FEBRUARY 2005 NUMBER 726 - Part I

Solar-Geophysical Data prompt reports

Data for December 2004 and January 2005
Explanation of Data Reports Issued as Number 515 (Supplement) July 1987

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Data for December 2004 and January 2005

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Number 726
(Issued in Two Parts)

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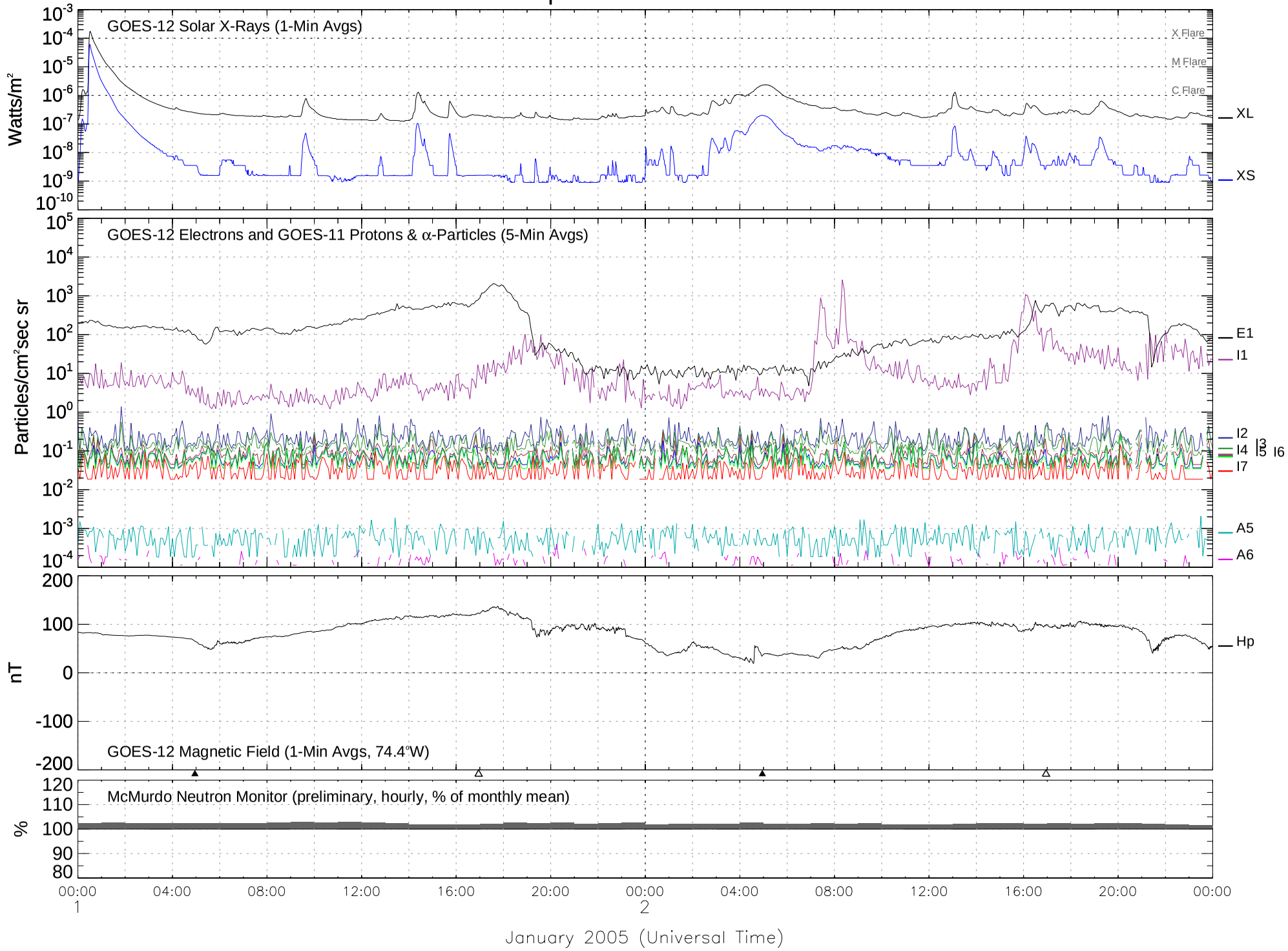
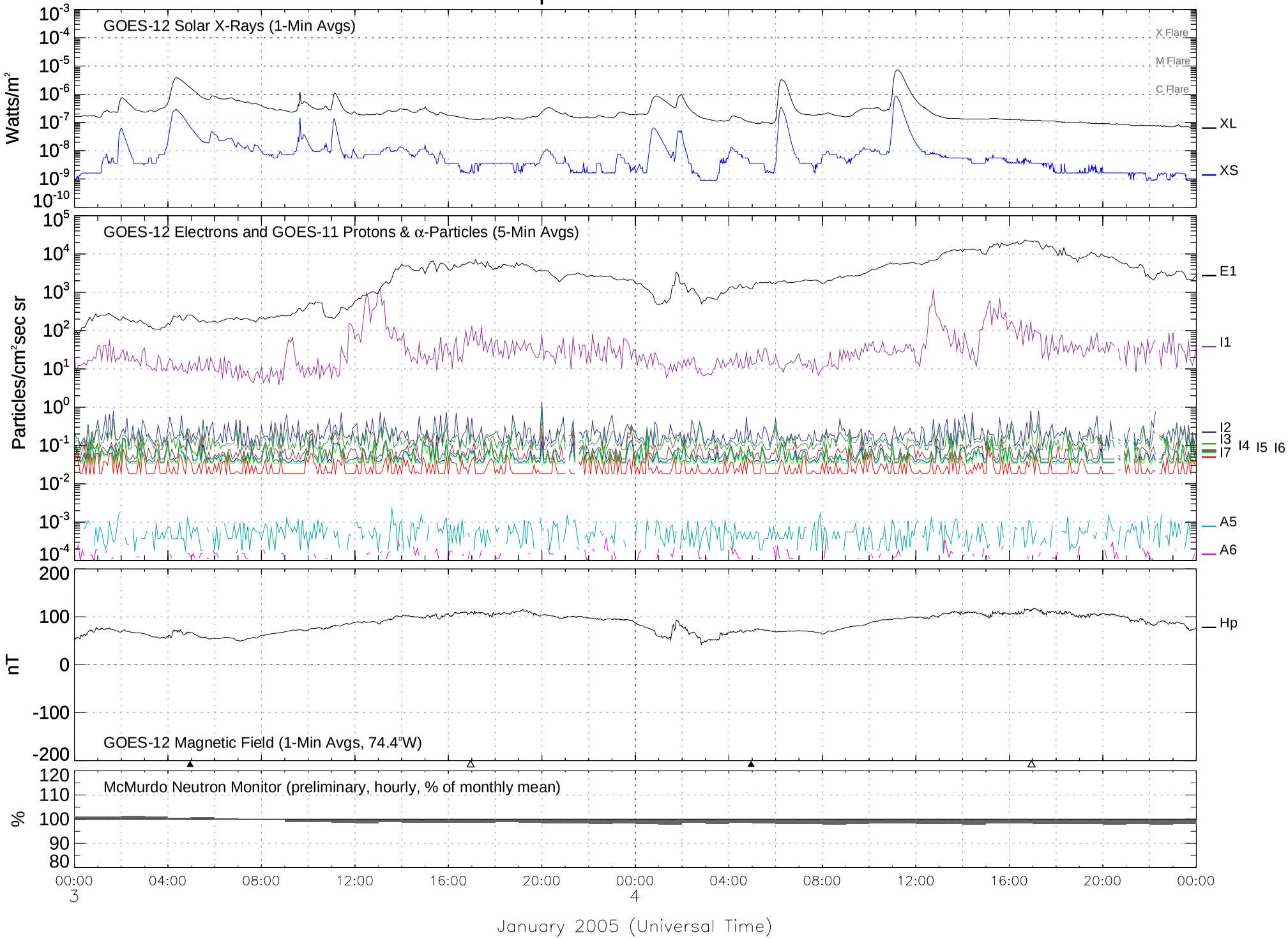
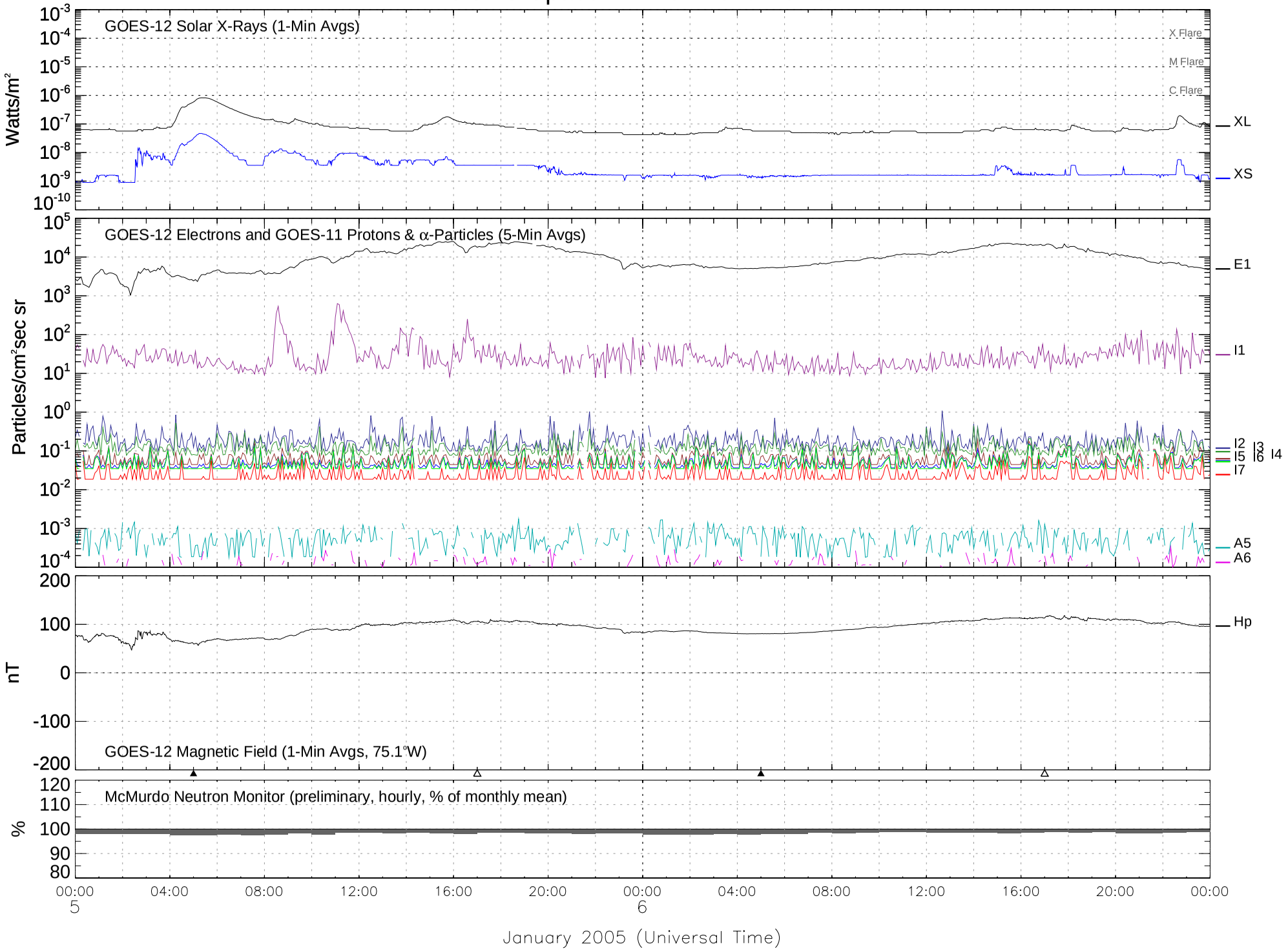


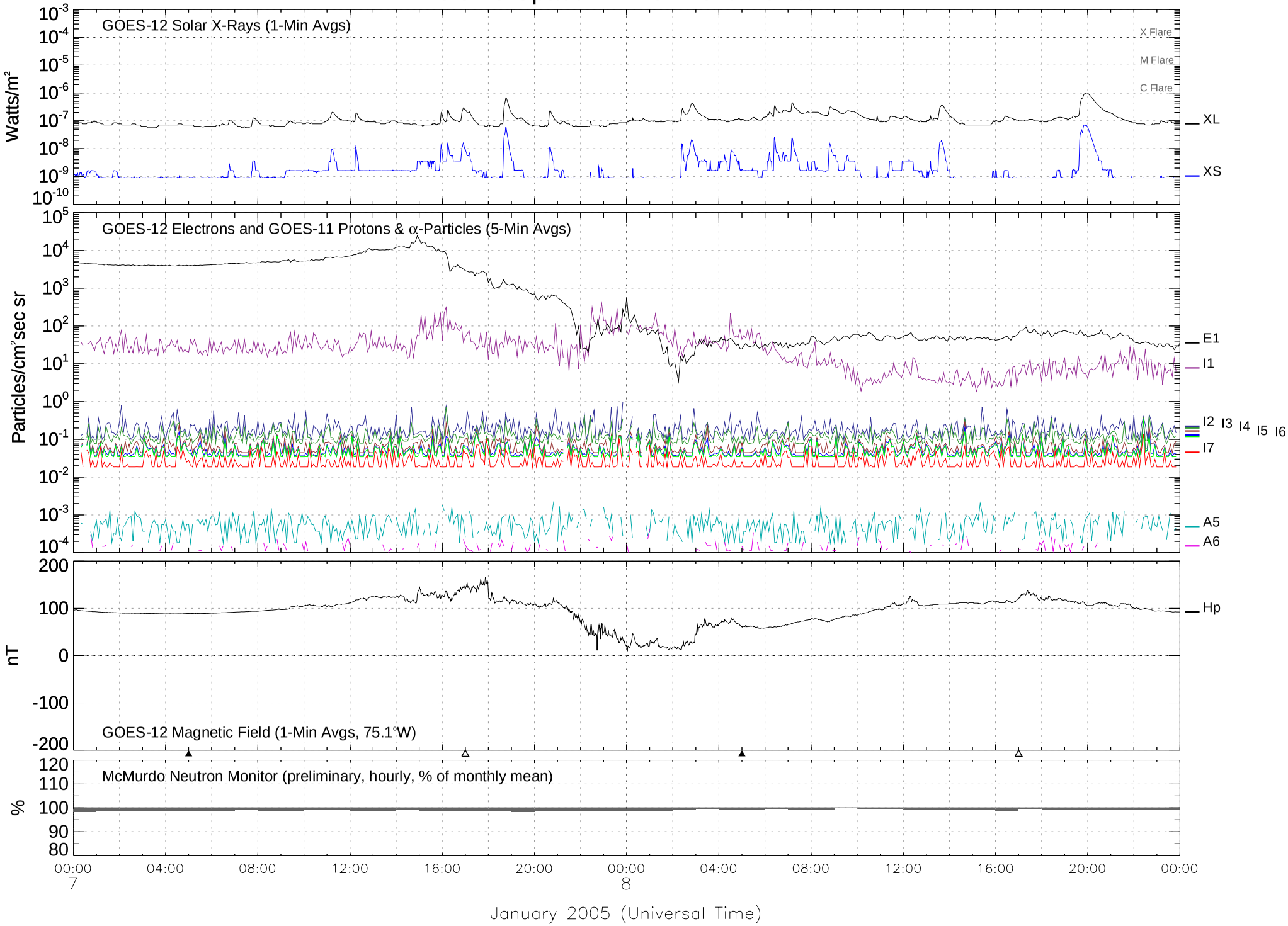
GOES Space Environment Monitor



GOES Space Environment Monitor



GOES Space Environment Monitor



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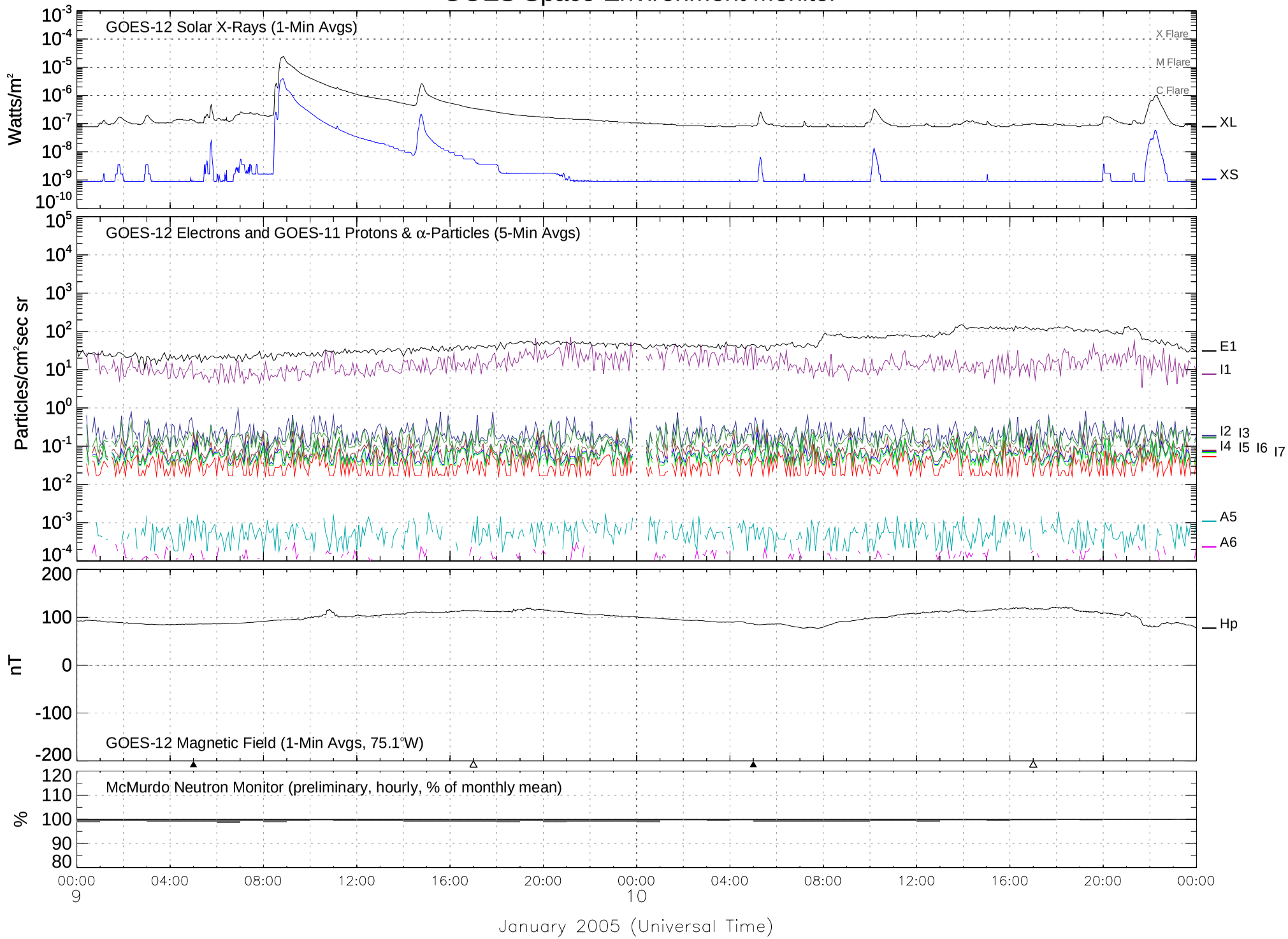

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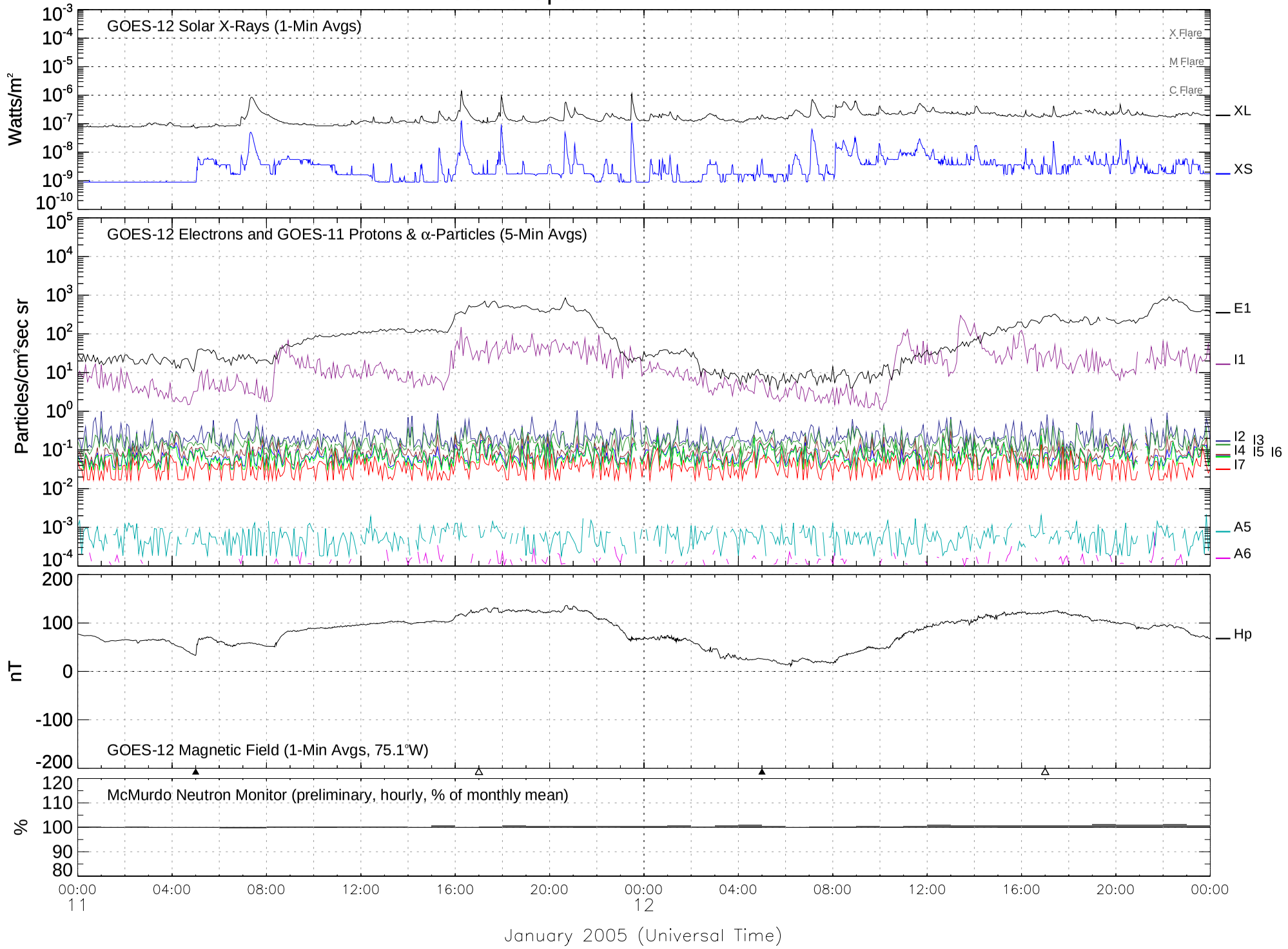

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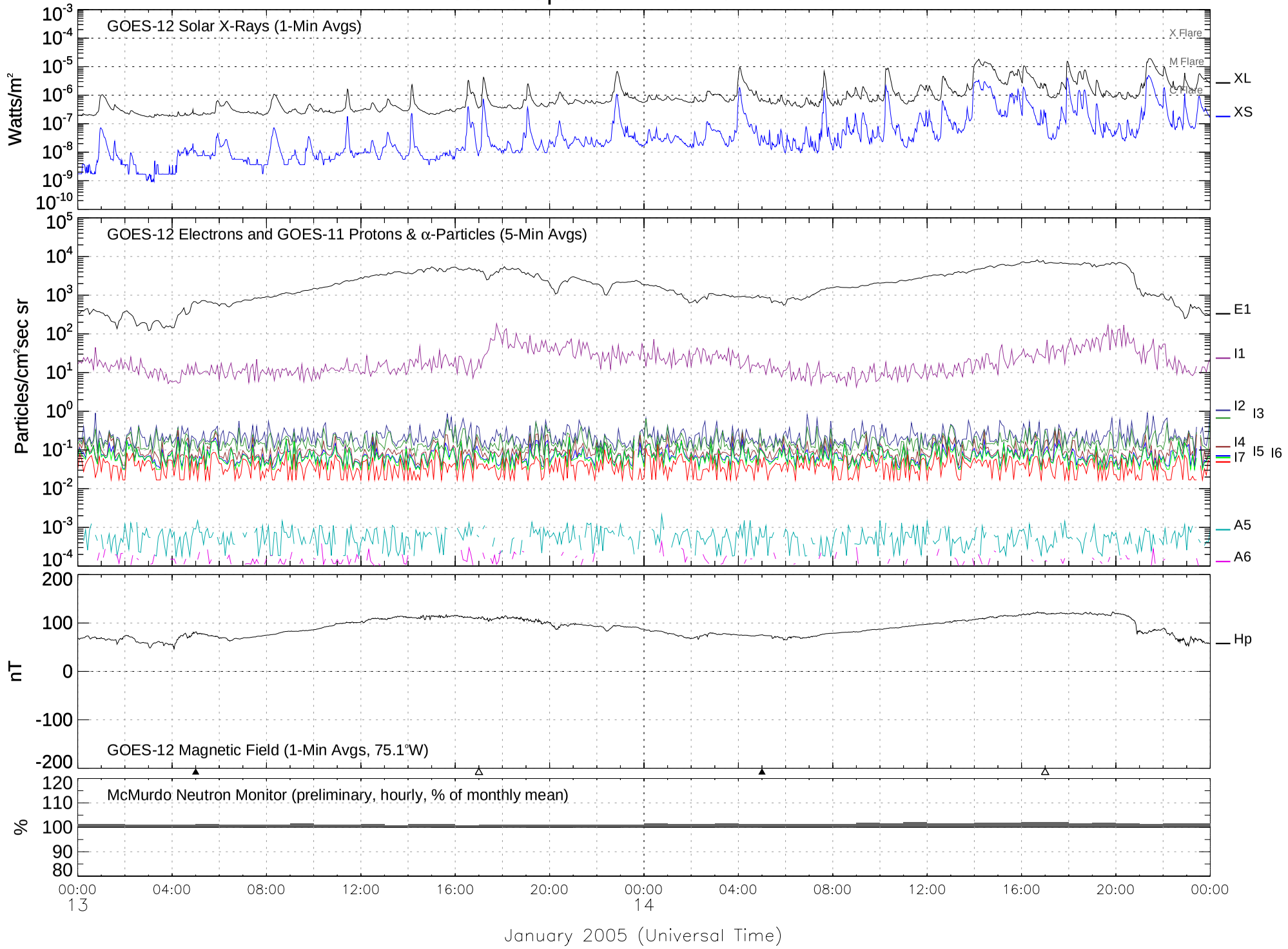

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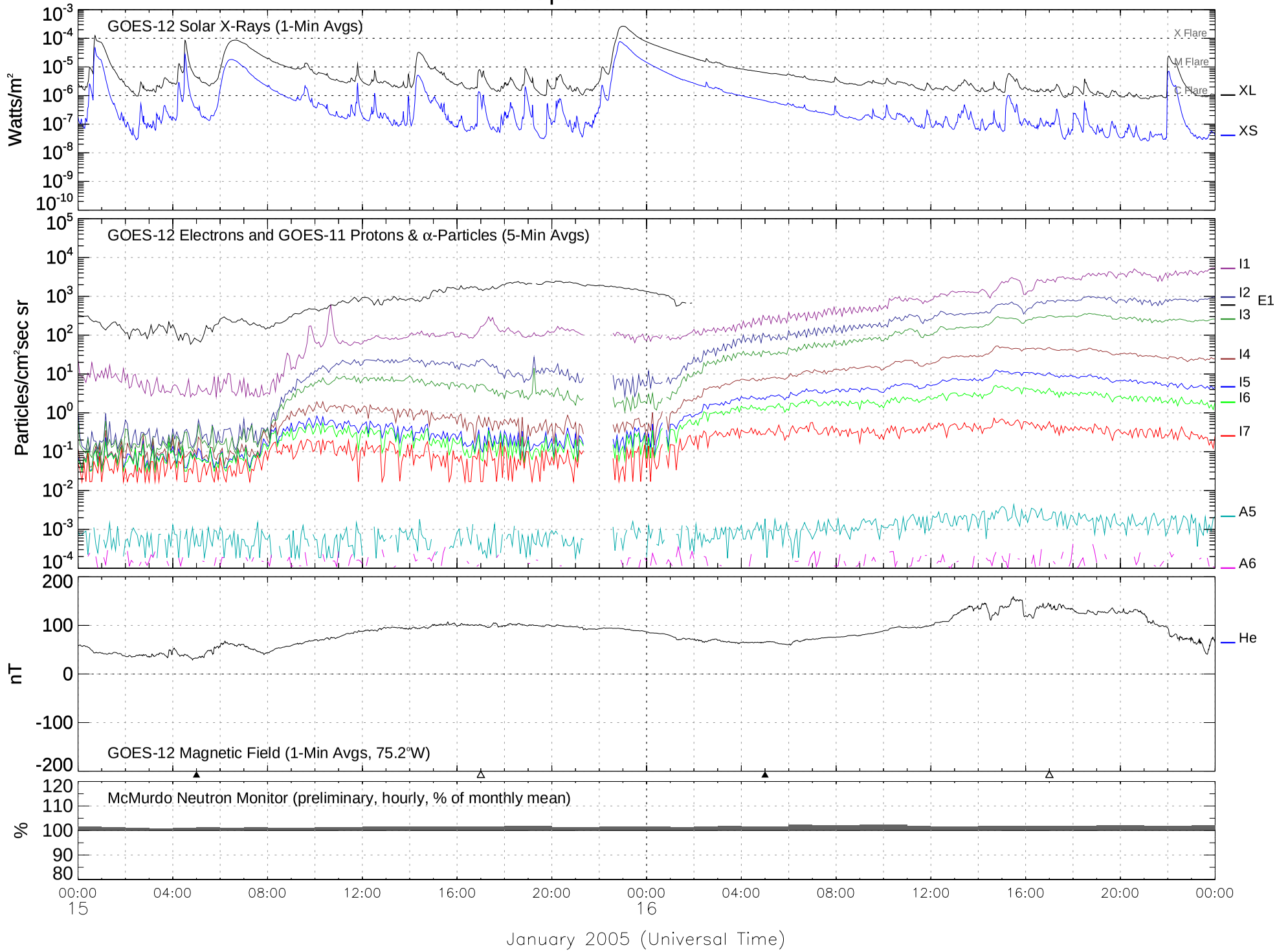

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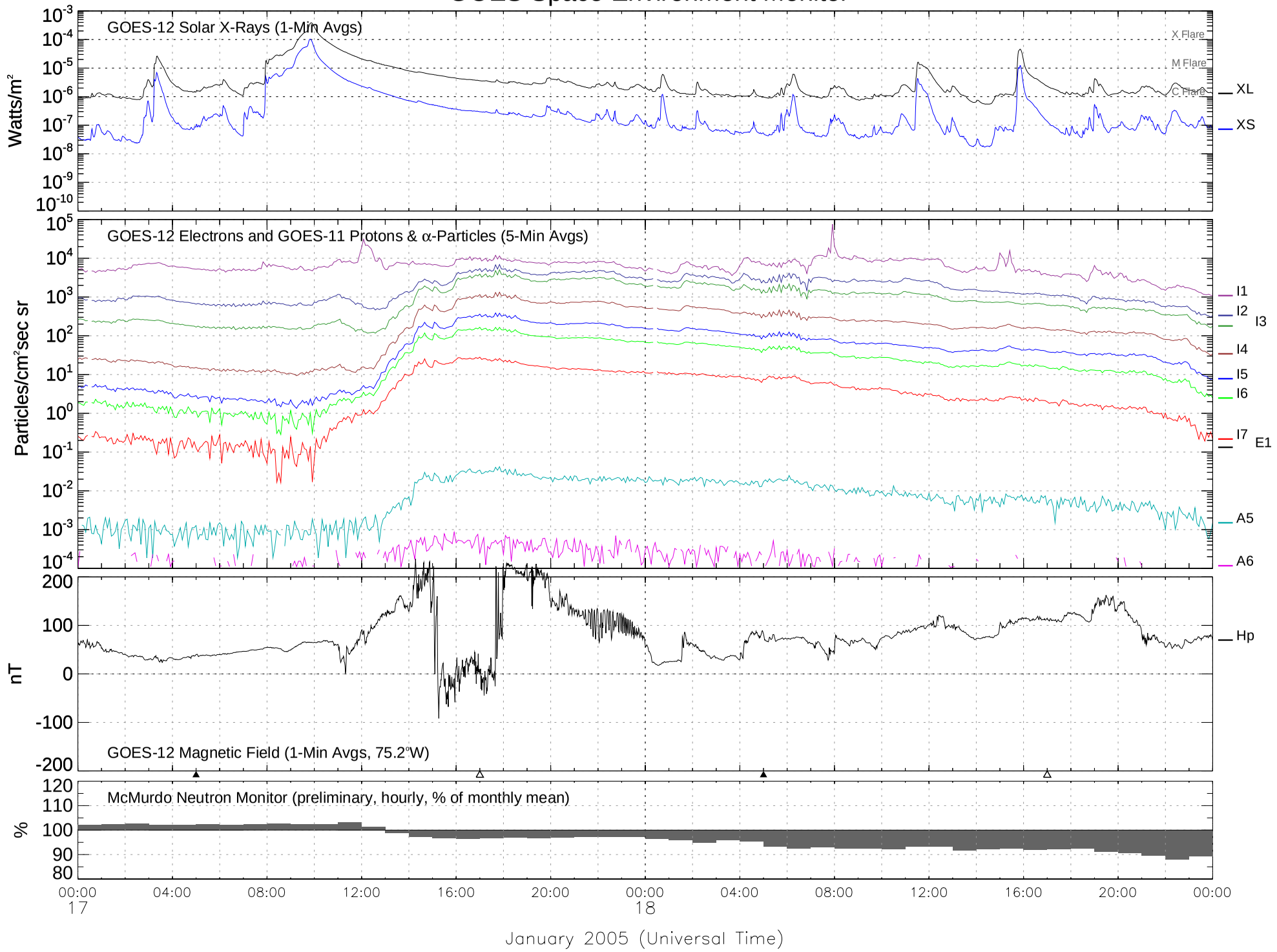

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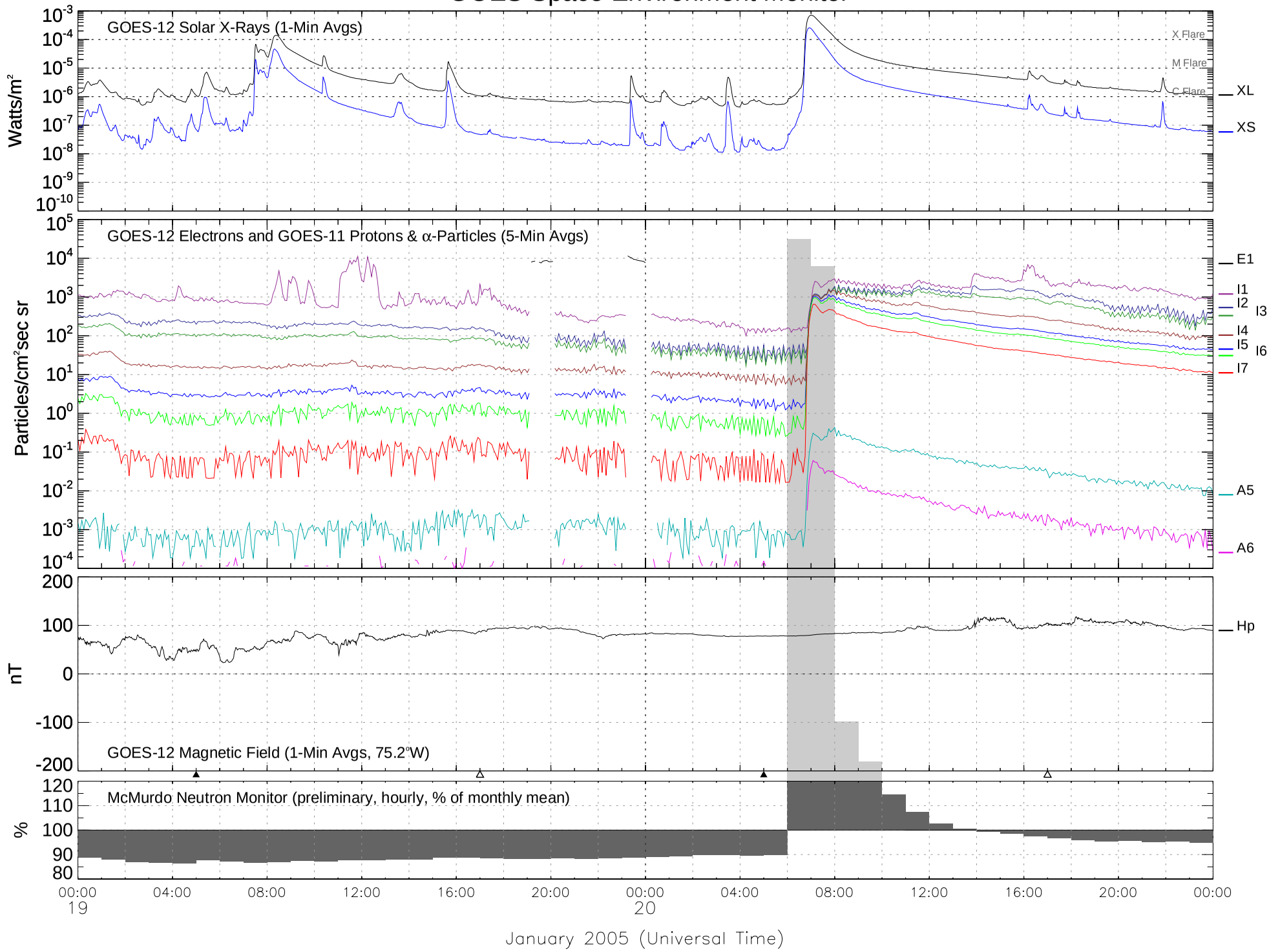
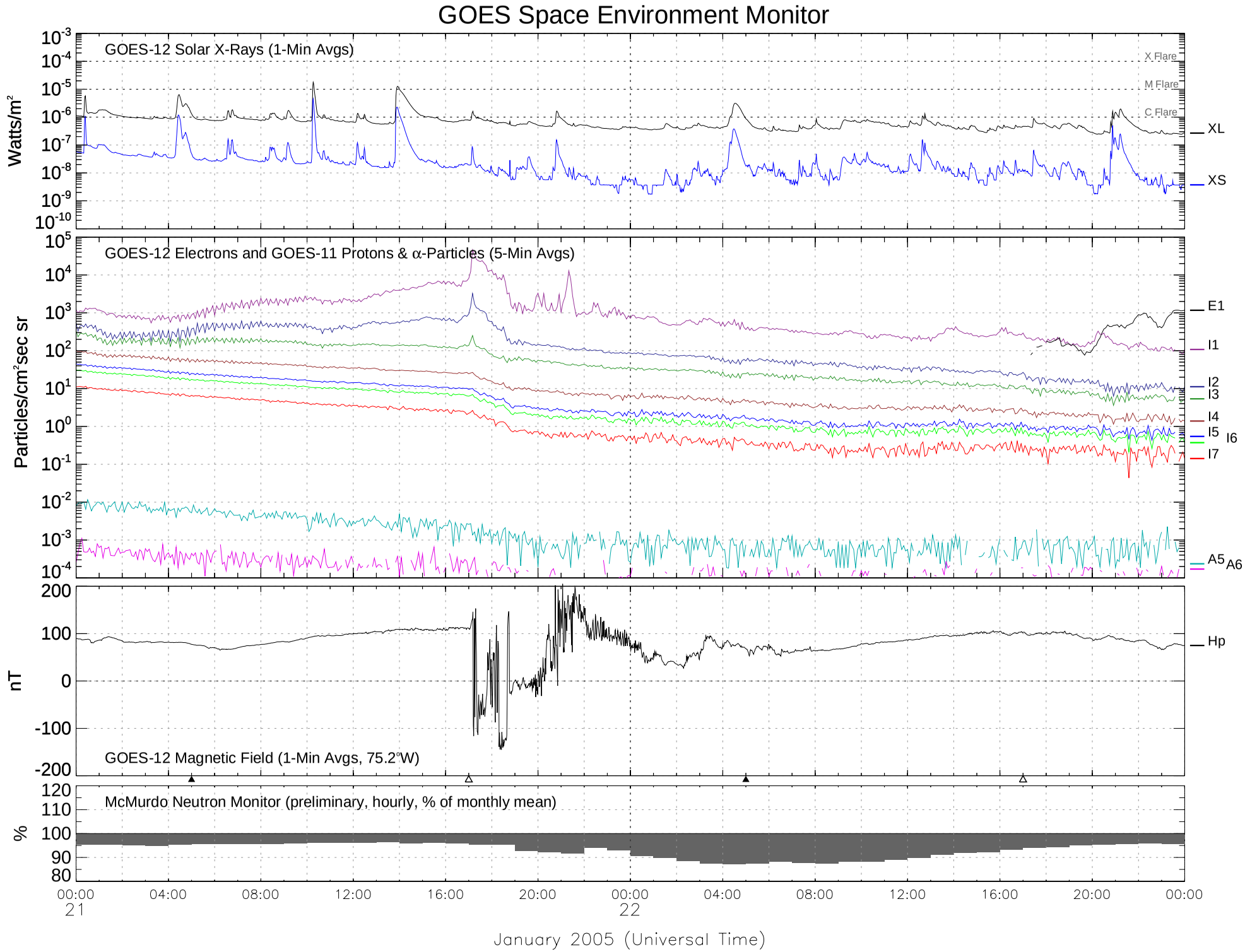
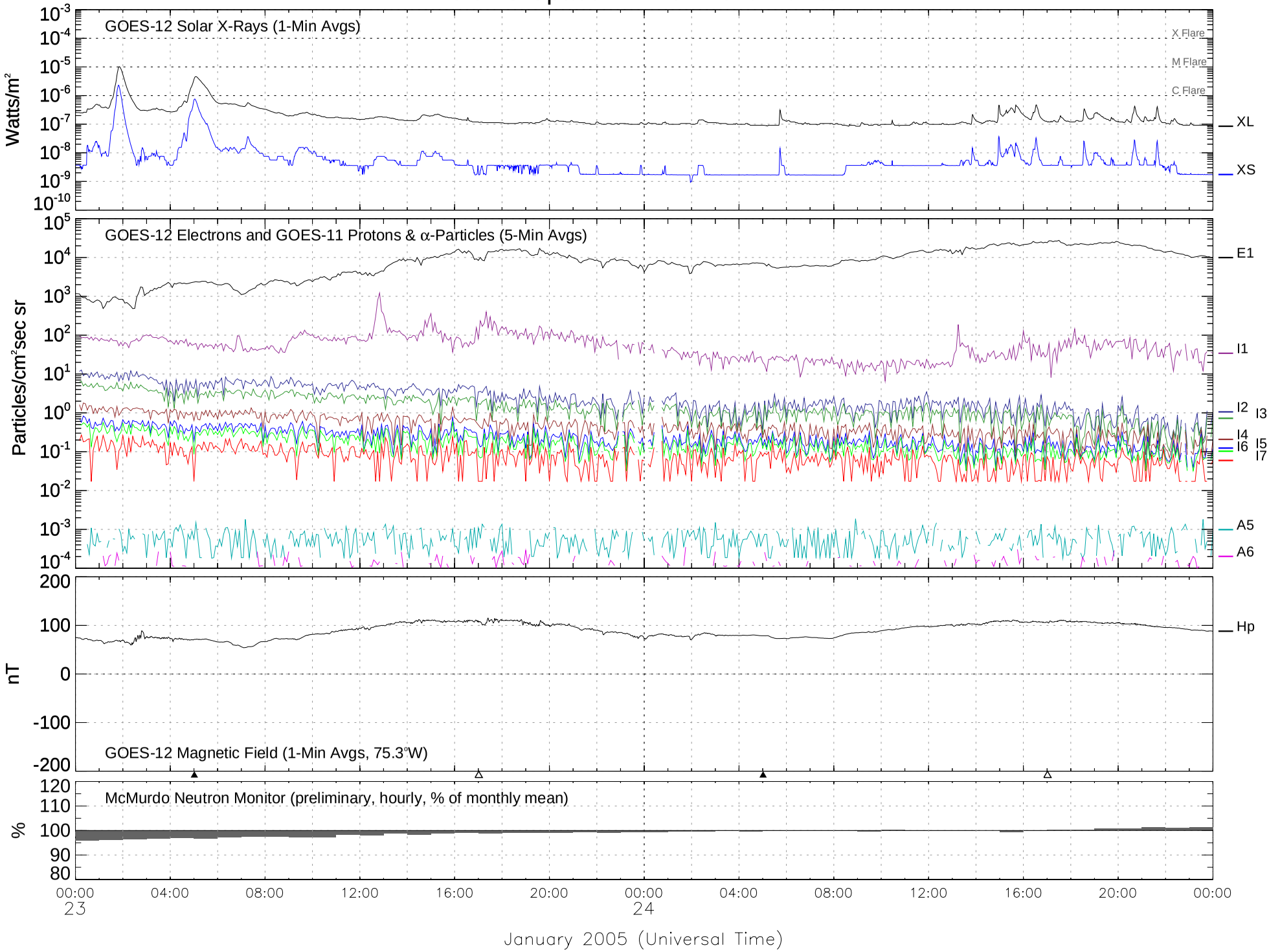



GOES Space Environment Monitor
GOES-12 Solar X-Rays (1-Min Avgs)
Watts/m²
X Flare
M Flare
C Flare
XL
XS
GOES-12 Electrons and GOES-11 Protons & α-Particles (5-Min Avgs)
Particles/cm²sec sr
E1
I1
I2
I3
I4
I5
I6
I7
A5
A6
GOES-12 Magnetic Field (1-Min Avgs, 75.2°W)
nT
Hp
McMurdo Neutron Monitor (preliminary, hourly, % of monthly mean)
%
00:00
21
04:00
08:00
12:00
16:00
20:00
00:00
22
04:00
08:00
12:00
16:00
20:00
00:00
January 2005 (Universal Time)

GOES Space Environment Monitor



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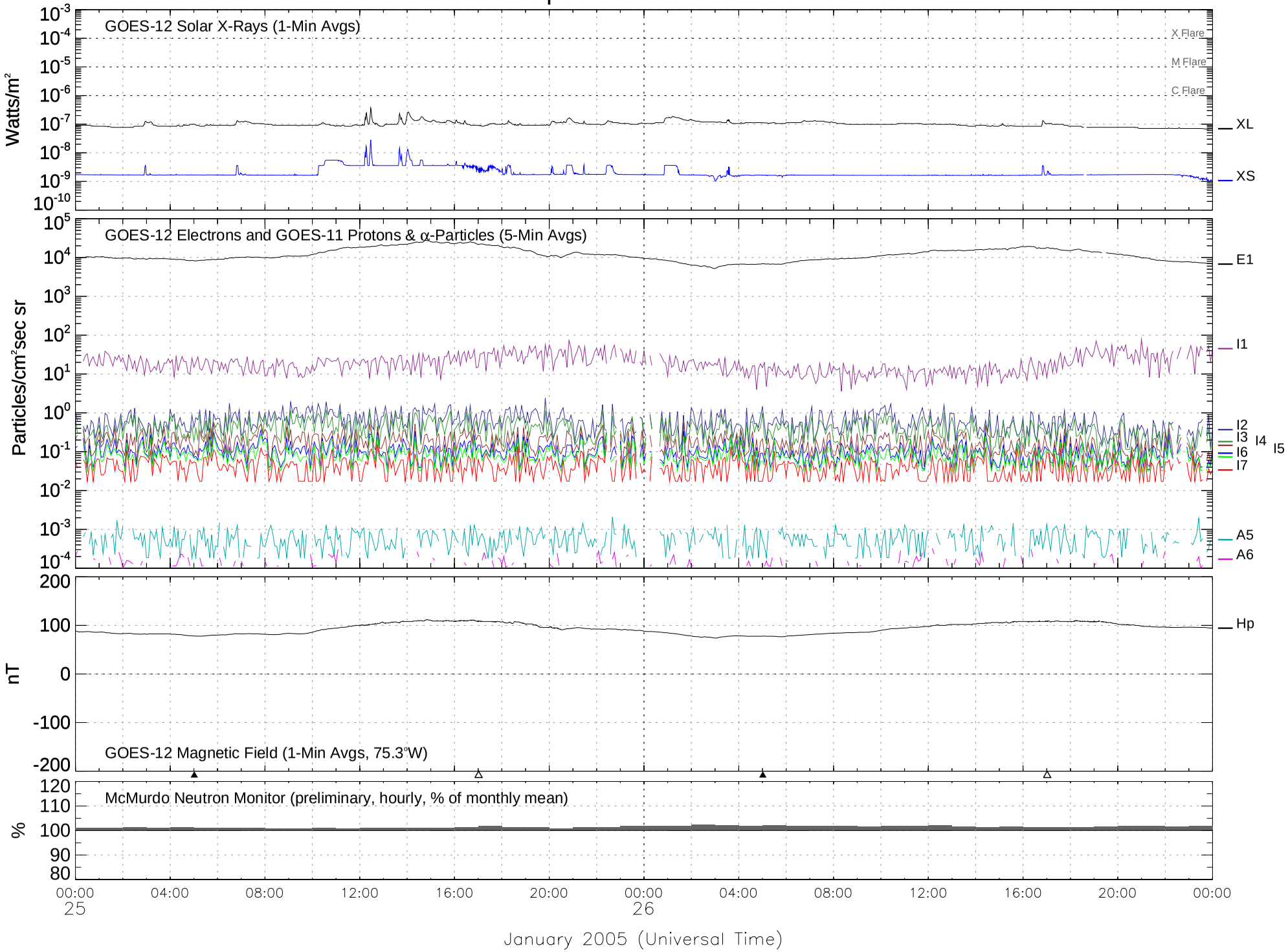
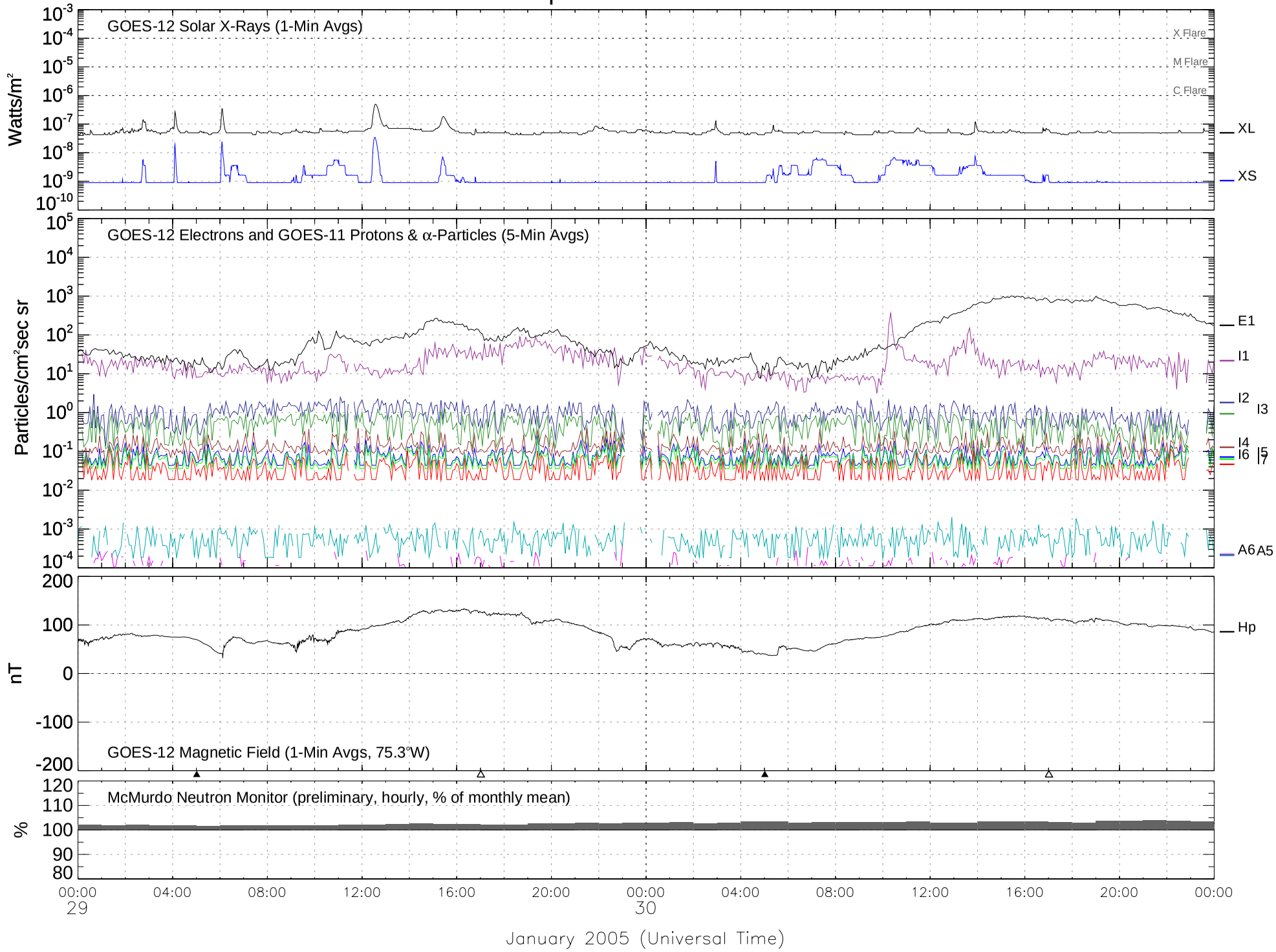
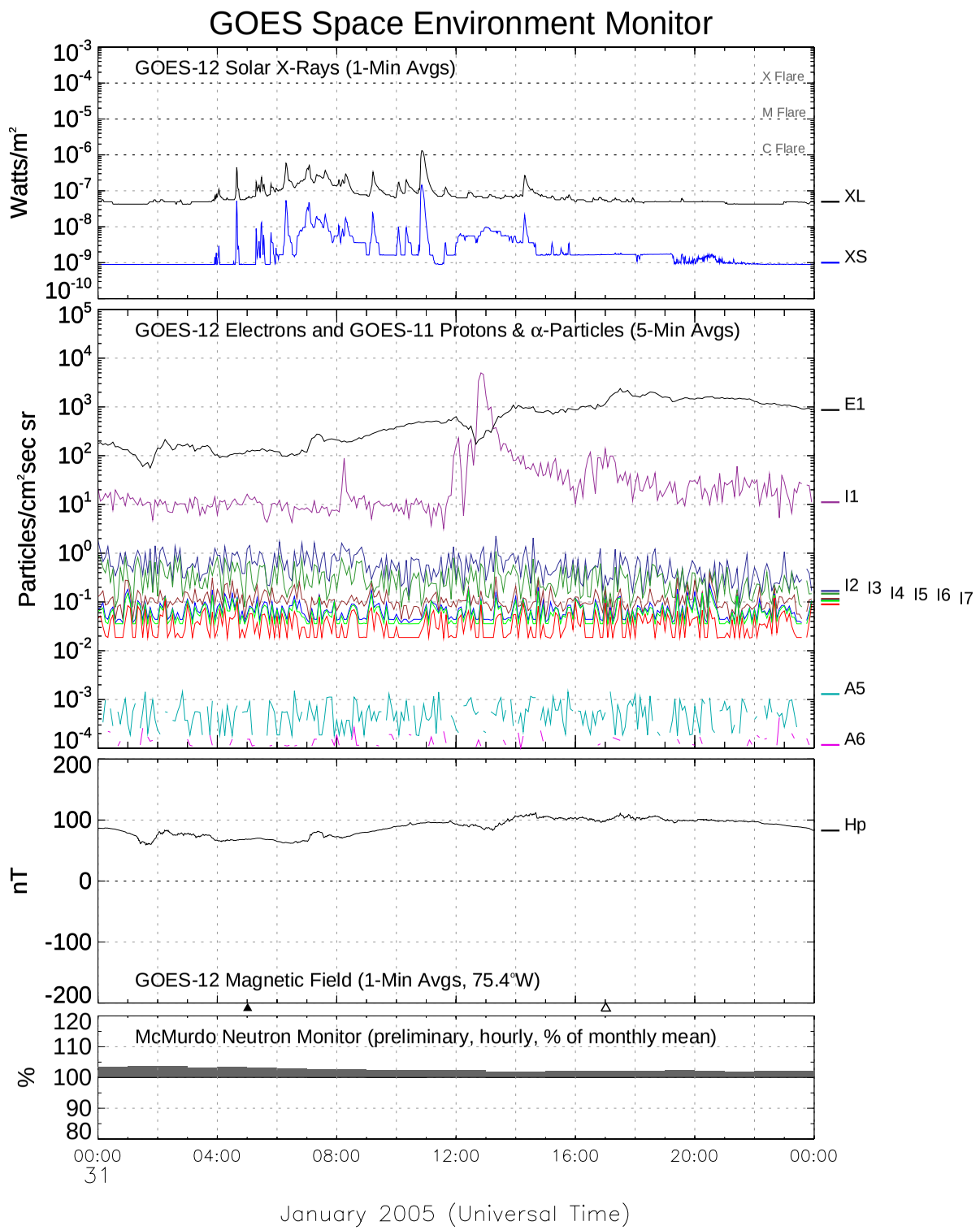


GOES Space Environment Monitor

GOES Space Environment Monitor




GOES Space Environment Monitor
GOES-12 Solar X-Rays (1-Min Avgs)
X Flare
M Flare
C Flare
Watts/m²
XL
XS
GOES-12 Electrons and GOES-11 Protons & α-Particles (5-Min Avgs)
Particles/cm²sec sr
E1
I1
I2 I3 I4 I5 I6 I7
A5
A6
Hp
nT
GOES-12 Magnetic Field (1-Min Avgs, 75.4°W)
McMurdo Neutron Monitor (preliminary, hourly, % of monthly mean)
%
00:00
04:00
08:00
12:00
16:00
20:00
00:00
31
January 2005 (Universal Time)

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

JANUARY 2005

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Rgn No.	Location Lat	Location Lon	Flares Opt	Flares M	Flares X	Date of Fcst	Region Fcst(1)	Geoadvice(1)
001	01	31	60	99	9	10715	N04	E34	4	1	0	01	A	SOL: Major
						10716	S14	E37	0	0	0	01	A	MAG: Quiet
						10717	N07	W56	0	0	0	01	A	PRO: Warning
002	02	01	51	99	15	10715	N05	E21	0	0	1	02	E	SOL: Active
						10716	S14	E24	0	0	0	02	Q	MAG: Active
						10717	N07	W73	1	0	0	02	Q	PRO: Quiet
003	03	02	52	100	30	10715	N05	E08	0	0	0	03	Q	SOL: Eruptive
						10716	S13	E11	0	0	0	03	Q	MAG: Minor
						10717	N08	W86	0	0	0	03	Q	PRO: Quiet
004	04	03	43	94	20	10716	N04	W04	1	0	0	04	E	SOL: Eruptive
						10716	S13	W01	0	0	0	04	Q	MAG: Active
									0	0	0	04		PRO: Quiet
005	05	04	30	88	20	10716	N05	W19	3	0	0	05	Q	SOL: Eruptive
						10716	S13	W16	0	0	0	05	Q	MAG: Active
									0	0	0	05		PRO: Quiet
006	06	05	15	88	18	10715	N04	W33	0	0	0	06	Q	SOL: Quiet
									0	0	0	06		MAG: Quiet
									0	0	0	06		PRO: Quiet
007	07	06	14	83	2	10715	N04	W46	0	0	0	07	Q	SOL: Quiet
									0	0	0	07		MAG: Active
									0	0	0	07		PRO: Quiet
008	08	07	22	84	40	10718	N06	W59	0	0	0	08	Q	SOL: Quiet
						10718	S09	E78	0	0	0	08	Q	MAG: Major
									0	0	0	08		PRO: Quiet
009	09	08	34	89	20	10715	N08	W69	0	0	0	09	Q	SOL: Eruptive
						10718	S08	E67	0	0	0	09	Q	MAG: Active
						10719	S09	E82	0	0	0	09	Q	PRO: Quiet
010	10	09	28	88	4	10719	S08	E54	0	0	0	10	Q	SOL: Eruptive
						10719	S08	E64	2	1	0	10	Q	MAG: Quiet
									0	0	0	10		PRO: Quiet
011	11	10	40	90	6	10718	S08	E44	0	0	0	11	Q	SOL: Quiet
						10719	S10	E52	0	0	0	11	Q	MAG: Quiet
						10720	N09	E65	0	0	0	11	Q	PRO: Quiet
012	12	11	25	94	13	10720	S06	E32	0	0	0	12	Q	SOL: Eruptive
						10720	N13	E52	0	0	0	12	Q	MAG: Active
									0	0	0	12		PRO: Quiet
013	13	12	58	102	24	10720	S07	E19	0	0	0	13	Q	SOL: Eruptive
						10720	N13	E37	2	0	0	13	E	MAG: Active
									0	0	0	13		PRO: Quiet
014	14	13	77	116	13	10720	S07	E07	5	0	0	14	E	SOL: Active
						10720	N13	E24	0	0	0	14	E	MAG: Quiet
									0	0	0	14		PRO: Quiet
015	15	14	65	130	12	10720	S05	W06	1	1	0	15	E	SOL: Active
						10720	N13	E10	8	2	0	15	E	MAG: Active
									0	0	0	15		PRO: Quiet
016	16	15	100	145	19	10720	S07	W21	4	1	0	16	E	SOL: Active
						10720	N31	E40	23	5	2	16	Q	MAG: Severe
									0	0	0	16		PRO: Proton
017	17	16	99	145	12	10718	S07	W34	0	0	0	17	E	SOL: Proton
						10720	N13	W15	8	1	0	17	P	MAG: Major
						10721	S03	E14	0	0	0	17	Q	PRO: IP

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

JANUARY 2005

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Rgn No.	Location Lat	Location Lon	Flares Opt	Flares M	Flares X	Date of Fcst	Region Fcst(1)	Geoadvice(1)
						10722	N19	E04	0	0	0	17	Q	
018	18	17	107	138	46	10718	S07	W47	0	0	0	18	E	SOL: Proton
						10720	N13	W30	6	1	1	18	P	MAG: Major
						10721	S03	E02	0	0	0	18	Q	PRO: IP
						10723	N06	E77	0	0	0	18	Q	
019	19	18	109	124	52	10718	S07	W64	0	0	0	19	Q	SOL: Major
						10720	N13	W44	9	2	0	19	P	MAG: Major
						10722	N19	W25	0	0	0	19	Q	PRO: IP
						10723	N07	E63	0	0	0	19	Q	
						10724	S12	W07	0	0	0	19	Q	
020	20	19	66	133	47	10718	S06	W76	0	0	0	20	Q	SOL: Major
						10720	N14	W56	7	3	1	20	P	MAG: Major
						10723	N06	E52	1	0	0	20	Q	PRO: IP
021	21	20	61	123	11	10718	S07	W88	0	0	0	21	Q	SOL: Major
						10720	N14	W70	5	0	1	21	P	MAG: Active
						10723	N06	E35	0	0	0	21	Q	PRO: IP
022	22	21	69	114	47	10720	N13	W83	2	1	0	22	P	SOL: Active
						10723	N06	E22	0	0	0	22	A	MAG: Minor
						10725	S04	W36	0	0	0	22	A	PRO: IP
						10726	S02	E27	0	0	0	22	A	
023	23	22	60	102	22	10720	N11	W93	0	0	0	23	E	SOL: Eruptive
						10723	N07	E07	0	0	0	23	Q	MAG: Active
						10725	S04	W49	0	0	0	23	E	PRO: Quiet
						10726	S01	E14	0	0	0	23	Q	
024	24	23	40	96	17	10723	N06	W04	0	0	0	24	Q	SOL: Eruptive
						10725	S03	W64	0	0	0	24	Q	MAG: Active
						10726	S01	W02	0	0	0	24	Q	PRO: Quiet
025	25	24	42	95	6	10723	N06	W17	0	0	0	25	Q	SOL: Eruptive
						10725	S03	W77	0	0	0	25	Q	MAG: Active
						10727	S09	E38	0	0	0	25	Q	PRO: Quiet
026	26	25	56	94	6	10723	N06	W30	0	0	0	26	Q	SOL: Quiet
						10725	S03	W90	0	0	0	26	Q	MAG: Quiet
						10727	S09	E25	0	0	0	26	Q	PRO: Quiet
						10728	S14	E66	0	0	0	26	Q	
027	27	26	46	89	3	10723	N06	W44	0	0	0	27	Q	SOL: Quiet
						10727	S09	E11	0	0	0	27	Q	MAG: Quiet
						10728	S14	E53	0	0	0	27	Q	PRO: Quiet
028	28	27	43	87	5	10723	N06	W57	0	0	0	28	Q	SOL: Quiet
						10727	S09	W02	0	0	0	28	Q	MAG: Quiet
						10728	S14	E36	0	0	0	28	Q	PRO: Quiet
029	29	28	43	85	6	10723	N05	W70	0	0	0	29	Q	SOL: Quiet
						10727	S05	W16	0	0	0	29	Q	MAG: Active
						10728	S14	E24	0	0	0	29	Q	PRO: Quiet
030	30	29	30	86	20	10727	N06	W84	0	0	0	30	Q	SOL: Quiet
						10727	S10	W26	0	0	0	30	Q	MAG: Active
									0	0	0	30		PRO: Quiet
031	31	30	38	86	10	10728	S09	W42	0	0	0	31	Q	SOL: Quiet
						10728	S13	E01	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 L E R T P E R I O D S
The International Space Environment Service

JANUARY 2005

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 > 10 MeV)
'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
Termination of the STRATALERT Reports
Stratospheric Research Group, FU Berlin

In the 1960s the stratospheric midwinter warmings were regarded as an exciting and interesting research problem. The observations taken during a warming were scarce but in great demand, and a much desired aim was to launch meteorological rockets when a warming was developing above a station. For this purpose an advisory system was necessary, such as had been established in the international geophysical community for other phenomena, the so-called GEOALERT. Charged by WMO (World Meteorological Organisation) the Stratospheric Research Group of the Freie UniversitΣt in Berlin got together with their colleagues of the American Weather Bureau and developed a warning system which was named STRATALERT. It was introduced in 1964 when the IQSY (International Year of the Quiet Sun) began (cf. ALERTING CRITERIA for more information).

The Berlin group was at first responsible for the European space, later for the whole Northern Hemisphere, and issued a STRATALERT report every day during winter, and when needed also a GEOALERT. The alerts were disseminated through the German Weather Service's international net and reached all interested parties everywhere. The STRATALERT reports were an essential source of information about what was going on in the stratosphere, information which at that time would not otherwise have been available to many scientists interested in current conditions. Because of this information it was possible to time experiments, for instance with meteorological rockets, to take place under desired conditions, and local observations could be fitted into and interpreted on the background of a wider field. This information system has served as a basis for decisions made in many large-scale field experiments. A review and classification of stratospheric warmings can be found in SPARC Newsletter No. 15, (Labitzke and Naujokat, 2000, updated table 1).

The winter, 2003/2004, was the last STRATALERT winter. After 41 years we are sorry to announce that we cannot continue this timely warning system in its old format and we could not find a successor. For those who are interested in STRATALERT messages, we provide access to all available messages via ftp:
ftp://strat50.met.fu-berlin.de/pub/stratalert

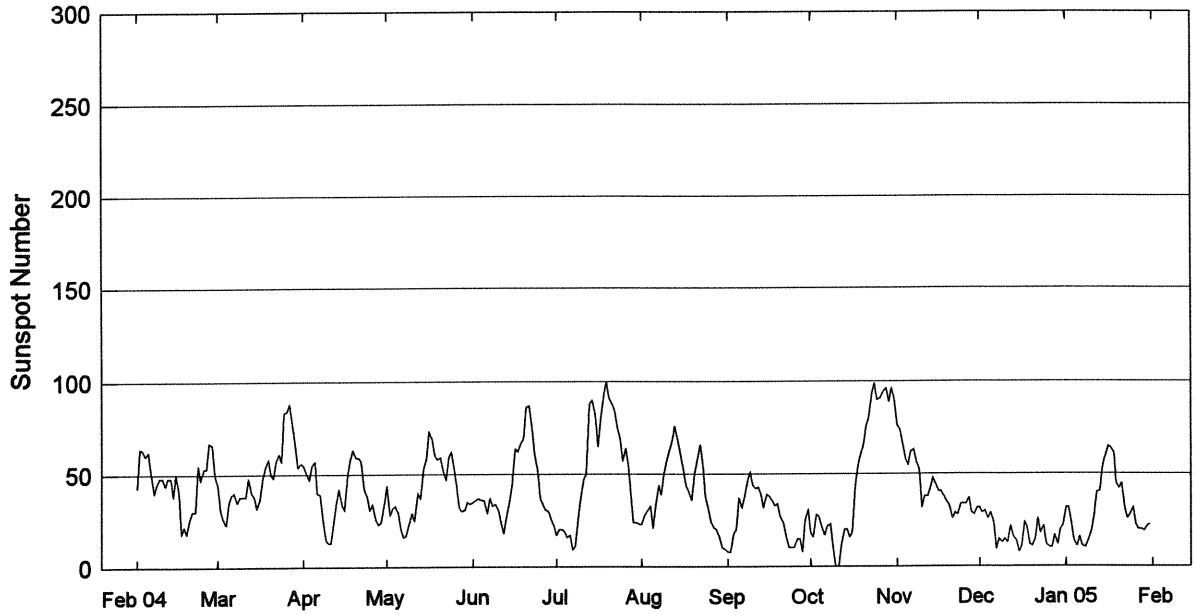
Those interested in the daily development of the stratospheric circulation can find some analyses and different stratospheric parameters based on the ECMWF-data here:
http://strat-www.met.fu-berlin.de/cgi-bin/winterdiagnostics.
The general evaluation is, however, left to the user.

