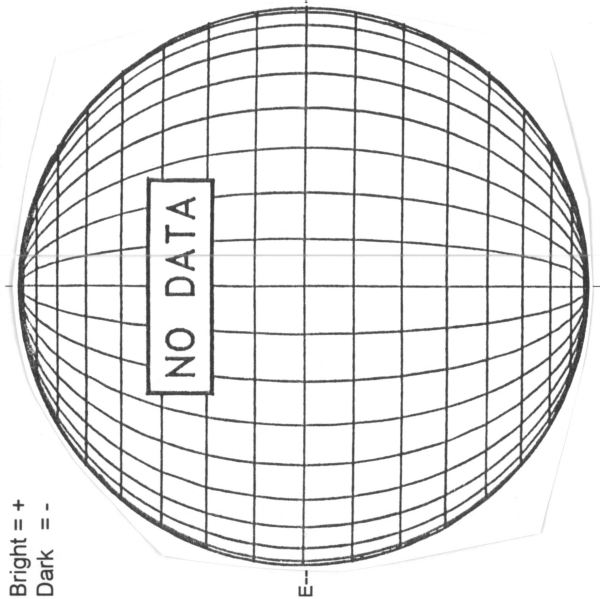


76  
Jun 04

JUNE 29, 2004 (P = -3.46, Bo = 2.68, Lo = 309.10)

KITT PEAK MAGNETOGRAM--SOLIS  
\*\*854.2 nm\*\*

Bright = +  
Dark = -



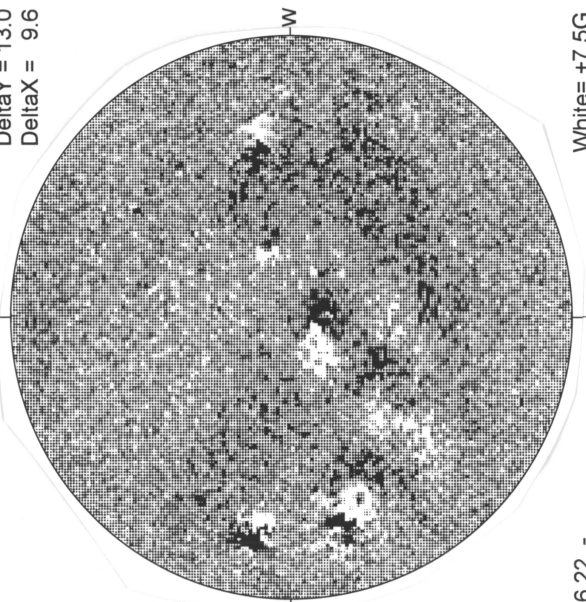
STANFORD MAGNETOGRAM

Solid = +  
Dashed = -



MT. WILSON MAGNETOGRAM

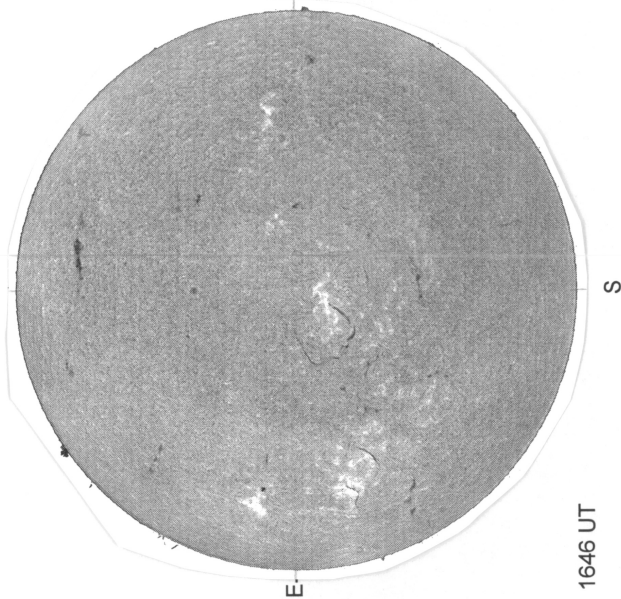
DeltaY = 13.0  
DeltaX = 9.6



16.22 -  
17.15 UT

White = +7.5G  
Black = -7.5G

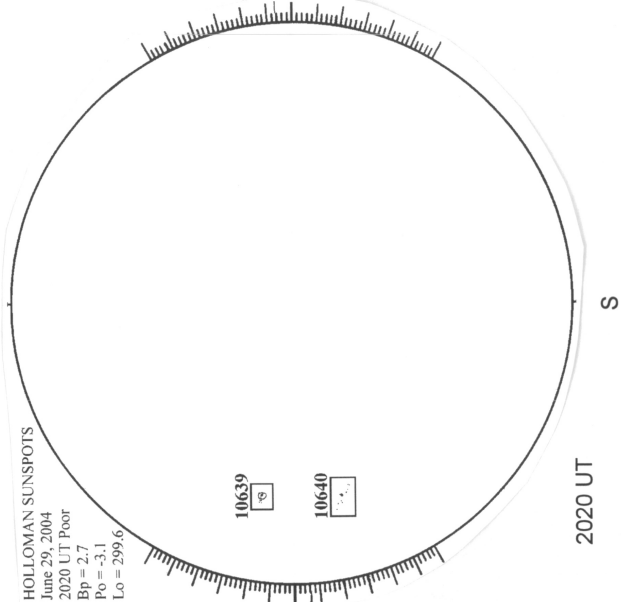
BIG BEAR H-ALPHA



1646 UT

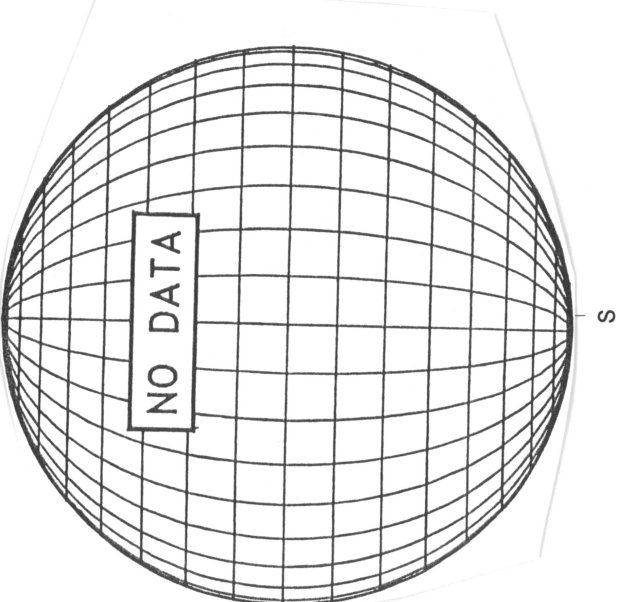
HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS  
June 29, 2004  
2020 UT Poor  
Bp = 2.7  
Po = -3.1  
Lo = 299.6



2020 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----





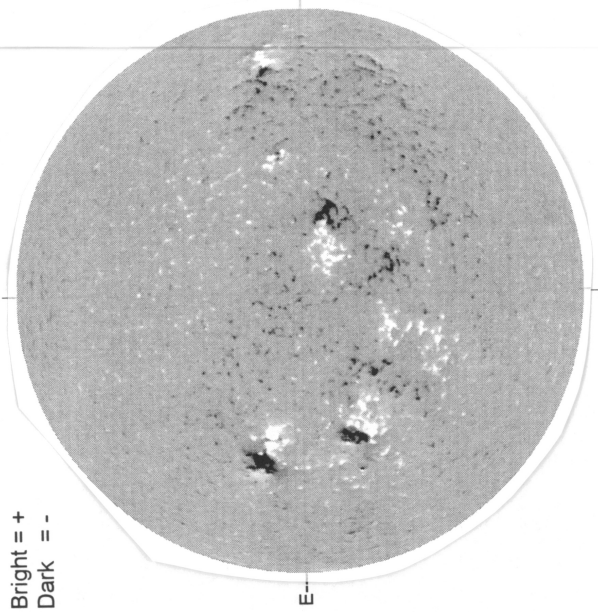
JUNE 30, 2004 (P = -3.00, Bo = 2.80, Lo = 295.86)

KITT PEAK MAGNETOGRAM—SOLIS

\*\*854.2 nm\*\*

N

Bright = +  
Dark = -

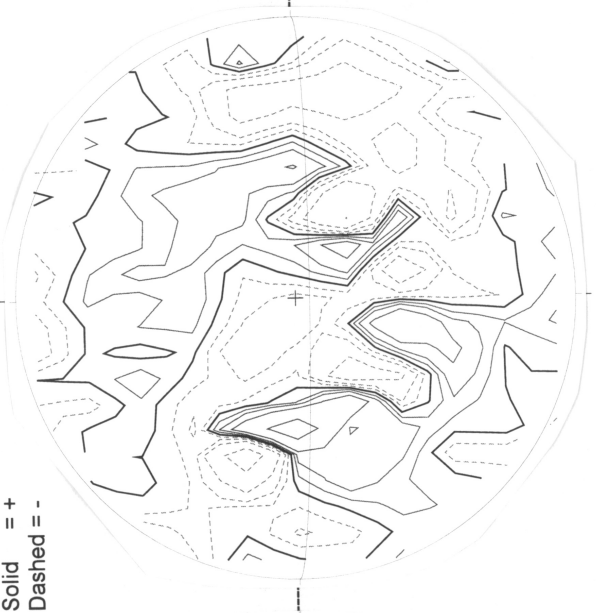


1848 UT

STANFORD MAGNETOGRAM

N

Solid = +  
Dashed = -

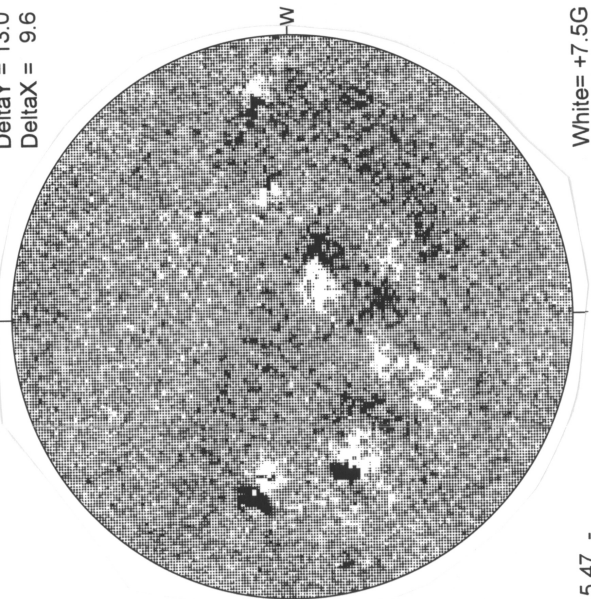


2123 UT

MT. WILSON MAGNETOGRAM

N

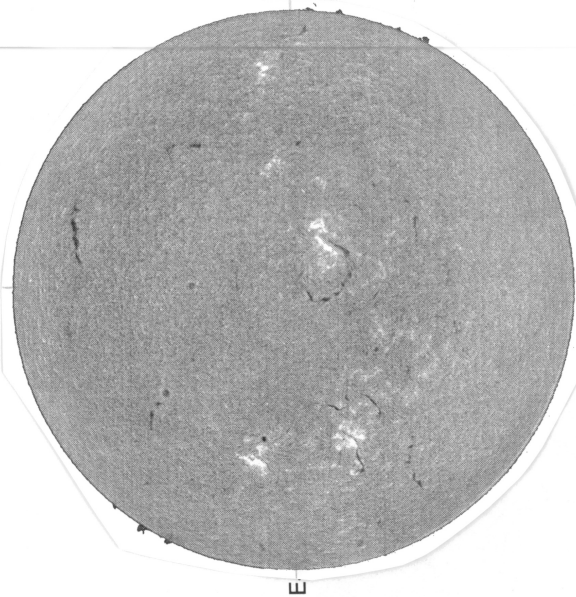
Delta Y = 13.0  
Delta X = 9.6



15.47 -  
16.39 UT

White = +7.5G  
Black = -7.5G

BIG BEAR H-ALPHA



1631 UT

HOLLOMAN SUNSPOTS

HOLLOMAN SUNSPOTS

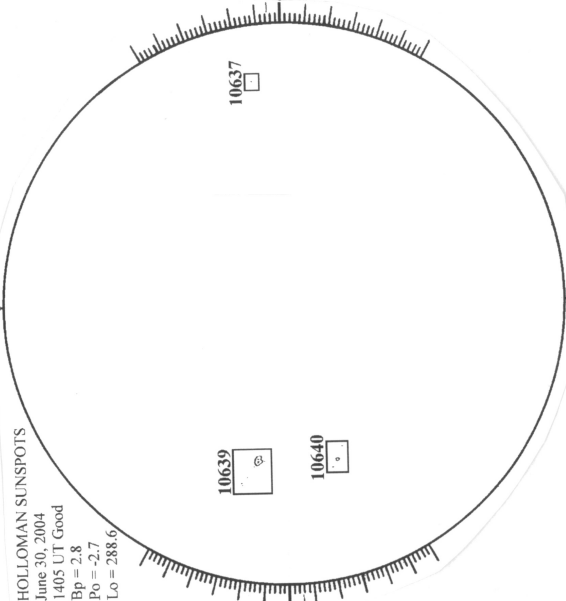
June 30, 2004

1405 UT Good

Bp = 2.8

Po = -2.7

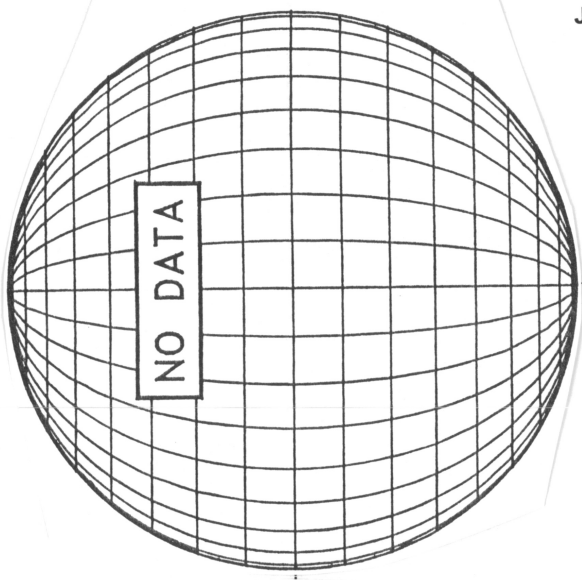
Lo = 288.6



1405 UT

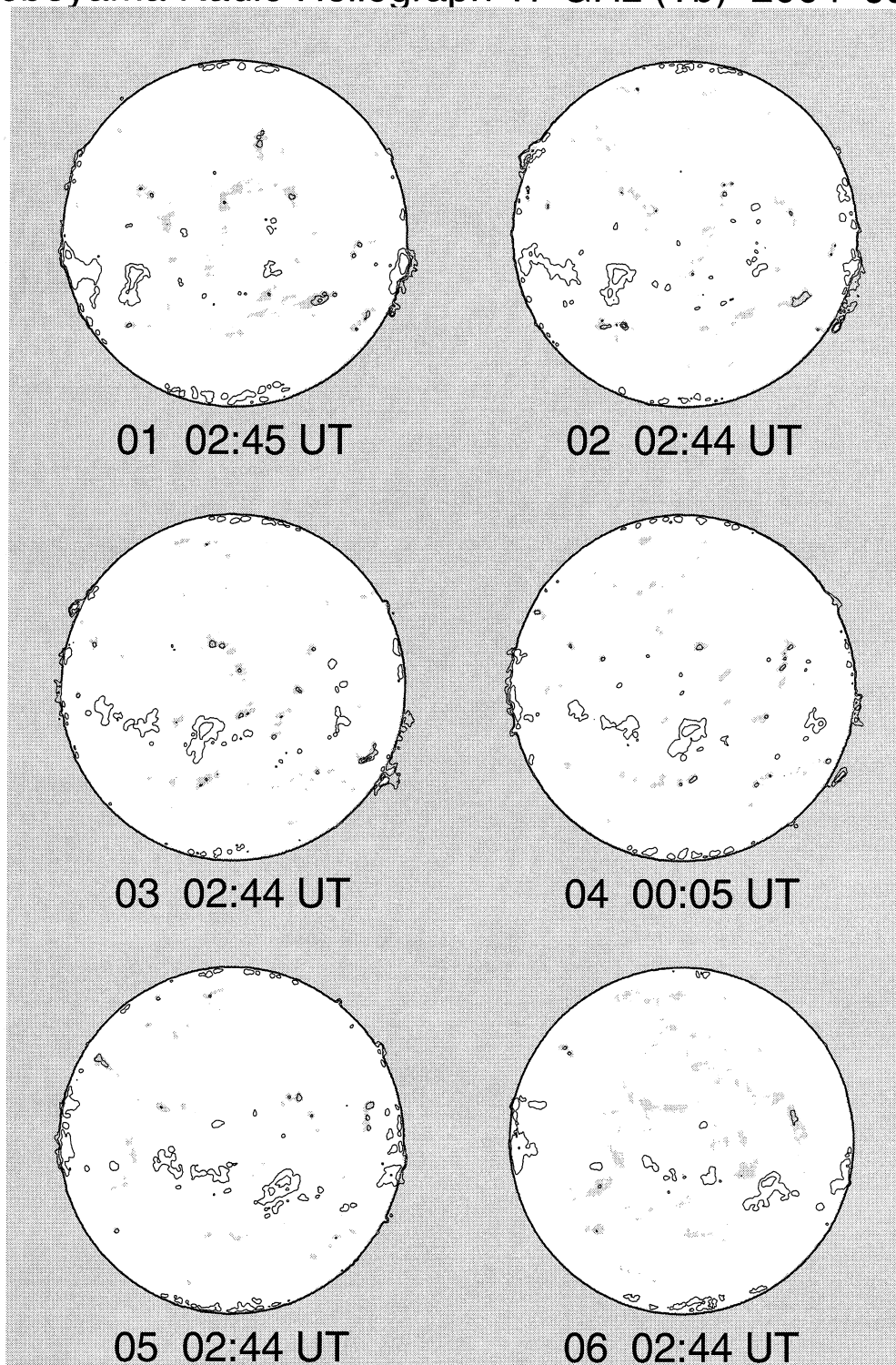
S

LOMNICKY PEAK CORONA (1.04 Radii)----



77  
Jun 04

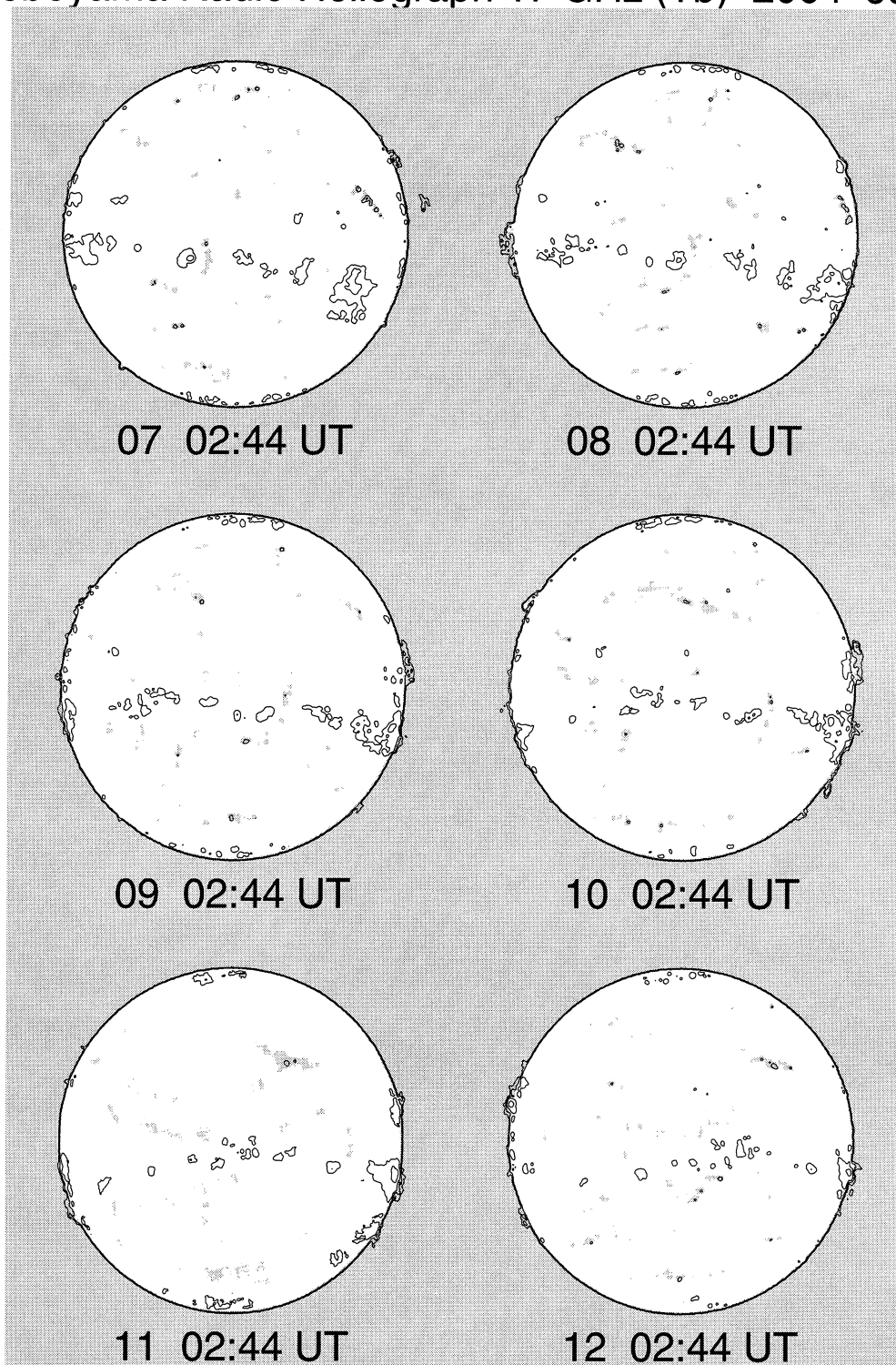
# Nobeyama Radio Heliograph 17 GHz (Tb) 2004 June



Contour Levels Tb=[5,8,12,20,50,100] x 10<sup>3</sup> K  
Grey level Tb ≤ 9,500 K

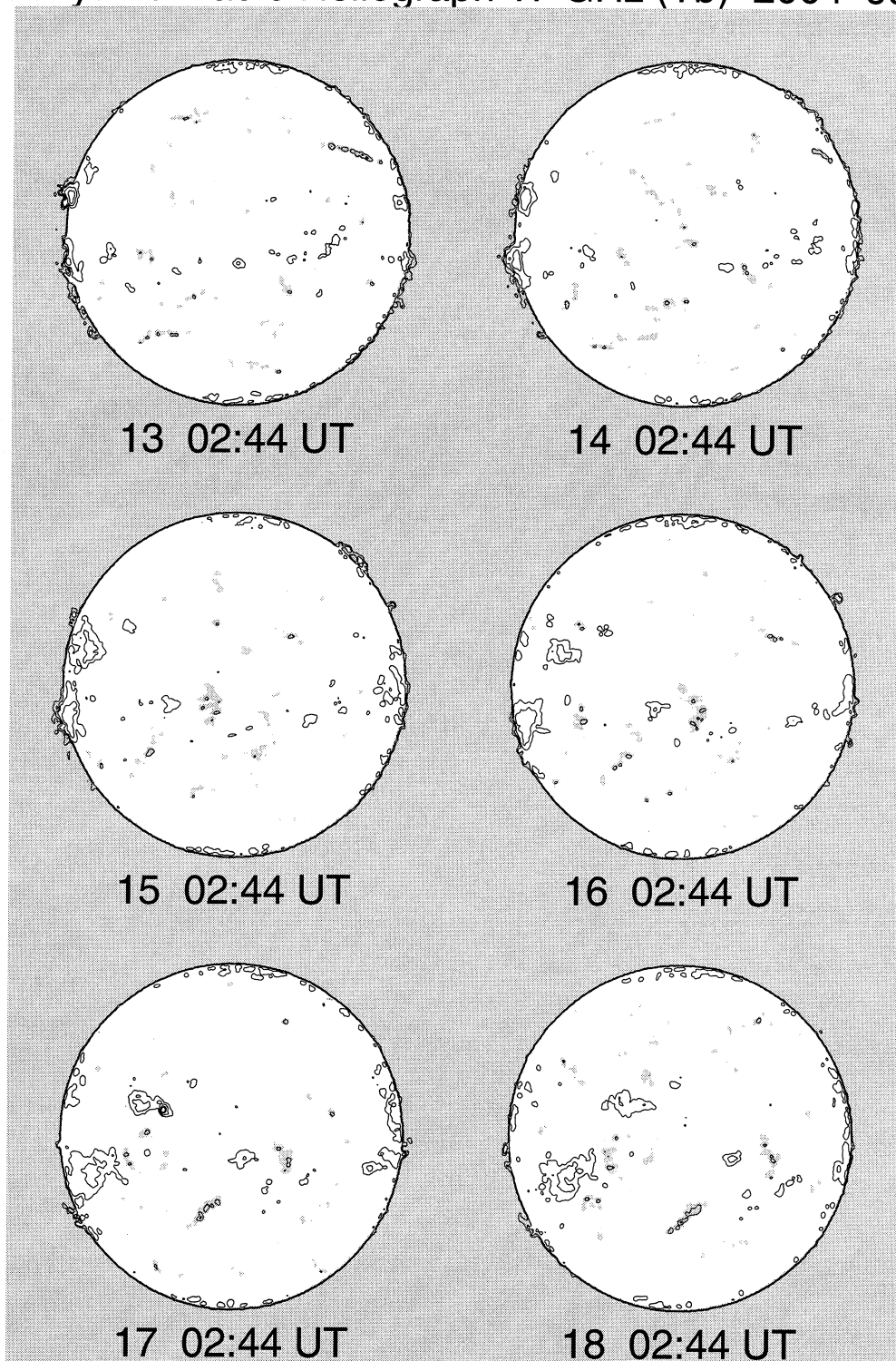


# Nobeyama Radio Heliograph 17 GHz (Tb) 2004 June



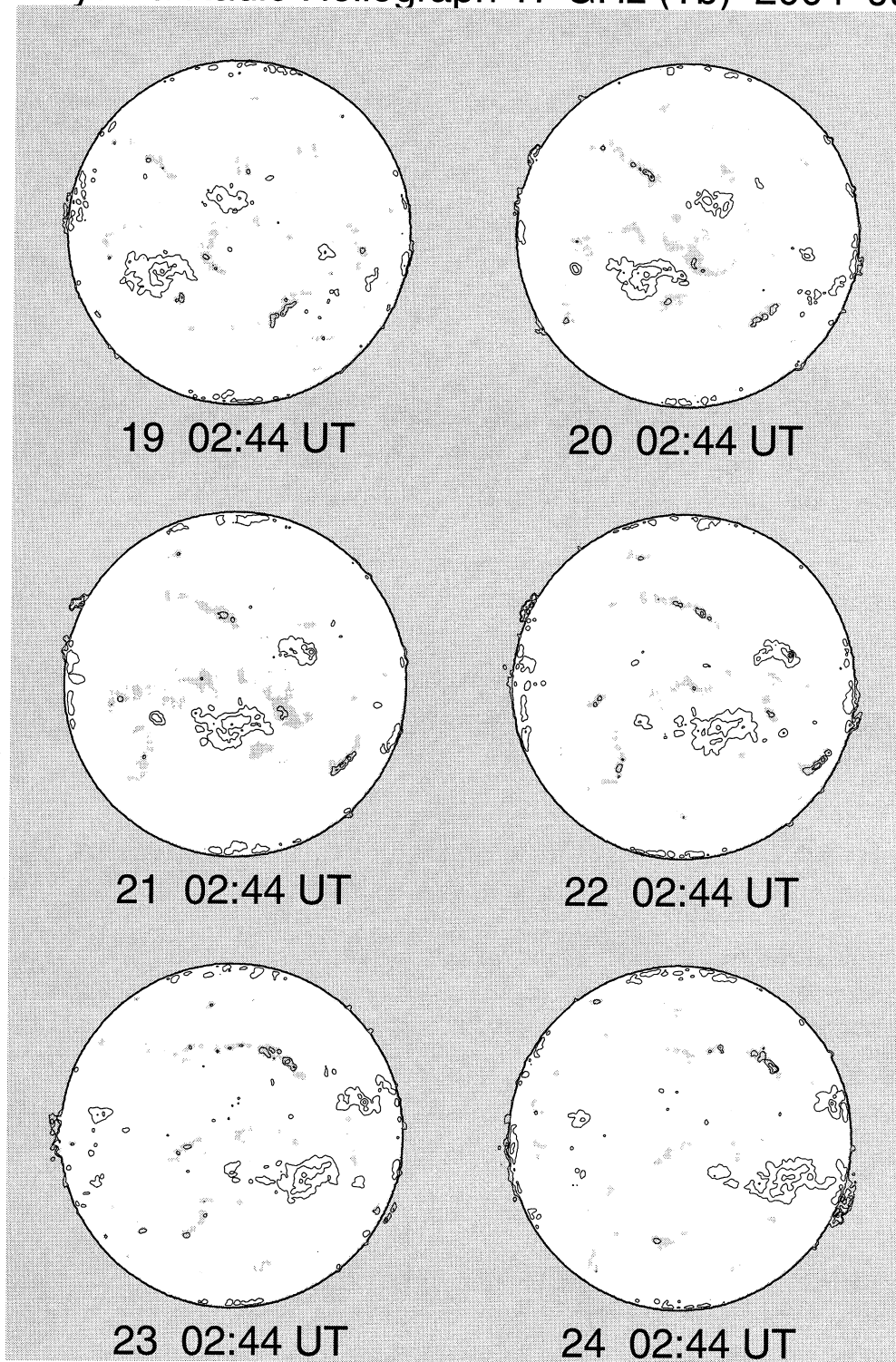
Contour Levels Tb=[5,8,12,20,50,100] x 10<sup>3</sup> K  
Grey level Tb <= 9,500 K

# Nobeyama Radio Heliograph 17 GHz (Tb) 2004 June



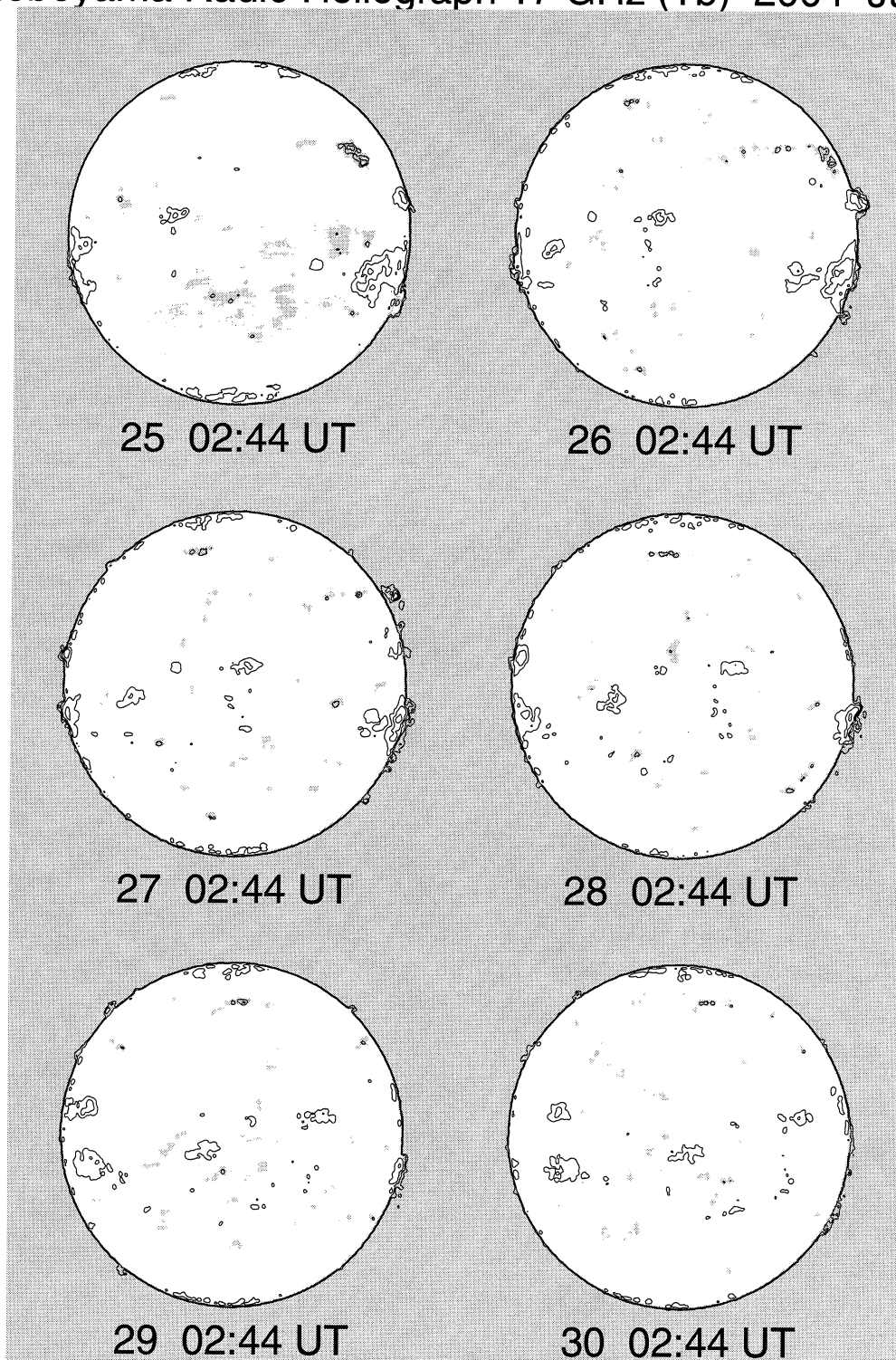
Contour Levels Tb=[5,8,12,20,50,100] x 10<sup>3</sup> K  
Grey level Tb <= 9,500 K

# Nobeyama Radio Heliograph 17 GHz (Tb) 2004 June



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S U N S P O T   G R O U P S  
(Ordered by Central Meridian Passage Date)

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Jun 04

JUNE                      2004

| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time<br>Mo Day (UT) | Lat CMD | CMP<br>Mo Day | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|------------------------------------|---------|---------------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10620A                 | 32102                 | HOLL | 05 29 1435                         | S02 E52 | 06 2.5        |          | B            | BXO           | 10                               | 3             | 2                        | 3    |
| 10620A                 |                       | MWIL | 05 29 1445                         | S01 E52 | 06 2.5        | 4        | (B )         |               |                                  |               |                          |      |
| 10620A                 |                       | LEAR | 05 30 0100                         | S01 E45 | 06 2.4        |          | B            | BXO           | 10                               | 3             | 2                        | 3    |
| 10621                  | 32101                 | HOLL | 05 28 1407                         | S14 E85 | 06 4.0        |          | A            | AXX           | 30                               | 2             | 7                        | 4    |
| 10621                  |                       | MWIL | 05 28 1430                         | S14 E79 | 06 3.6        | 4        | (AP)         |               |                                  |               |                          |      |
| 10621                  |                       | LEAR | 05 29 0122                         | S14 E73 | 06 3.6        |          | B            | CAO           | 100                              | 5             | 5                        | 3    |
| 10621                  | 32101                 | HOLL | 05 29 1435                         | S15 E68 | 06 3.7        |          | B            | DAI           | 120                              | 5             | 8                        | 3    |
| 10621                  |                       | MWIL | 05 29 1445                         | S14 E68 | 06 3.7        | 4        | (B )         |               |                                  |               |                          |      |
| 10621                  |                       | LEAR | 05 30 0100                         | S14 E62 | 06 3.7        |          | B            | DAI           | 160                              | 14            | 6                        | 3    |
| 10621                  | 32101                 | SVTO | 05 30 1127                         | S16 E56 | 06 3.7        |          | B            | DAO           | 120                              | 7             | 7                        | 3    |
| 10621                  |                       | HOLL | 05 30 1405                         | S15 E57 | 06 3.9        |          | B            | DAC           | 150                              | 20            | 6                        | 4    |
| 10621                  |                       | MWIL | 05 30 1445                         | S14 E55 | 06 3.8        | 5        | (BP)         |               |                                  |               |                          |      |
| 10621                  | 32101                 | VORO | 05 30 2159                         | S14 E51 | 06 3.8        |          |              | DAI           | 119                              | 7             | 6                        | 3    |
| 10621                  |                       | LEAR | 05 31 0124                         | S14 E50 | 06 3.8        |          | B            | DAC           | 130                              | 15            | 7                        | 3    |
| 10621                  |                       | SVTO | 05 31 0655                         | S16 E45 | 06 3.7        |          | B            | DAO           | 90                               | 11            | 9                        | 3    |
| 10621                  | 32101                 | HOLL | 05 31 1329                         | S16 E44 | 06 3.9        |          | B            | DSI           | 80                               | 23            | 9                        | 3    |
| 10621                  |                       | MWIL | 05 31 1445                         | S14 E42 | 06 3.8        | 5        | (BP)         |               |                                  |               |                          |      |
| 10621                  |                       | VORO | 05 31 2206                         | S14 E38 | 06 3.8        |          |              | DAI           | 104                              | 7             | 6                        | 3    |
| 10621                  | 32101                 | LEAR | 06 01 0025                         | S17 E37 | 06 3.8        |          | B            | DSO           | 80                               | 17            | 8                        | 3    |
| 10621                  |                       | SVTO | 06 01 0552                         | S15 E34 | 06 3.8        |          | B            | DSO           | 80                               | 13            | 9                        | 3    |
| 10621                  |                       | KAND | 06 01 1155                         | S15 E30 | 06 3.8        |          |              | DSI           |                                  | 15            | 9                        | 3    |
| 10621                  | 32101                 | HOLL | 06 01 1330                         | S15 E30 | 06 3.8        |          | B            | DAI           | 60                               | 23            | 9                        | 3    |
| 10621                  |                       | MWIL | 06 01 1430                         | S14 E28 | 06 3.7        | 4        | (BP)         |               |                                  |               |                          |      |
| 10621                  |                       | VORO | 06 01 2144                         | S14 E24 | 06 3.7        |          |              | DAI           | 103                              | 5             | 5                        | 3    |
| 10621                  | 32101                 | LEAR | 06 02 0030                         | S14 E24 | 06 3.8        |          | B            | DSO           | 60                               | 12            | 7                        | 3    |
| 10621                  |                       | KAND | 06 02 0742                         | S16 E20 | 06 3.8        |          |              | DSO           |                                  | 9             | 7                        | 2    |
| 10621                  |                       | HOLL | 06 02 1345                         | S13 E16 | 06 3.8        |          | BG           | DAI           | 60                               | 26            | 7                        | 3    |
| 10621                  | 32101                 | MWIL | 06 02 1430                         | S14 E16 | 06 3.8        | 5        | (BG)         |               |                                  |               |                          |      |
| 10621                  |                       | VORO | 06 02 2203                         | S14 E11 | 06 3.7        |          |              | DAI           | 119                              | 6             | 5                        | 2    |
| 10621                  |                       | LEAR | 06 03 0104                         | S13 E11 | 06 3.9        |          | B            | DAI           | 100                              | 29            | 8                        | 3    |
| 10621                  | 32101                 | KAND | 06 03 1040                         | S15 E05 | 06 3.8        |          |              | BXI           |                                  | 23            | 8                        | 3    |
| 10621                  |                       | MWIL | 06 03 1430                         | S14 E04 | 06 3.9        | 4        | (B )         |               |                                  |               |                          |      |
| 10621                  |                       | HOLL | 06 03 1434                         | S15 E03 | 06 3.8        |          | B            | DSI           | 70                               | 30            | 8                        | 3    |
| 10621                  | 32101                 | VORO | 06 03 2248                         | S15 W01 | 06 3.9        |          |              | CAI           | 40                               | 9             | 4                        | 3    |
| 10621                  |                       | LEAR | 06 04 0048                         | S14 W04 | 06 3.7        |          | B            | CAO           | 60                               | 17            | 8                        | 3    |
| 10621                  |                       | KAND | 06 04 0845                         | S16 W07 | 06 3.8        |          |              | CRO           |                                  | 9             | 5                        | 3    |
| 10621                  | 32101                 | HOLL | 06 04 1414                         | S14 W10 | 06 3.8        |          | B            | CSI           | 50                               | 24            | 6                        | 4    |
| 10621                  |                       | VORO | 06 04 2346                         | S14 W16 | 06 3.8        |          |              | CAI           | 28                               | 5             | 6                        | 3    |
| 10621                  |                       | LEAR | 06 05 0135                         | S15 W15 | 06 3.9        |          | B            | CAO           | 40                               | 10            | 7                        | 2    |
| 10621                  | 32101                 | KAND | 06 05 1310                         | S15 W25 | 06 3.6        |          |              | BXO           |                                  | 11            | 6                        | 2    |
| 10621                  |                       | HOLL | 06 05 1405                         | S14 W25 | 06 3.7        |          | B            | BXO           | 20                               | 12            | 8                        | 3    |
| 10621                  |                       | MWIL | 06 05 1500                         | S15 W24 | 06 3.8        | 4        | (B )         |               |                                  |               |                          |      |
| 10621                  | 32101                 | VORO | 06 05 2253                         | S15 W27 | 06 3.9        |          |              | AXX           | 7                                | 1             |                          | 3    |
| 10621                  |                       | LEAR | 06 06 0100                         | S15 W29 | 06 3.8        |          | B            | CAO           | 30                               | 6             | 5                        | 3    |
| 10621                  |                       | KAND | 06 06 0625                         | S16 W35 | 06 3.6        |          |              | BXO           |                                  | 10            | 7                        | 4    |
| 10621                  | 32101                 | MWIL | 06 06 1400                         | S14 W38 | 06 3.7        | 4        | (B )         |               |                                  |               |                          |      |
| 10621                  |                       | HOLL | 06 06 1436                         | S14 W38 | 06 3.7        |          | B            | CSO           | 20                               | 7             | 5                        | 4    |
| 10621                  |                       | VORO | 06 06 2232                         | S14 W40 | 06 3.9        |          |              | AXX           | 5                                | 2             |                          | 3    |
| 10621                  | 32101                 | LEAR | 06 07 0055                         | S17 W45 | 06 3.6        |          | B            | BXO           | 10                               | 5             | 8                        | 3    |
| 10621                  |                       | HOLL | 06 07 1423                         | S14 W54 | 06 3.5        |          | A            | AXX           | 20                               | 2             | 1                        | 2    |
| 10621                  |                       | MWIL | 06 07 1445                         | S15 W53 | 06 3.6        | 4        | (B )         |               |                                  |               |                          |      |
| 10621                  | 32101                 | VORO | 06 07 2140                         | S14 W57 | 06 3.6        |          |              | AXX           | 14                               | 1             |                          | 3    |
| 10621                  |                       | LEAR | 06 08 0139                         | S15 W60 | 06 3.5        |          | A            | AXX           | 10                               | 2             | 1                        | 3    |
| 10621                  |                       | HOLL | 06 08 1345                         | S15 W68 | 06 3.4        |          | A            | AXX           | 20                               | 2             | 2                        | 4    |
| 10621                  |                       | VORO | 06 08 2255                         | S14 W69 | 06 3.7        |          |              | AXX           | 10                               | 1             |                          | 3    |
| 10621A                 | 32106                 | MWIL | 06 02 1430                         | S15 E25 | 06 4.5        | 3        | (AF)         |               |                                  |               |                          |      |
| 10622                  | 32103                 | SVTO | 05 30 1127                         | S12 E77 | 06 5.3        |          | A            | HSX           | 30                               | 1             | 1                        | 3    |
| 10622                  |                       | HOLL | 05 30 1405                         | S12 E78 | 06 5.5        |          | A            | HAX           | 20                               | 4             | 2                        | 4    |
| 10622                  |                       | MWIL | 05 30 1445                         | S12 E77 | 06 5.4        | 4        | (AP)         |               |                                  |               |                          |      |
| 10622                  | 32103                 | VORO | 05 30 2159                         | S11 E71 | 06 5.2        |          |              | HAX           | 69                               | 2             |                          | 3    |
| 10622                  |                       | LEAR | 05 31 0124                         | S11 E69 | 06 5.2        |          | B            | CAO           | 30                               | 3             | 3                        | 3    |
| 10622                  |                       | SVTO | 05 31 0655                         | S13 E67 | 06 5.3        |          | A            | HSX           | 20                               | 2             | 1                        | 3    |
| 10622                  | 32103                 | HOLL | 05 31 1329                         | S12 E63 | 06 5.3        |          | A            | HAX           | 40                               | 4             | 2                        | 3    |
| 10622                  |                       | MWIL | 05 31 1445                         | S12 E63 | 06 5.4        | 4        | (AP)         |               |                                  |               |                          |      |
| 10622                  |                       | VORO | 05 31 2206                         | S11 E58 | 06 5.3        |          |              | HAX           | 35                               | 2             | 1                        | 3    |
| 10622                  |                       | LEAR | 06 01 0025                         | S11 E58 | 06 5.4        |          | B            | CAO           | 20                               | 2             | 2                        | 3    |

