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Data for March, April 1998 and Late Data

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Number 645

(Issued in Two Parts)

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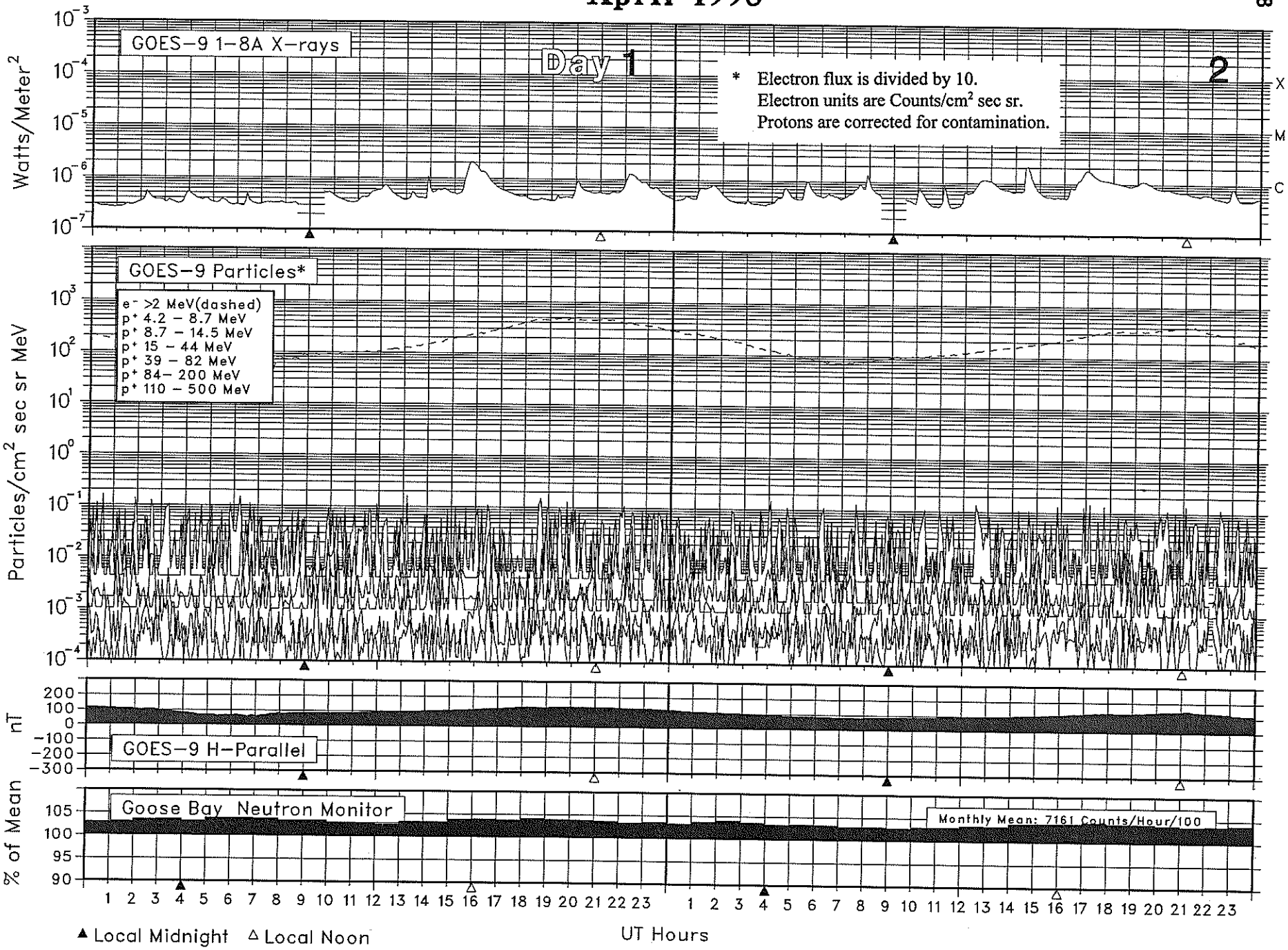
April 1998



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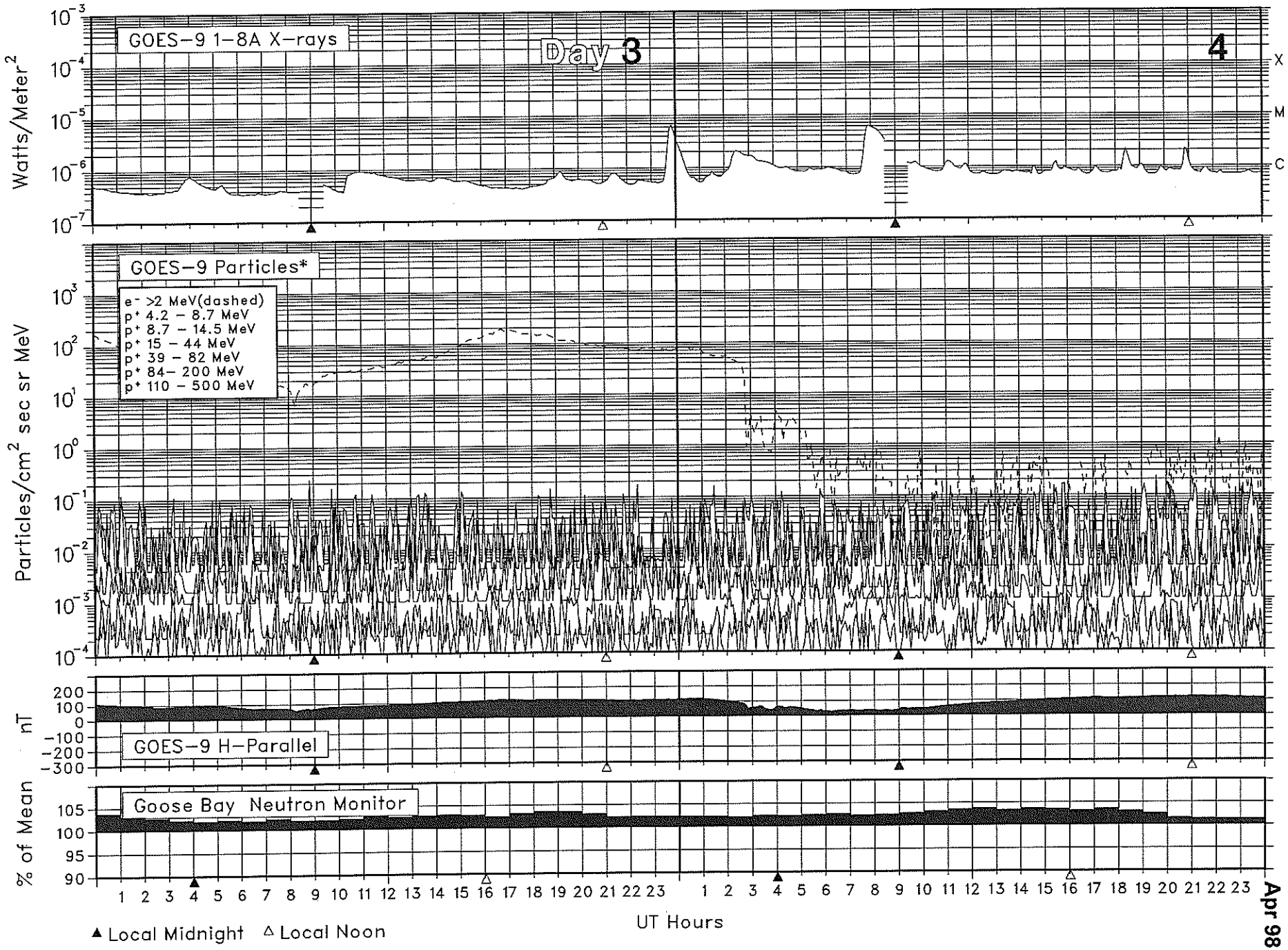
April 1998



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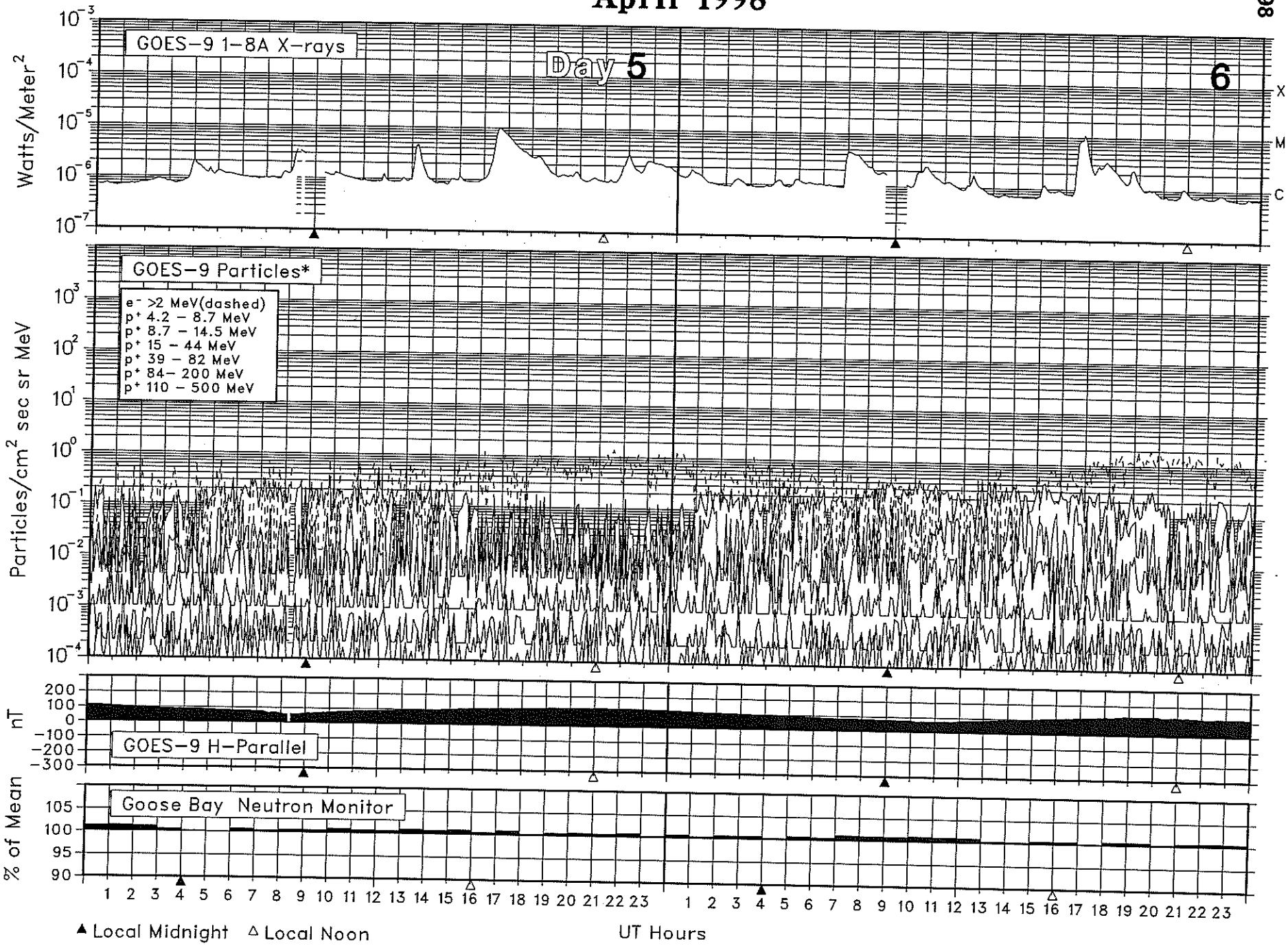

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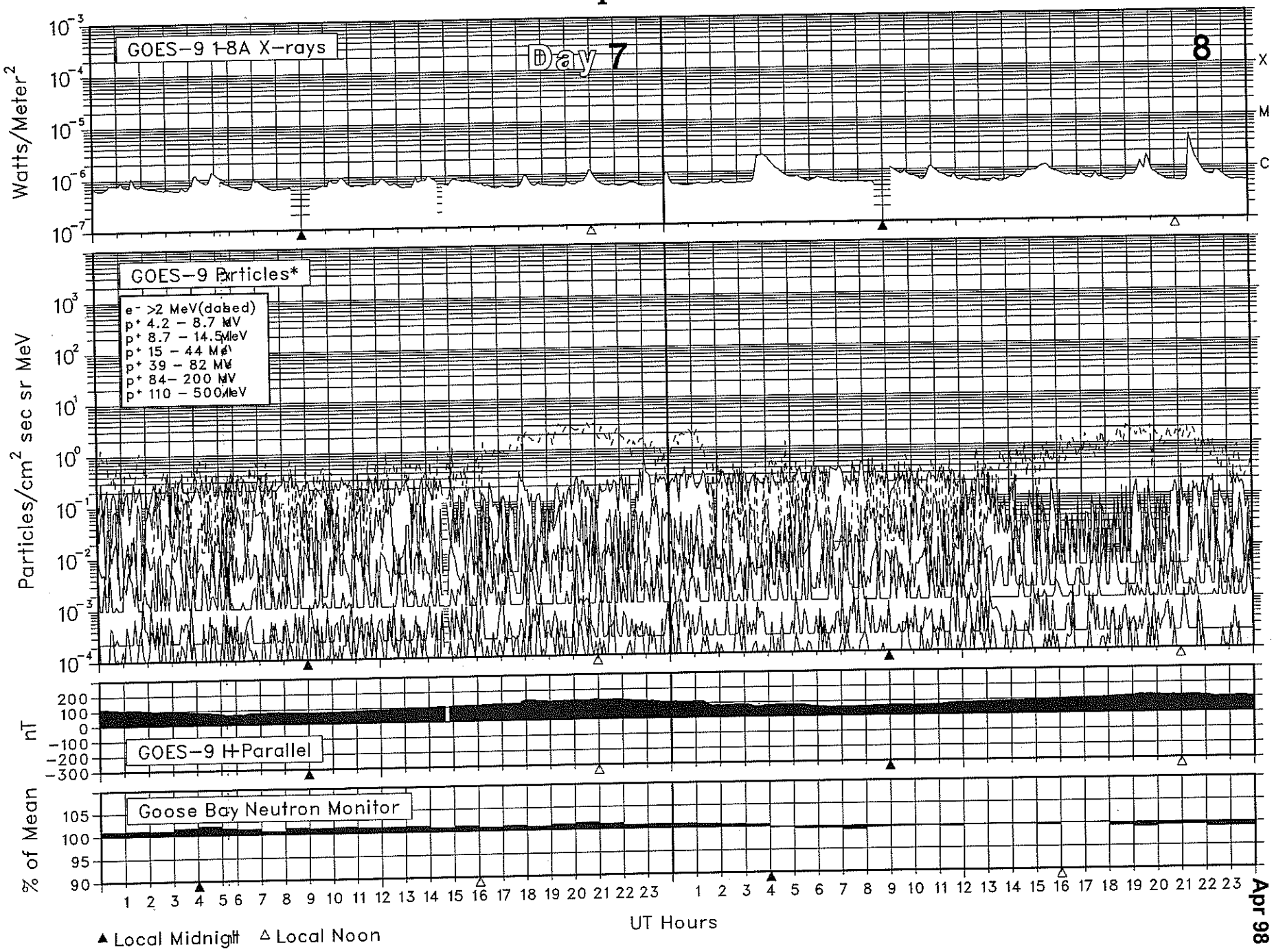

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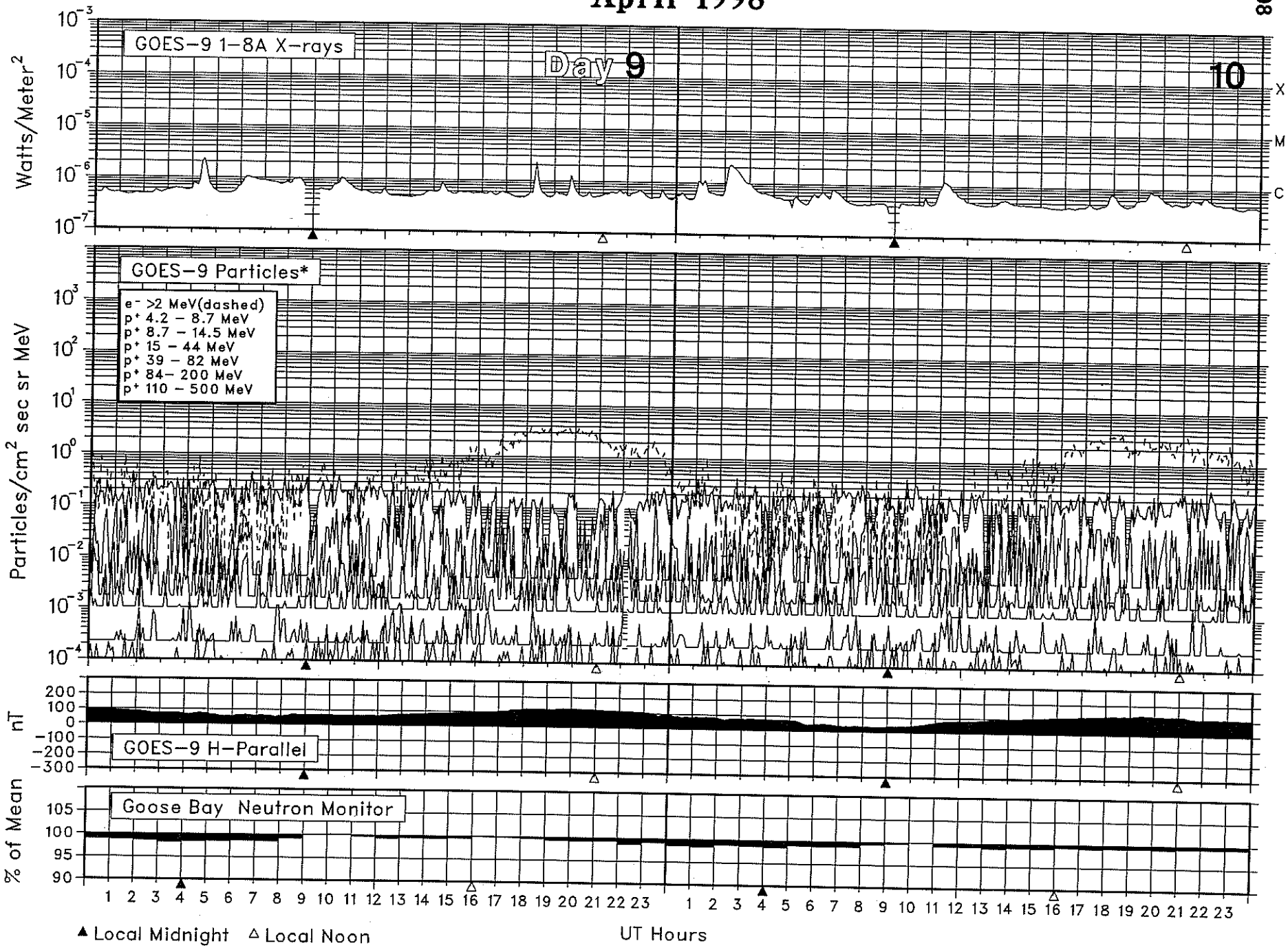

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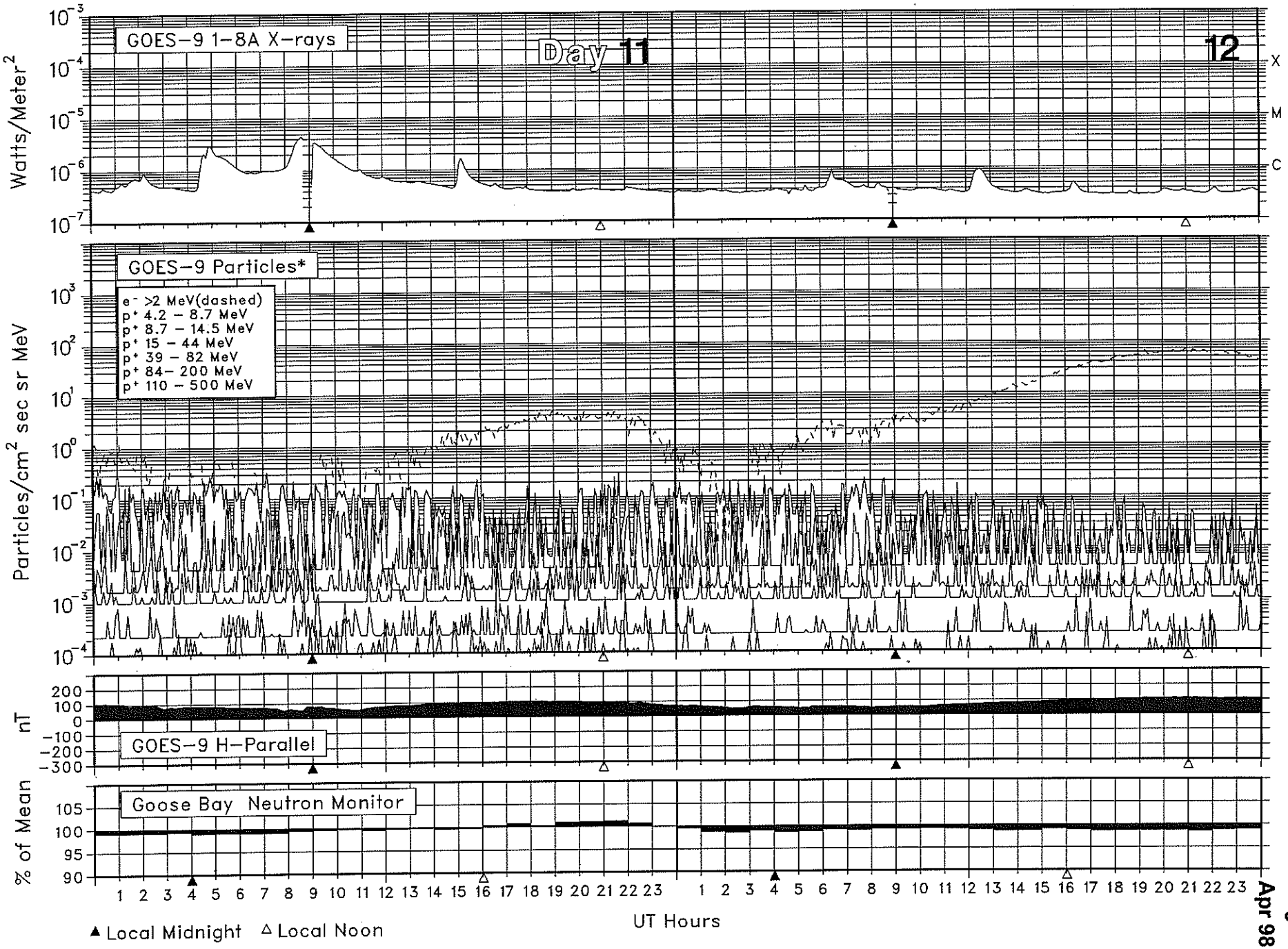

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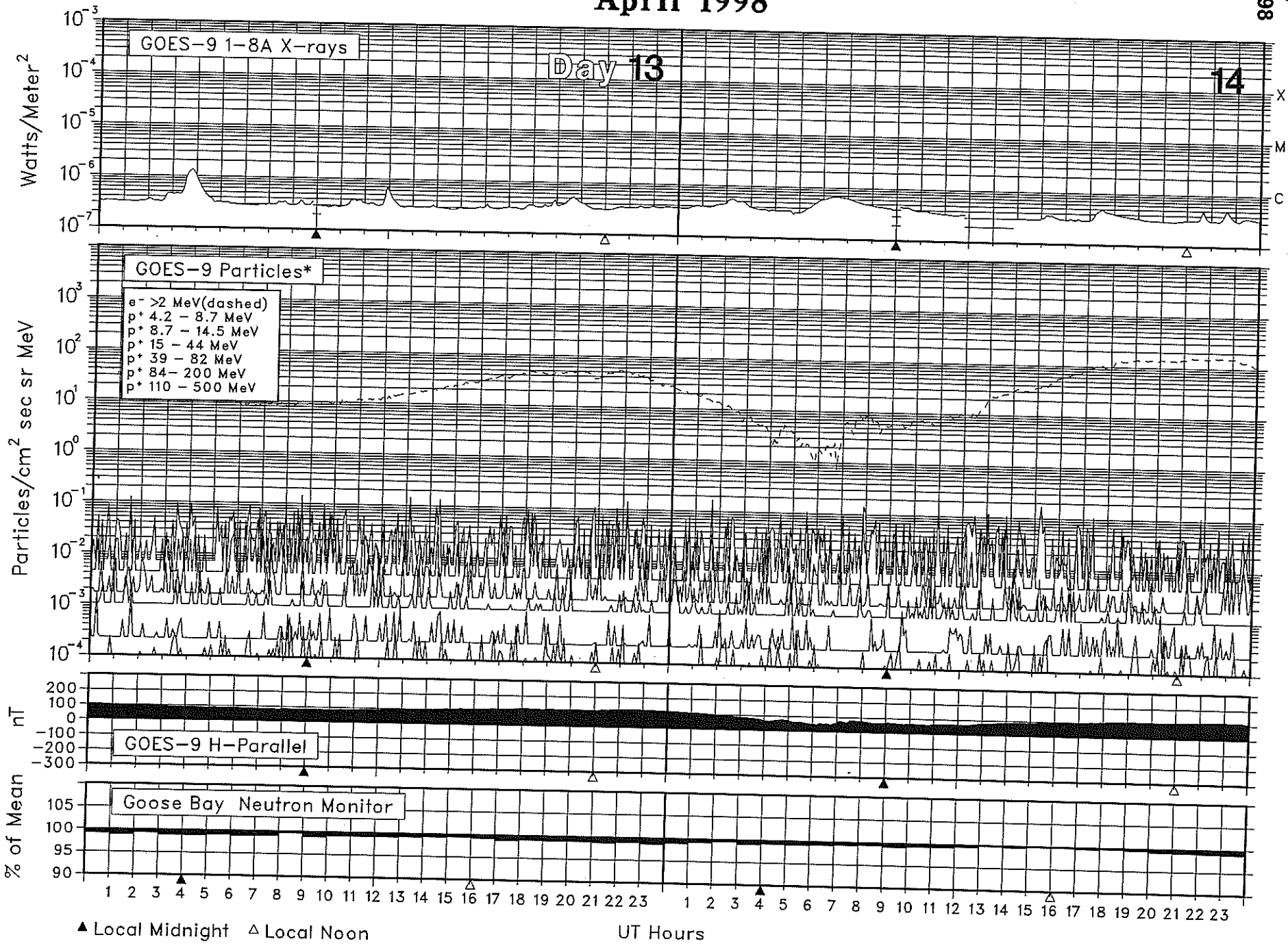

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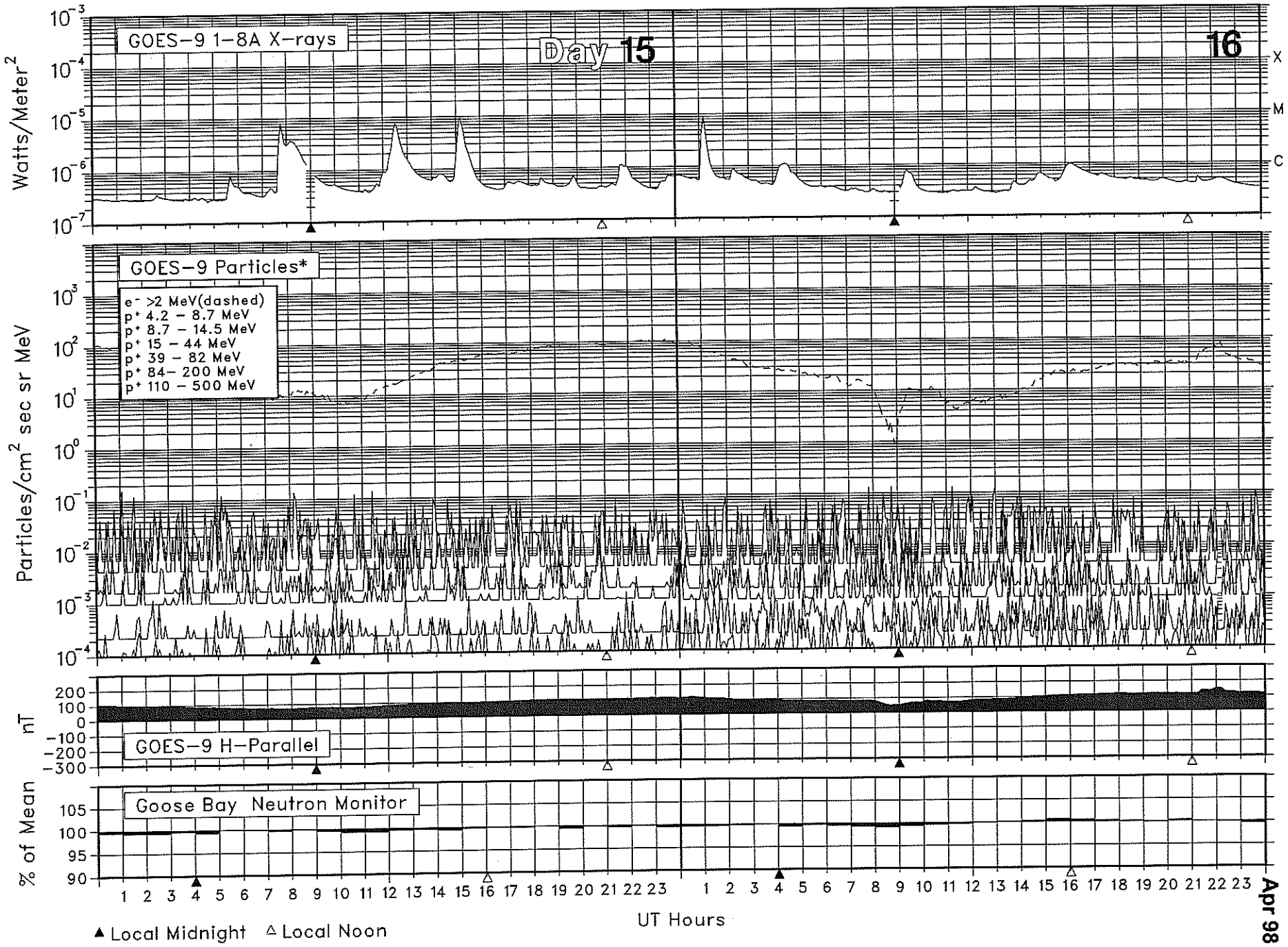

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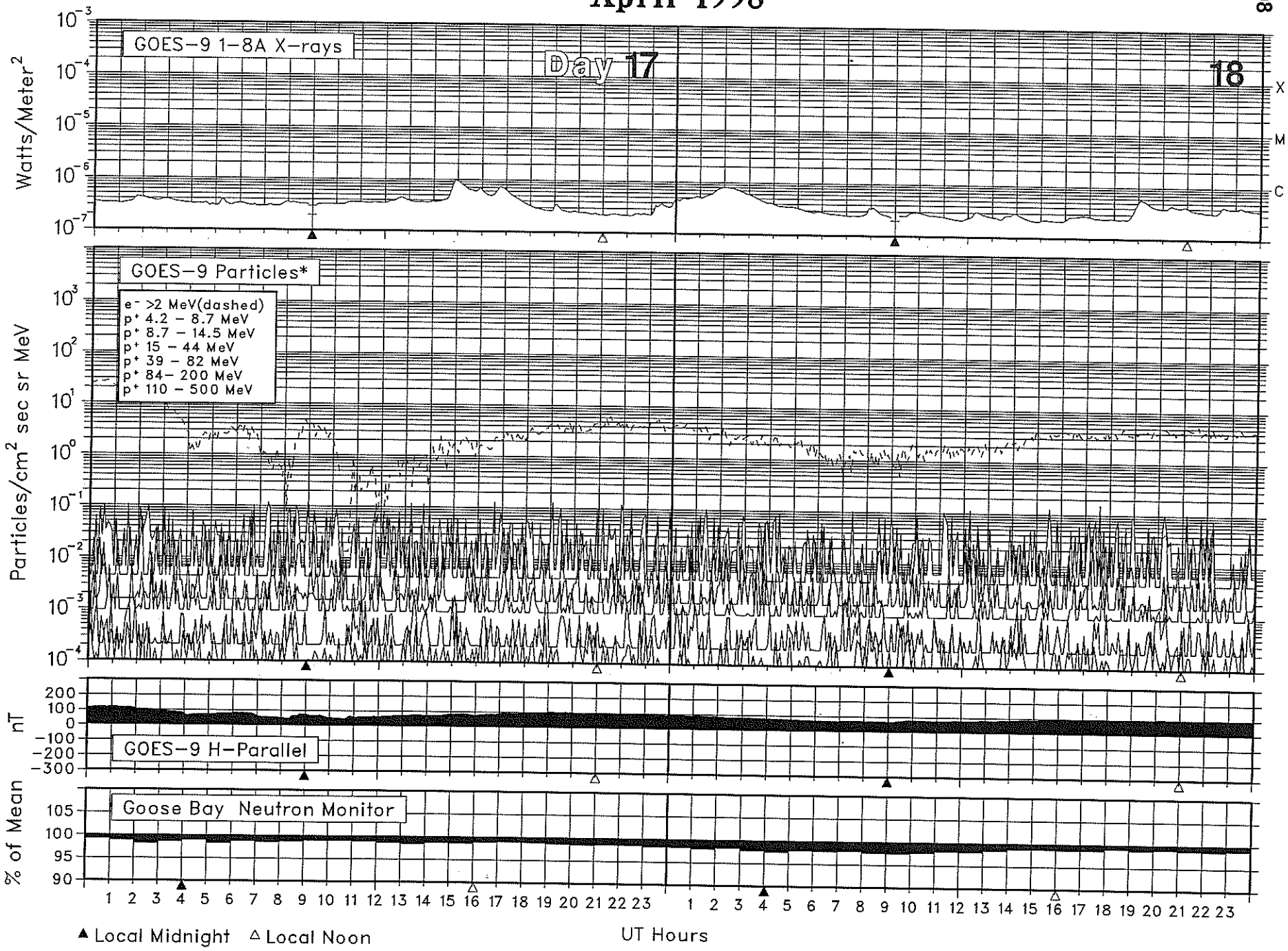

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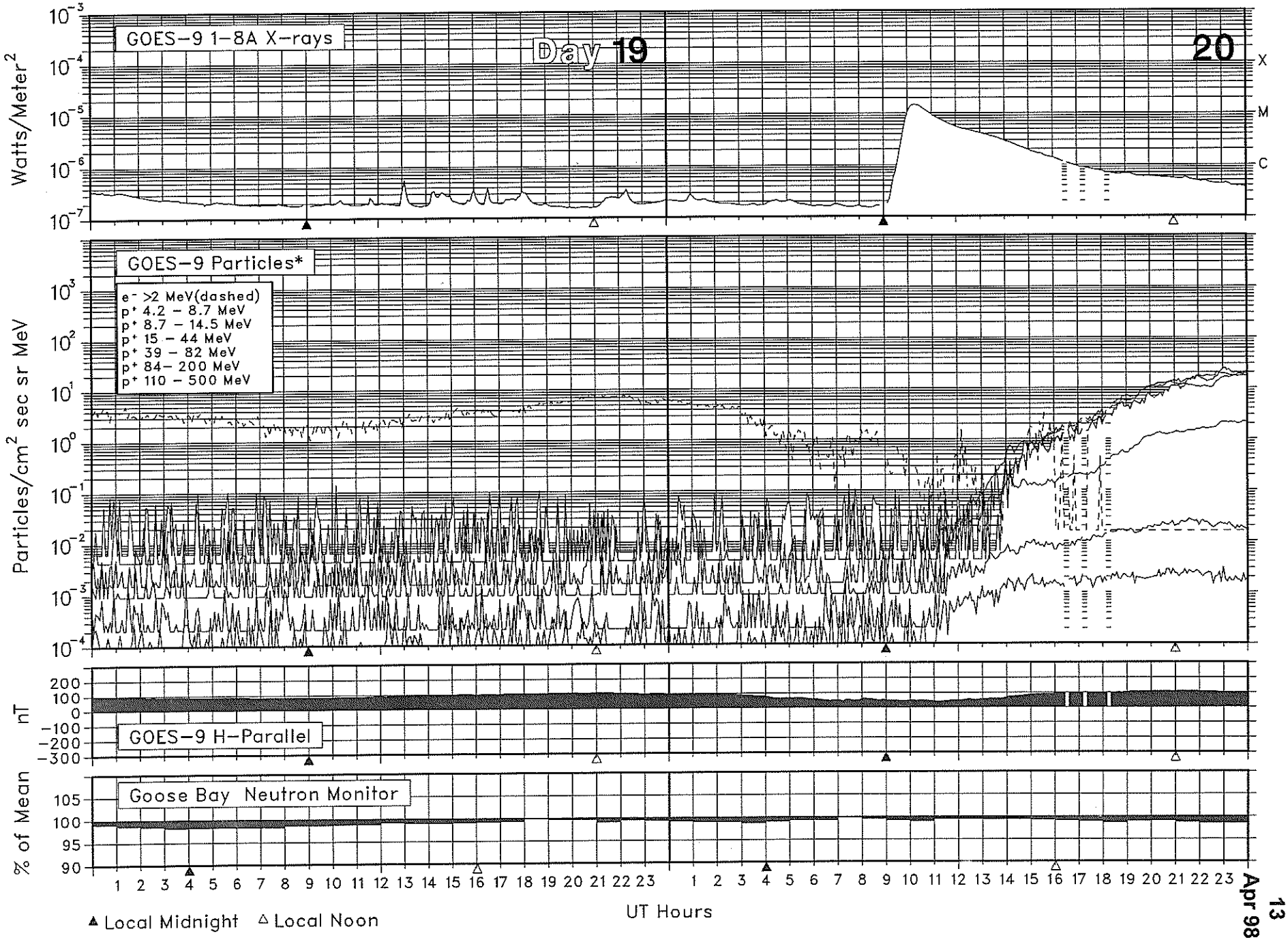

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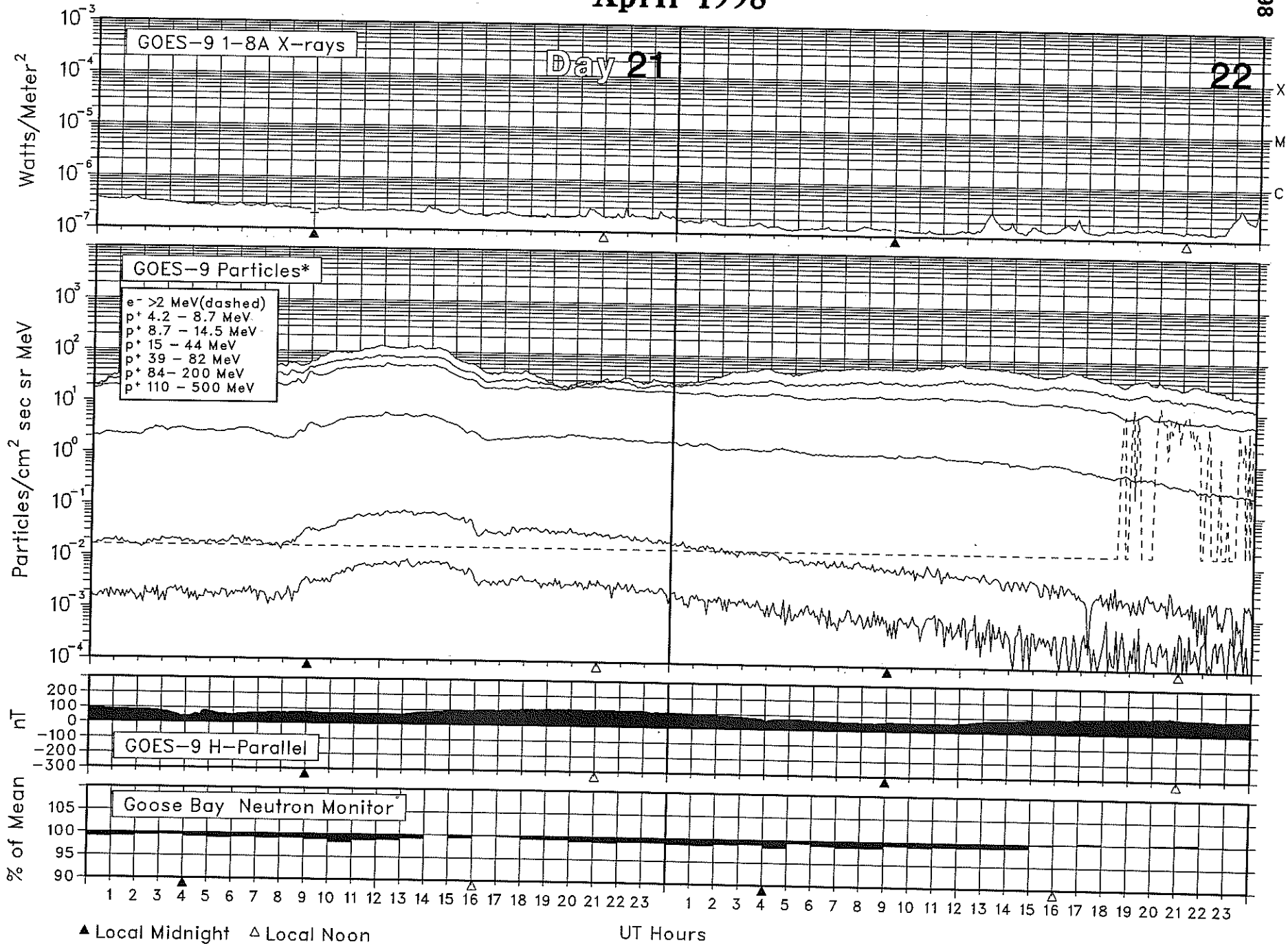

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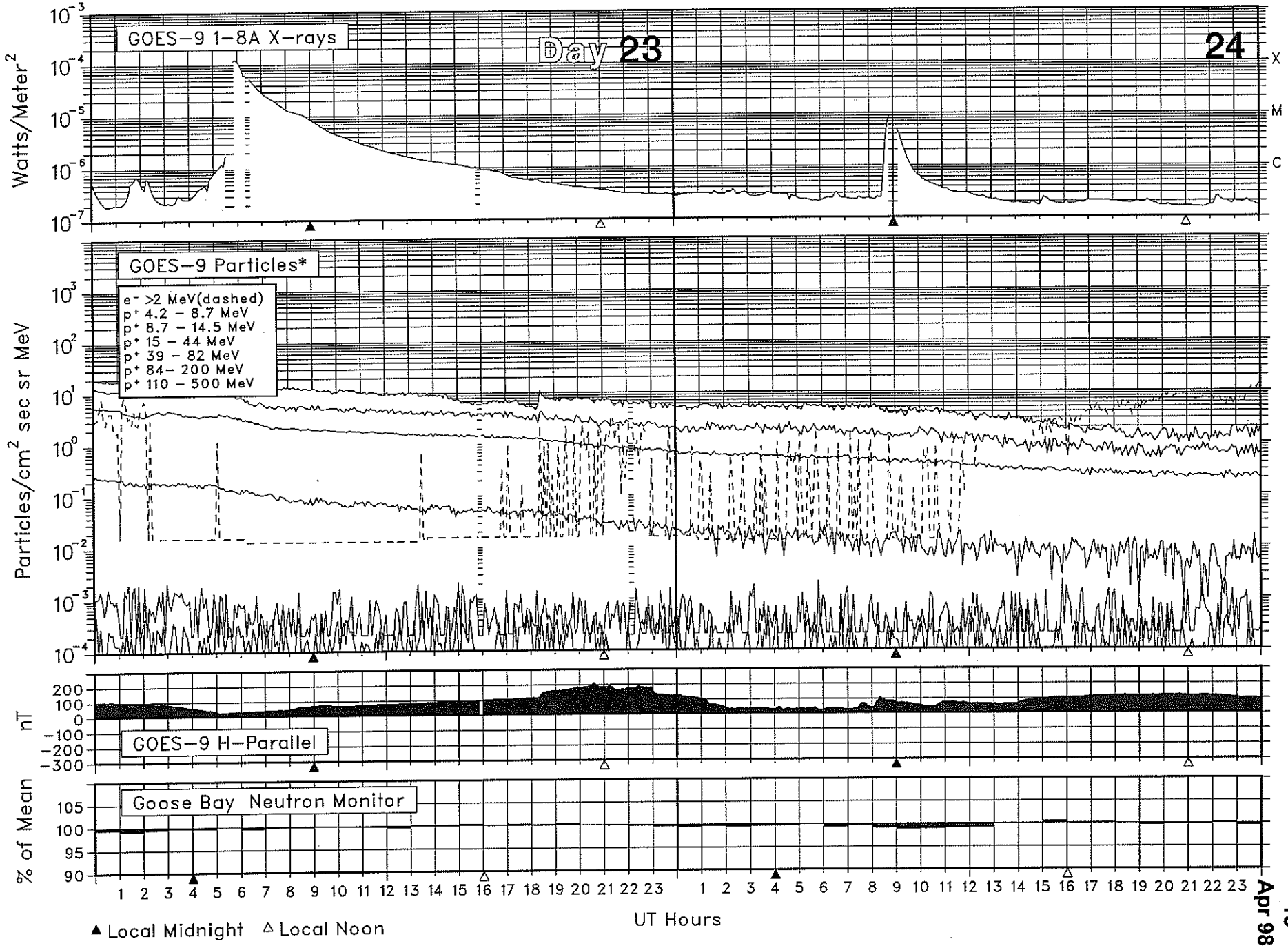

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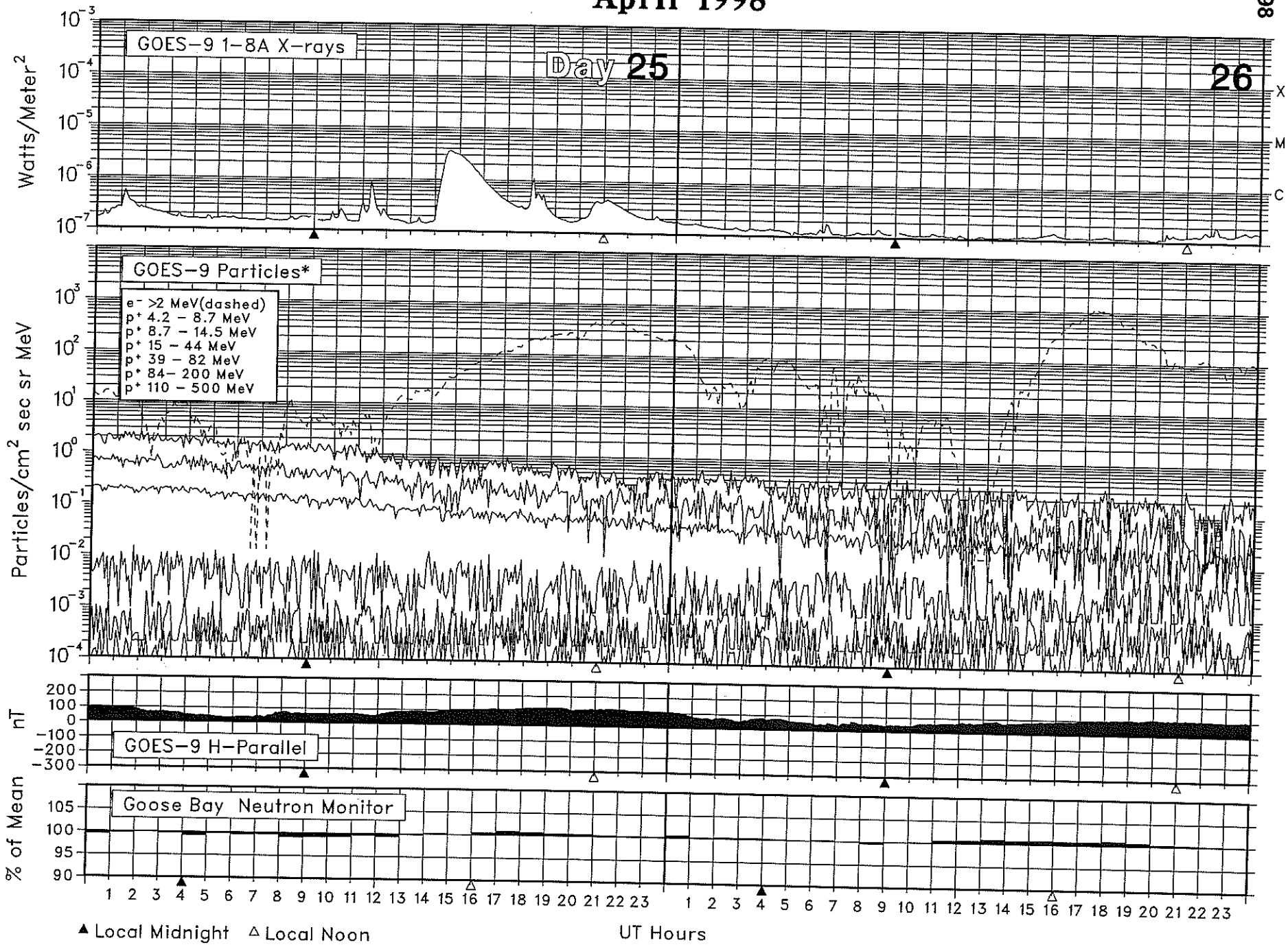

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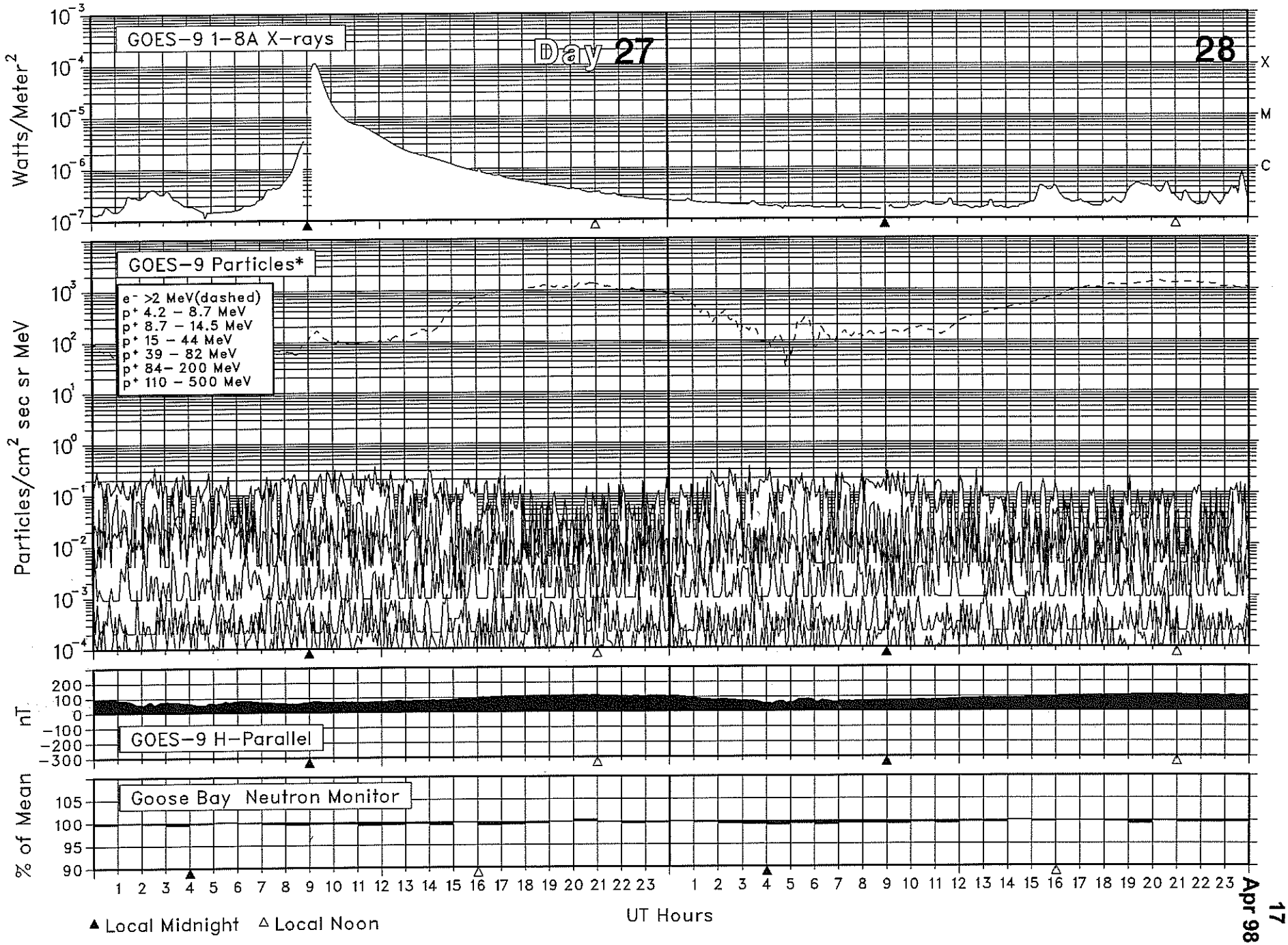

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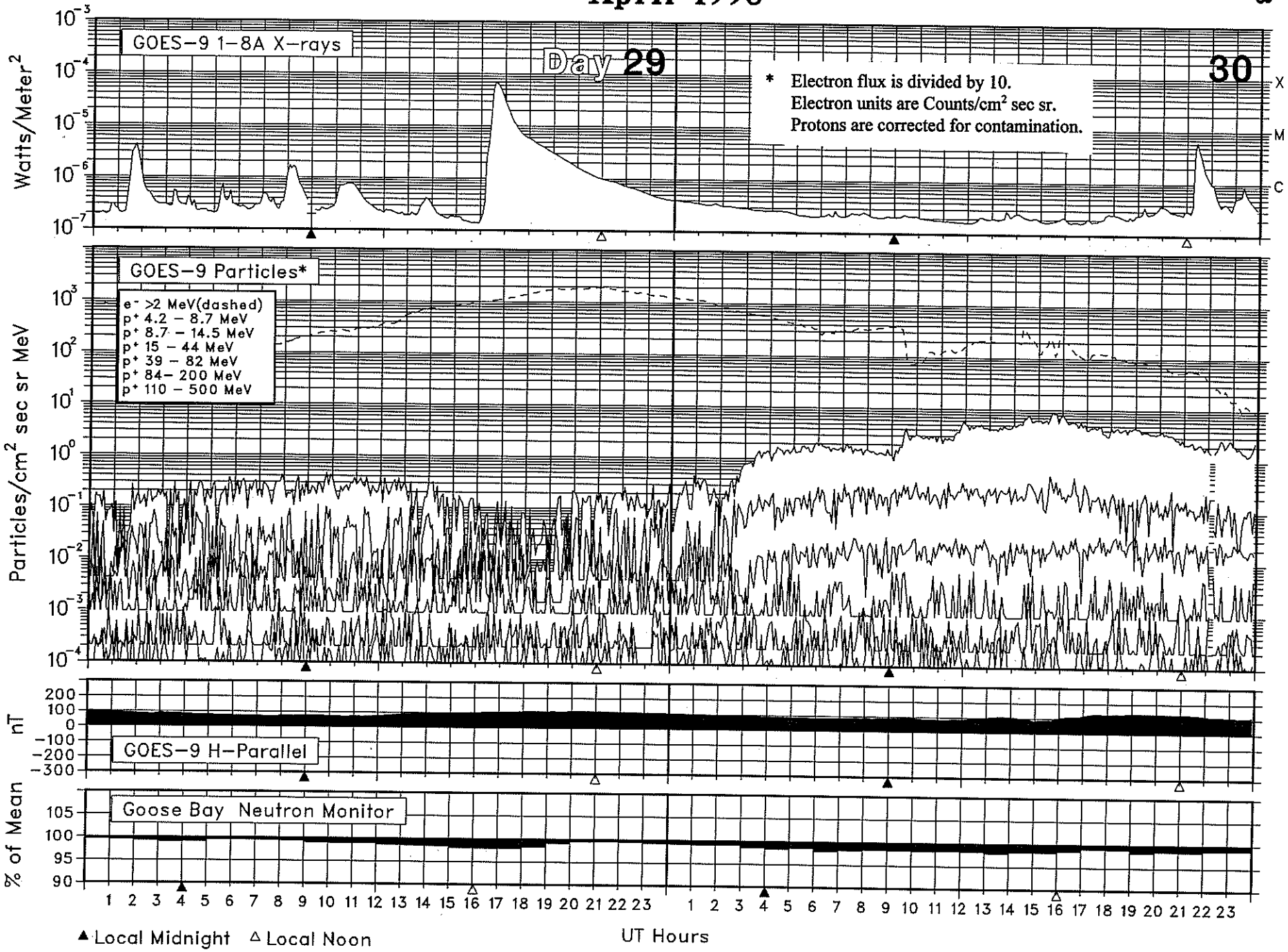
April 1998



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

APRIL 1998

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location Lat	Location Long	Flares Optical	Flares M	Flares X	Date of Forecast	Region Forecast(1)	Geoadvice(1)
091	01	31	71	108	6	S25	W51	0	0	0	01	Q	SOL: Eruptive
						S27	W73	2	0	0	01	Q	MAG: Active
						S22	E36	9	0	0	01	E	PRO: Quiet
						S20	E52	0	0	0	01	Q	
092	02	01	90	106	3	S25	W64	1	0	0	02	E	SOL: Eruptive
						N29	W33	0	0	0	02	Q	MAG: Active
						S21	E25	5	0	0	02	E	PRO: Quiet
						S21	E34	0	0	0	02	Q	
						S33	W42	0	0	0	02	Q	
093	03	02	67	103	2	S24	W75	0	0	0	03	E	SOL: Eruptive
						S19	E10	6	0	0	03	E	MAG: Active
						S19	E21	2	0	0	03	Q	PRO: Quiet
						S30	W55	0	0	0	03	Q	
094	04	03	74	104	5	S25	W85	0	0	0	04	Q	SOL: Eruptive
						S20	W03	2	0	0	04	E	MAG: Quiet
						S20	E09	1	0	0	04	Q	PRO: Quiet
						S32	W68	0	0	0	04	Q	
095	05	04	70	110	9	S22	W95	0	0	0	05	Q	SOL: Eruptive
						S20	W17	6	0	0	05	Q	MAG: Quiet
						S22	W05	1	0	0	05	Q	PRO: Quiet
						S22	E42	8	0	0	05	E	
096	06	05	82	126	3	S20	W30	0	0	0	06	Q	SOL: Eruptive
						S21	W19	0	0	0	06	Q	MAG: Quiet
						S22	E28	2	0	0	06	E	PRO: Quiet
						S18	E71	4	1	0	06	E	
						S26	E75	0	0	0	06	Q	
097	07	06	82	133	4	S20	W48	0	0	0	07	Q	SOL: Eruptive
						S20	W31	0	0	0	07	Q	MAG: Quiet
						S22	E14	0	0	0	07	Q	PRO: Quiet
						S18	E60	1	0	0	07	E	
						S27	E62	2	1	0	07	E	
098	08	07	120	135	7	S21	W60	0	0	0	08	Q	SOL: Active
						S23	E02	0	0	0	08	Q	MAG: Quiet
						S18	E49	0	0	0	08	E	PRO: Quiet
						S27	E52	0	0	0	08	E	
						N18	W61	0	0	0	08	Q	
						N32	E48	0	0	0	08	Q	
						S28	E74	0	0	0	08	Q	
						S26	W02	0	0	0	08	Q	
099	09	08	131	141	7	S21	W72	0	0	0	09	Q	SOL: Eruptive
						S23	W12	0	0	0	09	Q	MAG: Quiet
						S19	E36	4	0	0	09	Q	PRO: Quiet
						S27	E38	3	0	0	09	Q	
						N18	W72	0	0	0	09	Q	
						N32	E34	0	0	0	09	Q	
						S28	E60	4	0	0	09	E	
						S27	W16	0	0	0	09	Q	
100	10	09	192	140	8	S22	W86	0	0	0	10	Q	SOL: Eruptive
						S23	W24	0	0	0	10	Q	MAG: Quiet
						S18	E24	0	0	0	10	E	PRO: Quiet
						S27	E27	1	0	0	10	E	
						N18	W91	0	0	0	10	Q	
						N32	E21	0	0	0	10	Q	
						S28	E49	4	0	0	10	Q	
						S27	W29	0	0	0	10	Q	
						S21	E06	3	0	0	10	Q	
						N19	E62	0	0	0	10	Q	
						S21	E56	0	0	0	10	Q	

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

APRIL 1998

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location Lat	Location Long	Flares Optical	Flares M	Flares X	Date of Forecast	Region Forecast(1)	Geoadvice(1)
101	11	10	145	130	12	S23	W38	0	0	0	11	Q	SOL: Eruptive
						S17	E10	0	0	0	11	E	MAG: Quiet
						S25	E18	0	0	0	11	Q	PRO: Quiet
						S28	E36	0	0	0	11	Q	
						S28	W42	1	0	0	11	Q	
						S22	W07	1	0	0	11	Q	
						S21	E43	2	0	0	11	Q	
102	12	11	132	128	11	S23	W52	0	0	0	12	Q	SOL: Eruptive
						S19	W03	2	0	0	12	E	MAG: Quiet
						S27	E05	0	0	0	12	Q	PRO: Quiet
						S28	E23	0	0	0	12	Q	
						S27	W54	0	0	0	12	Q	
						S22	W21	0	0	0	12	Q	
						S21	E29	0	0	0	12	Q	
103	13	12	111	117	7	S22	W64	0	0	0	13	Q	SOL: Eruptive
						S19	W17	0	0	0	13	Q	MAG: Quiet
						S26	W09	0	0	0	13	Q	PRO: Quiet
						S28	E09	0	0	0	13	Q	
						S27	W68	0	0	0	13	Q	
						S21	W34	0	0	0	13	Q	
						S23	E17	2	0	0	13	Q	
104	14	13	82	115	4	S21	W76	0	0	0	14	Q	SOL: Eruptive
						S18	W30	0	0	0	14	Q	MAG: Quiet
						S28	E00	0	0	0	14	Q	PRO: Quiet
						S26	W82	1	0	0	14	Q	
						S22	W46	1	0	0	14	Q	
						S26	E06	1	0	0	14	Q	
105	15	14	83	112	8	S19	W42	0	0	0	15	Q	SOL: Eruptive
						S27	W33	0	0	0	15	Q	MAG: Quiet
						S29	W17	1	0	0	15	Q	PRO: Quiet
						S23	W61	0	0	0	15	Q	
						S26	W07	0	0	0	15	Q	
						N30	W12	0	0	0	15	Q	
106	16	15	79	113	4	S17	W56	0	0	0	16	Q	SOL: Eruptive
						S29	W31	2	0	0	16	Q	MAG: Quiet
						S21	W71	0	0	0	16	Q	PRO: Quiet
						S24	W21	0	0	0	16	Q	
						N31	W24	4	0	0	16	E	
107	17	16	59	106	7	S16	W73	0	0	0	17	Q	SOL: Eruptive
						S23	W33	1	0	0	17	Q	MAG: Active
						N31	W41	0	0	0	17	E	PRO: Quiet
						S15	E12	0	0	0	17	Q	
108	18	17	70	101	13	S17	W87	0	0	0	18	Q	SOL: Eruptive
						S24	W47	0	0	0	18	Q	MAG: Active
						N31	W51	0	0	0	18	Q	PRO: Quiet
						S16	W02	0	0	0	18	Q	
						N21	E00	0	0	0	18	Q	
109	19	18	28	99	6	N33	W59	0	0	0	19	Q	SOL: Quiet
						N21	W12	0	0	0	19	Q	MAG: Quiet
								0	0	0	19		PRO: Quiet
110	20	19	35	96	2	N21	W25	3	0	0	20	Q	SOL: Quiet
						N23	E42	0	0	0	20	Q	MAG: Quiet
								0	0	0	20		PRO: Quiet
111	21	20	35	98	9	N21	W40	0	0	0	21	Q	SOL: Quiet
						N25	E29	0	0	0	21	Q	MAG: Quiet
								0	0	0	21		PRO: Quiet

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

APRIL 1998

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location Lat	Location Long	Flares Optical	Flares M	Flares X	Date of Forecast	Region Forecast(1)	Geoadvice(1)
112	22	21	47	92	7	N21	W53	0	0	0	22	Q	SOL: Eruptive
						N24	E14	0	0	0	22	Q	MAG: Quiet
						N00	W09	0	0	0	22	Q	PRO: IP
113	23	22	41	88	7	N21	W66	7	0	0	23	Q	SOL: Quiet
						N24	E01	0	0	0	23	Q	MAG: Quiet
						N18	E57	0	0	0	23	Q	PRO: IP
114	24	23	38	90	10	N22	W79	0	0	0	24	Q	SOL: Warning
						N17	E42	0	0	0	24	Q	MAG: Active
						S22	W06	0	0	0	24	Q	PRO: IP
115	25	24	22	91	25	N18	E30	0	0	0	25	Q	SOL: Warning
						S24	W16	0	0	0	25	Q	MAG: Minor
								0	0	0	25		PRO: Quiet
116	26	25	50	92	21	N18	E16	0	0	0	26	Q	SOL: Active
						S24	W34	0	0	0	26	Q	MAG: Minor
						S16	E67	3	0	0	26	Q	PRO: Quiet
						S22	W12	0	0	0	26	Q	
117	27	26	30	91	25	S17	E56	1	0	0	27	Q	SOL: Eruptive
						S22	W26	0	0	0	27	Q	MAG: Active
								0	0	0	27		PRO: Quiet
118	28	27	19	91	16	S17	E42	2	0	1	28	E	SOL: Eruptive
								0	0	0	28		MAG: Active
								0	0	0	28		PRO: Quiet
119	29	28	54	98	8	S17	E30	7	0	0	29	E	SOL: Eruptive
						S30	W65	1	0	0	29	Q	MAG: Active
						S25	E54	0	0	0	29	Q	PRO: Quiet
120	30	29	65	101	6	S17	E18	9	1	0	30	E	SOL: Active
						S31	W81	0	0	0	30	Q	MAG: Active
						S24	E40	0	0	0	30	Q	PRO: Quiet
						N28	E60	0	0	0	30	Q	

(1) Region Forecast and Flare (SOL) Advice

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

Magnetic (MAG) Geoadvice

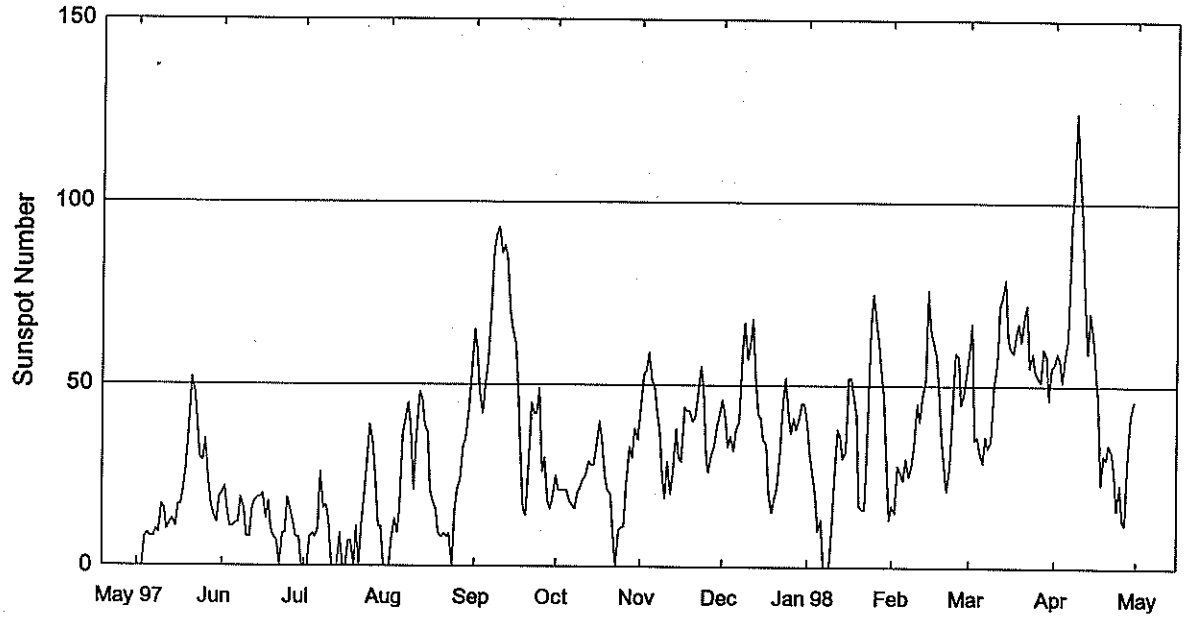
'Quiet'		
'Active'	conditions expected	(A>=20 or K=4)
'Minor'	storm expected	(A>=30 or K=5)
'Major'	storm expected	(A>=50 or K>=6)
'Severe'	storm expected	(A>=100 or K>=7)
'IP'	magstorm in progress	(A>=30 or K>=4)
'Warning'	(activity levels are expected to increase, but no numerical forecast given)	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

Proton (PRO) Geoadvice

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

STRATWARM ALERTS - NONE

International Relative Sunspot Numbers
May 1997 - Apr 1998

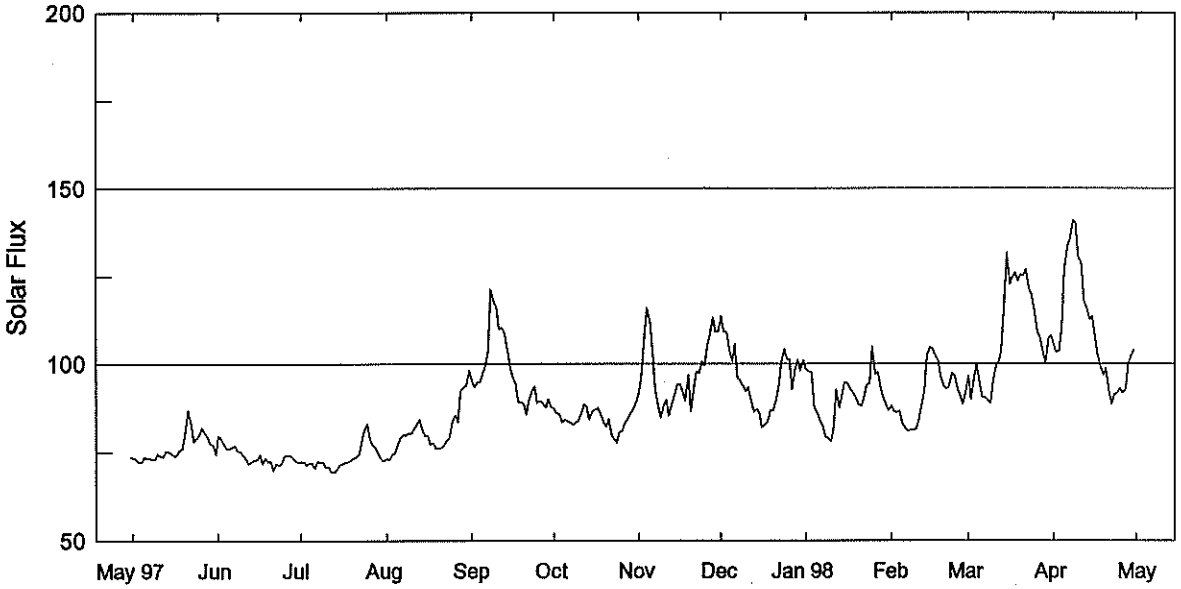


Day	May 97	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 98*	Feb*	Mar*	Apr*
1	0	20	0	0	65	25	43	46	39	17	59	56
2	0	22	0	8	59	21	53	41	31	15	67	59
3	0	15	8	13	48	21	54	33	25	28	35	57
4	8	11	9	9	42	21	59	36	20	26	36	51
5	9	11	8	17	50	21	51	32	10	24	32	59
6	8	12	10	36	56	18	50	38	13	30	29	63
7	8	12	26	41	68	17	43	40	0	25	36	93
8	10	19	16	45	87	16	37	58	0	28	33	106
9	9	16	17	38	91	20	25	67	0	33	35	125
10	17	8	13	21	93	22	19	57	10	45	50	108
11	16	8	0	36	86	24	29	61	27	40	56	96
12	10	16	0	48	88	25	20	68	38	47	72	75
13	12	18	0	46	85	29	26	53	36	51	74	59
14	13	19	9	39	70	28	38	42	30	76	79	70
15	11	19	0	37	65	28	30	41	32	65	63	63
16	17	20	0	21	61	34	29	35	52	62	60	54
17	17	13	7	18	49	40	44	34	52	58	59	46
18	21	18	7	16	33	35	43	20	46	49	64	23
19	27	10	0	9	16	25	43	15	42	35	67	31
20	39	8	11	8	14	21	40	19	17	28	62	30
21	52	7	0	9	26	20	41	22	16	21	69	34
22	48	0	11	8	45	9	47	32	16	28	72	32
23	40	9	20	9	42	0	55	45	40	44	55	26
24	30	9	29	0	42	10	49	52	66	59	59	16
25	29	19	39	15	49	11	30	42	75	58	54	23
26	35	15	34	21	26	11	26	37	67	45	52	13
27	25	12	25	24	30	23	31	41	61	48	51	12
28	17	8	11	33	18	33	33	38	53	54	60	32
29	14	8	11	35	16	30	39	41	47		58	42
30	12	0	0	43	19	38	42	45	28		46	46
31	19		0	53		35		45	13		55	
Mean	18.5	12.7	10.4	24.4	51.3	22.8	39.0	41.2	32.3	40.7	54.8	53.3

* = Provisional.

Penticton 2800 MHz (10.7cm) Solar Flux
May 97 - Apr 98

Adjusted to 1 AU



Day	May 97	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 98	Feb	Mar	Apr
1	73.4	79.6	72.4	73.2	95.1	87.3	91.6	113.7	98.3	88.1	96.5	105.6
2	73.3	79.1	72.4	72.9	93.3	86.0	96.2	109.0	97.6	86.5	89.9*	103.4
3	72.3	77.4	71.4	74.3	94.7	85.8	108.0	109.0	97.7	86.3	95.0	103.6
4	72.1	76.1	72.0	74.9	94.6	83.4	115.9	104.2	87.7	86.6	100.0	110.2
5	73.6	76.1	72.0	76.9	97.6	84.3	111.9	100.7	86.3	83.1	95.1	126.4
6	73.4	76.4	70.6	79.0	99.1	83.6	103.5	105.6	84.1	81.8	90.3	133.7
7	73.3	76.9	72.6	80.1	103.6	83.4	92.7	96.0	82.1	80.8	90.5	135.5
8	73.3	75.4	72.1	79.9	121.1	82.7	87.9	95.1	79.5	81.3	89.9	141.0
9	73.0	75.3	72.3	80.3	117.7	83.3	84.8	93.8	78.9	81.5	88.7	140.2
10	74.6*	74.2	70.8	80.4	116.4	84.0	87.6	92.2	78.0	81.5	95.0	130.2
11	73.8	73.0	70.9	81.6	110.0	85.8	89.6	93.4	82.0	84.0	99.4	128.8
12	73.7	71.8	69.6	83.0	110.3	88.3	85.4	89.6	92.7	88.3	100.3	117.6
13	75.4	72.3	69.3	84.2	108.9	87.8	88.2	86.5	87.5	92.3	103.7	115.5
14	75.1	72.9	70.3	81.6	103.7	84.3	91.0	87.1	90.8	102.3	118.2	112.6
15	74.7	73.0	71.5	79.6	99.1	86.4	94.1	86.3	94.6	104.7	131.6	113.5
16	73.9	74.4	71.9	79.8	96.4	86.9	94.1	82.0	94.4	104.2	122.6	107.2
17	74.4	71.8	72.2	77.4	94.0	87.5	92.0	82.9	92.8	102.4	124.3	102.1
18	75.8	73.5	72.3	77.7	89.0	85.9	89.4	83.5	92.0	100.9	125.9	99.4
19	76.0	72.4	72.8	76.1	89.1	84.0	96.8	86.8	90.5	96.3	123.5	96.7
20	81.1	72.5	73.5	76.3	88.4	82.1	86.5	86.7	88.5	93.6	125.5	98.7
21	86.9	69.8	73.6	76.3	85.8	84.2	93.6	89.0	88.0	92.8	124.9	92.9
22	83.0	71.8	74.5	77.2	89.6	79.9	97.7	93.8	90.1	93.5	126.8	88.5
23	78.1	71.3	78.1	78.2	92.3	78.8	97.3	100.7	93.9	97.3	121.3	91.3
24	78.9	72.2	81.2	79.4	93.5	77.7	100.6	104.3	94.5	96.6	119.9	91.7
25	80.1	74.1	83.0	83.7	88.9	80.5	99.4	101.3	105.0	92.9	114.4	93.0
26	82.0#	74.2	79.0	85.5	89.5	81.0	105.2	101.3	96.9	90.9	109.5	91.8
27	80.4	74.1	76.8	83.5	88.8	83.3	108.2	92.7	97.7	88.6	107.7	92.6
28	79.5	73.6	76.5	92.3	87.5	84.4	113.2	98.7	93.7	92.3	103.6	99.8
29	77.6	72.6	75.0	93.3	90.0	86.0	109.0	101.0	90.9		100.0	102.0
30	77.2	72.1	73.2	93.8	87.9	86.9	109.3	98.0	88.4		107.2	104.1
31	74.5		72.5	98.2		89.2		101.1	86.8		107.9	
Mean	76.3	74.0	73.4	81.0	97.2	84.3	97.4	95.7	90.4	91.1	108.0	109.0

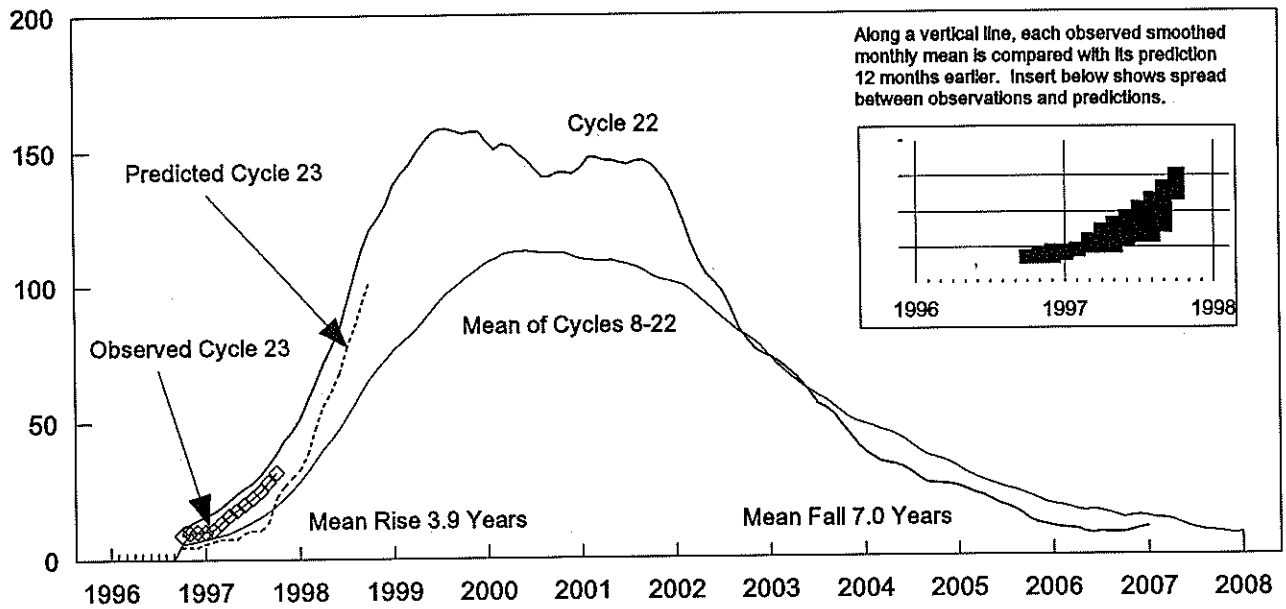
NOTE: *=1700UT reading, snow on antenna at 2000UT. #=1900UT reading.

DAILY SOLAR INDICES
April 1998

Day	Day of Year	Bartels Cycle Day	Sunspot Numbers Int	Sunspot Numbers Amer	Obs Flux Penticton (2800)	Solar Flux Adjusted to 1 Astronomical Unit — LEAR (15400)	LEAR (8800)	LEAR (4995)	Pentic (2800)	LEAR (2695)	LEAR (1415)	LEAR (610)	LEAR (410)	LEAR (245)
1	91	15	56	62	105.7	546	225	149	105.6	105	76	40	30	14
2	92	16	59	64	103.4	--	223	140	103.4	98	71	--	--	--
3	93	17	57	57	103.6	545	224	143	103.6	99	75	35	27	24
4	94	18	51	54	110.2	554	228	148	110.2	103	79	38	29	17
5	95	19	59	66	126.2	560	238	158	126.4	114	83	44	34	23
6	96	20	63	69	133.4	--	--	--	133.7	--	--	49	39	23
7	97	21	93	106	135.2	551	236	165	135.5	130	91	49	38	25
8	98	22	106	111	140.6	555	233	173	141.0	138	99	43	39	27
9	99	23	125	116	139.7	471	--	--	140.2	--	--	48	36	18
10	100	24	108	109	129.7	299	184	139	130.2	127	96	39	35	38
11	101	25	96	106	128.3	472	228	157	128.8	125	90	--	--	--
12	102	26	75	81	117.0	474	213	152	117.6	120	96	49	35	18
13	103	27	59	72	114.8	477	228	153	115.5	114	93	48	33	13
14	104	1	70	70	111.9	469	219	149	112.6	112	91	48	34	20
15	105	2	63	72	112.7	462	214	149	113.5	106	89	48	34	14
16	106	3	54	60	106.4	480	207	149	107.2	110	88	48	36	17
17	107	4	46	40	101.3	492	200	144	102.1	102	84	49	36	15
18	108	5	23	28	98.5	482	190	141	99.4	101	80	48	36	16
19	109	6	31	35	95.8	482	190	140	96.7	98	75	47	35	15
20	110	7	30	32	97.7	485	184	136	98.7	93	71	44	33	16
21	111	8	34	35	92.0	630	196	134	92.9	89	69	41	31	16
22	112	9	32	27	87.6	619	191	132	88.5	86	68	41	31	13
23	113	10	26	20	90.2	610	191	129	91.3	82	64	41	32	22
24	114	11	16	14	90.6	619	191	134	91.7	87	66	42	32	12
25	115	12	23	16	91.9	616	191	133	93.0	88	65	42	32	15
26	116	13	13	15	90.7	620	188	130	91.8	90	67	41	32	16
27	117	14	12	15	91.4	615	193	131	92.6	90	68	42	34	23
28	118	15	32	31	98.4	617	191	135	99.8	90	68	41	30	16
29	119	16	42	34	100.5	616	198	140	102.0	96	70	44	38	25
30	120	17	46	50	102.5	616	237	138	104.1	97	70	47	34	22
MEAN			53.3	55.6	108.3	536	208	143	109.0	103	78	44	33	19

The International numbers shown above are preliminary values; the American numbers are final.

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
1992	124	115	108	103	100	97	91	84	80	76	74	73	94
1993	71	69	67	64	60	56	55	52	48	45	41	38	56
1994	37	35	34	34	33	31	29	27	27	27	26	26	31
1995	24	23	22	21	19	18	17	16	13	12	11	11	17
1996	11	10	10	9	8*	9	8	8	8	9**	10	10	8
1997	11	11	14	17	18	20	23	25	28	32	36	40	23
( )											(2)	(6)	(1)
1998	46	51	57	62	67	73	80	88	95	102	107	111	78
( )	(6)	(8)	(11)	(14)	(17)	(19)	(22)	(25)	(28)	(31)	(34)	(37)	(21)

Solar Cycle 22 | Solar Cycle 23 | Min, Max, and Predictions

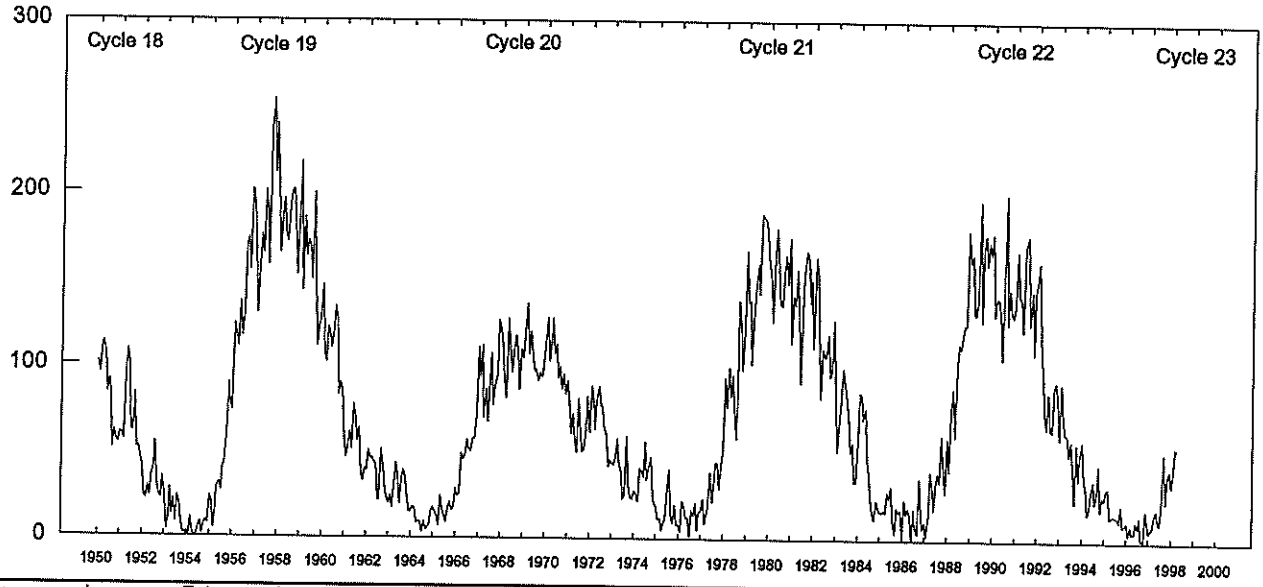
* May 1996 marks Cycle 22's mathematical minimum. ** October 1996 marks the consensus minimum NGDC is now using.

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 Dec 1997 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 October 1998 prediction. There exists a 90% chance that in October 1998, the actual smoothed number will fall somewhere between 71 and 133.

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 1950 - Apr 1998



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	101.6	94.8	109.7	113.4	106.2	83.6	91.0	85.2	51.3	61.4	54.8	54.1	83.9
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	21.2	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	32.3	40.7	54.8	53.3									45.3

Values are preliminary after Dec 97. For the yearly means, each 'M' marks a sunspot cycle maximum and each 'm' a minimum.