Additional data links are (amongst others) available:

US National Centers for Environmental Prediction (CPC/NCEP):
http://www.cpc.ncep.noaa.gov/products/stratosphere

Japan Meteorological Agency (JMA):
http://okdk.kishou.go.jp/products/clisys/STRAT

International Relative Sunspot Numbers
Feb 2004 - Jan 2005

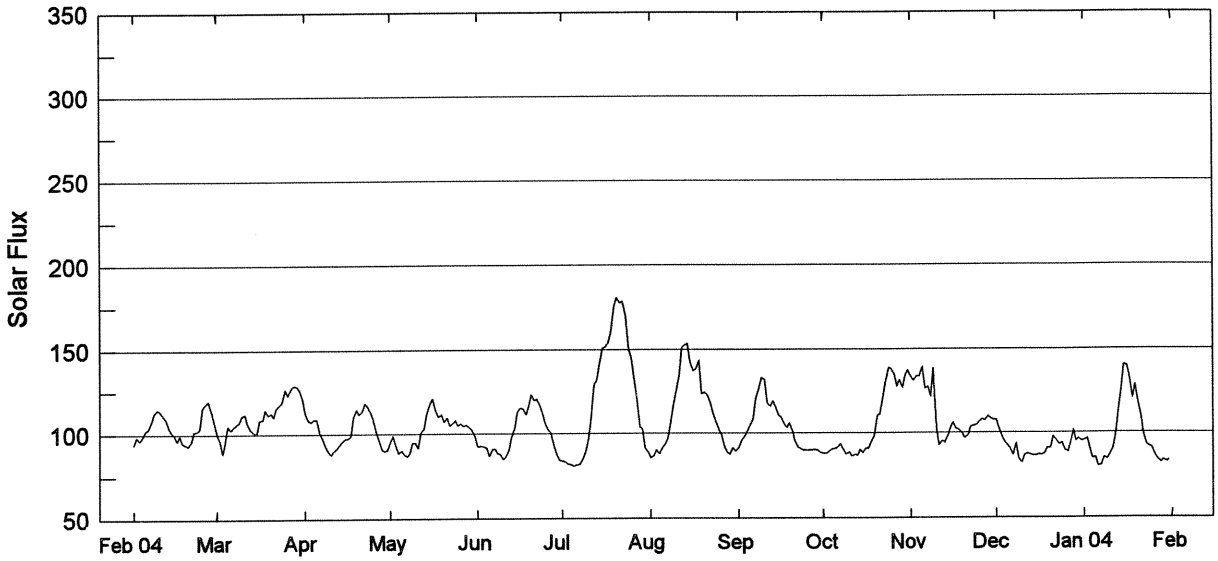


Day	Feb 04	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 05*
1	43	44	55	44	35	17	23	8	18	76	32	32
2	64	31	51	28	36	20	28	8	16	74	29	32
3	63	26	47	32	37	20	30	18	28	67	30	24
4	60	23	55	33	36	19	33	20	27	58	26	14
5	62	35	57	29	36	16	21	37	21	55	29	11
6	51	39	40	20	29	17	33	32	17	62	22	16
7	40	40	39	16	37	9	44	38	22	63	9	11
8	45	35	27	17	33	11	39	47	23	57	15	10
9	48	38	15	24	34	27	50	51	10	52	13	14
10	48	38	13	29	31	38	58	44	0	32	15	19
11	44	38	13	25	24	47	63	42	0	38	13	27
12	48	48	25	40	18	54	68	43	12	38	22	40
13	48	40	35	37	28	88	76	39	20	42	16	41
14	38	38	42	54	35	90	68	32	20	48	12	54
15	50	32	34	58	44	82	61	39	16	44	8	59
16	41	37	31	73	64	65	54	38	18	41	10	65
17	18	48	50	69	62	79	44	36	44	41	24	64
18	22	54	58	60	67	93	41	33	54	38	21	61
19	18	58	63	58	69	100	36	34	60	35	12	45
20	26	50	59	59	86	91	50	27	66	33	11	42
21	30	48	59	52	87	88	57	24	76	26	15	45
22	30	57	57	47	76	84	66	17	80	29	26	31
23	55	61	43	59	61	74	56	10	93	28	18	26
24	47	57	38	62	52	69	38	10	99	34	22	28
25	53	83	31	55	37	57	31	10	90	34	12	32
26	53	84	34	43	34	64	24	15	91	34	10	23
27	67	88	26	32	31	55	21	15	94	37	10	20
28	66	76	23	30	30	39	20	8	96	29	17	20
29	50	66	24	31	26	24	16	25	89	28	12	19
30		54	34	35	22	24	10	31	96	32	20	22
31		56		34		23	9		91		22	23
Mean	45.8	49.1	39.3	41.5	43.2	51.1	40.9	27.7	48.0	43.5	17.9	31.3

* = Provisional.

Penticton 2800 MHz (10.7cm) Solar Flux
Feb 2004 - Jan 2005

Adjusted to 1 AU



Day	Feb 04	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 05
1	94.5	100.0	112.6	95.7	92.5	84.0	85.8	91.5	88.1	133.4	107.8	95.6
2	98.5	97.1	108.1	99.1	93.0	83.4	87.0	95.6	88.1	131.0	102.6	96.7
3	96.6	88.9	107.4	92.8	92.6	82.2	90.1	98.3	89.1	133.7	97.9	91.0
4	98.6	95.9	109.0	88.9	92.0	82.1	87.9	100.9	90.7	133.7	94.6	85.1
5	102.5	105.0	108.9	90.1	87.0	80.9	91.5	104.8	90.8	138.8	93.1	85.3
6	103.7	102.9	101.6	88.0	91.0	81.6	93.6	108.2	92.0	126.5	90.4	80.4
7	108.1	104.6	98.4	86.8	91.2	81.9	97.3	120.7	93.7	127.2	87.1	80.7
8	113.1	106.3	93.8	88.9	88.6	84.6	107.7	126.3	90.4	121.7	93.6	85.6
9	114.7	107.2	90.3	95.0	87.9	89.6	117.0	132.8	87.7	138.1	84.7	84.6
10	113.5	111.1	88.1	94.8	85.0	96.4	124.7	131.8	88.7	102.6	82.3	87.1
11	111.2	111.7	90.0	92.0	86.5	107.9	134.3	117.9	86.6	93.0	87.1	91.1
12	109.3	106.2	91.8	100.9	90.7	129.2	151.1	116.0	87.2	95.4	87.7	98.8
13	105.1	102.6	93.6	103.0	98.2	131.6#	152.5	119.1	86.7+	94.4	87.0	111.9
14	101.1	101.3	95.8	112.1	103.1	142.6	153.1	116.0	90.2	98.1	86.5	125.6
15	99.6	100.3	97.4	117.9	112.9	150.5	142.4	110.8	88.6	103.3	86.5	140.2
16	96.3	108.5	97.6	121.0	115.1	151.3	137.0	109.4	91.1	106.0	87.2	139.8
17	99.5	108.8	99.0	113.7	114.9	154.1	138.3	105.5	91.2	102.5	87.1	133.1
18	95.4	114.4	110.0	110.4	111.3	160.2	143.3	103.6	95.5	101.6	87.7	120.3
19	94.2	111.3	114.5	111.4	116.4	175.8	123.5	106.1	98.2	99.8	90.9	128.3
20	93.2	112.7	111.8	107.2	123.0	180.8	124.2	101.3	110.3	96.9	90.9	118.8
21	96.0	110.4	113.9	109.6	119.6	177.7	122.8	95.6	111.0	98.5	97.7	109.9
22	101.7	115.6	118.4	105.0	120.5	178.4	117.8	92.0	121.2	103.7	95.6	99.1
23	102.1	117.6	116.6	106.6	116.2	170.4	111.9	90.8	130.2	104.2	93.2	92.8
24	103.4	119.0	112.9	107.9	111.9	151.8	107.2	89.9	138.7	104.5	94.0	91.7
25	116.1	126.4	108.4	105.1	106.3	143.9*	102.5	89.9	137.9+	106.6	90.0	91.2
26	118.4	123.2	100.9	106.1	102.2	132.0	99.5	89.9	135.0	108.2	88.7	86.6
27	119.8	127.2	96.4	104.6	100.4	121.8	92.3	90.2	127.8	107.4	93.7	84.3
28	113.6	128.6	90.7	105.2	92.4	103.8	88.9	90.2	131.6	109.8	101.7	82.4
29	108.0	128.3	89.8	104.0	87.9	102.8	87.7	90.0	127.0	108.4	95.3	83.9
30		126.4	90.8	102.4	84.5	91.4	91.6	88.4	134.4	107.5	96.7	82.9
31		121.0		98.1		89.0	89.7		137.1		95.2	83.6
Mean	104.4	111.0	101.9	102.1	100.5	122.4	112.7	104.1	105.1	111.2	92.1	99.0

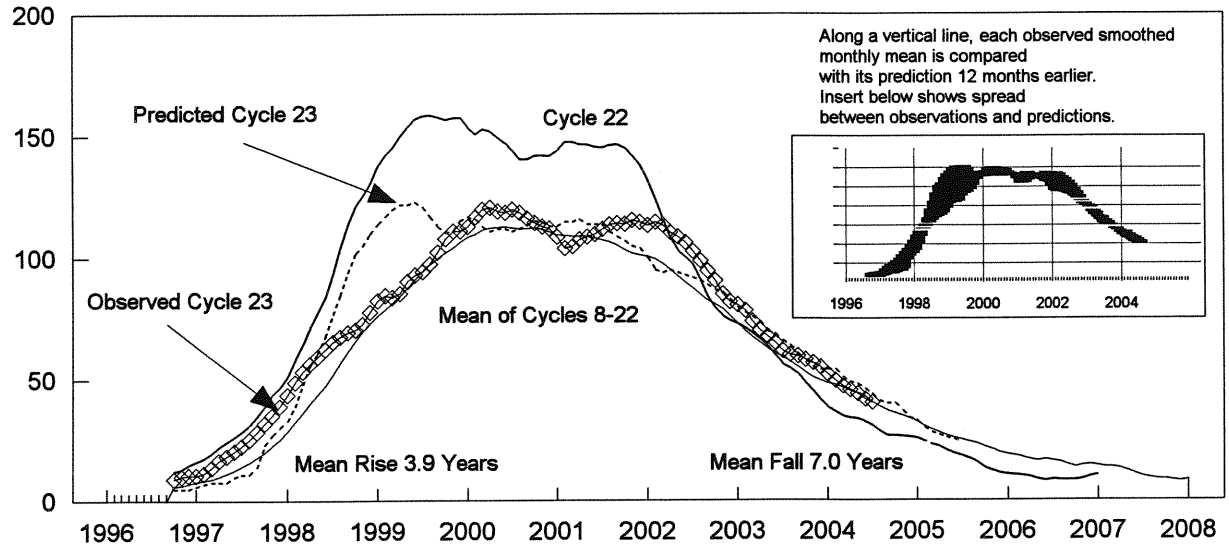
NOTE: # - 1700 or 1800UT reading, burst in progress at 2000UT. *-2300UT reading, burst in progress.
+ - 1700UT Reading, no data available at 2000UT.

DAILY SOLAR INDICES
January 2005

Day	Day of Year	Bartels Cycle Day	Sunspot Numbers Int	Sunspot Numbers Amer	Obs Flux Penticton (2800)	SGMR (15400)	SGMR (8800)	SGMR (4995)	Penticton (2800)	SGMR (2695)	SGMR (1415)	SGMR (610)	SGMR (410)	SGMR (245)
						----Solar Flux Adjusted to 1 Astronomical Unit--------								
1	1	25	32	28	98.9	508	228	148	95.6	99	59	29	26	12
2	2	26	32	26	100.0	508	238	151	96.7	101	59	37	29	14
3	3	27	24	21	94.2	481	213	142	91.0	96	59	33	25	11
4	4	1	14	17	88.0	487	227	143	85.1	88	54	33	25	10
5	5	2	11	13	88.2	463	212	135	85.3	88	54	33	24	9
6	6	3	16	16	83.2	418	212	130	80.4	81	49	30	22	10
7	7	4	11	4	83.5	498	229	140	80.7	84	49	31	23	15
8	8	5	10	12	88.5	472	226	142	85.6	85	51	—	—	—
9	9	6	14	17	87.5	504	206	136	84.6	90	52	30	23	15
10	10	7	19	18	90.1	490	228	142	87.1	88	54	32	23	17
11	11	8	27	31	94.2	507	234	148	91.1	92	55	33	25	12
12	12	9	40	41	102.1	415	208	140	98.8	102	54	29	25	—
13	13	10	41	42	115.6	500	294	185	111.9	113	61	31	31	—
14	14	11	54	56	129.8	433	255	181	125.6	115	62	40	48	—
15	15	12	59	60	144.9	557	402	230	140.2	144	78	44	39	—
16	16	13	65	65	144.5	579	327	229	139.8	148	76	42	37	—
17	17	14	64	59	137.5	533	300	219	133.1	144	74	41	44	—
18	18	15	61	59	124.3	554	334	222	120.3	141	74	39	32	—
19	19	16	45	51	132.5	540	302	208	128.3	142	76	41	31	—
20	20	17	42	49	122.7	550	277	195	118.8	133	73	40	27	11
21	21	18	45	46	113.5	497	277	172	109.9	113	65	38	26	8
22	22	19	31	32	102.2	511	266	162	99.1	109	61	41	27	14
23	23	20	26	22	95.8	—	—	—	92.8	—	—	—	—	—
24	24	21	28	26	94.6	507	236	145	91.7	99	57	38	27	10
25	25	22	32	30	94.1	510	233	153	91.2	93	56	38	30	16
26	26	23	23	23	89.3	483	224	136	86.6	90	54	35	25	10
27	27	24	20	22	86.9	503	230	135	84.3	88	53	36	29	14
28	28	25	20	20	84.9	498	226	133	82.4	86	51	36	27	10
29	29	26	19	20	86.4	506	229	135	83.9	86	50	36	27	21
30	30	27	22	21	85.5	507	223	139	82.9	88	52	34	26	12
31	31	1	23	24	86.2	501	227	136	83.6	88	50	35	32	9
MEAN			31.3	31.5	102.2	500	250	160	99.0	103	59	35	28	12

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

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
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	49	47	46	46	42	40	38	36	35	34	32	42
								(3)	(6)	(7)	(8)	(10)	(4)
2005	31	30	29	28	26	25	24	23	23	22	21	20	26
	(12)	(13)	(14)	(14)	(15)	(15)	(15)	(15)	(16)	(15)	(15)	(14)	(14)
2006	19	18	17	16	16	15	15	14	13	13	12	11	15
	(13)	(13)	(14)	(14)	(15)	(15)	(14)	(13)	(13)	(13)	(13)	(12)	(14)
2007	11	11	11	11	11	11	12	13	14	14	15	16	13
	(12)	(11)	(11)	(10)	(10)	(11)	(12)	(13)	(15)	(17)	(18)	(20)	(13)

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.**

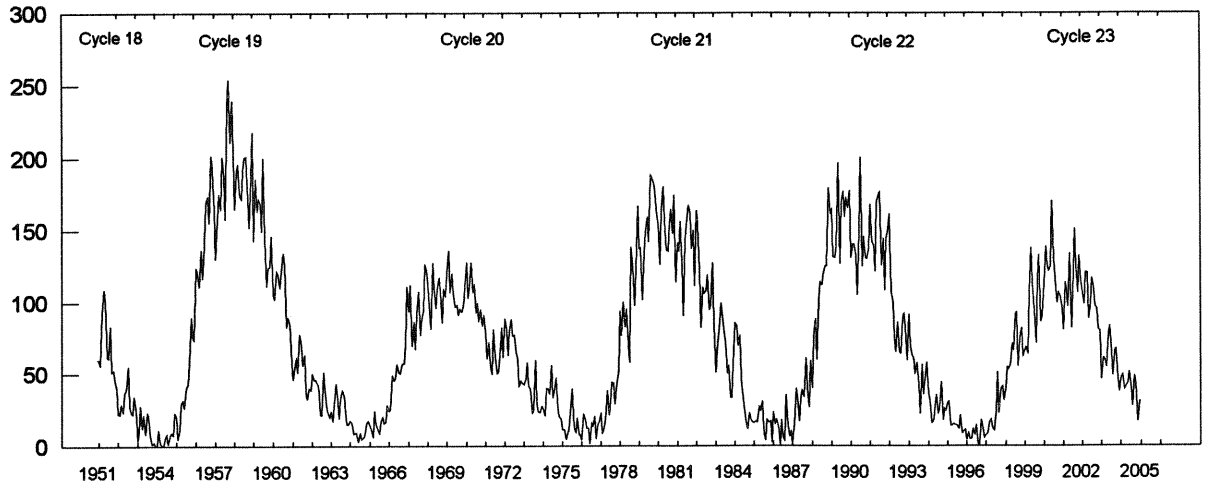
+ April 2000 marks Cycle 23 maximum.

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 Sep 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 July 2005 prediction. There exists a 90% chance that in July, the actual smoothed number will fall somewhere between 9 and 39.

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 - Jan 2005



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	40.9	27.7	48.0	43.5	17.9	40.4	
2005	31.3												31.3	

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

Hα S O L A R F L A R E S

JANUARY 2005

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
GOES	01	0001	0031	0039			10715			38		X 1.7						9.2E-02
GOES		0927	0939	0945			10715			18		B 7.8						5.8E-04
GOES		1408	1424	1432			10715			24		C 1.2						1.1E-03
GOES		1538	1544	1553			10715			15		B 6.2						3.9E-04
HOLL		1844	1845	1848	N07	W69	10717	12	27.7	4	SF		3	E		15		
GOES		1918	1922	1927						9		B 2.5						1.2E-04
GOES		2358	2402	2405			10717			7		B 3.2						1.1E-04
GOES	02	0101	0106	0113			10715			12		B 4.0						2.6E-04
GOES		0241	0252	0306			10715			25		B 6.5						7.9E-04
GOES		0421	0505	0529						68		C 2.3						7.7E-03
GOES		1256	1306	1311			10715			15		C 1.2						8.5E-04
GOES		1601	1608	1616			10717			15		B 5.2						3.9E-04
GOES	03	0150	0202	0218			10717			28		B 7.5						9.8E-04
GOES		0402	0422	0448	N03	E07	10715			46	SF	C 3.8						7.5E-03
LEAR		0408	0419	0457	N03	E07	10715	01	3.7	49	SF		3	E		55		ZU
GOES		0931	0939	0941			10717			10		C 1.1						3.5E-04
GOES		1058	1109	1118			10717			20		C 1.1						9.5E-04
GOES	04	0038	0054	0115						37		B 8.5						1.6E-03
GOES		0144	0158	0205	N03	W03	10715			21	SF	C 1.0						9.8E-04
LEAR		0150	0156	0204	N03	W03	10715	01	3.8	14	SF		3	E		21		F
GOES		0559	0616	0630	N04	W04	10715			31	SF	C 3.3						3.8E-03
LEAR		0606	0614	0646	N04	W04	10715	01	3.9	40	SF		3	E		65		
GOES		1053	1113	1129	N04	W10	10715			36	SF	C 7.3						9.9E-03
SVTO		1104E	1114	1129	N04	W10	10715	01	3.7	25D	SF		3	E		22		F
GOES	05	0403	0522	0544			10715			101		B 8.2						3.2E-03
GOES	06	2233	2243	2256						23		B 1.9						2.3E-04
GOES	07	0743	0749	0800						17		B 1.2						1.1E-04
GOES		1109	1115	1120						11		B 1.9						1.1E-04
GOES		1211	1216	1222						11		B 1.9						1.0E-04
GOES		1553	1558	1602						9		B 2.0						7.9E-05
GOES		1610	1615	1619						9		B 2.4						9.9E-05
GOES		1647	1655	1712			10719			25		B 2.9						3.2E-04
GOES		1837	1846	1853			10719			16		B 6.8						4.1E-04
GOES		2035	2041	2048			10719			13		B 2.3						1.3E-04
GOES	08	0219	0225	0231			10719			12		B 2.7						1.4E-04
GOES		0622	0625	0630			10719			8		B 3.4						1.4E-04
GOES		0706	0711	0716			10719			10		B 4.4						2.1E-04
GOES		0844	0850	0908			10719			24		B 3.1						3.8E-04
GOES		1049	1052	1054						5		B 1.3						3.3E-05
GOES		1122	1129	1150						28		B 1.3						2.1E-04
GOES		1329	1340	1351			10719			22		B 3.5						3.7E-04
GOES		1936	1957	2015			10719			39		C 1.0						1.7E-03
GOES	09	0525	0546	0549	S06	E73	10718			24	1F	B 4.6						3.3E-04
GOES		0825	0851	0909	S09	E69	10719			44	1N	M 2.4						3.3E-02
LEAR		0828	0845	1017	S09	E69	10719	01	14.5	109	1N		3	E		178		FH
SVTO		0841E	0857U	0902	S09	E74	10719	01	14.9	21D	SF		2	E		94		FH
GOES		1433	1447	1456	S09	E68	10719			23	SF	C 2.6						2.3E-03
HOLL		1452	1453	1458	S09	E68	10719	01	14.7	6	SF		3	E		16		
GOES	10	0511	0519	0524						13		B 2.5						1.5E-04
GOES		0709	0712	0714						5		B 1.2						3.3E-05
GOES		1003	1011	1020			10719			17		B 3.3						2.6E-04
GOES		1957	2011	2028						31		B 1.7						3.0E-04
GOES		2145	2215	2227	S08	E52	10719			42	SF	C 1.0						1.5E-03
GOES	11	0652	0722	0734			10718			42		B 8.4						1.0E-03
GOES		1134	1137	1142						8		B 1.1						4.9E-05
GOES		1229	1232	1234						5		B 1.7						4.4E-05
GOES		1315	1318	1321						6		B 1.7						5.6E-05
GOES		1429	1435	1438						9		B 1.8						8.8E-05

Hα SOLAR FLARES

JANUARY 2005

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Area Measurement Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
GOES	11	1515	1520	1526			10718			11		B 2.7						1.4E-04
GOES		1604	1616	1619			10718			15		C 1.4						5.0E-04
GOES		1754	1757	1801			10718			7		B 9.2						2.6E-04
GOES		1850	1853	1856						6		B 1.7						5.7E-05
GOES		2035	2041	2046			10720			11		B 5.7						2.7E-04
GOES		2100	2104	2107			10718			7		B 3.6						1.2E-04
GOES		2325	2329	2331			10718			6		C 1.1						2.3E-04
GOES	12	0013	0018	0024			10720			11		B 2.2						1.3E-04
GOES		0122	0125	0130			10720			8		B 1.9						8.5E-05
GOES		0701	0708	0717			10720			16		B 7.0						4.7E-04
GOES		0805	0828	0840			10718			35		B 5.9						9.1E-04
GOES		0853	0858	0901			10720			8		B 6.2						2.6E-04
GOES		0955	0959	1003			10720			8		B 4.1						1.6E-04
GOES		1133	1142	1149						16		B 5.0						4.1E-04
GOES		1359	1406	1410			10720			11		B 4.1						2.4E-04
GOES		1608	1611	1613	N12	E42	10720			5	SF	B 2.8						6.9E-05
HOLL		1611	1612	1615	N12	E42	10720	01	15.8	4	SF		3	E		13		
GOES		1718	1722	1724	N11	E43	10720			6	SF	B 4.1						1.2E-04
HOLL		1720	1721	1727	N11	E43	10720	01	15.9	7	SF		3	E		24		H
GOES		2008	2011	2013			10720			5		B 4.6						1.1E-04
GOES	13	0052	0102	0114	S10	E17	10718			22	SF	C 1.0						1.1E-03
LEAR		0058	0058	0108	S10	E17	10718	01	14.3	10	SF		3	E		13		F
GOES		0131	0134	0139			10720			8		B 4.6						2.0E-04
GOES		0412	0416	0418						6		B 2.4						7.6E-05
GOES		0548	0556	0603	S06	E25	10718			15	SF	B 6.5						4.5E-04
GOES		0808	0819	0829			10718			21		C 1.0						1.0E-03
GOES		1119	1126	1129			10718			10		C 1.6						5.6E-04
GOES		1225	1230	1235			10718			10		B 5.4						2.9E-04
GOES		1304	1309	1314			10718			10		B 7.4						3.8E-04
GOES		1403	1410	1413						10		C 2.3						7.6E-04
GOES		1624	1633	1637	S07	E16	10718			13	SF	C 3.3						1.3E-03
HOLL		1636	1638	1650	S07	E16	10718	01	14.9	14	SF		3	E		33		FH
GOES		1704	1712	1717	S08	E16	10718			13	SF	C 4.2						1.7E-03
HOLL		1708	1714	1721	S08	E16	10718	01	14.9	13	SF		3	E		21		FH
GOES		1850	1905	1910	S07	E15	10718			20	SF	C 2.5						1.4E-03
HOLL		1903	1903	1907	S07	E15	10718	01	14.9	4	SF		3	E		23		F
GOES		2021	2026	2031			10718			10		C 1.2						6.7E-04
GOES		2236	2252	2258	S10	E05	10718			22	SF	C 6.8						4.5E-03
HOLL		2245	2247	2302	S07	E12	10718	01	14.8	17	SF		3	E		49		FH
LEAR		2245	2253	2313	S10	E05	10718	01	14.3	28	SF		3	E		52		F
LEAR		2252	2255	2257	N11	E24	10720	01	15.7	5	SF		3	E		12		F
LEAR		2314	2314	2321	S10	E05	10718	01	14.3	7	SF		3	E		10		
GOES	14	0008	0014	0017	N11	E24	10720			9	SF	C 1.0						4.8E-04
LEAR		0010	0013	0016	N11	E24	10720	01	15.8	6	SF		3	E		11		
GOES		0206	0209	0215	N11	E23	10720			9	SF	B 8.6						4.1E-04
LEAR		0208	0212	0222	N11	E23	10720	01	15.8	14	SF		3	E		15		
GOES		0236	0243	0254	N11	E22	10720			18	SF	C 1.4						1.3E-03
LEAR		0246	0247	0249	N11	E22	10720	01	15.8	3	SF		3	E		10		
LEAR		0352	0353	0402	N11	E22	10720	01	15.8	10	SF		3	E		24		F
GOES		0355	0404	0409	S10	E02	10718			14	SF	C 9.3						4.8E-03
LEAR		0358	0405	0425	S10	E02	10718	01	14.3	27	SF		3	E		51		F
LEAR		0445	0445	0459D	N16	E23	10720	01	15.9	14D	SF		3	E		14		FH
GOES		0545	0549	0552			10720			7		C 1.0						3.6E-04
GOES		0601	0604	0610			10720			9		B 6.7						3.2E-04
GOES		0648	0653	0657			10720			9		B 8.1						3.7E-04
GOES		0723	0738	0743	N11	E20	10720			20	SF	C 6.8						2.7E-03
LEAR		0736	0738	0747	N11	E20	10720	01	15.8	11	SF		3	E		37		FH
GOES		0821	0837	0844			10720			23		C 1.4						1.2E-03
GOES		0854	0858	0901			10720			7		C 1.8						6.5E-04
GOES		0912	0917	0923			10720			11		C 1.9						1.1E-03
GOES		0951	0955	0958			10720			7		C 1.0						3.6E-04
GOES		1008	1020	1026	N21	E15	10720			18	SF	C 8.9						6.0E-03
LEAR		1017E	1017	1031	S08	E06	10718	01	14.9	14D	SF		3	E		45		FH
LEAR		1017E	1017	1042D	N21	E15	10720	01	15.6	25D	SF		2	E		99		FH
GOES		1134	1144	1153			10718			19		C 2.3						2.1E-03

Hα SOLAR FLARES

JANUARY 2005

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Time (UT)	Area Measurement Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
GOES	14	1202	1205	1208			10720			6		C 2.1						6.6E-04
GOES		1233	1241	1250			10718			17		C 4.6						3.1E-03
GOES		1338	1342	1346			10720			8		C 2.4						9.2E-04
GOES		1353	1411	1445	N13	E14	10720			52	SF	M 1.8						3.9E-02
SVTO		1400	1424	1447	N13	E14	10720	01	15.6	47	SF		3	E		18		UF
GOES		1524	1551	1556			10720			32		C 8.0						1.1E-02
GOES		1602	1606	1614			10718			12		M 1.0						6.1E-03
GOES		1655	1658	1703			10720			8		C 2.5						1.1E-03
GOES		1735	1742	1750			10720			15		C 2.8						1.9E-03
GOES		1753	1757	1803			10720			10		M 1.5						6.6E-03
GOES		1821	1829	1833			10720			12		C 6.8						3.9E-03
GOES		1836	1841	1845			10720			9		C 7.7						3.5E-03
GOES		1907	1911	1917			10720			10		C 3.3						1.5E-03
GOES		1932	1936	1943			10720			11		C 1.4						8.5E-04
GOES		2026	2030	2035			10720			9		C 1.2						5.9E-04
GOES		2108	2126	2139	N15	E08	10720			31	2N	M 1.9						2.3E-02
GOES		2159	2203	2207	N13	E10	10720			8	1F	C 9.6						3.7E-03
GOES		2223	2226	2228	N13	E10	10720			5	1F	C 3.0						7.3E-04
GOES		2250	2255	2257	N11	E11	10720			7	SF	C 6.0						1.5E-03
LEAR		2256	2256	2307	N11	E11	10720	01	15.8	11	SF		3	E		41		UF
GOES		2323	2333	2344	N11	E11	10720			21	SF	C 5.6						5.1E-03
LEAR		2330	2330	2343	N11	E11	10720	01	15.8	13	SF		3	E		25		UF
GOES	15	0022	0043	0102			10720			40		X 1.2						1.2E-01
LEAR		0028	0029	0037	N11	E10	10720	01	15.8	9	SF		3	E		24		UF
LEAR		0039	0041	0130	N11	E10	10720	01	15.8	51	1B		3	E		178		ZU
GOES		0234	0239	0244	N11	E09	10720			10	SF	C 2.9						1.3E-03
LEAR		0238	0240	0242	N11	E09	10720	01	15.8	4	SF		3	E		15		
GOES		0316	0340	0357			10720			41		C 4.2						6.8E-03
LEAR		0319	0321	0323	N11	E09	10720	01	15.8	4	SF		3	E		14		
LEAR		0334	0339	0409	S10	W11	10718	01	14.3	35	SF		3	E		48		F
LEAR		0356	0400	0402	N11	E08	10720	01	15.8	6	SF		3	E		12		
GOES		0409	0416	0422	N11	E08	10720			13	2N	M 1.3						6.6E-03
LEAR		0410	0434	0459	N11	E08	10720	01	15.8	49	2N		3	E		252		ZU
LEAR		0411	0414	0424	S10	W11	10718	01	14.3	13	SF		3	E		40		F
GOES		0426	0431	0436	N14	E06	10720			10	2N	M 8.4						2.8E-02
GOES		0554	0638	0717	N11	E06	10720			83	SF	M 8.6						2.9E-01
LEAR		0556	0559	0750	N11	E06	10720	01	15.7	114	SF		3	E		39		ZU
LEAR		0803	0804	0807	N13	E03	10720	01	15.6	4	SF		3	E		15		ZH
LEAR		0914	0916	0919	N13	E03	10720	01	15.6	5	SF		3	E		16		UF
LEAR		0927	0939	0948	N12	E03	10720	01	15.6	21	SF		3	E		97		ZF
GOES		1141	1148	1150	N12	E04	10720			9	SF	M 1.2						3.6E-03
SVTO		1149E	1149U	1159D	N12	E04	10720	01	15.8	10D	SF		2	E		62		
GOES		1227	1231	1234			10720			7		C 7.4						2.2E-03
GOES		1352	1357	1359			10720			7		C 5.5						1.5E-03
GOES		1408	1423	1439	S08	W11	10718			31	SF	M 3.2						3.9E-02
SVTO		1427E	1427U	1508D	S09	W10	10718	01	14.8	41D	SF		2	E		67		F
HOLL		1441	1527	1534	N13	E01	10720	01	15.7	53	SF		3	E		57		FH
HOLL		1607	1609	1616	N12	E01	10720	01	15.7	9	SF		3	E		18		
GOES		1650	1657	1702	N14	W01	10720			12	SF	C 8.0						4.5E-03
HOLL		1652	1705	1723	N14	W01	10720	01	15.6	31	SF		3	E		70		FH
GOES		1703	1707	1709			10720			6		C 7.2						2.1E-03
HOLL		1731	1731	1736	N14	W02	10720	01	15.6	5	SF		3	E		11		F
GOES		1749	1816	1824	N14	W02	10720			35	SF	C 4.2						5.7E-03
HOLL		1751	1802	1828	N14	W02	10720	01	15.6	37	SF		3	E		69		FH
GOES		1757	1802	1805			10720			8		C 2.9						1.3E-03
GOES		1812	1815	1818						6		C 4.4						1.4E-03
GOES		1842	1853	1901	N14	W01	10720			19	1N	C 8.8						5.5E-03
HOLL		1846	1852	1918	N14	W01	10720	01	15.7	32	1N		3	E		128		FH
GOES		1944	1949	1954	N14	W03	10720			10	SF	C 3.5						1.4E-03
HOLL		1947	1948	2053	N14	W03	10720	01	15.6	66	SF		3	E		66		FH
GOES		2008	2022	2027	N15	W04	10720			19	SF	C 5.4						4.8E-03
HOLL		2057	2058	2111	N13	E00	10720	01	15.9	14	SF		3	E		25		FH
HOLL		2125	2126	2133	N13	E00	10720	01	15.9	8	SF		3	E		15		FH
HOLL		2154	2249	2409D	N14	W08	10720	01	15.3	135D	3B		3	E		802		ZUT
GOES		2201	2208	2216	N14	W09	10720			15	SF	M 1.0						6.9E-03
HOLL		2220	2224	2227	S08	W16	10718	01	14.7	7	SF		3	E		16		
GOES		2225	2302	2331			10720			66		X 2.6						6.3E-01

Hα SOLAR FLARES

JANUARY 2005

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Area Measurement Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
HOLL	15	2232	2233	2241	S09	E55		01	20.1	9	SF		3	E		38		
LEAR		2339	2339	2514	N13	W03	10720	01	15.7	95	1F		3	E		218		ZUT
LEAR	16	0115	0115	0124	N11	W03	10720	01	15.8	9	SF		3	E		86		ZF
LEAR		0255	0311	0314	N13	W06	10720	01	15.7	19	SF		3	E		14		ZF
GOES		0754	0758	0802			10720			8		C 4.4						1.9E-03
GOES		1005	1009	1013			10720			8		C 4.0						1.8E-03
GOES		1147	1151	1157						10		C 2.8						1.5E-03
GOES		1437	1440	1442	N14	W12	10720			5	SF	C 2.9						7.2E-04
HOLL		1441E	1442	1458	N14	W12	10720	01	15.7	17D	SF		3	E		44		F
GOES		1506	1518	1532	N14	W12	10720			26	SF	C 5.9						6.7E-03
HOLL		1512	1514	1613	N14	W12	10720	01	15.7	61	SF		3	E		49		F
HOLL		1651	1652	1728	N13	W13	10720	01	15.7	37	SF		3	E		29		F
GOES		1758	1807	1816			10720			18		C 2.0						2.0E-03
GOES		1825	1829	1836	N13	W14	10720			11	SN	C 3.7						1.7E-03
HOLL		1828	1830	1838	N13	W14	10720	01	15.7	10	SN		3	E		81		
HOLL		1937	1939	1943	N17	W12	10720	01	15.9	6	SF		3	E		12		
GOES		2155	2203	2222	N13	W16	10720			27	1N	M 2.4						2.4E-02
HOLL		2200	2201	2303	N13	W16	10720	01	15.7	63	1N		3	E		125		FH
GOES	17	0244	0259	0307			10720			23		C 3.9						3.6E-03
GOES		0310	0321	0332			10720			22		M 2.6						2.2E-02
GOES		0606	0610	0615			10720			9		C 3.9						1.9E-03
GOES		0659	0952	1007			10720			188		X 3.8						8.4E-01
SVTO		0906E	0950U	1011D	N13	W23	10720	01	15.6	65D	2F		2	E		546		UF
SVTO		1012E	1032U	1043D	N13	W22	10720	01	15.8	31D	SF		2	E		68		F
HOLL		1946	1955	2010	N14	W28	10720	01	15.7	24	SF		3	E		37		FH
HOLL		2014	2018	2026	N16	W27	10720	01	15.8	12	SF		3	E		52		
HOLL		2052	2054	2058	N13	W26	10720	01	15.9	6	SF		3	E		20		
HOLL		2214	2215	2217	N10	W26	10720	01	16.0	3	SF		3	E		22		FH
GOES	18	0037	0044	0051	N13	W29	10720			14	SF	C 6.0						3.9E-03
LEAR		0039	0041	0059	N13	W29	10720	01	15.8	20	SF		3	E		20		F
GOES		0206	0212	0217	N17	W28	10720			11	SF	C 3.2						1.6E-03
LEAR		0209	0210	0221	N17	W28	10720	01	16.0	12	SF		3	E		27		F
LEAR		0435	0435	0438	N16	W34	10720	01	15.6	3	SF		3	E		22		F
GOES		0541	0546	0549			10720			8		C 2.0						7.9E-04
GOES		0552	0615	0624			10720			32		C 6.1						6.8E-03
GOES		0747	0800	0818	N14	W39	10720			31	1F	C 2.4						3.8E-03
GOES		1123	1132	1159			10720			36		M 1.6						2.3E-02
GOES		1538	1551	1559	N14	W40	10720			21	2N	M 4.6						3.4E-02
HOLL		1540	1549	1636	N14	W40	10720	01	15.6	56	2N		3	E		425		FH
HOLL		1748	1749	1756	N14	W41	10720	01	15.6	8	SF		3	E		13		F
HOLL		1830	1900	1938	N18	W38	10720	01	15.9	68	1F		3	E		112		F
GOES		1843	1848	1852			10720			9		C 2.1						1.0E-03
GOES		1856	1901	1909			10720			13		C 4.2						2.6E-03
HOLL		1940	2127	2247	N15	W43	10720	01	15.6	187	SF		3	E		67		F
HOLL		2247	2257	2309	N13	W41	10720	01	15.8	22	SF		3	E		13		
HOLL		2316	2324	2337	N17	W43	10720	01	15.7	21	SF		3	E		11		
GOES	19	0310	0324	0337			10720			27		C 1.8						2.5E-03
GOES		0444	0448	0452						8		C 1.9						8.4E-04
GOES		0510	0526	0535	N12	W44	10720			25	SF	C 7.2						6.9E-03
LEAR		0514	0527	0541	N12	W44	10720	01	15.9	27	SF		3	E		50		ZF
GOES		0658	0731	0755	N19	W47	10720			57	2N	M 6.7						7.7E-02
LEAR		0726	0813	0956	N19	W47	10720	01	15.7	150	2N		3	E		331		ZU
GOES		0803	0822	0840			10720			37		X 1.3						2.2E-01
LEAR		0956	0956	1004	N18	W47	10720	01	15.8	8	SF		3	E		16		FH
LEAR		1004	1005	1013	N18	W47	10720	01	15.8	9	SF		3	E		18		F
LEAR		1015	1023	1042D	N18	W47	10720	01	15.8	27D	1N		2	E		116		ZF
GOES		1019	1024	1029	N18	W47	10720			10	1N	M 2.7						1.3E-02
GOES		1532	1540	1548	N13	W50	10720			16	2F	M 1.6						9.9E-03
HOLL		1539E	1539U	1554	N13	W50	10720	01	15.9	15D	2F		3	E		250		FH
HOLL		1556	1607	1618	N13	W60	10720	01	15.1	22	SF		3	E		11		
GOES		2318	2324	2329	S01	E55	10723			11	SF	C 5.3						2.1E-03
LEAR		2322	2325	2332	S01	E55		01	24.1	10	SF		3	E		21		F
GOES	20	0037	0047	0056			10720			19		C 1.6						1.5E-03

Hα SOLAR FLARES

JANUARY 2005

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
GOES	20	0321	0330	0336	N11	W58	10720			15	SF	C 4.8						2.7E-03
LEAR		0325	0333	0347	N11	W58	10720	01	15.8	22	SF		3	E		75		FH
GOES		0636	0701	0726	N12	W58	10720			50	2B	X 7.1						1.3E00
LEAR		0641	0646	0854	N12	W58	10720	01	15.9	133	2B		3	E		293		ZU
LEAR		0855	0858	0918	N14	W57	10720	01	16.1	23	SF		3	E		20		F
LEAR		0919	0922	0933	N14	W57	10720	01	16.1	14	SF		3	E		16		F
GOES		1608	1614	1619	N19	W64	10720			11	SF	C 8.0						4.3E-03
HOLL		1612	1646	1707	N19	W64	10720	01	15.8	55	SF		3	E		59		F
GOES		1813	1816	1819			10720			6		C 3.6						1.2E-03
GOES		2147	2153	2156			10720			9		C 4.5						1.7E-03
GOES	21	0019	0024	0026	N15	W67	10720			7	SF	C 5.8						1.5E-03
LEAR		0022	0023	0028	N15	W67	10720	01	15.9	6	SF		3	E		23		
GOES		0417	0427	0434	N19	W69	10720			17	SF	C 6.3						4.0E-03
LEAR		0423	0425	0432	N19	W69	10720	01	15.9	9	SF		3	E		53		F
GOES		0630	0636	0638			10720			8		C 1.6						6.5E-04
GOES		0641	0646	0649			10720			8		C 1.8						7.4E-04
GOES		0821	0835	0840			10719			19		C 1.3						1.4E-03
GOES		0905	0912	0918			10719			13		C 1.7						1.1E-03
GOES		1010	1016	1019			10720			9		M 1.7						4.5E-03
GOES		1207	1212	1216			10719			9		C 1.3						6.1E-04
GOES		1347	1355	1410			10719			23		M 1.2						1.1E-02
GOES		1705	1711	1714			10720			9		C 1.6						6.8E-04
GOES		2043	2049	2055			10720			12		C 1.6						8.8E-04
GOES	22	0414	0432	0447			10719			33		C 3.1						4.1E-03
GOES		0608	0612	0615			10725			7		B 4.7						1.7E-04
GOES		0715	0719	0723			10720			8		B 5.1						2.0E-04
GOES		0800	0803	0805			10720			5		B 8.5						2.1E-04
GOES		1203	1207	1213			10720			10		B 7.3						3.8E-04
GOES		1235	1245	1247			10720			12		C 1.3						6.9E-04
GOES		1724	1728	1734			10725			10		B 8.9						4.3E-04
GOES		2045	2048	2050			10720			5		B 6.6						1.5E-04
GOES		2050	2053	2055						5		C 1.6						3.4E-04
GOES		2056	2100	2105			10720			9		C 1.4						7.1E-04
GOES		2108	2113	2118			10720			10		C 1.9						9.9E-04
GOES	23	0128	0151	0201			10720			33		M 1.0						9.4E-03
GOES		0443	0505	0523			10720			40		C 4.5						7.1E-03
GOES	24	0540	0544	0547			10724			7		B 3.1						8.7E-05
GOES		1025	1028	1030						5		B 1.2						3.1E-05
GOES		1348	1351	1356						8		B 2.1						8.4E-05
GOES		1453	1458	1501			10724			8		B 4.6						1.4E-04
GOES		1538	1541	1548			10724			10		B 4.6						2.3E-04
GOES		1628	1633	1636			10727			8		B 4.7						1.9E-04
GOES		1829	1834	1839			10727			10		B 3.4						1.5E-04
GOES		1857	1907	1915			10727			18		B 2.4						2.4E-04
GOES		2032	2042	2046			10727			14		B 4.2						2.2E-04
GOES		2104	2108	2113			10727			9		B 1.8						8.7E-05
GOES		2134	2139	2142			10727			8		B 4.0						1.4E-04
GOES	25	0252	0258	0311			10725			19		B 1.2						1.3E-04
GOES		0644	0650	0726			10725			42		B 1.3						3.0E-04
GOES		1211	1217	1219			10725			8		B 2.4						8.2E-05
GOES		1223	1228	1230			10725			7		B 3.6						9.1E-05
GOES		1337	1341	1343			10725			6		B 2.3						6.4E-05
GOES		1355	1403	1409			10724			14		B 2.6						1.7E-04
GOES		2042	2051	2059						17		B 1.6						1.5E-04
GOES	26	0105	0113	0132						27		B 1.8						2.8E-04
GOES		1646	1650	1656						10		B 1.3						6.9E-05
GOES	27	0306	0311	0313			10727			7		B 6.8						1.5E-04
GOES		1929	1934	1941						12		B 1.5						8.8E-05
GOES	29	0241	0245	0252			10727			11		B 1.4						7.5E-05
GOES		0403	0406	0409			10727			6		B 2.7						6.7E-05

Hα SOLAR FLARES

JANUARY 2005

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	29	0600	0605	0608			10727			8		B 3.4						1.0E-04
GOES		1223	1234	1242			10727			19		B 4.9						3.8E-04
GOES		1518	1526	1533			10727			15		B 1.8						1.4E-04
GOES	30	0253	0257	0259			10727			6		B 1.2						3.3E-05
GOES		1351	1355	1358						7		B 1.2						3.8E-05
GOES	31	0400	0403	0405						5		B 1.1						2.7E-05
GOES		0435	0439	0441						6		B 4.5						7.5E-05
GOES		0515	0518	0520						5		B 1.7						3.5E-05
GOES		0526	0529	0531						5		B 2.3						5.2E-05
GOES		0544	0548	0553						9		B 1.5						6.3E-05
GOES		0612	0618	0622						10		B 5.9						2.0E-04
GOES		0656	0705	0707						11		B 5.1						2.5E-04
GOES		0716	0720	0731						15		B 2.8						2.3E-04
GOES		0733	0737	0740						7		B 3.7						1.3E-04
GOES		0801	0805	0807						6		B 2.0						6.0E-05
GOES		0808	0812	0814						6		B 2.0						6.3E-05
GOES		0815	0818	0822						7		B 2.9						1.0E-04
GOES		0907	0913	0916	S10	E25	10729			9	SF	B 3.3						1.1E-04
LEAR		0913	0914	0917	S10	E25		02	2.3	4	SF		3	E		12		
GOES		0959	1005	1008						9		B 1.7						6.8E-05
GOES		1016	1020	1025						9		B 2.0						8.3E-05
GOES		1046	1052	1058			10729			12		C 1.3						6.3E-04
GOES		1135	1139	1143						8		B 1.2						5.1E-05
GOES		1413	1418	1423						10		B 2.6						1.1E-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.

SOLAR RADIO EMISSION
Selected Fixed Frequency Events

JANUARY 2005

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 -22 W/m 2 Hz)	Flux Density Mean (10 -22 W/m 2 Hz)	Int	Remarks
01	8800	LEAR	49	GB	0026.0	0029.0	23.0	4000.0			QL=4 ST=2 TYP=6
	2695	LEAR	48	C	0027.0	0029.0	9.0	760.0			QL=4 ST=2 TYP=8
	2695	PALE	48	C	0027.0	0030.0	10.0	870.0			QL=4 ST=2 TYP=8
	8800	PALE	49	GB	0027.0	0030.0	23.0	3800.0			QL=4 ST=2 TYP=6
02	2695	SGMR	8	S	1259.0	1259.0	1.0	56.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	1259.0	1259.0	U	22.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1259.0	1259.0	2.0	73.0			QL=4 ST=2 TYP=3
04	2695	SVTO	8	S	1059.0	1100.0	1.0	53.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	1102.0	1104.0	3.0	45.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	1104.0	1105.0	5.0	23.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	1117.0	1117.0	3.0	68.0			QL=4 ST=2 TYP=3
09	2695	SVTO	4	S/F	0838.0	0844.0	9.0	77.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	0842.0	0844.0	5.0	66.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0843.0	0843.0	2.0	72.0			QL=4 ST=2 TYP=3
13	8800	SGMR	8	S	1632.0	1633.0	1.0	63.0			QL=4 ST=2 TYP=3
	2695	SGMR	8	S	1633.0	1633.0	U	21.0			QL=4 ST=2 TYP=3
	8800	LEAR	4	S/F	2246.0	2247.0	3.0	100.0			QL=4 ST=3 TYP=3
	8800	PALE	8	S	2247.0	2247.0	1.0	65.0			QL=4 ST=2 TYP=3
14	2695	LEAR	8	S	1017.0	1019.0	2.0	75.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	1018.0	1018.0	1.0	100.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1018.0E	1019.0U	2.0D	76.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	1018.0E	1019.0U	10.0D	140.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	1232.0	1237.0	8.0	67.0			QL=2 ST=2 TYP=3
	2695	SGMR	4	S/F	1237.0	1237.0	7.0	72.0			QL=4 ST=2 TYP=3
	8800	SVTO	48	C	1237.0	1245.0	9.0	180.0			QL=2 ST=2 TYP=8
	8800	SGMR	4	S/F	1354.0	1358.0	12.0				QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1424.0	1424.0	U	95.0			QL=4 ST=2 TYP=3
	2695	SGMR	4	S/F	1603.0	1606.0	4.0	47.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1604.0	1605.0	2.0	79.0			QL=4 ST=2 TYP=3
	2695	SGMR	8	S	1608.0	1608.0	1.0	67.0			QL=4 ST=2 TYP=3
	8800	LEAR	4	S/F	2249.0	2254.0	7.0	94.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	2325.0	2331.0	22.0	150.0			QL=4 ST=2 TYP=3
	8800	LEAR	4	S/F	2329.0	2331.0	4.0	100.0			QL=4 ST=2 TYP=3
15	8800	LEAR	4	S/F	0027.0	0028.0	6.0	63.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	0028.0	0029.0	4.0	63.0			QL=4 ST=2 TYP=3
	8800	LEAR	48	C	0037.0	0040.0	40.0	510.0			QL=4 ST=2 TYP=8
	8800	PALE	49	GB	0039.0	0041.0	52.0	590.0			QL=4 ST=2 TYP=6
	2695	PALE	8	S	0042.0	0043.0	2.0	120.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0043.0	0043.0	U	97.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0420.0	0420.0	U	58.0			QL=4 ST=2 TYP=3
	8800	LEAR	4	S/F	0428.0	0430.0	10.0	130.0			QL=4 ST=2 TYP=3
	8800	LEAR	48	C	0552.0	0637.0	117.0	2400.0			QL=4 ST=2 TYP=8
	2695	LEAR	48	C	0552.0	0629.0	142.0	3000.0			QL=4 ST=2 TYP=8
	2695	SVTO	48	C	0634.0	0644.0U	173.0	3500.0			QL=4 ST=2 TYP=8
	8800	SVTO	48	C	0637.0	0642.0U	170.0	1900.0			QL=4 ST=2 TYP=8
	2695	SGMR	4	S/F	1413.0	1419.0	24.0	420.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	1413.0	1419.0	23.0	460.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	1414.0	1420.0	41.0	180.0			QL=4 ST=2 TYP=3
	8800	SGMR	4	S/F	1415.0	1419.0	27.0	180.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1705.0	1705.0	U	60.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1757.0	1757.0	U	57.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	1851.0	1852.0	4.0	320.0			QL=4 ST=2 TYP=3
	8800	SGMR	4	S/F	1851.0	1852.0	7.0	360.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	1947.0	1947.0	1.0	170.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1947.0	1947.0	1.0	140.0			QL=4 ST=2 TYP=3
	8800	PALE	48	C	2203.0	2248.0	178.0	17000.0			QL=4 ST=2 TYP=8
	2695	PALE	48	C	2224.0	2306.0	158.0	6400.0			QL=4 ST=2 TYP=8
	2695	LEAR	48	C	2230.0	2305.0	122.0	5400.0			QL=4 ST=3 TYP=8
	8800	LEAR	48	C	2230.0	2248.0	147.0	21000.0			QL=4 ST=3 TYP=8
16	8800	SGMR	8	S	1637.0	1637.0	U	54.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	1828.0	1828.0	1.0	160.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1828.0	1828.0	1.0	130.0			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

JANUARY 2005

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 -22 W/m 2 Hz)	Flux Density Mean (10 -22 W/m 2 Hz)	Int	Remarks
16	2695	PALE	8	S	2159.0	2159.0	U	54.0			QL=4 ST=2 TYP=3
	8800	PALE	49	GB	2159.0	2159.0	11.0	2800.0			QL=4 ST=2 TYP=6
17	8800	LEAR	48	C	0313.0	0313.0	8.0	310.0			QL=4 ST=2 TYP=8
	8800	PALE	48	C	0313.0	0314.0	12.0	410.0			QL=4 ST=2 TYP=8
	8800	SVTO	48	C	0744.0	0926.0	237.0	16000.0			QL=4 ST=3 TYP=8
	8800	LEAR	49	GB	0755.0	0926.0	187.0	17000.0			QL=4 ST=3 TYP=6
	2695	LEAR	48	C	0804.0	0931.0	178.0	12000.0			QL=4 ST=3 TYP=8
	2695	SVTO	48	C	0804.0	0931.0	243.0	12000.0			QL=4 ST=3 TYP=8
18	8800	SVTO	4	S/F	1127.0	1127.0	9.0	67.0			QL=4 ST=2 TYP=3
	8800	SGMR	48	C	1543.0	1544.0	28.0	330.0			QL=4 ST=2 TYP=8
	2695	SGMR	4	S/F	1546.0	1547.0	4.0	100.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	1858.0	1858.0	1.0	200.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1858.0	1858.0	1.0	200.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	2118.0	2118.0	U	53.0			QL=4 ST=2 TYP=3
19	2695	LEAR	49	GB	0510.0	0511.0	1.0	3500.0			QL=4 ST=2 TYP=6
	8800	LEAR	8	S	0511.0	0511.0	1.0	76.0			QL=4 ST=2 TYP=3
	8800	LEAR	49	GB	0726.0	0728.0	5.0	880.0			QL=4 ST=2 TYP=6
	8800	LEAR	48	C	0738.0	0825.0	197.0	17000.0			QL=4 ST=2 TYP=8
	2695	LEAR	48	C	0741.0	0944.0	194.0	5000.0			QL=4 ST=2 TYP=8
	8800	SVTO	49	GB	1033.0	1033.0U	69.0	1400.0			QL=4 ST=2 TYP=6
	2695	SVTO	49	GB	1033.0	1033.0U	193.0	2900.0			QL=4 ST=2 TYP=6
	2695	SGMR	4	S/F	1250.0	1251.0U	55.0	150.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1534.0E	1535.0U	1.0D	150.0			QL=4 ST=2 TYP=3
20	8800	LEAR	8	S	0324.0	0325.0	1.0	100.0			QL=4 ST=2 TYP=3
	8800	LEAR	48	C	0635.0	0647.0	91.0	62000.0			QL=4 ST=2 TYP=8
	2695	LEAR	48	C	0635.0	0656.0	125.0	8400.0			QL=4 ST=2 TYP=8
	8800	SVTO	49	GB	0638.0	0647.0	125.0	44000.0			QL=2 ST=2 TYP=6
	2695	SVTO	48	C	0639.0	0657.0	121.0	9000.0			QL=2 ST=2 TYP=8
	2695	LEAR	4	S/F	0934.0	0936.0	6.0	93.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	0935.0	0937.0	3.0	76.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1610.0	1610.0	1.0	210.0			QL=4 ST=2 TYP=3
21	8800	LEAR	8	S	0020.0	0021.0	1.0	180.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0021.0	0021.0	U	98.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	1014.0	1014.0	1.0	270.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	1014.0	1015.0	1.0	220.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1015.0	1015.0	U	51.0			QL=4 ST=2 TYP=3
	8800	LEAR	48	C	1048.0	1052.0	12.0	120.0			QL=4 ST=2 TYP=8
	8800	SVTO	8	S	1151.0	1151.0	1.0	28.0			QL=4 ST=2 TYP=3
27	8800	SVTO	8	S	0756.0	0757.0	1.0	66.0			QL=4 ST=2 TYP=3

Reports are received routinely from the following observatories:
LEAR = Learmonth PALE = Palehua SGMR = Sagamore Hill SVTO = San Vito

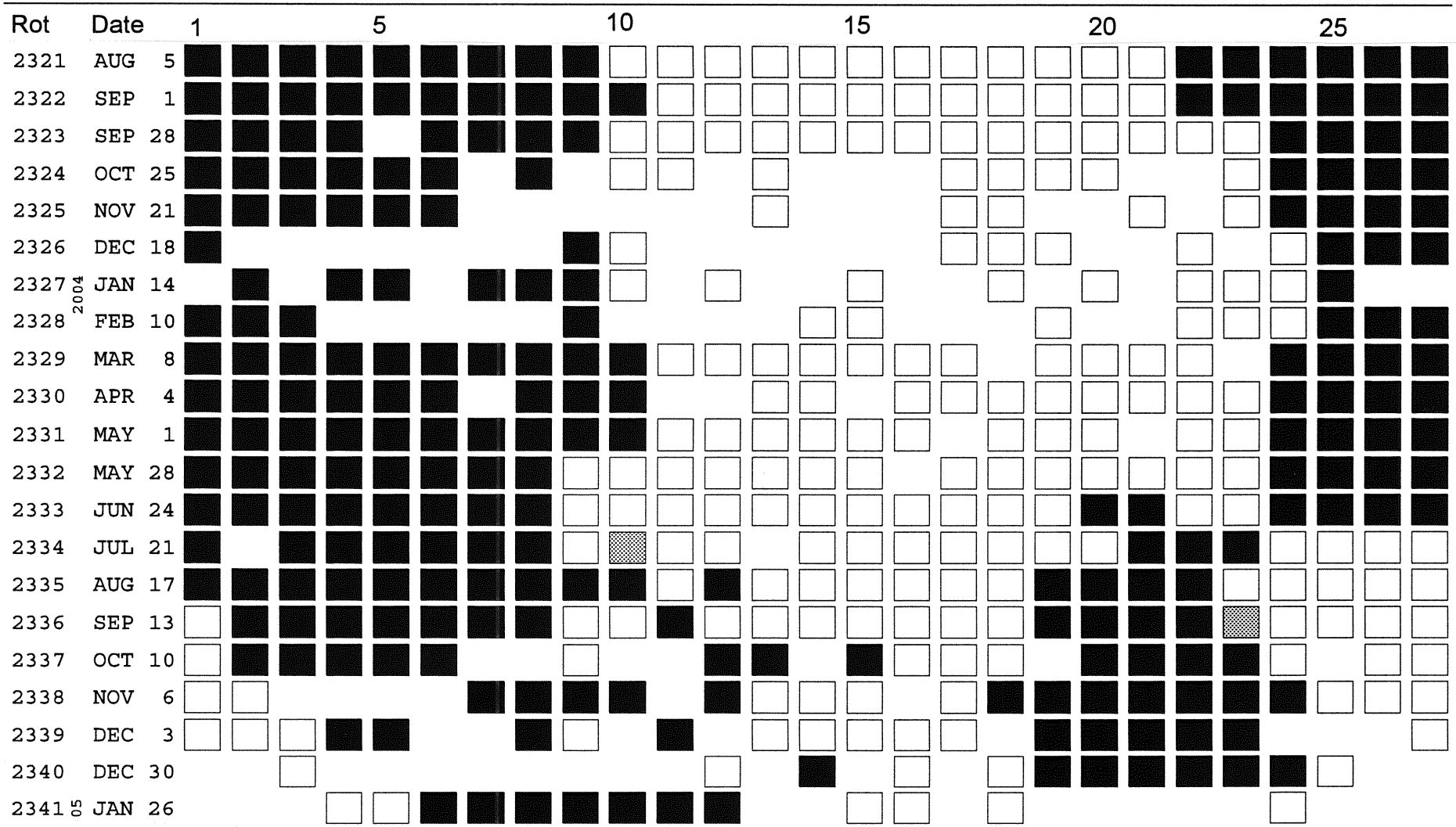
Explanation of Type Code:

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 Precusor	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	4O Rise Only	16A Fall A	27AF Rise and Fall AF
21A Simple 3A GRF	4OF Rise Only F	26O 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

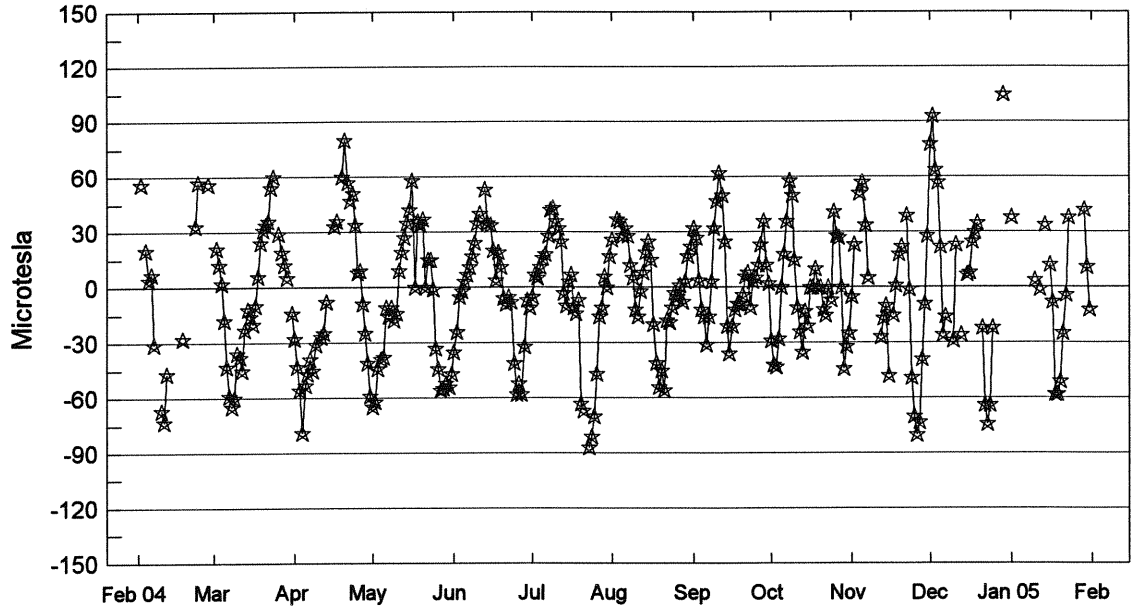


Mean Solar Magnetic Field Polarity: = field > 2 microT; = -2 microT ≤ field ≤ 2 microT

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

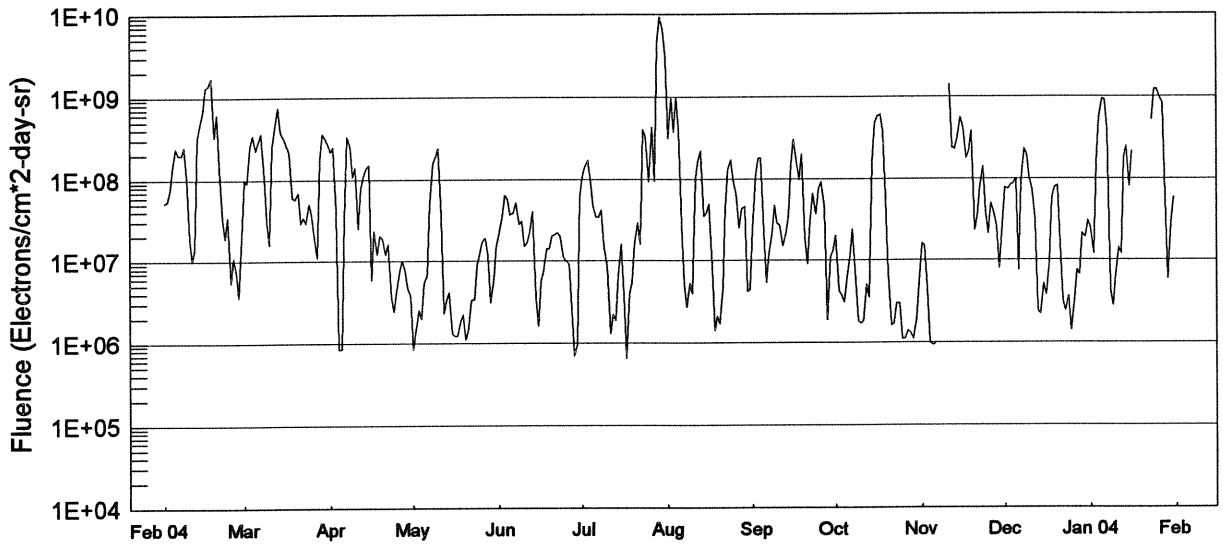
Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates are five days earlier, to mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

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



Day	Feb 04	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 05
1	---	---	-28	-65	-35	-5	26	32	-29	-5	78	38
2	56	21	-43	-62	-24	7	---	27	-42	23	93	---
3	---	12	-56	-44	-5	5	37	4	-43	---	64	---
4	20	2	-79	-39	-2	11	36	-12	-28	51	57	---
5	4	-18	-53	-38	3	16	28	-16	0	57	22	---
6	7	-43	-47	-11	7	18	32	-31	18	34	-26	---
7	-31	-59	-39	-16	11	28	28	-16	36	5	-16	---
8	---	-65	-45	-11	17	42	12	3	58	---	---	---
9	---	-60	-31	-18	24	43	5	32	50	---	---	---
10	-67	-36	---	-14	35	36	-12	47	15	---	-29	4
11	-73	-38	-27	9	40	32	-16	62	-11	---	23	---
12	-47	-45	-25	19	---	25	-2	50	-24	-27	---	-1
13	---	-23	-8	27	53	-3	8	25	-35	-17	-26	---
14	---	-12	---	35	35	-10	19	-21	-13	-10	---	34
15	---	-16	---	42	34	3	25	-36	-21	-48	7	---
16	---	-20	33	58	20	7	15	-21	---	---	8	12
17	---	-10	36	---	4	-11	-20	-12	---	-15	25	-8
18	-28	6	---	36	19	-14	-41	-9	10	1	30	-58
19	---	24	60	34	11	-7	-54	-9	---	18	35	-58
20	---	31	80	37	-6	-63	-45	-4	---	22	---	-51
21	---	34	57	---	-9	-67	-56	6	-12	---	-22	-25
22	---	36	47	15	-5	---	-18	8	-15	39	-64	-4
23	33	54	51	15	-8	-87	-19	-11	---	-1	-74	38
24	57	60	34	-1	-41	-81	-11	3	-7	-49	-64	---
25	---	---	8	-33	-58	-70	-3	5	41	-70	-22	---
26	---	29	9	-44	-52	-47	-5	12	28	-80	---	---
27	---	19	-9	-56	-58	-16	1	23	27	-73	---	---
28	56	12	-25	-55	-32	-11	-8	36	---	-39	---	---
29	---	5	-41	-52	-7	6	3	12	-44	-9	105	42
30		---	-59	-54	-11	0	17	2	-32	28	---	11
31		-14		-47		17	22		-25		---	-12

GOES Daily Electron Fluence
Feb 2004 - Jan 2005



Day	Feb 04	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 05
1	5.3E+07	9.9E+07	2.2E+08	8.3E+05	2.1E+07	1.1E+08	3.1E+08	2.4E+07	2.0E+07	1.6E+07	7.8E+07	2.5E+07
2	5.5E+07	9.2E+07	2.5E+08	1.4E+06	3.4E+07	1.4E+08	9.6E+08	1.1E+08	4.2E+06	1.5E+07	7.5E+07	1.2E+07
3	7.1E+07	2.6E+08	4.1E+07	2.5E+06	6.4E+07	1.7E+08	3.7E+08	1.8E+08	3.8E+06	4.5E+06	8.4E+07	1.6E+08
4	1.6E+08	3.4E+08	8.3E+05	2.0E+06	5.8E+07	1.0E+08	1.0E+09	1.8E+08	3.1E+06	9.9E+05	8.7E+07	5.3E+08
5	2.4E+08	2.3E+08	8.5E+05	5.4E+06	3.7E+07	4.7E+07	4.1E+08	2.2E+07	6.6E+06	9.3E+05	1.0E+08	9.2E+08
6	2.0E+08	2.9E+08	3.3E+07	6.6E+06	3.9E+07	3.4E+07	2.7E+07	5.4E+06	1.1E+07	9.8E+05	7.5E+06	9.1E+08
7	2.0E+08	3.6E+08	3.3E+08	5.2E+07	5.2E+07	3.4E+07	5.1E+06	1.2E+07	2.4E+07	-999	9.3E+07	4.1E+08
8	2.5E+08	1.1E+08	2.6E+08	1.6E+08	2.8E+07	4.2E+07	2.7E+06	2.1E+07	7.6E+06	-999	2.3E+08	4.3E+06
9	1.1E+08	3.1E+07	1.1E+08	1.9E+08	3.1E+07	1.5E+07	5.3E+06	4.7E+07	1.8E+06	-999	2.0E+08	2.8E+06
10	1.9E+07	1.6E+07	1.4E+08	2.4E+08	1.5E+07	8.4E+06	4.0E+06	2.8E+07	1.7E+06	-999	1.0E+08	6.5E+06
11	1.0E+07	2.5E+08	2.5E+07	3.4E+07	1.7E+07	1.3E+06	1.0E+08	2.7E+07	1.8E+06	1.4E+09	7.6E+07	1.4E+07
12	1.4E+07	4.7E+08	7.8E+07	2.3E+06	2.4E+07	2.2E+06	1.7E+08	1.5E+07	5.1E+06	2.4E+08	3.2E+07	1.2E+07
13	3.2E+08	7.4E+08	1.1E+08	3.3E+06	4.0E+07	1.9E+06	2.2E+08	2.1E+07	3.5E+06	2.3E+08	2.4E+06	1.8E+08
14	5.0E+08	3.8E+08	1.4E+08	4.1E+06	3.5E+06	6.6E+06	3.5E+07	3.5E+07	1.6E+08	3.1E+08	2.2E+06	2.5E+08
15	6.7E+08	3.2E+08	1.5E+08	1.3E+06	1.6E+06	1.6E+07	3.8E+07	1.5E+08	4.7E+08	5.5E+08	5.2E+06	8.1E+07
16	1.3E+09	2.6E+08	5.9E+06	1.2E+06	5.6E+06	3.8E+06	4.9E+07	3.0E+08	5.7E+08	4.3E+08	3.8E+06	2.2E+08
17	1.4E+09	2.2E+08	2.3E+07	1.2E+06	7.6E+06	6.5E+05	8.4E+06	1.6E+08	6.0E+08	1.8E+08	9.5E+06	-999
18	1.7E+09	6.0E+07	1.2E+07	1.8E+06	1.4E+07	4.0E+06	1.4E+06	9.8E+07	3.8E+08	2.2E+08	5.7E+07	-999
19	3.3E+08	5.7E+07	2.0E+07	2.2E+06	1.4E+07	5.5E+06	2.1E+06	2.0E+08	5.9E+07	3.8E+08	7.8E+07	-999
20	6.1E+08	6.9E+07	1.9E+07	1.1E+06	2.0E+07	1.6E+07	1.7E+06	1.8E+07	6.9E+06	2.3E+07	8.2E+07	-999
21	1.4E+08	2.9E+07	1.2E+07	1.4E+06	2.1E+07	2.9E+07	4.6E+06	9.0E+06	1.6E+06	3.4E+07	1.6E+07	-999
22	3.3E+07	3.4E+07	1.6E+07	3.3E+06	2.2E+07	1.6E+07	4.4E+07	3.0E+07	1.7E+06	7.9E+07	3.2E+06	-999
23	1.9E+07	2.9E+07	3.5E+06	3.4E+06	2.0E+07	4.0E+08	1.3E+08	6.6E+07	3.0E+06	1.4E+08	2.4E+06	5.2E+08
24	3.4E+07	5.1E+07	2.4E+06	8.9E+06	1.1E+07	3.3E+08	1.7E+08	3.7E+07	3.0E+06	3.9E+07	3.6E+06	1.2E+09
25	5.5E+06	3.7E+07	4.3E+06	1.2E+07	1.0E+07	9.3E+07	9.2E+07	7.6E+07	1.1E+06	2.1E+07	1.4E+06	1.2E+09
26	1.1E+07	2.0E+07	7.5E+06	1.7E+07	9.2E+06	4.3E+08	6.8E+07	9.1E+07	1.1E+06	5.0E+07	2.7E+06	9.6E+08
27	7.7E+06	1.1E+07	1.0E+07	1.9E+07	2.6E+06	9.4E+07	2.5E+07	4.5E+07	1.4E+06	3.7E+07	7.6E+06	8.2E+08
28	3.6E+06	1.8E+08	7.9E+06	1.2E+07	7.0E+05	4.5E+09	4.3E+07	1.9E+06	1.3E+06	2.6E+07	6.6E+06	5.9E+07
29	2.0E+07	3.6E+08	4.8E+06	3.1E+06	9.5E+05	9.3E+09	4.6E+07	1.1E+07	1.1E+06	7.9E+06	2.1E+07	5.9E+06
30		3.1E+08	3.8E+06	5.9E+06	6.0E+07	6.4E+09	4.2E+06	1.3E+07	1.9E+06	2.7E+07	1.9E+07	2.8E+07
31		2.7E+08		1.5E+07		3.0E+09	4.4E+06		5.2E+06		3.0E+07	6.0E+07