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S U N S P O T G R O U P S  
(Ordered by Central Meridian Passage Date)

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| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time<br>Mo Day (UT) | Lat CMD | CMP<br>Mo Day | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|------------------------------------|---------|---------------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10622                  |                       | SVTO | 06 01 0552                         | S12 E55 | 06 5.4        |          | B            | CSO           | 30                               | 2             | 2                        | 3    |
| 10622                  |                       | KAND | 06 01 1155                         | S12 E51 | 06 5.3        |          |              | AX            |                                  | 3             | 2                        | 3    |
| 10622                  |                       | HOLL | 06 01 1330                         | S12 E50 | 06 5.3        |          | B            | DAO           | 30                               | 3             | 2                        | 3    |
| 10622                  | 32103                 | MWIL | 06 01 1430                         | S12 E49 | 06 5.3        | 4        | (AP)         |               |                                  |               |                          |      |
| 10622                  |                       | VORO | 06 01 2144                         | S10 E46 | 06 5.4        |          |              | AXX           | 16                               | 2             |                          | 3    |
| 10622                  |                       | LEAR | 06 02 0030                         | S11 E44 | 06 5.3        |          | B            | CAO           | 20                               | 2             | 2                        | 3    |
| 10622                  |                       | HOLL | 06 02 1345                         | S12 E37 | 06 5.4        |          | A            | HSX           | 80                               | 1             | 1                        | 3    |
| 10622                  | 32103                 | MWIL | 06 02 1430                         | S12 E37 | 06 5.4        | 4        | (AP)         |               |                                  |               |                          |      |
| 10622                  |                       | LEAR | 06 03 0104                         | S09 E32 | 06 5.4        |          | A            | AXX           | 10                               | 3             | 2                        | 3    |
| 10622                  |                       | LEAR | 06 04 0048                         | S12 E18 | 06 5.4        |          | A            | AXX           | 10                               | 1             | 1                        | 3    |
| 10622                  |                       | HOLL | 06 09 1408                         | S11 W54 | 06 5.5        |          | B            | BXO           | 10                               | 4             | 3                        | 3    |
| 10622                  |                       | VORO | 06 09 2310                         | S11 W59 | 06 5.5        |          |              | ARX           | 19                               | 8             |                          | 3    |
| 10622                  |                       | HOLL | 06 10 1419                         | S11 W67 | 06 5.5        |          | B            | CSO           | 30                               | 3             | 4                        | 3    |
| 10622                  |                       | LEAR | 06 11 0035                         | S11 W74 | 06 5.4        |          | B            | BXO           | 20                               | 4             | 4                        | 3    |
| 10622                  |                       | KAND | 06 11 0645                         | S11 W77 | 06 5.5        |          |              | AX            |                                  | 1             | 1                        | 4    |
| 10626                  |                       | VORO | 06 04 2346                         | N05 E07 | 06 5.5        |          |              | AXX           | 8                                | 2             | 2                        | 3    |
| 10626                  |                       | LEAR | 06 05 0135                         | N05 E06 | 06 5.5        |          | A            | AXX           | 10                               | 3             | 3                        | 2    |
| 10626                  |                       | KAND | 06 05 1310                         | N05 W03 | 06 5.3        |          |              | CSO           |                                  | 2             | 2                        | 2    |
| 10626                  | 32108                 | HOLL | 06 05 1405                         | N05 W01 | 06 5.5        |          | B            | CSO           | 20                               | 3             | 3                        | 3    |
| 10626                  |                       | MWIL | 06 05 1500                         | N05 W03 | 06 5.4        | 4        | (B )         |               |                                  |               |                          |      |
| 10626                  |                       | LEAR | 06 06 0100                         | N06 W08 | 06 5.4        |          | A            | AXX           | 10                               | 2             | 2                        | 3    |
| 10626                  |                       | KAND | 06 06 0625                         | N05 W11 | 06 5.4        |          |              | AX            |                                  | 2             | 1                        | 4    |
| 10626                  | 32115                 | MWIL | 06 10 1445                         | N11 W70 | 06 5.3        | 4        | (B )         |               |                                  |               |                          |      |
| 10626A                 |                       | HOLL | 06 05 1405                         | S08 E07 | 06 6.1        |          | A            | AXX           | 10                               | 2             | 2                        | 3    |
| 10626A                 | 32109                 | MWIL | 06 05 1500                         | S10 E09 | 06 6.3        | 4        | (AF)         |               |                                  |               |                          |      |
| 10626A                 |                       | LEAR | 06 06 0100                         | S10 E03 | 06 6.3        |          | A            | AXX           | 10                               | 3             | 3                        | 3    |
| 10626A                 |                       | LEAR | 06 07 0055                         | S12 W12 | 06 6.1        |          | A            | AXX           | 10                               | 5             | 6                        | 3    |
| 10624                  |                       | KAND | 06 01 1155                         | S08 E68 | 06 6.6        |          |              | AX            |                                  | 1             |                          | 3    |
| 10624                  |                       | HOLL | 06 01 1330                         | S09 E69 | 06 6.7        |          | A            | HSX           | 30                               | 1             | 1                        | 3    |
| 10624                  | 32105                 | MWIL | 06 01 1430                         | S08 E69 | 06 6.8        | 4        | (AP)         |               |                                  |               |                          |      |
| 10624                  |                       | LEAR | 06 02 0030                         | S07 E63 | 06 6.7        |          | A            | AXX           | 10                               | 1             | 1                        | 3    |
| 10624                  |                       | KAND | 06 02 0742                         | S09 E58 | 06 6.7        |          |              | HS            |                                  | 1             | 1                        | 4    |
| 10624                  |                       | HOLL | 06 02 1345                         | S08 E56 | 06 6.8        |          | A            | HSX           | 70                               | 1             | 1                        | 3    |
| 10624                  | 32105                 | MWIL | 06 02 1430                         | S08 E56 | 06 6.8        | 4        | (AP)         |               |                                  |               |                          |      |
| 10624                  |                       | VORO | 06 02 2203                         | S07 E51 | 06 6.7        |          |              | AXX           | 5                                | 1             |                          | 2    |
| 10624                  |                       | LEAR | 06 03 0104                         | S06 E51 | 06 6.9        |          | B            | CAO           | 20                               | 2             | 2                        | 3    |
| 10624                  |                       | KAND | 06 03 1040                         | S08 E44 | 06 6.7        |          |              | AX            |                                  | 3             | 1                        | 3    |
| 10624                  | 32105                 | MWIL | 06 03 1430                         | S07 E42 | 06 6.7        | 4        | (AP)         |               |                                  |               |                          |      |
| 10624                  |                       | HOLL | 06 03 1434                         | S08 E42 | 06 6.7        |          | A            | HSX           | 20                               | 1             | 1                        | 3    |
| 10624                  |                       | VORO | 06 03 2248                         | S08 E37 | 06 6.7        |          |              | AXX           | 5                                | 1             |                          | 3    |
| 10624                  |                       | LEAR | 06 04 0048                         | S07 E35 | 06 6.6        |          | A            | AXX           | 10                               | 2             | 1                        | 3    |
| 10624                  |                       | KAND | 06 04 0845                         | S09 E32 | 06 6.8        |          |              | AX            |                                  | 2             | 1                        | 3    |
| 10624                  |                       | HOLL | 06 04 1414                         | S09 E29 | 06 6.8        |          | A            | AXX           | 10                               | 2             | 1                        | 4    |
| 10624                  |                       | VORO | 06 04 2346                         | S08 E23 | 06 6.7        |          |              | AXX           | 4                                | 1             |                          | 3    |
| 10624                  |                       | LEAR | 06 05 0135                         | S08 E22 | 06 6.7        |          | A            | AXX           | 10                               | 2             | 2                        | 2    |
| 10624                  |                       | KAND | 06 05 1310                         | S09 E14 | 06 6.6        |          |              | AX            |                                  | 2             | 1                        | 2    |
| 10624                  | 32105                 | MWIL | 06 05 1500                         | S08 E15 | 06 6.7        | 4        | (AP)         |               |                                  |               |                          |      |
| 10624                  |                       | LEAR | 06 06 0100                         | S08 E10 | 06 6.8        |          | A            | AXX           | 10                               | 2             | 2                        | 3    |
| 10624                  |                       | HOLL | 06 06 1436                         | S08 W03 | 06 6.4        |          | A            | AXX           | 10                               | 2             | 2                        | 4    |
| 10624                  |                       | HOLL | 06 07 1423                         | S14 W16 | 06 6.4        |          | A            | AXX           |                                  | 1             | 1                        | 2    |
| 10624                  | 32112                 | MWIL | 06 07 1445                         | S13 W16 | 06 6.4        | 4        | (AF)         |               |                                  |               |                          |      |
| 10624                  |                       | LEAR | 06 08 0139                         | S14 W22 | 06 6.4        |          | A            | AXX           | 10                               | 2             | 1                        | 3    |
| 10624A                 |                       | LEAR | 06 09 0030                         | S12 W20 | 06 7.5        |          | A            | AXX           | 10                               | 1             | 1                        | 3    |
| 10627                  |                       | HOLL | 06 04 1414                         | S09 E49 | 06 8.3        |          | A            | AXX           | 10                               | 1             | 1                        | 4    |
| 10627                  |                       | VORO | 06 04 2346                         | S08 E44 | 06 8.3        |          |              | BRO           | 16                               | 2             | 3                        | 3    |
| 10627                  |                       | LEAR | 06 05 0135                         | S08 E43 | 06 8.3        |          | A            | AXX           | 10                               | 2             | 5                        | 2    |
| 10627                  |                       | KAND | 06 05 1310                         | S09 E34 | 06 8.1        |          |              | HS            |                                  | 3             | 2                        | 2    |
| 10627                  |                       | HOLL | 06 05 1405                         | S09 E35 | 06 8.2        |          | A            | HAX           | 20                               | 5             | 2                        | 3    |
| 10627                  | 32110                 | MWIL | 06 05 1500                         | S08 E34 | 06 8.2        | 4        | (AP)         |               |                                  |               |                          |      |
| 10627                  |                       | VORO | 06 05 2253                         | S08 E29 | 06 8.1        |          |              | AXX           | 12                               | 1             |                          | 3    |
| 10627                  |                       | LEAR | 06 06 0100                         | S08 E29 | 06 8.2        |          | A            | AXX           | 10                               | 1             | 1                        | 3    |
| 10627                  |                       | KAND | 06 06 0625                         | S09 E25 | 06 8.1        |          |              | CRO           |                                  | 7             | 5                        | 4    |
| 10627                  | 32110                 | MWIL | 06 06 1400                         | S08 E23 | 06 8.3        | 4        | (B )         |               |                                  |               |                          |      |
| 10627                  |                       | HOLL | 06 06 1436                         | S09 E23 | 06 8.3        |          | B            | CSO           | 30                               | 9             | 6                        | 4    |



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| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time<br>Mo Day (UT) | Lat CMD | CMP<br>Mo Day | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|------------------------------------|---------|---------------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10627                  |                       | VORO | 06 06 2232                         | S08 E18 | 06 8.3        |          |              | CAO           | 50                               | 5             | 3                        | 3    |
| 10627                  |                       | LEAR | 06 07 0055                         | S07 E16 | 06 8.2        |          | B            | DAI           | 90                               | 27            | 8                        | 3    |
| 10627                  |                       | KAND | 06 07 0750                         | S09 E12 | 06 8.2        |          |              | CSO           |                                  | 5             | 5                        | 4    |
| 10627                  |                       | HOLL | 06 07 1423                         | S09 E08 | 06 8.2        |          | B            | CSO           | 40                               | 10            | 5                        | 2    |
| 10627                  | 32110                 | MWIL | 06 07 1445                         | S08 E09 | 06 8.3        | 4        | (B )         |               |                                  |               |                          |      |
| 10627                  |                       | VORO | 06 07 2140                         | S08 E05 | 06 8.3        |          |              | CAO           | 49                               | 10            | 3                        | 3    |
| 10627                  |                       | KAND | 06 08 0025                         | S09 W02 | 06 7.9        |          |              | CRO           |                                  | 4             | 4                        | 3    |
| 10627                  |                       | LEAR | 06 08 0139                         | S08 E03 | 06 8.3        |          | B            | DAI           | 80                               | 19            | 8                        | 3    |
| 10627                  |                       | SVTO | 06 08 0536                         | S09 E01 | 06 8.3        |          | B            | DSO           | 30                               | 6             | 5                        | 3    |
| 10627                  |                       | HOLL | 06 08 1345                         | S09 W05 | 06 8.2        |          | B            | DAO           | 30                               | 7             | 4                        | 4    |
| 10627                  | 32110                 | MWIL | 06 08 1430                         | S09 W04 | 06 8.3        | 4        | (B )         |               |                                  |               |                          |      |
| 10627                  |                       | VORO | 06 08 2255                         | S08 W08 | 06 8.3        |          |              | CRO           | 25                               | 3             | 3                        | 3    |
| 10627                  |                       | LEAR | 06 09 0030                         | S09 W10 | 06 8.3        |          | B            | CAO           | 30                               | 5             | 6                        | 3    |
| 10627                  |                       | KAND | 06 09 1100                         | S10 W16 | 06 8.2        |          |              | BXO           |                                  | 7             | 5                        | 3    |
| 10627                  |                       | HOLL | 06 09 1408                         | S09 W17 | 06 8.3        |          | B            | BXO           | 20                               | 7             | 5                        | 3    |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10628                  |                       | HOLL | 06 07 1423                         | S09 E18 | 06 8.9        |          | B            | BXO           | 10                               | 2             | 3                        | 2    |
| 10628                  | 32113                 | MWIL | 06 07 1445                         | S08 E19 | 06 9.0        | 4        | (B )         |               |                                  |               |                          |      |
| 10628                  |                       | VORO | 06 07 2140                         | S08 E15 | 06 9.0        |          |              | BXO           | 9                                | 4             | 2                        | 3    |
| 10628                  |                       | LEAR | 06 08 0139                         | S08 E13 | 06 9.0        |          | B            | CAI           | 30                               | 12            | 3                        | 3    |
| 10628                  |                       | SVTO | 06 08 0536                         | S08 E10 | 06 9.0        |          | B            | CSO           | 20                               | 3             | 3                        | 3    |
| 10628                  |                       | KAND | 06 08 1125                         | S09 E08 | 06 9.1        |          |              | AX            |                                  | 2             | 1                        | 3    |
| 10628                  | 32113                 | MWIL | 06 08 1430                         | S09 E05 | 06 9.0        | 3        | (AP)         |               |                                  |               |                          |      |
| 10628                  |                       | VORO | 06 08 2255                         | S08 E02 | 06 9.1        |          |              | BXO           | 15                               | 4             | 2                        | 3    |
| 10628                  |                       | LEAR | 06 09 0030                         | S09 E01 | 06 9.1        |          | B            | BXO           | 10                               | 2             | 3                        | 3    |
| 10628                  |                       | KAND | 06 09 1100                         | S10 W07 | 06 8.9        |          |              | BXO           |                                  | 2             | 2                        | 3    |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10629                  |                       | HOLL | 06 07 1423                         | S04 E27 | 06 9.6        |          | B            | BXO           | 10                               | 2             | 4                        | 2    |
| 10629                  | 32114                 | MWIL | 06 07 1445                         | S04 E28 | 06 9.7        | 4        | (B )         |               |                                  |               |                          |      |
| 10629                  |                       | VORO | 06 07 2140                         | S03 E25 | 06 9.8        |          |              | BXO           | 13                               | 3             | 5                        | 3    |
| 10629                  |                       | LEAR | 06 08 0139                         | S04 E23 | 06 9.8        |          | B            | CAO           | 20                               | 7             | 8                        | 3    |
| 10629                  |                       | SVTO | 06 08 0536                         | S03 E17 | 06 9.5        |          | A            | AXX           |                                  | 1             |                          | 3    |
| 10629                  |                       | KAND | 06 08 1125                         | S03 E15 | 06 9.6        |          |              | AX            |                                  | 1             |                          | 3    |
| 10629                  |                       | HOLL | 06 08 1345                         | S03 E12 | 06 9.5        |          | A            | HSX           | 20                               | 1             | 1                        | 4    |
| 10629                  | 32114                 | MWIL | 06 08 1430                         | S03 E12 | 06 9.5        | 4        | (AP)         |               |                                  |               |                          |      |
| 10629                  |                       | VORO | 06 08 2255                         | S03 E12 | 06 9.8        |          |              | AXX           | 8                                | 1             |                          | 3    |
| 10629                  |                       | LEAR | 06 09 0030                         | S04 E10 | 06 9.8        |          | A            | AXX           | 10                               | 1             | 1                        | 3    |
| 10629                  |                       | KAND | 06 09 1100                         | S05 E02 | 06 9.6        |          |              | BXO           |                                  | 8             | 4                        | 3    |
| 10629                  |                       | HOLL | 06 09 1408                         | S05 E01 | 06 9.7        |          | B            | BXO           | 20                               | 7             | 3                        | 3    |
| 10629                  |                       | VORO | 06 09 2310                         | S04 W04 | 06 9.7        |          |              | BRI           | 12                               | 5             | 4                        | 3    |
| 10629                  |                       | LEAR | 06 10 0040                         | S05 W05 | 06 9.6        |          | B            | CAO           | 20                               | 2             | 4                        | 3    |
| 10629                  | 32116                 | MWIL | 06 10 1445                         | S06 W11 | 06 9.8        | 3        | (AF)         |               |                                  |               |                          |      |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10629A                 |                       | LEAR | 06 10 0040                         | S05 E08 | 06 10.6       |          | B            | BXO           | 20                               | 4             | 4                        | 3    |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10629B                 |                       | KAND | 06 05 1310                         | N00 E77 | 06 11.3       |          |              | AX            |                                  | 2             | 1                        | 2    |
| 10629B                 |                       | LEAR | 06 11 0035                         | N00 E02 | 06 11.2       |          | B            | BXO           | 20                               | 11            | 8                        | 3    |
| 10629B                 |                       | HOLL | 06 11 1428                         | S01 W07 | 06 11.1       |          | A            | AXX           |                                  | 1             | 1                        | 4    |
| 10629B                 | 32120                 | MWIL | 06 11 1430                         | S01 W06 | 06 11.1       | 4        | (AP)         |               |                                  |               |                          |      |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10629C                 |                       | LEAR | 06 07 0055                         | S07 E60 | 06 11.5       |          | A            | AXX           | 20                               | 4             | 5                        | 3    |
| 10629C                 |                       | HOLL | 06 07 1423                         | S09 E48 | 06 11.2       |          | A            | AXX           | 10                               | 2             | 1                        | 2    |
| 10629C                 |                       | HOLL | 06 11 1428                         | S08 W05 | 06 11.2       |          | B            | BXO           | 10                               | 2             | 4                        | 4    |
| 10629C                 | 32121                 | MWIL | 06 11 1430                         | S08 W05 | 06 11.2       | 4        | (AF)         |               |                                  |               |                          |      |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10630                  |                       | KAND | 06 06 0625                         | N12 E80 | 06 12.3       |          |              | CRO           |                                  | 4             | 4                        | 4    |
| 10630                  | 32111                 | MWIL | 06 06 1400                         | N13 E76 | 06 12.3       | 3        | (AP)         |               |                                  |               |                          |      |
| 10630                  |                       | HOLL | 06 06 1436                         | N12 E76 | 06 12.3       |          | A            | AXX           |                                  | 1             | 1                        | 4    |
| 10630                  |                       | VORO | 06 06 2232                         | N13 E70 | 06 12.2       |          |              | AXX           | 4                                | 1             |                          | 3    |
| 10630                  |                       | LEAR | 06 07 0055                         | N14 E68 | 06 12.2       |          | A            | AXX           | 10                               | 2             | 1                        | 3    |
| 10630                  |                       | HOLL | 06 07 1423                         | N12 E62 | 06 12.3       |          | A            | AXX           | 10                               | 1             | 1                        | 2    |
| 10630                  | 32111                 | MWIL | 06 07 1445                         | N14 E61 | 06 12.2       | 4        | (AP)         |               |                                  |               |                          |      |
| 10630                  |                       | VORO | 06 07 2140                         | N13 E57 | 06 12.2       |          |              | AXX           | 23                               | 1             |                          | 3    |
| 10630                  |                       | LEAR | 06 08 0139                         | N14 E55 | 06 12.2       |          | A            | AXX           | 10                               | 1             | 1                        | 3    |
| 10630                  |                       | HOLL | 06 08 1345                         | N13 E48 | 06 12.2       |          | A            | HSX           | 20                               | 1             | 1                        | 4    |
| 10630                  | 32117                 | MWIL | 06 10 1445                         | N14 E21 | 06 12.2       | 4        | (AP)         |               |                                  |               |                          |      |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10631                  |                       | KAND | 06 09 1100                         | S11 E49 | 06 13.1       |          |              | BXO           |                                  | 3             | 3                        | 3    |
| 10631                  |                       | HOLL | 06 09 1408                         | S11 E47 | 06 13.1       |          | B            | BXO           | 10                               | 4             | 3                        | 3    |

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S U N S P O T G R O U P S  
(Ordered by Central Meridian Passage Date)

JUNE 2004

| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time<br>Mo Day (UT) | Lat CMD | CMP<br>Mo Day | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|------------------------------------|---------|---------------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10631                  |                       | VORO | 06 09 2310                         | S10 E42 | 06 13.1       |          |              | BRI           | 12                               | 5             | 3                        | 3    |
| 10631                  |                       | LEAR | 06 10 0040                         | S10 E40 | 06 13.0       |          | B            | CAO           | 30                               | 3             | 4                        | 3    |
| 10631                  |                       | HOLL | 06 10 1419                         | S10 E35 | 06 13.2       |          | B            | DSO           | 50                               | 4             | 6                        | 3    |
| 10631                  | 32118                 | MWIL | 06 10 1445                         | S10 E32 | 06 13.0       | 4        | (B )         |               |                                  |               |                          |      |
| 10631                  |                       | VORO | 06 10 2204                         | S10 E30 | 06 13.2       |          |              | BRO           | 21                               | 2             | 4                        | 3    |
| 10631                  |                       | LEAR | 06 11 0035                         | S09 E27 | 06 13.0       |          | B            | BXO           | 20                               | 7             | 5                        | 3    |
| 10631                  |                       | KAND | 06 11 0645                         | S10 E26 | 06 13.2       |          |              | BXO           |                                  | 6             | 5                        | 4    |
| 10631                  |                       | HOLL | 06 11 1428                         | S10 E20 | 06 13.1       |          | B            | DSO           | 30                               | 12            | 7                        | 4    |
| 10631                  | 32118                 | MWIL | 06 11 1430                         | S09 E20 | 06 13.1       | 5        | (B )         |               |                                  |               |                          |      |
| 10631                  |                       | VORO | 06 11 2146                         | S09 E16 | 06 13.1       |          |              | BRO           | 26                               | 0             | 3                        | 3    |
| 10631                  |                       | KAND | 06 12 0525                         | S11 E12 | 06 13.1       |          |              | CRO           |                                  | 4             | 4                        | 4    |
| 10631                  |                       | HOLL | 06 12 1420                         | S10 E07 | 06 13.1       |          | B            | CSO           | 20                               | 6             | 5                        | 4    |
| 10631                  | 32118                 | MWIL | 06 12 1430                         | S10 E07 | 06 13.1       | 5        | (B )         |               |                                  |               |                          |      |
| 10631                  |                       | VORO | 06 12 2238                         | S09 E03 | 06 13.2       |          |              | BRO           | 21                               | 3             | 4                        | 3    |
| 10631                  |                       | LEAR | 06 13 0056                         | S10 E01 | 06 13.1       |          | B            | CAO           | 20                               | 5             | 5                        | 3    |
| 10631                  |                       | SVTO | 06 13 0803                         | S10 W01 | 06 13.3       |          | A            | HSX           | 10                               | 1             | 1                        | 2    |
| 10631                  |                       | KAND | 06 13 0945                         | S11 W02 | 06 13.2       |          |              | HR            |                                  | 1             |                          | 4    |
| 10631                  |                       | HOLL | 06 13 1405                         | S10 W05 | 06 13.2       |          | B            | CAO           | 20                               | 4             | 2                        | 3    |
| 10631                  | 32118                 | MWIL | 06 13 1445                         | S10 W06 | 06 13.2       | 4        | (BF)         |               |                                  |               |                          |      |
| 10631                  |                       | HOLL | 06 14 1322                         | S13 W17 | 06 13.3       |          | A            | AXX           | 10                               | 2             | 2                        | 4    |
| 10631                  |                       | HOLL | 06 15 1330                         | S10 W33 | 06 13.1       |          | B            | BXO           | 10                               | 3             | 4                        | 4    |
| 10631                  | 32125                 | MWIL | 06 15 1430                         | S10 W36 | 06 12.9       | 4        | (AP)         |               |                                  |               |                          |      |
| 10631                  |                       | VORO | 06 15 2256                         | S09 W40 | 06 12.9       |          |              | AXX           | 4                                | 1             |                          | 3    |
| 10631                  |                       | LEAR | 06 16 0055                         | S10 W40 | 06 13.0       |          | B            | CAO           | 20                               | 4             | 3                        | 3    |
| 10631                  |                       | SVTO | 06 16 0523                         | S10 W43 | 06 13.0       |          | B            | CSO           | 30                               | 4             | 4                        | 3    |
| 10631                  |                       | KAND | 06 16 0850                         | S11 W46 | 06 12.9       |          |              | CSO           |                                  | 3             | 4                        | 5    |
| 10631                  |                       | HOLL | 06 16 1345                         | S10 W49 | 06 12.9       |          | B            | BXO           | 10                               | 4             | 4                        | 4    |
| 10631                  | 32125                 | MWIL | 06 16 1430                         | S10 W49 | 06 12.9       | 4        | (B )         |               |                                  |               |                          |      |
| 10631                  |                       | LEAR | 06 17 0146                         | S11 W55 | 06 12.9       |          | B            | CAO           | 20                               | 2             | 3                        | 2    |
| 10631                  |                       | VORO | 06 17 0259                         | S10 W55 | 06 13.0       |          |              | DRO           | 33                               | 2             | 3                        | 2    |
| 10631                  |                       | SVTO | 06 17 0510                         | S10 W57 | 06 12.9       |          | B            | DSO           | 50                               | 2             | 4                        | 3    |
| 10631                  |                       | KAND | 06 17 0840                         | S11 W60 | 06 12.8       |          |              | CSO           |                                  | 2             | 5                        | 4    |
| 10631                  |                       | HOLL | 06 17 1415                         | S10 W61 | 06 13.0       |          | B            | BXO           | 10                               | 7             | 8                        | 4    |
| 10631                  | 32125                 | MWIL | 06 17 1500                         | S11 W65 | 06 12.7       | 4        | (B )         |               |                                  |               |                          |      |
| 10631                  |                       | VORO | 06 17 2311                         | S10 W68 | 06 12.8       |          |              | ARX           | 12                               | 1             |                          | 3    |
| 10631                  |                       | LEAR | 06 18 0030                         | S11 W69 | 06 12.8       |          | A            | AXX           | 10                               | 1             | 1                        | 4    |
| 10632                  |                       | HOLL | 06 09 1408                         | S11 E81 | 06 15.7       |          | A            | HSX           | 60                               | 1             | 1                        | 3    |
| 10632                  |                       | VORO | 06 09 2310                         | S11 E79 | 06 15.9       |          |              | HAX           | 109                              | 1             |                          | 3    |
| 10632                  |                       | LEAR | 06 10 0040                         | S09 E76 | 06 15.7       |          | A            | AXX           | 60                               | 1             | 3                        | 3    |
| 10632                  |                       | HOLL | 06 10 1419                         | S12 E71 | 06 15.9       |          | A            | HAX           | 100                              | 1             | 2                        | 3    |
| 10632                  | 32119                 | MWIL | 06 10 1445                         | S11 E70 | 06 15.9       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | VORO | 06 10 2204                         | S11 E66 | 06 15.9       |          |              | HAX           | 112                              | 1             |                          | 3    |
| 10632                  |                       | LEAR | 06 11 0035                         | S10 E64 | 06 15.8       |          | A            | HAX           | 90                               | 1             | 2                        | 3    |
| 10632                  |                       | KAND | 06 11 0645                         | S11 E64 | 06 16.1       |          |              | HS            |                                  | 1             | 2                        | 4    |
| 10632                  |                       | HOLL | 06 11 1428                         | S12 E58 | 06 16.0       |          | A            | HAX           | 70                               | 1             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 11 1430                         | S10 E57 | 06 15.9       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | VORO | 06 11 2146                         | S11 E53 | 06 15.9       |          |              | HAX           | 87                               | 1             |                          | 3    |
| 10632                  |                       | KAND | 06 12 0525                         | S11 E50 | 06 16.0       |          |              | HS            |                                  | 1             | 2                        | 4    |
| 10632                  |                       | HOLL | 06 12 1420                         | S11 E43 | 06 15.8       |          | A            | HSX           | 70                               | 2             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 12 1430                         | S11 E44 | 06 15.9       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | VORO | 06 12 2238                         | S11 E40 | 06 15.9       |          |              | HSX           | 96                               | 1             |                          | 3    |
| 10632                  |                       | LEAR | 06 13 0056                         | S10 E38 | 06 15.9       |          | A            | HAX           | 60                               | 1             | 2                        | 3    |
| 10632                  |                       | SVTO | 06 13 0803                         | S12 E35 | 06 16.0       |          | A            | HSX           | 100                              | 1             | 2                        | 2    |
| 10632                  |                       | KAND | 06 13 0945                         | S12 E34 | 06 16.0       |          |              | HS            |                                  | 1             | 2                        | 4    |
| 10632                  |                       | HOLL | 06 13 1405                         | S12 E31 | 06 15.9       |          | A            | HSX           | 60                               | 1             | 2                        | 3    |
| 10632                  | 32119                 | MWIL | 06 13 1445                         | S11 E31 | 06 15.9       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | LEAR | 06 14 0030                         | S10 E25 | 06 15.9       |          | A            | HAX           | 60                               | 1             | 2                        | 2    |
| 10632                  |                       | VORO | 06 14 0105                         | S11 E25 | 06 15.9       |          |              | HSX           | 103                              | 1             |                          | 3    |
| 10632                  |                       | SVTO | 06 14 0955                         | S13 E20 | 06 15.9       |          | A            | HSX           | 60                               | 1             | 1                        | 3    |
| 10632                  |                       | KAND | 06 14 1020                         | S12 E19 | 06 15.9       |          |              | HS            |                                  | 1             | 2                        | 4    |
| 10632                  |                       | HOLL | 06 14 1322                         | S11 E18 | 06 15.9       |          | A            | HSX           | 90                               | 2             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 14 1430                         | S12 E18 | 06 16.0       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | VORO | 06 14 2255                         | S11 E14 | 06 16.0       |          |              | HSX           | 98                               | 1             |                          | 3    |
| 10632                  |                       | KAND | 06 15 0705                         | S12 E09 | 06 16.0       |          |              | HS            |                                  | 1             | 2                        | 3    |
| 10632                  |                       | SVTO | 06 15 0845                         | S12 E08 | 06 16.0       |          | A            | HSX           | 80                               | 1             | 2                        | 3    |
| 10632                  |                       | HOLL | 06 15 1330                         | S12 E05 | 06 15.9       |          | A            | HSX           | 100                              | 1             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 15 1430                         | S11 E04 | 06 15.9       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | VORO | 06 15 2256                         | S11 E01 | 06 16.0       |          |              | HAX           | 84                               | 1             |                          | 3    |

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(Ordered by Central Meridian Passage Date)

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| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time<br>Mo Day (UT) | Lat CMD | CMP<br>Mo Day | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|------------------------------------|---------|---------------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10632                  |                       | LEAR | 06 16 0055                         | S11 W01 | 06 16.0       |          | A            | HAX           | 60                               | 1             | 2                        | 3    |
| 10632                  |                       | LEAR | 06 16 0055                         | S16 E03 | 06 16.3       |          | A            | AXX           | 10                               | 2             | 1                        | 3    |
| 10632                  |                       | SVTO | 06 16 0523                         | S12 W04 | 06 15.9       |          | A            | HSX           | 100                              | 1             | 3                        | 3    |
| 10632                  |                       | KAND | 06 16 0850                         | S12 W06 | 06 15.9       |          |              | HA            |                                  | 2             | 1                        | 5    |
| 10632                  |                       | HOLL | 06 16 1345                         | S12 W09 | 06 15.9       |          | A            | HSX           | 20                               | 2             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 16 1430                         | S12 W09 | 06 15.9       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | LEAR | 06 17 0146                         | S13 W15 | 06 15.9       |          | A            | HAX           | 50                               | 1             | 2                        | 2    |
| 10632                  |                       | VORO | 06 17 0259                         | S11 W15 | 06 16.0       |          |              | HAX           | 88                               | 1             |                          | 2    |
| 10632                  |                       | SVTO | 06 17 0510                         | S12 W17 | 06 15.9       |          | A            | HSX           | 100                              | 1             | 3                        | 3    |
| 10632                  |                       | KAND | 06 17 0840                         | S12 W19 | 06 15.9       |          |              | HS            |                                  | 1             | 2                        | 4    |
| 10632                  |                       | HOLL | 06 17 1415                         | S12 W22 | 06 15.9       |          | A            | HSX           | 50                               | 1             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 17 1500                         | S12 W22 | 06 16.0       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | VORO | 06 17 2311                         | S11 W26 | 06 16.0       |          |              | HAX           | 88                               | 1             |                          | 3    |
| 10632                  |                       | LEAR | 06 18 0030                         | S12 W28 | 06 15.9       |          | A            | HSX           | 40                               | 1             | 2                        | 4    |
| 10632                  |                       | SVTO | 06 18 0955                         | S12 W33 | 06 15.9       |          | A            | HSX           | 100                              | 1             | 2                        | 3    |
| 10632                  |                       | HOLL | 06 18 1449                         | S12 W36 | 06 15.9       |          | A            | HSX           | 50                               | 1             | 2                        | 3    |
| 10632                  | 32119                 | MWIL | 06 18 1500                         | S11 W35 | 06 16.0       | 4        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | LEAR | 06 19 0030                         | S11 W40 | 06 16.0       |          | A            | HAX           | 50                               | 1             | 2                        | 3    |
| 10632                  |                       | VORO | 06 19 0425                         | S10 W42 | 06 16.0       |          |              | HSX           | 92                               | 1             |                          | 4    |
| 10632                  |                       | SVTO | 06 19 0608                         | S11 W43 | 06 16.0       |          | A            | HSX           | 60                               | 1             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 19 1430                         | S11 W48 | 06 16.0       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | HOLL | 06 19 1650                         | S13 W49 | 06 16.0       |          | A            | HAX           | 30                               | 1             | 2                        | 3    |
| 10632                  |                       | VORO | 06 19 2312                         | S10 W52 | 06 16.0       |          |              | HAX           | 79                               | 1             |                          | 2    |
| 10632                  |                       | LEAR | 06 20 0132                         | S11 W53 | 06 16.1       |          | A            | HSX           | 60                               | 1             | 2                        | 2    |
| 10632                  |                       | KAND | 06 20 1215                         | S11 W61 | 06 15.9       |          |              | HS            |                                  | 1             | 1                        | 4    |
| 10632                  | 32119                 | MWIL | 06 20 1445                         | S11 W60 | 06 16.1       | 5        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | HOLL | 06 20 1635                         | S10 W64 | 06 15.9       |          | A            | HAX           | 60                               | 1             | 2                        | 2    |
| 10632                  |                       | LEAR | 06 21 0040                         | S12 W67 | 06 16.0       |          | A            | HSX           | 70                               | 1             | 2                        | 3    |
| 10632                  |                       | SVTO | 06 21 0540                         | S10 W69 | 06 16.0       |          | A            | HSX           | 40                               | 1             | 2                        | 3    |
| 10632                  |                       | KAND | 06 21 0645                         | S12 W70 | 06 16.0       |          |              | HS            |                                  | 1             | 2                        | 4    |
| 10632                  | 32119                 | MWIL | 06 21 1430                         | S12 W74 | 06 16.0       | 4        | (AP)         |               |                                  |               |                          |      |
| 10632                  |                       | HOLL | 06 21 1445                         | S11 W74 | 06 16.0       |          | A            | HSX           | 50                               | 1             | 2                        | 2    |
| 10632                  |                       | LEAR | 06 22 0120                         | S12 W77 | 06 16.2       |          | A            | HAX           | 30                               | 1             | 2                        | 2    |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10633                  |                       | VORO | 06 12 2238                         | S05 E52 | 06 16.8       |          |              | ARX           | 6                                | 2             |                          | 3    |
| 10633                  |                       | LEAR | 06 13 0056                         | S04 E50 | 06 16.8       |          | B            | BXO           | 10                               | 2             | 2                        | 3    |
| 10633                  |                       | KAND | 06 13 0945                         | S06 E44 | 06 16.7       |          |              | HR            |                                  | 1             |                          | 4    |
| 10633                  |                       | HOLL | 06 13 1405                         | S06 E41 | 06 16.6       |          | A            | AXX           | 10                               | 2             | 2                        | 3    |
| 10633                  |                       | LEAR | 06 14 0030                         | S04 E35 | 06 16.6       |          | A            | AXX           | 20                               | 3             | 4                        | 2    |
| 10633                  |                       | VORO | 06 14 0105                         | S05 E37 | 06 16.8       |          |              | ARX           | 3                                | 3             |                          | 3    |
| 10633                  |                       | HOLL | 06 14 1322                         | S07 E29 | 06 16.7       |          | B            | BXO           | 10                               | 3             | 4                        | 4    |
| 10633                  | 32123                 | MWIL | 06 14 1430                         | S05 E28 | 06 16.7       | 4        | (B )         |               |                                  |               |                          |      |
| 10633                  |                       | VORO | 06 14 2255                         | S04 E26 | 06 16.9       |          |              | AXX           | 2                                | 4             |                          | 3    |
| 10633                  |                       | VORO | 06 14 2255                         | S06 E23 | 06 16.7       |          |              | AXX           | 2                                | 1             |                          | 3    |
| 10633                  |                       | VORO | 06 15 2256                         | S06 E12 | 06 16.8       |          |              | AXX           | 4                                | 1             |                          | 3    |
| 10633                  |                       | LEAR | 06 16 0055                         | S05 E10 | 06 16.8       |          | B            | BXO           | 10                               | 7             | 3                        | 3    |
| 10633                  |                       | SVTO | 06 16 0523                         | S08 E06 | 06 16.7       |          | A            | HSX           | 10                               | 1             | 1                        | 3    |
| 10633                  |                       | KAND | 06 16 0850                         | S08 E05 | 06 16.7       |          |              | AX            |                                  | 1             |                          | 5    |
| 10633                  |                       | HOLL | 06 16 1345                         | S08 E03 | 06 16.8       |          | A            | AXX           |                                  | 1             | 1                        | 4    |
| 10633                  | 32126                 | MWIL | 06 16 1430                         | S07 E02 | 06 16.7       | 4        | (AP)         |               |                                  |               |                          |      |
| 10633                  |                       | HOLL | 06 17 1415                         | S08 W10 | 06 16.8       |          | A            | AXX           |                                  | 1             |                          | 4    |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10633A                 |                       | LEAR | 06 16 0055                         | N06 E21 | 06 17.6       |          | A            | AXX           | 10                               | 2             | 5                        | 3    |
|                        |                       |      |                                    |         |               |          |              |               |                                  |               |                          |      |
| 10634                  |                       | SVTO | 06 13 0803                         | N12 E78 | 06 19.2       |          | B            | BXO           | 30                               | 2             | 2                        | 2    |
| 10634                  |                       | KAND | 06 13 0945                         | N12 E75 | 06 19.0       |          |              | HA            |                                  | 3             | 3                        | 4    |
| 10634                  |                       | HOLL | 06 13 1405                         | N12 E80 | 06 19.6       |          | B            | DAO           | 180                              | 10            | 11                       | 3    |
| 10634                  | 32122                 | MWIL | 06 13 1445                         | N13 E78 | 06 19.5       | 5        | (B )         |               |                                  |               |                          |      |
| 10634                  |                       | LEAR | 06 14 0030                         | N13 E70 | 06 19.3       |          | B            | DSO           | 300                              | 8             | 10                       | 2    |
| 10634                  |                       | VORO | 06 14 0105                         | N13 E72 | 06 19.5       |          |              | ESI           | 349                              | 12            | 11                       | 3    |
| 10634                  |                       | SVTO | 06 14 0955                         | N12 E68 | 06 19.5       |          | B            | EHO           | 390                              | 7             | 13                       | 3    |
| 10634                  |                       | KAND | 06 14 1020                         | N12 E68 | 06 19.5       |          |              | EAO           |                                  | 12            | 15                       | 4    |
| 10634                  |                       | HOLL | 06 14 1322                         | N13 E66 | 06 19.5       |          | BG           | EKC           | 350                              | 21            | 13                       | 4    |
| 10634                  | 32122                 | MWIL | 06 14 1430                         | N13 E65 | 06 19.5       | 5        | (B )         |               |                                  |               |                          |      |
| 10634                  |                       | VORO | 06 14 2255                         | N12 E61 | 06 19.5       |          |              | EKI           | 431                              | 16            | 11                       | 3    |
| 10634                  |                       | KAND | 06 15 0705                         | N12 E56 | 06 19.5       |          |              | EAI           |                                  | 15            | 13                       | 3    |
| 10634                  |                       | SVTO | 06 15 0845                         | N12 E56 | 06 19.6       |          | B            | FKO           | 450                              | 18            | 16                       | 3    |
| 10634                  |                       | HOLL | 06 15 1330                         | N11 E53 | 06 19.5       |          | BG           | EKC           | 310                              | 31            | 15                       | 4    |
| 10634                  | 32122                 | MWIL | 06 15 1430                         | N13 E52 | 06 19.5       | 5        | (BG)         |               |                                  |               |                          |      |