Hα SOLAR FLARES

APRIL 1998

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	01	0621	0625	0628						7		B 5.9						1.9E-04
GOES		0916	0923	0926	S23	E17	8190			10	SF	C 2.7						8.2E-04
LEAR		0921	0923	0931	S23	E17	8190	04	2.7	10	SF		3	E		26		
SVTO		0921E	0925U	0932	S23	E31	8190	04	3.8	11D	SF		2	E		17		F
GOES		1353	1357	1400	S20	W69	8185			7	SF	C 1.4						3.6E-04
SVTO		1356	1357	1429	S22	W70	8185	03	27.3	33	SF		3	E		25		
HOLL		1356	1358	1400	S20	W69	8185	03	27.4	4	SF		3	E		16		
GOES		1521	1544	1604	S23	E25	8190			43	SF	C 2.1						4.0E-03
HOLL		1522	1538	1632	S23	E25	8190	04	3.6	70	SF		3	E		76		
SVTO		1527	1547	1604	S23	E13	8190	04	2.6	37	SF		3	E		20		
RAMY		1528E	1532U	1603	S23	E27	8190	04	3.7	35D	SF		3	E		35		
HOLL		1956	2004	2015	S23	E25	8190	04	3.7	19	SF		3	E		45		
GOES		1959	2004	2010	S23	E25	8190			11		C 1.0						5.7E-04
GOES		2152	2216	2311	S23	E22	8190			79	SF	C 1.2						4.5E-03
HOLL		2202	2210	2228	S23	E22	8190	04	3.6	26	SF		3	E		29		
HOLL		2329	2329	2334	S23	E23	8190	04	3.7	5	SF		3	E		14		
LEAR	02	0138	0140	0143	S23	E08	8190	04	2.7	5	SF		3	E		13		
GOES		0259	0302	0304						5		B 5.1						1.3E-04
GOES		0428	0433	0443	S23	E07	8190			15	SF	B 7.9						6.2E-04
LEAR		0431	0433	0443	S23	E07	8190	04	2.7	12	SF		3	E		17		
GOES		0519	0530	0539						20		C 1.0						1.0E-03
LEAR		0735	0737	0744	S23	E05	8190	04	2.7	9	SF		3	E		15		
GOES		0752	0757	0802	S23	E05	8190			10	SF	C 1.4						7.0E-04
LEAR		0754	0755	0814	S23	E05	8190	04	2.7	20	SF		3	E		51		
LEAR		0917	0919	0930	S23	E30	8191	04	4.7	13	SF		3	E		14		
GOES		0959	1004	1013						14		B 9.0						5.9E-04
GOES		1102	1107	1111	S24	E31	8191			9	SF	C 1.0						4.3E-04
SVTO		1104	1106U	1151D	S24	E31	8191	04	4.8	47D	SF		2	E		48		F
GOES		1152	1247	1328						96		C 1.1						5.1E-03
GOES		1422	1428	1439	S22	E24	8190			17	SF	C 2.3						1.8E-03
HOLL		1427	1428	1447	S22	E24	8190	04	4.4	20	SF		3	E		52		
GOES		1611	1659	1737	S23	E23	8190			86	SF	C 1.8						6.5E-03
HOLL		1643	1647	1702	S23	E23	8190	04	4.5	19	SF		3	E		29		
HOLL		1703	1706	1712	S23	E22	8190	04	4.4	9	SF		3	E		21		
GOES		2152	2216	2311						79		C 1.2						
GOES	03	1024	1054	1249						145		B 9.2						7.0E-03
HOLL		1857	1901	1904	S20	E06	8190	04	4.2	7	SF		3	E		10		F
HOLL		1912	1916	1929	S20	E07	8190	04	4.3	17	SF		3	E		24		F
GOES		2335	2350	2402			8190			27		C 6.7						6.8E-03
LEAR		2336	2347	2416	S26	E17	8191	04	5.3	40	1N		3	E		100		FH
HOLL		2337	2349	2421	S22	E07	8190	04	4.5	44	1N		3	E		175		FH
GOES	04	0739	0757	0834						55		C 6.2						1.5E-02
SVTO		1102	1105	1110	S22	W13	8190	04	3.5	8	SF		3	E		21		F
SVTO		1148	1150	1156	S23	E02	8191	04	4.6	8	SF		3	E		19		
RAMY		1342E	1344U	1409	S18	E45		04	8.0	27D	SF		3	E		15		
HOLL		1344	1346	1356	S24	E46		04	8.1	12	SF		3	E		27		
HOLL		1405	1406	1408	S24	E42		04	7.8	3	SF		3	E		18		
GOES		1439	1443	1447						8		C 1.2						4.9E-04
HOLL		1806	1807	1816	S23	W01	8190	04	4.7	10	SF		3	E		18		F
GOES		1819	1825	1833						14		C 2.2						1.5E-03
HOLL		1840	1847	1851	S23	E44	8193	04	8.2	11	SF		3	E		17		F
HOLL		1848	1849	1854	S23	W02	8190	04	4.6	6	SF		3	E		10		
HOLL		1852	1911	1917	S23	E43	8193	04	8.1	25	SF		3	E		29		
HOLL		1857	1859	1910	S19	W12	8190	04	3.9	13	SF		3	E		30		
HOLL		1923	1928	1942	S23	E43	8193	04	8.1	19	SF		3	E		24		
HOLL		2021	2022	2025	S23	E43	8193	04	8.2	4	SF		3	E		12		
HOLL		2034	2037	2045	S22	W02	8190	04	4.7	11	SF		3	E		11		
GOES		2046	2053	2059						13		C 2.6						1.4E-03
HOLL		2138	2139	2148	S22	W03	8190	04	4.7	10	SF		3	E		35		
HOLL		2259	2307	2320	S23	E42	8193	04	8.2	21	SF		3	E		40		
HOLL		2332	2336	2339	S23	E41	8193	04	8.1	7	SF		3	E		19		
GOES	05	0355	0402	0412						17		C 2.1						1.9E-03
GOES		0808	0820	0842						34		C 3.3						5.8E-03
GOES		1148	1151	1155	S20	E35	8193			7	SF	C 1.1						4.4E-04

Hα SOLAR FLARES

APRIL 1998

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
SVTO	05	1150	1151	1157	S22	E34	8193	04	8.1	7	SF		3	E		20		
RAMY		1150	1151	1157	S20	E35	8193	04	8.2	7	SF		3	E		21		
GOES		1303	1315	1324						21		C 4.9						4.3E-03
RAMY		1339	1339	1351	S22	E33	8193	04	8.1	12	SF		3	E		10		
GOES		1622	1639	1710	S20	E84	8194			48	SF	M 1.0						2.1E-02
HOLL		1632	1634	1644	S20	E84	8194	04	12.1	12	SF		3	E		50		F
HOLL		1742	1742	1753	S20	E83	8194	04	12.1	11	SF		3	E		25		
HOLL		1759	1801	1803	S19	E86	8194	04	12.3	4	SF		3	E		19		
HOLL		1950	1951	1956	S20	E68	8194	04	11.0	6	SF		3	E		25		
GOES		2155	2200	2205						10		C 3.6						1.9E-03
GOES	06	0652	0701	0743						51		C 4.7						1.1E-02
GOES		0946	1014	1032						46		C 2.5						5.5E-03
GOES		1206	1211	1216						10		C 1.8						9.3E-04
GOES		1459	1504	1515						16		C 1.2						1.1E-03
GOES		1623	1648	1655	S30	E78	8195			32	2F	M 1.1						1.5E-02
RAMY		1629	1641U	1658D	S27	E75	8195	04	12.5	29D	1F		3	E		133		H
HOLL		1630	1634	1707	S30	E78	8195	04	12.8	37	2F		3	E		286		F
HOLL		1715	1720	1748	S18	E64	8194	04	11.6	33	SF		3	E		51		
GOES		1715	1741	1759	S18	E64	8194			44		C 3.4						7.5E-03
RAMY		1717	1721	1734	S16	E62	8194	04	11.4	17	SF		3	E		27		
GOES		1836	1846	1854	S29	E68	8195			18	SF	C 2.4						2.3E-03
RAMY		1842E	1842U	1853D	S25	E68	8195	04	12.0	11D	SF		3	E		19		
HOLL		1842	1842	1853	S29	E68	8195	04	12.1	11	SF		3	E		14		
GOES	07	0107	0110	0112						5		C 1.3						2.9E-04
GOES		0133	0138	0142						9		C 1.2						5.5E-04
GOES		0409	0412	0422						13		C 1.2						8.9E-04
GOES		0446	0459	0507						21		C 1.3						1.4E-03
GOES		0657	0702	0706						9		C 1.1						5.0E-04
GOES		1340	1347	1349						9		C 1.1						4.6E-04
GOES		2048	2059	2105						17		C 1.2						1.1E-03
GOES	08	0003	0009	0014						11		B 9.8						5.7E-04
GOES		0344	0406	0428						44		C 2.1						4.7E-03
GOES		0848	0858	0936						48		C 1.1						2.8E-03
HOLL		1741	1743	1748	S33	E65	8198	04	13.9	7	SF		3	E		28		
HOLL		1802	1802	1804	S25	E42	8194	04	12.0	2	SF		3	E		27		
HOLL		1929	1936	1948	S30	E38	8195	04	11.8	19	SF		3	E		23		
HOLL		1929	1936	2005	S24	E44	8194	04	12.2	36	SF		3	E		73		
GOES		1933	1937	1941			8195			8		C 1.3						5.9E-04
GOES		1947	1953	1957	S30	E38	8195			10	SF	C 1.9						8.9E-04
HOLL		1949	1950	2007	S30	E38	8195	04	11.8	18	SF		3	E		14		
HOLL		2011	2013	2021	S30	E38	8195	04	11.8	10	SF		3	E		14		
HOLL		2013	2017	2021	S21	E36	8194	04	11.6	8	SF		3	E		18		
GOES		2132	2138	2141	S24	E43	8194			9	1F	C 5.7						1.7E-03
HOLL		2136	2136	2149	S24	E43	8194	04	12.2	13	1F		3	E		134		UE
HOLL		2241	2245	2248	S31	E61	8198	04	13.7	7	SF		3	E		24		
HOLL		2252	2254	2259	S31	E61	8198	04	13.8	7	SF		3	E		11		
HOLL		2353	2354	2402	S31	E60	8198	04	13.7	9	SF		3	E		12		
HOLL	09	0005	0005	0010	S31	E60	8198	04	13.7	5	SF		3	E		10		
HOLL		0022	0024	0033	S30	E36	8195	04	11.8	11	SF		3	E		31		
GOES		0404	0408	0414						10		B 8.6						4.6E-04
GOES		0422	0430	0437						15		C 2.4						1.7E-03
GOES		1417	1422	1431						14		B 8.9						6.8E-04
HOLL		1708	1713	1724	S22	E08		04	10.3	16	SF		3	E		14		
HOLL		1740	1742	1746	S22	E08	8200	04	10.3	6	SF		3	E		13		
HOLL		1802	1804	1808	S22	E08	8200	04	10.4	6	SF		3	E		25		
GOES		1810	1815	1819	S29	E47	8198			9	SF	C 2.9						9.9E-04
RAMY		1814	1815	1821	S29	E47	8198	04	13.4	7	SF		3	E		41		F
GOES		1935	1942	1948	S22	E05	8200			13	SF	C 1.3						8.1E-04
HOLL		1937	1942	1955	S22	E05	8200	04	10.2	18	SF		3	E		48		
RAMY		1938	1941	1950	S23	E07	8200	04	10.3	12	SF		3	E		25		
HOLL		2155	2155	2200	S30	E44	8198	04	13.4	5	SF		3	E		17		
HOLL		2234	2237	2240	S29	E40	8198	04	13.1	6	SF		3	E		24		
GOES		2324	2327	2330						6		B 8.5						2.6E-04
GOES	10	0051	0057	0109						18		C 1.1						1.0E-03

Hα S O L A R F L A R E S

APRIL 1998

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	10	0111	0114	0116						5	C	1.5						3.8E-04
GOES		0201	0215	0241						40	C	2.3						4.2E-03
GOES		0623	0627	0637						14	B	9.1						6.4E-04
GOES		1013	1017	1019						6	B	7.9						2.1E-04
GOES		1044	1102	1126	S26	W34	8199			42	SF	C 1.2						2.4E-03
RAMY		1046E	1047U	1128	S26	W34	8199	04	7.8	42D	SF		2	E		16		FH
HOLL		1929	1930	1932	S28	E40	8202	04	13.9	3	SF		3	E		13		
HOLL		1933	1938	1944	S24	E44	8202	04	14.2	11	SF		3	E		16		
HOLL		2144	2145	2147	S22	W06	8200	04	10.4	3	SF		3	E		10		
GOES	11	0426	0455	0531						65	C	3.0						7.2E-03
GOES		0428	0443	0446						18	C	2.1						1.7E-03
GOES		0813	0844	0923						70	C	4.5						9.8E-03
GOES		0909	0912	0949						40	C	3.6						6.8E-03
GOES		1508	1515	1524	S20	E06	8194			16	SF	C 1.8						1.3E-03
HOLL		1513	1513	1527	S20	E06	8194	04	12.1	14	SF		3	E		15		F
HOLL		1529	1530	1536	S21	E07	8194	04	12.2	7	SF		3	E		34		F
GOES	12	0524	0527	0529						5	B	5.7						1.3E-04
LEAR		0620	0628	0644	S23	E25	8202	04	14.2	24	SF		3	E		48		
GOES		0626	0631	0635	S23	E25	8202			9	B	9.8						4.5E-04
GOES		0900	0911	1132						152	B	3.8						3.2E-03
GOES		1212	1236	1253						41	B	9.0						1.8E-03
GOES		1616	1624	1634	S23	E19	8202			18	SF	B 5.4						4.9E-04
HOLL		1624	1626	1629	S23	E19	8202	04	14.1	5	SF		3	E		27		
LEAR	13	0332	0343	0412	S24	E17	8202	04	14.5	40	SF		3	E		51		F
GOES		0332	0350	0403	S24	E17	8202			31	SF	C 1.3						2.1E-03
LEAR		0824	0824	0827	S22	W38	8200	04	10.4	3	SF		3	E		15		
GOES		1152	1158	1204						12	B	7.1						4.5E-04
GOES		1851	1855	1857	S25	W77	8199			6	SF	B 6.4						1.8E-04
HOLL		1854	1855	1858	S25	W77	8199	04	7.8	4	SF		3	E		26		H
GOES	14	1323	1327	1334						11	B	4.0						0.0E+00
GOES		2136	2140	2144	S30	W19	8198			8	SF	B 5.6						2.3E-04
HOLL		2138	2139	2145	S30	W20	8198	04	13.3	7	SF		3	E		29		
RAMY		2138	2140	2148	S30	W19	8198	04	13.4	10	SF		3	E		53		
GOES		2230	2239	2247						17	B	5.1						4.5E-04
GOES	15	0533	0541	0547						14	B	9.0						5.4E-04
SVTO		0721	0722	0730	N29	W15	8203	04	14.1	9	SF		3	E		15		
GOES		0737	0746	0754	N29	W15	8203			17	SN	C 8.8						4.5E-03
SVTO		0739	0745	0806	N29	W15	8203	04	14.1	27	SN		3	E		81		
GOES		0801	0812	0822						21	C	3.7						4.4E-03
GOES		1155	1233	1242	N27	W19	8203			47	SF	C 8.2						8.7E-03
SVTO		1201	1223	1245	N27	W19	8203	04	14.0	44	SF		3	E		75		
RAMY		1419	1419	1434	S30	W25	8198	04	13.6	15	SF		3	E		10		H
GOES		1458	1511	1520	N31	W19	8203			22	SF	C 9.9						7.6E-03
RAMY		1502	1506	1515	N31	W19	8203	04	14.1	13	SF		3	E		44		
RAMY		1505	1511	1555	S28	W32	8198	04	13.1	50	1F		3	E		199		
SVTO		1509	1510	1514	N27	W20	8203	04	14.1	5	SF		3	E		22		
SVTO		1509	1512	1550	S32	W33	8198	04	13.0	41	1F		3	E		104		F
GOES		2140	2149	2210			8200			30	C	1.2						1.8E-03
GOES	16	0102	0111	0117						15	C	9.5						4.9E-03
GOES		0219	0223	0232	S22	W24	8202			13	SF	C 1.0						6.6E-04
LEAR		0222	0222	0228	S22	W24	8202	04	14.2	6	SF		3	E		23		
GOES		0406	0424	0445						39	C	1.0						2.1E-03
GOES		0904	0908	0913						9	B	4.5						2.1E-04
GOES		0923	0932	0948						25	B	7.8						1.0E-03
GOES		2124	2127	2129						5	B	6.9						1.6E-04
GOES	19	1139	1144	1147						8	B	2.8						1.2E-04
GOES		1300	1305	1311	N21	W17	8205			11	SF	B 6.2						3.0E-04
SVTO		1302	1305U	1319	N21	W17	8205	04	18.2	17	SF		3	E		26		
GOES		1412	1420	1427	N21	W18	8205			15	SF	B 3.6						2.7E-04
SVTO		1412	1420U	1429D	N21	W18	8205	04	18.2	17D	SF		3	E		25		F
GOES		1555	1600	1604						9	B	4.2						1.8E-04

Hα SOLAR FLARES

APRIL 1998

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	19	1633	1636	1639	N19	W19	8205			6	SF	B 4.1						1.3E-04
RAMY		1635	1636	1641	N19	W19	8205	04	18.2	6	SF		4	E		14		
GOES		2217	2220	2224						7		B 3.8						1.4E-04
GOES	20	0938	1021	1118						100		M 1.4						6.1E-02
GOES	21	2136	2139	2141						5		B 2.8						7.1E-05
GOES		2153	2156	2158						5		B 4.3						9.2E-05
GOES		2321	2324	2326	N03	W50	8205			5	SF	B 4.2						8.5E-05
HOLL		2324	2324	2329	N03	W50	8205	04	18.2	5	SF		3	E		20		FH
HOLL	22	1341	1343	1346	N22	W65	8205	04	17.6	5	SF		3	E		12		
SVTO		1342	1351	1359	N19	W59	8205	04	18.1	17	SF		3	E		16		
GOES		1348	1351	1354	N22	W63	8205			6	SF	B 2.3						7.4E-05
HOLL		1348	1351	1359	N22	W63	8205	04	17.7	11	SF		3	E		31		
HOLL		1606	1609	1617	N22	W67	8205	04	17.5	11	SF		3	E		33		
GOES		1631	1635	1640						9		B 2.7						1.3E-04
HOLL		1843	1843	1849	N22	W69	8205	04	17.5	6	SF		3	E		13		
HOLL		1904	1907	1915	N22	W69	8205	04	17.5	11	SF		3	E		22		
HOLL		2244	2245	2250	N23	W70	8205	04	17.5	6	SF		3	E		36		
HOLL		2255	2256	2301	N23	W70	8205	04	17.6	6	SF		3	E		21		
GOES		2356	2402	2408						12		B 6.3						3.4E-04
GOES	23	0131	0152	0204						33		B 7.2						1.1E-03
GOES		0212	0218	0225						13		B 6.8						4.7E-04
GOES		0535	0555	0623						48		X 1.2						2.4E-01
GOES	24	0226	0229	0231						5		B 4.7						1.2E-04
GOES		0834	0852	0854						20		C 8.9						5.6E-03
GOES		1506	1509	1524						18		B 2.5						2.5E-04
GOES		1605	1608	1610						5		B 2.6						6.2E-05
GOES	25	0017	0020	0023						6		B 2.5						7.9E-05
GOES		0104	0113	0118						14		B 5.6						3.8E-04
GOES		0943	0946	0949						6		B 2.7						7.8E-05
GOES		1003	1007	1013						10		B 2.9						1.5E-04
GOES		1056	1059	1103						7		B 5.1						1.4E-04
GOES		1118	1123	1127						9		C 1.2						4.3E-04
GOES		1148	1152	1159						11		B 2.7						1.6E-04
GOES		1318	1321	1324						6		B 2.0						6.4E-05
GOES		1402	1439	1533	S19	E73	8210			91	SF	C 3.6						1.3E-02
SVTO		1422	1514	1557	S19	E73	8210	05	1.2	95	SF		3	E		51		F
HOLL		1517	1517	1535	S20	E72	8210	05	1.1	18	SF		3	E		13		
HOLL		1541	1541	1549	S21	E72	8210	05	1.2	8	SF		3	E		14		
GOES		1758	1806	1809	S18	E72	8210			11	1F	C 1.5						5.8E-04
HOLL		1801	1816	1835	S18	E72	8210	05	1.2	34	1F		3	E		242		H
SVTO	26	0613	0613	0618	S14	E68	8210	05	1.4	5	SF		3	E		13		
GOES		2009	2012	2015						6		B 1.3						4.4E-05
GOES		2209	2212	2214						5		B 2.7						6.1E-05
SVTO	27	0836	0911	1234	S16	E50	8210	05	1.1	238	2B		3	E		462		ZU
LEAR		0842	0910	0950D	S19	E50	8210	05	1.2	68D	2B		3	E		422		UF
GOES		0855	0920	0938	S16	E50	8210			43		X 1.0						1.6E-01
RAMY		1209E	1209U	1250	S17	E46	8210	05	1.0	41D	SF		3	E		19		
HOLL		1318	1423	1455	S18	E45	8210	05	1.0	97	SF		3	E		32		UF
SVTO		1451	1454	1456	S17	E43	8210	04	30.9	5	SF		3	E		16		
GOES		1607	1611	1613						6		C 1.2						3.6E-04
GOES	28	1321	1324	1327						6		B 2.9						8.7E-05
GOES		1514	1527	1551	S27	W62	8212			37	SF	B 3.8						8.1E-04
HOLL		1523	1534	1538	S27	W62	8212	04	23.8	15	SF		4	E		23		F
GOES		1550	1605	1618	S18	E32	8210			28	SF	B 4.0						6.3E-04
HOLL		1601	1601	1610	S18	E32	8210	05	1.1	9	SF		4	E		15		F
HOLL		1801	1807	1808	S21	E33	8210	05	1.3	7	SF		4	E		22		F
HOLL		1837	1839	1841	S17	E35	8210	05	1.4	4	SF		4	E		27		H
HOLL		1911	1913	1915	S25	E25	8210	04	30.7	4	SF		3	E		23		F
RAMY		2031	2033	2047	S15	E35	8210	05	1.5	16	SF		3	E		21		F

Hα SOLAR FLARES

APRIL 1998

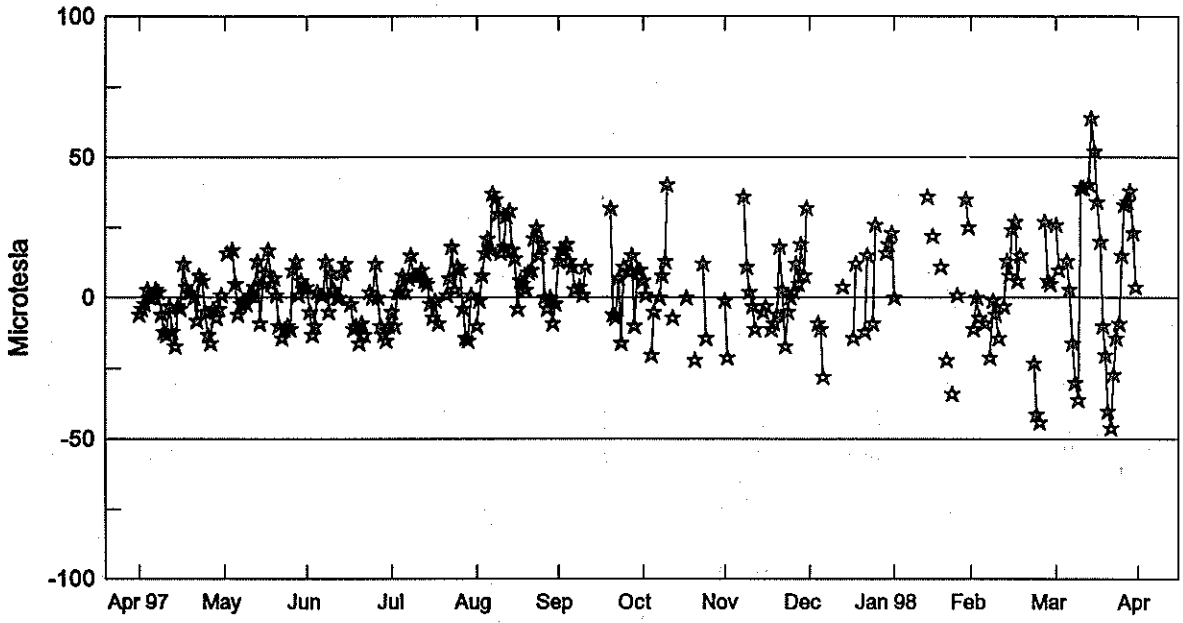
Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
HOLL	28	2039E	2040	2045	S16	E35	8210	05	1.5	6D	SF		3	E		40		F
GOES		2119	2124	2131	S17	E31	8210			12	SF	B 3.8						2.3E-04
HOLL		2123	2124	2129	S17	E31	8210	05	1.2	6	SF		3	E		18		F
HOLL		2304E	2331U	2353D	S15	E33	8210	05	1.4	49D	SF		3	E		36		
GOES		2339	2344	2352	S17	E32	8210			13	SF	B 8.3						5.0E-04
LEAR		2341	2345	2358	S17	E32	8210	05	1.4	17	SF		3	E		68		H
GOES	29	0044	0049	0054						10		B 3.2						1.8E-04
GOES		0124	0146	0156	S19	E27	8210			32	1F	C 4.3						4.8E-03
LEAR		0138	0143	0203	S19	E27	8210	05	1.1	25	1F		3	E		147		ZU
GOES		0319	0323	0327						8		B 7.6						2.7E-04
GOES		0353	0358	0402						9		B 4.6						2.1E-04
GOES		0409	0413	0415						6		B 3.9						1.2E-04
GOES		0513	0522	0525	S17	E29	8210			12	SF	B 7.7						4.2E-04
LEAR		0514	0519	0527	S17	E29	8210	05	1.4	13	SF		3	E		72		FH
SVTO		0515E	0516U	0534D	S17	E22	8210	04	30.9	19D	SF		2	E		26		F
GOES		0537	0540	0542	S19	E24	8210			5	SF	B 7.6						1.8E-04
LEAR		0539	0540	0548	S19	E24	8210	05	1.1	9	SF		3	E		50		F
SVTO		0541E	0543U	0549D	S18	E24	8210	05	1.1	8D	SF		2	E		17		
GOES		0658	0703	0713	S20	E24	8210			15	SF	B 5.1						4.2E-04
SVTO		0701	0702	0718	S20	E24	8210	05	1.1	17	SF		3	E		13		
GOES		0722	0726	0729	S17	E21	8210			7	SF	B 3.9						1.5E-04
SVTO		0725	0726	0740	S17	E21	8210	04	30.9	15	SF		3	E		14		
SVTO		0745	0818	0907	S17	E23	8210	05	1.1	82	1F		3	E		165		F
GOES		0754	0806	0827	S17	E23	8210			33		C 1.7						2.6E-03
LEAR		0758	0804	0825	S18	E24	8210	05	1.1	27	SF		2	E		65		F
GOES		0959	1040	1116						77		B 7.8						2.8E-03
RAMY		1342	1344	1351	S16	E20	8210	05	1.1	9	SF		3	E		10		
SVTO		1343	1343	1354	S16	E21	8210	05	1.2	11	SF		3	E		18		
HOLL		1344	1349	1356	S16	E20	8210	05	1.1	12	SF		3	E		21		
HOLL		1605	1630	2023	S18	E20	8210	05	1.2	258	3B		3	E		901		ZU
GOES		1606	1637	1659	S18	E20	8210			53		M 6.8						1.0E-01
RAMY		1611	1635	2145	S14	E23	8210	05	1.4	334	3B		3	E		651		ZFT
SVTO		1707E	1707U	1717D	S18	E20	8210	05	1.2	10D	2N		2	E		403		UF
RAMY		2147	2148	2214	S14	E14	8210	05	1.0	27	SF		3	E		13		
GOES	30	0634	0638	0640						6		B 3.2						9.6E-05
GOES		1335	1338	1341						6		B 3.1						1.0E-04
HOLL		1952	1955	2003	N25	E51	8214	05	4.8	11	SF		3	E		13		
HOLL		2040	2040	2055	N24	E50	8214	05	4.7	15	SF		3	E		29		
HOLL		2056	2100	2106	N24	E48	8214	05	4.6	10	SF		3	E		19		
RAMY		2059	2102	2136D	N25	E47	8214	05	4.5	37D	SF		3	E		19		
HOLL		2107	2136	2140	N24	E49	8214	05	4.7	33	SF		3	E		23		
GOES		2115	2125	2136	S21	E03	8210			21	2N	C 6.6						5.0E-03
HOLL		2118	2122	2221	S21	E03	8210	05	1.1	63	2N		3	E		297		FE
RAMY		2136	2137	2220D	S21	E02	8210	05	1.0	44D	1F		3	E		112		F
HOLL		2144	2205	2302	N24	E49	8214	05	4.7	78	SF		3	E		55		
HOLL		2300	2313	2319	S18	E01	8210	05	1.0	19	SF		3	E		10		
HOLL		2302	2323	2359	N25	E47	8214	05	4.6	57	SF		3	E		51		
GOES		2317	2322	2327			8210			10		B 9.5						4.9E-04
LEAR		2349	2349	2358	N22	E47	8214	05	4.6	9	SF		3	E		20		F

SOLAR RADIO EMISSION
Selected Fixed Frequency Events

APRIL 1998

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	2695	SGMR	8	S	1356.0	1356.0	1.0	56.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1356.0	1356.0	1.0	54.0			QL=4 ST=2 TYP=3
03	2695	LEAR	4	S/F	2346.0	2346.0	3.0	34.0			QL=4 ST=2 TYP=3
	2695	PALE	4	S/F	2346.0	2346.0	3.0	40.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	2347.0	2348.0	3.0	30.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	2348.0	2349.0	1.0	23.0			QL=4 ST=2 TYP=3
08	8800	LEAR	20	GRF	0342.0	0351.0	60.0	4.0			QL=4 ST=2 TYP=2
	2695	LEAR	20	GRF	0343.0	0349.0	137.0	11.0			QL=4 ST=2 TYP=2
	2695	LEAR	4	S/F	0848.0	0851.0	6.0	30.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	0850.0	0851.0	2.0	29.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	1950.0	1950.0	U	59.0			QL=4 ST=2 TYP=3
	2695	PALE	4	S/F	2134.0	2135.0	7.0	130.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	2134.0	2135.0	7.0	59.0			QL=2 ST=2 TYP=3
	2695	SGMR	8	S	2135.0	2135.0	1.0	110.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	2135.0	2135.0	U	56.0			QL=4 ST=2 TYP=3
15	8800	SVTO	4	S/F	0741.0	0745.0	12.0	140.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	0742.0	0745.0	6.0	49.0			QL=4 ST=2 TYP=3
	2695	LEAR	4	S/F	0743.0	0745.0	4.0	41.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0744.0	0745.0	1.0	42.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	0759.0	0801.0	3.0	28.0			QL=2 ST=2 TYP=3
	2695	SVTO	4	S/F	0806.0	0807.0	3.0	35.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0807.0	0807.0	1.0	29.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	1215.0	1226.0	32.0	72.0			QL=4 ST=3 TYP=3
	2695	SGMR	8	S	1225.0	1226.0	2.0	75.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1225.0	1226.0	2.0	72.0			QL=4 ST=2 TYP=3
16	8800	LEAR	4	S/F	0105.0	0108.0	7.0	27.0			QL=4 ST=2 TYP=3
	2695	LEAR	4	S/F	0105.0	0110.0	7.0	21.0			QL=4 ST=2 TYP=3
	2695	PALE	4	S/F	0107.0	0109.0	8.0	13.0			QL=4 ST=2 TYP=3
23	8800	LEAR	49	GB	0536.0	0542.0	16.0	2400.0			QL=4 ST=2 TYP=6
	2695	LEAR	4	S/F	0536.0	0541.0	29.0	430.0			QL=4 ST=2 TYP=3
	2695	SVTO	48	C	0536.0	0542.0	33.0	480.0			QL=4 ST=2 TYP=8
	8800	SVTO	48	C	0536.0	0542.0	32.0	3100.0			QL=4 ST=2 TYP=8
24	2695	LEAR	4	S/F	0844.0	0848.0	8.0	61.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	0845.0	0847.0	10.0	210.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	0846.0	0848.0	5.0	59.0			QL=4 ST=3 TYP=3
25	8800	SVTO	49	GB	1329.0	1330.0	2.0	14000.0			QL=4 ST=3 TYP=6
	2695	SGMR	4	S/F	1422.0	1426.0	10.0	38.0			QL=4 ST=3 TYP=3
	2695	SVTO	4	S/F	1423.0	1426.0	5.0	37.0			QL=4 ST=2 TYP=3
	2695	SGMR	4	S/F	1453.0	1453.0	8.0	73.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1453.0	1454.0	1.0	18.0			QL=2 ST=2 TYP=3
	2695	SVTO	4	S/F	1453.0	1453.0	6.0	74.0			QL=4 ST=2 TYP=3
27	2695	LEAR	48	C	0850.0	0913.0	57.0	1100.0			QL=4 ST=2 TYP=8
	2695	SVTO	48	C	0850.0	0911.0	910.0	950.0			QL=4 ST=1 TYP=8
	2695	SVTO	48	C	0856.0	0911.0	44.0	950.0			QL=4 ST=2 TYP=8
	8800	SVTO	48	C	0901.0	0910.0	96.0	990.0			QL=4 ST=3 TYP=8
	8800	LEAR	48	C	0902.0	0909.0	36.0	540.0			QL=4 ST=2 TYP=8
29	8800	SVTO	8	S	0813.0	0813.0	1.0	34.0			QL=4 ST=2 TYP=3
	2695	SGMR	4	S/F	1613.0	1616.0	4.0	57.0			QL=4 ST=2 TYP=3
	2695	SGMR	4	S/F	1629.0	1630.0	7.0	100.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1630.0	1631.0	1.0	60.0			QL=2 ST=2 TYP=3
	2695	PALE	8	S	1636.0	1637.0	1.0	61.0			QL=4 ST=2 TYP=3
	8800	PALE	20	GRF	1636.0	1637.0	9.0	91.0			QL=4 ST=2 TYP=2
	2695	PALE	8	S	1756.0	1756.0	U	28.0			QL=4 ST=2 TYP=3
30	8800	SGMR	4	S/F	2120.0	2121.0	5.0	99.0			QL=2 ST=2 TYP=3
	2695	SGMR	4	S/F	2120.0	2121.0	5.0	120.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	2121.0	2121.0	U	130.0			QL=2 ST=2 TYP=3
	2695	PALE	8	S	2121.0	2121.0	1.0	140.0			QL=4 ST=2 TYP=3

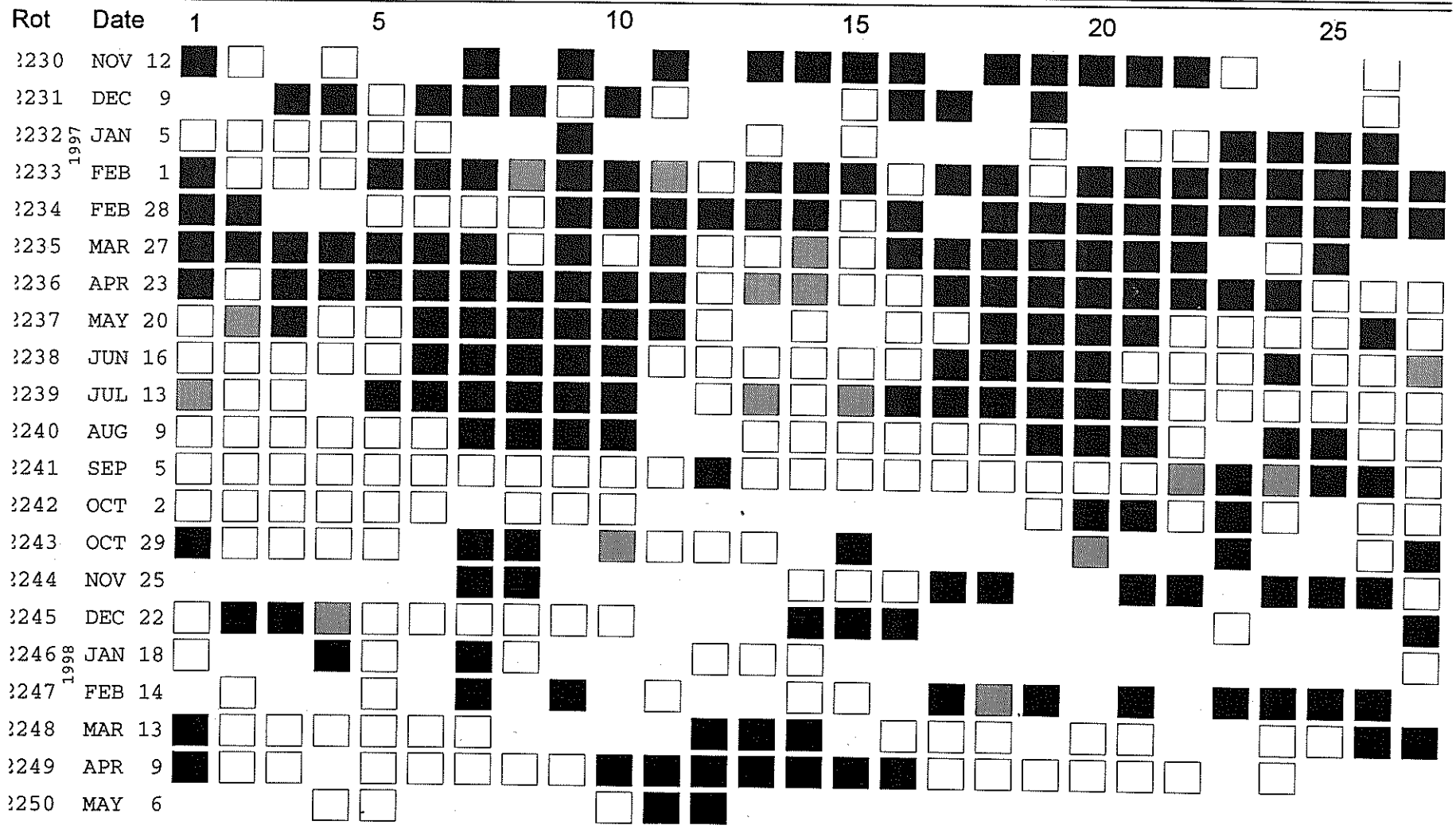
Stanford Mean Solar Magnetic Field (Microtesla)
"Sun-As-A-Star"



Day	May 97	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 98	Feb	Mar	Apr
1	-6	---	4	-5	-10	13	6	-1	---	---	---	26
2	-4	16	-5	-10	-1	17	1	-21	---	---	-11	10
3	-2	---	-13	2	8	17	---	---	---	---	0	---
4	3	17	-10	2	16	19	-20	---	-9	---	-7	---
5	0	5	-2	8	21	13	-5	---	-11	---	---	13
6	0	-6	1	2	17	11	---	---	-28	---	-9	3
7	3	-2	1	7	37	3	0	---	---	---	---	-16
8	2	-1	13	15	35	---	8	36	---	---	-21	-30
9	-6	-2	-5	8	30	4	13	11	---	---	-1	-36
10	-12	1	9	8	16	1	40	2	---	---	-6	39
11	-13	1	3	8	18	11	---	-3	---	---	-14	39
12	-3	4	0	10	29	---	-7	-11	---	---	---	---
13	-12	13	0	6	31	---	---	---	4	36	-3	40
14	-17	-9	9	5	17	---	---	---	---	---	13	64
15	-3	5	12	-2	14	---	---	-5	---	22	8	52
16	-4	9	---	-7	-4	---	---	-3	---	---	24	34
17	12	17	-2	-1	6	---	0	---	-14	---	27	20
18	4	5	-11	-9	5	---	---	-11	12	11	6	-10
19	2	7	-10	---	3	---	---	-9	---	---	15	-20
20	2	1	-16	---	9	32	-22	-6	---	-22	---	-40
21	0	-10	-9	1	10	-6	---	18	-12	---	---	-46
22	-8	-14	-13	7	21	-7	---	3	15	-34	---	-27
23	8	-11	---	18	25	7	12	-17	---	---	---	-14
24	6	-10	2	3	15	-16	-14	-5	-9	1	-23	-9
25	-5	-11	0	11	19	11	---	0	26	---	-41	15
26	-13	10	12	10	0	---	---	2	---	---	-44	33
27	-16	13	0	-4	-4	9	---	12	---	35	---	34
28	-4	1	-10	-14	0	15	---	5	---	25	27	38
29	-7	6	-13	-15	-9	-10	---	19	16		6	23
30	-4	4	-15	1	-2	10	---	8	19		5	4
31	1		-10	---		10		32	23		---	

Note: --- Indicates no data available for the day.

STANFORD MEAN SOLAR MAGNETIC FIELD



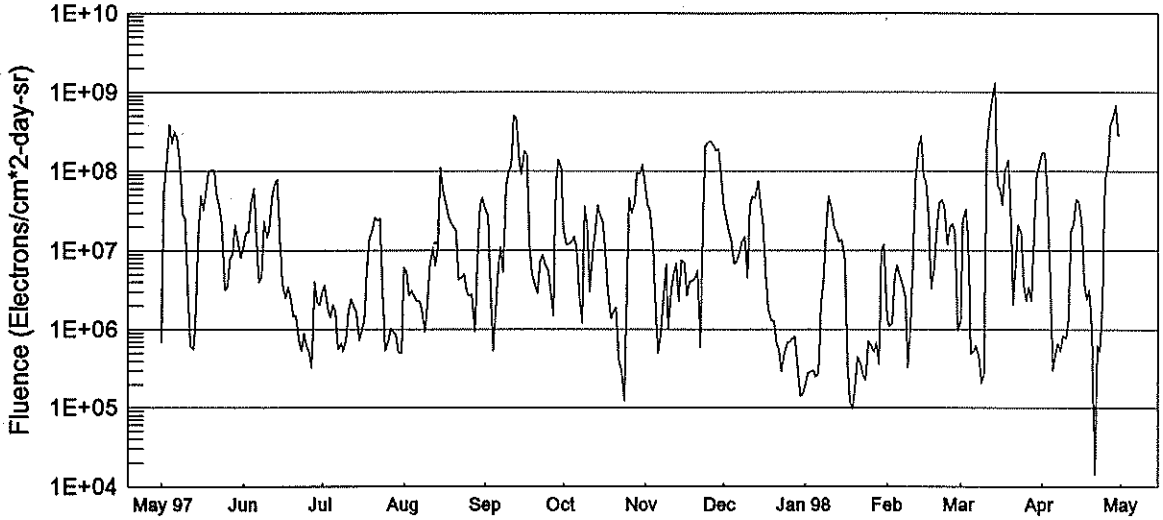
Mean Solar Magnetic Field Polarity:

□ = 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.

GOES Daily Electron Fluence
May 97 - Apr 98



Day	May 97	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 98	Feb	Mar	Apr
1	6.8E+05	1.0E+07	2.9E+06	6.1E+06	3.5E+07	1.9E+07	6.9E+07	3.8E+07	2.0E+05	1.4E+06	1.3E+06	1.7E+08
2	5.2E+07	1.6E+07	3.6E+06	5.4E+06	2.8E+07	1.2E+07	3.8E+07	2.4E+07	2.8E+05	1.1E+06	2.3E+07	1.7E+08
3	1.3E+08	1.6E+07	1.8E+06	2.6E+06	5.5E+06	1.2E+07	3.3E+07	1.7E+07	2.9E+05	1.2E+06	3.3E+07	6.2E+07
4	3.8E+08	3.7E+07	1.4E+06	3.1E+06	5.4E+05	1.3E+07	1.2E+07	1.3E+07	3.0E+05	4.6E+06	1.3E+07	7.3E+06
5	2.2E+08	6.1E+07	2.0E+06	2.5E+06	1.7E+06	1.5E+07	1.8E+06	6.7E+06	2.5E+05	6.6E+06	4.9E+05	3.0E+05
6	3.1E+08	1.3E+07	1.6E+06	2.3E+06	5.4E+06	1.1E+07	5.0E+05	7.4E+06	2.8E+05	4.9E+06	5.2E+05	4.9E+05
7	2.6E+08	3.9E+06	5.5E+05	2.2E+06	1.1E+07	2.4E+06	8.7E+05	9.8E+06	2.2E+06	3.9E+06	6.3E+05	6.7E+05
8	1.1E+08	4.6E+06	6.6E+05	1.7E+06	5.3E+06	1.2E+06	2.2E+06	1.3E+07	4.0E+06	2.6E+06	4.5E+05	5.3E+05
9	2.9E+07	2.3E+07	5.2E+05	9.3E+05	6.6E+07	3.6E+07	6.7E+06	1.5E+07	1.7E+07	3.3E+05	2.1E+05	8.5E+05
10	2.6E+07	1.4E+07	7.6E+05	1.9E+06	1.0E+08	2.2E+07	1.0E+06	4.5E+06	4.9E+07	1.1E+06	2.7E+05	7.8E+05
11	3.1E+06	1.8E+07	1.7E+06	6.3E+06	1.2E+08	3.0E+06	3.2E+06	3.7E+07	3.4E+07	6.9E+06	1.8E+08	1.4E+06
12	6.1E+05	4.8E+07	2.4E+06	1.0E+07	5.0E+08	9.9E+06	5.2E+06	4.8E+07	2.0E+07	7.6E+07	4.4E+08	1.8E+07
13	5.5E+05	6.8E+07	1.9E+06	6.4E+06	4.6E+08	1.5E+07	7.0E+06	4.6E+07	1.7E+07	2.1E+08	8.5E+08	2.1E+07
14	1.2E+06	7.8E+07	1.6E+06	1.0E+07	1.3E+08	3.7E+07	2.3E+06	7.6E+07	1.3E+07	2.7E+08	1.3E+09	4.4E+07
15	1.6E+07	1.4E+07	7.2E+05	1.1E+08	9.1E+07	2.8E+07	7.5E+06	3.9E+07	1.4E+07	8.5E+07	6.7E+07	4.2E+07
16	4.9E+07	3.7E+06	1.0E+06	5.7E+07	1.8E+08	2.3E+07	7.1E+06	2.1E+07	7.5E+06	7.4E+07	6.1E+07	2.3E+07
17	3.2E+07	2.4E+06	1.3E+06	3.8E+07	1.6E+08	9.3E+06	2.7E+06	5.0E+06	3.7E+05	2.7E+07	3.7E+07	3.9E+06
18	5.5E+07	3.4E+06	5.4E+06	2.7E+07	1.2E+07	3.0E+06	4.0E+06	1.8E+06	1.2E+05	3.3E+06	1.0E+08	2.4E+06
19	9.8E+07	2.5E+06	1.3E+07	2.2E+07	5.1E+06	1.4E+06	4.1E+06	1.3E+06	9.7E+04	6.2E+06	1.4E+08	3.2E+06
20	1.0E+08	1.4E+06	1.8E+07	2.0E+07	3.6E+06	1.7E+06	4.3E+06	1.3E+06	1.8E+05	1.9E+07	3.8E+07	1.0E+06
21	1.0E+08	1.5E+06	2.6E+07	1.8E+07	2.9E+06	1.9E+06	5.6E+06	6.7E+05	4.5E+05	4.1E+07	2.1E+06	1.4E+04
22	5.0E+07	7.3E+05	2.4E+07	4.2E+06	7.3E+06	4.2E+05	5.9E+05	5.5E+05	3.6E+05	4.3E+07	6.6E+06	6.3E+05
23	3.6E+07	5.2E+05	2.5E+07	4.5E+06	8.9E+06	2.9E+05	1.6E+07	2.9E+05	2.6E+05	3.6E+07	2.1E+07	5.3E+05
24	2.1E+07	9.0E+05	2.9E+06	4.9E+06	6.7E+06	1.2E+05	2.1E+08	4.8E+05	2.3E+05	1.2E+07	1.7E+07	2.2E+06
25	3.1E+06	6.1E+05	5.4E+05	2.9E+06	5.6E+06	2.9E+06	2.3E+08	6.9E+05	7.1E+05	2.0E+07	3.6E+06	7.8E+07
26	3.4E+06	5.2E+05	7.2E+05	2.6E+06	3.0E+06	4.6E+07	2.4E+08	7.0E+05	6.5E+05	2.2E+07	2.3E+06	1.3E+08
27	8.0E+06	3.2E+05	1.0E+06	2.7E+06	1.5E+06	3.0E+07	2.1E+08	7.7E+05	5.2E+05	1.7E+07	3.5E+06	3.8E+08
28	8.8E+06	4.0E+06	9.3E+05	9.4E+05	6.6E+07	4.1E+07	1.8E+08	8.3E+05	6.9E+05	9.7E+05	2.3E+06	4.9E+08
29	2.1E+07	2.2E+06	8.7E+05	6.9E+06	1.4E+08	9.5E+07	1.9E+08	3.8E+05	3.6E+05		2.2E+07	6.9E+08
30	1.4E+07	2.0E+06	5.1E+05	3.6E+07	1.1E+08	9.3E+07	9.3E+07	1.4E+05	1.0E+07		8.3E+07	2.7E+08
31	8.2E+06		5.0E+05	4.6E+07		1.2E+08		1.5E+05	1.2E+07		1.3E+08	

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. GOES9 data began April, 1996.

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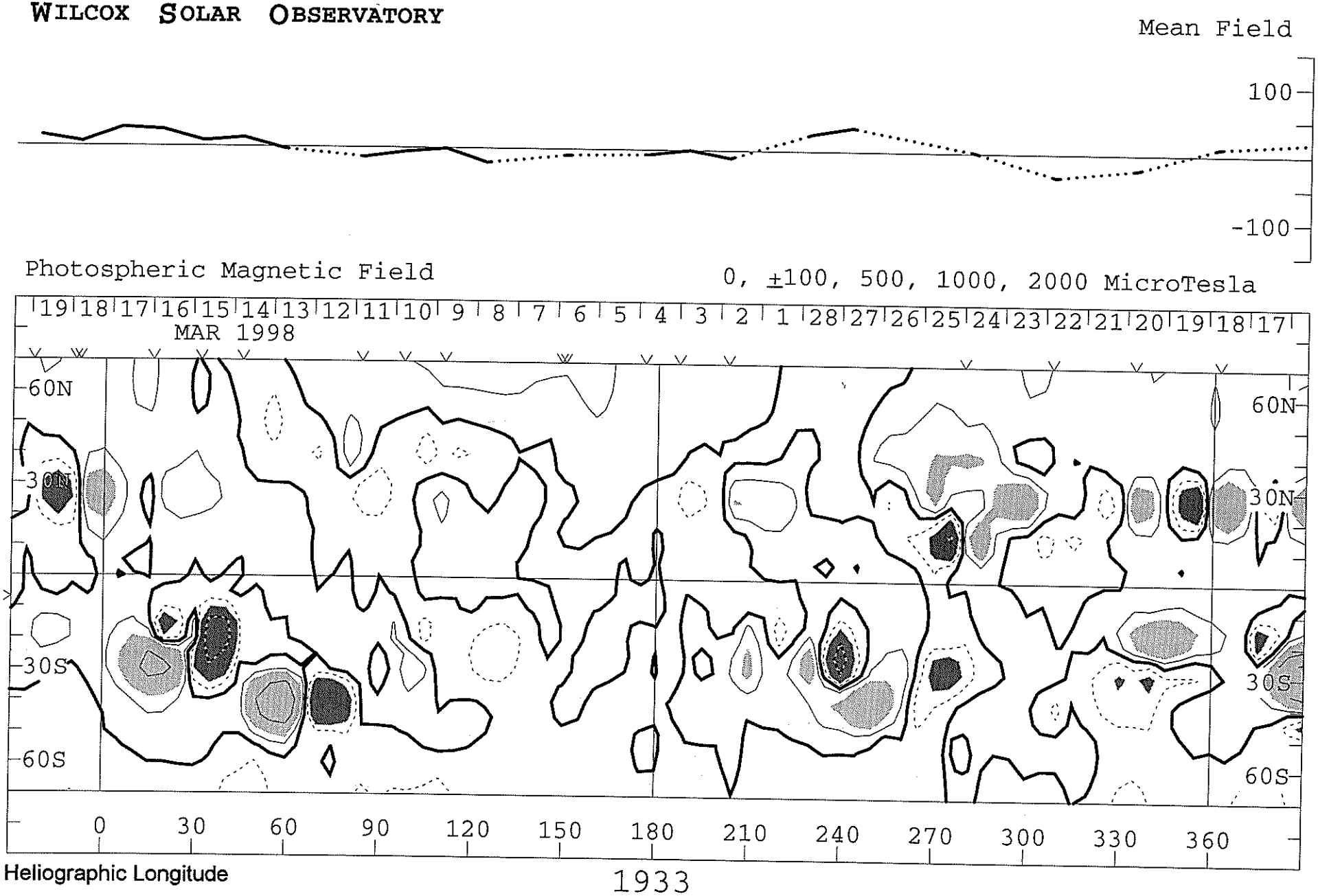
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1933
(18 February to 18 March 1998)

WILCOX SOLAR OBSERVATORY



SOLAR MAGNETIC FIELD SYNOPTIC CHART

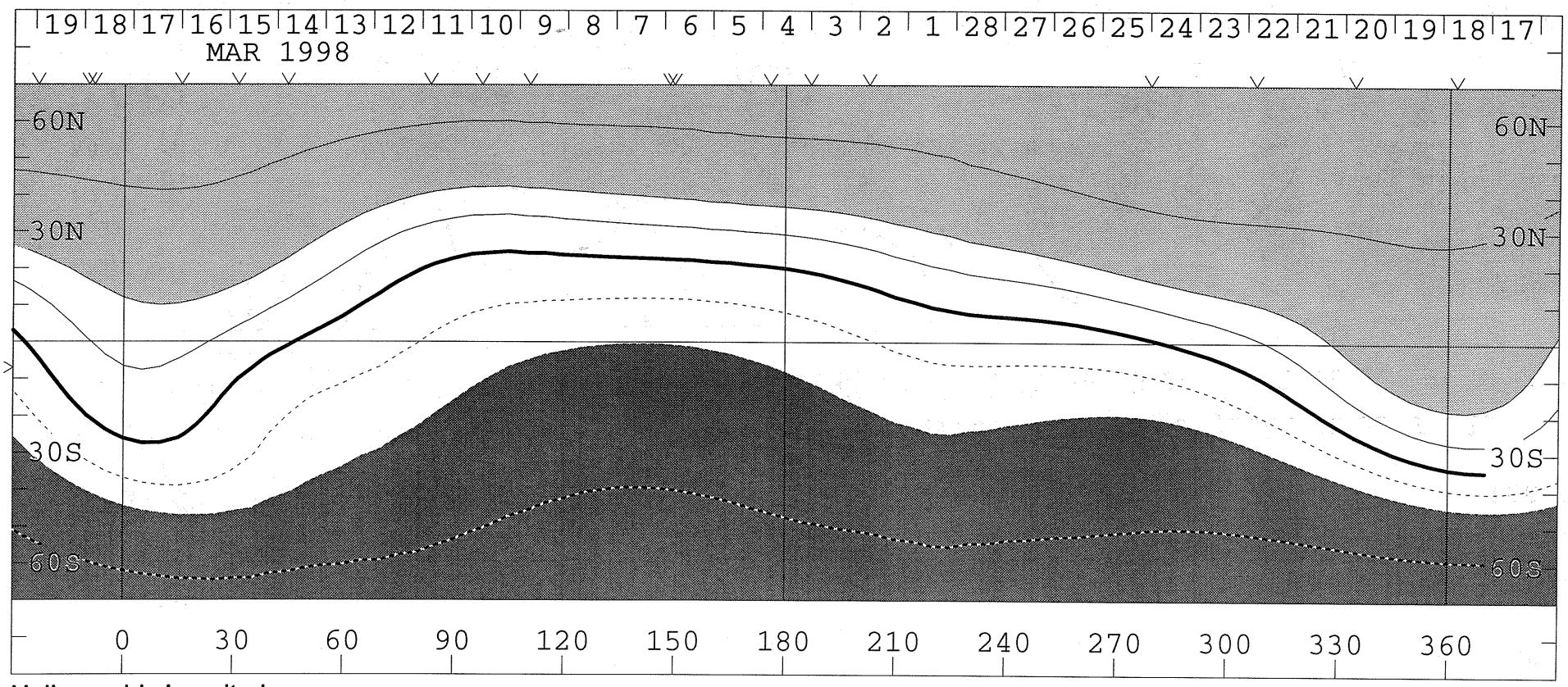
SOURCE SURFACE FIELD

CARRINGTON ROTATION NUMBER 1933

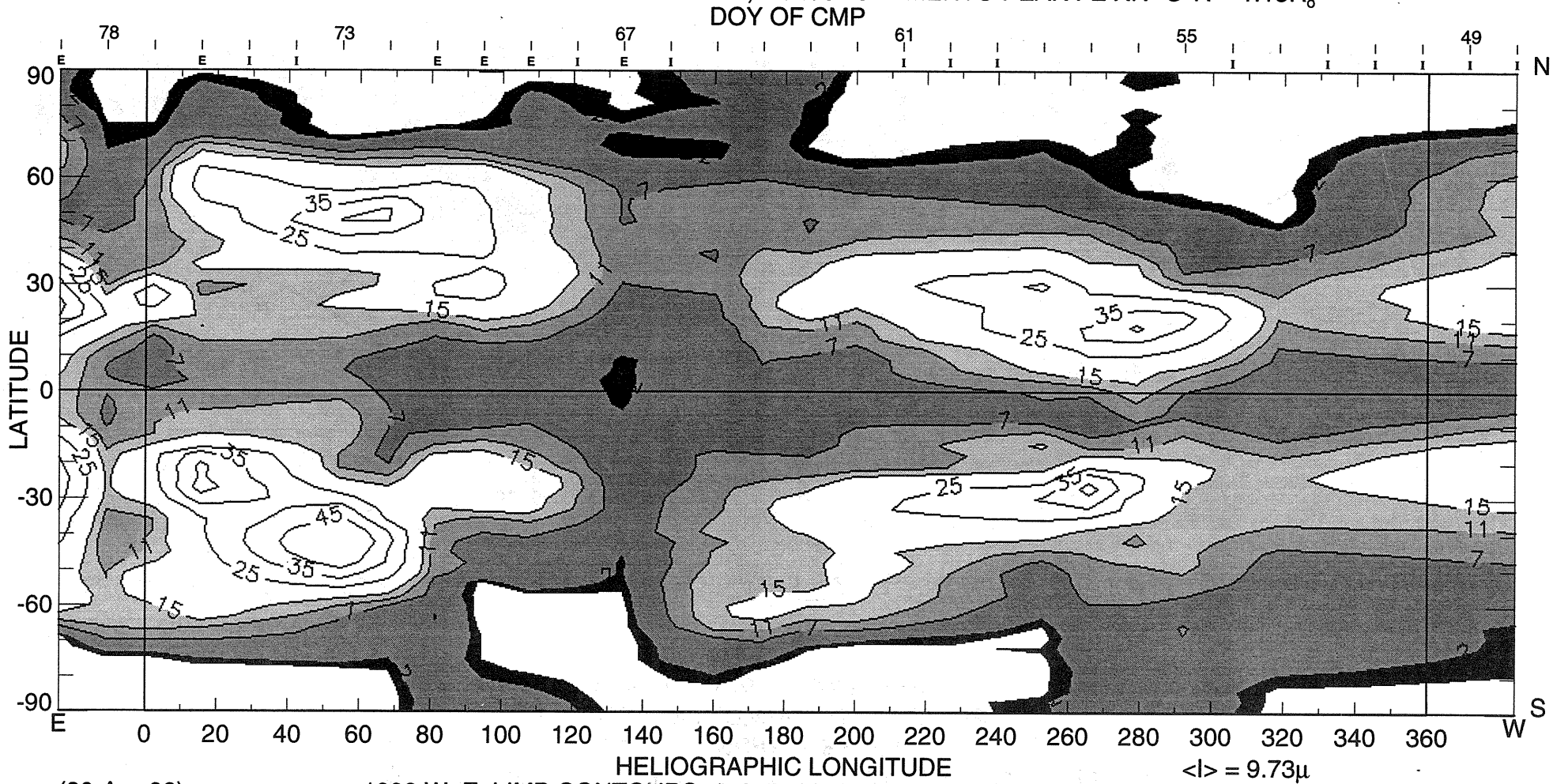
(18 February to 18 March 1998)

Wilcox Solar Observatory

0, ±1, 2, 5, 10, 20 microTesla



CARRINGTON ROTATION NUMBER 1933 ; NSO/SACRAMENTO PEAK FE XIV @ R = 1.15R_o



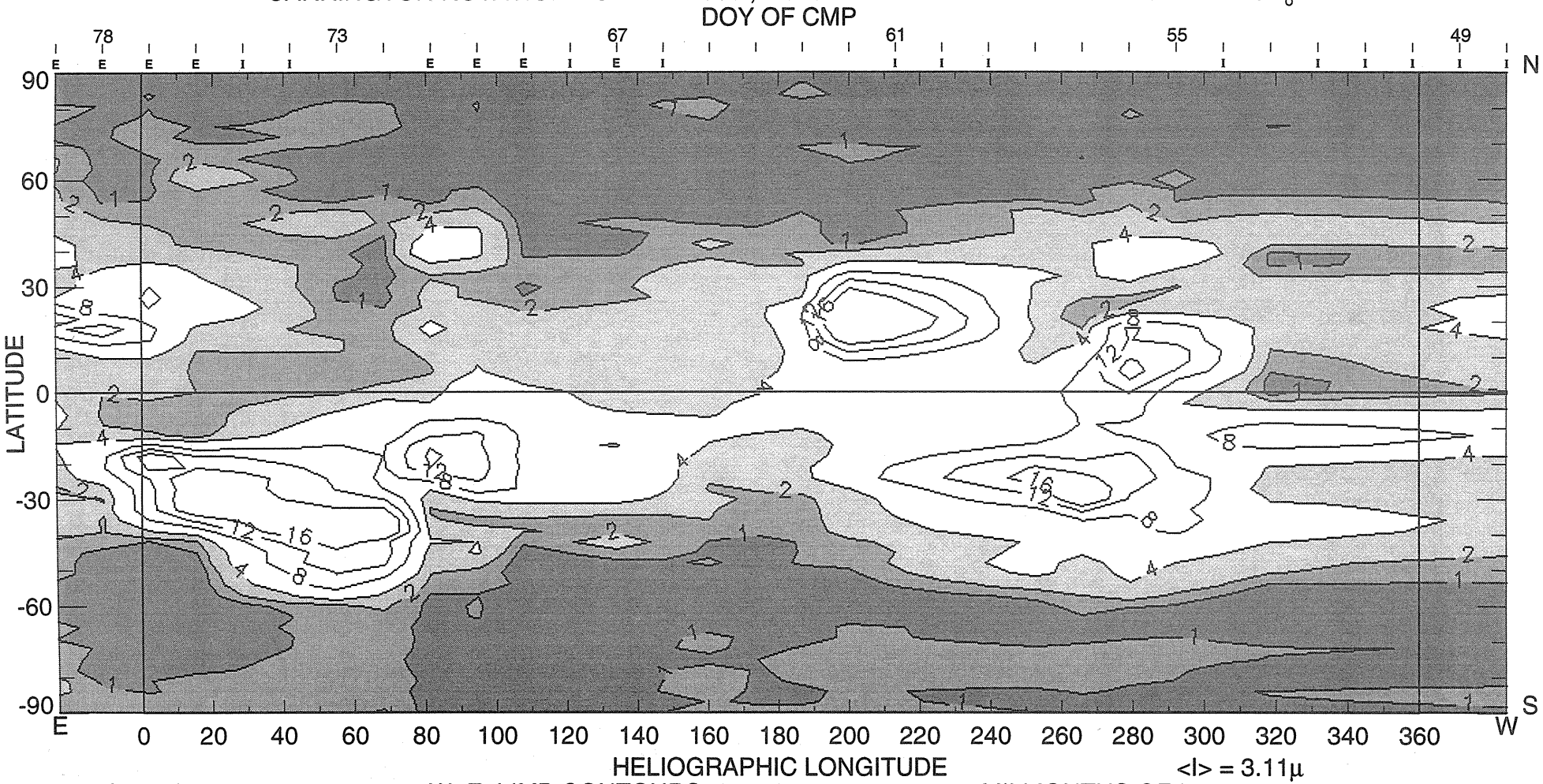
<I> = 9.73μ

(30-Apr-98)

1998 W+E LIMB CONTOURS: 1, 2, 7, 11, 15, 25, 35, 45 MILLIONTHS OF I_o

CORONAL HOLES ARE SHOWN AS WHITE BORDERED BY BLACK

CARRINGTON ROTATION NUMBER 1933 ; NSO/SACRAMENTO PEAK FE X @ R = 1.15R_o



<I> = 3.11μ

(30-Apr-98) 1998 W+E LIMB CONTOURS: 1, 2, 4, 8, 12, 16, 32, 48 MILLIONTHS OF I_o

NOTE: No Ca XV emission observed at Sacramento Peak for rotation 1933.

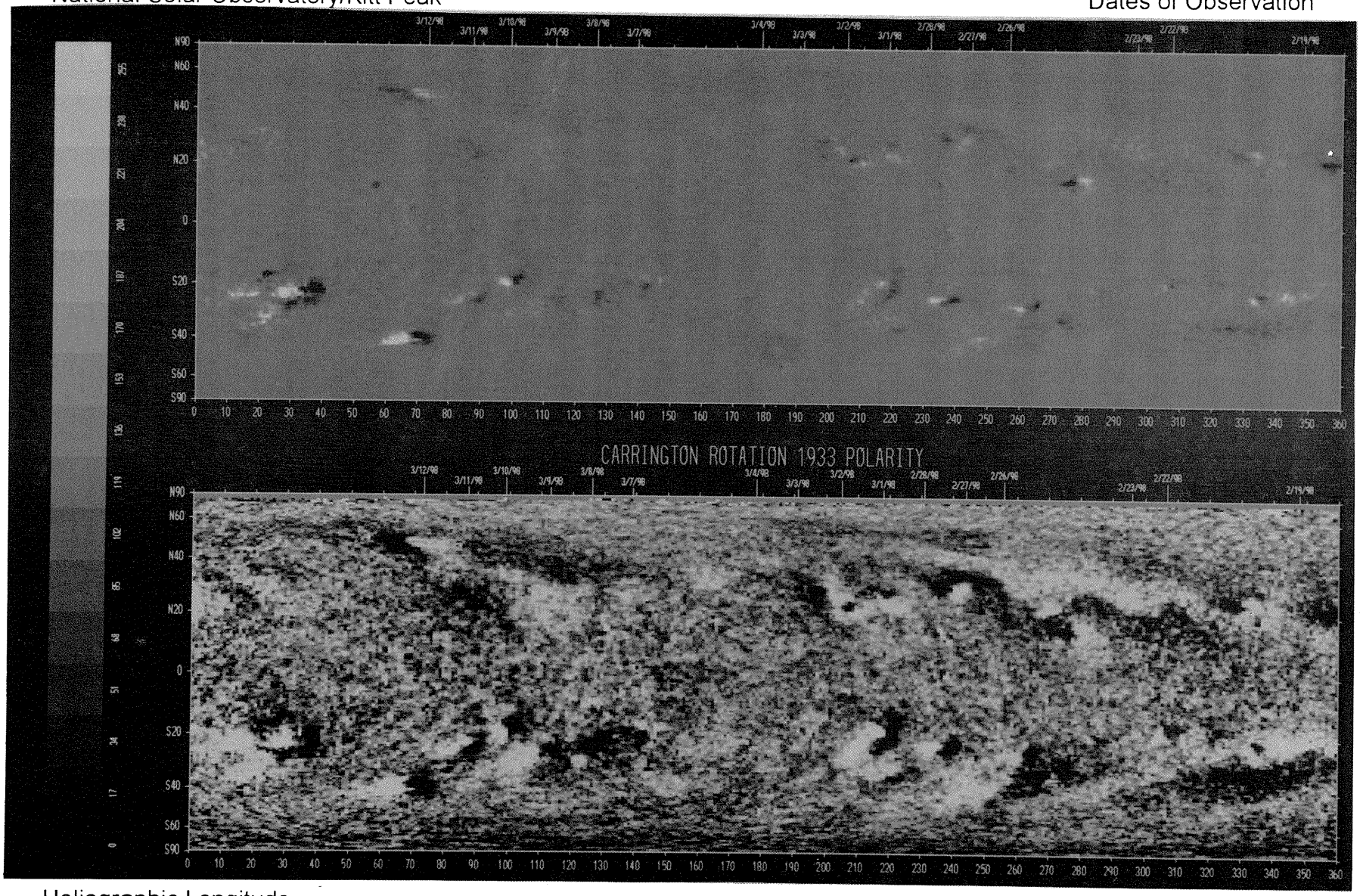
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1933

(18 February to 18 March 1998)

National Solar Observatory/Kitt Peak

Dates of Observation



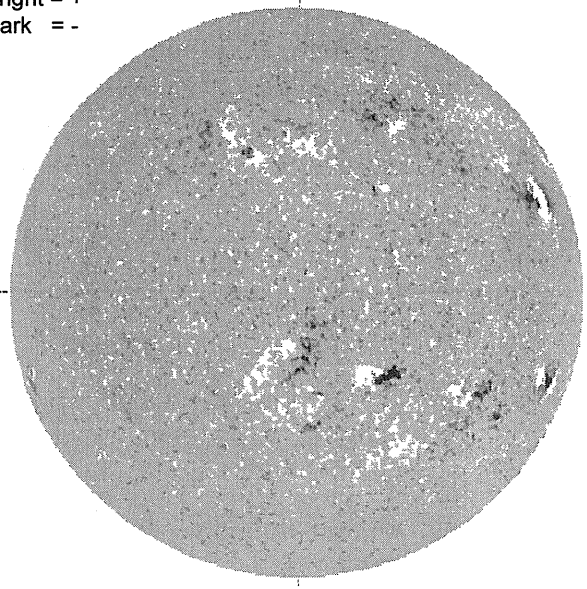
Heliographic Longitude

MARCH 1, 1998 (P= - 21.49 , Bo = - 7.22 , Lo = 226.24)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



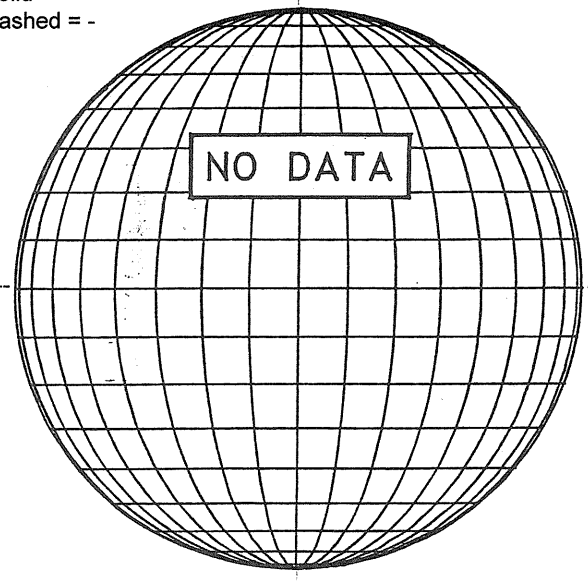
E--

1450 UT

STANFORD MAGNETOGRAM

N

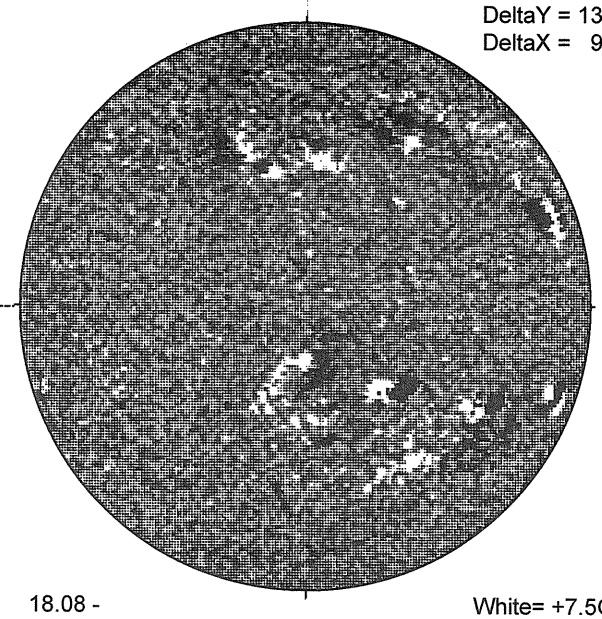
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

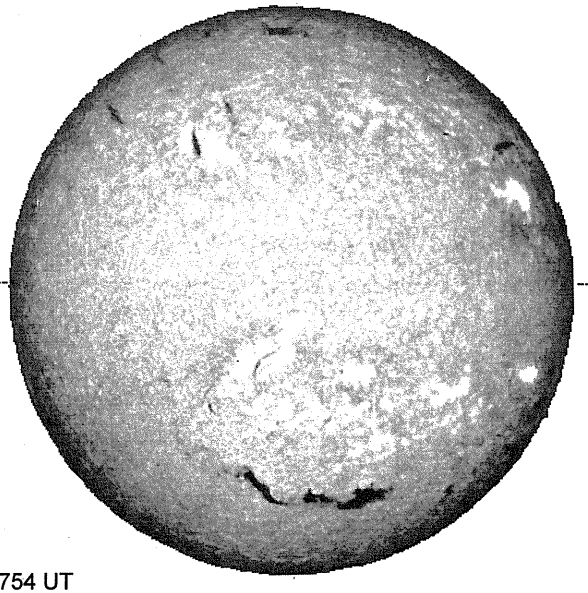
DeltaY = 13.0
DeltaX = 9.6



18.08 -
19.05 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

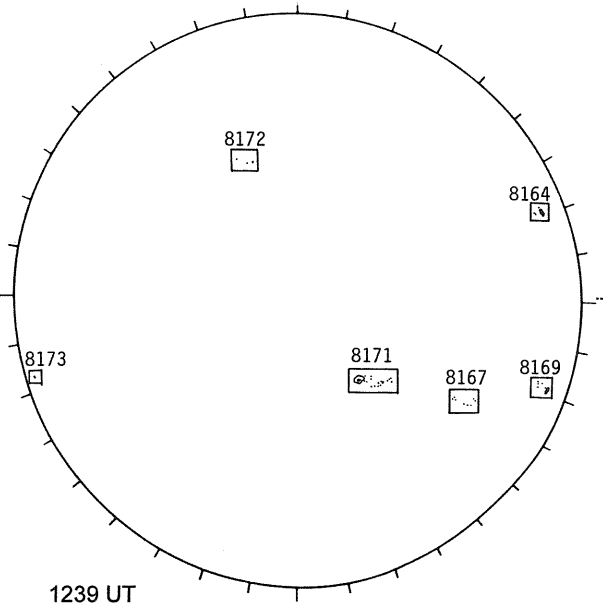


E--

0754 UT

S

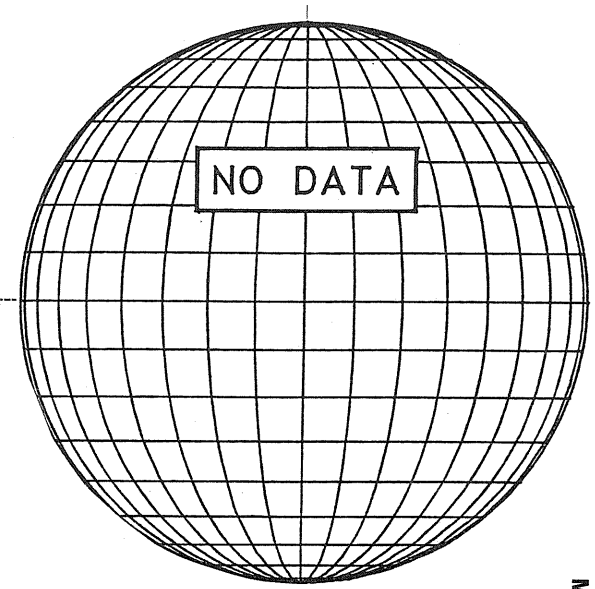
RAMEY SUNSPOT



1239 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----



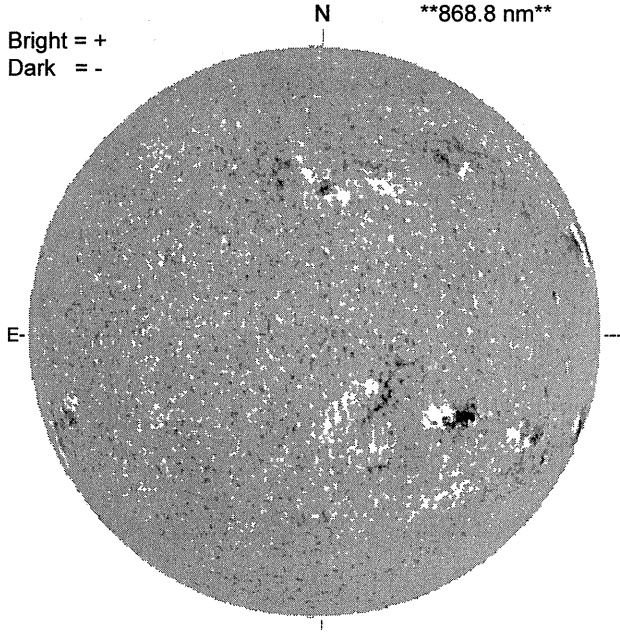
S

MARCH 2, 1998 (P= - 21.74 , Bo = - 7.23 , Lo = 213.07)

KITT PEAK MAGNETOGRAM

868.8 nm

Bright = +
Dark = -



1528 UT

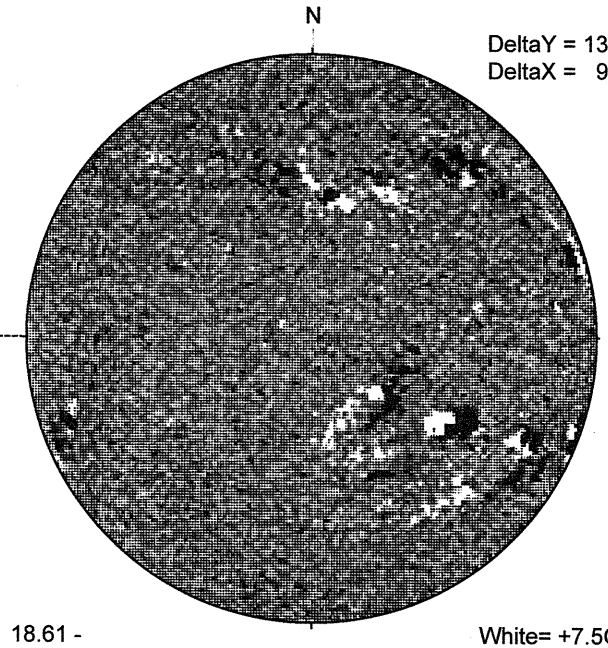
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

1853 UT

MT. WILSON MAGNETOGRAM

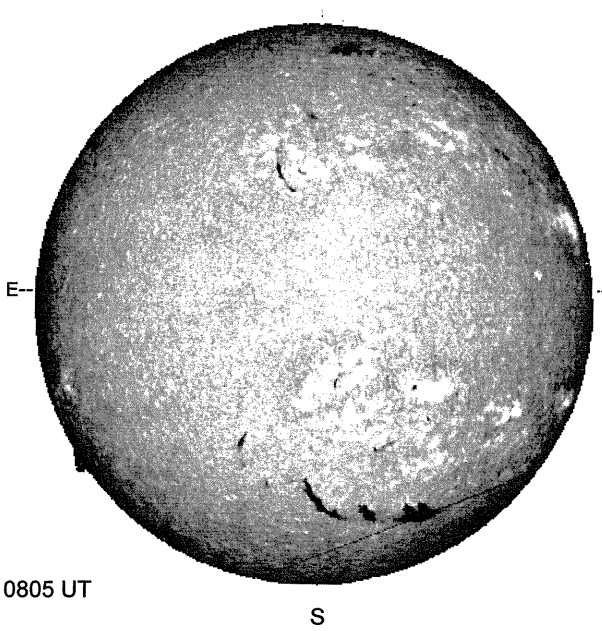
DeltaY = 13.0
DeltaX = 9.6



18.61 -
19.58 UT

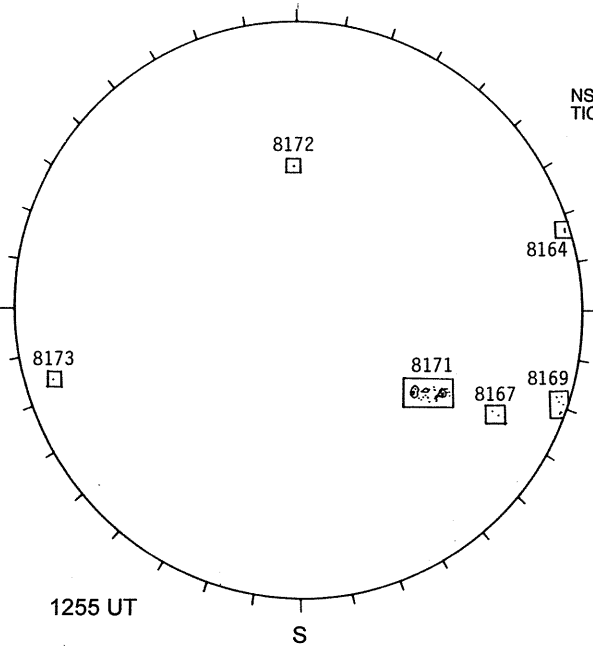
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



0805 UT

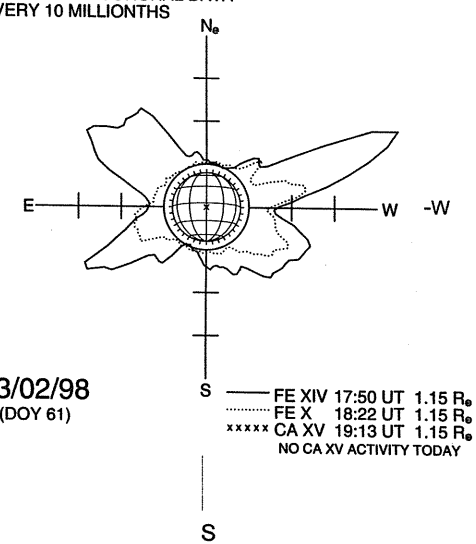
RAMEY SUNSPOT



1255 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



03/02/98
(DOY 61)

FE XIV 17:50 UT 1.15 Re
FE X 18:22 UT 1.15 Re
xxxxx CA XV 19:13 UT 1.15 Re
NO CA XV ACTIVITY TODAY

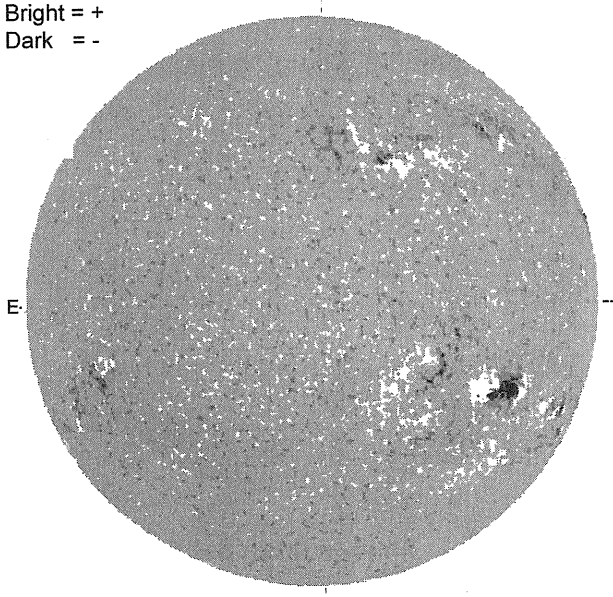
MARCH 3, 1998 (P = - 21.98 , Bo = - 7.24 , Lo = 199.90)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



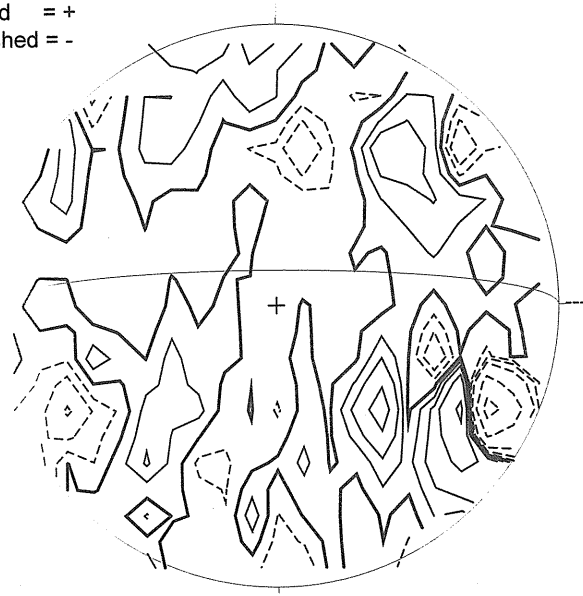
E

1604 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

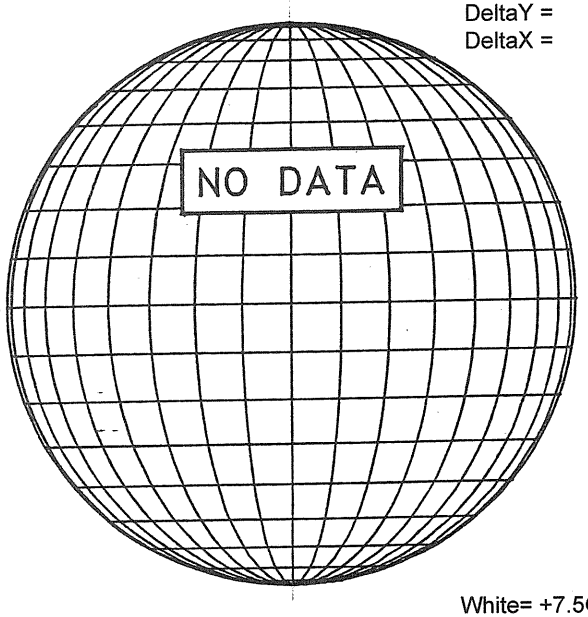


2345 UT

MT. WILSON MAGNETOGRAM

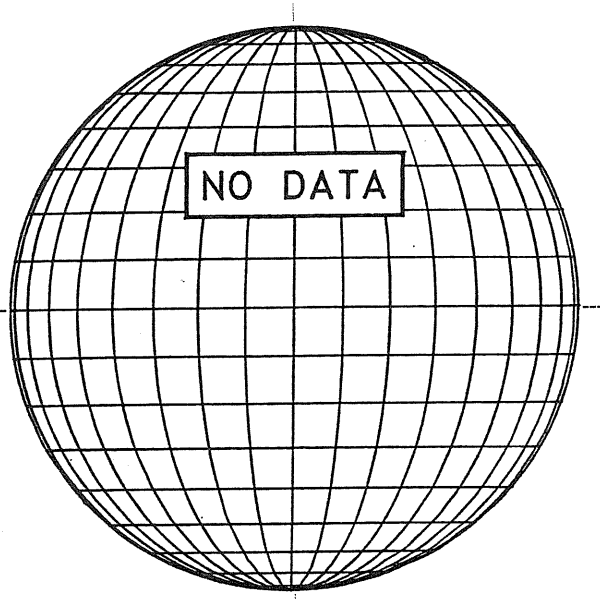
N

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

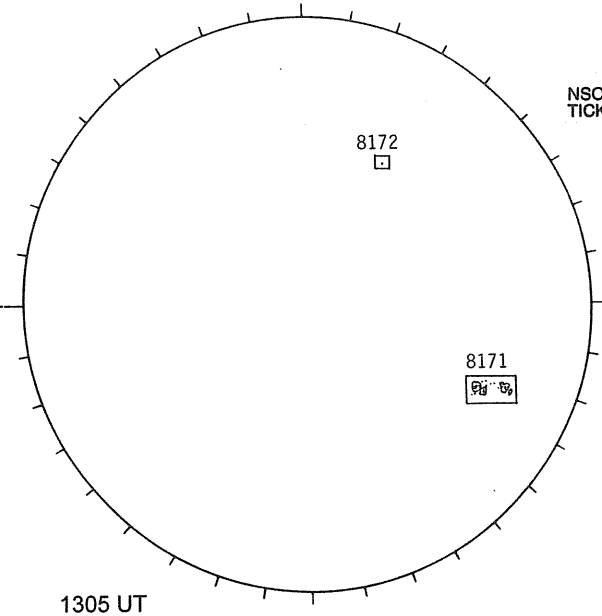
MEUDON H-ALPHA



E

S

RAMEY SUNSPOT

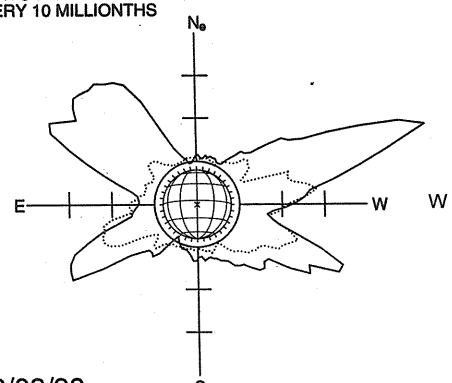


1305 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



03/03/98
(DOY 62)

FE XIV 15:11 UT 1.15 $R_\odot$
FE X 15:21 UT 1.15 $R_\odot$
xxxxx CA XV 15:58 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

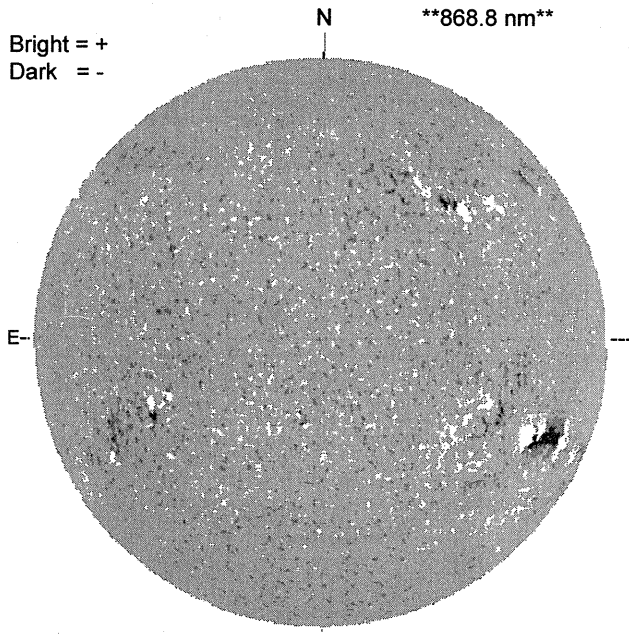
S

45
Mar 98

MARCH 4, 1998 (P = - 22.22 , Bo = - 7.24 , Lo = 186.72)