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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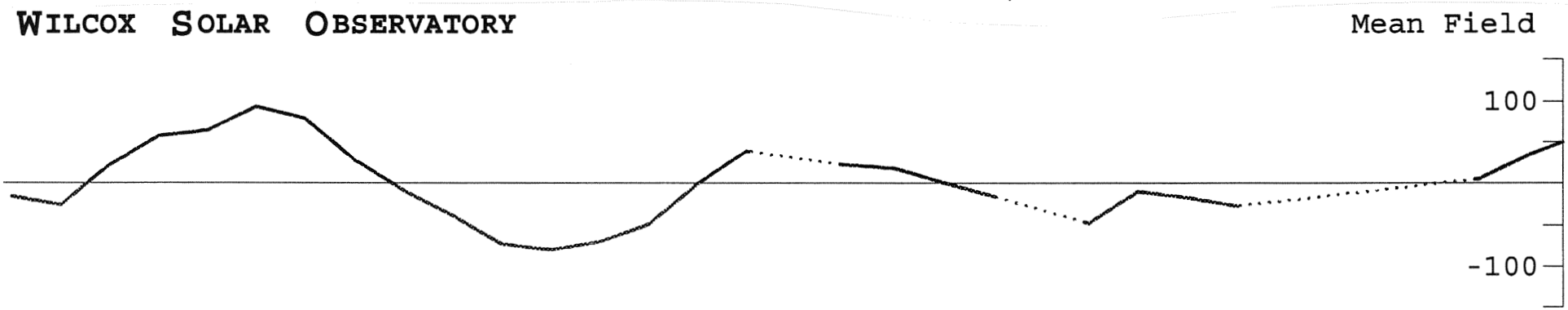
SOLAR MAGNETIC FIELD SYNOPTIC CHART

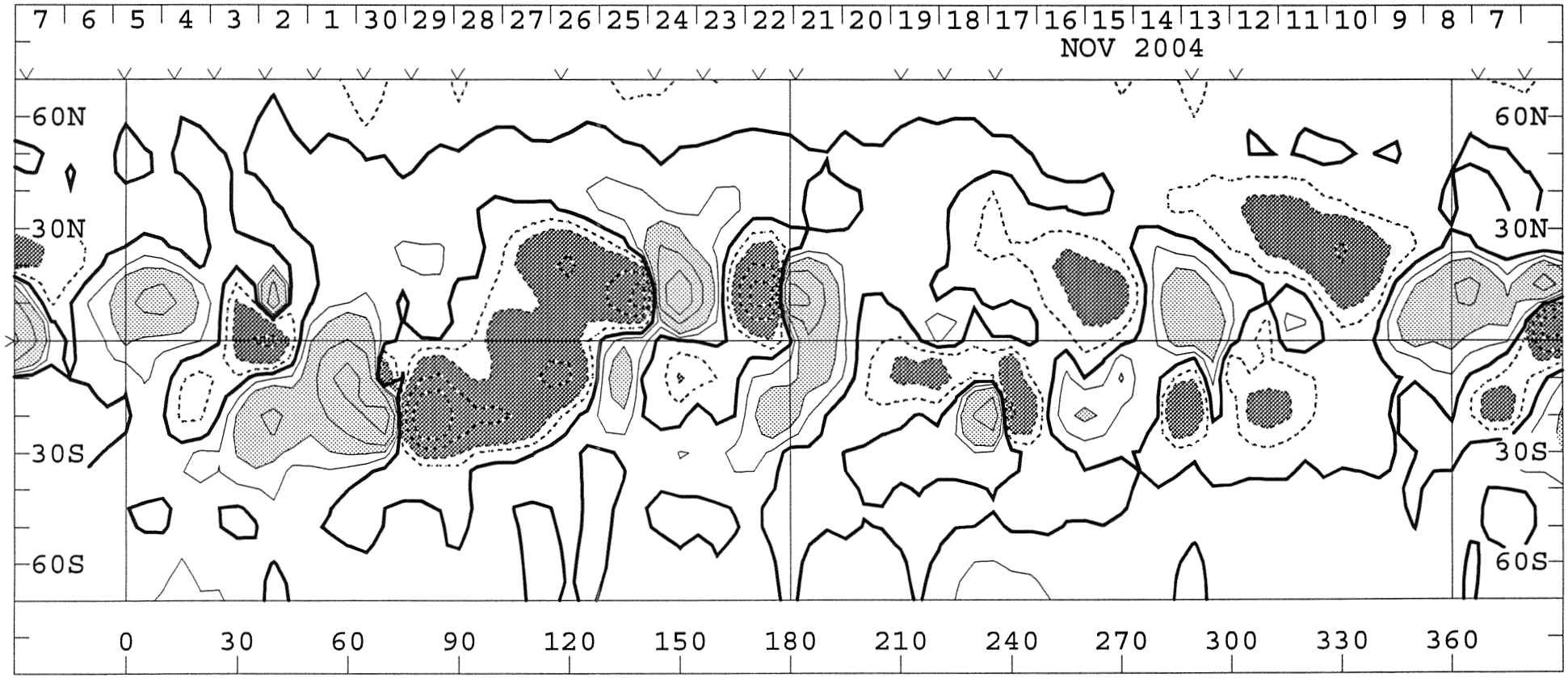
CARRINGTON ROTATION NUMBER 2023

(8 November to 5 December 2004)

WILCOX SOLAR OBSERVATORY



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



Heliographic Longitude

SOLAR MAGNETIC FIELD SYNOPTIC CHART

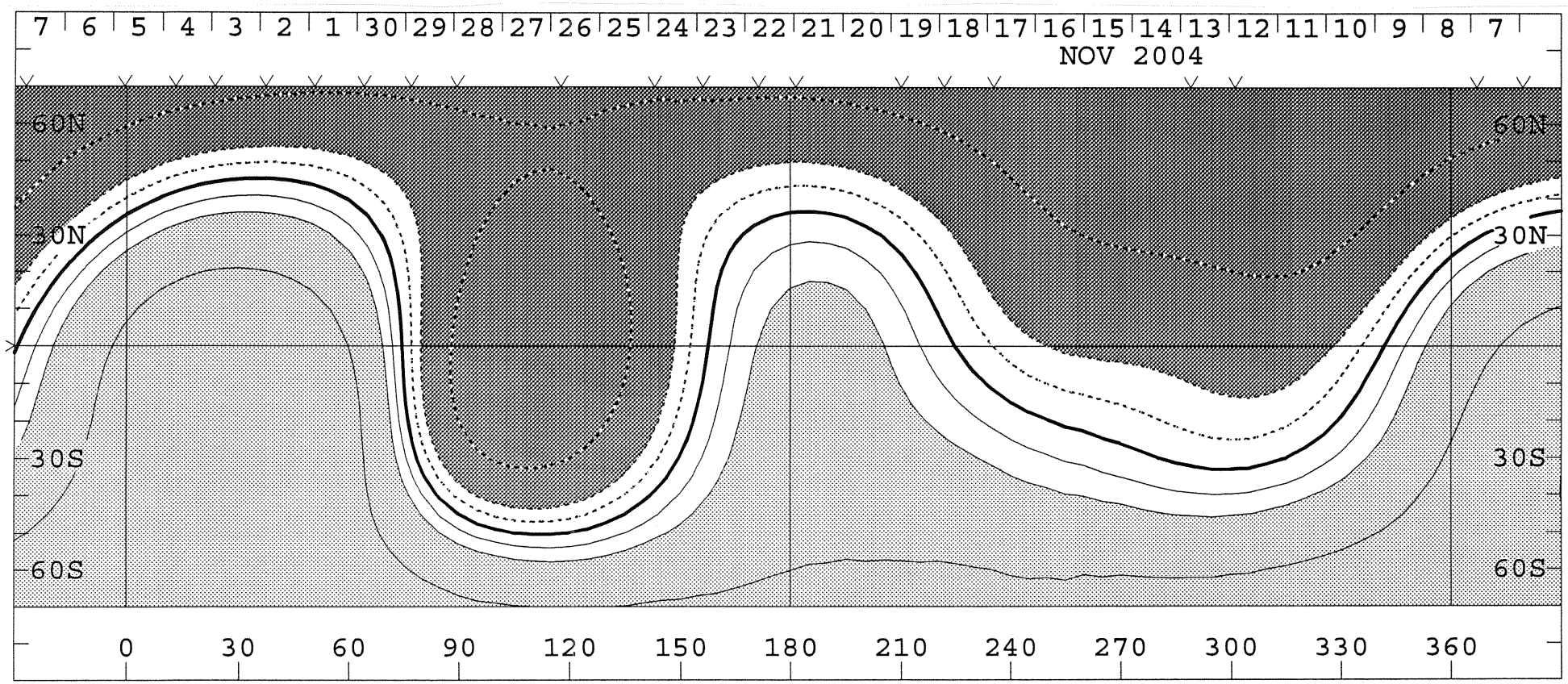
SOURCE SURFACE FIELD

CARRINGTON ROTATION NUMBER 2023

(8 November to 5 December 2004)

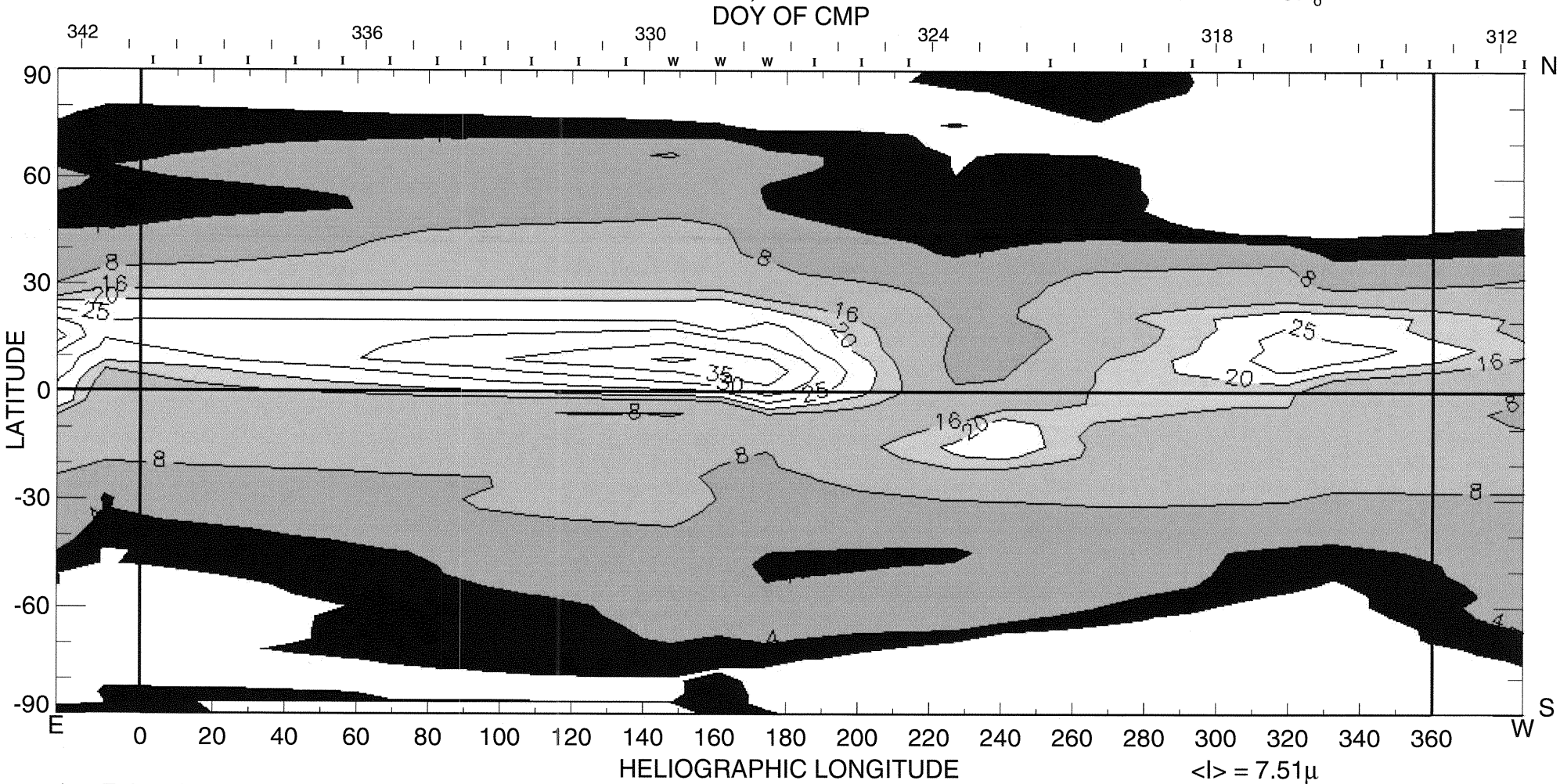
Wilcox Solar Observatory

0, ±1, 2, 5, 10, 20 microTesla



Heliographic Longitude

CARRINGTON ROTATION NUMBER 2023 ; NSO/SACRAMENTO PEAK FE XIV @ R = 1.15R_o



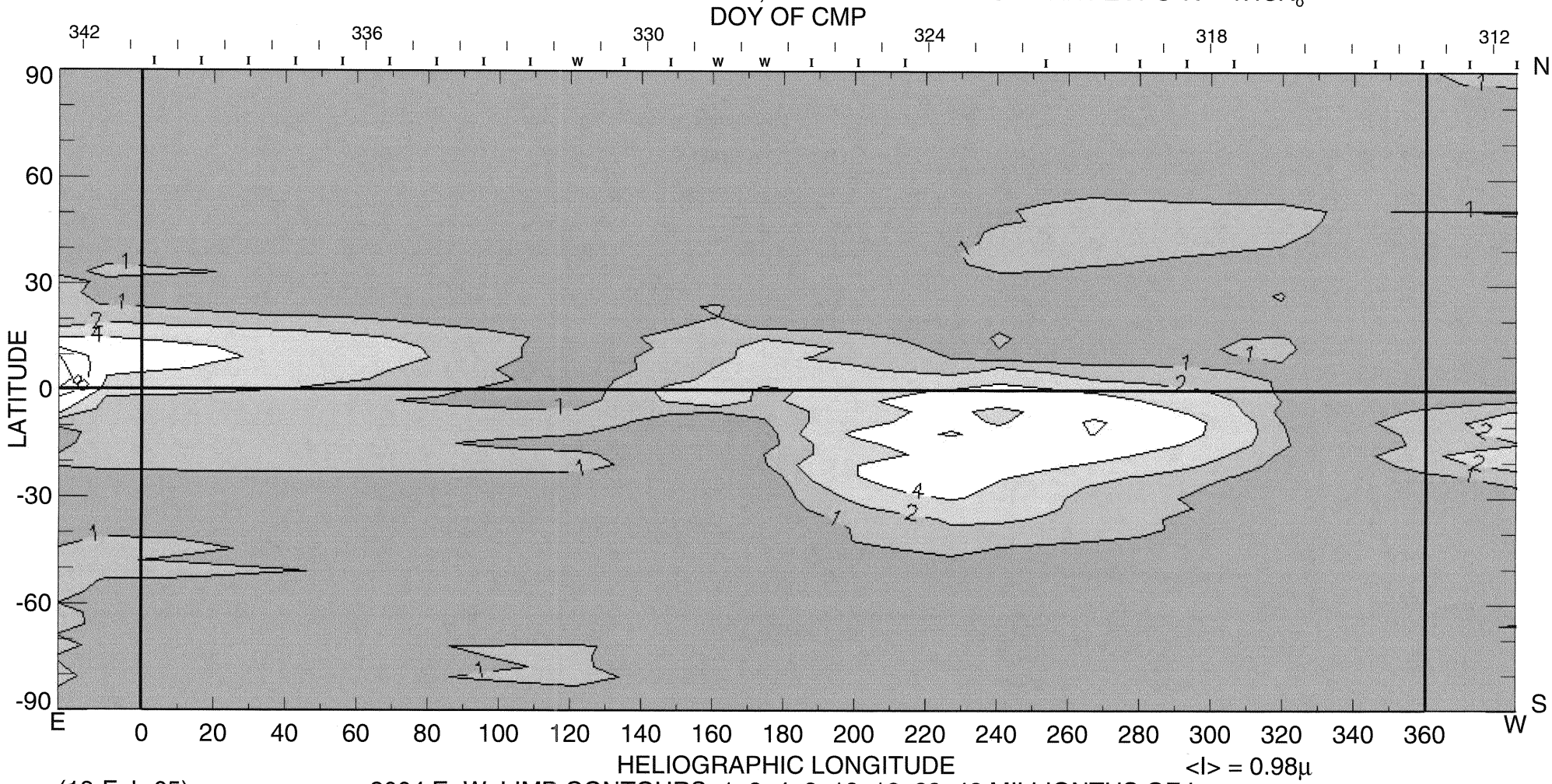
<I> = 7.51μ

(18-Feb-05) 2004 E+W LIMB CONTOURS: 2, 4, 8, 16, 20, 25, 30, 35, 40, 100, 120 MILLIONTHS OF I_o

CORONAL HOLES ARE SHOWN AS WHITE BORDERED BY BLACK

tex Fri Feb 18 09:40:33 2005

CARRINGTON ROTATION NUMBER 2023 ; NSO/SACRAMENTO PEAK FE X @ R = 1.15R_o



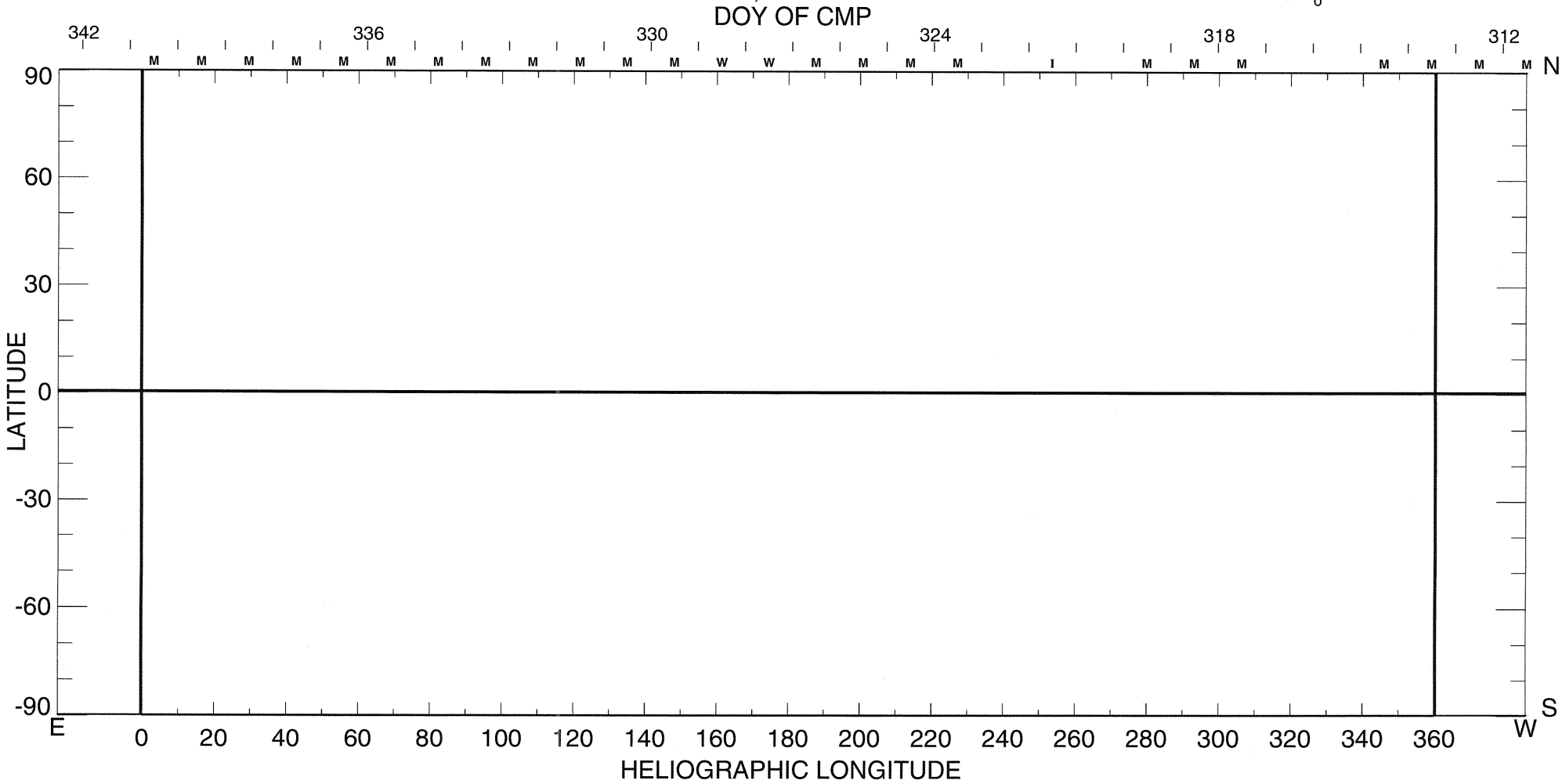
<I> = 0.98μ

(18-Feb-05)

2004 E+W LIMB CONTOURS: 1, 2, 4, 8, 12, 16, 32, 48 MILLIONTHS OF I_o

tex Fri Feb 18 10:05:59 2005

CARRINGTON ROTATION NUMBER 2023 ; NSO/SACRAMENTO PEAK CA XV @ R = 1.15R_o



(18-Feb-05) 2004 E+W LIMB CONTOURS: YELMIN, 1, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20 MILLIONTHS OF I_o

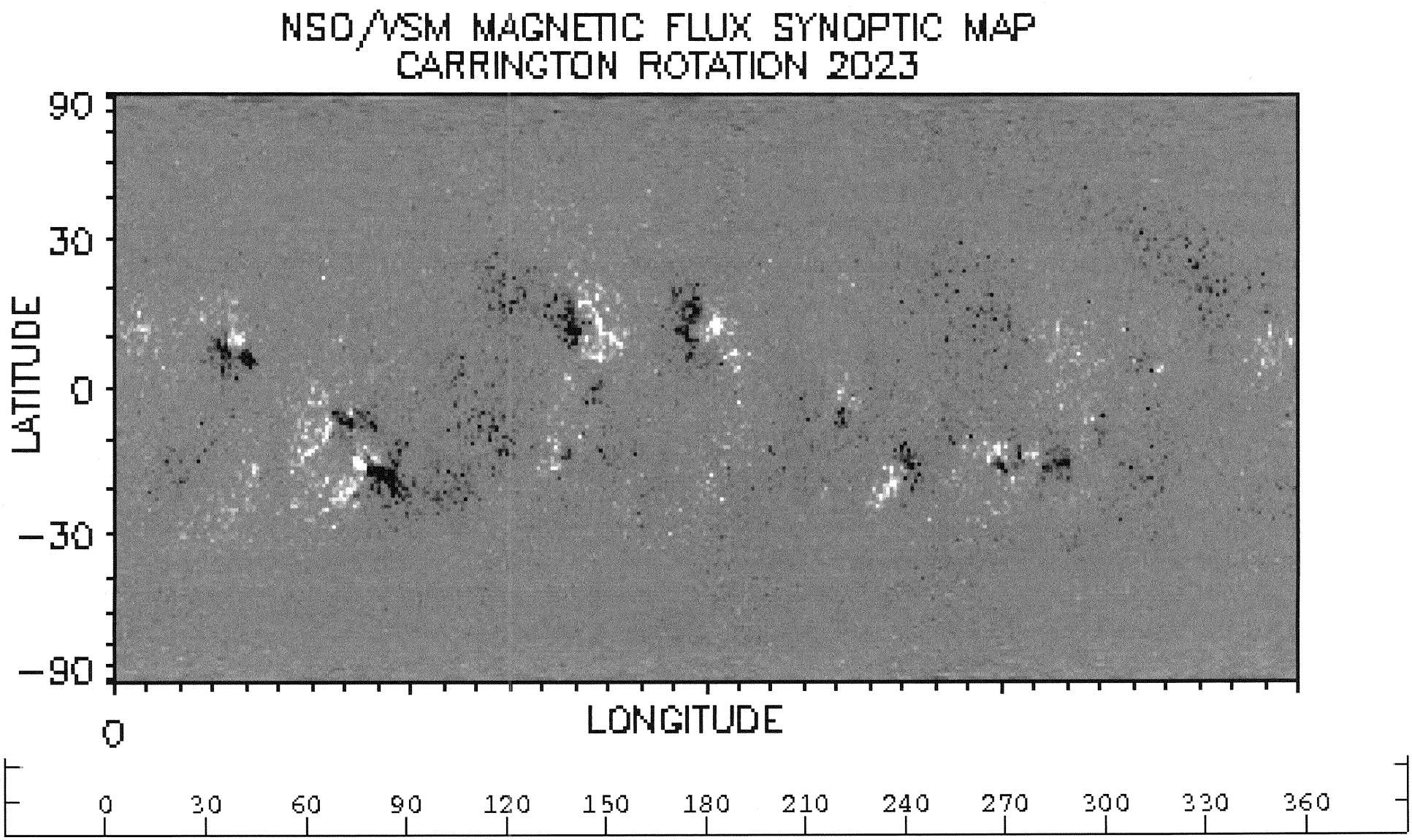
tex Fri Feb 18 10:04:38 2005

SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 2023

(8 November to 5 December 2004)

National Solar Observatory/Kitt Peak



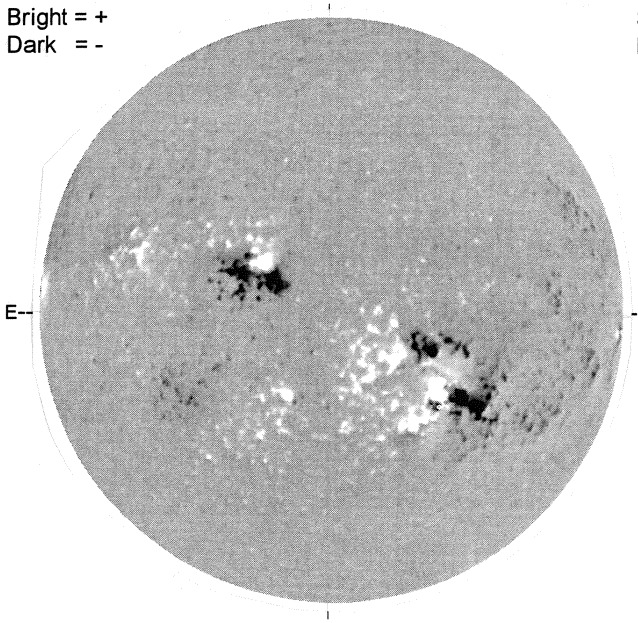
Heliographic Longitude

DECEMBER 1, 2004 (P= 15.98, Bo = 0.84, Lo = 62.26)

KITT PEAK MAGNETOGRAM--SOLIS

854.2 nm

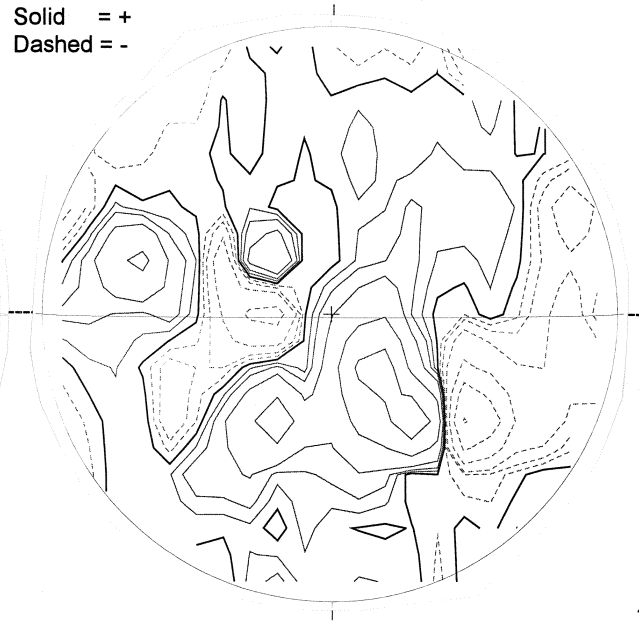
Bright = +
Dark = -



2026 UT

STANFORD MAGNETOGRAM

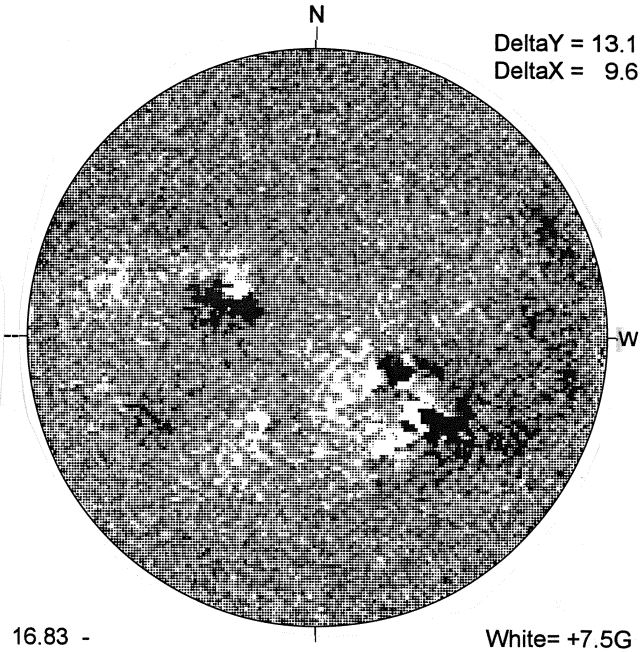
Solid = +
Dashed = -



2059 UT

MT. WILSON MAGNETOGRAM

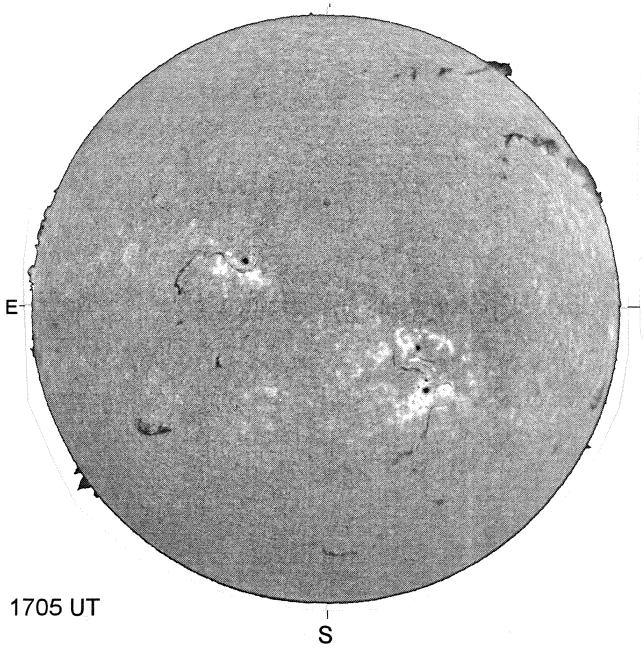
DeltaY = 13.1
DeltaX = 9.6



16.83 -
17.79 UT

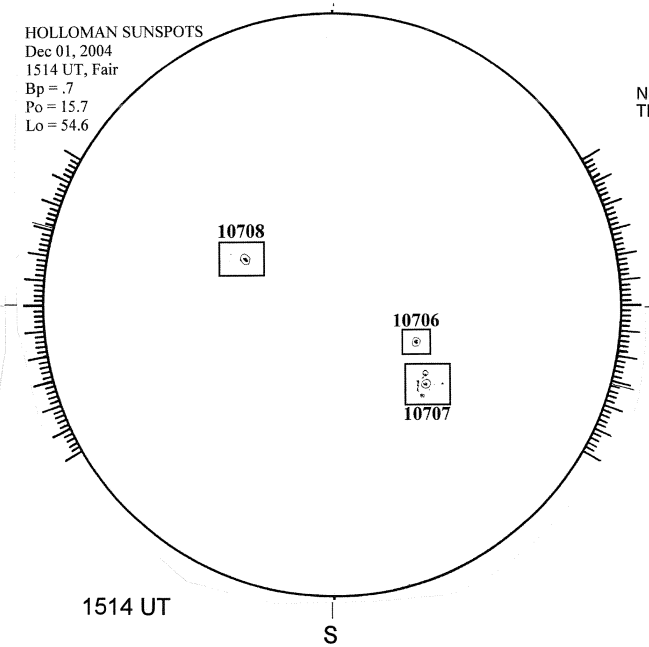
White= +7.5G
Black = -7.5G

BIG BEAR H-ALPHA



1705 UT

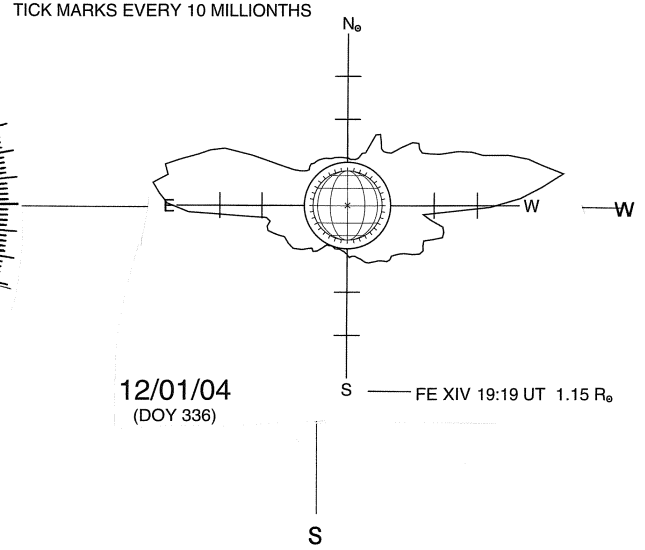
HOLLOMAN SUNSPOTS



1514 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS

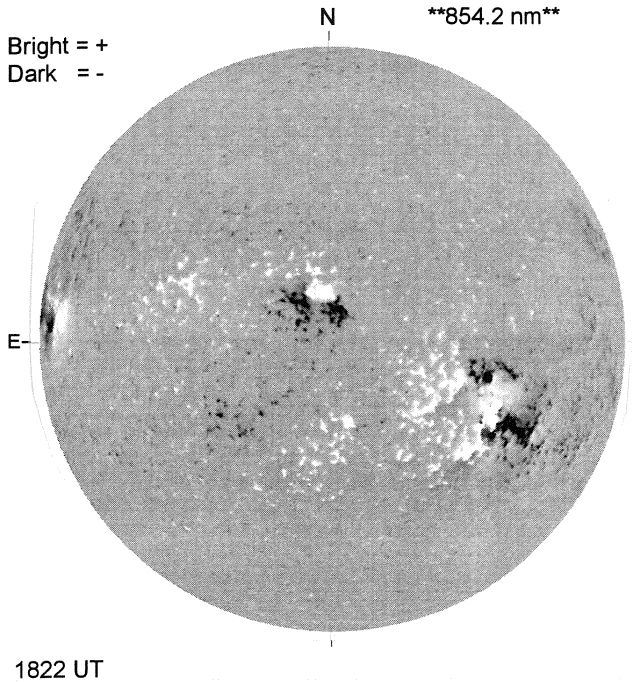


12/01/04
(DOY 336)

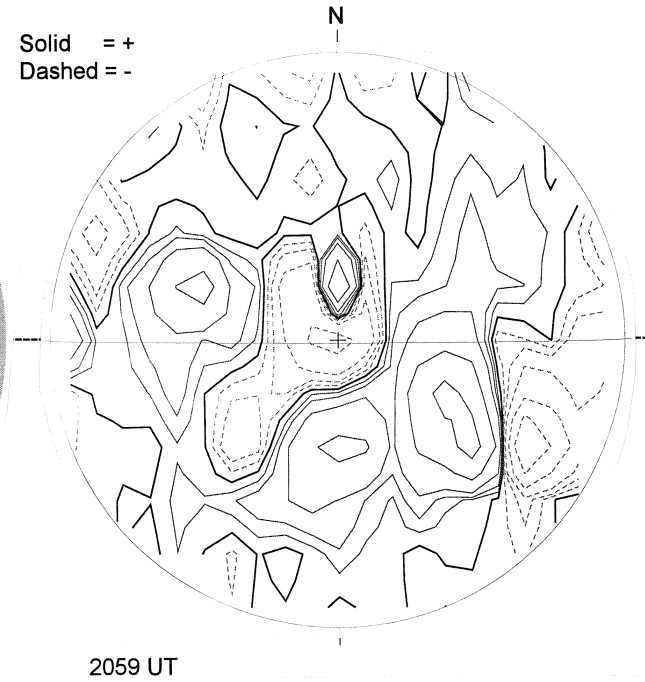
FE XIV 19:19 UT 1.15 R⊙

DECEMBER 2, 2004 (P= 15.59, Bo = 0.72, Lo = 49.08)

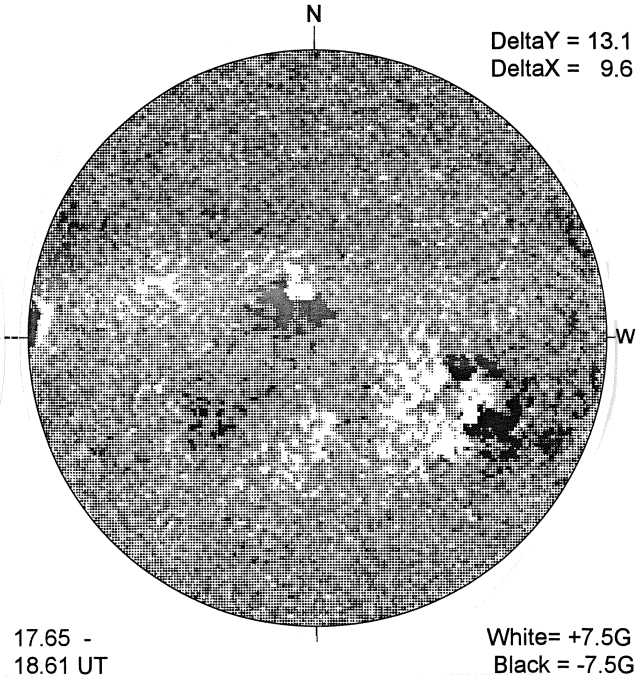
KITT PEAK MAGNETOGRAM--SOLIS



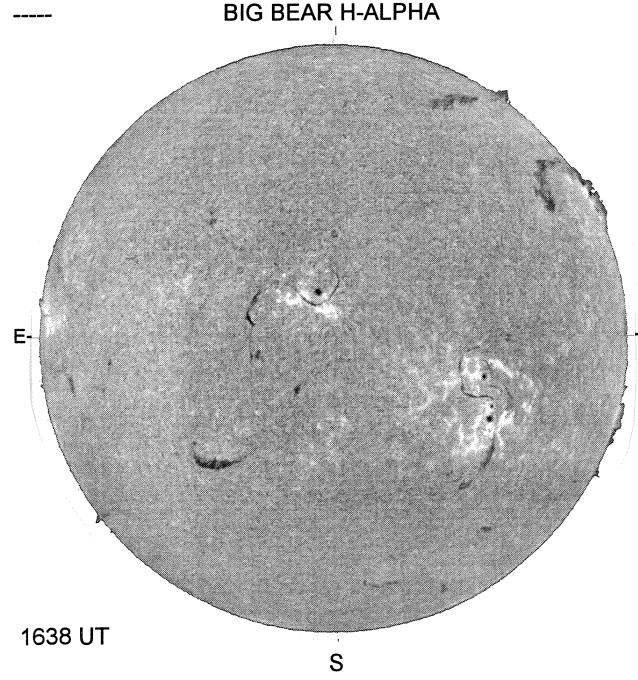
STANFORD MAGNETOGRAM



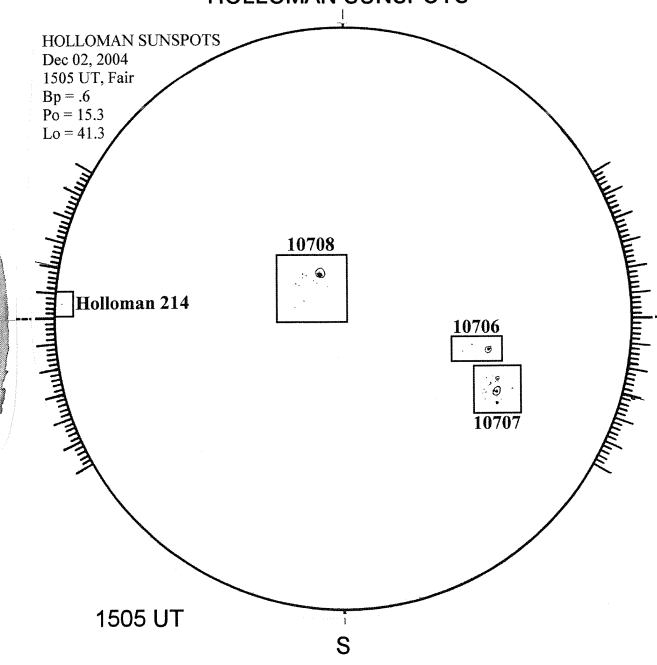
MT. WILSON MAGNETOGRAM



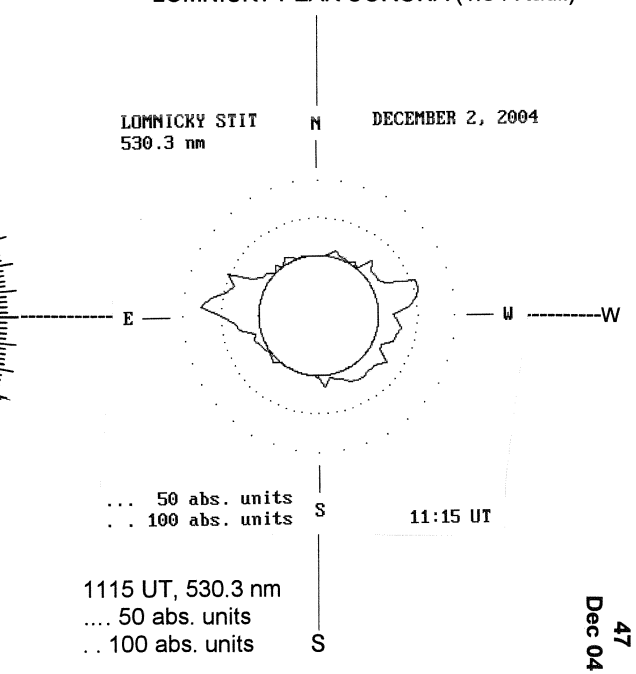
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



LOMNICKY PEAK CORONA (1.04 Radii)----

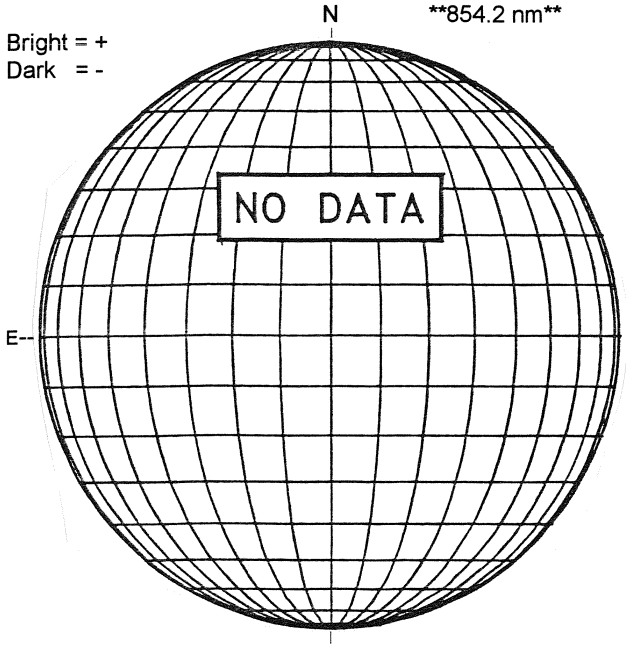


DECEMBER 3, 2004 (P= 15.20, Bo = 0.59, Lo = 35.90)

KITT PEAK MAGNETOGRAM--SOLIS

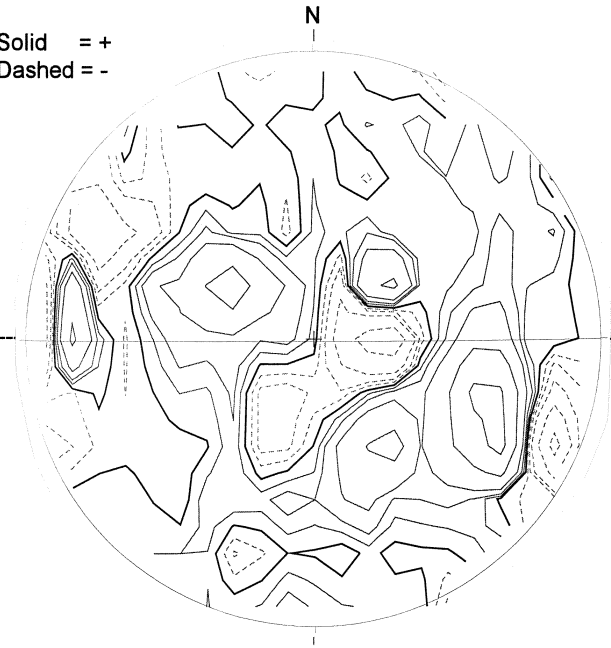
854.2 nm

Bright = +
Dark = -



STANFORD MAGNETOGRAM

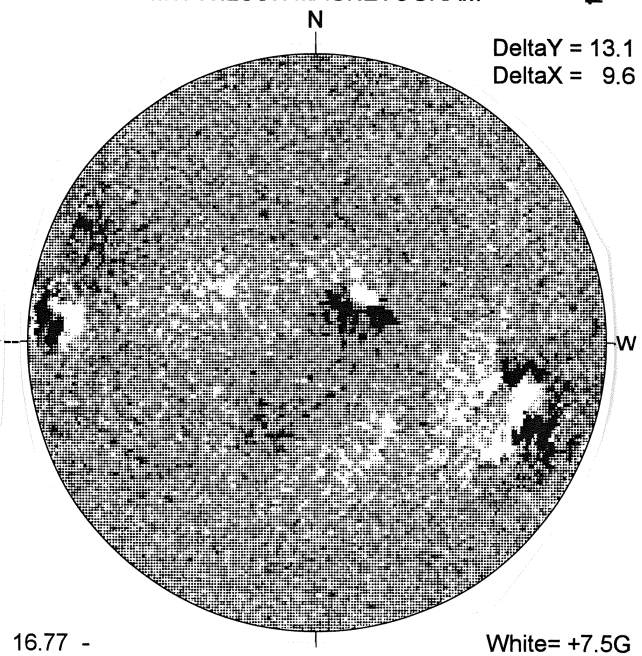
Solid = +
Dashed = -



2216 UT

MT. WILSON MAGNETOGRAM

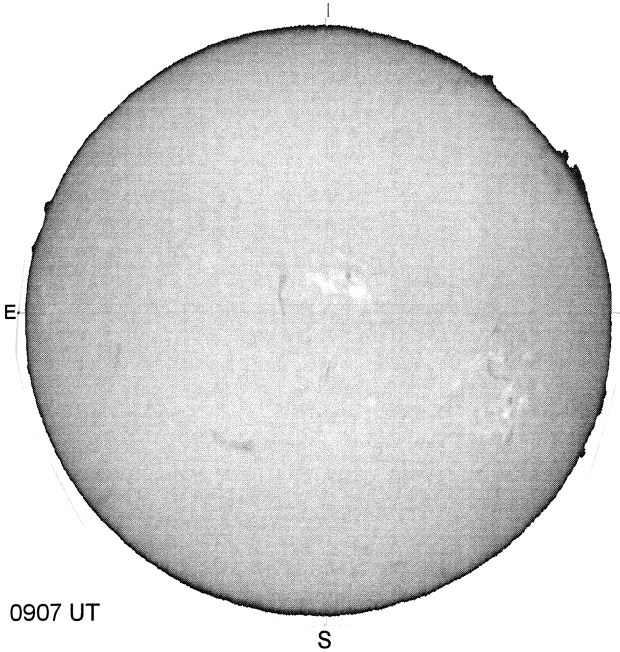
DeltaY = 13.1
DeltaX = 9.6



16.77 -
17.74 UT

White= +7.5G
Black = -7.5G

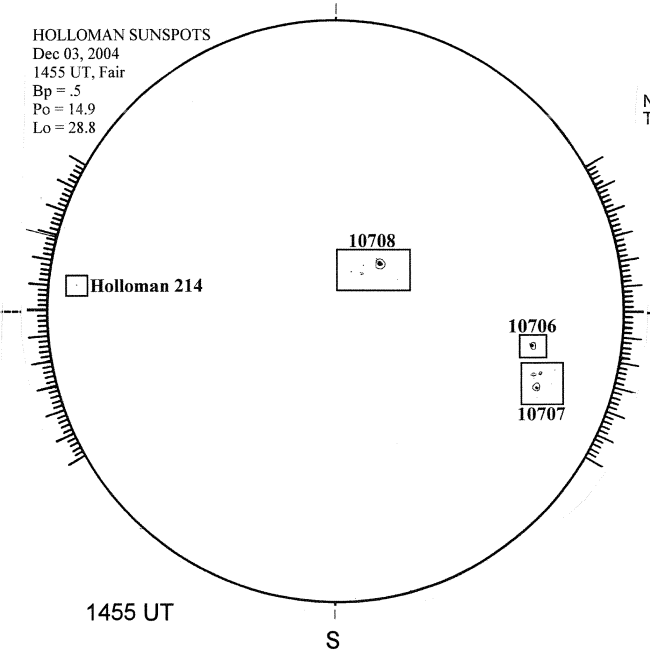
MEUDON H-ALPHA



0907 UT

HOLLOMAN SUNSPOTS

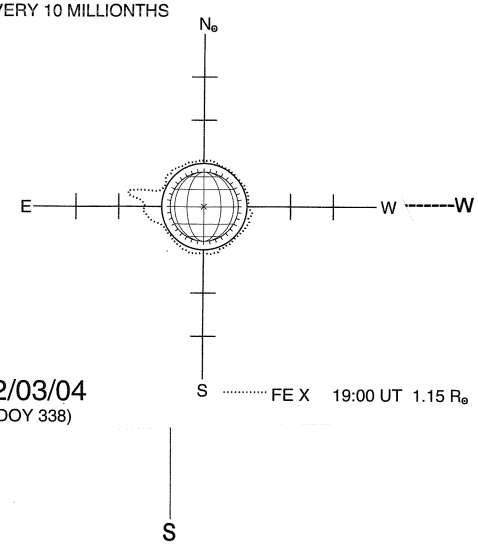
HOLLOMAN SUNSPOTS
Dec 03, 2004
1455 UT, Fair
Bp = .5
Po = 14.9
Lo = 28.8



1455 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



12/03/04
(DOY 338)

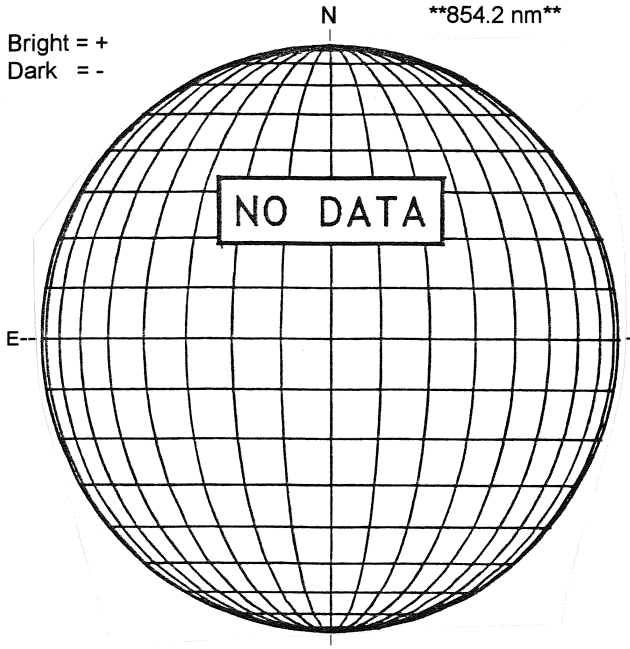
FE X 19:00 UT 1.15 R⊙

DECEMBER 4, 2004 (P= 14.80, Bo = 0.46, Lo = 22.72)

KITT PEAK MAGNETOGRAM--SOLIS

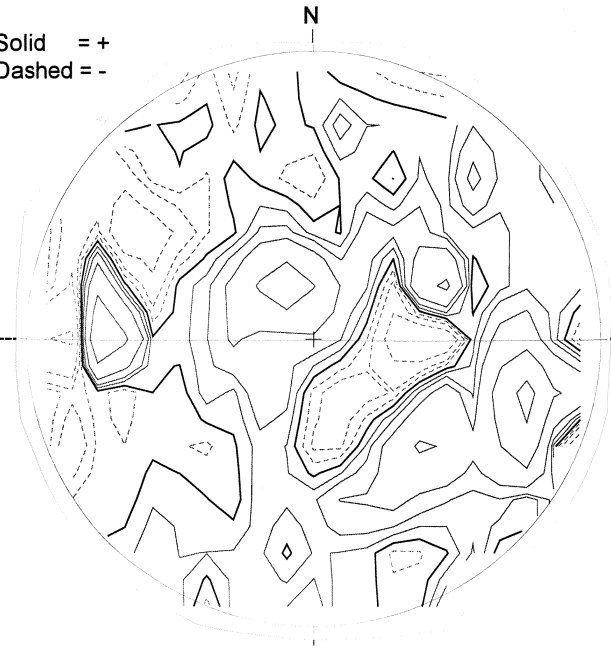
854.2 nm

Bright = +
Dark = -



STANFORD MAGNETOGRAM

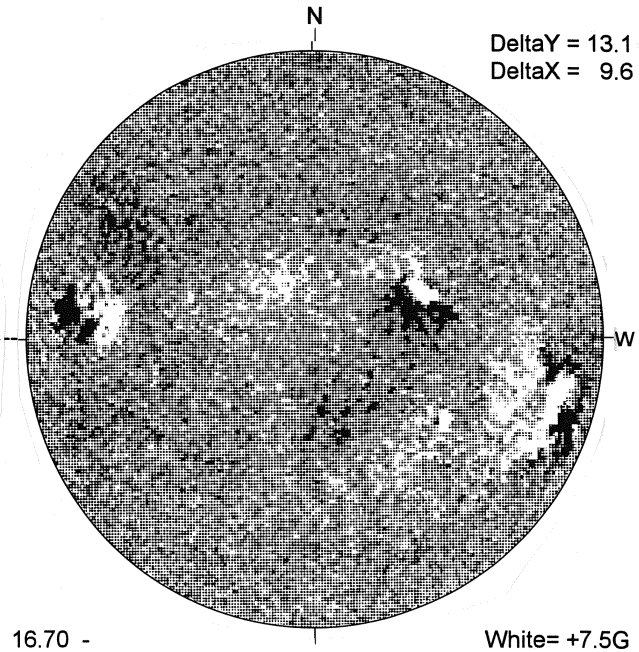
Solid = +
Dashed = -



1745 UT

MT. WILSON MAGNETOGRAM

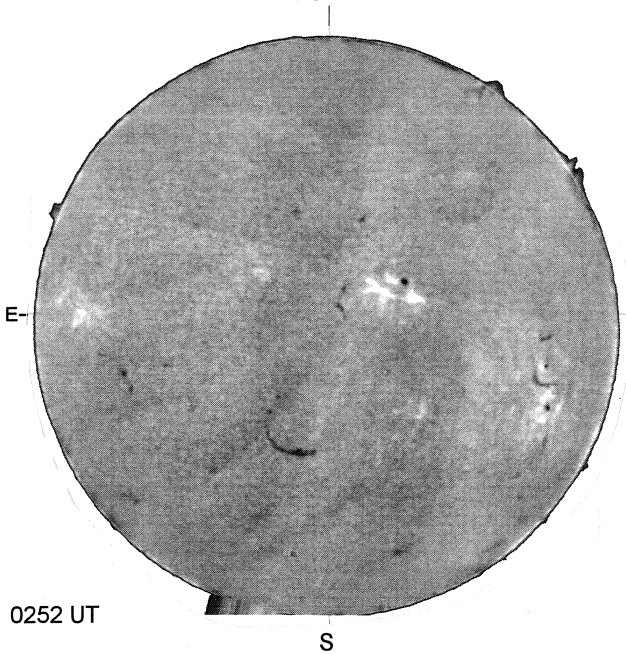
DeltaY = 13.1
DeltaX = 9.6



16.70 -
17.66 UT

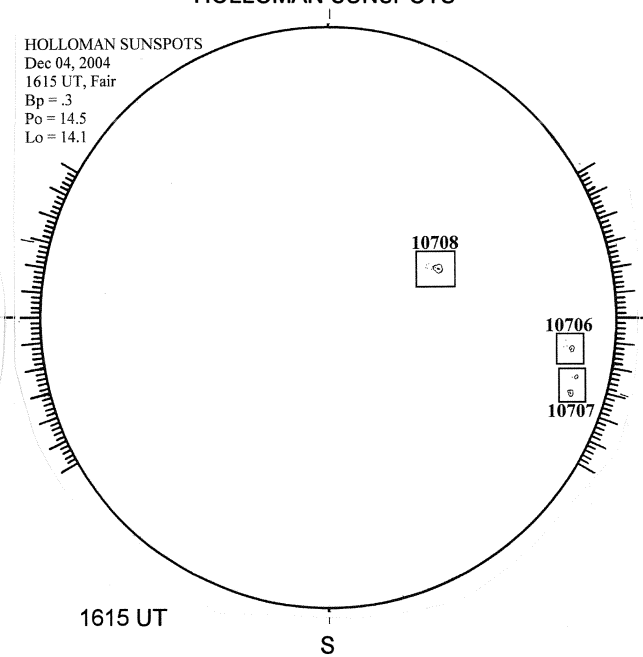
White= +7.5G
Black = -7.5G

HUAIROU H-ALPHA



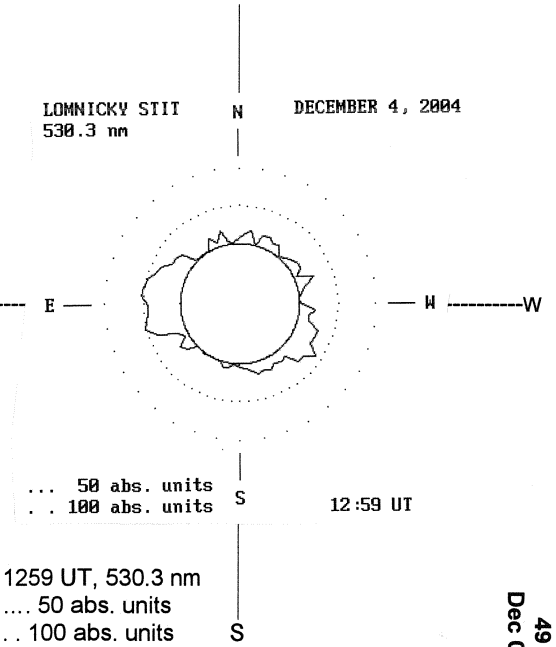
0252 UT

HOLLOMAN SUNSPOTS



1615 UT

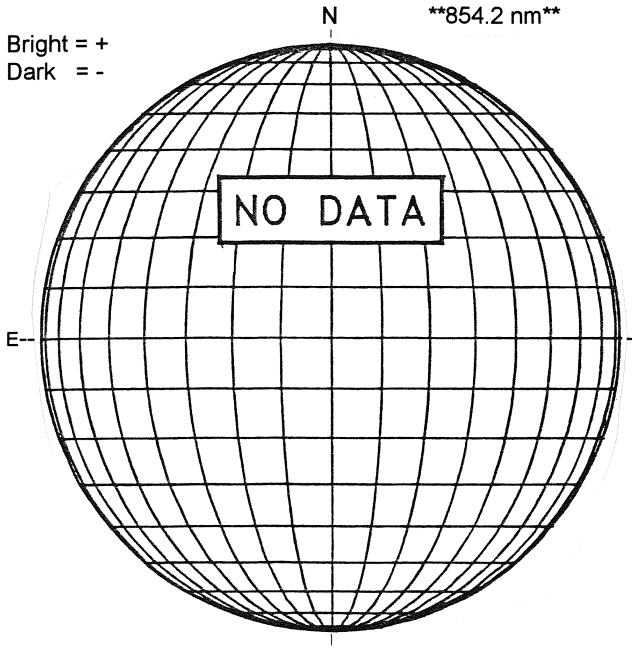
LOMNICKY PEAK CORONA (1.04 Radii)----



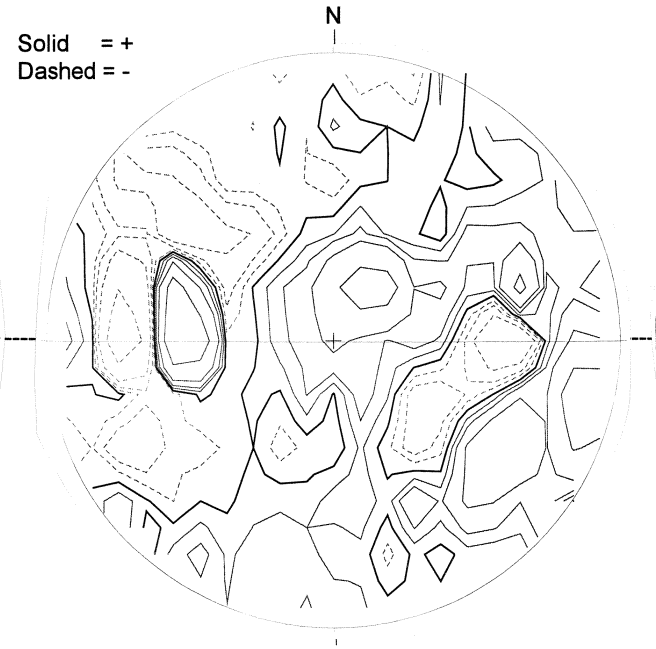
1259 UT, 530.3 nm
.... 50 abs. units
. . 100 abs. units

DECEMBER 5, 2004 (P= 14.39, Bo = 0.33, Lo = 9.54)

KITT PEAK MAGNETOGRAM--SOLIS

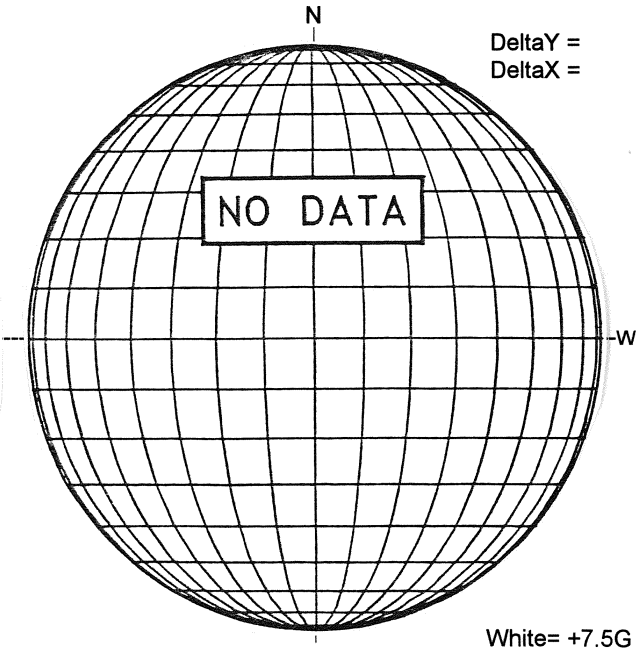


STANFORD MAGNETOGRAM

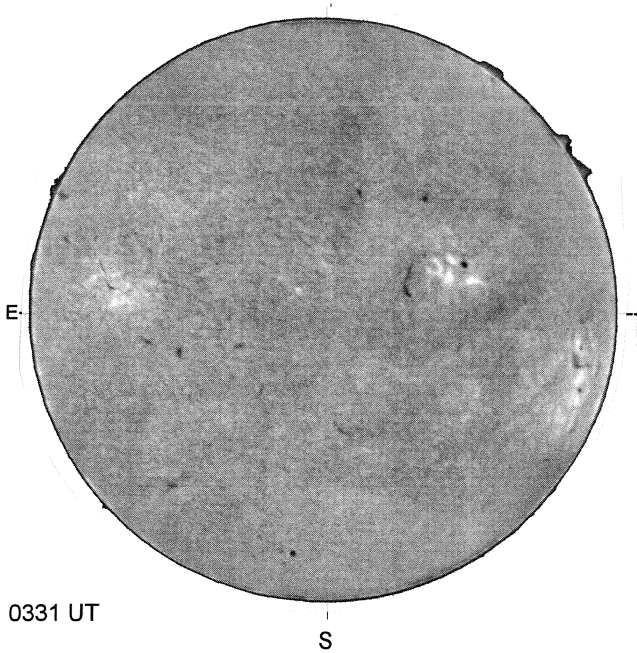


1829 UT

MT. WILSON MAGNETOGRAM

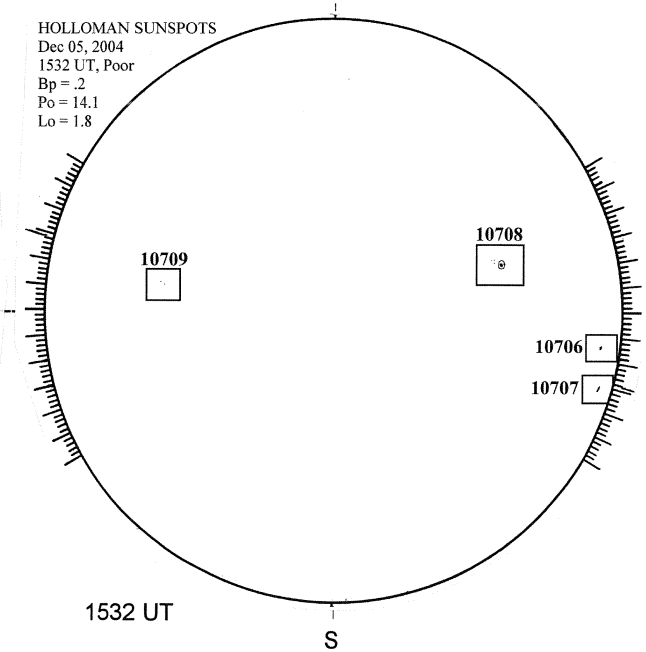


HUAIROU H-ALPHA



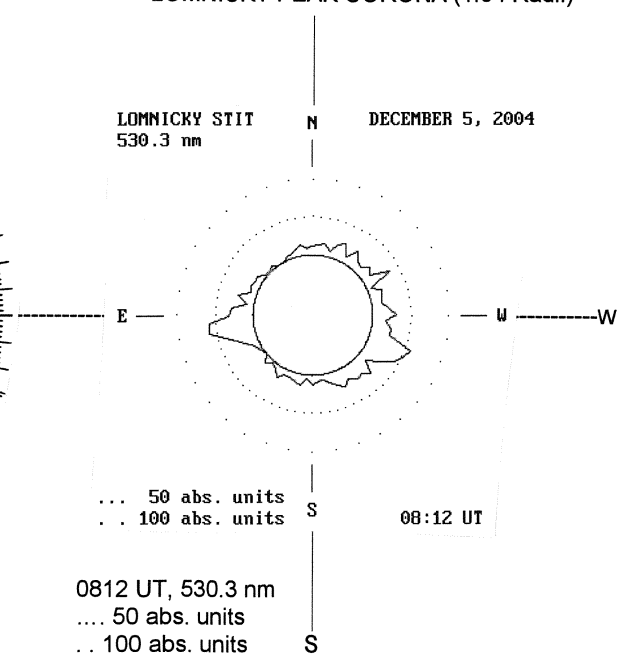
0331 UT

HOLLOMAN SUNSPOTS



1532 UT

LOMNICKY PEAK CORONA (1.04 Radii)----



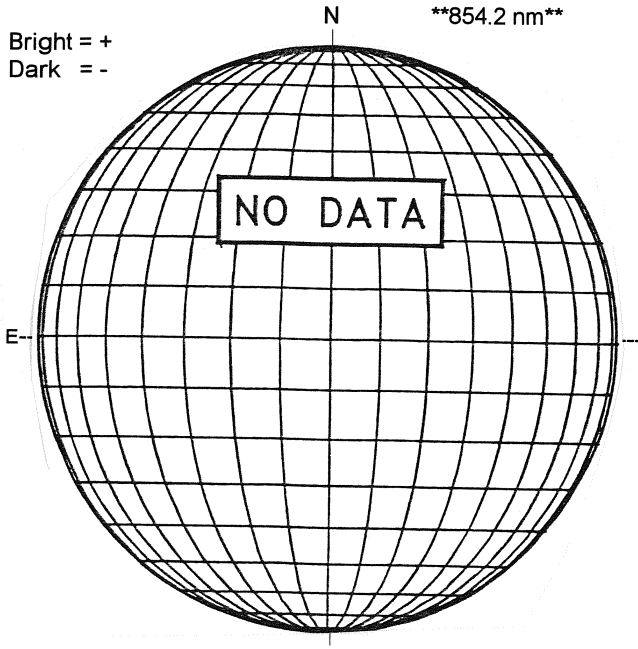
0812 UT, 530.3 nm
.... 50 abs. units
. . 100 abs. units

DECEMBER 6, 2004 (P= 13.98, Bo = 0.20, Lo = 356.37)

KITT PEAK MAGNETOGRAM--SOLIS

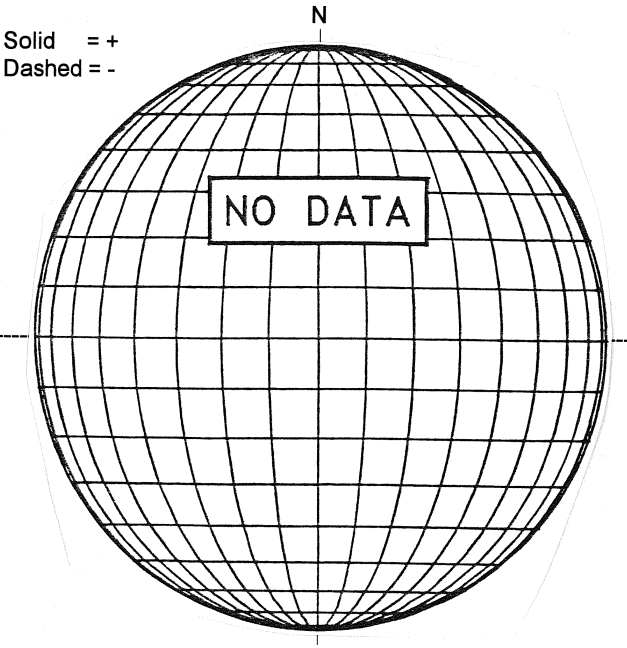
854.2 nm

Bright = +
Dark = -



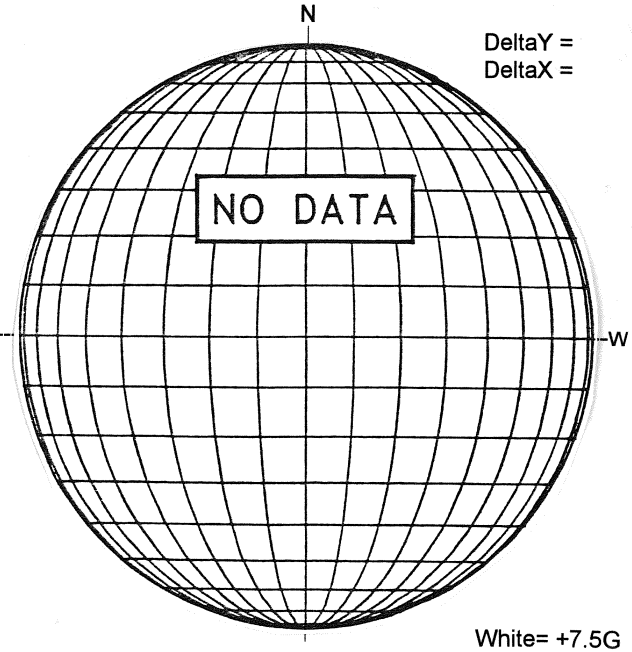
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