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SUNSPOT GROUPS  
(Ordered by Central Meridian Passage Date)

JUNE 2004

| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time<br>Mo Day (UT) | Lat CMD | CMP<br>Mo Day | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|------------------------------------|---------|---------------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10634                  |                       | VORO | 06 15 2256                         | N12 E44 | 06 19.3       |          |              | DAI           | 295                              | 5             | 6                        | 3    |
| 10634                  |                       | LEAR | 06 16 0055                         | N13 E45 | 06 19.4       |          | BG           | EAI           | 420                              | 26            | 15                       | 3    |
| 10634                  |                       | SVTO | 06 16 0523                         | N13 E43 | 06 19.5       |          | BG           | EKI           | 380                              | 15            | 15                       | 3    |
| 10634                  |                       | KAND | 06 16 0850                         | N11 E41 | 06 19.4       |          |              | FAI           |                                  | 14            | 16                       | 5    |
| 10634                  |                       | HOLL | 06 16 1345                         | N11 E39 | 06 19.5       |          | BG           | FKI           | 340                              | 31            | 16                       | 4    |
| 10634                  | 32122                 | MWIL | 06 16 1430                         | N12 E38 | 06 19.5       | 5        | (BG)         |               |                                  |               |                          |      |
| 10634                  |                       | LEAR | 06 17 0146                         | N13 E32 | 06 19.5       |          | BG           | FAI           | 430                              | 19            | 16                       | 2    |
| 10634                  |                       | VORO | 06 17 0259                         | N12 E28 | 06 19.2       |          |              | DKI           | 270                              | 8             | 5                        | 2    |
| 10634                  |                       | SVTO | 06 17 0510                         | N13 E29 | 06 19.4       |          | B            | EKO           | 430                              | 10            | 15                       | 3    |
| 10634                  |                       | KAND | 06 17 0840                         | N12 E28 | 06 19.5       |          |              | FKO           |                                  | 14            | 17                       | 4    |
| 10634                  |                       | HOLL | 06 17 1415                         | N11 E25 | 06 19.5       |          | BG           | FKI           | 350                              | 45            | 16                       | 4    |
| 10634                  | 32122                 | MWIL | 06 17 1500                         | N12 E25 | 06 19.5       | 5        | (BG)         |               |                                  |               |                          |      |
| 10634                  |                       | VORO | 06 17 2311                         | N12 E17 | 06 19.2       |          |              | DKI           | 333                              | 14            | 5                        | 3    |
| 10634                  |                       | LEAR | 06 18 0030                         | N12 E20 | 06 19.5       |          | BG           | EKO           | 440                              | 28            | 15                       | 4    |
| 10634                  |                       | SVTO | 06 18 0955                         | N12 E14 | 06 19.5       |          | BG           | EKI           | 420                              | 26            | 15                       | 3    |
| 10634                  |                       | HOLL | 06 18 1449                         | N11 E12 | 06 19.5       |          | BG           | FKI           | 380                              | 56            | 18                       | 3    |
| 10634                  | 32122                 | MWIL | 06 18 1500                         | N12 E12 | 06 19.5       | 5        | (BG)         |               |                                  |               |                          |      |
| 10634                  |                       | LEAR | 06 19 0030                         | N12 E07 | 06 19.5       |          | BG           | EKO           | 300                              | 15            | 15                       | 3    |
| 10634                  |                       | VORO | 06 19 0425                         | N13 W01 | 06 19.1       |          |              | HHX           | 340                              | 5             |                          | 4    |
| 10634                  |                       | SVTO | 06 19 0608                         | N13 E04 | 06 19.5       |          | BG           | EKI           | 420                              | 17            | 14                       | 4    |
| 10634                  | 32122                 | MWIL | 06 19 1430                         | N12 W02 | 06 19.4       | 6        | (D )         |               |                                  |               |                          |      |
| 10634                  |                       | HOLL | 06 19 1650                         | N09 W02 | 06 19.5       |          | BG           | EKI           | 330                              | 20            | 14                       | 3    |
| 10634                  |                       | VORO | 06 19 2312                         | N13 W11 | 06 19.1       |          |              | HKX           | 372                              | 7             |                          | 2    |
| 10634                  |                       | LEAR | 06 20 0132                         | N12 W07 | 06 19.5       |          | BGD          | FKO           | 490                              | 25            | 17                       | 2    |
| 10634                  |                       | KAND | 06 20 1215                         | N11 W14 | 06 19.4       |          |              | EKO           |                                  | 8             | 14                       | 4    |
| 10634                  | 32122                 | MWIL | 06 20 1445                         | N13 W15 | 06 19.5       | 6        | (D )         |               |                                  |               |                          |      |
| 10634                  |                       | HOLL | 06 20 1635                         | N14 W15 | 06 19.5       |          | BG           | EKI           | 330                              | 14            | 15                       | 2    |
| 10634                  |                       | LEAR | 06 21 0040                         | N12 W20 | 06 19.5       |          | BGD          | FAO           | 280                              | 15            | 16                       | 3    |
| 10634                  |                       | SVTO | 06 21 0540                         | N12 W21 | 06 19.6       |          | B            | EKO           | 380                              | 13            | 14                       | 3    |
| 10634                  |                       | KAND | 06 21 0645                         | N12 W25 | 06 19.4       |          |              | CKO           |                                  | 11            | 15                       | 4    |
| 10634                  | 32122                 | MWIL | 06 21 1430                         | N12 W30 | 06 19.3       | 6        | (D )         |               |                                  |               |                          |      |
| 10634                  |                       | HOLL | 06 21 1445                         | N12 W28 | 06 19.5       |          | BG           | FKO           | 230                              | 14            | 16                       | 2    |
| 10634                  |                       | LEAR | 06 22 0120                         | N11 W39 | 06 19.1       |          | B            | FAO           | 250                              | 5             | 4                        | 2    |
| 10634                  |                       | SVTO | 06 22 0515                         | N12 W41 | 06 19.1       |          | B            | DKO           | 130                              | 2             | 5                        | 3    |
| 10634                  |                       | KAND | 06 22 0825                         | N11 W43 | 06 19.1       |          |              | CSO           |                                  | 2             | 4                        | 5    |
| 10634                  |                       | HOLL | 06 22 1423                         | N12 W40 | 06 19.6       |          | B            | CKO           | 180                              | 10            | 16                       | 3    |
| 10634                  |                       | LEAR | 06 23 0040                         | N13 W49 | 06 19.3       |          | BG           | CAO           | 240                              | 7             | 9                        | 3    |
| 10634                  |                       | VORO | 06 23 0223                         | N13 W53 | 06 19.1       |          |              | HKX           | 311                              | 1             |                          | 3    |
| 10634                  |                       | SVTO | 06 23 0555                         | N13 W55 | 06 19.1       |          | A            | HKX           | 150                              | 1             | 4                        | 3    |
| 10634                  |                       | HOLL | 06 23 1335                         | N13 W55 | 06 19.4       |          | BG           | CKO           | 150                              | 11            | 13                       | 4    |
| 10634                  |                       | VORO | 06 23 2222                         | N13 W64 | 06 19.1       |          |              | HKX           | 310                              | 3             |                          | 4    |
| 10634                  |                       | LEAR | 06 24 0139                         | N12 W65 | 06 19.2       |          | A            | HKX           | 260                              | 3             | 3                        | 3    |
| 10634                  |                       | SVTO | 06 24 0529                         | N13 W69 | 06 19.0       |          | A            | HSX           | 190                              | 1             | 4                        | 3    |
| 10634                  |                       | HOLL | 06 24 1411                         | N12 W70 | 06 19.3       |          | A            | HKX           | 210                              | 3             | 5                        | 3    |
| 10634                  | 32122                 | MWIL | 06 24 1430                         | N13 W73 | 06 19.1       | 6        | (AP)         |               |                                  |               |                          |      |
| 10634                  |                       | LEAR | 06 25 0037                         | N13 W78 | 06 19.1       |          | A            | HAX           | 180                              | 1             | 3                        | 3    |
| 10634                  |                       | HOLL | 06 25 1415                         | N12 W81 | 06 19.5       |          | A            | HAX           | 80                               | 1             | 6                        | 4    |
| 10634                  | 32122                 | MWIL | 06 25 1445                         | N13 W86 | 06 19.1       | 5        | (AP)         |               |                                  |               |                          |      |
| 10633B                 |                       | SVTO | 06 22 0515                         | S15 W38 | 06 19.3       |          | B            | BXO           | 10                               | 3             | 3                        | 3    |
| 10633B                 |                       | KAND | 06 22 0825                         | S15 W40 | 06 19.3       |          |              | BXO           |                                  | 2             | 2                        | 5    |
| 10633B                 |                       | HOLL | 06 22 1423                         | S13 W43 | 06 19.3       |          | B            | CAO           | 20                               | 4             | 5                        | 3    |
| 10633B                 |                       | LEAR | 06 23 0040                         | S14 W47 | 06 19.5       |          | B            | CAI           | 30                               | 8             | 6                        | 3    |
| 10633B                 |                       | VORO | 06 23 0223                         | S13 W50 | 06 19.3       |          |              | BRO           | 22                               | 3             | 3                        | 3    |
| 10633B                 |                       | SVTO | 06 23 0555                         | S15 W52 | 06 19.3       |          | A            | HSX           | 10                               | 1             | 1                        | 3    |
| 10633B                 |                       | LEAR | 06 24 0139                         | S15 W61 | 06 19.4       |          | A            | AXX           | 10                               | 2             | 2                        | 3    |
| 10634A                 |                       | VORO | 06 15 2256                         | N12 E53 | 06 19.9       |          |              | HKX           | 308                              | 2             |                          | 3    |
| 10634A                 |                       | VORO | 06 17 0259                         | N12 E38 | 06 20.0       |          |              | HKX           | 237                              | 6             |                          | 2    |
| 10634A                 |                       | VORO | 06 17 2311                         | N12 E27 | 06 20.0       |          |              | HKX           | 160                              | 10            |                          | 3    |
| 10634A                 |                       | VORO | 06 19 0425                         | N12 E10 | 06 19.9       |          |              | HAX           | 136                              | 8             |                          | 4    |
| 10634A                 |                       | VORO | 06 19 2312                         | N12 E00 | 06 20.0       |          |              | HAX           | 58                               | 5             |                          | 2    |
| 10635                  |                       | SVTO | 06 14 0955                         | S09 E81 | 06 20.5       |          | A            | HSX           | 120                              | 1             | 4                        | 3    |
| 10635                  |                       | KAND | 06 14 1020                         | S09 E82 | 06 20.6       |          |              | HA            |                                  | 1             | 3                        | 4    |
| 10635                  |                       | HOLL | 06 14 1322                         | S08 E79 | 06 20.5       |          | B            | CHO           | 130                              | 8             | 7                        | 4    |
| 10635                  | 32124                 | MWIL | 06 14 1430                         | S09 E80 | 06 20.6       | 5        | (BP)         |               |                                  |               |                          |      |
| 10635                  |                       | VORO | 06 14 2255                         | S08 E77 | 06 20.7       |          |              | EKI           | 395                              | 6             | 10                       | 3    |
| 10635                  |                       | KAND | 06 15 0705                         | S10 E74 | 06 20.8       |          |              | EAO           |                                  | 12            | 13                       | 3    |

S U N S P O T   G R O U P S  
(Ordered by Central Meridian Passage Date)

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| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time |    | Lat  | CMD     | CMP<br>Mo Day | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|---------------------|----|------|---------|---------------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10635                  |                       | SVTO | 06                  | 15 | 0845 | S10 E73 | 06 20.8       |          | B            | FHO           | 660                              | 13            | 16                       | 3    |
| 10635                  |                       | HOLL | 06                  | 15 | 1330 | S10 E70 | 06 20.8       |          | BG           | FKI           | 180                              | 21            | 17                       | 4    |
| 10635                  | 32124                 | MWIL | 06                  | 15 | 1430 | S09 E70 | 06 20.8       | 5        | (B )         |               |                                  |               |                          |      |
| 10635                  |                       | VORO | 06                  | 15 | 2256 | S08 E64 | 06 20.7       |          |              | EKI           | 541                              | 6             | 11                       | 3    |
| 10635                  |                       | LEAR | 06                  | 16 | 0055 | S08 E63 | 06 20.8       |          | BG           | FAI           | 680                              | 22            | 17                       | 3    |
| 10635                  |                       | SVTO | 06                  | 16 | 0523 | S13 E60 | 06 20.7       |          | B            | FHC           | 720                              | 15            | 18                       | 3    |
| 10635                  |                       | KAND | 06                  | 16 | 0850 | S11 E59 | 06 20.8       |          |              | EAO           |                                  | 14            | 14                       | 5    |
| 10635                  |                       | HOLL | 06                  | 16 | 1345 | S10 E56 | 06 20.8       |          | BG           | FKC           | 330                              | 36            | 19                       | 4    |
| 10635                  | 32124                 | MWIL | 06                  | 16 | 1430 | S10 E56 | 06 20.8       | 5        | (B )         |               |                                  |               |                          |      |
| 10635                  |                       | LEAR | 06                  | 17 | 0146 | S09 E51 | 06 20.9       |          | BG           | FAO           | 480                              | 18            | 16                       | 2    |
| 10635                  |                       | VORO | 06                  | 17 | 0259 | S08 E48 | 06 20.7       |          |              | EKI           | 429                              | 8             | 12                       | 2    |
| 10635                  |                       | SVTO | 06                  | 17 | 0510 | S11 E46 | 06 20.7       |          | B            | EHO           | 530                              | 8             | 15                       | 3    |
| 10635                  |                       | KAND | 06                  | 17 | 0840 | S10 E47 | 06 20.9       |          |              | FKO           |                                  | 22            | 17                       | 4    |
| 10635                  |                       | HOLL | 06                  | 17 | 1415 | S11 E43 | 06 20.8       |          | BG           | EKI           | 350                              | 35            | 14                       | 4    |
| 10635                  | 32124                 | MWIL | 06                  | 17 | 1500 | S10 E42 | 06 20.8       | 5        | (BG)         |               |                                  |               |                          |      |
| 10635                  |                       | VORO | 06                  | 17 | 2311 | S08 E37 | 06 20.7       |          |              | EKI           | 423                              | 12            | 12                       | 3    |
| 10635                  |                       | LEAR | 06                  | 18 | 0030 | S10 E37 | 06 20.8       |          | BG           | EKO           | 470                              | 47            | 15                       | 4    |
| 10635                  |                       | SVTO | 06                  | 18 | 0955 | S13 E32 | 06 20.8       |          | BG           | FKI           | 620                              | 30            | 21                       | 3    |
| 10635                  |                       | HOLL | 06                  | 18 | 1449 | S13 E30 | 06 20.9       |          | BG           | FKI           | 420                              | 42            | 16                       | 3    |
| 10635                  | 32124                 | MWIL | 06                  | 18 | 1500 | S10 E28 | 06 20.7       | 5        | (BG)         |               |                                  |               |                          |      |
| 10635                  | 32129                 | MWIL | 06                  | 18 | 1500 | S14 E23 | 06 20.4       | 4        | AP           |               |                                  |               |                          |      |
| 10635                  |                       | LEAR | 06                  | 19 | 0030 | S12 E25 | 06 20.9       |          | BGD          | FKO           | 390                              | 33            | 20                       | 3    |
| 10635                  |                       | VORO | 06                  | 19 | 0425 | S08 E21 | 06 20.7       |          |              | EHI           | 379                              | 18            | 12                       | 4    |
| 10635                  |                       | VORO | 06                  | 19 | 0425 | S13 E15 | 06 20.3       |          |              | ARX           | 10                               | 2             |                          | 4    |
| 10635                  |                       | SVTO | 06                  | 19 | 0608 | S12 E21 | 06 20.8       |          | BGD          | FKI           | 600                              | 51            | 20                       | 4    |
| 10635                  | 32124                 | MWIL | 06                  | 19 | 1430 | S10 E15 | 06 20.7       | 5        | (D )         |               |                                  |               |                          |      |
| 10635                  |                       | HOLL | 06                  | 19 | 1650 | S13 E14 | 06 20.7       |          | BG           | FKI           | 410                              | 40            | 21                       | 3    |
| 10635                  |                       | VORO | 06                  | 19 | 2312 | S09 E13 | 06 20.9       |          |              | EKI           | 741                              | 29            | 12                       | 2    |
| 10635                  |                       | LEAR | 06                  | 20 | 0132 | S12 E12 | 06 21.0       |          | BGD          | FKI           | 630                              | 76            | 19                       | 2    |
| 10635                  |                       | KAND | 06                  | 20 | 1215 | S11 E03 | 06 20.7       |          |              | FKO           |                                  | 46            | 16                       | 4    |
| 10635                  | 32124                 | MWIL | 06                  | 20 | 1445 | S10 E02 | 06 20.8       | 5        | (D )         |               |                                  |               |                          |      |
| 10635                  |                       | HOLL | 06                  | 20 | 1635 | S11 E02 | 06 20.8       |          | BG           | FKC           | 560                              | 82            | 20                       | 2    |
| 10635                  |                       | LEAR | 06                  | 21 | 0040 | S12 W02 | 06 20.9       |          | BGD          | FAI           | 570                              | 83            | 20                       | 3    |
| 10635                  |                       | SVTO | 06                  | 21 | 0540 | S12 W05 | 06 20.8       |          | BG           | FKI           | 500                              | 41            | 22                       | 3    |
| 10635                  |                       | KAND | 06                  | 21 | 0645 | S10 W07 | 06 20.7       |          |              | EKO           |                                  | 39            | 15                       | 4    |
| 10635                  | 32124                 | MWIL | 06                  | 21 | 1430 | S10 W11 | 06 20.8       | 5        | (D )         |               |                                  |               |                          |      |
| 10635                  |                       | HOLL | 06                  | 21 | 1445 | S13 W10 | 06 20.9       |          | BGD          | FKC           | 440                              | 68            | 20                       | 2    |
| 10635                  |                       | LEAR | 06                  | 22 | 0120 | S12 W16 | 06 20.8       |          | BG           | FAI           | 460                              | 51            | 20                       | 2    |
| 10635                  |                       | SVTO | 06                  | 22 | 0515 | S12 W18 | 06 20.9       |          | BG           | FHI           | 450                              | 28            | 22                       | 3    |
| 10635                  |                       | KAND | 06                  | 22 | 0825 | S10 W21 | 06 20.8       |          |              | FAC           |                                  | 26            | 16                       | 5    |
| 10635                  |                       | HOLL | 06                  | 22 | 1423 | S11 W22 | 06 20.9       |          | BGD          | FKC           | 470                              | 62            | 21                       | 3    |
| 10635                  |                       | LEAR | 06                  | 23 | 0040 | S11 W28 | 06 20.9       |          | BGD          | FAC           | 620                              | 78            | 24                       | 3    |
| 10635                  |                       | VORO | 06                  | 23 | 0223 | S10 W32 | 06 20.7       |          |              | EKI           | 836                              | 14            | 13                       | 3    |
| 10635                  |                       | SVTO | 06                  | 23 | 0555 | S14 W28 | 06 21.1       |          | BG           | FHI           | 450                              | 31            | 22                       | 3    |
| 10635                  |                       | HOLL | 06                  | 23 | 1335 | S12 W38 | 06 20.7       |          | BGD          | FKI           | 430                              | 35            | 19                       | 4    |
| 10635                  |                       | VORO | 06                  | 23 | 2222 | S10 W42 | 06 20.8       |          |              | EKI           | 582                              | 11            | 13                       | 4    |
| 10635                  |                       | LEAR | 06                  | 24 | 0139 | S11 W40 | 06 21.0       |          | BGD          | FAC           | 550                              | 51            | 20                       | 3    |
| 10635                  |                       | SVTO | 06                  | 24 | 0529 | S12 W44 | 06 20.9       |          | BG           | FSI           | 520                              | 21            | 23                       | 3    |
| 10635                  |                       | HOLL | 06                  | 24 | 1411 | S11 W48 | 06 21.0       |          | BGD          | FKC           | 470                              | 35            | 20                       | 3    |
| 10635                  | 32124                 | MWIL | 06                  | 24 | 1430 | S10 W51 | 06 20.8       | 5        | (D )         |               |                                  |               |                          |      |
| 10635                  |                       | LEAR | 06                  | 25 | 0037 | S11 W53 | 06 21.0       |          | BGD          | FAI           | 460                              | 35            | 27                       | 3    |
| 10635                  |                       | HOLL | 06                  | 25 | 1415 | S11 W64 | 06 20.8       |          | BGD          | FKI           | 350                              | 21            | 18                       | 4    |
| 10635                  | 32124                 | MWIL | 06                  | 25 | 1445 | S10 W65 | 06 20.7       | 5        | (D )         |               |                                  |               |                          |      |
| 10635                  |                       | VORO | 06                  | 25 | 2123 | S10 W69 | 06 20.7       |          |              | EKI           | 565                              | 5             | 13                       | 3    |
| 10635                  |                       | LEAR | 06                  | 26 | 0040 | S11 W68 | 06 20.9       |          | BGD          | FKI           | 360                              | 10            | 17                       | 3    |
| 10635                  | 32124                 | MWIL | 06                  | 26 | 1445 | S11 W79 | 06 20.7       | 5        | (BG)         |               |                                  |               |                          |      |
| 10635                  |                       | VORO | 06                  | 27 | 0024 | S12 W77 | 06 21.2       |          |              | HKX           | 266                              | 1             |                          | 3    |
| 10635                  |                       | LEAR | 06                  | 27 | 0103 | S10 W78 | 06 21.2       |          | BG           | CAO           | 210                              | 3             | 3                        | 3    |
| 10635                  | 32124                 | MWIL | 06                  | 27 | 1445 | S09 W80 | 06 21.6       | 4        | (B )         |               |                                  |               |                          |      |
| 10635B                 |                       | VORO | 06                  | 14 | 2255 | S12 E83 | 06 21.2       |          |              | HKX           | 361                              | 1             |                          | 3    |
| 10635B                 |                       | VORO | 06                  | 15 | 2256 | S12 E70 | 06 21.2       |          |              | HAX           | 188                              | 1             |                          | 3    |
| 10635B                 | 32127                 | MWIL | 06                  | 16 | 1430 | S15 E65 | 06 21.5       | 4        | (B )         |               |                                  |               |                          |      |
| 10635B                 |                       | VORO | 06                  | 17 | 0259 | S12 E54 | 06 21.2       |          |              | HKX           | 192                              | 1             |                          | 2    |
| 10635B                 | 32128                 | MWIL | 06                  | 17 | 1500 | S15 E52 | 06 21.6       | 3        | (AF)         |               |                                  |               |                          |      |
| 10635B                 |                       | VORO | 06                  | 17 | 2311 | S12 E43 | 06 21.2       |          |              | HKX           | 236                              | 7             |                          | 3    |
| 10635B                 |                       | VORO | 06                  | 17 | 2311 | S16 E42 | 06 21.1       |          |              | ARX           | 16                               | 7             |                          | 2    |
| 10635B                 | 32128                 | MWIL | 06                  | 18 | 1500 | S15 E35 | 06 21.3       | 4        | (B )         |               |                                  |               |                          |      |
| 10635B                 |                       | VORO | 06                  | 19 | 0425 | S12 E27 | 06 21.2       |          |              | HKX           | 258                              | 7             |                          | 4    |

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Jun 04

S U N S P O T G R O U P S  
(Ordered by Central Meridian Passage Date)

JUNE 2004

| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Mo | Day | Time<br>(UT) | Lat | CMD | CMP<br>Mo | Day  | Max<br>H | Mag<br>Class | Spot<br>Class | Corrected<br>Area<br>(10-6 Hemi) | Spot<br>Count | Long.<br>Extent<br>(Deg) | Qual |
|------------------------|-----------------------|------|----|-----|--------------|-----|-----|-----------|------|----------|--------------|---------------|----------------------------------|---------------|--------------------------|------|
| 10635B                 |                       | VORO | 06 | 19  | 0425         | S15 | E29 | 06        | 21.4 |          |              | DRI           | 69                               | 10            | 7                        | 4    |
| 10635B                 | 32128                 | MWIL | 06 | 19  | 1430         | S15 | E23 | 06        | 21.3 | 4        | (B )         |               |                                  |               |                          |      |
| 10635B                 |                       | VORO | 06 | 19  | 2312         | S15 | E19 | 06        | 21.4 |          |              | BRI           | 36                               | 14            | 6                        | 2    |
| 10635B                 |                       | KAND | 06 | 20  | 1215         | S16 | E11 | 06        | 21.3 |          |              | BXO           |                                  | 13            | 8                        | 4    |
| 10635B                 | 32128                 | MWIL | 06 | 20  | 1445         | S15 | E11 | 06        | 21.4 | 4        | (B )         |               |                                  |               |                          |      |
| 10635B                 |                       | KAND | 06 | 21  | 0645         | S15 | E01 | 06        | 21.3 |          |              | BXI           |                                  | 23            | 9                        | 4    |
| 10635B                 | 32128                 | MWIL | 06 | 21  | 1430         | S15 | W03 | 06        | 21.4 | 4        | (B2)         |               |                                  |               |                          |      |
| 10635B                 |                       | KAND | 06 | 22  | 0825         | S17 | W12 | 06        | 21.4 |          |              | BXO           |                                  | 13            | 5                        | 5    |
| 10635B                 |                       | VORO | 06 | 23  | 0223         | S16 | W25 | 06        | 21.2 |          |              | BRI           | 30                               | 4             | 5                        | 3    |
| 10635B                 |                       | VORO | 06 | 23  | 2222         | S15 | W35 | 06        | 21.3 |          |              | BSI           | 31                               | 6             | 8                        | 4    |
| 10635B                 | 32128                 | MWIL | 06 | 24  | 1430         | S16 | W42 | 06        | 21.4 | 4        | (BF)         |               |                                  |               |                          |      |
| 10635B                 | 32128                 | MWIL | 06 | 25  | 1445         | S16 | W55 | 06        | 21.4 | 4        | (BF)         |               |                                  |               |                          |      |
| 10635C                 | 32131                 | MWIL | 06 | 20  | 1445         | N19 | E15 | 06        | 21.7 | 3        | (AF)         |               |                                  |               |                          |      |
| 10635A                 | 32130                 | MWIL | 06 | 19  | 1430         | S10 | E36 | 06        | 22.3 | 4        | (AF)         |               |                                  |               |                          |      |
| 10635A                 |                       | KAND | 06 | 20  | 1215         | S12 | E24 | 06        | 22.3 |          |              | AX            |                                  | 3             | 2                        | 4    |
| 10635A                 | 32130                 | MWIL | 06 | 20  | 1445         | S10 | E23 | 06        | 22.3 | 3        | (AF)         |               |                                  |               |                          |      |
| 10635A                 |                       | LEAR | 06 | 21  | 0040         | S12 | E16 | 06        | 22.2 |          | B            | BXO           | 10                               | 2             | 2                        | 3    |
| 10635A                 |                       | KAND | 06 | 21  | 0645         | S11 | E12 | 06        | 22.2 |          |              | AX            |                                  | 1             |                          | 4    |
| 10635A                 | 32130                 | MWIL | 06 | 21  | 1430         | S09 | E08 | 06        | 22.2 | 4        | (AF)         |               |                                  |               |                          |      |
| 10635A                 |                       | HOLL | 06 | 21  | 1445         | S08 | E08 | 06        | 22.2 |          | A            | AXX           |                                  | 1             | 1                        | 2    |
| 10635A                 |                       | LEAR | 06 | 22  | 0120         | S08 | E03 | 06        | 22.3 |          | A            | AXX           | 10                               | 1             | 1                        | 2    |
| 10635A                 |                       | HOLL | 06 | 22  | 1423         | S11 | W05 | 06        | 22.2 |          | A            | AXX           |                                  | 1             | 1                        | 3    |
| 10635A                 |                       | LEAR | 06 | 23  | 0040         | S08 | W11 | 06        | 22.2 |          | A            | AXX           | 10                               | 2             | 2                        | 3    |
| 10635A                 |                       | HOLL | 06 | 23  | 1335         | S08 | W17 | 06        | 22.3 |          | B            | BXO           | 10                               | 3             | 2                        | 4    |
| 10635A                 |                       | LEAR | 06 | 25  | 0037         | S09 | W37 | 06        | 22.2 |          | A            | AXX           | 20                               | 5             | 4                        | 3    |
| 10636                  |                       | VORO | 06 | 19  | 2312         | S10 | E42 | 06        | 23.1 |          |              | AXX           | 2                                | 1             |                          | 4    |
| 10636                  |                       | LEAR | 06 | 20  | 0132         | S11 | E42 | 06        | 23.2 |          | B            | CSO           | 60                               | 6             | 4                        | 2    |
| 10636                  |                       | KAND | 06 | 20  | 1215         | S10 | E36 | 06        | 23.2 |          |              | BXO           |                                  | 7             | 5                        | 4    |
| 10636                  | 32132                 | MWIL | 06 | 20  | 1445         | S10 | E35 | 06        | 23.2 | 4        | (B )         |               |                                  |               |                          |      |
| 10636                  |                       | HOLL | 06 | 20  | 1635         | S10 | E34 | 06        | 23.2 |          | B            | DAO           | 40                               | 8             | 6                        | 2    |
| 10636                  |                       | LEAR | 06 | 21  | 0040         | S10 | E28 | 06        | 23.1 |          | B            | CAO           | 50                               | 11            | 6                        | 3    |
| 10636                  |                       | SVTO | 06 | 21  | 0540         | S10 | E26 | 06        | 23.2 |          | B            | DSO           | 60                               | 6             | 7                        | 3    |
| 10636                  |                       | KAND | 06 | 21  | 0645         | S10 | E25 | 06        | 23.1 |          |              | BXO           |                                  | 9             | 7                        | 4    |
| 10636                  | 32132                 | MWIL | 06 | 21  | 1430         | S09 | E21 | 06        | 23.2 | 4        | (B )         |               |                                  |               |                          |      |
| 10636                  |                       | HOLL | 06 | 21  | 1445         | S10 | E20 | 06        | 23.1 |          | B            | DSO           | 30                               | 10            | 8                        | 2    |
| 10636                  |                       | LEAR | 06 | 22  | 0120         | S09 | E15 | 06        | 23.2 |          | B            | BXO           | 20                               | 5             | 7                        | 2    |
| 10636                  |                       | SVTO | 06 | 22  | 0515         | S09 | E09 | 06        | 22.9 |          | A            | AXX           | 10                               | 2             | 2                        | 3    |
| 10636                  |                       | KAND | 06 | 22  | 0825         | S10 | E10 | 06        | 23.1 |          |              | BXO           |                                  | 5             | 7                        | 5    |
| 10636                  |                       | HOLL | 06 | 22  | 1423         | S10 | E07 | 06        | 23.1 |          | B            | CSO           | 10                               | 5             | 7                        | 3    |
| 10636                  |                       | LEAR | 06 | 23  | 0040         | S09 | E03 | 06        | 23.2 |          | B            | BXO           | 10                               | 7             | 4                        | 3    |
| 10636                  |                       | VORO | 06 | 23  | 0223         | S10 | E02 | 06        | 23.2 |          |              | AXX           | 5                                | 4             | 1                        | 3    |
| 10636                  |                       | HOLL | 06 | 23  | 1335         | S09 | W07 | 06        | 23.0 |          | B            | BXO           | 10                               | 2             | 5                        | 4    |
| 10636                  |                       | LEAR | 06 | 24  | 0139         | S08 | W13 | 06        | 23.1 |          | B            | BXI           | 10                               | 8             | 6                        | 3    |
| 10636                  |                       | HOLL | 06 | 24  | 1411         | S11 | W18 | 06        | 23.2 |          | B            | BXO           | 10                               | 3             | 2                        | 3    |
| 10636                  |                       | LEAR | 06 | 25  | 0037         | S09 | W24 | 06        | 23.2 |          | B            | BXO           | 10                               | 3             | 3                        | 3    |
| 10636                  |                       | LEAR | 06 | 26  | 0040         | S06 | W37 | 06        | 23.2 |          | A            | AXX           |                                  | 1             |                          | 3    |
| 10636                  |                       | HOLL | 06 | 28  | 1916         | S09 | W77 | 06        | 23.0 |          | A            | RX            | 20                               | 3             | 5                        | 2    |
| 10637                  |                       | KAND | 06 | 21  | 0645         | N09 | E72 | 06        | 26.7 |          |              | AX            |                                  | 2             | 1                        | 4    |
| 10637                  | 32133                 | MWIL | 06 | 21  | 1430         | N09 | E68 | 06        | 26.7 | 4        | (AP)         |               |                                  |               |                          |      |
| 10637                  |                       | HOLL | 06 | 21  | 1445         | N08 | E68 | 06        | 26.7 |          | A            | AXX           |                                  | 1             | 1                        | 2    |
| 10637                  |                       | LEAR | 06 | 22  | 0120         | N10 | E59 | 06        | 26.5 |          | A            | AXX           | 10                               | 1             | 1                        | 2    |
| 10637                  |                       | HOLL | 06 | 22  | 1423         | N07 | E53 | 06        | 26.6 |          | B            | BXO           | 10                               | 4             | 4                        | 3    |
| 10637                  |                       | LEAR | 06 | 23  | 0040         | N08 | E48 | 06        | 26.6 |          | B            | BXO           | 20                               | 6             | 5                        | 3    |
| 10637                  |                       | HOLL | 06 | 23  | 1335         | N08 | E42 | 06        | 26.7 |          | B            | BXO           | 10                               | 2             | 1                        | 4    |
| 10637                  |                       | VORO | 06 | 23  | 2123         | N09 | E35 | 06        | 26.5 |          |              | AXX           | 6                                | 2             | 3                        | 3    |
| 10637                  |                       | LEAR | 06 | 24  | 0139         | N09 | E34 | 06        | 26.6 |          | B            | BXI           | 20                               | 10            | 6                        | 3    |
| 10637                  |                       | HOLL | 06 | 24  | 1411         | N08 | E31 | 06        | 26.9 |          | B            | BXI           | 20                               | 9             | 4                        | 3    |
| 10637                  |                       | LEAR | 06 | 25  | 0037         | N07 | E22 | 06        | 26.7 |          | B            | BXI           | 30                               | 14            | 12                       | 3    |
| 10637                  |                       | HOLL | 06 | 25  | 1415         | N08 | E17 | 06        | 26.9 |          | B            | DSO           | 30                               | 11            | 7                        | 4    |
| 10637                  | 32134                 | MWIL | 06 | 25  | 1445         | N08 | E11 | 06        | 26.4 | 4        | (AP)         |               |                                  |               |                          |      |
| 10637                  | 32135                 | MWIL | 06 | 25  | 1445         | N08 | E16 | 06        | 26.8 | 4        | (B )         |               |                                  |               |                          |      |
| 10637                  |                       | VORO | 06 | 25  | 2123         | N09 | E10 | 06        | 26.6 |          |              | BSO           | 15                               | 5             | 7                        | 3    |
| 10637                  |                       | LEAR | 06 | 26  | 0040         | N09 | E09 | 06        | 26.7 |          | B            | BXO           | 20                               | 11            | 8                        | 3    |
| 10637                  | 32135                 | MWIL | 06 | 26  | 1445         | N08 | E02 | 06        | 26.8 | 4        | (B )         |               |                                  |               |                          |      |
| 10637                  | 32134                 | MWIL | 06 | 26  | 1445         | N08 | W03 | 06        | 26.4 | 4        | (AP)         |               |                                  |               |                          |      |



S U N S P O T   G R O U P S  
(Ordered by Central Meridian Passage Date)

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Jun 04

JUNE                      2004

| NOAA/<br>USAF<br>Group | Mt<br>Wilson<br>Group | Sta  | Observation<br>Time |          | Lat  | CMP | Max | Mag | Spot  | Corrected<br>Area | Spot  | Long.<br>Extent | Qual |
|------------------------|-----------------------|------|---------------------|----------|------|-----|-----|-----|-------|-------------------|-------|-----------------|------|
|                        |                       |      | Mo                  | Day (UT) | CMD  | Mo  | Day | H   | Class | (10-6 Hemi)       | Count | (Deg)           |      |
| 10637                  | 32135                 | VORO | 06                  | 27       | 0024 | N09 | W04 | 06  | 26.7  |                   | 10    | 2               | 3    |
| 10637                  |                       | LEAR | 06                  | 27       | 0103 | N08 | W04 | 06  | 26.7  |                   | 3     | 5               | 3    |
| 10637                  |                       | MWIL | 06                  | 27       | 1445 | N08 | W12 | 06  | 26.7  | 4                 | 13    |                 |      |
| 10637                  |                       | VORO | 06                  | 27       | 2244 | N09 | W17 | 06  | 26.7  | (B )              |       |                 |      |
| 10637                  | 32135                 | LEAR | 06                  | 28       | 0119 | N09 | W19 | 06  | 26.6  |                   | 8     | 4               | 3    |
| 10637                  |                       | KAND | 06                  | 28       | 0820 | N09 | W25 | 06  | 26.6  | B                 | 30    | 9               | 8    |
| 10637                  |                       | MWIL | 06                  | 28       | 1430 | N09 | W27 | 06  | 26.6  | BXO               | 3     | 5               | 4    |
| 10637                  |                       | HOLL | 06                  | 28       | 1916 | N08 | W29 | 06  | 26.6  | (BG)              |       |                 |      |
| 10637                  | 32135                 | LEAR | 06                  | 29       | 0041 | N08 | W33 | 06  | 26.5  | B                 | 20    | 3               | 2    |
| 10637                  |                       | VORO | 06                  | 29       | 0459 | N09 | W34 | 06  | 26.5  | BG                | 30    | 8               | 10   |
| 10637                  |                       | KAND | 06                  | 29       | 0745 | N09 | W37 | 06  | 26.5  | BXO               | 15    | 2               |      |
| 10637                  |                       | MWIL | 06                  | 29       | 1430 | N08 | W38 | 06  | 26.5  | AXX               | 2     | 1               | 3    |
| 10637                  | 32135                 | HOLL | 06                  | 30       | 1405 | N08 | W53 | 06  | 26.6  | AX                |       |                 | 4    |
| 10637                  |                       | MWIL | 06                  | 30       | 1430 | N08 | W53 | 06  | 26.6  | A                 |       | 1               | 1    |
|                        | 32136                 |      |                     |          |      |     |     |     | (BP)  |                   |       |                 |      |
| 10637A                 |                       | HOLL | 06                  | 25       | 1415 | N07 | E42 | 06  | 28.7  |                   |       |                 |      |
| 10637A                 |                       | MWIL | 06                  | 25       | 1445 | N07 | E40 | 06  | 28.6  | A                 |       | 1               | 1    |
| 10637A                 |                       | VORO | 06                  | 25       | 2123 | N07 | E35 | 06  | 28.5  | (B )              |       |                 |      |
| 10637A                 | 32136                 | LEAR | 06                  | 26       | 0040 | N07 | E34 | 06  | 28.6  |                   | 8     | 2               | 3    |
| 10637A                 |                       | MWIL | 06                  | 26       | 1445 | N07 | E25 | 06  | 28.5  | A                 | 10    | 2               | 1    |
|                        |                       |      |                     |          |      |     |     |     | (AF)  |                   |       |                 | 3    |
| 10637C                 | 32140                 | MWIL | 06                  | 29       | 1430 | S03 | W08 | 06  | 29.0  |                   |       |                 |      |
|                        |                       |      |                     |          |      |     |     | 4   | (AP)  |                   |       |                 |      |
| 10637B                 | 32139                 | MWIL | 06                  | 28       | 1430 | S08 | E13 | 06  | 29.6  |                   |       |                 |      |
| 10637B                 | 32139                 | MWIL | 06                  | 29       | 1430 | S02 | E00 | 06  | 29.6  |                   |       |                 |      |
|                        |                       |      |                     |          |      |     |     | 3   | (BP)  |                   |       |                 |      |
|                        |                       |      |                     |          |      |     |     | 4   | (AP)  |                   |       |                 |      |

Stations reporting:

HOLL = Holloman  
KAND = Kandilli  
LEAR = Learmonth

MWIL = Mt. Wilson  
PALE = Palehua

RAMY = Ramey  
SVTO = San Vito

TACH = Tashkent  
VORO = Voroshilov

## SUDDEN IONOSPHERIC DISTURBANCES

JUNE 2004

| Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Imp | Wide<br>Spread<br>Index | Number of Station Reports by Type |     |     |            |     | Flare<br>(UT) | X-ray<br>Class | NOAA<br>Region |
|-----|---------------|-------------|-------------|-----|-------------------------|-----------------------------------|-----|-----|------------|-----|---------------|----------------|----------------|
|     |               |             |             |     |                         | SWF                               | SEA | SPA | LF-<br>SPA | SES |               |                |                |
| 02  | 0644          | 0720        | 0746        | 2-  | 5                       | 1                                 |     | 1   |            |     | No flare      |                |                |
| 03  | 1351          | 1408        | 1427        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 05  | 1229          | 1245U       | 1322        | 1   | 1                       |                                   | 1   |     |            |     | 1238          | B1.9           |                |
| 05  | 1324          | 1331        | 1351        | 1   | 1                       |                                   | 1   |     |            |     | 1332          | B2.6           |                |
| 06  | 1100          | 1208U       | 1245        | 1   | 1                       |                                   | 1   |     |            |     | 1125          | B1.7           | 10627          |
| 07  | 1309          | 1343        | 1351        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |
| 08  | 1834          | 1843        | 1909        | 2-  | 3                       |                                   |     |     |            | 2   | 1841          | B8.0           | 10621          |
| 11  | 1234          | 1247        | 1328        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |
| 11  | 1333          | 1350U       | 1450        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 12  | 1838          | 1842        | 1914        | 2-  | 3                       |                                   |     |     |            | 7   | 1837          | C1.9           |                |
| 12  | 1941          | 1944        | 2020        | 2-  | 3                       |                                   |     |     |            | 6   | 1940          | C1.1           |                |
| 13  | 0435          | 0530        | 0752        | 1   | 1                       |                                   | 1   |     |            |     | 0427          | C4.1           | 10634          |
| 13  | 0919          | 0936        | 1123        | 2   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 13  | 1135          | 1153        | 1207        | 3-  | 5                       | 1                                 | 1   | 1   |            | 6   | 1127          | M1.0           | 10634          |
| 14  | 0834          | 0851U       | 0934        | 1   | 1                       |                                   | 1   |     |            |     | 0838          | C1.5           | 10634          |
| 14  | 1451          | 1510        | 1547        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 18  | 0709          | 0727U       | 0800        | 2   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 18  | 0801          | 0819        | 0848        | 2   | 1                       |                                   | 1   |     |            |     | 0815          | B8.3           | 10634          |
| 18  | 0903          | 0914        | 0930        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |
| 18  | 1130          | 1206        | 1246        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 18  | 1520          | 1547U       | 1623        | 1   | 1                       |                                   | 1   |     |            |     | 1534          | B4.6           | 10634          |
| 18  | 1622          | 1631        | 1659        | 1   | 1                       |                                   | 1   |     |            | 1   | 1619          | C1.8           | 10635          |
| 19  | 0708          | 0748        | 0804        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 19  | 0810          | 0815        | 0825        | 1-  | 1                       |                                   |     |     |            | 1   | 0808          | C1.0           | 10635          |
| 19  | 0825          | 0830        | 0835        | 1-  | 1                       |                                   |     |     |            | 1   | 0823          | C2.4           |                |
| 19  | 1015          | 1040        | 1050        | 2   | 1                       |                                   |     |     |            | 1   | 1017          | C1.2           | 10635          |
| 19  | 1110          | 1140        | 1150        | 2   | 1                       |                                   |     |     |            | 1   | 1108          | C1.0           | 10635          |
| 19  | 1931          | 1938        | 2032        | 2   | 3                       |                                   |     |     |            | 2   | 1930          | C3.0           | 10635          |
| 19  | 2137          | 2139        | 2150        | 1-  | 1                       |                                   |     |     |            | 1   | 2133          | C1.3           | 10635          |
| 20  | 1326          | 1329        | 1405        | 1+  | 3                       |                                   |     |     |            | 3   | 1323          | C2.0           | 10635          |
| 21  | 1432          | 1441        | 1548        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 21  | 1708          | 1714        | 1747        | 2-  | 3                       |                                   |     |     |            | 7   | 1709          | C2.0           | 10635          |
| 22  | 1304          | 1321U       | 1341        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 22  | 2157          | 2207        | 2231        | 2-  | 3                       |                                   |     |     |            | 2   | 2148          | C1.7           | 10635          |
| 23  | 0550          | 0607        | 0638        | 1   | 1                       |                                   | 1   |     |            |     | 0549          | C2.5           | 10635          |
| 24  | 0532          | 0605        | 0656        | 1   | 1                       |                                   | 1   |     |            |     | 0552          | C1.4           | 10635          |
| 24  | 0755          | 0803        | 0854        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 25  | 1126          | 1134        | 1203        | 2   | 5                       | 1                                 |     | 1   |            | 2   | 1118          | C2.5           | 10635          |
| 26  | 0646          | 0721        | 0758        | 2+  | 5                       | 1                                 | 1   | 1   |            | 1   | 0653          | C8.6           | 10635          |
| 26  | 0838          | 0848        | 0902        | 1   | 1                       |                                   | 1   |     |            |     | No flare      |                |                |
| 26  | 0917          | 0936        | 1004        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |
| 26  | 1018          | 1028        | 1136        | 1   | 1                       |                                   | 1   |     |            |     | 1112          | B8.7           | 10635          |
| 26  | 1142          | 1204        | 1259        | 1   | 1                       |                                   | 1   |     |            |     | 1112          | B8.7           | 10635          |
| 26  | 1404          | 1417        | 1439        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |

\* = no flare patrol.