KITT PEAK MAGNETOGRAM

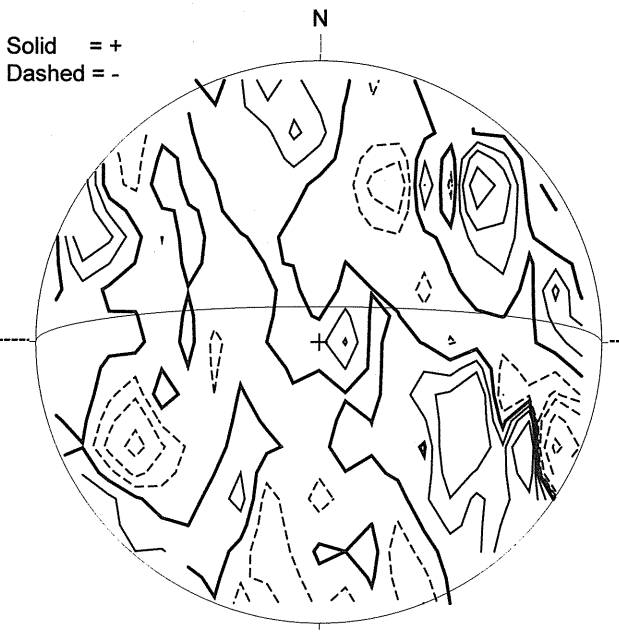
Bright = +
Dark = -



1507 UT

STANFORD MAGNETOGRAM

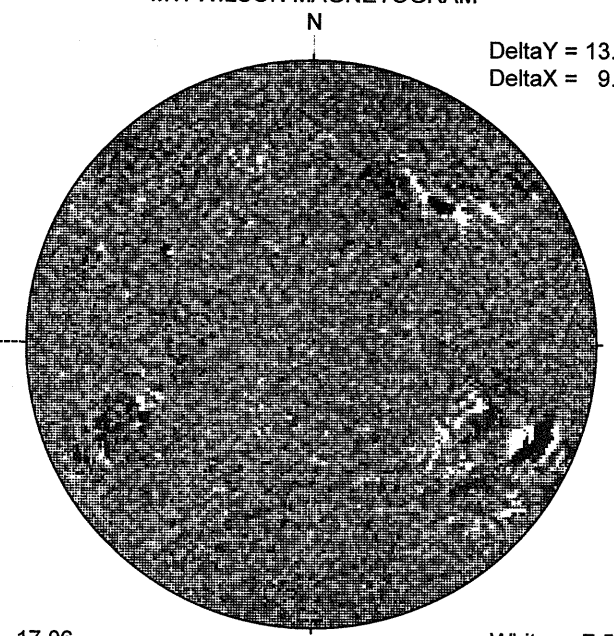
Solid = +
Dashed = -



1950 UT

MT. WILSON MAGNETOGRAM

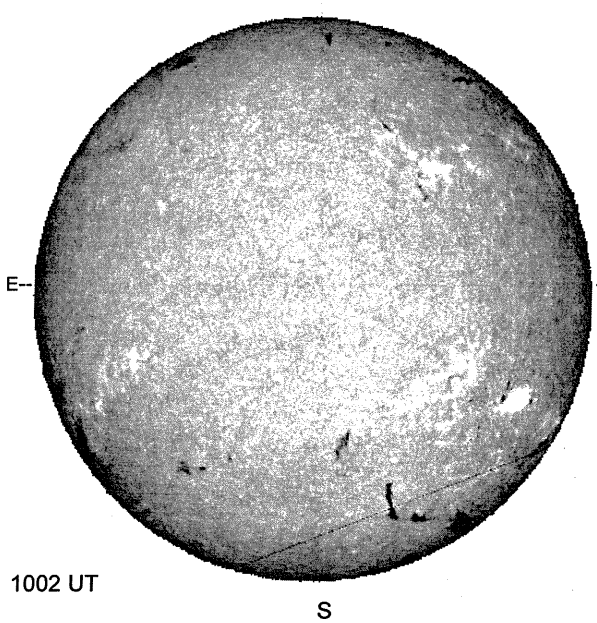
DeltaY = 13.0
DeltaX = 9.6



17.06 -
18.03 UT

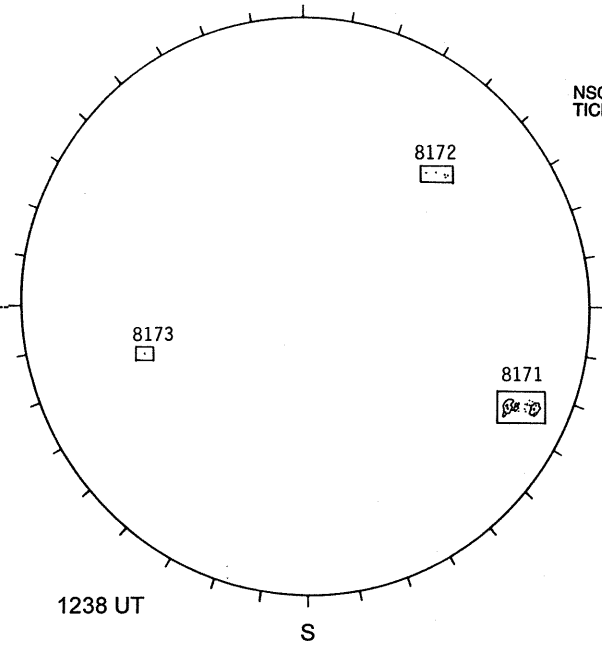
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



1002 UT

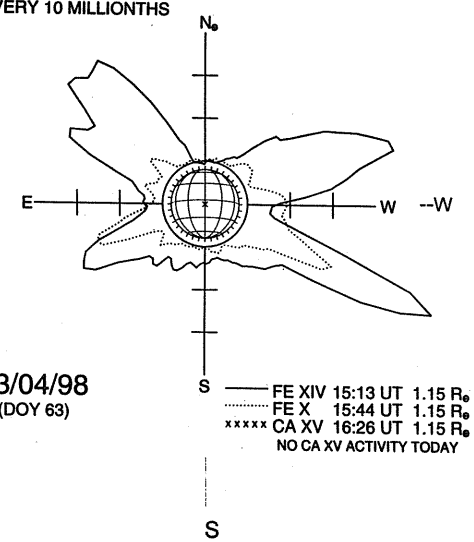
RAMEY SUNSPOT



1238 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



03/04/98
(DOY 63)

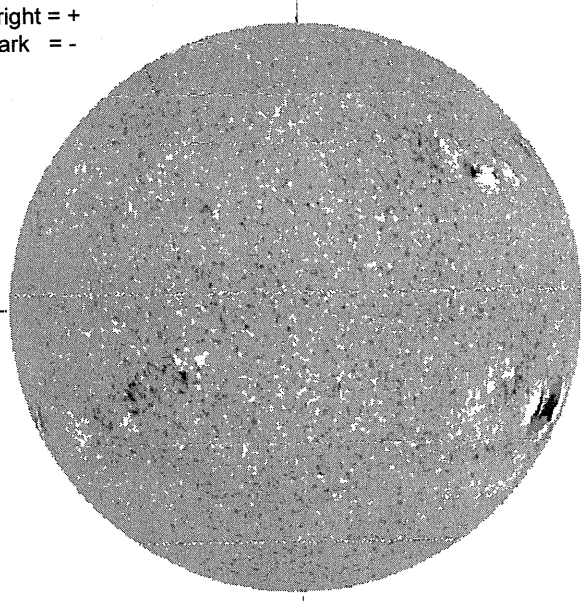
MARCH 5, 1998 (P= - 22.45 , Bo = - 7.25 , Lo = 173.55)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



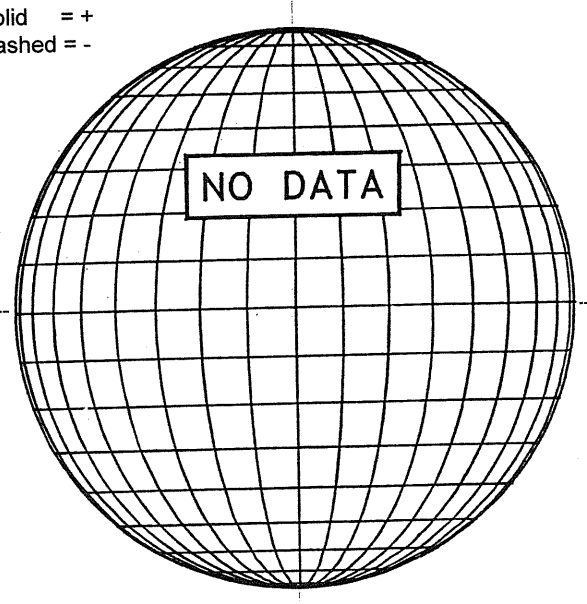
E-

1607 UT

STANFORD MAGNETOGRAM

N

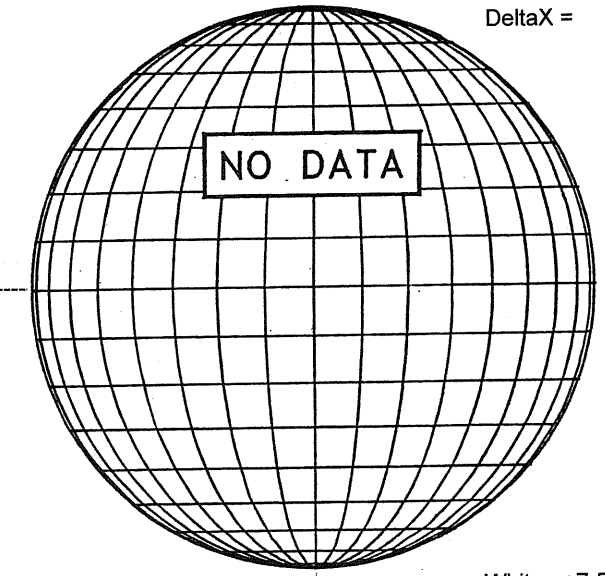
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

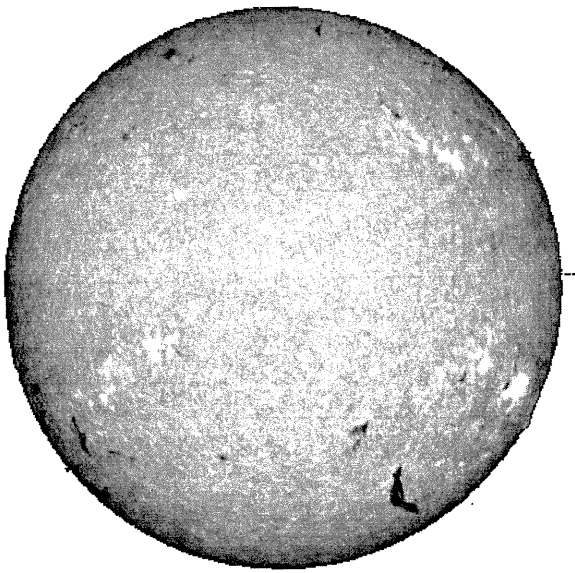
N

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

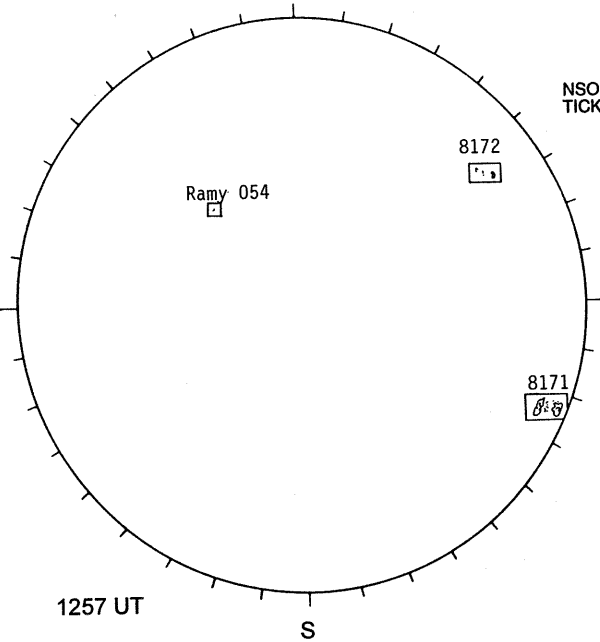


E---

0831 UT

S

RAMEY SUNSPOT

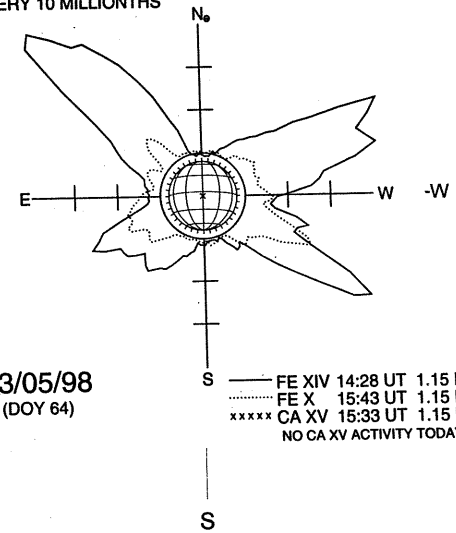


1257 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS

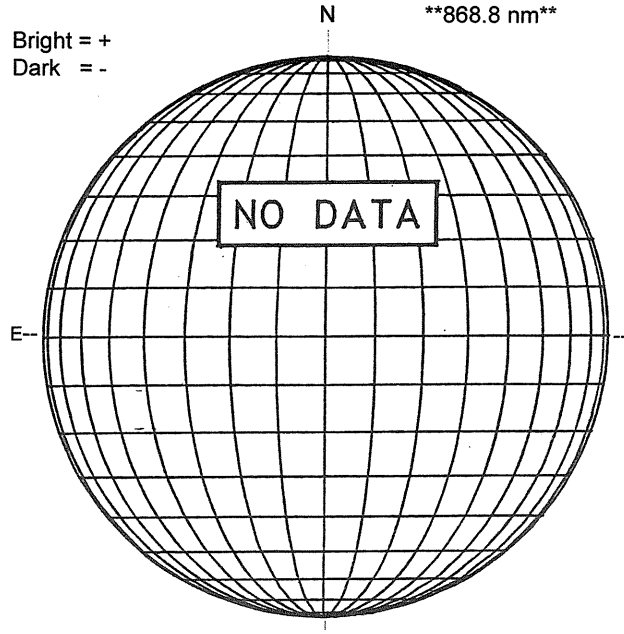


03/05/98
(DOY 64)

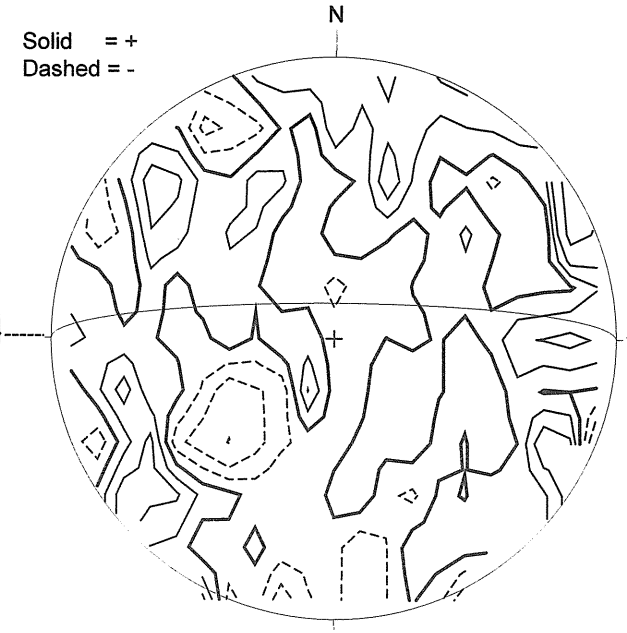
S

MARCH 6, 1998 (P= - 22.67 , Bo = - 7.25 , Lo = 160.38)

KITT PEAK MAGNETOGRAM

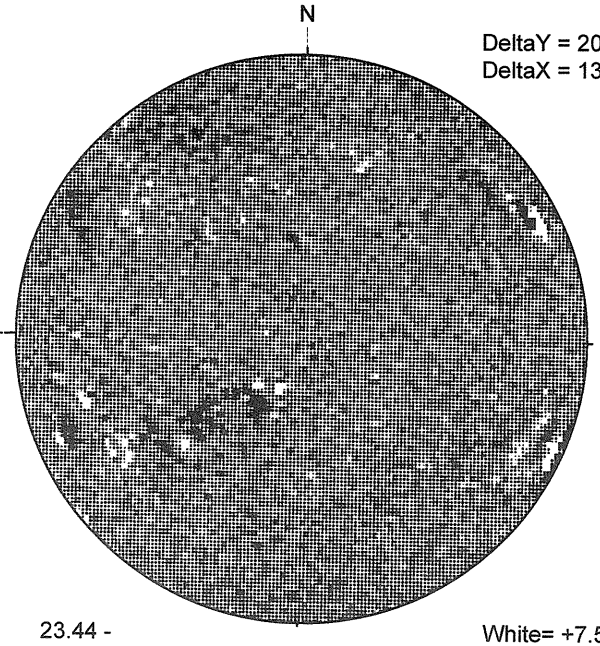


STANFORD MAGNETOGRAM



1857 UT

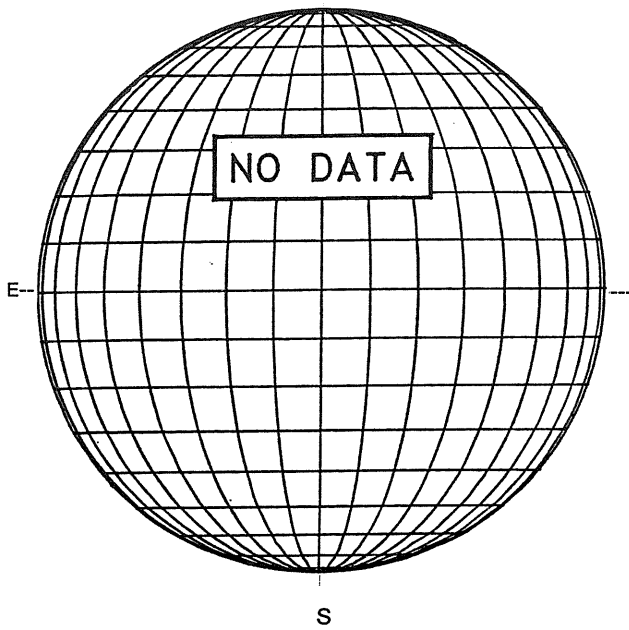
MT. WILSON MAGNETOGRAM



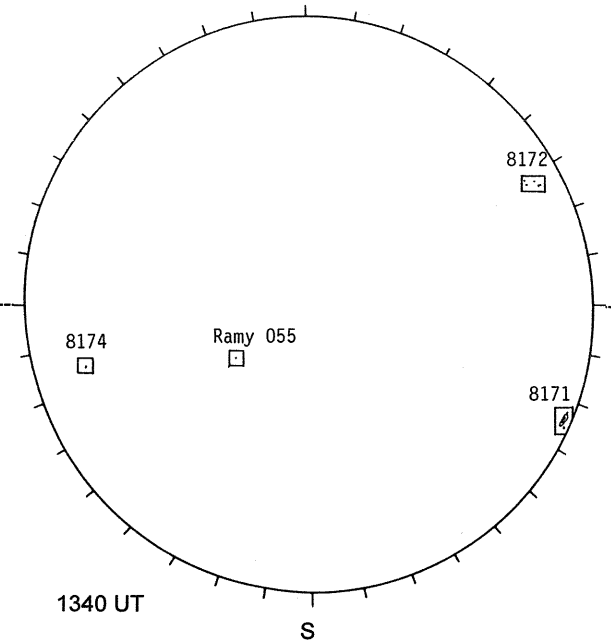
23.44 -
23.86 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

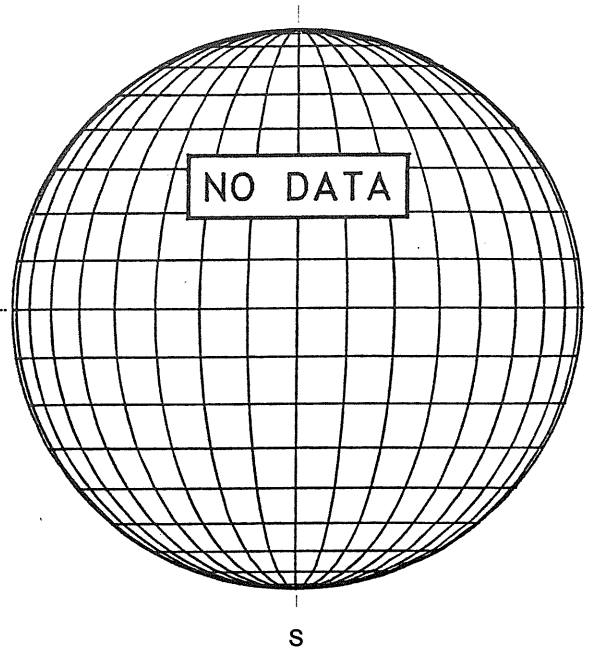


RAMEY SUNSPOT



1340 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



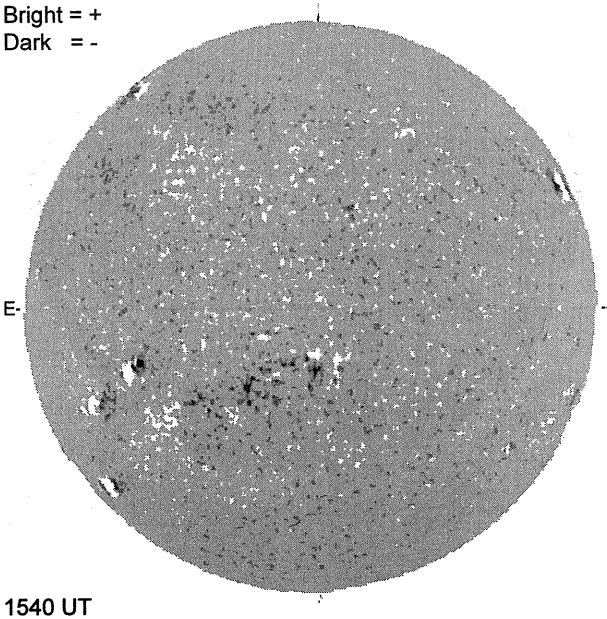
MARCH 7, 1998 (P= - 22.89 , Bo = - 7.25 , Lo = 147.20)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



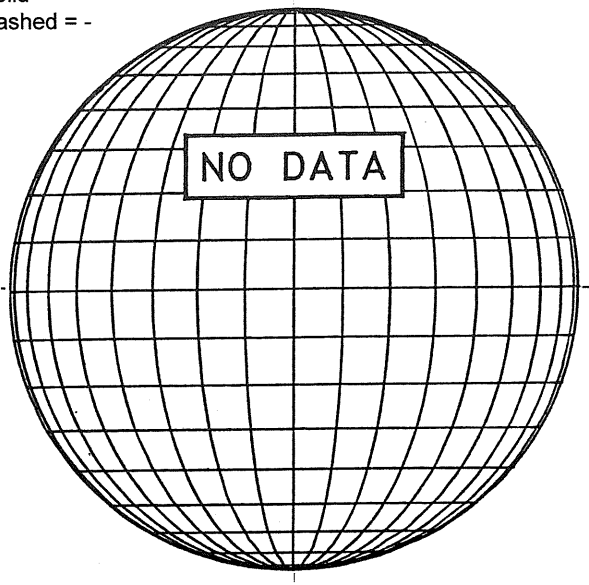
E-

1540 UT

STANFORD MAGNETOGRAM

N

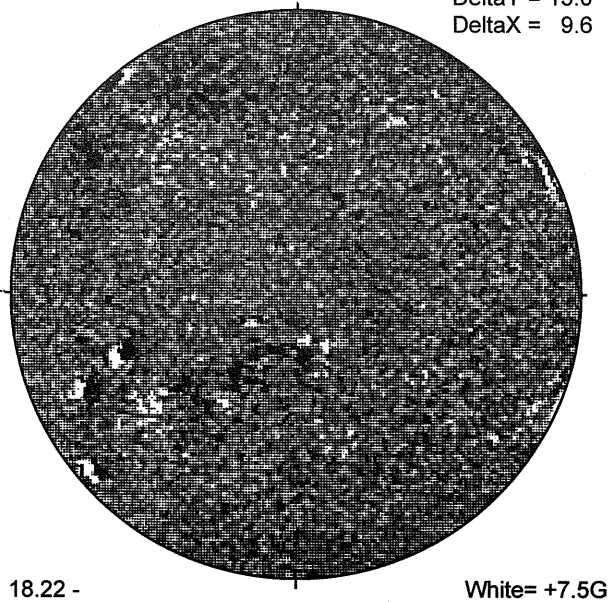
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

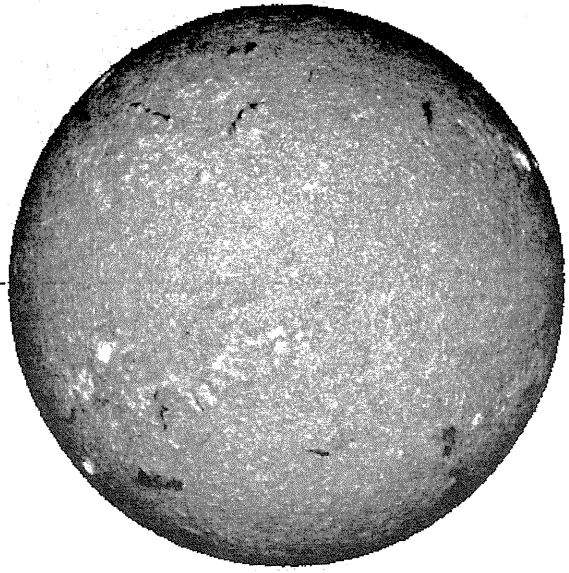
DeltaY = 13.0
DeltaX = 9.6



18.22 -
19.18 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

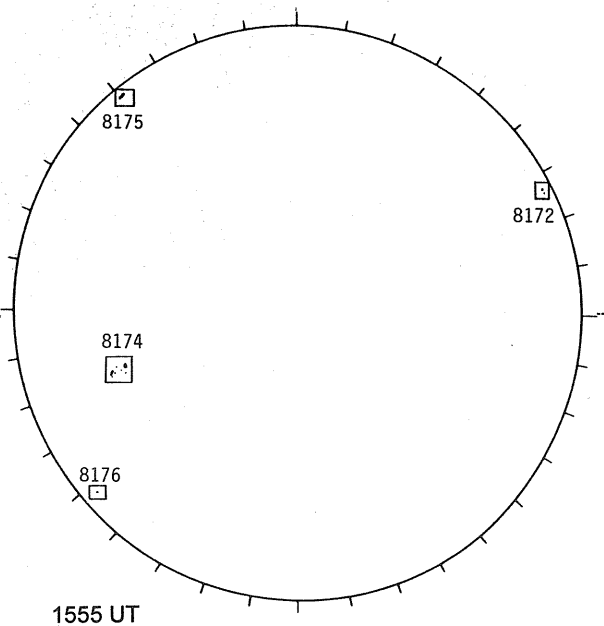


E--

1138 UT

S

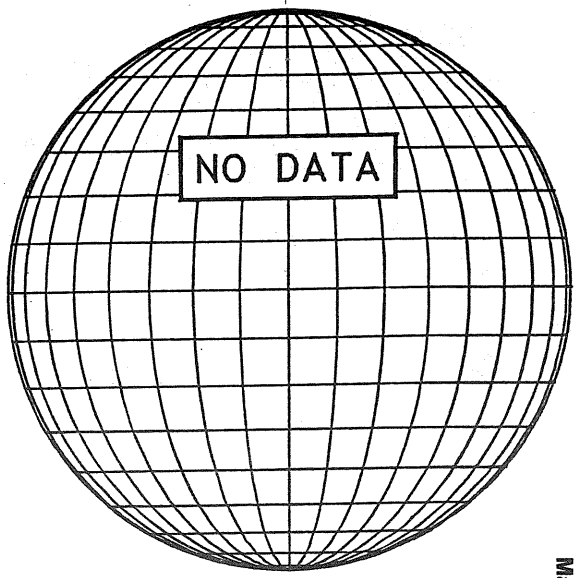
RAMEY SUNSPOT



1555 UT

S

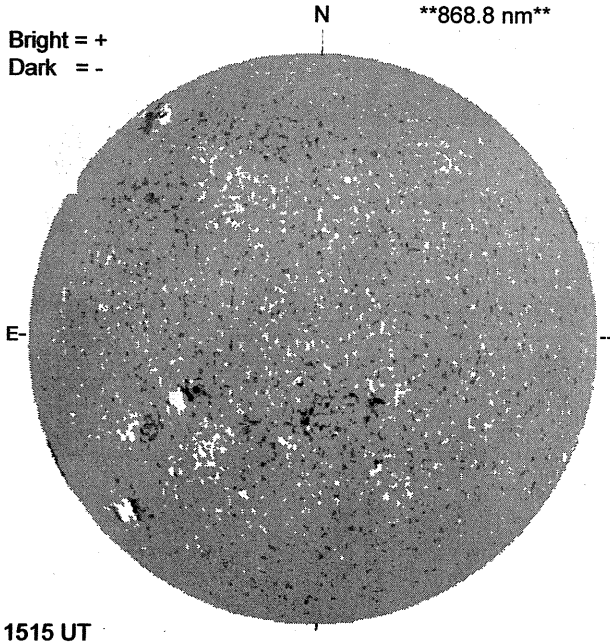
SACRAMENTO PEAK CORONA (1.15 Radii)----



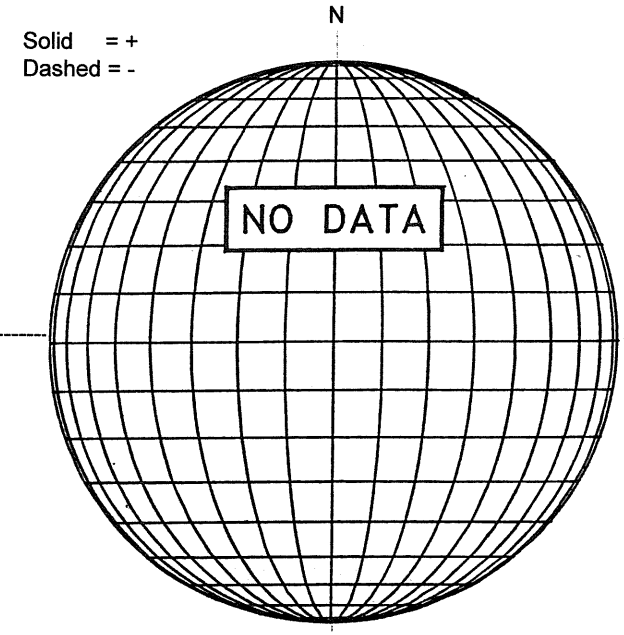
S

MARCH 8, 1998 (P= - 23.10 , Bo = - 7.25 , Lo = 134.02)

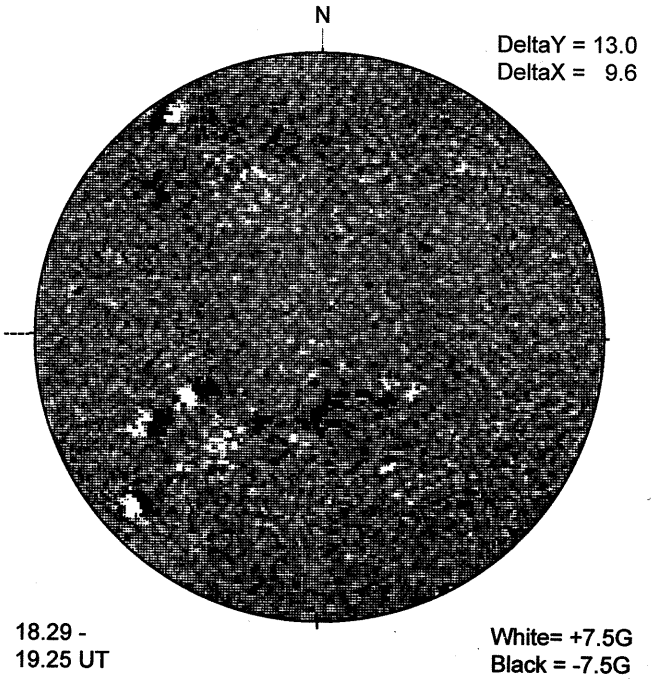
KITT PEAK MAGNETOGRAM



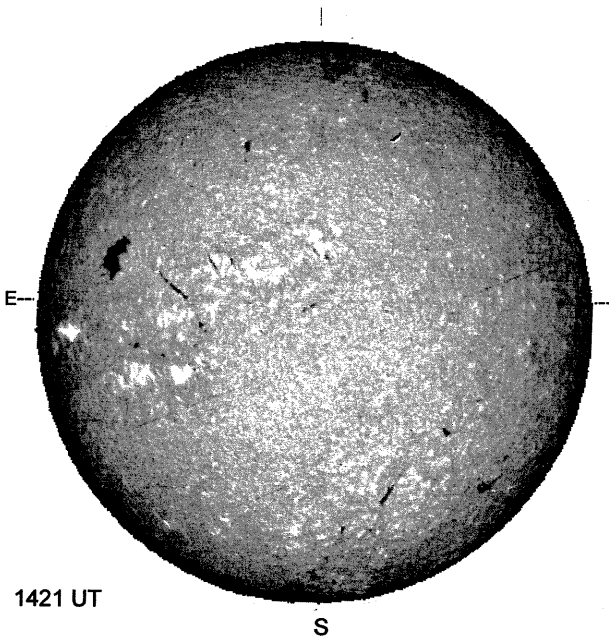
STANFORD MAGNETOGRAM



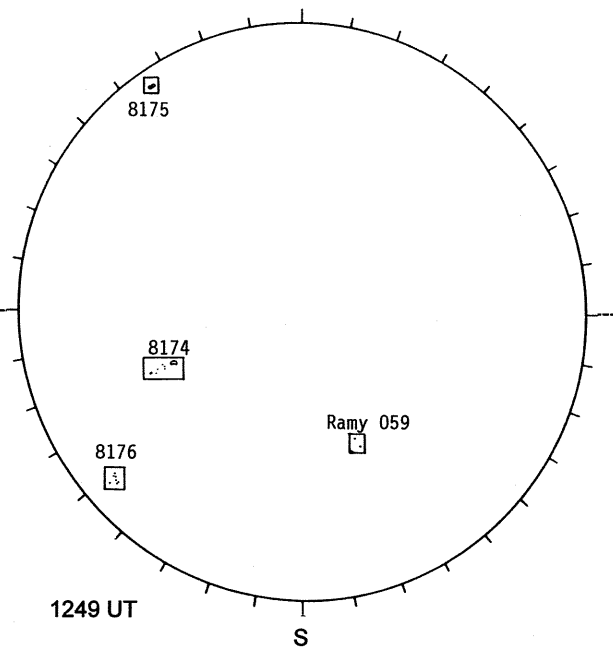
MT. WILSON MAGNETOGRAM



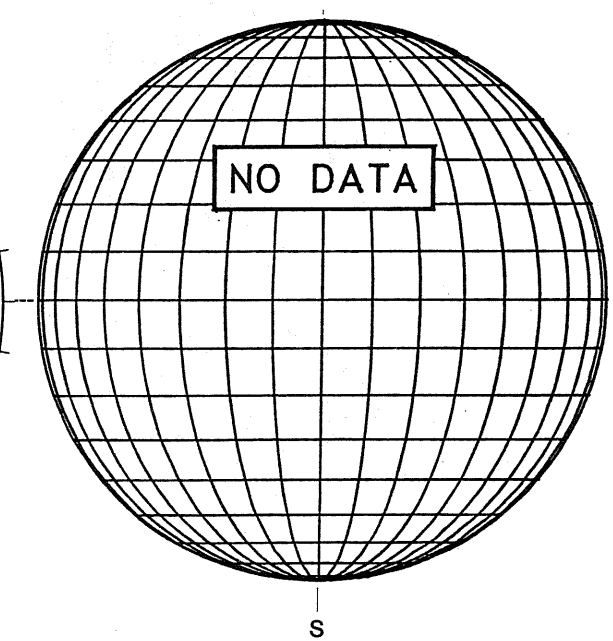
MEUDON H-ALPHA



RAMEY SUNSPOT

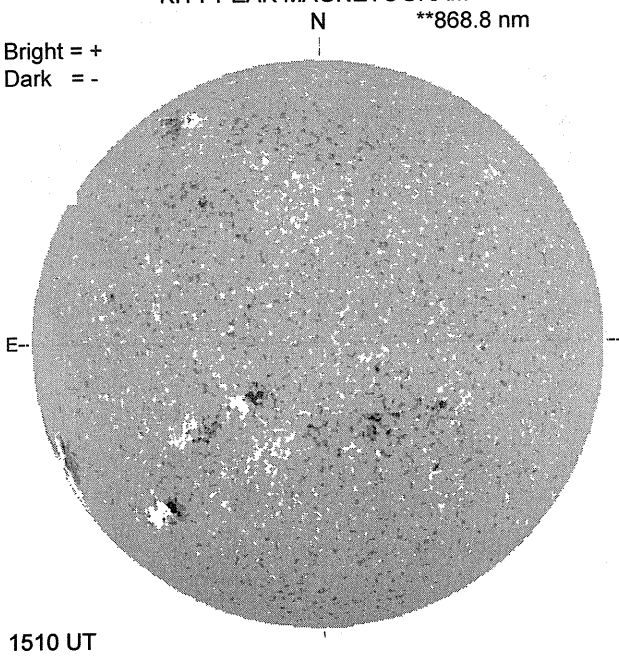


SACRAMENTO PEAK CORONA (1.15 Radii)----

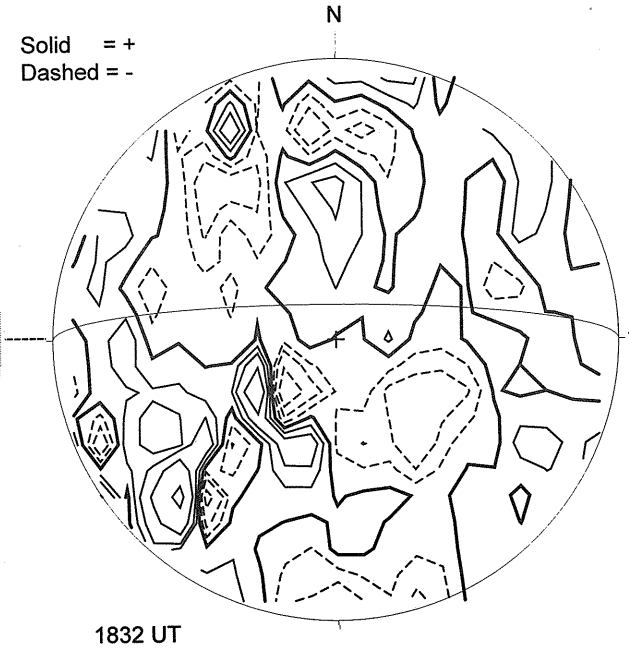


MARCH 9, 1998 (P= - 23.31 , Bo = - 7.24 , Lo = 120.85)

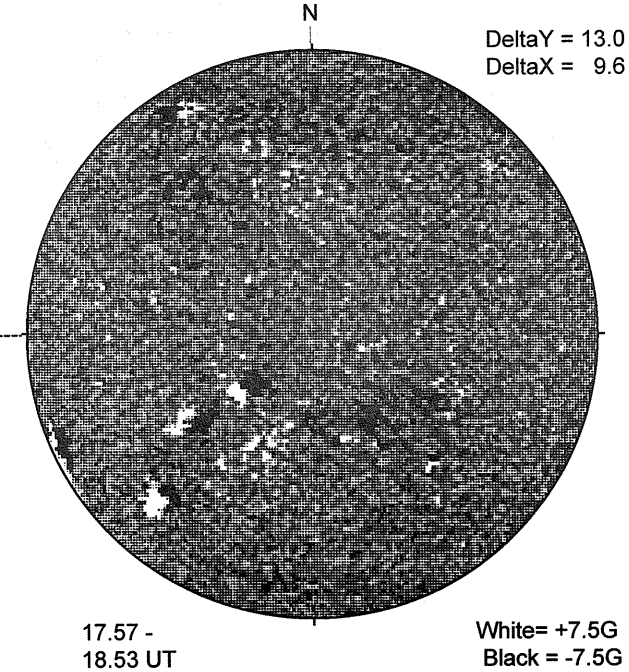
KITT PEAK MAGNETOGRAM



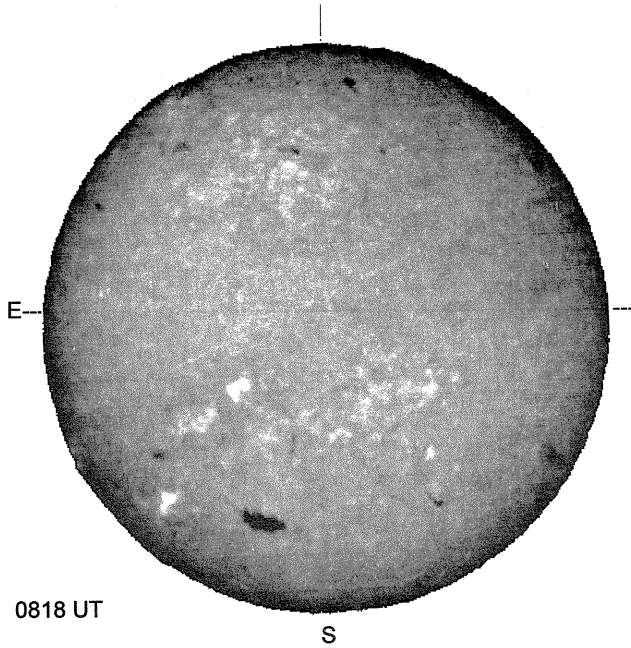
STANFORD MAGNETOGRAM



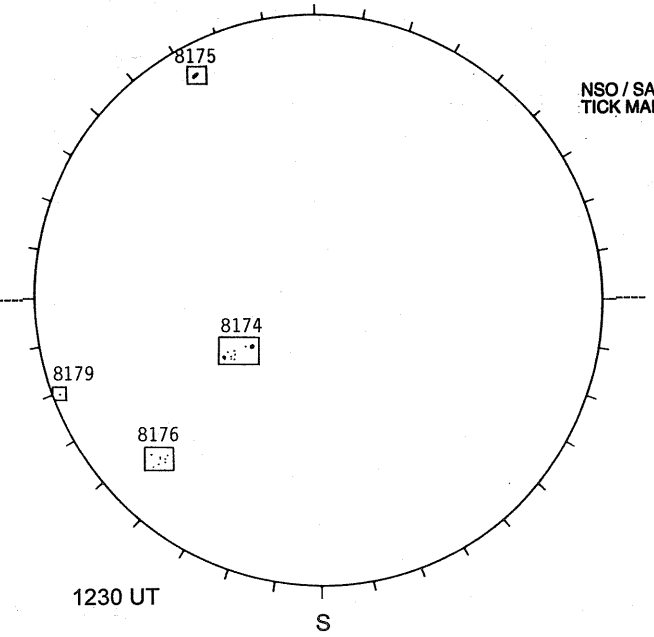
MT. WILSON MAGNETOGRAM



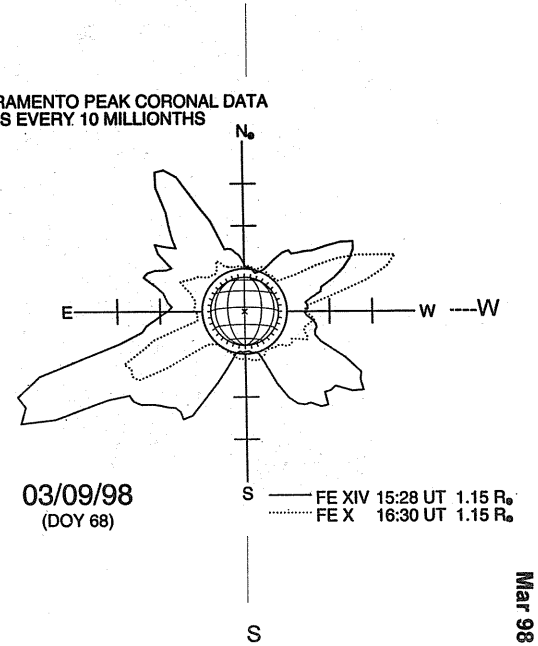
MEUDON H-ALPHA



RAMEY SUNSPOT

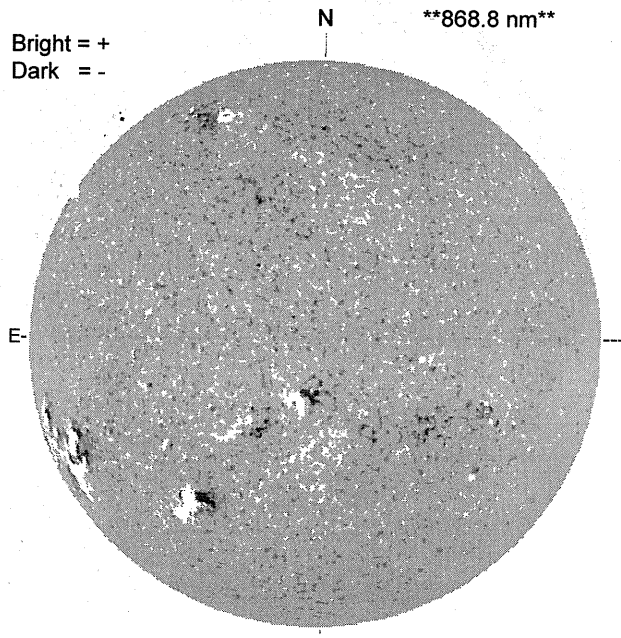


SACRAMENTO PEAK CORONA (1.15 Radii)----



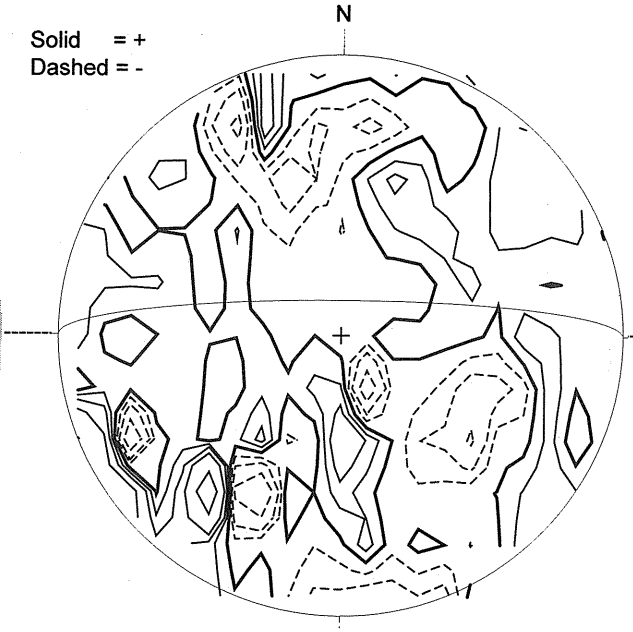
MARCH 10, 1998 (P= - 23.51 , Bo = - 7.24 , Lo = 107.67)

KITT PEAK MAGNETOGRAM



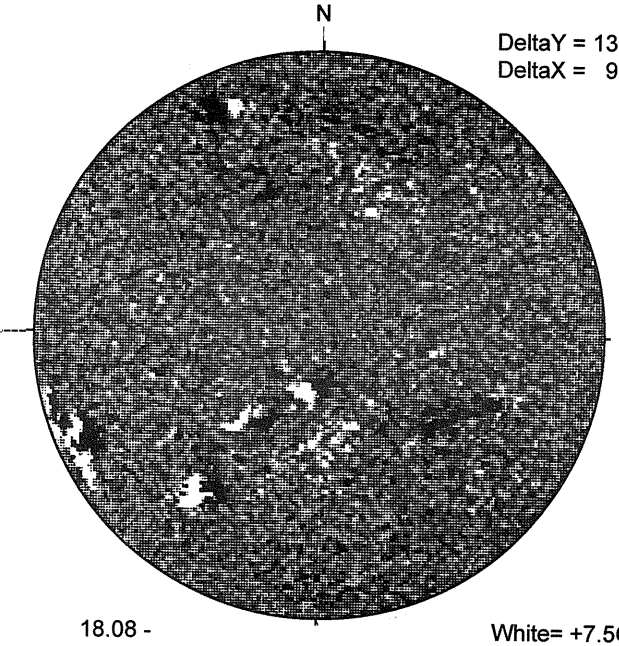
1514 UT

STANFORD MAGNETOGRAM



1829 UT

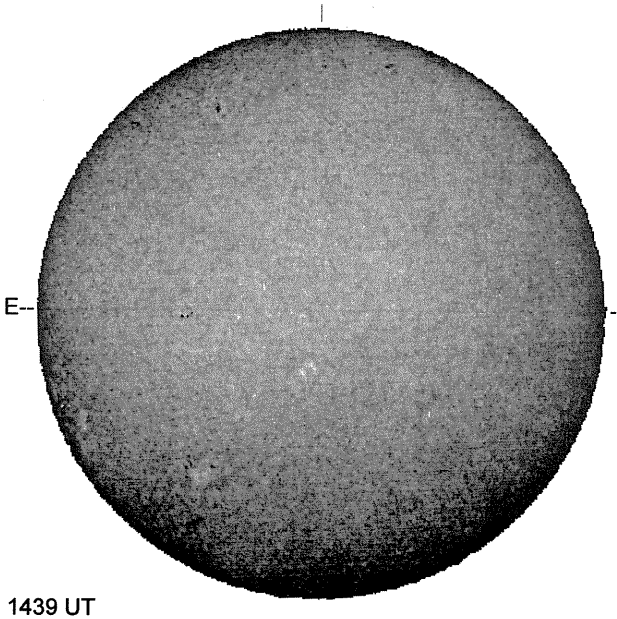
MT. WILSON MAGNETOGRAM



18.08 -
19.04 UT

White= +7.5G
Black = -7.5G

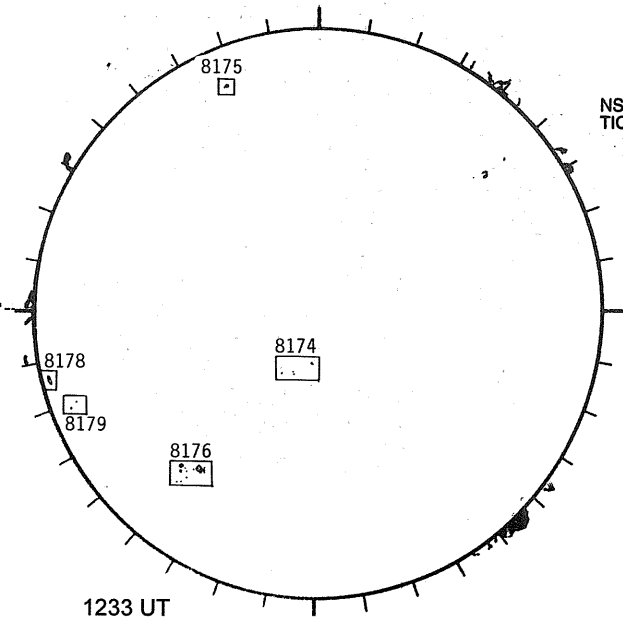
SACRAMENTO PEAK H-ALPHA



1439 UT

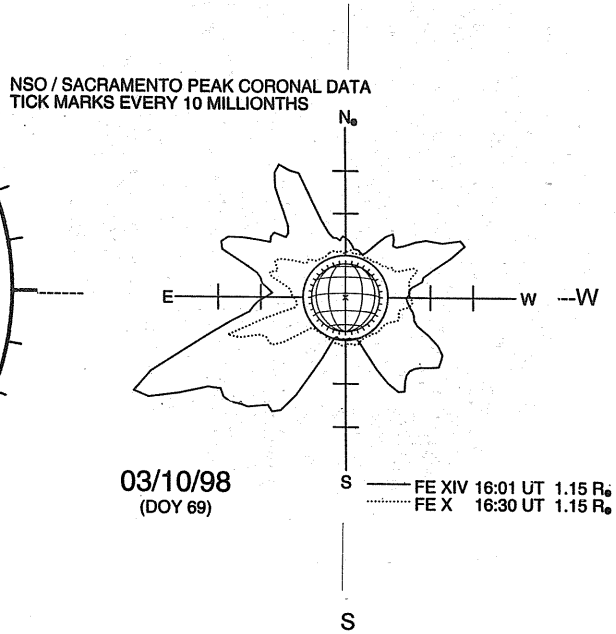
S

RAMEY SUNSPOT



1233 UT
0954 UT VALA Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----

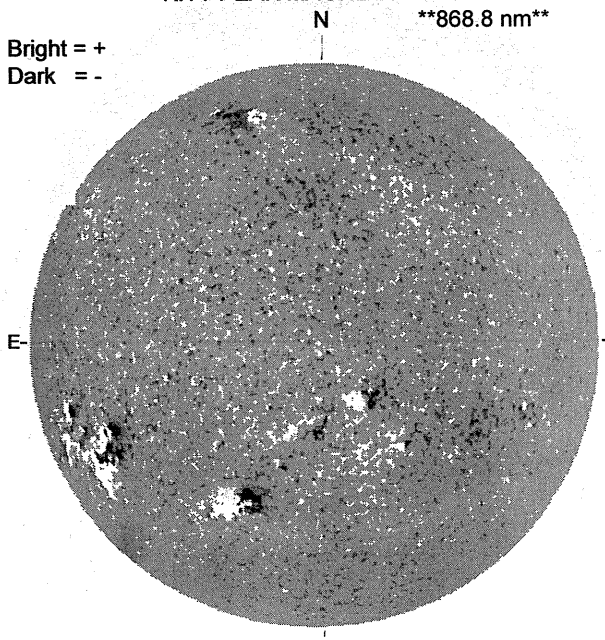


03/10/98
(DOY 69)

S

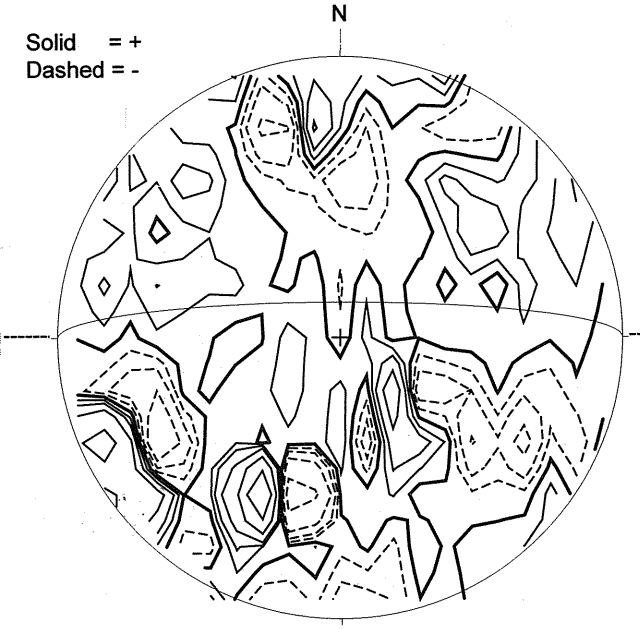
MARCH 11, 1998 (P= - 23.70 , Bo = - 7.23 , Lo = 94.49)

KITT PEAK MAGNETOGRAM



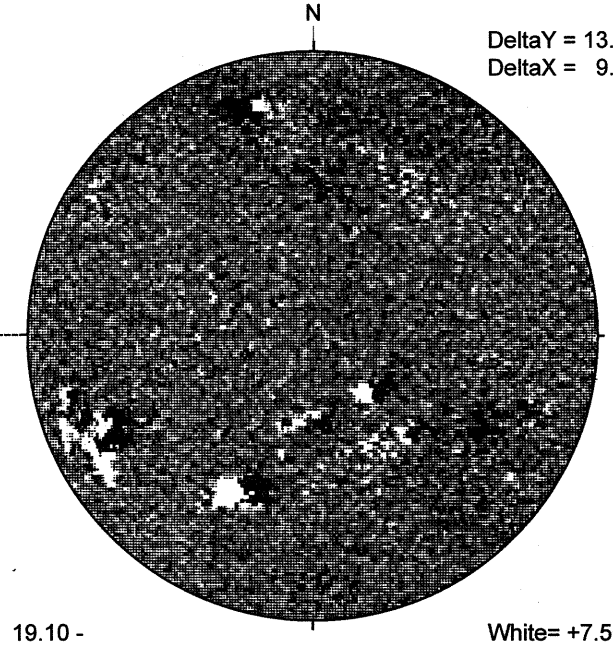
1424 UT

STANFORD MAGNETOGRAM



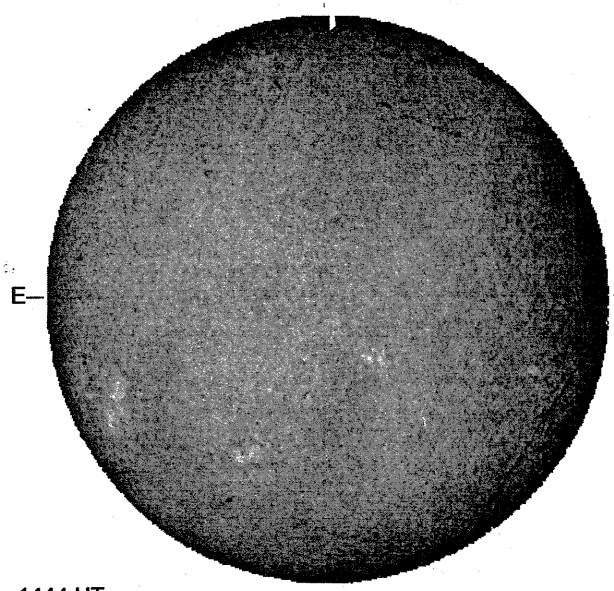
1942 UT

MT. WILSON MAGNETOGRAM



19.10 -
20.06 UT

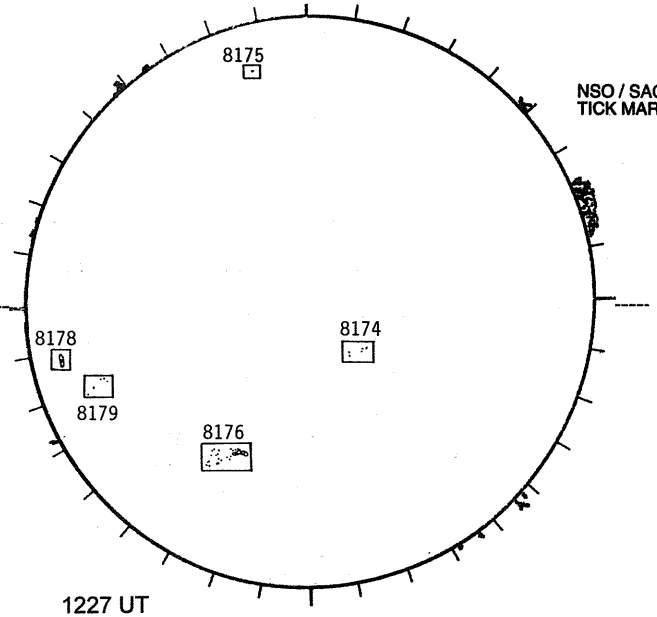
SACRAMENTO PEAK H-ALPHA



1444 UT

S

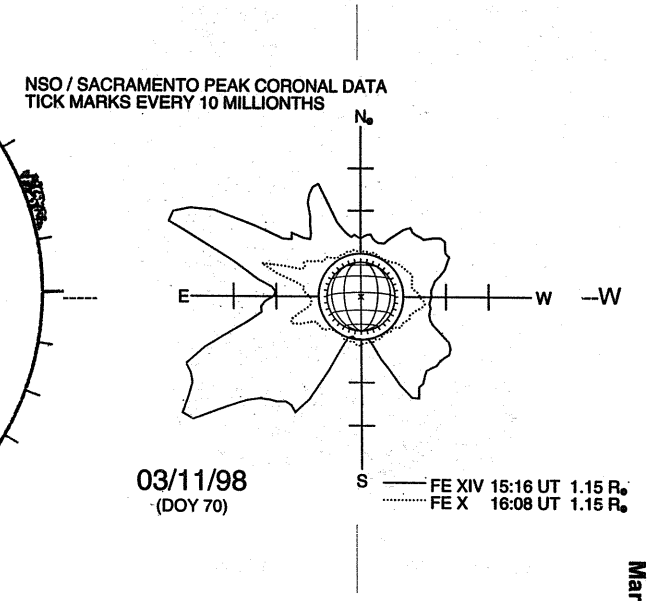
RAMEY SUNSPOT



1227 UT
0901 UT VALA Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)----



03/11/98
(DOY 70)

S

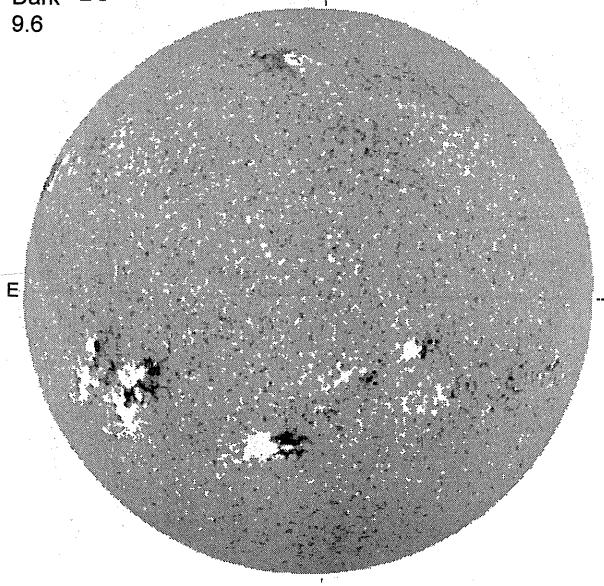
MARCH 12, 1998 (P= - 23.89 , Bo = - 7.22 , Lo = 81.32)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -
9.6



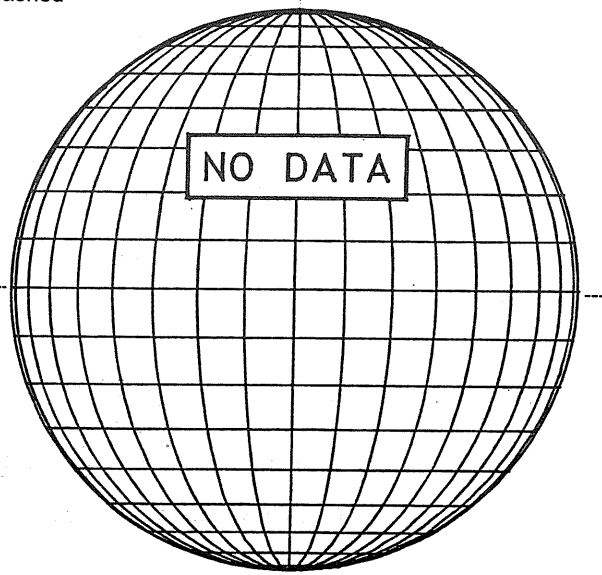
E

1453 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

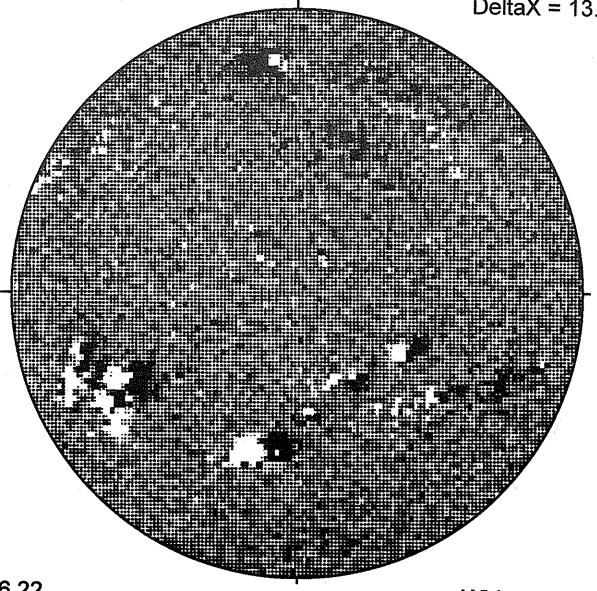


16.22 -
16.64 UT

MT. WILSON MAGNETOGRAM

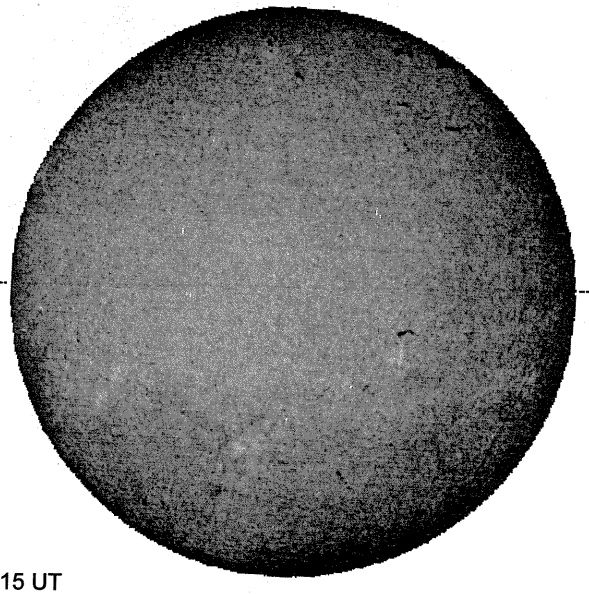
N

DeltaY = 20.1
DeltaX = 13.0



White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA

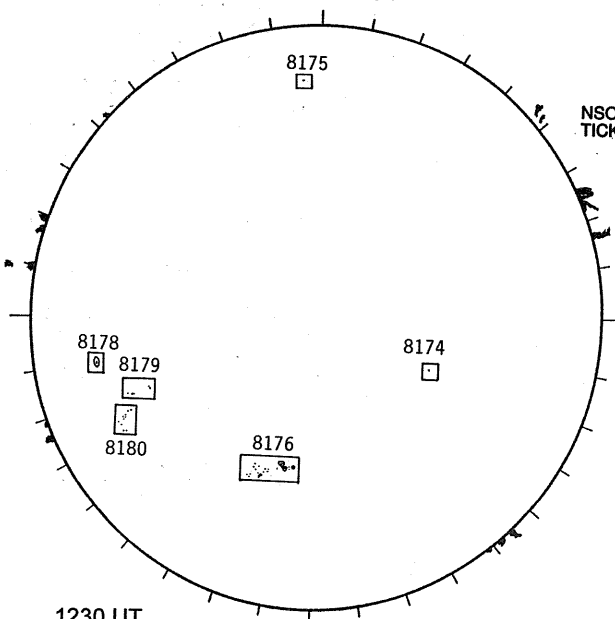


E---

1415 UT

S

RAMEY SUNSPOT

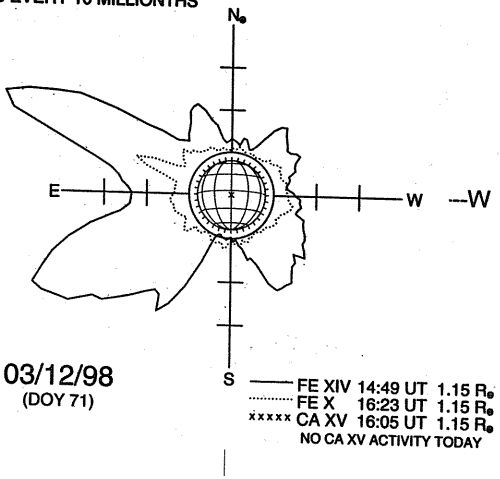


1230 UT
0826 UT LOMN Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS

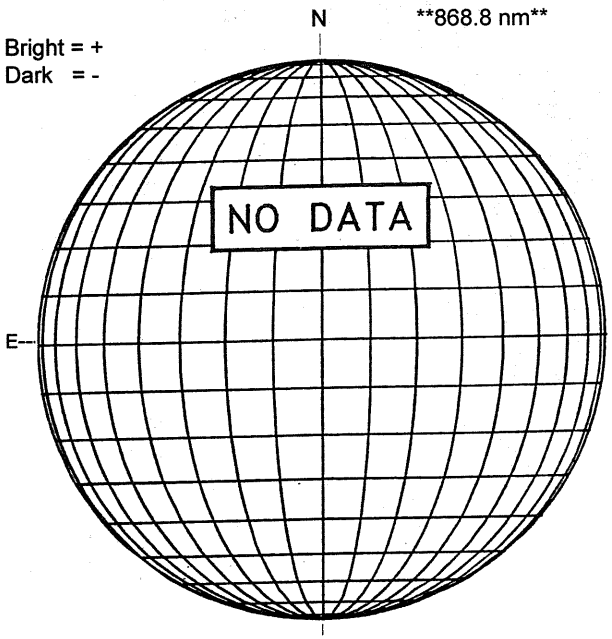


03/12/98
(DOY 71)

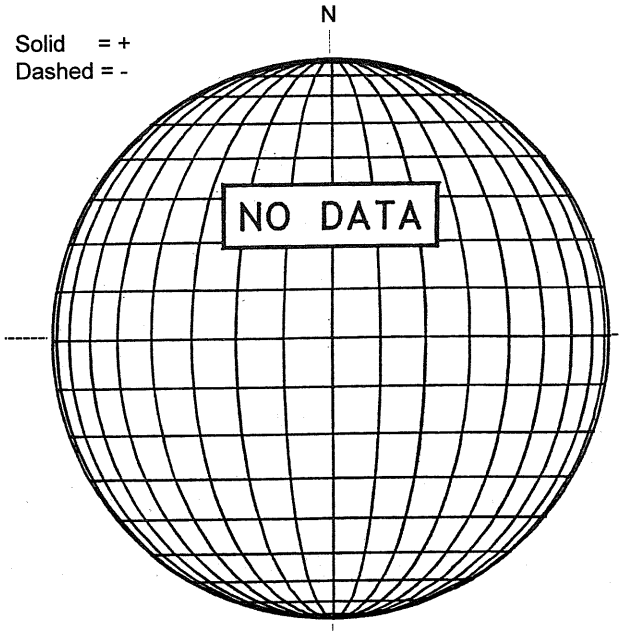
S

MARCH 13, 1998 (P= - 24.07 , Bo = - 7.21 , Lo = 68.14)

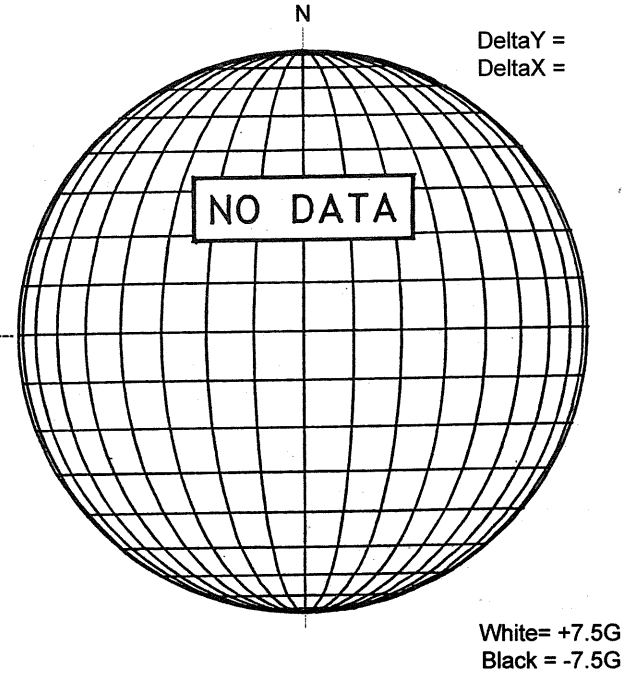
KITT PEAK MAGNETOGRAM



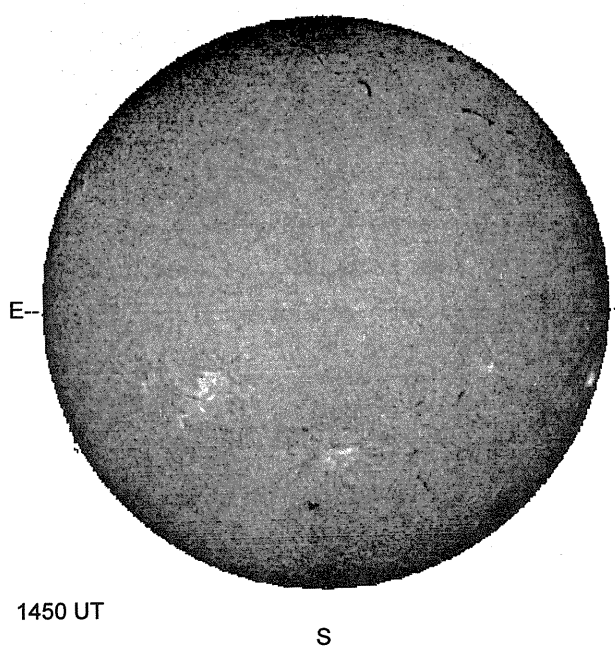
STANFORD MAGNETOGRAM



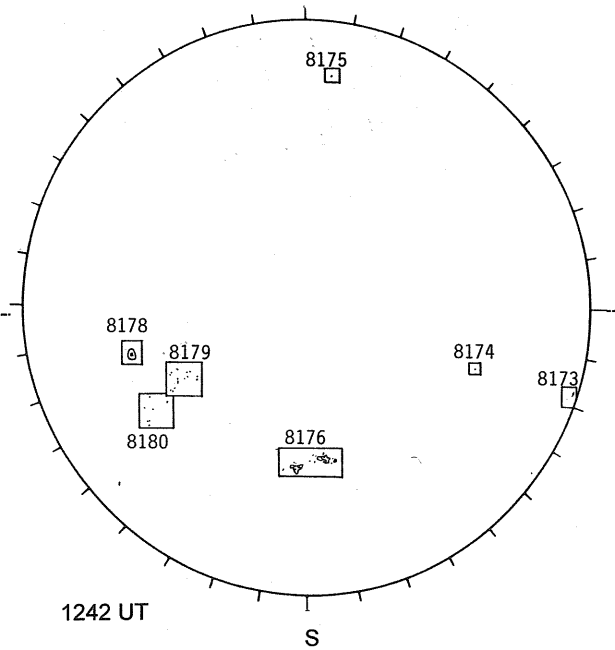
MT. WILSON MAGNETOGRAM



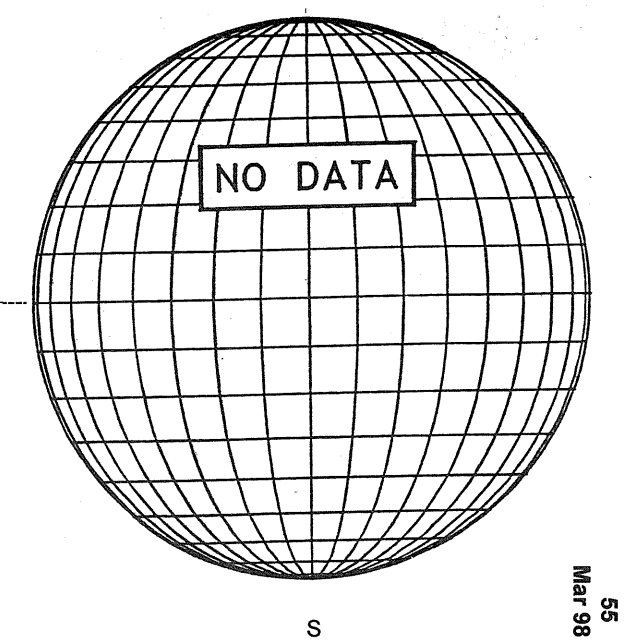
---- SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----

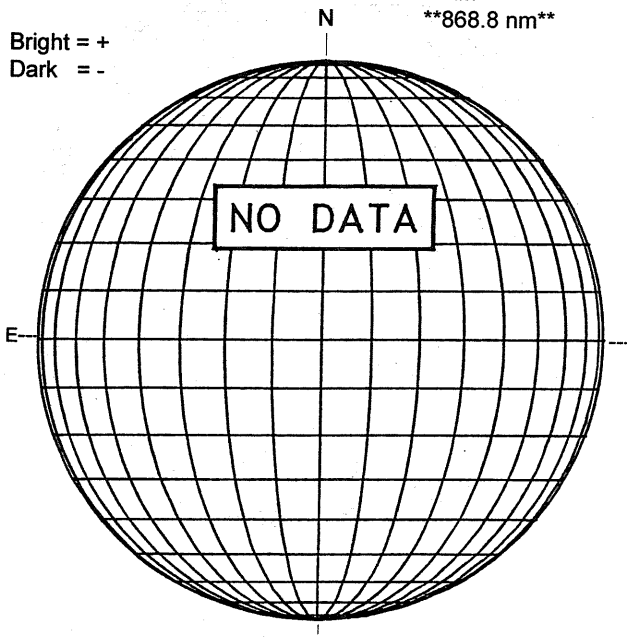


55
Mar 98

MARCH 14, 1998 (P= - 24.24 , Bo = - 7.19 , Lo= 54.96)

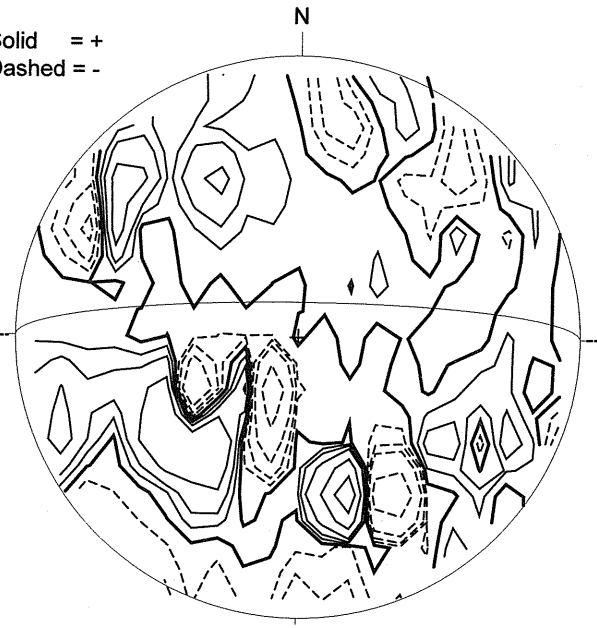
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



STANFORD MAGNETOGRAM

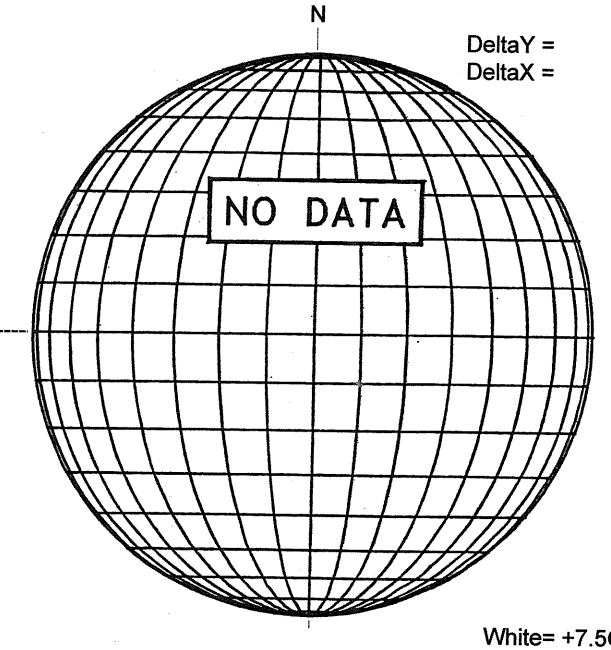
Solid = +
Dashed = -



1837 UT

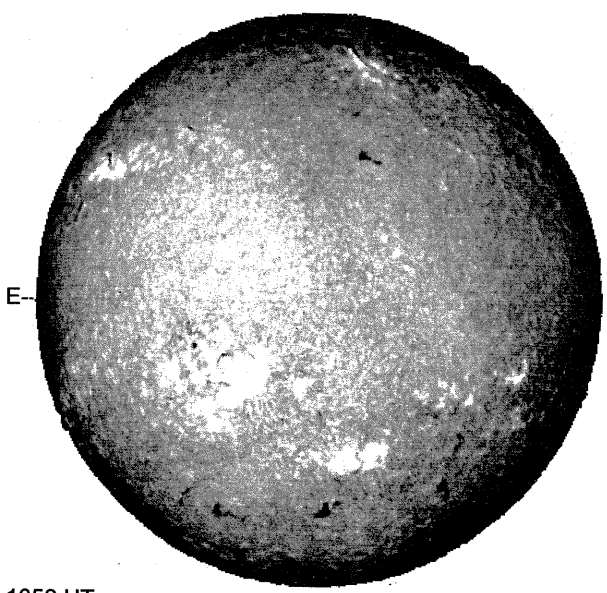
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

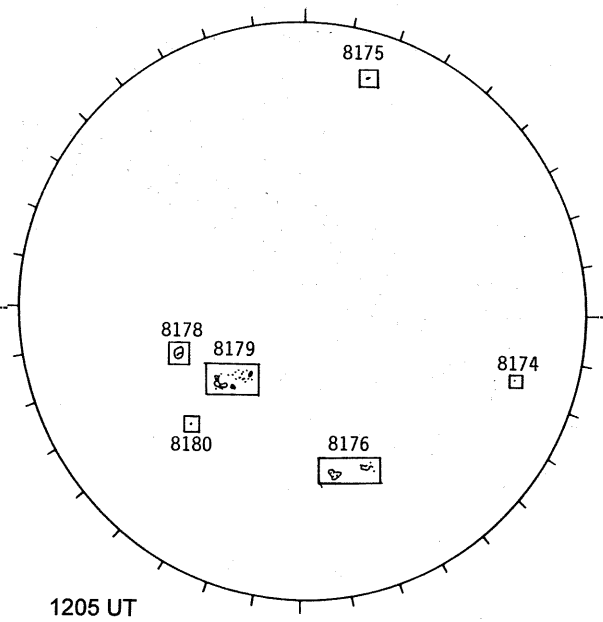
MEUDON H-ALPHA



1058 UT

S

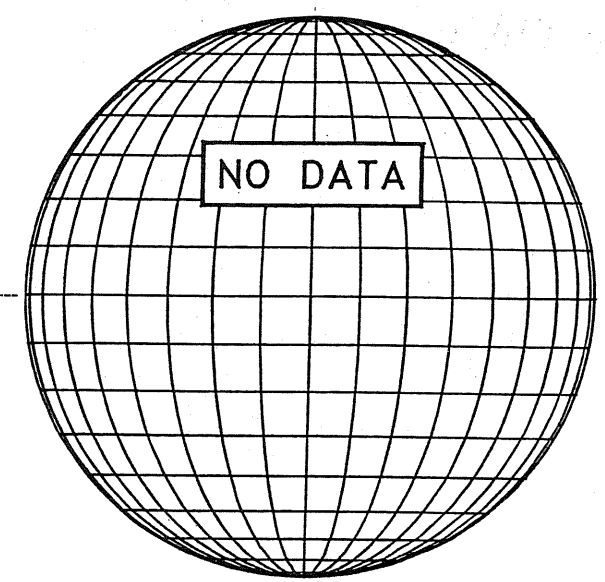
RAMEY SUNSPOT



1205 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)--



S

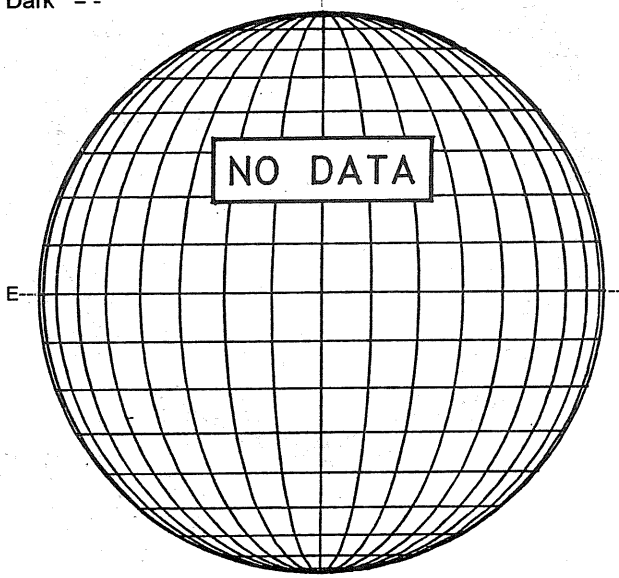
MARCH 15, 1998 (P= - 24.40 , Bo = - 7.17 , Lo = 41.78)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -

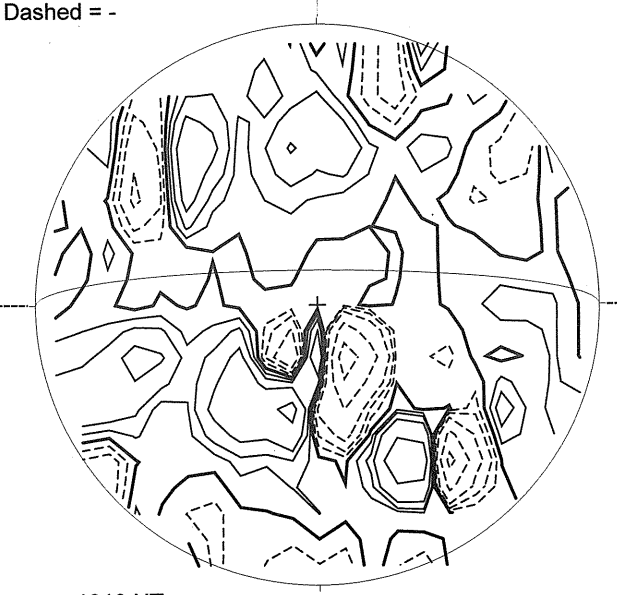


E

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

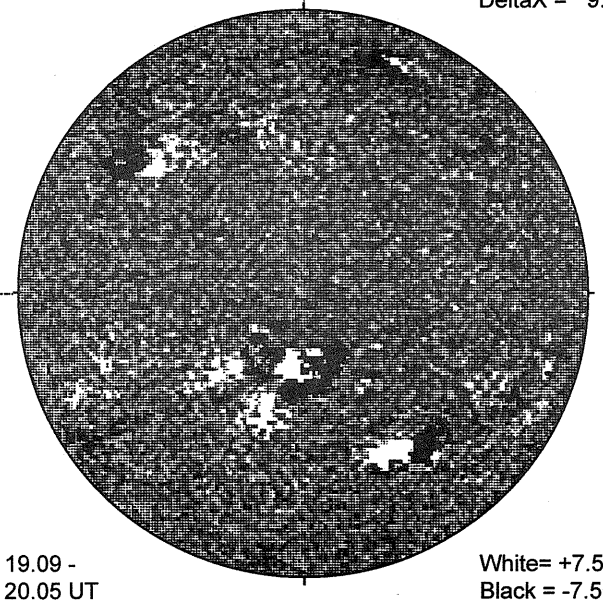


1919 UT

MT. WILSON MAGNETOGRAM

N

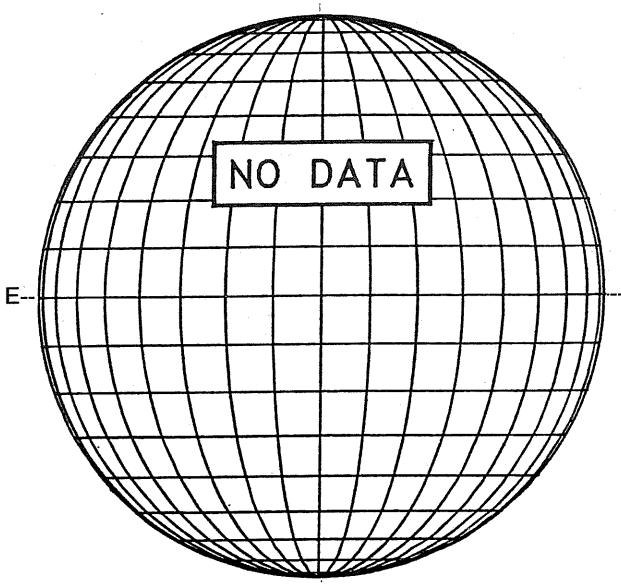
DeltaY = 13.0
DeltaX = 9.6



19.09 -
20.05 UT

White= +7.5G
Black = -7.5G

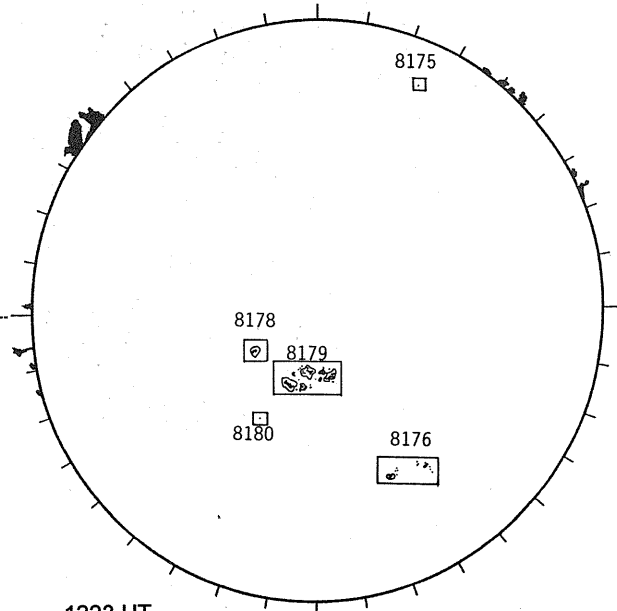
MEUDON H-ALPHA



E

S

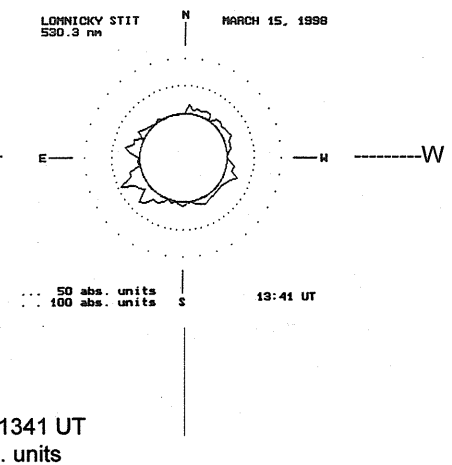
RAMEY SUNSPOT



1223 UT
1320 UT LOMN Prom

S

LOMNICKY PEAK CORONA (1.04 Radii)----



530.3 nm, 1341 UT
..... 50 abs. units
. . 100 abs. unit

S

57
Mar 98

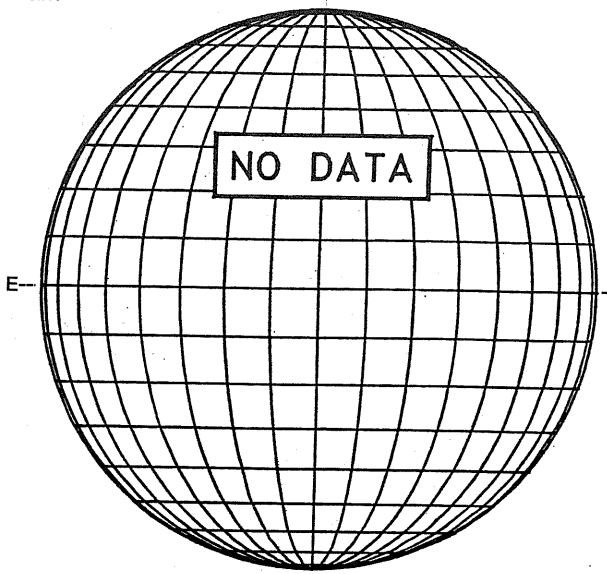
MARCH 16, 1998 (P = - 24.56 , Bo = - 7.15 , Lo = 28.60)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -