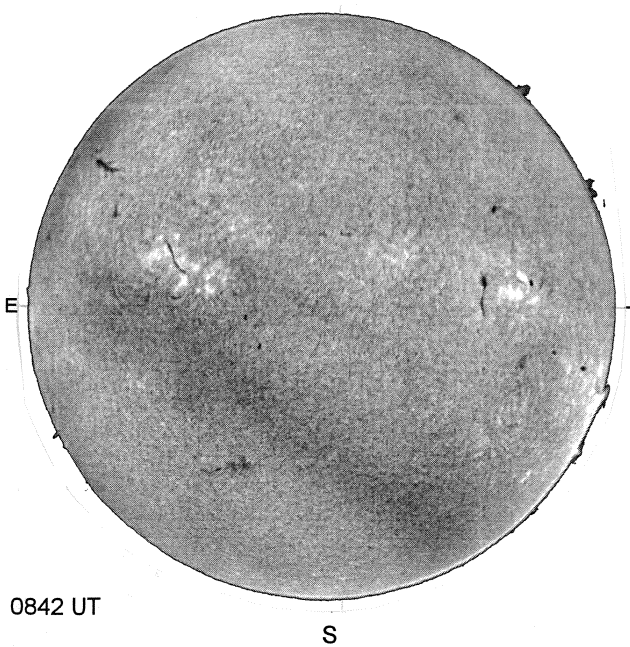
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



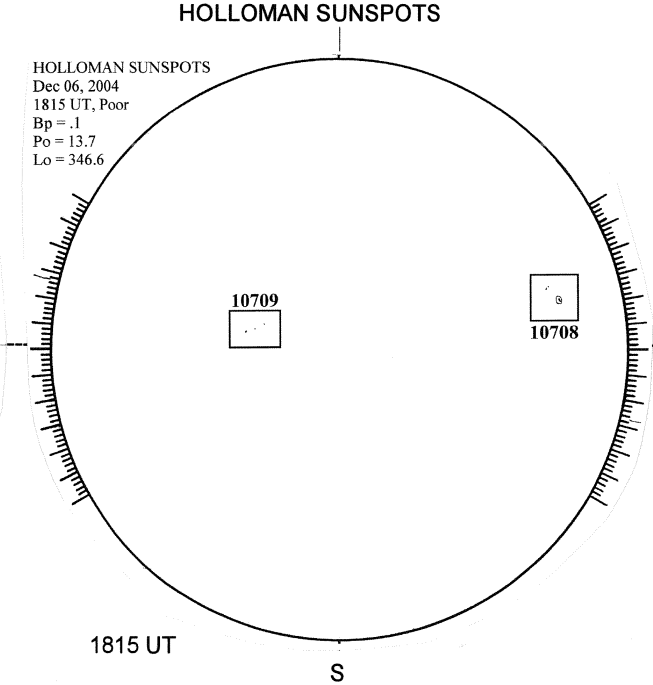
White= +7.5G
Black = -7.5G

KANZELHOEHE H-ALPHA



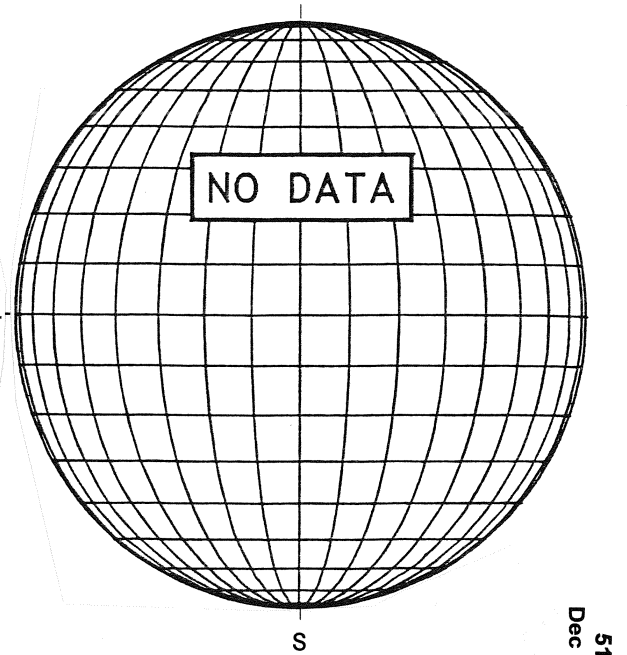
0842 UT

HOLLOMAN SUNSPOTS



1815 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

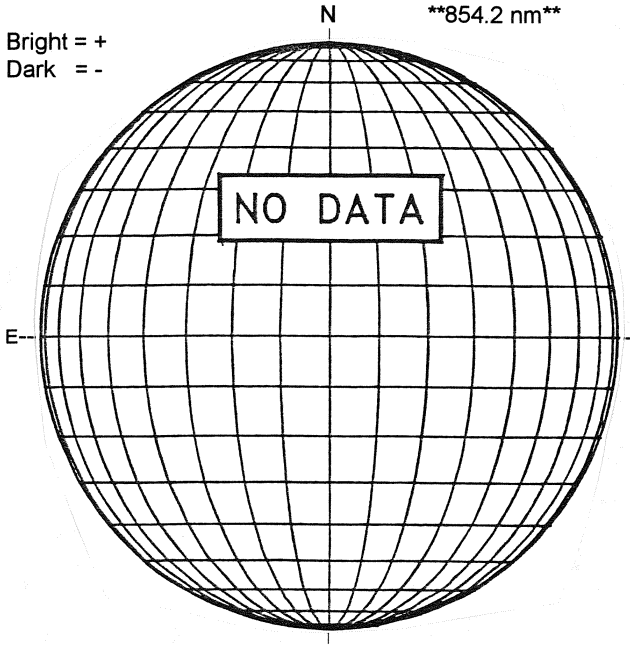


DECEMBER 7, 2004 (P= 13.56, Bo = 0.08, Lo = 343.19)

KITT PEAK MAGNETOGRAM--SOLIS

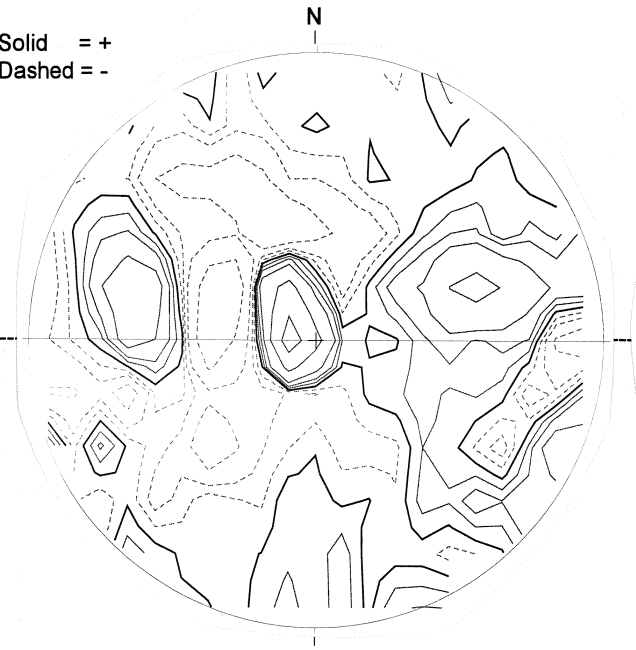
854.2 nm

Bright = +
Dark = -



STANFORD MAGNETOGRAM

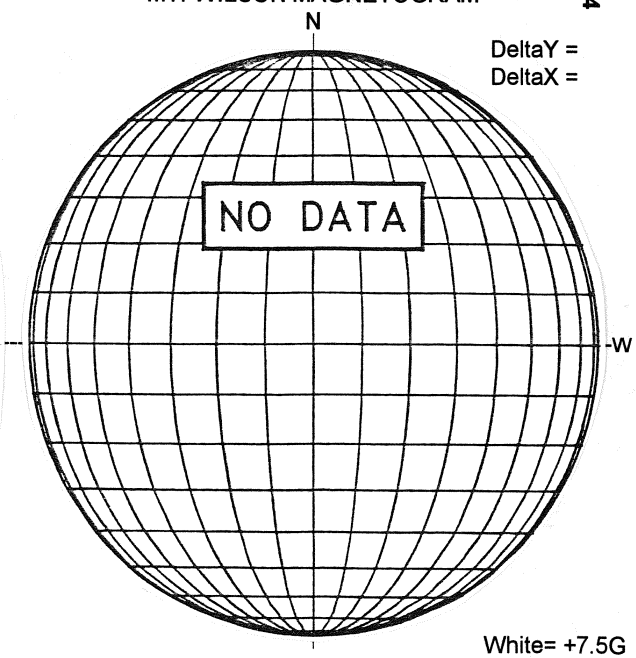
Solid = +
Dashed = -



1843 UT

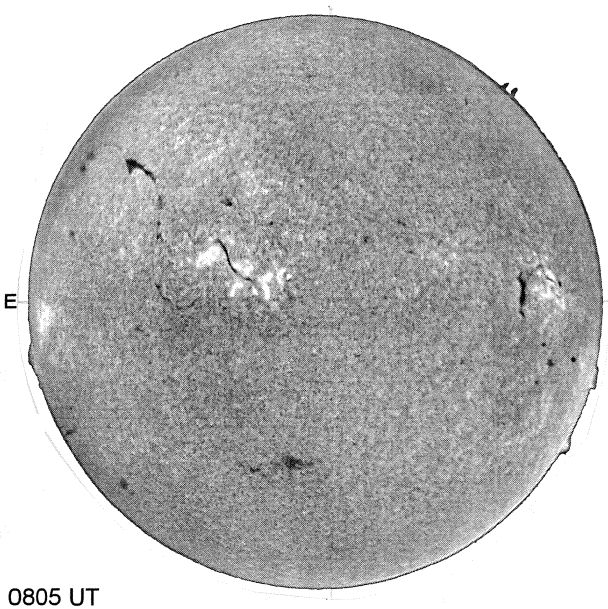
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

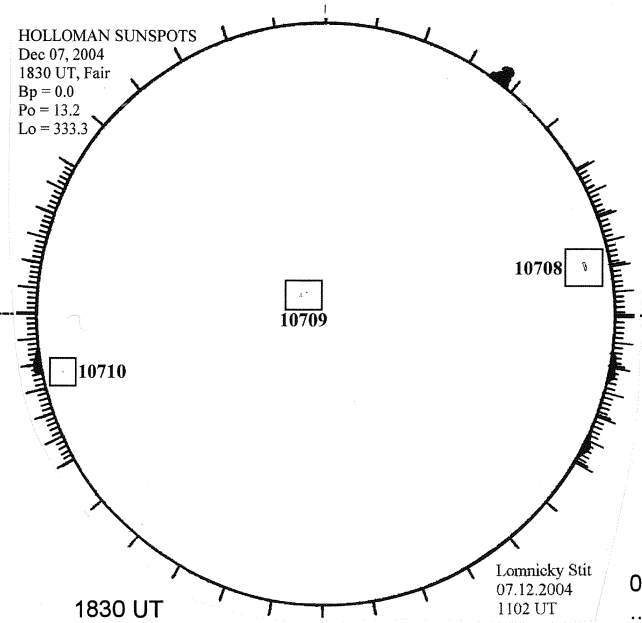
KANZELHOHE H-ALPHA



0805 UT

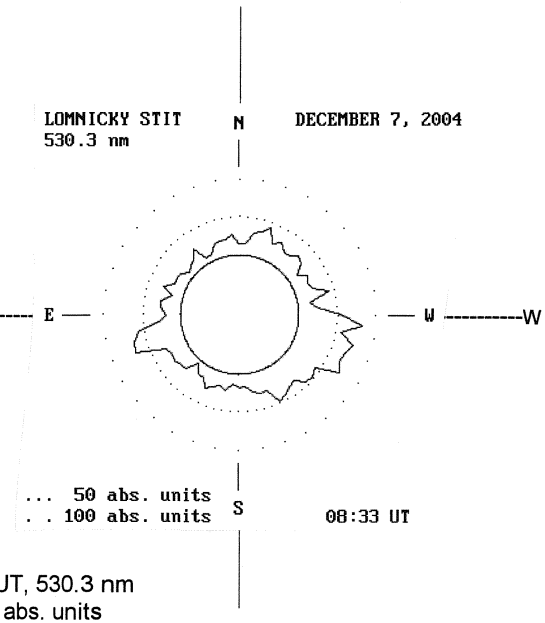
S

HOLLOMAN SUNSPOTS



1830 UT
1102 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----

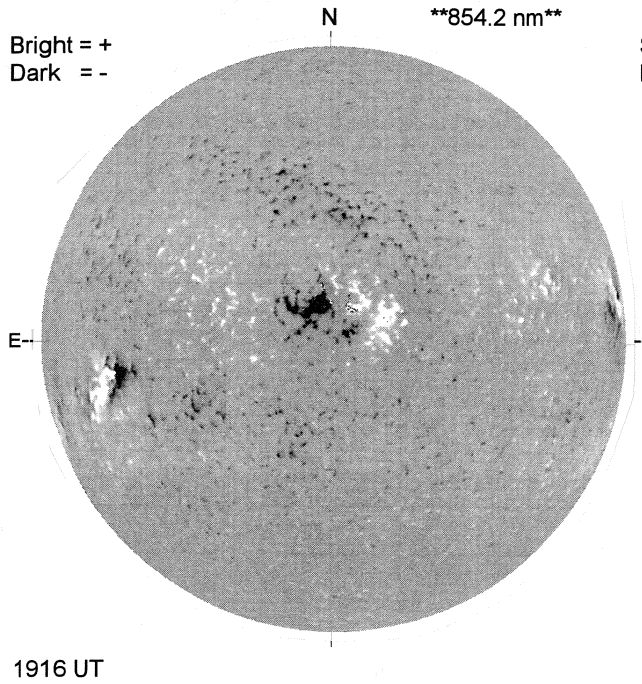


0833 UT, 530.3 nm
.... 50 abs. units
. . 100 abs. units

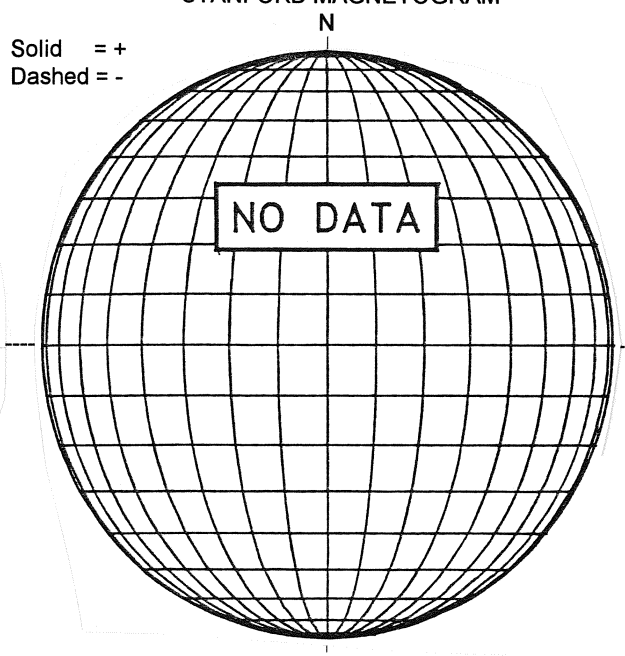
S

DECEMBER 8, 2004 (P= 13.14, Bo = -0.05, Lo = 330.01)

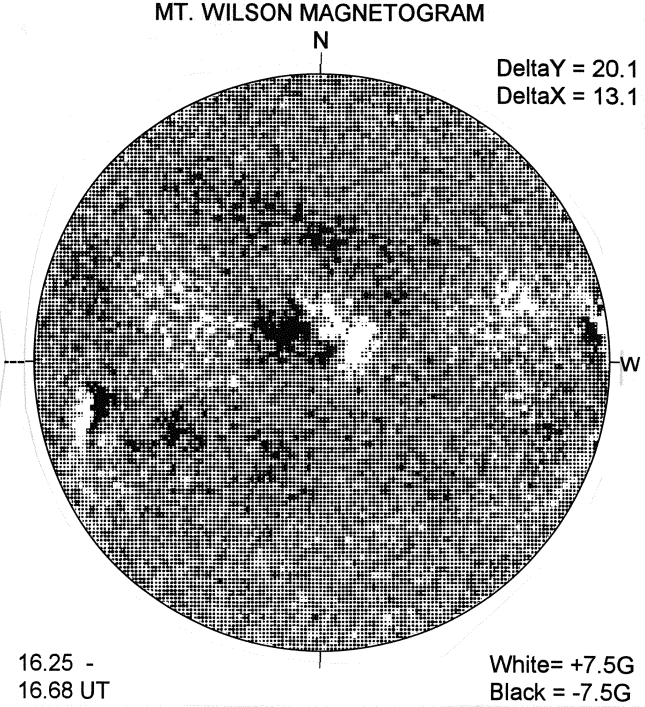
KITT PEAK MAGNETOGRAM--SOLIS



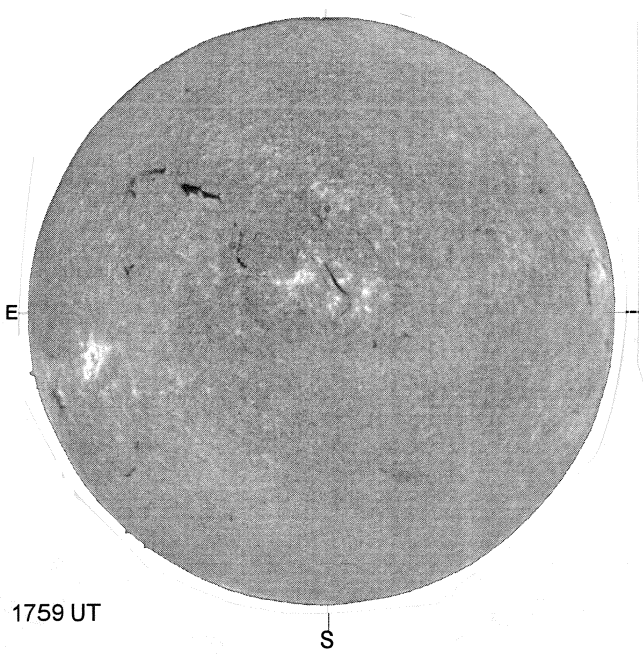
STANFORD MAGNETOGRAM



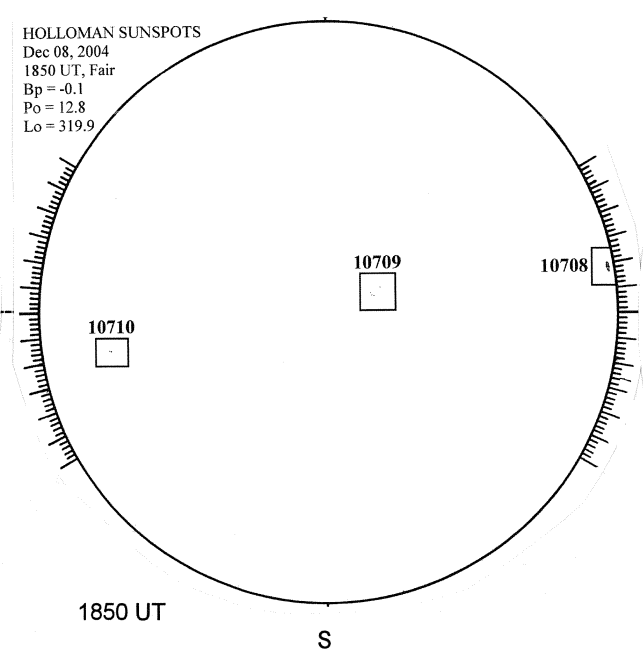
MT. WILSON MAGNETOGRAM



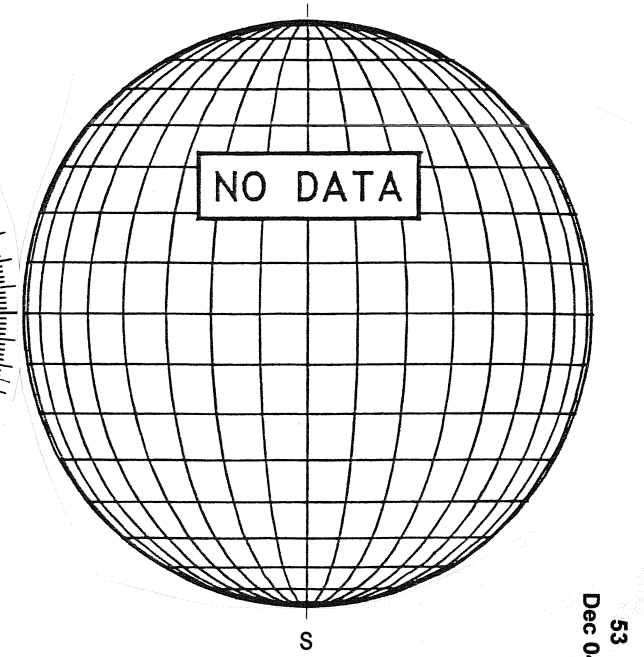
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)----

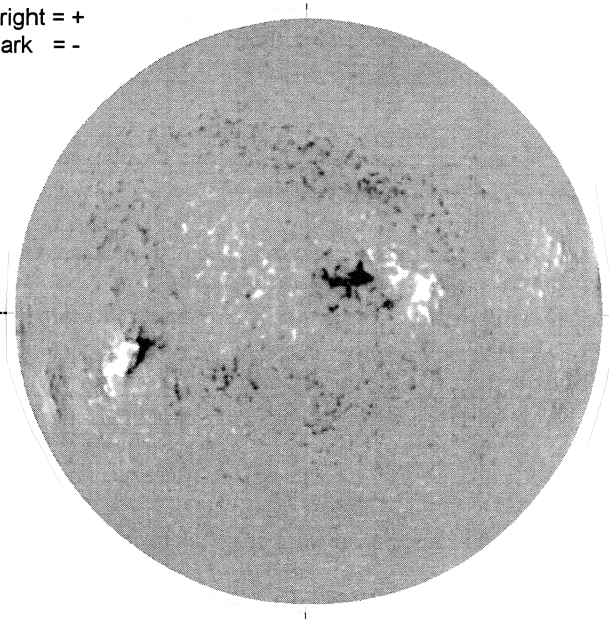


DECEMBER 9, 2004 (P= 12.71, Bo = -0.18, Lo = 316.84)

KITT PEAK MAGNETOGRAM--SOLIS

**854.2 nm

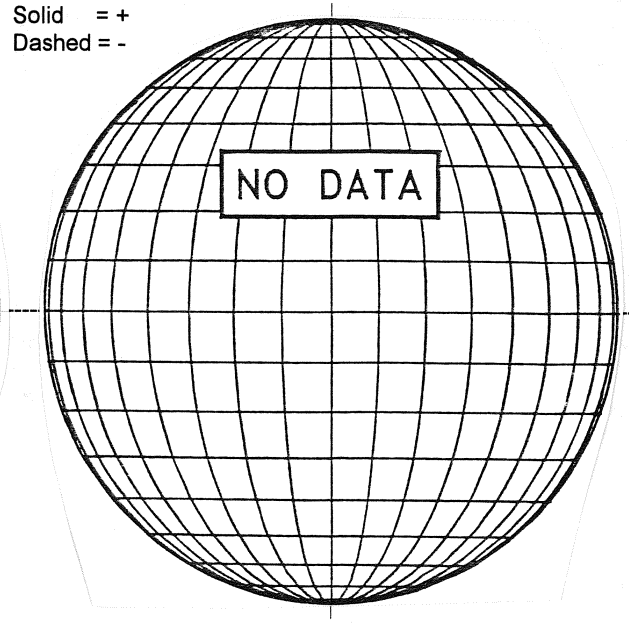
Bright = +
Dark = -



1757 UT

STANFORD MAGNETOGRAM

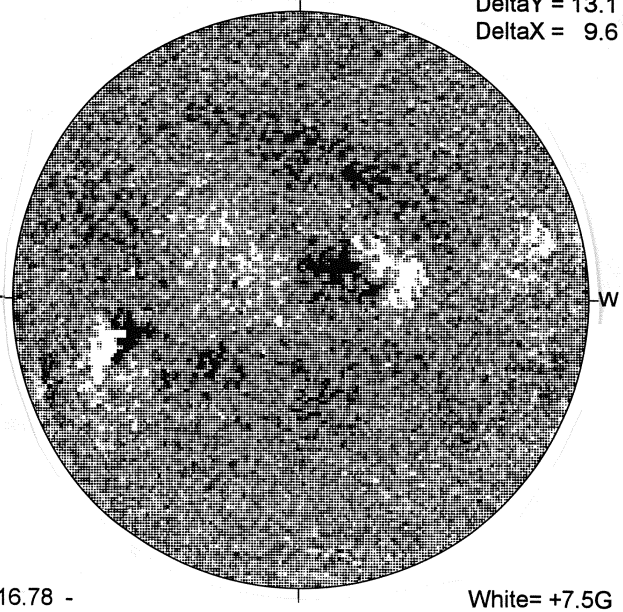
Solid = +
Dashed = -



16.78 -
17.74 UT

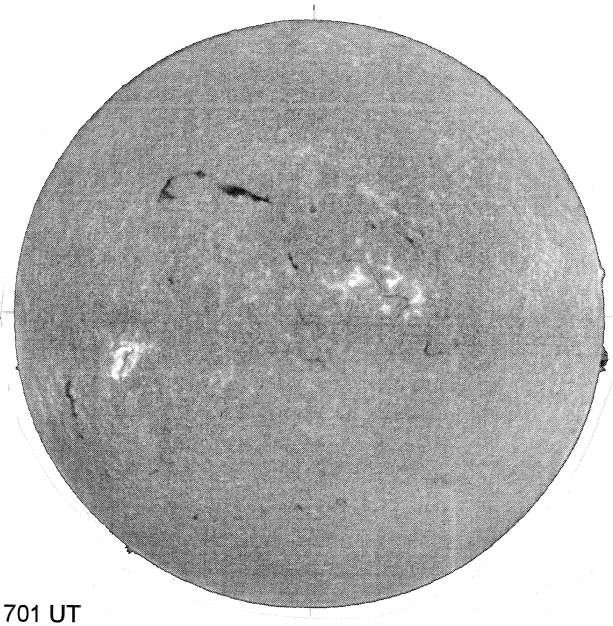
MT. WILSON MAGNETOGRAM

DeltaY = 13.1
DeltaX = 9.6



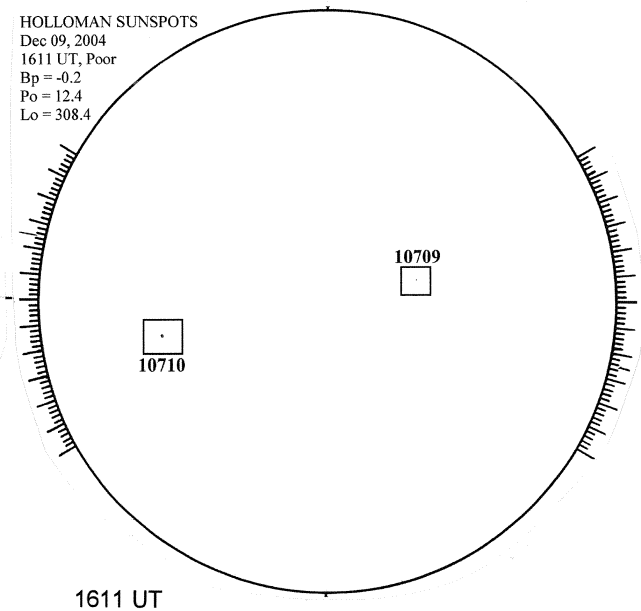
White= +7.5G
Black = -7.5G

BIG BEAR H-ALPHA



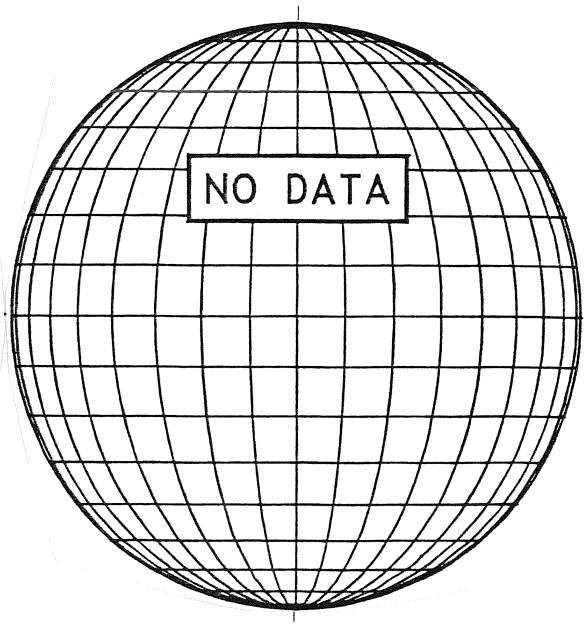
1701 UT

HOLLOMAN SUNSPOTS



1611 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

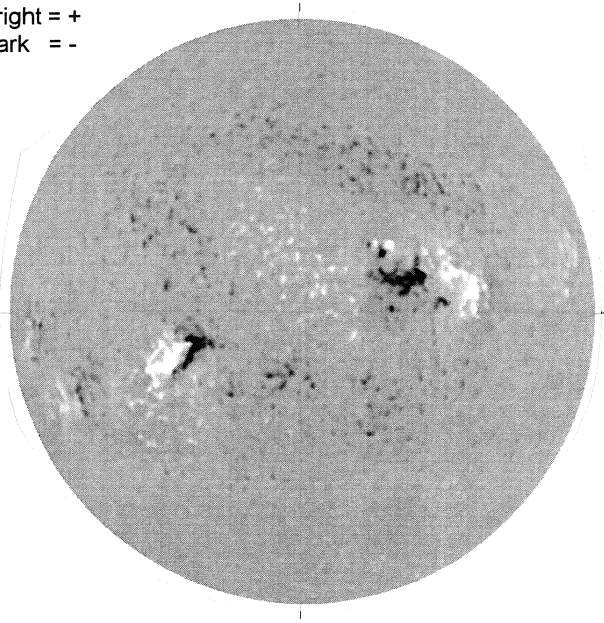


DECEMBER 10, 2004 (P= 12.28, Bo = -0.31 Lo = 303.66)

KITT PEAK MAGNETOGRAM--SOLIS

N **854.2 nm**

Bright = +
Dark = -



E-

1726 UT

STANFORD MAGNETOGRAM

N

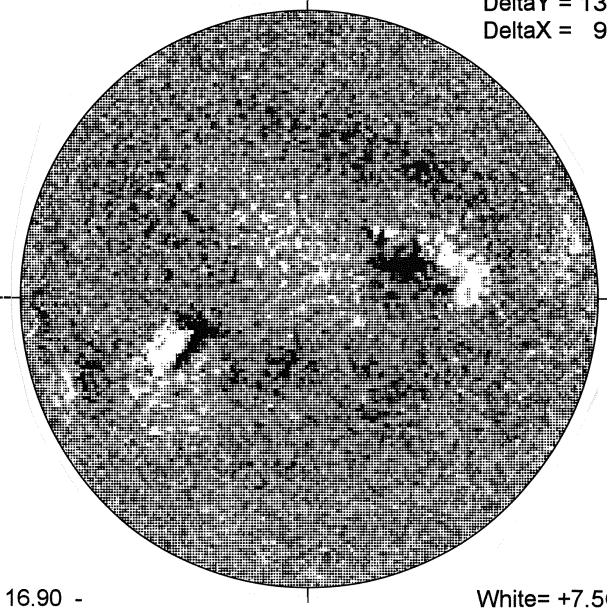
Solid = +
Dashed = -

2151 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

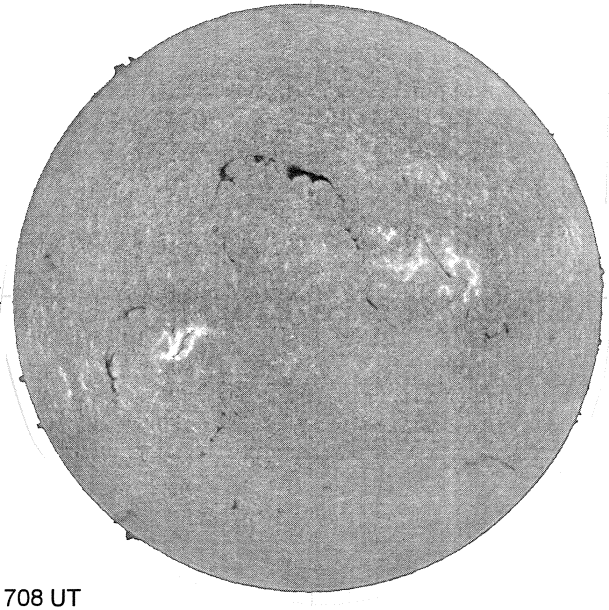


-W

16.90 -
17.87 UT

White= +7.5G
Black = -7.5G

BIG BEAR H-ALPHA

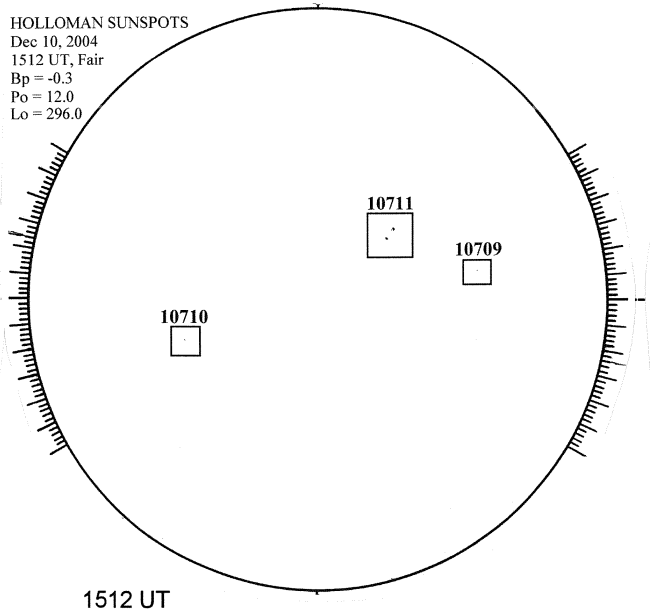


E

1708 UT

S

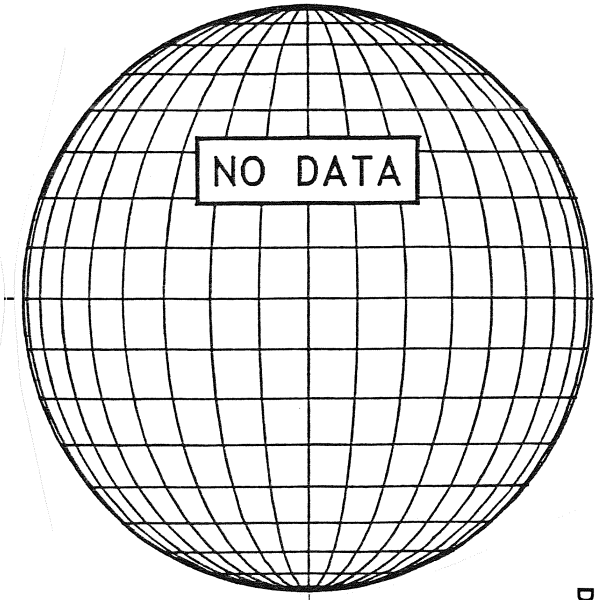
HOLLOMAN SUNSPOTS



1512 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----



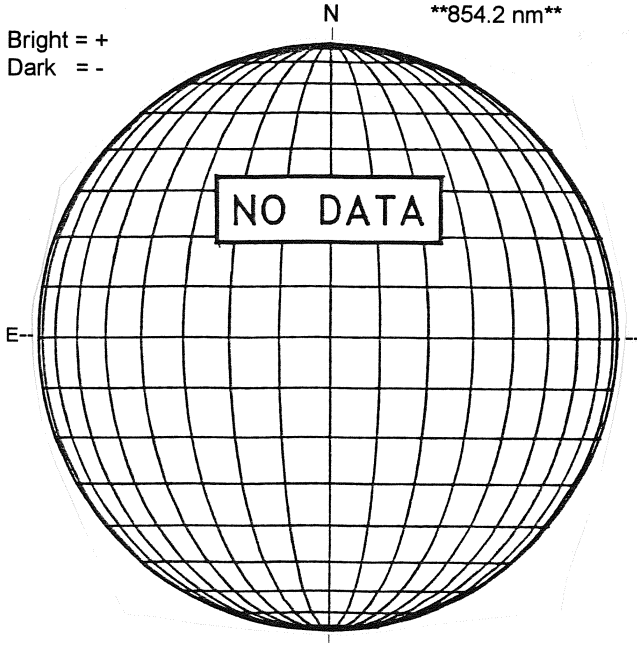
S

DECEMBER 11, 2004 (P= 11.85, Bo = -0.44, Lo = 290.49)

KITT PEAK MAGNETOGRAM--SOLIS

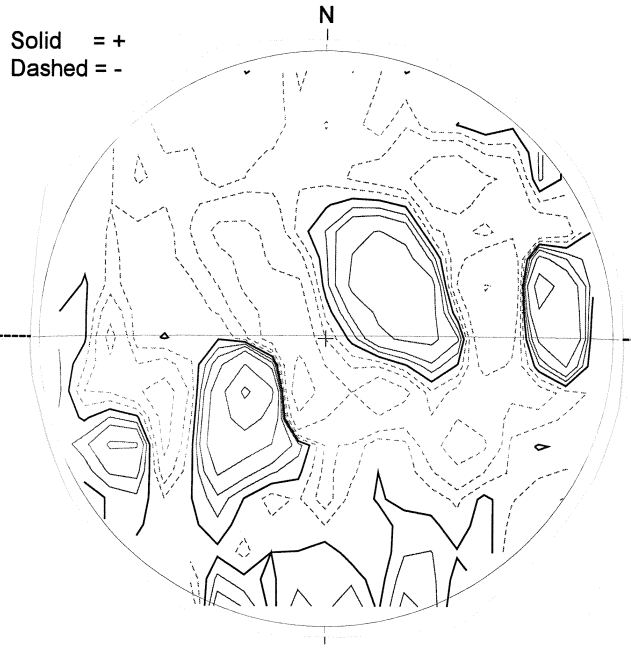
854.2 nm

Bright = +
Dark = -



STANFORD MAGNETOGRAM

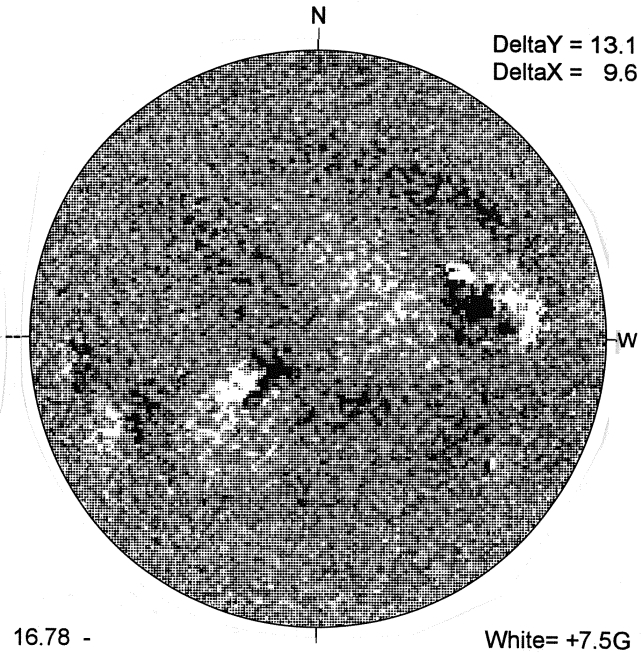
Solid = +
Dashed = -



2104 UT

MT. WILSON MAGNETOGRAM

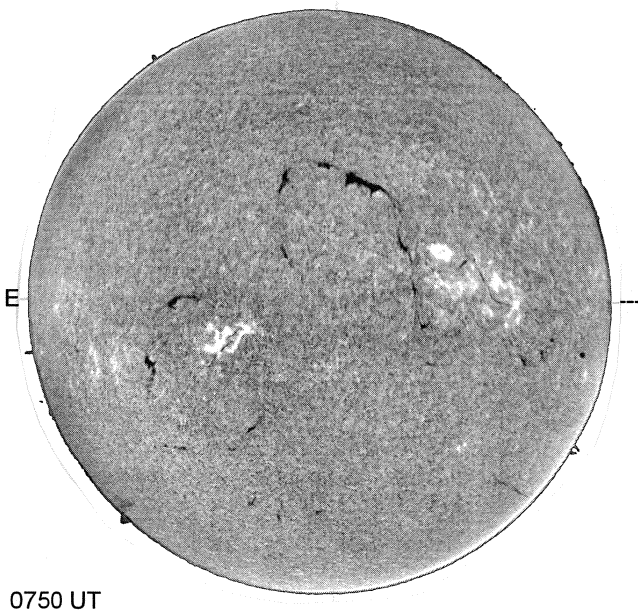
DeltaY = 13.1
DeltaX = 9.6



16.78 -
17.75 UT

White= +7.5G
Black = -7.5G

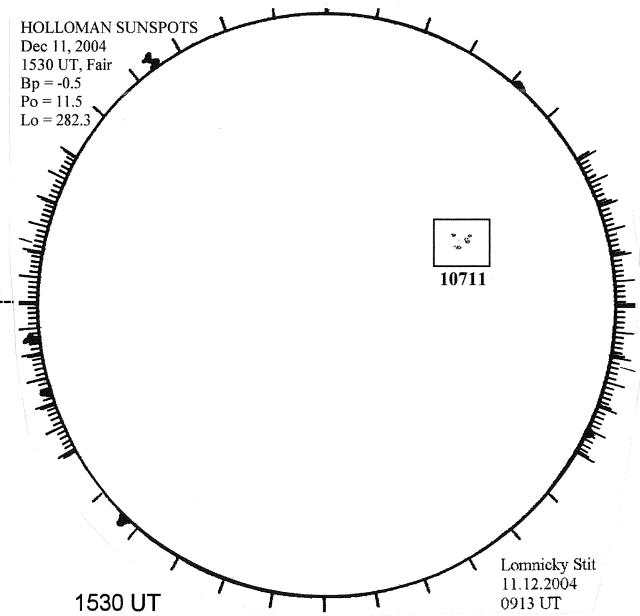
KANZELHOHE H-ALPHA



0750 UT

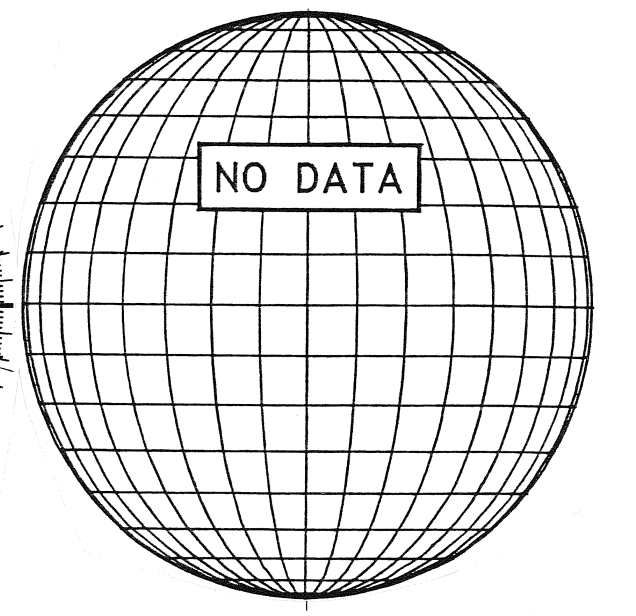
S

HOLLOMAN SUNSPOTS



1530 UT
0913 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



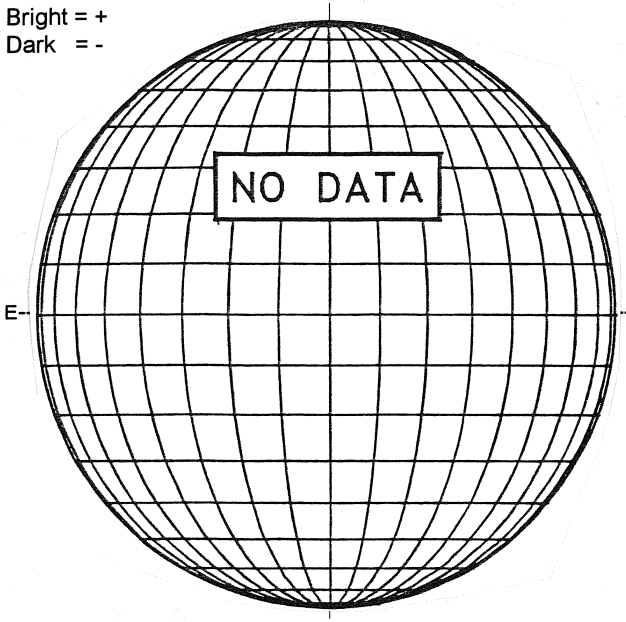
S

DECEMBER 12, 2004 (P= 11.41, Bo = -0.56, Lo = 277.31)

KITT PEAK MAGNETOGRAM--SOLIS

N **854.2 nm**

Bright = +
Dark = -

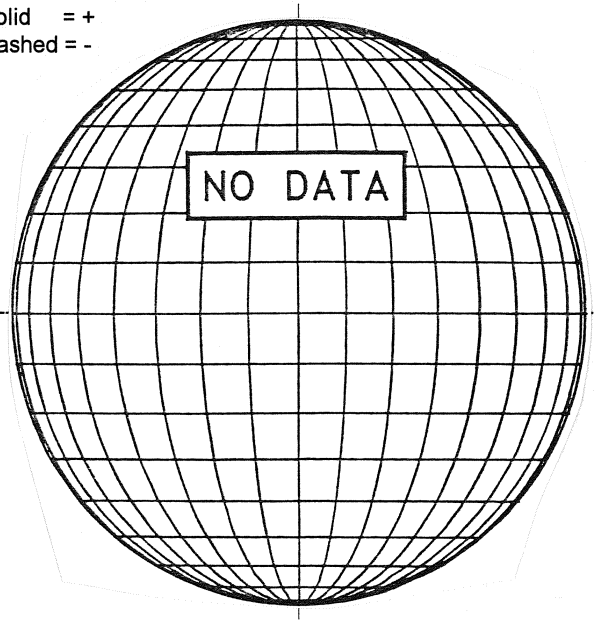


E

STANFORD MAGNETOGRAM

N

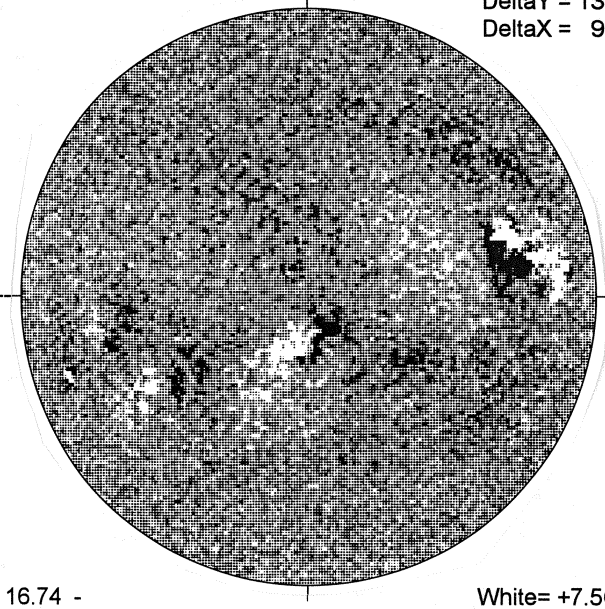
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

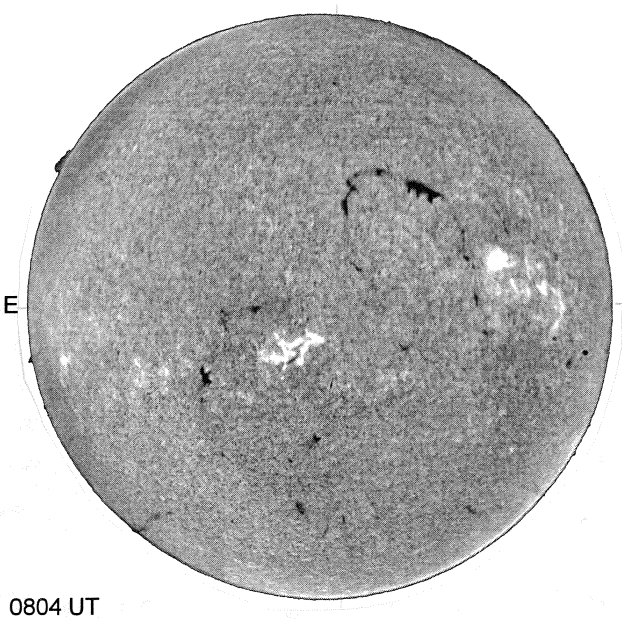


W

16.74 -
17.71 UT

White= +7.5G
Black = -7.5G

---- KANZELHOHE H-ALPHA

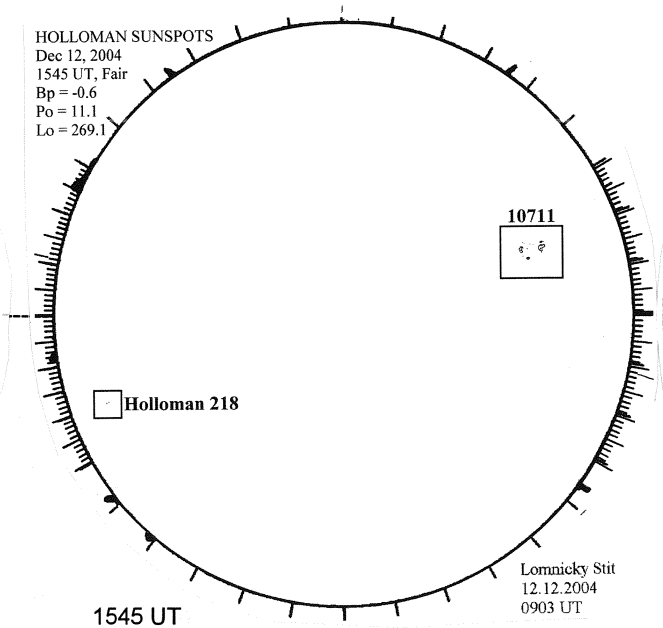


E

0804 UT

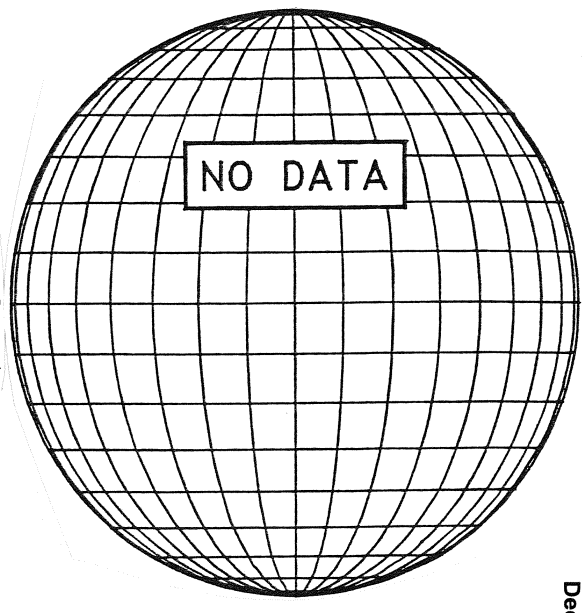
S

HOLLOMAN SUNSPOTS



1545 UT
0903 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----



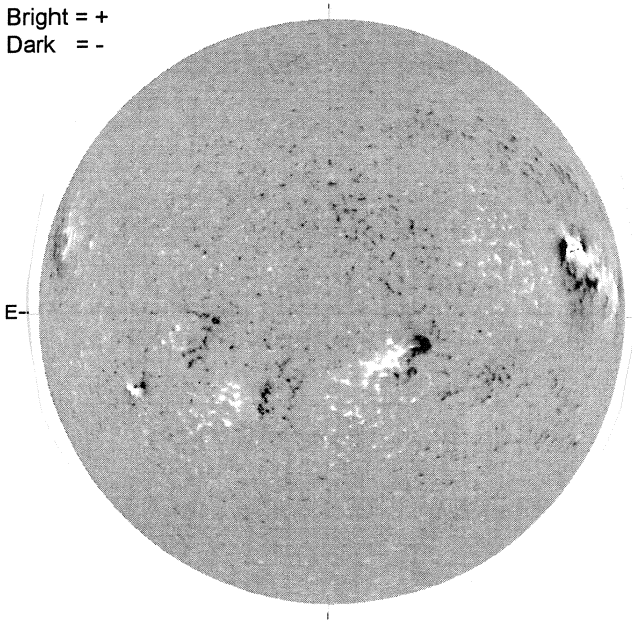
S

DECEMBER 13, 2004 (P= 10.96, Bo = -0.69, Lo = 264.13)

KITT PEAK MAGNETOGRAM--SOLIS

854.2 nm

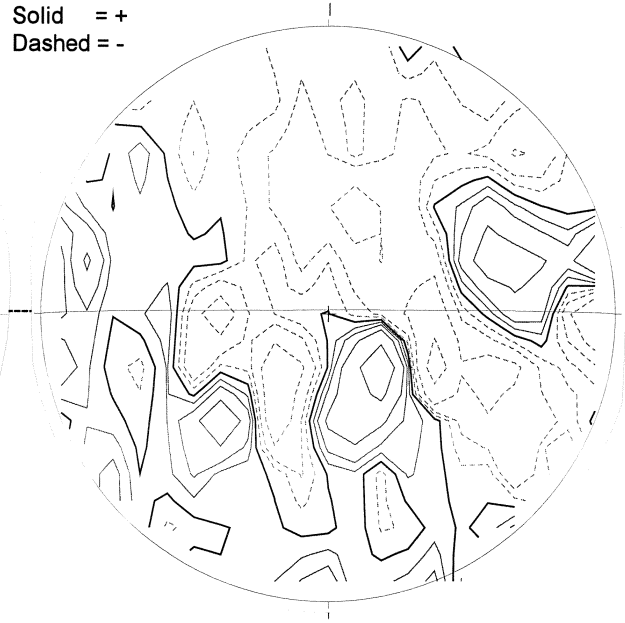
Bright = +
Dark = -



1817 UT

STANFORD MAGNETOGRAM

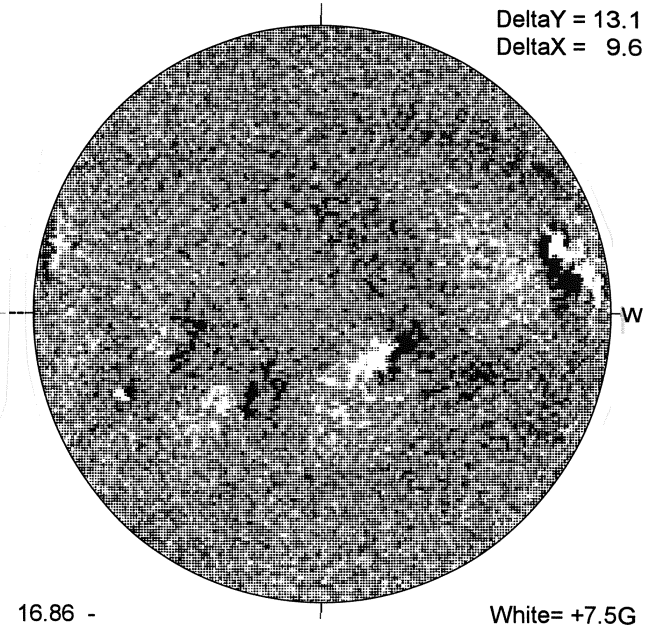
Solid = +
Dashed = -



2053 UT

MT. WILSON MAGNETOGRAM

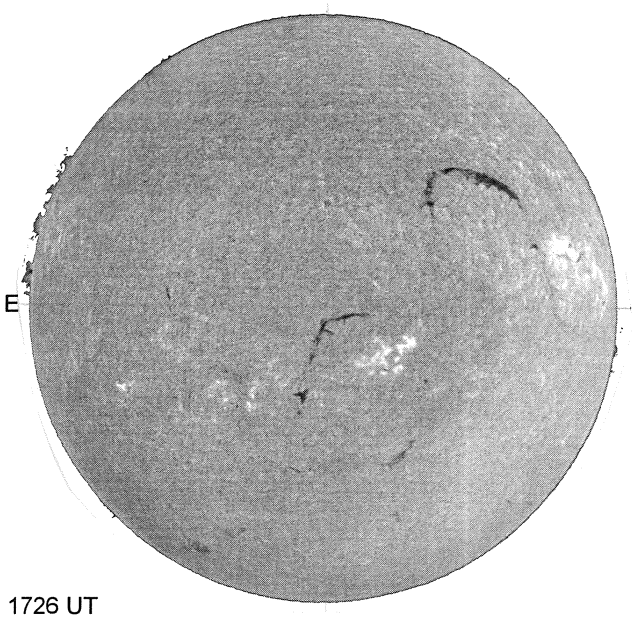
DeltaY = 13.1
DeltaX = 9.6



16.86 -
17.83 UT

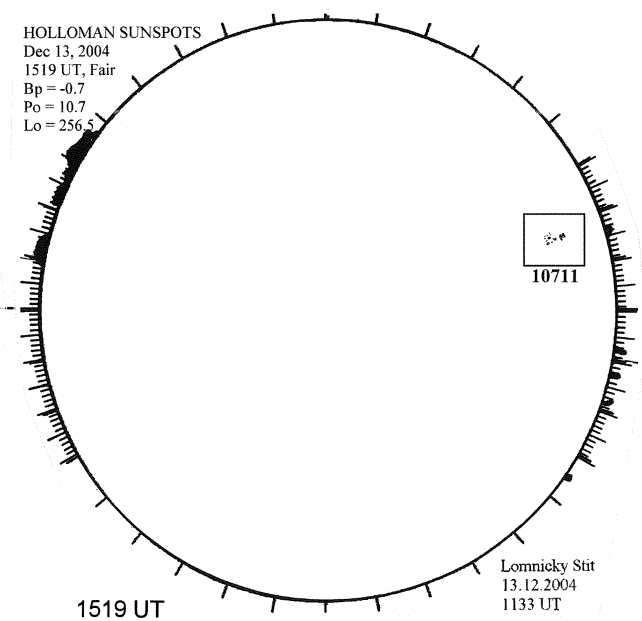
White= +7.5G
Black = -7.5G

BIG BEAR H-ALPHA



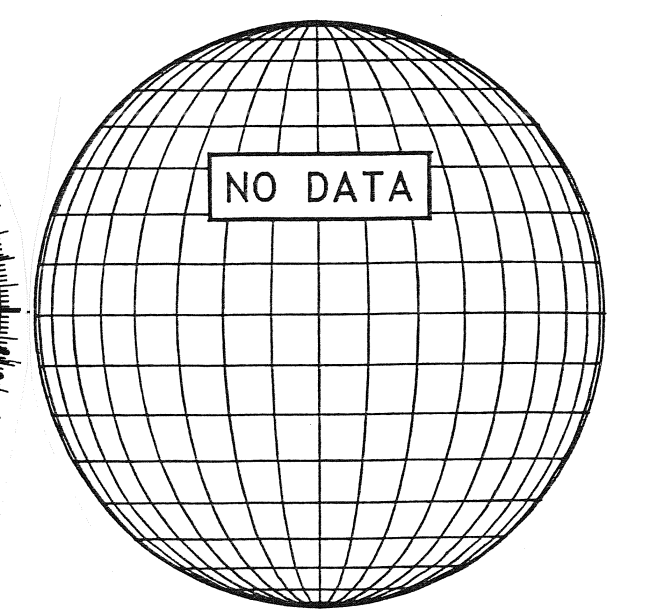
1726 UT

HOLLOMAN SUNSPOTS



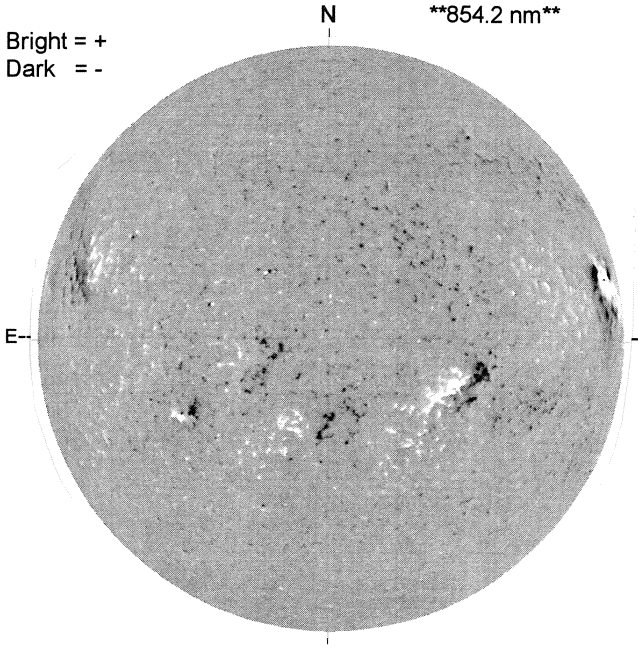
1519 UT
1133 UT LOMN Prom

LOMNICKY PEAK CORONA (1.04 Radii)

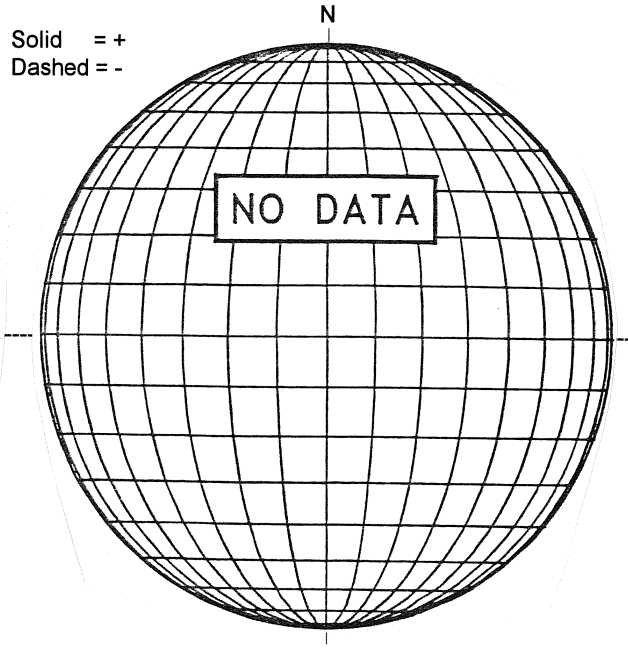


DECEMBER 14, 2004 (P= 10.51, Bo = -0.82, Lo = 250.96)

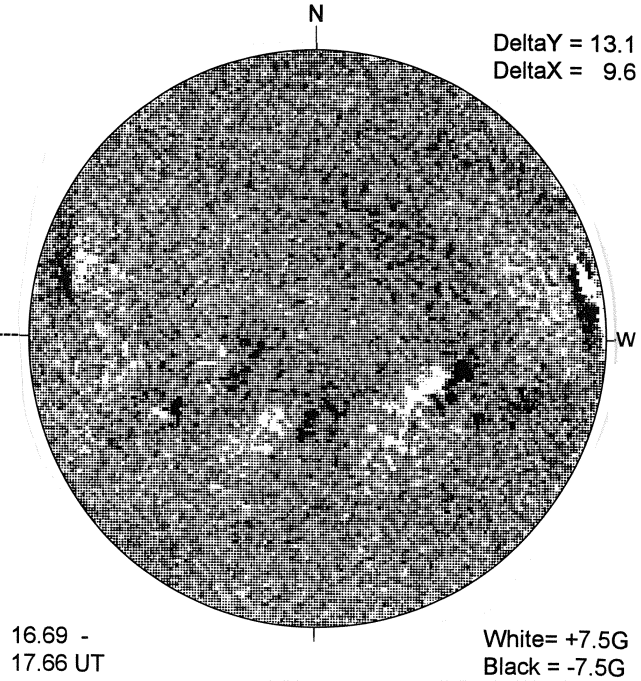
KITT PEAK MAGNETOGRAM--SOLIS



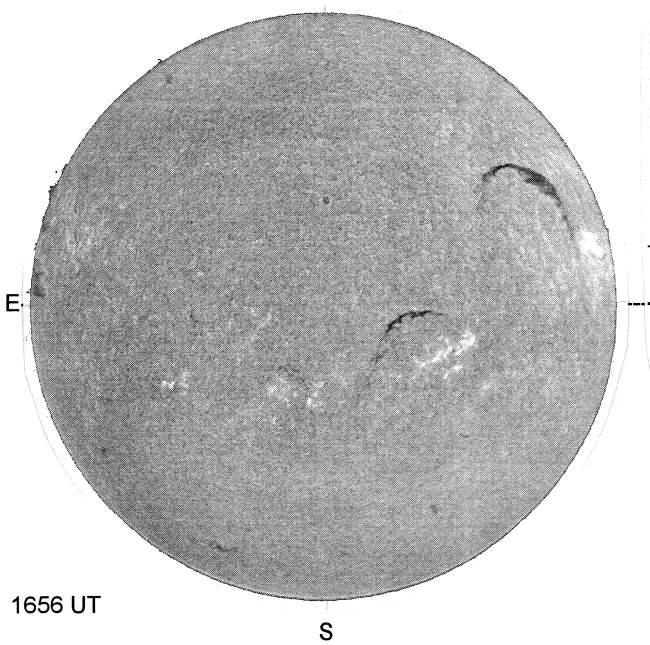
STANFORD MAGNETOGRAM



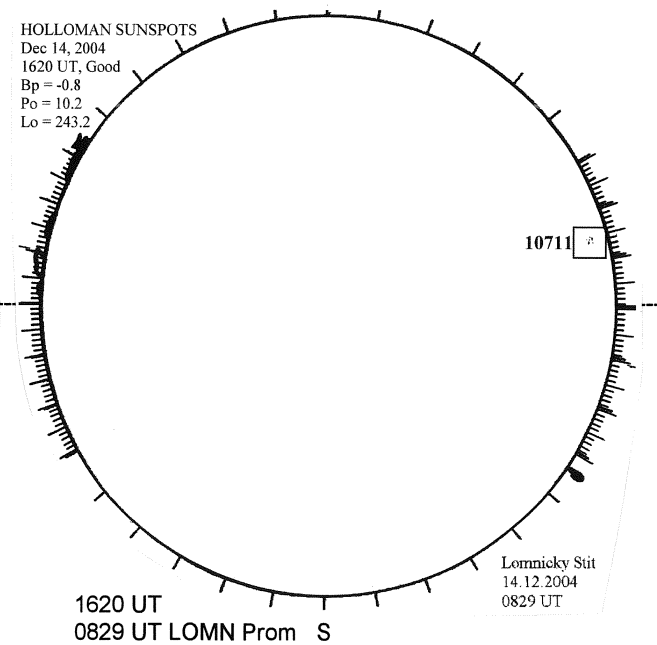
MT. WILSON MAGNETOGRAM



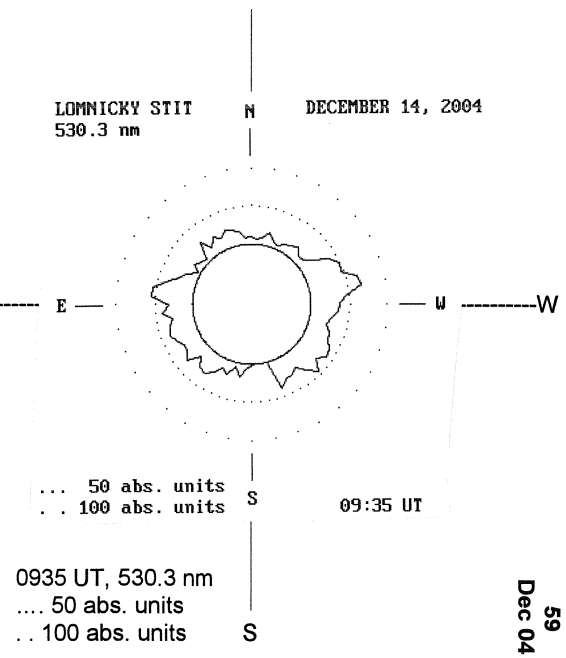
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



LOMNICKY PEAK CORONA (1.04 Radii)----

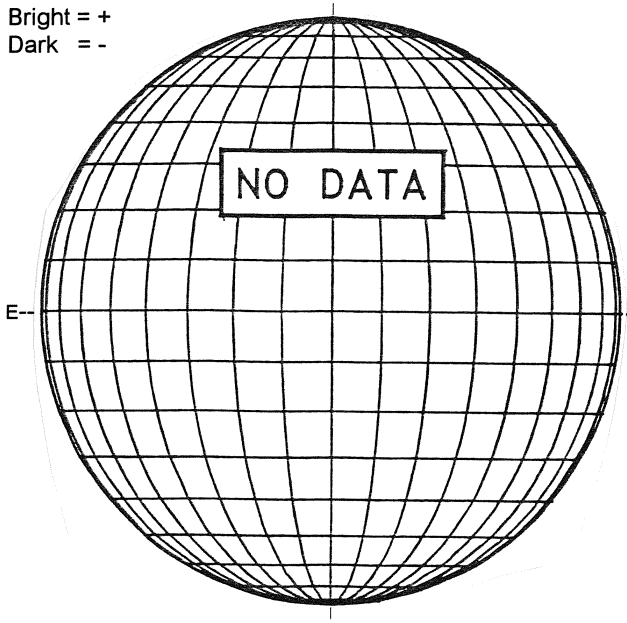


DECEMBER 15, 2004 (P= 10.06, Bo = -0.95, Lo = 237.78)