# SUDDEN IONOSPHERIC DISTURBANCES

93  
Jun 04

JUNE 2004

| Day | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Imp | Wide<br>Spread<br>Index | Number of Station Reports by Type |     |     |            |     | Flare<br>(UT) | X-ray<br>Class | NOAA<br>Region |
|-----|---------------|-------------|-------------|-----|-------------------------|-----------------------------------|-----|-----|------------|-----|---------------|----------------|----------------|
|     |               |             |             |     |                         | SWF                               | SEA | SPA | LF-<br>SPA | SES |               |                |                |
| 28  | 1009          | 1013        | 1038        | 3-  | 5                       | 1                                 | 1   | 1   |            | 7   | 1003          | C4.1           | 10618          |
| 27  | 1547          | 1559        | 1625        | 2   | 5                       | 1                                 | 1   | 1   |            | 5   | 1544          | C2.3           | 10635          |
| 27  | 1925          | 1932        | 2001        | 2-  | 3                       |                                   |     |     |            | 3   | 1924          | C1.6           |                |
| 27  | 2010          | 2018        | 2107        | 2   | 3                       |                                   |     |     |            | 6   | 2013          | C2.5           | 10635          |
| 27  | 2232          | 2243        | 2305        | 2-  | 1                       |                                   |     |     |            | 2   | 2229          | C3.6           | 10635          |
| 28  | 1154          | 1204        | 1231        | 2   | 3                       |                                   |     |     |            | 2   | 1154          | C1.6           | 10635          |
| 28  | 1159          | 1214        | 1307        | 1   | 1                       |                                   | 1   |     |            |     | 1154          | C1.6           | 10635          |
| 28  | 1210          | 1253        | 1309        | 1   | 1                       | 1                                 |     |     |            |     | 1154          | C1.6           | 10635          |
| 28  | 1359          | 1408        | 1442        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |
| 28  | 1546          | 1550        | 1639        | 2+  | 1                       |                                   |     |     |            | 1   | 1553          | B4.2           | 10635          |
| 29  | 1113          | 1139U       | 1204        | 1   | 1                       |                                   | 1   |     |            |     | 1102          | B2.6           | 10639          |
| 29  | 1312          | 1322        | 1352        | 2-  | 5                       | 1                                 |     | 1   |            |     | 1333          | B1.1           |                |
| 29  | 1602          | 1614        | 1627        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |
| 29  | 1721          | 1728        | 1750        | 1   | 1                       |                                   | 1   |     |            |     | *             |                |                |
| 30  | 1431          | 1445        | 1458        | 2   | 5                       | 1                                 | 1   | 1   |            | 2   | 1426          | C1.3           | 10640          |

\* = no flare patrol.

## OBSERVATORIES REPORTING FOR JUNE 2004

|                                 |     |                              |               |
|---------------------------------|-----|------------------------------|---------------|
| Alberta, Canada                 | SES | Nerja, Spain                 | SES           |
| Athens, Greece                  | SES | Palo Alto, California, USA   | SES           |
| Bedford, Massachusetts, USA     | SES | Panska Ves, Czech Republic   | SES, SEA, SWF |
| Brookline, Massachusetts, USA   | SES | Sussex, United Kingdom       | SES           |
| Cambridge, England, UK          | SES | Torrington, Connecticut, USA | SES           |
| Houston, Texas, USA             | SES | Tucson, Arizona, USA         | SES           |
| Isola del Gran Sasso, Italy     | SES | Upice, Czech Republic        | SEA           |
| Marlborough, Massachusetts, USA | SES |                              |               |

Observations are not necessarily continuous.

94  
Jun 04

# S O L A R R A D I O E M I S S I O N Spectral Observations

JUNE 2004

| OBSERVATION |               |             | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|-------------|---------------|-------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Day         | Start<br>(UT) | End<br>(UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 01          | 0000          | 0700        | CULG | 0000.0E       | 0110.0      | III               | N                | 1            | 27             | 200            |         |
|             |               |             | HIRA | 0019.5        | 0020.0      | III               | G                | 1            | 120            | 220            |         |
|             |               |             | PALE | 0052.0        | 0053.0      | III               |                  | 1            | 25             | 87             |         |
|             |               |             | CULG | 0053.0        | 0053.0      | III               | B                | 3            | 20             | 170            |         |
|             |               |             | HIRA | 0053.0        | 0053.5      | III               | B                | 1            | 30             | 80             |         |
|             |               |             | CULG | 0105.0        | 0108.0      | III               | G                | 2            | 20             | 180            |         |
|             |               |             | HIRA | 0105.5        | 0151.0      | III               | G                | 2            | 25X            | 310            |         |
|             |               |             | PALE | 0108.0        | 0111.0      | III               |                  | 1            | 25             | 180            |         |
|             |               |             | CULG | 0110.0        | 0333.0      | III               | N                | 3            | 18X            | 300            |         |
|             |               |             | PALE | 0122.0        | 0452.0      | III               | N                | 1            | 25             | 180            |         |
|             |               |             | HIRA | 0224.0        | 0224.5      | III               | B                | 1            | 110            | 210            |         |
|             |               |             | HIRA | 0225.0        | 0225.5      | III               | B                | 1            | 25X            | 80             |         |
|             |               |             | HIRA | 0319.0        | 0320.0      | III               | G                | 1            | 25X            | 200            |         |
|             |               |             | CULG | 0333.0        | 0503.0      | III               | N                | 1            | 20             | 180            |         |
|             | 0417          | 1742        | ONDR |               |             |                   |                  |              |                |                |         |
|             |               |             | SVTO | 0427.0        | 0437.0      | III               |                  | 2            | 25             | 158            |         |
|             |               |             | CULG | 0428.0        | 0430.0      | III               | G                | 3            | 18X            | 200            |         |
|             |               |             | HIRA | 0428.0        | 0429.5      | III               | G                | 2            | 25X            | 140            |         |
|             |               |             | CULG | 0436.0        | 0437.0      | III               | G                | 2            | 20             | 200            |         |
|             |               |             | HIRA | 0436.0        | 0436.5      | III               | B                | 1            | 40             | 200            |         |
|             |               |             | SVTO | 0502.0        | 0502.0      | III               |                  | 1            | 25             | 74             |         |
|             |               |             | CULG | 0529.0        | 0535.0      | III               | G                | 3            | 18             | 200            |         |
|             |               |             | LEAR | 0530.0        | 0546.0      | III               | N                | 2            | 25             | 180            |         |
|             |               |             | SVTO | 0530.0        | 0546.0      | III               | N                | 3            | 25             | 180            |         |
|             |               |             | HIRA | 0530.5        | 0531.0      | III               | B                | 1            | 40             | 210            |         |
|             |               |             | HIRA | 0532.5        | 0533.5      | III               | G                | 1            | 30             | 220            |         |
|             |               |             | CULG | 0544.0        | 0547.0      | III               | G                | 3            | 18             | 200            |         |
|             |               |             | HIRA | 0544.0        | 0545.5      | III               | B                | 3            | 25X            | 190            |         |
|             |               |             | SVTO | 0634.0        | 0635.0      | III               |                  | 1            | 25             | 70             |         |
|             |               |             | CULG | 0635.0        | 0635.0      | III               | G                | 1            | 23             | 90             |         |
|             | 0602          | 1200        | IZMI | 0635.1        | 0635.2      | III               | B                | 2            | 45             | 85             |         |
|             |               |             | SVTO | 0659.0        | 0742.0      | III               | N                | 1            | 25             | 167            |         |
|             |               |             | IZMI | 0659.6        | 0700.0      | III               | G                | 1            | 45             | 95             |         |
|             |               |             | IZMI | 0709.3        | 0709.4      | III               | B                | 1            | 45             | 85             |         |
|             |               |             | IZMI | 0717.2        | 0717.9      | III               | G,C              | 1            | 50U            | 85             |         |
|             |               |             | IZMI | 0729.3        | 0730.2      | III               | G                | 2            | 40             | 85             |         |
|             |               |             | IZMI | 0732.9        | 0734.5      | III               | GG               | 2            | 25X            | 155            |         |
|             |               |             | HIRA | 0733.0        | 0734.0      | III               | G                | 1            | 40             | 120            |         |
|             |               |             | LEAR | 0733.0        | 0742.0      | III               |                  | 1            | 25             | 115            |         |
|             |               |             | IZMI | 0742.3        | 0742.4      | III               | G,C              | 2            | 30             | 155            |         |
|             |               |             | SVTO | 0917.0        | 0917.0      | III               |                  | 1            | 25             | 54             |         |
|             |               |             | IZMI | 0929.9        | 0930.3      | III               | G                | 1            | 135            | 260            |         |
|             | 0435          | 1805        | BLEN | 0934.7        | 0935.3      | III               | GG               | 1            | 180            | 600            |         |
|             |               |             | IZMI | 0934.8        | 0936.7      | III               | G                | 2            | 25X            | 270X           |         |
|             |               |             | HIRA | 0935.0        | 0935.5      | III               | G                | 1            | 160            | 430            |         |
|             |               |             | SVTO | 0935.0        | 0936.0      | III               |                  | 1            | 25             | 126            |         |
|             |               |             | SVTO | 1005.0        | 1006.0      | III               |                  | 1            | 25             | 124            |         |
|             |               |             | IZMI | 1005.4        | 1006.2      | III               | G                | 1            | 25X            | 160            |         |
|             |               |             | SVTO | 1039.0        | 1039.0      | III               |                  | 1            | 28U            | 78U            |         |
|             |               |             | IZMI | 1142.0        | 1143.5      | III               | G,C              | 2            | 25X            | 270X           |         |
|             |               |             | SVTO | 1142.0        | 1143.0      | III               |                  | 1            | 25             | 140            |         |
|             |               |             | SVTO | 1157.0        | 1305.0      | III               | N                | 1            | 25             | 140            |         |
|             |               |             | IZMI | 1157.6        | 1158.2      | III               | G                | 2            | 25X            | 175            |         |
|             |               |             | HOLL | 1242.0        | 1242.0      | III               |                  | 1            | 25             | 118            |         |
|             |               |             | HOLL | 1314.0        | 1314.0      | III               |                  | 1            | 25             | 50             |         |
|             |               |             | SVTO | 1338.0        | 1610.0      | III               | N                | 1            | 25             | 163            |         |
|             |               |             | HOLL | 1513.0        | 1515.0      | III               |                  | 1            | 25             | 62             |         |
|             |               |             | HOLL | 1548.0        | 1910.0      | III               | N                | 1            | 25             | 71             |         |
|             |               |             | SVTO | 1700.0        | 1700.0      | III               |                  | 1            | 46             | 140            |         |
|             |               |             | PALE | 1833.0        | 1836.0      | III               |                  | 1            | 25             | 180            |         |
|             | 1920          | 2400        | HIRA |               |             |                   |                  |              |                |                |         |
|             |               |             | CULG | 2206.0        | 2400.0D     | III               | N                | 1            | 27             | 180            |         |
|             | 2100          | 2400        | PALE | 2357.0        | 2358.0      | III               |                  | 1            | 25             | 180            |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |
| 02          | 0000          | 0700        | CULG | 0000.0E       | 0002.0      | III               | N                | 1            | 27             | 180            |         |
|             |               |             | CULG | 0055.0        | 0112.0      | I                 | S                | 1            | 100            | 180            |         |
|             |               |             | CULG | 0224.0        | 0243.0      | I                 | S                | 1            | 100            | 180            |         |
|             | 0417          | 1743        | ONDR |               |             |                   |                  |              |                |                |         |
|             |               |             | BLEN |               |             |                   |                  |              |                |                |         |

# S O L A R   R A D I O   E M I S S I O N

## Spectral Observations

95  
Jun 04

JUNE                      2004

| OBSERVATION |           | Sta  | Start<br>(UT) | End<br>(UT) | EVENT    |         | Int<br>(1-3) | FREQUENCY |       | Remarks  |
|-------------|-----------|------|---------------|-------------|----------|---------|--------------|-----------|-------|----------|
| Start       | End       |      |               |             | Spectral | Event   |              | Lower     | Upper |          |
| Day (UT)    | (UT)      |      | (UT)          | (UT)        | Class    | Remarks |              | (MHz)     | (MHz) |          |
| 02          | 0000 0952 | LEAR | 0501.0        | 0502.0      | III      |         | 1            | 25        | 102   |          |
|             |           | CULG | 0502.0        | 0504.0      | III      | G       | 3            | 18        | 150   |          |
|             |           | SVTO | 0502.0        | 0502.0      | III      |         | 1            | 25        | 82    |          |
|             |           | HIRA | 0502.0        | 0502.5      | III      | B       | 1            | 25X       | 70    |          |
|             |           | CULG | 0534.0        | 0535.0      | III      | G       | 3            | 18        | 90    |          |
|             |           | HIRA | 0534.0        | 0534.5      | III      | B       | 1            | 40        | 50    |          |
|             |           | LEAR | 0534.0        | 0644.0      | III      | N       | 1            | 25        | 115   |          |
|             |           | SVTO | 0534.0        | 0534.0      | III      |         | 1            | 25        | 60    |          |
|             |           | CULG | 0543.0        | 0611.0      | III      | N       | 1            | 20        | 180   |          |
|             |           | SVTO | 0553.0        | 0553.0      | III      |         | 1            | 25        | 81    |          |
|             | 0600 1200 | HIRA | 0553.5        | 0554.0      | III      | B       | 1            | 40        | 100   |          |
|             |           | SVTO | 0644.0        | 0644.0      | III      |         | 1            | 25        | 47    |          |
|             |           | IZMI | 0830.3        | 0830.5      | III      | B       | 1            | 45        | 95    |          |
|             |           | SVTO | 0835.0        | 0836.0      | III      |         | 1            | 25        | 50    |          |
|             |           | IZMI | 0835.3        | 0836.1      | III      | G       | 1            | 35        | 160   |          |
|             |           | SVTO | 0923.0        | 0924.0      | III      |         | 1            | 25        | 49    |          |
|             |           | SVTO | 1103.0        | 1105.0      | III      |         | 1            | 25        | 150   |          |
|             |           | IZMI | 1103.9        | 1104.8      | III      | G,C     | 2            | 30        | 170   |          |
|             |           | HOLL | 1314.0        | 1315.0      | III      |         | 1            | 25        | 56    |          |
|             |           | SVTO | 1314.0        | 1315.0      | III      |         | 1            | 25        | 53    |          |
|             | 2100 2400 | CULG | 2149.0        | 2232.0      | III      | N       | 1            | 20        | 140   |          |
|             |           | CULG | 2258.0        | 2301.0      | III      | G       | 3            | 18        | 230   |          |
|             |           | HOLL | 2258.0        | 2301.0      | III      |         | 1            | 25        | 180   |          |
|             |           | PALE | 2258.0        | 2301.0      | III      |         | 2            | 25        | 180   |          |
|             | 1919 2400 | HIRA | 2258.0        | 2301.0      | III      | G       | 3            | 25X       | 210   |          |
|             |           | CULG | 2301.0        | 2303.0      | V        |         | 3            | 20        | 160   |          |
|             |           | CULG | 2308.0        | 2319.0      | II       | UE      | 1            | 23        | 75    |          |
|             |           | HOLL | 2309.0        | 2316.0      | II       |         | 1            | 25        | 69    | ESS 1027 |
|             |           | CULG | 2310.0        | 2317.0      | III      | G       | 3            | 20        | 70    |          |
|             |           | PALE | 2310.0        | 2315.0      | II       |         | 1            | 25        | 69    | ESS 0658 |
|             |           | HIRA | 2310.5        | 2316.0      | II       |         | 1            | 25X       | 70    |          |
|             |           |      |               |             |          |         |              |           |       |          |
|             |           |      |               |             |          |         |              |           |       |          |
|             |           |      |               |             |          |         |              |           |       |          |
| 03          | 0000 0952 | HIRA | 0043.5        | 0044.0      | III      | B       | 1            | 100       | 500   |          |
|             | 0000 0700 | CULG | 0044.0        | 0044.0      | III      | B       | 1            | 18        | 180   |          |
|             |           | LEAR | 0051.0        | 0056.0      | III      |         | 1            | 25        | 180   |          |
|             |           | CULG | 0052.0        | 0056.0      | III      | G       | 3            | 18X       | 200   |          |
|             |           | HOLL | 0052.0        | 0055.0      | III      |         | 1            | 25        | 180   |          |
|             |           | PALE | 0052.0        | 0056.0      | III      |         | 1            | 25        | 180   |          |
|             |           | HIRA | 0052.5        | 0056.0      | III      | G       | 2            | 25X       | 210   |          |
|             |           | CULG | 0107.0        | 0108.0      | III      | G       | 1            | 50        | 160   |          |
|             |           | LEAR | 0135.0        | 0234.0      | III      | N       | 1            | 25        | 111   |          |
|             |           | CULG | 0137.0        | 0138.0      | III      | G       | 2            | 18        | 140   |          |
|             | 0417 1744 | CULG | 0157.0        | 0158.0      | III      | B       | 3            | 18        | 70    |          |
|             |           | CULG | 0226.0        | 0244.0      | III      | N       | 1            | 20        | 150   |          |
|             |           | CULG | 0328.0        | 0332.0      | III      | G       | 1            | 20        | 170   |          |
|             |           | ONDR |               |             |          |         |              |           |       |          |
|             |           | BLEN |               |             |          |         |              |           |       |          |
|             | 0435 1805 | LEAR | 0449.0        | 0516.0      | III      | N       | 1            | 25        | 180   |          |
|             |           | SVTO | 0449.0        | 0452.0      | III      |         | 1            | 25        | 146   |          |
|             |           | CULG | 0450.0        | 0455.0      | III      | G       | 2            | 20        | 280   |          |
|             |           | HIRA | 0451.0        | 0451.5      | III      | B       | 1            | 120       | 300   |          |
|             |           | CULG | 0515.0        | 0517.0      | III      | G       | 2            | 23        | 200   |          |
|             |           | HIRA | 0515.0        | 0516.0      | III      | G       | 1            | 40        | 200   |          |
|             |           | SVTO | 0515.0        | 0516.0      | III      |         | 1            | 25        | 170   |          |
|             |           | CULG | 0619.0        | 0619.0      | III      | B       | 3            | 20        | 150   |          |
|             |           | HIRA | 0619.0        | 0619.5      | III      | B       | 1            | 40        | 110   |          |
|             |           | SVTO | 0619.0        | 0628.0      | III      |         | 2            | 25        | 81    |          |
|             | 0555 1200 | IZMI | 0619.0        | 0919.2      | III      | B       | 2            | 25X       | 130   |          |
|             |           | IZMI | 0626.8        | 0627.0      | III      | G,C     | 2            | 25X       | 125   |          |
|             |           | CULG | 0627.0        | 0627.0      | III      | B       | 3            | 20        | 130   |          |
|             |           | IZMI | 0649.8        | 0950.0      | III      | G       | 1            | 45        | 85    |          |
|             |           | IZMI | 0710.7        | 0710.8      | III      | B       | 1            | 45        | 65    |          |
|             |           | IZMI | 0735.9        | 0736.0      | III      | B       | 2            | 50        | 70U   |          |
|             |           | LEAR | 0852.0        | 0852.0      | III      |         | 1            | 25        | 105   |          |
|             |           | SVTO | 0852.0        | 0853.0      | III      |         | 1            | 25        | 134   |          |
|             |           | HIRA | 0852.5        | 0853.0      | III      | B       | 2            | 40        | 100   |          |
|             |           | IZMI | 0852.5        | 0852.7      | III      | B,C     | 2            | 45        | 125   |          |
|             |           | HIRA | 0926.0        | 0926.5      | III      | B       | 1            | 30        | 130   |          |
|             |           | SVTO | 0926.0        | 0926.0      | III      |         | 1            | 25        | 158   |          |

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Jun 04

# SOLAR RADIO EMISSION Spectral Observations

JUNE 2004

| OBSERVATION |               |             | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks  |
|-------------|---------------|-------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|----------|
| Day         | Start<br>(UT) | End<br>(UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |          |
| 03          |               |             | IZMI | 0926.3        | 0926.6      | III               | G                | 2            | 25X            | 175            |          |
|             |               |             | IZMI | 1147.9        | 1148.2      | III               | G                | 1            | 25X            | 70U            |          |
|             |               |             | SVTO | 1243.0        | 1245.0      | V                 |                  | 2            | 25             | 135            |          |
|             |               |             | HOLL | 1244.0        | 1245.0      | III               |                  | 1            | 25             | 103            |          |
|             |               |             | HOLL | 1300.0        | 1300.0      | III               |                  | 1            | 25             | 132            |          |
|             |               |             | SVTO | 1300.0        | 1300.0      | III               |                  | 2            | 25             | 165            |          |
|             |               |             | SVTO | 1325.0        | 1328.0      | III               |                  | 1            | 25             | 83             |          |
|             |               |             | SVTO | 1342.0        | 1347.0      | V                 |                  | 2            | 25             | 80             |          |
|             |               |             | HOLL | 1343.0        | 1347.0      | III               |                  | 1            | 25             | 78             |          |
|             |               |             | SVTO | 1414.0        | 1415.0      | III               |                  | 1            | 25             | 53             |          |
|             |               |             | SVTO | 1524.0        | 1529.0      | III               |                  | 1            | 25             | 77             |          |
|             |               |             | HOLL | 1613.0        | 1645.0      | III               | N                | 1            | 25             | 127            |          |
|             |               |             | SVTO | 1613.0        | 1618.0      | III               |                  | 1            | 25             | 130            |          |
|             |               |             | SVTO | 1624.0        | 1640.0      | II                |                  | 1            | 25             | 130            | ESS 0717 |
|             |               |             | HOLL | 1625.0        | 1634.0      | II                |                  | 1            | 25             | 90             | ESS 1023 |
|             |               |             | HOLL | 1744.0        | 1744.0      | III               |                  | 1            | 25             | 82             |          |
|             |               |             | PALE | 1744.0        | 1744.0      | III               |                  | 1            | 25             | 71             |          |
|             | 1919          | 2400        | HIRA |               |             |                   |                  |              |                |                |          |
|             | 2100          | 2400        | CULG |               |             |                   |                  |              |                |                |          |
| 04          | 0000          | 0700        | CULG | 0019.0        | 0021.0      | III               | G                | 1            | 18             | 170            |          |
|             |               |             | CULG | 0135.0        | 0135.0      | III               | B                | 1            | 20             | 80             |          |
|             |               |             | CULG | 0200.0        | 0246.0      | III               | N                | 1            | 20             | 90             |          |
|             |               |             | LEAR | 0352.0        | 0353.0      | III               |                  | 1            | 25             | 90             |          |
|             |               |             | PALE | 0352.0        | 0353.0      | III               |                  | 1            | 25             | 75             |          |
|             |               |             | CULG | 0353.0        | 0354.0      | III               | G                | 2            | 18             | 90             |          |
|             | 0000          | 0953        | HIRA | 0353.0        | 0353.5      | III               | B                | 1            | 25X            | 80             |          |
|             | 0416          | 1745        | ONDR |               |             |                   |                  |              |                |                |          |
|             |               |             | CULG | 0636.0        | 0637.0      | III               | G                | 1            | 27             | 130            |          |
|             | 0555          | 1200        | IZMI | 0636.1        | 0636.3      | III               | B                | 1            | 40             | 85             |          |
|             |               |             | LEAR | 0732.0        | 0737.0      | III               |                  | 1            | 25             | 180            |          |
|             |               |             | IZMI | 0732.9        | 0734.5      | III               | G,C,FS           | 2            | 25X            | 95U            |          |
|             |               |             | HIRA | 0733.0        | 0734.0      | III               | B                | 1            | 25X            | 100            |          |
|             |               |             | SVTO | 0733.0        | 0737.0      | III               |                  | 1            | 25U            | 138U           |          |
|             |               |             | IZMI | 0735.3        | 0737.8      | UNCLF             |                  | 2            | 25X            | 90             |          |
|             |               |             | HIRA | 0736.0        | 0749.5      | II                |                  | 1            | 30             | 250            |          |
|             |               |             | IZMI | 0736.3        | 0738.0      | III               | GG,C             | 2            | 80U            | 270X           |          |
|             | 0430          | 1805        | BLEN | 0736.3        | 0738.1      | III               | G                | 1            | 150            | 270            |          |
|             |               |             | IZMI | 0736.4        | 0737.9      | I                 | GG,DC            | 2            | 80U            | 215            |          |
|             |               |             | IZMI | 0739.0        | 0742.0      | I                 | N                | 1            | 110            | 160            |          |
|             |               |             | LEAR | 0741.0        | 0753.0      | II                |                  | 1            | 25             | 124            | ESS 0700 |
|             |               |             | IZMI | 0742.0        | 0754.6      | II                | HARM             | 2            | 25X            | 130            |          |
|             |               |             | SVTO | 0744.0        | 0755.0      | II                |                  | 2            | 25U            | 82U            | ESS 0795 |
|             |               |             | IZMI | 0750.5        | 0755.5      | IV                |                  | 2            | 45             | 90U            |          |
|             | 1918          | 2400        | HIRA |               |             |                   |                  |              |                |                |          |
|             |               |             | HOLL | 2010.0        | 2010.0      | III               |                  | 1            | 25             | 60             |          |
|             |               |             | PALE | 2010.0        | 2010.0      | III               |                  | 1            | 25             | 80             |          |
|             | 2200          | 2400        | CULG |               |             |                   |                  |              |                |                |          |
| 05          | 0000          | 0954        | HIRA |               |             |                   |                  |              |                |                |          |
|             | 0000          | 0700        | CULG | 0116.0        | 0116.0      | III               | B                | 1            | 30             | 80             |          |
|             | 0415          | 1746        | ONDR |               |             |                   |                  |              |                |                |          |
|             | 0430          | 1805        | BLEN |               |             |                   |                  |              |                |                |          |
|             |               |             | LEAR | 0557.0        | 0606.0      | III               |                  | 1            | 25             | 146            |          |
|             |               |             | SVTO | 0557.0        | 0558.0      | III               |                  | 1            | 25             | 112            |          |
|             | 0555          | 1200        | IZMI | 0557.5        | 0606.0      | III               | GG               | 1            | 25X            | 165            |          |
|             |               |             | CULG | 0558.0        | 0606.0      | III               | GG               | 1            | 23             | 180            |          |
|             |               |             | PALE | 2025.0        | 0445.0      | III               | N                | 1            | 25             | 133            |          |
|             |               |             | HOLL | 2121.0        | 2122.0      | III               |                  | 1            | 25             | 122            |          |
|             | 1918          | 2400        | HIRA | 2121.0        | 2122.0      | III               | B                | 1            | 25X            | 200            |          |
|             | 2100          | 2400        | CULG | 2121.0        | 2122.0      | III               | G                | 3            | 23             | 200            |          |
|             |               |             | CULG | 2301.0        | 2301.0      | III               | B                | 1            | 27             | 50             |          |
| 06          | 0000          | 0954        | HIRA |               |             |                   |                  |              |                |                |          |
|             | 0415          | 1746        | ONDR |               |             |                   |                  |              |                |                |          |
|             |               |             | LEAR | 0429.0        | 0430.0      | III               |                  | 1            | 25             | 41             |          |
|             |               |             | SVTO | 0430.0        | 0430.0      | III               |                  | 1            | 25             | 33             |          |
|             | 0000          | 0700        | CULG | 0430.0        | 0430.0      | III               | B                | 3            | 20             | 80             |          |
|             | 0601          | 1200        | IZMI | 0847.1        | 0847.8      | III               | GG               | 1            | 50U            | 270X           |          |



| Day  | OBSERVATION   |             | Sta    | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|------|---------------|-------------|--------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
|      | Start<br>(UT) | End<br>(UT) |        |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 06   | 0430          | 1805        | BLEN   | 1506.0        | 1506.1      | III               | G                | 1            | 500            | 1000           |         |
|      | 1918          | 2400        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 2100          | 2400        | CULG   | 2159.0        | 2201.0      | III               | G                | 1            | 23             | 60             |         |
|      |               |             | CULG   | 2240.0        | 2245.0      | III               | G                | 1            | 30             | 140            |         |
| 07   | 0000          | 0955        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 0000          | 0700        | CULG   | 0029.0        | 0129.0      | III               | S,C              | 1            | 35             | 200            |         |
|      | 0415          | 1747        | ONDR   |               |             |                   |                  |              |                |                |         |
|      | 0430          | 1805        | BLEN   |               |             |                   |                  |              |                |                |         |
|      | 0606          | 1200        | IZMI   |               |             |                   |                  |              |                |                |         |
|      | 1918          | 2400        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 2100          | 2400        | CULG   |               |             |                   |                  |              |                |                |         |
| 08   | 0000          | 0955        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 0414          | 1748        | ONDR   |               |             |                   |                  |              |                |                |         |
|      | 0430          | 1805        | BLEN   |               |             |                   |                  |              |                |                |         |
|      | 0555          | 1200        | IZMI   |               |             |                   |                  |              |                |                |         |
|      | 0000          | 0700        | CULG   | 0602.0        | 0602.0      | III               | B                | 1            | 50             | 180            |         |
|      | 1917          | 2400        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 2100          | 2400        | CULG   |               |             |                   |                  |              |                |                |         |
| 09   | 0000          | 0700        | CULG   |               |             |                   |                  |              |                |                |         |
|      | 0000          | 0956        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 0414          | 1748        | ONDR   |               |             |                   |                  |              |                |                |         |
|      | 0430          | 1810        | BLEN   |               |             |                   |                  |              |                |                |         |
|      | 0600          | 1200        | IZMI   |               |             |                   |                  |              |                |                |         |
|      |               |             | SVTO   | 1238.0        | 1238.0      | III               |                  | 1            | 25             | 49             |         |
|      |               |             | HOLL   | 1404.0        | 1431.0      | III               | N                | 1            | 25             | 54             |         |
|      | 1917          | 2400        | HIRA   |               |             |                   |                  |              |                |                |         |
| 2100 | 2400          | CULG        |        |               |             |                   |                  |              |                |                |         |
|      |               | HOLL        | 2258.0 | 0045.0        | III         |                   | 1                | 25           | 63             |                |         |
| 10   | 0000          | 0700        | CULG   |               |             |                   |                  |              |                |                |         |
|      | 0000          | 0956        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 0414          | 1749        | ONDR   |               |             |                   |                  |              |                |                |         |
|      | 0425          | 1810        | BLEN   |               |             |                   |                  |              |                |                |         |
|      | 0603          | 1200        | IZMI   |               |             |                   |                  |              |                |                |         |
|      | 1917          | 2400        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 2100          | 2400        | CULG   |               |             |                   |                  |              |                |                |         |
| 11   | 0000          | 0957        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 0000          | 0650        | CULG   | 0045.0        | 0045.0      | III               | B                | 1            | 50             | 200            |         |
|      | 0414          | 1749        | ONDR   |               |             |                   |                  |              |                |                |         |
|      | 0425          | 1810        | BLEN   |               |             |                   |                  |              |                |                |         |
|      | 0555          | 1200        | IZMI   |               |             |                   |                  |              |                |                |         |
|      |               |             | SVTO   | 1210.0        | 1219.0      | III               |                  | 1            | 25             | 51             |         |
|      | 1917          | 2400        | HIRA   |               |             |                   |                  |              |                |                |         |
| 2100 | 2400          | CULG        |        |               |             |                   |                  |              |                |                |         |
| 12   | 0000          | 0957        | HIRA   |               |             |                   |                  |              |                |                |         |
|      | 0000          | 0650        | CULG   | 0103.0        | 0103.0      | III               | B                | 1            | 20             | 90             |         |
|      |               |             | CULG   | 0356.0        | 0358.0      | III               | G                | 2            | 18             | 150            |         |
|      | 0425          | 1810        | BLEN   |               |             |                   |                  |              |                |                |         |
|      | 0604          | 1200        | IZMI   | 0604.0E       | 1200.0D     | I                 | N                | 1            | 50U            | 270X           |         |
|      | 0414          | 1750        | ONDR   | 0802.5        | 0803.1      | DCIM              | G                | 1            | 800X           | 1114           |         |
|      |               |             | IZMI   | 1136.4        | 1136.6      | III               | G                | 1            | 50U            | 115            |         |
|      |               |             | IZMI   | 1155.3        | 1156.8      | III               | G                | 1            | 50U            | 120U           |         |
|      |               |             | HOLL   | 1527.0        | 1528.0      | III               |                  | 1            | 25             | 59             |         |
|      |               |             | SVTO   | 1527.0        | 1528.0      | III               |                  | 1            | 25             | 51             |         |
|      |               |             | HOLL   | 1550.0        | 1630.0      | III               | N                | 1            | 25             | 132            |         |
|      |               |             | SVTO   | 1550.0        | 1550.0      | III               |                  | 1            | 25             | 83             |         |
|      |               |             | SVTO   | 1557.0        | 1557.0      | III               |                  | 1            | 25             | 83             |         |
|      |               |             | HOLL   | 1720.0        | 1720.0      | III               |                  |              |                |                |         |

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# S O L A R R A D I O E M I S S I O N Spectral Observations

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| OBSERVATION |                        | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|-------------|------------------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Day         | Start End<br>(UT) (UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 13          |                        | CULG | 0334.0        | 0650.0D     | I                 | S                | 1            | 100            | 180            |         |
|             |                        | CULG | 0412.0        | 0413.0      | III               | G                | 1            | 20             | 60             |         |
|             | 0414 1750              | ONDR |               |             |                   |                  |              |                |                |         |
|             |                        | LEAR | 0421.0        | 0537.0      | CONT              |                  | 1            | 86             | 180            |         |
|             | 0425 1810              | CULG | 0423.0        | 0423.0      | III               | B                | 1            | 18             | 40             |         |
|             |                        | BLEN |               |             |                   |                  |              |                |                |         |
|             |                        | CULG | 0503.0        | 0503.0      | III               | B                | 2            | 18             | 45             |         |
|             |                        | CULG | 0530.0        | 0615.0      | III               | N                | 1            | 23             | 180            |         |
|             | 0630 1200              | IZMI | 0603.0E       | 1200.0D     | I                 | S                | 2            | 80U            | 270X           |         |
|             |                        | LEAR | 0725.0        | 0906.0      | CONT              |                  | 1            | 72             | 180            |         |
|             |                        | IZMI | 0726.5        | 0727.9      | III               | G                | 1            | 45             | 95             |         |
|             |                        | IZMI | 0750.6        | 0751.1      | III               | G                | 1            | 45             | 85             |         |
|             |                        | IZMI | 0848.1        | 0848.4      | III               | G                | 2            | 180            | 270X           |         |
|             |                        | IZMI | 0942.6        | 0942.9      | III               | G                | 1            | 55             | 90             |         |
|             |                        | HOLL | 1847.0        | 1848.0      | III               |                  | 1            | 25             | 76             |         |
|             |                        | HOLL | 2108.0        | 2108.0      | III               |                  | 1            | 25             | 58             |         |
|             | 1917 2400              | HIRA | 2108.0        | 2108.5      | III               | B                | 1            | 30             | 60             |         |
|             | 2110 2400              | CULG | 2110.0E       | 2400.0D     | I                 | S,C              | 1            | 100            | 180            |         |
|             |                        | CULG | 2119.0        | 2324.0      | III               | N                | 1            | 27             | 150            |         |
|             |                        | LEAR | 2338.0        | 0906.0      | CONT              |                  | 1            | 111            | 180            |         |
| 14          | 0000 0650              | CULG | 0000.0E       | 0650.0D     | I                 | S,C              | 1            | 100            | 180            |         |
|             |                        | CULG | 0005.0        | 0005.0      | III               | G                | 1            | 20             | 50             |         |
|             |                        | CULG | 0020.0        | 0020.0      | III               | B                | 1            | 27             | 80             |         |
|             |                        | HIRA | 0130.5        | 0131.0      | III               | B                | 1            | 200            | 500            |         |
|             | 0000 0958              | LEAR | 0131.0        | 0131.0      | III               |                  | 1            | 69             | 114            |         |
|             |                        | CULG | 0132.0        | 0132.0      | III               | B                | 1            | 70             | 170            |         |
|             |                        | CULG | 0300.0        | 0300.0      | III               | B                | 1            | 20             | 80             |         |
|             |                        | CULG | 0307.0        | 0308.0      | III               | G                | 1            | 20             | 80             |         |
|             | 0414 1751              | ONDR |               |             |                   |                  |              |                |                |         |
|             | 0425 1815              | BLEN |               |             |                   |                  |              |                |                |         |
|             |                        | CULG | 0426.0        | 0427.0      | III               | G                | 3            | 20             | 180            |         |
|             |                        | HIRA | 0426.0        | 0427.0      | III               | G                | 1            | 25X            | 120            |         |
|             |                        | LEAR | 0426.0        | 0427.0      | III               |                  | 1            | 25             | 132            |         |
|             |                        | SVTO | 0426.0        | 0426.0      | III               |                  | 1            | 25             | 138            |         |
|             |                        | CULG | 0445.0        | 0445.0      | III               | B                | 2            | 20             | 80             |         |
|             |                        | CULG | 0512.0        | 0620.0      | III               | N                | 1            | 25             | 90             |         |
|             |                        | IZMI | 0555.0E       | 1200.0D     | I                 | S                | 2            | 110U           | 270X           |         |
|             | 0555 1200              | LEAR | 0609.0        | 0611.0      | III               |                  | 1            | 25             | 101            |         |
|             |                        | CULG | 0610.0        | 0612.0      | III               | G                | 3            | 20             | 160            |         |
|             |                        | HIRA | 0610.0        | 0611.0      | III               | B                | 2            | 25X            | 80             |         |
|             |                        | IZMI | 0610.0        | 0613.4      | III               | G                | 2            | 25X            | 95             |         |
|             |                        | SVTO | 0610.0        | 0611.0      | III               |                  | 2            | 25             | 136            |         |
|             |                        | IZMI | 0610.1        | 0613.4      | V                 |                  | 2            | 25X            | 45             |         |
|             |                        | IZMI | 0836.8        | 0837.6      | III               | G                | 1            | 45             | 65             |         |
|             |                        | IZMI | 0841.6        | 0901.1      | III               | N                | 1            | 45             | 95             |         |
|             |                        | HOLL | 1320.0        | 1321.0      | III               |                  | 1            | 25             | 56             |         |
|             |                        | SVTO | 1320.0        | 1321.0      | III               |                  | 1            | 25U            | 74U            |         |
|             |                        | HOLL | 1356.0        | 1356.0      | III               |                  | 1            | 25             | 77             |         |
|             |                        | SVTO | 1356.0        | 1356.0      | III               |                  | 1            | 25U            | 56U            |         |
|             | 1917 2400              | HIRA |               |             |                   |                  |              |                |                |         |
|             | 2110 2400              | CULG | 2110.0E       | 2400.0D     | III               | N                | 1            | 23             | 180            |         |
|             |                        | HOLL | 2312.0        | 2312.0      | III               |                  | 1            | 25             | 87             |         |
| 15          | 0000 0650              | CULG | 0000.0E       | 0650.0D     | III               | N                | 1            | 20             | 180            |         |
|             |                        | CULG | 0024.0        | 0650.0D     | I                 | S                | 1            | 60             | 180            |         |
|             |                        | LEAR | 0031.0        | 0032.0      | III               |                  | 1            | 70             | 163            |         |
|             |                        | HIRA | 0031.5        | 0032.0      | III               | B                | 1            | 80             | 210            |         |
|             | 0000 0958              | LEAR | 0044.0        | 0906.0      | CONT              |                  | 1            | 75             | 180            |         |
|             |                        | LEAR | 0051.0        | 0053.0      | III               |                  | 1            | 56             | 162            |         |
|             |                        | HIRA | 0053.0        | 0053.5      | III               | B                | 1            | 60             | 110            |         |
|             |                        | LEAR | 0143.0        | 0148.0      | III               |                  | 1            | 67             | 180            |         |
|             |                        | HIRA | 0143.5        | 0144.0      | III               | B                | 1            | 70             | 200            |         |
|             |                        | CULG | 0144.0        | 0144.0      | III               | G                | 2            | 40             | 200            |         |
|             | 0414 1751              | ONDR |               |             |                   |                  |              |                |                |         |
|             | 0425 1815              | BLEN |               |             |                   |                  |              |                |                |         |
|             |                        | LEAR | 0527.0        | 0527.0      | III               |                  | 1            | 25             | 45             |         |
|             |                        | HIRA | 0532.0        | 0532.5      | III               | B                | 1            | 80             | 140            |         |
|             |                        | LEAR | 0609.0        | 0706.0      | III               | N                | 1            | 25             | 180            |         |