N

868.8 nm

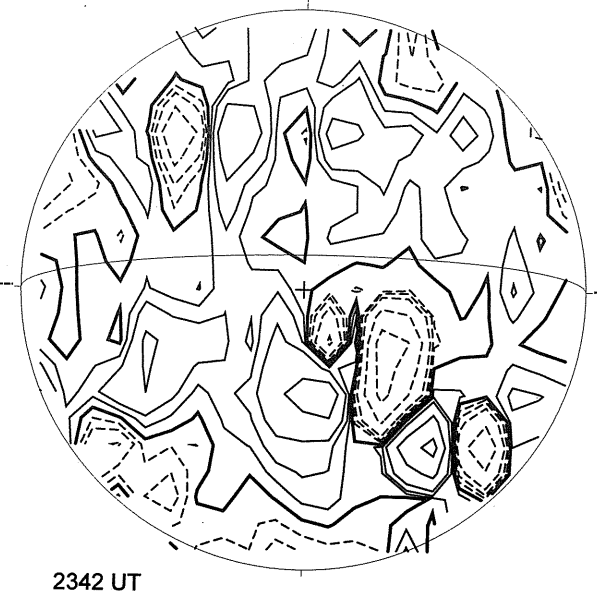


E--

STANFORD MAGNETOGRAM

Solid = +
Dashed = -

N

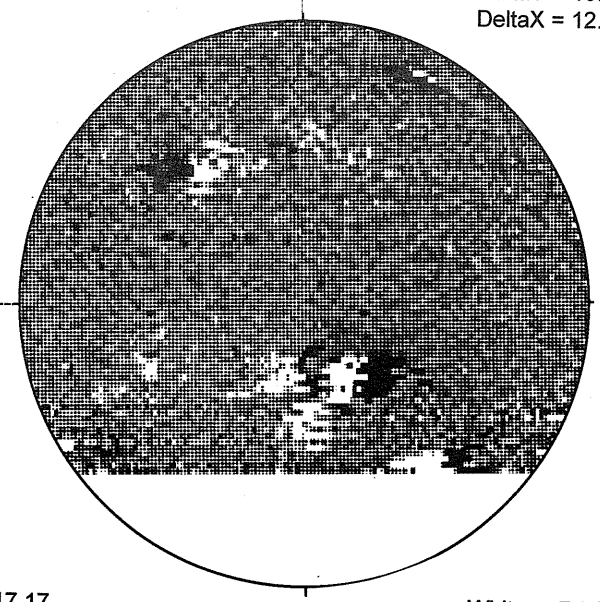


2342 UT

MT. WILSON MAGNETOGRAM

N

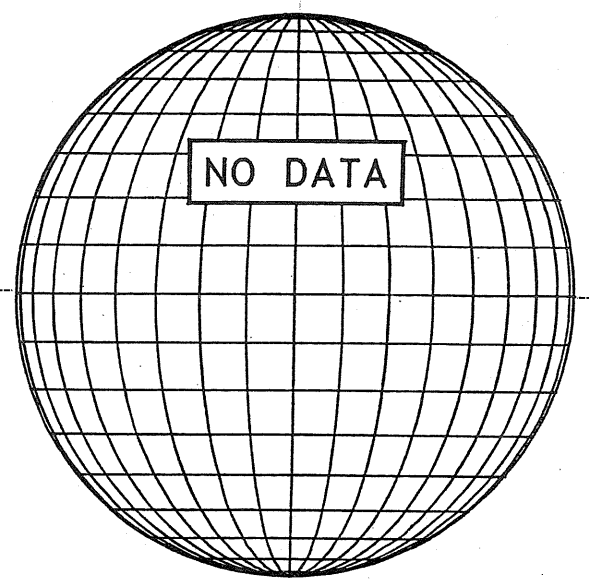
DeltaY = 19.9
DeltaX = 12.9



17.17 -
17.59 UT

White= +7.5G
Black = -7.5G

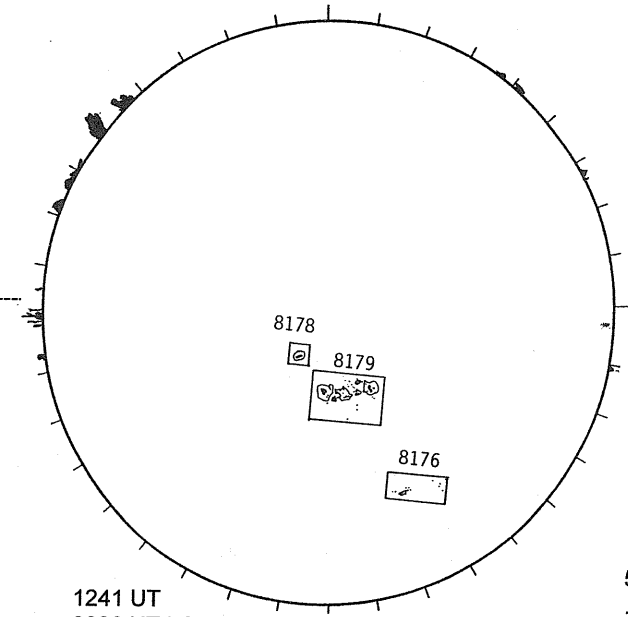
MEUDON H-ALPHA



E--

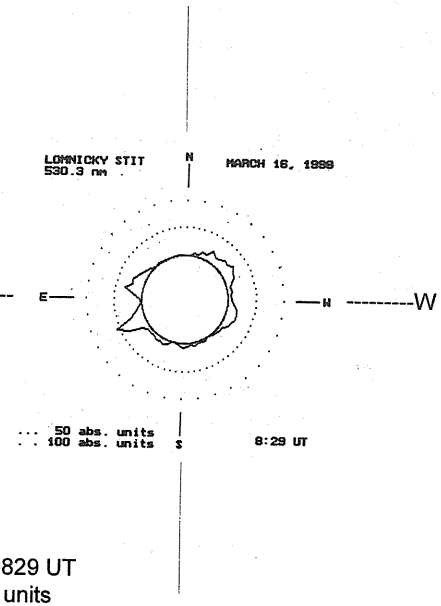
S

RAMEY SUNSPOT



1241 UT
0820 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----

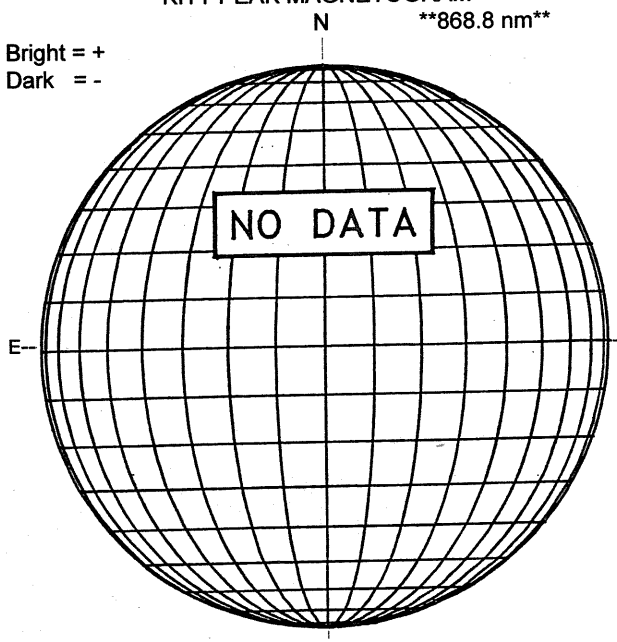


530.3 nm, 0829 UT
..... 50 abs. units
. . 100 abs. units

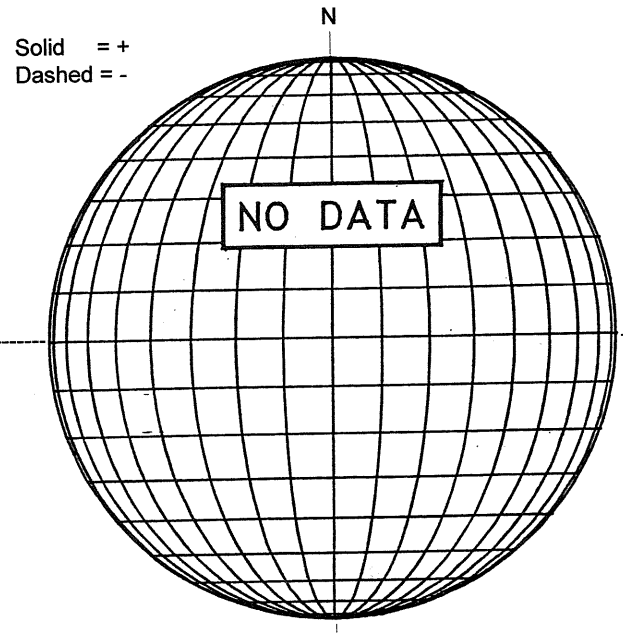
S

MARCH 17, 1998 (P= - 24.71 , Bo = - 7.13 , Lo = 15.42)

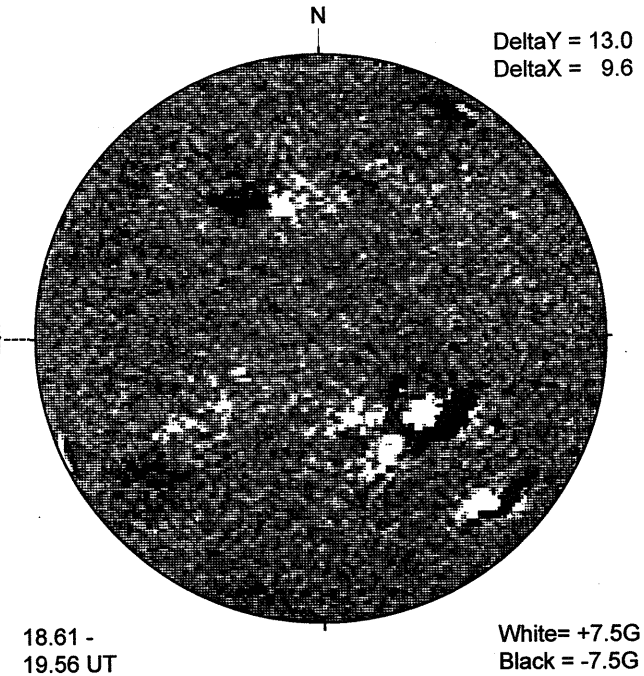
KITT PEAK MAGNETOGRAM



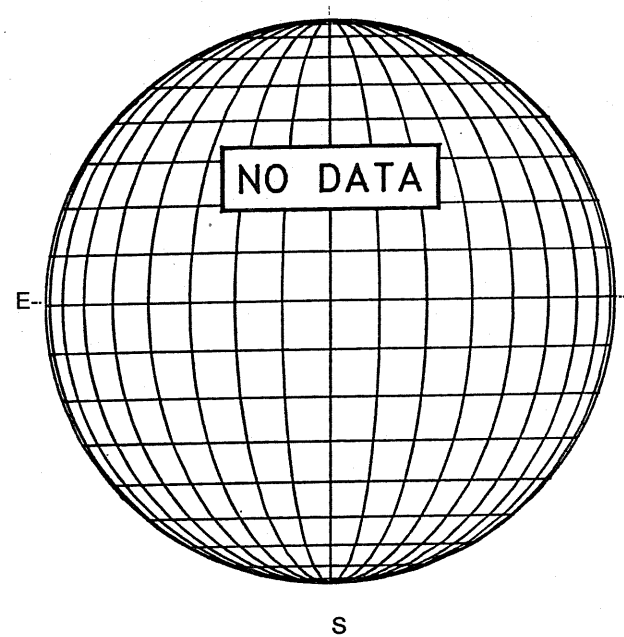
STANFORD MAGNETOGRAM



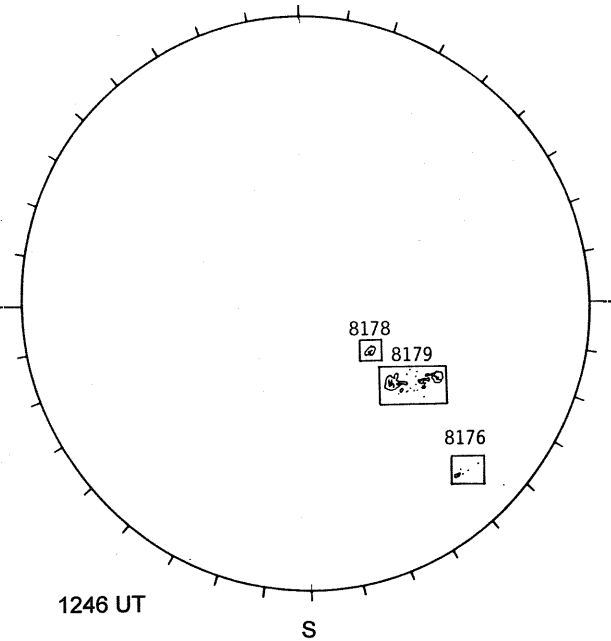
MT. WILSON MAGNETOGRAM



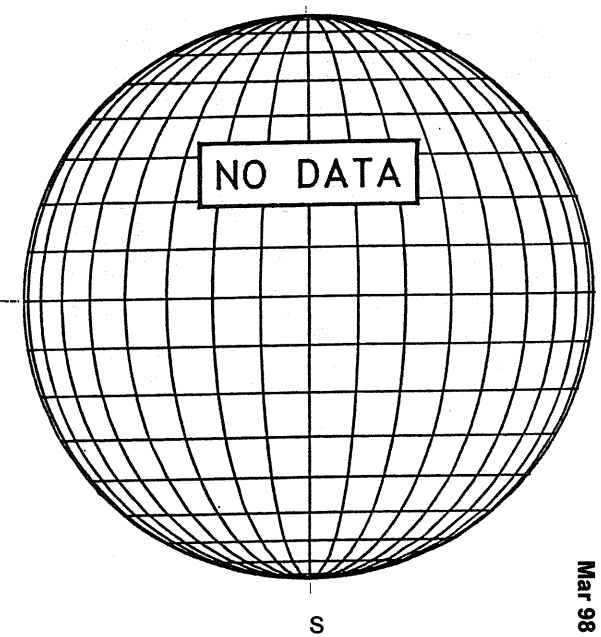
MEUDON H-ALPHA



RAMEY SUNSPOT

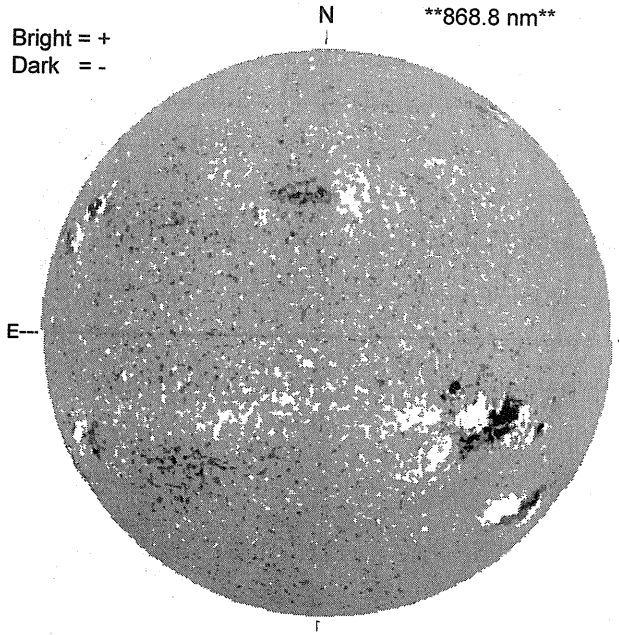


SACRAMENTO PEAK CORONA (1.15 Radii)----



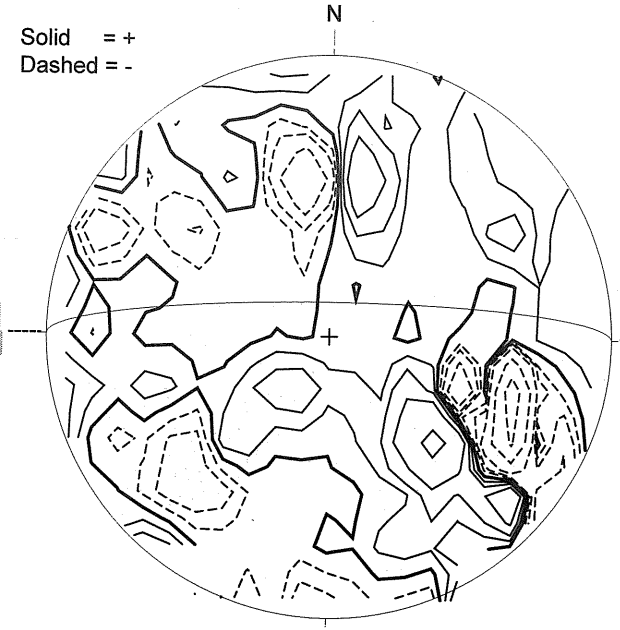
MARCH 18, 1998 (P= - 24.86 , Bo = - 7.11 , Lo = 2.23)

KITT PEAK MAGNETOGRAM



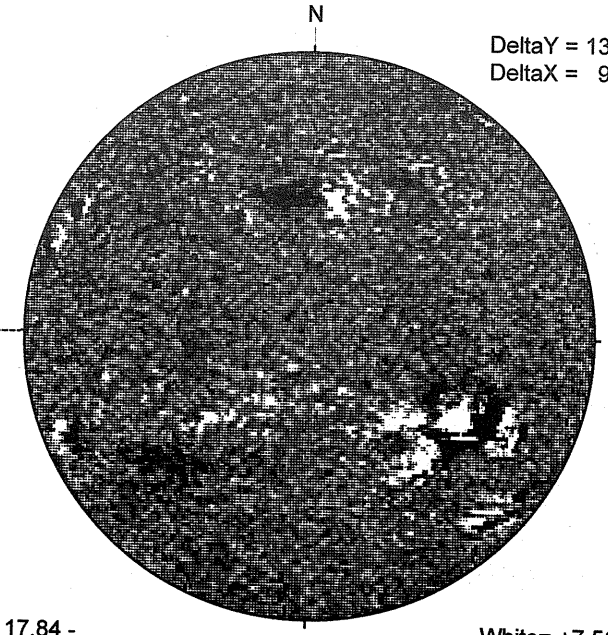
1559 UT

STANFORD MAGNETOGRAM



1858 UT

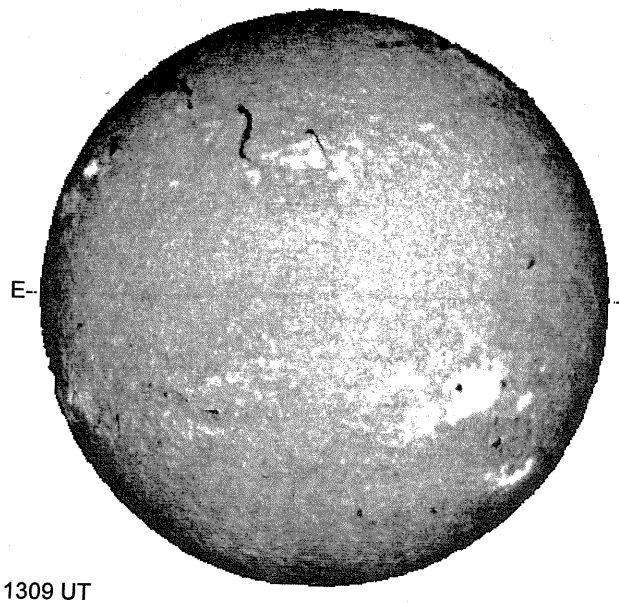
MT. WILSON MAGNETOGRAM



17.84 -
18.80 UT

White= +7.5G
Black = -7.5G

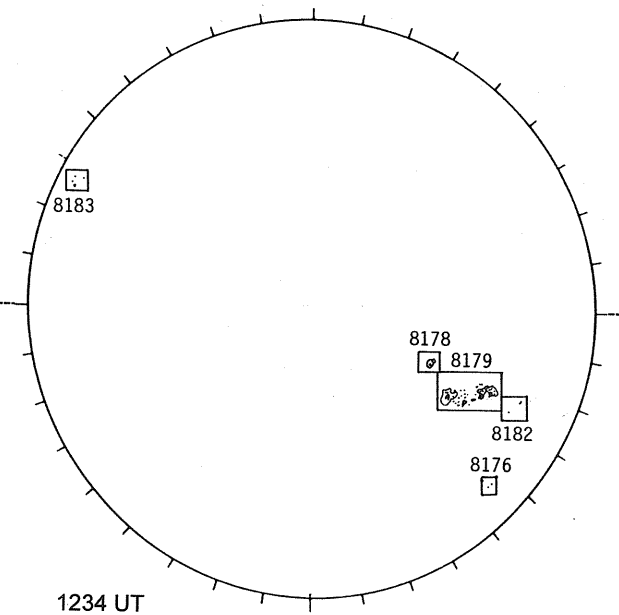
MEUDON H-ALPHA



1309 UT

S

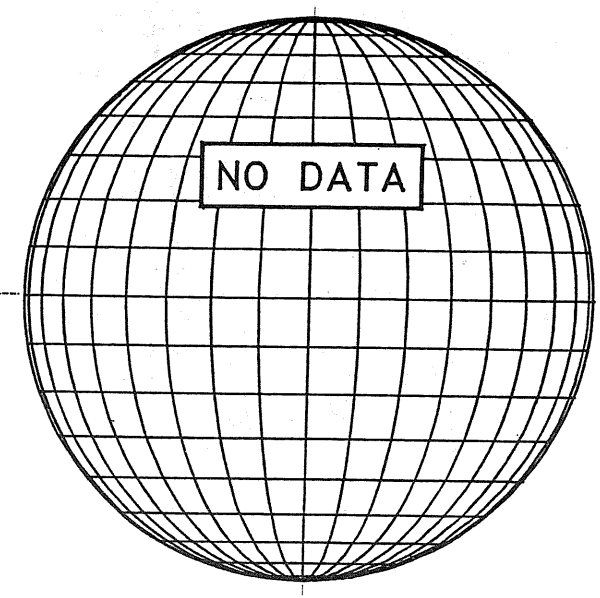
RAMEY SUNSPOT



1234 UT

S

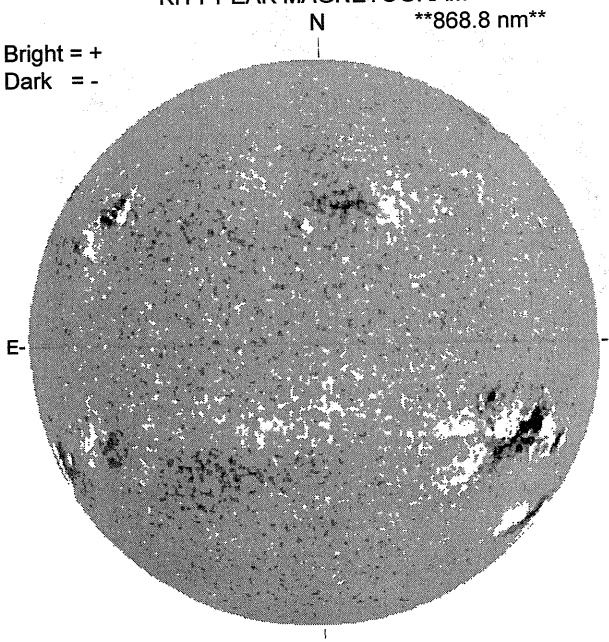
SACRAMENTO PEAK CORONA (1.15 Radii)----



S

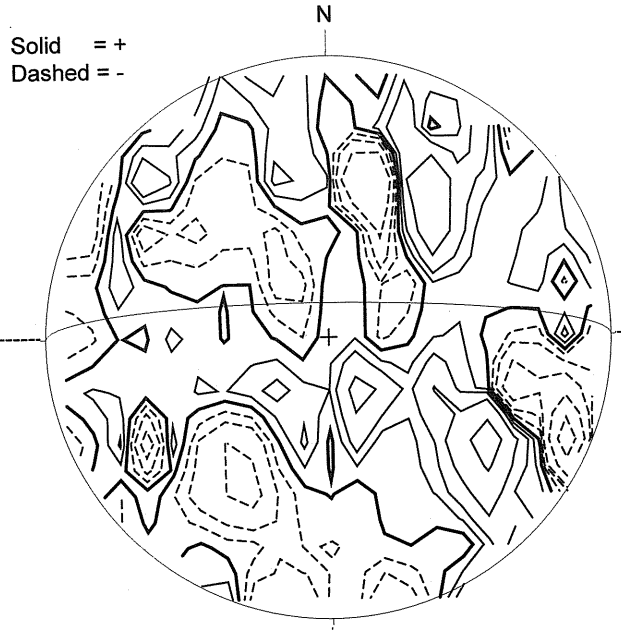
MARCH 19, 1998 (P= - 25.00 , Bo = - 7.08 , Lo = 349.05)

KITT PEAK MAGNETOGRAM



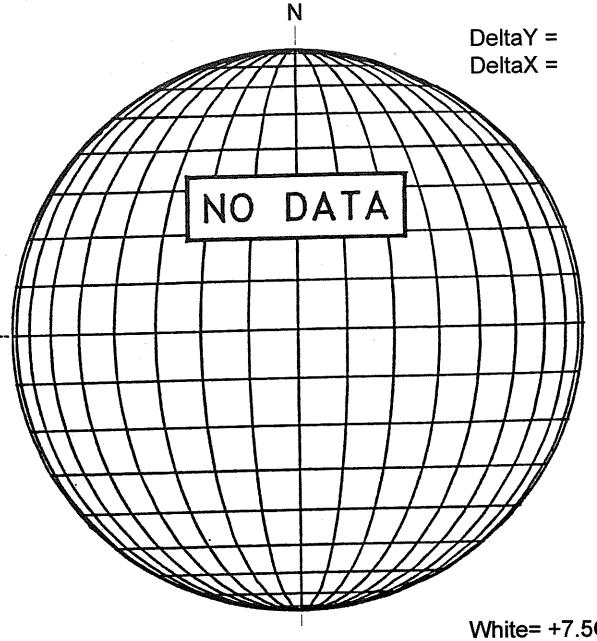
1436 UT

STANFORD MAGNETOGRAM



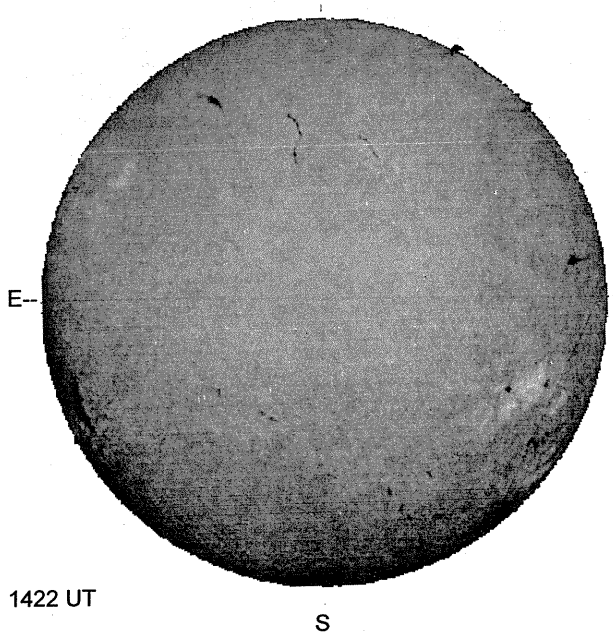
2238 UT

MT. WILSON MAGNETOGRAM



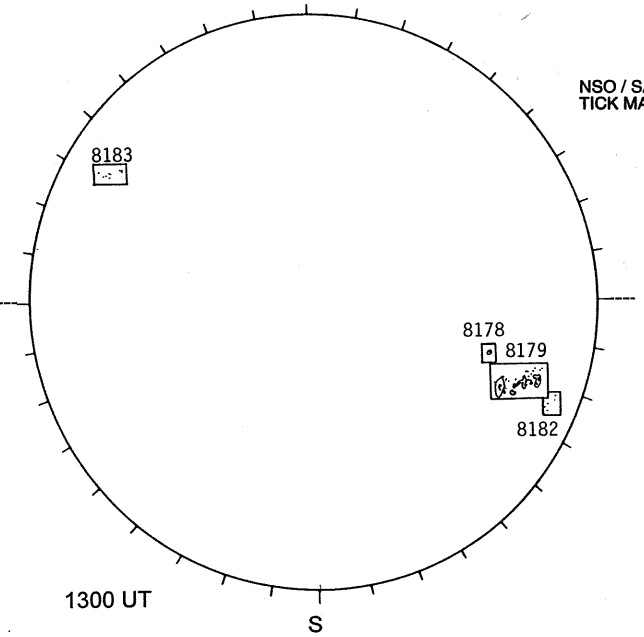
White= +7.5G
Black = -7.5G

---- SACRAMENTO PEAK H-ALPHA



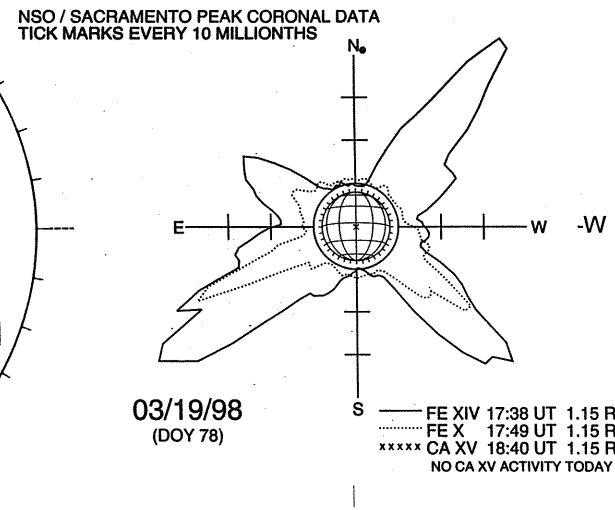
1422 UT

RAMEY SUNSPOT



1300 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



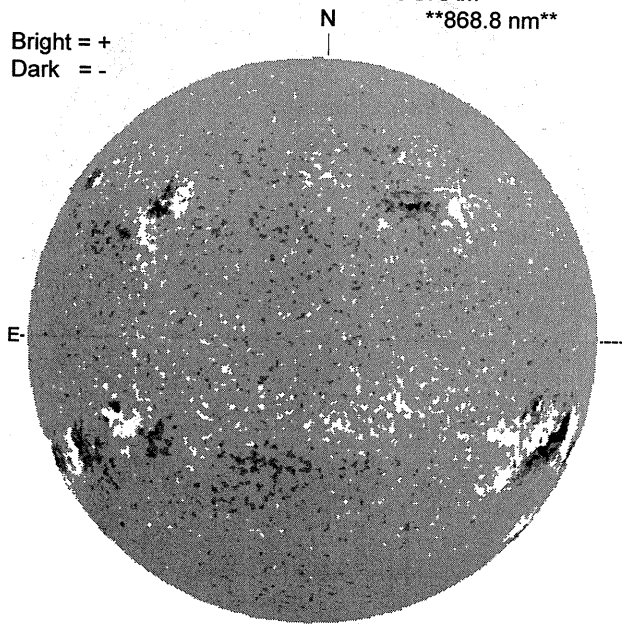
03/19/98
(DOY 78)

S

MARCH 20, 1998 (P= - 25.13 , Bo = - 7.05 , Lo = 335.87)

KITT PEAK MAGNETOGRAM

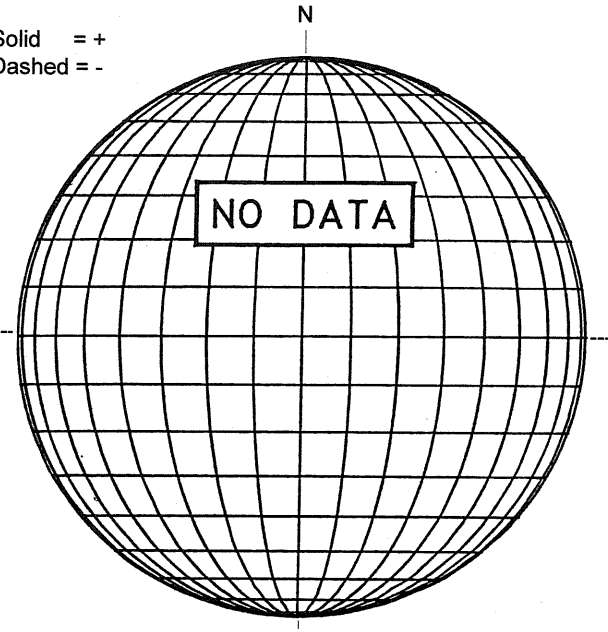
Bright = +
Dark = -



1835 UT

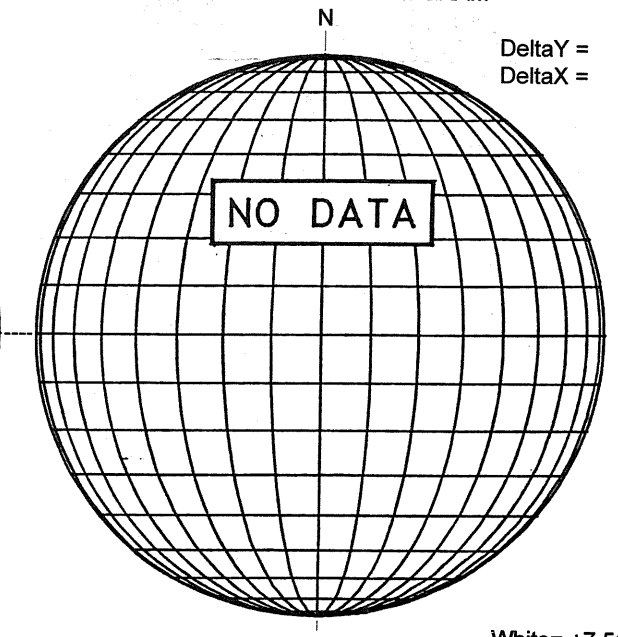
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



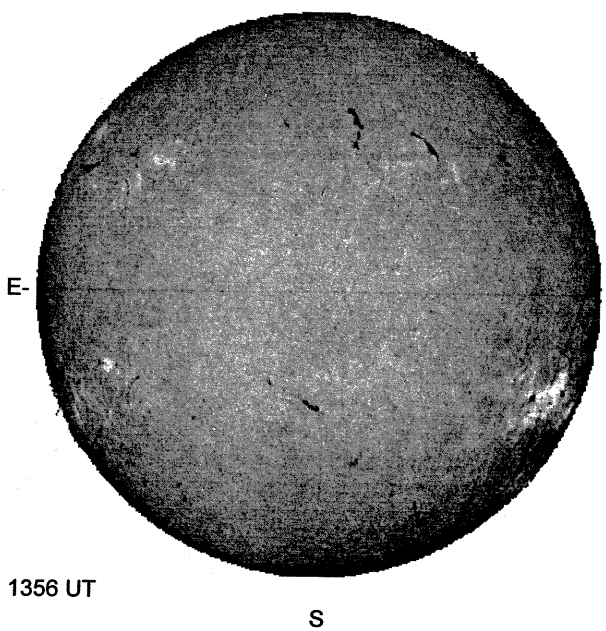
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



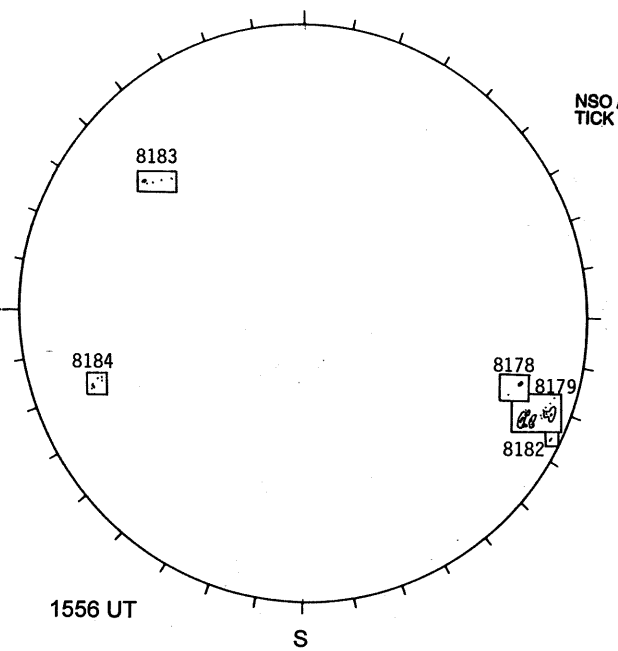
White= +7.5G
Black = -7.5G

----- SACRAMENTO PEAK H-ALPHA



1356 UT

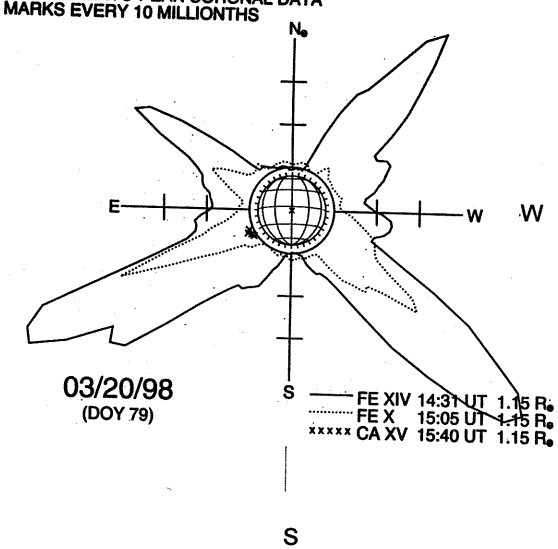
RAMEY SUNSPOT



1556 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

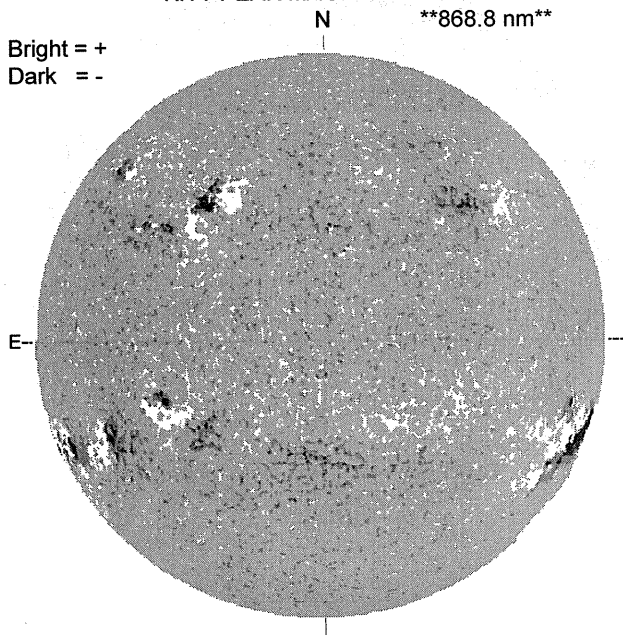
NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



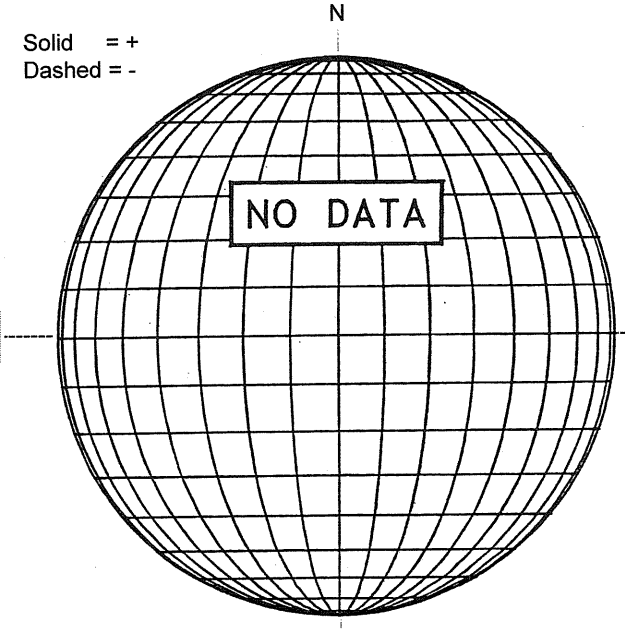
03/20/98
(DOY 79)

MARCH 21, 1998 (P= - 25.25 , Bo = - 7.02 , Lo = 322.68)

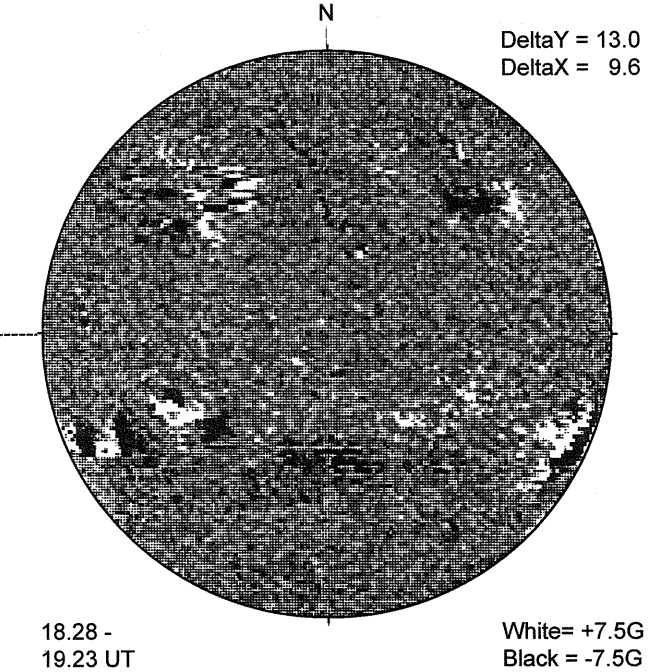
KITT PEAK MAGNETOGRAM



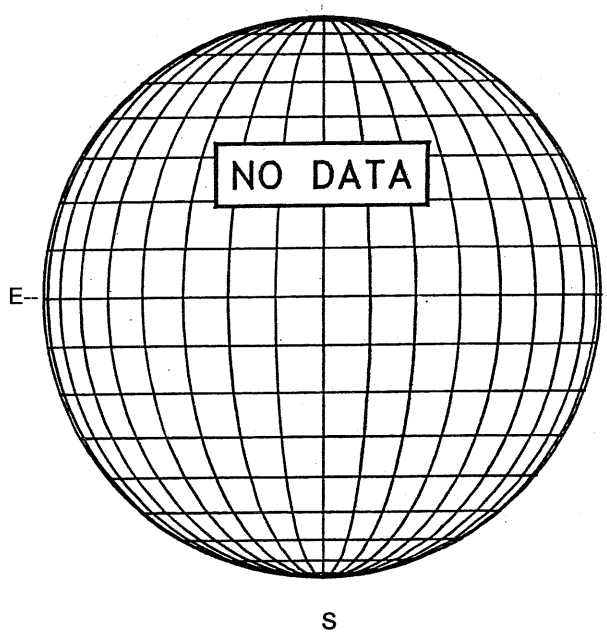
STANFORD MAGNETOGRAM



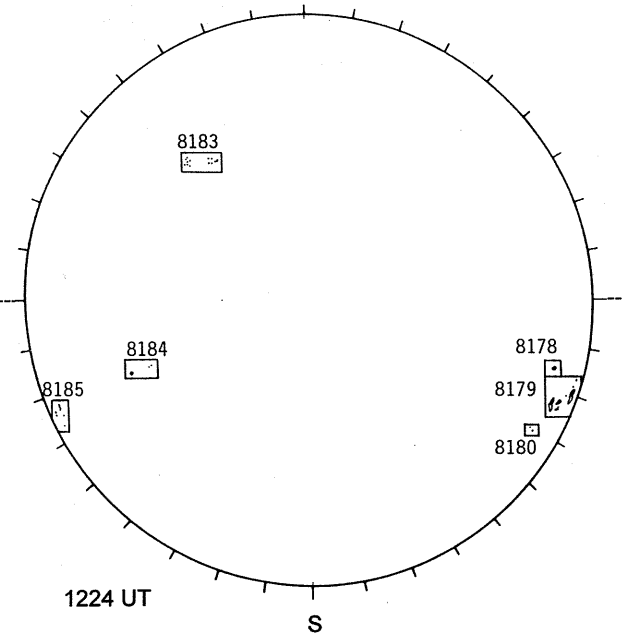
MT. WILSON MAGNETOGRAM



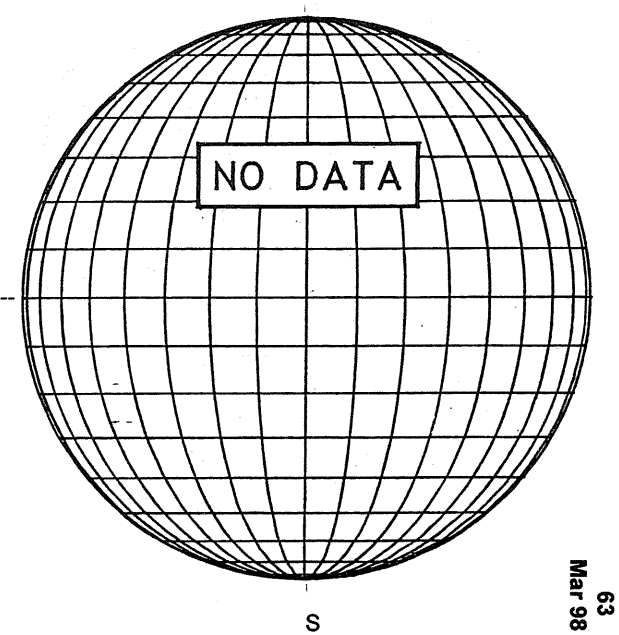
----- SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



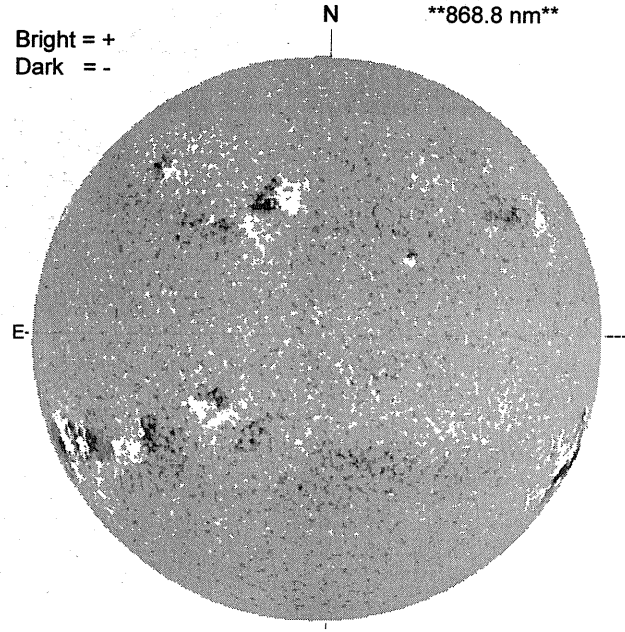
SACRAMENTO PEAK CORONA (1.15 Radii)-----



MARCH 22, 1998 (P= - 25.37 , Bo = - 6.99 , Lo = 309.50)

KITT PEAK MAGNETOGRAM

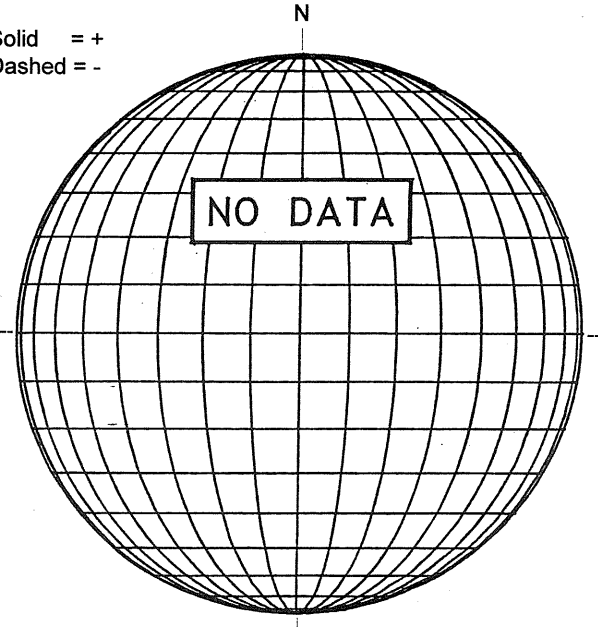
Bright = +
Dark = -



1454 UT

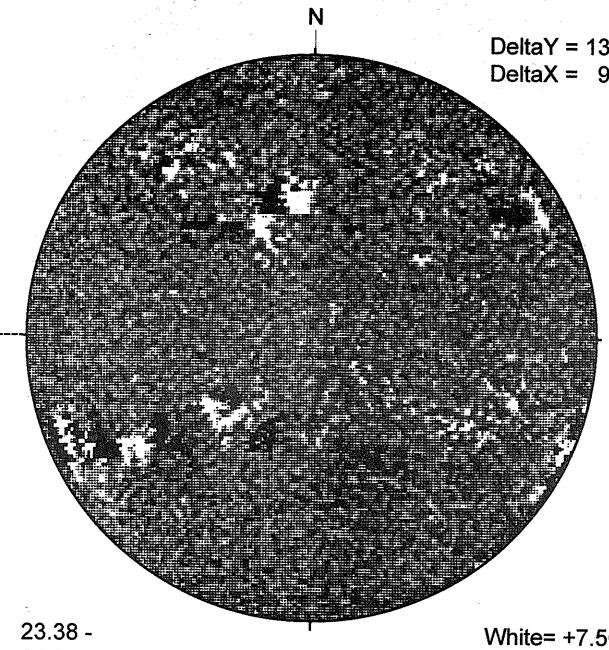
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

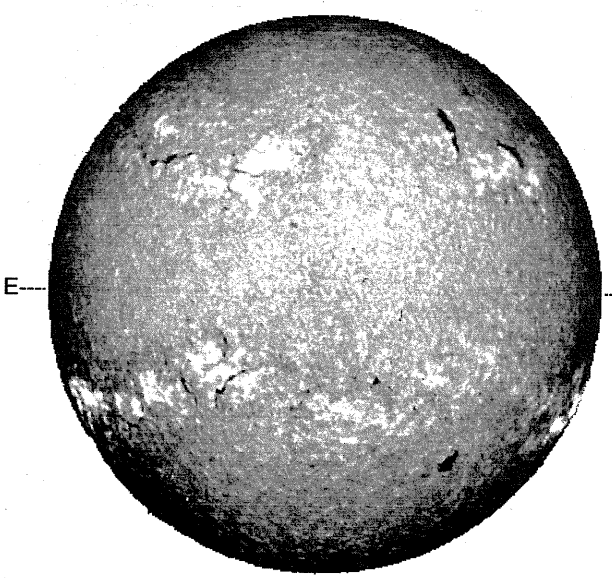
DeltaY = 13.1
DeltaX = 9.6



23.38 -
24.33 UT

White= +7.5G
Black = -7.5G

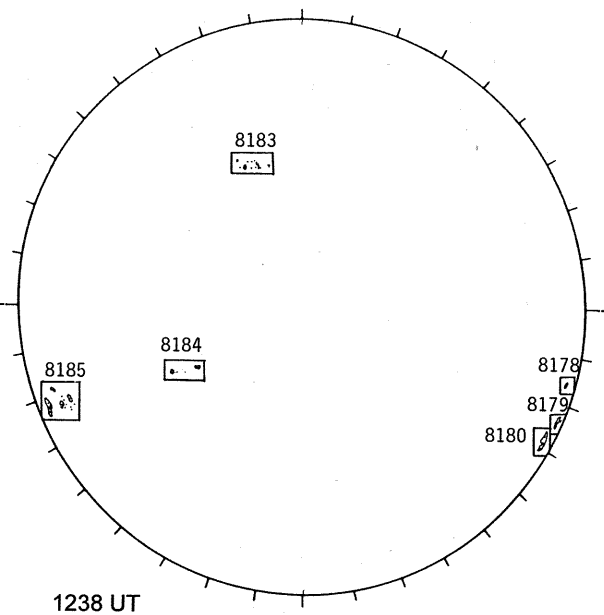
MEUDON H-ALPHA



0837 UT

S

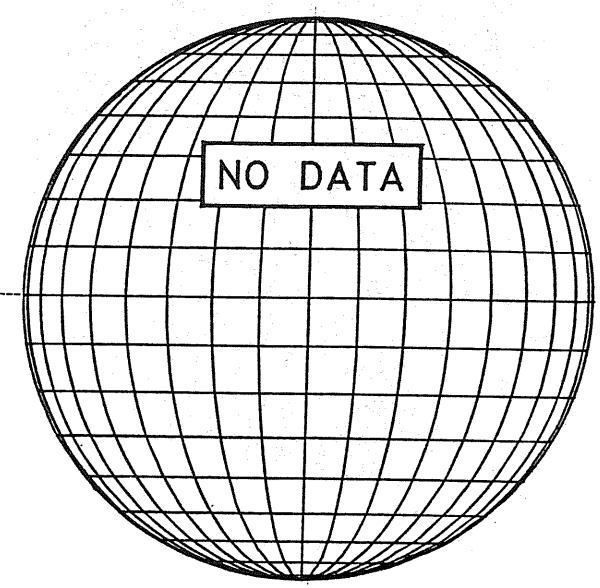
RAMEY SUNSPOT



1238 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----



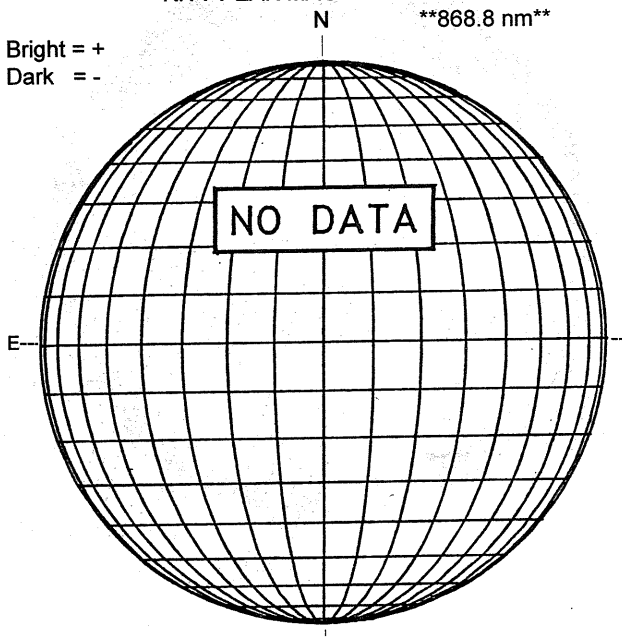
S

MARCH 23, 1998 (P= - 25.48 , Bo = - 6.95 , Lo = 296.31)

KITT PEAK MAGNETOGRAM

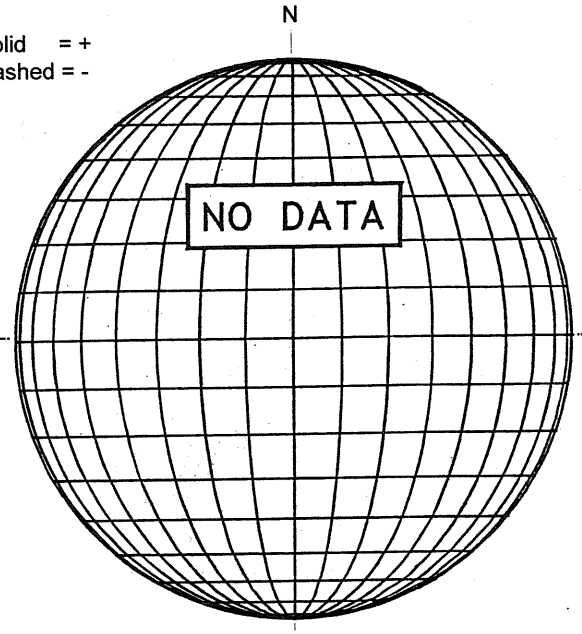
868.8 nm

Bright = +
Dark = -



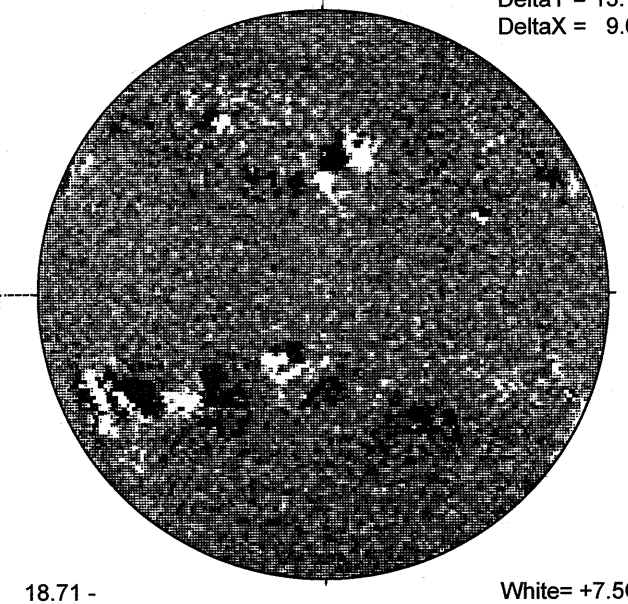
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

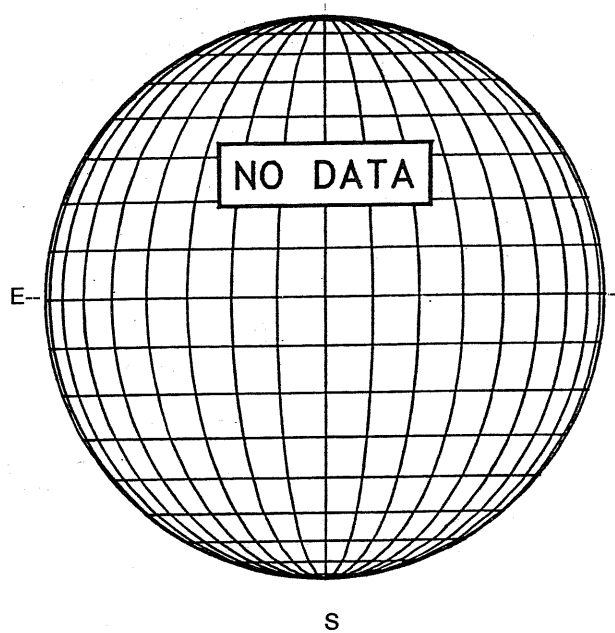
DeltaY = 13.1
DeltaX = 9.6



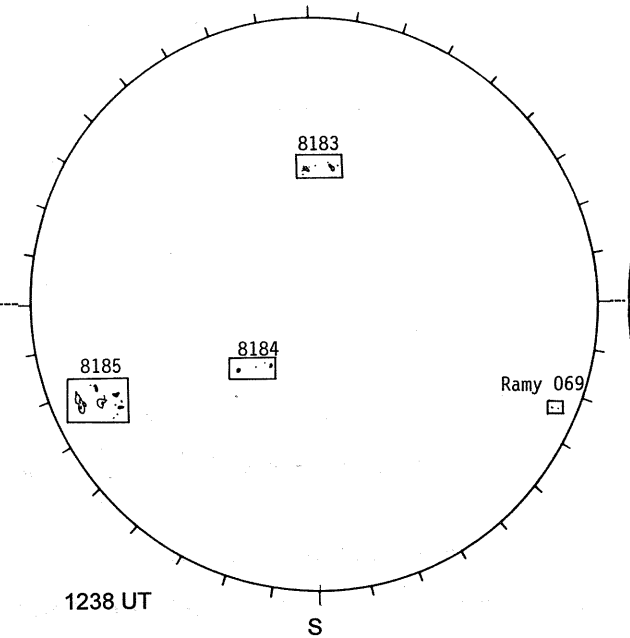
18.71 -
19.66 UT

White= +7.5G
Black = -7.5G

---- SACRAMENTO PEAK H-ALPHA

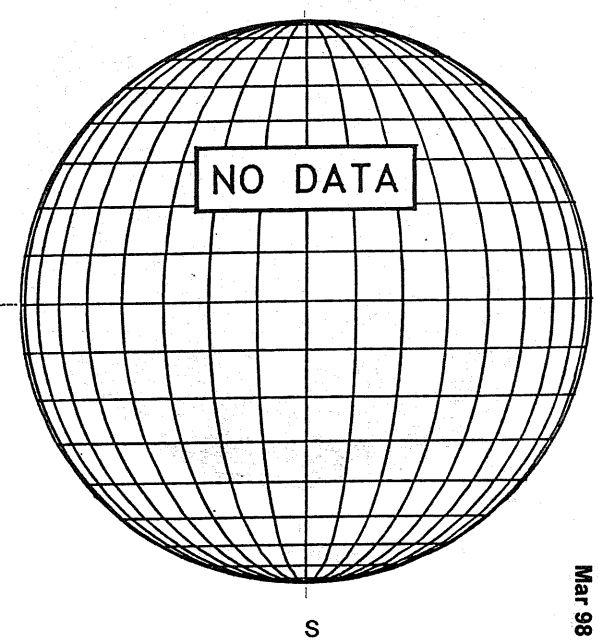


RAMEY SUNSPOT



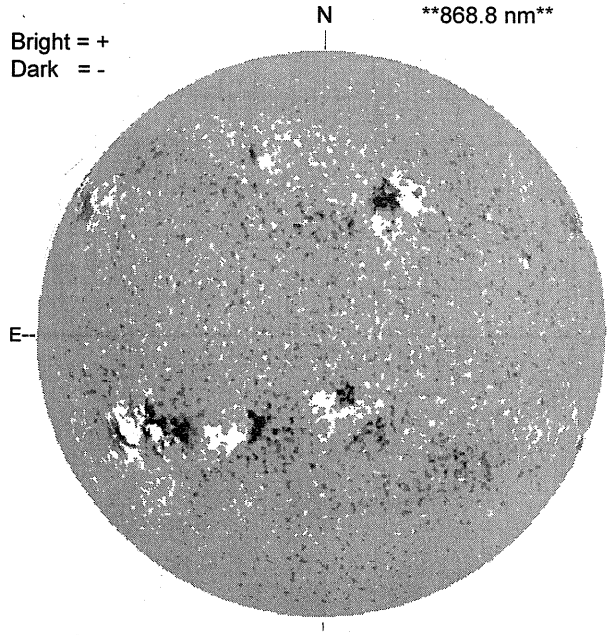
1238 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



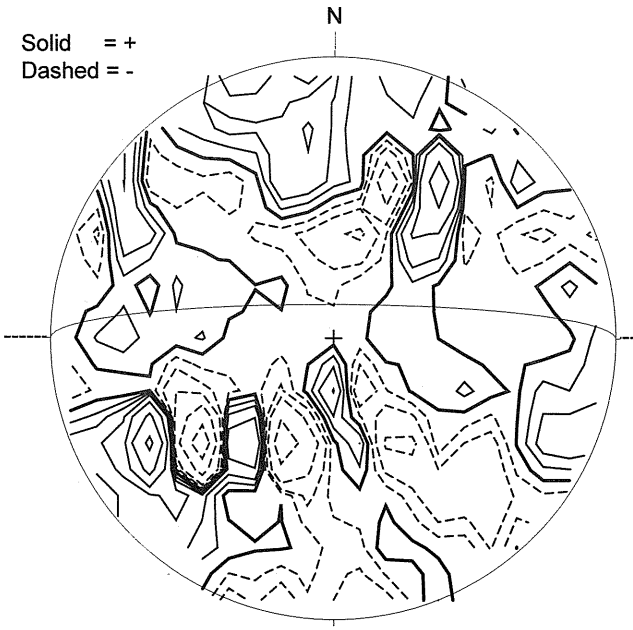
MARCH 24, 1998 (P= - 25.59 , Bo = - 6.92 , Lo = 283.13)

KITT PEAK MAGNETOGRAM



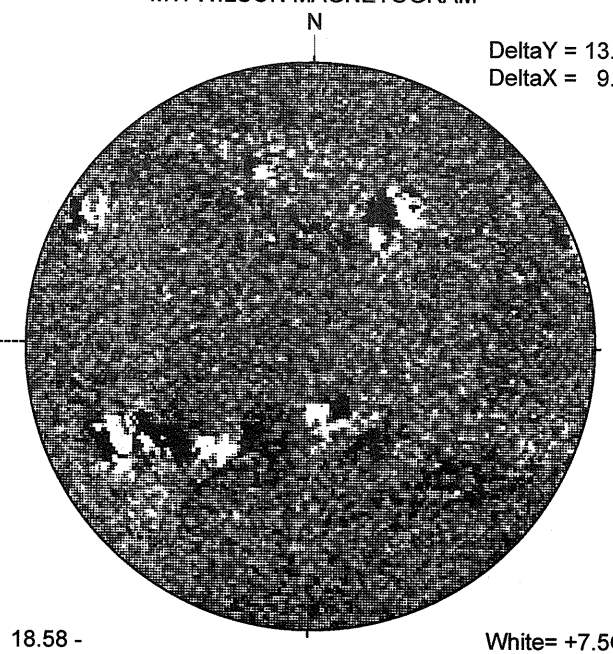
1553 UT

STANFORD MAGNETOGRAM



1845 UT

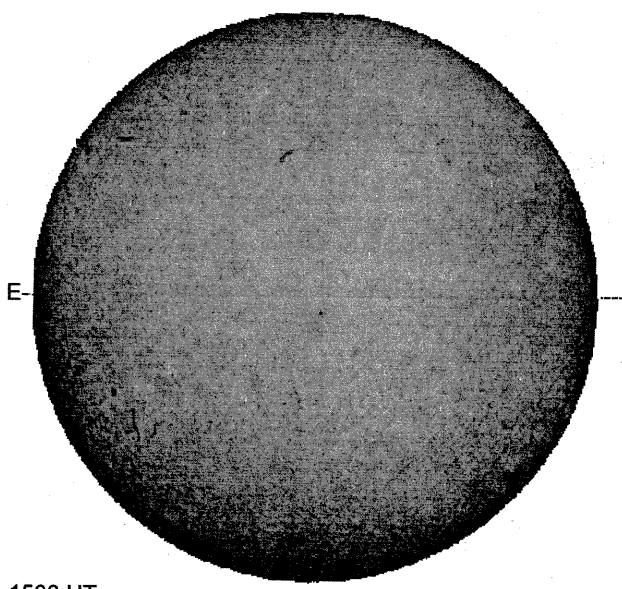
MT. WILSON MAGNETOGRAM



18.58 -
19.54 UT

White= +7.5G
Black = -7.5G

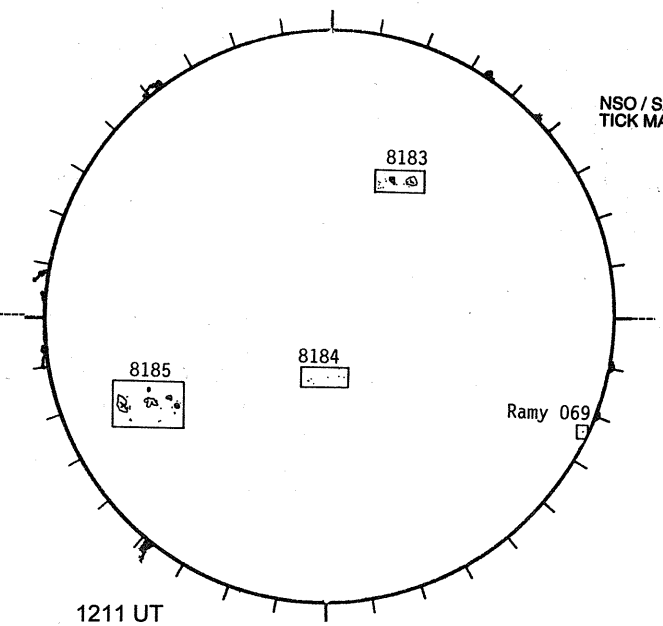
SACRAMENTO PEAK H-ALPHA



1500 UT

S

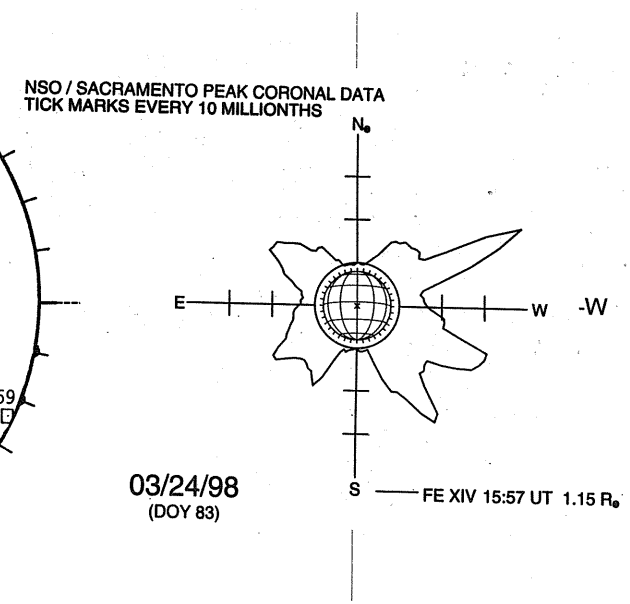
RAMEY SUNSPOT



1211 UT
0819 UT VALA Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

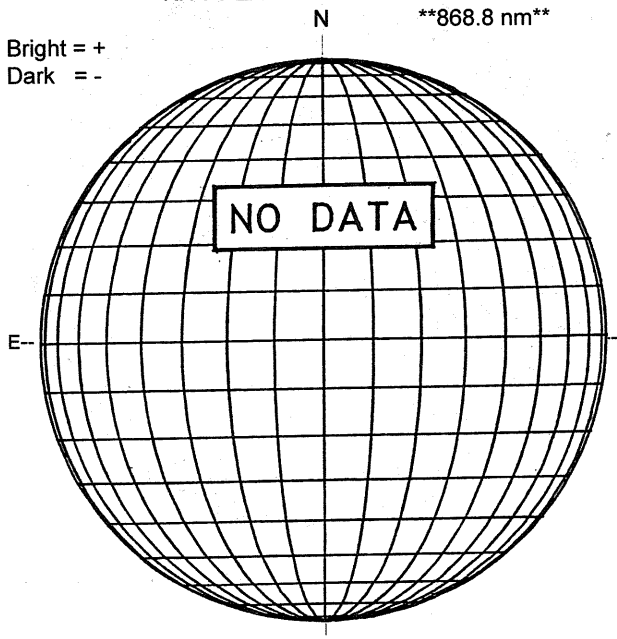


03/24/98
(DOY 83)

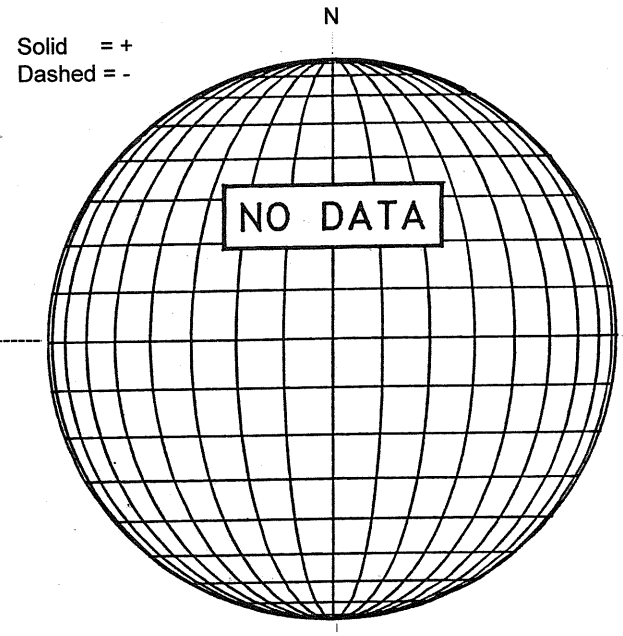
S

MARCH 25, 1998 (P= - 25.68 , Bo = - 6.88 , Lo = 269.94)

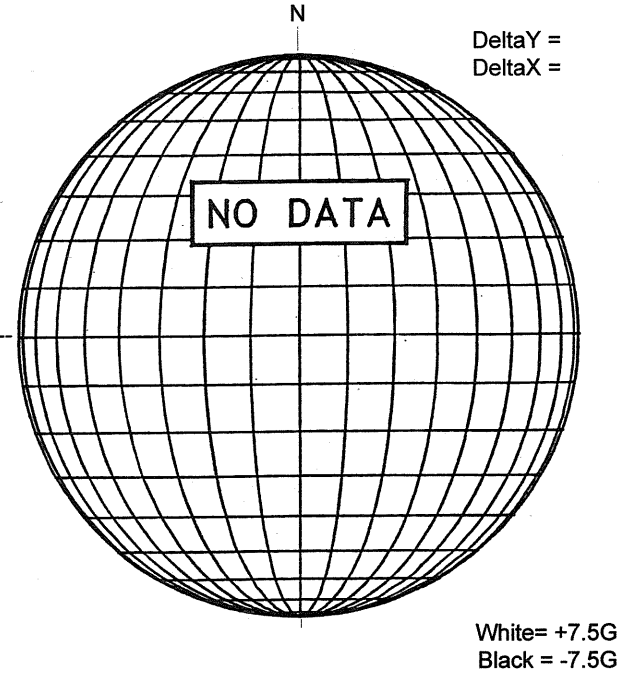
KITT PEAK MAGNETOGRAM



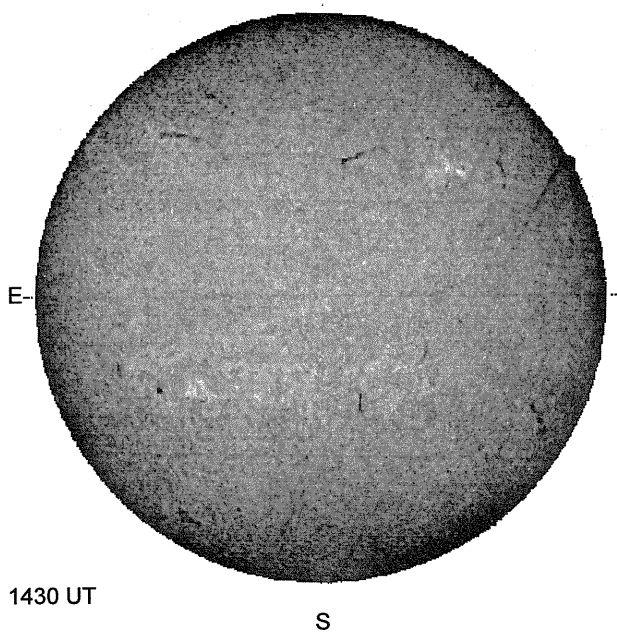
STANFORD MAGNETOGRAM



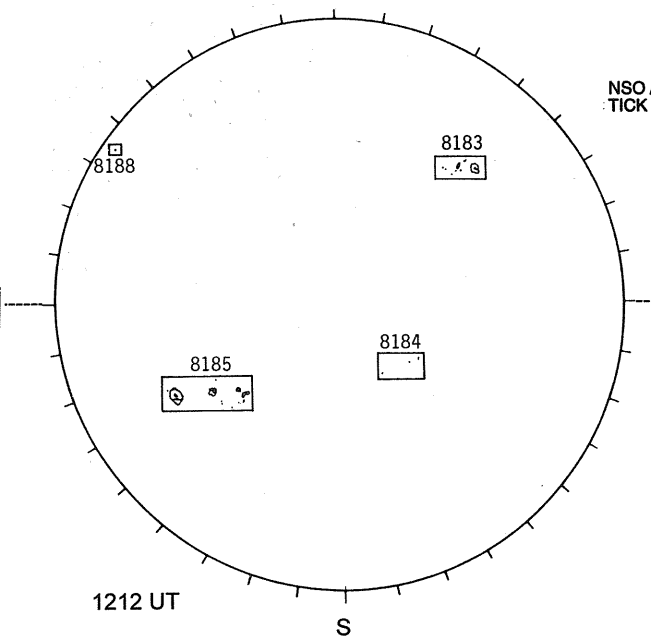
MT. WILSON MAGNETOGRAM



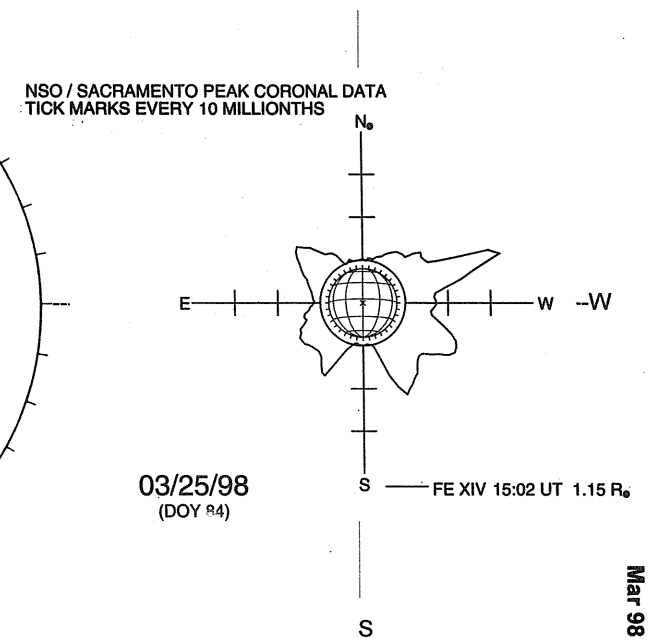
----- SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



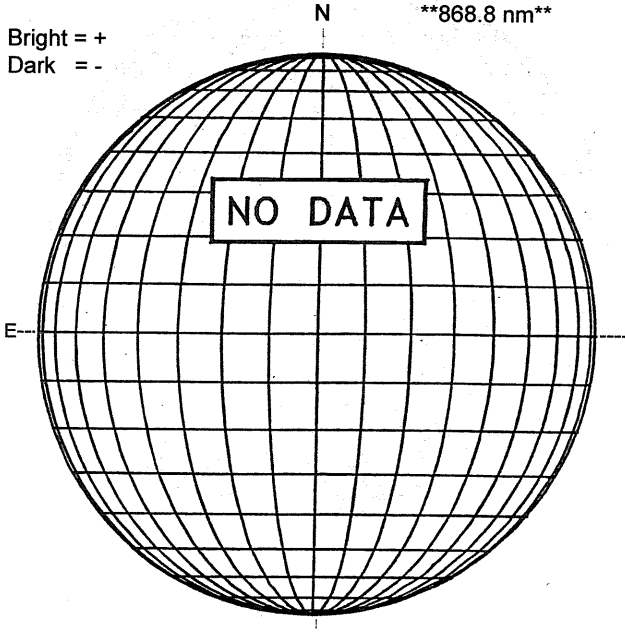
SACRAMENTO PEAK CORONA (1.15 Radii)----



MARCH 26, 1998 (P= - 25.77 , Bo = - 6.84 , Lo = 256.76)

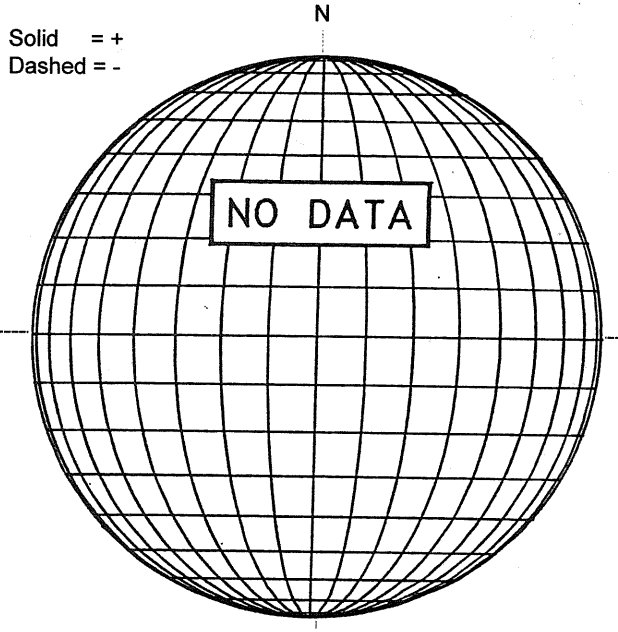
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



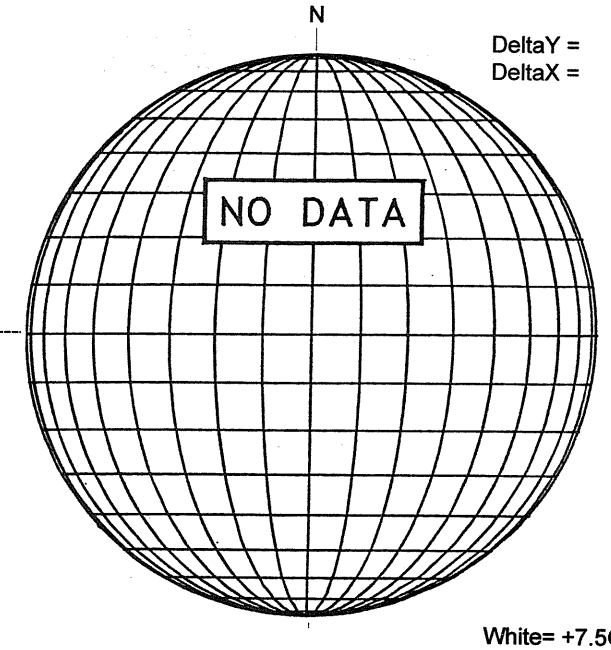
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



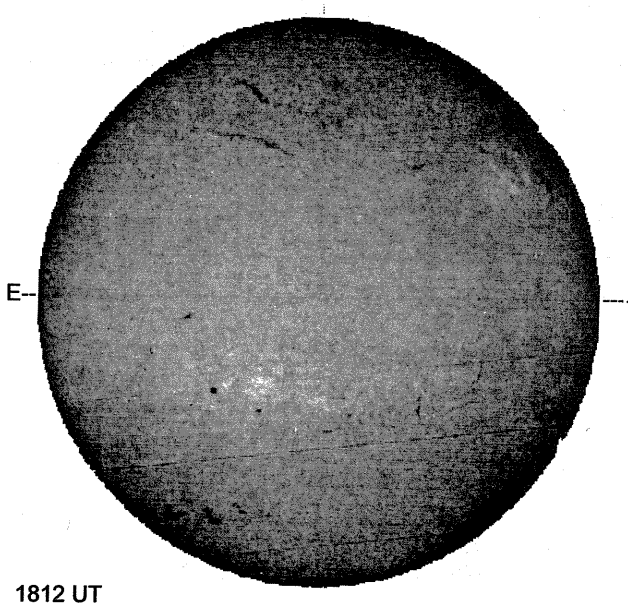
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

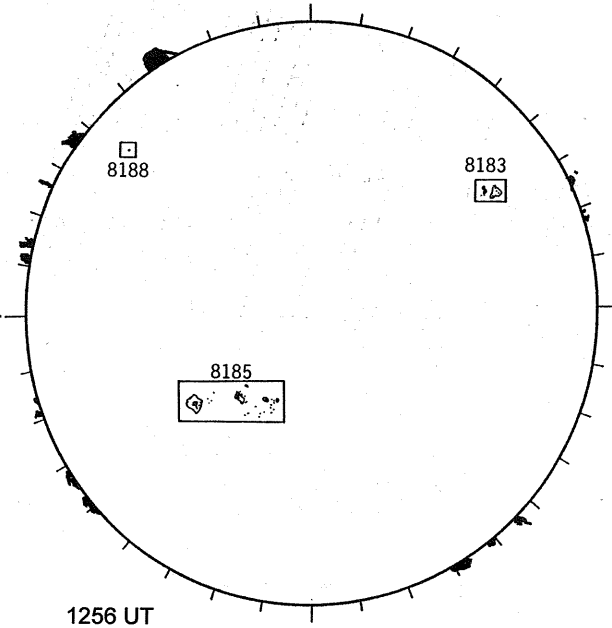
SACRAMENTO PEAK H-ALPHA



1812 UT

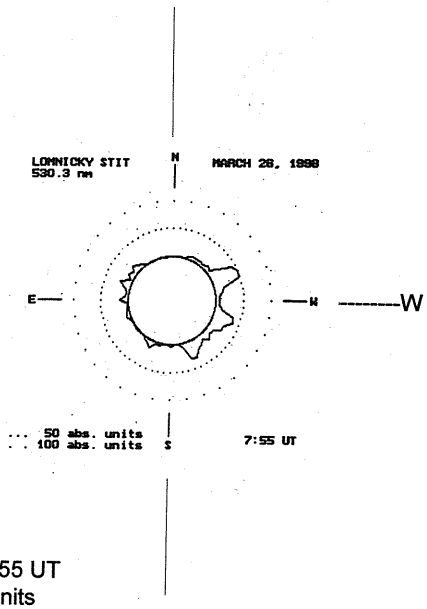
S

RAMEY SUNSPOT



1256 UT
0720 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)



530.3 nm, 0755 UT
..... 50 abs. units
. . 100 abs. units

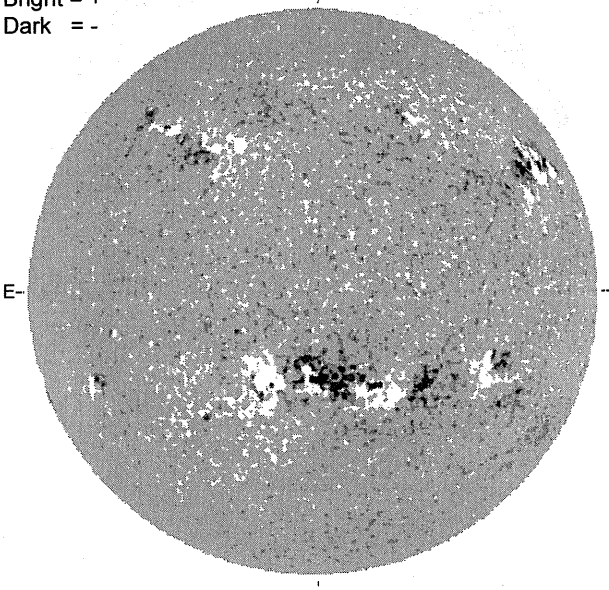
S

MARCH 27, 1998 (P= - 25.86 , Bo = - 6.80 , Lo = 243.57)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