KITT PEAK MAGNETOGRAM--SOLIS

N **854.2 nm**

Bright = +
Dark = -



E--

STANFORD MAGNETOGRAM

N

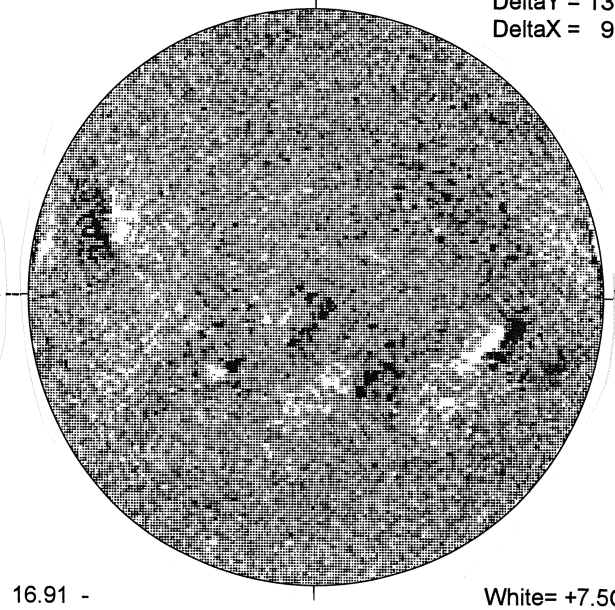
Solid = +
Dashed = -

2050 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

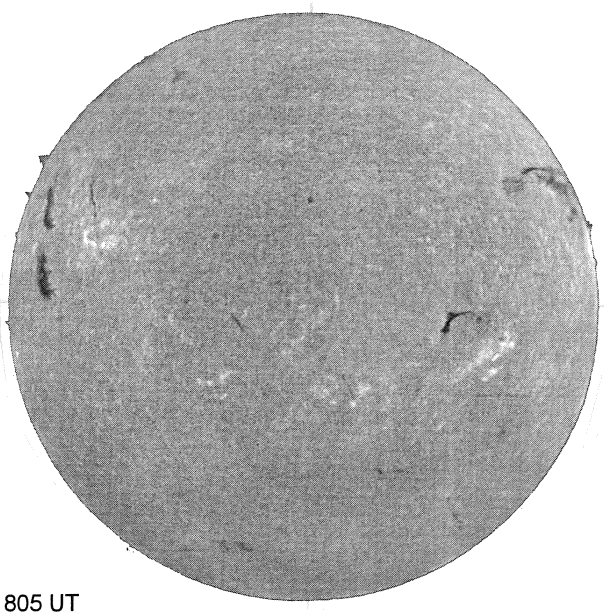


-W

16.91 -
17.88 UT

White= +7.5G
Black = -7.5G

BIG BEAR H-ALPHA

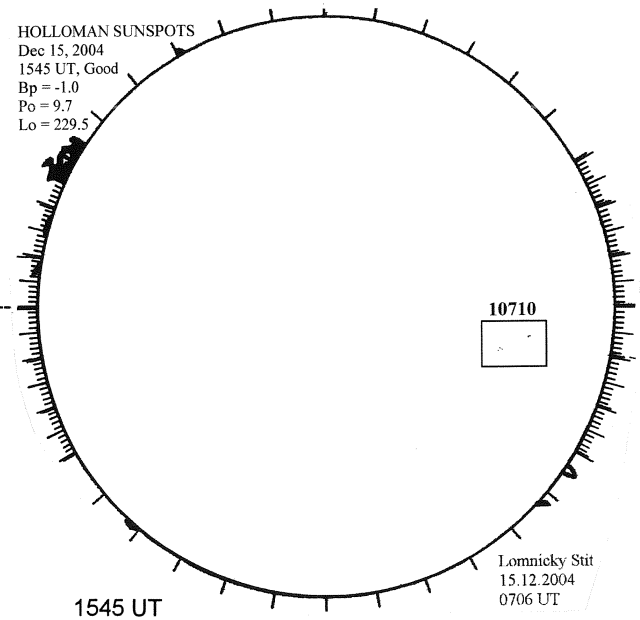


E

1805 UT

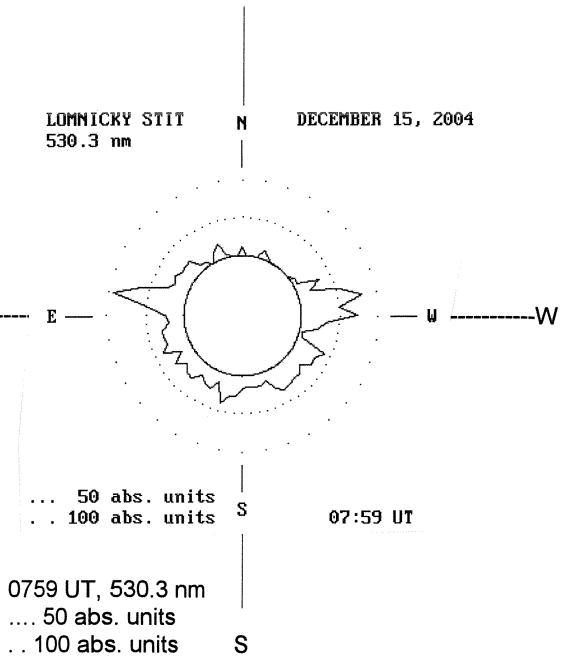
S

HOLLOMAN SUNSPOTS



1545 UT
0706 UT LOMN Prom S

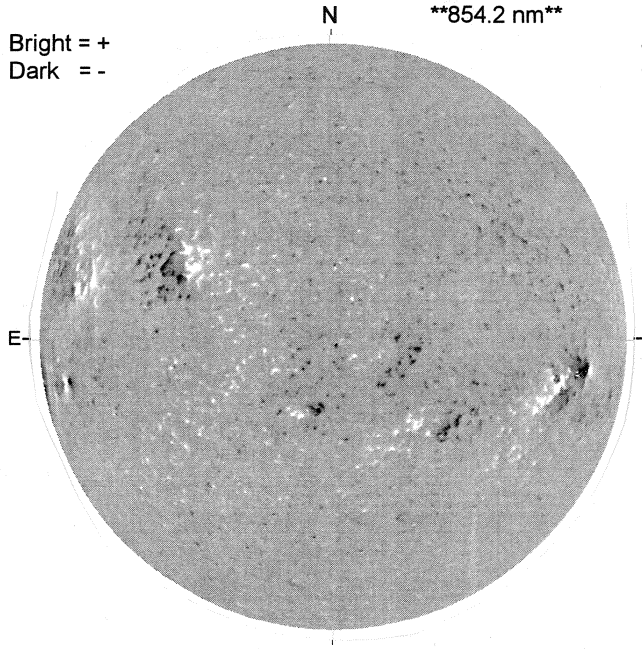
LOMNICKY PEAK CORONA (1.04 Radii)----



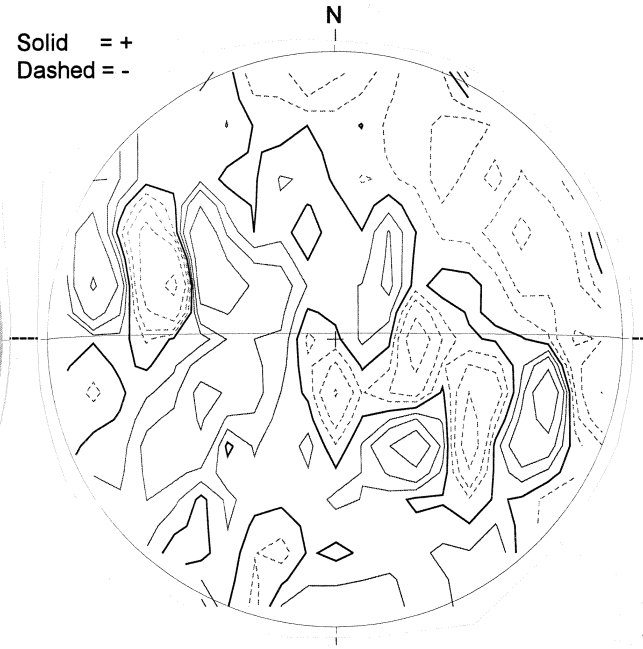
0759 UT, 530.3 nm
.... 50 abs. units
. . 100 abs. units S

DECEMBER 16, 2004 (P= 9.60, Bo = -1.08, Lo = 224.61)

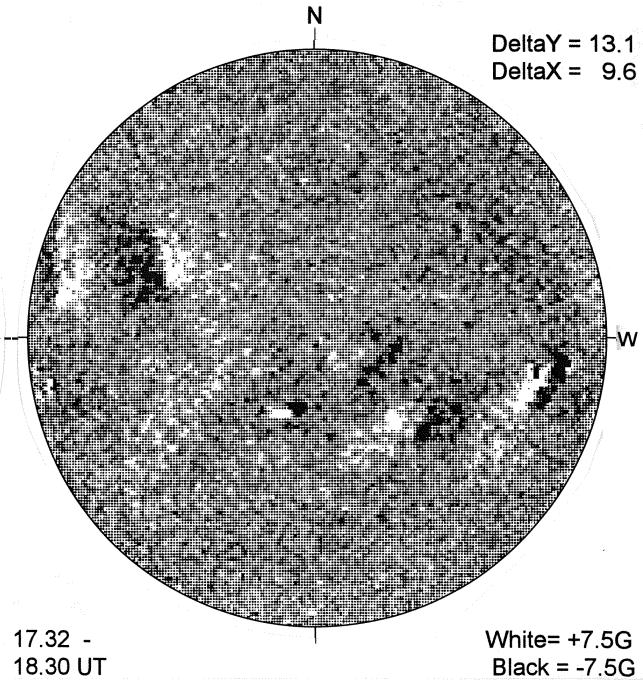
KITT PEAK MAGNETOGRAM--SOLIS



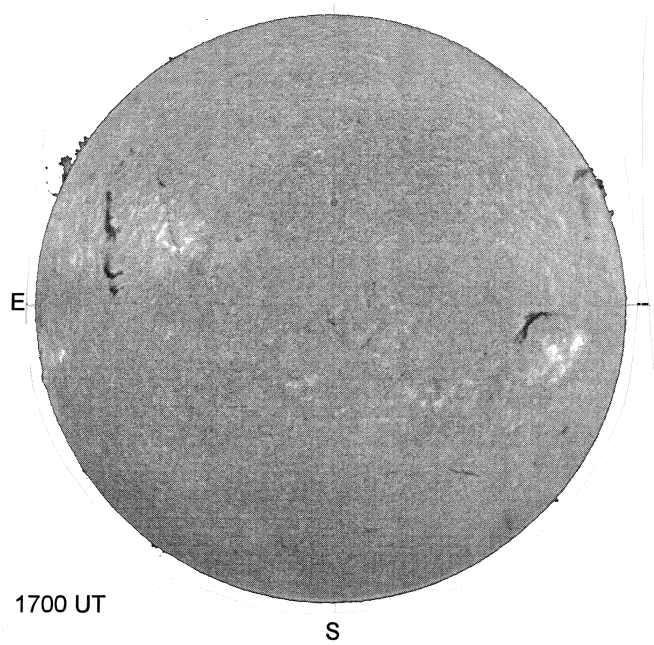
STANFORD MAGNETOGRAM



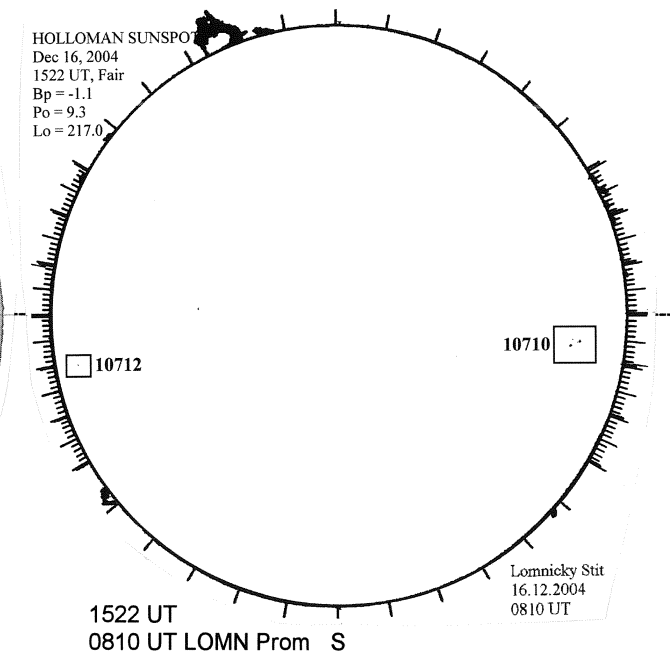
MT. WILSON MAGNETOGRAM



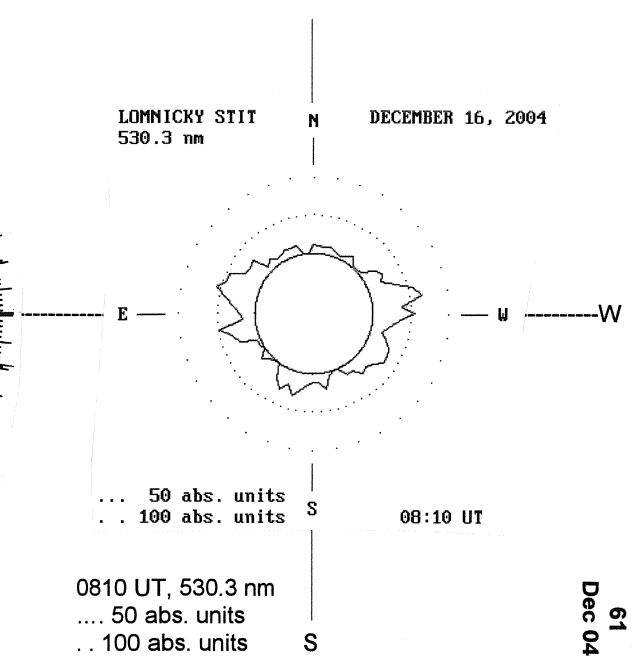
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



LOMNICKY PEAK CORONA (1.04 Radii)----

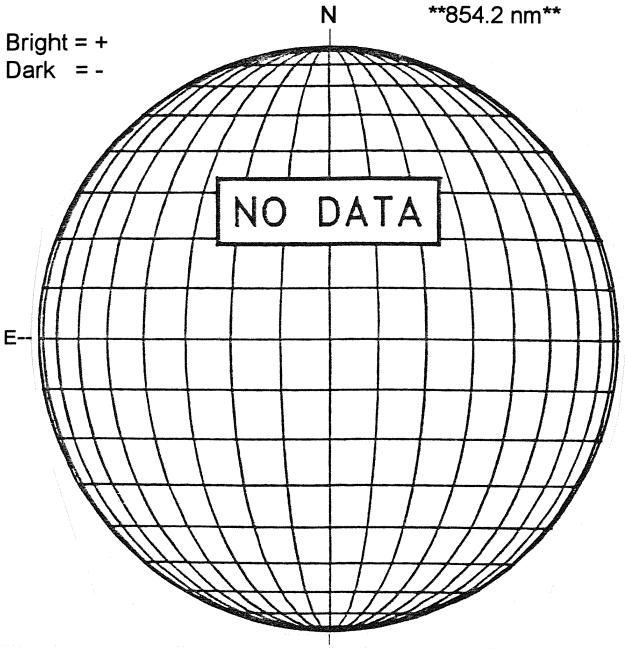


DECEMBER 17, 2004 (P= 9.15, Bo = -1.20, Lo = 211.44)

KITT PEAK MAGNETOGRAM--SOLIS

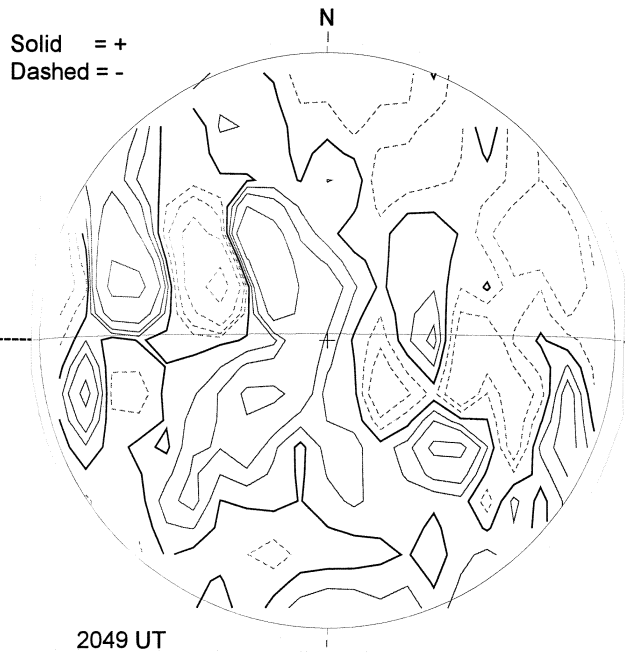
854.2 nm

Bright = +
Dark = -



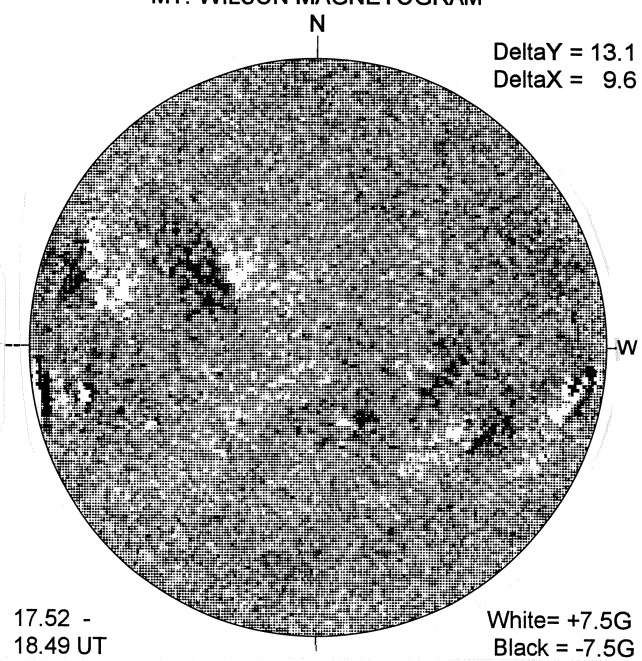
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

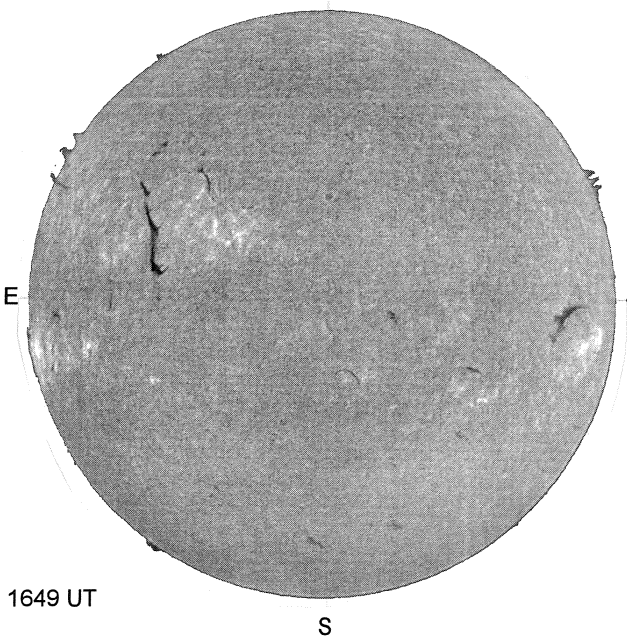


MT. WILSON MAGNETOGRAM

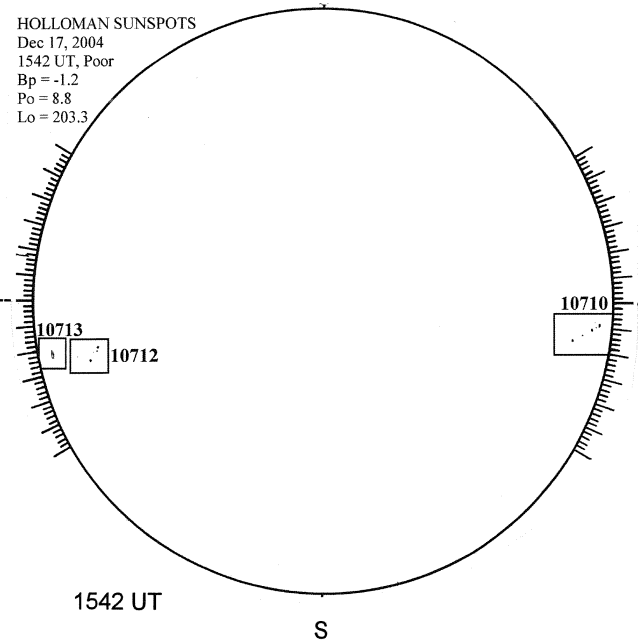
DeltaY = 13.1
DeltaX = 9.6



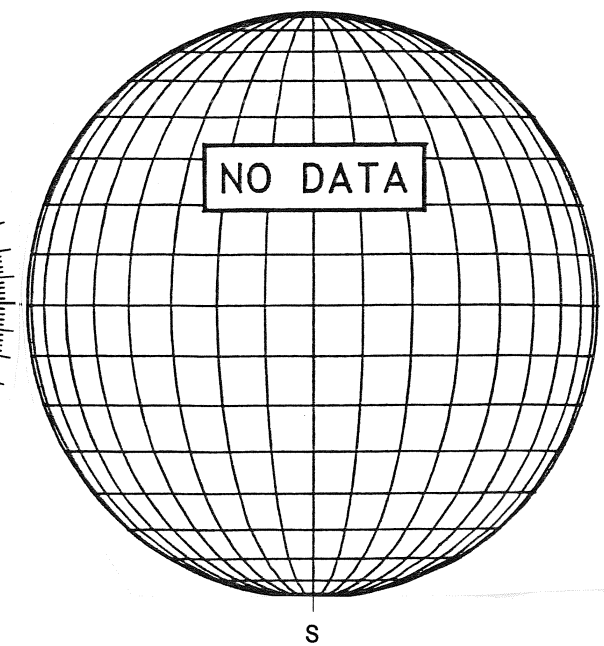
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



LOMNICKY PEAK CORONA (1.04 Radii)----

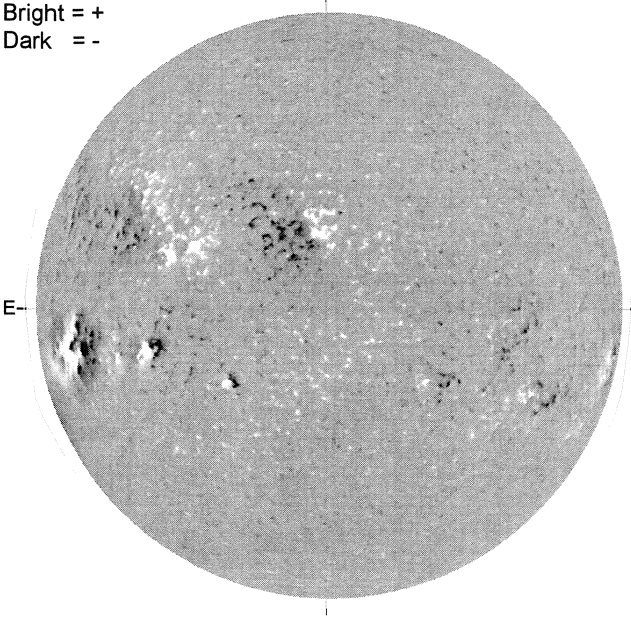


DECEMBER 18, 2004 (P= 8.68, Bo = -1.33, Lo = 198.26)

KITT PEAK MAGNETOGRAM--SOLIS

N **854.2 nm**

Bright = +
Dark = -



E

2005 UT

STANFORD MAGNETOGRAM

N

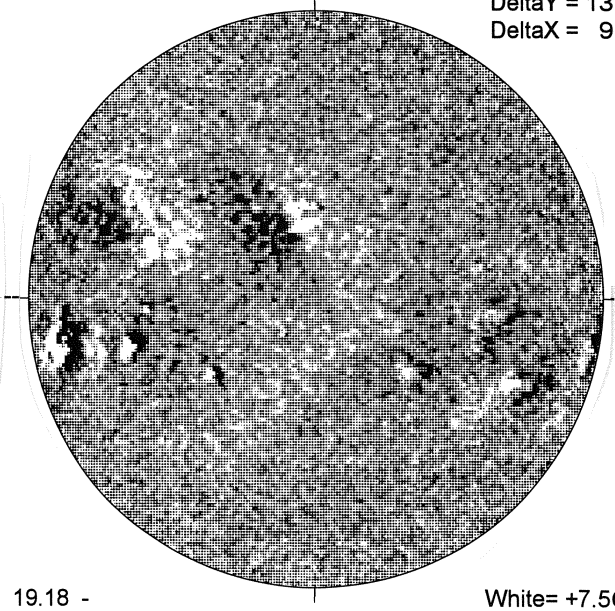
Solid = +
Dashed = -

2214 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

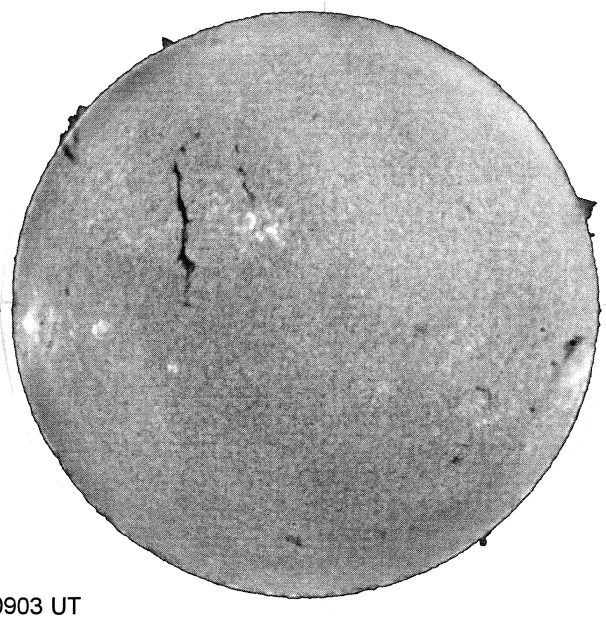


W

19.18 -
20.16 UT

White= +7.5G
Black = -7.5G

KANZELHOHE H-ALPHA

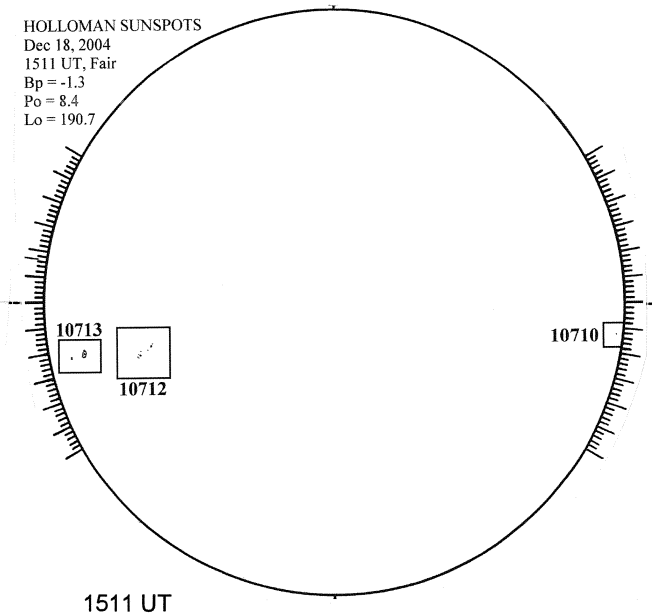


E

0903 UT

S

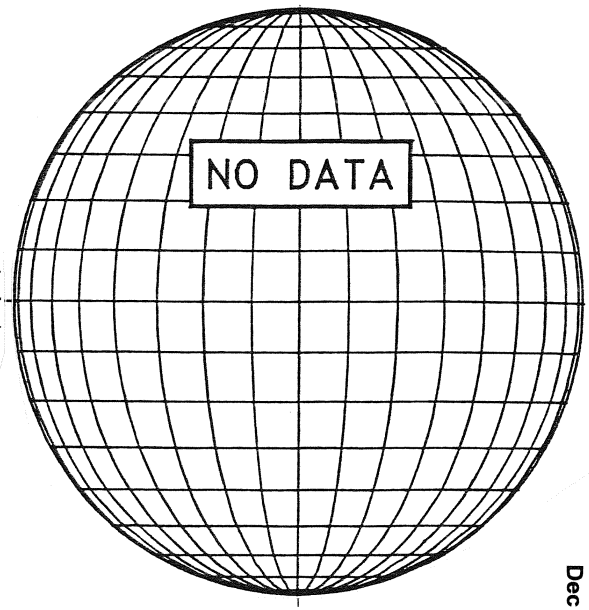
HOLLOMAN SUNSPOTS



1511 UT

S

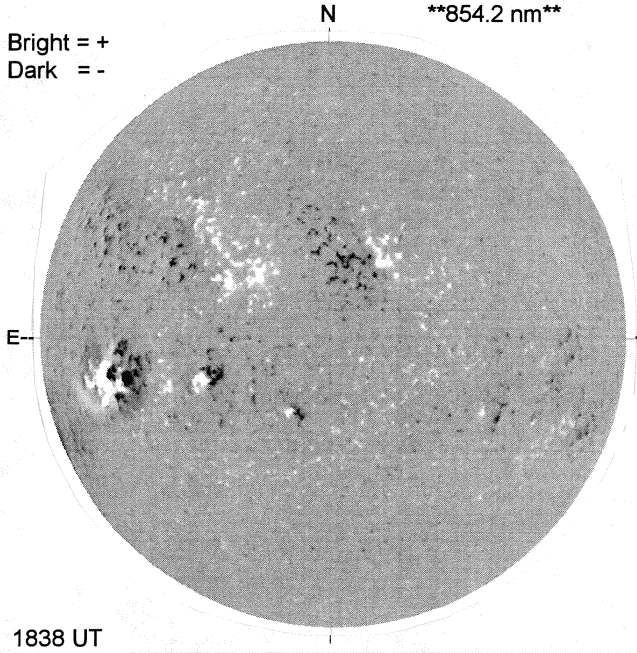
LOMNICKY PEAK CORONA (1.04 Radii)----



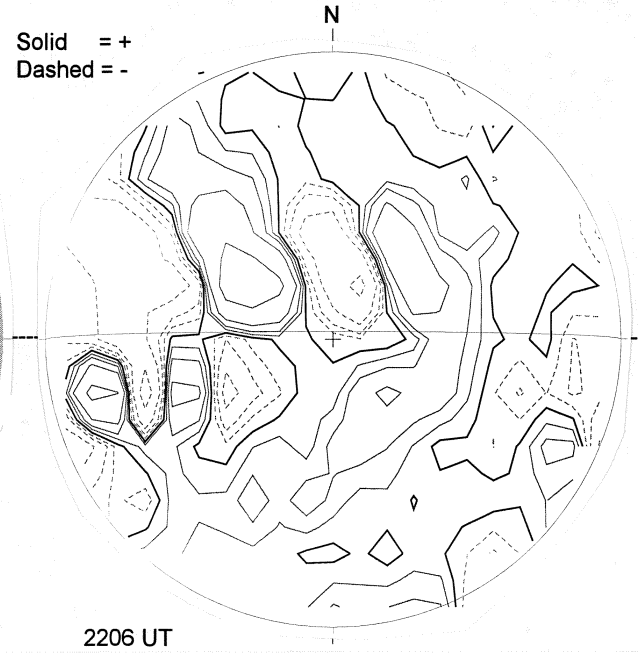
S

DECEMBER 19, 2004 (P= 8.22, Bo = -1.45, Lo = 185.09)

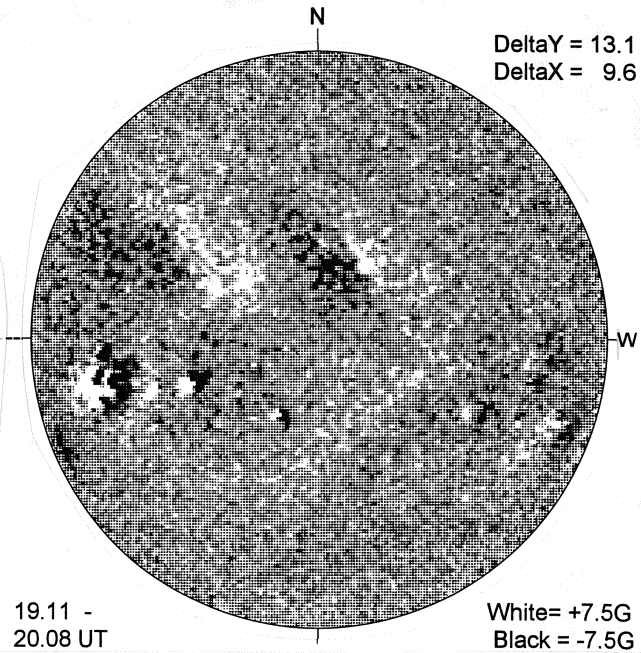
KITT PEAK MAGNETOGRAM--SOLIS



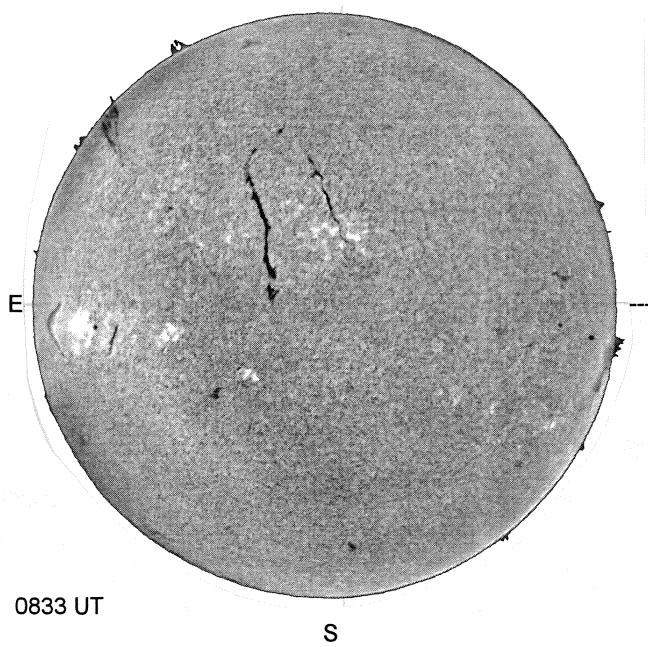
STANFORD MAGNETOGRAM



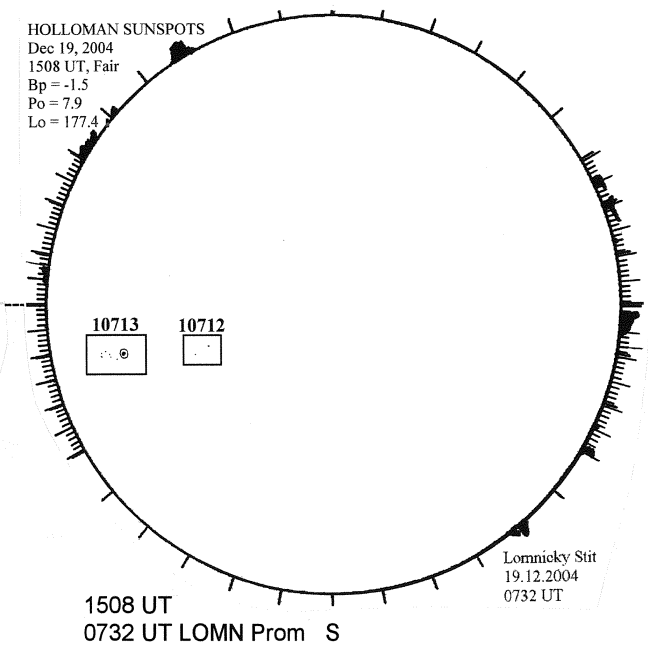
MT. WILSON MAGNETOGRAM



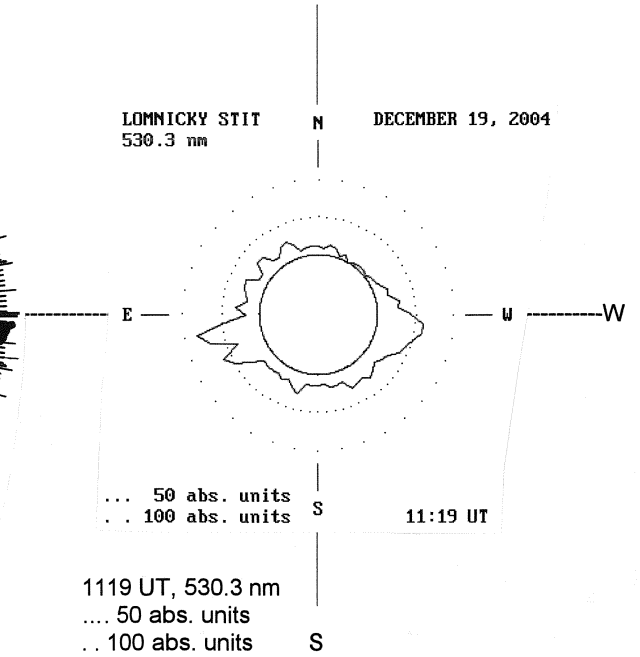
KANZELHOHE H-ALPHA



HOLLOMAN SUNSPOTS



LOMNICKY PEAK CORONA (1.04 Radii)----



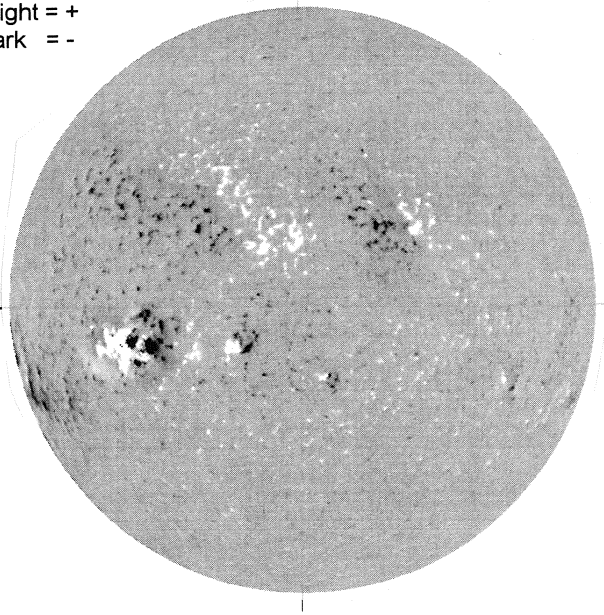
DECEMBER 20, 2004 (P= 7.75, Bo = -1.58, Lo = 171.91)

KITT PEAK MAGNETOGRAM--SOLIS

N

854.2 nm

Bright = +
Dark = -



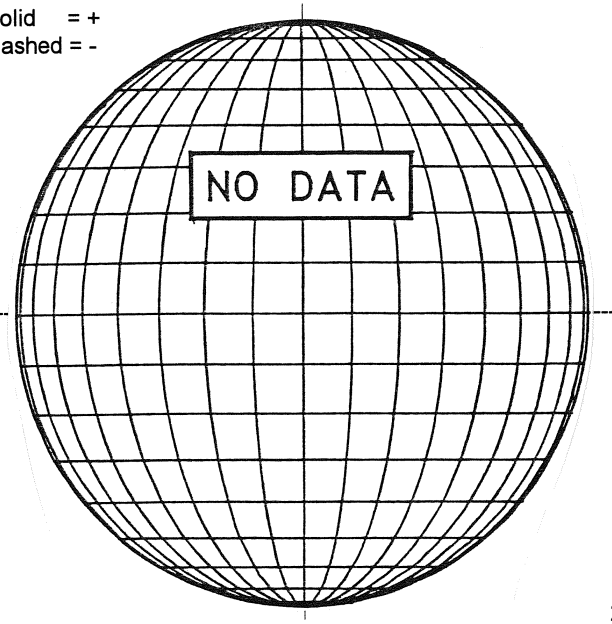
E--

1840 UT

STANFORD MAGNETOGRAM

N

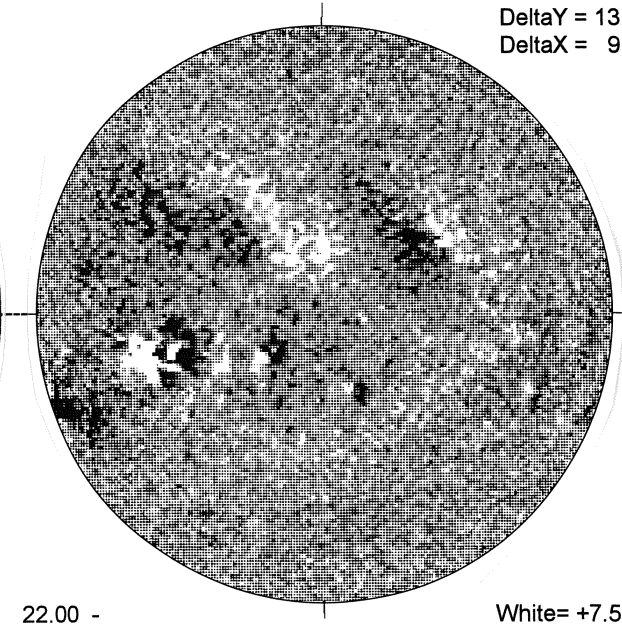
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

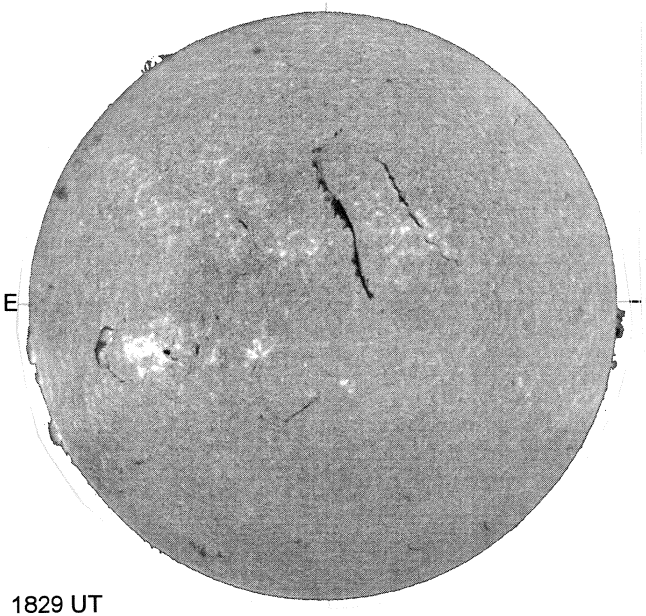


W

22.00 -
22.98 UT

White= +7.5G
Black = -7.5G

---- BIG BEAR H-ALPHA

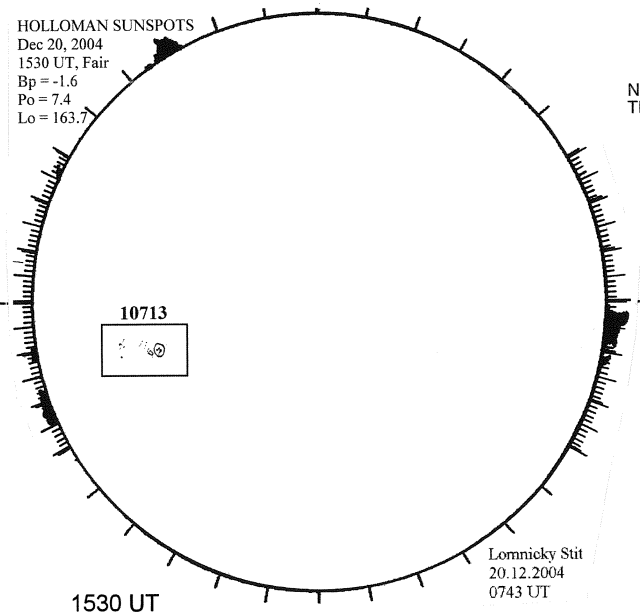


E

1829 UT

S

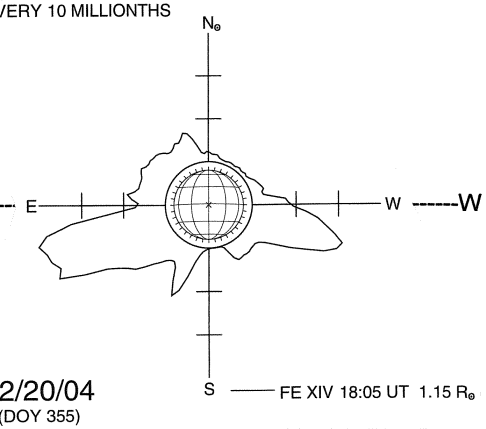
HOLLOMAN SUNSPOTS



1530 UT
0743 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



12/20/04
(DOY 355)

S

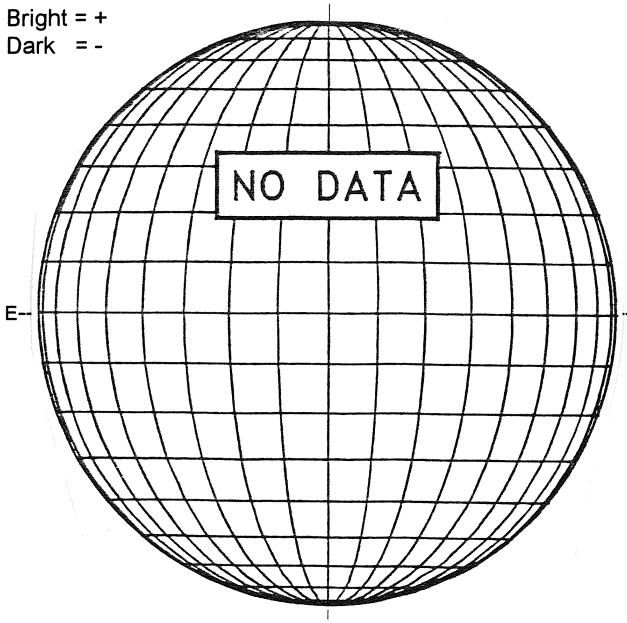
DECEMBER 21, 2004 (P= 7.28, Bo = -1.71, Lo = 158.74)

KITT PEAK MAGNETOGRAM--SOLIS

N

854.2 nm

Bright = +
Dark = -



E--

STANFORD MAGNETOGRAM

N

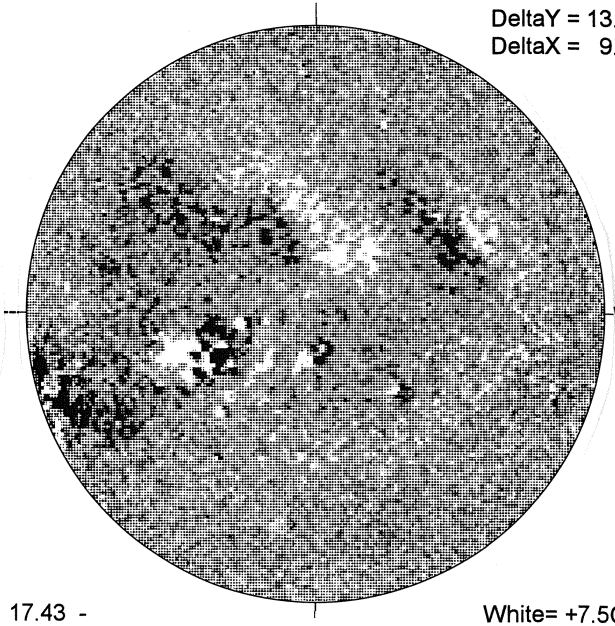
Solid = +
Dashed = -

2109 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

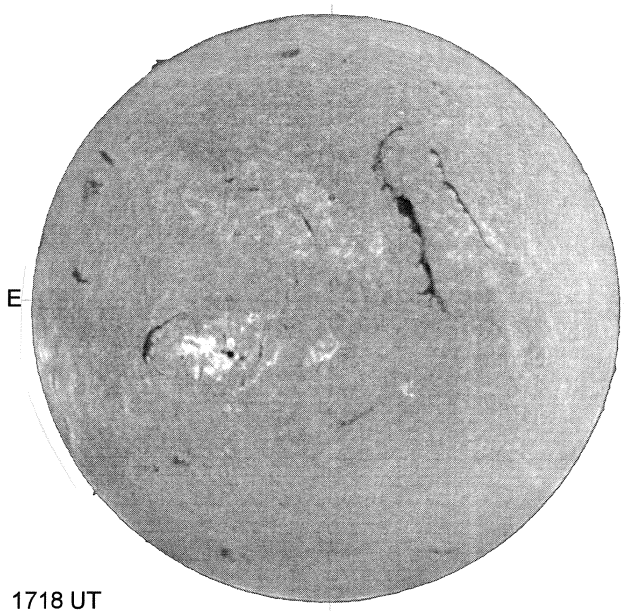


-W

17.43 -
18.40 UT

White= +7.5G
Black = -7.5G

----- BIG BEAR H-ALPHA



E

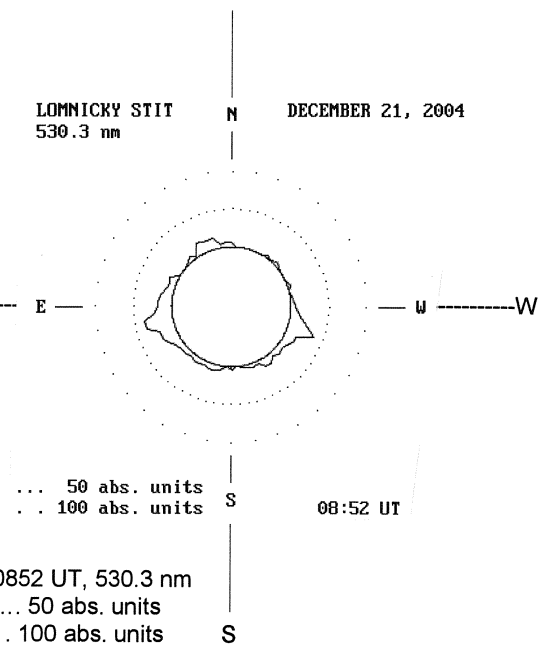
1718 UT

S

SAN VITO SUNSPOTS

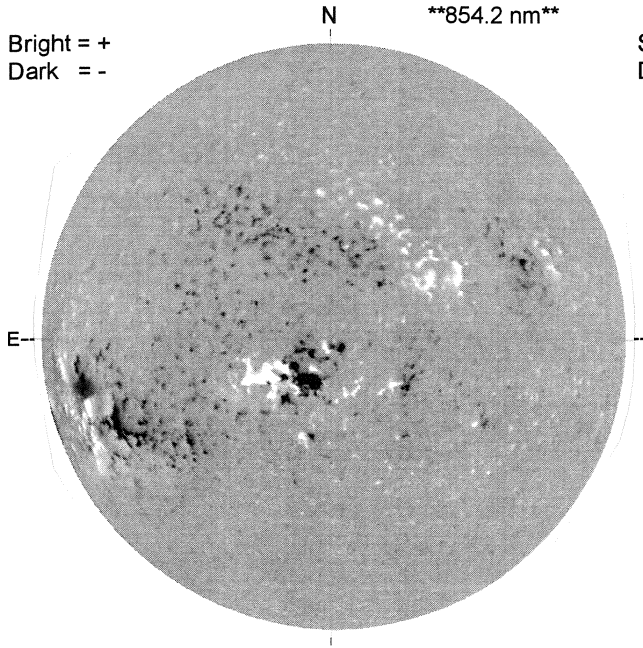
0823 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----

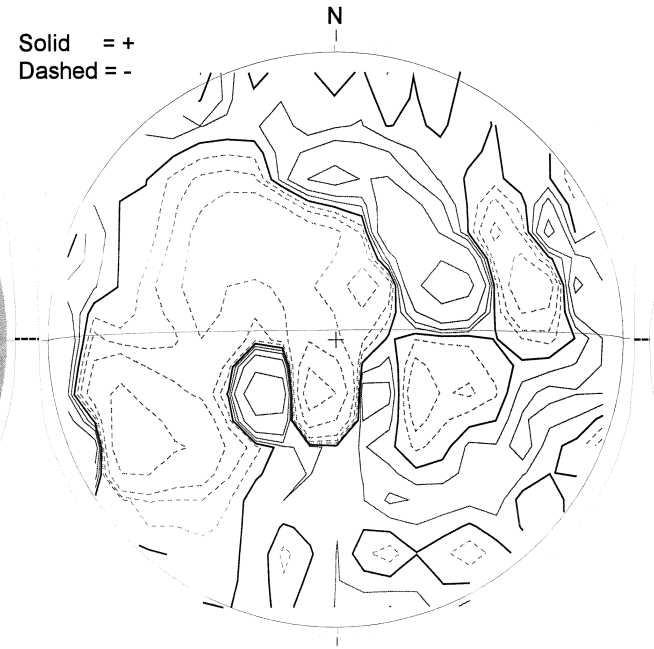


DECEMBER 22, 2004 (P= 6.81, Bo = -1.83, Lo = 145.57)

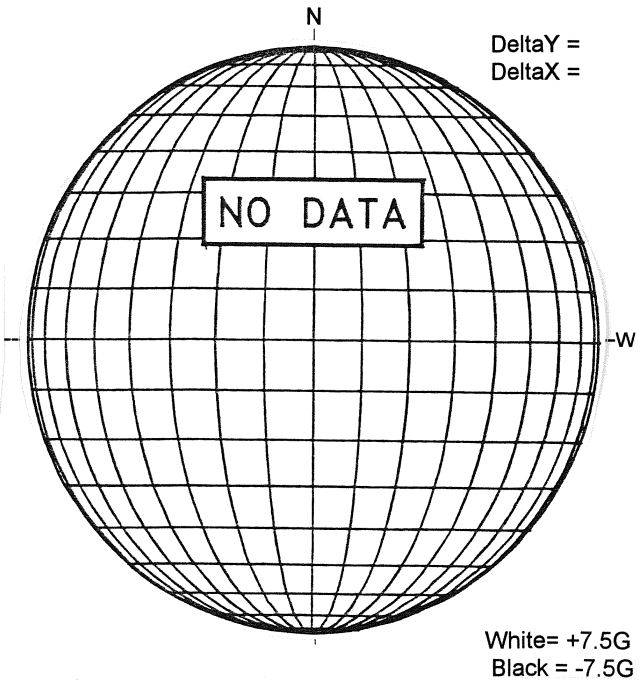
KITT PEAK MAGNETOGRAM--SOLIS



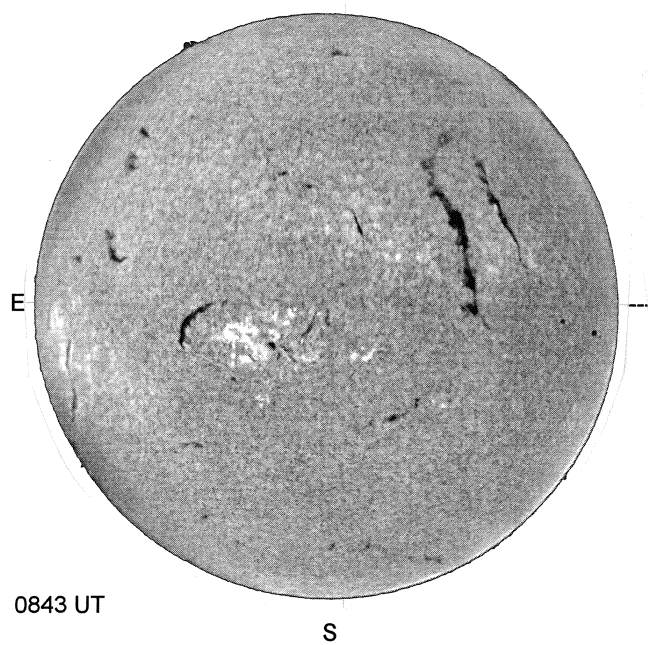
STANFORD MAGNETOGRAM



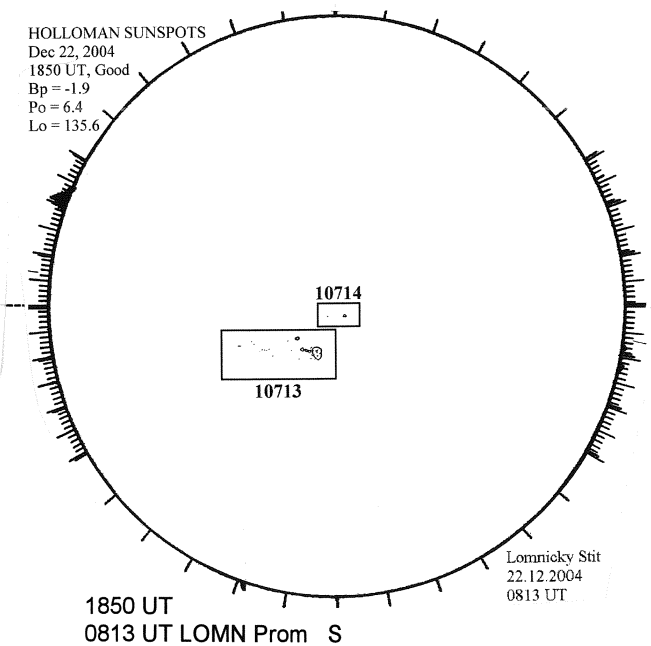
MT. WILSON MAGNETOGRAM



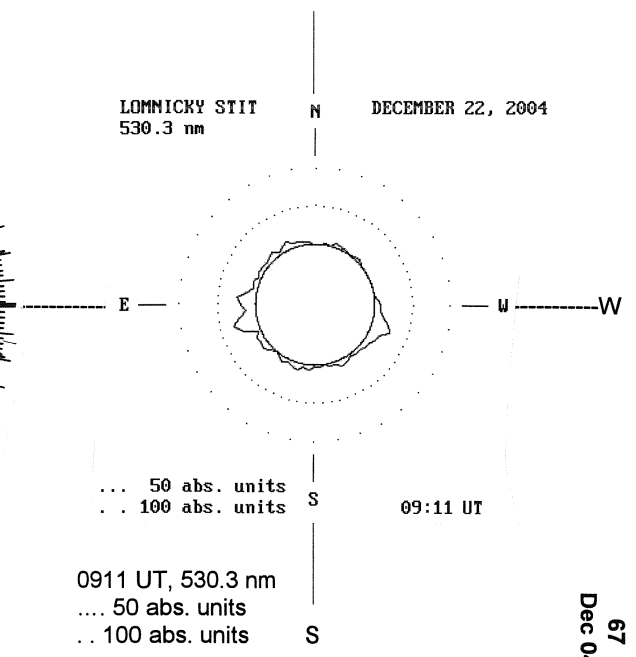
----- KANZELHOHE H-ALPHA



HOLLOMAN SUNSPOTS

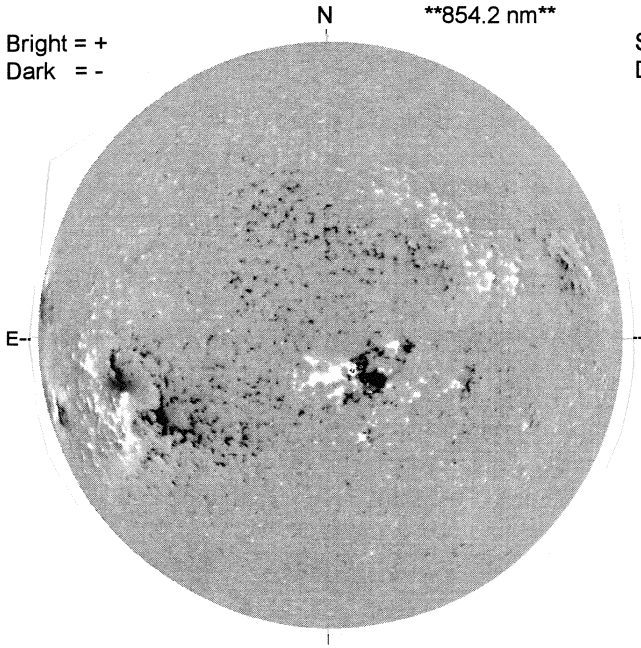


LOMNICKY PEAK CORONA (1.04 Radii)----

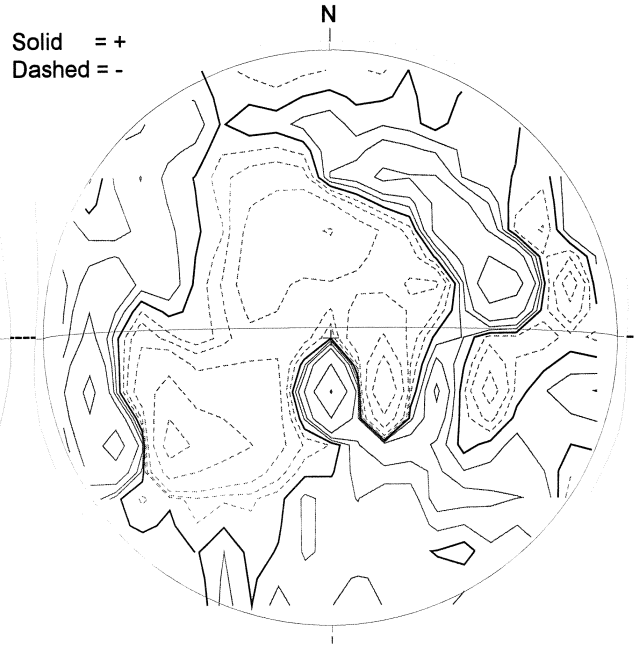


DECEMBER 23, 2004 (P= 6.33, Bo = -1.95, Lo = 132.39)

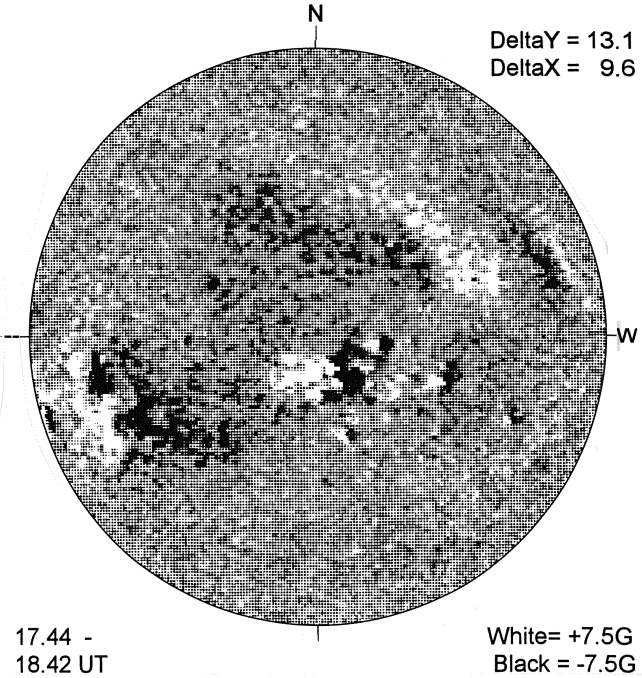
KITT PEAK MAGNETOGRAM--SOLIS



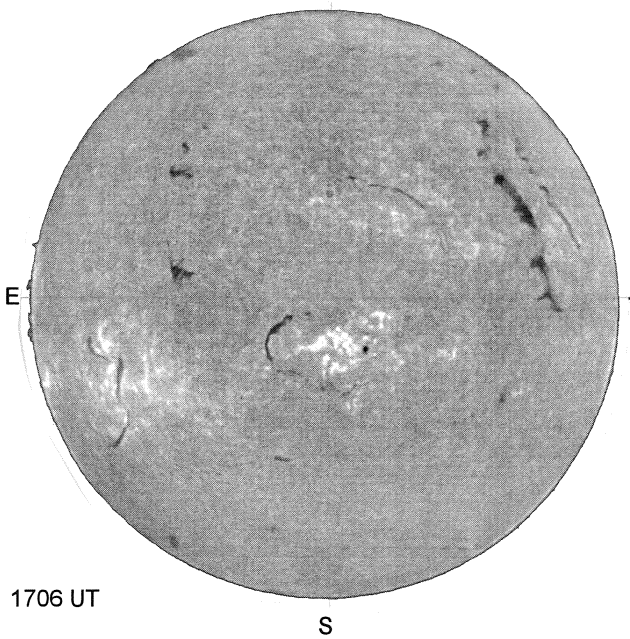
STANFORD MAGNETOGRAM



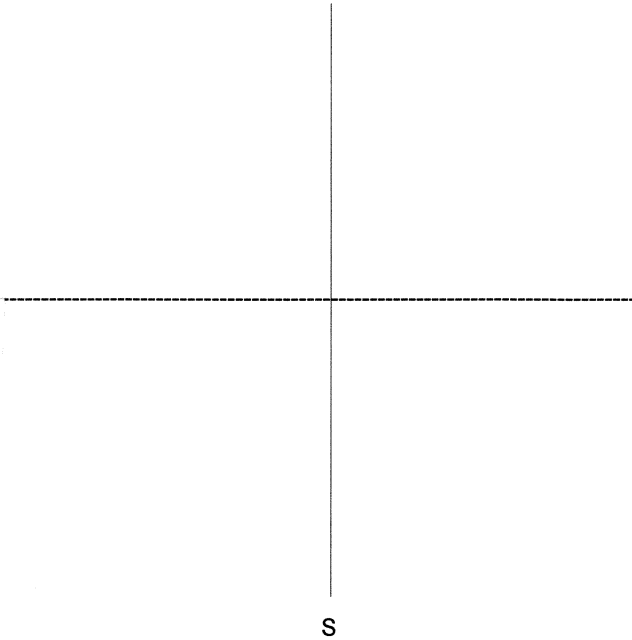
MT. WILSON MAGNETOGRAM



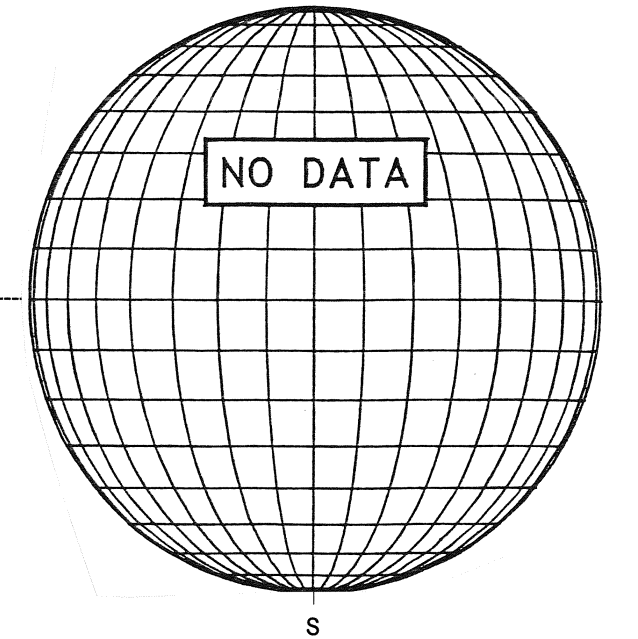
BIG BEAR H-ALPHA



SAN VITO SUNSPOTS

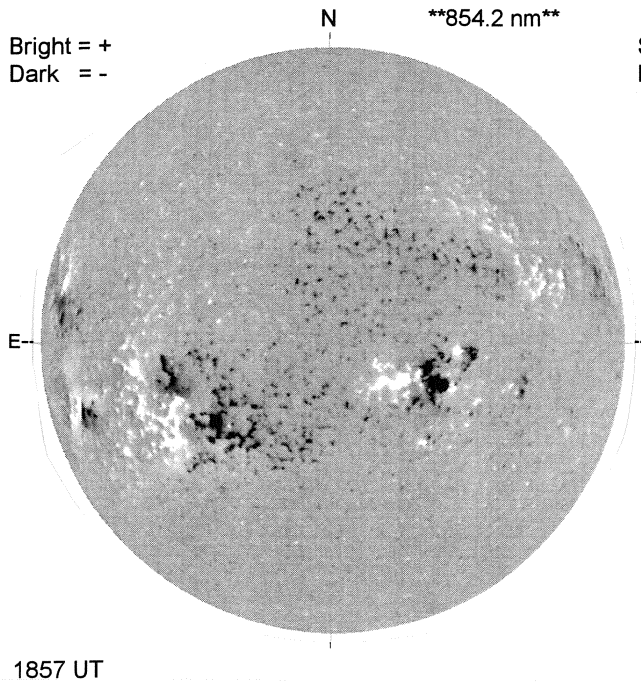


LOMNICKY PEAK CORONA (1.04 Radii)----

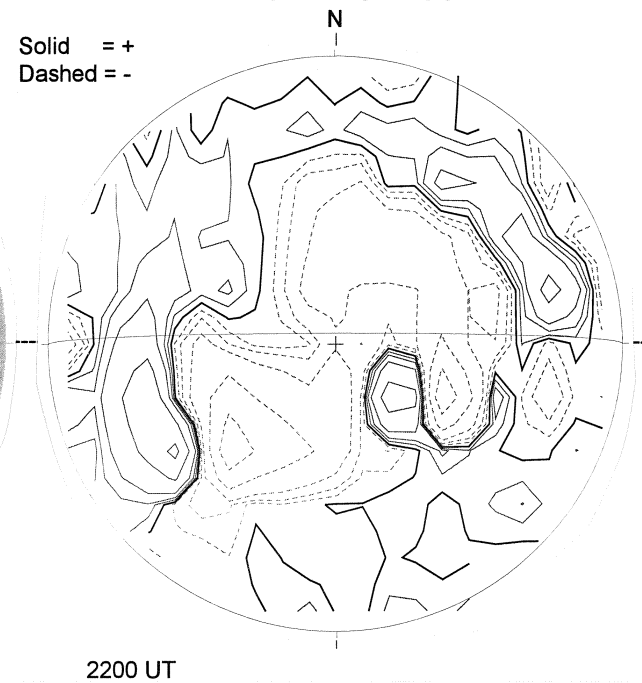


DECEMBER 24, 2004 (P= 5.86, Bo = -2.08, Lo = 119.22)