# S O L A R   R A D I O   E M I S S I O N

## Spectral Observations

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| OBSERVATION |               |             | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks  |
|-------------|---------------|-------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|----------|
| Day         | Start<br>(UT) | End<br>(UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |          |
| 15          | 0618          | 1204        | SVTO | 0609.0        | 0619.0      | III               |                  | 1            | 25             | 180            |          |
|             |               |             | IZMI | 0609.8        | 0618.2      | III               | GG               | 2            | 25X            | 215            |          |
|             |               |             | CULG | 0610.0        | 0615.0      | III               | G                | 3            | 20             | 150            |          |
|             |               |             | HIRA | 0610.0        | 0615.5      | III               | G                | 1            | 25X            | 150            |          |
|             |               |             | IZMI | 0618.0E       | 1204.0D     | I                 | S                | 2            | 110U           | 270X           |          |
|             |               |             | HIRA | 0619.0        | 0620.0      | III               | B                | 2            | 80             | 200            |          |
|             |               |             | CULG | 0620.0        | 0620.0      | III               | B                | 2            | 40             | 180            |          |
|             |               |             | IZMI | 0638.7        | 0638.8      | III               | B                | 1            | 45             | 85             |          |
|             |               |             | LEAR | 0849.0        | 0850.0      | III               |                  | 1            | 61             | 142            |          |
|             |               |             | SVTO | 0849.0        | 0850.0      | III               |                  | 1            | 62U            | 146U           |          |
|             |               |             | HIRA | 0849.5        | 0851.0      | III               | G                | 1            | 80             | 220            |          |
|             |               |             | IZMI | 0849.6        | 0850.8      | III               | G                | 2            | 55             | 175            |          |
|             |               |             | IZMI | 0858.7        | 0858.8      | III               | B                | 1            | 55             | 85             |          |
|             |               |             | IZMI | 0913.6        | 0917.5      | III               | G                | 1            | 45             | 70U            |          |
|             |               |             | SVTO | 0947.0        | 0951.0      | III               |                  | 1            | 25             | 162            |          |
|             |               |             | IZMI | 0950.4        | 0951.1      | III               | G                | 1            | 25X            | 160            |          |
|             |               |             | IZMI | 1013.1        | 1013.6      | III               | G                | 2            | 80U            | 210            |          |
|             |               |             | IZMI | 1131.0        | 1131.6      | III               | G                | 1            | 45             | 85             |          |
|             |               |             | IZMI | 1134.4        | 1136.4      | III               | G                | 1            | 95             | 270X           |          |
|             |               |             | HOLL | 1339.0        | 1340.0      | III               |                  | 1            | 25             | 67             |          |
|             |               |             | SVTO | 1339.0        | 1340.0      | III               |                  | 1            | 25             | 59             |          |
|             |               |             | HOLL | 1631.0        | 1631.0      | III               |                  | 1            | 25             | 145            |          |
|             |               |             | SVTO | 1631.0        | 1631.0      | III               |                  | 1            | 25             | 175            |          |
|             | 1917          | 2400        | HIRA | 1958.5        | 1959.5      | III               | B                | 2            | 80             | 410            |          |
|             |               |             | HOLL | 1959.0        | 1959.0      | III               |                  | 1            | 25             | 65             |          |
|             |               |             | HOLL | 1959.0        | 1959.0      | III               |                  | 1            | 25             | 180            |          |
|             |               |             | HOLL | 2030.0        | 0026.0      | III               | N                | 1            | 25             | 170            |          |
|             |               |             | HIRA | 2037.5        | 2046.0      | III               | G                | 1            | 25X            | 200            |          |
|             |               |             | PALE | 2039.0        | 2046.0      | III               |                  | 1            | 25             | 125            |          |
|             |               |             | CULG | 2110.0E       | 2400.0D     | III               | N                | 1            | 23             | 180            |          |
|             |               |             | CULG | 2130.0        | 2131.0      | III               | G                | 3            | 23             | 150            |          |
|             | 2110          | 2400        | HIRA | 2130.0        | 2130.5      | III               | B                | 1            | 30             | 130            |          |
|             |               |             | HIRA | 2134.5        | 2135.0      | III               | B                | 1            | 25X            | 50             |          |
|             |               |             | CULG | 2141.0        | 2142.0      | III               | G                | 2            | 20             | 140            |          |
|             |               |             | HIRA | 2141.0        | 2142.0      | III               | G                | 1            | 25X            | 120            |          |
|             |               |             | HIRA | 2215.5        | 2221.0      | III               | G                | 1            | 25X            | 110            |          |
|             |               |             | CULG | 2216.0        | 2222.0      | III               | G                | 2            | 20             | 180            |          |
|             |               |             | HIRA | 2314.5        | 2315.5      | III               | G                | 1            | 190            | 310            |          |
|             |               |             |      |               |             |                   |                  |              |                |                |          |
|             |               |             |      |               |             |                   |                  |              |                |                |          |
|             |               |             |      |               |             |                   |                  |              |                |                |          |
|             |               |             |      |               |             |                   |                  |              |                |                |          |
|             |               |             |      |               |             |                   |                  |              |                |                |          |
| 16          | 0000          | 0650        | CULG | 0000.0E       | 0650.0D     | III               | N                | 1            | 20             | 180            |          |
|             |               |             | ONDR |               |             |                   |                  |              |                |                |          |
|             |               |             | LEAR | 0422.0        | 0432.0      | II                |                  | 1            | 25             | 134            | ESS 2165 |
|             |               |             | CULG | 0423.0        | 0425.0      | II                | FN               | 3            | 25             | 60             |          |
|             | 0414          | 1752        | CULG | 0423.0        | 0425.0      | II                | SH               | 3            | 50             | 120            | ESS 2000 |
|             |               |             | HIRA | 0423.0        | 0436.0      | II                |                  | 2            | 50             | 120            |          |
|             |               |             | PALE | 0423.0        | 0432.0      | II                |                  | 2            | 25             | 134            |          |
|             |               |             | SVTO | 0423.0        | 0432.0      | II                |                  | 2            | 25             | 141            | ESS 1416 |
|             | 0000          | 0959        | HIRA | 0423.0        | 0429.0      | II                |                  | 2            | 25X            | 50             |          |
|             |               |             | CULG | 0424.0        | 0444.0      | II                | SH               | 3            | 25             | 150            | ESS 550  |
|             |               |             | LEAR | 0424.0        | 0440.0      | II                |                  | 1            | 25             | 119            | ESS 0662 |
|             |               |             |      |               |             |                   |                  |              |                |                |          |
|             | 0425          | 1345        | BLEN |               |             |                   |                  |              |                |                |          |
|             |               |             | CULG | 0425.0        | 0433.0      | II                | FN               | 3            | 25             | 40             |          |
|             |               |             | CULG | 0449.0        | 0449.0      | III               | B                | 3            | 20             | 80             |          |
|             |               |             | CULG | 0511.0        | 0511.0      | III               | B                | 3            | 20             | 80             |          |
|             | 0555          | 1200        | IZMI | 0555.0E       | 1200.0D     | III               | N                | 1            | 25X            | 95U            |          |
|             |               |             | IZMI | 0555.0E       | 1200.0D     | I                 | N                | 1            | 110U           | 250X           |          |
|             |               |             | HIRA | 0759.0        | 0759.5      | III               | B                | 1            | 50             | 210            |          |
|             |               |             | SVTO | 0759.0        | 0759.0      | III               |                  | 1            | 25             | 146            |          |
|             |               |             | IZMI | 0759.4        | 0759.9      | III               | G                | 2            | 25X            | 250            |          |
|             |               |             | HIRA | 0802.0        | 0802.5      | III               | B                | 1            | 60             | 220            |          |
|             |               |             | IZMI | 0802.3        | 0803.9      | III               | G                | 2            | 45U            | 250            |          |
|             |               |             | SVTO | 0824.0        | 0825.0      | III               |                  | 1            | 25             | 55             |          |
|             |               |             | SVTO | 0853.0        | 0854.0      | III               |                  | 1            | 25             | 180            |          |
|             |               |             | HIRA | 0853.5        | 0854.0      | III               | B                | 1            | 25X            | 70             |          |
|             |               |             | IZMI | 0853.9        | 0854.0      | III               | G                | 2            | 25X            | 90             |          |
|             |               |             | SVTO | 0905.0        | 0907.0      | III               |                  | 1            | 25             | 82             |          |
|             |               |             | IZMI | 0905.1        | 0907.7      | III               | G                | 2            | 25X            | 145            |          |
|             | 0957          | 1005        | SVTO | 0957.0        | 1005.0      | III               |                  | 1            | 25             | 53             |          |
|             |               |             | IZMI | 1005.4        | 1005.9      | III               | G                | 2            | 45U            | 85             |          |

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Jun 04

# S O L A R R A D I O E M I S S I O N Spectral Observations

JUNE 2004

| OBSERVATION |            |          | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|-------------|------------|----------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Day (UT)    | Start (UT) | End (UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 16          |            |          | SVTO | 1050.0        | 1147.0      | III               | N                | 2            | 25             | 180            |         |
|             |            |          | IZMI | 1113.0        | 1113.6      | III               | G                | 2            | 50U            | 270X           |         |
|             |            |          | IZMI | 1119.2        | 1119.7      | III               | G                | 2            | 50U            | 270X           |         |
|             |            |          | IZMI | 1145.9        | 1147.3      | III               | G                | 2            | 25X            | 160            |         |
|             |            |          | SVTO | 1327.0        | 1333.0      | III               |                  | 1            | 25             | 53             |         |
|             |            |          | SVTO | 1427.0        | 1428.0      | III               |                  | 1            | 25             | 69             |         |
|             |            |          | SVTO | 1454.0        | 1454.0      | III               |                  | 1            | 25             | 49             |         |
|             |            |          | PALE | 2022.0        | 2024.0      | III               |                  | 1            | 25             | 65             |         |
|             | 1918       | 2400     | HIRA | 2022.0        | 2022.5      | III               | B                | 1            | 25X            | 50             |         |
|             | 2110       | 2400     | CULG | 2110.0E       | 2400.0D     | I                 | S,C              | 1            | 65             | 180            |         |
|             |            |          | CULG | 2135.0        | 2400.0D     | III               | N                | 1            | 23             | 180            |         |
|             |            |          | CULG | 2138.0        | 2140.0      | III               | G                | 2            | 25             | 180            |         |
|             |            |          | HIRA | 2138.0        | 2140.0      | III               | G                | 1            | 50             | 220            |         |
|             |            |          | CULG | 2233.0        | 2233.0      | III               | B                | 2            | 20             | 90             |         |
|             |            |          | LEAR | 2331.0        | 0907.0      | CONT              |                  | 1            | 85             | 180            |         |
| 17          |            |          | CULG | 0000.0E       | 0650.0D     | I                 | S                | 1            | 120            | 180            |         |
|             |            |          | CULG | 0000.0E       | 0650.0D     | III               | N                | 1            | 20             | 180            |         |
|             |            |          | CULG | 0121.0        | 0122.0      | III               | G                | 3            | 18             | 140            |         |
|             |            |          | HOLL | 0121.0        | 0132.0      | III               |                  | 1            | 25             | 180            |         |
|             |            |          | LEAR | 0121.0        | 0121.0      | III               |                  | 1            | 25             | 124            |         |
|             |            |          | PALE | 0121.0        | 0121.0      | III               |                  | 1            | 25             | 93             |         |
|             |            |          | HIRA | 0121.0        | 0122.0      | III               | B                | 1            | 25X            | 110            |         |
|             |            |          | LEAR | 0131.0        | 0132.0      | III               |                  | 1            | 25             | 180            |         |
|             |            |          | PALE | 0131.0        | 0132.0      | III               |                  | 1            | 25             | 180            |         |
|             |            |          | HIRA | 0131.5        | 0132.0      | III               | B                | 2            | 25X            | 200            |         |
|             |            |          | CULG | 0132.0        | 0132.0      | III               | B                | 3            | 18             | 220            |         |
|             |            |          | LEAR | 0220.0        | 0221.0      | III               |                  | 1            | 25             | 88             |         |
|             |            |          | PALE | 0220.0        | 0221.0      | III               |                  | 1            | 25             | 64             |         |
|             |            |          | CULG | 0221.0        | 0221.0      | III               | B                | 2            | 20             | 100            |         |
|             |            |          | HIRA | 0236.0        | 0239.5      | III               | G                | 1            | 110            | 320            |         |
|             |            |          | LEAR | 0408.0        | 0408.0      | III               |                  | 1            | 25             | 39             |         |
|             |            |          | PALE | 0408.0        | 0408.0      | III               |                  | 1            | 25             | 44             |         |
|             |            |          | CULG | 0409.0        | 0409.0      | III               | B                | 3            | 20             | 35             |         |
|             | 0424       | 1752     | ONDR |               |             |                   |                  |              |                |                |         |
|             | 0605       | 1200     | IZMI | 0605.0E       | 1200.0D     | I                 | S                | 2            | 110U           | 270X           |         |
|             |            |          | IZMI | 0615.2        | 0618.0      | III               | G                | 1            | 45             | 170            |         |
|             |            |          | LEAR | 0650.0        | 0651.0      | III               |                  | 1            | 25             | 110            |         |
|             |            |          | SVTO | 0650.0        | 0651.0      | III               |                  | 1            | 25             | 81             |         |
|             |            |          | IZMI | 0650.8        | 0651.1      | III               | G                | 1            | 30             | 95             |         |
|             |            |          | SVTO | 0736.0        | 0736.0      | III               |                  | 1            | 25             | 52             |         |
|             |            |          | LEAR | 0820.0        | 0829.0      | III               |                  | 1            | 25             | 161            |         |
|             |            |          | IZMI | 0825.3        | 0825.4      | III               | B                | 1            | 50             | 145            |         |
|             |            |          | SVTO | 0827.0        | 0828.0      | III               |                  | 1            | 25             | 82             |         |
|             |            |          | HIRA | 0827.5        | 0829.5      | III               | G                | 1            | 25X            | 180            |         |
|             |            |          | IZMI | 0827.7        | 0829.7      | III               | GG               | 2            | 25X            | 160            |         |
|             |            |          | SVTO | 0858.0        | 0858.0      | III               |                  | 1            | 25             | 50             |         |
|             |            |          | IZMI | 0905.0E       | 1200.0D     | III               | N                | 1            | 25X            | 95U            |         |
|             |            |          | SVTO | 0924.0        | 0931.0      | III               |                  | 1            | 25             | 180            |         |
|             |            |          | HIRA | 0924.5        | 0925.5      | III               | G                | 3            | 25X            | 170            |         |
|             |            |          | IZMI | 0924.6        | 0925.7      | III               | GG,C             | 2            | 25X            | 270X           |         |
|             |            |          | IZMI | 0929.9        | 0931.7      | III               | G                | 1            | 25X            | 160            |         |
|             |            |          | SVTO | 0952.0        | 0958.0      | III               |                  | 1            | 25             | 49             |         |
|             | 0650       | 1815     | BLEN | 1118.0        | 1815.0X     | I                 | DC               | 2            | 180            | 350            |         |
|             |            |          | BLEN | 1138.7        | 1139.1      | III               |                  | 2            | 180            | 350            |         |
|             |            |          | IZMI | 1139.0        | 1139.1      | III               | G                | 2            | 180            | 270X           |         |
|             |            |          | HOLL | 1304.0        | 1305.0      | III               |                  | 1            | 25             | 96             |         |
|             |            |          | SVTO | 1304.0        | 1305.0      | III               |                  | 1            | 25             | 83             |         |
|             |            |          | SVTO | 1318.0        | 1318.0      | III               |                  | 1            | 25             | 35             |         |
|             |            |          | HOLL | 1424.0        | 1430.0      | III               |                  | 1            | 25             | 179            |         |
|             |            |          | SVTO | 1424.0        | 1430.0      | III               |                  | 1            | 25             | 180            |         |
|             |            |          | HOLL | 1444.0        | 2039.0      | III               | N                | 1            | 25             | 178            |         |
|             |            |          | SVTO | 1456.0        | 1458.0      | III               |                  | 1            | 25             | 180            |         |
|             |            |          | SVTO | 1512.0        | 1520.0      | III               |                  | 1            | 25             | 155            |         |
|             |            |          | SVTO | 1546.0        | 1552.0      | III               |                  | 1            | 25             | 85             |         |
|             |            |          | SVTO | 1556.0        | 1655.0      | III               | N                | 1            | 25             | 180            |         |
|             |            |          | PALE | 1618.0        | 1619.0      | III               |                  | 1            | 25             | 118            |         |
|             |            |          | SVTO | 1618.0        | 1620.0      | III               |                  | 1            | 25             | 180            |         |
|             |            |          | PALE | 1738.0        | 1738.0      | III               |                  | 1            | 25             | 58             |         |

# S O L A R   R A D I O   E M I S S I O N

## Spectral Observations

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Jun 04

JUNE                      2004

| OBSERVATION |                        | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|-------------|------------------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Day         | Start End<br>(UT) (UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 17          |                        | PALE | 1806.0        | 1807.0      | III               |                  | 1            | 25             | 126            |         |
|             |                        | PALE | 1825.0        | 1826.0      | III               |                  | 1            | 25             | 71             |         |
|             |                        | PALE | 1912.0        | 0246.0      | III               | N                | 1            | 25             | 180            |         |
|             | 2110 2400              | CULG | 2110.0E       | 2400.0D     | III               | S,C              | 1            | 20             | 180            |         |
|             |                        | CULG | 2110.0E       | 2400.0D     | I                 | S                | 1            | 100            | 180            |         |
|             |                        | HOLL | 2127.0        | 2320.0      | III               | N                | 1            | 25             | 165            |         |
|             | 1918 2400              | HIRA | 2127.0        | 2129.0      | III               | G                | 2            | 25X            | 200            |         |
|             |                        | HIRA | 2142.5        | 2143.0      | III               | B                | 2            | 25X            | 190            |         |
|             |                        | CULG | 2143.0        | 2144.0      | III               | G                | 3            | 18             | 180            |         |
|             |                        | CULG | 2204.0        | 2227.0      | III               | N                | 3            | 20             | 180            |         |
|             |                        | HIRA | 2206.5        | 2207.0      | III               | B                | 1            | 25X            | 120            |         |
|             |                        | HIRA | 2232.0        | 2234.5      | III               | G                | 2            | 25X            | 210            |         |
|             |                        | CULG | 2233.0        | 2234.0      | III               | G                | 3            | 18X            | 260            |         |
|             |                        | CULG | 2256.0        | 2258.0      | III               | G                | 3            | 20             | 100            |         |
|             |                        | HIRA | 2256.5        | 2258.0      | III               | G                | 1            | 25X            | 80             |         |
|             |                        | LEAR | 2355.0        | 0907.0      | CONT              |                  | 1            | 70             | 180            |         |
|             |                        | LEAR | 2355.0        | 0907.0      | III               | N                | 1            | 25             | 180            |         |
| 18          | 0000 0650              | CULG | 0000.0E       | 0650.0D     | III               | S                | 1            | 20             | 180            |         |
|             |                        | CULG | 0000.0E       | 0650.0D     | I                 | S,C              | 2            | 60             | 180            |         |
|             |                        | CULG | 0045.0        | 0046.0      | III               | G                | 2            | 20             | 160            |         |
|             | 0000 0959              | HIRA | 0045.5        | 0046.0      | III               | B                | 1            | 25X            | 60             |         |
|             |                        | CULG | 0123.0        | 0125.0      | III               | G                | 3            | 18X            | 150            |         |
|             |                        | HOLL | 0123.0        | 0124.0      | III               |                  | 1            | 25             | 130            |         |
|             |                        | HIRA | 0123.5        | 0124.5      | III               | B                | 2            | 25X            | 120            |         |
|             |                        | SVTO | 0341.0        | 1759.0      | CONT              |                  | 1            | 75             | 180            |         |
|             |                        | SVTO | 0341.0        | 1759.0      | CONT              |                  | 1            | 95             | 180            |         |
|             | 0414 1752              | ONDR |               |             |                   |                  |              |                |                |         |
|             |                        | CULG | 0416.0        | 0417.0      | III               | G                | 3            | 18X            | 160            |         |
|             |                        | PALE | 0416.0        | 0416.0      | III               |                  | 1            | 25             | 142            |         |
|             |                        | SVTO | 0416.0        | 0416.0      | III               |                  | 1            | 25             | 138            |         |
|             |                        | HIRA | 0416.5        | 0417.0      | III               | B                | 2            | 25X            | 180            |         |
|             | 0425 1815              | BLN  | 0425.0X       | 1815.0X     | I                 | DC               | 3            | 100X           | 400            |         |
|             |                        | IZMI | 0555.0E       | 1200.0D     | III               | N                | 2            | 25X            | 92U            |         |
|             | 0555 1200              | IZMI | 0555.0E       | 1200.0D     | I                 | S,C              | 2            | 50U            | 270X           |         |
|             |                        | SVTO | 0621.0        | 1712.0      | III               | N                | 1            | 25             | 180            |         |
|             |                        | IZMI | 0635.5        | 0643.7      | III               | GG               | 2            | 25X            | 245            |         |
|             |                        | IZMI | 0745.4        | 0749.2      | III               | GG               | 2            | 25X            | 95             |         |
|             |                        | IZMI | 0942.0        | 0942.2      | III               | G                | 2            | 25X            | 150            |         |
|             |                        | IZMI | 1157.5        | 1158.0      | III               | G                | 2            | 25X            | 170            |         |
|             |                        | HOLL | 1232.0        | 0154.0      | CONT              |                  | 1            | 96             | 180            |         |
|             |                        | PALE | 1608.0        | 0458.0      | CONT              |                  | 1            | 100U           | 180U           |         |
|             |                        | PALE | 1608.0        | 0458.0      | III               | N                | 1            | 25             | 180            |         |
|             | 1918 2400              | HIRA | 2015.0        | 2020.0      | III               | G                | 1            | 25X            | 200            |         |
|             |                        | CULG | 2110.0E       | 2400.0D     | III               | S                | 2            | 20             | 180            |         |
|             | 2110 2400              | CULG | 2110.0E       | 2400.0D     | I                 | S,C              | 2            | 57             | 180            |         |
|             |                        | CULG | 2314.0        | 2315.0      | III               | G                | 3            | 18             | 160            |         |
|             |                        | HIRA | 2314.0        | 2315.0      | III               | G                | 1            | 25X            | 140            |         |
|             |                        | CULG | 2331.0        | 2331.0      | III               | B                | 3            | 18X            | 180            |         |
|             |                        | HIRA | 2331.5        | 2332.0      | III               | B                | 2            | 25X            | 170            |         |
|             |                        | HIRA | 2343.0        | 2344.0      | III               | G                | 2            | 25X            | 170            |         |
|             |                        | CULG | 2344.0        | 2344.0      | III               | B                | 3            | 18X            | 200            |         |
|             |                        | LEAR | 2346.0        | 0907.0      | CONT              |                  | 1            | 56             | 180            |         |
|             |                        | LEAR | 2346.0        | 0907.0      | III               | N                | 1            | 25             | 180            |         |
|             |                        |      |               |             |                   |                  |              |                |                |         |
| 19          |                        | CULG | 0000.0        | 0001.0      | III               | G                | 3            | 18X            | 160            |         |
|             |                        | CULG | 0000.0E       | 0650.0D     | III               | S                | 2            | 18             | 180            |         |
|             |                        | CULG | 0000.0E       | 0650.0D     | I                 | S,C              | 2            | 50             | 180            |         |
|             | 0000 0650              | CULG | 0117.0        | 0117.0      | III               | B                | 3            | 18X            | 180            |         |
|             |                        | HIRA | 0117.0        | 0117.5      | III               | B                | 1            | 25X            | 200            |         |
|             |                        | CULG | 0300.0        | 0300.0      | III               | G                | 3            | 18X            | 130            |         |
|             |                        | CULG | 0306.0        | 0310.0      | III               | G                | 3            | 18X            | 150            |         |
|             |                        | HIRA | 0306.0        | 0310.0      | III               | G                | 1            | 25X            | 110            |         |
|             |                        | SVTO | 0341.0        | 1419.0      | CONT              |                  | 1            | 45             | 180            |         |
|             |                        | SVTO | 0409.0        | 1759.0      | III               | N                | 2            | 25             | 180            |         |
|             | 0414 1753              | ONDR |               |             |                   |                  |              |                |                |         |
|             |                        | BLN  | 0425.0X       | 1815.0X     | I                 | DC               | 3            | 100X           | 400            |         |
|             | 0425 1815              | HIRA | 0454.0        | 0458.0      | III               | G                | 1            | 25X            | 130            |         |
|             |                        | CULG | 0456.0        | 0458.0      | III               | G                | 3            | 18X            | 150            |         |

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# S O L A R R A D I O E M I S S I O N Spectral Observations

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| OBSERVATION  |             | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|--------------|-------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Start<br>Day | End<br>(UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 19           | 0602 1200   | SVTO | 0456.0        | 0457.0      | III               |                  | 2            | 25             | 146            |         |
|              |             | CULG | 0524.0        | 0524.0      | III               | B                | 3            | 20             | 90             |         |
|              |             | IZMI | 0602.0E       | 1200.0D     | III               | N                | 2            | 25X            | 95U            |         |
|              |             | IZMI | 0602.0E       | 1200.0D     | I                 | S,C              | 2            | 45U            | 270X           |         |
|              |             | IZMI | 0645.1        | 0656.2      | III               | G,C              | 2            | 25X            | 150            |         |
|              |             | HIRA | 0655.0        | 0655.5      | III               | B                | 1            | 30             | 140            |         |
|              |             | SVTO | 0655.0        | 0655.0      | III               |                  | 1            | 25             | 151            |         |
|              |             | IZMI | 0810.8        | 0812.8      | III               | G                | 2            | 25X            | 130            |         |
|              |             | IZMI | 0835.3        | 0840.9      | III               | GG               | 2            | 25X            | 95U            |         |
|              |             | IZMI | 0846.0        | 0853.2      | III               | GG               | 2            | 25X            | 215            |         |
|              |             | HIRA | 0849.5        | 0851.0      | III               | G                | 1            | 25X            | 180            |         |
|              |             | IZMI | 0859.3        | 0859.7      | III               | G,C              | 3            | 25X            | 225            |         |
|              |             | IZMI | 0938.4        | 0938.6      | III               | G                | 2            | 25X            | 75             |         |
|              |             | IZMI | 1128.4        | 1136.9      | III               | GG               | 2            | 25X            | 270X           |         |
|              | 1918 2400   | PALE | 1714.0        | 0458.0      | III               | N                | 1            | 25             | 180            |         |
|              |             | HIRA | 1929.5        | 1930.0      | III               | B                | 1            | 30             | 120            |         |
|              |             | CULG | 2110.0E       | 2400.0D     | III               | S,C              | 1            | 20             | 160            |         |
|              |             | CULG | 2110.0E       | 2400.0D     | I                 | S,C              | 1            | 70             | 180            |         |
|              | 2110 2400   | CULG | 2203.0        | 2209.0      | III               | G                | 3            | 20             | 60             |         |
|              |             | CULG | 2216.0        | 2303.0      | III               | S,C              | 3            | 18             | 80             |         |
|              |             | LEAR | 2346.0        | 0907.0      | CONT              |                  | 1            | 25             | 180            |         |
|              |             | LEAR | 2346.0        | 0907.0      | III               | N                | 1            | 25             | 180            |         |
| 20           | 0000 0650   | CULG | 0000.0E       | 0650.0D     | III               | S,C              | 1            | 20             | 180            |         |
|              |             | CULG | 0000.0E       | 0650.0D     | I                 | S,C              | 1            | 60             | 180            |         |
|              |             | CULG | 0201.0        | 0202.0      | III               | G                | 3            | 18             | 140            |         |
|              | 0000 1000   | HIRA | 0201.0        | 0202.0      | III               | B                | 1            | 25X            | 50             |         |
|              |             | HIRA | 0330.5        | 0331.0      | III               | B                | 1            | 25X            | 130            |         |
|              |             | CULG | 0331.0        | 0331.0      | III               | B                | 3            | 18X            | 240            |         |
|              |             | SVTO | 0350.0        | 1000.0      | CONT              |                  | 1            | 111            | 180            |         |
|              | 0425 1815   | SVTO | 0414.0        | 1759.0      | III               | N                | 2            | 25             | 180            |         |
|              |             | BLEN | 0425.0X       | 1815.0X     | I                 | DC               | 3            | 100X           | 400            |         |
|              |             | IZMI | 0550.0E       | 1200.0D     | III               | N                | 1            | 25X            | 95U            |         |
|              | 0550 1200   | IZMI | 0550.0E       | 0845.0U     | I                 | S                | 2            | 45U            | 270X           |         |
|              |             | IZMI | 0550.7        | 0552.3      | III               | GG               | 2            | 25X            | 160            |         |
|              |             | CULG | 0551.0        | 0552.0      | III               | G                | 3            | 18             | 180            |         |
|              |             | LEAR | 0551.0        | 0552.0      | III               |                  | 1            | 25             | 150            |         |
|              |             | HIRA | 0551.5        | 0552.0      | III               | B                | 1            | 25X            | 120            |         |
|              |             | CULG | 0632.0        | 0633.0      | III               | G                | 3            | 18             | 200            |         |
|              |             | HIRA | 0632.0        | 0632.5      | III               | B                | 1            | 25X            | 200            |         |
|              |             | IZMI | 0632.1        | 0632.8      | III               | G,C              | 2            | 25X            | 200            |         |
|              |             | IZMI | 0809.2        | 0810.4      | III               | G                | 2            | 25X            | 95             |         |
|              |             | IZMI | 0845.0        | 1200.0D     | I                 | S                | 1            | 45U            | 270X           |         |
|              |             | ONDR | 0845.4        | 0846.2      | DCIM              | G                | 1            | 800X           | 2000X          |         |
|              | 0414 1753   | ONDR | 0845.4        | 0845.5      | DCIM              | G                | 1            | 2000X          | 4500X          |         |
|              |             | BLEN | 0845.7        | 0846.5      | III               | GG,C             | 2            | 500            | 4000X          |         |
|              |             | IZMI | 1032.5        | 1037.2      | III               | GG               | 1            | 25X            | 140            |         |
|              |             | IZMI | 1043.6        | 1048.1      | III               | GG               | 1            | 25X            | 170            |         |
|              |             | SVTO | 1308.0        | 1759.0      | CONT              |                  | 1            | 110            | 180            |         |
|              |             | BLEN | 1326.7        | 1329.5      | DCIM              | C                | 2            | 1300           | 4000X          |         |
|              |             | ONDR | 1327.0        | 1328.4      | DCIM              | G                | 1            | 2322           | 4285           |         |
|              |             | HOLL | 1445.0        | 0100.0      | III               | N                | 1            | 25             | 180            |         |
|              |             | PALE | 1625.0        | 1626.0      | III               |                  | 1            | 25             | 180            |         |
|              |             | PALE | 1926.0        | 0458.0      | III               | N                | 1            | 25             | 180            |         |
|              | 1918 2400   | HIRA | 1958.5        | 1959.0      | III               | G                | 2            | 50             | 170            |         |
|              |             | HIRA | 2017.0        | 2023.5      | III               | G                | 2            | 25X            | 320            |         |
|              |             | CULG | 2110.0E       | 2400.0D     | III               | N                | 1            | 20             | 180            |         |
|              | 2110 2400   | CULG | 2110.0E       | 2400.0D     | I                 | S,C              | 1            | 100            | 200            |         |
|              |             | CULG | 2226.0        | 2226.0      | III               | B                | 3            | 18             | 140            |         |
|              |             | HIRA | 2226.0        | 2226.5      | III               | B                | 1            | 25X            | 130            |         |
|              |             | LEAR | 2342.0        | 0908.0      | CONT              |                  | 1            | 74             | 180            |         |
|              |             | LEAR | 2342.0        | 0908.0      | III               | N                | 1            | 25             | 180            |         |
| 21           | 0000 0650   | CULG | 0000.0E       | 0650.0D     | III               | S                | 1            | 20             | 180            |         |
|              |             | CULG | 0000.0E       | 0323.0      | I                 | S,C              | 1            | 100            | 180            |         |
|              | 0000 1000   | HIRA | 0101.5        | 0107.5      | III               | G                | 1            | 25X            | 130            |         |
|              |             | CULG | 0103.0        | 0105.0      | III               | G                | 3            | 18             | 170            |         |
|              |             | CULG | 0113.0        | 0113.0      | III               | B                | 3            | 18             | 180            |         |
|              |             | HIRA | 0113.0        | 0113.5      | III               | B                | 1            | 25X            | 170            |         |



# S O L A R R A D I O E M I S S I O N

## Spectral Observations

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| OBSERVATION |               |             | Sta  | EVENT         |             | Event<br>Remarks  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|-------------|---------------|-------------|------|---------------|-------------|-------------------|--------------|----------------|----------------|---------|
| Day         | Start<br>(UT) | End<br>(UT) |      | Start<br>(UT) | End<br>(UT) | Spectral<br>Class |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 21          |               |             | CULG | 0116.0        | 0117.0      | III               | G            | 3              | 18             | 180     |
|             |               |             | HIRA | 0117.5        | 0118.0      | III               | B            | 1              | 25X            | 170     |
|             |               |             | CULG | 0323.0        | 0650.0D     | I                 | S,C          | 2              | 57             | 180     |
|             |               |             | PALE | 0324.0        | 0458.0      | CONT              |              | 1              | 50             | 180     |
|             |               |             | SVTO | 0354.0        | 1759.0      | CONT              |              | 1              | 25             | 180     |
|             |               |             | SVTO | 0443.0        | 1714.0      | III               | N            | 2              | 25             | 180     |
|             |               |             | CULG | 0536.0        | 0538.0      | III               | G            | 3              | 20             | 100     |
|             |               |             | HIRA | 0537.0        | 0537.5      | III               | B            | 1              | 80             | 130     |
|             |               |             | IZMI | 0602.0E       | 1200.0D     | III               | N            | 1              | 25X            | 95U     |
|             | 0602          | 1200        | IZMI | 0602.0E       | 1200.0D     | I                 | S,C          | 2              | 45U            | 270X    |
|             |               |             | IZMI | 0624.2        | 0627.0      | III               | GG           | 2              | 45             | 160     |
|             |               |             | IZMI | 0635.6        | 0638.8      | III               | G,FS         | 2              | 45             | 120     |
|             |               |             | IZMI | 0645.2        | 0653.6      | III               | GG           | 2              | 25X            | 210     |
|             |               |             | CULG | 0647.0        | 0650.0      | III               | G            | 3              | 20             | 180     |
|             |               |             | HIRA | 0647.0        | 0650.0      | III               | G            | 1              | 25X            | 170     |
|             |               |             | IZMI | 0657.7        | 0658.0      | III               | G            | 1              | 35             | 150     |
|             |               |             | IZMI | 0704.4        | 0705.3      | III               | G            | 1              | 45             | 130     |
|             |               |             | IZMI | 0720.8        | 0728.4      | III               | GG           | 2              | 40             | 190     |
|             |               |             | IZMI | 0731.6        | 0833.2      | III               | G            | 2              | 30             | 140     |
|             |               |             | IZMI | 0735.1        | 0748.6      | III               | GG           | 2              | 25X            | 190     |
|             |               |             | IZMI | 0751.0        | 0751.9      | III               | G,C          | 2              | 45             | 165     |
|             |               |             | IZMI | 0822.9        | 0825.9      | III               | G,FS         | 2              | 25X            | 130     |
|             |               |             | IZMI | 0913.2        | 0913.7      | III               | G            | 2              | 25X            | 160     |
|             |               |             | IZMI | 0922.7        | 0926.6      | I                 | G,FS         | 2              | 25X            | 175     |
|             |               |             | IZMI | 1023.1        | 1023.3      | III               | G,C          | 2              | 25X            | 65      |
|             |               |             | IZMI | 1100.8        | 1101.1      | III               | G            | 2              | 60             | 155     |
|             |               |             | IZMI | 1107.1        | 1108.0      | III               | G            | 1              | 25X            | 160     |
|             |               |             | IZMI | 1132.7        | 1135.4      | III               | GG           | 1              | 25X            | 210     |
|             |               |             | IZMI | 1136.0        | 1137.8      | III               | GG,C         | 2              | 25X            | 175     |
|             | 0425          | 1815        | SVTO | 1136.0        | 1138.0      | III               |              | 2              | 25             | 180     |
|             |               |             | BLEN | 1136.5        | 1137.4      | III               | GG           | 2              | 100X           | 500     |
|             |               |             | HOLL | 1314.0        | 1317.0      | III               |              | 1              | 25             | 180     |
|             |               |             | SVTO | 1314.0        | 1317.0      | III               |              | 2              | 25             | 180     |
|             |               |             | HOLL | 1326.0        | 0153.0      | III               | N            | 1              | 25             | 173     |
|             |               |             | HOLL | 1427.0        | 0157.0      | CONT              |              | 1              | 66             | 180     |
|             | 0415          | 1753        | ONDR | 1614.2        | 1615.1      | DCIM              | G            | 1              | 2879X          | 4500X   |
|             |               |             | PALE | 1744.0        | 1745.0      | III               |              | 1              | 25             | 180     |
|             |               |             | SVTO | 1745.0        | 1745.0      | III               |              | 2              | 25             | 180     |
|             |               |             | HOLL | 1802.0        | 1803.0      | III               |              | 2              | 25             | 180     |
|             |               |             | PALE | 1802.0        | 1803.0      | III               |              | 2              | 25             | 180     |
|             |               |             | CULG | 2110.0E       | 2400.0D     | III               | S,C          | 2              | 20             | 180     |
|             | 2110          | 2400        | CULG | 2110.0E       | 2400.0D     | I                 | S,C          | 2              | 50             | 180     |
|             | 1918          | 2400        | HIRA | 2220.5        | 2221.0      | III               | B            | 1              | 25X            | 130     |
|             |               |             | CULG | 2221.0        | 2221.0      | III               | B            | 3              | 20             | 160     |
|             |               |             | CULG | 2317.0        | 2321.0      | III               | G            | 3              | 18X            | 160     |
|             |               |             | HIRA | 2317.5        | 2319.5      | III               | G            | 2              | 25X            | 100     |
|             |               |             | LEAR | 2332.0        | 0908.0      | CONT              |              | 1              | 74             | 180     |
|             |               |             | LEAR | 2332.0        | 0908.0      | III               | N            | 1              | 25             | 140     |
| 22          | 0000          | 1000        | HIRA |               |             |                   |              |                |                |         |
|             |               |             | CULG | 0000.0E       | 0700.0D     | III               | S,C          | 1              | 20             | 180     |
|             | 0000          | 0700        | CULG | 0000.0E       | 0700.0D     | I                 | S,C          | 1              | 45             | 180     |
|             |               |             | SVTO | 0341.0        | 1800.0      | CONT              |              | 1              | 25             | 180     |
|             | 0415          | 1753        | ONDR |               |             |                   |              |                |                |         |
|             | 0425          | 1815        | BLEN |               |             |                   |              |                |                |         |
|             | 0555          | 1200        | IZMI | 0555.0E       | 1200.0D     | I                 | S            | 2              | 45U            | 270X    |
|             |               |             | IZMI | 0837.6        | 0838.5      | III               | G,U          | 2              | 25X            | 140X    |
|             |               |             | IZMI | 0903.8        | 0904.2      | III               | G            | 2              | 50             | 95      |
|             |               |             | IZMI | 0928.4        | 0929.6      | III               | G            | 2              | 45             | 95      |
|             |               |             | IZMI | 0933.6        | 0934.8      | III               | G            | 2              | 45             | 130     |
|             |               |             | IZMI | 0951.2        | 0951.9      | III               | G            | 1              | 55             | 95      |
|             |               |             | SVTO | 0956.0        | 1020.0      | III               | N            | 1              | 25             | 138     |
|             |               |             | IZMI | 0956.4        | 0956.8      | III               | G            | 2              | 25X            | 215     |
|             |               |             | IZMI | 0959.5        | 1000.7      | III               | G            | 2              | 25X            | 120     |
|             |               |             | IZMI | 1051.6        | 1051.9      | III               | B            | 1              | 55             | 85      |
|             |               |             | IZMI | 1105.4        | 1110.3      | III               | GG           | 2              | 25X            | 160     |
|             |               |             | SVTO | 1156.0        | 1333.0      | III               | N            | 2              | 25             | 180     |
|             |               |             | IZMI | 1156.6        | 1157.4      | III               | G,U,C        | 2              | 40             | 240     |
|             |               |             | HOLL | 1238.0        | 1238.0      | III               |              | 1              | 25             | 94      |