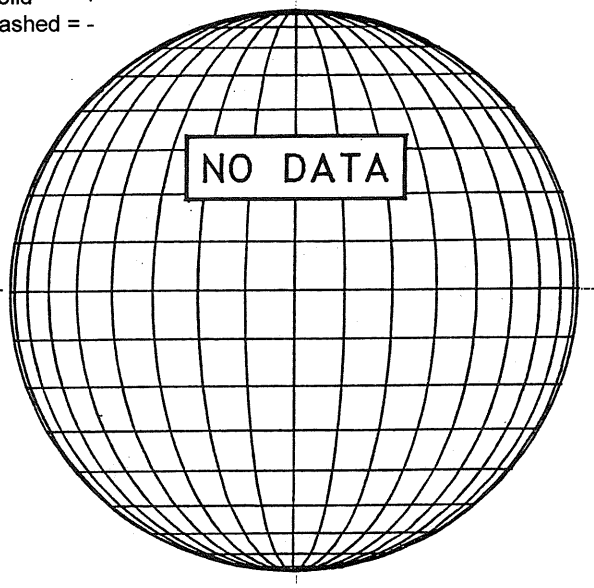
E--

1554 UT

STANFORD MAGNETOGRAM

N

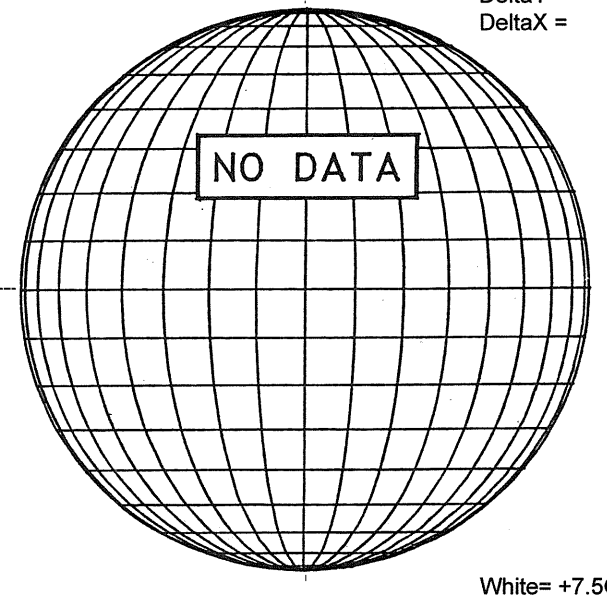
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

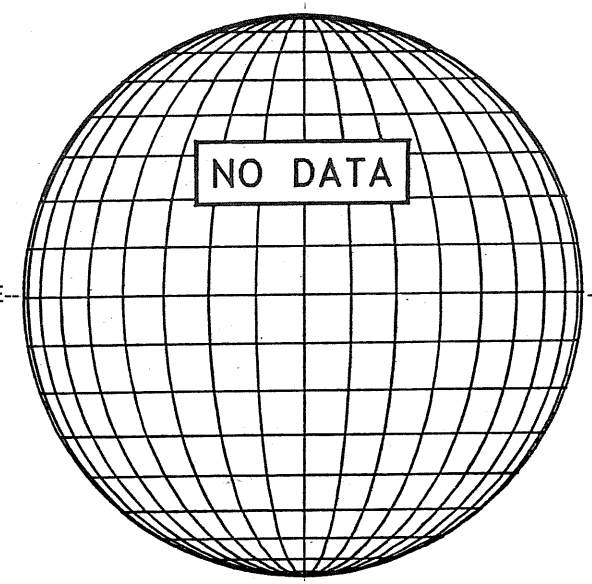
N

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

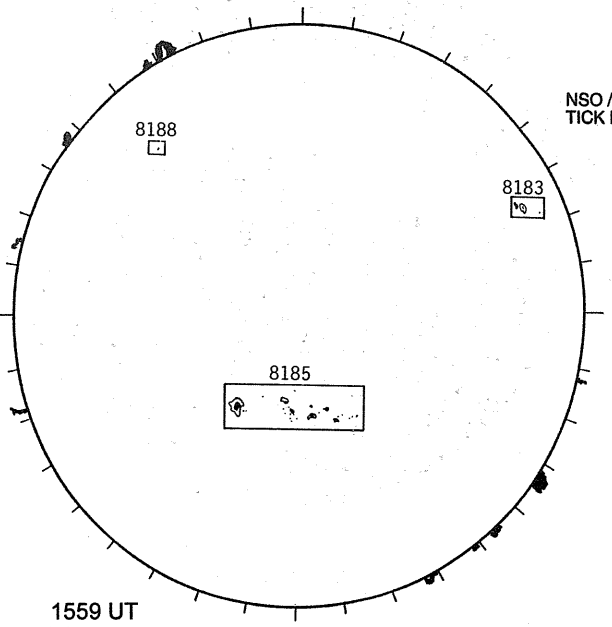
---- SACRAMENTO PEAK H-ALPHA



E--

S

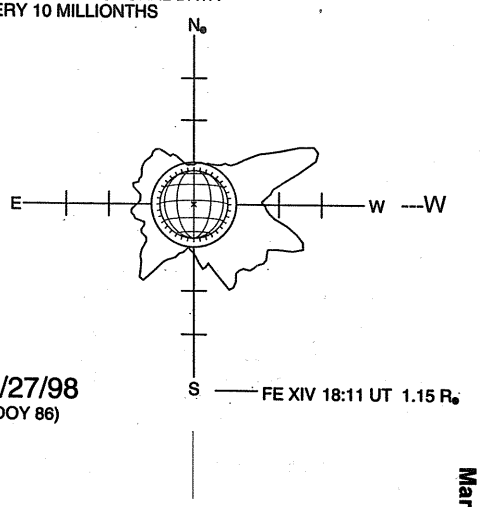
RAMEY SUNSPOT



1559 UT
1011 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



03/27/98
(DOY 86)

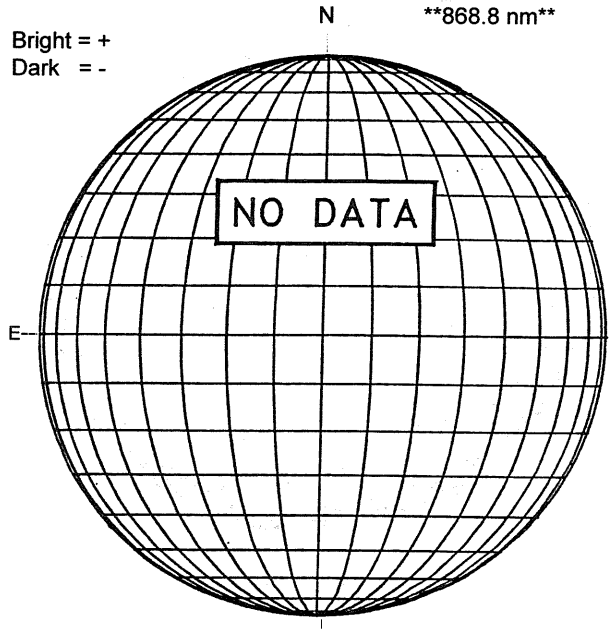
S

69
Mar 98

MARCH 28, 1998 (P= - 25.93 , Bo = - 6.75 , Lo = 230.38)

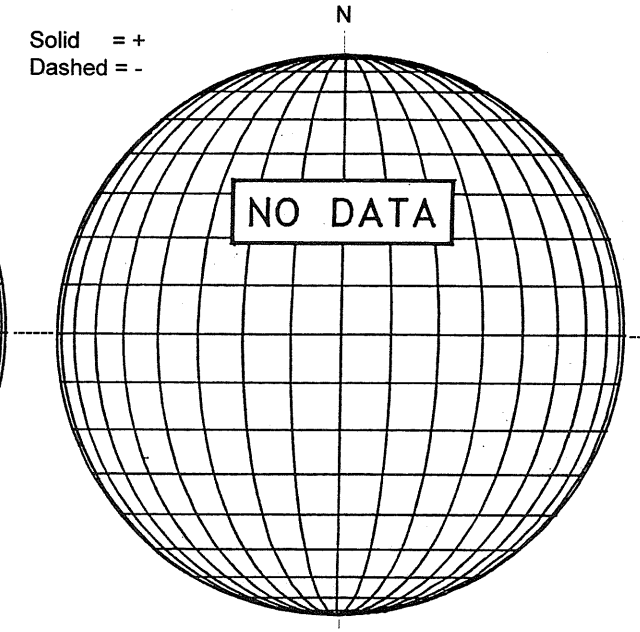
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



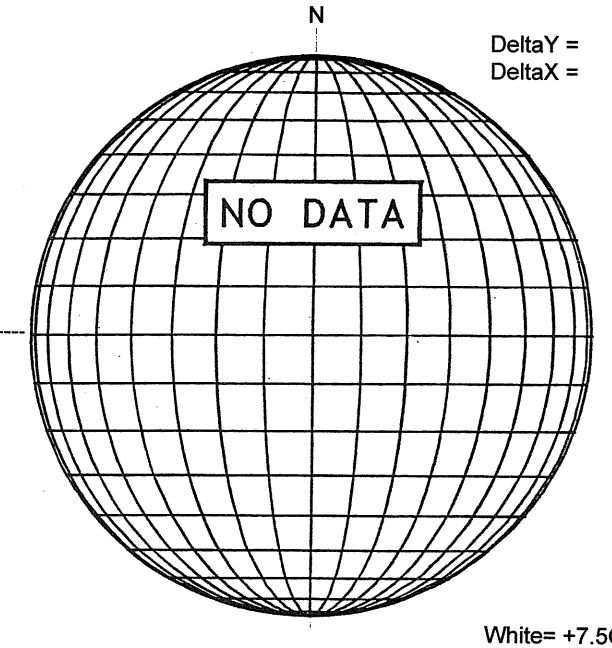
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



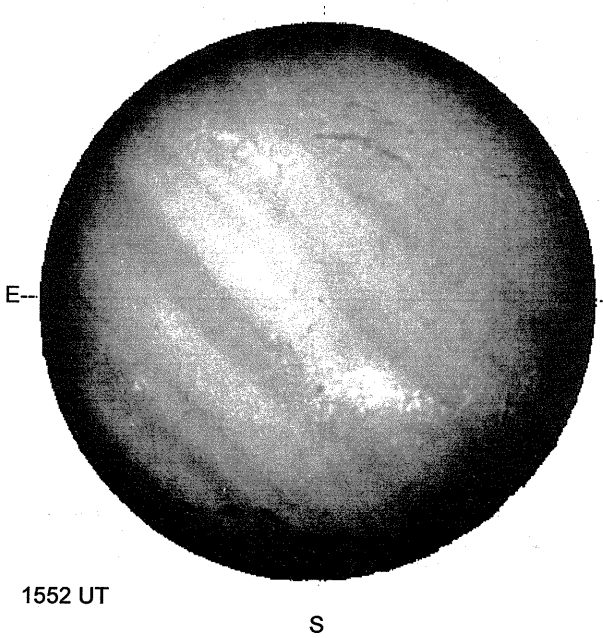
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



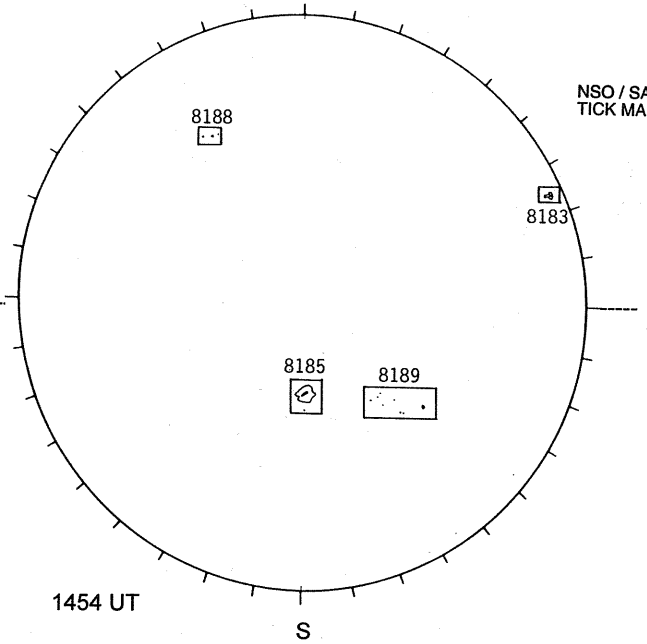
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



1552 UT

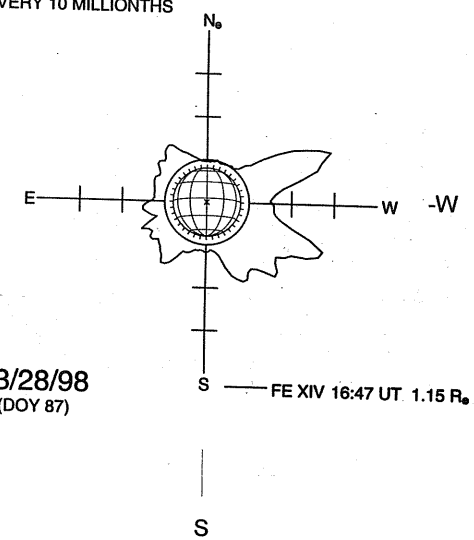
RAMEY SUNSPOT



1454 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 10 MILLIONTHS



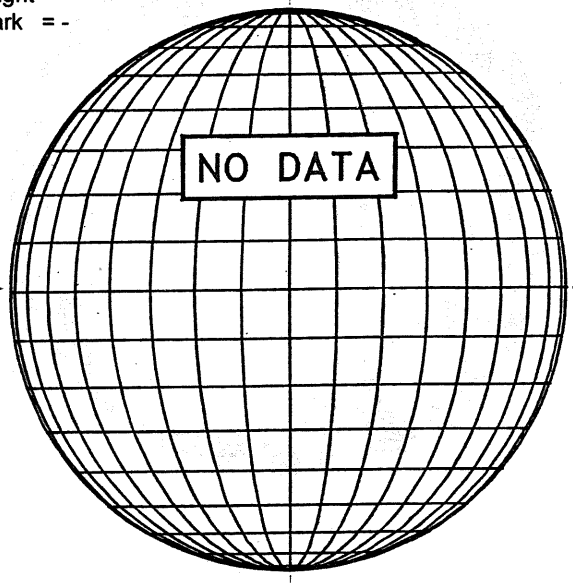
03/28/98
(DOY 87)

MARCH 29, 1998 (P= - 26.00 , Bo = - 6.70 , Lo = 217.19)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



E--

STANFORD MAGNETOGRAM

N

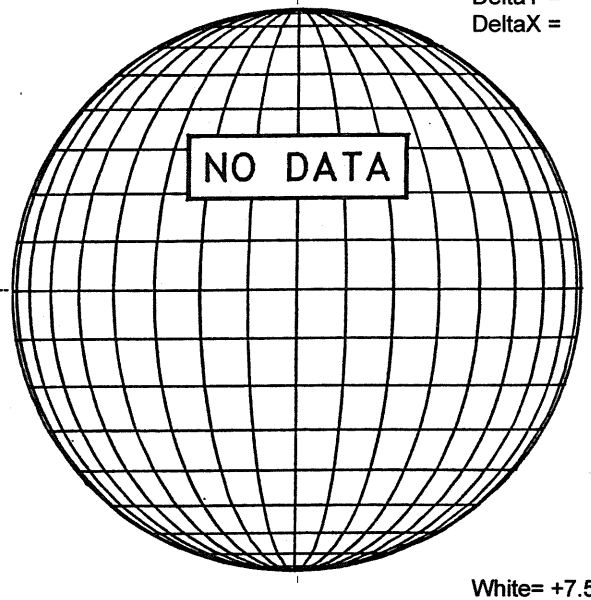
Solid = +
Dashed = -

1955 UT

MT. WILSON MAGNETOGRAM

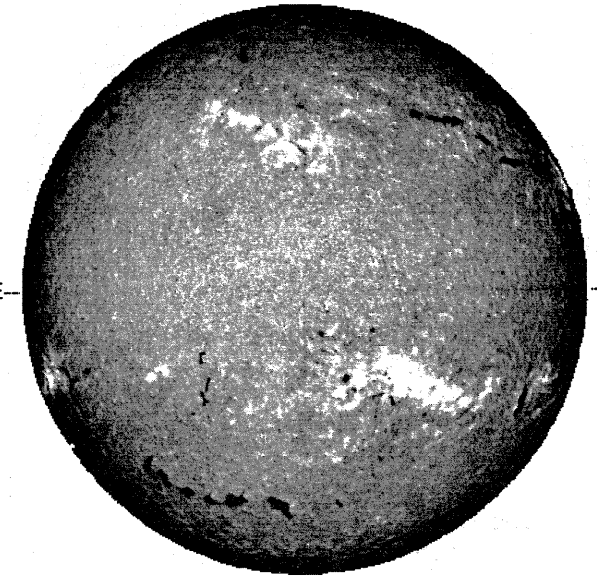
N

DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

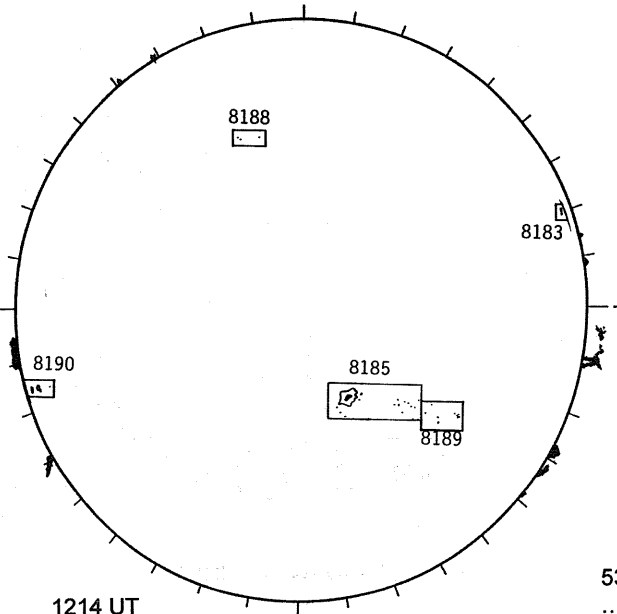


E--

0757 UT

S

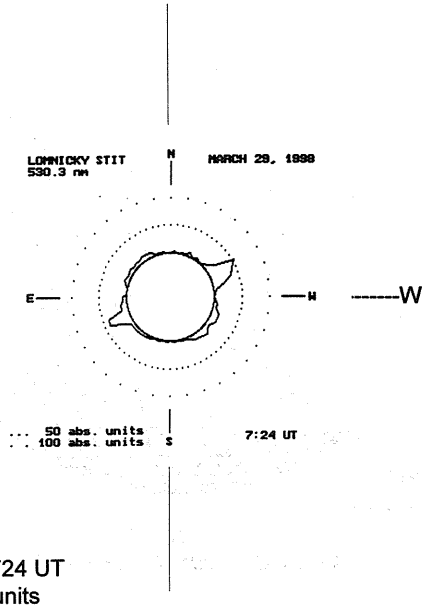
RAMEY SUNSPOT



1214 UT
0716 UT LOMN Prom

S

LOMNICKY PEAK CORONA (1.04 Radii)----



530.3 nm, 0724 UT
..... 50 abs. units
. . 100 abs. units

S

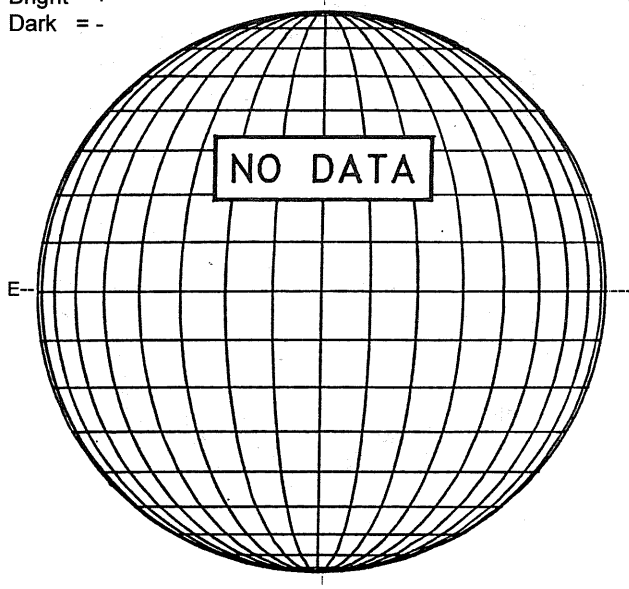
71
Mar 98

MARCH 30, 1998 (P= - 26.06 , Bo = - 6.65 , Lo = 204.00)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

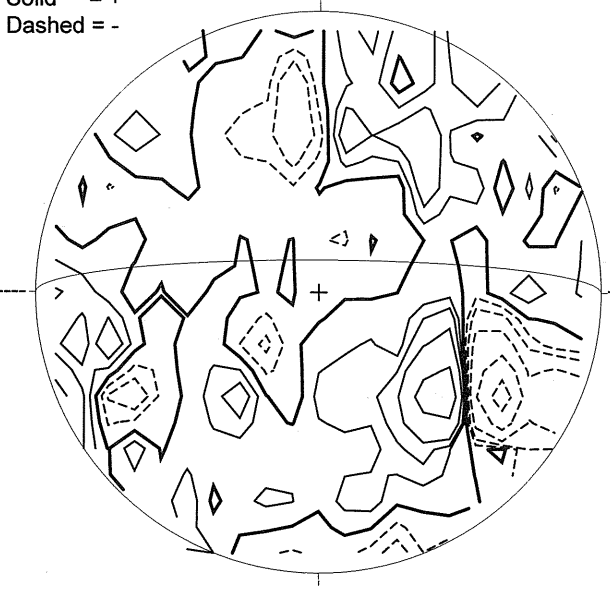
Bright = +
Dark = -



STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

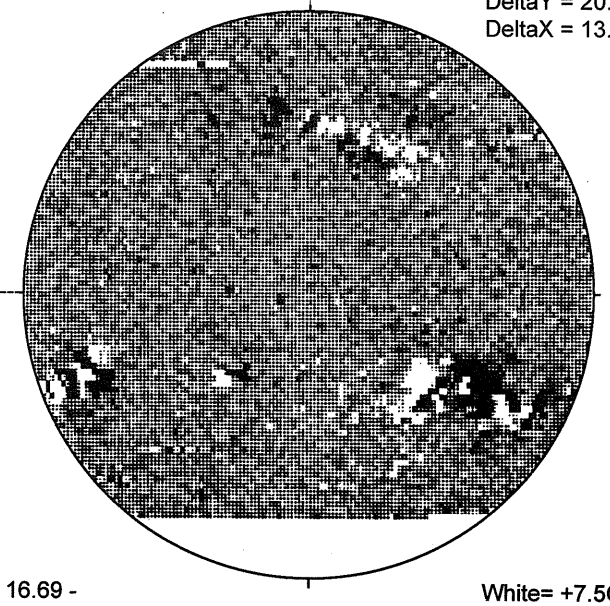


1916 UT

MT. WILSON MAGNETOGRAM

N

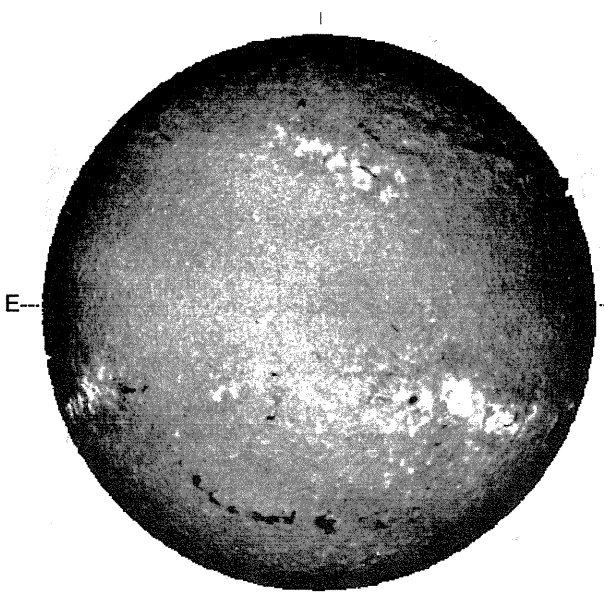
DeltaY = 20.1
DeltaX = 13.0



16.69 -
17.57 UT

White= +7.5G
Black = -7.5G

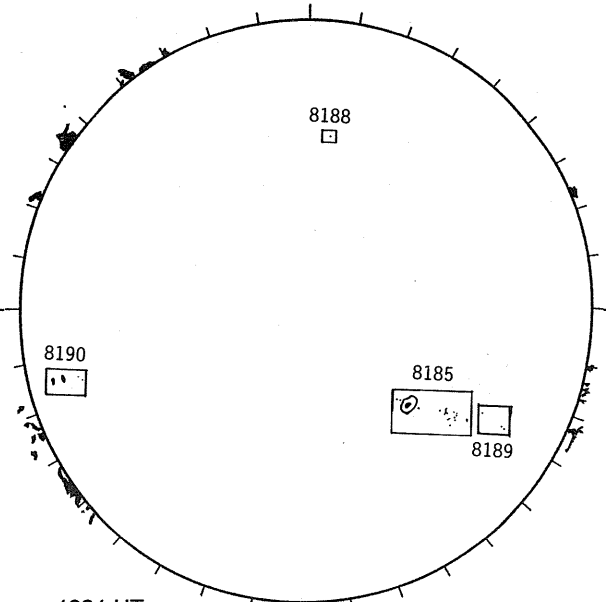
MEUDON H-ALPHA



0717 UT

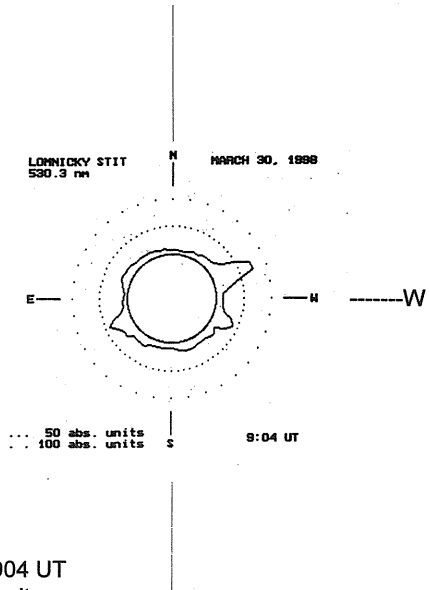
S

RAMEY SUNSPOT



1221 UT
0843 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----



530.3 nm, 0904 UT
..... 50 abs. units
. . 100 abs. units

S

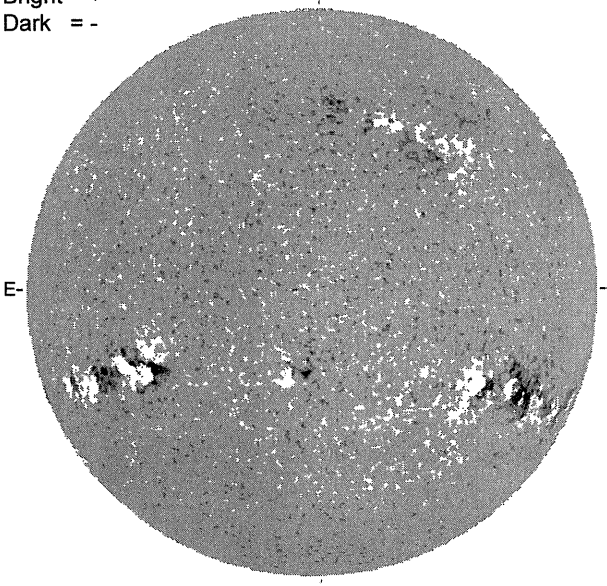
MARCH 31, 1998 (P= - 26.12 , Bo = - 6.60 , Lo = 190.81)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -

E-

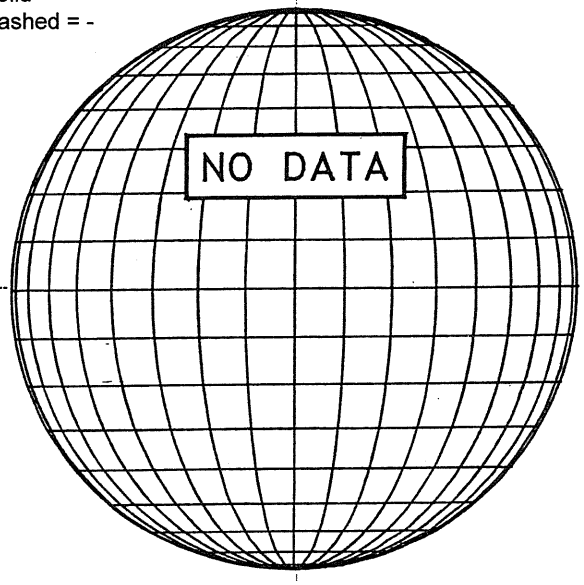


1531 UT

STANFORD MAGNETOGRAM

N

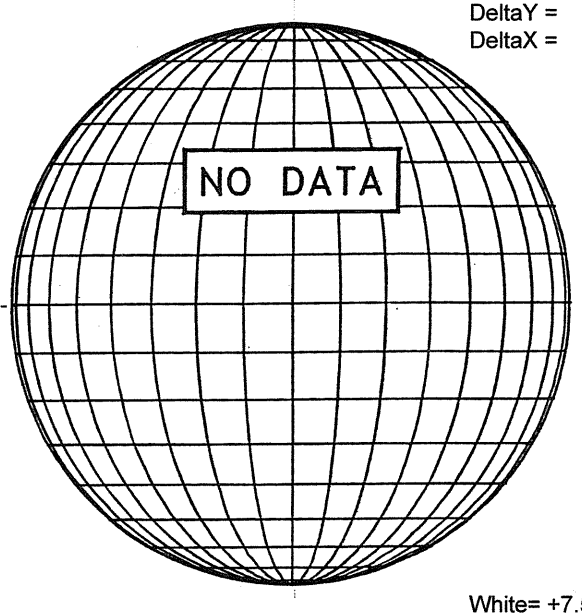
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

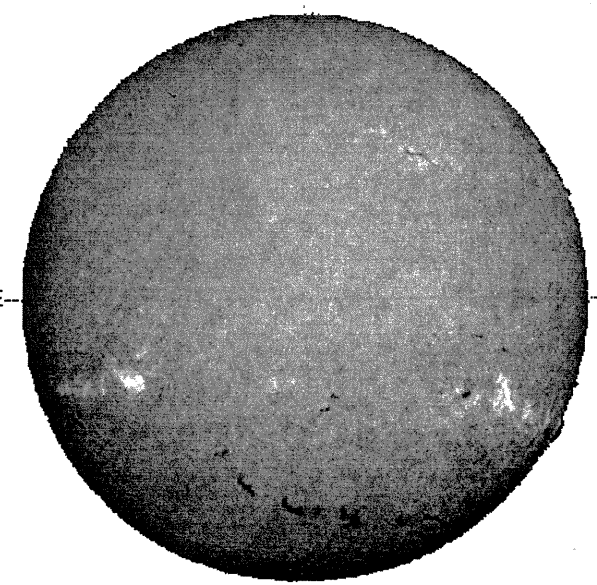
DeltaY =
DeltaX =



White= +7.5G
Black = -7.5G

----- SACRAMENTO PEAK H-ALPHA

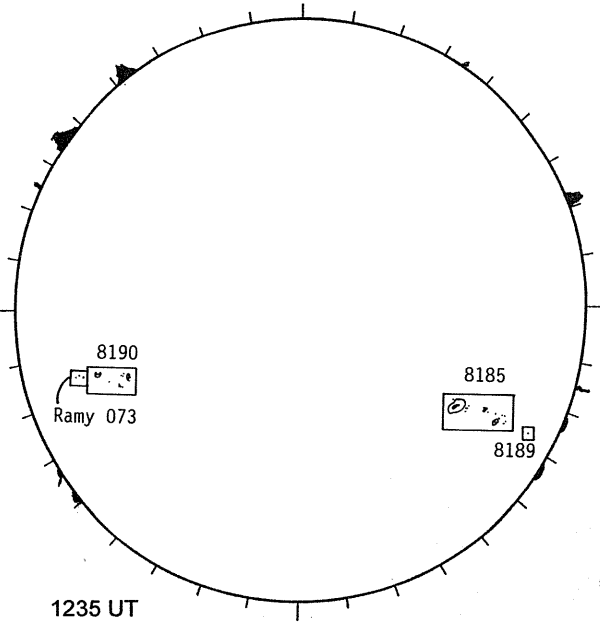
E--



1452 UT

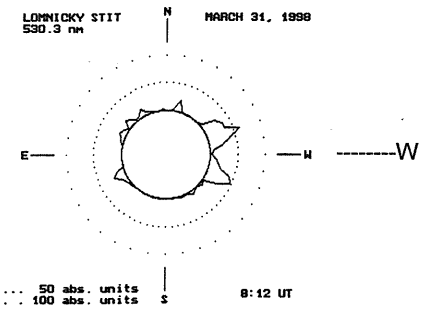
S

RAMEY SUNSPOT



1235 UT
0614 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)----

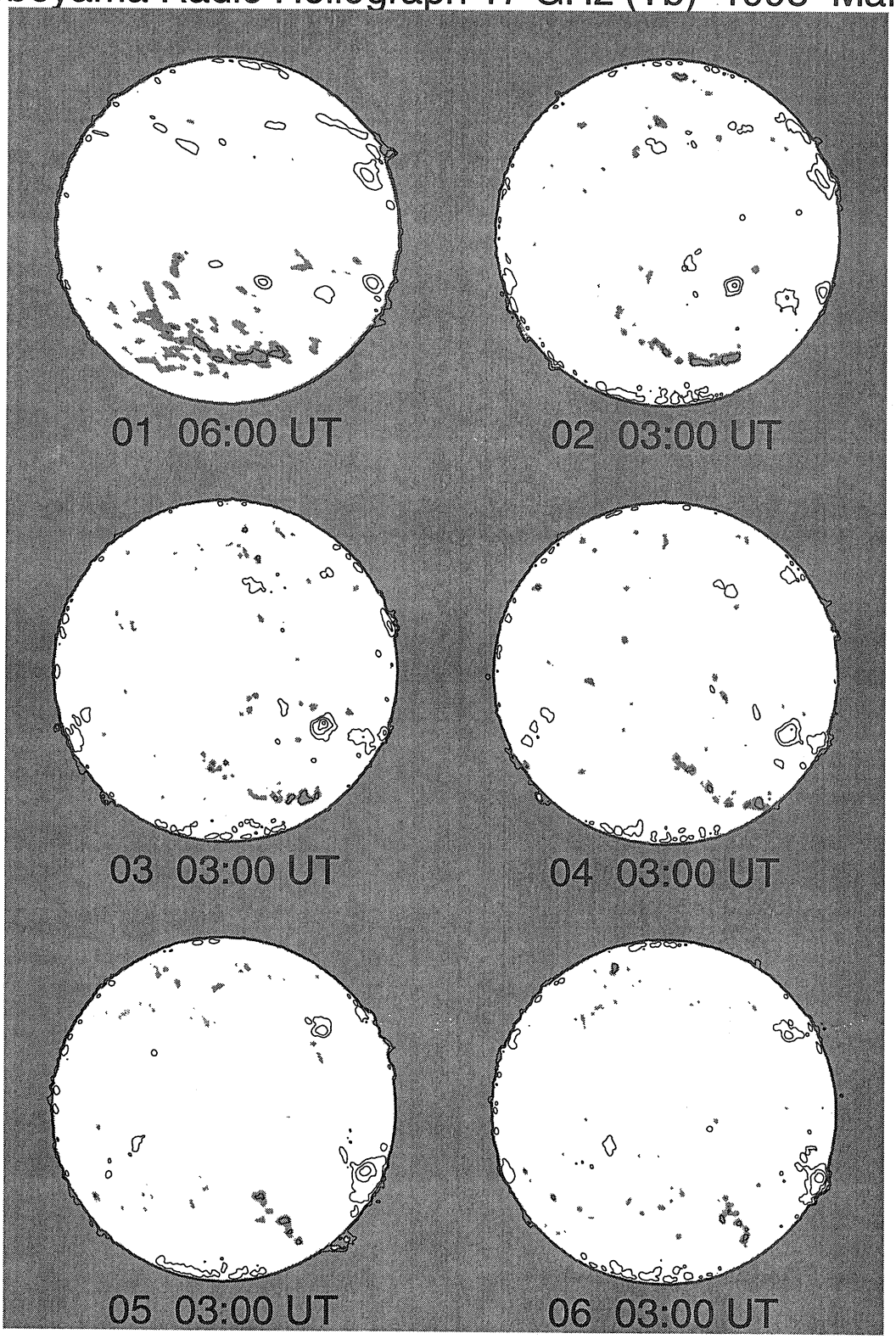


530.3 nm, 0812 UT
..... 50 abs. units
. . 100 abs. units

S

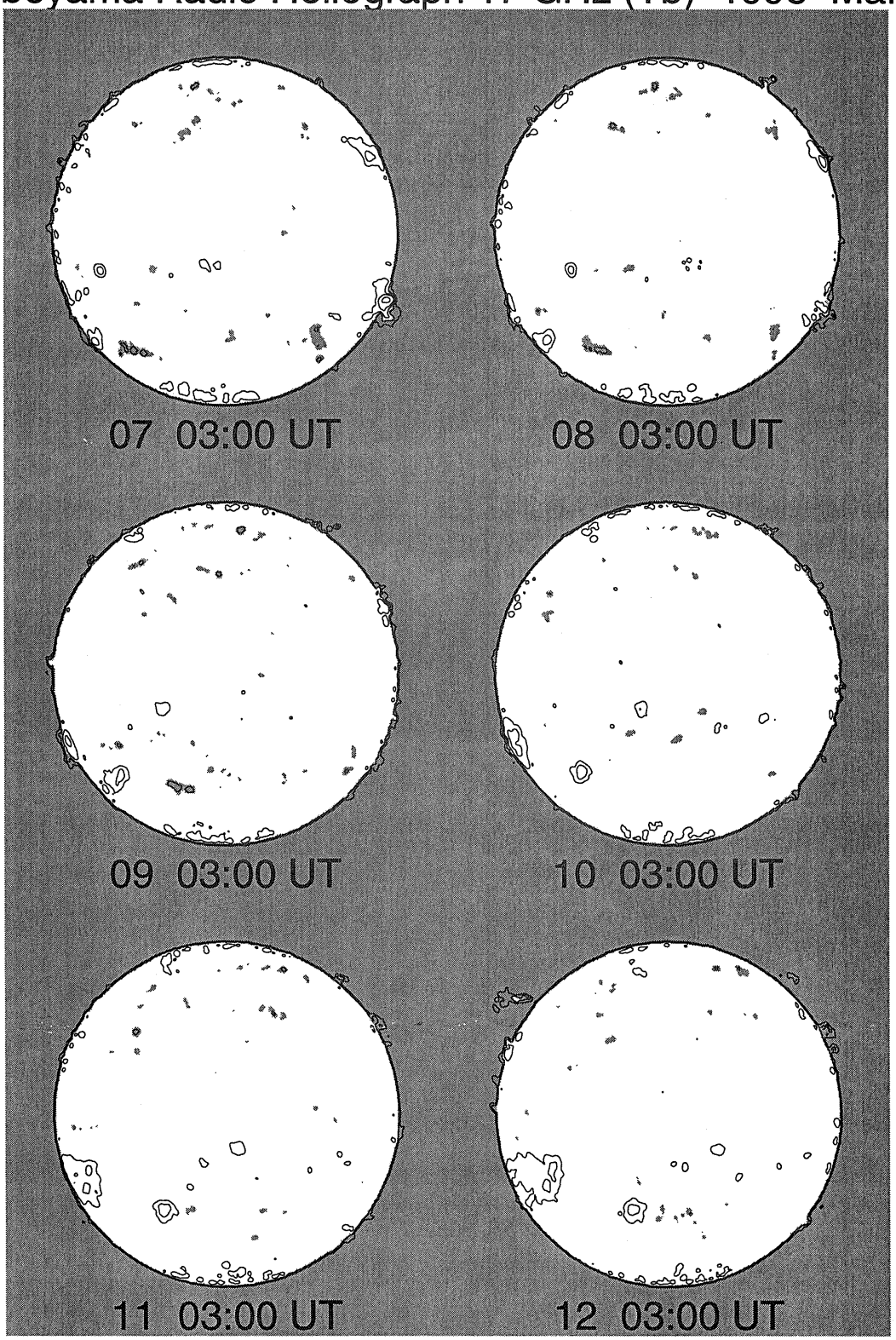
73
Mar 98

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 March



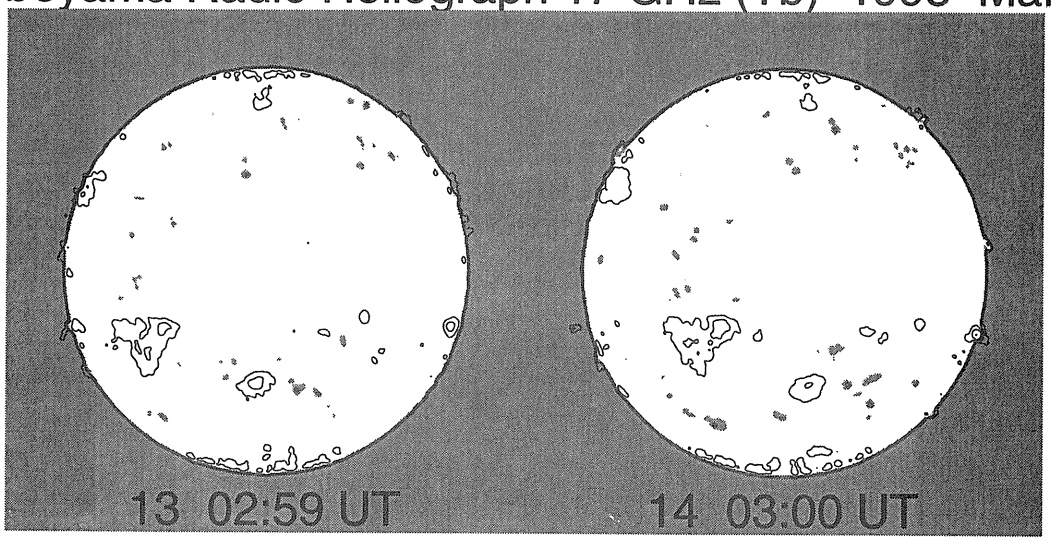
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

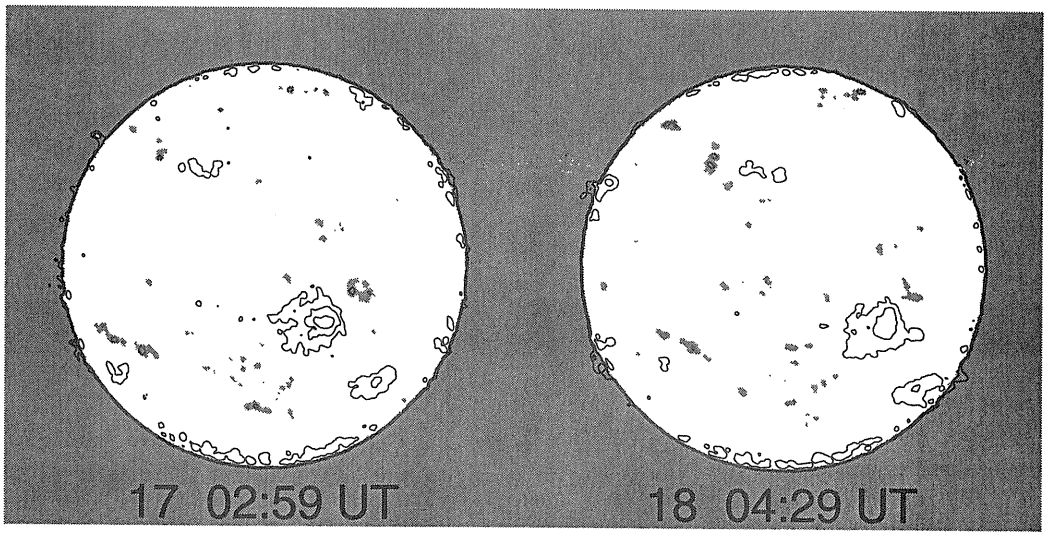
Nobeyama Radio Heliograph 17 GHz (Tb) 1998 March



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

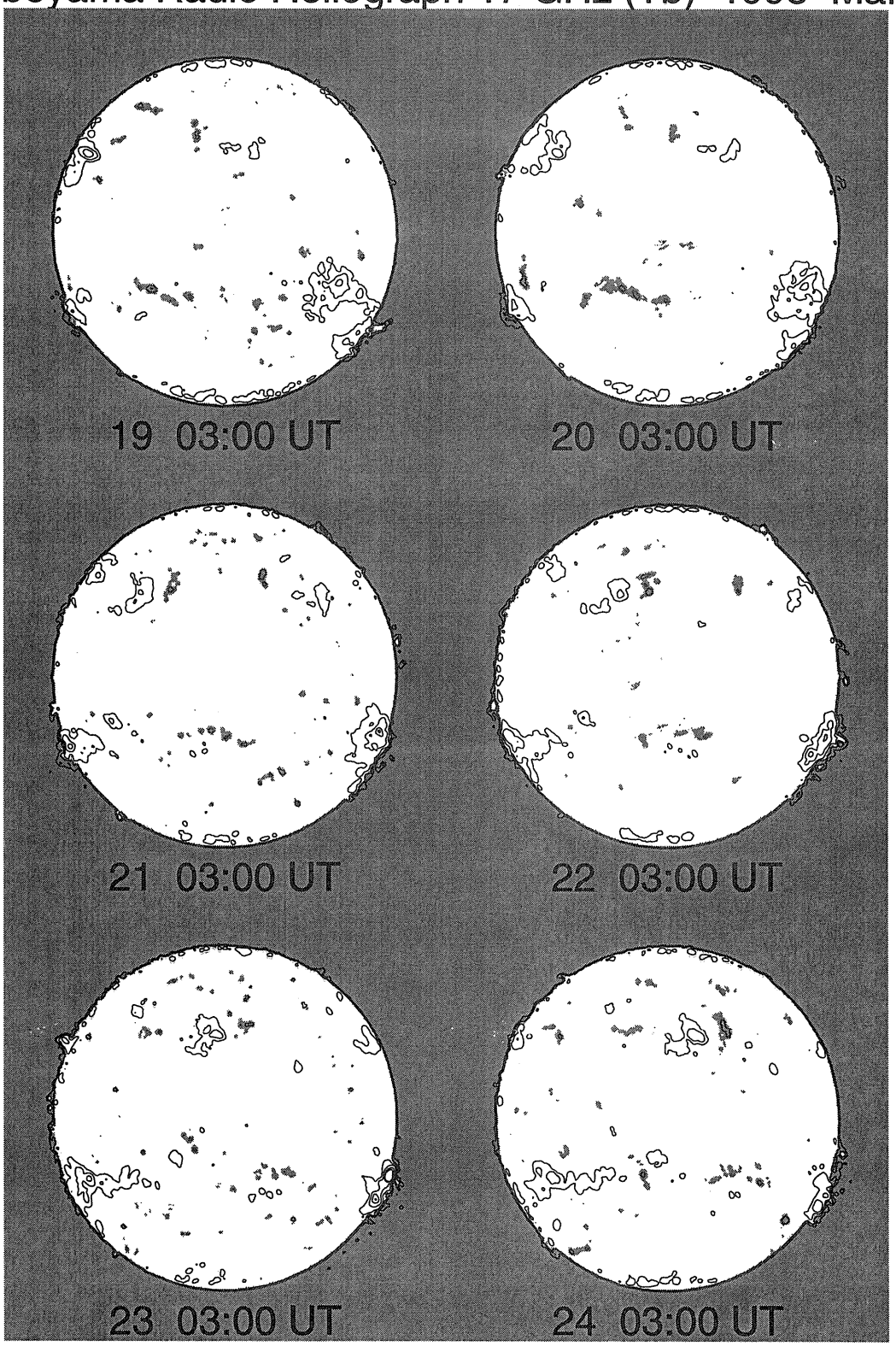
Nobeyama Radio Heliograph 17 GHz (Tb) 1998 March





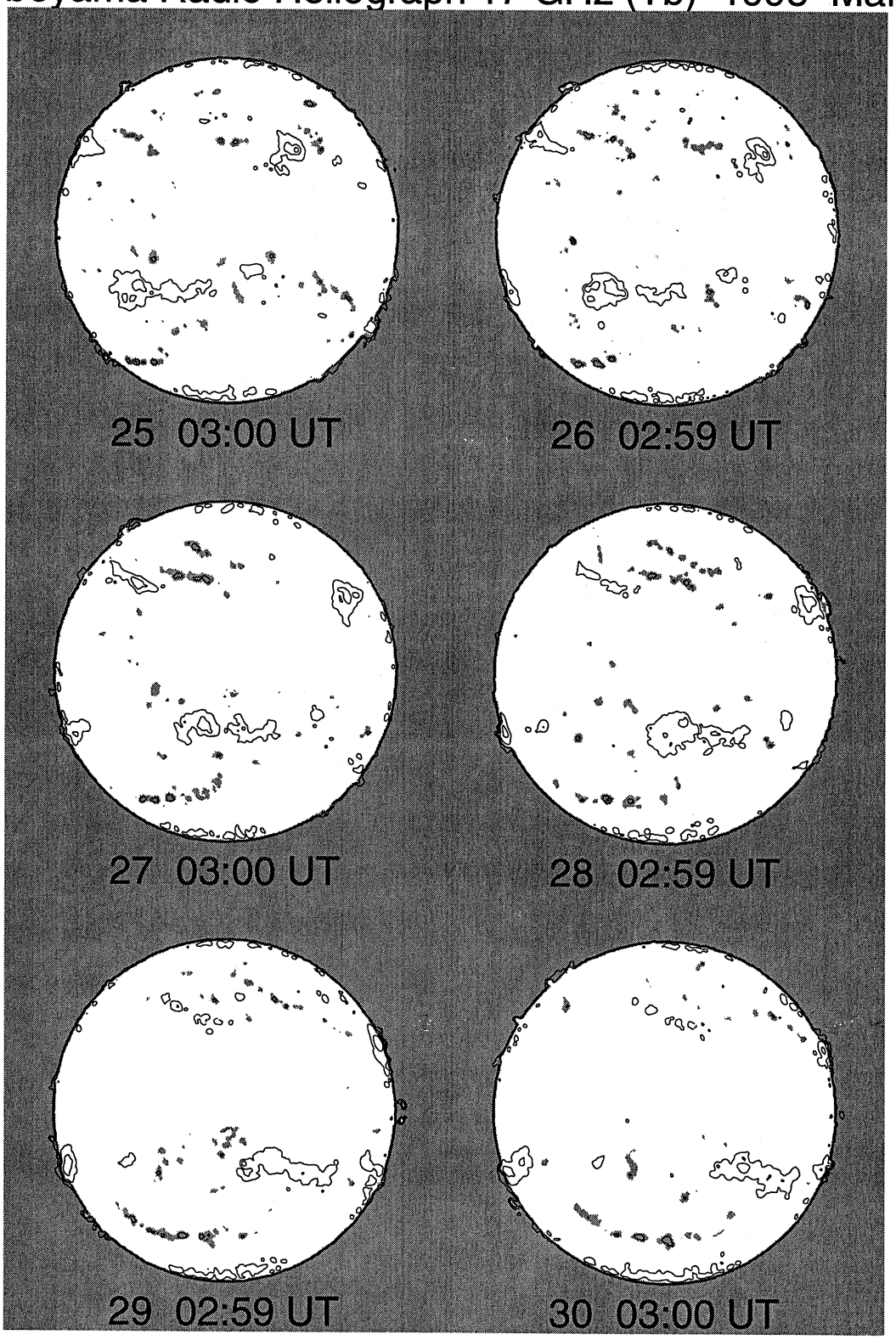
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 March



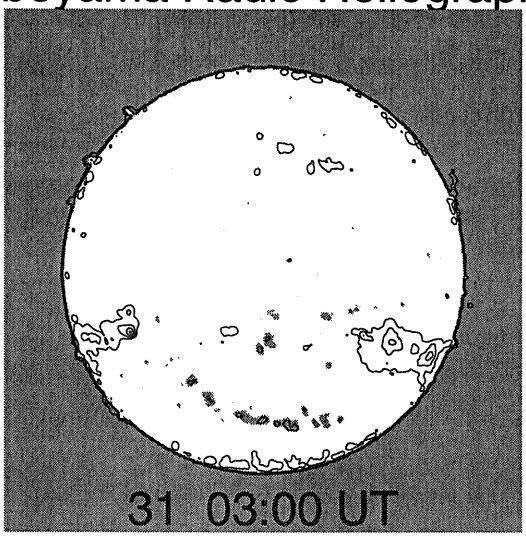
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 March



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

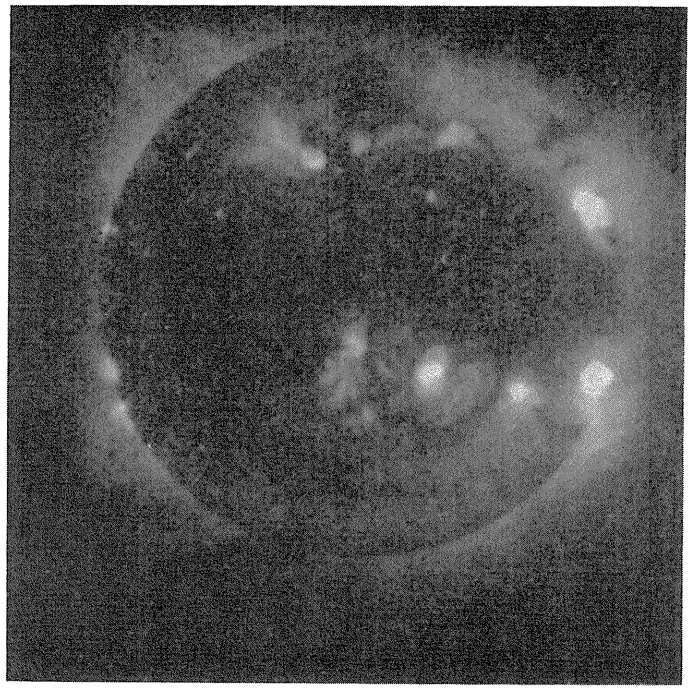
Nobeyama Radio Heliograph 17 GHz (Tb) 1998 March



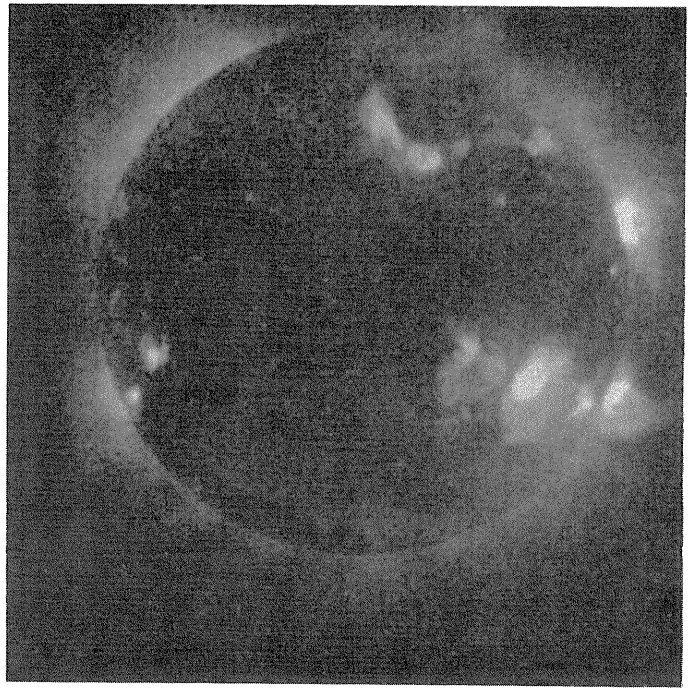
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

YOHKOH SOFT X-RAY TELESCOPE IMAGES

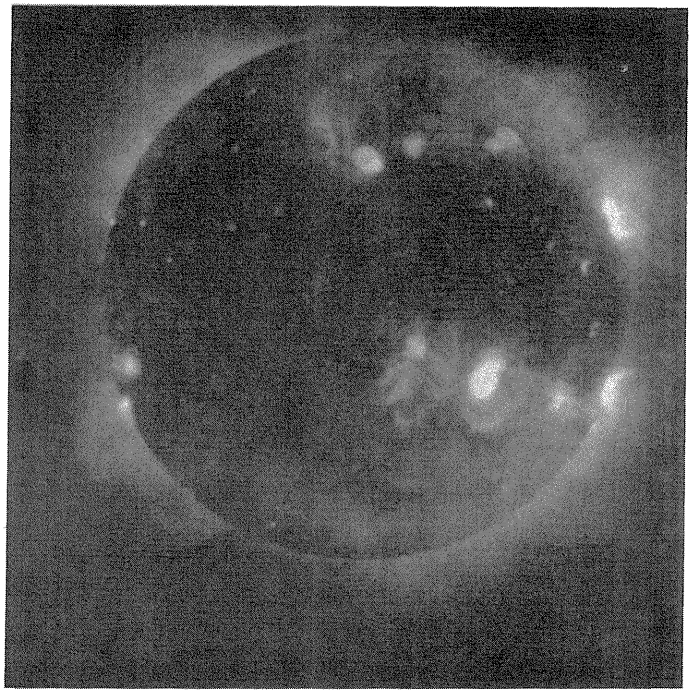
March
1998



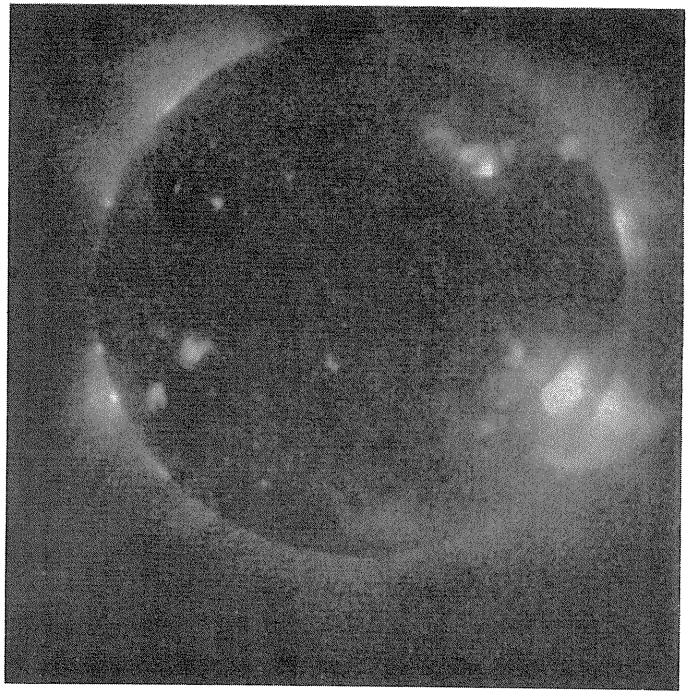
Day 1
11:56:05 UT



Day 3
11:55:17 UT



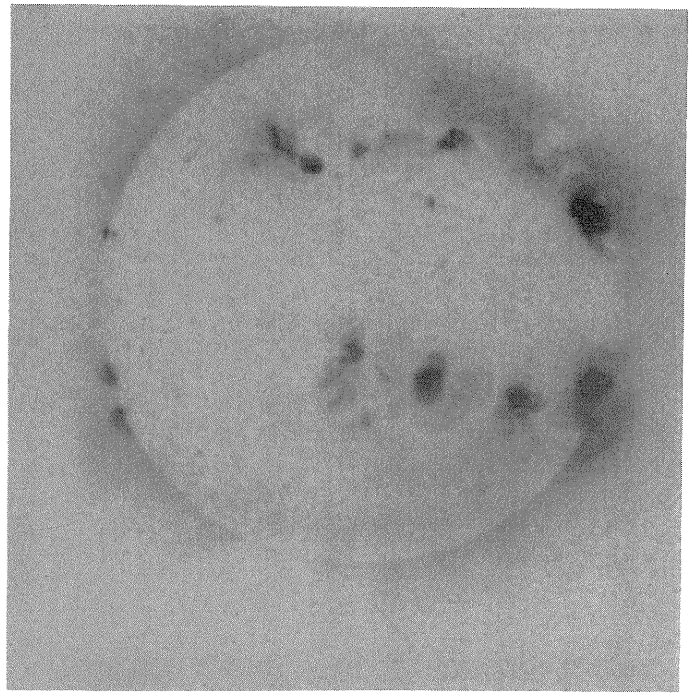
Day 2
12:06:33 UT



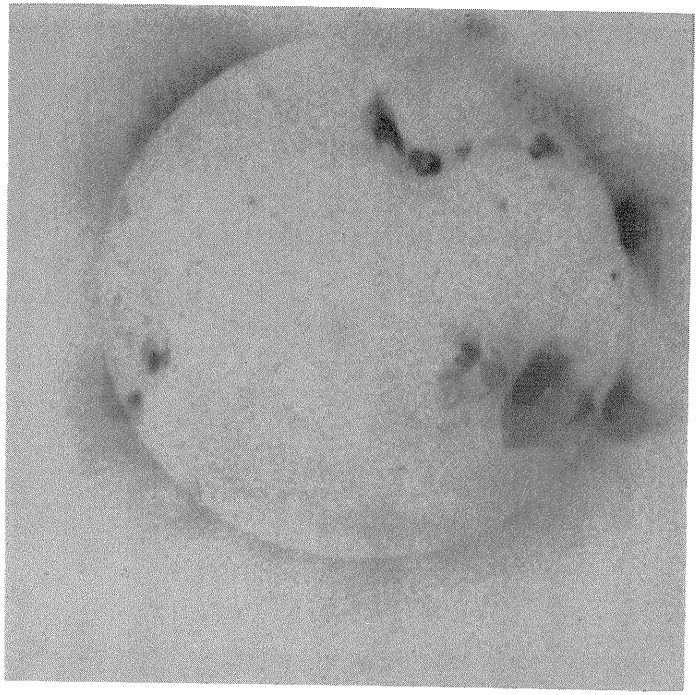
Day 4
12:03:33 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

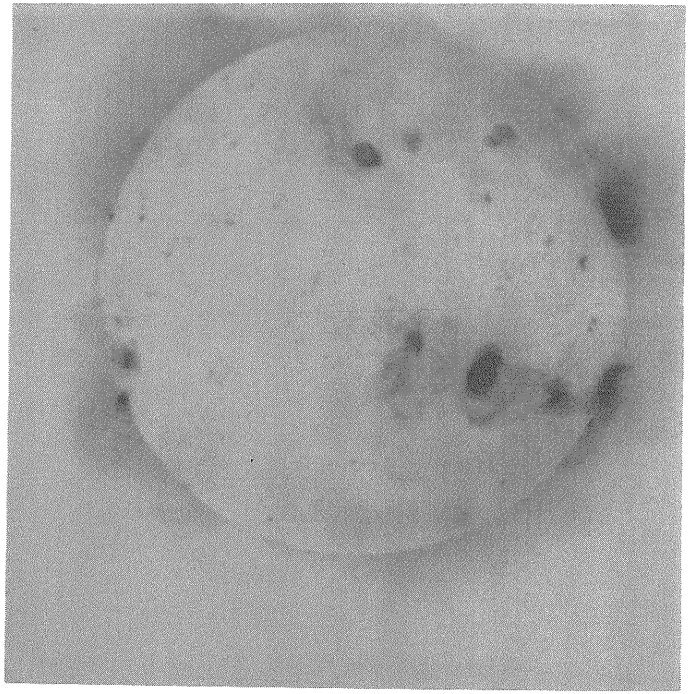
March 1998



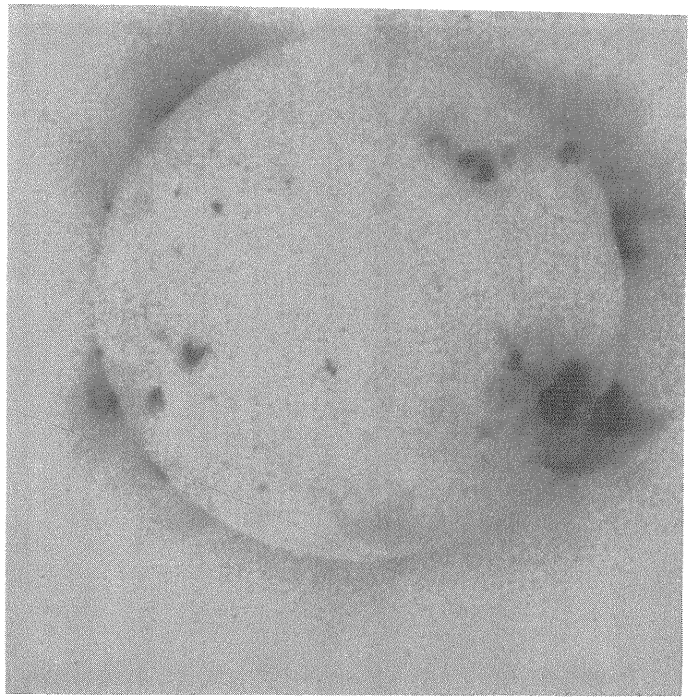
Day 1
11:56:05 UT



Day 3
11:55:17 UT



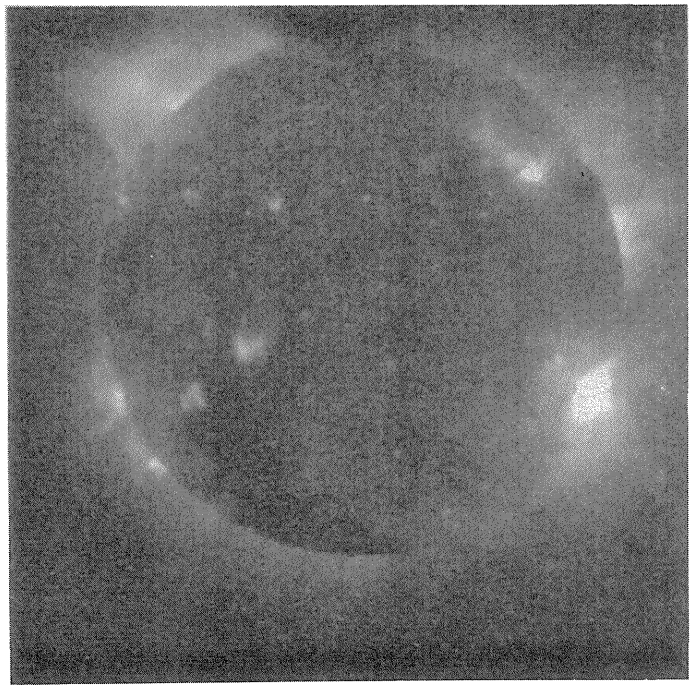
Day 2
12:06:33 UT



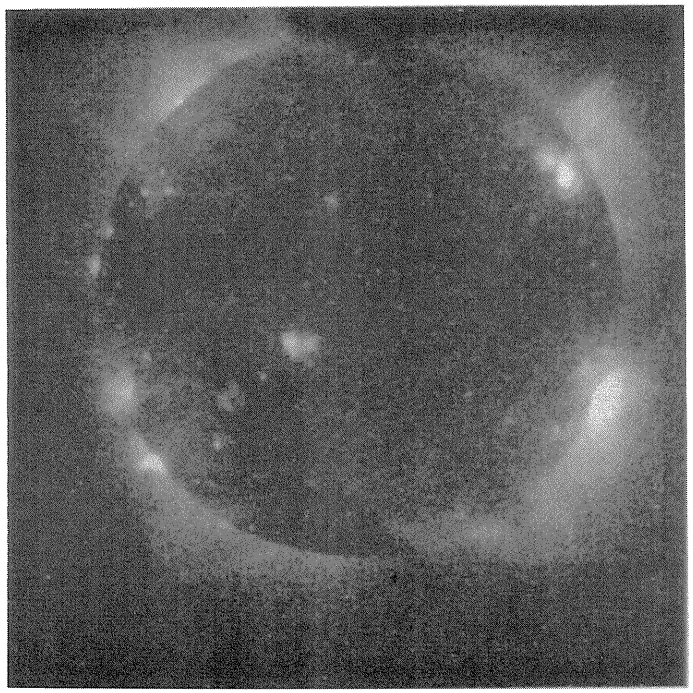
Day 4
12:03:33 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

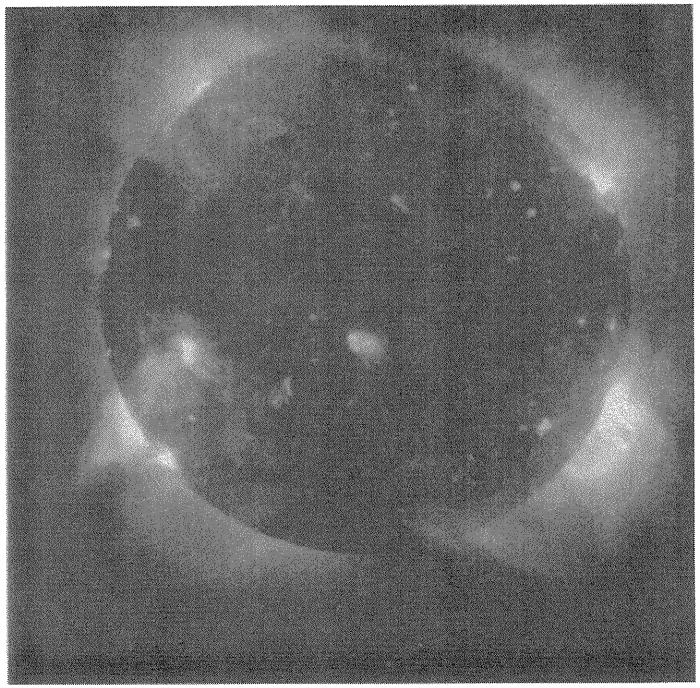
March
1998



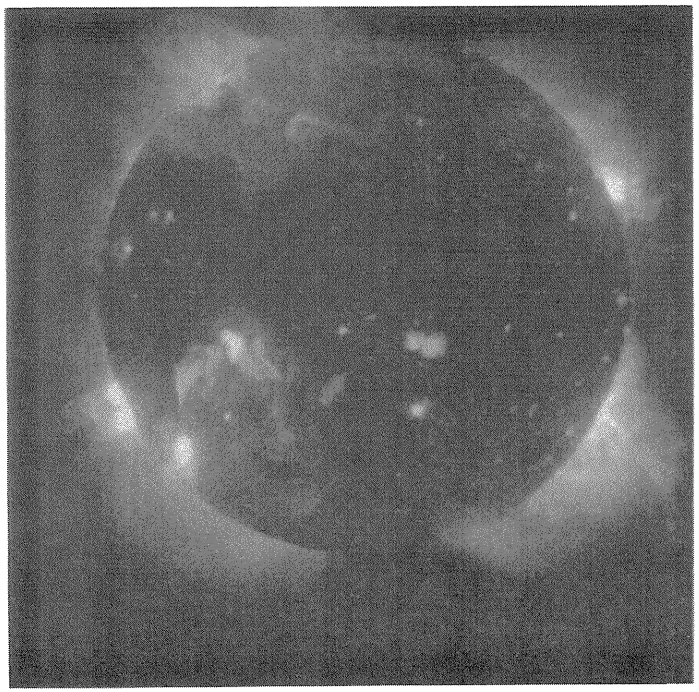
Day 5
12:10:13 UT



Day 6
11:39:48 UT



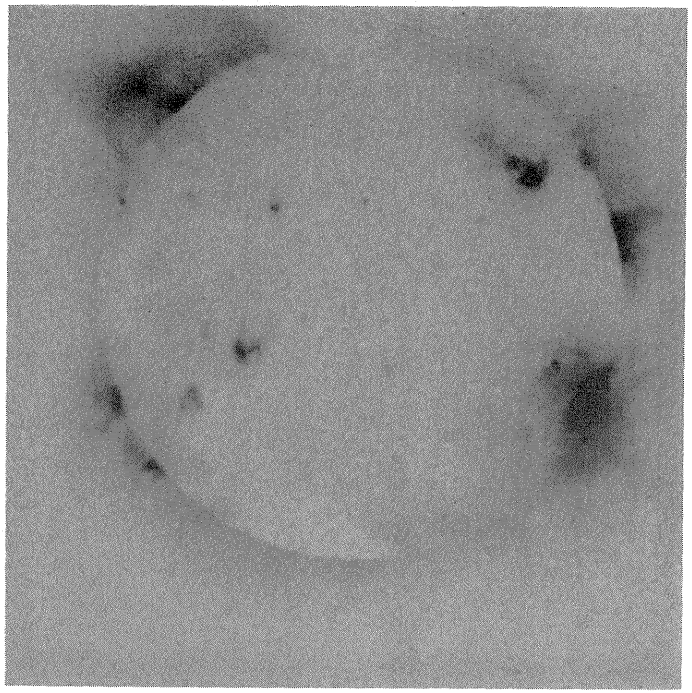
Day 7
12:01:04 UT



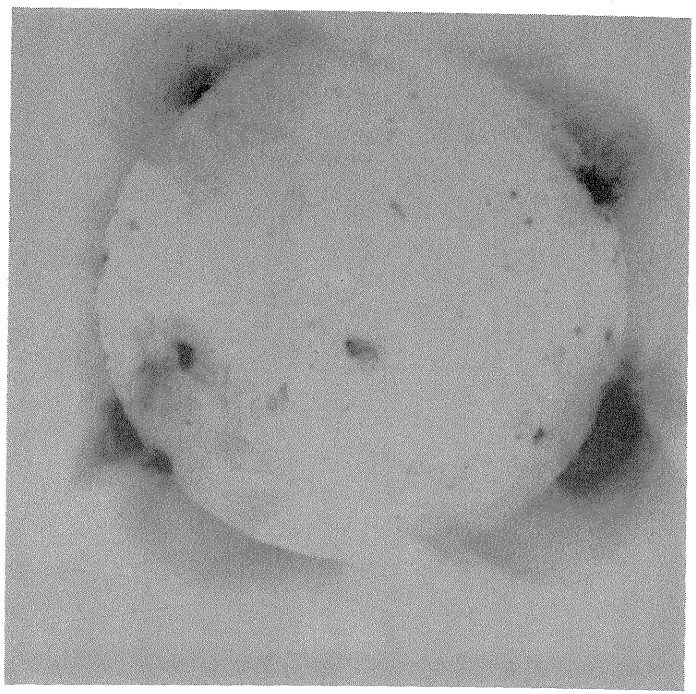
Day 8
12:10:14 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

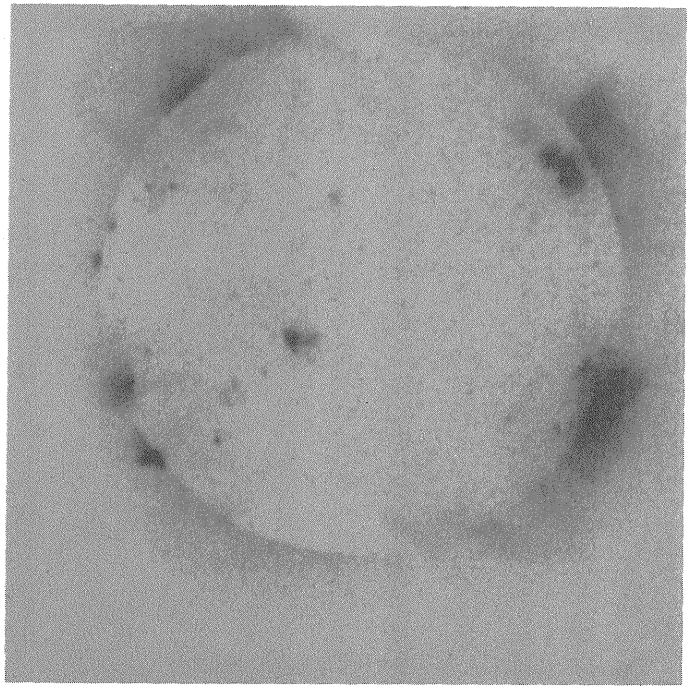
March 1998



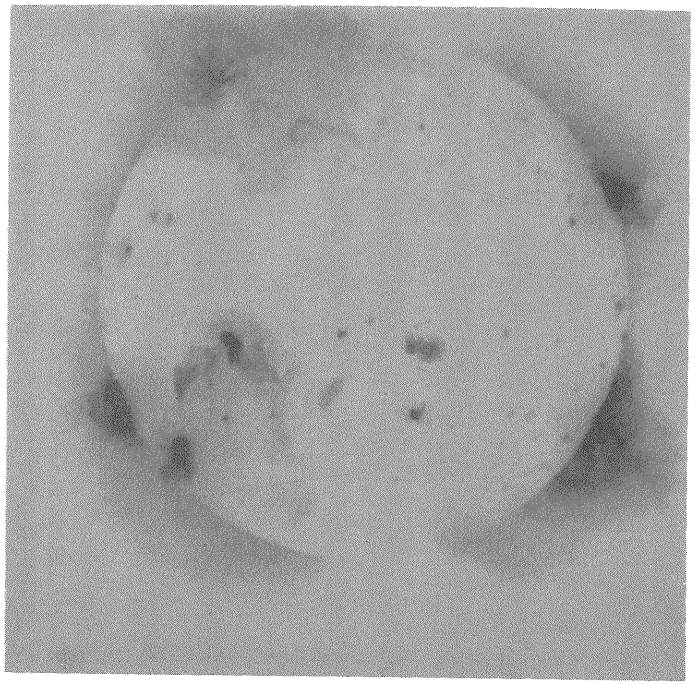
Day 5
12:10:13 UT



Day 7
12:01:04 UT



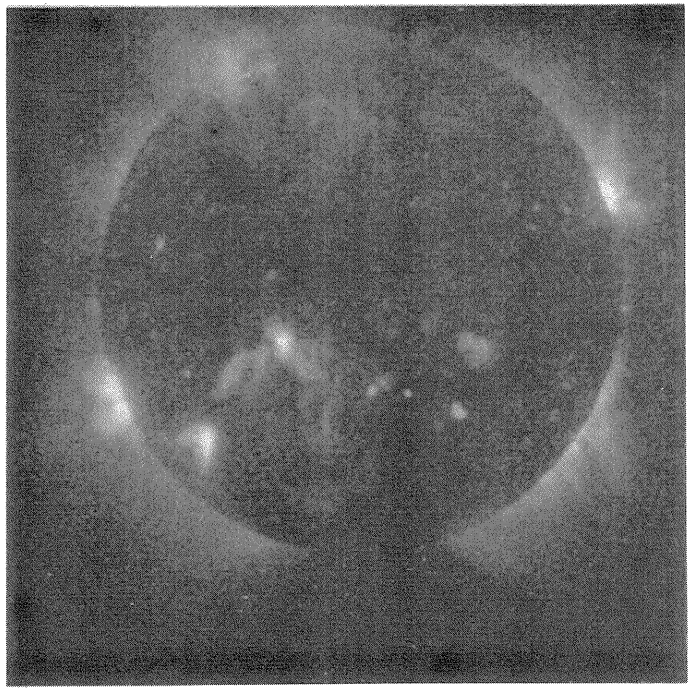
Day 6
11:39:48 UT



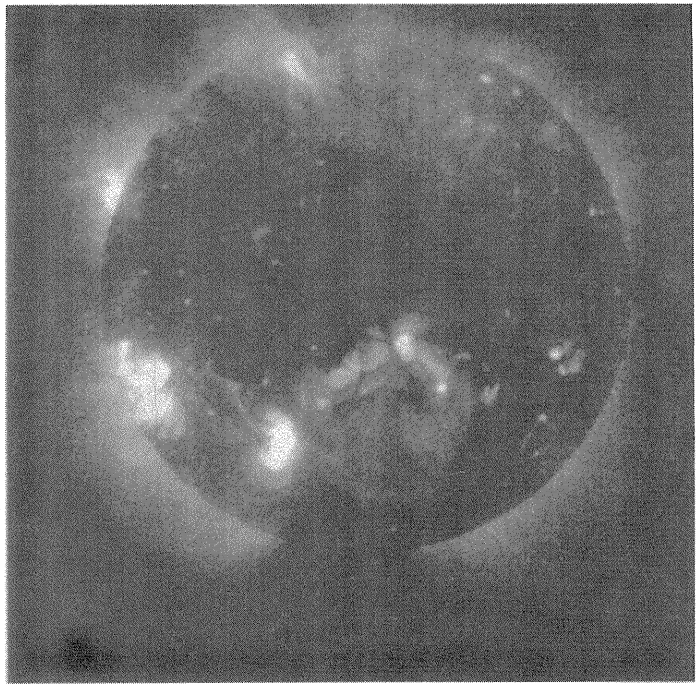
Day 8
12:10:14 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

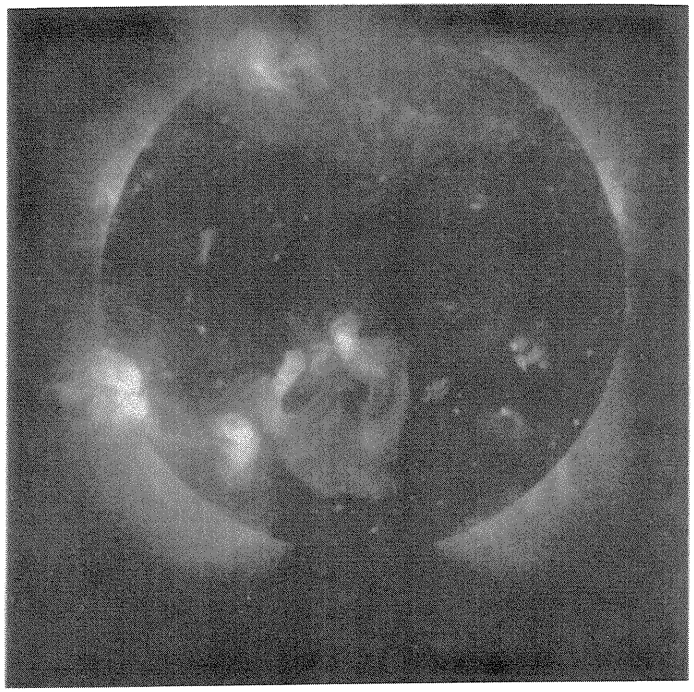
March
1998



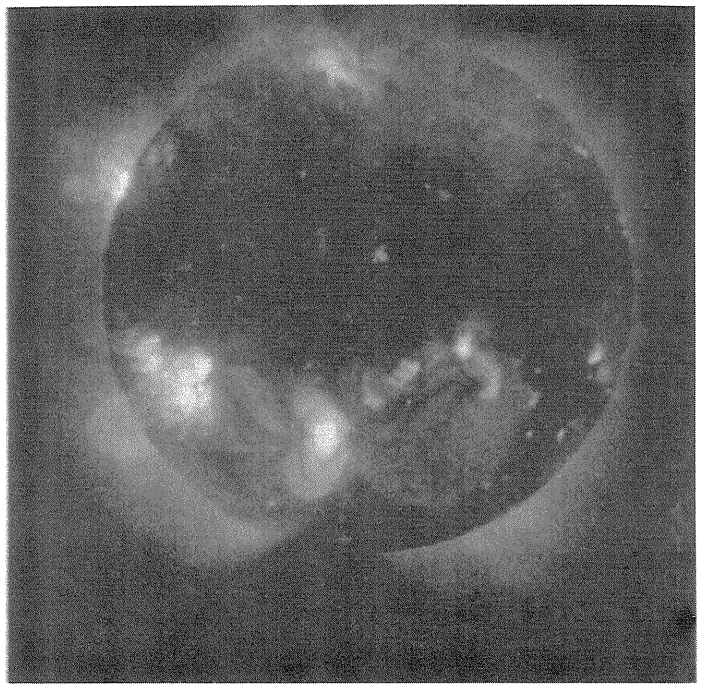
Day 9
11:56:52 UT



Day 11
11:36:15 UT



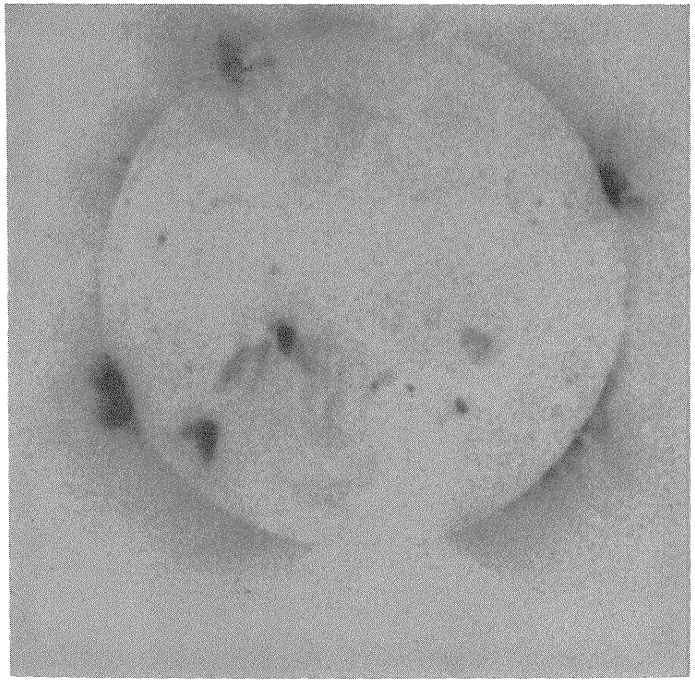
Day 10
12:40:42 UT



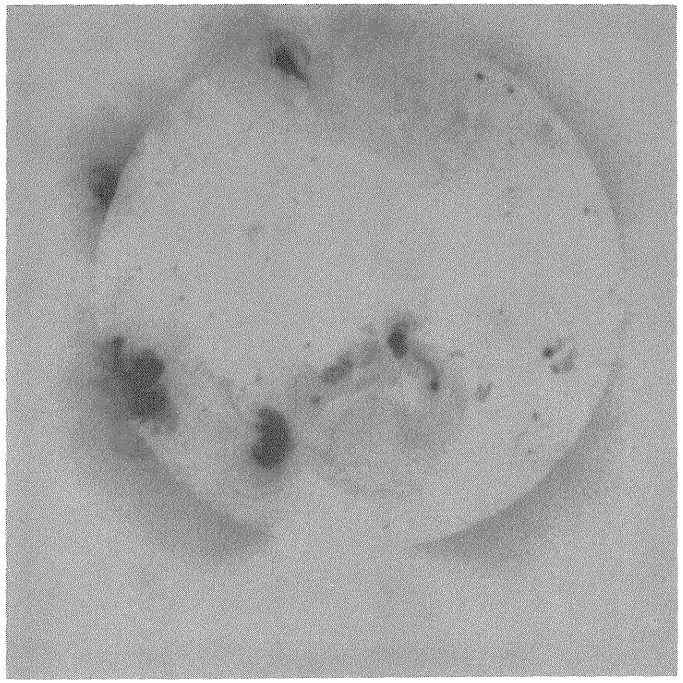
Day 12
11:48:49 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