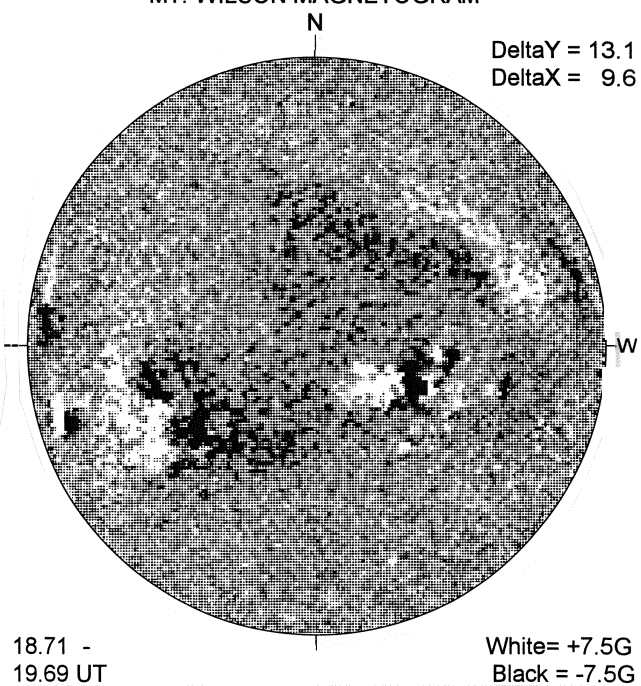
KITT PEAK MAGNETOGRAM--SOLIS



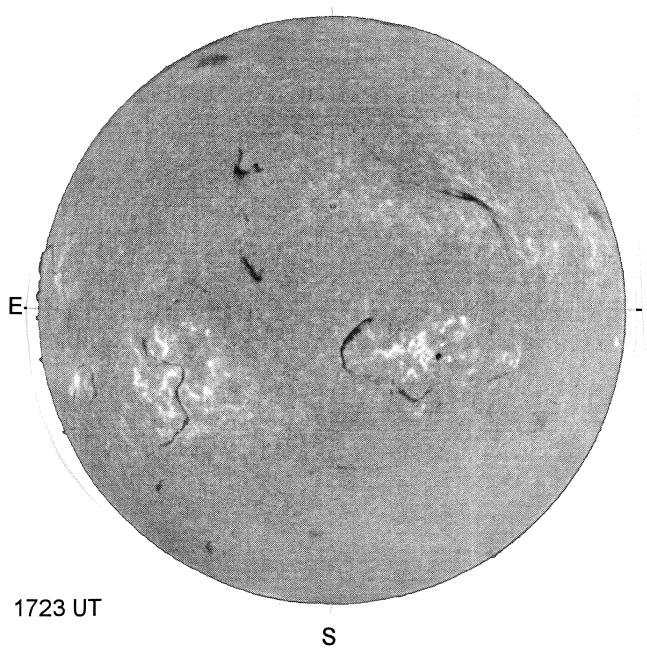
STANFORD MAGNETOGRAM



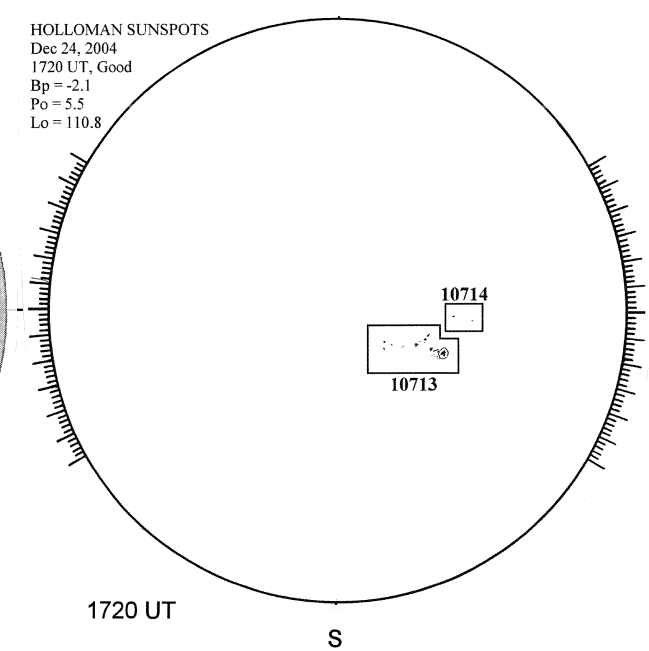
MT. WILSON MAGNETOGRAM



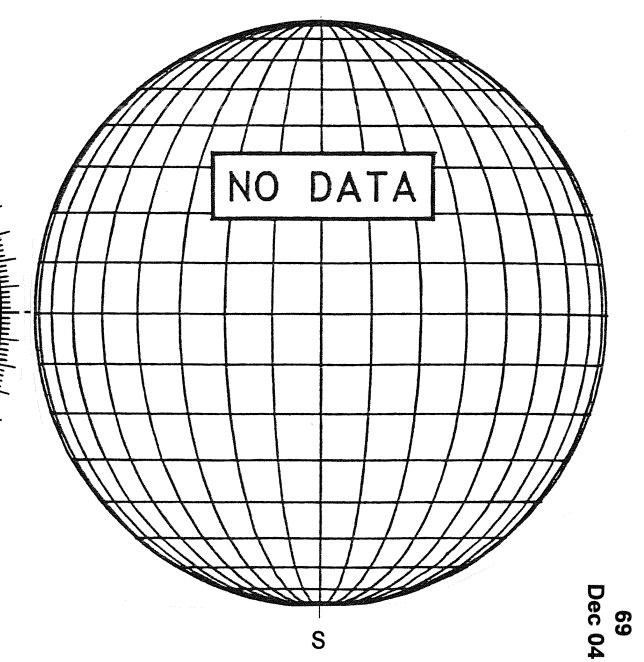
BIG BEAR H-ALPHA



HOLLOMAN SUNSPOTS



LOMNICKY PEAK CORONA (1.04 Radii)----

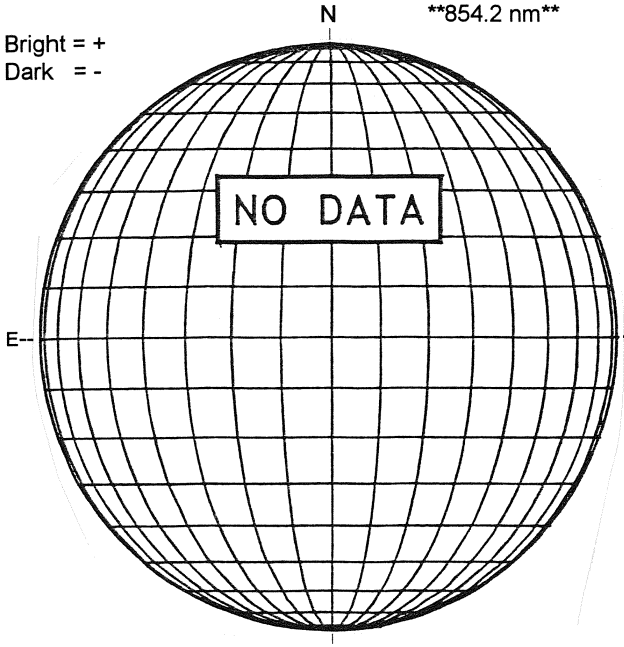


DECEMBER 25, 2004 (P= 5.38, Bo = -2.20, Lo = 106.05)

KITT PEAK MAGNETOGRAM--SOLIS

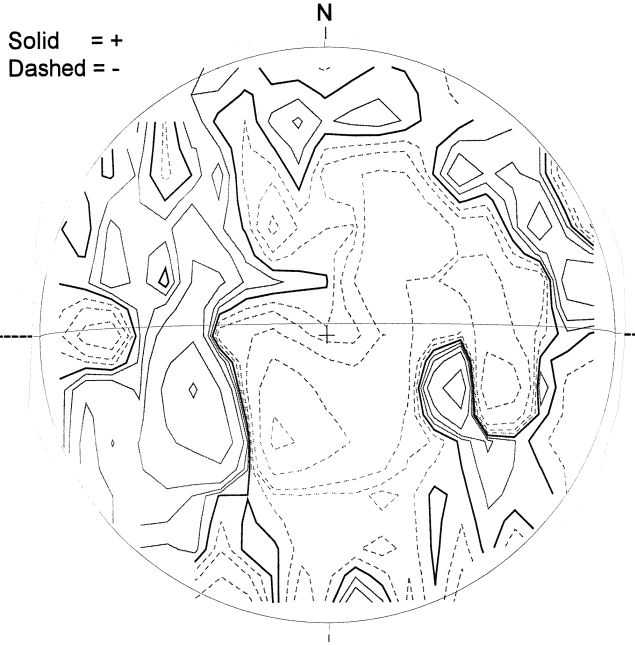
854.2 nm

Bright = +
Dark = -



STANFORD MAGNETOGRAM

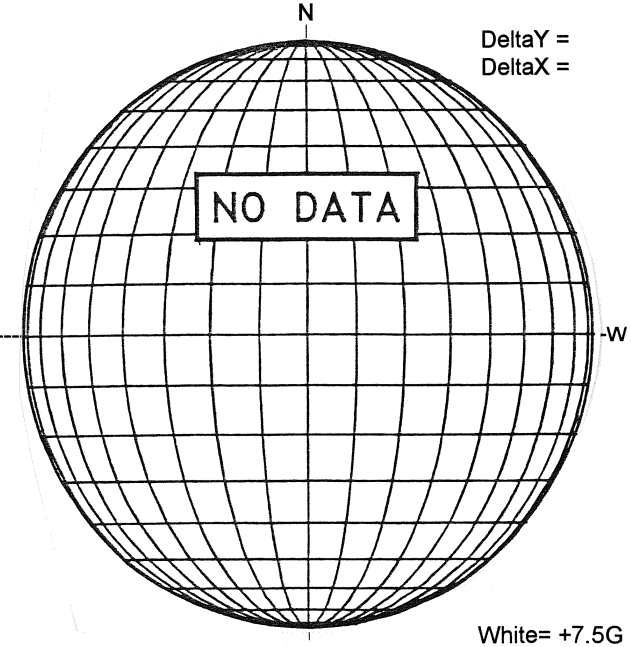
Solid = +
Dashed = -



2246 UT

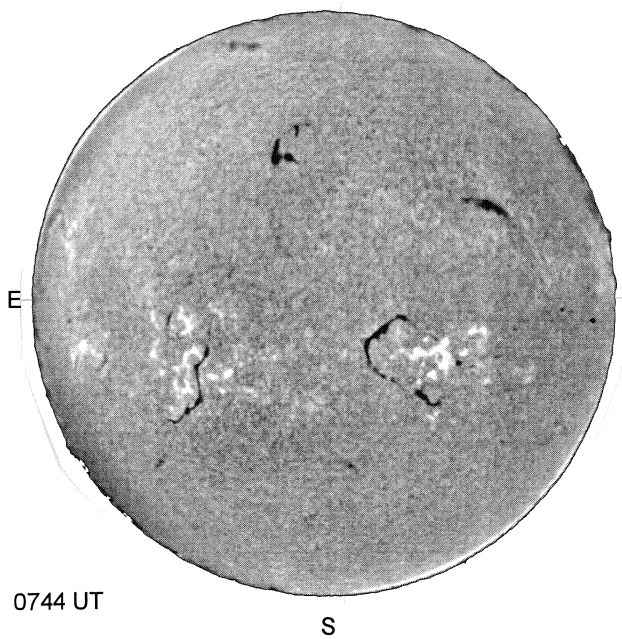
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

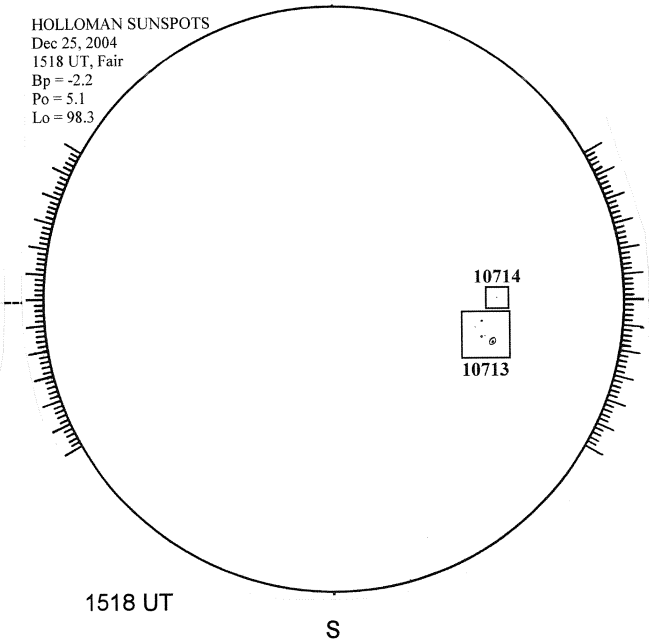
KANZELHOHE H-ALPHA



0744 UT

S

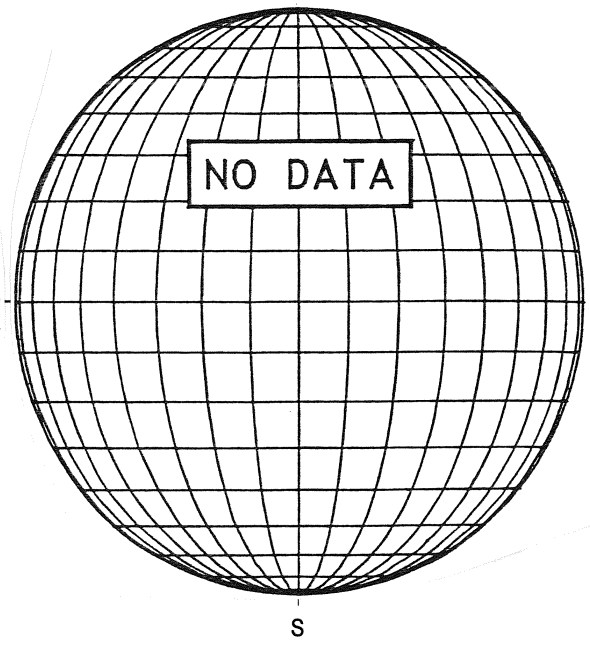
HOLLOMAN SUNSPOTS



1518 UT

S

LOMNICKY PEAK CORONA (1.04 Radii)----



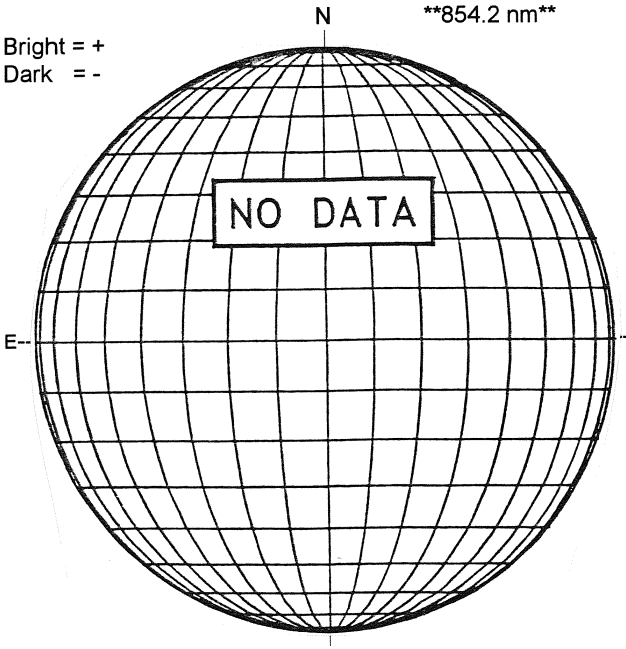
S

DECEMBER 26, 2004 (P= 4.90, Bo = -2.32, Lo = 92.88)

KITT PEAK MAGNETOGRAM--SOLIS

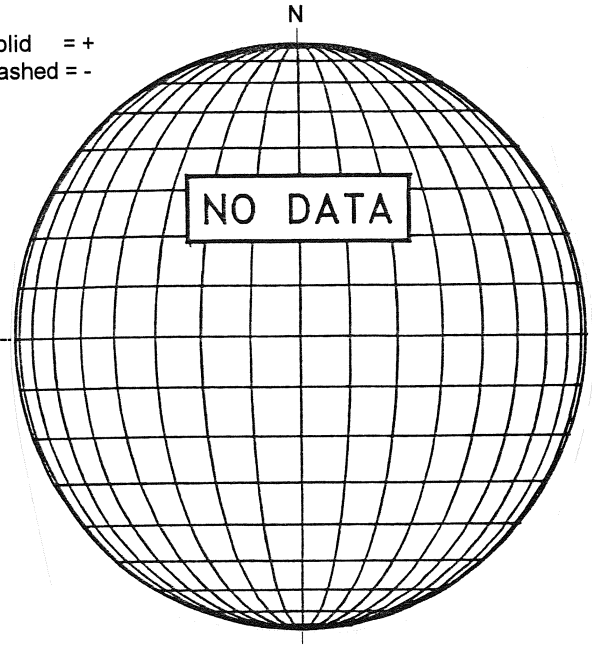
854.2 nm

Bright = +
Dark = -



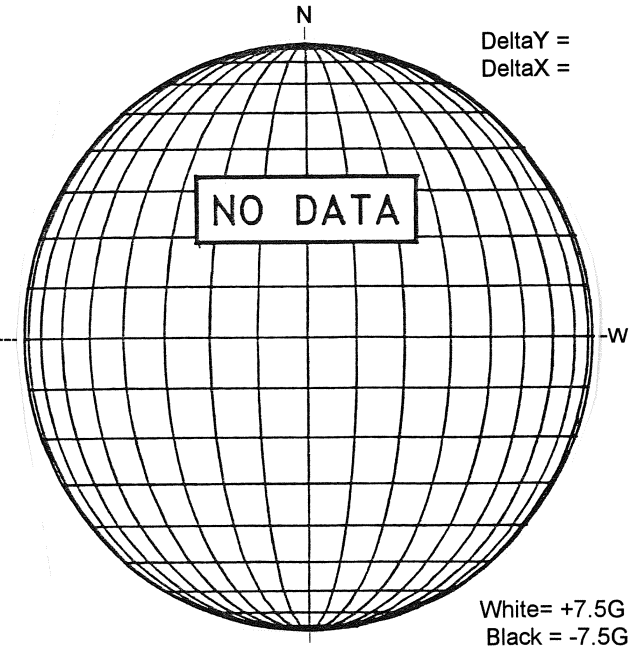
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



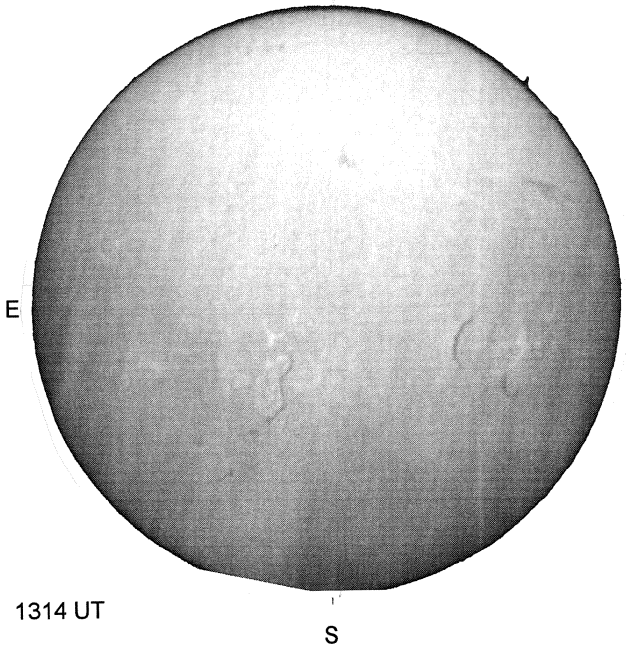
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =

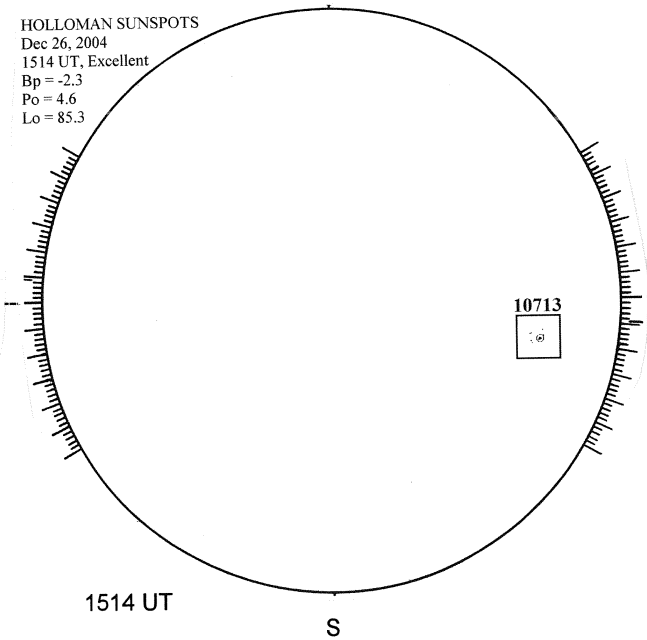


White= +7.5G
Black = -7.5G

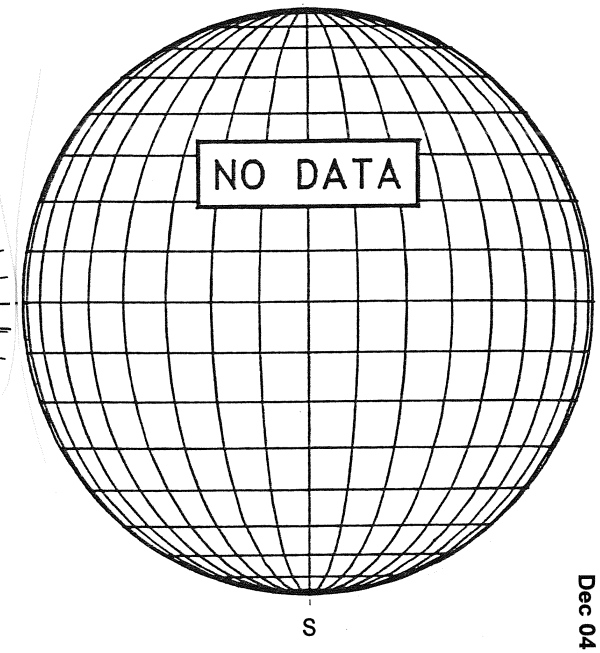
MEUDON H-ALPHA



HOLLOMAN SUNSPOTS



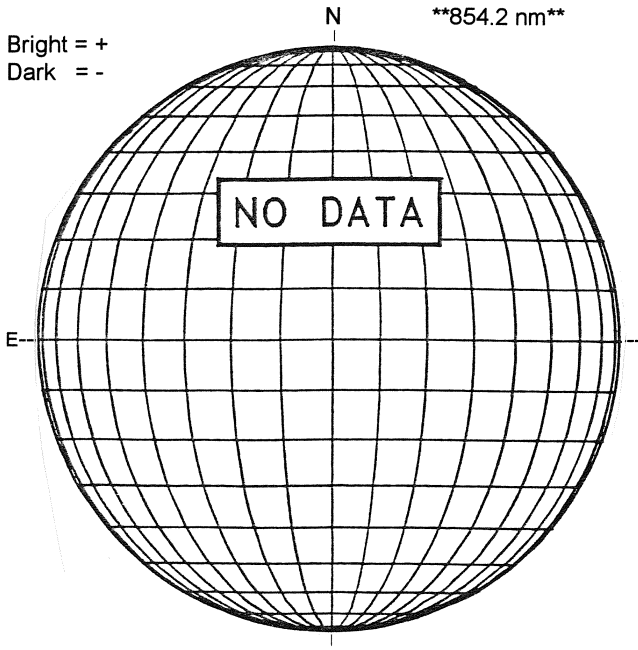
LOMNICKY PEAK CORONA (1.04 Radii)----



DECEMBER 27, 2004 (P= 4.42, Bo = -2.44, Lo = 79.70)

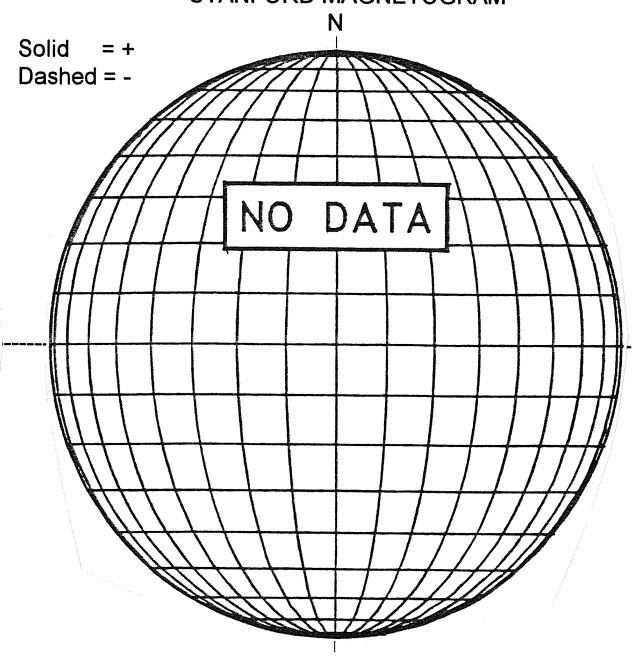
KITT PEAK MAGNETOGRAM--SOLIS
854.2 nm

Bright = +
Dark = -



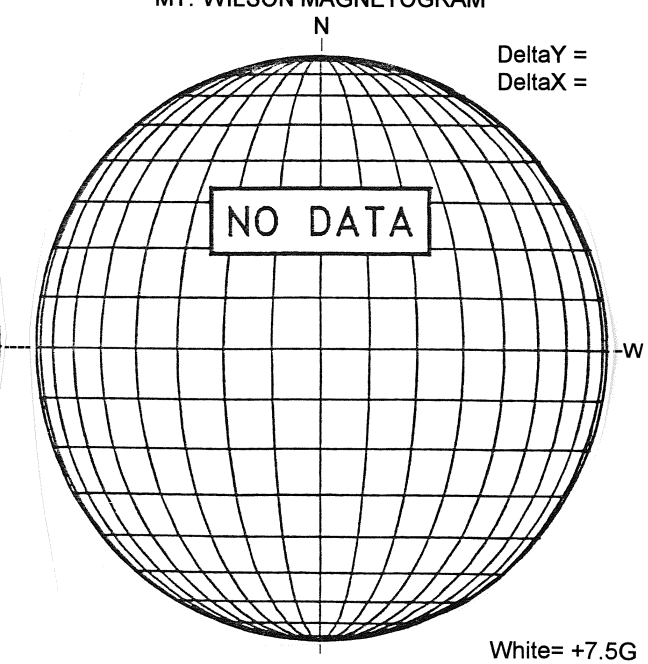
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



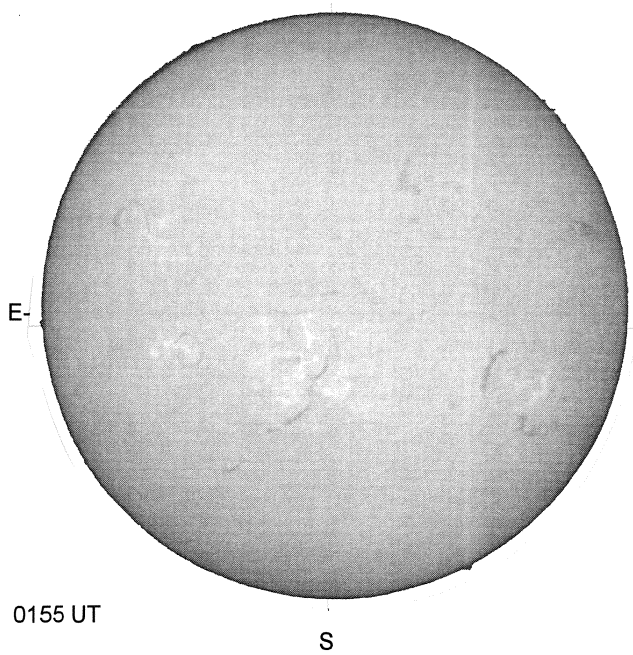
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =

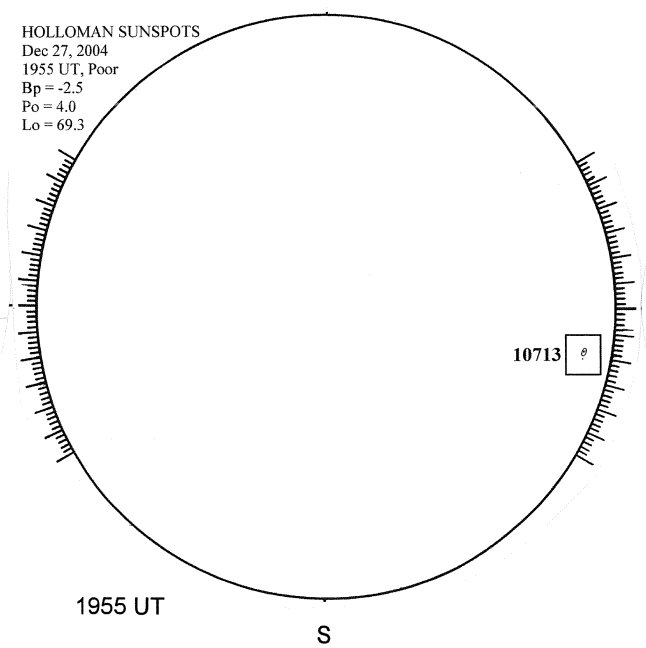


White= +7.5G
Black = -7.5G

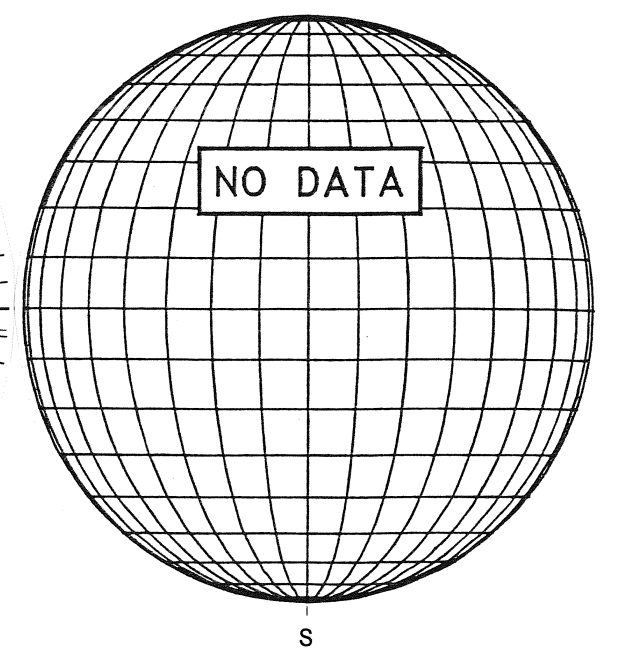
YUNNAN H-ALPHA



HOLLOMAN SUNSPOTS

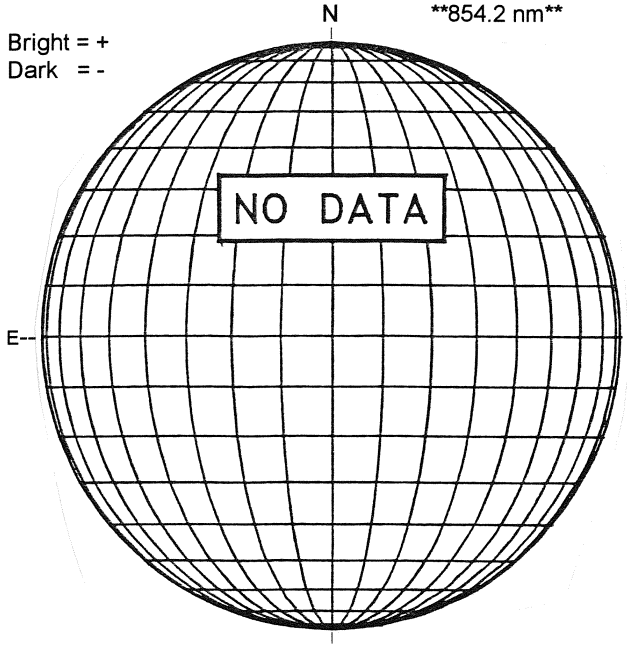


SACRAMENTO PEAK CORONA (1.15 Radii)----

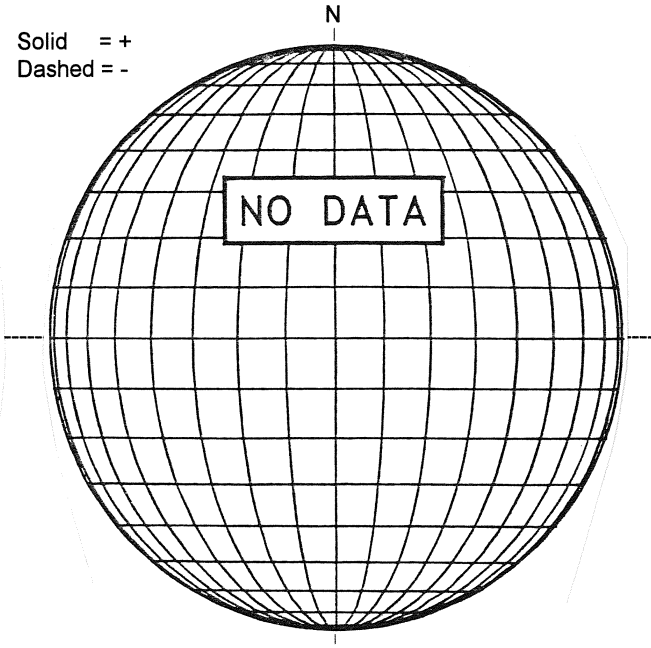


DECEMBER 28, 2004 (P= 3.93, Bo = -2.57, Lo = 66.53)

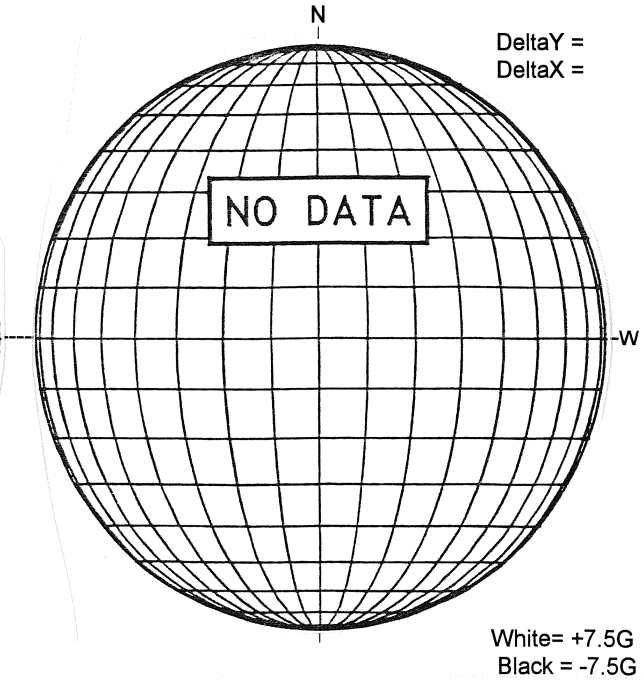
KITT PEAK MAGNETOGRAM--SOLIS



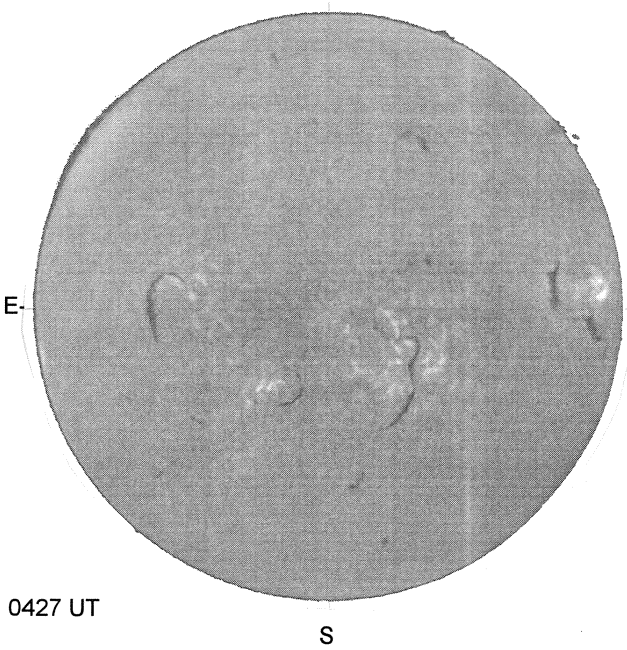
STANFORD MAGNETOGRAM



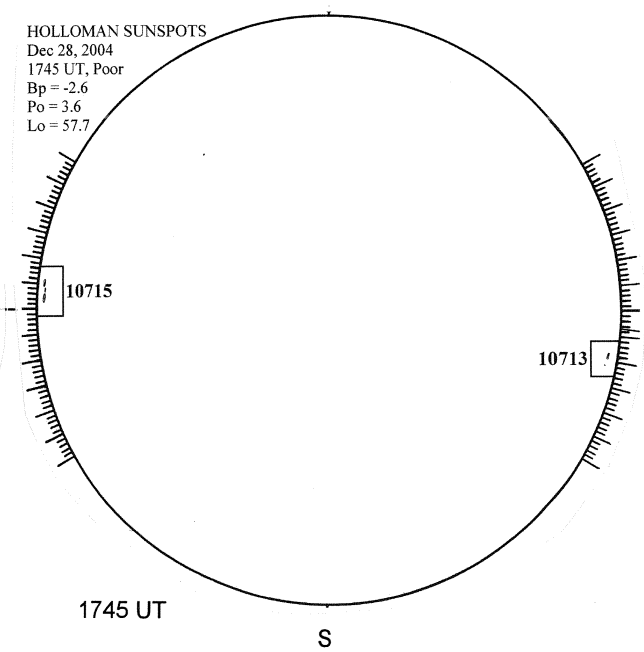
MT. WILSON MAGNETOGRAM



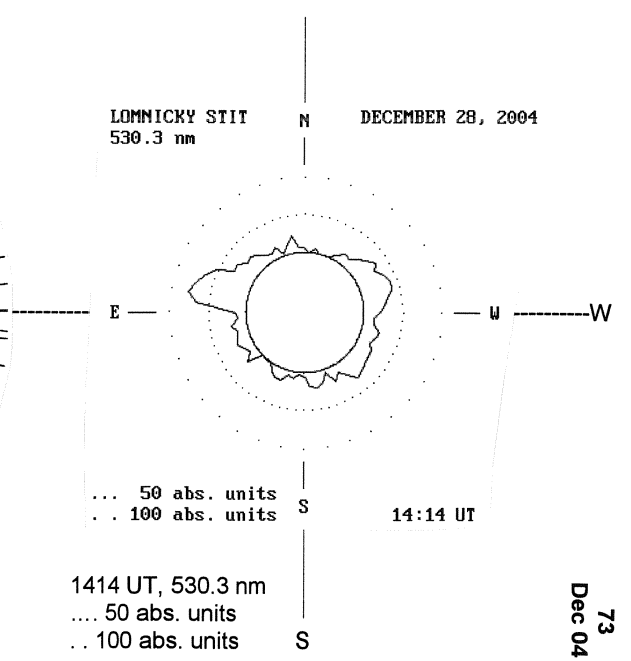
----- YUNNAN H-ALPHA



HOLLOMAN SUNSPOTS



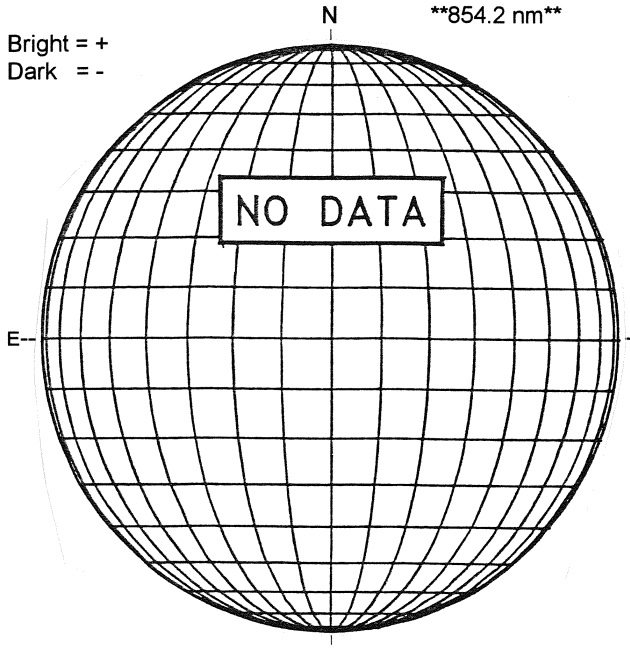
LOMNICKY PEAK CORONA (1.04 Radii)----



DECEMBER 29, 2004 (P= 3.45, Bo = -2.69, Lo = 53.36)

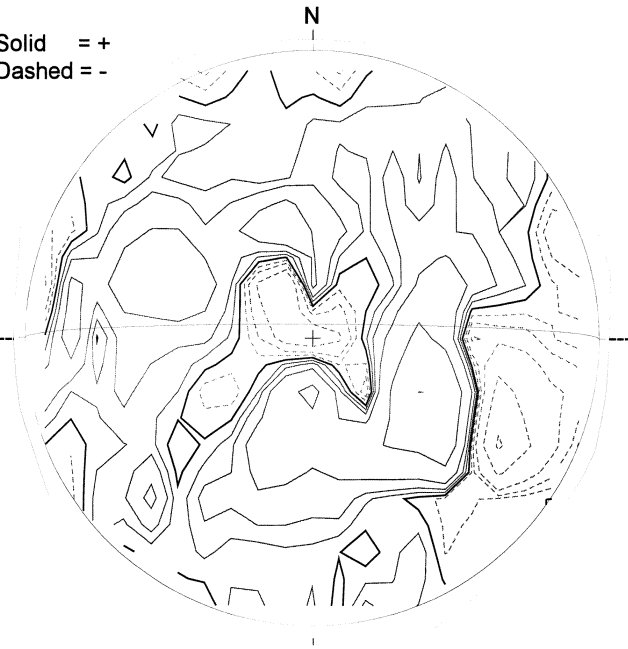
KITT PEAK MAGNETOGRAM--SOLIS

Bright = +
Dark = -



STANFORD MAGNETOGRAM

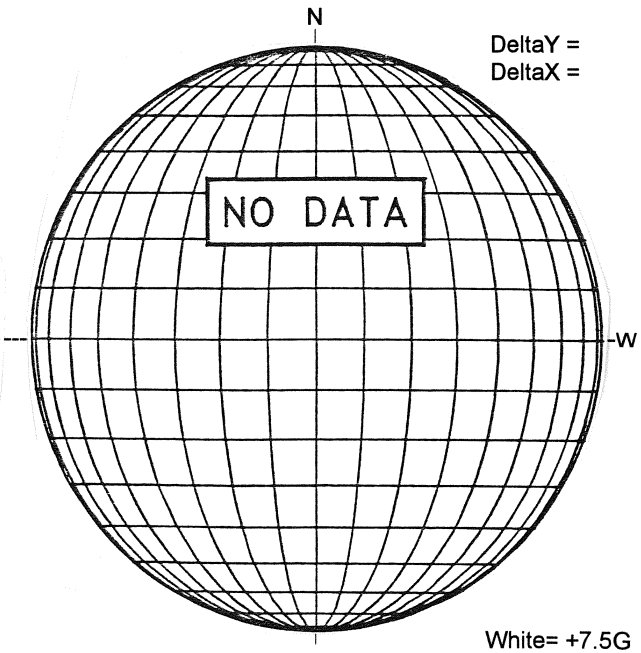
Solid = +
Dashed = -



2110 UT

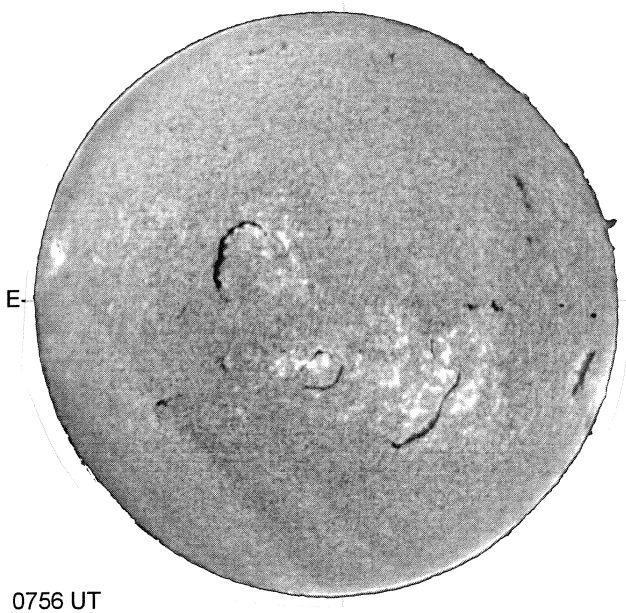
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

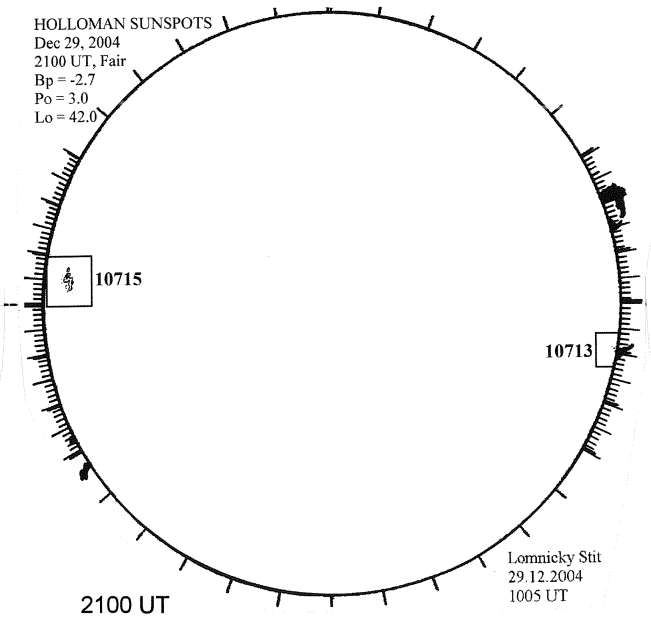
KANZELHOHE H-ALPHA



0756 UT

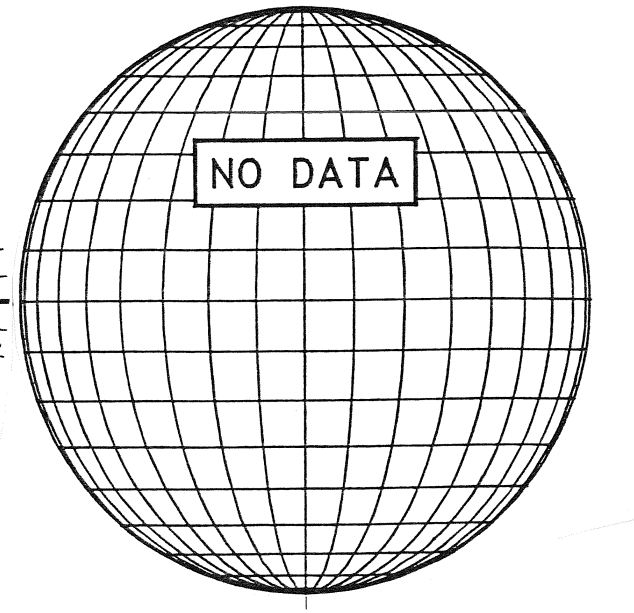
S

HOLLOMAN SUNSPOTS



2100 UT
1005 UT LOMN Prom S

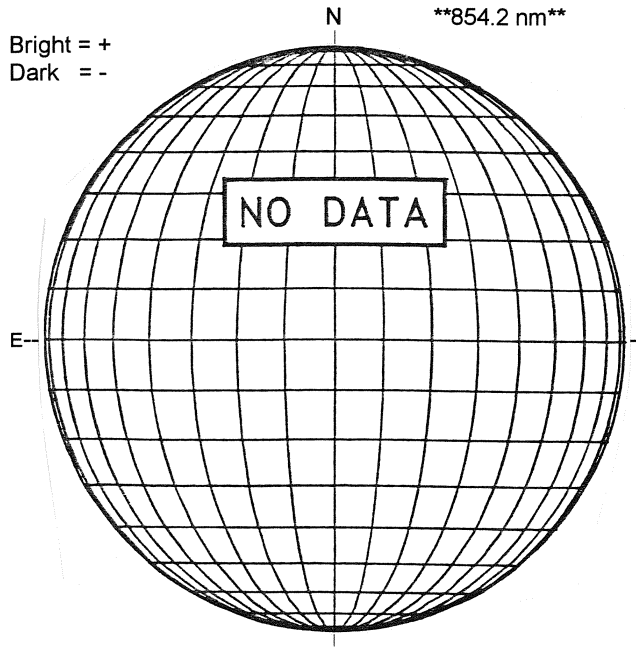
SACRAMENTO PEAK CORONA (1.15 Radii)----



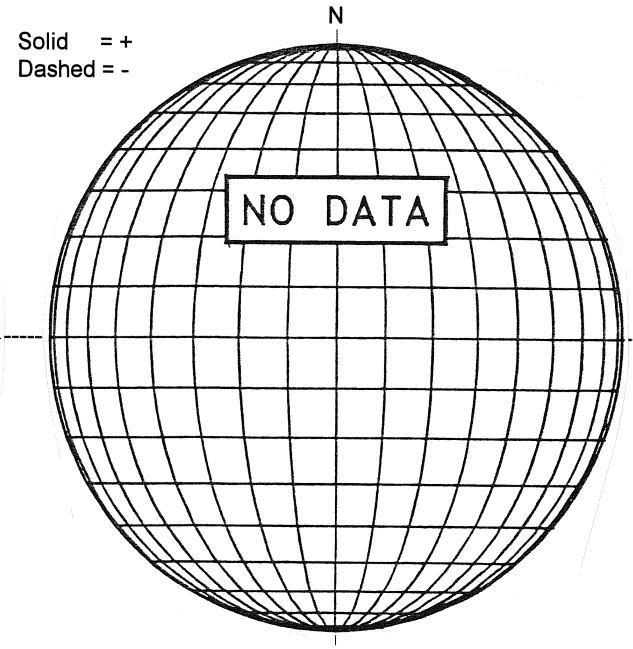
S

DECEMBER 30, 2004 (P= 2.97, Bo = -2.80, Lo = 40.19)

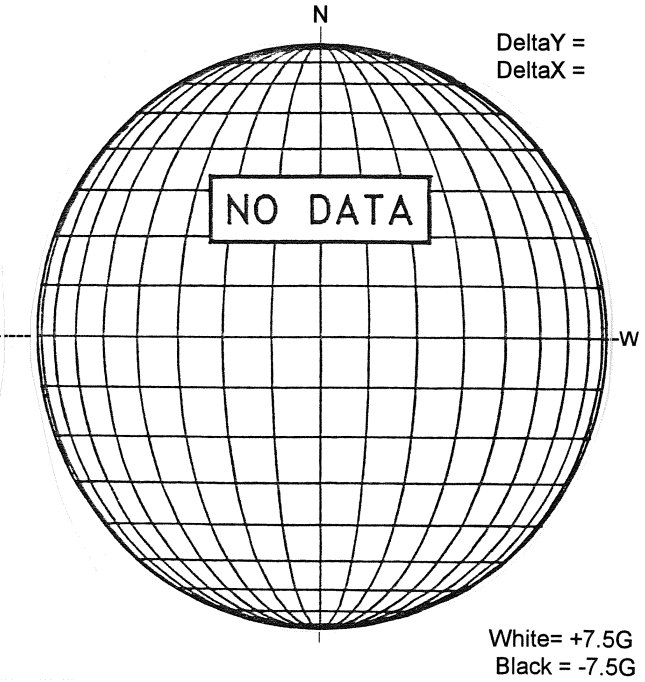
KITT PEAK MAGNETOGRAM—SOLIS



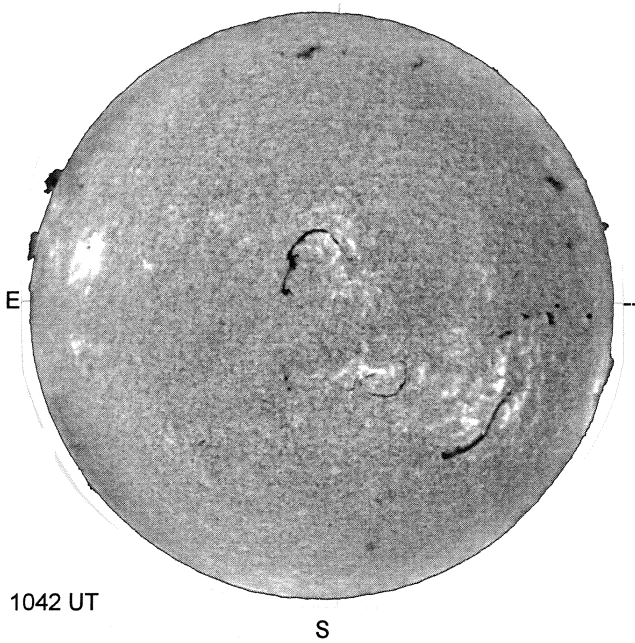
STANFORD MAGNETOGRAM



MT. WILSON MAGNETOGRAM

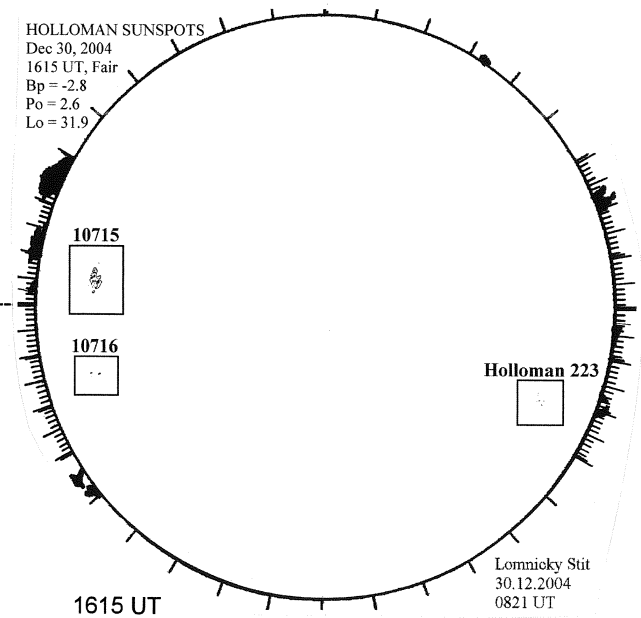


----- KANZELHOHE H-ALPHA



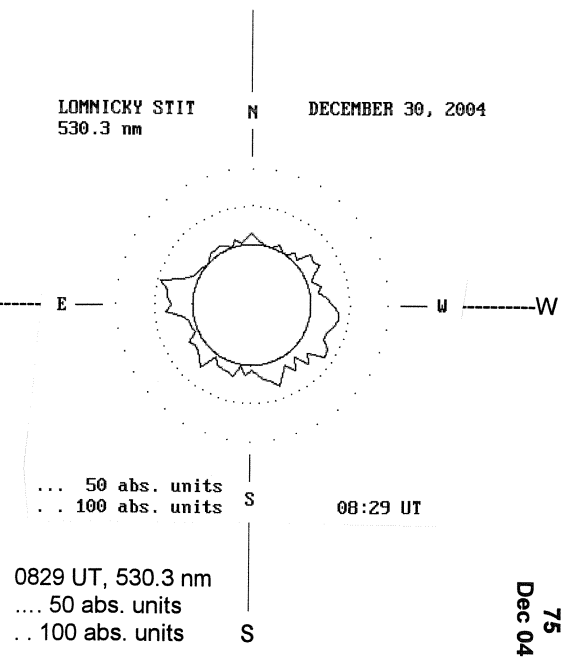
1042 UT

HOLLOMAN SUNSPOTS



1615 UT
0821 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----



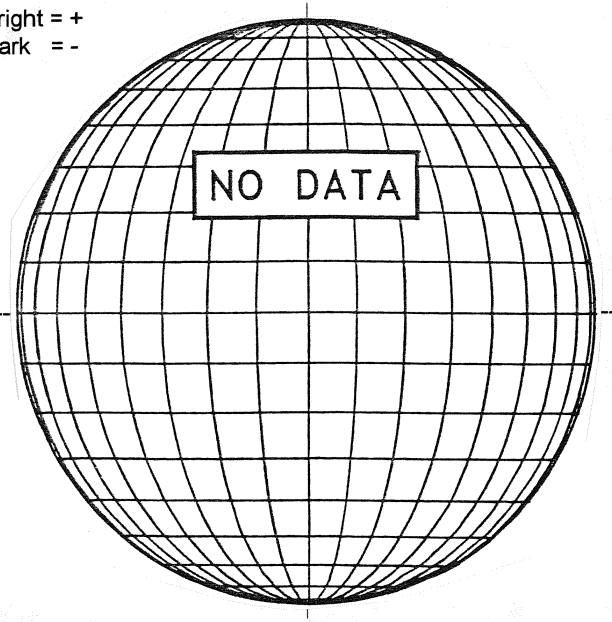
0829 UT, 530.3 nm
.... 50 abs. units
. . 100 abs. units S

DECEMBER 31, 2004 (P= 2.48, Bo = -2.92, Lo = 27.02)

KITT PEAK MAGNETOGRAM--SOLIS

N **854.2 nm**

Bright = +
Dark = -

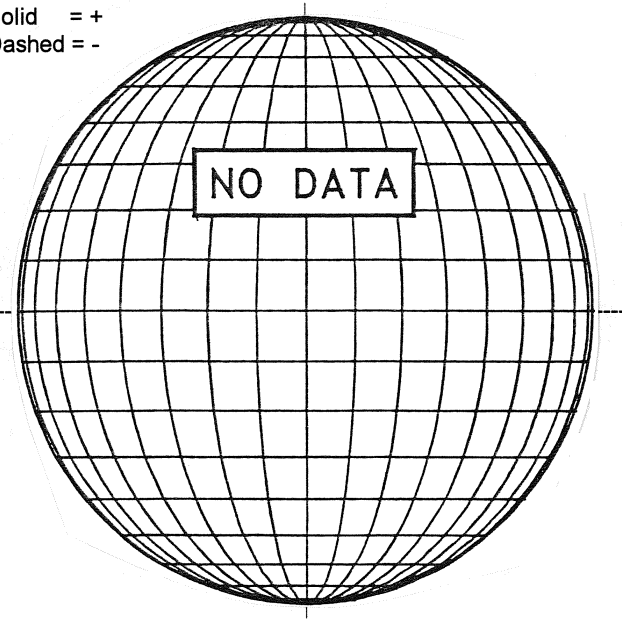


E--

STANFORD MAGNETOGRAM

N

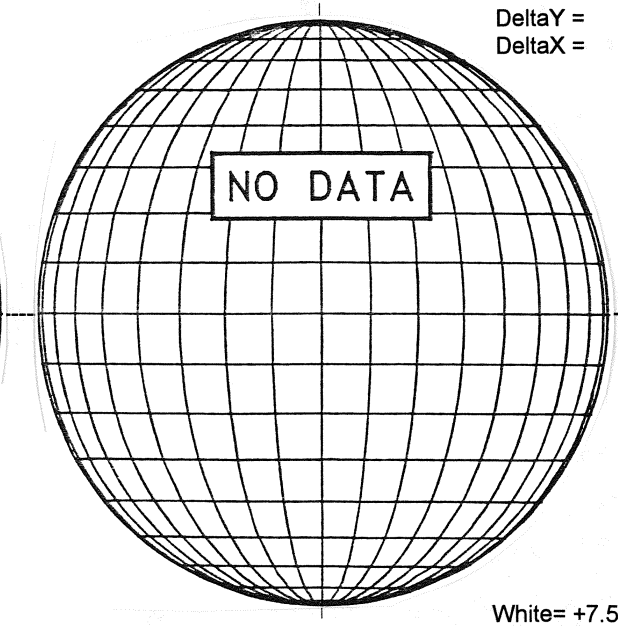
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

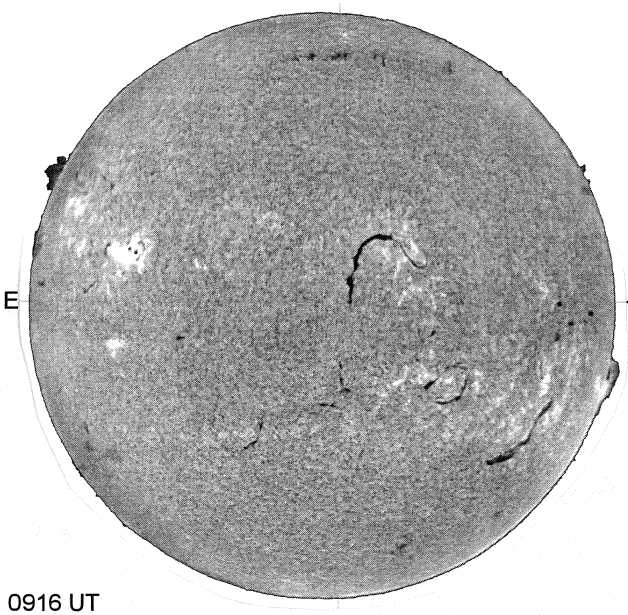
DeltaY =
DeltaX =



-W

White= +7.5G
Black = -7.5G

KANZELHOHE H-ALPHA

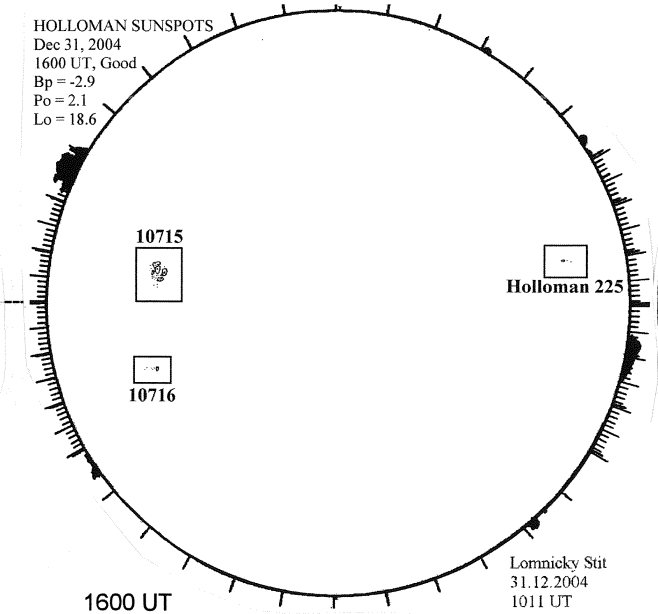


E

0916 UT

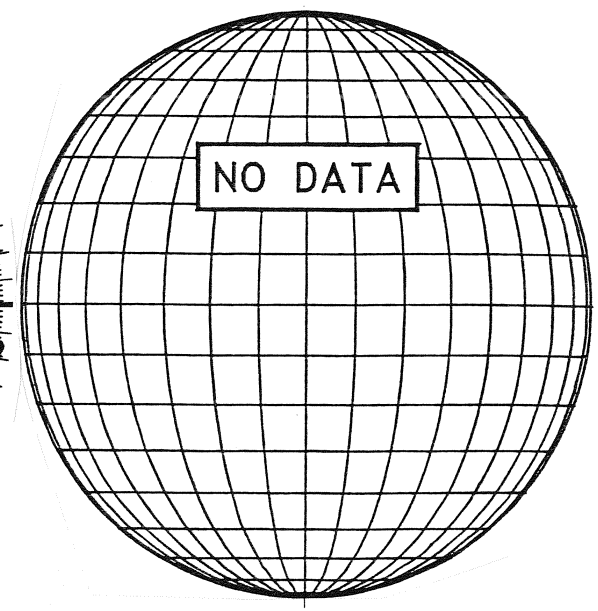
S

HOLLOMAN SUNSPOTS



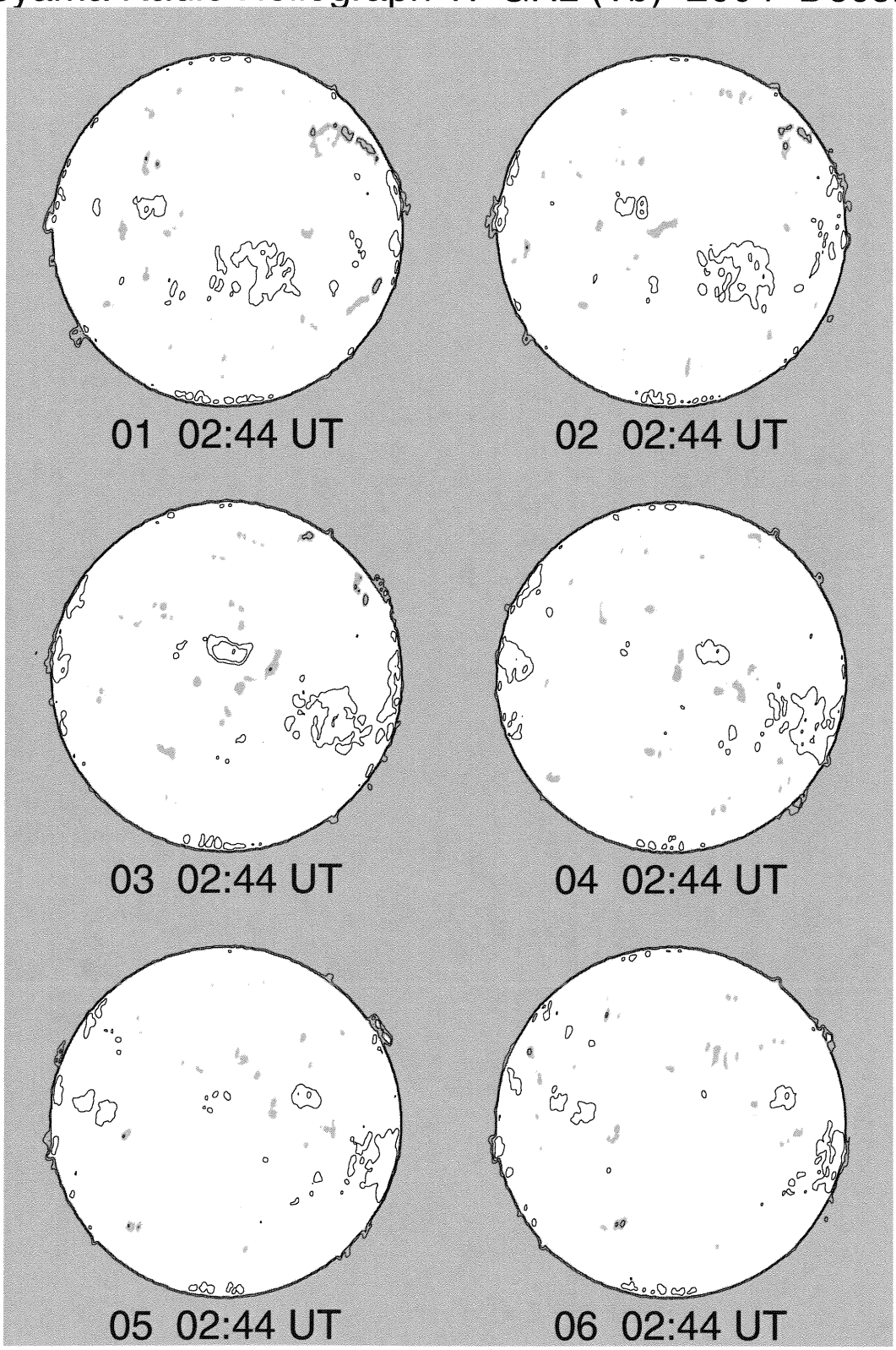
1600 UT
1011 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



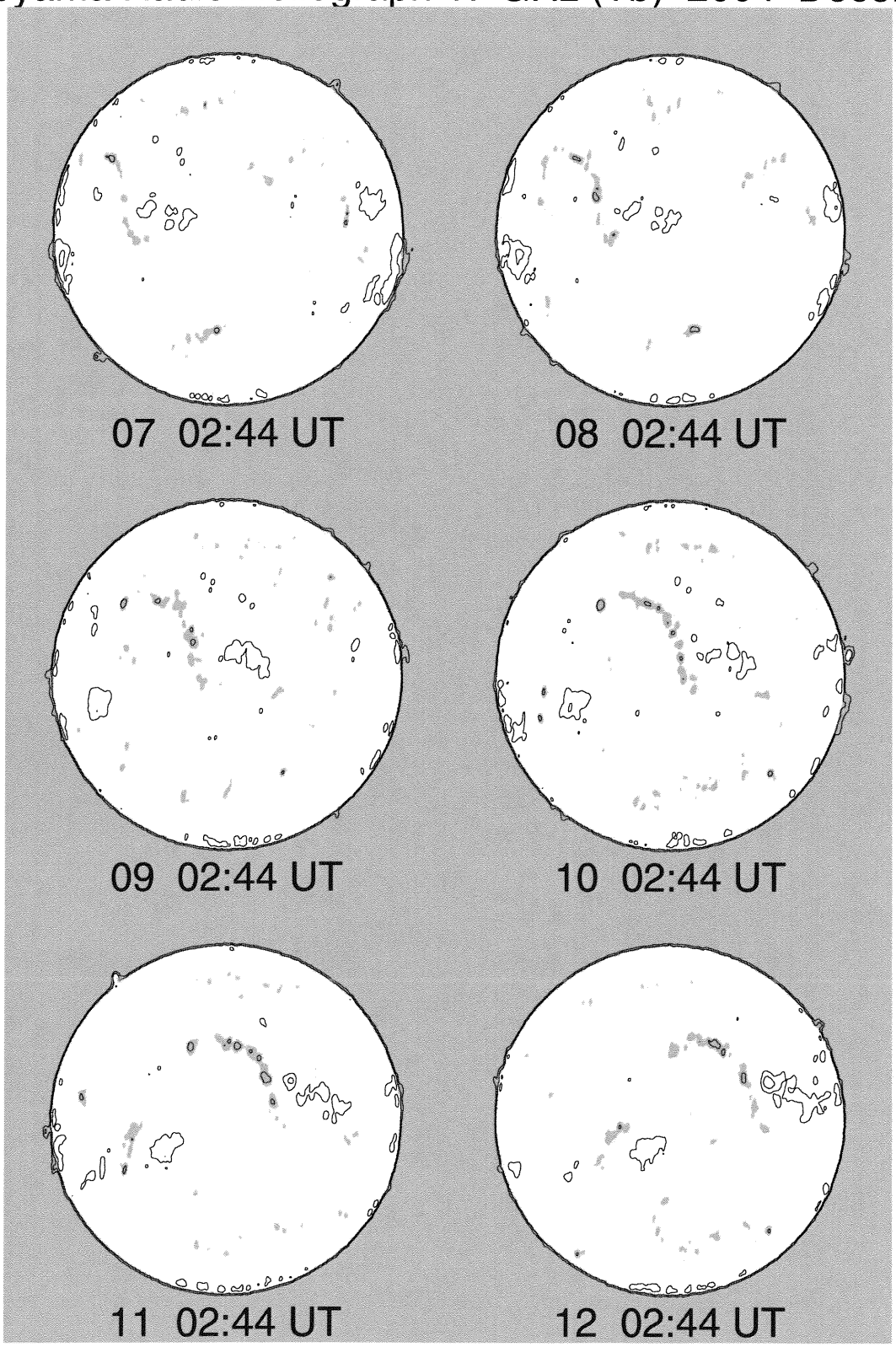
S

Nobeyama Radio Heliograph 17 GHz (Tb) 2004 December



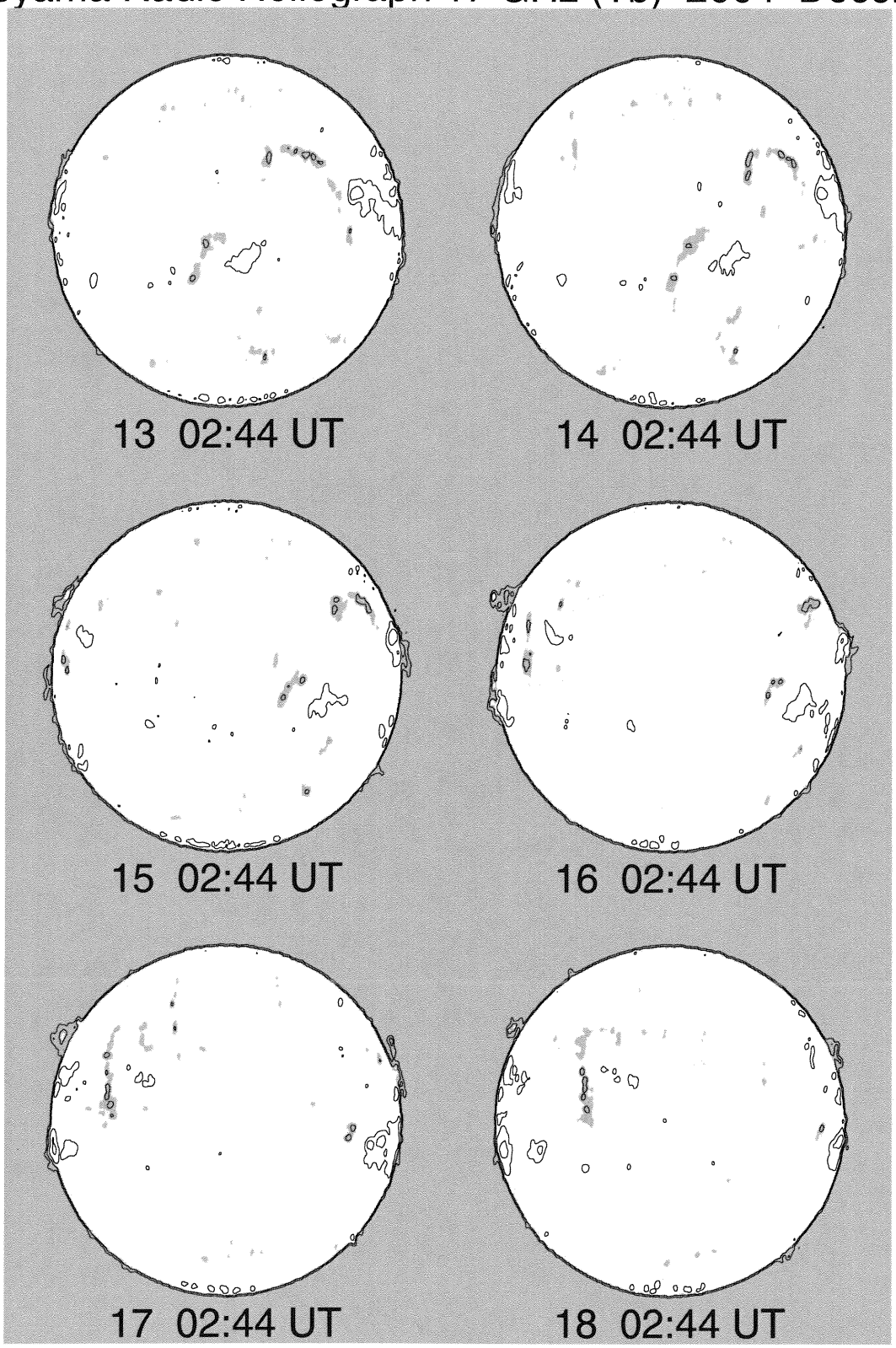
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 2004 December