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# S O L A R R A D I O E M I S S I O N Spectral Observations

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| OBSERVATION |           | Sta  | EVENT      |          | Spectral Class | Event Remarks | Int (1-3) | FREQUENCY   |             | Remarks  |
|-------------|-----------|------|------------|----------|----------------|---------------|-----------|-------------|-------------|----------|
| Start Day   | End Day   |      | Start (UT) | End (UT) |                |               |           | Lower (MHz) | Upper (MHz) |          |
| 22          |           | HOLL | 1308.0     | 1558.0   | III            | N             | 1         | 25          | 131         |          |
|             |           | SVTO | 1425.0     | 1425.0   | III            |               | 1         | 25U         | 83U         |          |
|             |           | SVTO | 1454.0     | 1651.0   | III            | N             | 1         | 25          | 82          |          |
|             |           | PALE | 1609.0     | 0459.0   | III            | N             | 1         | 25          | 180         |          |
|             |           | SVTO | 1640.0     | 1643.0   | III            |               | 1         | 25          | 150         |          |
|             |           | HOLL | 1641.0     | 1642.0   | III            |               | 1         | 25          | 145         |          |
|             |           | PALE | 1642.0     | 1642.0   | III            |               | 1         | 25          | 155         |          |
|             |           | PALE | 1753.0     | 0459.0   | III            | N             | 1         | 25          | 180         |          |
|             |           | HOLL | 1759.0     | 1800.0   | III            |               | 1         | 25          | 89          |          |
|             |           | PALE | 1759.0     | 1800.0   | III            |               | 1         | 25          | 90          |          |
|             |           | HOLL | 1909.0     | 1912.0   | III            |               | 1         | 25          | 126         |          |
|             | 2110 2400 | CULG | 2110.0E    | 2400.0D  | III            | N             | 1         | 23          | 180         |          |
|             |           | HOLL | 2146.0     | 2146.0   | III            |               | 1         | 25          | 87          |          |
|             | 1919 2400 | HIRA | 2146.0     | 2146.5   | III            | B             | 1         | 30          | 90          |          |
|             |           | CULG | 2326.0     | 2328.0   | III            | G             | 3         | 18          | 200         |          |
|             |           | HIRA | 2326.0     | 2328.0   | III            | G             | 3         | 25X         | 300         |          |
|             |           | HOLL | 2326.0     | 2327.0   | III            |               | 2         | 25          | 180         |          |
|             |           | LEAR | 2326.0     | 2327.0   | III            |               | 2         | 25          | 180         |          |
| 23          | 0000 0700 | CULG | 0000.0E    | 0700.0D  | III            | N             | 1         | 20          | 180         |          |
|             |           | LEAR | 0018.0     | 0019.0   | III            |               | 1         | 25          | 104         |          |
|             | 0000 1000 | HIRA | 0018.5     | 0019.0   | III            | B             | 1         | 60          | 80          |          |
|             | 0415 1753 | ONDR |            |          |                |               |           |             |             |          |
|             |           | BLN  |            |          |                |               |           |             |             |          |
|             | 0555 1200 | SVTO | 0515.0     | 0706.0   | III            | N             | 1         | 25          | 180         |          |
|             |           | IZMI | 0541.7     | 0614.4   | III            | GG,C          | 2         | 25X         | 270X        |          |
|             |           | CULG | 0549.0     | 0601.0   | III            | GG            | 3         | 18X         | 200         |          |
|             |           | LEAR | 0549.0     | 0724.0   | III            | N             | 1         | 25          | 180         |          |
|             |           | HIRA | 0550.0     | 0601.0   | III            | G             | 1         | 25X         | 200         |          |
|             |           | IZMI | 0555.0E    | 1200.0D  | I              | N             | 1         | 45U         | 270X        |          |
|             |           | CULG | 0601.0     | 0608.0   | II             | FN            | 1         | 30          | 57          |          |
|             |           | CULG | 0601.0     | 0612.0   | II             | SH            | 1         | 45          | 110         | ESS 500  |
|             |           | CULG | 0618.0     | 0700.0D  | I              | S,C           | 1         | 60          | 180         |          |
|             |           | CULG | 0619.0     | 0625.0   | UNCLF          |               | 1         | 27          | 50          |          |
|             |           | IZMI | 0725.4     | 0725.4   | III            | B             | 1         | 45          | 95          |          |
|             |           | IZMI | 0910.7     | 0910.8   | III            | B             | 1         | 55          | 65          |          |
|             |           | IZMI | 0913.8     | 0914.0   | III            | GG            | 2         | 30          | 165         |          |
|             |           | IZMI | 0932.4     | 0933.0   | III            | GG            | 1         | 30          | 165         |          |
|             |           | IZMI | 0938.4     | 0939.6   | III            | G,U           | 2         | 25X         | 165         |          |
|             |           | SVTO | 1104.0     | 1104.0   | III            |               | 1         | 28U         | 130U        |          |
|             |           | IZMI | 1104.2     | 1104.7   | III            | G,U,C         | 2         | 50          | 145         |          |
|             |           | SVTO | 1323.0     | 1324.0   | III            |               | 1         | 25          | 119         |          |
|             |           | HOLL | 1324.0     | 1729.0   | III            | N             | 1         | 25          | 102         |          |
|             |           | SVTO | 1335.0     | 1336.0   | III            |               | 1         | 30          | 81          |          |
|             |           | SVTO | 1422.0     | 1431.0   | III            |               | 1         | 28U         | 79U         |          |
|             |           | SVTO | 1523.0     | 1525.0   | III            |               | 1         | 25          | 76          |          |
|             |           | SVTO | 1559.0     | 1800.0   | III            | N             | 1         | 32          | 82          |          |
|             |           | HOLL | 2047.0     | 2047.0   | III            |               | 1         | 25          | 175         |          |
|             |           | PALE | 2047.0     | 2047.0   | III            |               | 1         | 25          | 180         |          |
|             | 1919 2400 | HIRA | 2047.5     | 2048.0   | III            | B             | 3         | 25X         | 210         |          |
|             | 2110 2400 | CULG | 2142.0     | 2145.0   | III            | G             | 1         | 20          | 120         |          |
|             |           | CULG | 2156.0     | 2156.0   | III            | B             | 1         | 20          | 100         |          |
|             |           | CULG | 2229.0     | 2229.0   | III            | B             | 2         | 18          | 100         |          |
|             |           | CULG | 2301.0     | 2301.0   | III            | B             | 1         | 20          | 100         |          |
| 24          | 0000 0700 | CULG | 0036.0     | 0052.0   | III            | N             | 1         | 40          | 90          |          |
|             |           | CULG | 0127.0     | 0127.0   | III            | B             | 1         | 50          | 200         |          |
|             |           | LEAR | 0127.0     | 0127.0   | III            |               | 1         | 80          | 180         |          |
|             |           | CULG | 0134.0     | 0134.0   | III            | B             | 1         | 20          | 80          |          |
|             |           | CULG | 0423.0     | 0431.0   | III            | G             | 1         | 20          | 100         |          |
|             |           | LEAR | 0612.0     | 0621.0   | III            |               | 2         | 25          | 180         |          |
|             | 0555 1200 | SVTO | 0612.0     | 0622.0   | III            |               | 2         | 25          | 180         |          |
|             |           | IZMI | 0612.7     | 0617.9   | III            | GG,C,FS       | 2         | 25X         | 270X        |          |
|             |           | CULG | 0613.0     | 0618.0   | III            | GG            | 3         | 18X         | 200         |          |
|             |           | HIRA | 0613.0     | 0617.5   | III            | G             | 1         | 25X         | 230         |          |
|             | 0000 1000 | ONDR | 0613.3     | 0617.0   | DCIM           | G             | 1         | 800X        | 2000X       |          |
|             | 0415 1753 | LEAR | 0619.0     | 0631.0   | II             |               | 1         | 30          | 164         | ESS 0555 |
|             |           | HIRA | 0619.5     | 0625.0   | II             |               | 1         | 80          | 130         |          |
|             |           | IZMI | 0619.6     | 0630.0   | II             | HARM          | 2         | 30          | 170         |          |

# S O L A R R A D I O E M I S S I O N

## Spectral Observations

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| OBSERVATION |               |             | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|-------------|---------------|-------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Day         | Start<br>(UT) | End<br>(UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 24          |               |             | CULG | 0620.0        | 0625.0      | II                | FN               | 1            | 35             | 80             |         |
|             |               |             | CULG | 0620.0        | 0626.0      | II                | SH               | 1            | 60             | 160            | ESS 750 |
|             |               |             | CULG | 0621.0        | 0622.0      | III               | G                | 3            | 30             | 180            |         |
|             |               |             | CULG | 0626.0        | 0635.0      | II                | SH               | 1            | 35             | 100            | ESS 850 |
|             |               |             | IZMI | 0626.7        | 0631.2      | II                | G                | 1            | 50             | 95             |         |
|             |               |             | CULG | 0627.0        | 0631.0      | II                | FN               | 1            | 30             | 50             |         |
|             |               |             | IZMI | 0632.0        | 0633.2      | III               | G                | 1            | 50             | 65             |         |
|             |               |             | IZMI | 0638.00       | 0739.0      | I                 | N                | 1            | 1100           | 270X           |         |
|             |               |             | CULG | 0646.0        | 0700.00     | I                 | S                | 1            | 120            | 180            |         |
|             |               |             | LEAR | 0647.0        | 0750.0      | CONT              |                  | 1            | 117            | 180            |         |
|             |               |             | IZMI | 0746.0        | 0746.1      | III               | B                | 1            | 45             | 95             |         |
|             |               |             | LEAR | 0806.0        | 0807.0      | III               |                  | 1            | 25             | 114            |         |
|             |               |             | IZMI | 0806.8        | 0807.8      | III               | G,FS             | 1            | 50             | 185            |         |
| 0815        | 1445          |             | BLEN |               |             |                   |                  |              |                |                |         |
|             |               |             | IZMI | 0844.4        | 0844.6      | III               | B                | 2            | 50             | 65             |         |
|             |               |             | IZMI | 0914.4        | 0916.0      | III               | GG,C             | 2            | 25X            | 270X           |         |
|             |               |             | HIRA | 0914.5        | 0916.0      | III               | G                | 1            | 30             | 240            |         |
|             |               |             | SVTO | 0915.0        | 0915.0      | III               |                  | 1            | 25             | 153            |         |
|             |               |             | IZMI | 0917.1        | 0919.6      | III               | GG               | 1            | 50             | 215            |         |
|             |               |             | IZMI | 0952.6        | 0952.9      | III               | G,C              | 2            | 50             | 90             |         |
|             |               |             | IZMI | 1021.1        | 1022.3      | III               | G,C              | 2            | 50             | 175            |         |
|             |               |             | SVTO | 1054.0        | 1055.0      | III               |                  | 1            | 25             | 126            |         |
|             |               |             | IZMI | 1054.8        | 1055.2      | III               | G,C              | 2            | 25X            | 145            |         |
|             |               |             | IZMI | 1156.3        | 1156.5      | III               | B                | 1            | 25X            | 165            |         |
|             |               |             | HOLL | 1502.0        | 1503.0      | III               |                  | 1            | 25             | 146            |         |
|             |               |             | SVTO | 1502.0        | 1512.0      | III               |                  | 1            | 25             | 155            |         |
|             |               |             | HOLL | 1701.0        | 1701.0      | III               |                  | 1            | 25             | 92             |         |
| 1919        | 2400          |             | HIRA | 2135.0        | 2135.5      | III               | B                | 1            | 70             | 100            |         |
| 2110        | 2400          |             | CULG | 2135.0        | 2137.0      | III               | G                | 1            | 57             | 120            |         |
|             |               |             | CULG | 2157.0        | 2157.0      | III               | B                | 1            | 25             | 50             |         |
|             |               |             | CULG | 2254.0        | 2300.0      | III               | G                | 1            | 18             | 100            |         |
| 25          |               |             | LEAR | 0004.0        | 0009.0      | III               |                  | 1            | 25             | 180            |         |
| 0000        | 0700          |             | CULG | 0004.0        | 0010.0      | III               | G                | 2            | 20             | 200            |         |
|             |               |             | PALE | 0006.0        | 0009.0      | III               |                  | 1            | 25             | 93             |         |
| 0000        | 1000          |             | HIRA | 0006.5        | 0009.5      | III               | G                | 1            | 25X            | 130            |         |
|             |               |             | CULG | 0041.0        | 0043.0      | III               | G                | 2            | 20             | 90             |         |
|             |               |             | HIRA | 0041.0        | 0043.0      | III               | G                | 1            | 25X            | 50             |         |
|             |               |             | LEAR | 0041.0        | 0042.0      | III               |                  | 1            | 25             | 87             |         |
|             |               |             | PALE | 0041.0        | 0042.0      | III               |                  | 1            | 25             | 79             |         |
|             |               |             | CULG | 0051.0        | 0051.0      | III               | B                | 1            | 23             | 80             |         |
|             |               |             | LEAR | 0144.0        | 0146.0      | III               |                  | 1            | 25             | 180            |         |
|             |               |             | PALE | 0144.0        | 0144.0      | III               |                  | 1            | 25             | 68             |         |
|             |               |             | HIRA | 0144.5        | 0145.0      | III               | B                | 1            | 25X            | 50             |         |
|             |               |             | CULG | 0145.0        | 0146.0      | III               | G                | 2            | 18X            | 100            |         |
|             |               |             | CULG | 0209.0        | 0212.0      | III               | G                | 1            | 18             | 90             |         |
|             |               |             | LEAR | 0209.0        | 0223.0      | III               | N                | 1            | 25             | 94             |         |
|             |               |             | CULG | 0223.0        | 0223.0      | III               | B                | 1            | 20             | 100            |         |
|             |               |             | LEAR | 0323.0        | 0324.0      | III               |                  | 1            | 25             | 52             |         |
|             |               |             | CULG | 0324.0        | 0324.0      | III               | B                | 1            | 18X            | 90             |         |
|             |               |             | LEAR | 0334.0        | 0336.0      | III               |                  | 1            | 25             | 167            |         |
|             |               |             | PALE | 0334.0        | 0336.0      | III               |                  | 1            | 25             | 160            |         |
|             |               |             | HIRA | 0334.5        | 0335.5      | III               | G                | 1            | 25X            | 50             |         |
|             |               |             | CULG | 0335.0        | 0337.0      | III               | G                | 3            | 18             | 180            |         |
|             |               |             | LEAR | 0353.0        | 0353.0      | III               |                  | 1            | 25             | 76             |         |
|             |               |             | CULG | 0354.0        | 0354.0      | III               | B                | 1            | 23             | 150            |         |
| 0416        | 1753          |             | ONDR |               |             |                   |                  |              |                |                |         |
|             |               |             | CULG | 0501.0        | 0508.0      | III               | G                | 1            | 23             | 75             |         |
| 0604        | 1210          |             | IZMI | 0621.8        | 0623.4      | III               | G                | 1            | 45             | 85             |         |
|             |               |             | CULG | 0622.0        | 0624.0      | III               | G                | 1            | 25             | 160            |         |
|             |               |             | LEAR | 0622.0        | 0712.0      | CONT              |                  | 1            | 76             | 180            |         |
|             |               |             | IZMI | 0653.3        | 0654.5      | I                 | GG               | 1            | 250            | 270X           |         |
|             |               |             | HIRA | 0750.0        | 0757.0      | III               | G                | 2            | 25X            | 300            |         |
|             |               |             | LEAR | 0750.0        | 0756.0      | III               |                  | 2            | 25             | 180            |         |
|             |               |             | SVTO | 0750.0        | 0756.0      | III               |                  | 2            | 25             | 180            |         |
|             |               |             | IZMI | 0750.3        | 0752.7      | III               | GG,C             | 2            | 25X            | 270X           |         |
|             |               |             | IZMI | 0752.8        | 0754.1      | II                | FS               | 2            | 110            | 270X           |         |
|             |               |             | IZMI | 0753.0        | 0754.8      | III               | GG,C             | 2            | 25X            | 130            |         |
|             |               |             | IZMI | 0754.3        | 0755.2      | CONT              |                  | 2            | 50             | 160            |         |

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# S O L A R R A D I O E M I S S I O N Spectral Observations

JUNE 2004

| OBSERVATION  |             | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|--------------|-------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Start<br>Day | End<br>(UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 25           | 1630 1815   | IZMI | 0754.3        | 0757.0      | III               | S                | 2            | 50             | 175U           |         |
|              |             | IZMI | 0757.0        | 0757.0      | III               | B                | 2            | 135            | 210            |         |
|              |             | IZMI | 0954.1        | 0955.0      | I                 | GG               | 1            | 240            | 265            |         |
|              |             | BLN  |               |             |                   |                  |              |                |                |         |
|              |             | HOLL | 1636.0        | 1637.0      | III               |                  | 1            | 25             | 86             |         |
|              | 2110 2400   | SVTO | 1636.0        | 1637.0      | III               |                  | 1            | 25             | 56             |         |
|              |             | PALE | 2122.0        | 2123.0      | III               |                  | 1            | 25             | 90             |         |
|              |             | CULG | 2122.0        | 2141.0      | III               | N                | 1            | 23             | 120            |         |
|              |             | HOLL | 2140.0        | 2143.0      | III               |                  | 1            | 25             | 180            |         |
|              |             | PALE | 2140.0        | 2144.0      | III               |                  | 1            | 25             | 180            |         |
|              | 1920 2400   | CULG | 2143.0        | 2144.0      | III               | G                | 3            | 18X            | 400            |         |
|              |             | HIRA | 2143.0        | 2143.5      | III               | B                | 2            | 25X            | 360            |         |
| 26           | 0000 0700   | CULG | 0113.0        | 0113.0      | III               | G                | 1            | 23             | 80             |         |
|              |             | CULG | 0402.0        | 0402.0      | III               | B                | 1            | 27             | 100            |         |
|              |             | CULG | 0545.0        | 0545.0      | III               | B                | 1            | 27             | 90             |         |
|              |             | CULG | 0552.0        | 0552.0      | III               | B                | 1            | 25             | 70             |         |
|              |             | CULG | 0618.0        | 0618.0      | III               | B                | 1            | 25             | 100            |         |
|              | 0555 1200   | SVTO | 0618.0        | 0618.0      | III               |                  | 1            | 37             | 74             |         |
|              |             | IZMI | 0618.3        | 0618.4      | III               | B                | 1            | 50             | 90             |         |
|              |             | BLN  | 0656.0        | 0702.8      | DCIM              | C,P              | 2            | 1000           | 4000X          |         |
|              |             | ONDR | 0656.1        | 0702.4      | DCIM              | G                | 2            | 2000X          | 4500X          |         |
|              |             | ONDR | 0701.5        | 0702.3      | DCIM              | GG               | 2            | 1527           | 2000X          |         |
|              | 0425 1815   | IZMI | 0707.0        | 0717.0      | I                 | N                | 1            | 200            | 270X           |         |
|              |             | HIRA | 0806.5        | 0807.0      | III               | B                | 1            | 100            | 500            |         |
|              |             | SVTO | 0852.0        | 0852.0      | III               |                  | 1            | 30             | 55             |         |
|              |             | IZMI | 0852.1        | 0852.3      | III               | B                | 1            | 25X            | 85             |         |
|              |             | IZMI | 1017.8        | 1017.9      | III               | B                | 1            | 50             | 90             |         |
|              | 0416 1753   | SVTO | 1042.0        | 1043.0      | III               |                  | 1            | 25             | 77             |         |
|              |             | IZMI | 1042.7        | 1043.2      | III               | G                | 2            | 25X            | 145            |         |
|              |             | SVTO | 1127.0        | 1127.0      | III               |                  | 1            | 25             | 50             |         |
|              |             | IZMI | 1127.2        | 1127.6      | III               | B                | 1            | 25X            | 65             |         |
|              |             | HIRA |               |             |                   |                  |              |                |                |         |
|              | 1920 2400   | CULG | 2157.0        | 2158.0      | III               | G                | 2            | 23             | 90             |         |
|              |             | CULG | 2232.0        | 2234.0      | III               | G                | 3            | 20             | 90             |         |
|              |             | CULG | 2333.0        | 2334.0      | III               | G                | 1            | 23             | 80             |         |
| 27           | 0000 0700   | CULG | 0200.0        | 0200.0      | III               | B                | 1            | 27             | 80             |         |
|              |             | HIRA | 0202.5        | 0203.0      | III               | B                | 1            | 30             | 100            |         |
|              |             | CULG | 0203.0        | 0203.0      | III               | G                | 2            | 23             | 90             |         |
|              |             | CULG | 0216.0        | 0217.0      | III               | G                | 1            | 18             | 90             |         |
|              |             | CULG | 0245.0        | 0401.0      | III               | N                | 1            | 25             | 90             |         |
|              | 0416 1753   | ONDR |               |             |                   |                  |              |                |                |         |
|              |             | BLN  |               |             |                   |                  |              |                |                |         |
|              |             | CULG | 0506.0        | 0506.0      | III               | B                | 1            | 25             | 70             |         |
|              |             | CULG | 0645.0        | 0700.00     | III               | N                | 1            | 57             | 180            |         |
|              |             | IZMI | 0646.5        | 0646.9      | III               | G,C              | 1            | 55             | 95             |         |
|              | 0609 1200   | IZMI | 1039.3        | 1040.3      | III               | G,C              | 2            | 50             | 155            |         |
|              |             | PALE | 2130.0        | 2130.0      | III               |                  | 1            | 25             | 65             |         |
|              |             | CULG | 2130.0        | 2130.0      | III               | B                | 1            | 25             | 170            |         |
|              |             | CULG | 2135.0        | 2135.0      | III               | B                | 1            | 18             | 170            |         |
|              |             | CULG | 2356.0        | 2356.0      | III               | B                | 1            | 23             | 230            |         |
| 28           | 0000 0700   | LEAR | 0001.0        | 0002.0      | III               |                  | 1            | 25             | 155            |         |
|              |             | CULG | 0002.0        | 0002.0      | III               | B                | 3            | 18X            | 200            |         |
|              |             | CULG | 0107.0        | 0107.0      | III               | B                | 1            | 50             | 90             |         |
|              |             | LEAR | 0319.0        | 0407.0      | III               | N                | 1            | 61             | 106            |         |
|              |             | HIRA | 0321.5        | 0322.0      | III               | B                | 1            | 50             | 90             |         |
|              | 0058 1000   | CULG | 0322.0        | 0322.0      | III               | B                | 1            | 30             | 100            |         |
|              |             | ONDR |               |             |                   |                  |              |                |                |         |
|              |             | BLN  |               |             |                   |                  |              |                |                |         |
|              |             | CULG | 0518.0        | 0518.0      | III               | B                | 1            | 27             | 80             |         |
|              |             | CULG | 0522.0        | 0522.0      | III               | B                | 1            | 50             | 190            |         |
|              | 0417 1753   | HIRA | 0522.0        | 0522.5      | III               | B                | 1            | 50             | 110            |         |
|              |             | CULG | 0606.0        | 0606.0      | III               | B                | 1            | 27             | 120            |         |
|              |             | LEAR | 0723.0        | 0723.0      | III               |                  | 1            | 25             | 41             |         |
|              |             | SVTO | 0723.0        | 0723.0      | III               |                  | 1            | 25             | 50             |         |
|              |             | IZMI | 0723.5        | 0724.0      | III               | G                | 1            | 45             | 65             |         |
|              | 0425 1815   | SVTO | 0811.0        | 0835.0      | III               | N                | 1            | 25             | 81             |         |

# S O L A R   R A D I O   E M I S S I O N

## Spectral Observations

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| OBSERVATION |               |             | Sta  | Start<br>(UT) | End<br>(UT) | EVENT             |                  | Int<br>(1-3) | FREQUENCY      |                | Remarks |
|-------------|---------------|-------------|------|---------------|-------------|-------------------|------------------|--------------|----------------|----------------|---------|
| Day         | Start<br>(UT) | End<br>(UT) |      |               |             | Spectral<br>Class | Event<br>Remarks |              | Lower<br>(MHz) | Upper<br>(MHz) |         |
| 28          |               |             | IZMI | 0812.0        | 0812.1      | III               | B                | 1            | 25X            | 95             |         |
|             |               |             | LEAR | 0812.0        | 0833.0      | III               | N                | 1            | 25             | 109            |         |
|             |               |             | IZMI | 0824.0        | 0825.8      | III               | G                | 1            | 25X            | 95             |         |
|             |               |             | SVTO | 1309.0        | 1309.0      | III               |                  | 2            | 25             | 180            |         |
|             | 2110          | 2400        | CULG | 2149.0        | 2150.0      | III               | G                | 1            | 27             | 160            |         |
|             | 1921          | 2400        | HIRA | 2149.5        | 2150.0      | III               | B                | 1            | 110            | 210            |         |
|             |               |             | CULG | 2220.0        | 2220.0      | III               | G                | 1            | 25             | 100            |         |
| 29          | 0000          | 1000        | HIRA |               |             |                   |                  |              |                |                |         |
|             | 0000          | 0700        | CULG | 0221.0        | 0225.0      | III               | G                | 1            | 35             | 100            |         |
|             |               |             | CULG | 0401.0        | 0401.0      | III               | B                | 1            | 45             | 150            |         |
|             |               |             | CULG | 0406.0        | 0408.0      | III               | G                | 1            | 45             | 180            |         |
|             | 0417          | 1753        | ONDR |               |             |                   |                  |              |                |                |         |
|             | 0425          | 1815        | BLEN |               |             |                   |                  |              |                |                |         |
|             |               |             | CULG | 0449.0        | 0449.0      | III               | B                | 1            | 23             | 80             |         |
|             |               |             | CULG | 0459.0        | 0459.0      | III               | B                | 1            | 25             | 65             |         |
|             | 0604          | 1200        | IZMI |               |             |                   |                  |              |                |                |         |
|             | 1921          | 2400        | HIRA | 2349.0        | 2349.5      | III               | B                | 1            | 25X            | 110            |         |
|             | 2110          | 2400        | CULG | 2349.0        | 2352.0      | III               | G                | 1            | 25             | 180            |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |
| 30          | 0000          | 0700        | CULG | 0039.0        | 0039.0      | III               | B                | 1            | 75             | 160            |         |
|             | 0425          | 1815        | BLEN |               |             |                   |                  |              |                |                |         |
|             |               |             | CULG | 0500.0        | 0500.0      | III               | B                | 1            | 20             | 70             |         |
|             |               |             | CULG | 0511.0        | 0511.0      | III               | B                | 1            | 30             | 75             |         |
|             | 0555          | 1200        | IZMI | 0700.2        | 0700.4      | III               | G,FS             | 2            | 45             | 90             |         |
|             |               |             | LEAR | 0721.0        | 0723.0      | V                 |                  | 2            | 25             | 116            |         |
|             |               |             | IZMI | 0721.8        | 0722.9      | III               | G,C              | 2            | 25X            | 140            |         |
|             | 0000          | 1000        | HIRA | 0722.0        | 0723.0      | III               | G                | 1            | 25X            | 110            |         |
|             |               |             | IZMI | 0741.8        | 0741.9      | III               | B                | 1            | 50             | 90             |         |
|             |               |             | IZMI | 0759.7        | 0759.9      | III               | B                | 1            | 50             | 85             |         |
|             |               |             | IZMI | 0813.1        | 0813.1      | III               | B                | 1            | 50             | 65             |         |
|             |               |             | IZMI | 1026.5        | 1027.0      | III               | G                | 2            | 25X            | 65             |         |
|             |               |             | IZMI | 1124.3        | 1128.5      | II                | HARM             | 2            | 75             | 155            |         |
|             | 0418          | 1753        | ONDR | 1430.3        | 1433.1      | DCIM              | G                | 1            | 800X           | 2000X          |         |
|             | 1922          | 2400        | HIRA |               |             |                   |                  |              |                |                |         |
|             | 2110          | 2400        | CULG | 2355.0        | 2356.0      | III               | G                | 1            | 27             | 90             |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |
|             |               |             |      |               |             |                   |                  |              |                |                |         |

### Event Remarks:

|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B = Single burst<br>C = Underlying continuum<br>(particularly with Type I)<br>DC = Drifting chains<br>DP = Drifting pairs<br>F = Fundamental emission (Type II)<br>FS = Fine structures (Type IV)<br>G = Small group of bursts (<10)<br>GG = Large group of bursts (>10)<br>H = Herringbone<br>HARM = Harmonic | N = Intermittent activity in this period<br>MOV = Moving (Type IV)<br>MWB = Meter wave burst<br>RS = Reverse slope burst<br>S = Storm in the sense of intermittent<br>but apparently connected actively<br>SH = Secondary harmonic emission<br>STA = Stationary (Type IV)<br>U = U-shaped burst of Type III<br>UE = Uncertain emission (Type II)<br>W = Weak |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Frequency qualifiers:

X = Extends beyond instrument range      U = Uncertain frequency

### Remarks:

SWF = Associated short wave fade observed  
 ESS = Estimated shock speed in km/s (Type II)  
 FLA = Associated flare observed (class optional)

### Stations Reporting:

|                 |                |                      |                 |               |
|-----------------|----------------|----------------------|-----------------|---------------|
| CULG = Culgoora | IZMI = Izmiran | LEAR = Learmonth     | ONDR = Ondrejov | BLEN = Bleien |
| PALE = Palehua  | POTS = Potsdam | SGMR = Sagamore Hill | SVTO = San Vito |               |

NOTE 1: Beginning June 26, 2001, the Bleien observatory changed to higher frequencies (1-4Ghz).

# SOLAR RADIO NOISE STORM AT 164 MHZ

## FROM NANÇAY RADIOHELIOGRAPH

JUNE 2004

|          | HELIOGRAPHICS POSITIONS<br>MEAN VALUES <sup>1</sup> |       | IMP <sup>2</sup> | OBSERVING TIME <sup>3</sup> |         |
|----------|-----------------------------------------------------|-------|------------------|-----------------------------|---------|
| DAY      | E-W                                                 | S-N   |                  | START( UT)                  | END(UT) |
| 12/06/04 | -1.57                                               | +0.00 | II               | 9H46 E                      | 15H21 D |
| 12/06/04 | -1.43                                               | +0.14 | II               | 9H46 E                      | 15H21 D |
| 13/06/04 | -1.46                                               | +0.08 | III              | 8H21 E                      | 15H21 D |
| 14/06/04 | -1.29                                               | +0.31 | II               | 8H22 E                      | 15H22 E |
| 14/06/04 | -1.29                                               | -0.05 | II               | 8H22 E                      | 15H22 E |
| 15/06/04 | -1.11                                               | +0.38 | I                | 8H32 E                      | 15H22 D |
| 15/06/04 | -0.88                                               | +0.38 | I                | 8H32 E                      | 15H22 D |
| 16/06/04 | -1.05                                               | -0.06 | III              | 8H22 E                      | 15H22 E |
| 16/06/04 | -1.04                                               | +0.23 | III              | 8H22 E                      | 15H22 E |
| 17/06/04 | -0.70                                               | -0.06 | III              | 8H21 E                      | 15H22 E |
| 18/06/04 | -0.40                                               | -0.05 | IV               | 8H22 E                      | 15H22 D |
| 21/06/04 | +0.42                                               | -0.10 | IV               | 8H39 E                      | 15H23 D |
| 21/06/04 | +0.44                                               | +0.01 | IV               | 8H39 E                      | 15H23 D |
| 21/06/04 | +0.51                                               | +0.68 | IV               | 10H50                       | 15H23 D |
| 22/06/04 | +0.17                                               | +0.19 | I                | 8H23 E                      | 15H23 D |
| 22/06/04 | +0.57                                               | +0.05 | I                | 8H23 E                      | 15H23 D |
| 22/06/04 | +0.84                                               | +0.57 | II               | 8H23 E                      | 15H23 D |
| 22/06/04 | +1.05                                               | +0.30 | I                | 8H23 E                      | 15H23 D |
| 23/06/04 | +1.03                                               | -0.01 | I                | 8H23 E                      | 15H23 D |
| 23/06/04 | +1.19                                               | +0.45 | I                | 12H52                       | 15H23 D |
| 24/06/04 | +1.12                                               | +0.50 | I                | 8H24 E                      | 15H24 D |
| 24/06/04 | +1.16                                               | +0.14 | I                | 8H24 E                      | 15H24 D |

<sup>1</sup> POSITIVE E-W AND S-N COORDINATES CORRESPOND TO THE N-W QUADRANT

<sup>2</sup> IMP1: FLUX< 5 SFU IMP2: 5< FLUX < 20 SFU IMP3: 20< FLUX <100 SFU  
IMP4: 100< FLUX <300 SFU IMP5> 300 SFU

<sup>3</sup> E NOISE STORM IN PROGRESS AT THE BEGINNING OF THE NANÇAY OBSERVATIONS  
D NOISE STORM IN PROGRESS AT THE END OF THE NANÇAY OBSERVATIONS



**SOLAR RADIO NOISE STORM AT 327 MHZ  
FROM NANÇAY RADIOHELIOGRAPH  
JUNE 2004**

| DAY      | HELIOGRAPHICS POSITIONS<br>MEAN VALUES <sup>1</sup> |       | IMP <sup>2</sup> | OBSERVING TIME <sup>3</sup> |         |
|----------|-----------------------------------------------------|-------|------------------|-----------------------------|---------|
|          | E-W                                                 | S-N   |                  | START(UT)                   | END(UT) |
| 01/06/04 | +1.35                                               | +0.00 | I                | 8H31 E                      | 15H19 D |
| 02/06/04 | +1.28                                               | +0.07 | I                | 8H19 E                      | 15H19 D |
| 11/06/04 | -0.92                                               | +0.03 | I                | 8H21 E                      | 15H21 D |
| 11/06/04 | -0.38                                               | -0.17 | I                | 8H21 E                      | 15H21 D |
| 12/06/04 | -1.29                                               | +0.06 | I                | 9H46 E                      | 15H21 D |
| 12/06/04 | -0.85                                               | -0.08 | I                | 8H46 E                      | 12H19   |
| 13/06/04 | -1.23                                               | +0.08 | II               | 8H21 E                      | 15H21 D |
| 14/06/04 | -1.23                                               | -0.02 | I                | 8H22 E                      | 15H22 E |
| 14/06/04 | -1.14                                               | +0.19 | I                | 8H22 E                      | 15H22 E |
| 14/06/04 | -0.99                                               | -0.06 | I                | 12H06                       | 15H22 E |
| 15/06/04 | -0.98                                               | +0.34 | I                | 8H32 E                      | 15H22 D |
| 15/06/04 | -0.87                                               | -0.03 | I                | 8H32 E                      | 15H22 D |
| 15/06/04 | -0.73                                               | +0.31 | I                | 8H32 E                      | 15H22 D |
| 16/06/04 | -0.86                                               | +0.27 | II               | 8H22 E                      | 15H22 E |
| 16/06/04 | -0.93                                               | -0.01 | II               | 8H22 E                      | 15H22 E |
| 16/06/04 | -0.69                                               | -0.10 | I                | 8H22 E                      | 15H22 E |
| 16/06/04 | -0.42                                               | +0.40 | I                | 14H05                       | 15H22 E |
| 17/06/04 | -0.70                                               | +0.00 | II               | 8H21 E                      | 15H22 D |
| 18/06/04 | -0.37                                               | -0.13 | III              | 8H22 E                      | 15H22 D |
| 21/06/04 | +0.40                                               | +0.04 | I                | 8H39 E                      | 15H23 D |
| 21/06/04 | +0.42                                               | -0.24 | II               | 8H39 E                      | 15H23 D |
| 21/06/04 | +0.52                                               | +0.58 | II               | 8H39 E                      | 15H23 D |
| 22/06/04 | +0.15                                               | -0.19 | I                | 8H23 E                      | 15H23 D |
| 22/06/04 | +0.60                                               | +0.01 | I                | 8H23 E                      | 15H23 D |
| 22/06/04 | +0.94                                               | +0.31 | I                | 8H23 E                      | 15H23 D |
| 23/06/04 | +0.84                                               | +0.03 | I                | 8H23 E                      | 15H23 D |
| 23/06/04 | +1.03                                               | +0.28 | I                | 14H11                       | 15H23 D |
| 23/06/04 | +1.10                                               | +0.41 | I                | 8H23 E                      | 15H23 D |
| 24/06/04 | +1.07                                               | +0.49 | I                | 8H24 E                      | 15H24 D |
| 25/06/04 | +1.14                                               | +0.07 | I                | 8H53 E                      | 15H24 D |
| 26/06/04 | +1.28                                               | +0.35 | I                | 8H23 E                      | 15H24 D |
| 26/06/04 | +1.29                                               | +0.07 | I                | 8H23 E                      | 15H24 D |

**05,06,19,20 JUNE : NO DATA**

**OTHERS DAYS: NO DETECTABLE NOISE STORM**

\* For the days marked by an asterisk, intense ionospheric gravity waves are observed during the whole day. Without a more detailed analysis leading to decreased uncertainties in the deviation, the positions which are indicated are estimated within 0.2 R.