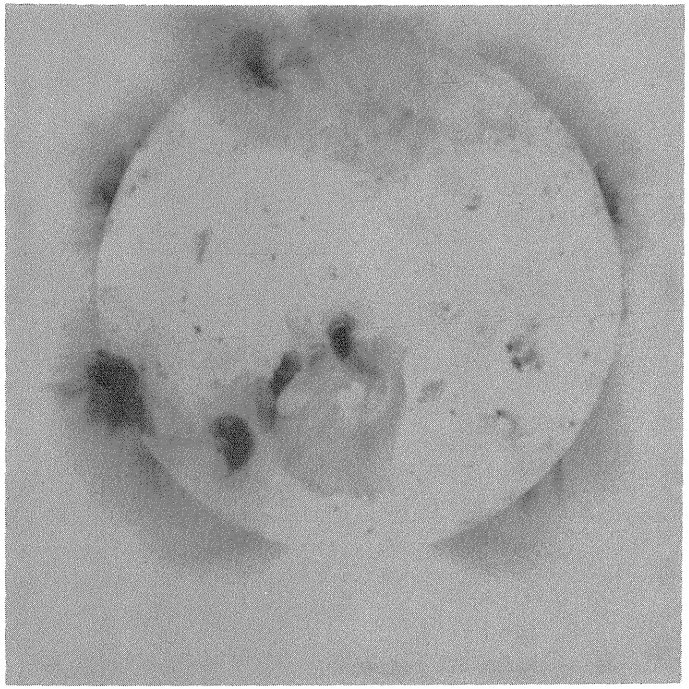
March 1998



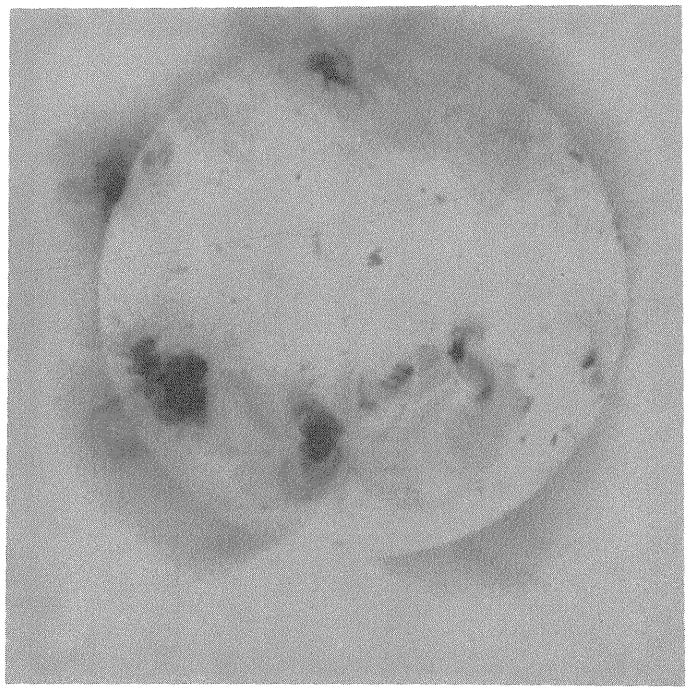
Day 9
11:56:52 UT



Day 11
11:36:15 UT



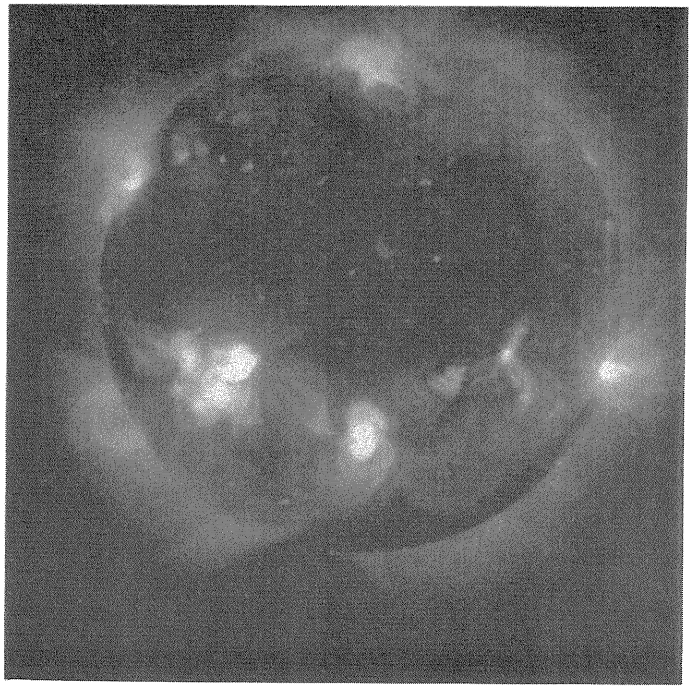
Day 10
12:40:42 UT



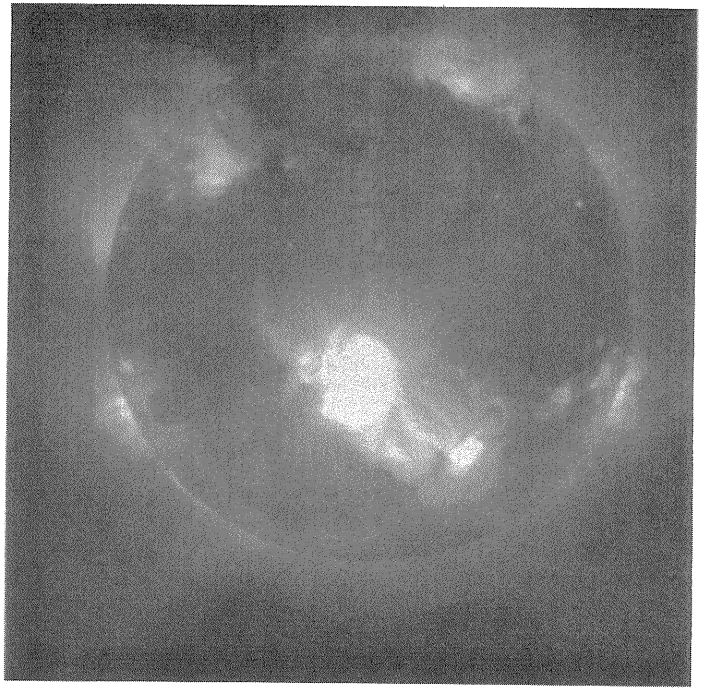
Day 12
11:48:49 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

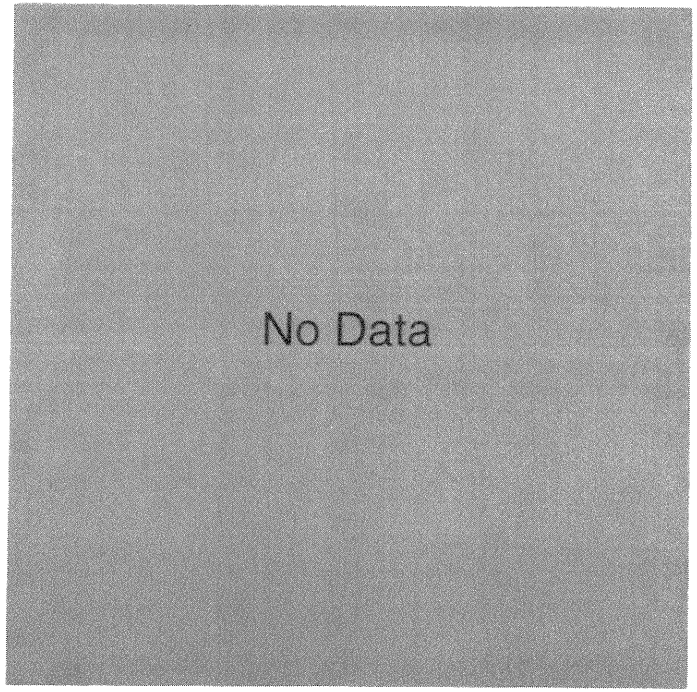
March
1998



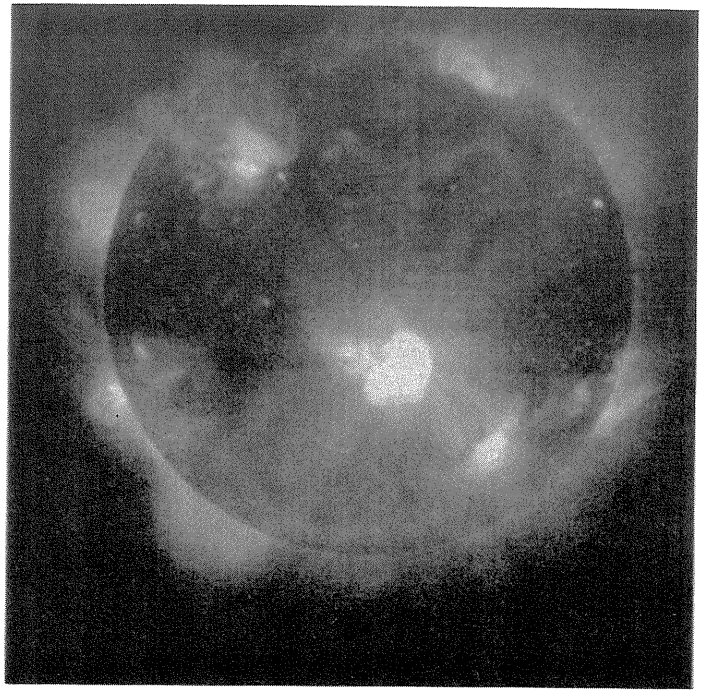
Day 13
11:57:37 UT



Day 15
18:15:34 UT



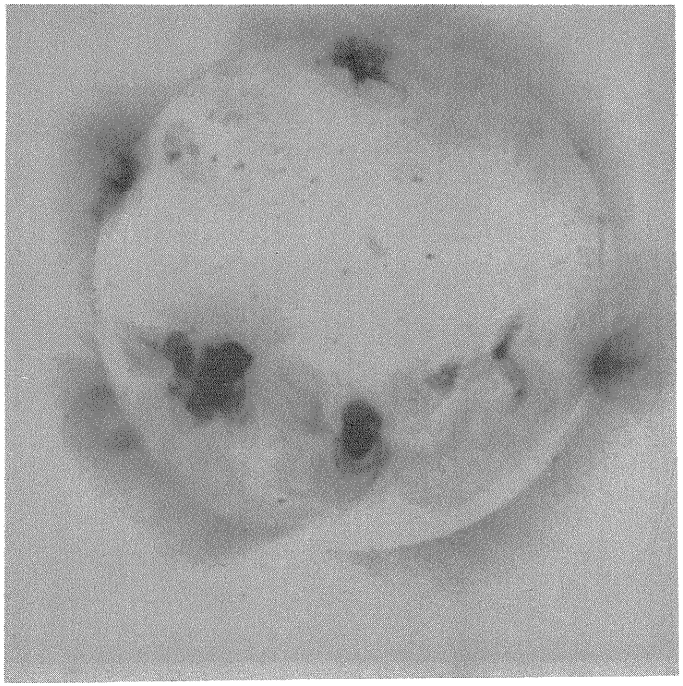
Day 14



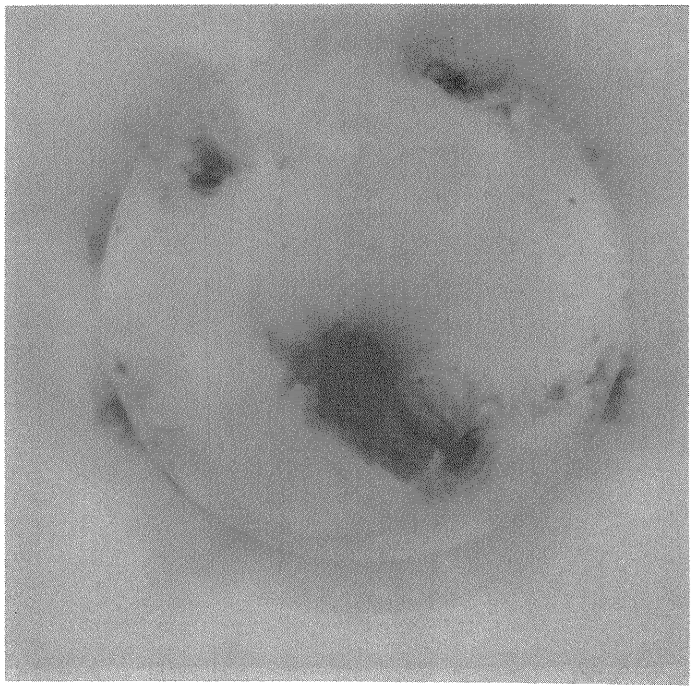
Day 16
11:15:40 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

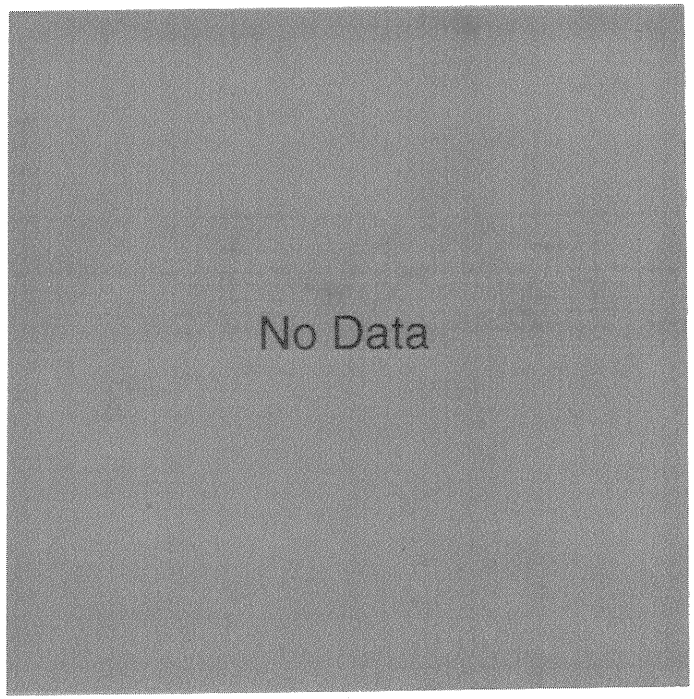
March 1998



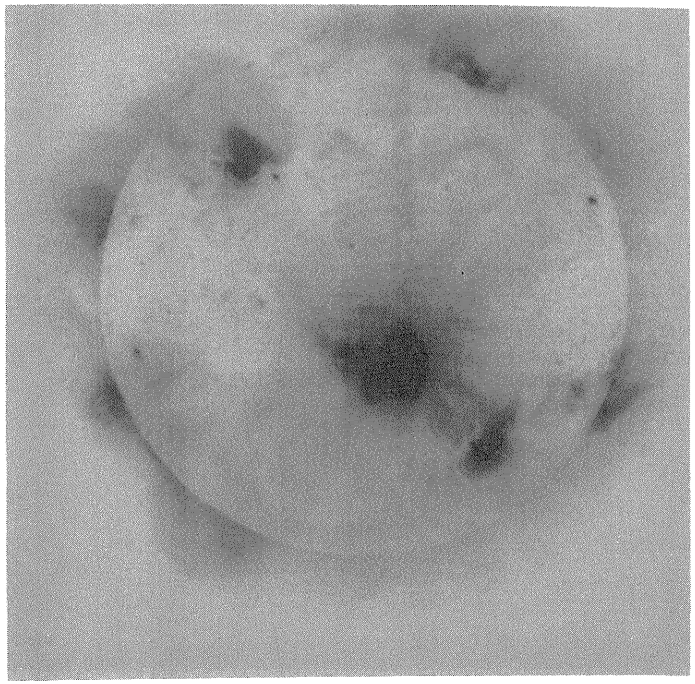
Day 13
11:57:37 UT



Day 15
18:15:34 UT



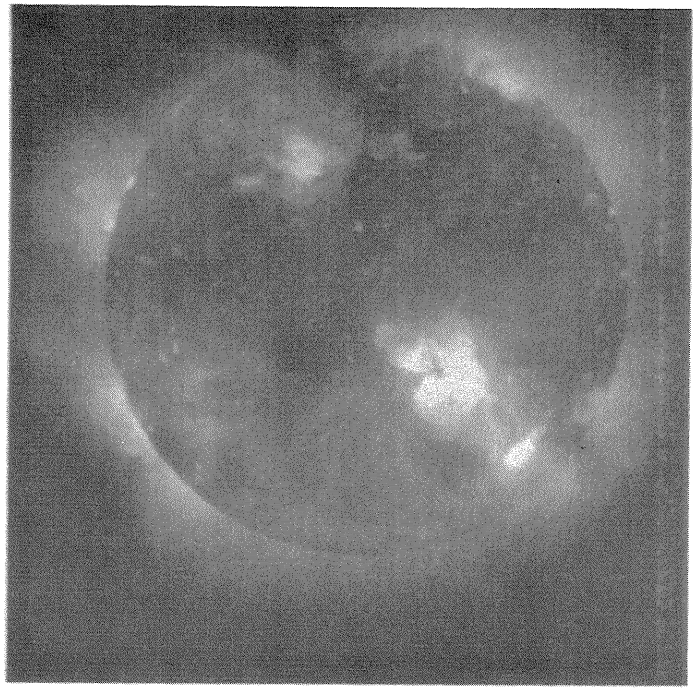
Day 14



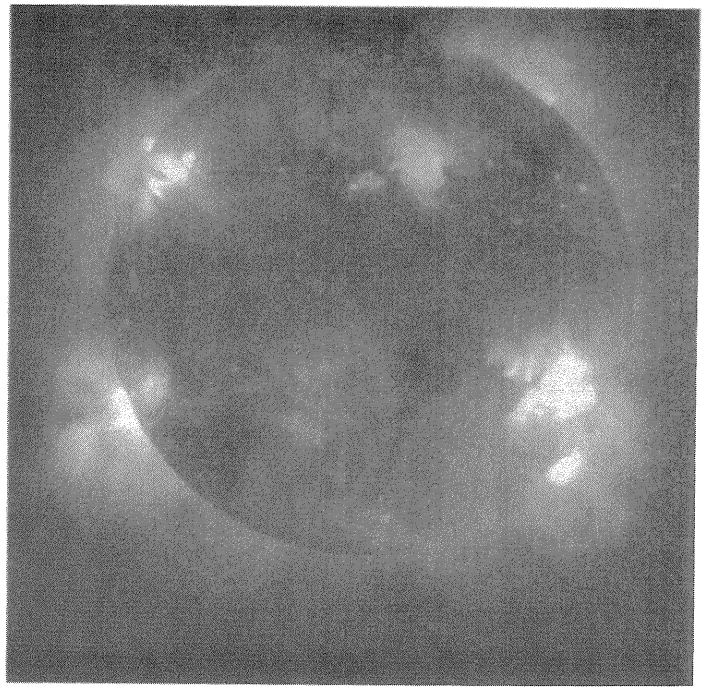
Day 16
11:15:40 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

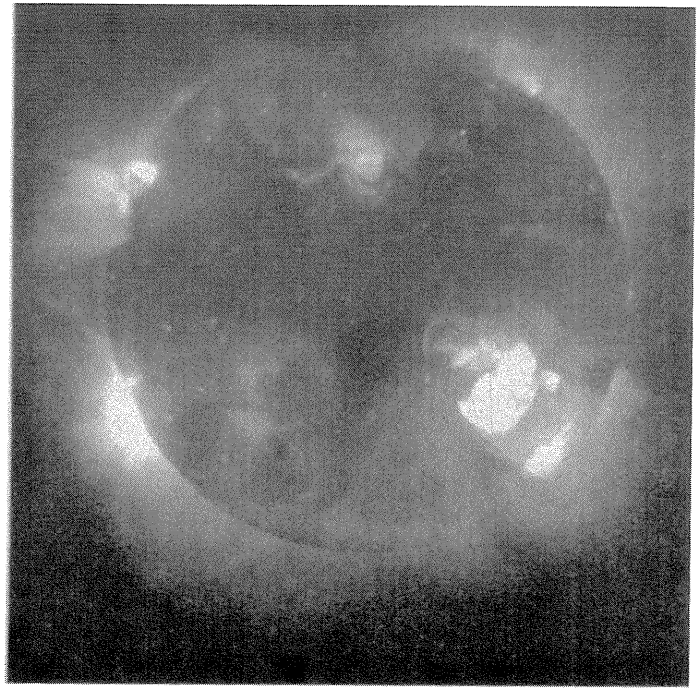
March
1998



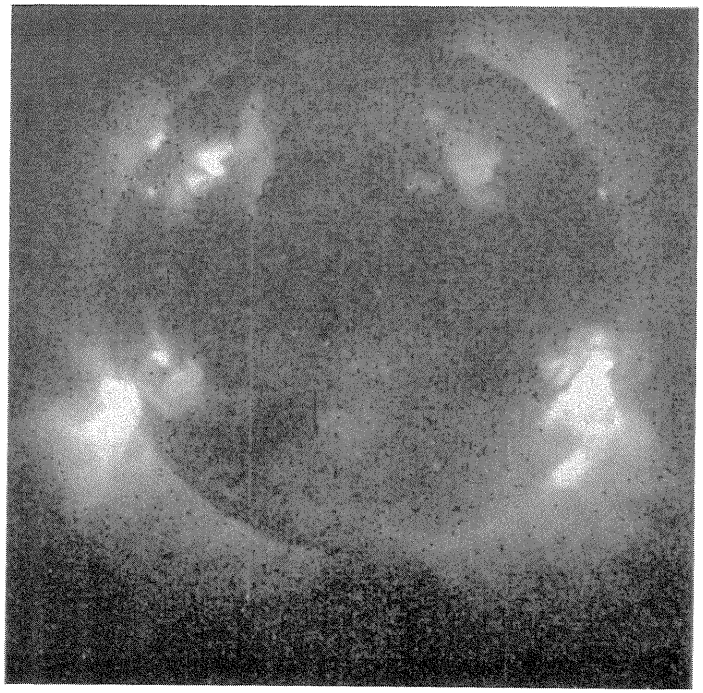
Day 17
11:37:44 UT



Day 19
12:04:54 UT



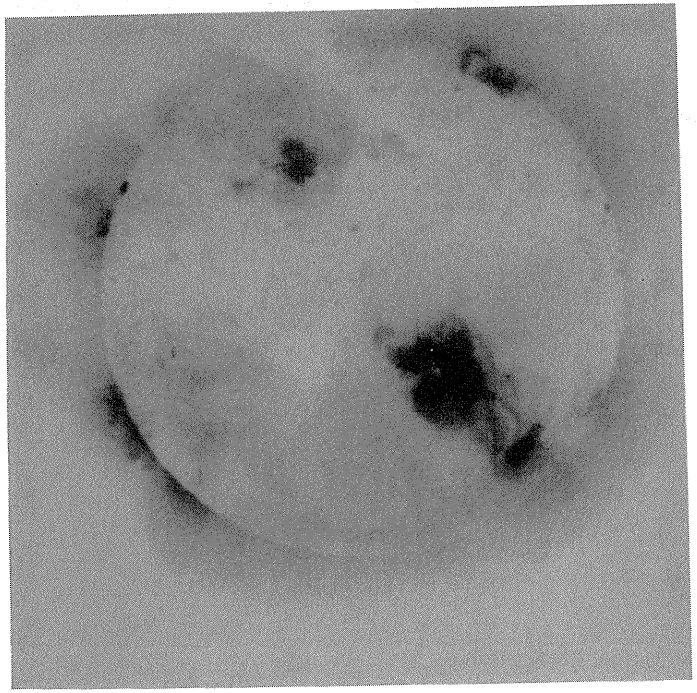
Day 18
12:46:42 UT



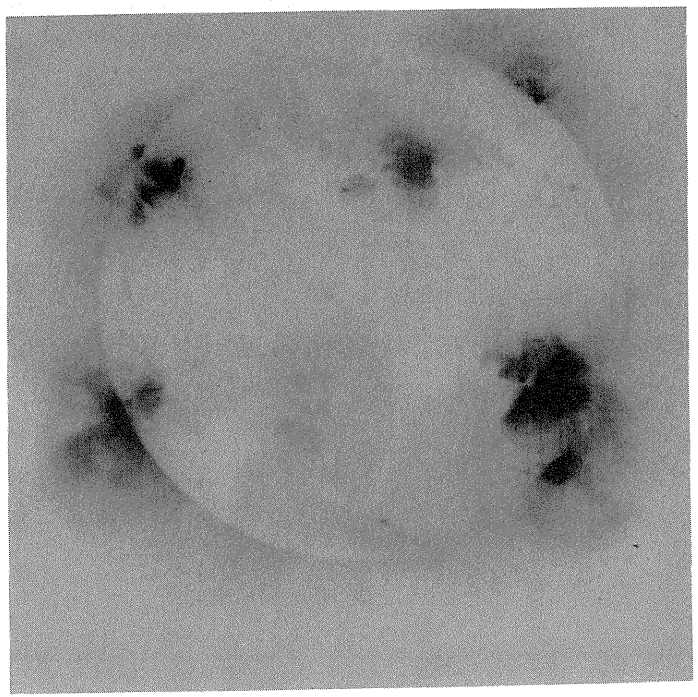
Day 20
11:45:21 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

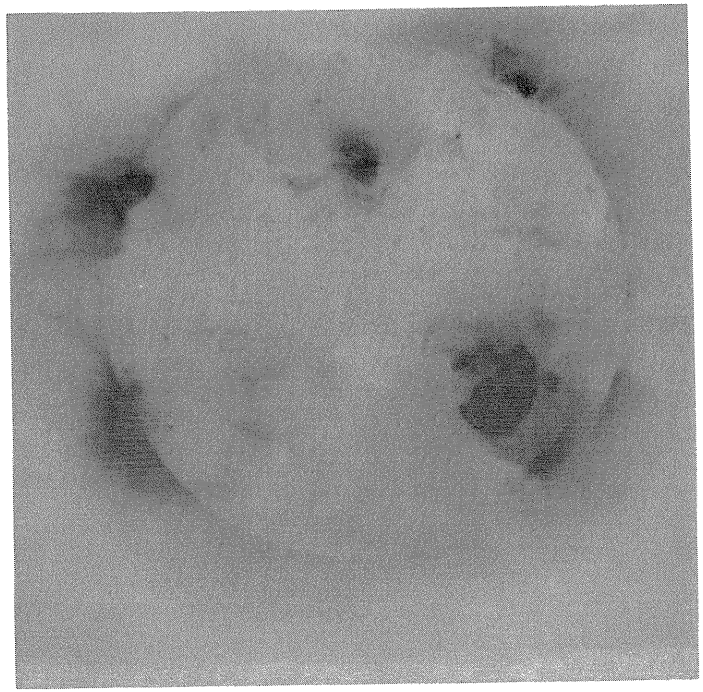
March 1998



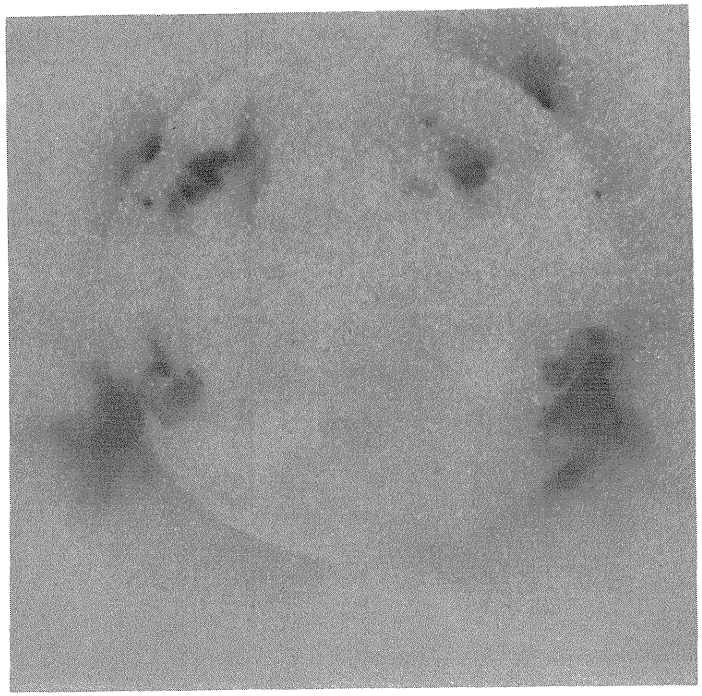
Day 17
11:37:44 UT



Day 19
12:04:54 UT



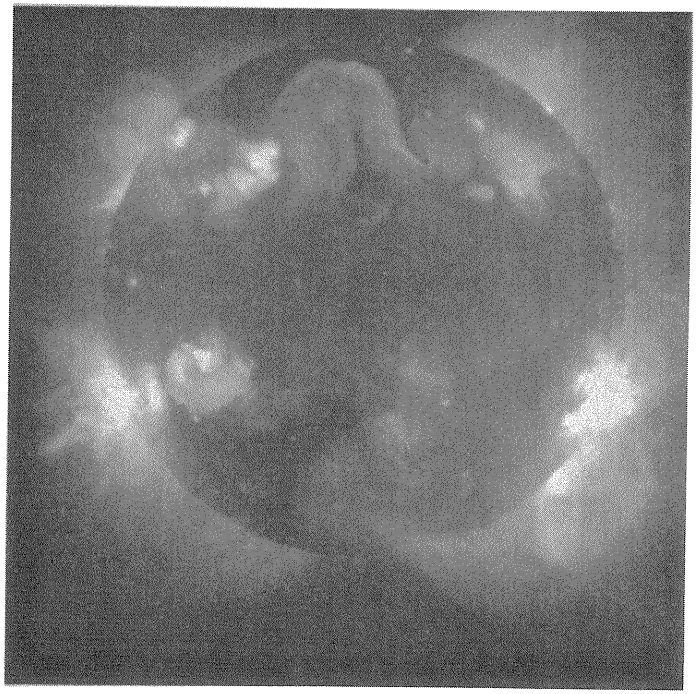
Day 18
12:46:42 UT



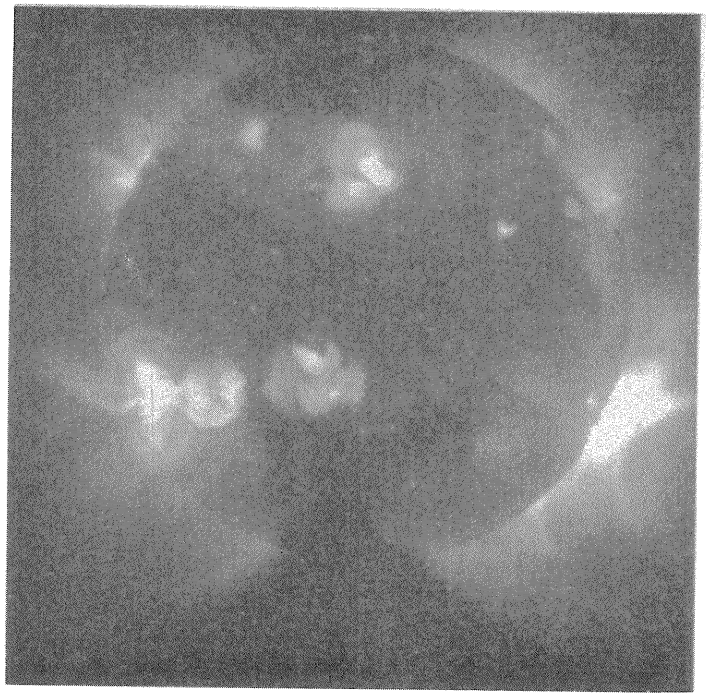
Day 20
11:45:21 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

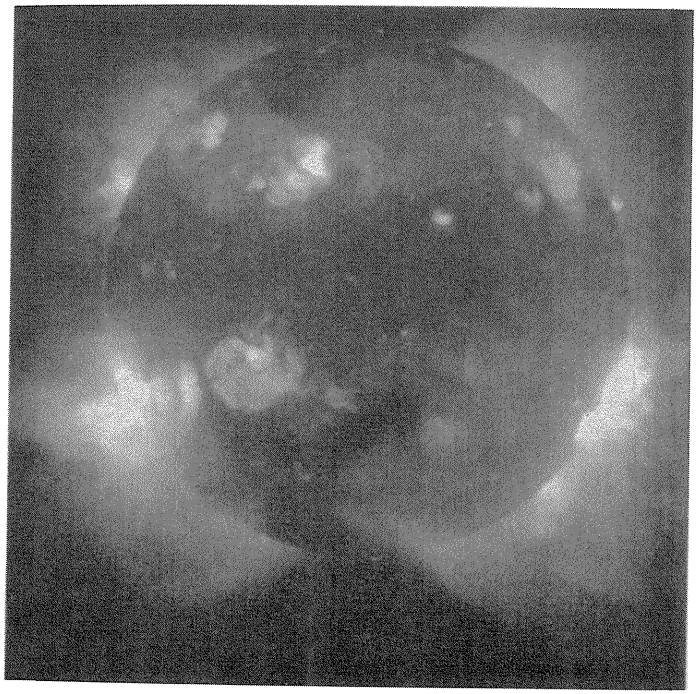
March 1998



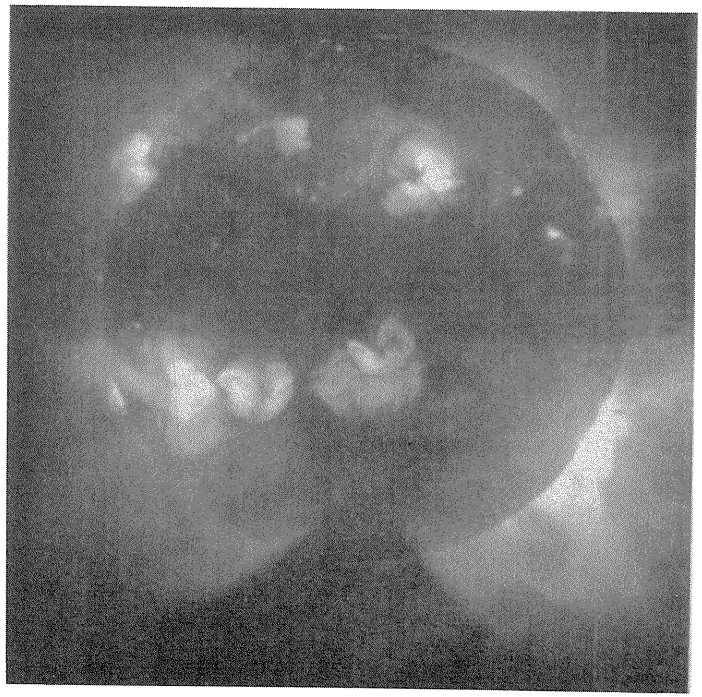
Day 21
12:06:25 UT



Day 23
11:47:29 UT



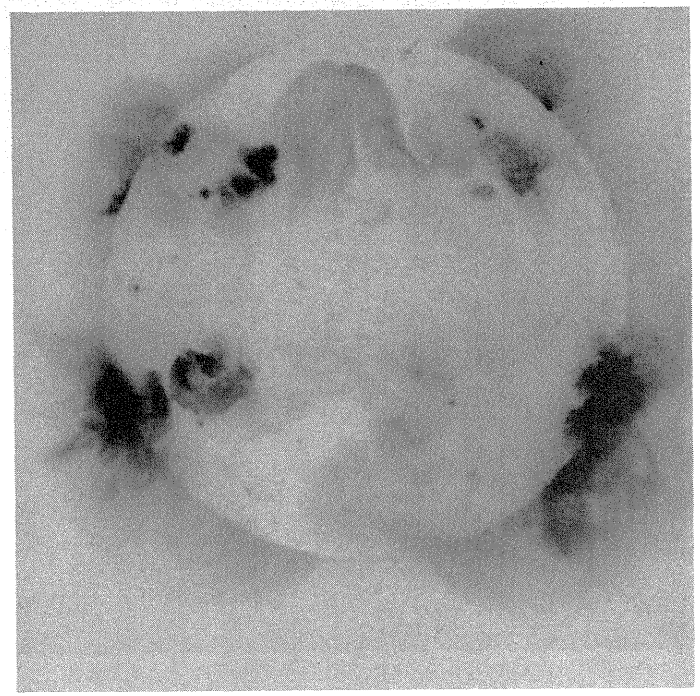
Day 22
09:46:55 UT



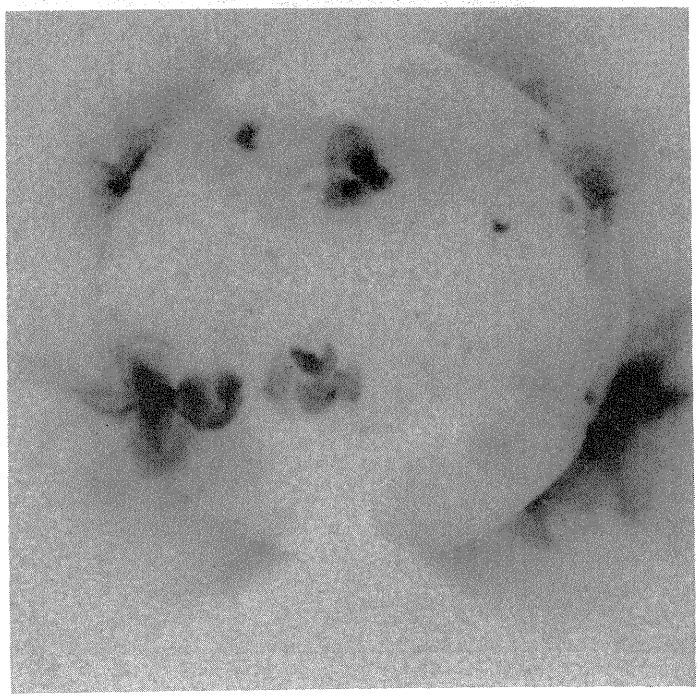
Day 24
12:47:39 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

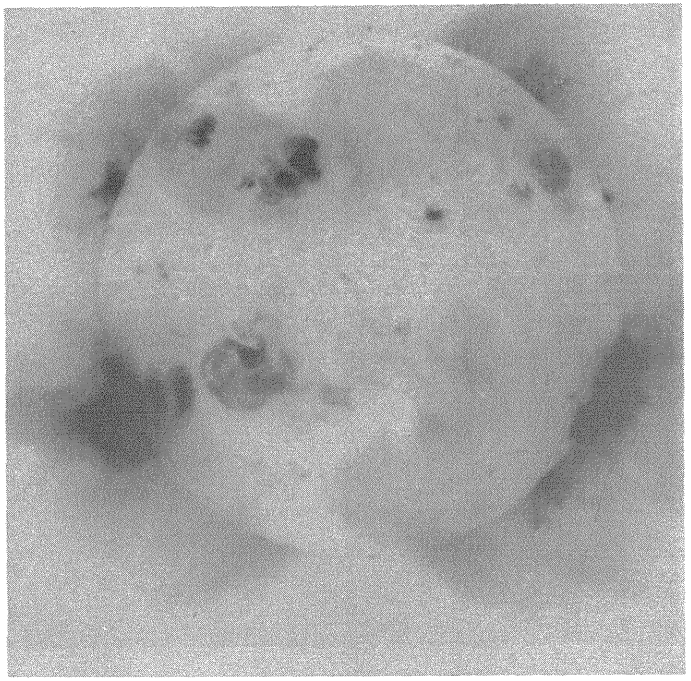
March 1998



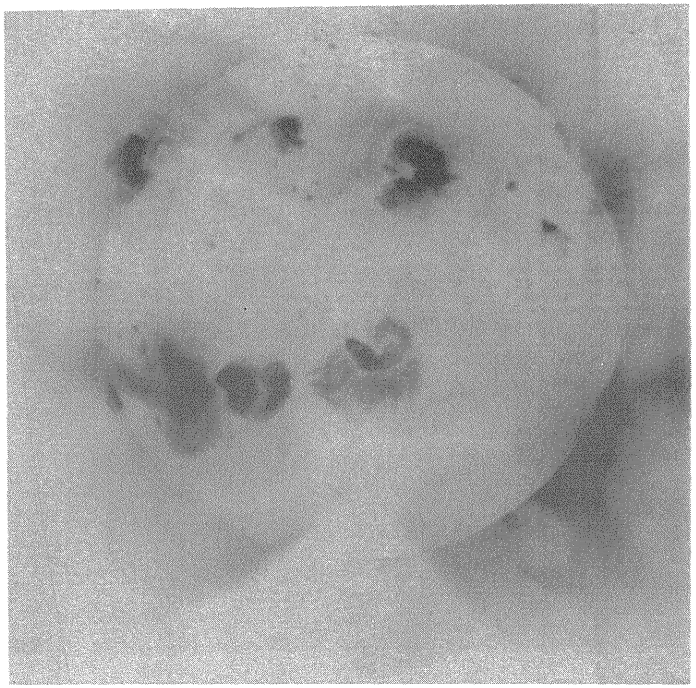
Day 21
12:06:25 UT



Day 23
11:47:29 UT



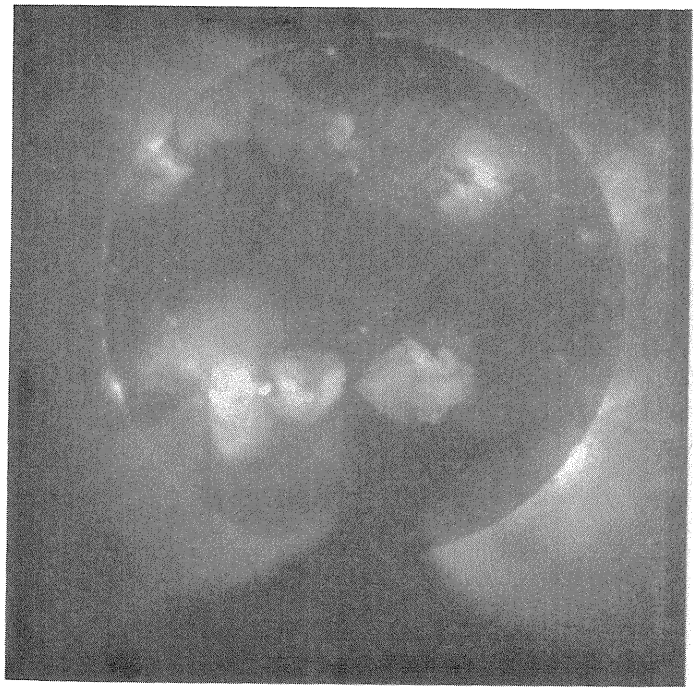
Day 22
09:46:55 UT



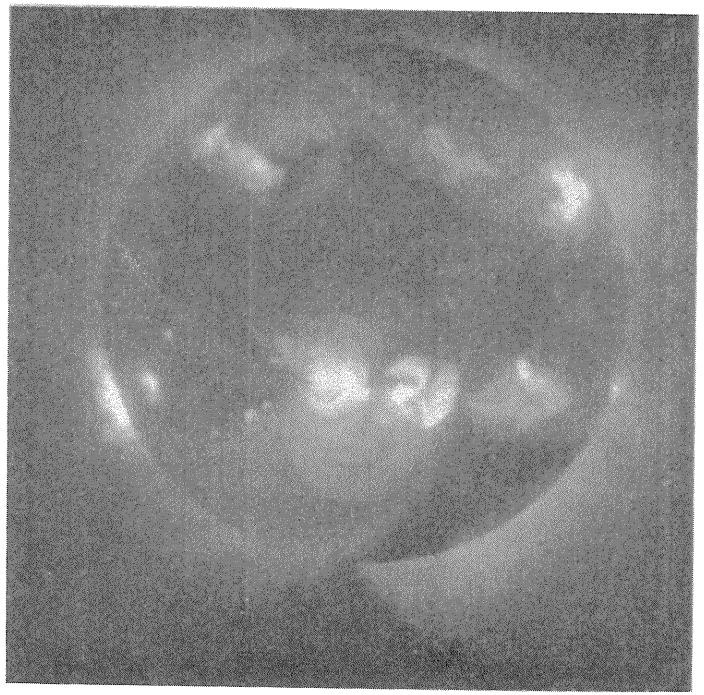
Day 24
12:47:39 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

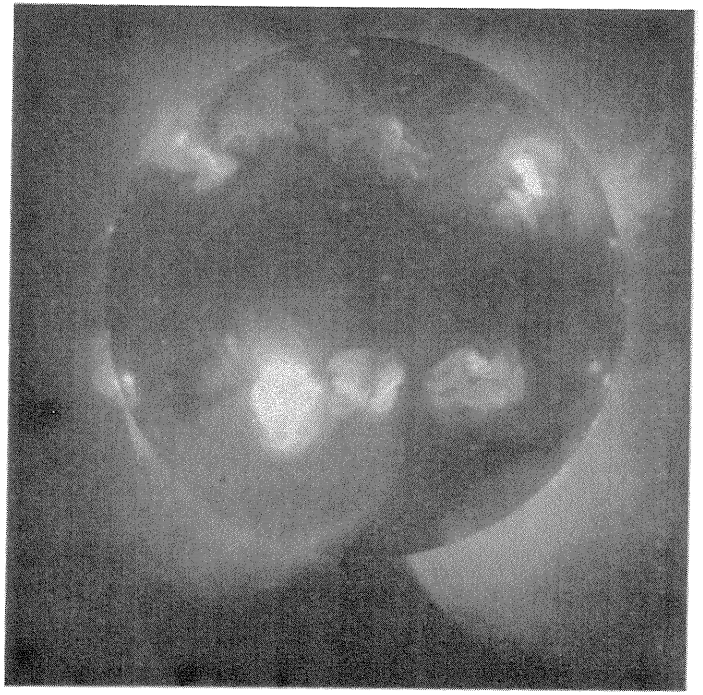
March
1998



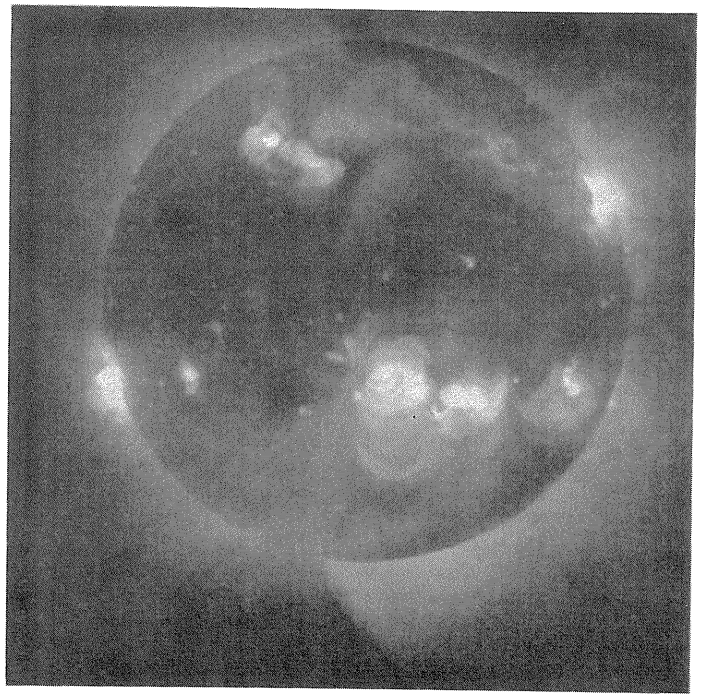
Day 25
11:28:00 UT



Day 27
12:02:56 UT



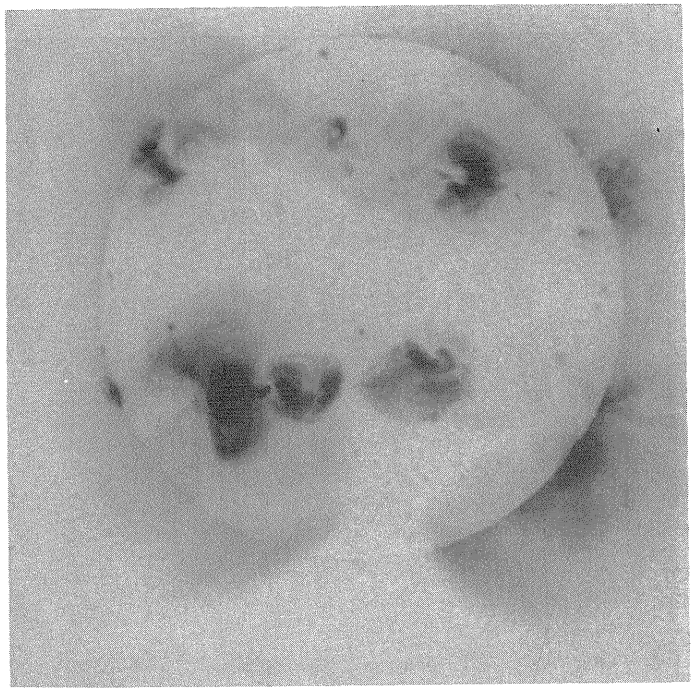
Day 26
11:48:30 UT



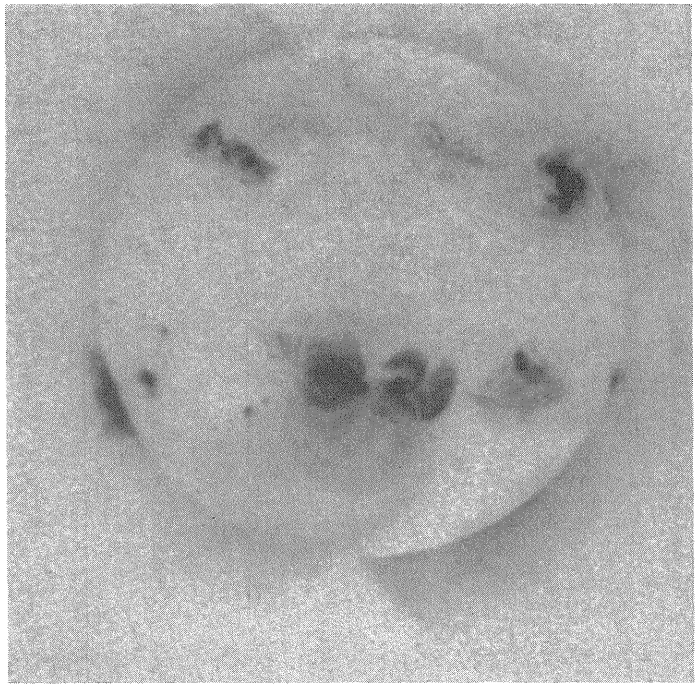
Day 28
13:14:10 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

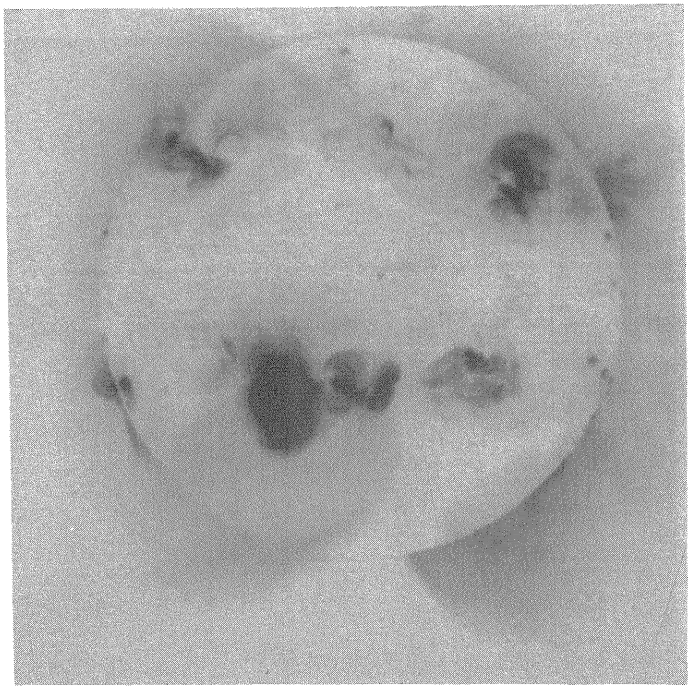
March 1998



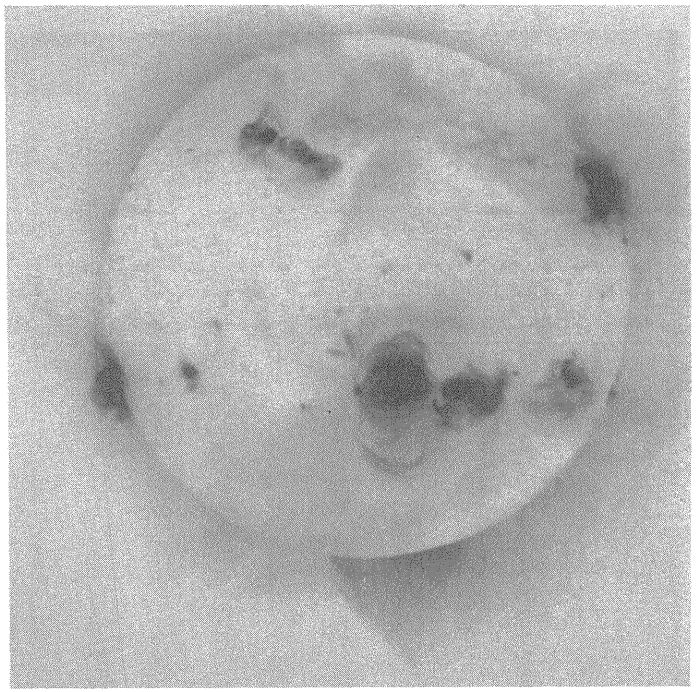
Day 25
11:28:00 UT



Day 27
12:02:56 UT



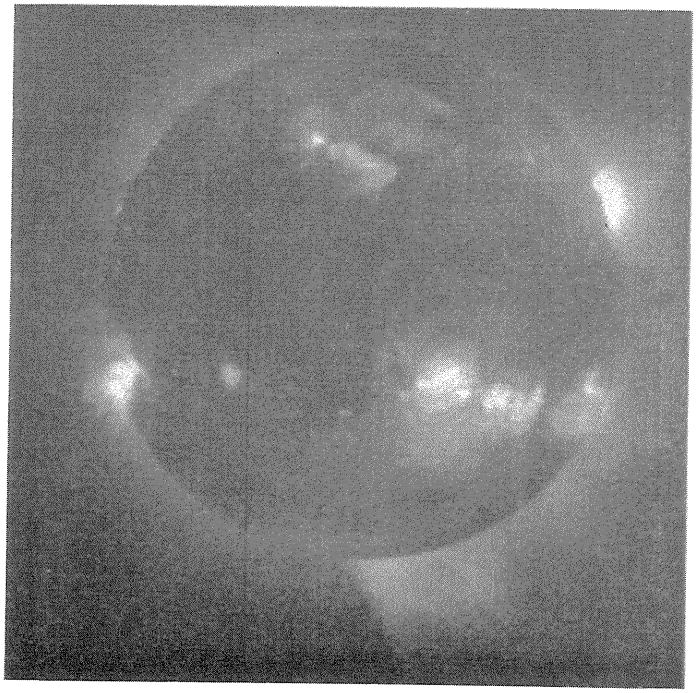
Day 26
11:48:30 UT



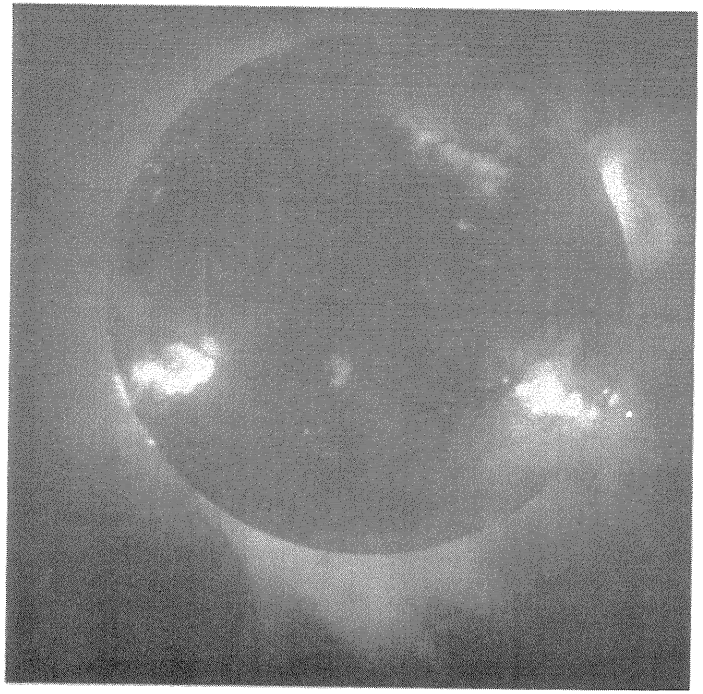
Day 28
13:14:10 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

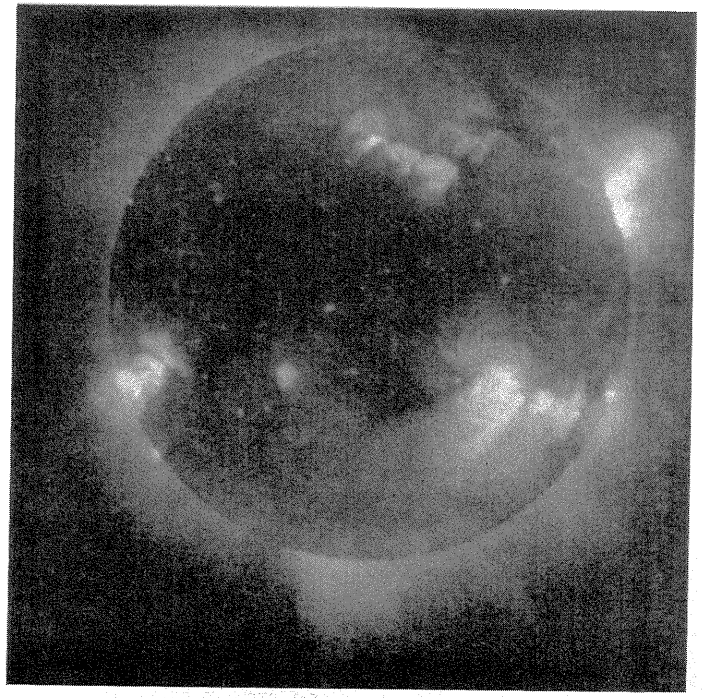
March
1998



Day 29
00:25:50 UT



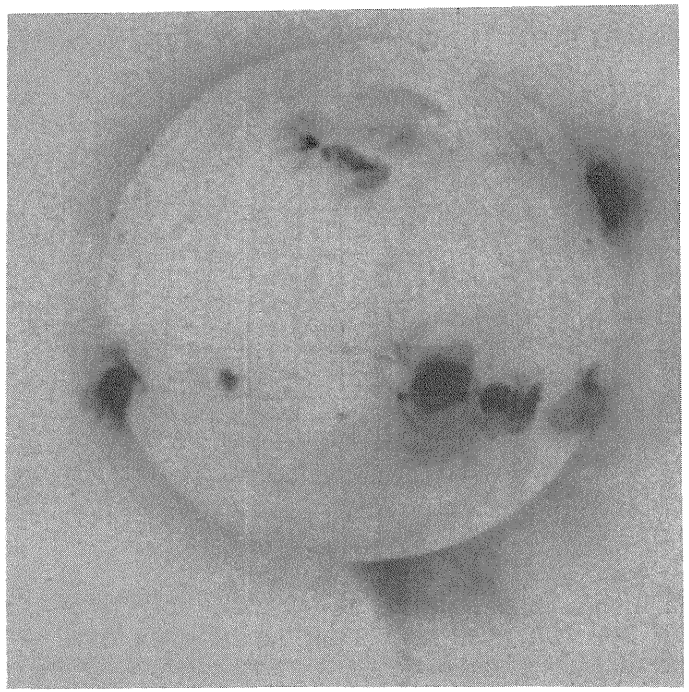
Day 31
12:08:15 UT



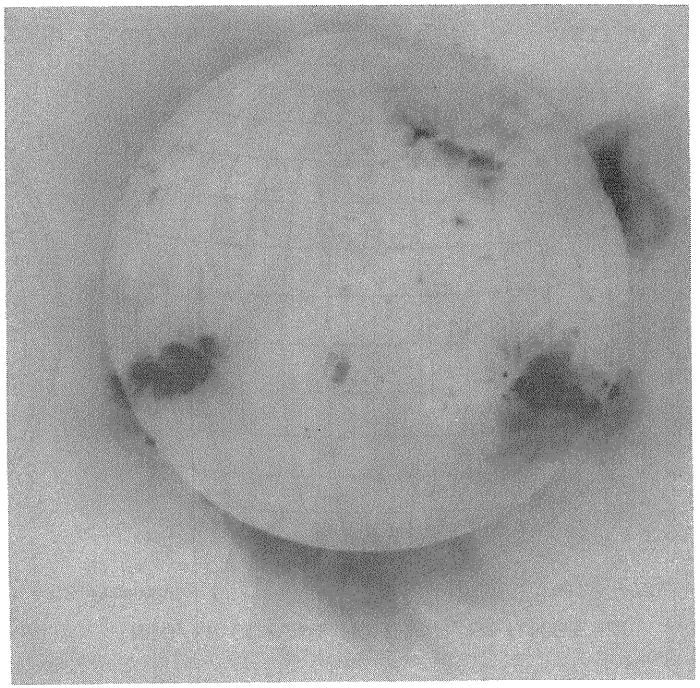
Day 30
11:56:31 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

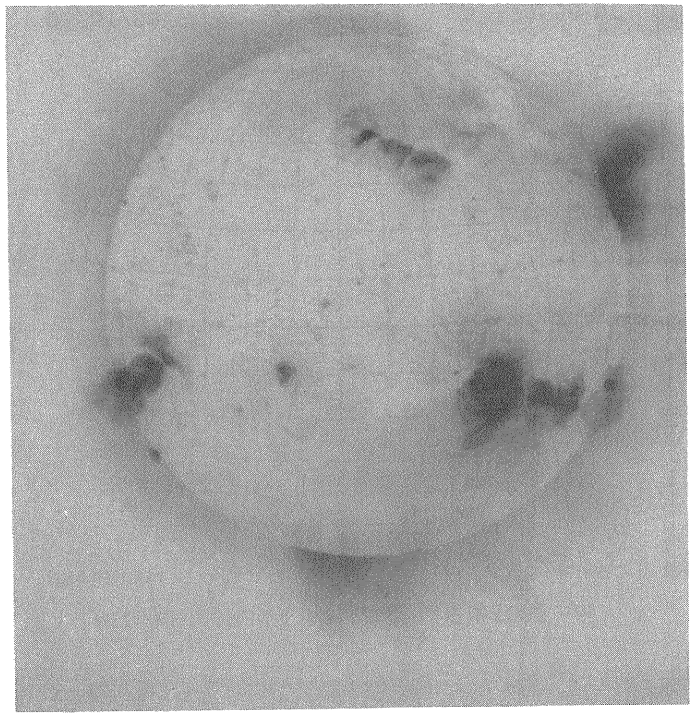
March
1998



Day 29
00:25:50 UT

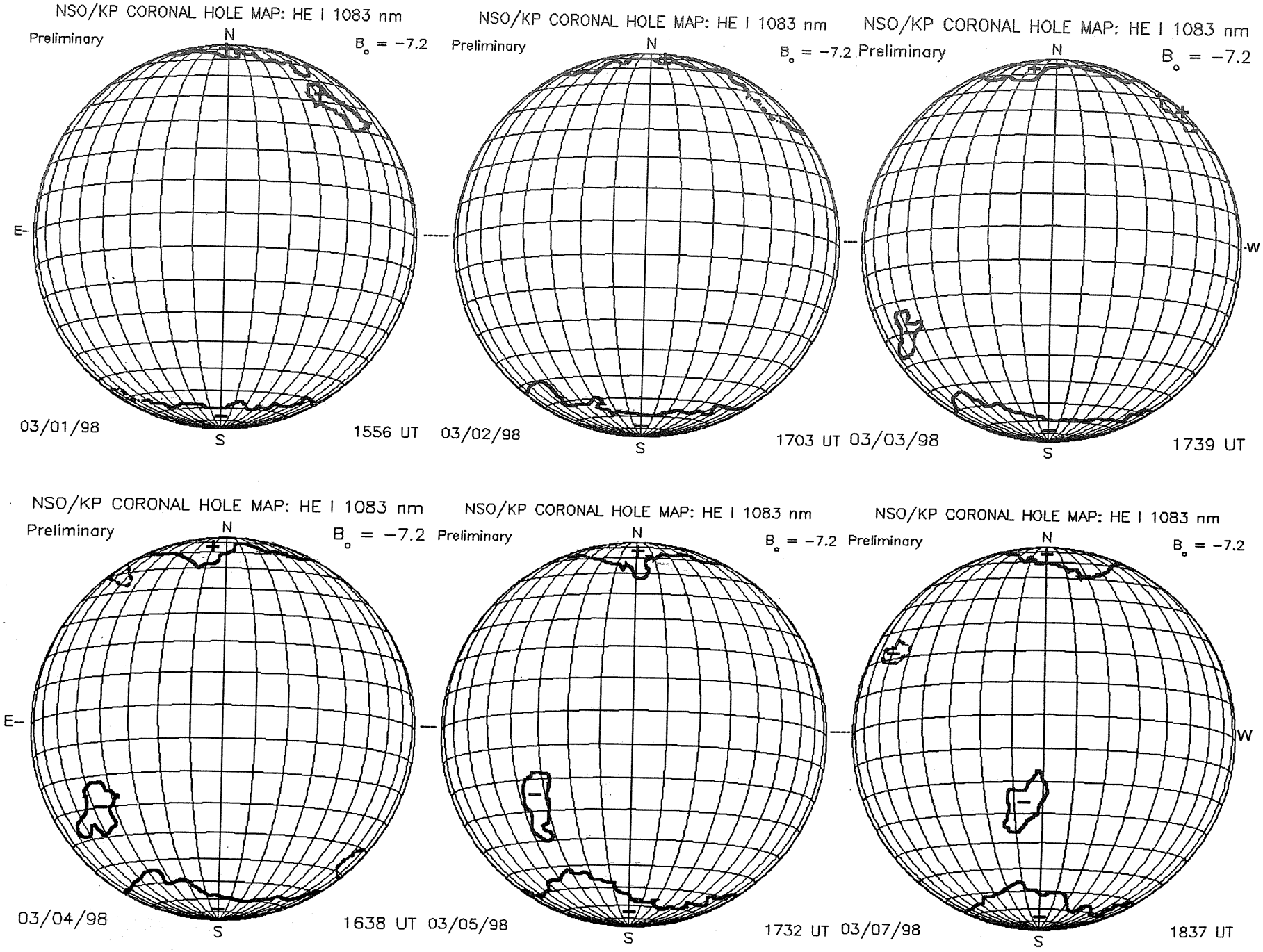


Day 31
12:08:15 UT

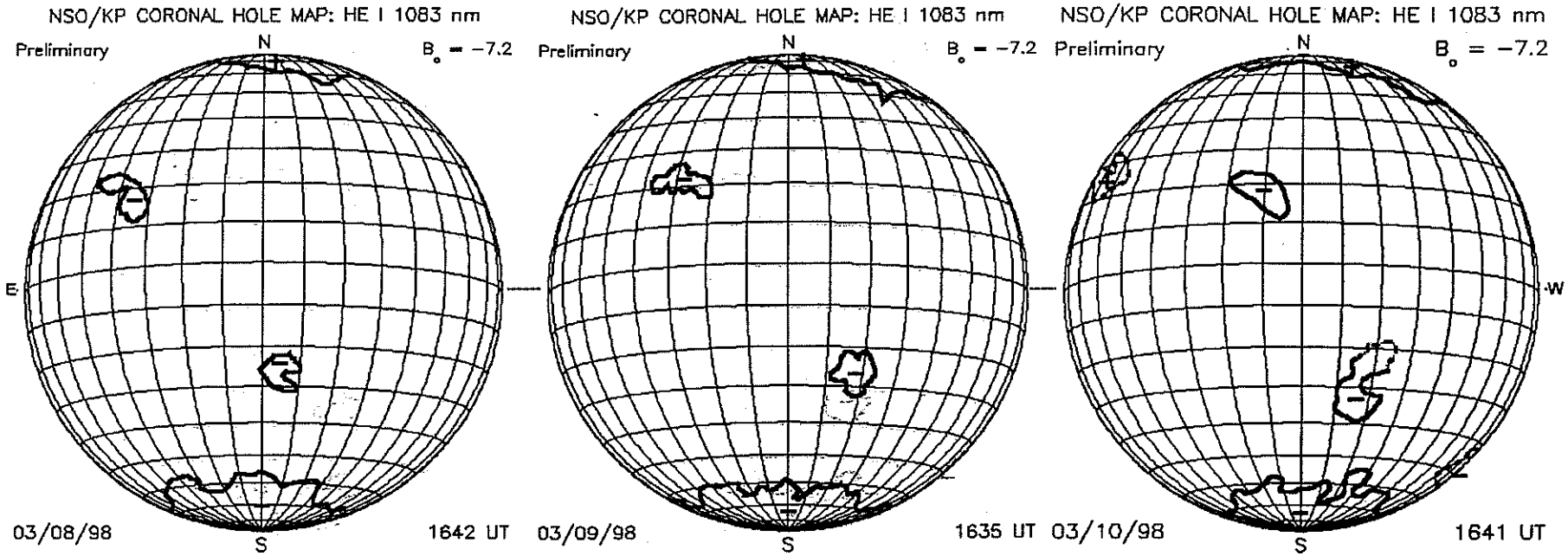


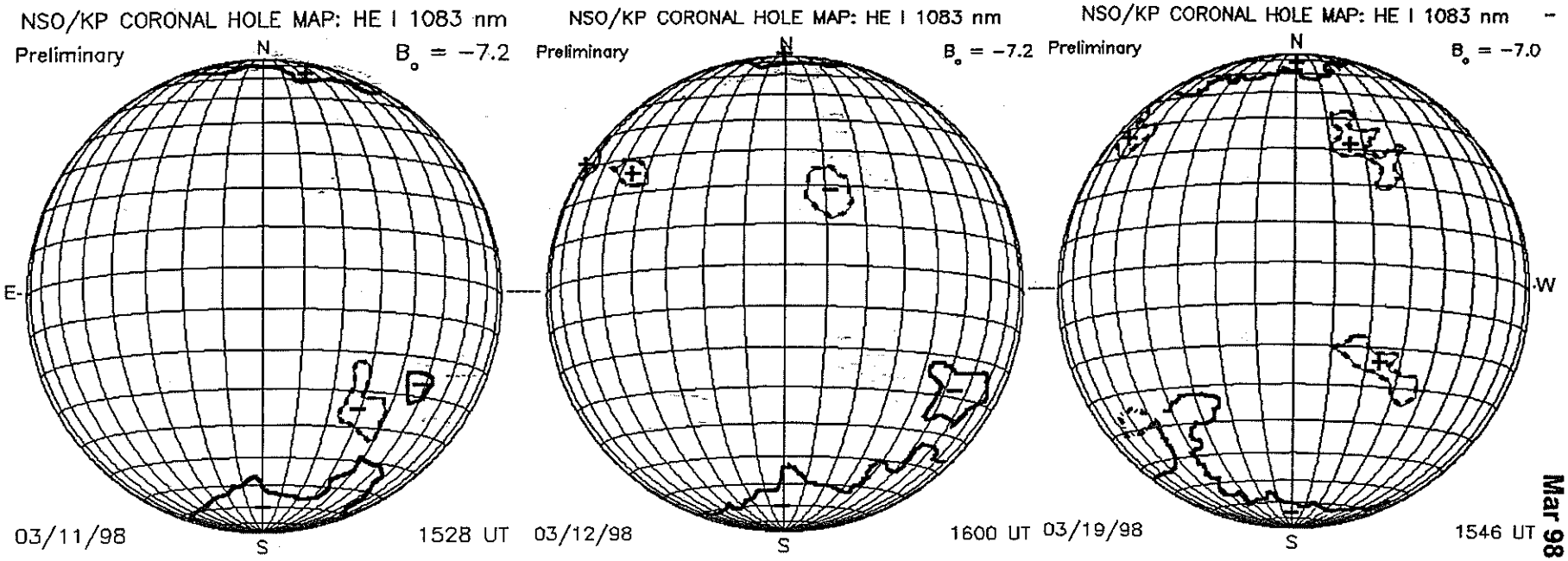
Day 30
11:56:31 UT

KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
March 1998

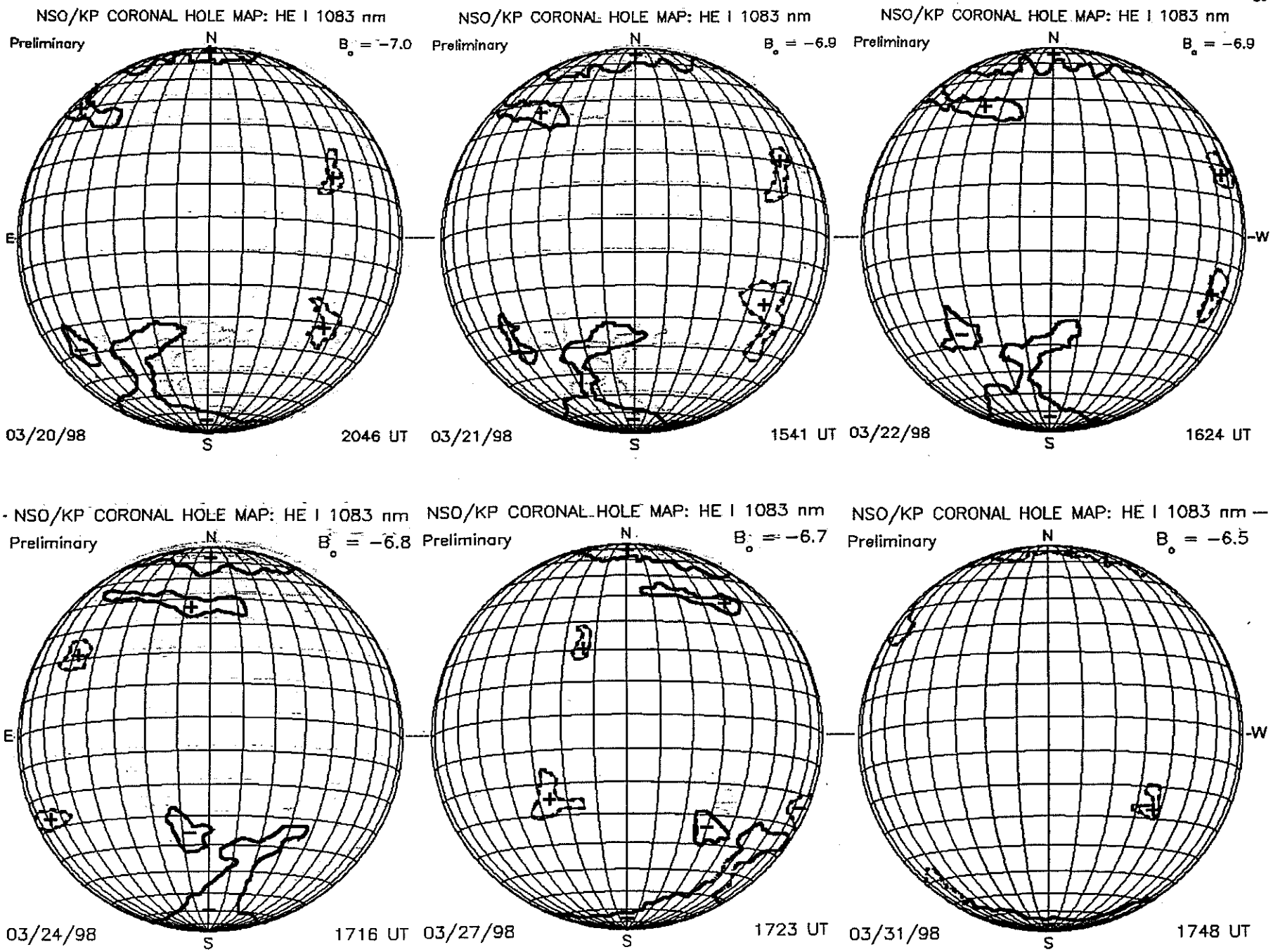


KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
March 1998





KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
March 1998



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

MARCH 1998

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
8172		KAND	03	01	0715	N21	E13	03	2.3			AX		1		4
8172		SVTO	03	01	1201	N23	E13	03	2.5		B	BXO	10	3	4	3
8172		RAMY	03	01	1239	N22	E11	03	2.4		B	BXO	10	4	4	4
8172		HOLL	03	01	1455	N22	E09	03	2.3		B	BXO	30	4	4	3
8172	28584	MWIL	03	01	1530	N22	E09	03	2.3	4	(B)					
8172		LEAR	03	02	0042	N22	E03	03	2.2		B	BXO	10	6	5	5
8172		RAMY	03	02	1255	N23	E01	03	2.6		A	AX		1		4
8172		HOLL	03	02	1528	N23	W04	03	2.3		B	BXO	10	3	7	4
8172	28584	MWIL	03	02	1545	N22	W05	03	2.3	3	(B)					
8172		SVTO	03	03	0700	N24	W12	03	2.4		B	BXO	10	2	3	3
8172		KAND	03	03	0705	N22	W13	03	2.3			BXO		2	2	3
8172		RAMY	03	03	1305	N23	W17	03	2.2		A	AX		1		4
8172	28584	MWIL	03	03	1530	N22	W19	03	2.2	4	(AP)					
8172		HOLL	03	03	1540	N21	W20	03	2.1		A	AX	10	2		3
8172		VORO	03	03	2305	N22	W24	03	2.1			AXX	18	1		2
8172		LEAR	03	04	0155	N21	W23	03	2.3		B	CRO	20	3	12	4
8172		SVTO	03	04	0635	N25	W24	03	2.4		B	BXO	10	3	6	3
8172		KAND	03	04	0850	N22	W28	03	2.2			CRI		7	6	5
8172		RAMY	03	04	1238	N22	W29	03	2.3		B	BXO	20	6	5	5
8172	28584	MWIL	03	04	1530	N22	W31	03	2.3	4	(B)					
8172		HOLL	03	04	1531	N22	W32	03	2.2		B	CRO	40	7	6	3
8172		VORO	03	04	2337	N22	W38	03	2.1			HAX	24	1		2
8172		LEAR	03	05	0348	N21	W39	03	2.2		B	CSO	40	6	5	3
8172		SVTO	03	05	0745	N25	W41	03	2.1		B	DRO	50	5	6	3
8172		KAND	03	05	0800	N22	W40	03	2.2			CSO		6	5	4
8172		RAMY	03	05	1257	N22	W43	03	2.2		B	CRO	60	7	5	4
8172		HOLL	03	05	1505	N22	W45	03	2.2		B	DRO	50	5	8	2
8172	28584	MWIL	03	05	1530	N22	W45	03	2.2	5	(B)					
8172		LEAR	03	06	0121	N21	W51	03	2.1		B	CSO	40	4	7	3
8172		SVTO	03	06	0730	N25	W55	03	2.0		B	CRO	40	5	7	3
8172		RAMY	03	06	1340	N22	W58	03	2.1		B	BXO	20	5	7	3
8172		HOLL	03	06	1745	N22	W58	03	2.3		B	BXO	50	8	7	2
8172	28584	MWIL	03	06	2100	N22	W61	03	2.2	3	(B)					
8172		VORO	03	06	2310	N22	W61	03	2.3			CRO	171	2	6	2
8172		LEAR	03	07	0130	N22	W65	03	2.1		B	CSO	50	6	8	3
8172		TACH	03	07	0526	N22	W65	03	2.2			BRI	15	7	7	3
8172		KAND	03	07	0705	N23	W66	03	2.2			BXO		3	7	3
8172		SVTO	03	07	0740	N25	W68	03	2.0		B	BXO	40	3	8	3
8172	28584	MWIL	03	07	1530	N22	W70	03	2.3	4	(B)					
8172		RAMY	03	07	1555	N22	W68	03	2.4		A	AX	10	2	1	2
8172		HOLL	03	07	1615	N23	W69	03	2.4		A	AX	10	1		3
8172		LEAR	03	08	0035	N22	W78	03	2.0		A	AX	10	1	1	3
8172A		HOLL	03	02	1528	N01	E17	03	3.9		A	AX		1		4
8172B		KAND	03	05	0800	N11	E21	03	6.9			AX		1		4
8172B		RAMY	03	05	1257	N13	E18	03	6.9		A	AX		1		4
8172C		SVTO	03	08	1244	S33	W17	03	7.2		B	BXO	10	2	3	3
8172C		RAMY	03	08	1249	S33	W13	03	7.5		B	BXO	10	2	2	3
8172C		HOLL	03	08	1546	S33	W18	03	7.2		B	BXO	10	2	3	3
8173		RAMY	03	01	1239	S18	E75	03	7.2		A	AX		1		4
8173		HOLL	03	01	1455	S16	E77	03	7.5		A	AX	10	1		3
8173	28585	MWIL	03	01	1530	S17	E75	03	7.3	4	(AP)					
8173		LEAR	03	02	0042	S16	E68	03	7.2		A	AX	10	1	1	5
8173		SVTO	03	02	1010	S18	E65	03	7.4		A	AX		1		3
8173		RAMY	03	02	1255	S17	E64	03	7.4		A	AX	10	1		4
8173		HOLL	03	02	1528	S16	E62	03	7.3		A	AX		1		4
8173	28585	MWIL	03	02	1545	S17	E61	03	7.3	3	(AF)					
8173		HOLL	03	03	1540	S15	E47	03	7.2		A	AX		1		3
8173		RAMY	03	04	1238	S16	E35	03	7.2		A	AX		1		5
8173		SVTO	03	06	0730	S18	E17	03	7.6		B	BXO		2	2	3
8173		RAMY	03	06	1340	S17	E16	03	7.8		A	AX		1		3
8173		RAMY	03	13	1242	S19	W79	03	7.5		B	CRO	20	3	3	4
8173		HOLL	03	13	1511	S19	W76	03	7.8		B	BXO	30	3	5	3
8173	28594	MWIL	03	13	1520	S18	W79	03	7.6	3	X					
8173		LEAR	03	14	0108	S19	W87	03	7.4		A	AX		1		3

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

MARCH 1998

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
8173A	28591	MWIL	03	11	1515	S26	W22	03	9.9	3	(AP)					
8174		RAMY	03	06	1340	S16	E54	03	10.7		A	AX		1		3
8174		HOLL	03	06	1745	S18	E53	03	10.8		B	BXO	10	2	4	2
8174	28586	MWIL	03	06	2100	S17	E52	03	10.8	3	(B)					
8174		VORO	03	06	2310	S18	E51	03	10.8			CRO	84	2	4	2
8174		LEAR	03	07	0130	S16	E49	03	10.8		B	BXO	20	4	4	3
8174		TACH	03	07	0526	S17	E47	03	10.8			ARI	43	9	4	3
8174		KAND	03	07	0705	S18	E47	03	10.9			BXO		5	5	3
8174		SVTO	03	07	0740	S18	E46	03	10.8		B	CRO	40	6	7	3
8174	28586	MWIL	03	07	1530	S17	E41	03	10.8	4	(B)					
8174		RAMY	03	07	1555	S18	E41	03	10.8		B	DSO	50	8	5	2
8174		HOLL	03	07	1615	S18	E41	03	10.8		B	DSO	60	7	5	3
8174		LEAR	03	08	0035	S18	E38	03	10.9		B	CSO	50	10	7	3
8174		VORO	03	08	0040	S17	E37	03	10.8			CRO	190	6	5	2
8174		TACH	03	08	0515	S17	E34	03	10.8			CSI	110	4	6	3
8174		KAND	03	08	0750	S19	E32	03	10.8			CSO		6	6	3
8174		SVTO	03	08	1244	S20	E30	03	10.8		B	CSO	40	5	6	3
8174		RAMY	03	08	1249	S18	E31	03	10.9		B	CSO	60	9	7	3
8174	28586	MWIL	03	08	1515	S17	E28	03	10.8	5	(B)					
8174		HOLL	03	08	1546	S18	E28	03	10.8		A	AX	70	6	7	3
8174		LEAR	03	09	0020	S17	E24	03	10.8		B	DSO	50	11	8	3
8174		VORO	03	09	0040	S18	E25	03	10.9			CRO	56	3	6	2
8174		TACH	03	09	0509	S18	E20	03	10.7			CSI	112	11	6	3
8174		KAND	03	09	0820	S18	E19	03	10.8			CSO		7	6	2
8174	28586	MWIL	03	09	1500	S17	E16	03	10.8	4	(B)					
8174		VORO	03	09	2320	S18	E12	03	10.9			BXO	36	3	6	2
8174		LEAR	03	10	0146	S18	E11	03	10.9		B	DAO	50	7	8	4
8174		TACH	03	10	0502	S18	E08	03	10.8			BSI	65	7	6	3
8174		SVTO	03	10	0747	S18	E07	03	10.8		B	CRO	30	4	6	2
8174		RAMY	03	10	1233	S18	E04	03	10.8		B	BXO	20	5	7	3
8174		HOLL	03	10	1450	S17	E03	03	10.8		B	CSO	30	7	7	3
8174	28586	MWIL	03	10	1500	S18	E02	03	10.8	5	(B)					
8174		VORO	03	10	2304	S19	W02	03	10.8			BXO	38	3	6	2
8174		LEAR	03	11	0056	S18	W03	03	10.8		B	CAO	30	6	8	4
8174		TACH	03	11	0535	S17	W05	03	10.8			BRI	37	3	6	3
8174		SVTO	03	11	0845	S18	W09	03	10.7		B	CRO	20	5	4	3
8174		RAMY	03	11	1227	S17	W10	03	10.7		B	BXO	20	5	4	3
8174	28586	MWIL	03	11	1515	S17	W12	03	10.7	5	(B)					
8174		HOLL	03	11	1647	S17	W12	03	10.8		B	BXO	30	5	5	3
8174		LEAR	03	12	0203	S17	W19	03	10.6		A	HS	10	1	1	3
8174		TACH	03	12	0554	S17	W19	03	10.8			BSI	45	2	3	3
8174		SVTO	03	12	0825	S17	W22	03	10.7		B	BXO	10	2	5	3
8174		KAND	03	12	0910	S17	W23	03	10.6			AX		1		2
8174		RAMY	03	12	1230	S17	W25	03	10.6		A	AX	10	1		4
8174	28586	MWIL	03	12	1500	S16	W26	03	10.6	5	(AP)					
8174		HOLL	03	12	1530	S17	W27	03	10.6		A	AX	10	1		4
8174		VORO	03	12	2304	S17	W31	03	10.6			AXX	20	1		2
8174		LEAR	03	13	0042	S17	W32	03	10.6		A	AX	10	1	1	3
8174		KAND	03	13	0930	S17	W36	03	10.7			AX		2	1	1
8174		RAMY	03	13	1242	S18	W38	03	10.6		A	AX	10	1		4
8174		HOLL	03	13	1511	S17	W39	03	10.7		A	AX	10	1	1	3
8174	28586	MWIL	03	13	1520	S17	W40	03	10.6	4	(AP)					
8174		LEAR	03	14	0108	S18	W45	03	10.6		A	AX	10	1		3
8174		KAND	03	14	0705	S18	W48	03	10.6			AX		1		4
8174		RAMY	03	14	1205	S18	W52	03	10.5		A	AX		1		4
8174		SVTO	03	14	1219	S15	W52	03	10.6		A	AX		1	1	3
8174		HOLL	03	14	1738	S17	W55	03	10.5		A	AX		1		2
8175	28587	MWIL	03	06	2100	N46	E70	03	12.7	3	(AP)					
8175		VORO	03	06	2310	N46	E72	03	13.0			HAX	215	1		2
8175		TACH	03	07	0526	N47	E67	03	12.8			AXX	5	1	1	3
8175	28587	MWIL	03	07	1530	N46	E62	03	12.8	4	(AP)					
8175		RAMY	03	07	1555	N45	E60	03	12.6		A	HS	30	1	1	2
8175		HOLL	03	07	1615	N44	E59	03	12.5		A	AX	20	2	1	3
8175		LEAR	03	08	0035	N48	E58	03	12.9		A	HA	20	1	2	3
8175		VORO	03	08	0040	N47	E59	03	13.0			HAX	115	1		2
8175		TACH	03	08	0515	N46	E53	03	12.6			HSX	45	1	2	3
8175		KAND	03	08	0750	N43	E51	03	12.5			HA		1	1	3

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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
8175		SVTO	03	08	1244	N45	E50	03	12.7		A	HA	60	1	3	3
8175		RAMY	03	08	1249	N46	E50	03	12.7		A	HS	50	1	1	3
8175	28587	MWIL	03	08	1515	N46	E50	03	12.8	5	(AP)					
8175		HOLL	03	08	1546	N45	E50	03	12.8		B	DSO	30	1	1	3
8175		LEAR	03	09	0020	N47	E46	03	12.9		A	HA	50	1	3	3
8175		VORO	03	09	0040	N46	E48	03	13.0			HAX	47	1		2
8175		TACH	03	09	0509	N45	E40	03	12.5			HSX	50	1	2	3
8175		KAND	03	09	0820	N45	E39	03	12.6			HA		1	1	2
8175	28587	MWIL	03	09	1500	N46	E38	03	12.8	4	(AP)					
8175		VORO	03	09	2320	N46	E35	03	12.9			HAX	44	1		2
8175		LEAR	03	10	0146	N47	E34	03	12.9		A	HA	40	1	2	4
8175		TACH	03	10	0502	N45	E31	03	12.8			HSX	30	1	1	3
8175		SVTO	03	10	0747	N47	E35	03	13.2		A	HR	20	1	1	2
8175		RAMY	03	10	1233	N47	E28	03	12.9		A	HS	20	1	1	3
8175		HOLL	03	10	1450	N46	E28	03	12.9		A	HS	20	1	1	3
8175	28587	MWIL	03	10	1500	N46	E28	03	12.9	4	(AP)					
8175		VORO	03	10	2304	N46	E24	03	13.0			HAX	29	1		2
8175		LEAR	03	11	0056	N47	E22	03	12.9		A	HA	20	1	1	4
8175		TACH	03	11	0535	N45	E20	03	12.9			HSX	50	1	2	3
8175		SVTO	03	11	0845	N45	E22	03	13.2		A	HR	30	1	1	3
8175		RAMY	03	11	1227	N48	E17	03	12.9		A	HR	10	1	1	3
8175	28587	MWIL	03	11	1515	N46	E17	03	13.0	5	(AP)					
8175		HOLL	03	11	1647	N47	E16	03	13.0		A	AX	10	1	1	3
8175		LEAR	03	12	0203	N48	E12	03	13.1		A	HR	10	1	1	3
8175		TACH	03	12	0554	N45	E10	03	13.1			HSX	40	1	2	3
8175		SVTO	03	12	0825	N47	E10	03	13.2		A	HR	20	1	1	3
8175		KAND	03	12	0910	N46	E07	03	13.0			AX		1		2
8175		RAMY	03	12	1230	N47	E06	03	13.0		A	AX	10	1	1	4
8175	28587	MWIL	03	12	1500	N47	E05	03	13.0	5	(AP)					
8175		HOLL	03	12	1530	N47	E04	03	13.0		A	HR	20	1		4
8175		VORO	03	12	2304	N48	E01	03	13.0			BXO	27	2	1	2
8175		LEAR	03	13	0042	N48	E00	03	13.0		A	HS	20	1	1	3
8175		KAND	03	13	0930	N46	W05	03	13.0			AX		1		1
8175		RAMY	03	13	1242	N47	W08	03	12.8		A	AX	10	1		4
8175		HOLL	03	13	1511	N47	W08	03	13.0		A	AX	10	1	1	3
8175	28587	MWIL	03	13	1520	N47	W06	03	13.1	4	(AP)					
8175		LEAR	03	14	0108	N47	W13	03	12.9		A	HS	30	1	1	3
8175		KAND	03	14	0705	N47	W15	03	13.0			AX		1		4
8175		RAMY	03	14	1205	N48	W20	03	12.8		A	AX	10	1	1	4
8175		SVTO	03	14	1219	N49	W16	03	13.2		A	AX		1	1	3
8175		HOLL	03	14	1738	N47	W21	03	13.0		A	AX	10	1	1	2
8175		VORO	03	15	0000	N49	W25	03	12.9			AXX	18	1		2
8175		RAMY	03	15	1223	N47	W31	03	12.9		A	AX		1		4
8175	28587	MWIL	03	15	1520	N47	W30	03	13.1	4	(AP)					
8176		TACH	03	07	0526	S42	E76	03	13.5			HSX	32	3	2	3
8176		KAND	03	07	0705	S42	E76	03	13.5			AX		1		3
8176		SVTO	03	07	0740	S43	E73	03	13.3		A	AX	10	1	1	3
8176		RAMY	03	07	1555	S42	E70	03	13.4		A	AX		1		2
8176		LEAR	03	08	0035	S39	E67	03	13.5		A	AX	10	1		3
8176		TACH	03	08	0515	S41	E62	03	13.3			AXX	10	1	1	3
8176		KAND	03	08	0750	S42	E64	03	13.6			BXI		4	5	3
8176		SVTO	03	08	1244	S44	E59	03	13.4		B	BXO	40	5	6	3
8176		RAMY	03	08	1249	S40	E60	03	13.4		B	BXO	30	7	5	3
8176	28588	MWIL	03	08	1515	S41	E58	03	13.4	4	(B)					
8176		HOLL	03	08	1546	S43	E57	03	13.3		B	BXO	40	6	7	3
8176		LEAR	03	09	0020	S40	E54	03	13.4		B	CSO	50	7	9	3
8176		VORO	03	09	0040	S41	E53	03	13.4			BXO	88	5	4	2
8176		TACH	03	09	0509	S40	E48	03	13.1			BXI	47	7	6	3
8176		KAND	03	09	0820	S41	E49	03	13.3			BXO		9	9	2
8176	28588	MWIL	03	09	1500	S40	E45	03	13.3	4	(B)					
8176		VORO	03	09	2320	S40	E41	03	13.3			CRO	131	4	3	2
8176		LEAR	03	10	0146	S38	E41	03	13.4		B	DAO	120	14	8	4
8176		TACH	03	10	0502	S40	E39	03	13.4			CAI	155	13	7	3
8176		SVTO	03	10	0747	S40	E35	03	13.2		B	CSO	100	10	9	2
8176		RAMY	03	10	1233	S39	E36	03	13.4		B	DAO	120	15	10	3
8176		HOLL	03	10	1450	S40	E34	03	13.4		B	DSO	110	16	10	3
8176	28588	MWIL	03	10	1500	S40	E33	03	13.3	5	(B)					
8176		VORO	03	10	2304	S40	E30	03	13.4			CRO	167	6	7	2