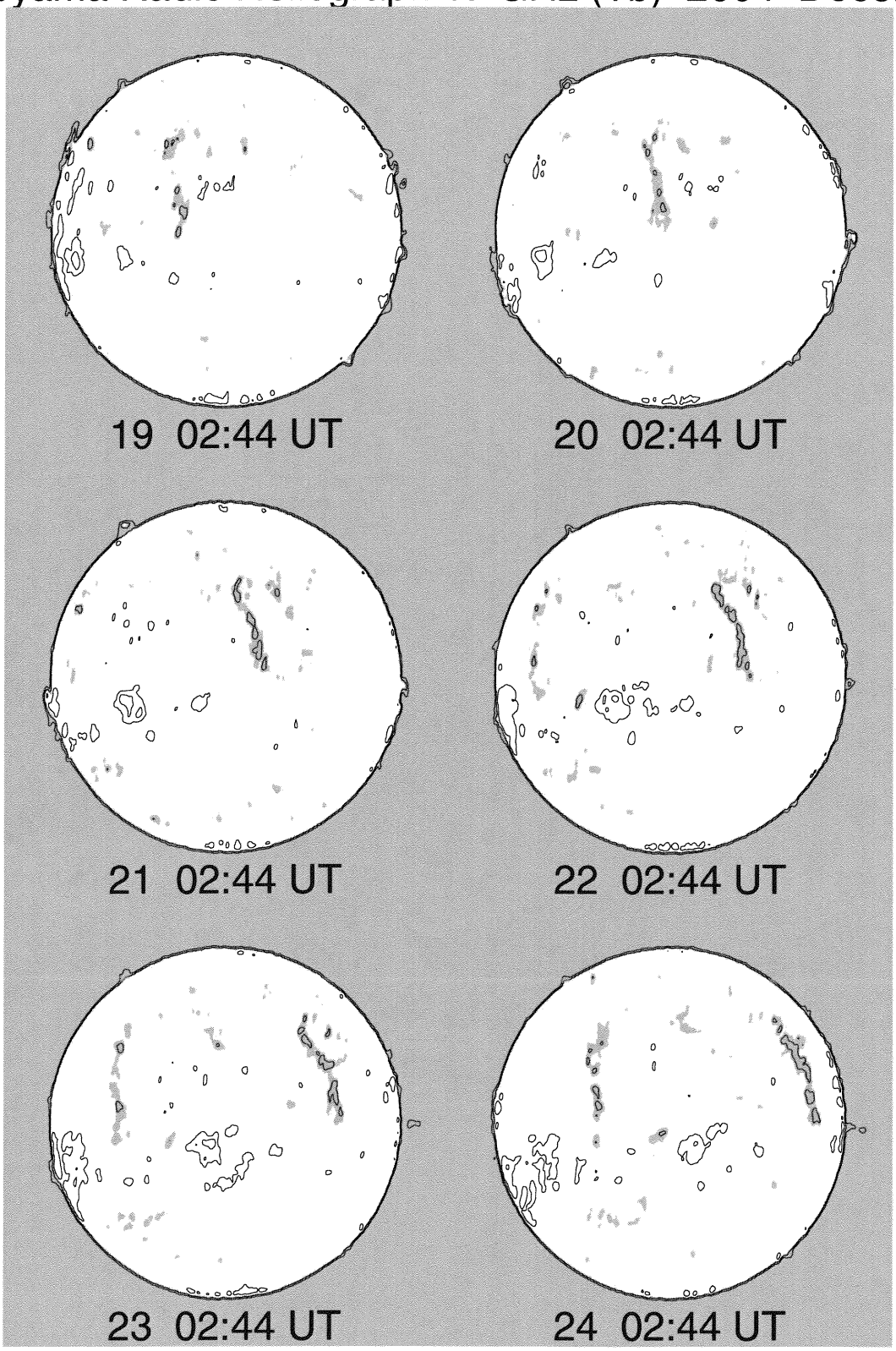
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 2004 December



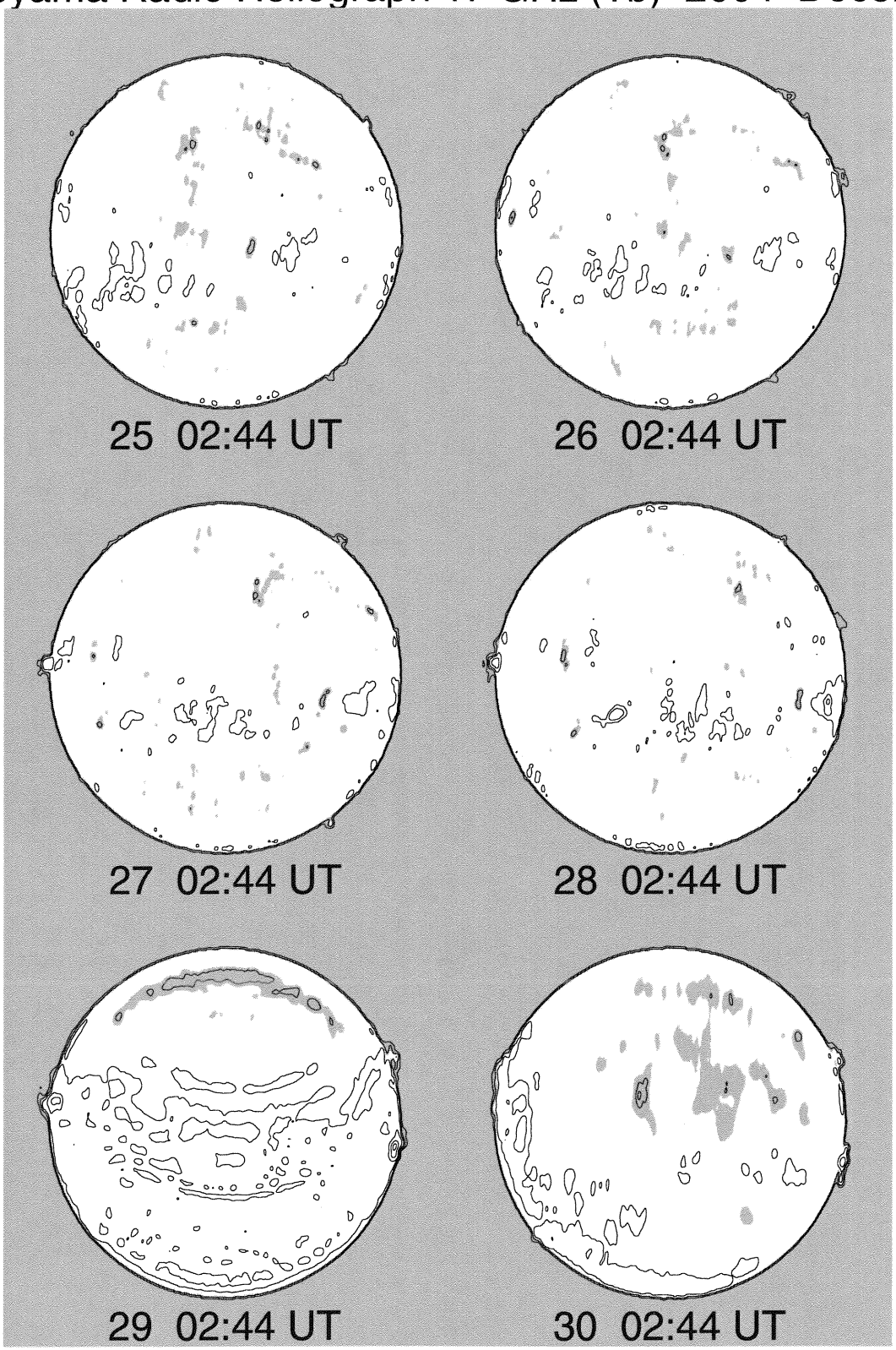
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 2004 December



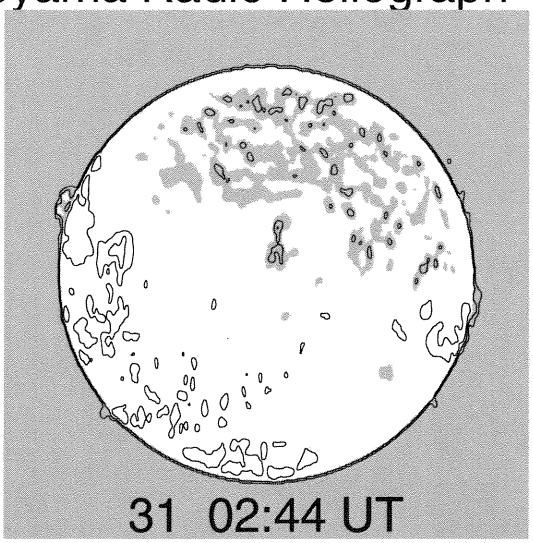
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 2004 December



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

Nobeyama Radio Heliograph 17 GHz (Tb) 2004 December



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

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

DECEMBER 2004

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Mo	Day	Time (UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
10708		HOLL	11	26	1620	N08	E85	12	3.0		A	HAX	120	1	3	3
10708		VORO	11	27	0043	N10	E79	12	3.0			HAX	138	1		3
10708		LEAR	11	27	0117	N11	E78	12	2.9		A	HXX	120	1	1	3
10708		TACH	11	27	0539	N11	E78	12	3.1			HSX	108	1	2	3
10708		SVTO	11	27	0932	N10	E74	12	2.9		A	HSX	60	1	3	3
10708		KAND	11	27	1055	N10	E74	12	3.0			HA		1	1	2
10708		HOLL	11	27	1610	N08	E71	12	3.0		A	HAX	120	2	3	4
10708		LEAR	11	28	0016	N10	E67	12	3.0		B	CSO	150	2	3	3
10708		VORO	11	28	0028	N11	E65	12	2.9			HKX	169	1		3
10708		SVTO	11	28	0715	N11	E67	12	3.3		A	HSX	120	1	3	3
10708		KAND	11	28	0925	N10	E63	12	3.1			HS		1	3	5
10708		VORO	11	29	0012	N10	E52	12	2.9			HKX	167	1		3
10708		LEAR	11	29	0015	N10	E52	12	2.9		A	HSX	130	1	2	4
10708		KAND	11	29	0852	N11	E48	12	3.0			HA		1	3	5
10708		SVTO	11	29	0937	N11	E47	12	2.9		A	HSX	140	1	3	2
10708		HOLL	11	29	1747	N08	E43	12	3.0		A	HKX	200	1	3	2
10708		LEAR	11	30	0001	N10	E39	12	2.9		A	HSX	110	1	2	4
10708		VORO	11	30	0008	N10	E39	12	2.9			HKX	172	1		3
10708		KAND	11	30	0900	N10	E34	12	2.9			HS		1	3	5
10708		HOLL	11	30	1501	N11	E31	12	2.9		A	HKX	170	2	4	2
10708		VORO	12	01	0011	N10	E25	12	2.9			HHX	160	1		3
10708		LEAR	12	01	0037	N08	E25	12	2.9		B	CAI	140	6	6	2
10708		TACH	12	01	0454	N11	E22	12	2.8			HHX	192	1	2	3
10708		KAND	12	01	0810	N10	E21	12	2.9			HS		1	2	4
10708		HOLL	12	01	1514	N10	E19	12	3.1		B	CSO	130	3	4	3
10708		VORO	12	02	0005	N10	E12	12	2.9			HHX	157	1		3
10708		LEAR	12	02	0117	N10	E11	12	2.9		A	HSX	50	1	2	3
10708		TACH	12	02	0539	N10	E09	12	2.9			HSX	154	1	2	2
10708		KAND	12	02	0745	N11	E07	12	2.8			HA		1	2	3
10708		HOLL	12	02	1505	N08	E07	12	3.1		B	DSI	150	16	6	3
10708		LEAR	12	03	0120	N09	W01	12	3.0		B	CSO	170	4	7	3
10708		KAND	12	03	0835	N10	W06	12	2.9			CSO		6	9	3
10708		HOLL	12	03	1455	N08	W07	12	3.1		B	DSI	150	6	9	3
10708		LEAR	12	04	0257	N08	W14	12	3.1		B	CAO	60	2	1	2
10708		TACH	12	04	0555	N10	W16	12	3.0			HSX	135	2	2	4
10708		HOLL	12	04	1615	N10	W22	12	3.0		B	CAO	110	8	3	3
10708		LEAR	12	05	0159	N09	W29	12	2.9		A	HXX	90	1	2	2
10708		TACH	12	05	0848	N11	W33	12	2.9			HSX	121	1	2	4
10708		SVTO	12	05	0903	N09	W34	12	2.8		A	HSX	40	1	3	2
10708		KAND	12	05	1045	N08	W35	12	2.8			HS		1	2	3
10708		HOLL	12	05	1532	N10	W37	12	2.9		A	HSX	80	4	4	2
10708		VORO	12	06	0023	N09	W41	12	2.9			HSX	132	1		2
10708		LEAR	12	06	0104	N09	W42	12	2.9		A	HAX	100	1	2	2
10708		KAND	12	06	0811	N08	W48	12	2.7			HA		1	2	4
10708		SVTO	12	06	1040	N09	W48	12	2.8		A	HSX	110	1	1	2
10708		HOLL	12	06	1815	N11	W48	12	3.1		B	CSO	100	4	6	2
10708		VORO	12	07	0024	N09	W55	12	2.9			HHX	172	3		3
10708		LEAR	12	07	0141	N09	W55	12	2.9		A	HAX	100	1	2	3
10708		SVTO	12	07	0935	N08	W60	12	2.9		A	HSX	80	1	4	3
10708		HOLL	12	07	1830	N10	W67	12	2.7		A	HAX	60	1	2	3
10708		VORO	12	07	2351	N09	W67	12	3.0			HAX	149	2		3
10708		LEAR	12	08	0100	N09	W69	12	2.9		A	HSX	50	1	2	3
10708		TACH	12	08	0555	N10	W72	12	2.8			HSX	50	1	1	4
10708		KAND	12	08	0850	N08	W74	12	2.8			HA		1	2	3
10708		HOLL	12	08	1850	N09	W79	12	2.8		A	HAX	100	1	2	3
10708		LEAR	12	09	0120	N09	W80	12	3.0		A	HSX	60	1	2	3
10709		HOLL	12	02	1505	N03	E78	12	8.4		A	AXX	30	1	1	3
10709		HOLL	12	03	1455	N06	E65	12	8.5		A	AXX	20	1	1	3
10709		LEAR	12	05	0159	N04	E42	12	8.2		A	AXX	10	2	9	2
10709		KAND	12	05	1045	N06	E39	12	8.4			AX		1		3
10709		HOLL	12	05	1532	N07	E36	12	8.3		A	AXX		2	1	2
10709		LEAR	12	06	0104	N04	E27	12	8.1		B	BXO	10	4	17	2
10709		HOLL	12	06	1815	N05	E18	12	8.1		B	BXO	10	3	4	2
10709		LEAR	12	07	0141	N05	E13	12	8.0		A	AXX	10	3	4	3
10709		HOLL	12	07	1830	N05	E04	12	8.1		B	BXO	10	5	2	3
10709		LEAR	12	08	0100	N04	E01	12	8.1		B	BRO	20	8	12	3
10709		HOLL	12	08	1850	N05	W10	12	8.0		B	BXO	10	5	2	3
10709		LEAR	12	09	0120	N05	W09	12	8.4		B	BRO	30	7	7	3

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NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo	Day	(UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
10709		LEAR	12	10	0120	N05	W27	12	8.0		A	AXX	10	1	1	3
10709		HOLL	12	10	1512	N05	W34	12	8.1		A	AXX		1	1	3
10711		HOLL	12	10	1512	N13	W16	12	9.4		B	DSO	20	4	4	3
10711		VORO	12	11	0016	N11	W21	12	9.4			HAX	31	4	2	3
10711		LEAR	12	11	0130	N13	W21	12	9.5		B	DAO	20	3	3	3
10711		TACH	12	11	0619	N12	W24	12	9.4			BRO	32	3	3	2
10711		SVTO	12	11	0838	N13	W27	12	9.3		B	DRO	40	6	4	3
10711		HOLL	12	11	1530	N13	W29	12	9.4		B	DAI	80	10	5	3
10711		LEAR	12	12	0019	N11	W34	12	9.4		B	DAO	90	16	5	3
10711		SVTO	12	12	0820	N13	W37	12	9.5		B	DAO	100	16	7	3
10711		KAND	12	12	0945	N11	W41	12	9.3			CAI		21	8	3
10711		HOLL	12	12	1545	N13	W42	12	9.5		B	DAI	110	15	7	3
10711		VORO	12	13	0022	N12	W46	12	9.5			DAI	123	18	6	3
10711		LEAR	12	13	0039	N13	W46	12	9.5		BG	DAI	150	12	6	3
10711		SVTO	12	13	1414	N13	W57	12	9.3		B	DAO	90	8	7	2
10711		HOLL	12	13	1519	N13	W54	12	9.6		B	DAI	120	15	8	3
10711		LEAR	12	14	0023	N13	W60	12	9.5		BG	DAO	220	12	8	3
10711		SVTO	12	14	0810	N13	W67	12	9.3		B	CSO	110	6	9	3
10711		HOLL	12	14	1620	N14	W70	12	9.4		B	DSO	70	6	5	4
10711		LEAR	12	15	0042	N13	W76	12	9.3		BG	DAO	150	4	6	2
10711		TACH	12	15	0448	N12	W84	12	8.9			HR	100	2	4	2
10710		HOLL	12	07	1830	S12	E59	12	12.2		A	AXX		1	1	3
10710		LEAR	12	08	0100	S07	E59	12	12.5		A	AXX	10	1	1	3
10710		TACH	12	08	0555	S06	E56	12	12.4			AXX	9	1	1	4
10710		KAND	12	08	0850	S07	E56	12	12.6			AX		1	1	3
10710		HOLL	12	08	1850	S08	E49	12	12.4		A	AXX	20	2	1	3
10710		LEAR	12	09	0120	S07	E45	12	12.4		A	AXX	10	1	1	3
10710		TACH	12	09	0609	S06	E42	12	12.4			AXX	10	1	1	3
10710		KAND	12	09	0830	S07	E41	12	12.4			AX		1		3
10710		LEAR	12	10	0120	S07	E31	12	12.4		B	BXO	20	4	3	3
10710		HOLL	12	10	1512	S08	E28	12	12.7		A	AXX		1	1	3
10710		HOLL	12	15	1545	S08	W42	12	12.5		B	CAO	20	4	7	4
10710		LEAR	12	16	0048	S04	W51	12	12.2		A	AXX	20	1	1	3
10710		VORO	12	16	0125	S06	W51	12	12.2			AXX	9	1		3
10710		KAND	12	16	1200	S07	W57	12	12.2			CRO		2	5	1
10710		HOLL	12	16	1522	S07	W56	12	12.4		B	DSO	40	4	5	3
10710		LEAR	12	17	0030	S08	W60	12	12.5		B	EAO	30	5	13	3
10710		VORO	12	17	0439	S07	W61	12	12.6			DAO	77	12	13	3
10710		KAND	12	17	0800	S08	W62	12	12.7			CRI		7	14	4
10710		HOLL	12	17	1542	S05	W67	12	12.6		B	ESI	70	6	12	2
10710		LEAR	12	18	0010	S08	W69	12	12.8		B	CAO	30	3	9	2
10710		VORO	12	18	0202	S07	W74	12	12.5			HAX	13	4		3
10710		HOLL	12	18	1511	S07	W79	12	12.7		A	AXX		1	1	3
10710A		SVTO	12	12	0820	S15	E65	12	17.3		A	AXX		1		3
10710A		HOLL	12	12	1545	S18	E59	12	17.1		A	AXX	10	2	2	3
10710A		VORO	12	13	0022	S16	E54	12	17.1			AXX	10	6		3
10710A		LEAR	12	13	0039	S15	E54	12	17.1		A	AXX	20	1	1	3
10710A		LEAR	12	14	0023	S14	E39	12	17.0		A	AXX	10	1	1	3
10712		LEAR	12	16	0048	S09	E77	12	21.8		A	AXX	30	1	1	3
10712		HOLL	12	16	1522	S10	E68	12	21.7		A	AXX		1	1	3
10712		LEAR	12	17	0030	S09	E62	12	21.7		A	AXX	20	1	2	3
10712		KAND	12	17	0800	S09	E60	12	21.8			BXO		3	4	4
10712		HOLL	12	17	1542	S11	E53	12	21.6		B	DSO	20	4	6	2
10712		LEAR	12	18	0010	S10	E50	12	21.8		B	CAO	20	3	4	2
10712		VORO	12	18	0202	S09	E48	12	21.7			DRO	11	5	4	3
10712		SVTO	12	18	1358	S09	E43	12	21.8		B	BXO	20	4	5	3
10712		HOLL	12	18	1511	S10	E41	12	21.7		B	DSI	40	8	6	3
10712		VORO	12	19	0126	S09	E35	12	21.7			DAO	14	4	3	3
10712		HOLL	12	19	1508	S11	E28	12	21.7		B	BXO	10	2	4	3
10714		LEAR	12	22	0030	S03	E11	12	22.8		B	DSO	20	2	2	2
10714		VORO	12	22	0053	S04	E10	12	22.8			BRI	22	3	4	3
10714		HOLL	12	22	1850	S04	E01	12	22.8		B	CAO	10	2	3	4
10714		VORO	12	23	0034	S04	W05	12	22.6			ARX	8	1		3
10714		LEAR	12	23	0104	S03	W04	12	22.7		B	BXX	20	6	4	2

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NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo	Day	(UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
10714		LEAR	12	24	0030	S04	W16	12	22.8		B	DAO	30	5	4	3
10714		VORO	12	24	0052	S04	W17	12	22.8			BRO	11	5	3	3
10714		TACH	12	24	0442	S02	W18	12	22.8			BXO	8	2	4	3
10714		KAND	12	24	0735	S04	W21	12	22.7			BXO		2	4	3
10714		SVTO	12	24	0747	S04	W21	12	22.7		B	CRO	30	2	4	3
10714		HOLL	12	24	1720	S03	W27	12	22.7		B	CRO	10	2	5	4
10714		HOLL	12	25	1518	S03	W36	12	22.9		A	AXX		1	1	3
10713		LEAR	12	17	0030	S09	E84	12	23.3		A	AXX	30	1	5	3
10713		KAND	12	17	0800	S08	E82	12	23.5			HA		1	4	4
10713		HOLL	12	17	1542	S11	E72	12	23.1		A	HAX	120	1	1	2
10713		LEAR	12	18	0010	S10	E70	12	23.3		A	HKX	120	1	3	2
10713		VORO	12	18	0202	S09	E68	12	23.2			HKX	118	1		3
10713		KAND	12	18	1100	S09	E65	12	23.3			HS		1	2	1
10713		SVTO	12	18	1358	S09	E63	12	23.3		A	HSX	80	2	2	3
10713		HOLL	12	18	1511	S11	E65	12	23.5		B	DAO	110	4	7	3
10713		VORO	12	19	0126	S09	E55	12	23.2			HKX	162	1		3
10713		KAND	12	19	0650	S09	E54	12	23.3			HS		1	4	1
10713		SVTO	12	19	0855	S10	E52	12	23.3		A	HSX	130	1	3	3
10713		HOLL	12	19	1508	S11	E52	12	23.5		B	CSO	100	7	10	3
10713		LEAR	12	20	0108	S07	E45	12	23.4		BG	CSI	190	16	9	3
10713		VORO	12	20	0146	S10	E42	12	23.2			HHX	219	12		3
10713		TACH	12	20	0553	S08	E45	12	23.6			CAI	195	9	9	3
10713		HOLL	12	20	1530	S11	E38	12	23.5		BG	EAI	230	24	11	3
10713		VORO	12	21	0043	S10	E28	12	23.1			HKX	231	8		3
10713		LEAR	12	21	0143	S08	E34	12	23.6		BG	EAI	210	15	11	3
10713		TACH	12	21	0553	S10	E30	12	23.5			CAO	196	4	9	3
10713		LEAR	12	22	0030	S09	E20	12	23.5		BG	FSI	190	20	16	2
10713		VORO	12	22	0053	S10	E14	12	23.1			HKX	285	8		3
10713		HOLL	12	22	1850	S10	E09	12	23.5		BG	FAI	190	27	16	4
10713		VORO	12	23	0034	S11	E00	12	23.0			HKX	225	7		3
10713		LEAR	12	23	0104	S08	E10	12	23.8		BG	FAC	230	29	17	2
10713		SVTO	12	23	0920	S09	W02	12	23.2		B	DAO	180	13	8	2
10713		LEAR	12	24	0030	S06	W10	12	23.3		BG	EAI	220	26	15	3
10713		VORO	12	24	0052	S10	W10	12	23.3			CKI	218	13	6	3
10713		TACH	12	24	0442	S08	W12	12	23.3			CSI	115	5	5	3
10713		KAND	12	24	0735	S11	W15	12	23.2			DAO		7	7	3
10713		SVTO	12	24	0747	S09	W14	12	23.3		B	DSO	180	10	8	3
10713		HOLL	12	24	1720	S09	W17	12	23.4		B	EAI	170	24	13	4
10713		LEAR	12	25	0034	S10	W23	12	23.3		B	DAI	150	15	7	3
10713		VORO	12	25	0130	S03	W23	12	23.3			AXX	7	4		3
10713		VORO	12	25	0130	S10	W24	12	23.2			CKI	175	9	6	3
10713		TACH	12	25	0500	S08	W26	12	23.2			CAI	130	6	7	3
10713		SVTO	12	25	0755	S09	W28	12	23.2		B	CSO	100	5	6	3
10713		KAND	12	25	1042	S12	W32	12	23.0			CAO		9	6	4
10713		HOLL	12	25	1518	S08	W32	12	23.2		B	DSI	100	5	8	3
10713		LEAR	12	26	0051	S10	W37	12	23.2		A	HAX	120	7	4	3
10713		VORO	12	26	0118	S11	W39	12	23.1			HAX	147	9		3
10713		TACH	12	26	0523	S09	W43	12	23.0			HR	124	3	2	2
10713		LEAR	12	27	0050	S09	W52	12	23.1		A	HAX	100	1	3	3
10713		VORO	12	27	0058	S10	W52	12	23.1			HAX	153	1		3
10713		KAND	12	27	1150	S12	W61	12	22.9			HS		1	2	3
10713		SVTO	12	27	1429	S11	W59	12	23.2		A	HSX	110	1	2	1
10713		HOLL	12	27	1955	S09	W65	12	22.9		B	CSO	80	2	3	2
10713		LEAR	12	28	0030	S11	W67	12	23.0		B	DAO	160	7	6	3
10713		VORO	12	28	0044	S11	W66	12	23.1			HAX	121	4	0	3
10713		KAND	12	28	1020	S12	W73	12	22.9			CAO		4	5	3
10713		SVTO	12	28	1117	S11	W72	12	23.0		B	DSO	110	5	2	3
10713		HOLL	12	28	1745	S10	W76	12	23.0		B	CSO	50	2	7	2
10713		VORO	12	29	0025	S11	W78	12	23.1			AXX	19	2	2	3
10713		LEAR	12	29	0040	S11	W80	12	23.0		B	EAI	150	4	12	2
10713		HOLL	12	29	2100	S10	W83	12	23.6		B	BXO	10	2	8	3
10713F		VORO	12	21	0043	S10	E38	12	23.9			AXX	8	6		3
10713F		VORO	12	22	0053	S10	E24	12	23.8			AXX	16	5		3
10713F		VORO	12	23	0034	S10	E10	12	23.8			AXX	6	3		3
10713F		VORO	12	24	0052	S11	W03	12	23.8			AXX	1	1		3
10713G		VORO	12	21	0043	N04	E53	12	25.0			AXX	4	3		3

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

DECEMBER 2004

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo	Day	(UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
10713A		HOLL	12	30	1615	S20	W53	12	26.6		B	BXO	10	6	4	3
10713B		LEAR	12	29	0040	S21	W21	12	27.4		A	AXX	10	1	1	2
10717		HOLL	12	31	1600	N07	W52	12	27.8		B	CAO	10	3	3	4
10717		LEAR	01	01	0135	N06	W60	12	27.7		A	AXX		1		3
10717		HOLL	01	01	1630	N08	W70	12	27.5		B	CAO	30	4	3	3
10717		LEAR	01	02	0110	N08	W75	12	27.5		B	CSO	60	4	3	2
10717		VORO	01	02	0156	N08	W72	12	27.8			AXX	85	2		3
10717		SVTO	01	02	1010	N08	W79	12	27.6		B	DSO	150	2	5	3
10713D		LEAR	12	27	0050	S12	E14	12	28.1		A	AXX	10	1	1	3
10713D		VORO	12	27	0058	S16	E13	12	28.0			AXX	5	2	3	3
10713E		LEAR	12	29	0040	S15	E03	12	29.2		A	AXX	10	1	1	2

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
DECEMBER 2004

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Flare (UT)	X-ray Class	NOAA Region
01	0710	0724	0840	2	3		1			1	0700	M1.1	10708
01	1257	1303	1305	1-	1					1	1257	C1.3	10707
01	1601	1604	1612	1-	3					3	1558	C2.6	10707
01	1618	1622	1629	1-	5					5	1614	C4.2	10707
01	1828	1835	1846	1-	1					1	1821	C1.5	10707
01	1908	1912	1925	1-	1					1	No flare		
02	2359	2405	2415	1-	1					1	2344	M1.5	10708
03	1357	1412	1428	1	1		1				*		
04	1028	1046	1140	1	1		1				*		
07	0909	0929	1045	2	1		1				*		
07	1603	1625	1745	3	1					1	No flare		
07	1608	1635	1758	3	3					2	No flare		
08	1104	1114U	1152	1	1		1				*		
08	1213	1226	1315	1	1		1				*		
09	1034	1043	1154	1	1		1				*		
10	0734	0803	0840	2	1		1				0742	B1.1	
10	0915	0947	1016	2	1		1				0945	B1.2	
10	1033	1037U	1059	1	1		1				*		
12	1033	1059	1158	1	1		1				1106	B1.8	
12	1543	1611	1742	3	3					2	No flare		
15	0916	0951	1033	1	1		1				0955	B6.2	
15	1219	1231	1328	1	1		1				*		
17	1202	1224	1250	1	1		1				*		
18	0934	0938U	1148	1	1		1				No flare		
19	0401	0412	0445	2	1					1	0349	C1.8	10713
20	1312	1326U	1336	1	1		1				*		
21	1042	1102U	1200	1	1		1				*		
21	1202	1214U	1253	1	1		1				1219	B3.7	
22	1058	1207U	1213	1	1		1				*		
23	0956	1007	1027	1+	5		1			4	0957	C5.1	10713
26	1237	1243	1247	1-	1					1	1232	B9.9	10713
27	2130	2131	2220	2-	3					2	*		
28	0008	0011	0042	2	1					1	0004	C7.2	10713
28	0606	0611	0633D	1+	1					1	0600	C2.3	10713
28	0633E	0635	0645	1-	1					1	0628	C2.4	10713
28	0913	0916	0933	1	3					2	0911	C3.5	10713
28	1232	1237	1319	1	3		1			1	1228	C4.3	10713
28	1540	1554	1618	1+	3					5	1545	C4.1	10713
28	1742	1756	1846	2	3					7	1741	C7.2	10715
28	2029	2031	2042	1-	1					1	2025	C1.9	10715
28	2059	2103	2117	1	1					1	2051	C3.5	10713
29	0800	0821	0858	2+	1					1	0734	C2.6	10713
29	1332	1341	1353	1	5					4	1325	C2.5	10713
29	1436	1444	1452	1-	1					1	1434	B6.3	10713
29	1616	1628	1712	2	5		1			7	1557	M2.3	10715
29	1914	1921	1949	2-	3					3	1910	M1.4	10713

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 2004

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Flare (UT)	X-ray Class	NOAA Region
30	0620	0626	0650	1+	3					3	0617	C2.5	10715
30	0739	0742	0759	1	3					4	0738	C1.6	10715
30	1009	1013	1036	1	3		1			1	1010	C1.3	10715
30	1037	1046	1202	2	5		1			5	1034	M2.2	10715
30	1116	1117	1122	1-	1					1	No flare		
30	1212	1221	1232	1-	5					2	1214	C2.6	10715
30	2149	2155	2206D	1-	1					1	2141	C4.1	10715
30	2207	2215	2310	2+	3					2	2202	M4.2	10715
31	0418	0438	0603	3	1					1	0411	C5.7	10715
31	1217	1246U	1322	1	1		1				1210	B7.2	10715
31	1443	1449	1516	1+	5		1			10	1438	M1.2	10715

* = no flare patrol.

OBSERVATORIES REPORTING FOR DECEMBER 2004

Alberta, Canada	SES	Milan, Italy	SES
Amherst, New Hampshire, USA	SES	Palo Alto, California, USA	SES
Bedford, Massachusetts, USA	SES	Sofia, Bulgaria	SES
Brookline, Massachusetts, USA	SES	Sussex, United Kingdom	SES
Edenvale, Rep of S. Africa	SES	Torrington, Connecticut, USA	SES
Houston, Texas, USA	SES	Tucson, Arizona, USA	SES
Hudson, Ohio, USA	SES	Udine City, Italy	SES
Isola del Gran Sasso, Italy	SES	Upice, Czech Republic	SEA
Marlborough, Massachusetts, USA	SES	Villiersdorp, South Africa	SES

Observations are not necessarily continuous.

SOLAR RADIO EMISSION
Spectral Observations

DECEMBER 2004

Day	OBSERVATION Start (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
01			IZMI	0658.0	0658.2	III	G	1	45	160	
	0700	1200	IZMI	0700.0E	1200.0D	I	n	1	130U	270X	
			LEAR	0703.0	0727.0	III	N	1	25	180	
			LEAR	0703.0	0730.0	III	N	1	25	180	
			SVTO	0703.0	0756.0	IV		1	25	180	
	0000	0724	HIRA	0703.0		IV		1	80	1200	
	0000	0800	CULG	0703.0	0800.0D	IV		1	25	650	
			IZMI	0703.5	0705.0	III	G,C	2	30	160	
			CULG	0704.0	0730.0	III	N	3	20	180	
			IZMI	0704.0U	0805.0U	IV	P	2	45U	270X	
			IZMI	0705.8	0712.1	III	GG	1	45U	270	
			IZMI	0708.1	0708.6	III	GG,FS	2	30	250	
	0830	1440	BLEN	0845.6	0855.0	III	GG,S	3	230	500	
			IZMI	0854.7	0854.9	III	G	2	230	270X	
			BLEN	1007.0	1009.5	III	GG,S	3	200	1800	
			IZMI	1007.0	1007.4	III	G	2	200	270X	
	0813	1329	ONDR	1009.0	1009.2	DCIM	G	2	800X	2000X	
			BLEN	1301.0	1307.6	III	GG,S	3	360	1000	
			SGMR	1305.0	1307.0	III		1	30	61	
	2000	2400	CULG								
	2130	2400	HIRA								
02	0000	0724	HIRA	0349.0	0349.5	III	B	1	210	310	
	0000	0800	CULG	0349.0	0349.0	III	B	1	250	650	
	0702	1200	IZMI								
	0835	1440	BLEN	1235.5	1240.2	III	GG,C	3	200	4000X	
	0815	1328	ONDR	1239.1	1240.2	DCIM	GG	2	800X	1672	
			BLEN	1434.7	1435.4	III	GG	2	200	600	
			SGMR	1435.0	1436.0	V		1	30	69	
			SVTO	1435.0	1435.0	III		1	25	46	
	2000	2400	CULG	2348.0	2351.0	III	G	1	20	1300	
			LEAR	2349.0	2349.0	III		1	25	91	
	2131	2400	HIRA	2349.5	2350.0	III	B	1	25X	70	
			CULG	2352.0	2400.0D	IV		1	220	1200	
			PALE	2352.0	2359.0	II		2	25	180	ESS 0622
			CULG	2353.0	2355.0	II	FN	3	45	90	
			CULG	2353.0	2358.0	II	SH	3	60	190	FLA ESS 1000
			CULG	2353.0	2400.0D	III	G	3	18X	170	
			HIRA	2353.0	2357.0	II		3	40	120	
			LEAR	2353.0	0037.0	III	N	1	25	180	
			LEAR	2353.0	2357.0	II		2	38	128	ESS 0745
			LEAR	2357.0	0052.0	IV		2	25	180	
			HIRA	2358.0	0058.0	IV		2	50	2000	
03	0000	0723	HIRA								
			CULG	0000.0E	0003.0	III	G	3	20	150	
			PALE	0000.0	0000.0	IV		1	70	180	
	0000	0800	CULG	0000.0E	0058.0	IV	FS	2	25U	1700	
			CULG	0005.0	0056.0	III	S,C	1	20	180	
			CULG	0010.0	0010.0	III	B	3	20	100	
			CULG	0105.0	0152.0	IV	FS	1	100	800	
	0655	1200	IZMI								
	0817	1327	ONDR	1304.5	1305.3	DCIM	G	1	973	2000X	
	0840	1435	BLEN	1304.8	1305.6	III	GG,RS	2	330	3600	
	2000	2400	CULG								
	2132	2400	HIRA								
04	0000	0723	HIRA								
	0000	0800	CULG								
	0705	1200	IZMI								
	0819	1326	ONDR								
	0840	1435	BLEN								
	2000	2400	CULG								
	2133	2400	HIRA								
05	0000	0723	HIRA								
	0000	0800	CULG	0507.0	0509.0	III	G	1	60	80	
			CULG	0522.0	0522.0	III	B	1	23	170	
			CULG	0615.0	0617.0	III	G	1	35	180	

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

DECEMBER 2004

OBSERVATION Day	Start (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
05	0702	1200	IZMI								
	0820	1325	ONDR								
	0840	1435	BLEN								
	2000	2400	CULG								
	2134	2400	HIRA								
06	0000	0723	HIRA								
	0000	0800	CULG								
	0655	1200	IZMI								
	0822	1324	ONDR								
	0840	1435	BLEN								
	2000	2400	CULG								
	2134	2400	HIRA								
07	0000	0723	HIRA								
	0000	0800	CULG								
	0700	1200	IZMI								
	0823	1324	ONDR								
	0845	1435	BLEN								
	2000	2400	CULG								
	2135	2400	HIRA								
08	0000	0723	HIRA								
	0000	0800	CULG								
	0655	1200	IZMI								
	0825	1323	ONDR								
	0845	1435	BLEN								
			PALE	1945.0	2004.0	II		1	25	85	ESS 0808
	2000	2400	CULG								
	2136	2400	HIRA								
			LEAR	2201.0	0811.0	CONT		1	67	180	
09	0000	0723	HIRA								
	0000	0800	CULG								
	0700	1200	IZMI								
	0826	1322	ONDR								
	0850	1435	BLEN								
	2000	2400	CULG								
	2137	2400	HIRA								
10	0000	0723	HIRA								
	0000	0800	CULG								
	0700	1200	IZMI								
	0828	1322	ONDR								
	0850	1435	BLEN								
	2000	2400	CULG								
	2138	2400	HIRA								
11	0000	0724	HIRA								
	0000	0800	CULG								
	0700	1200	IZMI								
	0829	1322	ONDR								
	0850	1435	BLEN								
	2000	2400	CULG	2025.0	2026.0	III	G	1	23	45	
			CULG	2054.0	2105.0	III	G	1	20	150	
	2139	2400	HIRA								
			CULG	2143.0	2143.0	III	B	3	18	60	
			CULG	2153.0	2155.0	III	G	3	18	80	
12	0000	0724	HIRA								
	0000	0800	CULG								
	0700	1200	IZMI								
	0830	1321	ONDR								
	0850	1435	BLEN								
	2000	2400	CULG								
	2139	2400	HIRA								
13	0000	0724	HIRA								
	0000	0800	CULG								

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

DECEMBER 2004

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
13	0705	1200	IZMI								
	0831	1321	ONDR								
	0850	1440	BLEN								
	2000	2400	CULG								
	2140	2400	HIRA								
14			LEAR	0640.0	0640.0	III		1	25	137	
	0000	0725	HIRA	0640.0	0640.5	III	B	1	90	120	
	0000	0800	CULG	0640.0	0642.0	III	G	1	50	160	
	0700	1200	IZMI								
	0832	1321	ONDR								
	0850	1440	BLEN								
	2140	2400	HIRA								
	2000	2400	CULG	2159.0	2159.0	III	B	1	20	90	
15	0000	0725	HIRA								
	0000	0800	CULG	0302.0	0302.0	III	B	1	35	80	
	0655	0739	IZMI								
	0833	1321	ONDR								
	0850	1440	BLEN								
			IZMI	1047.2	1047.7	III	G	2	50	250	
	2000	2400	CULG								
	2141	2400	HIRA								
16	0000	0725	HIRA								
	0000	0800	CULG								
	0700	1200	IZMI								
	0834	1321	ONDR								
	0855	1440	BLEN								
	2000	2400	CULG								
	2142	2400	HIRA								
17	0000	0725	HIRA								
	0000	0800	CULG								
	0835	1321	ONDR								
	0855	1440	BLEN								
	0655	1200	IZMI	1059.6	1059.9	III	G	2	40	80	
	2142	2400	HIRA								
18	0000	0726	HIRA								
	0722	1200	IZMI								
	0836	1321	ONDR								
	0855	1440	BLEN								
	2143	2400	HIRA								
19	0000	0726	HIRA								
			LEAR	0408.0	1024.0	III	N	1	25	123	
	0704	1200	IZMI	0716.9	0721.9	III	GG	1	40	80	
	0837	1322	ONDR								
	0855	1440	BLEN								
			IZMI	0916.5	0916.6	III	B	1	45	82	
			LEAR	2324.0	2325.0	III		2	25	143	
	2143	2400	HIRA	2324.0	2326.0	III	G	1	25X	140	
			LEAR	2356.0	2356.0	III		1	25	131	
			HIRA	2356.5	2357.0	III	B	1	30	120	
20			LEAR	0037.0	0304.0	III	N	2	25	180	
	0000	0727	HIRA	0041.5	0042.0	III	B	2	25X	120	
			HIRA	0047.0	0048.0	III	B	2	25X	130	
	0200	0800	CULG	0208.0	0215.0	III	G	2	18	180	
			PALE	0214.0	0215.0	III		1	33	55	
			HIRA	0214.5	0215.0	III	B	1	25X	60	
			CULG	0227.0	0236.0	III	G	1	20	90	
			CULG	0337.0	0337.0	III	B	1	20	80	
			CULG	0416.0	0417.0	III	G	1	23	80	
			CULG	0440.0	0447.0	III	G	1	20	90	
			CULG	0521.0	0521.0	III	G	1	20	90	
			CULG	0556.0	0559.0	III	G	1	20	90	
			LEAR	0558.0	0559.0	III		1	25U	109U	

SOLAR RADIO EMISSION
Spectral Observations

DECEMBER 2004

OBSERVATION Day	Start (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
20			HIRA	0558.5	0559.0	III	B	1	25X	70	
			CULG	0629.0	0629.0	III	B	1	23	90	
			CULG	0632.0	0639.0	III	G	3	18	180	
			HIRA	0635.0	0638.5	III	G	1	30	140	
			LEAR	0635.0	0638.0	III		2	25U	142U	
			SVTO	0635.0	0638.0	III		1	25U	75U	
			CULG	0657.0	0657.0	III	B	1	20	80	
			CULG	0729.0	0800.0D	III	N	1	20	90	
	0703	1200	IZMI	0805.0U	1132.0U	III	N	1	25X	95U	
	0837	1322	ONDR								
	0855	1440	BLEN								
			IZMI	0908.1	0911.8	III	GG	2	45	90	
			SGMR	1426.0	1427.0	III		1	30	68	
			SVTO	1426.0	1427.0	III		1	25	54	
			SGMR	1529.0	1530.0	III		1	42	180	
			PALE	1738.0	1744.0	V		1	30	97	
			SGMR	1739.0	1739.0	III		1	30	180	
	2000	2400	CULG	2000.0E	2400.0D	III	S,C	1	20	180	
			CULG	2150.0	2152.0	III	G	3	18	200	
			LEAR	2204.0	1025.0	CONT		1	75	180	
	2144	2400	HIRA	2248.0	2258.5	III	G	2	25X	230	
			CULG	2251.0	2258.0	III	G	3	18X	200	
			PALE	2251.0	2258.0	III	N	1	25	153	
			HIRA	2337.0	2337.5	III	B	1	50	200	
			HIRA	2343.0	2343.5	III	B	1	25X	70	
			HIRA	2356.0	2358.0	III	G	1	25X	110	
21	0000	0800	CULG	0000.0E	0800.0D	III	S,C	1	20	180	
			CULG	0007.0	0800.0D	I	S,C	1	100	180	
			PALE	0030.0	0030.0	III		1	25	55	
	0000	0727	HIRA	0030.0	0030.5	III	B	1	25X	200	
			CULG	0037.0	0042.0	III	G	2	20	250	
			HIRA	0037.0	0044.0	III	G	1	25X	210	
			PALE	0037.0	0044.0	III		1	25	180	
			HIRA	0138.0	0140.0	III	G	1	25X	110	
			CULG	0200.0	0202.0	III	G	3	18X	180	
			HIRA	0201.5	0202.0	III	G	1	25X	260	
			CULG	0208.0	0209.0	III	G	3	18X	270	
			HIRA	0208.5	0209.0	III	G	2	25X	240	
			CULG	0327.0	0327.0	III	B	3	18	180	
			HIRA	0327.0	0333.0	III	G	1	25X	140	
			HIRA	0414.5	0415.0	III	B	1	25X	130	
			CULG	0415.0	0415.0	III	B	3	18	180	
			HIRA	0421.0	0430.0	III	G	1	25X	150	
			HIRA	0451.0	0453.0	III	G	1	25X	130	
			CULG	0458.0	0554.0	III	N	3	18	180	
			HIRA	0458.0	0458.5	III	B	2	25X	120	
			HIRA	0506.5	0514.0	III	G	1	25X	200	
			HIRA	0518.5	0519.0	III	B	1	25X	80	
			HIRA	0532.5	0533.5	III	G	1	25X	140	
			HIRA	0537.5	0538.0	III	B	1	25X	90	
			HIRA	0541.0	0549.5	III	G	1	25X	200	
			CULG	0604.0	0606.0	III	G	2	18	150	
			IZMI	0650.0E	1200.0D	I	S	2	110U	270X	
	0650	1200	IZMI	0650.0E	1200.0D	III	N	2	25X	180U	
			IZMI	0656.5	0701.4	III	GG	2	45	170	
			CULG	0700.0	0701.0	III	G	3	18X	160	
			HIRA	0700.0	0700.5	III	B	1	25X	120	
			SVTO	0700.0	0701.0	III		1	25	84	
			SVTO	0709.0	1410.0	III	N	2	25	180	
			CULG	0751.0	0756.0	III	G	3	20	180	
			IZMI	0751.3	0800.3	III	GG,C	2	25X	190	
			IZMI	0821.7	0830.3	III	GG	2	25X	170	
			IZMI	0832.6	0832.6	III	B	2	45	165	
			IZMI	0835.7	0838.2	III	G,C	2	25X	175	
			IZMI	0841.2	0843.6	III	GG	2	25X	270X	
			IZMI	0853.6	0856.8	III	GG	2	45	95	
			IZMI	0857.5	0902.3	III	GG,C	2	40	125	
			IZMI	0903.7	0910.5	III	GG	2	25X	130	

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21			IZMI	0915.2	0925.6	III	GG,C	2	25X	270X	
	0855	1440	BLEN	0920.0	0925.2	III	GG,RS,S	3	130	4000	
			SVTO	0921.0	0924.0	III		2	25	180	
	0838	1323	ONDR	0923.5	0924.5	DCIM	G	1	2000X	4500X	
			ONDR	0924.0	0924.5	DCIM	GG	2	800X	2000X	
			BLEN	0930.0	1430.0X	I	DC	2	130	500	
			IZMI	0931.7	0935.6	III	GG	2	25X	170	
			IZMI	1013.2	1022.9	III	GG	2	25X	270	
			BLEN	1017.5	1029.6	DCIM	P	2	130	900	
			IZMI	1038.0	1041.6	III	GG,C	2	25X	175	
			IZMI	1047.7	1048.5	III	GG	2	25X	270X	
			IZMI	1049.2	1052.4	III	GG	2	25X	270X	
			IZMI	1054.0	1102.2	III	GG	2	25X	160	
			IZMI	1106.6	1106.9	III	B,HARM	2	40	160	
			IZMI	1120.0	1120.3	III	B	2	25X	210	
			IZMI	1121.4	1124.4	III	GG	2	25X	175	
			IZMI	1128.8	1129.4	III	G,C	2	25X	175	
			IZMI	1135.0	1140.8	III	GG	1	25X	260	
			IZMI	1147.6	1149.3	III	G	2	25X	160	
			SVTO	1453.0	1453.0	III		1	25	180	
			PALE	1859.0	1859.0	III		1	25	138	
			PALE	1947.0	1948.0	III		1	25	96	
	2000	2400	CULG	2000.0E	2400.0D	III	S,C	1	20	180	
			PALE	2008.0	2010.0	III		2	25	180	
			SGMR	2008.0	2010.0	III		2	30	180	
			CULG	2009.0	2013.0	III	G	3	18	500	
			CULG	2030.0	2030.0	III	B	3	18	140	
			CULG	2101.0	2101.0	III	G	3	20	180	
			CULG	2102.0	2400.0D	I	S,C	1	60	160	
			CULG	2107.0	2107.0	III	B	3	18	180	
			CULG	2136.0	2136.0	III	B	3	20	160	
			CULG	2208.0	2234.0	III	N	3	20	180	
	2145	2400	HIRA	2208.0	2218.5	III	G	2	25X	300	
			LEAR	2226.0	1026.0	CONT		1	50	180	
			LEAR	2226.0	1026.0	III	N	2	25	180	
			HIRA	2226.5	2234.5	III	G	3	25X	290	
			CULG	2229.0	2233.0	III	G	3	18X	650	
			CULG	2336.0	2340.0	III	G	2	18	180	
			HIRA	2336.0	2339.5	III	G	1	25X	180	
22			CULG	0000.0E	0800.0D	I	S,C	1	60	160	
	0000	0800	CULG	0000.0E	0800.0D	III	S,C	1	20	180	
	0000	0728	HIRA	0016.5	0017.5	III	B	1	30	120	
			HIRA	0025.5	0026.0	III	B	1	25X	120	
			CULG	0026.0	0026.0	III	B	3	18	160	
			HIRA	0035.5	0036.0	III	B	1	25X	190	
			CULG	0036.0	0036.0	III	B	3	20	180	
			HIRA	0114.0	0116.5	III	G	1	25X	200	
			CULG	0116.0	0116.0	III	B	3	18	160	
			HIRA	0121.5	0122.0	III	B	1	25X	110	
			HIRA	0130.5	0132.0	III	G	3	25X	220	
			CULG	0131.0	0132.0	III	G	3	18X	170	
			HIRA	0144.5	0145.0	III	B	1	25X	110	
			CULG	0145.0	0145.0	III	B	3	18X	100	
			HIRA	0201.0	0204.0	III	G	3	25X	400	
			CULG	0202.0	0204.0	III	G	3	18X	240	
			LEAR	0202.0	0204.0	III		2	25	180	
			HIRA	0209.5	0210.0	III	B	1	25X	110	
			CULG	0213.0	0213.0	III	B	2	18X	150	
			HIRA	0213.5	0214.0	III	B	1	25X	120	
			HIRA	0227.5	0228.5	III	G	1	25X	120	
			CULG	0228.0	0228.0	III	B	3	18	180	
			CULG	0340.0	0346.0	III	GG	3	18X	180	
			HIRA	0340.0	0346.5	III	G	2	25X	300	
			CULG	0618.0	0641.0	III	N	3	18	180	
			HIRA	0618.0	0627.0	III	G	1	30	200	
			SVTO	0633.0	1501.0	CONT		1	75	170	
			HIRA	0635.0	0641.0	III	G	1	30	190	
			LEAR	0639.0	0640.0	III		2	25	180	

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22			LEAR	0639.0	0640.0	III	N	2	25	180	
			SVTO	0639.0	0640.0	III		1	25	36	
			IZMI	0658.2	0658.32	III	B	2	45	85	
			IZMI	0700.0E	1200.0D	III	N	1	25X	95U	
	0700	1200	IZMI	0700.0E	1200.0D	I	N	2	80U	270X	
			IZMI	0700.6	0700.9	III	G	2	40	160	
			IZMI	0715.0	0717.8	III	GG	2	25X	215	
			SVTO	0715.0	0718.0	III		2	25	180	
			CULG	0716.0	0718.0	III	G	3	18X	170	
			SVTO	0716.0	0718.0	III		2	25	180	
			HIRA	0716.5	0717.5	III	G	1	30	170	
			IZMI	0745.6	0745.6	III	G	1	45	155	
			IZMI	0802.1	0802.5	III	G	1	55	135	
			IZMI	0807.1	0807.6	III	G	1	55	175	
			IZMI	0813.3	0814.3	III	GG	2	45	150	
	0838	1323	ONDR								
			SVTO	0851.0	0858.0	III		1	25	152	
			IZMI	0851.2	0851.8	III	G	2	40	170	
			IZMI	0855.1	0858.8	III	GG	2	25X	180	
	0900	1440	BLEN								
			IZMI	0931.0	0938.2	III	GG	2	45	125	
			IZMI	0953.6	0955.6	III	GG	2	40	165	
			IZMI	1021.0	1025.2	III	G	2	40	160	
			IZMI	1048.3	1055.7	III	GG	2	45	165	
			IZMI	1115.5	1116.3	III	G	2	135	260	
			IZMI	1136.0	1137.5	III	GG	2	50	150	
			SGMR	1645.0	1646.0	III		1	30	180	
			PALE	1742.0	1742.0	III		1	25	180	
	2000	2400	CULG	2011.0	2011.0	III	B	1	25	70	
			CULG	2028.0	2028.0	III	B	1	23	80	
			CULG	2049.0	2049.0	III	B	1	23	200	
			PALE	2049.0	2049.0	III		1	25	45	
			CULG	2126.0	2127.0	III	G	1	100	550	
			CULG	2139.0	2139.0	III	B	1	23	180	
			CULG	2204.0	2340.0	III	N	1	20	180	
			CULG	2214.0	2214.0	III	B	2	18	180	
			CULG	2332.0	2335.0	III	G	3	18X	150	
			LEAR	2332.0	2335.0	III		2	25	148	
			PALE	2332.0	2335.0	III		1	25	142	
	2145	2400	HIRA	2332.0	2333.0	III	B	1	25X	120	
23	0000	0800	CULG	0028.0	0133.0	III	N	1	20	160	
			LEAR	0041.0	0042.0	III		1	25	180	
			CULG	0042.0	0042.0	III	B	2	23	190	
	0000	0728	HIRA	0042.0	0042.5	III	B	1	25X	200	
			HIRA	0057.0	0057.5	III	B	1	25X	80	
			LEAR	0057.0	0057.0	III		1	25	126	
			HIRA	0122.0	0122.5	III	B	1	25X	200	
			LEAR	0122.0	0122.0	III		1	25	131	
			LEAR	0156.0	0858.0	III	N	2	25	180	
			PALE	0156.0	0156.0	III		1	25	180	
			HIRA	0156.5	0157.0	III	B	1	25X	170	
			CULG	0157.0	0157.0	III	B	3	18X	180	
			CULG	0207.0	0209.0	III	G	3	18X	180	
			HIRA	0207.0	0209.0	III	G	1	25X	300	
			LEAR	0207.0	0208.0	III		2	25	180	
			PALE	0207.0	0209.0	III		1	25	180	
			CULG	0222.0	0222.0	III	B	1	30	90	
			CULG	0359.0	0359.0	III	B	1	18	100	
			CULG	0443.0	0445.0	III	G	2	18	180	
			CULG	0503.0	0517.0	III	G	1	20	180	
			CULG	0602.0	0603.0	III	G	1	20	180	
			LEAR	0734.0	0735.0	III		2	25U	164U	
			SVTO	0734.0	0740.0	III		1	25	147	
	0700	1200	IZMI	0734.6	0735.3	III	G,C	2	25X	205	
			CULG	0735.0	0735.0	III	B	3	18	200	
			IZMI	0735.5	0735.7	III	G	2	60	155	
			IZMI	0739.9	0740.3	III	G	2	45	260	
			CULG	0740.0	0740.0	III	B	2	23	150	

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23			CULG	0746.0	0746.0	III	B	1	23	160	
			IZMI	0746.0	0746.5	III	G	1	60	180	
	0839	1324	ONDR								
	0900	1440	BLEN								
			IZMI	1007.1	1007.4	III	G	2	45	155	
			SVTO	1059.0	1102.0	III		1	35	171	
			IZMI	1059.7	1100.4	III	G	2	25X	210	
			IZMI	1101.7	1102.2	III	G	2	55	265	
			SVTO	1342.0	1343.0	III		1	25	143	
			LEAR	2259.0	2300.0	III		2	25	136	
			PALE	2259.0	2300.0	III		1	25	72	
	2145	2400	HIRA	2259.5	2300.5	III	B	1	25X	70	
	2000	2400	CULG	2300.0	2300.0	III	B	3	20	180	
24	0000	0729	HIRA								
	0000	0800	CULG	0225.0	0226.0	III	G	1	18	120	
	0655	1200	IZMI	0749.3	0749.7	III	G	1	55	160	
			IZMI	0809.1	0809.3	III	G	2	80	160	
	0839	1324	ONDR								
	0900	1440	BLEN								
			SVTO	1140.0	1144.0	III		1	54	137	
			IZMI	1140.3	1141.1	III	G,C	2	50	215	
			IZMI	1143.8	1144.0	III	G	1	55	160	
			SVTO	1332.0	1334.0	III		1	25	155	
	2000	2400	CULG	2013.0	2013.0	III	G	1	30	170	
			CULG	2156.0	2156.0	III	G	1	20	300	
			LEAR	2321.0	2322.0	III		1	25	141	
	2145	2400	HIRA	2321.5	2322.5	III	G	1	30	90	
25	0000	0800	CULG	0043.0	0043.0	III	B	2	20	160	
			CULG	0119.0	0119.0	III	B	2	30	160	
			LEAR	0206.0	0207.0	III		2	25	158	
			PALE	0206.0	0207.0	III		1	25	160	
	0000	0730	HIRA	0206.5	0207.0	III	B	1	50	190	
			CULG	0207.0	0207.0	III	B	3	20	180	
			CULG	0422.0	0422.0	III	G	2	30	100	
			CULG	0524.0	0524.0	III	B	3	50	160	
			LEAR	0524.0	0630.0	III	N	1	25	180	
			CULG	0741.0	0744.0	III	G	3	23	400	
			LEAR	0741.0	0745.0	III		1	25	180	
			SVTO	0741.0	0744.0	III		1	25	180	
			SVTO	0741.0	0744.0	V		1	25	180	
	0702	1200	IZMI	0741.2	0742.2	III	GG	2	30	270X	
			IZMI	0742.5	0745.0	III	GG	2	25X	270X	
	0839	1325	ONDR								
			IZMI	0933.0	0933.1	III	G	1	45	160	
			IZMI	1123.3	1123.4	III	B	2	40	135	
			SVTO	1200.0	1208.0	III		2	25	180	
			IZMI	1202.5	1203.0D	III	GG	2	45	145	
	0900	1440	BLEN	1202.5	1204.7	III	GG,RS	2	100X	420	
			SVTO	1438.0	1444.0	III		1	25	180	
			SGMR	1440.0	1440.0	III		1	30	180	
			SGMR	1649.0	1649.0	III		1	30	180	
			PALE	2000.0	2001.0	III		1	25	88	
			SGMR	2000.0	2000.0	III		1	30	43	
	2000	2400	CULG	2000.0	2002.0	III	G	2	18	180	
			CULG	2134.0	2240.0	III	N	1	20	180	
			PALE	2155.0	2204.0	III		1	25	180	
			LEAR	2156.0	2204.0	III		1	25	180	
	2146	2400	HIRA	2156.5	2204.0	III	G	2	25X	190	
			CULG	2157.0	2157.0	III	B	3	18X	180	
			CULG	2202.0	2202.0	III	B	3	18	180	
			CULG	2229.0	2231.0	III	G	3	18X	180	
			HIRA	2229.0	2230.5	III	G	2	25X	180	
			LEAR	2229.0	2230.0	III		2	25	169	
			PALE	2229.0	2230.0	III		1	25	163	
26			LEAR	0232.0	0233.0	III		1	25	107	
	0000	0730	HIRA	0232.5	0233.0	III	B	1	25X	80	

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26	0000	0800	CULG	0233.0	0233.0	III	B	2	18	90	
			LEAR	0243.0	0246.0	III		1	25	151	
			CULG	0244.0	0246.0	III	G	1	20	160	
			HIRA	0245.5	0246.0	III	B	1	25X	210	
			CULG	0354.0	0357.0	III	G	3	18X	240	
			HIRA	0354.0	0357.0	III	B	1	25X	190	
			LEAR	0354.0	0357.0	III		1	25	142	
			LEAR	0507.0	0508.0	III		1	25	180	
			CULG	0508.0	0509.0	III	G	3	18X	180	
			HIRA	0508.0	0508.5	III	B	1	25X	290	
			CULG	0511.0	0513.0	III	G	1	35	80	
	0700	1200	IZMI	0706.5	0706.6	III	B	2	50	65	
			IZMI	0729.9	0730.2	III	G	1	55	165	
			CULG	0730.0	0732.0	III	G	1	20	170	
	0840	1326	ONDR								
	0900	1440	BLEN								
			SVTO	1237.0	1240.0	III		1	55	150	
	2000	2130	CULG								
	2146	2400	HIRA								
27	0000	0010	HIRA								
	0840	1327	ONDR								
	0900	1445	BLEN								
	0655	1200	IZMI	1058.0	1058.2	III	B	2	45	270	
			SGMR	1409.0	1409.0	III		1	30	48	
			SVTO	1409.0	1409.0	III		1	31	147	
			LEAR	2221.0	2222.0	III		1	25	125	
			LEAR	2235.0	0027.0	III	N	1	25	147	
28			LEAR	0007.0	0011.0	III		2	25	180	
			PALE	0009.0	0010.0	III		2	25	180	
			LEAR	0103.0	0107.0	III		1	25	71	
			LEAR	0120.0	0122.0	III		2	25	156	
			LEAR	0130.0	0132.0	III		2	25	180	
			LEAR	0156.0	0158.0	III		1	25	90	
			LEAR	0206.0	0209.0	III		2	25	180	
			LEAR	0217.0	0219.0	III		2	25	180	
			LEAR	0230.0	0231.0	III		2	25	180	
			LEAR	0243.0	0243.0	III		1	25	140	
			LEAR	0251.0	0253.0	III		1	25	127	
			LEAR	0258.0	0258.0	III		2	25	180	
			LEAR	0318.0	0926.0	III	N	2	25	180	
	0347	0731	HIRA	0354.5	0401.0	III	G	2	25X	250	
			HIRA	0418.0	0418.5	III	B	1	25X	50	
			HIRA	0425.5	0426.0	III	B	1	25X	110	
			LEAR	0449.0	0452.0	III		2	25	180	
			HIRA	0450.0	0504.0	III	G	3	25X	340	
			HIRA	0524.5	0525.0	III	B	1	30	220	
			HIRA	0603.0	0610.0	III	G	1	30	120	
			LEAR	0626.0	0629.0	III		2	25	180	
			HIRA	0627.0	0633.0	III	G	3	30	260	
			LEAR	0630.0	0633.0	III		2	25	180	
	0655	1200	IZMI	0702.8	0705.1	III	G,C	2	25X	165	
			SVTO	0704.0	0704.0	III		1	25U	84U	
			HIRA	0704.5	0705.0	III	B	3	50	230	
			IZMI	0741.8	0743.3	III	G	2	40	190	
			IZMI	0747.0	0747.1	III	B	1	90	175	
			IZMI	0757.5	0757.6	III	B	2	120	180	
			SVTO	0806.0	0936.0	III	N	1	25	180	
			IZMI	0806.2	0807.9	III	G,C	2	25X	160	
			IZMI	0826.5	0827.0	III	G	1	40	90	
			LEAR	0830.0	0832.0	III		2	25	114	
			IZMI	0830.8	0835.2	III	GG,C	2	25X	165	
			SVTO	0831.0	0831.0	III		1	25	59	
			IZMI	0853.5	0859.6	III	GG	1	45	85	
	0900	1445	BLEN	0902.3	0951.6	IV	C	2	100X	4000X	
			IZMI	0903.2	0907.0	III	GG	2	25X	270X	
			LEAR	0904.0	0905.0	III		2	25	180	
			IZMI	0913.5	0918.1	III	GG	2	25X	270X	

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

DECEMBER 2004

OBSERVATION Day	Start (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
28			LEAR	0914.0	0916.0	III		2	25	180	
			SVTO	0914.0	0916.0	III		2	25	180	
			LEAR	0920.0	0922.0	III		2	25	180	
			SVTO	0920.0	0923.0	III		2	25	180	
			IZMI	0920.1	0926.0	III	GG	2	25x	270X	
			IZMI	0927.5	0935.5	III	GG	2	25X	270X	
			LEAR	0928.0	0932.0	III		2	25	180	
			SVTO	0928.0	0930.0	III		2	25	180	
	0840	1328	ONDR	0928.1	0935.2	DCIM	G	1	2420	4500X	
			LEAR	0934.0	0935.0	III		2	25	180	
			IZMI	1044.6	1048.5	III	GG,C	2	40	165	
			IZMI	1053.2	1058.8	III	GG	1	45	160	
			BLEN	1123.0	1155.3	III	GG,RS,C	3	100X	3600	
			SVTO	1123.0	1123.0	III		1	25	150	
			IZMI	1123.2	1124.0	III	G,C	2	25X	270X	
			SVTO	1135.0	1158.0	III	N	1	25	153	
			IZMI	1135.6	1138.2	III	GG,C	2	25X	270X	
			SVTO	1137.0	1139.0	III		2	25	155	
			ONDR	1137.3	1137.4	DCIM	G	1	2000X	3689	
			ONDR	1137.4	1137.5	DCIM	G	1	1367	2000X	
			IZMI	1137.5	1138.8	V		2	25X	150	
			IZMI	1140.9	1141.5	III	G	2	25X	170	
			IZMI	1143.9	1145.0	III	G	2	25X	175	
			SGMR	1203.0	1233.0	III		2	30	180	
			SVTO	1230.0	1236.0	III		3	25	180	
			BLEN	1230.1	1238.3	III	GG,RS,C	3	100X	3600	
			ONDR	1230.5	1235.3	DCIM	G	1	800X	2000X	
			ONDR	1231.0	1235.1	DCIM	G	1	2000X	4500X	
			SVTO	1254.0	1301.0	III		3	25	180	
			BLEN	1254.2	1259.7	III	GG	3	100X	1600	
			SGMR	1257.0	1301.0	III		1	30	180	
			ONDR	1257.2	1259.1	DCIM	G	1	800X	1648	
			SVTO	1332.0	1333.0	III		1	25	151	
			SVTO	1352.0	1504.0	III	N	1	25	150	
			SGMR	1401.0	1829.0	III	N	1	30	180	
			SGMR	1949.0	1950.0	III		1	30	76	
			PALE	2015.0	2018.0	V		1	25	58	
			SGMR	2015.0	2017.0	V		1	30	60	
			PALE	2026.0	2031.0	III		1	25	46	
			PALE	2053.0	2055.0	V		1	25	46	
			LEAR	2236.0	2237.0	III		1	25	94	
			PALE	2236.0	2237.0	III		1	25	45	
	2132	2400	HIRA	2236.0	2237.0	III	B	1	25X	70	
			HIRA	2317.0	2318.0	III	B	1	25X	50	
			LEAR	2317.0	2317.0	III		1	25	56	
29			LEAR	0106.0	0106.0	III		1	25	98	
			PALE	0106.0	0107.0	III		1	25	43	
	0000	0732	HIRA	0106.5	0107.0	III	B	1	25X	100	
			LEAR	0128.0	0137.0	III		1	25	138	
			HIRA	0129.0	0132.0	III	G	1	25X	120	
			LEAR	0255.0	0303.0	III		2	25	180	
			HIRA	0256.0	0302.0	III	G	1	25X	170	
			PALE	0257.0	0257.0	III		1	25	54	
			HIRA	0310.0	0310.5	III	B	1	25X	120	
			LEAR	0310.0	0310.0	III		1	25	180	
			HIRA	0419.0	0420.0	III	B	2	25X	80	
			LEAR	0419.0	0420.0	III		1	25	111	
			LEAR	0443.0	0443.0	III		1	25	128	
			HIRA	0443.5	0444.0	III	B	1	25X	100	
			LEAR	0547.0	0549.0	III		2	25	180	
			HIRA	0547.5	0549.5	III	G	2	25X	210	
			LEAR	0552.0	0651.0	III	N	1	25	180	
			HIRA	0651.0	0651.5	III	B	1	30	70	
			IZMI	0651.1	0651.4	III	B	2	25X	85	
	0700	1200	IZMI	0700.0E	1100.0U	I	N	1	60	270X	
			IZMI	0723.7	0724.7	III	G	1	110	150	
			LEAR	0733.0	0816.0	CONT		1	75	154	
			IZMI	0830.5	0830.8	III	B	1	45	65	