\*\* Following a large burst

\*\*\* Importance not well determined due to the proximity off the very strong other source

\*\*\*\* No flux measurements available

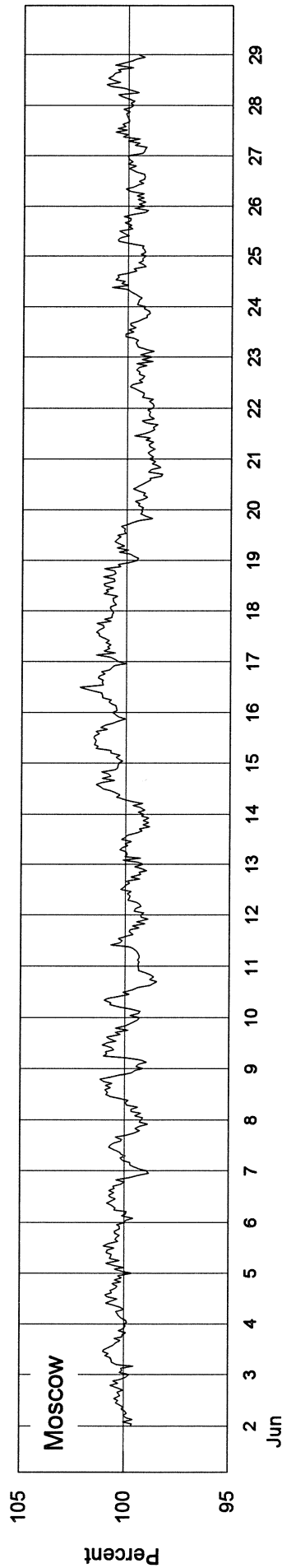
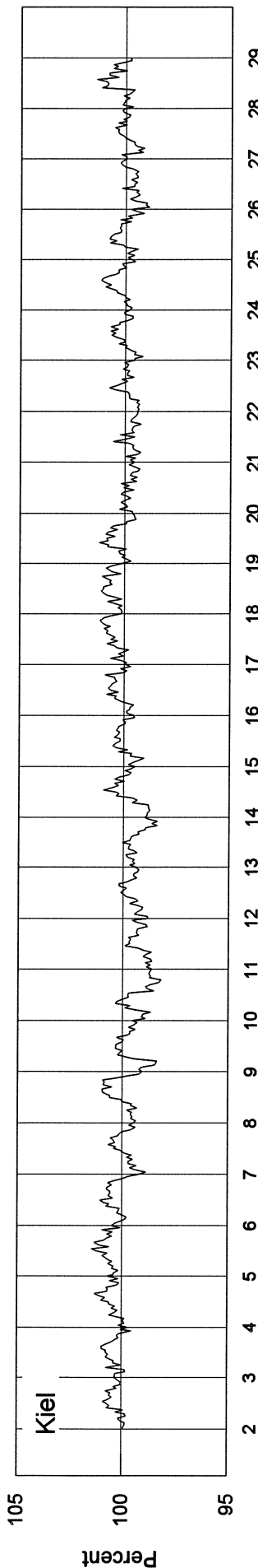
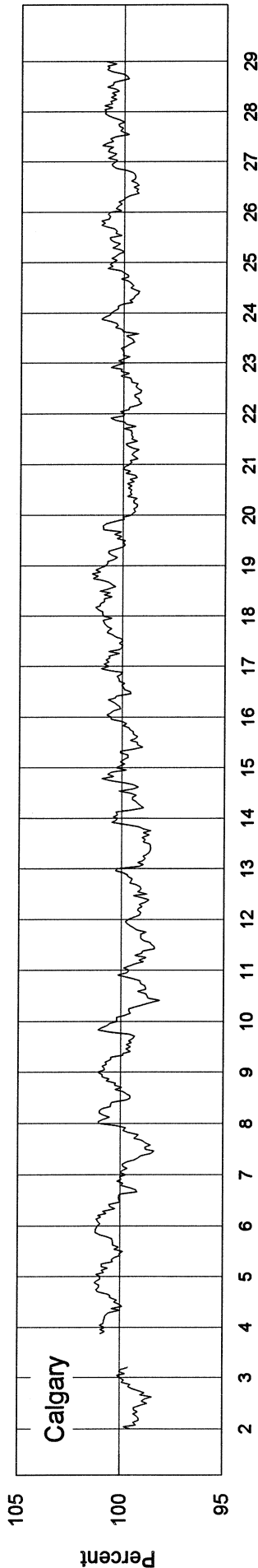
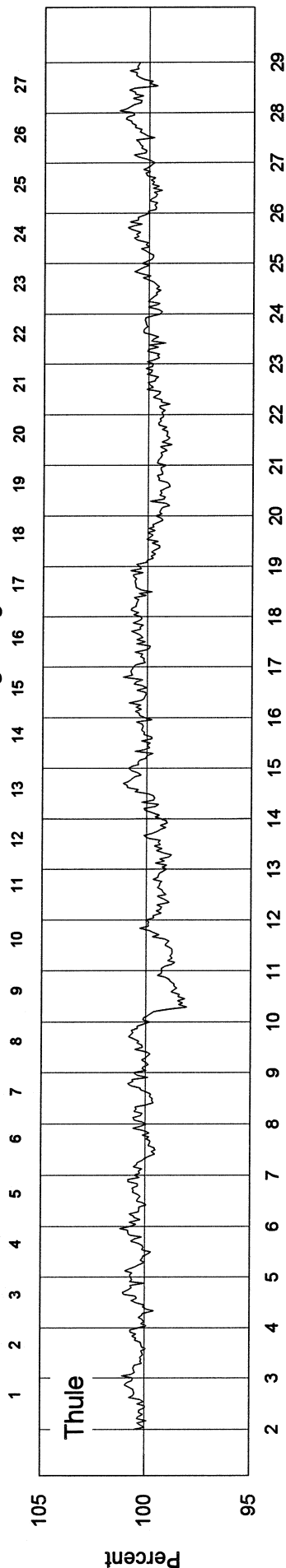
COSMIC RAY INDICES  
(Neutron Monitor)  
June 2004

| Day  | THULE<br>Average<br>(cts/h)/100 | CALGARY<br>Average<br>(cts/h)/300 | KIEL<br>Average<br>(cts/h)/100 | MOSCOW<br>Average<br>(cts/h)/64 | CLIMAX<br>Average<br>(cts/h)/100 | BEIJING<br>Average<br>(cts/h)/256 | HALEAKALA<br>Average<br>(cts/h)/1000 |
|------|---------------------------------|-----------------------------------|--------------------------------|---------------------------------|----------------------------------|-----------------------------------|--------------------------------------|
| 1    | 4234.2                          | 3657.2                            | 5909.0                         | 8674.4                          | —                                | 1945.5                            | 3548.3                               |
| 2    | 4252.2                          | 3661.7                            | 5917.7                         | 8692.8                          | —                                | 1956.2                            | 3551.6                               |
| 3    | 4252.7                          | 3698.8(9)                         | 5924.8                         | 8712.6                          | —                                | 1958.2                            | 3552.3                               |
| 4    | 4251.1                          | 3715.2                            | 5927.8                         | 8715.1                          | —                                | 1964.5                            | 3558.8                               |
| 5    | 4254.4                          | 3712.5                            | 5943.0                         | 8722.5                          | —                                | 1953.6                            | 3560.8                               |
| 6    | 4255.6                          | 3701.7                            | 5924.8                         | 8702.2                          | —                                | 1969.3                            | 3564.4                               |
| 7    | 4238.5                          | 3665.8                            | 5892.7                         | 8671.0                          | —                                | 1965.0                            | 3545.4                               |
| 8    | 4246.0                          | 3707.2                            | 5906.3                         | 8696.2                          | —                                | 1967.5                            | 3555.2                               |
| 9    | 4248.3                          | 3699.2                            | 5878.4                         | 8696.4                          | —                                | 1961.7                            | 3546.3                               |
| 10   | 4193.6                          | 3664.3                            | 5853.2                         | 8648.0                          | 3951.0(12)                       | 1946.8                            | 3533.8                               |
| 11   | 4204.5                          | 3658.3                            | 5852.5                         | 8649.6                          | 3943.8                           | 1939.3                            | 3538.8                               |
| 12   | 4210.5                          | 3664.7                            | 5874.2                         | 8647.7                          | 3942.5                           | 1944.2                            | 3546.5                               |
| 13   | 4208.8                          | 3656.0                            | 5864.6                         | 8649.5                          | 3939.0                           | 1944.0                            | 3546.5                               |
| 14   | 4244.0                          | 3684.3                            | 5884.8                         | 8713.6                          | 3982.8                           | 1955.7                            | 3558.5                               |
| 15   | 4244.6                          | 3680.5                            | 5900.8                         | 8760.9                          | 3988.4                           | 1946.9                            | 3551.6                               |
| 16   | 4255.2                          | 3699.3                            | 5914.0                         | 8771.3                          | 3978.0                           | 1958.9                            | 3551.0                               |
| 17   | 4250.9                          | 3709.3                            | 5933.2                         | 8767.5                          | 3975.9                           | 1961.2                            | 3551.4                               |
| 18   | 4257.8                          | 3726.7                            | 5938.1                         | 8744.2                          | 3987.7                           | 1957.1                            | 3563.5                               |
| 19   | 4228.2                          | 3706.0                            | 5918.7                         | 8675.4                          | 3957.8                           | 1943.3                            | 3559.4                               |
| 20   | 4208.7                          | 3675.3                            | 5889.7                         | 8602.4                          | 3933.7                           | 1949.5                            | 3552.0                               |
| 21   | 4207.0                          | 3679.2                            | 5882.3                         | 8592.2                          | 3942.4                           | 1952.3                            | 3553.8                               |
| 22   | 4221.7                          | 3677.8                            | 5893.7                         | 8620.3                          | 3954.0                           | 1956.5                            | 3556.5                               |
| 23   | 4232.2                          | 3693.7                            | 5903.2                         | 8635.3                          | 3962.6                           | 1957.8                            | 3561.0                               |
| 24   | 4231.1                          | 3688.5                            | 5920.1                         | 8664.6                          | 3963.2                           | 1954.8                            | 3565.7                               |
| 25   | 4252.4                          | 3710.7                            | 5904.8                         | 8666.2                          | 3978.3                           | 1960.2                            | 3570.3                               |
| 26   | 4230.5                          | 3686.2                            | 5878.9                         | 8648.2                          | 3953.7                           | 1949.0                            | 3547.6                               |
| 27   | 4255.8                          | 3708.0                            | 5898.6                         | 8676.6                          | 3972.1                           | 1948.4                            | 3558.8                               |
| 28   | 4261.6                          | 3710.3                            | 5921.2                         | 8704.2                          | 3981.8                           | 1944.1                            | 3565.2                               |
| 29   | 4229.5                          | 3687.8                            | 5896.7                         | 8701.5                          | 3970.0                           | 1951.8                            | 3557.2                               |
| 30   | 4226.7                          | 3684.8                            | 5888.2                         | 8690.3                          | 3963.4                           | 1945.0                            | 3552.5                               |
| Mean | 4236.0                          | 3689.0                            | 5901.2                         | 8683.8                          | 3963.4                           | 1953.6                            | 3554.2                               |

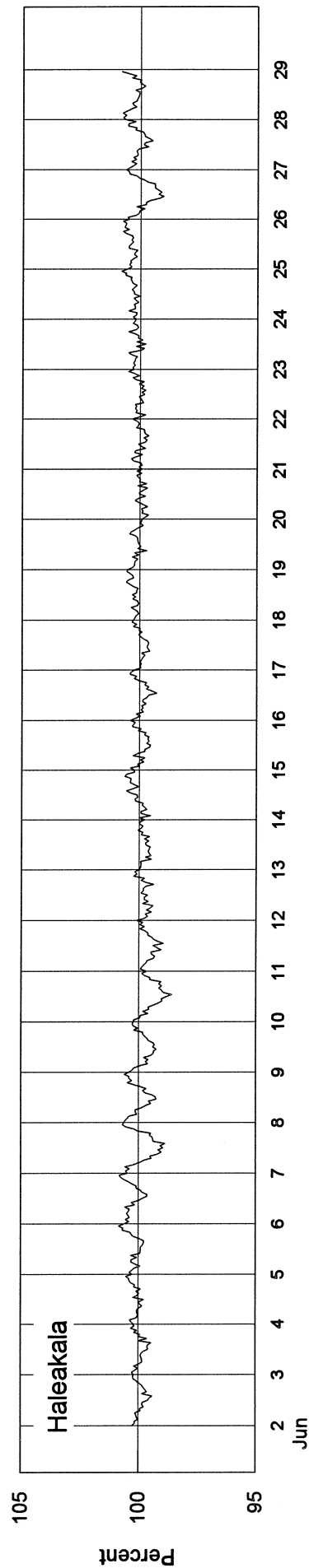
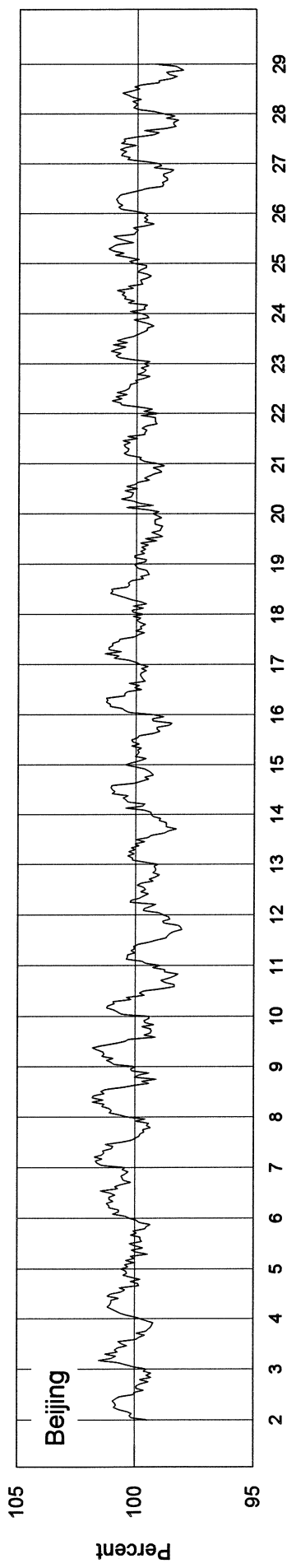
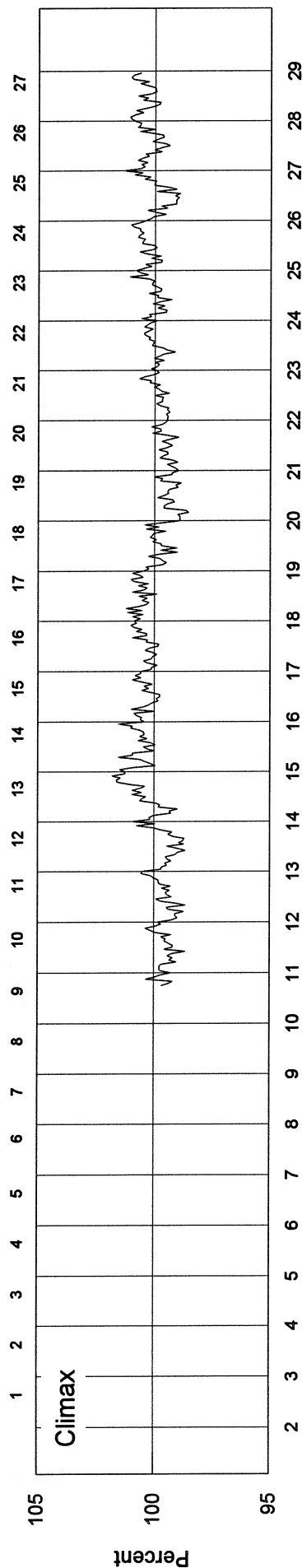
For less than 24-hour coverage, parentheses enclose the number of hours for which data are available. For Climax, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours, and for Haleakala, whenever the sum of all three sections falls below 60 hours.

# COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2332 - Beginning 2 Jun 2004

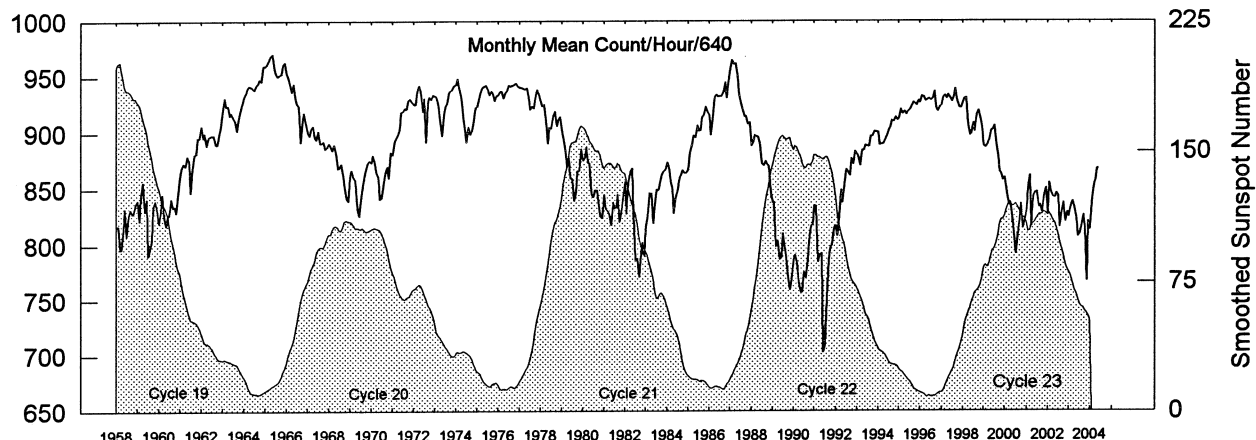


# COSMIC RAY INDICES (Neutron Monitor) Bartels Rotation 2332 - Beginning 2 Jun 2004



# Moscow Neutron Monitor Pressure-Corrected Values Jan 1958 - Jun 2004

113  
Jun 04



| Year | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   | Mean  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1958 | 8171* | 8175* | 7973* | 7971* | 8145* | 8330* | 8087* | 8266* | 8324* | 8291* | 8294* | 8378* | 8200* |
| 1959 | 8405  | 8223  | 8443  | 8565  | 8309  | 8416  | 7911  | 7972  | 8054  | 8351  | 8397  | 8325  | 8281  |
| 1960 | 8199  | 8313  | 8459  | 8264* | 8178* | 8272* | 8272* | 8417  | 8348  | 8348  | 8295  | 8464  | 8319* |
| 1961 | 8619  | 8682  | 8731* | 8708* | 8791* | 8759* | 8472  | 8676  | 8808  | 8816  | 8957  | 8956  | 8748* |
| 1962 | 9061  | 8959  | 8996  | 8891  | 8964* | 8974  | 8977  | 8977  | 8908  | 8902  | 8973  | 9056  | 8940* |
| 1963 | 9201  | 9308  | 9243  | 9239  | 9154  | 9180  | 9147  | 9109  | 9020  | 9110  | 9194  | 9259  | 9180  |
| 1964 | 9321  | 9353  | 9395  | 9416  | 9410  | 9396  | 9384  | 9425  | 9442  | 9473  | 9458  | 9594  | 9422  |
| 1965 | 9602  | 9608  | 9642  | 9685  | 9701  | 9586  | 9530  | 9505  | 9520  | 9525  | 9608  | 9630  | 9595  |
| 1966 | 9531  | 9502  | 9439  | 9367  | 9438  | 9336  | 9261  | 9242* | 8916  | 9105* | 9178  | 9094  | 9284* |
| 1967 | 9006  | 8973  | 9038  | 9059  | 8956  | 8940  | 9015  | 8913  | 8911  | 8924  | 8860  | 8873  | 8956  |
| 1968 | 8904  | 8875* | 8844* | 8892* | 8825* | 8690* | 8689  | 8725  | 8635* | 8533* | 8428  | 8394  | 8703* |
| 1969 | 8628  | 8666  | 8606  | 8584  | 8334  | 8261  | 8378  | 8510  | 8612  | 8689  | 8731  | 8751  | 8562  |
| 1970 | 8735  | 8799  | 8749  | 8639  | 8608  | 8418  | 8420  | 8540  | 8656  | 8702  | 8596  | 8827  | 8641  |
| 1971 | 8805  | 8921  | 8952  | 8982  | 9028  | 9185  | 9190  | 9219  | 9215  | 9285  | 9302  | 9276  | 9113  |
| 1972 | 9260  | 9254  | 9367  | 9419  | 9364  | 9192  | 9311  | 8916  | 9275  | 9319  | 9298  | 9336  | 9275  |
| 1973 | 9333  | 9321  | 9258  | 9107  | 8975  | 9160  | 9233  | 9263  | 9368  | 9376  | 9392  | 9423  | 9267  |
| 1974 | 9431  | 9481  | 9390  | 9327  | 9153  | 9062  | 8916  | 9054  | 8983  | 9027  | 9092  | 9222  | 9178  |
| 1975 | 9238  | 9317  | 9361  | 9405  | 9415  | 9425  | 9395  | 9339  | 9370  | 9361  | 9285* | 9330  | 9353* |
| 1976 | 9339  | 9375  | 9370  | 9310  | 9363  | 9371  | 9423  | 9418  | 9423  | 9428  | 9440  | 9415  | 9380  |
| 1977 | 9405  | 9404  | 9401  | 9392  | 9399  | 9318  | 9209  | 9236  | 9216  | 9302  | 9384* | 9341  | 9334* |
| 1978 | 9279  | 9243  | 9254  | 9113  | 8907  | 9050  | 9035  | 9149  | 9189  | 9062  | 9118  | 9145  | 9216  |
| 1979 | 9012  | 8955  | 8860  | 8693  | 8778  | 8599  | 8592  | 8396  | 8470  | 8662  | 8661  | 8857  | 8740  |
| 1980 | 8752  | 8776  | 8871  | 8737  | 8732  | 8463  | 8430  | 8490  | 8491  | 8379  | 8259  | 8242  | 8552  |
| 1981 | 8451  | 8330  | 8311  | 8277  | 8176  | 8379  | 8332  | 8338  | 8452  | 8206  | 8289  | 8439  | 8332  |
| 1982 | 8565  | 8277  | 8565  | 8649  | 8686  | 8279  | 7870  | 7882  | 7712  | 7931  | 8023  | 7902  | 8195  |
| 1983 | 8150  | 8253  | 8460  | 8460  | 8194  | 8343  | 8498  | 8492  | 8575  | 8625  | 8658  | 8670  | 8448  |
| 1984 | 8736  | 8686  | 8574  | 8505  | 8286  | 8421  | 8476  | 8590  | 8632  | 8669  | 8641  | 8644  | 8575  |
| 1985 | 8671  | 8813  | 8878  | 8973  | 8958  | 9066  | 9018  | 9017  | 9140  | 9155  | 9233  | 9183  | 9009  |
| 1986 | 9162  | 8982  | 9125  | 9316  | 9339  | 9328  | 9326  | 9327  | 9368  | 9444  | 9312  | 9472  | 9292  |
| 1987 | 9553  | 9646  | 9619  | 9618  | 9505  | 9349  | 9268  | 9202  | 9149  | 9153  | 9085  | 9094  | 9353  |
| 1988 | 8885  | 8922  | 8979  | 8968  | 8961  | 8904  | 8724  | 8704  | 8745  | 8716  | 8699  | 8474  | 8807  |
| 1989 | 8381  | 8385  | 7985  | 8043  | 7868  | 7888  | 8102  | 7977  | 7897  | 7709  | 7592  | 7701  | 7961  |
| 1990 | 7871  | 7910  | 7846  | 7652  | 7574  | 7569  | 7755  | 7701  | 7864  | 8037  | 8168  | 8185  | 7844  |
| 1991 | 8356  | 8347  | 7850  | 7915  | 7926  | 7025  | 7082  | 7510  | 7863  | 7964  | 8008  | 8153  | 7833  |
| 1992 | 8169  | 8078  | 8247  | 8490  | 8378  | 8535  | 8670  | 8649  | 8614  | 8767  | 8717  | 8833  | 8512  |
| 1993 | 8804  | 8784  | 8705  | 8846  | 8842  | 8888  | 8884  | 8880  | 8968  | 8968  | 9010  | 9011  | 8882  |
| 1994 | 9001  | 8895  | 8899  | 8898  | 8942  | 8963  | 9013  | 9055  | 9110  | 9098  | 9141  | 9112  | 9011  |
| 1995 | 9122  | 9206  | 9169  | 9193  | 9159  | 9186  | 9203  | 9228  | 9272  | 9257  | 9241  | 9286  | 9210  |
| 1996 | 9266  | 9328  | 9324  | 9287  | 9291  | 9302  | 9295  | 9302  | 9364  | 9226  | 9192  | 9227  | 9284  |
| 1997 | 9240  | 9311  | 9334  | 9302  | 9340  | 9318  | 9277  | 9322  | 9390  | 9281  | 9233  | 9217  | 9297  |
| 1998 | 9273  | 9306  | 9312  | 9057  | 8981  | 8983  | 9088  | 9007  | 9157  | 9196  | 9133  | 9036  | 9127  |
| 1999 | 8883  | 8867  | 8887  | 8937  | 9021  | 9018  | 9058  | 8904  | 8794  | 8660  | 8627  | 8574  | 8853  |
| 2000 | 8600  | 8481  | 8377  | 8358  | 8283  | 8107  | 7921  | 8081  | 8224  | 8365  | 8146  | 8215  | 8263  |
| 2001 | 8314  | 8521  | 8617  | 8168  | 8428  | 8468  | 8473  | 8334  | 8359  | 8289  | 8447  | 8505  | 8410  |
| 2002 | 8277  | 8555  | 8462  | 8434  | 8420  | 8462  | 8438  | 8157  | 8289  | 8374  | 8207  | 8297  | 8364  |
| 2003 | 8251  | 8344  | 8398  | 8329  | 8238  | 8075  | 8099  | 8178  | 8268  | 8150  | 7675  | 8209  | 8185  |
| 2004 | 8139  | 8385  | 8525  | 8580  | 8676  | 8684  |       |       |       |       |       |       | 8498  |

Multiply table entries by 64 to obtain hourly counting rate. Moscow, Russia: N55, E37, Alt= 200 m, Cutoff Rigidity= 2.42GV.  
NOTE: \* Indicates data have been restored using the corresponding data of other cosmic ray stations.

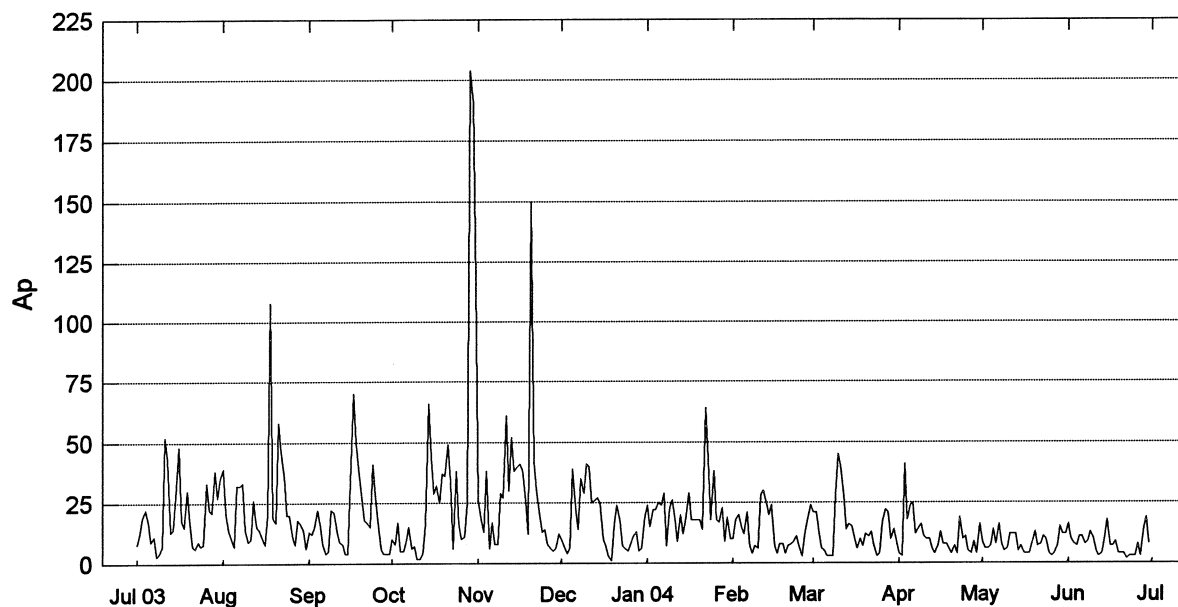
# Geomagnetic Activity Indices

## June 2004

| Kp Three-Hourly Indices |     |    |    |    |    |    |    |    |    |     |      |      |    |    |    |    |    |    |    |       |    |    |      |       | Km Three-Hourly Indices |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | aa Provisional |  |  |  |
|-------------------------|-----|----|----|----|----|----|----|----|----|-----|------|------|----|----|----|----|----|----|----|-------|----|----|------|-------|-------------------------|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------------|--|--|--|
| Day                     |     | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | Sum | Ap   | Cp   | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8     | Am | N  | S    | M     |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 1                       | D3* | 4- | 3  | 3+ | 3  | 4- | 2+ | 3- | 3  | 25- | 16   | 0.9  | 4- | 3o | 4- | 3o | 3+ | 2+ | 2o | 3o    | 31 | 38 | 29   | 35    | 33                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 2                       |     | 3- | 2  | 2  | 2  | 2  | 3- | 3  | 3  | 19+ | 10   | 0.6  | 3- | 3- | 2+ | 2+ | 2o | 3- | 3- | 3o    | 22 | 24 | 20   | 18    | 26                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 3                       |     | 2+ | 3  | 2  | 1  | 1+ | 1  | 1+ | 3- | 15- | 8    | 0.4  | 3- | 3- | 3- | 1+ | 1+ | 1o | 1o | 3-    | 15 | 19 | 13   | 16    | 16                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 4                       |     | 3- | 2  | 1  | 2- | 2+ | 2  | 1+ | 2- | 15- | 7    | 0.4  | 3o | 3- | 1+ | 3- | 3- | 2o | 2- | 2o    | 18 | 15 | 19   | 16    | 18                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 5                       |     | 3- | 2  | 1+ | 2+ | 2+ | 2+ | 3- | 4- | 19+ | 11   | 0.6  | 3- | 2o | 1+ | 2o | 2+ | 2+ | 2+ | 3-    | 18 | 26 | 13   | 16    | 23                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 6                       |     | 3  | 3+ | 3- | 2  | 2+ | 2- | 3  | 2  | 20  | 11   | 0.6  | 3o | 3+ | 3- | 2+ | 2+ | 2- | 3- | 2-    | 23 | 31 | 16   | 25    | 22                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 7                       |     | 3- | 2- | 1+ | 1+ | 2- | 1  | 1+ | 4- | 15- | 8    | 0.4  | 3- | 2- | 1+ | 2o | 2o | 1+ | 1+ | 3o    | 16 | 20 | 17   | 16    | 21                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 8                       |     | 3+ | 2+ | 1  | 3- | 2  | 2+ | 2+ | 2- | 18- | 9    | 0.5  | 3o | 2+ | 1+ | 3o | 2o | 2o | 3- | 1+    | 18 | 23 | 15   | 19    | 19                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 9                       | D5* | 3  | 2- | 2+ | 3+ | 3  | 3+ | 3  | 2+ | 22  | 13   | 0.8  | 3+ | 2+ | 3- | 3+ | 2+ | 3+ | 3- | 2+    | 28 | 32 | 27   | 30    | 30                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 10                      |     | 3+ | 2+ | 2- | 1- | 2  | 1- | 3+ | 3- | 17- | 10   | 0.5  | 3o | 3- | 2+ | 1o | 2o | 1- | 3o | 2+    | 18 | 23 | 13   | 18    | 18                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 11                      |     | 3- | 1  | 2- | 1+ | 1- | 1  | 1  | 0+ | 10- | 5    | 0.2  | 3o | 2- | 3- | 2o | 1- | 1+ | 1o | 0o    | 12 | 12 | 11   | 14    | 9 CK                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 12                      | Q6  | 0+ | 2- | 1+ | 1  | 1+ | 0+ | 0+ | 0  | 6+  | 3    | 0.1  | 0o | 2o | 2- | 1- | 1o | 0+ | 0o | 0o    | 5  | 6  | 6    | 8     | 4 CC                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 13                      | Q8  | 0  | 1- | 1  | 1  | 1- | 1  | 1  | 2- | 7   | 4    | 0.1  | 0o | 1- | 1+ | 1+ | 1- | 1o | 1- | 2-    | 6  | 10 | 5    | 6     | 9 CK                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 14                      |     | 1  | 1  | 2- | 3  | 3+ | 3- | 3- | 2  | 17+ | 10   | 0.5  | 1+ | 1o | 2+ | 3o | 3o | 2+ | 2+ | 2-    | 18 | 21 | 22   | 20    | 23                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 15                      | D2* | 2+ | 3- | 4+ | 3- | 4+ | 4- | 3- | 2+ | 25  | 18   | 1.0  | 3- | 3- | 4+ | 3o | 4- | 3o | 2+ | 2+    | 32 | 36 | 32   | 33    | 35                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 16                      |     | 3- | 2  | 3  | 1+ | 2- | 1+ | 1- | 1+ | 14  | 7    | 0.4  | 2+ | 2o | 3+ | 2o | 2- | 1+ | 0+ | 1+    | 14 | 15 | 13   | 18    | 10                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 17                      |     | 1  | 2+ | 2- | 2+ | 1+ | 2  | 2  | 2  | 15- | 7    | 0.3  | 1o | 2o | 2- | 2+ | 1+ | 1+ | 2o | 2-    | 12 | 16 | 11   | 11    | 16 CC                   |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 18                      |     | 1+ | 2  | 2- | 2+ | 3+ | 3- | 2+ | 2- | 17+ | 9    | 0.5  | 1+ | 2+ | 1+ | 2+ | 3- | 2o | 2- | 2-    | 15 | 20 | 13   | 12    | 21                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 19                      | Q10 | 2- | 2- | 1+ | 1+ | 2- | 1+ | 0+ | 0  | 9+  | 4    | 0.2  | 2o | 1+ | 2o | 2o | 1o | 1o | 0+ | 0o    | 9  | 12 | 9    | 11    | 10 CK                   |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 20                      | Q4  | 1- | 1- | 1+ | 1- | 1- | 1  | 1  | 1- | 7-  | 4    | 0.1  | 0+ | 0+ | 1+ | 1- | 1- | 1o | 1o | 0+    | 5  | 8  | 4    | 5     | 7 CC                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 21                      | Q7  | 1- | 1  | 1  | 1- | 1+ | 1  | 1  | 1  | 8-  | 4    | 0.1  | 0+ | 0+ | 1o | 1o | 1+ | 1- | 1- | 1o    | 5  | 8  | 5    | 5     | 8 CC                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 22                      | Q1  | 0+ | 1- | 0+ | 1- | 0+ | 0+ | 1- | 1- | 4   | 2    | 0.0  | 0+ | 0+ | 0+ | 1- | 0+ | 0+ | 0+ | 0+    | 3  | 5  | 4    | 5     | 4 CC                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 23                      | Q2  | 1- | 0+ | 1- | 0+ | 1  | 1  | 1- | 1- | 5+  | 3    | 0.1  | 0+ | 0+ | 1- | 0+ | 1- | 1- | 1- | 1-    | 4  | 7  | 2    | 4     | 6 CC                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 24                      | Q9  | 0+ | 1+ | 2  | 0+ | 2- | 0+ | 1- | 0  | 7-  | 3    | 0.1  | 0+ | 1+ | 2+ | 1- | 1+ | 0+ | 0+ | 0o    | 6  | 10 | 6    | 10    | 6 CC                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 25                      | Q5  | 0+ | 1- | 0+ | 0+ | 2- | 1- | 1+ | 1- | 6   | 3    | 0.1  | 0o | 0+ | 0+ | 0+ | 1+ | 1- | 1+ | 0+    | 4  | 9  | 4    | 3     | 10 CC                   |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 26                      |     | 1- | 1  | 1- | 1+ | 4- | 3  | 2- | 2  | 14  | 8    | 0.4  | 0o | 1o | 1- | 1+ | 3- | 2+ | 2- | 2o    | 11 | 16 | 8    | 6     | 18 KC                   |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 27                      | Q3  | 1- | 1- | 0+ | 1- | 1- | 1- | 1- | 2- | 6   | 3    | 0.1  | 1o | 1+ | 0+ | 1- | 1- | 0+ | 1o | 1+    | 6  | 6  | 5    | 3     | 7 CK                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 28                      | D4* | 3- | 3+ | 1+ | 3- | 2+ | 2+ | 4  | 4- | 22- | 14   | 0.8  | 3- | 3- | 2o | 3- | 2o | 2- | 3o | 3+    | 22 | 34 | 14   | 24    | 24                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 29                      | D1* | 4  | 4  | 4  | 3  | 3- | 3- | 4- | 3- | 27- | 19   | 1.0  | 4- | 3+ | 4o | 3o | 3- | 3- | 3+ | 3-    | 34 | 38 | 25   | 37    | 26                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 30                      |     | 3- | 2  | 3- | 2+ | 2  | 1+ | 2  | 1+ | 16+ | 8    | 0.4  | 3- | 2+ | 3- | 3- | 2+ | 1+ | 2- | 1+    | 17 | 16 | 19   | 22    | 12                      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| Mean                    |     |    |    |    |    |    |    |    |    |     | 8    | 0.41 |    |    |    |    |    |    |    |       |    |    |      | 14.9  | 18.6                    | 13.4 | 15.9 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| Ks Three-Hourly Indices |     |    |    |    |    |    |    |    |    |     |      |      |    |    |    |    |    |    |    |       |    |    |      |       | Prov                    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| Day                     |     | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | An  | 1    | 2    | 3  | 4  | 5  | 6  | 7  | 8  | As | Sa    | Ri | Ra | Rs   | IMF   |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 1                       |     | 3+ | 3o | 3+ | 3o | 4- | 3- | 3- | 3o | 32  | 4o   | 3-   | 4- | 3- | 3+ | 2o | 1+ | 3+ | 30 | 92.5  | 35 | 37 | 38   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 2                       |     | 3- | 3- | 3- | 3- | 2o | 3- | 3- | 3- | 23  | 3-   | 2+   | 2o | 2o | 2- | 3- | 3- | 3o | 20 | 93.0  | 36 | 34 | 38   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 3                       |     | 2o | 3- | 3- | 2- | 2- | 1+ | 1+ | 3- | 16  | 3o   | 2+   | 3- | 1- | 1- | 0+ | 1o | 3o | 14 | 92.6  | 37 | 36 | 38   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 4                       |     | 3- | 3- | 2- | 2+ | 3- | 2o | 2- | 2o | 19  | 3o   | 2+   | 1o | 3- | 2+ | 2+ | 1+ | 2+ | 17 | 92.0  | 36 | 32 | 37   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 5                       |     | 3- | 2+ | 2o | 2+ | 3o | 3- | 3- | 3o | 22  | 2+   | 2-   | 1- | 1+ | 2- | 2+ | 2+ | 3- | 14 | 87.0  | 36 | 30 | 32   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 6                       |     | 3+ | 3+ | 3- | 2+ | 3- | 2+ | 3- | 2o | 25  | 3o   | 3+   | 2+ | 2+ | 2o | 1+ | 3- | 1+ | 20 | 91.0  | 29 | 23 | 36   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 7                       |     | 2+ | 2- | 2- | 2o | 2o | 2- | 2- | 3o | 16  | 3-   | 1+   | 1+ | 2+ | 2o | 1+ | 1+ | 3+ | 16 | 91.2  | 37 | 31 | 36   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 8                       |     | 3o | 2o | 1+ | 3o | 2+ | 2+ | 2+ | 2- | 19  | 3o   | 2+   | 1+ | 3o | 2- | 1+ | 3- | 1o | 17 | 88.6  | 33 | 27 | 34   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 9                       |     | 3o | 2o | 3- | 3+ | 3- | 3+ | 3- | 3- | 27  | 4-   | 2+   | 3- | 3+ | 2o | 4- | 3o | 2o | 29 | 87.9  | 34 | 31 | 33   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 10                      |     | 3o | 3- | 2o | 2- | 3- | 1+ | 3o | 3- | 20  | 3+   | 2+   | 2+ | 0o | 1+ | 0o | 3+ | 2o | 17 | 85.0  | 31 | 26 | 30   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 11                      |     | 3- | 2- | 3- | 2o | 1o | 2- | 1+ | 0+ | 13  | 3+   | 1+   | 2+ | 2o | 1- | 1o | 1- | 0o | 11 | 86.5  | 26 | 23 | 31   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 12                      |     | 0+ | 2+ | 2- | 1+ | 1+ | 1- | 0o | 0o | 7   | 0o   | 2-   | 1+ | 0- | 0+ | 0o | 0o | 0o | 3  | 90.7  | 18 | 20 | 36   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 13                      |     | 0+ | 1- | 2- | 1+ | 1o | 2- | 1o | 2- | 8   | 0o   | 1-   | 1- | 1o | 0o | 0+ | 0o | 1+ | 4  | 98.2  | 28 | 29 | 44   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 14                      |     | 2- | 1+ | 2+ | 3- | 3o | 3- | 3- | 2+ | 20  | 1-   | 1-   | 3- | 3o | 3- | 2o | 2o | 1o | 16 | 103.1 | 35 | 35 | 49   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 15                      |     | 3- | 3- | 4o | 3+ | 4o | 3+ | 2+ | 2+ | 34  | 2o   | 2+   | 4+ | 3- | 4- | 3- | 2+ | 2o | 29 | 112.9 | 44 | 50 | 60   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 16                      |     | 3- | 2+ | 3+ | 2o | 2o | 1+ | 1- | 2- | 17  | 2o   | 2-   | 3o | 2- | 1+ | 1o | 0o | 0+ | 12 | 115.1 | 64 | 66 | 62   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 17                      |     | 1o | 2+ | 2o | 3- | 2- | 2o | 2+ | 2- | 15  | 1o   | 2-   | 2- | 2o | 1o | 1o | 2o | 1+ | 10 | 114.9 | 62 | 63 | 62   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 18                      |     | 2- | 2+ | 2- | 3- | 3o | 3- | 2+ | 2o | 19  | 1o   | 2o   | 1o | 2o | 2+ | 2- | 1+ | 1o | 11 | 111.3 | 67 | 70 | 58   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 19                      |     | 2+ | 2- | 2+ | 2+ | 2- | 2- | 1- | 0+ | 12  | 1+   | 1o   | 2- | 2- | 0+ | 0+ | 0o | 0o | 6  | 116.4 | 69 | 73 | 64   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 20                      |     | 1o | 1- | 2- | 1o | 1+ | 1+ | 1o | 1- | 7   | 0o   | 0+   | 1o | 1- | 0+ | 0+ | 1- | 0o | 3  | 123.0 | 86 | 91 | 71   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 21                      |     | 1- | 1o | 1+ | 1+ | 2- | 1+ | 1o | 1o | 8   | 0o   | 0o   | 1- | 1- | 1- | 0o | 0+ | 1- | 3  | 119.6 | 87 | 89 | 67   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 22                      |     | 1o | 1- | 0+ | 1o | 1- | 1- | 1- | 1- | 5   | 0o   | 0+   | 0o | 0+ | 0o | 0o | 0o | 0o | 1  | 120.5 | 76 | 72 | 68   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 23                      |     | 1- | 0+ | 1o | 0+ | 1+ | 1o | 1o | 1- | 6   | 0o   | 0o   | 0+ | 0o | 0o | 0o | 0+ | 0+ | 1  | 116.2 | 61 | 57 | 63   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 24                      |     | 0+ | 2- | 2+ | 1o | 2- | 1o | 1o | 0+ | 8   | 0o   | 1o   | 2o | 0o | 1- | 0o | 0o | 0o | 4  | 111.9 | 52 | 46 | 59   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 25                      |     | 0o | 1- | 1- | 1- | 2o | 1+ | 2- | 1- | 7   | 0o   | 0o   | 0o | 0o | 1- | 0o | 1- | 0o | 2  | 106.3 | 37 | 34 | 53   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 26                      |     | 0+ | 1o | 1+ | 2o | 3+ | 3o | 2+ | 2+ | 16  | 0o   | 1o   | 0+ | 1- | 1+ | 1+ | 1+ | 2- | 7  | 102.2 | 34 | 27 | 48   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 27                      |     | 1o | 1+ | 0+ | 1+ | 1- | 1- | 1o | 2- | 7   | 1-   | 1o   | 0o | 0+ | 0+ | 0+ | 1- | 1o | 4  | 100.4 | 31 | 25 | 46   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 28                      |     | 2+ | 3o | 2+ | 3o | 2+ | 2o | 3+ | 4- | 27  | 3-   | 2+   | 2- | 2+ | 1+ | 1+ | 2+ | 3o | 17 | 92.4  | 30 | 29 | 38   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 29                      |     | 4- | 4- | 4o | 3o | 3- | 3- | 3o | 3- | 36  | 4o   | 3o   | 4- | 3- | 2+ | 2o | 3+ | 3- | 31 | 87.9  | 26 | 27 | 33   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| 30                      |     | 2+ | 2+ | 3o | 3- | 3- | 2- | 2+ | 2- | 19  | 3o   | 2+   | 3- | 3- | 2o | 1o | 1+ | 1- | 16 | 84.5  | 20 | 22 | 29   |       |                         |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |
| Mean                    |     |    |    |    |    |    |    |    |    |     | 17.0 |      |    |    |    |    |    |    |    |       |    |    | 12.8 | 100.5 | 43.2                    | 41.9 | 46.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                |  |  |  |