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8176		LEAR	03	11	0056	S38	E29	03	13.4		B	DAO	120	15	8	4
8176		TACH	03	11	0535	S40	E26	03	13.3			BRI	104	14	10	3
8176		SVTO	03	11	0845	S42	E23	03	13.2		B	EAO	110	19	12	3
8176		RAMY	03	11	1227	S39	E23	03	13.4		B	EAO	140	25	12	3
8176	28588	MWIL	03	11	1515	S40	E20	03	13.3	5	(B)					
8176		HOLL	03	11	1647	S38	E21	03	13.4		B	EAI	180	26	13	3
8176		LEAR	03	12	0203	S40	E16	03	13.4		B	EAI	180	23	13	3
8176		TACH	03	12	0554	S41	E14	03	13.4			DAI	80	23	9	3
8176		SVTO	03	12	0825	S41	E11	03	13.2		B	EAO	130	33	12	3
8176		KAND	03	12	0910	S40	E10	03	13.2			DAI		19	13	2
8176		RAMY	03	12	1230	S39	E11	03	13.4		B	EAO	110	24	14	4
8176	28588	MWIL	03	12	1500	S40	E08	03	13.3	4	(B)					
8176		HOLL	03	12	1530	S39	E11	03	13.5		B	EAO	140	20	14	4
8176		VORO	03	12	2304	S41	E06	03	13.4			CRO	220	8	8	2
8176		LEAR	03	13	0042	S40	E05	03	13.4		B	EAO	150	17	14	3
8176		KAND	03	13	0930	S40	W01	03	13.3			DAI		24	12	1
8176		RAMY	03	13	1242	S40	W01	03	13.4		B	EAI	210	27	14	4
8176		HOLL	03	13	1511	S40	W02	03	13.5		B	EAI	270	13	13	3
8176	28588	MWIL	03	13	1520	S40	W04	03	13.3	5	(B)					
8176		LEAR	03	14	0108	S39	W09	03	13.3		B	ESI	140	20	11	3
8176		VORO	03	14	0136	S40	W09	03	13.3			BXO	65	6	8	1
8176		KAND	03	14	0705	S40	W12	03	13.3			EAO		11	12	4
8176		RAMY	03	14	1205	S40	W14	03	13.4		B	EAO	180	13	12	4
8176		SVTO	03	14	1219	S39	W18	03	13.0		B	CAO	140	15	12	3
8176		HOLL	03	14	1738	S40	W18	03	13.3		B	EAO	120	15	13	2
8176		VORO	03	15	0000	S41	W20	03	13.4			CRO	187	3	9	2
8176		LEAR	03	15	0201	S41	W22	03	13.3		B	ESI	80	7	13	4
8176		KAND	03	15	1155	S39	W25	03	13.5			ESO		9	12	3
8176		RAMY	03	15	1223	S40	W27	03	13.3		B	ESO	130	18	13	4
8176		SVTO	03	15	1408	S39	W30	03	13.1		B	CSO	80	9	13	2
8176	28588	MWIL	03	15	1520	S40	W27	03	13.4	5	(B)					
8176		HOLL	03	15	1845	S41	W27	03	13.6		B	CAO	80	10	16	3
8176		VORO	03	16	0000	S42	W33	03	13.3			DAI	158	11	12	2
8176		LEAR	03	16	0512	S39	W35	03	13.4		B	CSO	90	7	14	4
8176		SVTO	03	16	0720	S38	W40	03	13.1		B	CAO	60	11	11	3
8176		KAND	03	16	0905	S41	W34	03	13.6			CAO		9	15	4
8176		RAMY	03	16	1241	S41	W38	03	13.4		B	CAO	50	13	15	4
8176	28588	MWIL	03	16	1530	S40	W39	03	13.5	4	(BF)					
8176		HOLL	03	16	1625	S41	W38	03	13.6		B	CRO	60	8	17	3
8176		VORO	03	16	2250	S43	W40	03	13.6			HAX	110	3		3
8176		LEAR	03	17	0416	S41	W42	03	13.7		B	CSO	30	4	3	4
8176		KAND	03	17	0735	S41	W45	03	13.6			CSO		5	5	3
8176		SVTO	03	17	0805	S38	W46	03	13.6		B	CRO	30	9	7	3
8176		RAMY	03	17	1246	S41	W48	03	13.6		B	DRO	30	5	7	3
8176	28588	MWIL	03	17	1500	S40	W48	03	13.7	4	(B)					
8176		HOLL	03	17	1645	S41	W50	03	13.6		B	CRO	50	3	9	2
8176		LEAR	03	18	0041	S41	W50	03	13.9		A	AX	20	1	1	3
8176		SVTO	03	18	0830	S40	W57	03	13.7		A	AX		1		3
8176	28588	MWIL	03	18	1515	S38	W64	03	13.5	3	(B)					
8182	28595	MWIL	03	17	1500	S22	W40	03	14.5	4	(B)					
8182		SVTO	03	18	0830	S21	W52	03	14.4		A	AX	10	2	1	3
8182	28595	MWIL	03	18	1515	S23	W52	03	14.6	4	(B)					
8182		HOLL	03	18	1730	S24	W53	03	14.6		B	BXO	30	4	7	2
8182		SVTO	03	19	0700	S23	W64	03	14.4		B	CRO	20	5	6	3
8182		RAMY	03	19	1300	S24	W65	03	14.5		B	CRO	20	4	9	3
8182		HOLL	03	19	1500	S24	W63	03	14.7		B	BXO	70	4	4	3
8182	28595	MWIL	03	19	1500	S24	W65	03	14.6	4	(B)					
8182		LEAR	03	20	0140	S25	W72	03	14.5		B	BXO	10	2	3	3
8182		SVTO	03	20	0824	S23	W76	03	14.5		B	BXO	30	3	11	3
8182	28595	MWIL	03	20	1500	S24	W79	03	14.5	4	(B)					
8182		RAMY	03	20	1556	S26	W76	03	14.7		A	AX	10	1	1	2
8182		HOLL	03	20	1701	S25	W78	03	14.7		A	AX	20	1	1	3
8182		VORO	03	20	2345	S25	W84	03	14.5			HAX	101	1		2
8182		LEAR	03	21	0104	S25	W82	03	14.7		A	AX	20	1	1	4
8179		RAMY	03	10	1233	S22	E66	03	15.6		B	BXO		2	3	3
8179		HOLL	03	10	1450	S22	E65	03	15.6		B	BXO	30	4	5	3
8179	28589	MWIL	03	10	1500	S22	E65	03	15.6	4	(B)					

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8179		VORO	03	10	2304	S23	E61	03	15.7			BXO	29	2	5	2
8179		LEAR	03	11	0056	S22	E62	03	15.8		B	BXO	20	4	8	4
8179		TACH	03	11	0535	S24	E56	03	15.5			CSO	45	2	4	3
8179		SVTO	03	11	0845	S25	E56	03	15.7		B	CRO	30	5	8	3
8179		RAMY	03	11	1227	S22	E54	03	15.7		B	CRO	20	5	8	3
8179	28589	MWIL	03	11	1515	S23	E54	03	15.8	4	(B)					
8179		HOLL	03	11	1647	S25	E55	03	16.0		B	BXO	50	8	14	3
8179		LEAR	03	12	0203	S25	E49	03	15.9		B	ESO	60	10	15	3
8179		TACH	03	12	0554	S23	E44	03	15.6			BRI	33	5	7	3
8179		SVTO	03	12	0825	S24	E42	03	15.6		B	DRO	20	4	9	3
8179		KAND	03	12	0910	S23	E42	03	15.6			BXO		3	6	2
8179		RAMY	03	12	1230	S24	E43	03	15.8		B	BXO	20	12	12	4
8179	28589	MWIL	03	12	1500	S23	E39	03	15.6	5	(B)					
8179		HOLL	03	12	1530	S22	E39	03	15.6		B	BXO	30	6	6	4
8179		VORO	03	12	2304	S22	E33	03	15.5			AXX	14	1		2
8179		LEAR	03	13	0042	S22	E35	03	15.7		B	CSO	10	3	8	3
8179		KAND	03	13	0930	S22	E27	03	15.5			BXO		3	5	1
8179		RAMY	03	13	1242	S22	E28	03	15.7		B	BXO	40	17	7	4
8179		HOLL	03	13	1511	S22	E26	03	15.6		B	BXI	100	16	7	3
8179	28589	MWIL	03	13	1520	S21	E26	03	15.6	4	(B)					
8179		LEAR	03	14	0108	S21	E22	03	15.7		B	CSI	50	18	7	3
8179		VORO	03	14	0136	S21	E22	03	15.7			AXX	54	5	5	1
8179		KAND	03	14	0705	S21	E17	03	15.6			CAI		22	8	4
8179		RAMY	03	14	1205	S21	E15	03	15.6		B	DAI	160	28	8	4
8179		SVTO	03	14	1219	S22	E13	03	15.5		B	BXI	100	41	9	3
8179		HOLL	03	14	1738	S22	E11	03	15.6		B	DAC	390	38	10	2
8179		VORO	03	15	0000	S22	E08	03	15.6			DAI	564	4	8	2
8179		LEAR	03	15	0201	S22	E07	03	15.6		BG	EKC	520	29	11	4
8179		KAND	03	15	1155	S22	E02	03	15.6			EKC		20	12	3
8179		RAMY	03	15	1223	S21	E03	03	15.7		BGD	EKC	670	51	11	4
8179		SVTO	03	15	1408	S23	E01	03	15.7		BGD	EKC	680	40	11	2
8179	28589	MWIL	03	15	1520	S21	E01	03	15.7	5	(D)					
8179		HOLL	03	15	1845	S22	W01	03	15.7		BGD	EKC	690	48	13	3
8179		VORO	03	16	0000	S23	W04	03	15.7			DKI	964	38	10	2
8179		LEAR	03	16	0512	S22	W08	03	15.6		BG	EKI	670	38	14	4
8179		SVTO	03	16	0720	S22	W09	03	15.6		BGD	EKC	660	45	13	3
8179		KAND	03	16	0905	S22	W08	03	15.8			EKC		25	14	4
8179		RAMY	03	16	1241	S23	W11	03	15.7		BGD	EKC	810	53	13	4
8179	28589	MWIL	03	16	1530	S21	W12	03	15.7	5	(BG)					
8179		HOLL	03	16	1625	S22	W13	03	15.7		BG	EKC	790	50	14	3
8179		VORO	03	16	2250	S22	W17	03	15.6			DKI	1119	32	11	3
8179		LEAR	03	17	0416	S22	W20	03	15.6		BG	EKI	650	36	15	4
8179		KAND	03	17	0735	S22	W21	03	15.7			EKC		38	14	3
8179		SVTO	03	17	0805	S22	W23	03	15.6		B	EKC	740	58	14	3
8179		RAMY	03	17	1246	S23	W24	03	15.7		BG	EKI	800	37	14	3
8179	28589	MWIL	03	17	1500	S22	W24	03	15.8	5	(BG)					
8179		HOLL	03	17	1645	S22	W26	03	15.7		B	EKC	800	47	15	2
8179		LEAR	03	18	0041	S22	W33	03	15.5		BG	FKC	620	27	21	3
8179		SVTO	03	18	0830	S20	W36	03	15.6		BG	EKI	840	59	14	3
8179	28589	MWIL	03	18	1515	S22	W37	03	15.8	5	(BG)					
8179		HOLL	03	18	1730	S22	W39	03	15.7		B	EKC	950	41	15	2
8179		LEAR	03	19	0037	S22	W43	03	15.7		B	ESO	570	14	14	3
8179		SVTO	03	19	0700	S22	W47	03	15.7		BG	FKI	740	33	17	3
8179		RAMY	03	19	1300	S22	W51	03	15.6		B	FKC	780	36	18	3
8179	28589	MWIL	03	19	1500	S22	W50	03	15.8	5	(D)					
8179		HOLL	03	19	1500	S23	W52	03	15.6		B	EKC	800	31	15	3
8179		VORO	03	20	0000	S23	W57	03	15.6			DKI	1381	21	12	2
8179		LEAR	03	20	0140	S23	W58	03	15.6		BG	FHI	650	25	16	3
8179		SVTO	03	20	0824	S22	W60	03	15.7		BG	FKI	750	19	18	3
8179	28589	MWIL	03	20	1500	S22	W63	03	15.8	5	(BG)					
8179		RAMY	03	20	1556	S23	W65	03	15.6		B	EAI	670	13	14	2
8179		HOLL	03	20	1701	S22	W65	03	15.7		B	FKC	970	17	20	3
8179		VORO	03	20	2345	S23	W70	03	15.6			DKI	1200	15	13	2
8179		LEAR	03	21	0104	S21	W70	03	15.7		BG	FKI	750	15	18	4
8179		RAMY	03	21	1224	S23	W75	03	15.7		B	EAI	420	9	15	4
8179	28589	MWIL	03	21	1500	S21	W78	03	15.6	4	(B)					
8179		HOLL	03	21	1623	S23	W80	03	15.5		B	FKO	620	3	20	3
8179		VORO	03	21	2307	S23	W82	03	15.6			DKI	793	5	13	2
8179		LEAR	03	22	0121	S25	W83	03	15.6		BG	DKI	370	9	10	4

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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
8179		SVTO	03	22	0600	S22	W84	03	15.8		B	CAO	210	5	11	3
8179		RAMY	03	22	1238	S24	W84	03	16.0		B	DSO	100	2	8	3
8179	28589	MWIL	03	22	1545	S23	W85	03	16.1	5	AF					
8179		HOLL	03	22	1552	S24	W85	03	16.1		B	DAO	460	6	9	3
8179		LEAR	03	23	0129	S27	W85	03	16.4		A	HK	310	2	6	3
8179		SVTO	03	23	0810	S22	W89	03	16.5		A	AX	10	2	2	3
8180	28592	MWIL	03	11	1515	S28	E54	03	15.8	3	(B)					
8180		TACH	03	12	0554	S30	E51	03	16.2			BRI	25	5	4	3
8180		SVTO	03	12	0825	S30	E49	03	16.2		BG	BXO	20	8	8	3
8180		KAND	03	12	0910	S29	E49	03	16.2			CRO		5	6	2
8180		RAMY	03	12	1230	S30	E49	03	16.4		B	BXO		2	2	4
8180	28592	MWIL	03	12	1500	S28	E46	03	16.2	4	(B)					
8180		HOLL	03	12	1530	S28	E47	03	16.3		B	BXO	30	7	5	4
8180		LEAR	03	13	0042	S27	E41	03	16.2		B	CSO	10	4	6	3
8180		RAMY	03	13	1242	S27	E35	03	16.2		B	BXO	20	7	8	4
8180		HOLL	03	13	1511	S27	E34	03	16.3		B	BXO	30	6	8	3
8180	28592	MWIL	03	13	1520	S28	E34	03	16.3	4	(B)					
8180		LEAR	03	14	0108	S31	E32	03	16.6		A	AX		1		3
8180		KAND	03	14	0705	S30	E29	03	16.6			AX		3	1	4
8180		RAMY	03	14	1205	S29	E27	03	16.6		A	AX		1		4
8180		SVTO	03	14	1219	S31	E22	03	16.2		B	BXO	10	3	4	3
8180		HOLL	03	14	1738	S30	E23	03	16.5		B	BXO	20	4	1	2
8180		RAMY	03	15	1223	S30	E13	03	16.5		A	AX		1		4
8180	28592	MWIL	03	15	1520	S29	E10	03	16.4	3	(AF)					
8180		RAMY	03	21	1224	S30	W65	03	16.4		A	AX	10	2	1	4
8180	28600	MWIL	03	21	1500	S28	W67	03	16.4	3	(B)					
8180		HOLL	03	21	1623	S28	W68	03	16.4		B	BXO	20	4	4	3
8180		SVTO	03	22	0600	S28	W77	03	16.2		B	CAO	150	9	6	3
8180		RAMY	03	22	1238	S28	W79	03	16.3		B	DAI	240	3	4	3
8180	28600	MWIL	03	22	1545	S28	W80	03	16.4	3	(B)					
8178		LEAR	03	10	0146	S15	E85	03	16.5		A	HK	60	1	7	4
8178		TACH	03	10	0502	S17	E86	03	16.7			OSI	70	1	5	3
8178		RAMY	03	10	1233	S15	E77	03	16.3		A	HS	60	1	1	3
8178		HOLL	03	10	1450	S15	E77	03	16.4		A	HS	180	1	2	3
8178	28590	MWIL	03	10	1500	S16	E77	03	16.5	4	(AP)					
8178		VORO	03	10	2304	S16	E73	03	16.5			HAX	115	1		2
8178		LEAR	03	11	0056	S15	E73	03	16.6		A	HK	170	1	3	4
8178		TACH	03	11	0535	S17	E70	03	16.5			HSX	100	1	5	3
8178		SVTO	03	11	0845	S19	E67	03	16.5		A	HS	120	1	2	3
8178		RAMY	03	11	1227	S15	E64	03	16.4		A	HS	80	1	1	3
8178	28590	MWIL	03	11	1515	S16	E64	03	16.5	5	(AP)					
8178		HOLL	03	11	1647	S16	E62	03	16.4		A	HS	160	1	2	3
8178		LEAR	03	12	0203	S16	E59	03	16.6		A	HS	80	1	2	3
8178		TACH	03	12	0554	S17	E56	03	16.5			HSX	200	1	3	3
8178		SVTO	03	12	0825	S18	E55	03	16.5		A	HS	130	1	2	3
8178		KAND	03	12	0910	S17	E54	03	16.5			HS		1	2	2
8178		RAMY	03	12	1230	S16	E52	03	16.5		A	HS	90	1	2	4
8178	28590	MWIL	03	12	1500	S16	E51	03	16.5	5	(AP)					
8178		HOLL	03	12	1530	S17	E51	03	16.5		B	CSO	90	2	4	4
8178		VORO	03	12	2304	S17	E48	03	16.6			HAX	141	1		2
8178		LEAR	03	13	0042	S16	E46	03	16.5		A	HS	80	1	2	3
8178		KAND	03	13	0930	S17	E40	03	16.4			HS		1	2	1
8178		RAMY	03	13	1242	S16	E39	03	16.5		A	HS	130	1	2	4
8178		HOLL	03	13	1511	S16	E38	03	16.5		A	HS	100	1	2	3
8178	28590	MWIL	03	13	1520	S16	E38	03	16.5	5	(AP)					
8178		LEAR	03	14	0108	S17	E33	03	16.5		A	HS	100	1	2	3
8178		VORO	03	14	0136	S15	E33	03	16.6			HAX	70	1		1
8178		KAND	03	14	0705	S16	E29	03	16.5			HS		1	2	4
8178		RAMY	03	14	1205	S16	E26	03	16.5		A	HS	120	1	2	4
8178		SVTO	03	14	1219	S18	E26	03	16.5		A	HS	120	1	2	3
8178		HOLL	03	14	1738	S16	E24	03	16.5		A	HS	110	1	3	2
8178		VORO	03	15	0000	S16	E20	03	16.5			HAX	124	1		2
8178		LEAR	03	15	0201	S16	E19	03	16.5		A	HS	100	1	2	4
8178		KAND	03	15	1155	S16	E13	03	16.5			HS		1	2	3
8178		RAMY	03	15	1223	S16	E13	03	16.5		A	HS	130	1	2	4
8178		SVTO	03	15	1408	S18	E13	03	16.6		A	HS	170	1	2	2
8178	28590	MWIL	03	15	1520	S16	E11	03	16.5	5	(AP)					

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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
8178		HOLL	03	15	1845	S17	E09	03	16.5		A	HS	110	1	3	3
8178		VORO	03	16	0000	S17	E08	03	16.6			HAX	156	1		2
8178		LEAR	03	16	0512	S16	E04	03	16.5		A	HA	100	1	3	4
8178		SVTO	03	16	0720	S16	E02	03	16.4		A	HS	100	2	2	3
8178		KAND	03	16	0905	S16	E02	03	16.5			HS		2	2	4
8178		RAMY	03	16	1241	S16	E00	03	16.5		A	HS	150	2	2	4
8178	28590	MWIL	03	16	1530	S16	W02	03	16.5	5	(AP)					
8178		HOLL	03	16	1625	S16	W03	03	16.4		A	HS	130	1	3	3
8178		VORO	03	16	2250	S17	W06	03	16.5			HAX	178	1		3
8178		LEAR	03	17	0416	S17	W08	03	16.6		A	HA	100	1	3	4
8178		KAND	03	17	0735	S17	W10	03	16.5			HA		4	3	3
8178		SVTO	03	17	0805	S16	W11	03	16.5		A	HA	80	5	2	3
8178		RAMY	03	17	1246	S16	W13	03	16.5		A	HS	110	1	2	3
8178	28590	MWIL	03	17	1500	S16	W14	03	16.6	5	(AP)					
8178		HOLL	03	17	1645	S16	W16	03	16.5		A	HA	100	1	3	2
8178		LEAR	03	18	0041	S16	W20	03	16.5		A	HA	80	1	1	3
8178		SVTO	03	18	0830	S16	W25	03	16.4		A	HA	70	3	2	3
8178	28590	MWIL	03	18	1515	S16	W27	03	16.6	4	(AP)					
8178		HOLL	03	18	1730	S17	W28	03	16.6		A	HA	100	2	2	2
8178		LEAR	03	19	0037	S17	W32	03	16.6		A	HS	50	1	1	3
8178		SVTO	03	19	0700	S16	W37	03	16.5		A	HA	30	2	2	3
8178		RAMY	03	19	1300	S17	W40	03	16.5		A	HA	50	1	2	3
8178	28590	MWIL	03	19	1500	S16	W40	03	16.6	5	(AP)					
8178		HOLL	03	19	1500	S18	W41	03	16.5		A	HS	50	1	2	3
8178		VORO	03	20	0000	S17	W45	03	16.6			HAX	83	1		2
8178		LEAR	03	20	0140	S17	W46	03	16.6		A	HS	50	1	2	3
8178		SVTO	03	20	0824	S18	W48	03	16.7		B	CSO	70	2	8	3
8178	28590	MWIL	03	20	1500	S17	W52	03	16.7	4	(BP)					
8178		RAMY	03	20	1556	S18	W52	03	16.7		B	CSO	20	2	5	2
8178		HOLL	03	20	1701	S17	W54	03	16.6		A	HS	80	1	2	3
8178		VORO	03	20	2345	S17	W58	03	16.6			HAX	104	1		2
8178		LEAR	03	21	0104	S16	W58	03	16.6		A	HS	40	1	1	4
8178		RAMY	03	21	1224	S17	W65	03	16.6		A	HS	20	1	1	4
8178	28590	MWIL	03	21	1500	S16	W66	03	16.6	4	(AP)					
8178		HOLL	03	21	1623	S17	W67	03	16.6		A	HS	60	1	3	3
8178		VORO	03	21	2307	S17	W71	03	16.6			HAX	30	1		2
8178		LEAR	03	22	0121	S15	W71	03	16.7		A	HS	30	1	2	4
8178		SVTO	03	22	0600	S14	W75	03	16.6		A	AX	20	1	1	3
8178		RAMY	03	22	1238	S16	W78	03	16.6		A	HS	20	1	1	3
8178	28590	MWIL	03	22	1545	S16	W80	03	16.6	4	AP					
8178		HOLL	03	22	1552	S16	W79	03	16.7		B	HS	30	1	2	3
8181	28593	MWIL	03	11	1515	S23	E64	03	16.6	3	(AP)					
8181	28593?	MWIL	03	12	1500	S20	E52	03	16.6	4	(AP)					
8181		HOLL	03	12	1820	S20	E51	03	16.7		B	BXO	20	2	4	4
8181A		RAMY	03	23	1238	S24	W69	03	18.2		B	BXO	10	2	3	3
8181A	28602	MWIL	03	23	1515	S23	W69	03	18.3	4	(B)					
8181A		RAMY	03	24	1211	S23	W81	03	18.3		A	AX		1		4
8181A	28602	MWIL	03	24	1500	S23	W84	03	18.1	3	(AF)					
8181B	28596	MWIL	03	17	1500	N22	E10	03	18.4	4	(B)					
8181C		LEAR	03	20	0140	N36	W14	03	18.9		B	BXO		2	2	3
8181D		LEAR	03	22	0121	N09	W12	03	21.1		B	BXO	10	2	1	4
8183		SVTO	03	18	0830	N21	E65	03	23.3		B	BXO	10	2	2	3
8183	28597	MWIL	03	18	1515	N21	E61	03	23.3	4	(B)					
8183		HOLL	03	18	1730	N23	E61	03	23.4		B	CRO	100	4	5	2
8183		LEAR	03	19	0037	N21	E56	03	23.3		B	DAO	100	4	12	3
8183		SVTO	03	19	0700	N20	E54	03	23.4		B	DAO	60	6	8	3
8183		RAMY	03	19	1300	N22	E49	03	23.3		B	CRO	50	7	5	3
8183	28597	MWIL	03	19	1500	N22	E48	03	23.3	4	(BG)					
8183		HOLL	03	19	1500	N23	E48	03	23.3		B	BXO	100	8	8	3
8183		LEAR	03	20	0140	N23	E42	03	23.3		B	CSO	120	7	8	3
8183		SVTO	03	20	0824	N23	E38	03	23.3		B	BXO	50	13	8	3
8183	28597	MWIL	03	20	1500	N22	E36	03	23.4	4	(B)					
8183		RAMY	03	20	1556	N22	E33	03	23.2		B	BXO	20	5	8	2

SUNSPOT GROUPS
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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
8183		HOLL	03	20	1701	N23	E34	03	23.3		B	BXO	40	7	8	3
8183		VORO	03	20	2345	N23	E32	03	23.4			BXI	65	7	8	2
8183		LEAR	03	21	0104	N22	E30	03	23.3		BG	DSO	50	11	9	4
8183		RAMY	03	21	1224	N23	E24	03	23.4		B	BXO	30	12	8	4
8183	28597	MWIL	03	21	1500	N22	E23	03	23.4	4	(B)					
8183		HOLL	03	21	1623	N24	E20	03	23.2		B	BXO	60	10	9	3
8183		VORO	03	21	2307	N23	E19	03	23.4			CAI	45	6	7	2
8183		LEAR	03	22	0121	N22	E18	03	23.4		B	CSO	30	9	8	4
8183		SVTO	03	22	0600	N21	E17	03	23.5		B	BXO	30	6	7	3
8183		RAMY	03	22	1238	N23	E11	03	23.4		B	DRO	50	14	7	3
8183	28597	MWIL	03	22	1545	N22	E10	03	23.4	4	(B)					
8183		HOLL	03	22	1552	N22	E10	03	23.4		B	DSO	40	12	8	3
8183		VORO	03	22	2250	N22	E05	03	23.3			CAI	220	3	6	2
8183		LEAR	03	23	0129	N22	E05	03	23.4		B	DAO	80	5	8	3
8183		TACH	03	23	0635	N22	E02	03	23.4			BRI	55	6	5	2
8183		SVTO	03	23	0810	N22	E02	03	23.5		B	DSO	110	8	8	3
8183		RAMY	03	23	1238	N22	W02	03	23.4		B	DSO	80	9	8	3
8183	28597	MWIL	03	23	1515	N22	W03	03	23.4	5	(B)					
8183		HOLL	03	23	1605	N23	W04	03	23.4		B	DSO	100	10	8	3
8183		VORO	03	23	2300	N22	W07	03	23.4			CAI	273	5	7	2
8183		TACH	03	24	0731	N21	W11	03	23.5			CSI	346	7	7	3
8183		KAND	03	24	1040	N21	W14	03	23.4			DAI		15	9	3
8183		RAMY	03	24	1211	N21	W15	03	23.3		B	DSO	150	18	8	4
8183	28597	MWIL	03	24	1500	N22	W16	03	23.4	5	(B)					
8183		HOLL	03	24	1540	N23	W17	03	23.3		B	DSO	280	13	9	4
8183		VORO	03	24	2210	N22	W20	03	23.4			CAI	232	4	8	2
8183		LEAR	03	25	0205	N22	W22	03	23.4		B	DHC	170	11	9	4
8183		TACH	03	25	0627	N22	W24	03	23.4			DSI	406	7	8	3
8183		KAND	03	25	0805	N21	W26	03	23.3			DSO		10	9	4
8183		RAMY	03	25	1212	N22	W27	03	23.4		B	DSO	130	8	8	2
8183		HOLL	03	25	1615	N23	W29	03	23.4		B	DSO	250	11	10	4
8183		VORO	03	25	2300	N23	W34	03	23.3			CAI	172	2	5	2
8183		RAMY	03	26	1256	N21	W42	03	23.3		B	DAO	200	11	5	3
8183		HOLL	03	26	1748	N22	W45	03	23.3		B	CSO	120	4	5	1
8183		VORO	03	26	2256	N20	W48	03	23.3			HAX	159	1		2
8183		LEAR	03	27	0605	N21	W51	03	23.3		B	CSO	150	7	8	1
8183		SVTO	03	27	0752	N25	W54	03	23.1		B	CSO	180	3	12	3
8183		RAMY	03	27	1559	N20	W60	03	23.1		B	CAO	150	3	10	2
8183		HOLL	03	27	1612	N20	W58	03	23.2		B	CAO	40	2	4	2
8183		LEAR	03	28	0011	N22	W62	03	23.2		B	CSO	90	5	5	3
8183		TACH	03	28	0634	N23	W64	03	23.3			HAX	100	2	10	3
8183		SVTO	03	28	0810	N25	W66	03	23.2		B	CSO	140	4	7	3
8183		RAMY	03	28	1454	N21	W68	03	23.4		A	HA	140	1	2	1
8183		HOLL	03	28	1456	N20	W67	03	23.5		B	CAO	90	7	4	3
8183		LEAR	03	29	0307	N19	W75	03	23.4		B	CSO	30	3	4	3
8183		TACH	03	29	0627	N22	W82	03	23.0			ASX	25	1	5	2
8183		SVTO	03	29	0733	N23	W78	03	23.3		A	HA	120	1	6	2
8183		RAMY	03	29	1214	N21	W80	03	23.4		A	HS	30	1	1	4
8183A		KAND	03	24	1040	N15	W02	03	24.3			AX		1		3
8183A	28603	MWIL	03	24	1500	N15	W05	03	24.2	4	(AP)					
8184	28598	MWIL	03	20	1500	S19	E52	03	24.6	5	(B)					
8184		RAMY	03	20	1556	S19	E49	03	24.4		B	BXO	20	4	4	2
8184		HOLL	03	20	1701	S18	E49	03	24.4		B	CSO	70	3	4	3
8184		VORO	03	20	2345	S20	E47	03	24.6			CAI	73	3	5	2
8184		LEAR	03	21	0104	S21	E45	03	24.5		B	DAO	50	4	6	4
8184		RAMY	03	21	1224	S19	E39	03	24.5		B	CSO	20	3	6	4
8184	28598	MWIL	03	21	1500	S20	E38	03	24.5	4	(B)					
8184		HOLL	03	21	1623	S18	E36	03	24.4		B	DSO	50	3	7	3
8184		VORO	03	21	2307	S20	E34	03	24.6			CAI	82	3	6	2
8184		LEAR	03	22	0121	S20	E32	03	24.5		B	DAO	40	3	7	4
8184		SVTO	03	22	0600	S21	E29	03	24.5		B	CSO	40	3	7	3
8184		RAMY	03	22	1238	S19	E26	03	24.5		B	DSO	50	7	7	3
8184	28598	MWIL	03	22	1545	S20	E25	03	24.6	4	(B)					
8184		HOLL	03	22	1552	S20	E24	03	24.5		B	DSO	50	5	7	3
8184		VORO	03	22	2250	S20	E21	03	24.5			CAI	100	2	7	2
8184		LEAR	03	23	0129	S20	E18	03	24.4		B	DAO	40	3	7	3
8184		TACH	03	23	0635	S19	E15	03	24.4			BSO	65	2	7	2

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8184		SVTO	03	23	0810	S21	E14	03	24.4		B	DRO	20	3	8	3
8184		RAMY	03	23	1238	S19	E12	03	24.4		B	DSO	30	4	8	3
8184	28598	MWIL	03	23	1515	S20	E12	03	24.5	5	(B)					
8184		HOLL	03	23	1605	S19	E11	03	24.5		B	DSO	60	5	8	3
8184		VORO	03	23	2300	S19	E07	03	24.5			CAI	39	2	7	2
8184		TACH	03	24	0731	S19	E03	03	24.5			BXI	12	5	6	3
8184		KAND	03	24	1040	S20	E01	03	24.5			BXO		5	7	3
8184		RAMY	03	24	1211	S20	E00	03	24.5		B	BXO	10	6	7	4
8184	28598	MWIL	03	24	1500	S20	W01	03	24.5	4	(B)					
8184		HOLL	03	24	1540	S19	W03	03	24.4		B	BXO	30	3	8	4
8184		VORO	03	24	2210	S21	W02	03	24.8			AXX	11	1		2
8184		LEAR	03	25	0205	S21	W04	03	24.8		A	AX		1		4
8184		TACH	03	25	0627	S20	W06	03	24.8			AXX	10	1	1	3
8184		KAND	03	25	0805	S21	W07	03	24.8			AX		1	0	4
8184		RAMY	03	25	1212	S21	W13	03	24.5		B	BXO		3	8	2
8183B		TACH	03	25	0627	S24	E07	03	25.8			AXX	5	1	1	3
8189A	28599	MWIL	03	20	1500	S26	E69	03	26.0	3	(AP)					
8189B	28605	MWIL	03	30	1500	S23	W56	03	26.3	3	(AP)					
8189		LEAR	03	27	0605	S26	W08	03	26.6		B	BXO	10	4	5	1
8189		SVTO	03	27	0752	S26	W09	03	26.6		B	BXO	10	5	4	3
8189		HOLL	03	27	1612	S28	W13	03	26.6		B	CSO	30	4	5	2
8189		LEAR	03	28	0011	S26	W18	03	26.6		B	CSO	20	5	6	3
8189		TACH	03	28	0634	S25	W19	03	26.8			BRO	85	3	7	3
8189		SVTO	03	28	0810	S25	W24	03	26.5		B	DAO	40	4	6	3
8189		RAMY	03	28	1454	S26	W22	03	26.9		B	BXO	30	8	13	1
8189		HOLL	03	28	1456	S28	W24	03	26.7		B	DSO	40	11	8	3
8189		LEAR	03	29	0307	S26	W32	03	26.6		B	CSO	50	4	9	3
8189		SVTO	03	29	0733	S26	W37	03	26.4		B	CSO	70	3	5	2
8189		VORO	03	29	0740	S27	W35	03	26.6			CRO	708	2	4	2
8189		RAMY	03	29	1214	S26	W36	03	26.7		B	BXO	20	8	10	4
8189		HOLL	03	29	1542	S27	W35	03	26.9		B	CSO	30	7	12	1
8189		RAMY	03	30	1221	S26	W49	03	26.7		B	BXO	10	3	9	5
8189		HOLL	03	30	1600	S26	W49	03	26.8		B	BXO	30	4	13	2
8189		LEAR	03	31	0050	S27	W58	03	26.5		A	AX		1		4
8189		SVTO	03	31	0905	S26	W65	03	26.3		A	AX		1		2
8189		RAMY	03	31	1235	S27	W67	03	26.3		A	AX		1		4
8189		HOLL	03	31	1625	S28	W70	03	26.2		A	AX		1		3
8185		HOLL	03	20	1701	S24	E89	03	27.6		A	AX		1		3
8185		LEAR	03	21	0104	S25	E80	03	27.2		A	HA	60	1	3	4
8185		RAMY	03	21	1224	S25	E77	03	27.5		B	CRO	50	5	8	4
8185	28601	MWIL	03	21	1500	S25	E79	03	27.7	4	(B					
8185		HOLL	03	21	1623	S23	E78	03	27.7		B	CSO	150	7	18	3
8185		LEAR	03	22	0121	S24	E75	03	27.8		B	EAI	190	10	13	4
8185		SVTO	03	22	0600	S24	E71	03	27.7		B	CSO	130	11	16	3
8185		RAMY	03	22	1238	S23	E66	03	27.6		BG	EKO	410	18	15	3
8185	28601	MWIL	03	22	1545	S23	E68	03	27.9	4	(B)					
8185		HOLL	03	22	1552	S24	E69	03	28.0		B	FKC	720	22	19	3
8185		TACH	03	23	0635	S25	E60	03	27.9			DAI	440	12	16	2
8185		SVTO	03	23	0810	S27	E59	03	27.9		G	FKI	640	22	18	3
8185		RAMY	03	23	1238	S24	E56	03	27.8		BG	FKI	530	18	18	3
8185	28601	MWIL	03	23	1515	S24	E56	03	28.0	5	(BF)					
8185		HOLL	03	23	1605	S24	E53	03	27.8		B	FKC	530	19	18	3
8185		TACH	03	24	0731	S23	E46	03	27.8			DHI	885	14	18	3
8185		KAND	03	24	1040	S25	E45	03	27.9			FKC		25	20	3
8185		RAMY	03	24	1211	S25	E43	03	27.8		BG	FKC	560	25	19	4
8185	28601	MWIL	03	24	1500	S24	E42	03	27.9	5	(D)					
8185		HOLL	03	24	1540	S24	E41	03	27.8		BG	FKC	740	17	18	4
8185		LEAR	03	25	0205	S25	E36	03	27.9		BG	FKC	520	26	20	4
8185		TACH	03	25	0627	S24	E34	03	27.9			DHI	797	12	17	3
8185		KAND	03	25	0805	S25	E32	03	27.8			FKI		23	20	4
8185		RAMY	03	25	1212	S24	E31	03	27.9		BG	FHC	460	21	19	2
8185		HOLL	03	25	1615	S25	E28	03	27.8		BG	FKC	700	30	21	4
8185		RAMY	03	26	1256	S25	E18	03	27.9		BG	FHC	520	42	21	3
8185		HOLL	03	26	1748	S25	E14	03	27.8		BG	FHC	550	21	23	1

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8185		LEAR	03	27	0605	S25	E07	03	27.8		BG	HKI	410	25	22	1
8185		SVTO	03	27	0752	S24	E04	03	27.6		BG	FKC	490	35	22	3
8185		RAMY	03	27	1559	S25	E01	03	27.7		BG	FKC	510	24	29	2
8185		HOLL	03	27	1612	S25	E00	03	27.7		B	CSO	510	18	23	2
8185		LEAR	03	28	0011	S25	W06	03	27.5		BG	FKI	390	33	22	3
8185		TACH	03	28	0634	S23	W08	03	27.6			DHI	781	10	17	3
8185		SVTO	03	28	0810	S26	W09	03	27.6		BG	FKI	420	26	23	3
8185		RAMY	03	28	1454	S27	W09	03	27.9		B	CKO	370	2	4	1
8185		HOLL	03	28	1456	S26	W08	03	28.0		BG	FKC	490	21	20	3
8185		LEAR	03	29	0307	S25	W18	03	27.7		BG	FKO	410	20	22	3
8185		SVTO	03	29	0733	S26	W19	03	27.8		B	CKI	460	17	23	2
8185		RAMY	03	29	1214	S25	W19	03	28.0		B	CKO	480	17	18	4
8185		HOLL	03	29	1542	S25	W20	03	28.1		BG	FKC	410	14	18	1
8185		RAMY	03	30	1221	S26	W32	03	28.0		BG	CHO	390	20	19	5
8185	28601	MWIL	03	30	1500	S22	W32	03	28.2	5	(BG)					
8185		HOLL	03	30	1600	S25	W34	03	28.0		B	FKC	420	8	16	2
8185		LEAR	03	31	0050	S24	W39	03	28.0		BG	FKC	500	18	19	4
8185		SVTO	03	31	0905	S26	W43	03	28.0		B	FHI	630	17	18	2
8185		KAND	03	31	1030	S25	W45	03	27.9			FKI		19	20	3
8185		RAMY	03	31	1235	S26	W45	03	28.0		BG	FHI	410	17	19	4
8185		HOLL	03	31	1625	S25	W47	03	28.0		BG	FHI	460	13	23	3
8185		LEAR	04	01	0048	S26	W52	03	28.1		BG	FHI	370	15	18	3
8185		KAND	04	01	0655	S25	W56	03	28.0			FAO		8	19	4
8185		SVTO	04	01	0800	S24	W56	03	28.1		BG	FKO	450	13	18	3
8185		RAMY	04	01	1210	S26	W58	03	28.1		BG	FHO	470	11	25	4
8185		HOLL	04	01	1505	S25	W60	03	28.1		B	FHO	470	10	19	4
8185		VORO	04	01	2215	S24	W57	03	28.6			HAX	479	1		2
8185		LEAR	04	02	0125	S24	W64	03	28.2		BG	FKO	360	6	16	3
8185		KAND	04	02	0700	S25	W68	03	28.1			FAO		3	19	5
8185		SVTO	04	02	1050	S24	W70	03	28.1		B	FAO	240	2	17	2
8185		RAMY	04	02	1313	S25	W71	03	28.1		B	FSO	310	2	17	3
8185	28601	MWIL	04	02	1530	S23	W66	03	28.7	5	(AF)					
8185		HOLL	04	02	1545	S25	W67	03	28.6		B	EAO	220	3	14	2
8185		VORO	04	02	2242	S23	W67	03	28.9			HAX	524	1		2
8185		LEAR	04	03	0055	S24	W77	03	28.2		B	FKO	270	5	20	3
8185		SVTO	04	03	0650	S24	W75	03	28.6		B	CAO	130	4	5	3
8185		KAND	04	03	0810	S25	W75	03	28.6			HK		3	4	3
8185		RAMY	04	03	1233	S28	W79	03	28.4		A	HK	250	3	4	3
8185		HOLL	04	03	1716	S23	W80	03	28.6		A	HS	180	1	2	3
8185		LEAR	04	04	0035	S23	W82	03	28.8		B	CAO	120	1	5	3
8185		SVTO	04	04	0834	S22	W89	03	28.6		A	AX	10	1	1	3
8185A		TACH	03	29	0627	S20	W09	03	28.6			CHX	655	3	6	2
8185A		TACH	04	03	0430	S24	W72	03	28.7			HSX	100	1	5	2
8192		SVTO	04	01	0800	S33	W35	03	29.6		A	AX		1		3
8192		HOLL	04	01	1505	S33	W37	03	29.8		B	BXO	20	2	3	4
8192		VORO	04	01	2215	S32	W42	03	29.7			AXX	13	1		2
8192		KAND	04	02	0700	S31	W46	03	29.8			BXO		2	2	5
8192		SVTO	04	02	1050	S29	W50	03	29.6		A	BXO	50	3	2	2
8192		RAMY	04	02	1313	S31	W51	03	29.6		A	AX	10	1	1	3
8192	28609	MWIL	04	02	1530	S31	W51	03	29.7	3	(AP)					
8192		HOLL	04	02	1545	S31	W49	03	29.9		A	AX	20	1	1	2
8192		VORO	04	02	2242	S31	W55	03	29.7			AXX	18	1		2
8192		LEAR	04	03	0055	S31	W56	03	29.7		A	HS	20	1	1	3
8192		SVTO	04	03	0650	S33	W59	03	29.7		B	BXO	20	3	5	3
8192		KAND	04	03	0810	S32	W59	03	29.8			BXO		3	4	3
8192		RAMY	04	03	1233	S36	W62	03	29.6		B	BXO	10	3	4	3
8192		HOLL	04	03	1716	S32	W66	03	29.6		A	AX	10	1		3
8188	28604	MWIL	03	24	1500	N27	E70	03	30.1	3	(AP					
8188		LEAR	03	25	0205	N29	E67	03	30.3		A	AX		1		4
8188		RAMY	03	25	1212	N30	E64	03	30.5		A	AX	10	1		2
8188		HOLL	03	25	1615	N29	E61	03	30.4		A	AX	20	1	1	4
8188		RAMY	03	26	1256	N30	E47	03	30.2		A	AX	10	1		3
8188		HOLL	03	26	1748	N30	E45	03	30.3		A	AX		1		1
8188		LEAR	03	27	0605	N29	E39	03	30.3		A	AX		1		1
8188		RAMY	03	27	1559	N30	E34	03	30.3		A	AX		1		2
8188		LEAR	03	28	0011	N32	E33	03	30.6		B	BXO	10	3	8	3

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(Ordered by Central Meridian Passage Date)

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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
8188		TACH	03	28	0634	N30	E26	03	30.3			AXX	5	1	1	3
8188		SVTO	03	28	0810	N27	E28	03	30.5		B	BXO	10	5	4	3
8188		RAMY	03	28	1454	N29	E21	03	30.3		B	BXO	10	3	3	1
8188		HOLL	03	28	1456	N30	E22	03	30.3		B	BXO	20	9	5	3
8188		LEAR	03	29	0307	N30	E17	03	30.5		B	BXO	10	3	6	3
8188		TACH	03	29	0627	N30	E15	03	30.4			BXO	18	2	5	2
8188		SVTO	03	29	0733	N28	E16	03	30.6		B	BXO	70	3	4	2
8188		RAMY	03	29	1214	N30	E12	03	30.4		B	BXO	10	3	5	4
8188		HOLL	03	29	1542	N31	E07	03	30.2		A	AX	10	1		1
8188		RAMY	03	30	1221	N30	W05	03	30.1		A	AX		1		5
8188	28604?	MWIL	03	30	1500	N30	W04	03	30.3	3	(AP)					
8188		RAMY	04	01	1210	N29	W27	03	30.5		B	BXO	10	2	3	4
8188		HOLL	04	01	1505	N29	W29	03	30.4		B	BXO	20	2	4	4
8188		VORO	04	01	2215	N31	W33	03	30.4			AXX	21	2	4	2
8188A		TACH	03	29	0627	S26	E32	03	31.7			BRI	55	4	9	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
MARCH 1998

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	0723	0816	1000	2	1		1				0809	B6.5	
01	1307	1313	1351	1	1		1				1302	C1.2	8169
02	1135	1205	1232	1	1		1				1205	C1.2	
03	0719	0722	0730	1-	1					1	0716	C1.2	8171
03	0900	0911	0919	1	1		1				0908		8171
03	0930	0940	0957	1	1		1				0936	B4.2	8171
03	1351	1404	1527	1	1		1				1356	B9.7	8171
03	2043	2047	2056	1-	3					2	No flare		
03	2053	2057	2126	2-	3					2	No flare		
03	2202	2205	2220	1-	1					1	2158		8171
04	0713	0724	0828	1+	3		1			2	0711	C2.7	8171
04	1721	1723	1740	1	1					1	No flare		
04	1735	1739	1759	1	3					3	1734	C1.5	8171
04	1913	1916	1941	1+	3					3	1910	C2.1	8171
04	2133	2137	2155	1	3					2	2124	C2.7	8171
05	0732	0747	0820	1	1		1				No flare		
05	0812	0816	0835	1-	1					1	0812	C1.4	8171
05	0909	0915	0944	1	3					2	0905	C4.4	8171
05	1235	1238	1301	1-	5		1			3	1231	C2.6	8171
05	1320	1344	1416	1	1		1				1312	C2.0	8171
05	1459	1507	1531	1	5		1			6	1502	C2.5	8171
05	1733	1737	1810	1+	3					2	1729	C1.5	
05	2008	2010	2030	1	3					2	2004	C1.4	8172
08	1907	1923	1942	1+	1					1	1902	C1.1	
09	0825	0830	0905	1	1		1				*		
09	1234	1301	1326	1	1		1				1245	C1.1	
10	1114	1121	1151	1	1		1				No flare		
10	1458	1502	1546	1	1		1				No flare		
13	0912	0940	1019	1	1		1				No flare		
13	1130	1150	1225	1	1		1				1129	B3.4	
13	2058	2109	2137	2-	3					3	2051	C5.8	8173
14	1150	1153	1215	1-	1					1	1147	C2.2	
14	1446	1451	1510	1+	3					2	1443	C1.4	8179
15	0728	0730	0737	1-	1					1	0725	C1.1	
15	0848	0852	0902	1-	1					1	0846	B9.3	
15	1048	1055	1124	1	1		1				1109E		8179
15	1151	1156	1207	1	3		1			1	1148	C2.1	8179
15	1310	1316	1344	1-	3		1			1	1307	C1.6	8179
15	1437	1441	1503	1	5		1			5	1439	C2.9	8179
15	1458	1507	1552	2	5		1			6	1456	C5.8	
15	1540	1548	1600	1	1					1	No flare		
15	1604	1615	1643	1+	5		1			7	1604	M1.0	8179
15	1629	1634	1645	1-	3					3	No flare		
15	1638	1646	1700	1	5					2	1636E		8179
15	1701	1707	1730	1+	3					3	1636E		8179
15	1735	1737	1814	2-	3					5	1734	C7.5	8179
15	1913	1919	2006	2	5					6	1911	M1.8	8179
15	2020	2026	2056	1+	3					4	2016	C3.4	
15	2045	2046	2054D	1-	1					1	No flare		
15	2059	2108	2136	2-	3					3	2111		8179
15	2142	2146	2225	2-	3					5	2141	M2.7	
15	2245	2253	2309	1+	1					1	2245	C5.0	8179
15	2252	2330U	2353U	2	1					1	*		
16	0745	0818	0905	1+	3		1			1	0807	C3.7	8179
16	0947	0951	1012	1	1		1				No flare		
16	1100	1133	1133	1+	3		1			1	1057	C7.9	8179
16	1134	1152	1312	3	1		1				1057	C7.9	8179

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES
MARCH 1998

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
16	1156	1230	1342	2	1					1	No flare		
16	2204	2208	2239	1+	3					2	2201	C2.4	
17	0819	0828	0841	1-	3		1			1	0813	C1.1	8179
17	1038	1050	1240	2	1					1	1037	C2.3	
17	1253	1256	1317	1-	3					2	1253	B8.2	8179
17	1334	1337	1405	1	5		1			5	1329	C3.6	8179
18	0941	1017U	1049	1	1		1				*		
18	1057	1111	1241	2	3		1			2	1050	M1.0	
19	0515	0532	0600	2-	3					2	0508	C7.5	8183
19	0843	0858	0910	1-	3		1			1	0900	C1.1	8183
19	0921	0923	0929	1-	1					1	0919	C1.0	
19	0957	1005	1033	1+	3		1			2	0959	C3.2	8183
19	1139	1152	1250	1	1					1	1145	C1.7	8183
19	1843	1849	1924	2	3					4	1844	C2.8	8179
19	2027	2030	2052	1	3					2	2024	C1.0	8179
20	0642	0646	0652	1-	1					1	0640	C2.0	
20	1205	1213	1307	1	1					1	1203	C4.5	
20	1232	1238	1252	1-	5		1			3	1229	C1.7	
20	1630	1633	1656	1	3					4	1628	C1.8	
20	1945	1947	2000	1-	1					1	1943	C1.8	
22	0654	0703	0800	2	3		1			3	0651	M1.1	8185
22	0833	0836	0857	1	3					3	0829	C2.1	
22	1104	1108	1205	1	1					1	1102	C2.0	8183
22	1632	1635	1653	1-	3					4	1631	C1.9	8185
22	2016	2018	2036	1-	3					2	2026		8185
22	2239	2245	2300	1-	3					2	2257		8185
23	1210	1219	1346	1	1		1				No flare		
23	1405	1411	1514	1	1		1				No flare		
23	2138	2146	2210	1+	3					2	No flare		
24	0654	0701	0805	1	1					1	0650	C1.3	
24	1008	1030	1030	1	1		1				1022	C8.0	
24	1027	1108	1342	3-	3		1			1	1022	C8.0	
24	1836	1838	1845	1-	1					1	1833	B9.6	8185
24	2008	2010	2025	1-	3					2	No flare		
25	1228	1258	1445	3-	5		1			5	1231	C5.3	
26	0837	0905	0945	1	1		1				*		
26	1004	1010	1035	1	1		1				*		
26	1107	1110	1136	1	1		1				No flare		
26	1222	1228	1246	1	1		1				No flare		
26	1248	1257	1417	2+	5		1			6	1246	M1.8	8185
27	1015	1026	1051	1	1		1				No flare		
27	1316	1319	1330	1-	1					1	1307	C1.3	
27	2213	2221	2337	3-	3					3	2149	M2.4	8185
28	0714	0719	0800	1	3		1			3	0703	C4.9	8183
28	1953	1957	2020	1	3					3	1950	C1.3	
29	1727	1728	1750	1+	3					2	1721	B8.3	

* = no flare patrol.

OBSERVATORIES REPORTING FOR MARCH 1998

Columbia City, Indiana, USA	SES	Seattle, Washington, USA	SES
Edenvale, Rep of S. Africa	SES	Sofia, Bulgaria	SES
Houston, Texas, USA	SES	Sun City Center, FL, USA	SES
Hudson, Ohio, USA	SES	Tucson, Arizona, USA	SES
Nerja, Spain	SES	Upice, Czech Republic	SEA
New Milford, New York, USA	SES	Ziar nad Hronom, Slovakia	SEA
Panska Ves, Czech Republic	SES, SEA, SWF	Zilina, Slovakia	SEA
Rimavska Sobota, Slovakia	SEA		

Observations are not necessarily continuous.

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

MARCH 1998

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	0000	0738	CULG								
	0000	0837	HIRA								
	0630	1545	POTS	0630 E	1545 U	I	S	2	110U	400	
	0656	1531	ONDR								
	0701	1200	IZMI								
			POTS	0907.0	0907.9	DCIM		1	260	450	
			POTS	1147.8	1147.9	DCIM		1	600	750	
			PALE	2024.0	2025.0	III		1	27	45	
	2044	2400	CULG								
	2107	2400	HIRA								
02	0000	0600	HIRA								
	0000	0738	CULG								
	0630	1545	POTS	0630 E	1545 U	I	S	2	110U	375	
	0654	1531	ONDR								
	0700	1200	IZMI								
	2044	2400	CULG								
	2106	2400	HIRA								
03	0000	0737	CULG								
	0000	0839	HIRA								
	0630	1545	POTS	0630 E	1545 U	I	S,C,DC	2	110U	450	
	0651	1532	ONDR								
	0700	1200	IZMI	0700.0E	1200.0D	I	S	1	110	260	
	2104	2400	HIRA								
	2044	2400	CULG	2206.0	2206.0	III	B	1	20	100	
			CULG	2229.0	2229.0	III	B	1	18X	40	
04	0000	0737	CULG								
	0000	0840	HIRA								
	0630	1545	POTS	0630 E	1545 U	I	S,C,DC	2	110U	350	
			POTS	0639.8	0639.9	III	B	2	110U	170U	
	0649	1536	ONDR								
	0703	1058	IZMI	0700.0E	1058.0D	I	S	1	105	245	
			POTS	0922.4	0922.5	III	B	2	110U	160	
	1101	1200	IZMI	1101.0E	1200.0D	I	S	1	105	245	
			POTS	1514.0	1514.2	III	G	2	50	170U	
	2044	2400	CULG								
	2103	2400	HIRA								
05	0000	0737	CULG								
	0000	0841	HIRA								
	0630	1545	POTS	0630 E	1545 U	I	S	1	110U	300	
	0647	1536	ONDR								
	0700	0815	IZMI								
	0910	1200	IZMI								
			POTS	0910.6	0910.7	DCIM		1	360	400	
			POTS	1334.5	1334.7	III	B	2	40X	70	
			POTS	1420.2	1420.3	III	B	1	110U	170U	
	2102	2400	HIRA								
	2043	2400	CULG	2126.0	2227.0	I	S	2	60	90	
06	0000	0842	HIRA								
			LEAR	0302.0	0303.0	III		1	30	55	
	0000	0736	CULG	0302.0	0303.0	III	G	1	30	80	
	0630	1545	POTS	0630 E	1545 U	I	S,C,DC	2	110U	400	
	0644	1539	ONDR								
			CULG	0645.0	0646.0	III	B	1	20	35	
			POTS	0654.5	0654.6	III	B	1	40X	60	
	0700	1200	IZMI	0700.0E	1200.0D	I	S	1	105	160	
			SVTO	1038.0	1039.0	III		2	35	77	
			IZMI	1038.5	1039.2	III	G	2	45X	175	
			POTS	1038.6	1039.3	III	G	3	40X	350	
			IZMI	1038.9	1039.1	V		2	45X	90	
	2043	2400	CULG								
	2100	2400	HIRA								
07	0000	0843	HIRA								
	0000	0736	CULG	0112.0	0114.0	III	G	1	20	60	

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

MARCH 1998

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
07	0630	1545	POTS	0630 E	1545 U	I	S,C	1	110U	400	
	0642	1539	ONDR								
	0700	1200	IZMI	0806.0U	1200.0D	I	N	1	80	135	
			POTS	0855.7	0858.5	III	G	2	40X	90U	
	2043	2400	CULG								
	2059	2400	HIRA								
08	0000	0736	CULG								
	0000	0844	HIRA								
	0640	1543	ONDR								
	0701	1200	IZMI								
	0630	1545	POTS	0708.3	0708.4	III	G	1	110U	170U	
			POTS	0827	1545 U	I	S,W	1	110U	350	
			POTS	1327.8	1327.9	III	B	1	110U	170U	
			SGMR	1550.0	1551.0	III		1	30	60	
			SVTO	1550.0	1550.0	III		2	50U	64U	
			SVTO	1551.0	1551.0	III		2	50U	64U	
	2043	2400	CULG								
	2058	2400	HIRA								
09	0000	0845	HIRA								
	0000	0641	CULG	0326.0	0326.0	III	B	1	110	170	
	0638	1544	ONDR								
	0630	1545	POTS	0734.3	0739.4	III	G	1	110U	220	
			POTS	0943.9	0944.1	III	B	1	40X	170U	
			POTS	1125.9	1127.4	III	GG	3	40X	250	
	0813	1159	IZMI	1125.9	1127.2	III	G	2	45	175	
			POTS	1348	1545 U	I	S	1	110U	250	
			POTS	1416.3	1416.6	III	G	2	120	225	
			POTS	1544.0	1544.1	III	B	1	110U	150	
	2043	2400	CULG								
	2056	2400	HIRA								
10	0000	0735	CULG								
	0000	0846	HIRA								
	0630	1545	POTS	0630 E	1545 U	I	S	1	110U	300	
	0635	1545	ONDR								
	0731	1200	IZMI	0951.7U	0955.6	I	N	1	200	220	
			POTS	1248.6	1248.9	III	B	2	70	170U	
			POTS	1308.9	1309.0	III	B	1	110U	160	
	2054	2400	HIRA								
	2042	2400	CULG	2322.0	2322.0	III	B	1	100	140	
			CULG	2324.0	2324.0	III	B	1	80U	170	
11	0000	0847	HIRA	0307.7	0307.9	III	B	1	140	420	
	0000	0735	CULG	0523.0	0523.0	III	B	1	55	160	
	0607	1606	POTS	0607 E	1606 U	I	S	1	110U	400	
			POTS	0629.1	0629.2	III	B	1	110U	170U	
	0633	1546	ONDR								
	0700	1200	IZMI								
			POTS	0754.2	0754.3	III	B	2	110U	170U	
			POTS	1142.4	1142.5	III	B	2	110U	170U	
			POTS	1345.7	1345.9	III	G	2	65	250	
			POTS	1352.3	1353.7	III	G	1	110U	170U	
			POTS	1532.7	1533.3	III	G	2	60	170U	
			POTS	1603.3	1604.1	III	G	1	110U	170U	
	2042	2204	CULG								
	2053	2400	HIRA								
12			LEAR	0510.0	0511.0	III		2	30	61	
	0000	0656	CULG	0510.0	0512.0	III	G	2	18	170	
	0000	0847	HIRA	0511.0	0511.1	III	B	1	40	160	
	0607	1606	POTS	0607 E	1606 U	I	S,W	1	110U	170U	
	0631	1550	ONDR								
	0700	1200	IZMI								
			POTS	1009.8	1011.0	III	G	1	110U	150	
			POTS	1303.0	1303.3	III	G	1	110U	170U	
			POTS	1323.8	1324.1	III	G	2	110U	170U	
			POTS	1353.6	1355.0	III	G	2	110U	250	

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

MARCH 1998

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
12	2042	2400	CULG	2209.0	2209.0	III	B	1	60	180	
			CULG	2235.0	2236.0	III	B	1	20	45	
			CULG	2239.0	2240.0	III	B	2	18	250	
	2052	2400	HIRA	2239.3	2239.5	III	B	1	25X	250	
			CULG	2308.0	2308.0	III	B	1	20	80	
			CULG	2327.0	2327.0	III	B	1	30	75	
13	0000	0848	HIRA								
	0000	0735	CULG	0100.0	0102.0	III	G	1	25	180	
			CULG	0222.0	0222.0	III	B	1	25	45	
			CULG	0510.0	0510.0	III	B	1	60	150	
	0607	1606	POTS	0607 E	1606 U	I	S	1	110U	170U	
			POTS	0625.7	0628.0	III	G	2	55	275	
	0628	1551	ONDR								
			CULG	0628.0	0628.0	III	B	1	60	150	
			POTS	0708.1	0708.3	III	G	1	110U	225	
			POTS	0751.9	0755.6	III	G	1	110U	170U	
			POTS	0802.3	0806.5	III	G	2	110U	250	
			POTS	0849.2	0852.4	III	G	1	110U	170U	
			POTS	0955.9	0956.3	III	G	2	50	250	
	0700	1200	IZMI	0955.9	0956.3	III	G	1	55	220	
			POTS	1007.7	1008.2	III	G	2	110U	220	
			IZMI	1035.8	1040.0	III	G	1	205	270X	
			POTS	1035.8	1036.1	DCIM		2	200U	575	
			POTS	1044.1	1044.8	DCIM		2	200U	575	
			IZMI	1044.6	1044.7	III	B	1	245	270X	
			POTS	1107.5	1108.3	DCIM		1	250	375	
			POTS	1119.9	1121.0	III	G	2	110U	170U	
			POTS	1127.8	1127.9	III	B	1	110U	170U	
			POTS	1133.0	1133.1	DCIM		1	300	600	
			POTS	1142.0	1144.6	III	GG	2	110U	350	
			POTS	1206.4	1206.5	III	B	1	120	170U	
			POTS	1227.6	1227.7	III	B	2	110U	170U	
			POTS	1312.4	1312.5	III	G	1	110U	170U	
			POTS	1322.2	1322.4	III	G	1	110U	170U	
			POTS	1332.1	1334.4	III	G	2	110U	170U	
			POTS	1411.8	1424.2	III	GG	2	110U	250	
			POTS	1443.3	1443.5	III	G	2	110U	220	
			POTS	1514.0	1514.1	III	B	1	110U	170U	
			POTS	1527.0	1529.0	III	G	2	65	170U	
			PALE	1759.0	1759.0	III		1	40	55	
			SGMR	1759.0	1800.0	III		1	30	55	
	2041	2400	CULG	2059.0	2116.0	III	N	1	20	60	
			CULG	2232.0	2233.0	III	G	1	40	200	
	2050	2400	HIRA	2232.4	2233.0	III	G	1	80	250	
			CULG	2235.0	2235.0	III	B	2	18X	180	
			HIRA	2235.0	2235.2	III	B	2	25X	150	
			PALE	2235.0	2235.0	III		2	25	60	
14			LEAR	0053.0	0053.0	III		2	30	67	
			PALE	0053.0	0053.0	III		1	25	55	
	0000	0734	CULG	0053.0	0053.0	III	B	1	18X	180	
			CULG	0211.0	0211.0	III	B	1	60	180	
	0000	0849	HIRA	0211.4	0211.5	III	B	1	80	220	
			HIRA	0228.6	0228.7	III	B	1	60	170	
			CULG	0303.0	0303.0	III	B	1	20	100	
			LEAR	0303.0	0303.0	III		1	30	51	
	0607	1606	POTS	0607 E	1606 U	I	S,W	1	120	400	
	0626	1552	ONDR								
			POTS	0626.2	0630.2	III	G	3	40X	275	
			LEAR	0628.0	0629.0	III		2	30	80	
			SVTO	0628.0	0629.0	III		2	66	85	
			HIRA	0628.8	0629.0	III	B	2	60	220	
			CULG	0629.0	0629.0	III	G	2	25	180	
	0700	0849	IZMI								
			CULG	0722.0	0722.0	III	B	1	25	80	
			POTS	0725.7	0726.7	III	G	2	110U	170U	
			POTS	0840.2	0840.3	III	B	1	110U	170U	
			POTS	0917.0	0923.8	III	G	3	40X	250	

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14			LEAR	0923.0	0923.0	III		1	30	80	
			SVTO	0923.0	0923.0	III		2	56U	80U	
	0950	1029	IZMI								
	1127	1200	IZMI								
			POTS	1152.6	1152.8	III	G	1	110U	170U	
			POTS	1254.4	1254.8	III	G	1	110U	170U	
			SGMR	1411.0	1411.0	III		1	30	50	
			POTS	1411.1	1411.2	III	B	2	40X	50	
			POTS	1457.7	1506.2	III	GG	3	70	375	
			POTS	1514.6	1515.2	III	G	1	110U	170U	
			POTS	1557.9	1558.1	III	G	2	110U	170U	
	2041	2400	CULG								
	2049	2400	HIRA								
15	0000	0850	HIRA								
	0000	0734	CULG	0159.0	0159.0	III	B	1	120	180	
	0607	1606	POTS	0607 E	1606 U	I	S,C	2	70	400	
	0700	1200	IZMI								
			POTS	1004.8	1005.0	III	B	1	110U	170U	
			SVTO	1032.0	1033.0	III		1	35	85	
			POTS	1151.9	1152.6	DCIM		1	350	800X	
	0624	1556	ONDR	1152.1	1152.3	DCIM	SP	3	800X	1945	
			POTS	1259.7	1259.9	III	G	1	110U	170U	
			POTS	1454.9	1455.0	UNCLF		2	200U	250	
			POTS	1511.6	1511.8	III	G	2	110U	250	
	2041	2400	CULG	2041.0E	2116.0	I	S	1	130	180	
	2047	2400	HIRA								
			PALE	2206.0	2208.0	III		1	25U	56U	
			PALE	2226.0	2228.0	III		1	25U	56U	
16	0000	0734	CULG								
	0000	0851	HIRA								
	0607	1606	POTS	0607 E	1606 U	I	S	1	130	350	
			POTS	0618.9	0619.1	III	G	1	130	170U	
	0700	1200	IZMI								
			POTS	0852.3	0852.6	III	G	1	110U	150	
			POTS	1207.5	1208.0	III	G	2	40X	170U	
			POTS	1245.0	1245.1	III	B	2	110U	160	
			POTS	1426.6	1426.7	III	B	1	110U	150	
	0622	1556	ONDR	1550.4	1554.3	DCIM	GG,SP	3	800	2000	
			POTS	1551.2	1551.3	DCIM		1	200U	375	
	2041	2400	CULG								
	2046	2400	HIRA								
17			PALE	0259.0	0300.0	III		1	30	55	
			LEAR	0300.0	0300.0	III		2	30	75	
	0000	0734	CULG	0300.0	0301.0	III	G	2	20	150	
	0000	0852	HIRA	0524.4	0524.6	III	B	1	530	820	
			POTS	0607 E	1606 U	III	N	1	110U	170U	
	0607	1606	POTS	0607 E	1606 U	I	S,W	1	110U	250	
	0619	1557	ONDR								
			CULG	0713.0	0716.0	III	G	1	30	90	
	0700	1200	IZMI	0713.0	0713.1	III	G	1	45X	85	
			POTS	0713.1	0717.2	III	G	3	40X	170U	
			IZMI	0716.2	0716.3	III	G	1	45X	140	
			LEAR	0733.0	0734.0	III		3	30	80	
			CULG	0734.0	0734.0	III	B	2	22	180	
			IZMI	0734.0	0734.3	III	G	2	45X	150	
			SVTO	0734.0	0734.0	III		2	35	85	
			IZMI	0734.1	0734.3	V		2	45	65	
			POTS	0734.1	0734.7	III	G	3	40X	170U	
			LEAR	0754.0	0755.0	III		2	30	60	
			POTS	0754.9	0755.1	III	B	2	40X	65	
			SVTO	0755.0	0755.0	III		1	35	45	
			POTS	0808.6	0809.2	III	G	2	130	170U	
			LEAR	0908.0	0909.0	III		2	35	65	
			SVTO	0908.0	0909.0	III		1	37	49	
			POTS	0908.4	0908.9	III	G	3	40X	160	
			IZMI	0908.5	0908.9	III	G	2	45X	135	

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17			POTS	0940.9	0941.1	III	G	1	40X	75	
			POTS	1040.8	1041.3	III	G	2	120	170U	
			POTS	1141.8	1141.9	III	B	2	110U	170U	
			POTS	1449.5	1450.0	III	G	2	110U	170U	
	2045	2400	HIRA								
			LEAR	2344.0	2344.0	III		1	30	52	
			PALE	2344.0	2344.0	III		1	32	47	
	2040	2400	CULG	2345.0	2345.0	III	B	1	20	90	
			CULG	2358.0	2358.0	III	B	1	70	250	
18	0000	0733	CULG	0204.0	0211.0	III	G	1	65	180	
	0000	0853	HIRA	0204.1	0204.2	III	B	1	60	250	
			HIRA	0229.0	0229.1	III	B	1	120	210	
			CULG	0428.0	0428.0	III	B	1	70	110	
			POTS	0607 E	1607 U	III	N	1	110U	170U	
	0607	1606	POTS	0607 E	1607 U	I	S,C	2	40X	400	
			POTS	0642.8	0642.9	III	B	2	110U	130	
	0702	1125	IZMI	0702.0E	1057.0U	I	N	1	200	270X	
			POTS	0824.6	0828.5	III	G	2	110U	170U	
			POTS	0839.3	0839.4	III	B	2	110U	160	
			POTS	0904.8	0904.9	III	B	2	110U	250	
			IZMI	0916.1	0918.1	III	GG	2	45	165	
			POTS	0916.1	0921.4	III	GG	3	40X	275	
			POTS	0927.2	0931.6	III	G	2	110U	170U	
			POTS	0945.5	0945.6	III	B	2	110U	130	
			POTS	0957.1	0957.3	III	G	2	110U	160	
			POTS	1002.5	1002.6	III	G	2	110U	170U	
			POTS	1015.3	1015.4	III	B	2	110U	170U	
			POTS	1047.9	1103.2	III	GG,C	3	40X	400	
			IZMI	1048.2	1049.4	III	G	1	45X	270X	
	0617	1559	ONDR	1050.5	1101.1	DCIM	GG	3	800X	2000X	
			IZMI	1051.6	1125.0D	III	N	1	45X	160	
			IZMI	1057.0U	1125.0D	I	S	2	95U	270X	
			POTS	1057.9	1058.1	DCIM		1	650	800X	
			POTS	1110.8	1116.3	II	UE	2	40X	55	
			SVTO	1209.0	1210.0	III		2	36	48	
			POTS	1209.4	1211.7	III	G	3	40X	160	
			POTS	1251.0	1253.8	III	G	3	40X	170U	
			POTS	1314.4	1314.7	III	G	2	40X	150	
			POTS	1447.7	1451.3	III	G	3	40X	170U	
			POTS	1517.2	1518.3	III	G	2	110U	275	
	2040	2400	CULG	2048.0	2048.0	III	B	1	25	45	
			LEAR	2349.0	2354.0	III		3	30	80	
			CULG	2350.0	2350.0	III	B	1	35	130	
	2043	2400	HIRA	2353.9	2354.1	III	B	2	25X	260	
			CULG	2354.0	2354.0	III	B	3	25	270	
19			LEAR	0125.0	0126.0	III		2	30	80	
			PALE	0125.0	0126.0	III		1	29	57	
	0000	0854	HIRA	0125.9	0126.4	III	B	1	25X	250	
	0000	0733	CULG	0126.0	0127.0	III	G	2	18X	180	
			CULG	0310.0	0733.0D	I	S	1	100	180	
			POTS	0607 E	1606 U	III	N	1	110U	170U	
	0607	1606	POTS	0607 E	1606 U	I	S,C	2	110U	400	
	0615	1603	ONDR								
			IZMI	0645.0E	0730.0U	III	N	1	90U	270	
	0645	1200	IZMI	0645.0E	0918.0U	I	S	2	110	270X	
			CULG	0700.0	0700.0	III	B	1	70	180	
			IZMI	0700.2	0700.5	III	G	1	65	165	
			POTS	0700.2	0700.8	III	G	2	65	170U	
			IZMI	0722.3	0722.5	III	B	1	80	135	
			IZMI	0852.2	0859.1	III	G	2	45X	165	
			LEAR	0858.0	0858.0	III		1	34	80	
			SVTO	0858.0	0858.0	III		1	35U	85U	
			POTS	0858.1	0906.1	III	GG,RS	3	40X	250	
			IZMI	0858.3	0858.7	V	G	1	45	70	
			LEAR	0934.0	0934.0	III		1	35	80	
			POTS	0934.4	0934.5	III	G	1	110U	160	
			POTS	0934.9	0935.1	DCIM		1	375	550	

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19			SVTO	0939.0	0939.0	III		1	35U	85U	
			IZMI	0939.1	0939.4	III	G	2	45X	170	
			POTS	0939.1	0940.6	III	G	3	40X	170U	
			POTS	1028.2	1028.3	III	B	2	110U	160	
			POTS	1124.9	1125.1	III	B	1	40X	170U	
			POTS	1127.4	1127.9	III	G	1	40X	70	
			POTS	1129.1	1129.2	III	B	2	110U	150	
			POTS	1147.3	1147.4	III	G	1	325	400	
			POTS	1406.9	1407.9	III	G,U,RS	2	200X	325	
			POTS	1449.1	1450.1	III	G,U	2	110U	170U	
			POTS	1502.3	1503.6	III	G,C,U,RS	3	110U	170U	
			POTS	1503.0	1503.5	DCIM		1	500	800X	
			POTS	1526.3	1526.5	III	G	2	55	150	
			POTS	1544.5	1552.1	III	GG,C	3	40X	170U	
			SGMR	1628.0	1629.0	III		1	30	57	
			PALE	1854.0	1854.0	III		1	40	55	
			PALE	1906.0	1906.0	III		1	48	56	
	2040	2400	CULG	2128.0	2129.0	III	B	2	30	180	
			CULG	2159.0	2203.0	III	G	3	18X	180	
			PALE	2159.0	2202.0	III		2	27	55	
			SGMR	2159.0	2200.0	III		1	30	57	
	2041	2400	HIRA	2159.1	2159.3	III	B	2	25X	120	
			CULG	2230.0	2232.0	III	G	1	20	90	
			PALE	2353.0	2354.0	III		2	30	75	
20	0000	0855	HIRA								
			POTS	0607 E	1606 U	III	N	1	110U	170U	
	0607	1606	POTS	0607 E	1606 U	I	S,C	2	110U	400	
			POTS	0641.8	0641.9	DCIM		2	200U	600	
			POTS	0642.0	0643.9	III	G,C,RS	3	110U	200U	
	0000	0733	CULG	0642.0	0642.0	III	B	1	100	160	
			CULG	0644.0	0644.0	III	B	1	75	160	
	0702	0839	IZMI	0702.0E	1200.0D	I	N	2	160	270X	
			POTS	0818.0	0818.1	III	B	2	110U	160	
			POTS	0840.5	0841.6	DCIM		1	300	450	
			POTS	0928.3	0928.4	III	B	2	110U	300	
	0855	1200	IZMI	0928.3	0928.4	III	B	2	185	270X	
			POTS	0956.8	0956.9	III	G	2	110U	170U	
			POTS	1049.0	1049.1	III	B	1	350	450	
	0613	1604	ONDR	1206.1	1209.4	DCIM	G	2	800X	2000	
			POTS	1206.6	1208.3	DCIM		2	350	600	
			POTS	1207.0	1213.6	III	GG,C	3	110U	350	
	2040	2400	HIRA								
	2040	2400	CULG	2040.0E	2400.0D	I	S	1	70	160	
21	0000	0856	HIRA								
	0000	0733	CULG	0000.0E	0733.0D	I	S	1	70	170	
	0543	1620	POTS	0543 E	1620 U	I	S,C	2	110U	300	
	0700	1200	IZMI	0700.0D	1200.0D	I	S	2	80	245	
			POTS	1333.4	1334.0	III	G,U	3	110U	160	
	0610	1604	ONDR	1359.2	1406.5	DCIM	GG	2	800X	1875	
			POTS	1401.0	1401.7	DCIM		1	600	800X	
	2039	2400	CULG								
	2039	2400	HIRA								
22	0543	1620	POTS	0543 E	1620 U	I	S,C	2	110U	250	
			POTS	0629.1	0629.2	III	G	2	110U	145	
	0608	1606	ONDR	0654.1	0657.1	DCIM	GG,SP	3	800	1660	
			POTS	0655	0659.5	DCIM		2	135	800X	
	0000	0857	HIRA	0655.0	0655.6	III	G	1	800	1200	
	0655	1200	IZMI	0656.5	0658.4	III	G	1	200	270X	
			HIRA	0656.7	0657.7	III	G	1	200	400	
			CULG	0700.0	0712.0	II	SH	2	40	160	ESS 650
			IZMI	0700.0	0709.8	II	HARM	2	45	165	
			IZMI	0700.0U	1200.0D	I	N	1	85	135	
			LEAR	0700.0	0711.0	II		1	30	80	ESS 0600
			SVTO	0700.0	0710.0	II		2	50	85	ESS 1000
	0000	0732	CULG	0700.0	0708.0	II	FN	2	30	80	ESS 750
			POTS	0700.3	0705	II	F,H	3	40X	80	

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22			HIRA	0700.6	0702.1	II	SH	2	100	140	ESS 900
			POTS	0700.9	0711	II	SH,H	3	40X	170U	
			HIRA	0701.0	0701.8	II	FN	2	50	70	ESS 900
			HIRA	0703.4	0704.6	II		2	80	100	ESS 700
			LEAR	0718.0	0721.0	II		1	43	62	ESS 0700
			LEAR	0718.0	0732.0	II		1	30	62	ESS 0700
			CULG	0719.0	0732.0	II	SH	1	25	60	ESS 400
			IZMI	0719.0	0721.3	UNCLF		1	45X	65	
			SVTO	0719.0	0728.0	II		2	35	55	ESS 2000
			IZMI	0941.4	0941.6	III	G	1	50	165	
			POTS	0941.4	0941.7	III	G	2	40X	160	
			POTS	1011.2	1011.3	III	B	2	110U	170U	
			PALE	1653.0	1653.0	III		1	27	56	
	2037	2400	HIRA								
	2039	2400	CULG								
23	0000	0858	HIRA								
	0000	0732	CULG	0007.0	0007.0	III	B	1	35	90	
			CULG	0354.0	0540.0	I	S	1	60	140	
			LEAR	0400.0	0525.0	CONT		1	30	80	
	0543	1620	POTS	0543 E	1620 U	I	S,C	2	40X	400	
	0606	1609	ONDR								
	0655	0711	IZMI	0655.0E	0711.0D	I	S	1	85	260	
	0711	1200	IZMI	0711.1E	1200.0D	I	S	2	85	260	
			LEAR	0837.0	0936.0	CONT		2	45	80	
			SVTO	0837.0	0942.0	CONT		2	65	80	
	2039	2400	CULG	2050.0	2050.0	III	B	1	45	150	
			CULG	2113.0	2113.0	III	B	1	60	150	
			CULG	2159.0	2201.0	III	G	3	20	340	
			PALE	2159.0	2200.0	III		2	27	68	
			SGMR	2159.0	2200.0	III		1	37	80	
	2036	2400	HIRA	2159.8	2200.6	III	B	2	25X	140	
			CULG	2240.0	2240.0	III	B	1	25	150	
24	0000	0858	HIRA								
	0000	0732	CULG	0045.0	0312.0	I	S	1	100	160	
			CULG	0450.0	0450.0	III	B	1	18X	45	
			POTS	0543 E	1620 U	III	N	1	110U	170U	
	0543	1620	POTS	0543 E	1620 U	I	S,C	2	110U	400	
	0700	1200	IZMI	0700.0E	1200.0D	I	S	1	90	145	
			POTS	0753.9	0754.0	III	B	2	40X	90U	
			IZMI	0917.1	0917.5	III	G	1	50	70	
			POTS	0917.1	0917.3	III	B	1	50	130	
			IZMI	0925.2	0925.3	III	G, HARM	1	45	135	
			POTS	0925.2	0926.2	III	G	2	40X	170U	
			ONDR	1025.5	1029.3	DCIM		1	910	2000X	
	0604	1611	ONDR	1026.2	1028.0	DCIM		1	2000X	4430	
			IZMI	1053.0U	1126.0U	III	S	1	45	90	
			IZMI	1152.2	1152.3	III	B	1	45X	120	
			IZMI	1153.4	1153.7	III	G	1	50	270X	
			POTS	1153.4	1153.7	III	G	2	40X	375	
			POTS	1231.3	1231.7	DCIM		1	300	400	
			POTS	1231.5	1231.7	III	B	2	40X	400	
			POTS	1357.7	1357.8	III	B	1	40X	60	
	2035	2400	HIRA								
	2038	2400	CULG	2149.0	2209.0	III	N	1	20	170	
			PALE	2159.0	2201.0	V		1	28	66	
			CULG	2207.0	2400.0	IV	FS	1	60	170	
25			POTS	0543 U	1620 U	III	N	1	110U	170U	
	0543	1620	POTS	0543 U	1620 U	I	S,C	2	40X	400	
			LEAR	0548.0	0549.0	III		1	30	59	
			SVTO	0548.0	0549.0	III		1	37U	60U	
	0000	0731	CULG	0548.0	0550.0	III	G	1	20	110	
			POTS	0548.1	0548.7	III	G	2	40X	170U	
	0700	1027	IZMI	0700.0E	1027.0D	I	S	1	110	270X	
			LEAR	0721.0	0722.0	III		3	30	80	
			SVTO	0721.0	0722.0	III		2	35	85	
			IZMI	0721.6	0721.7	III	G	2	45X	150	

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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
25			POTS	0721.6	0722.1	III	G	3	40X	170U	
			IZMI	0721.7	0722.0	V		2	45	90	
	0000	0859	HIRA	0721.7	0721.9	III	B	1	25X	130	
			CULG	0722.0	0722.0	III	B	2	22	160	
			POTS	0807.6	0809.5	III	G	2	110U	170U	
			POTS	0828.9	0829.3	III	G	2	40X	60	
			LEAR	0829.0	0829.0	III		1	30	52	
			SVTO	0829.0	0829.0	III		1	35	45	
			IZMI	0920.9	0921.1	III	B	1	50	90	
			POTS	0921.0	0921.1	III	B	1	40X	70	
			IZMI	0922.8	0922.9	III	B	1	85	130	
			POTS	0922.8	0922.9	III	B,RS	2	110U	140	
			POTS	1047.4	1047.6	III	G	2	110U	160	
			POTS	1136.4	1137.9	DCIM		2	200U	450	
	1133	1200	IZMI	1136.5	1137.8	III	GG	2	105	270X	
			POTS	1137.7	1137.8	III	B	3	130	170U	
			ONDR	1228.3	1238.4	DCIM		1	800	2000X	
	0601	1611	ONDR	1234.3	1236.4	DCIM		1	2000X	3955	
			POTS	1243.4	1244.6	DCIM		1	300	450	
			SVTO	1249.0	1346.0	CONT		2	35	80	
			ONDR	1253.0	1256.2	DCIM		1	800X	2000X	
			SGMR	1305.0	1347.0	CONT		1	30	80	
	2033	2400	HIRA								
	2038	2400	CULG								
26			LEAR	0406.0	0407.0	III		1	43	80	
	0000	0900	HIRA	0406.7	0406.8	III	B	2	40	170	
	0000	0731	CULG	0407.0	0407.0	III	B	3	40	170	
			POTS	0543 E	1620 U	III	N	1	110U	170U	
	0543	1620	POTS	0543 E	1620 U	I	S	2	110U	400	
			POTS	0559.5	0601.8	III	G	3	40X	170U	
			CULG	0600.0	0602.0	III	G	2	55	150	
			SVTO	0600.0	0601.0	III		1	70	85	
			POTS	0642.6	0642.7	III	B	2	110U	160	
			POTS	0645.3	0645.4	III	B	2	110U	150	
	0700	0925	IZMI	0705.0U	0925.0D	I	N	1	120	245	
			IZMI	0903.7	0903.8	III	B	1	190	245	
			POTS	0903.7	0903.9	III	B	1	110U	250	
			POTS	1027.6	1027.7	III	B	2	110U	170U	
			POTS	1033.1	1035.7	III	G	2	120	170U	
			POTS	1042.0	1051.9	III	GG,RS	2	110U	170U	
			POTS	1108.2	1108.5	III	G	3	60	250	
	0955	1149	IZMI	1108.2	1108.3	III	G	2	80	150	
			SVTO	1204.0	1204.0	III		2	58	85	
			POTS	1204.4	1205.2	III	G,U	3	40X	250	
			ONDR	1250.2	1255.5	DCIM		1	800X	2000X	
	0559	1613	ONDR	1252.5	1255.0	DCIM		1	2000X	4430X	
			POTS	1408.9	1411.0	III	G,RS	2	110U	170U	
	2038	2400	CULG	2315.0	2400.0D	IV	FS	2	60	170	
	2031	2400	HIRA	2316.0	2400.0D	IV		2	80	200	
			LEAR	2339.0	0114.0	CONT		1	30	80	
27	0000	0731	CULG	0000.0E	0130.0	IV	FS	2	60	170	
	0000	0901	HIRA	0000.0E	0115.0	IV		2	80	200	
			CULG	0042.0	0049.0U	II	FN,H	3	22	50	ESS 600
			CULG	0042.0	0049.0U	II	SH,H	3	45	120	
			LEAR	0042.0	0051.0	II		3	30	80	ESS 1000
			PALE	0042.0	0050.0	II		2	25	75	ESS 0900
			HIRA	0042.3	0048.3	II	SH	3	50	120	ESS 700
			HIRA	0042.8	0048.3	II	FN	3	25X	40	ESS 700
			PALE	0057.0	0113.0	V		1	30	50	
			CULG	0100.0	0114.0	CONT		1	30	40	
			CULG	0209.0	0403.0	I	S	1	110	170	
			CULG	0251.0	0251.0	III	B	1	30	85	
			CULG	0307.0	0307.0	III	B	1	70	150	
			POTS	0543 E	1620 U	III	N	1	110U	170U	
	0543	1620	POTS	0543 E	1620 U	I	S,C	2	110U	450	
			POTS	0616.5	0627.0	III	G,C	3	110U	400	
			CULG	0618.0	0618.0	III	B	1	120	180	