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

DECEMBER 2004

Day	OBSERVATION Start (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
29			IZMI	0834.4	0835.1	III	G	1	45	65	
	0839	1329	ONDR								
	0900	1445	BLEN								
			IZMI	0946.5	0946.8	III	G	1	140	270X	
			SVTO	1016.0	1016.0	III		1	25	152	
			IZMI	1016.4	1016.7	III	G,C	2	30	165	
			IZMI	1024.6	1031.1	III	N	1	30	145	
			SGMR	1623.0	1623.0	III		2	30	180	
			SGMR	1626.0	1632.0	II		1	55	146	ESS 0411
			PALE	2041.0	2044.0	III		1	25	91	
	2147	2400	HIRA								
30			LEAR	0020.0	0021.0	III		2	25	180	
			PALE	0020.0	0021.0	III		1	25	180	
	0000	0733	HIRA	0020.5	0022.0	III	G	3	25X	320	
			HIRA	0027.0	0027.5	III	B	1	90	190	
			LEAR	0030.0	0030.0	III		2	25	151	
			HIRA	0030.5	0031.0	III	B	1	25X	90	
			HIRA	0103.0	0103.5	III	B	2	25	120	
			LEAR	0103.0	0103.0	III		2	25U	136U	
			PALE	0103.0	0103.0	III		1	25	89	
	0135	0800	CULG								
			ONDR	1034.4	1127.1	DCIM	GG,SP	3	800X	2000X	
	0900	1445	BLEN	1037.3	1203.0	IV	P,F,C	3	100X	4000X	
	0839	1330	ONDR	1038.2	1124.3	DCIM	GG	2	2000X	4500X	
			IZMI	1039.0	1054.0	II	G,HARM	2	25X	270X	
			IZMI	1039.0	1129.0	IV	P	2	30U	270X	
			LEAR	1040.0	1041.0	III		1	25	180	
			SVTO	1040.0	1041.0	III		1	25	180	
			SVTO	1040.0	1041.0	III		1	31	180	
			IZMI	1040.8	1041.2	III	G	2	25X	270X	
			LEAR	1041.0	1056.0	II		1	29	180	ESS 0600
			SVTO	1041.0	1101.0	II		1	25	180	ESS 0653
			IZMI	1041.2	1042.0	III	GG,P	2	120	190	
			IZMI	1054.3	1055.5	III	G,P	2	110U	270X	
			ONDR	1133.0	1136.1	DCIM	G	1	800X	1470	
			ONDR	1152.4	1201.5	DCIM	G	1	800X	1789	
	2000	2400	CULG	2102.0	2102.0	III	B	1	50	80	
			CULG	2207.0	2338.0	IV	FS	1	20	1800X	
			LEAR	2208.0	2232.0	II		1	29	180	ESS 0800
			CULG	2211.0	2231.0	II	FN	3	18	90	
			CULG	2211.0	2235.0	II	SH	3	27	180	ESS 600
			PALE	2211.0	2225.0	II		1	25U	180U	ESS 1378
	2147	2400	HIRA	2211.5	2247.0	II		2	25X	160	
			CULG	2215.0	2221.0	III	G	1	20	1400	
			LEAR	2227.0	2340.0	IV		1	36	155	
31	0000	0800	CULG	0031.0	0031.0	III	B	1	550	860	
			CULG	0443.0	0443.0	III	B	1	100	1000	
			CULG	0443.0	0529.0	I	S	1	50	180	
			LEAR	0443.0	0443.0	III		1	83	129	
	0000	0733	HIRA	0443.0	0443.5	III	B	1	80	200	
			LEAR	0505.0	0536.0	III	N	1	25	136	
			CULG	0534.0	0537.0	III	G	1	30	60	
			LEAR	0625.0	0730.0	CONT		1	71	180	
			CULG	0626.0	0651.0	III	N	1	23	280	
			CULG	0626.0	0712.0	CONT		1	75	470	
	0700	0902	IZMI	0700.0E	0840.0U	I	N	1	80	270	
	0921	1200	IZMI	0705.2	0712.2	III	N	1	110	160	
			CULG	0739.0	0739.0	III	B	1	27	50	
	0839	1332	ONDR								
			LEAR	0852.0	0853.0	III		1	47	142	
			IZMI	1040.9	1041.1	III	G	1	35	65	
			IZMI	1055.5	1056.3	III	G	2	120	270X	
			SGMR	1442.0	1442.0	III		1	30	180	
			SVTO	1442.0	1443.0	III		2	25	180	
	0900	1505	BLEN	1442.3	1505.0X	IV	P,F,C	3	100X	4000X	
			SGMR	1518.0	1521.0	III		2	30	79	
			LEAR	2247.0	2248.0	III		1	25	147	

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

DECEMBER 2004

OBSERVATION Day	Start (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
31	2148	2400	HIRA	2247.5	2248.0	III	B	1	25X	130	
	2000	2400	CULG	2248.0	2249.0	III	G	1	23	180	

Event Remarks:

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

DECEMBER 2004

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
	E-W	S-N		START(UT)	END(UT)
01/12/04	-0.27	+0.21	I	10H07 E	15H10 D
03/12/04	+0.07	+0.10	I	8H38 E	14H30 D
09/12/04*	+0.71	+0.18	I	9H13 E	14H09 D
20/12/04*	-0.83	-0.41	II	8H53 E	14H41 D
21/12/04*	-0.36	-0.38	III	8H19 E	15H19 D
22/12/04*	-0.48	-0.25	II	8H19 E	15H20 D
22/12/04*	+0.03	-0.16	II	8H19 E	15H20 D
23/12/04*	-0.12	-0.32	I	8H19 E	15H20 D
24/12/04*	-0.79	-0.51	I	11H15	12H34
29/12/04*	-1.30	-0.14	I	8H23 E	15H23 D
29/12/04*	-1.10	+0.10		8H23 E	11H09
30/12/04*	-1.08	-0.18	I	8H24 E	15H24 D
31/12/04	-0.93	+0.25	I	8H24 E	10H15

[1] POSITIVE E-W AND S-N COORDINATES CORRESPOND TO THE N-W QUADRANT
[2] IMP1: FLUX< 5 SFU IMP2: 5< FLUX < 20 SFU IMP3: 20< FLUX <100 SFU
IMP4: 100< FLUX <300 SFU IMP5> 300 SFU
[3] E NOISE STORM IN PROGRESS AT THE BEGINNING OF THE NANÇAY OBSERVATIONS
D NOISE STORM IN PROGRESS AT THE END OF THE NANCAY OBSERVATIONS

SOLAR RADIO NOISE STORM AT 327 MHZ

FROM NANÇAY RADIOHELIOGRAPH

DECEMBER 2004

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
01/12/04*	-0.31	+0.31	II	10H07 E	15H10 D
03/12/04	+0.18	+0.09	I	8H38 E	14H30 D
20/12/04	-0.68	-0.23	I	8H53 E	14H41 D
21/12/04*	-0.36	-0.23	II	8H19 E	15H19 D
22/12/04	-0.08	-0.19	I	8H19 E	15H20 D
22/12/04	-0.06	-0.02	I	8H19 E	15H20 D
29/12/04	-1.28	-0.25	I	8H23 E	14H10
30/12/04	-0.85	-0.07	I	8H24 E	15H24 D

6, 7, 8, 10, 11, 12,18 DECEMBER : NO DATA

OTHERS DAYS: NO DETECTABLE NOISE STORM

- For the days marked by an asterisk, intense ionopheric 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

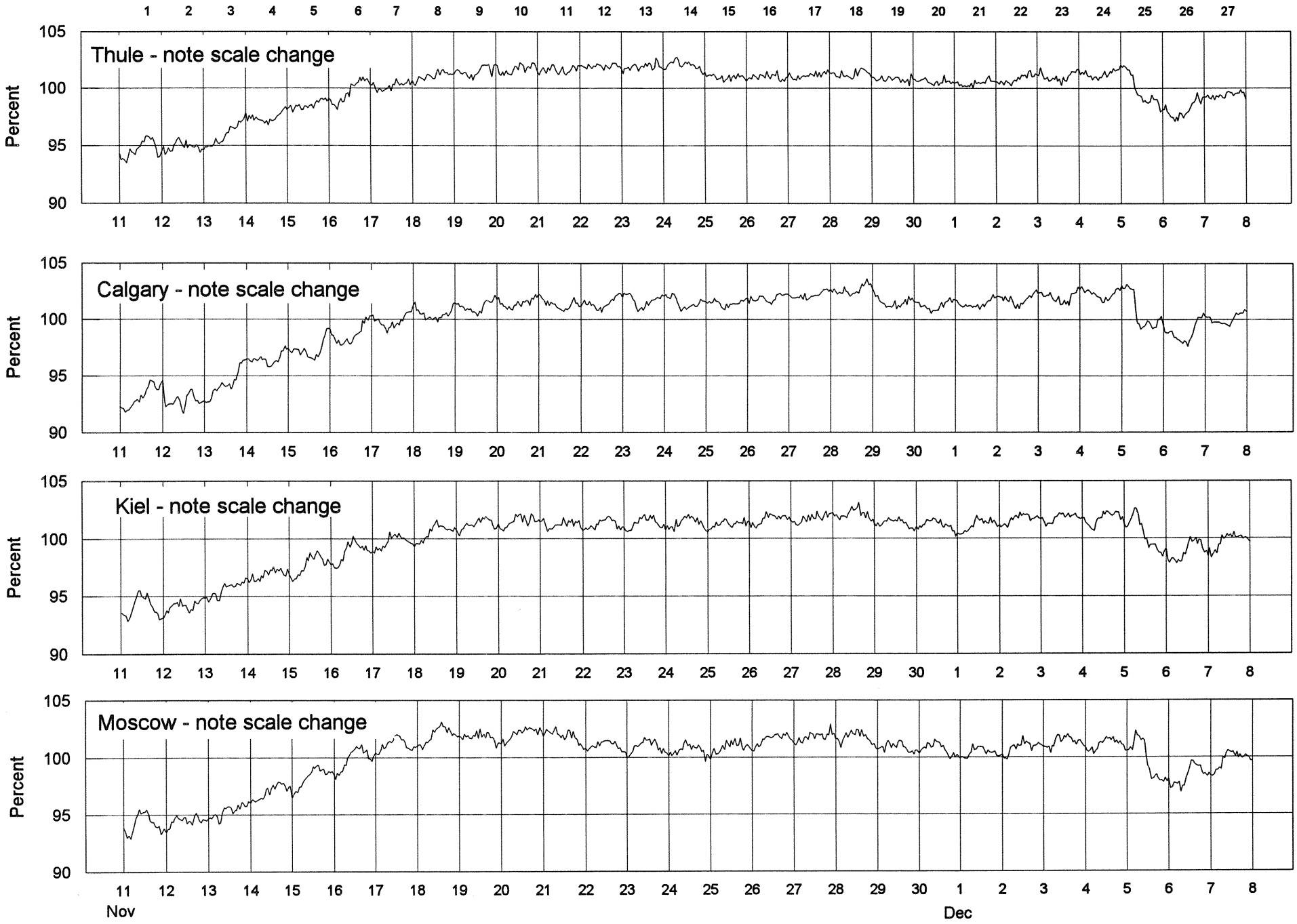
COSMIC RAY INDICES
(Neutron Monitor)
December 2004

Day	THULE Average (cts/h)/100	CALGARY Average (cts/h)/300	KIEL Average (cts/h)/100	MOSCOW Average (cts/h)/64	CLIMAX Average (cts/h)/100	BEIJING Average (cts/h)/256	HALEAKALA Average (cts/h)/1000
1	4211.2	3731.2	5973.3	8694.8	4042.5	2037.1	3549.5
2	4226.1	3746.2	6005.2	8732.6	4067.0	2036.4	3560.1
3	4235.4	3753.3	6011.3	8774.1	4073.9	2033.9	3567.8
4	4245.3	3763.7	6009.0	8753.3	4087.7	2043.3	3573.2
5	4188.9	3707.0	5927.9	8636.3	4027.9	2026.0	3541.8
6	4113.8	3637.7	5837.8	8516.5	3971.6	2010.7	3509.7
7	4166.5	3680.3	5887.2	8634.3	4009.0	2026.5	3517.2
8	4154.5	3673.8	5882.6	8685.7	4006.9	2022.9	3521.2
9	4169.6	3666.3	5894.3	8704.3	3991.2	2022.1	3513.2
10	4182.9	3680.2	5911.3	8726.3	3994.4	2020.6	3521.6
11	4206.5	3674.2	5908.8	8725.8	3996.0	2020.7	3525.5
12	4196.5	3699.3	5911.2	8751.7	4008.8	2028.8	3537.8
13	4164.1	3659.2	5865.9	8646.5	3957.1	2014.2	3522.5
14	4179.3	3653.3	5870.7	8626.2	3957.2	2009.0	3516.6
15	4193.4	3686.7	5888.5	8660.0	3995.0	2022.5	3532.4
16	4225.7	3712.0	5951.0	8737.0	4022.1	2025.9	3540.1
17	4249.2	3725.2	6004.7	8782.9	4040.3	2032.0	3546.7
18	4266.9	3735.3	6020.1	8810.0	4040.7	2034.5	3558.2
19	4263.2	3735.2	6024.4	8831.8	4052.9	2036.3	3556.9
20	4279.2	3758.5	6025.2	8827.9	4070.1	2033.6	3567.9
21	4277.4	3756.7	6010.1	8802.0	4072.3	2036.0	3564.2
22	4258.9	3751.7	5984.1	8800.4	4077.9	2026.5	3560.1
23	4270.2	3749.2	5999.1	8851.9	4089.6	2028.9	3552.5
24	4257.2	3733.7	6006.0	8859.9	4074.8	2027.0	3552.5
25	4239.7	3720.8	5996.6	8808.4	4039.6	2021.6	3552.4
26	4236.8	3710.8	5977.7	8732.5	4032.5	2032.4	3556.1
27	4226.0	3677.8	5954.2	8691.2	3977.6	2034.1	3517.5
28	4223.5	3665.7	5905.7	8678.3	3951.3	2035.3	3491.8
29	4144.0	3623.7	5839.9	8571.0	3947.9	2026.7	3499.6
30	4165.2	3658.7	5848.8	8591.9	3980.5	2034.7	3511.8
31	4167.6	3660.5	5858.7	8612.0(23)	3964.7	2032.1	3503.7
Mean	4212.0	3702.8	5941.7	8718.0	4020.2	2028.1	3536.8

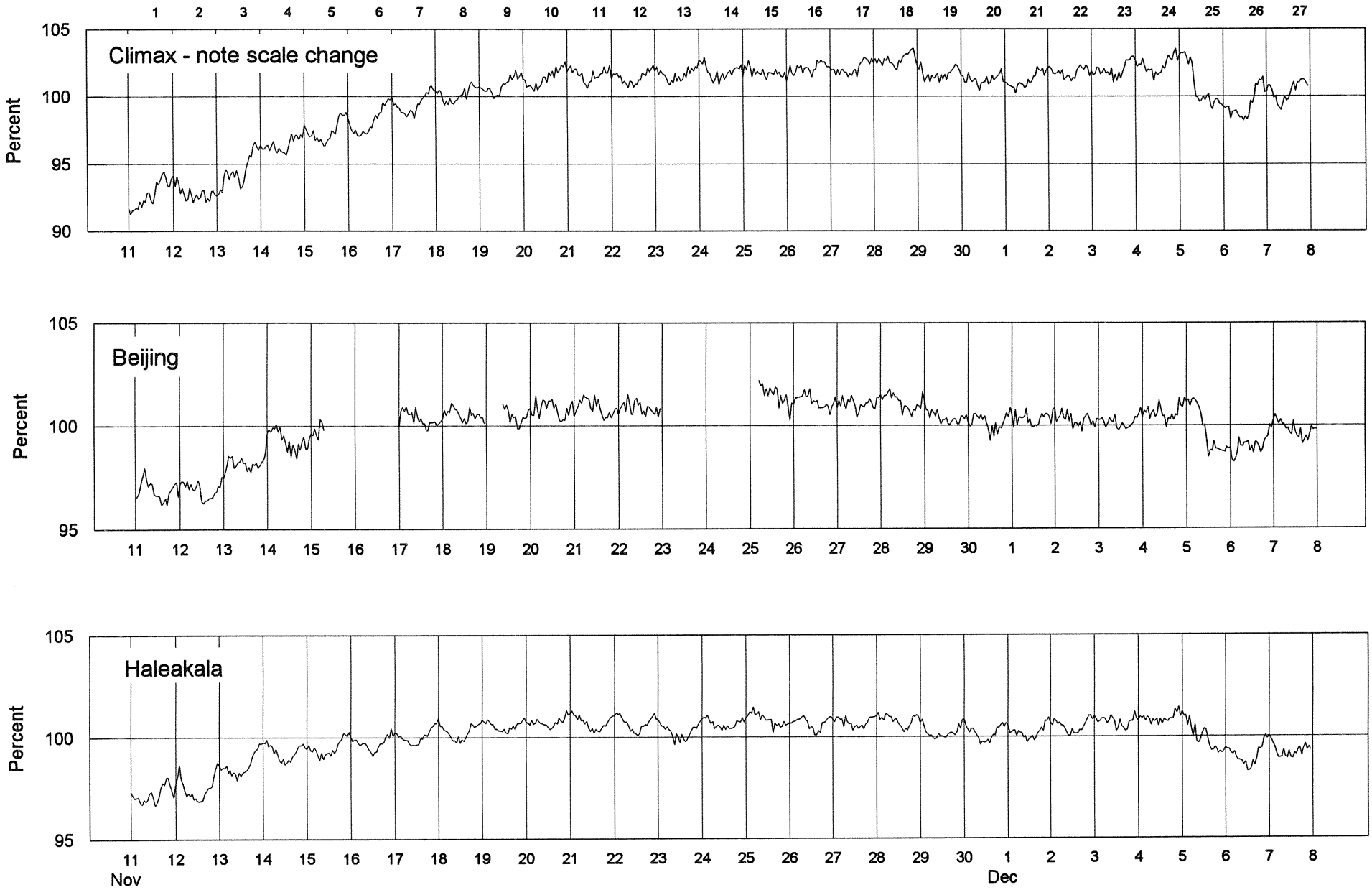
For less than 24-hour coverage, parentheses enclose the number of hours for which data are available. For Climax, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours, and for Haleakala, whenever the sum of all three sections falls below 60 hours.

COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2338 - Beginning 11 Nov 2004

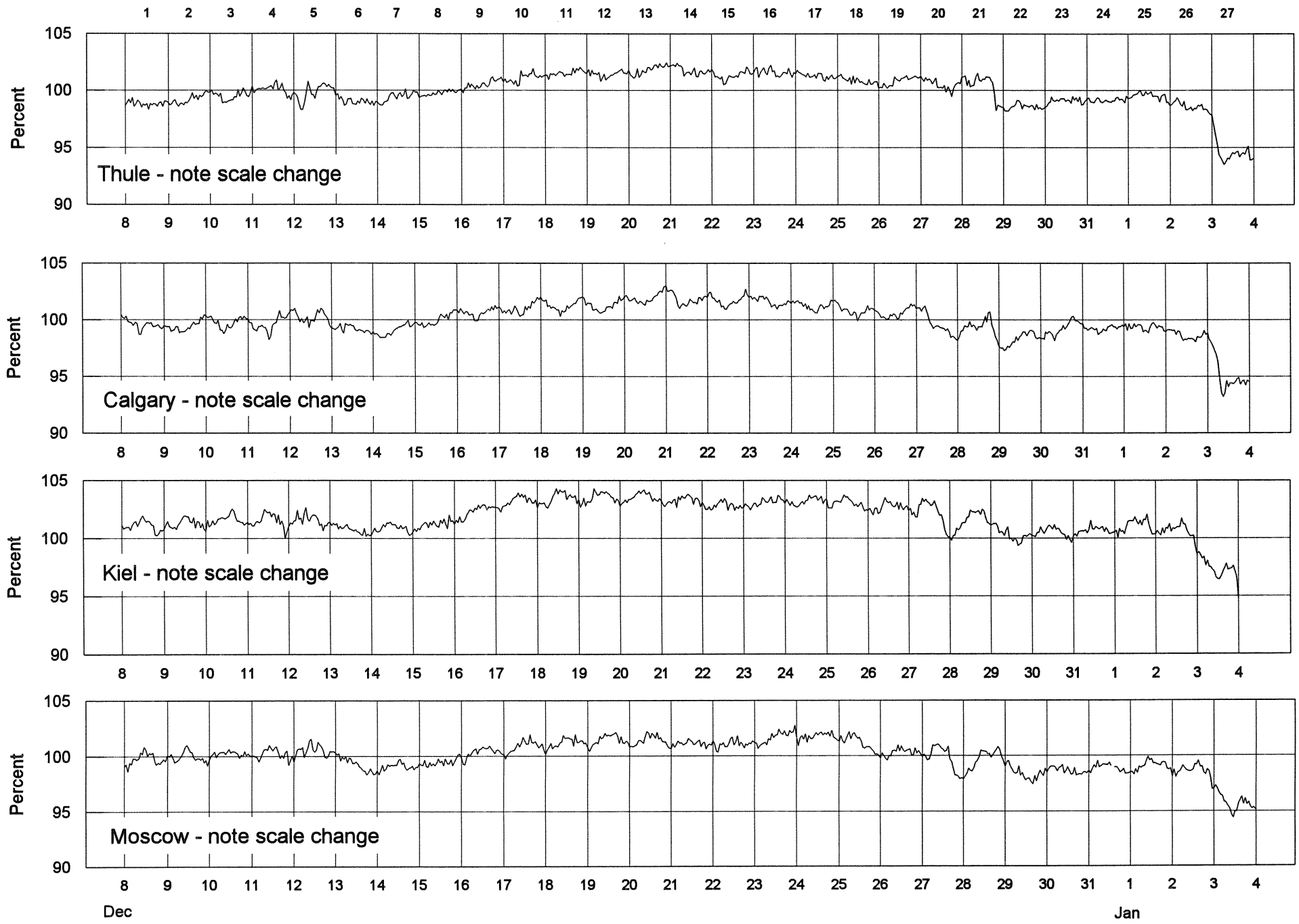


COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2338 - Beginning 8 Dec 2004



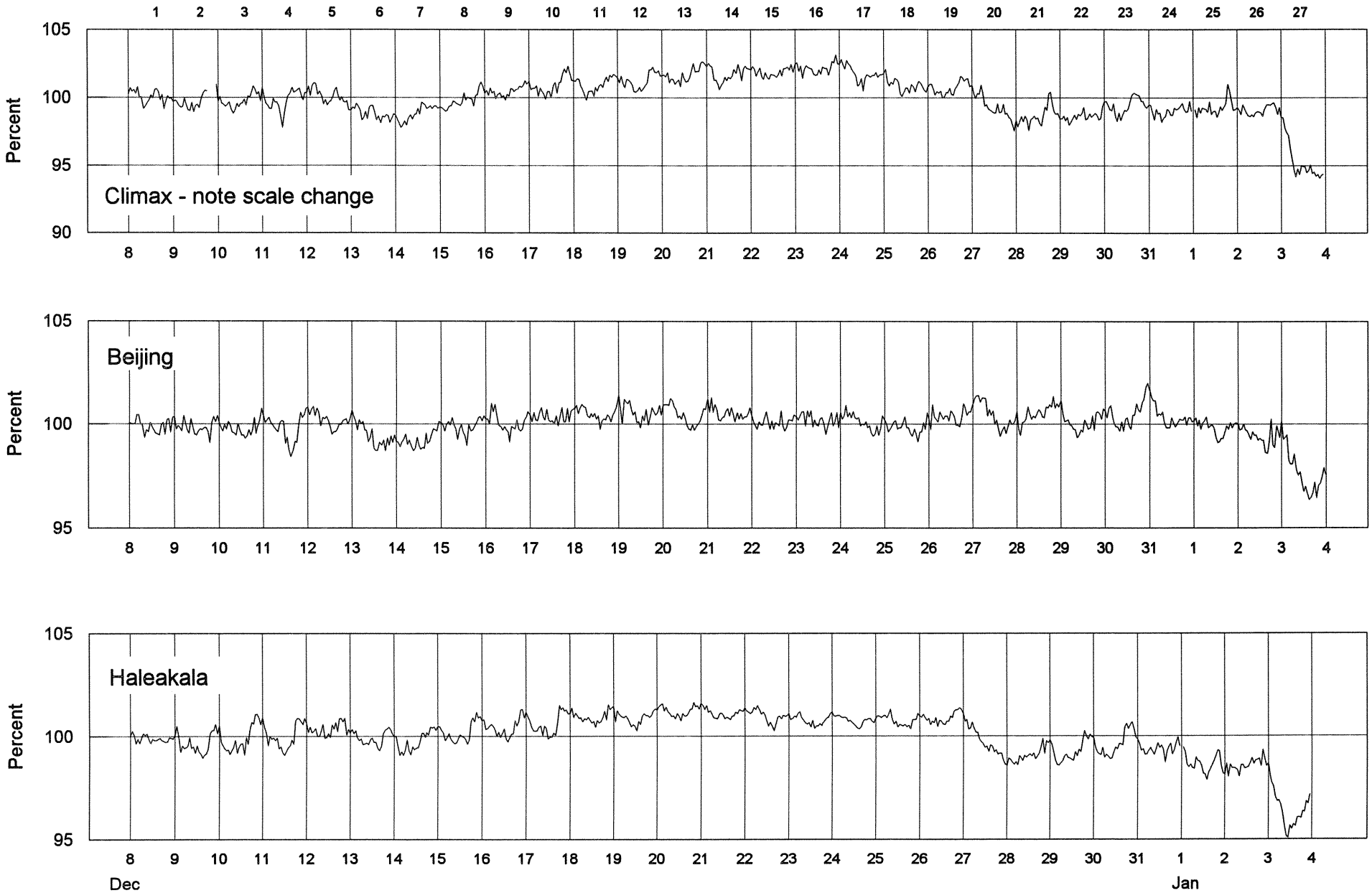
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2339 - Beginning 8 Dec 2004

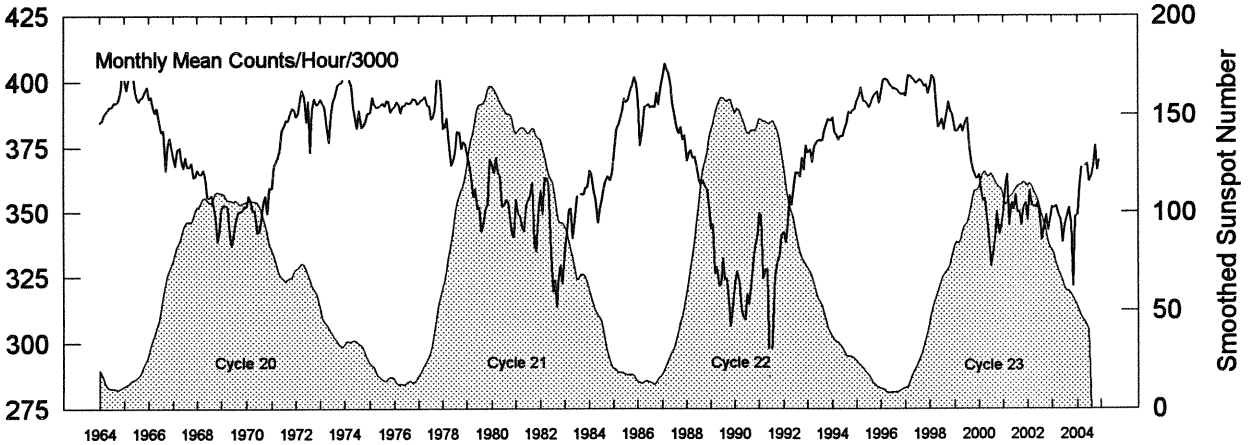


105
Dec 04

COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2339 - Beginning 8 Dec 2004



Calgary Neutron Monitor Pressure-Corrected Values
Jan 1964 - Dec 2004



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1964	3847	3852	3872	3883	3892	3905	3905	3921	3920	3926	3966	4064	3913
1965	4006	3968	4007	4040	4040	3967	3935	3923	3938	3942	3960	3980	3976
1966	3935	3943	3906	3881	3899	3844	3807	3814	3663	3758	3785	3750	3832
1967	3710	3678	3741	3750	3697	3671	3713	3679	3675	3691	3638	3639	3690
1968	3663	3653	3647	3665	3632	3561	3556	3567	3529	3482	3386	3420	3563
1969	3515	3531	3529	3520	3417	3370	3408	3464	3500	3507	3506	3524	3483
1970	3523	3565	3548	3505	3512	3424	3426	3477	3543	3564	3497	3596	3515
1971	3593	3678	3693	3712	3737	3813	3832	3853	3851	3883	3899	3893	3786
1972	3865	3875	3924	3969	3942	3847	3926	3731	3895	3935	3912	3920	3895
1973	3935	3919	3903	3819	3768	3875	3926	3944	3986	3995	3997	4008	3923
1974	4036	4043	4005	3988	3906	3861	3822	3890	3827	3831	3850	3881	3912
1975	3883	3943	3914	3905	3904	3910	3918	3907	3929	3927	3884	3897	3910
1976	3908	3923	3915	3881	387	3909	3921	3918	3920	3936	3935	3916	3916
1977	3919	3933	3933	3943	3911	3911	3857	3865	3895	4010	4055	3961	3933
1978	3823	3826	3860	3773	3681	3697	3730	3811	3808	3744	3772	3764	3774
1979	3726	3696	3647	3559	3592	3516	3521	3427	3447	3519	3528	3705	3573
1980	3681	3652	3711	3649	3643	3527	3525	3550	3540	3471	3414	3403	3564
1981	3550	3491	3483	3440	3426	3522	3546	3560	3615	3374	3348	3520	3490
1982	3586	3492	3634	3632	3608	3344	3196	3239	3137	3257	3296	3225	3387
1983	3364	3421	3510	3515	3399	3487	3563	No Data	3571	3569	3597	3599	3509
1984	3661	3646	3586	3551	3460	3515	3551	3593	3623	3641	3623	3652	3592
1985	3723	3821	3834	3858	3888	3936	3921	3929	3971	3987	4017	3997	3907
1986	3923	3755	3814	3905	3906	3915	3902	3907	3902	3958	3912	3974	3898
1987	4025	4068	4047	4028	3993	3914	3866	3822	3802	3827	3779	3796	3914
1988	3698	3729	3739	3709	3714	3682	3621	3608	3624	3603	3590	3520	3653
1989	3436	3454	3263	3290	3216	3222	3321	3224	3246	3164	3063	3152	3254
1990	3227	3272	3232	3129	3099	3089	3188	3147	3237	3317	3375	3401	3226
1991	3496	3489	3244	3279	3280	2873	2896	3078	3253	3311	3330	3412	3245
1992	3425	3382	3463	3566	3528	3593	3655	3655	3636	3711	3665	3758	3586
1993	3730	3741	3693	3753	3765	3775	3780	3775	3815	3836	3859	3852	3781
1994	3864	3807	3798	3779	3793	3793	3822	3841	3885	3878	3891	3896	3837
1995	3929	3945	3919	3929	3927	3917	3902	3919	3940	3956	3963	3920	3931
1996	3960	4008	4012	4010	3993	3983	3976	3976	3970	3960	3953	3955	3980
1997	3947	4023	4024	4014	4007	3998	4001	4010	3999	3985	3990	3955	3996
1998	3982	4025	4013	3910	3827	3839	3857	3817	3876	3925	3890	3875	3903
1999	3816	3811	3823	3836	3810	3843	3861	3760	3699	3664	3644	3631	3767
2000	3646	3586	3544	3554	3465	3386	3293	3337	3395	3503	3417	3447	3464
2001	3510	3599	3646	3449	3537	3511	3570	3501	3504	3449	3521	3537	3528
2002	3469	3585	3527	3526	3517	3541	3479	3393	3455	3493	3431	3474	3491
2003	3523	3517	3524	3488	3473	3384	3450	3480	3517	3460	3216	3485	3460
2004	3492	3604	3676	---	3680	3689	3612	3645	3683	3756	3665	3702	3655

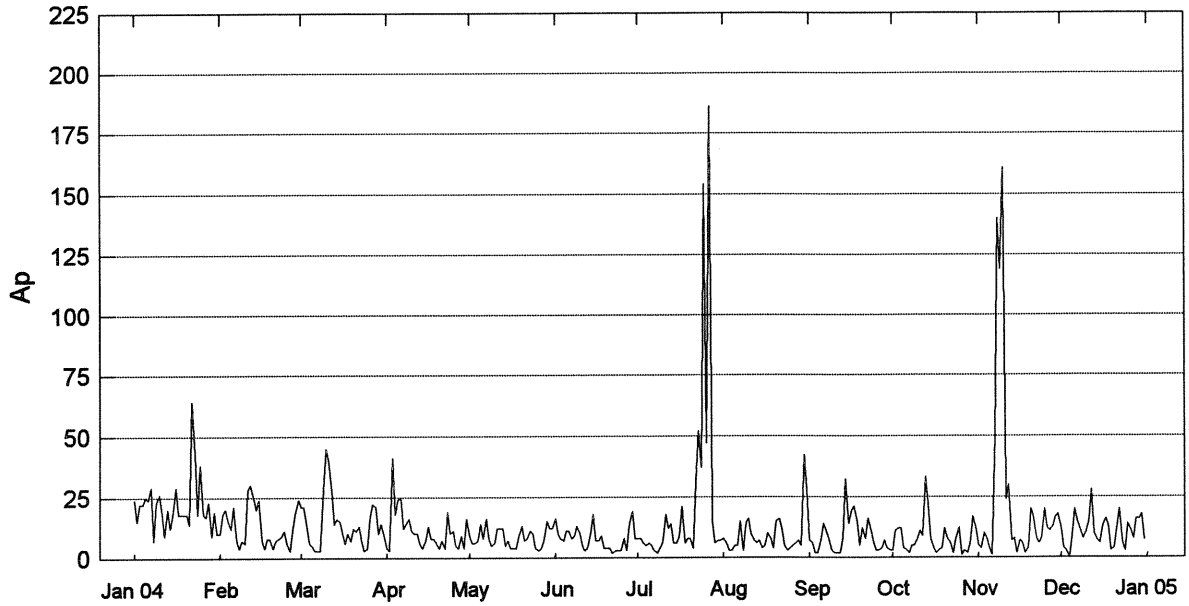
Multiply table entries by 300 to obtain hourly counting rate. Calgary, Canada: N51 W114, Alt=1128m, Cutoff Rigidity=1.09GV.

Geomagnetic Activity Indices
December 2004

Day		Kp Three-Hourly Indices 1	2	3	4	5	6	7	8	Sum	Ap	Cp	Km Three-Hourly Indices 1	2	3	4	5	6	7	8	Am	aa Provisional N	S	M	
1		2	3+	4	3-	1	2	1+	3-	19	12	0.7	2-	3-	3+	3-	1+	2+	2-	2+	19	22	17	26	13	
2	Q4	2-	1	1	0+	0+	1+	1	0+	7	4	0.1	1+	1o	1+	0+	1o	1+	1+	1-	7	6	7	7	7	CC
3	Q2	1-	0+	0+	0+	1-	1-	1	1	5	3	0.1	1o	1-	0+	1-	1o	1o	1+	1o	6	6	8	6	8	CC
4	Q1	0	0	0	0	0	0	0	0	0	0	0.0	0o	0o	0o	0+	0+	0o	0o	0o	1	2	3	2	3	CK
5		0+	1	4+	2	2-	2	2-	2-	15-	9	0.5	0o	2-	5-	3-	2-	2+	2+	2o	21	16	39	39	16	
6	D2	2+	3	4	3	4+	4-	4-	4-	28-	20	1.0	2+	3-	3o	3o	4o	4-	4-	4-	36	43	37	31	49	
7		3	3	3	2+	3	3-	4-	3	24-	15	0.8	3-	3-	2+	2+	3-	3o	3+	3-	26	32	26	20	39	
8		3-	3	3-	2-	2+	2+	2	3+	20	11	0.6	2+	3-	2+	2o	2+	2+	2+	3-	20	23	15	19	19	
9		3-	1-	1	2+	2	2	2+	2+	15+	8	0.4	2+	0+	1o	2+	2+	2-	3-	2+	15	19	12	12	19	
10		2	2+	2	2	2+	3	2+	3	19	10	0.5	2-	2-	2-	2o	2+	3o	3-	3o	19	26	23	17	33	
11		1-	1+	3-	1	4+	3+	3+	4	21-	15	0.8	1+	1o	3-	1+	4o	3+	4-	4-	30	33	31	10	54	
12	D1	5-	4	4	4	3	5+	3+	3	31+	28	1.2	4o	3+	4-	4o	3+	5o	3+	3+	49	47	43	40	50	
13		4+	4-	3-	1+	1-	1	0+	0+	14+	10	0.6	3+	3o	3-	2-	1+	1+	0+	1-	17	17	18	28	7	
14	Q9A	0+	1	2+	2+	2+	1+	2+	2	14	7	0.3	1o	1+	3-	3o	3o	1+	3-	2+	19	16	21	17	20	
15	Q7	2+	2	2	0	1-	2+	1+	2	13-	6	0.3	2-	2-	2+	1-	1o	3-	2o	2+	14	13	15	14	15	
16		2	3+	2+	0+	3-	2+	4-	4	21-	13	0.8	1o	3o	2o	1-	3o	3-	4-	4o	25	27	28	16	38	
17		3+	4	3+	3	2+	3+	2+	3+	25	16	0.9	3o	4-	3o	3o	2+	3+	3-	3+	31	31	30	34	27	
18		4+	4-	2+	2	3	2	2	1-	20	13	0.7	3+	3o	2o	3o	3+	2-	2-	1o	22	23	21	27	17	
19	Q3	1+	1-	1	1-	0	0	1-	1-	5	3	0.0	1o	0+	1+	1-	0+	0o	1+	1o	5	6	8	8	6	CC
20	Q6	2+	1-	1	1	1	0+	1-	1+	8+	4	0.1	2-	0+	1o	1+	1+	1-	1-	1o	7	9	8	9	8	C
21		2	1-	3	4+	2-	3-	3-	3-	20-	12	0.7	2-	1-	3o	4o	2+	3o	3-	3-	24	28	30	32	26	
22	D3	3+	4+	4+	4+	3	3-	2	2+	26+	20	1.0	3-	3+	4-	4-	3+	3-	3-	3-	32	38	38	50	26	
23	Q8	2+	1+	1+	1	1+	2+	2-	2+	14-	6	0.3	2o	1+	1o	2-	2o	2+	2-	2+	13	17	12	12	17	
24	Q5	1-	0	0+	0+	1	2	1-	1+	6+	3	0.1	1o	0+	1-	1-	1o	3-	1+	1+	8	6	13	6	13	C
25		4-	4	4	2+	1+	2-	2+	2+	22-	14	0.8	3o	3+	4-	3-	2o	2o	2+	2+	25	26	28	38	16	
26		3-	3-	2	2	2-	3	3	3-	20-	11	0.6	2+	2+	2+	2o	2o	3o	3-	2+	19	27	22	22	27	
27		2	2+	3-	1+	1	1	3-	3-	16-	8	0.4	2-	2o	2+	1+	1o	1+	3o	3-	15	18	17	18	17	
28	D5*	2+	2+	2	2+	2+	3+	5-	4+	24-	16	0.9	2o	2-	2o	3-	2+	3o	4+	4-	29	40	29	20	49	
29		4+	4-	3-	3	3+	3-	1	3	24-	16	0.9	4-	3o	3-	3+	3+	3o	1+	3o	29	29	29	33	25	
30	D4*	3-	3+	5-	3	4-	4-	2	3-	26-	18	1.0	2+	3o	5-	3o	4o	4-	2+	3-	38	34	62	53	44	
31	Q10A	3-	2	2-	2	2	1+	1-	2	14+	7	0.3	2+	1+	2o	2-	2+	2o	1o	2o	14	17	10	13	14	C
Mean											11	0.56									20.5	22.6	22.7		22.6	

Day	Kn Three-Hourly Indices 1	2	3	4	5	6	7	8	An	Ks Three-Hourly Indices 1	2	3	4	5	6	7	8	As	Sa	Prov Ri	Ra	Rs	IMF
1	1+	3-	4o	3-	1+	3-	1+	2o	21	2o	3-	3o	2o	1o	2+	2-	3-	18	107.8	32	34	54	
2	1+	1o	1o	0o	1o	2-	1+	0+	7	1+	1o	1+	0+	1o	1o	2-	1o	7	102.6	29	33	49	
3	1-	1-	0+	1-	1o	1o	1+	1-	5	1+	1o	0+	1o	1o	1o	1o	1o	6	97.9	30	31	44	
4	0o	0o	0o	0o	0o	0o	0o	0o	0	0+	0+	0o	0+	0+	0+	0+	0o	2	94.6	26	29	40	
5	0o	1o	4o	3-	2o	2+	2-	1+	17	0+	2o	5-	3-	2-	3-	3-	3-	26	93.1	29	31	39	
6	2o	3-	3+	3o	4+	4-	4o	4-	40	3-	3-	3-	3o	4-	3+	3o	4-	33	90.4	22	21	36	
7	3-	3o	2+	2+	3-	3+	3+	3-	27	3-	2o	2o	3-	3o	3o	3o	3o	24	87.1	9	10	32	
8	2+	3-	2+	2o	3-	3-	3-	3o	22	2+	3-	2+	2o	2+	2o	2-	2+	18	93.6	15	15	39	
9	2+	0+	1-	3-	3-	2-	3-	2o	15	2+	1-	1+	2o	2o	2o	3-	3-	15	84.7	13	8	29	
10	2-	2-	1+	2+	3-	3+	3-	3-	21	2-	2-	2o	2-	2o	3-	3-	3o	18	82.3	15	13	27	
11	1o	1o	3-	1o	4+	4-	4o	4o	33	1+	1o	3-	1+	4o	3o	3o	4-	27	87.1	13	18	32	
12	4o	4-	4-	4+	4-	5+	3o	3-	54	4o	3o	3+	3+	3o	5-	4-	4-	44	87.7	22	20	33	
13	3+	3o	2+	1+	1+	2-	0o	0o	15	4-	3o	3o	2o	1+	1o	1-	1o	18	87.0	16	17	32	
14	0+	1-	2+	3-	3-	1+	3o	2+	17	1+	2o	3o	3o	3o	1+	3-	3-	21	86.5	12	14	31	
15	1+	1+	2-	0+	1+	3-	2o	2o	12	2-	2o	3o	1-	1o	3-	2-	3-	16	86.5	8	5	31	
16	1o	3-	2o	0o	3+	3o	4-	4-	24	1o	3o	2o	1o	3-	3-	4-	4+	27	87.2	10	11	32	
17	3-	4-	3+	3o	2+	4-	3-	3-	30	4-	3+	3o	3-	2o	3+	3-	4-	31	87.1	24	27	32	
18	4-	3+	2o	3-	4-	2o	2-	1-	24	3-	3o	2o	3o	3o	1+	2o	1o	20	87.7	21	19	33	
19	1+	0+	1o	1-	0+	0o	1o	1-	4	1o	1-	1+	0+	1-	0o	1+	1+	6	90.9	17	14	36	
20	1+	0o	1o	1+	1+	1-	1-	1o	6	2-	1-	1o	2-	2-	1-	1-	1+	8	90.9	11	14	36	
21	1+	0+	3-	4o	2+	3-	2+	3-	22	2o	1-	3+	4o	2o	3o	3o	3o	26	97.7	15	20	44	
22	3-	3o	3+	4o	3+	2+	2+	2+	31	3-	4-	4o	3+	3+	3-	3-	3-	33	95.6	26	23	41	
23	2+	1+	1o	1+	2-	2+	1+	2+	13	2-	1o	1+	2o	2o	2o	2-	2o	12	93.2	14	23	39	
24	1-	0o	0+	0+	1o	2+	1+	1o	7	1+	0+	1o	1o	1o	3-	1+	2-	10	94.0	22	22	40	
25	3+	3o	3+	2+	2-	2-	2+	2o	23	3-	4-	4-	3o	2o	2o	2+	3-	27	90.0	12	13	35	
26	2+	2+	2o	2+	2o	3o	3o	2+	20	2o	2+	2+	2o	2o	3o	3-	2o	19	88.7	10	13	34	
27	2-	1+	2+	1-	1o	1+	3o	2+	14	2o	3-	2+	2-	1o	2-	3-	3-	17	93.7	10	12	39	
28	2o	2o	2o	3o	2+	3+	4o	4o	31	2+	1o	2+	2+	2o	3-	4+	4-	27	101.7	17	17	48	
29	4-	3+	2+	3+	3+	3-	1+	3o	30	3+	3o	3-	3+	3+	3o	2-	3o	29	95.3	12	13	41	
30	2+	3o	4o	3o	4o	4-	2+	3o	35	2+	3o	5o	3+	4o	4-	2+	2o	41	96.7	20	18	42	
31	3-	1+	2+	2-	3-	2o	1-	2o	15	2o	1+	2-	2-	2o	2o	1+	2o	12	95.2	24	25	41	
Mean									20.5									20.6	92.1	17.9	18.9	37.5	

Daily Average Indices Ap
Jan 2004 - Dec 2004

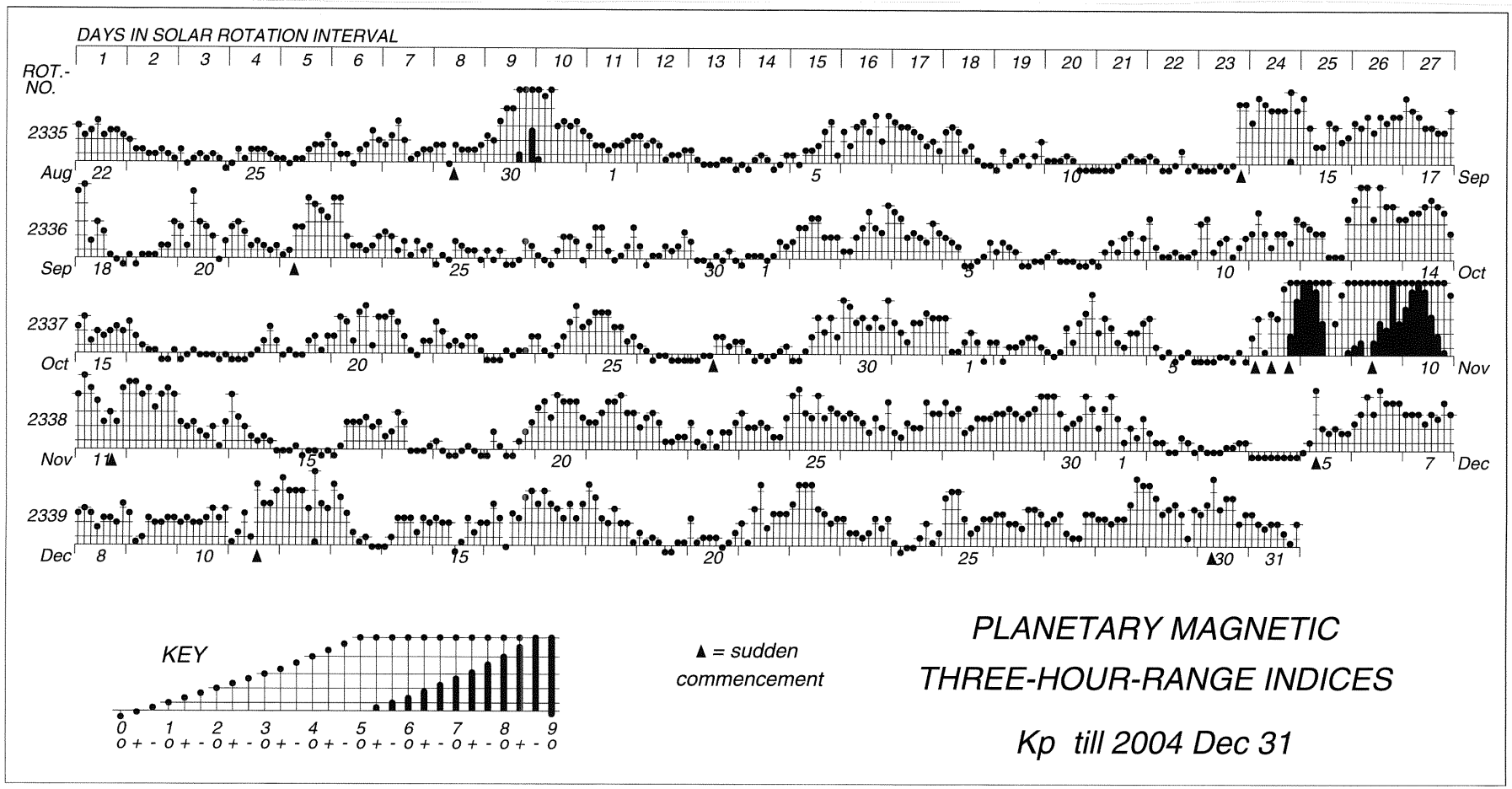


Day	Jan 04	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	24	10	21	4	9	16	8	8	7	3	5	12
2	15	18	21	3	6	10	8	6	6	11	4	4
3	22	20	13	41	6	8	6	3	2	12	10	3
4	22	15	6	18	7	7	5	3	2	12	8	0
5	25	12	5	24	14	11	6	5	7	4	4	9
6	24	21	3	25	8	11	5	5	14	3	1	20
7	29	7	3	12	16	8	3	15	11	2	50	15
8	7	4	3	14	8	9	2	3	7	5	140	11
9	23	7	28	16	5	13	4	14	3	5	119	8
10	26	6	45	11	6	10	6	16	2	8	161	10
11	19	28	40	10	12	5	18	10	2	11	24	15
12	9	30	28	10	12	3	12	7	2	9	30	28
13	20	25	14	6	12	4	14	6	8	33	7	10
14	12	20	16	4	5	10	6	7	32	22	8	7
15	18	24	15	7	7	18	6	4	14	8	2	6
16	29	7	10	13	4	7	9	5	19	4	7	13
17	18	4	6	8	4	7	21	10	21	2	6	16
18	18	8	10	8	4	9	6	8	15	3	2	13
19	18	8	7	6	9	4	8	4	5	4	4	3
20	18	4	12	4	13	4	8	15	12	12	20	4
21	14	7	11	7	7	4	4	16	8	8	17	12
22	64	8	13	4	8	2	31	12	16	6	8	20
23	43	9	7	19	11	3	52	5	12	2	6	6
24	18	11	3	10	10	3	37	3	6	8	8	3
25	38	6	4	11	4	3	154	4	3	12	20	14
26	18	3	17	5	3	8	47	5	3	1	12	11
27	17	12	22	4	4	3	186	6	4	3	11	8
28	23	19	21	9	7	14	15	7	7	2	13	16
29	9	24	10	4	15	19	6	5	4	6	17	16
30	19		14	16	12	8	7	42	3	17	18	18
31	10		9		12		7	28		12		7
Mean	22	13	14	11	8	8	23	9	9	8	25	11

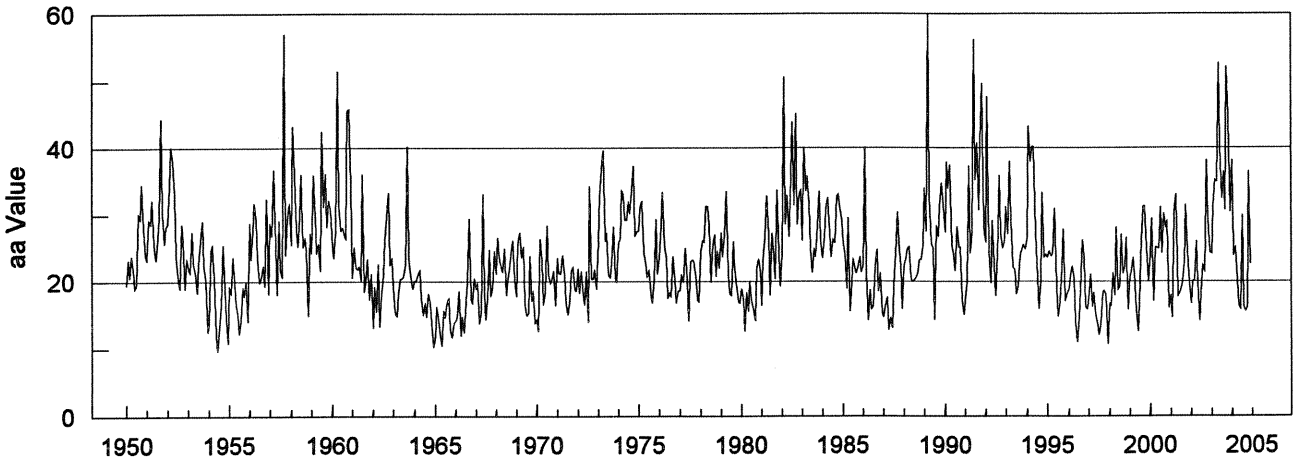
PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

GeoForschungsZentraum Potsdam

Kp through December 31, 2004



Monthly Mean aa Index Jan 1950 - Dec 2004

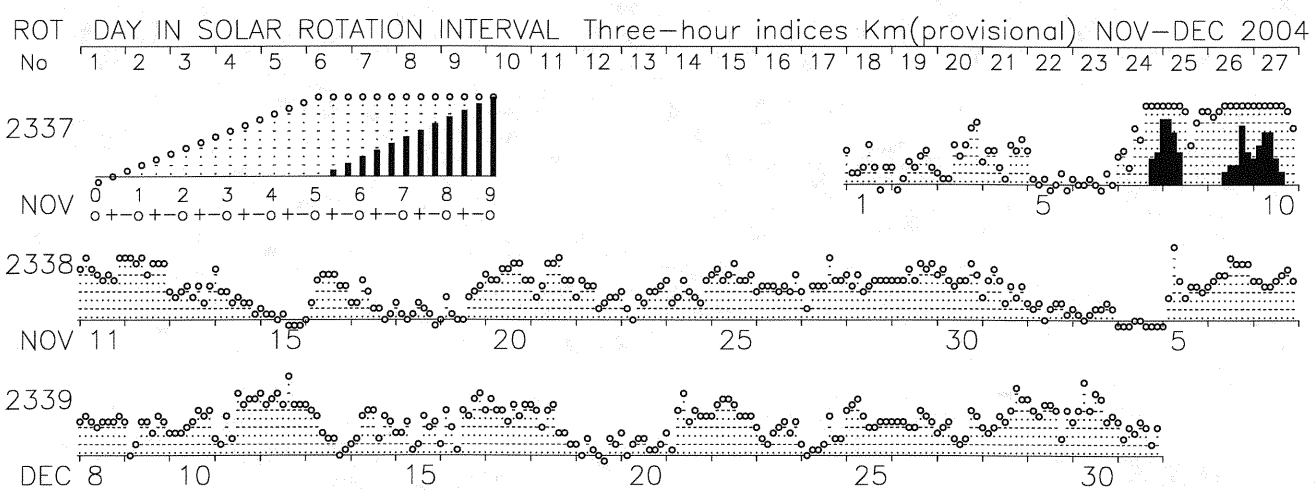


Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	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	29.9	16.3	15.6	16.3	36.4	22.6	23.1

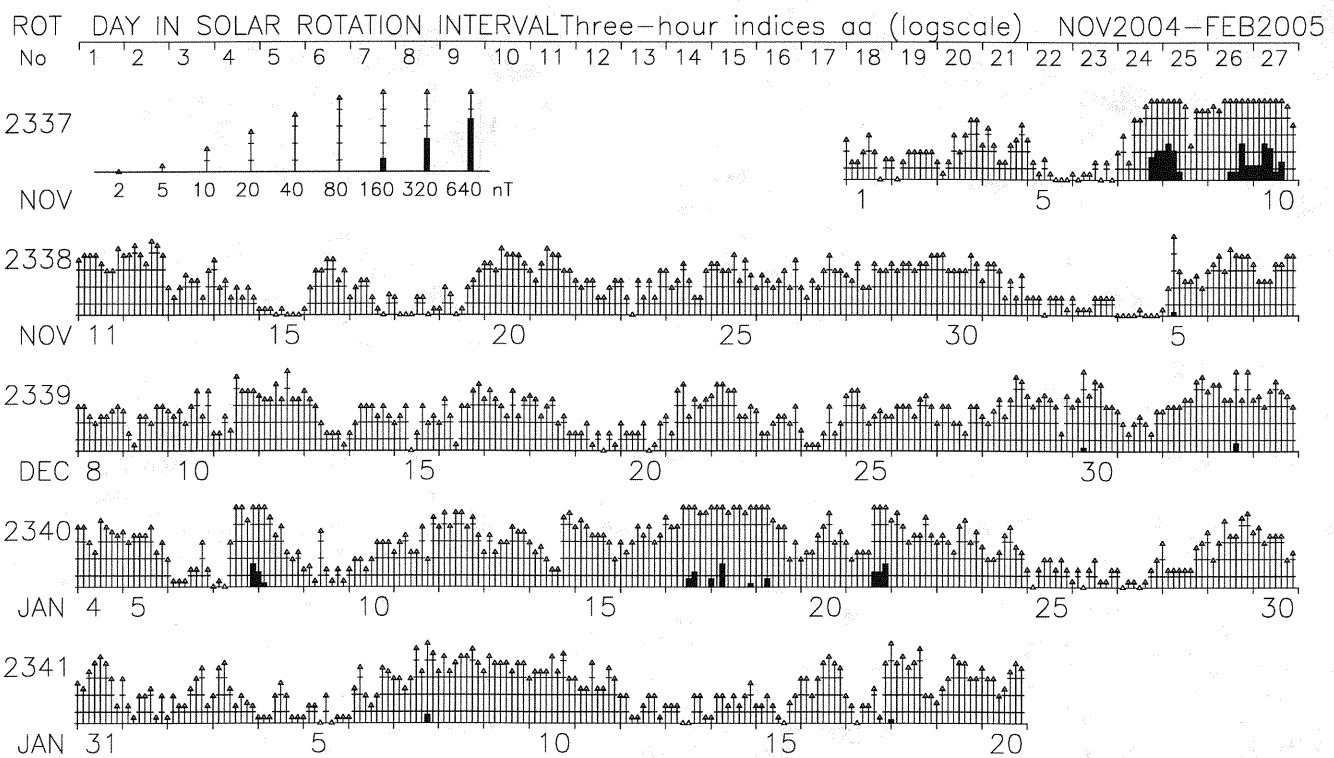
PLANETARY GEOMAGNETIC ACTIVITY

3-HOUR-RANGE INDICES Km AND aa BY 27-DAY SOLAR ROTATION INTERVAL

ISGI PUBLICATION OFFICE – EMail : ISGI.PUBOFF@cetp.ipsl.fr
CETP, 4 Avenue de Neptune, F-94107 Saint Maur des Fosses CEDEX – FRANCE



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.

WDC FOR GEOMAGNETISM, KYOTO UNIVERSITY

HOURLY EQUATORIAL DST VALUES(PROVISIONAL)

DECEMBER 2004

UNIT=NT 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	-18	-14	-17	-17	-24	-27	-27	-31	-36	-33	-32	-29	-26	-24	-26	-26	-29	-28	-30	-29	-26	-22	-19	-20
2	-22	-22	-22	-23	-25	-25	-26	-28	-29	-27	-25	-24	-22	-22	-23	-23	-22	-21	-21	-22	-21	-21	-19	-19
3	-19	-18	-17	-16	-14	-16	-17	-17	-19	-18	-19	-17	-15	-14	-13	-14	-15	-15	-13	-13	-14	-16	-17	-16
4	-14	-14	-13	-13	-13	-12	-11	-11	-12	-11	-12	-14	-17	-18	-16	-14	-13	-14	-14	-13	-11	-10	-11	-11
5	-10	-11	-11	-12	-12	-1	7	21	63	47	39	36	40	36	33	25	17	17	17	11	12	10	6	6
6	3	-1	0	0	-8	-23	-30	-32	-41	-39	-41	-46	-53	-51	-45	-58	-58	-52	-54	-53	-47	-46	-45	-41
7	-39	-43	-51	-48	-47	-46	-46	-46	-42	-40	-41	-40	-33	-34	-34	-34	-32	-36	-36	-36	-32	-30	-30	-29
8	-27	-25	-28	-29	-28	-32	-33	-31	-28	-30	-31	-32	-32	-32	-34	-36	-35	-35	-31	-27	-26	-29	-32	-29
9	-28	-25	-26	-28	-28	-27	-25	-25	-24	-25	-31	-32	-32	-31	-29	-27	-30	-36	-33	-28	-24	-23	-24	-22
10	-22	-21	-23	-22	-25	-21	-21	-22	-26	-30	-34	-34	-35	-36	-39	-42	-40	-37	-38	-37	-32	-29	-31	-28
11	-25	-22	-22	-22	-25	-30	-34	-34	-30	-32	-34	-33	-30	-20	-8	-10	-6	-6	-11	-28	-42	-46	-32	-27
12	-33	-37	-35	-36	-35	-39	-42	-35	-34	-38	-36	-33	-29	-38	-48	-48	-45	-31	-24	-23	-22	-17	-3	-12
13	-39	-52	-57	-59	-61	-59	-56	-50	-45	-43	-39	-37	-34	-32	-30	-28	-26	-26	-23	-22	-19	-17	-16	-15
14	-15	-15	-19	-21	-20	-20	-21	-30	-29	-29	-35	-37	-37	-36	-34	-33	-30	-27	-23	-26	-33	-37	-34	-31
15	-29	-28	-27	-27	-25	-24	-30	-37	-33	-28	-27	-26	-26	-28	-32	-35	-34	-28	-25	-24	-27	-32	-34	-28
16	-20	-13	-10	-16	-19	-21	-23	-21	-17	-15	-14	-13	-14	-16	-16	-14	-14	-16	-9	-9	-18	-21	-19	-12
17	-7	-11	-17	-21	-20	-24	-24	-27	-26	-21	-24	-26	-24	-23	-24	-24	-20	-28	-30	-30	-26	-22	-20	-23
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21	-7	-11	-13	-10	-7	-3	3	24	9	-1	-21	-25	-18	-11	-13	-24	-29	-26	-18	-12	-12	-13	-16	-17
22	-15	-11	-6	-1	-11	-17	-19	-25	-30	-35	-29	-23	-20	-27	-23	-25	-29	-33	-27	-22	-19	-21	-22	-25
23	-21	-20	-21	-25	-27	-29	-31	-28	-29	-29	-30	-25	-21	-23	-24	-24	-24	-23	-24	-20	-19	-24	-26	-26
24	-23	-22	-24	-26	-26	-25	-21	-21	-24	-23	-21	-19	-16	-17	-17	-19	-23	-22	-22	-21	-16	-10	-8	-4
25	-10	-9	-5	-3	-7	-18	-18	-18	-21	-13	-14	-11	-12	-15	-13	-14	-13	-17	-21	-25	-21	-18	-17	-15
26	-12	-9	-12	-7	-11	-14	-16	-16	-15	-15	-16	-17	-16	-11	-9	-14	-19	-21	-22	-18	-16	-12	-11	-10
27	-10	-11	-11	-8	-10	-15	-14	-6	-8	-7	-7	-3	-1	-1	-2	-5	-9	-10	-8	-12	-17	-23	-23	-23
28	-25	-28	-31	-32	-29	-29	-30	-35	-38	-30	-30	-29	-29	-24	-22	-21	-21	-31	-36	-44	-40	-40	-46	-48
29	-47	-48	-50	-50	-53	-48	-51	-48	-48	-51	-55	-46	-35	-31	-38	-37	-41	-43	-37	-28	-24	-26	-24	-28
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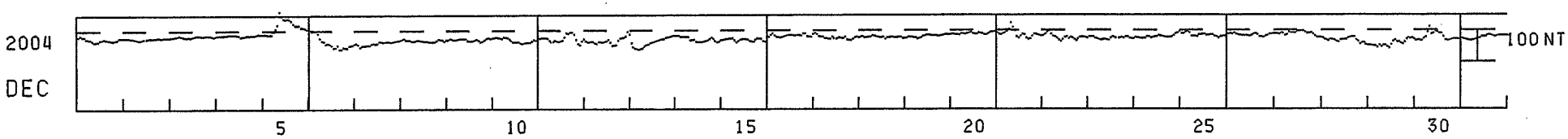

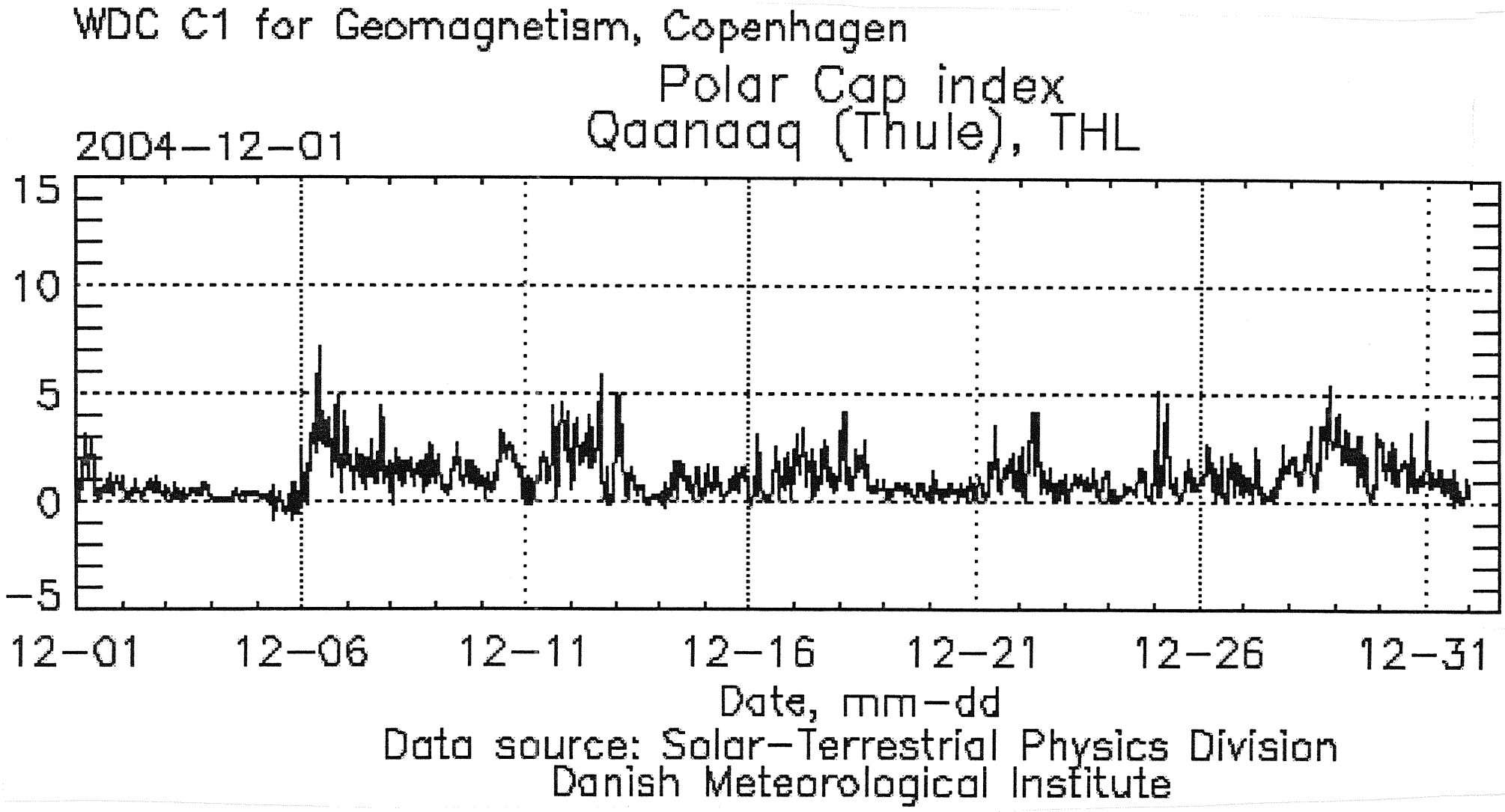
WDC C1 for Geomagnetism, Copenhagen
Polar Cap index
Qaanaaq (Thule), THL
2004-12-01
15
10
5
0
-5
12-01
12-06
12-11
12-16
12-21
12-26
12-31
Date, mm-dd
Data source: Solar-Terrestrial Physics Division
Danish Meteorological Institute

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

DECEMBER 2004

Sta	Geomag Lat	Commencement Day	Time (UT)	Type	SC Amplitudes D (Min)	H (Gamma)	Z (Gamma)	Maximum 3-Hour K Index Day(3-Hour Periods)	K	Ranges D (Min)	H (Gamma)	Z (Gamma)	End Day	Hour (UT)
JAI	17.4N	05	0745	SC	- 1.2	56	- 13		-	4	196	27	06	24
NGP	11.3N	05	0745	SC	- 0.7	71	- 9		-	3	207	23	06	24
ABG	09.4N	05	0745	SC	- 1.2	63	- 10	05(3)	6	4	203	28	06	24
HYB	07.6N	05	0745	SC	- 0.8	66	- 7	05(3)	6	3	196	23	07	24
PND	02.0N	05	0745	SC	- 0.6	72	50		-	2	195	76	06	24
TIR	00.6S	05	0745	SC	- 1.3	83	94		-	3	228	126	06	24
CAN	43.6S	05	0746	SC	2.2	114.2*	15.4*	05(3)	6	13	142	21	06	03
JAI	17.4N	11	1339	SC	- 0.3	23	- 4		-	5	88	19	13	24
NGP	11.3N	11	1339	SC	--	25	- 3		-	4	92	18	13	24
ABG	09.4N	11	1339	SC	- 0.3	22	- 3	11(7,8) 12(4,5,6)	5	4	--	28	13	24
HYB	07.6N	11	1139	SC	- 0.3	20	- 2	11(7) 12(5,6)	5	3	84	11	13	23
PND	02.0N	11	1339	SC	- 0.1	21	17		-	3	86	49	13	24
TIR	00.6S	11	1339	SC*	- 0.2	19	22		-	4	123	58	13	24
HYB	07.6N	14	0500	..	..	..	..	17(6)	4	3	77	26	18	22
JAI	17.4N	21	0630	..	..	..	..		-	3	108	27	22	24
NGP	11.3N	21	0630	..	..	..	..		-	3	118	11	22	24
ABG	09.4N	21	0630	..	..	..	..	21(4)	6	4	113	22	22	24
HYB	07.6N	21	0500	..	..	..	..	21(3,4)	5	3	115	17	23	04
PND	02.0N	21	0630	..	..	..	..		-	3	114	62	22	24
TIR	00.6S	21	0630	..	..	..	..		-	4	110	69	22	24
HYB	07.6N	24	1200	..	..	..	..	24(6) 25(2,3,4) 27(7)	3	3	64	17	27	23
HYB	07.6N	28	0100	..	..	..	..	30(3)	6	6	139	22	31	23
JAI	17.4N	30	0621	SC	- 1.2	38	- 9		-	4	106	25	30	24
KRC	16.4N	30	0124	..	..	..	..	30(6)	6	6	110	54	30	17
NGP	11.3N	30	0621	SC	- 0.6	43	- 6		-	4	128	17	30	24
ABG	09.4N	30	0621	SC	- 0.9	37	- 13	30(3)	6	4	133	21	30	24
PND	02.0N	30	0621	SC	- 0.3	42	32		-	3	135	82	30	24
TIR	00.6S	30	0621	SC*	- 0.9	76	63		-	3	172	137	30	24
CAN	43.6S	30	0400	..	..	..	..	30(3)	6	12	153	22	30	21

Stations:

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

Stations reporting no storms observed: GNA

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

December 2004

Storm Sudden Commencements (SSC)

Day	Time	Quality: Station Group*
05	0746	A: SOD* LER* ESK* VAL HAD NAG SPT* GUI HYB GNA* CNB* B: NUR* NGK* BDV* CLF* HRB EBR C: GCK*
11	1340	B: LER* ESK* HAD C: NGK* BDV* EBR SPT* GUI
30	0623	B: GUI C: NGK* BDV SPT*

Solar Flare Effects (sfe)

Day	Begin-End	Station(s)
27	0657-0712	GUI

REPORTING OBSERVATORIES (up to the 2nd of February 2005):
SOD NUR LER ESK NGK VAL HAD BDV CLF HRB NAG GCK MMB EBR SPT KAK 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 Antartic 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.