# Daily Average Indices Ap Jul 2003 - Jun 2004

115  
Jun 04



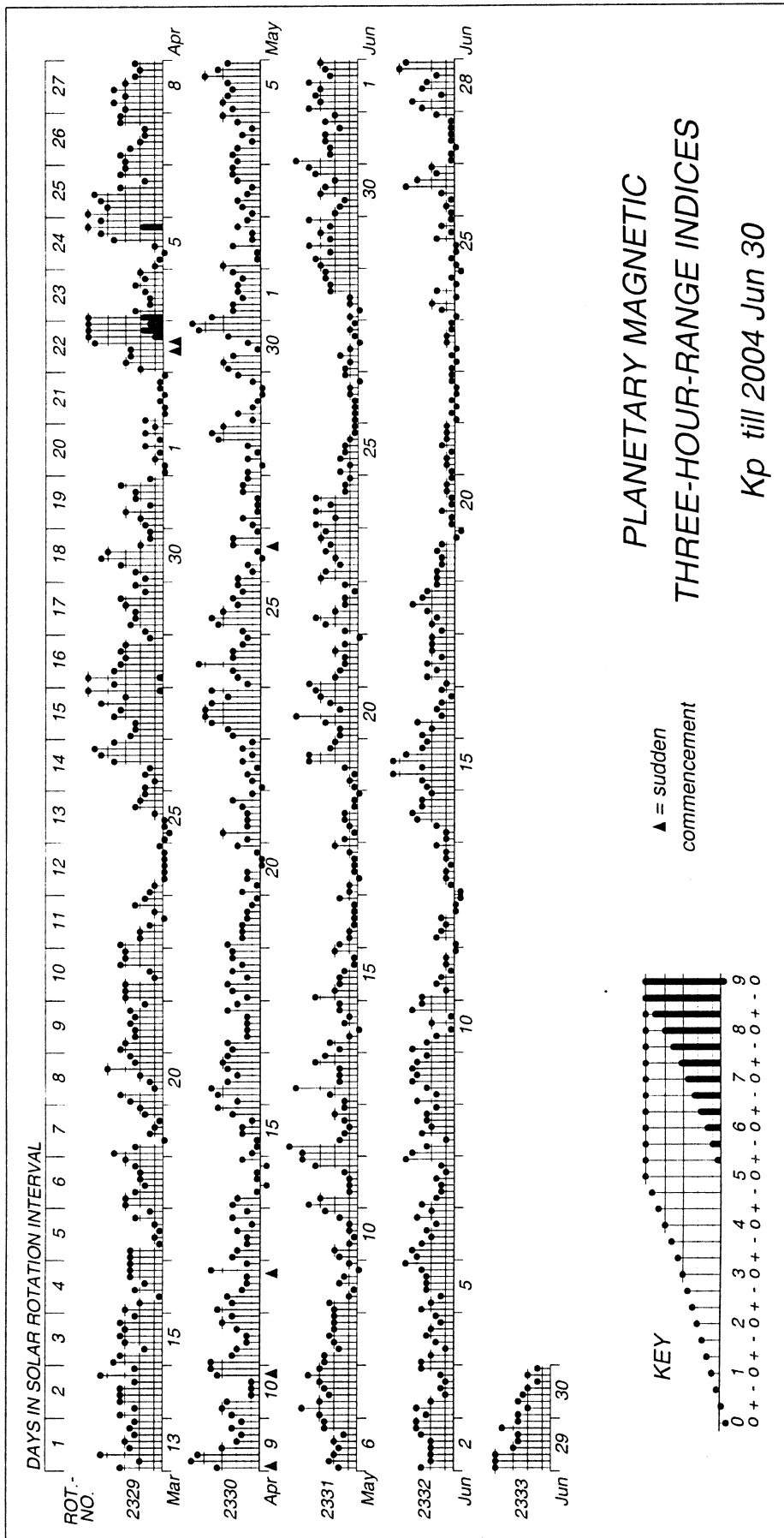
| Day  | Jul 03 | Aug | Sep | Oct | Nov | Dec | Jan 04 | Feb | Mar | Apr | May | Jun |
|------|--------|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|
| 1    | 8      | 39  | 13  | 10  | 26  | 10  | 24     | 10  | 21  | 4   | 9   | 16  |
| 2    | 12     | 21  | 12  | 8   | 18  | 7   | 15     | 18  | 21  | 3   | 6   | 10  |
| 3    | 19     | 14  | 15  | 17  | 13  | 4   | 22     | 20  | 13  | 41  | 6   | 8   |
| 4    | 22     | 10  | 22  | 5   | 38  | 6   | 22     | 15  | 6   | 18  | 7   | 7   |
| 5    | 18     | 7   | 16  | 5   | 6   | 39  | 25     | 12  | 5   | 24  | 14  | 11  |
| 6    | 9      | 32  | 8   | 9   | 17  | 23  | 24     | 21  | 3   | 25  | 8   | 11  |
| 7    | 11     | 32  | 4   | 15  | 8   | 14  | 29     | 7   | 3   | 12  | 16  | 8   |
| 8    | 3      | 33  | 5   | 6   | 8   | 35  | 7      | 4   | 3   | 14  | 8   | 9   |
| 9    | 4      | 14  | 22  | 7   | 29  | 29  | 23     | 7   | 28  | 16  | 5   | 13  |
| 10   | 7      | 9   | 21  | 2   | 27  | 41  | 26     | 6   | 45  | 11  | 6   | 10  |
| 11   | 52     | 10  | 14  | 2   | 61  | 40  | 19     | 28  | 40  | 10  | 12  | 5   |
| 12   | 43     | 26  | 9   | 4   | 30  | 25  | 9      | 30  | 28  | 10  | 12  | 3   |
| 13   | 13     | 15  | 8   | 16  | 52  | 26  | 20     | 25  | 14  | 6   | 12  | 4   |
| 14   | 14     | 14  | 4   | 66  | 38  | 27  | 12     | 20  | 16  | 4   | 5   | 10  |
| 15   | 28     | 11  | 4   | 44  | 40  | 25  | 18     | 24  | 15  | 7   | 7   | 18  |
| 16   | 48     | 8   | 34  | 29  | 41  | 10  | 29     | 7   | 10  | 13  | 4   | 7   |
| 17   | 18     | 20  | 70  | 32  | 39  | 7   | 18     | 4   | 6   | 8   | 4   | 7   |
| 18   | 15     | 108 | 50  | 25  | 26  | 3   | 18     | 8   | 10  | 8   | 4   | 9   |
| 19   | 30     | 19  | 39  | 37  | 12  | 1   | 18     | 8   | 7   | 6   | 9   | 4   |
| 20   | 17     | 17  | 27  | 36  | 150 | 16  | 18     | 4   | 12  | 4   | 13  | 4   |
| 21   | 7      | 58  | 18  | 49  | 42  | 24  | 14     | 7   | 11  | 7   | 7   | 4   |
| 22   | 6      | 46  | 17  | 34  | 30  | 18  | 64     | 8   | 13  | 4   | 8   | 2   |
| 23   | 9      | 36  | 15  | 6   | 22  | 7   | 43     | 9   | 7   | 19  | 11  | 3   |
| 24   | 7      | 20  | 41  | 38  | 13  | 6   | 18     | 11  | 3   | 10  | 10  | 3   |
| 25   | 8      | 20  | 28  | 16  | 14  | 5   | 38     | 6   | 4   | 11  | 4   | 3   |
| 26   | 33     | 11  | 15  | 10  | 8   | 8   | 18     | 3   | 17  | 5   | 3   | 8   |
| 27   | 22     | 8   | 6   | 11  | 6   | 11  | 17     | 12  | 22  | 4   | 4   | 3   |
| 28   | 21     | 18  | 4   | 25  | 5   | 13  | 23     | 19  | 21  | 9   | 7   | 14  |
| 29   | 38     | 16  | 4   | 204 | 6   | 5   | 9      | 24  | 10  | 4   | 15  | 19  |
| 30   | 27     | 14  | 4   | 191 | 12  | 6   | 19     |     | 14  | 16  | 12  | 8   |
| 31   | 35     | 6   |     | 116 |     | 19  | 10     |     | 9   |     | 12  |     |
| Mean | 19     | 23  | 18  | 35  | 28  | 16  | 22     | 13  | 14  | 11  | 8   | 8   |



## PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

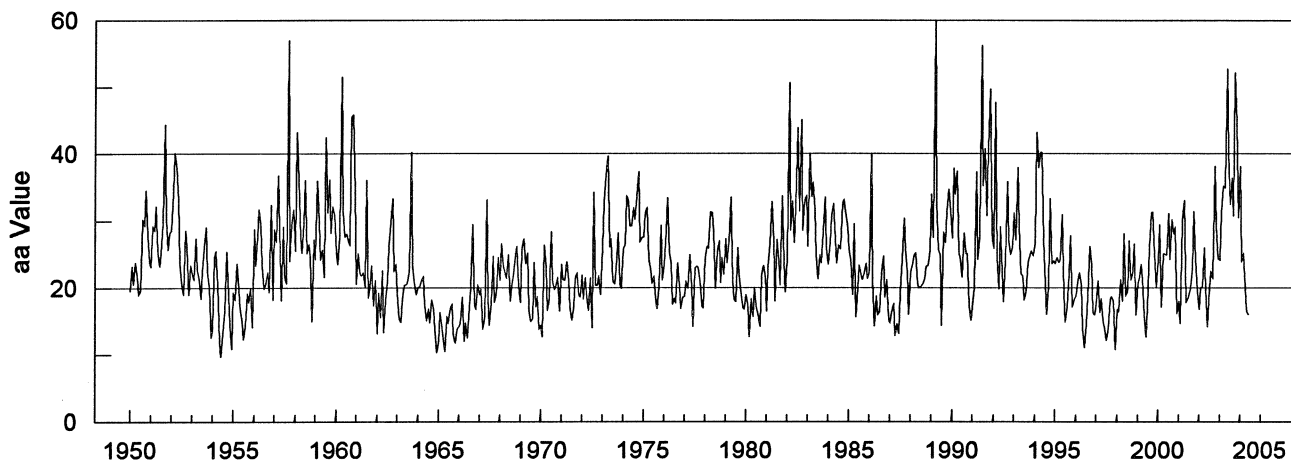
GeoForschungsZentrum Potsdam

Kp through June 30, 2004



# Monthly Mean aa Index Jan 1950 - Jun 2004

117  
Jun 04



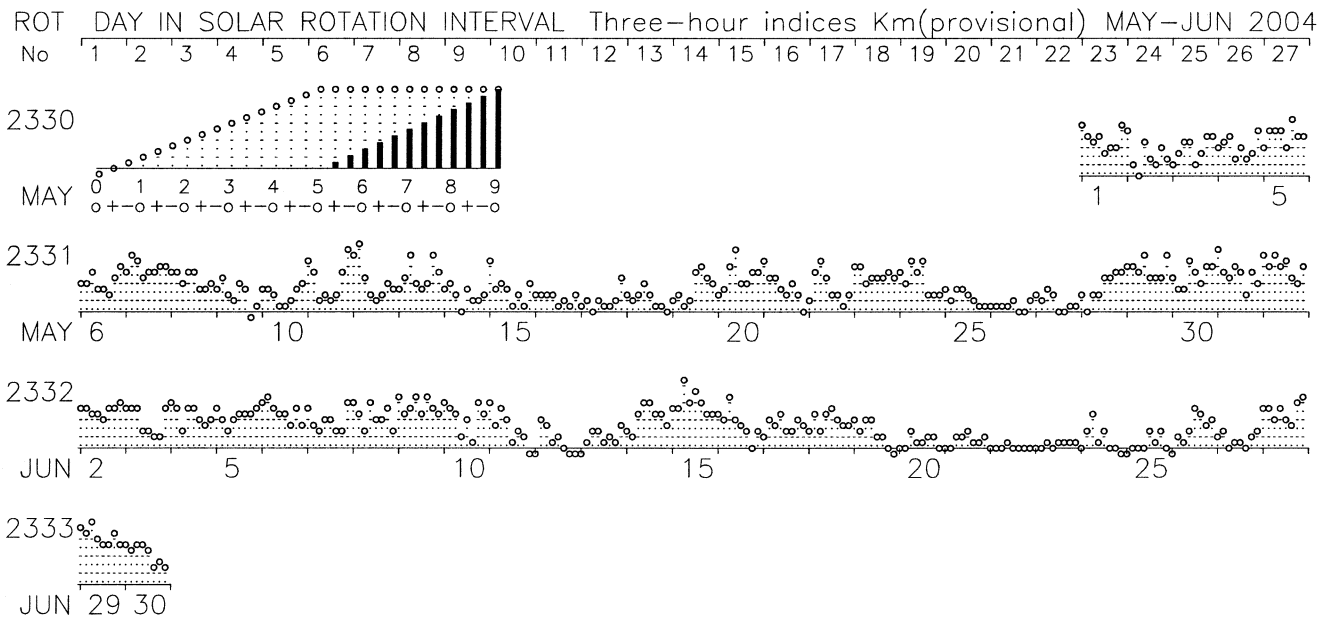
| Year | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Mean |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1950 | 19.5 | 23.2 | 20.6 | 23.8 | 21.7 | 19.0 | 19.5 | 30.2 | 29.3 | 34.5 | 28.0 | 24.0 | 24.4 |
| 1951 | 23.1 | 29.2 | 28.5 | 32.1 | 25.5 | 23.2 | 25.2 | 29.7 | 44.4 | 30.3 | 25.7 | 28.2 | 28.8 |
| 1952 | 28.5 | 34.3 | 40.1 | 38.0 | 33.1 | 23.8 | 20.7 | 19.0 | 28.5 | 26.4 | 18.9 | 23.4 | 27.9 |
| 1953 | 22.3 | 21.2 | 27.4 | 22.7 | 21.4 | 18.4 | 22.5 | 26.1 | 29.0 | 22.4 | 20.2 | 12.6 | 22.2 |
| 1954 | 13.9 | 24.5 | 25.5 | 20.6 | 12.0 | 9.7  | 13.1 | 16.5 | 25.4 | 21.1 | 14.5 | 10.9 | 17.3 |
| 1955 | 19.3 | 18.2 | 23.6 | 21.1 | 16.7 | 15.1 | 12.3 | 14.3 | 19.1 | 17.8 | 19.9 | 14.1 | 17.6 |
| 1956 | 28.7 | 23.3 | 27.6 | 31.7 | 29.3 | 23.5 | 19.8 | 20.7 | 22.4 | 19.3 | 32.3 | 18.2 | 24.7 |
| 1957 | 28.7 | 26.8 | 36.7 | 28.8 | 18.1 | 29.1 | 21.7 | 20.7 | 57.0 | 24.0 | 29.5 | 31.7 | 29.4 |
| 1958 | 25.5 | 43.2 | 36.1 | 27.6 | 25.2 | 29.7 | 36.0 | 25.1 | 26.5 | 24.7 | 15.0 | 27.2 | 28.5 |
| 1959 | 24.3 | 35.9 | 29.9 | 24.2 | 25.7 | 21.6 | 42.5 | 31.2 | 36.1 | 28.2 | 32.1 | 30.8 | 30.2 |
| 1960 | 25.2 | 23.5 | 27.6 | 51.5 | 31.6 | 27.6 | 28.1 | 27.2 | 26.4 | 45.6 | 45.9 | 34.5 | 32.9 |
| 1961 | 20.6 | 25.1 | 22.0 | 21.8 | 22.3 | 20.1 | 36.0 | 18.5 | 20.7 | 23.3 | 17.3 | 21.1 | 22.4 |
| 1962 | 13.2 | 19.2 | 15.5 | 22.6 | 13.4 | 18.1 | 21.0 | 26.2 | 29.8 | 33.3 | 22.5 | 23.5 | 21.5 |
| 1963 | 19.3 | 15.3 | 14.9 | 18.2 | 20.4 | 20.5 | 20.8 | 22.5 | 40.2 | 23.5 | 20.7 | 18.9 | 21.3 |
| 1964 | 20.1 | 20.1 | 21.0 | 21.7 | 17.5 | 15.1 | 16.9 | 14.8 | 18.2 | 16.9 | 13.8 | 10.3 | 17.2 |
| 1965 | 11.8 | 16.3 | 14.3 | 12.6 | 10.5 | 15.7 | 14.7 | 16.8 | 17.5 | 13.1 | 11.7 | 13.8 | 14.1 |
| 1966 | 14.2 | 14.8 | 18.6 | 12.0 | 14.8 | 12.5 | 17.1 | 20.0 | 29.4 | 17.5 | 16.8 | 20.5 | 17.3 |
| 1967 | 18.9 | 19.8 | 13.8 | 15.5 | 33.1 | 18.6 | 14.4 | 17.5 | 24.7 | 17.8 | 18.9 | 24.5 | 19.8 |
| 1968 | 21.1 | 26.5 | 23.3 | 22.2 | 21.4 | 24.9 | 18.0 | 20.1 | 22.0 | 24.8 | 26.2 | 20.3 | 22.6 |
| 1969 | 17.8 | 25.8 | 27.3 | 23.6 | 25.2 | 16.7 | 15.0 | 15.3 | 23.8 | 17.2 | 18.7 | 13.8 | 20.0 |
| 1970 | 14.4 | 12.7 | 26.4 | 23.1 | 16.6 | 18.3 | 28.4 | 21.0 | 19.7 | 20.6 | 21.6 | 16.5 | 19.9 |
| 1971 | 23.5 | 21.2 | 21.1 | 23.9 | 21.1 | 17.0 | 15.2 | 17.1 | 21.4 | 22.2 | 18.8 | 18.6 | 20.1 |
| 1972 | 21.9 | 18.3 | 21.5 | 18.1 | 16.6 | 21.5 | 14.0 | 34.2 | 20.4 | 20.4 | 21.8 | 18.9 | 20.6 |
| 1973 | 26.1 | 32.7 | 36.9 | 39.6 | 26.1 | 27.3 | 20.9 | 20.6 | 22.8 | 28.2 | 20.7 | 19.9 | 26.8 |
| 1974 | 25.8 | 26.4 | 33.7 | 32.9 | 29.2 | 29.2 | 32.0 | 30.2 | 33.7 | 37.3 | 26.8 | 27.5 | 30.4 |
| 1975 | 27.6 | 31.1 | 32.0 | 24.3 | 22.7 | 20.7 | 21.7 | 18.1 | 16.9 | 20.2 | 29.3 | 21.1 | 23.8 |
| 1976 | 23.3 | 28.5 | 33.4 | 25.4 | 23.7 | 17.5 | 18.4 | 17.7 | 23.7 | 20.4 | 16.9 | 18.6 | 22.3 |
| 1977 | 18.7 | 21.0 | 19.9 | 24.9 | 20.1 | 14.2 | 22.9 | 23.2 | 23.0 | 20.9 | 17.3 | 17.0 | 20.3 |
| 1978 | 24.6 | 26.2 | 25.9 | 31.3 | 31.2 | 28.3 | 19.9 | 25.6 | 27.0 | 20.8 | 24.6 | 22.0 | 25.6 |
| 1979 | 27.3 | 23.7 | 26.9 | 33.5 | 21.0 | 18.3 | 17.9 | 26.0 | 22.0 | 19.3 | 17.1 | 16.8 | 22.5 |
| 1980 | 19.0 | 17.3 | 12.7 | 18.4 | 15.6 | 20.0 | 17.0 | 15.9 | 14.2 | 21.9 | 23.3 | 21.7 | 18.1 |
| 1981 | 16.5 | 23.1 | 26.6 | 32.8 | 26.9 | 18.0 | 27.2 | 24.0 | 20.4 | 33.7 | 24.1 | 19.3 | 24.4 |
| 1982 | 24.2 | 50.6 | 28.5 | 32.9 | 26.7 | 32.1 | 43.9 | 31.4 | 45.1 | 28.5 | 33.0 | 33.8 | 34.2 |
| 1983 | 26.2 | 40.0 | 33.6 | 35.7 | 31.6 | 24.9 | 21.3 | 24.9 | 23.7 | 28.3 | 33.5 | 26.0 | 29.1 |
| 1984 | 23.5 | 26.7 | 30.7 | 32.5 | 27.2 | 23.7 | 26.4 | 25.8 | 32.6 | 33.1 | 31.0 | 29.0 | 28.5 |
| 1985 | 25.7 | 24.1 | 19.0 | 29.5 | 15.6 | 19.9 | 23.4 | 22.0 | 21.2 | 22.2 | 23.7 | 21.4 | 22.3 |
| 1986 | 22.4 | 40.0 | 21.1 | 14.3 | 18.8 | 15.9 | 16.3 | 22.3 | 24.7 | 18.6 | 21.2 | 15.3 | 20.9 |
| 1987 | 14.8 | 16.6 | 17.6 | 12.9 | 14.7 | 13.2 | 19.3 | 24.3 | 30.3 | 25.8 | 22.4 | 16.0 | 19.0 |
| 1988 | 22.4 | 23.4 | 24.8 | 25.2 | 20.5 | 20.0 | 20.2 | 20.6 | 21.4 | 23.2 | 23.3 | 25.5 | 22.5 |
| 1989 | 33.9 | 27.5 | 60.1 | 32.8 | 25.7 | 24.9 | 14.4 | 28.4 | 26.7 | 31.4 | 34.7 | 31.4 | 31.0 |
| 1990 | 27.4 | 37.8 | 33.9 | 37.4 | 25.1 | 24.6 | 21.6 | 28.2 | 25.1 | 25.1 | 17.4 | 15.2 | 26.6 |
| 1991 | 17.2 | 20.1 | 37.3 | 24.3 | 27.3 | 56.2 | 35.2 | 40.8 | 30.7 | 44.1 | 49.7 | 28.0 | 34.2 |
| 1992 | 25.9 | 47.7 | 24.5 | 19.8 | 29.1 | 24.8 | 17.9 | 24.1 | 35.8 | 27.0 | 25.0 | 26.1 | 27.3 |
| 1993 | 31.2 | 27.1 | 37.9 | 29.2 | 22.1 | 21.8 | 18.2 | 19.2 | 23.8 | 24.6 | 25.5 | 24.8 | 25.5 |
| 1994 | 26.5 | 43.2 | 37.9 | 40.2 | 40.2 | 27.2 | 20.6 | 16.0 | 20.2 | 33.3 | 23.6 | 24.1 | 29.4 |
| 1995 | 23.6 | 24.5 | 23.8 | 24.2 | 30.9 | 19.1 | 14.9 | 17.0 | 22.2 | 27.9 | 17.2 | 18.2 | 22.0 |
| 1996 | 18.8 | 20.8 | 22.3 | 20.5 | 14.0 | 11.1 | 14.7 | 18.8 | 26.2 | 23.5 | 16.3 | 15.9 | 18.6 |
| 1997 | 17.4 | 21.0 | 16.3 | 18.4 | 15.1 | 13.7 | 12.1 | 13.7 | 18.4 | 18.7 | 18.0 | 10.8 | 16.1 |
| 1998 | 16.8 | 16.4 | 21.2 | 18.0 | 28.1 | 18.8 | 19.3 | 27.0 | 21.1 | 22.4 | 26.5 | 15.9 | 21.0 |
| 1999 | 20.8 | 21.3 | 23.5 | 21.3 | 15.8 | 12.7 | 16.9 | 26.2 | 31.2 | 31.3 | 25.1 | 20.1 | 22.2 |
| 2000 | 24.2 | 29.4 | 17.1 | 25.1 | 25.0 | 24.9 | 31.1 | 24.3 | 30.2 | 28.1 | 29.1 | 16.1 | 25.4 |
| 2001 | 18.0 | 14.7 | 30.2 | 33.0 | 17.8 | 18.2 | 18.7 | 19.9 | 22.7 | 31.4 | 24.4 | 19.5 | 22.4 |
| 2002 | 16.8 | 20.0 | 20.2 | 26.0 | 19.9 | 14.2 | 19.9 | 22.5 | 21.4 | 38.1 | 29.3 | 24.4 | 22.7 |
| 2003 | 24.2 | 31.3 | 35.2 | 34.9 | 52.7 | 40.2 | 32.4 | 36.4 | 30.7 | 52.2 | 44.7 | 30.4 | 37.1 |
| 2004 | 38.1 | 23.9 | 25.2 | 20.1 | 16.6 | 15.9 |      |      |      |      |      |      | 23.3 |

# PLANETARY GEOMAGNETIC ACTIVITY

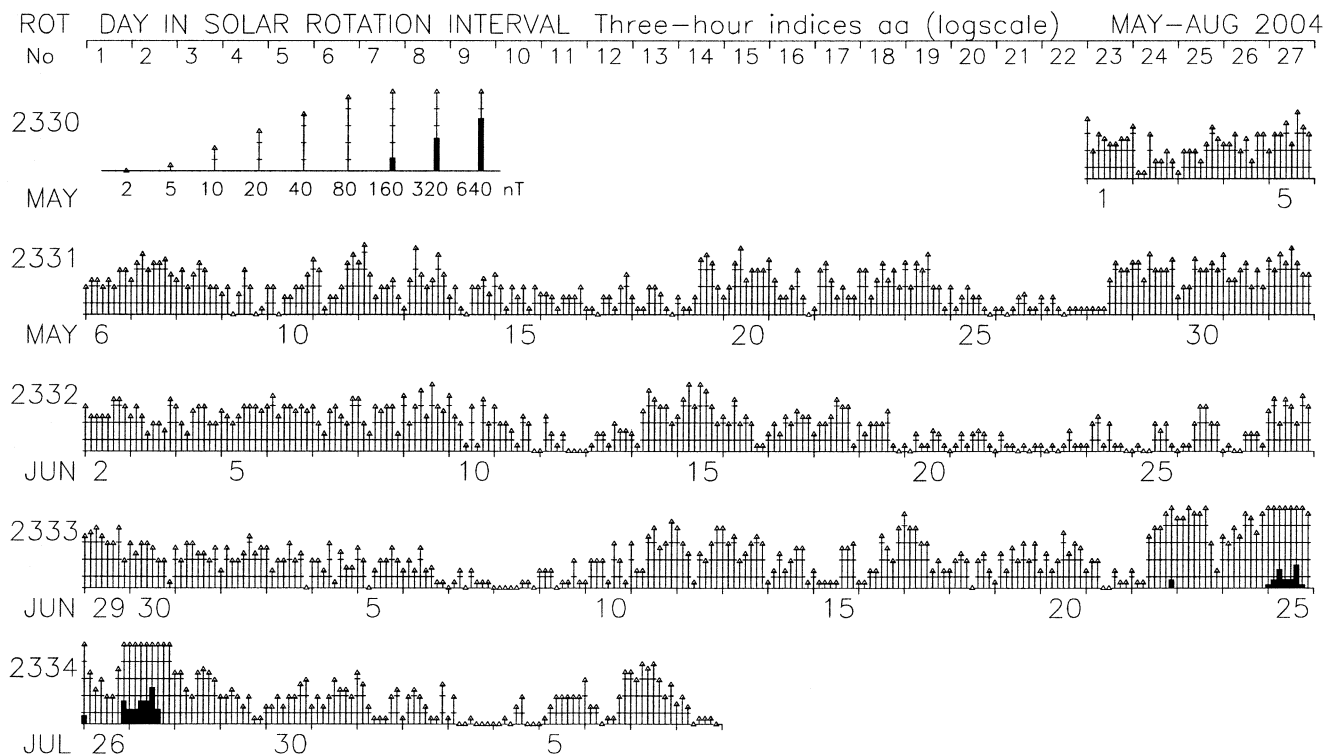
### 3-HOUR-RANGE INDICES $K_m$ AND $a_a$ BY 27-DAY SOLAR ROTATION INTERVAL

ISGI PUBLICATION OFFICE – EMail : ISGI.PUBOFF@cetp.ipsl.fr

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Indices Derivation at C.E.T.P.; Graph Prepared at ISGI Publication Office.

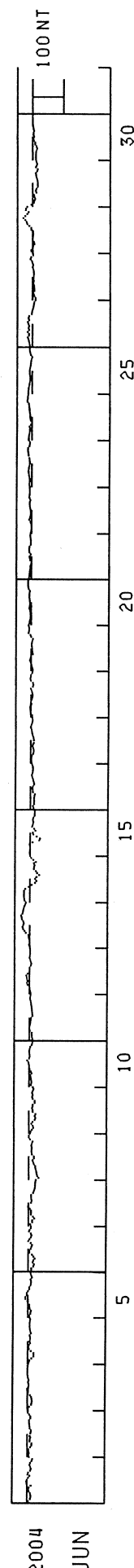


Indices Derivation at C.E.T.P.; Graph Prepared at ISGI Publication Office.

HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

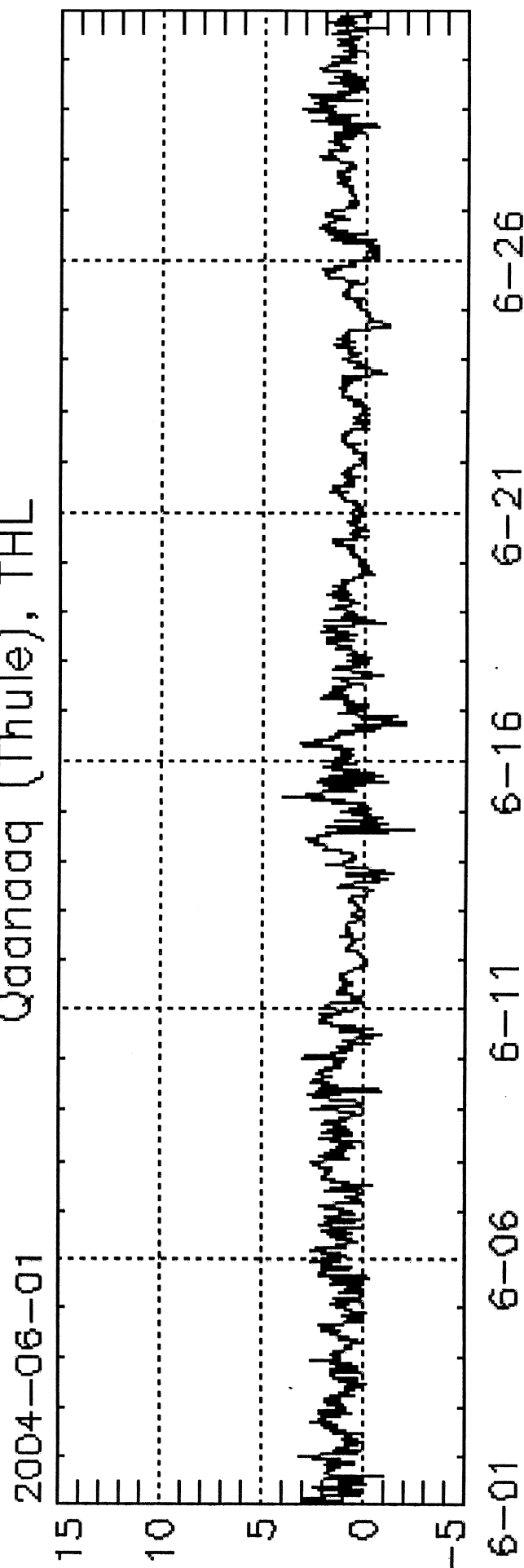
JUNE 2004

| UNIT=NT |     | JUNE 2004 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | U. T. |
|---------|-----|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| DAY     | 1   | 2         | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |       |
| 1       | -4  | -9        | -11 | -12 | -10 | -5  | -3  | -5  | -11 | 0   | 3   | 2   | -4  | -8  | -2  | -4  | -9  | -11 | -9  | -7  | -10 | -13 | -16 | -6  |       |
| 2       | -4  | -6        | -3  | -3  | -10 | -14 | -13 | -8  | -8  | -10 | -7  | -10 | -12 | -11 | -8  | -8  | -5  | -5  | -6  | -10 | -9  | -6  | -2  | -2  |       |
| 3       | -2  | -6        | -11 | -13 | -18 | -17 | -11 | -8  | -2  | -2  | -1  | -1  | -3  | -3  | -2  | -3  | -1  | 0   | 2   | 1   | 1   | 0   | 0   | -2  |       |
| 4       | -3  | -5        | -11 | -18 | -18 | -14 | -10 | -4  | -1  | -4  | -8  | -5  | -8  | -8  | -5  | -9  | -8  | -6  | -5  | -7  | -6  | -5  | -8  | -6  |       |
| 5       | -4  | -7        | -8  | -9  | -6  | -4  | -4  | 2   | 4   | 9   | 10  | 6   | 6   | 1   | -4  | -4  | -8  | -9  | -10 | -7  | -11 | -10 | -7  | -8  |       |
| 6       | -10 | -9        | -15 | -18 | -13 | -16 | -19 | -16 | -11 | -4  | -3  | -8  | -9  | -11 | -7  | 0   | -3  | -7  | -10 | -7  | -2  | -4  | -7  | -7  |       |
| 7       | -5  | -11       | -12 | -18 | -14 | -17 | -8  | -8  | -3  | 4   | 0   | -7  | -10 | -8  | -7  | -8  | -13 | -15 | -17 | -19 | -20 | -20 | -21 | -23 |       |
| 8       | -31 | -27       | -24 | -24 | -22 | -19 | -19 | -16 | -14 | -12 | -16 | -15 | -9  | -8  | -8  | -8  | -10 | -8  | -10 | -12 | -4  | 0   | 1   | -3  |       |
| 9       | -6  | -10       | -13 | -12 | -8  | -11 | -17 | -20 | -17 | -19 | -11 | -11 | -10 | -12 | -11 | -17 | -18 | -11 | -10 | -11 | -10 | -11 | -13 | -12 |       |
| 10      | -5  | -7        | -8  | -5  | -6  | -3  | -7  | -6  | -1  | 1   | 2   | 0   | 3   | 7   | 2   | -2  | -1  | 0   | 1   | -1  | -3  | -7  | -10 | -10 |       |
| 11      | -10 | -8        | -8  | -7  | -2  | 1   | 1   | -1  | -3  | -3  | -3  | -6  | -9  | -9  | -8  | -7  | -7  | -5  | -5  | -3  | -4  | -2  | -3  | -4  |       |
| 12      | -3  | -1        | 1   | 1   | 8   | 10  | 8   | 9   | 10  | 11  | 7   | 2   | 1   | 0   | -4  | -5  | -3  | -2  | 0   | -1  | -1  | -1  | -1  | -2  |       |
| 13      | 2   | 3         | 2   | 1   | 4   | 6   | 6   | 13  | 19  | 22  | 24  | 23  | 20  | 23  | 27  | 26  | 28  | 25  | 22  | 22  | 20  | 19  | 16  | 14  |       |
| 14      | 19  | 20        | 20  | 20  | 20  | 20  | 15  | 5   | -6  | -16 | -19 | -16 | -20 | -28 | -23 | -17 | -11 | -12 | -13 | -12 | -17 | -9  | -3  | 1   |       |
| 15      | 3   | 3         | 2   | 2   | 2   | 3   | -8  | -28 | -30 | -21 | -10 | -7  | -16 | -11 | -5  | -7  | -9  | -10 | -8  | -9  | -13 | -13 | -14 | -13 |       |
| 16      | -9  | -8        | -12 | -12 | -11 | -11 | -11 | -14 | -8  | -8  | -6  | -8  | -11 | -9  | -10 | -8  | -6  | -4  | -5  | -8  | -7  | -7  | -6  | -3  |       |
| 17      | -2  | -1        | -2  | -3  | -8  | -9  | -10 | -8  | -6  | -7  | -10 | -10 | -10 | -8  | -6  | -3  | -3  | -2  | 0   | -2  | -4  | -6  | -6  | -4  |       |
| 18      | -4  | 0         | 4   | 1   | 4   | 3   | -2  | 0   | -2  | -3  | -6  | -6  | -3  | -1  | 1   | -5  | -8  | -5  | 0   | 3   | 1   | 0   | -3  | -6  |       |
| 19      | -6  | -3        | -2  | 4   | 3   | 5   | 3   | 1   | -5  | -3  | -3  | -2  | -2  | -1  | -2  | -4  | -5  | 0   | 4   | 9   | 8   | 8   | 8   | -9  |       |
| 20      | 8   | 5         | 6   | 4   | 4   | 3   | 3   | 5   | 7   | 6   | 5   | 6   | 6   | 8   | 8   | 8   | 7   | 6   | 9   | 11  | 12  | 12  | 12  | 10  |       |
| 21      | 9   | 7         | 8   | 8   | 6   | 6   | 5   | 4   | 2   | 6   | 7   | 8   | 4   | 7   | 9   | 10  | 8   | 4   | 4   | 3   | 4   | 5   | 5   | 5   |       |
| 22      | 3   | 1         | 2   | 2   | 4   | 6   | 9   | 7   | 5   | 4   | 4   | 5   | 5   | 8   | 8   | 7   | 6   | 7   | 9   | 8   | 8   | 8   | 8   | 8   |       |
| 23      | 10  | 10        | 8   | 7   | 10  | 10  | 11  | 11  | 11  | 9   | 9   | 8   | 8   | 9   | 10  | 11  | 11  | 13  | 14  | 13  | 10  | 7   | 8   | 11  |       |
| 24      | 12  | 12        | 9   | 10  | 8   | 8   | 9   | 6   | 2   | 5   | 7   | 7   | 8   | 8   | 9   | 10  | 10  | 11  | 12  | 15  | 16  | 16  | 14  | 13  |       |
| 25      | 14  | 14        | 12  | 11  | 9   | 9   | 7   | 7   | 7   | 9   | 9   | 9   | 9   | 7   | 6   | 5   | 5   | 3   | 2   | 5   | 7   | 9   | 10  | 10  |       |
| 26      | 10  | 11        | 11  | 13  | 15  | 12  | 11  | 15  | 12  | 14  | 11  | 13  | 16  | 12  | 13  | 11  | 4   | 3   | 0   | -2  | -4  | -3  | -6  | -9  |       |
| 27      | -9  | -5        | -3  | -2  | -5  | -5  | -5  | -3  | -2  | -3  | -2  | -3  | -4  | -4  | -4  | -2  | 0   | -1  | 0   | 4   | 7   | 6   | -1  | -1  |       |
| 28      | 5   | 5         | 0   | -1  | -5  | -4  | 1   | 1   | -2  | -2  | -2  | 6   | 6   | 12  | 17  | 20  | 24  | 30  | 25  | 19  | 14  | 22  | 22  | 18  |       |
| 29      | 5   | -4        | -6  | -7  | -5  | -4  | -12 | -10 | -12 | -15 | -16 | -15 | -16 | -14 | -11 | -9  | -9  | -13 | -15 | -10 | -12 | -13 | -12 | -10 |       |
| 30      | -10 | -9        | -10 | -10 | -11 | -14 | -11 | -7  | -7  | -3  | -2  | -4  | -2  | -1  | -3  | -2  | -1  | 1   | 2   | -2  | 0   | 0   | 1   | 2   |       |



Note: The baselines for the observatories were adjusted for secular change for the Provisional Dst values for June 2004.

WDC C1 for Geomagnetism, Copenhagen  
Polar Cap index  
Qaanaaq (Thule), THL



Date, mm-dd  
Data source: Solar-Terrestrial Physics Division  
Danish Meteorological Institute

## P R I N C I P A L M A G N E T I C S T O R M S

JUNE 2004

| Sta | Geomag Lat | Commencement |          | Type | SC Amplitudes |              |              | Maximum 3-Hour K Index<br>Day(3-Hour Periods) | Ranges       |              |              | End |              |
|-----|------------|--------------|----------|------|---------------|--------------|--------------|-----------------------------------------------|--------------|--------------|--------------|-----|--------------|
|     |            | Time         | Day (UT) |      | D<br>(Min)    | H<br>(Gamma) | Z<br>(Gamma) |                                               | D<br>K (Min) | H<br>(Gamma) | Z<br>(Gamma) | Day | Hour<br>(UT) |
| JAI | 17.4N      | 01           | 0100     | ..   | ..            | ..           | ..           |                                               | -            | 8            | 64           | 36  | 02 22        |
| NGP | 11.3N      | 01           | 0100     | ..   | ..            | ..           | ..           |                                               | -            | 6            | 75           | 24  | 02 22        |
| ABG | 09.4N      | 01           | 0100     | ..   | ..            | ..           | ..           | 01(5)                                         | 4            | 6            | 71           | 35  | 02 22        |
| PND | 02.0N      | 01           | 0100     | ..   | ..            | ..           | ..           |                                               | -            | 5            | 73           | 36  | 02 22        |
| TIR | 00.6S      | 01           | 0100     | ..   | ..            | ..           | ..           |                                               | -            | 5            | 90           | 44  | 02 22        |
| HYB | 07.6N      | 08           | 0500     | ..   | ..            | ..           | ..           | 09(6)                                         | 4            | 5            | 77           | 23  | 10 22        |
| HYB | 07.6N      | 13           | 0600     | ..   | ..            | ..           | ..           | 15(3)                                         | 5            | 5            | 119          | 28  | 16 17        |
| JAI | 17.4N      | 14           | 0630     | ..   | ..            | ..           | ..           |                                               | -            | 5            | 103          | 33  | 15 22        |
| NGP | 11.3N      | 14           | 0630     | ..   | ..            | ..           | ..           |                                               | -            | 3            | 112          | 24  | 15 22        |
| ABG | 09.4N      | 14           | 0630     | ..   | ..            | ..           | ..           | 15(3)                                         | 5            | 4            | 113          | 36  | 15 22        |
| PND | 02.0N      | 14           | 0630     | ..   | ..            | ..           | ..           |                                               | -            | 2            | 119          | 37  | 15 22        |
| TIR | 00.6S      | 14           | 0630     | ..   | ..            | ..           | ..           |                                               | -            | 3            | 159          | 66  | 15 22        |
| HYB | 07.6N      | 27           | 2000     | ..   | ..            | ..           | ..           | 29(1)                                         | 4            | 6            | 72           | 25  | 30 24        |
| JAI | 17.4N      | 28           | 1600     | ..   | ..            | ..           | ..           |                                               | -            | 7            | 55           | 25  | 29 22        |
| NGP | 11.3N      | 28           | 1600     | ..   | ..            | ..           | ..           |                                               | -            | 6            | 59           | 20  | 29 22        |
| ABG | 09.4N      | 28           | 1600     | ..   | ..            | ..           | ..           | 28(7) 29(1,2,3,6,7)                           | 4            | 6            | 63           | 37  | 29 22        |
| PND | 02.0N      | 28           | 1600     | ..   | ..            | ..           | ..           |                                               | -            | 4            | 79           | 42  | 29 22        |
| TIR | 00.6S      | 28           | 1600     | ..   | ..            | ..           | ..           |                                               | -            | 4            | 132          | 61  | 29 22        |

## Stations:

|                        |                        |                         |                    |
|------------------------|------------------------|-------------------------|--------------------|
| ABG = ALIBAG           | CZT = PORT ALFRED      | HON = HONOLULU          | PMG = PORT MORESBY |
| AMS = MARTIN DE VIVIES | DRV = DUMONT D'URVILLE | HYB = HYDERABAD         | PND = PONDICHERRY  |
| ANN = ANNAMALAINAGAR   | ETT = ETAIYAPURAM      | JAI = JAIPUR            | SHL = SHILLONG     |
| BJI = BEIJING          | GNA = GNANGARA         | KRC = KARACHI           | SIT = SITKA        |
| CAN = CANBERRA         | GUA = GUAM             | NGP = NAGPUR            | TIR = TIRUNELVELI  |
| CMO = COLLEGE          | HER = HERMANUS         | PAF = PORT AUX FRANCAIS | UJJ = UJJAIN       |

Stations reporting no storms observed: CAN GNA KRC

## MAGNETIC STORM SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS (PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS)

June 2004

| Storm Sudden Commencements (SSC) |      |                         | Solar Flare Effects (sfe) |           |               |
|----------------------------------|------|-------------------------|---------------------------|-----------|---------------|
| Day                              | Time | Quality: Station Group* | Day                       | Begin-End | Station(s)    |
|                                  | None |                         | 13                        | 1123-1130 | NGK+ BDV HTY+ |
|                                  |      |                         | 25                        | 1318-1356 | GUI           |

### REPORTING OBSERVATORIES (up to the 3rd of August 2004):

NUR LER ESK NGK VAL HAD BDV CLF HRB NAG GCK MMB EBR COI SPT KAK HTY KNY GUI HYB GNA  
CNB

Three-letter codes identify each observatory. Reporting stations have been grouped by the character of the observed event. The letter A means very remarkable; B means fair, but unmistakable; C means very poor, doubtful; and - means no quality figure given. The \* means that the SSC, at least in one component, was preceded by a small reversed impulse. SSCs are given only when five or more stations report the event. SFEs include all reports. If an SFE is confirmed by solar or ionospheric events, the name of the station is identified with a plus sign (+).

Note that we have included data of the Antarctic Station LIVINGSTONE (62° 39' 44" S, 60°23' 41" W) -- Luis F.

### Criterion on Provisional SSC data

From December 2002, we are giving as provisional SSC only the SSC reported by more than 4 observatories. This is a change with respect to the previous criterion according to which we used to give the SSC reported by more than 5 observatories. The change, pending IAGA confirmation, has been provisionally taken because of the decreasing number of reporting observatories in order to keep the homogeneity of the data. The idea is to keep the same minimum percentage of the observatories reporting an SSC, relative to the total number of reporting observatories, to be considered as a probable SSC.