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27	0700	1200	IZMI	0700.0E	0800.0U	I	N	1	110	135	
			POTS	1023.0	1023.1	UNCLF		2	110U	130	
			IZMI	1100.0U	1148.0	I	N	1	200	270	
			IZMI	1148.0	1300.0	I	S	2	95	270X	
			ONDR	1443.3	1450.2	DCIM	GG	3	800X	1235	
			POTS	1443.4	1457.7	IV	C,P	2	110U	800X	
			ONDR	1452.4	1457.3	DCIM	GG	3	800X	1890	
	0557	1616	ONDR	1454.0	1456.4	DCIM		1	2000X	2740	
	2030	2400	HIRA								
28	0000	0902	HIRA								
			POTS	0543 E	1620 U	III	N	1	110U	170U	
	0543	1620	POTS	0543 E	1620 U	I	S	2	110U	450	
	0555	1616	ONDR								
	0700	1200	IZMI	0910.9	0911.5	III	G	1	245	270	
			IZMI	0912.0	0912.6	III	G	1	80	270	
			POTS	0912.0	0912.7	III	G	2	40X	275	
			POTS	1049.9	1050.0	III	B	1	40X	70	
			POTS	1144.4	1144.6	III	B	1	40X	70	
			POTS	1207.8	1207.9	III	B	1	40X	80	
			POTS	1240.9	1241.0	III	B	2	110U	170U	
			POTS	1248.2	1248.3	III	B	1	40X	70	
			POTS	1331.9	1332.0	III	B	1	40X	80	
			POTS	1417.1	1417.2	III	B	2	40X	160	
			POTS	1604.1	1605.2	III	G	2	40X	170U	
	2028	2400	HIRA								
29			LEAR	0107.0	0130.0	CONT		1	30	62	
			LEAR	0244.0	0248.0	III		3	30	80	
			LEAR	0245.0	0302.0	II		3	30	80	ESS 1000
			PALE	0246.0	0258.0	II		2	43	63	ESS 1000
	0000	0902	HIRA	0246.0	0257.6	II		2	40	60	ESS 600
			HIRA	0246.7	0248.0	III	G	2	30	50	
			LEAR	0302.0	0332.0	IV		1	30	75	
			LEAR	0413.0	0414.0	III		1	30	60	
			LEAR	0458.0	0459.0	III		2	30	70	
			POTS	0543 E	1620 U	III	N	1	40X	90U	
			POTS	0543 E	1620 U	III	N	1	110U	170U	
			POTS	0543 E	1620 U	III	N	2	40X	90U	
	0543	1620	POTS	0543 E	1620 U	I	S	1	110U	300	
			LEAR	0552.0	0621.0	III	N	1	30	50	
	0553	1617	ONDR								
	0600	1200	IZMI	0600.0E	1150.0U	III	N	1	45X	120	
			IZMI	0605.8	0606.2	III	G	2	45X	120	
			POTS	0606.1	0614.4	III	G	3	40X	90U	
			IZMI	0620.9	0621.1	III	G	1	45X	120	
			POTS	0630.6	0630.8	III	G	2	40X	170U	
			POTS	0645.4	0645.5	III	B,RS	1	120	160	
			LEAR	0728.0	0729.0	III		1	30	60	
			POTS	0728.8	0729.1	III	G	2	40X	140	
			LEAR	0748.0	0748.0	III		1	30	70	
			SVTO	0748.0	0748.0	III		1	34	70	
			IZMI	0748.4	0748.6	III	G	2	50	180	
			POTS	0748.4	0748.8	III	G,RS	2	40X	250	
			LEAR	0801.0	0801.0	III		1	52	62	
			SVTO	0801.0	0801.0	III		1	52	61	
			IZMI	0801.7	0801.8	III	B	1	45	120	
			POTS	0801.7	0801.9	III	B	2	40X	130	
			POTS	0815.4	0815.5	III	G	1	40X	155	
			IZMI	0839.0	1135.0U	I	S	1	180	245	
			POTS	0930.9	0945.4	III	GG,RS	2	40X	150	
			IZMI	1002.0	1002.1	III	B	2	45X	90	
			POTS	1002.0	1002.1	III	B	3	40X	130	
			POTS	1030.0	1030.1	III	B	2	40X	160	
			POTS	1036.1	1036.3	III	G	3	40X	90U	
			POTS	1040.0	1040.1	III	B	3	40X	120	
			POTS	1103.4	1105.5	III	G	2	40X	170U	
			POTS	1205.2	1205.3	III	B	2	110U	150	
			POTS	1218.5	1218.6	III	B	2	110U	140	

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29			SGMR	1342.0	1342.0	III		1	30	80	
			SVTO	1342.0	1342.0	III		2	35	74	
			POTS	1342.5	1342.8	III	G,RS	3	40X	140	
	2027	2400	HIRA								
	2036	2400	CULG								
30	0000	0903	HIRA								
	0000	0730	CULG	0232.0	0234.0	III	G	1	20U	180	
			LEAR	0247.0	0248.0	III		2	30	65	
			CULG	0248.0	0248.0	III	B	1	20U	100	
			CULG	0502.0	0515.0	III	N	1	25	80	
			POTS	0543 E	1620 U	III	N	1	40X	90U	
			POTS	0543 E	1620 U	III	N	1	110U	170U	
	0543	1620	POTS	0543 E	1620 U	I	S,W	1	130	350	
	0550	1620	ONDR								
			CULG	0640.0	0717.0	III	N	1	20	60	
			POTS	0943.5	0945.2	III	G	2	110U	170U	
	0610	1200	IZMI	0943.5	0943.7	III	G	1	80	140	
			POTS	0953.1	0953.2	III	B	3	40X	70	
			POTS	1012.0	1016.8	III	G	2	40X	340	
			POTS	1257.6	1257.7	III	B	2	40X	80	
			PALE	1937.0	1939.0	III		3	28	68	
			SGMR	1937.0	1939.0	V		1	30	80	
	2026	2400	HIRA								
			PALE	2139.0	2139.0	III		2	28	56	
	2036	2400	CULG	2139.0	2140.0	III	G	2	45U	110	
31	0000	0723	CULG	0056.0	0056.0	III	B	1	20	180	
			CULG	0158.0	0159.0	III	G	2	20	150	
			LEAR	0158.0	0158.0	III		2	30	60	
			PALE	0158.0	0158.0	III		2	30	60	
	0000	0904	HIRA	0158.2	0158.5	III	B	1	25X	120	
			CULG	0210.0	0236.0	III	N	1	30	90	
			LEAR	0215.0	0244.0	III	N	1	30	65	
			PALE	0222.0	0226.0	III		2	40	55	
			CULG	0252.0	0530.0	IV	FS	2	30U	160	
			LEAR	0300.0	0634.0	CONT		1	30	80	
			CULG	0500.0	0511.0	III	G	3	40	230	
			HIRA	0500.2	0510.8	III	GG	3	60	230	
			SVTO	0507.0	0509.0	III		2	75U	85U	
			CULG	0518.0	0545.0	III	N	1	20	180	
			POTS	0543 E	1620 U	III	N	1	40X	90U	
			POTS	0543 E	1620 U	III	N	2	40X	90U	
	0543	1620	POTS	0543 E	1620 U	I	S,C	2	40X	350	
	0545	1200	IZMI	0545.4	0546.4	III	G	1	55	90	
	0548	1621	ONDR								
			LEAR	0550.0	0557.0	III		2	30	80	
			CULG	0551.0	0558.0	II	FN	2	24	45	
			CULG	0551.0	0601.0	II	SH	3	45	120	ESS 900
			SVTO	0551.0	0557.0	V		2	35	85	
			POTS	0551.1	0601.2	UNCLF		3	40X	120	
			IZMI	0551.2	0601.2	III	S	2	45X	120	
			HIRA	0551.6	0558.0	III	G	2	30	120	
			CULG	0625.0	0625.0	III	B	1	25	160	
			SVTO	0625.0	0625.0	III		1	36	62	
			IZMI	0625.3	0625.5	III	B	2	45X	245	
			POTS	0625.3	0625.7	III	G	3	40X	170U	
			POTS	0656.3	0656.8	DCIM		1	200U	375	
			CULG	0657.0	0700.0	III	G	2	18X	200	
			IZMI	0657.0	0659.2	III	GG	2	45X	270X	
			SVTO	0657.0	0658.0	III		2	35	85	
			POTS	0657.1	0659.6	III	G	3	40X	350	
			HIRA	0657.2	0658.3	III	G	2	25X	170	
			IZMI	0657.4	0658.4	V	G	2	45	120	
			POTS	0710.4	0711.8	III	G,RS	2	110U	170U	
			POTS	0725.6	0726.8	III	G	1	250	400	
			IZMI	0742.9	1052.0U	III	N	1	45X	135	
			LEAR	0747.0	0758.0	III	N	1	30	75	
			POTS	0747.0	0758.2	III	GG,RS	2	40X	170U	

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31			SVTO	0748.0	0750.0	III		1	35	65	
			IZMI	0757.0	0757.1	III	G	2	45	245	
			IZMI	0757.0U	1052.0U	I	S	2	85	135	
			POTS	0758.0	0758.3	DCIM		1	250	400	
			POTS	0817.4	0818.3	DCIM		2	250	575	
			HIRA	0817.5	0818.0	III	B	1	320	440	
			SVTO	0900.0	0905.0	III		2	35	77	
			POTS	0900.4	0905.6	III	GG	3	40X	170U	
			LEAR	0902.0	0905.0	III		2	30	80	
			IZMI	0903.2	0905.5	III	GG	2	45X	165	
			POTS	0910.8	0910.9	III	B	2	50	90U	
			POTS	0933.1	0934.2	DCIM		2	375	650	
			POTS	1001.6	1002.0	III	G	3	40X	90U	
			POTS	1023.0	1034.8	III	GG	3	40X	150	
			POTS	1044.4	1044.6	III	G	3	40X	80	
			POTS	1048.1	1051.0	III	G	2	40X	170U	
			POTS	1136.7	1145.4	III	GG	3	40X	130	
			SVTO	1141.0	1359.0	CONT		1	35	70	
			SGMR	1153.0	1643.0	CONT		1	30	57	
			IZMI	1153.2	1159.7	III	GG	1	45X	70	
			POTS	1153.2	1156.5	III	G	3	40X	170U	
			POTS	1156.1	1156.5	DCIM		1	350	600	
			POTS	1234.7	1234.8	III	G	2	40X	170U	
			POTS	1242.8	1242.9	III	B	2	40X	170U	
			POTS	1312.7	1319.8	III	G	3	40X	130	
			SGMR	1357.0	1408.0	III		1	30	64	
			POTS	1406.8	1410.1	III	G	3	40X	170U	
			POTS	1521.9	1522.1	III	G	2	40X	145	
			SGMR	1539.0	1540.0	III		1	30	55	
			POTS	1539.8	1540.1	III	G	3	40X	170U	
			PALE	2030.0	2033.0	III		1	28	55	
			SGMR	2032.0	2033.0	III		1	30	57	
	2036	2400	CULG	2036.0E	2220.0	III	S	1	20	180	
			SGMR	2054.0	2126.0	CONT		1	30	70	
			PALE	2056.0	2312.0	CONT		1	25	55	
			PALE	2215.0	2218.0	III		2	25	55	
			SGMR	2215.0	2218.0	III		1	30	57	
	2025	2400	HIRA	2215.8	2217.8	III	G	2	25X	150	
			CULG	2216.0	2218.0	III	G	2	18X	180	
			HIRA	2319.1	2319.3	III	B	1	240	420	
			CULG	2339.0	2340.0	III	G	1	20	180	

Event Remarks:
- B = Single burst
- C = Underlyling continuum (particularly with Type I)
- DC = Drifting chains
- DP = Drifting pairs
- FN = Fundamental emission (Type II)
- FS = Fine structures (Type IV) (includes fiber, pulsations, zebra)
- 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
- FLA = Associated flare observed (class optional)
- ESS = Estimated shock speed in km/s (Type II)

Stations Reporting: CULG = Culgoora HIRA = Hiraiso IZMI = Izmiran LEAR = Learmonth
ONDR = Ondrejov PALE = Palehua POTS = Potsdam SGMR = Sagamore Hill SVTO = San Vito

SOLAR RADIO NOISE STORM AT 164 MHZ FROM NANCAY RADIOHELIOGRAPH MARCH 1998

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
01/03/98	+0.48	-0.45	I	8H19 E	15H48 D
01/03/98	+1.20	-0.50	I	8H19 E	15H48 D
02/03/98	+0.72	-0.47	I	8H18 E	15H47 D
03/03/98	+0.98	-0.55	II	8H18 E	15H47 D
04/03/98	+1.10	-0.68	II	8H19 E	13H19 D
04/03/98	+1.30	-0.53	II	8H19 E	13H19 D
05/03/98	+1.10	-0.79	I	8H18 E	15H19 D
07/03/98	+1.10	-1.20	I	8H09 E	15H39 D
10/03/98	-0.58	-0.63	I	8H13 E	14H25 D
11/03/98	-0.38	-0.68	I	12H55 E	15H45 D
12/03/98	-0.24	-0.74	I	8H20 E	15H15 D
13/03/98	-0.06	-0.74	I	10H46 E	15H45 D
18/03/98	+0.95	-0.47	III	12H32 E	15H43 D
19/03/98	+1.10	-0.45	I	11H21 E	15H43 D
20/03/98	+1.30	-0.53	II	11H46 E	15H43 D
21/03/98	+1.20	+0.05	I	8H13 E	15H42 D
21/03/98	+1.50	-0.39	II	8H13 E	15H42 D
22/03/98	-0.98	-0.11	I	8H13 E	15H42 D
22/03/98	+1.20	-0.00	I	8H13 E	15H42 D
23/03/98	-1.10	-0.74	II	9H37 E	15H42 D
23/03/98	-0.88	-0.05	I	9H37 E	15H42 D
23/03/98	+1.50	-0.63	II	9H37 E	15H42 D
24/03/98	-1.00	-0.53	I	8H43 E	15H42 D
24/03/98	-0.48	-0.39	I	8H43 E	15H42 D
25/03/98	-0.67	-0.34	II	11H19 E	15H40 D
25/03/98	-0.25	-0.26	II	11H19 E	15H40 D
25/03/98	+0.72	+0.68	II	11H19 E	15H40 D
26/03/98	-0.55	-0.53	I	11H21 E	15H13 D
26/03/98	+0.02	-0.26	I	11H21 E	15H13 D
27/03/98	-0.21	-0.53	III	13H51 E	15H41 D
28/03/98	+0.48	-1.30	I	12H26	15H40 D
29/03/98	+0.20	-0.55	I	9H41 E	15H40 D
31/03/98	-0.45	-0.11	I	13H10	15H39 D

[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 NAN,AY OBSERVATIONS
D NOISE STORM IN PROGRESS AT THE END OF THE NANCAY OBSERVATIONS

SOLAR RADIO NOISE STORM AT 327 MHZ FROM NANCAY RADIOHELIOGRAPH MARCH 1998

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
01/03/98	+0.30	-0.37	I	8H19 E	15H48 D
01/03/98	+0.48	-0.39	I	8H19 E	15H48 D
01/03/98	+1.10	-0.39	I	8H19 E	15H48 D
02/03/98	+0.41	-0.42	I	8H18 E	15H47 D
02/03/98	+0.66	-0.42	I	8H18 E	15H47 D
03/03/98	+0.90	-0.37	I	8H18 E	15H47 D
04/03/98	+0.78	-0.32	I	8H19 E	13H19 D
04/03/98	+1.10	-0.39	I	8H19 E	13H19 D
10/03/98	-0.55	-0.63	I	8H13 E	14H25 D
12/03/98	-0.20	-0.74	I	8H20 E	15H15 D
13/03/98	-0.04	-0.74	I	10H46 E	15H45 D
13/03/98	+0.22	-0.68	I	10H46 E	15H45 D
15/03/98	+0.20	-0.47	I	8H15 E	15H44 D
17/03/98	+0.64	-0.32	I	8H40 E	15H44 D
18/03/98	+0.95	-0.29	II	12H32 E	15H43 D
19/03/98	+1.00	-0.53	II	11H21 E	15H43 D
20/03/98	+1.20	-0.24	I	11H46 E	15H43 D
21/03/98	+1.20	-0.24	I	8H13 E	15H42 D
22/03/98	-0.95	-0.16	I	8H13 E	15H42 D
22/03/98	+1.20	-0.32	I	8H13 E	15H42 D
23/03/98	-0.98	-0.37	I	9H37 E	15H42 D
23/03/98	-0.74	-0.05	I	9H37 E	15H42 D
23/03/98	+1.30	-0.37	I	9H37 E	15H42 D
24/03/98	-0.46	-0.42	I	8H43 E	15H42 D
24/03/98	+0.19	+0.42	I	8H43 E	11H00
24/03/98	+0.47	+0.53	I	8H43 E	15H42 D
25/03/98	-0.66	-0.29	II	11H19 E	15H40 D
25/03/98	-0.25	-0.32	I	11H19 E	15H40 D
26/03/98	-0.63	-0.42	I	11H21E	15H13D
26/03/98	+0.01	-0.26	I	11H21E	15H13D
27/03/98	-0.18	-0.53	II	13H51 E	15H41 D
28/03/98	-0.04	-0.37	I	11H00	15H40 D
29/03/98	+0.05	-0.37	I	9H41 E	15H40 D
31/03/98	-0.50	-0.26	I	13H00	15H39 D

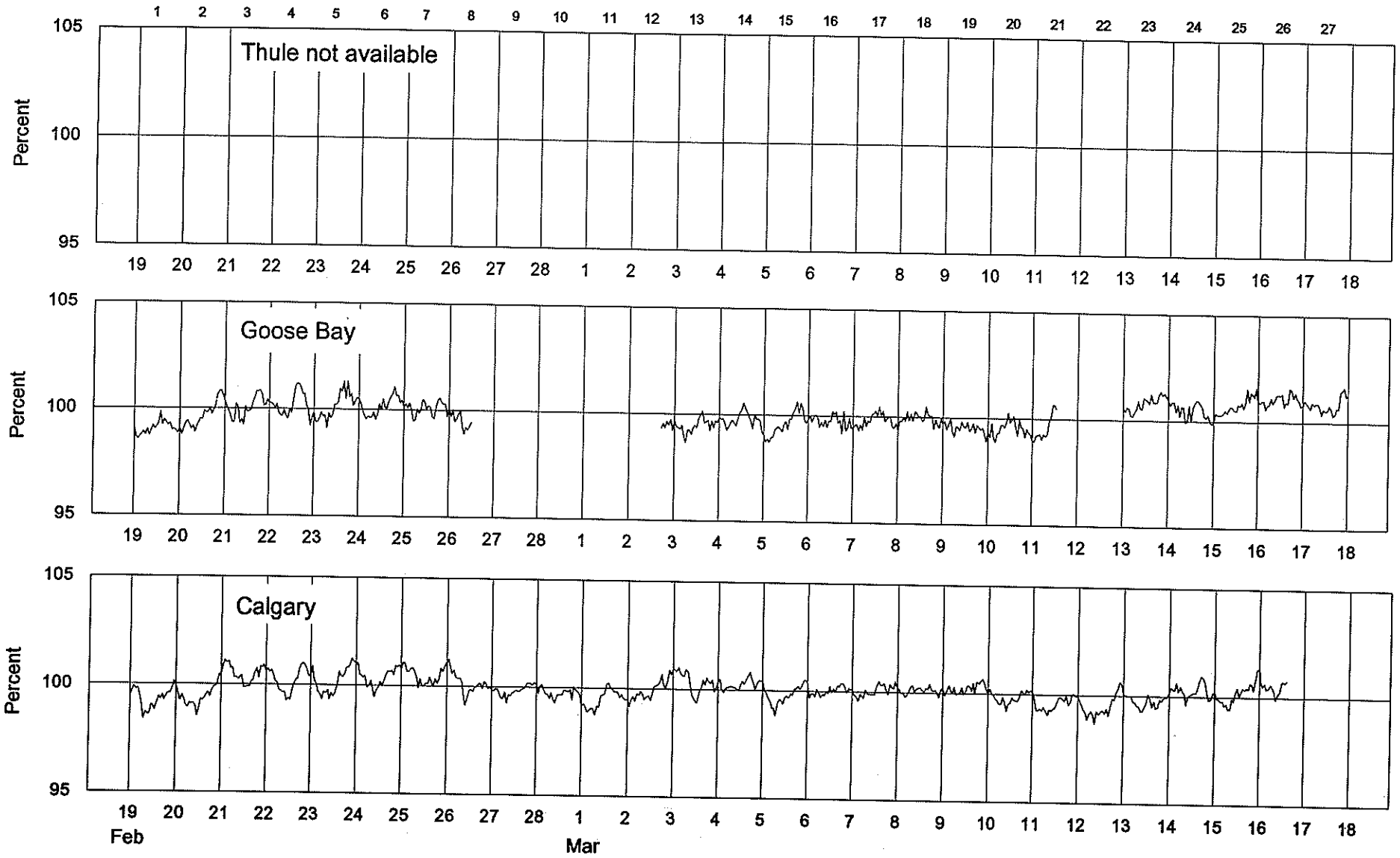
06, 30 MARCH 1998: NO DATA
OTHERS DAYS: NO DETECTABLE NOISE STORM

COSMIC RAY INDICES
(Neutron Monitor)
MARCH 1998

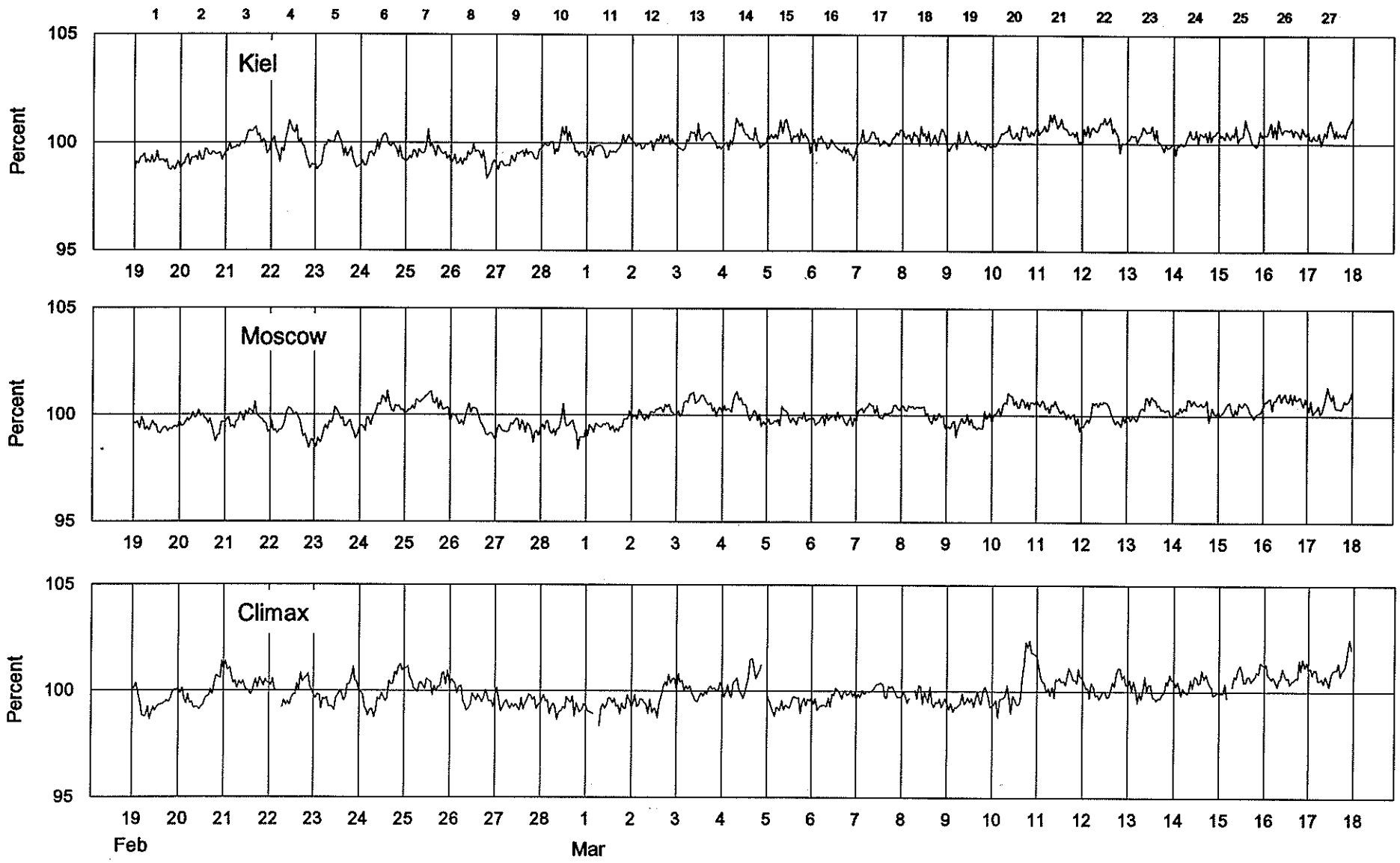
Day	THULE Average (cts/h)/100	GOOSE BAY Average (cts/h)/100	CALGARY Average (cts/h)/300	KIEL Average (cts/h)/100	MOSCOW Average (cts/h)/64	CLIMAX Average (cts/h)/100	BEIJING Average (cts/h)/256	HALEAKALA Average (cts/h)/1000
1	No data	---	4007.8	6295.5	9270.5	4262.4	2013.3	3574.9
2	at time of	7295.3 (7)	4024.5	6314.4	9327.7	4280.0	2015.6	3583.8
3	publication	7294.8	4041.8	6321.5	9365.2	4296.5	2020.8	3585.9
4	---	7318.3	4039.2	6328.3	9339.8	4311.9	2023.0	3597.2
5	---	7303.5	4020.0	6338.1	9302.3	4268.0	2010.4	3583.5
6	---	7317.0	4029.8	6300.9	9299.7	4279.9	2010.7	3575.5
7	---	7320.8	4030.8	6320.4	9336.6	4294.3	2012.8	3578.2
8	---	7329.5	4032.5	6333.3	9331.4	4281.3	2010.6	3578.9
9	---	7300.0	4038.0	6313.4	9282.8	4274.8	2027.1	3583.5
10	---	7300.2	4021.8	6334.2	9361.5	4305.8	2039.9	3591.9
11	---	7303.1 (14)	4011.8	6356.2	9338.7	4317.8	2044.9	3598.3
12	---	---	4008.3	6348.0	9324.8	4304.1	2042.6	3596.9
13	---	7393.0	4018.0	6328.4	9345.4	4298.7	2042.6	3597.1
14	---	7371.6	4039.2	6325.2	9350.5	4307.4	2052.1	3606.2
15	---	7387.2	4034.2	6335.5	9343.1	4319.9	2055.4	3615.7
16	---	7411.2	4049.8 (16)	6348.0	9387.7	4329.1	2057.6	3615.7
17	---	7395.0	---	6340.5	9368.5	4337.4	2044.1	3607.8
18	---	7447.2	---	6372.0	9410.2	4371.0	2047.9	3602.2
19	---	7434.5	---	6354.9	9390.0	4344.3	2066.9	3605.5
20	---	7460.4	4062.8 (20)	6405.5	9447.9	4346.4	2050.7	3606.2
21	---	7370.9	4017.7	6340.3	9342.9	4311.7	2049.5	3583.8
22	---	7319.0	3988.0	6309.4	9309.1	4275.3	2037.9	3565.7
23	---	7264.5	3947.2	6273.4	9251.5	4246.6	2035.3	3565.3
24	---	7256.1	3957.0	6248.1	9216.9	4222.7	2035.1	3563.7
25	---	7266.8	3958.5	6231.8	9199.0	4220.8	2024.6	3581.0
26	---	7212.1	3944.3	6226.1	9179.0	4199.8	2012.6	3565.9
27	---	7218.3	3965.0	6217.8	9170.7	4228.0	2015.6	3567.0
28		7248.8	3982.0	6226.2	9198.1	4242.2	2015.1	3573.7
29		7269.9	4009.2	6266.5	9243.7	4290.2	2021.6	3582.8
30		7319.5	4023.7	6302.2	9287.0	4317.7	2025.2	3584.4
31	---	7364.2	4048.3	6327.2	9336.8	4336.2	2038.3	3595.2
Mean	---	7327.3	4012.5	6312.4	9311.6	4291.0	2032.3	3587.5

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.

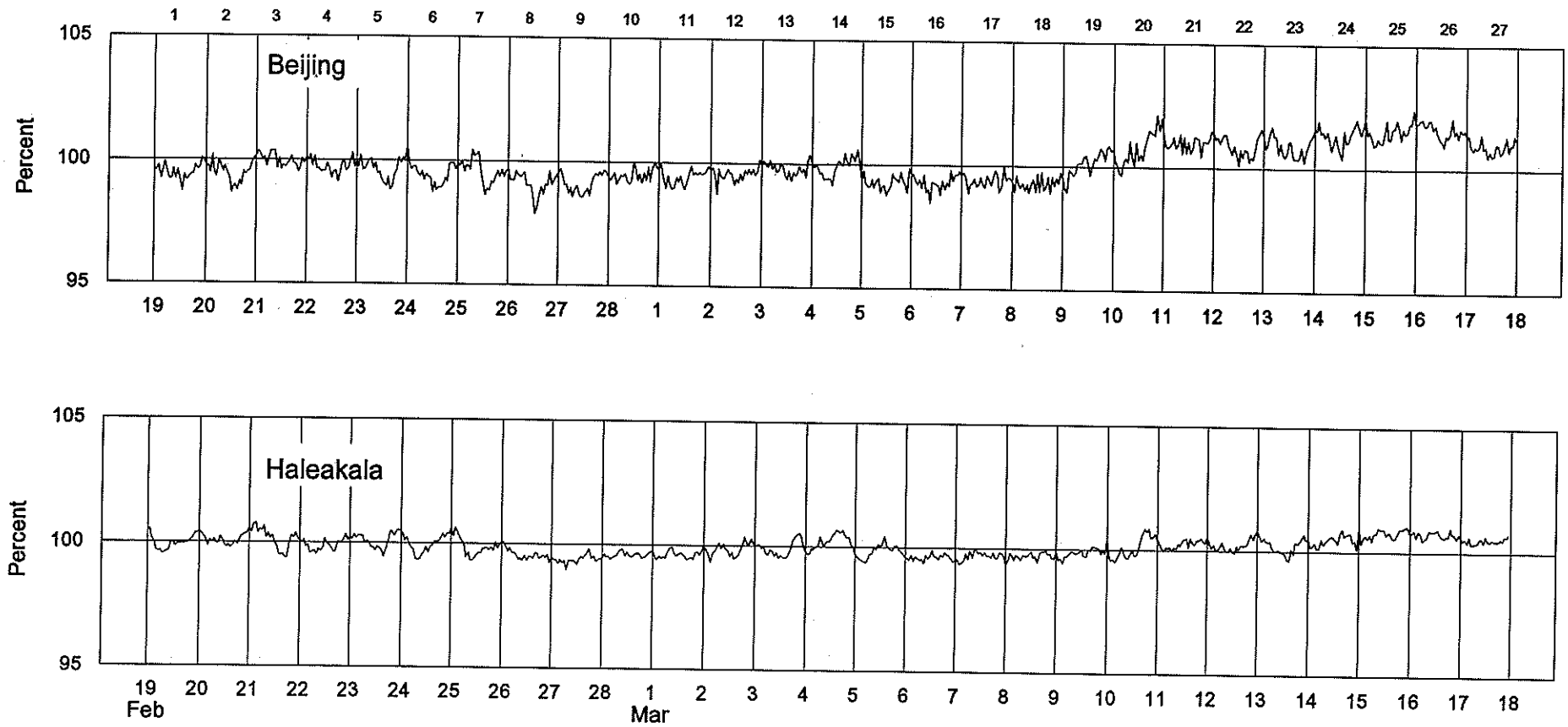
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2247 - Beginning 19 Feb 98



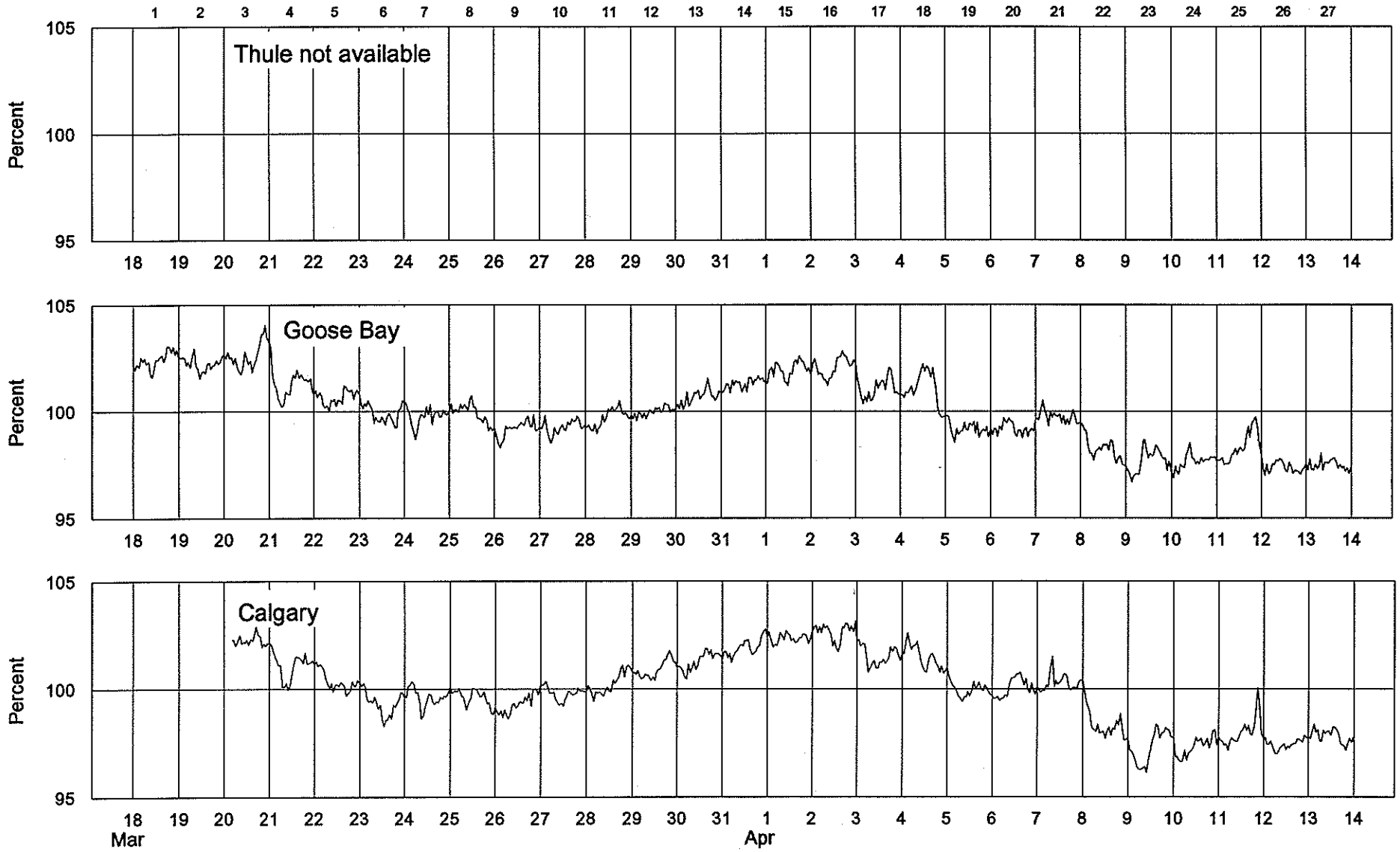
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2247 - Beginning 19 Feb 98



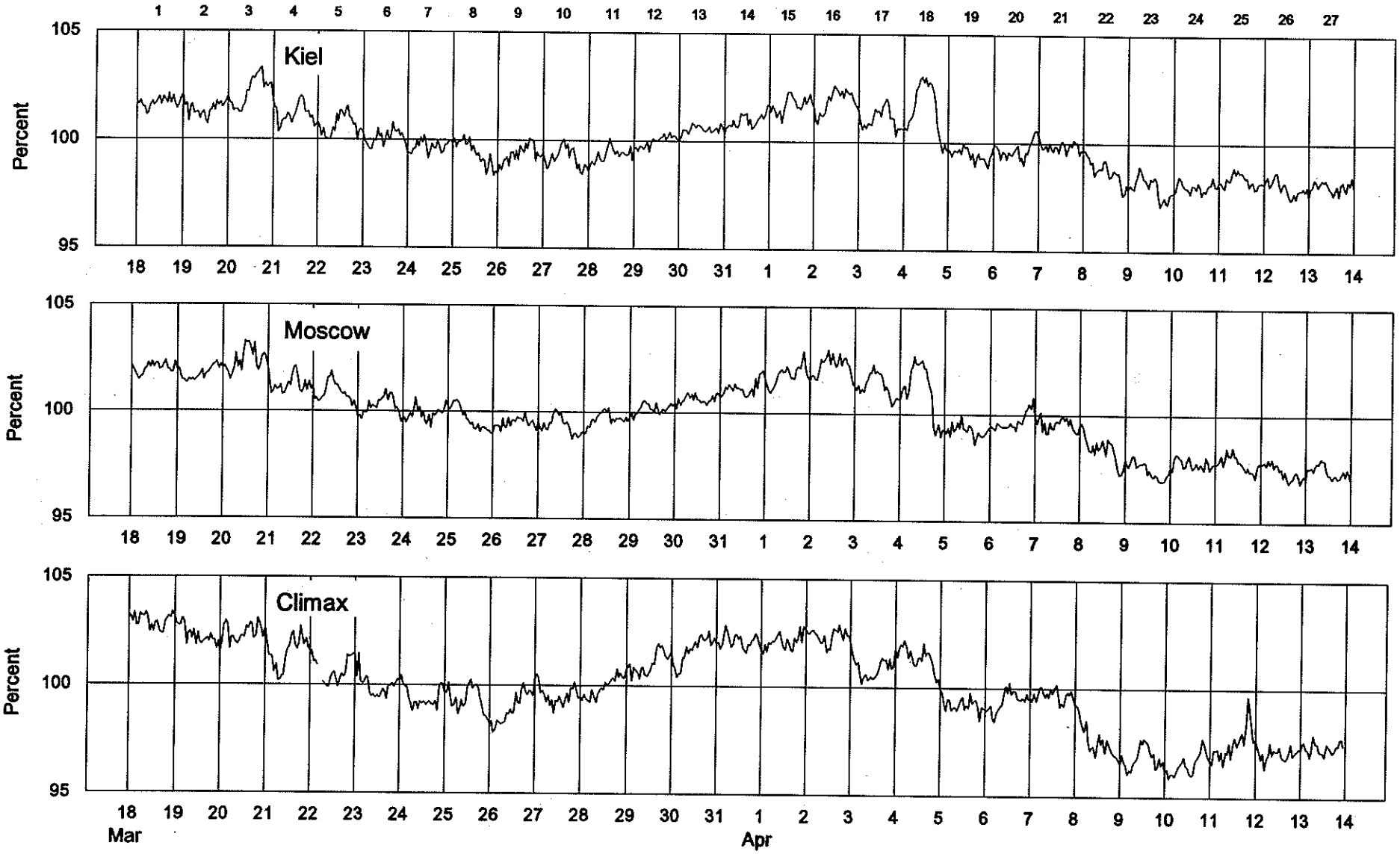
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2247 - Beginning 19 Feb 98



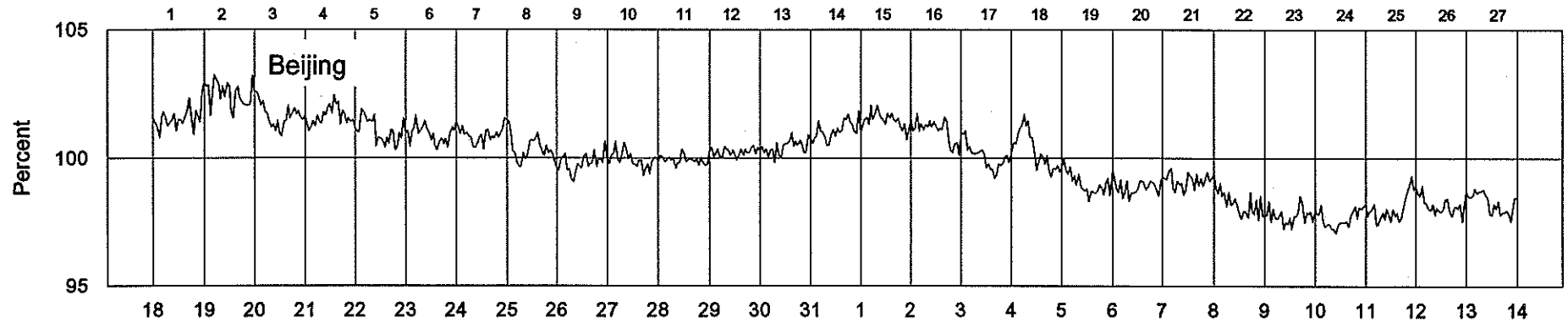
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2248 - Beginning 18 Mar 98

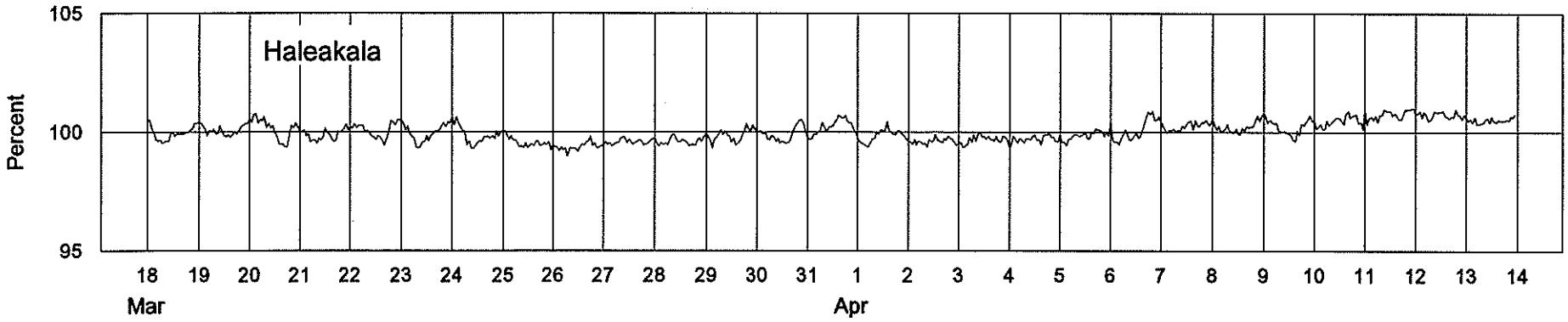


COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2248 - Beginning 18 Mar 98

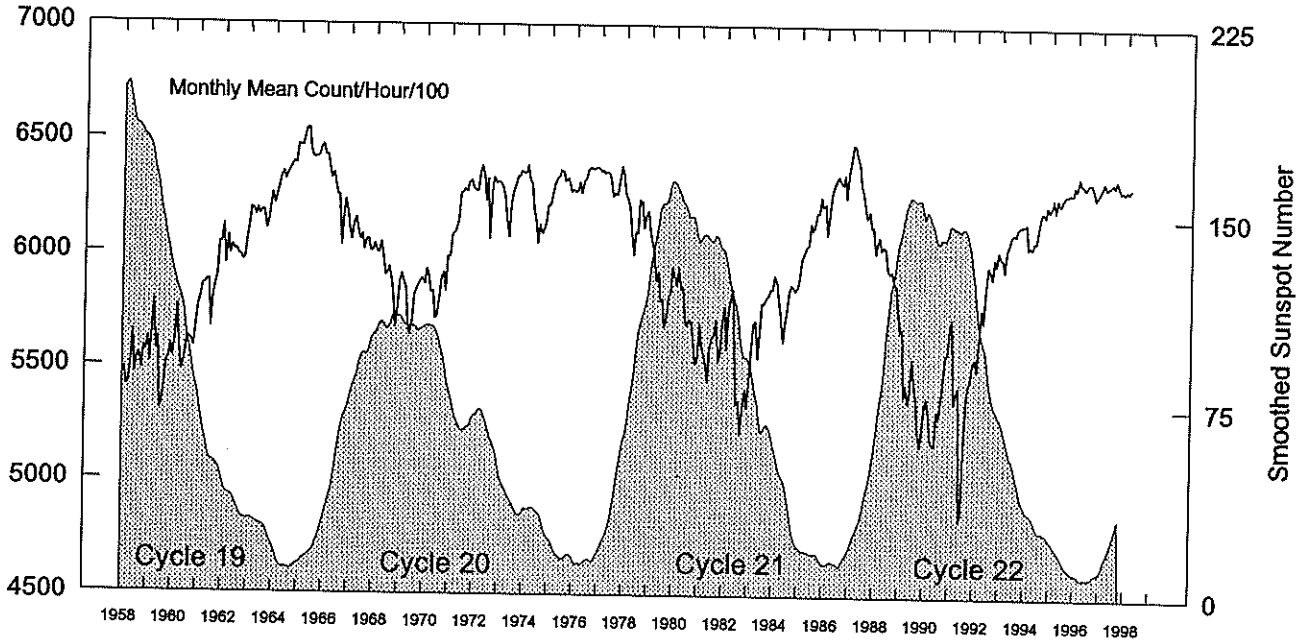


COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2248 - Beginning 18 Mar 98





Kiel Neutron Monitor Pressure-Corrected Values
Jan 1958 - Mar 1998



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1958	5481	5488	5409	5417	5523	5651	5466	5538	5553	5485	5584	5561	5513
1959	5623	5515	5659	5783	5569	5625	5307	5328	5420	5518	5536	5593	5540
1960	5539	5628	5764	5596	5480	5509	5557	5628	5620	5607	5586	5692	5601
1961	5766	5793	5853	5856	5872	5874	5672	5804	5859	5898	6046	6041	5861
1962	6122	5949	6072	5989	6030	6010	6013	5991	5982	5963	5971	6052	6012
1963	6125	6197	6191	6163	6194	6168	6185	6182	6103	6133	6197	6260	6175
1964	6215	6253	6287	6331	6355	6321	6347	6366	6383	6399	6393	6475	6344
1965	6474	6469	6506	6542	6545	6451	6424	6420	6423	6424	6467	6475	6468
1966	6433	6432	6375	6330	6353	6300	6258	6258	6033	6168	6236	6172	6279
1967	6101	6061	6139	6155	6088	6061	6086	6016	6064	6063	6014	6009	6071
1968	6041	6011	6001	6048	5997	5901	5910	5937	5878	5805	5673	5739	5912
1969	5876	5909	5872	5845	5686	5640	5700	5812	5843	5864	5879	5887	5818
1970	5863	5928	5906	5830	5831	5716	5719	5803	5885	5915	5832	5985	5851
1971	5985	6081	6094	6103	6151	6268	6265	6286	6275	6314	6322	6288	6203
1972	6281	6278	6351	6387	6344	6232	6328	6065	6306	6334	6313	6318	6295
1973	6309	6298	6250	6155	6074	6220	6271	6296	6341	6340	6365	6360	6273
1974	6353	6391	6331	6308	6201	6139	6047	6132	6090	6113	6139	6215	6205
1975	6217	6267	6308	6334	6341	6370	6363	6320	6334	6313	6272	6286	6310
1976	6275	6281	6314	6269	6325	6331	6370	6380	6379	6375	6383	6380	6339
1977	6366	6371	6355	6366	6357	6322	6254	6272	6263	6317	6391	6355	6332
1978	6271	6242	6215	6113	5998	6101	6095	6241	6232	6117	6167	6193	6165
1979	6104	6063	6006	5883	5923	5794	5806	5682	5723	5820	5827	5942	5881
1980	5905	5862	5942	5850	5854	5702	5690	5717	5704	5611	5522	5528	5741
1981	5697	5600	5569	5517	5447	5600	5642	5650	5717	5539	5564	5702	5604
1982	5772	5586	5755	5799	5848	5582	5347	5362	5217	5349	5414	5329	5530
1983	5481	5606	5702	5711	5549	5659	5787	5785	5814	5820	5852	5849	5718
1984	5911	5880	5799	5740	5622	5706	5753	5837	5867	5856	5844	5864	5807
1985	5911	5986	6016	6038	6049	6142	6114	6135	6193	6192	6260	6220	6105
1986	6229	6093	6176	6280	6308	6336	6350	6331	6315	6356	6259	6359	6283
1987	6429	6489	6484	6443	6410	6319	6273	6217	6171	6198	6131	6131	6308
1988	6013	6064	6085	6030	6047	6033	5945	5922	5931	5880	5872	5761	5965
1989	5673	5678	5385	5441	5360	5407	5552	5460	5378	5228	5167	5241	5414
1990	5348	5381	5313	5197	5177	5173	5324	5297	5382	5471	5563	5584	5351
1991	5696	5726	5355	5405	5431	4841	4882	5162	5390	5443	5466	5540	5361
1992	5553	5500	5624	5766	5713	5869	5956	5942	5905	5994	5960	6024	5817
1993	5996	5992	5937	6026	6061	6094	6108	6099	6129	6137	6142	6141	6072
1994	6150	6042	6052	6067	6070	6068	6129	6189	6203	6183	6226	6209	6132
1995	6225	6260	6205	6260	6234	6250	6267	6279	6281	6285	6279	6319	6262
1996	6301	6354	6330	6324	6306	6325	6332	6331	6303	6262	6277	6294	6312
1997	6313	6337	6313	6314	6324	6336	6317	6347	6319	6295	6301	6289	6317
1998	6305	6293	6313										6304

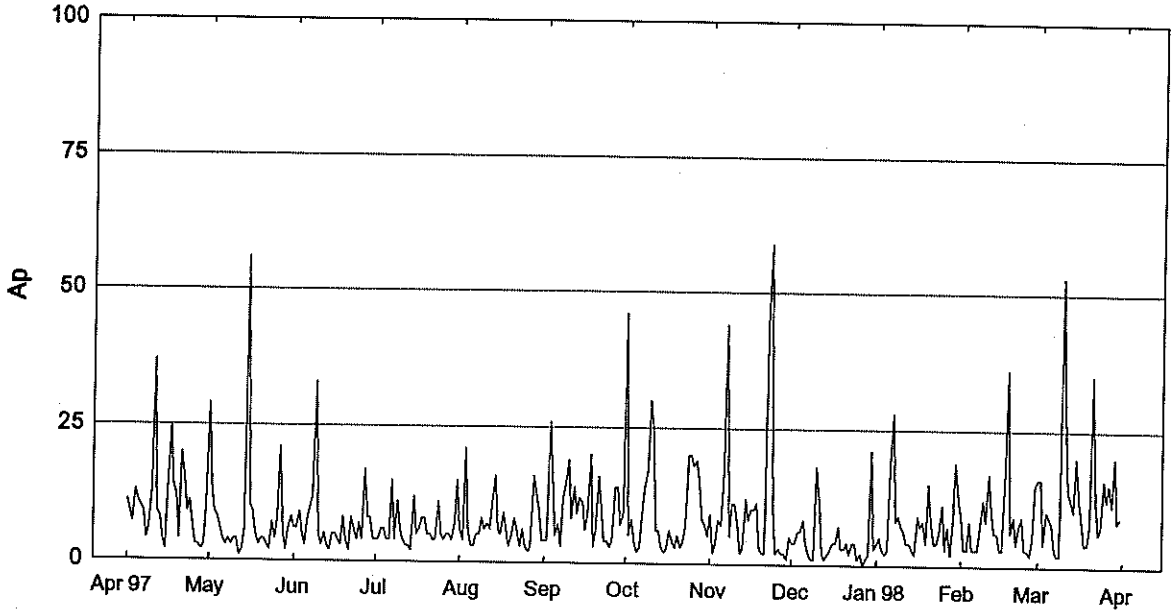
Multiply table entries by 100 to obtain hourly counting rate. Kiel, Germany: N54, E10, Alt= 54 m, Cutoff Rigidity= 2.32GV.

Geomagnetic Activity Indices
March 1998

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		4	3+	2-	2-	3	4-	3	3+	24-	16	0.9	3o	2+	2o	2o	3+	4-	3o	3+	28	2	28	11	19	
2		4-	3	4-	3-	3	3-	3	3+	25	16	0.9	3-	3-	4-	2+	3o	3-	3o	3o	27	34	23	23	35	
3	Q6K	3	2-	1-	0	0	0+	1+	1-	8-	4	0.1	3-	1+	1+	0+	0+	0+	2-	1o	9	10	9	11	9	C
4		2	2	1	1+	3-	4	2+	2	17+	10	0.5	2o	2-	1+	2-	3o	4o	3-	2o	21	23	27	11	39	
5		3-	2-	3-	3	1-	0+	1-	4-	15+	9	0.5	2o	1+	3-	3-	1+	1-	1o	4-	17	18	18	19	17	
6	Q9A	3+	2+	2-	1	2+	2-	1-	1+	14+	8	0.4	3o	3-	2o	1+	3-	2o	1-	1+	16	11	20	20	11	K
7	Q4	2-	2-	1+	1+	1-	0	0	0	7-	3	0.1	2-	1+	2-	1+	1+	0+	0+	0+	7	2	6	4	4	CC
8	Q1	1-	1-	0	0	0+	0+	0+	0	2+	2	0.0	1-	1-	0+	0o	1-	0+	0+	0+	3	2	5	4	2	CC
9	Q2	0	0	1+	1+	1-	0	0	0+	4-	2	0.0	0+	1-	1+	2o	1o	0+	0o	0+	6	4	10	10	5	CK
10	D1	1	2	4-	5	4	6	7+	6	35	53	1.6	1+	2-	4-	5-	4-	5o	6o	5+	73	67	61	33	94	
11	D3	4+	4	5+	4+	3	4	2-	4	31-	28	1.2	4-	4-	4o	4+	3+	3+	2o	4o	45	48	38	49	37	
12		3+	4-	3	2+	3	2+	3	2+	23	14	0.8	3o	3+	3+	3-	3-	2-	3o	2+	26	30	24	28	26	
13		3-	3	2+	2+	2	3+	3-	3	21+	12	0.7	2+	3-	2+	3-	2+	3+	3-	3o	23	11	20	18	13	
14		2-	1-	1+	2+	2+	4-	3	3	18	10	0.6	2-	1-	2-	2+	3-	4-	3+	3-	22	2	27	8	21	
15	D5	5	5-	4	2	2+	2-	1+	3	24	20	1.0	4+	4-	4o	3-	3-	2+	2-	3o	33	2	22	17	7	K
16		4-	3	3-	2	3-	3+	2	1	20+	12	0.7	3+	2+	2+	2+	3-	4-	2+	2+	24	26	23	23	26	
17	Q10A	2+	3-	1+	3	2-	1-	1	2+	15	8	0.4	2o	2o	1+	3o	2-	1-	1+	3-	14	16	13	16	12	
18	Q5	1-	2-	1-	0+	0+	1-	1-	2	7	4	0.1	1-	1+	1o	1-	1o	1+	1o	2-	7	8	6	6	8	CC
19	Q3	1+	0+	0+	1-	1	1	1-	2-	7	4	0.1	1o	1-	0o	1-	1o	2-	1-	2-	6	7	5	4	8	CC
20		3-	1-	1	2	2	3	2+	2+	16	8	0.4	2+	1-	1+	2+	2o	3o	3-	2o	16	20	13	12	21	
21	D2	2+	2-	2+	4+	6-	6+	5+	2+	30+	35	1.4	2+	2-	3-	4+	5o	5+	5-	3-	53	49	44	30	63	
22		2	2+	3	4-	3-	3+	3-	1	21-	12	0.7	3-	2+	3-	3+	3o	3+	3o	1+	25	23	29	27	25	
23	Q7K	3-	3-	1-	0+	1-	1-	1-	2-	10	6	0.2	2o	2o	1-	1-	1+	1o	1-	1+	8	14	7	11	10	C
24	Q8A	0+	1-	2	2-	2+	1+	2	3	13+	7	0.3	0+	1o	3-	2o	3-	2-	2+	3+	17	17	17	11	22	
25		2+	3	1	2+	4+	5-	3-	2-	22	16	0.9	2+	3-	1o	3o	4+	4o	3-	2o	29	28	39	21	47	
26		1-	2-	0+	2+	4-	4	3	2+	18	12	0.7	1-	2-	1o	2o	3+	4-	3o	3-	22	25	26	11	40	
27		3+	3-	3+	3-	3	3	3+	3-	24	15	0.8	3o	3o	3+	3o	3-	3o	3-	3-	28	31	23	24	30	
28		2+	3	2-	3	3-	2-	2-	3+	19+	11	0.6	2o	3-	2+	4o	3+	1+	2-	4-	26	20	28	26	23	
29	D4	5-	4	2+	1+	2+	5-	4-	3-	26-	20	1.0	5-	4-	2o	2-	2o	4+	4o	3o	40	49	36	32	53	
30		1+	2-	3-	2	2	2+	1+	3-	16	8	0.4	1+	2-	3o	2+	2+	3-	2-	3o	20	16	23	17	22	
31		3+	4-	3	1+	1+	0+	0	1	14	9	0.5	3o	3-	3o	2-	1+	0+	0+	1-	15	20	11	26	5	
Mean											13	0.60									22.8	20.6	22.0	21.2		

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	3o	3-	1+	2-	4-	4-	3o	3+	28	3o	2-	2+	2o	3+	3+	3-	4-	27	96.5	59	77	42	
2	3-	2+	4-	2+	3o	3-	3o	3o	28	3-	3-	3+	3-	3o	3-	3o	3-	27	89.9*	67	69	35	
3	2+	1+	1o	0o	0+	0o	2-	1-	6	3o	2-	1+	1o	0+	1-	2o	1o	10	95.0	35	45	41	
4	2-	2-	1o	2-	3o	4-	3-	2o	20	2+	2-	1+	2-	3o	4o	3o	2o	22	100.0	36	41	46	
5	2+	1+	3-	3-	1-	1-	1-	4-	17	2-	1+	3-	3-	2-	0+	1+	4-	16	95.1	32	39	41	
6	3o	2+	2o	1+	3-	2o	1-	2-	16	3o	3-	2o	1+	2+	2-	1-	1o	15	90.3	29	35	36	
7	2-	1o	2-	1o	1+	0o	0o	0o	6	1+	1+	1+	1+	2-	0+	0+	0+	7	90.5	36	50	36	
8	1-	1-	0o	0o	1-	0+	0o	0+	2	1o	1-	1-	0+	0+	0+	0+	0+	3	89.9	33	42	35	
9	0+	0+	1+	2-	1-	0o	0o	0+	4	1-	1o	2-	2+	1+	1-	0+	0+	8	88.7	35	44	34	
10	1-	2-	4-	5-	4o	5-	6o	5o	66	1+	2o	4o	5-	3+	5+	6+	6-	79	95.0	50	61	41	
11	4-	4o	5-	5-	3+	3+	2o	4-	50	4-	3o	3+	4-	3+	3+	2-	4+	40	99.4	56	74	45	
12	3o	3+	3o	3-	3-	2o	3o	2o	25	3-	3+	3+	2+	3-	1+	3o	3-	26	100.3	72	75	46	
13	2-	2+	2+	3-	2o	3+	3-	3o	23	3-	3-	2+	3-	2+	3+	3-	3-	24	103.7	74	77	50	
14	1+	0+	2-	2+	3-	4-	4-	3-	22	2+	1-	2-	2+	3-	4-	3o	3o	22	118.2	79	88	66	
15	5-	4-	4+	3-	2+	2+	1+	3o	35	4o	4-	3+	3-	3o	2+	2-	3+	32	131.6	63	80	80	
16	3+	2+	2+	2+	3o	3+	2o	1+	22	3+	3-	2+	2+	2+	4-	3-	3-	26	122.6	60	76	70	
17	2+	2o	1+	3o	2-	0+	1o	3-	15	2o	2-	1+	3-	2-	1-	1+	3-	14	124.3	59	71	72	
18	0+	1o	1-	0+	1o	1o	1-	2-	6	1-	2-	1+	1o	1-	1+	1+	2-	9	125.9	64	78	74	
19	1o	0o	0o	0+	1o	1+	0+	1+	5	1o	1o	0o	1o	1-	2o	1o	2-	8	123.5	67	83	71	
20	2o	1-	1+	2+	2o	3o	3-	2o	17	3-	0+	1o	2o	2o	3o	2+	2o	16	125.5	62	81	74	
21	3-	1+	3o	5-	5o	5+	5o	3-	54	2+	2-	3-	4+	5o	5+	4+	2+	51	124.9	69	86	73	
22	2+	2o	3o	3+	3o	3o	3o	1+	25	3o	3-	3-	3+	3-	3+	3o	1+	25	126.8	72	96	75	
23	2o	2o	0+	0+	1+	1o	1-	2-	8	2o	2o	1-	1o	1+	1o	0+	1-	8	121.3	55	68	69	
24	1-	1-	2+	2o	3-	1+	3-	3o	16	0o	1o	3-	2o	3-	2-	2+	4-	18	119.9	59	62	67	
25	2+	2+	1+	3-	4+	4o	3-	2o	29	3-	3o	1-	3o	4o	4-	3-	2o	29	114.4	54	71	62	
26	0+	1+	1-	2+	4-	4o	3o	3-	24	1-	2-	1+	2-	3o	4-	3-	2+	20	109.5	52	60	56	
27	3o	2o	3+	3-	3-	3o	3-	3o	26	3o	4-	3+	3o	3o	3o	2+	2+	30	107.7	51	65	54	
28	2-	3o	2-	4o	3o	1+	2-	3o	24	2+	2+	3-	4-	4-	1o	2-	4o	28	103.6	60	70	50	
29	4o	4-	2+	2-	2+	4o	4o	3o	36	5o	4o	2o	2o	2-	4+	4o	3+	43	100.0	58	60	46	
30	1+	2-	3+	2+	2o	3-	1+	3-	18	2-	2-	3-	2+	3-	2+	2-	4-	21	107.2	46	60	54	
31	3o	3+	3o	2-	2-	0+	0o	1+	17	3+	2+	3-	2o	1o	0+	0+	0+	14	107.9	55	66	55	
Mean									22.3									23.2	108.0	54.8	66.1	54.6	

Daily Average Indices Ap
Apr 1997 - Mar 1998

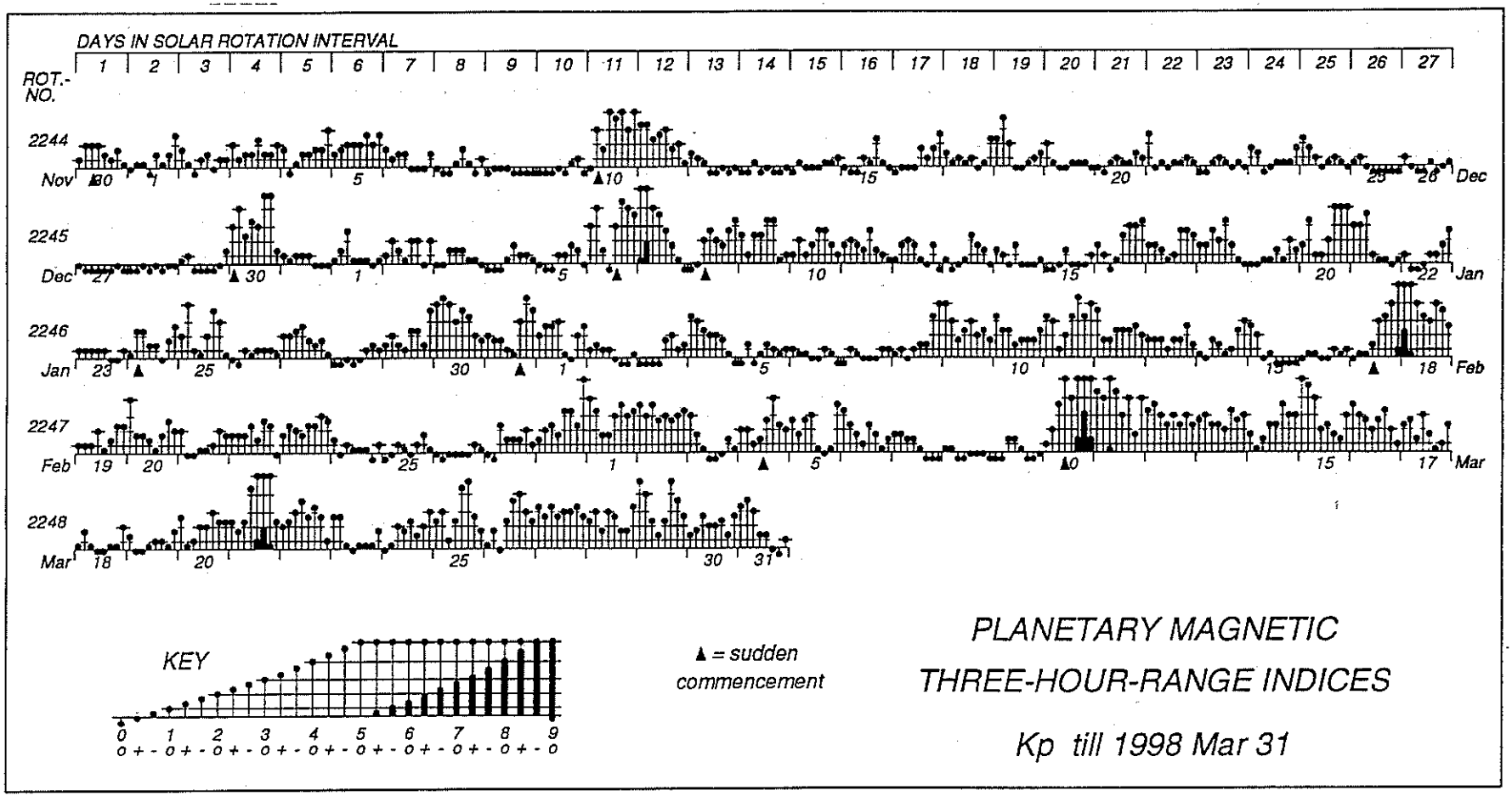


Day	Apr 97	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 98	Feb	Mar
1	11	29	6	4	6	4	46	9	4	4	9	16
2	9	14	6	4	4	4	5	2	4	5	3	16
3	7	9	9	6	21	26	8	4	6	3	3	4
4	13	8	5	6	6	16	4	8	6	2	8	10
5	11	6	3	4	3	5	2	7	8	3	3	9
6	10	4	8	4	3	7	3	17	4	18	3	8
7	9	3	10	15	5	3	9	44	2	28	3	3
8	4	4	12	4	5	12	14	5	1	8	8	2
9	6	3	33	11	8	15	17	11	1	9	12	2
10	13	4	5	6	6	19	30	11	18	7	8	53
11	37	4	3	4	7	8	25	7	11	6	17	28
12	9	1	5	3	6	14	6	2	2	4	10	14
13	8	2	3	3	11	9	6	3	1	4	6	12
14	4	6	2	2	16	12	3	12	2	3	6	10
15	2	56	5	12	6	11	2	8	3	2	3	20
16	15	10	5	5	5	6	3	10	4	9	3	12
17	25	9	4	6	9	9	6	10	4	7	18	8
18	14	5	3	8	6	20	4	11	7	8	36	4
19	12	3	8	8	3	3	3	3	3	4	6	4
20	4	4	4	5	5	6	5	2	3	15	9	8
21	20	4	2	5	8	16	3	2	4	8	4	35
22	15	3	8	4	6	10	4	44	2	4	7	12
23	9	2	6	4	3	4	7	59	4	4	9	6
24	11	7	4	11	6	4	20	10	4	6	3	7
25	6	4	7	5	3	3	20	2	1	11	3	16
26	3	8	4	4	2	4	18	3	2	3	2	12
27	3	21	17	5	3	14	19	2	0	7	5	15
28	2	5	8	5	16	14	15	2	1	2	15	11
29	3	2	8	4	13	7	8	1	2	8		20
30	10	6	4	7	10	9	7	5	21	19		8
31	5	8		15	4		5		3	12		9
Mean	10	8	7	6	7	10	10	11	4	8	8	13

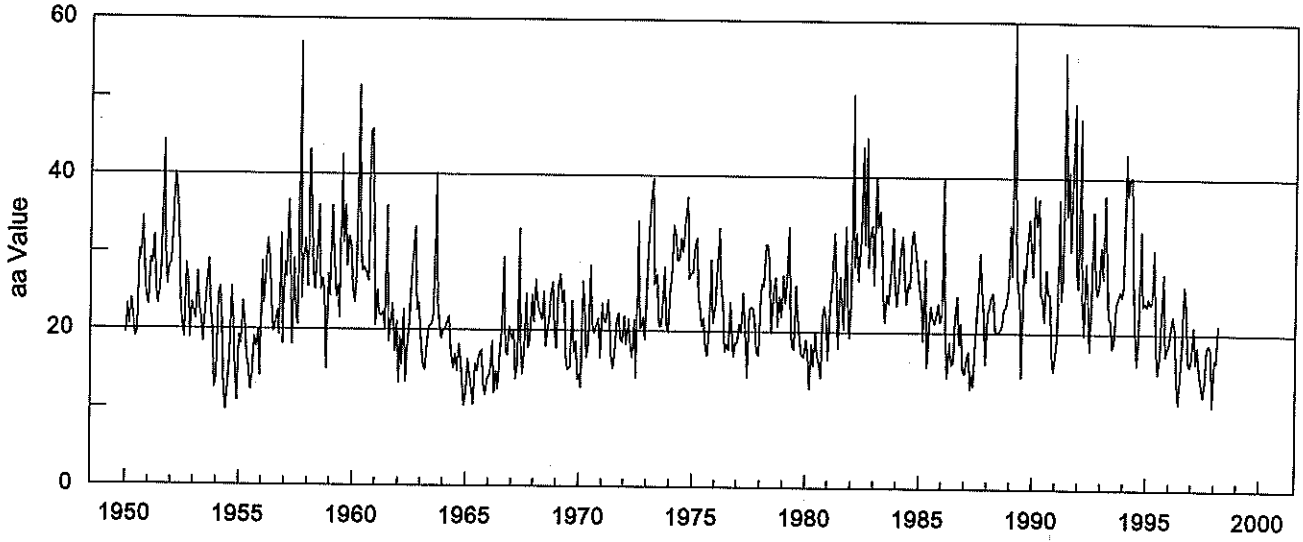
PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

GeoForschungsZentraum Potsdam

Kp through March 31, 1998



Monthly Mean aa Index Jan 1950 - Mar 1998



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										18.1

PLANETARY GEOMAGNETIC ACTIVITY

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

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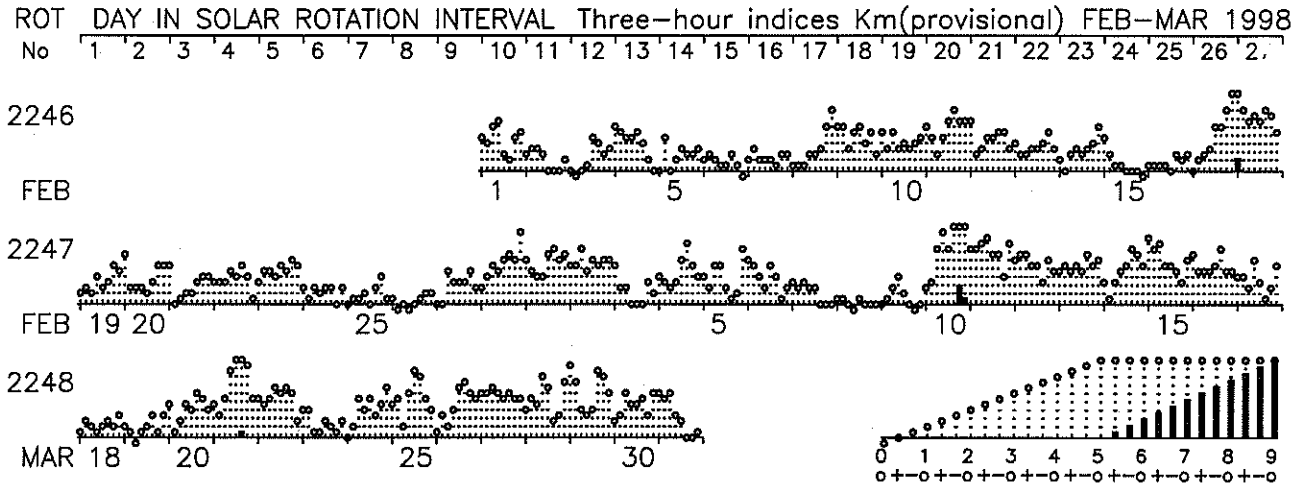
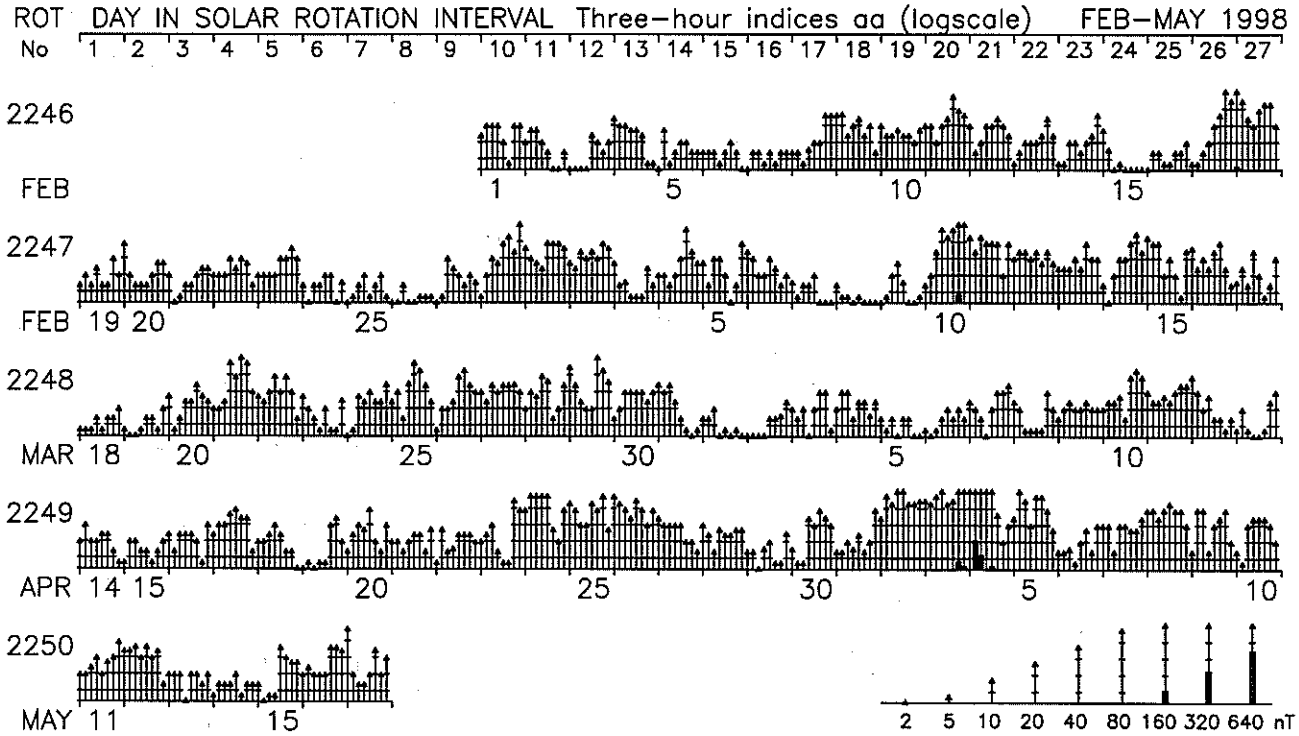


Indices Derivation at Universite Paris Sud; Graph Prepared at ISGI Publication Office.



Indices Derivation at Universite Paris Sud; Graph Prepared at ISGI Publication Office.

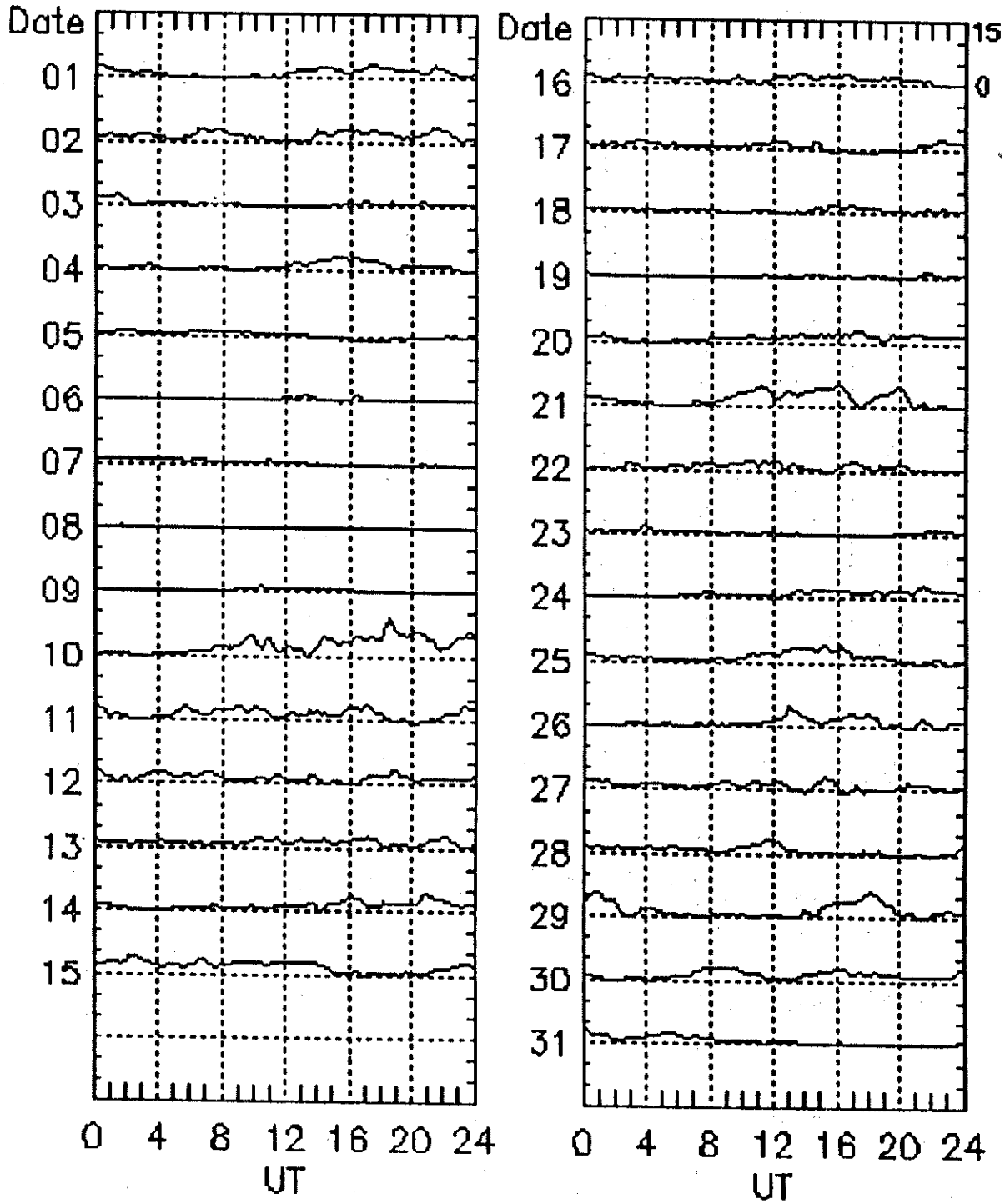
GEOMAGNETIC POLAR CAP INDEX (PC-INDEX)

Danish Meteorological Institute
World Data Center C1 for Geomagnetism, Copenhagen

Preliminary 15-minute Values

Thule (Qaanaaq)

MARCH 1998



WDC-C2 FOR GEOMAGNETISM, KYOTO UNIVERSITY

HOURLY EQUATORIAL DST VALUES(PROVISIONAL)

MARCH 1998

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	-25	-28	-34	-33	-28	-23	-20	-21	-23	-21	-22	-19	-18	-24	-19	-25	-33	-35	-40	-43	-42	-38	-44	-39
2	-26	-25	-29	-23	-23	-28	-36	-37	-40	-24	-26	-25	-23	-27	-38	-44	-43	-49	-52	-47	-39	-30	-36	-31
3	-36	-40	-39	-36	-35	-35	-36	-34	-30	-27	-24	-20	-19	-22	-25	-28	-30	-31	-33	-30	-30	-29	-30	-30
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5	-24	-21	-22	-22	-18	-19	-20	-19	-18	-16	-11	-8	-8	-14	-18	-20	-21	-20	-18	-18	-13	-5	9	6
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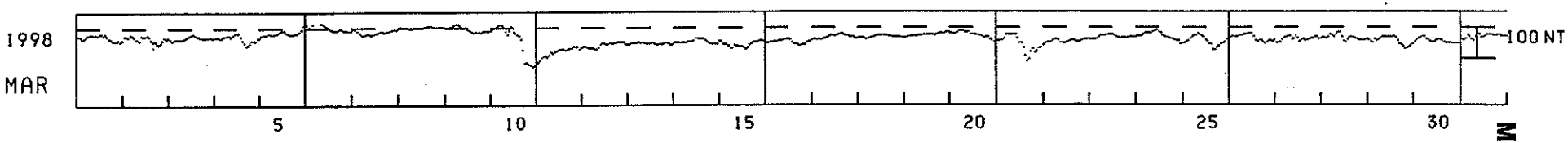


Note: The baselines for the observatories were adjusted for secular change for the Provisional Dst values for March 1998.

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

MARCH 1998

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)
UJJ	13.6N	01	0700	..	..	..	..		-	3	81	19	03	22
NGP	11.3N	01	0700	..	..	..	..		-	6	110	11	03	22
ABG	09.4N	01	0700	..	..	..	..	02(7) 04(5)	5	3	88	22	03	22
PND	02.0N	01	0700	..	..	..	..		-	--	--	--	03	22
ETT	00.7S	01	0100	..	..	..	..		-	--	131	32	02	22
TRD	01.1S	01	0700	..	..	..	..		-	2	111	48	03	22
BJI	28.8N	04	1157	SC	0.5	11	0	04(5)	5	5	53	7	04	23
KRC	16.4N	04	1000	..	..	..	..	04(5)	5	5	87	36	05	07
HYB	07.6N	04	1156	SC	0	7	- 1	04(6)	5	2	125	14	05	11
ETT	00.7S	04	1156	SC	0	9	6		-	--	146	30	05	16
UJJ	13.6N	05	2100	..	..	..	..		-	3	82	19	07	20
NGP	11.3N	05	2100	..	..	..	..		-	6	102	13	07	20
ABG	09.4N	05	2100	..	..	..	..	06(4)	5	3	87	28	07	20
HYB	07.6N	05	2152	SC	- 0.2	23	- 1	06(2)	4	2	88	13	06	21
PND	02.0N	05	2100	..	..	..	..		-	2	81	49	07	20
ETT	00.7S	05	2151	SC	- 0.1	22	19		-	--	104	39	06	21
TRD	01.1S	05	2100	..	..	..	..		-	2	112	60	07	20
KRC	16.4N	09	2337	..	..	..	..	10(6)	7	10	217	95	11	23
UJJ	13.6N	10	0000	..	..	..	..		-	5	209	30	12	18
NGP	11.3N	10	0000	..	..	..	..		-	8	252	24	12	18
ABG	09.4N	10	0000	..	..	..	..	10(6)	7	4	235	35	12	18
HYB	07.6N	10	0000	..	..	..	..	10(6)	7	4	249	19	12	21
PND	02.0N	10	0000	..	..	..	..		-	4	258	81	12	18
ETT	00.7S	10	0000	..	..	..	..		-	--	298	62	12	21
TRD	01.1S	10	0000	..	..	..	..		-	3	304	110	12	18
HER	33.6S	10	05--	..	..	..	..	10(6,7)	6	40	195	216	12	01
AMS	46.8S	10	06--	..	..	..	..	10(7)	7	54	220	181	13	01
CZT	51.5S	10	03--	..	..	..	..	10(7)	7	66	80	96	13	05
PAF	57.2S	10	06--	..	..	..	..	10(7)	9	174	880	493	14	00
DRV	75.2S	10	03--	..	..	..	..	11(1) 12(1)	5	418	516	432	15	16
UJJ	13.6N	20	1000	..	..	..	..		-	6	161	30	22	20
NGP	11.3N	20	1000	..	..	..	..		-	11	199	25	22	20
ABG	09.4N	20	1000	..	..	..	..	21(5,6)	6	5	180	37	22	20
HYB	07.6N	20	0900	..	..	..	..	21(5,6)	6	6	200	22	22	21
PND	02.0N	20	1000	..	..	..	..		-	4	208	55	22	20
TRD	01.1S	20	1000	..	..	..	..		-	3	282	93	22	20
BJI	28.8N	21	04--	..	..	..	..	21(4)	6	13	120	36	21	23
KRC	16.4N	21	0251	..	..	..	..	21(5,6)	6	8	165	68	22	06
ETT	00.7S	21	0500	..	..	..	..		-	--	272	32	22	21
HER	33.6S	21	06--	..	..	..	..	21(6)	6	29	168	134	21	22
AMS	46.8S	21	06--	..	..	..	..	21(6)	5	28	107	66	22	20
CZT	51.5S	21	06--	..	..	..	..	21(7)	6	29	40	60	23	22
PAF	57.2S	21	06--	..	..	..	..	21(5,6,7)	7	70	419	288	22	21
PAF	57.2S	24	07--	..	..	..	..	25(6)	5	25	123	233	25	23
KRC	16.4N	25	0314	..	..	..	..	25(4,6)	5	5	103	34	26	09
UJJ	13.6N	25	1000	..	..	..	..		-	4	108	22	27	19
NGP	11.3N	25	1000	..	..	..	..		-	--	--	--	27	19
ABG	09.4N	25	1000	..	..	..	..	26(6) 28(4)	5	4	116	28	27	19
HYB	07.6N	25	0100	..	..	..	..	25(6)	5	4	139	29	27	22
PND	02.0N	25	1000	..	..	..	..		-	2	147	59	27	19
ETT	00.7S	25	1100	..	..	..	..		-	--	206	47	27	21
TRD	01.1S	25	1000	..	..	..	..		-	2	210	64	27	19
ETT	00.7S	28	2300	..	..	..	..		-	--	172	38	30	16
CZT	51.5S	28	23--	..	..	..	..	29(1)	5	24	16	28	31	13
PAF	57.2S	28	20--	..	..	..	..	29(1)	5	33	164	134	30	00

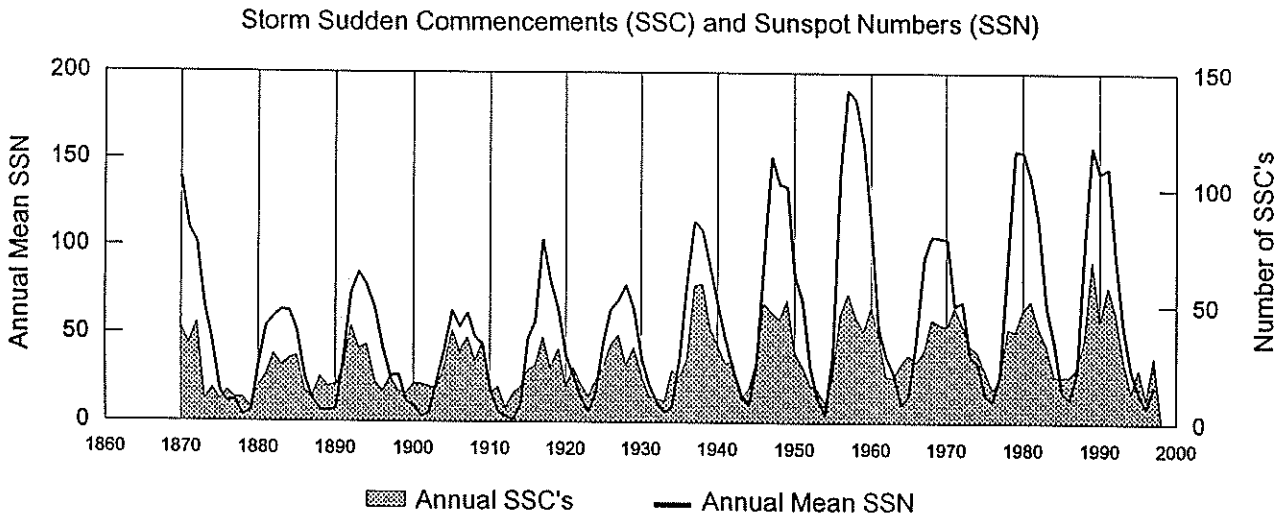
MAGNETIC STORM SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS (PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS)

MARCH 1998

Storm Sudden Commencements (SSC)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
04	1156	A: BJI	02	0905-0915	CLF
		B: WNG HRB* NAG*	17	1041-xxxx	NGK
		C: NGK CLF* HYB ETT	24	1058-1119	NAG
			28	0709-xxxx	NGK (ssc: HRB)

REPORTING OBSERVATORIES (up to the 4th of May 1998):
SOD DOB NUR WNG NGK VAL CLF HRB NAG GCK MMB EBR COI BJI KAK HTY KNY TEN HYB ETT CNB AMS CZT PAF DRV

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 (+).



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WORLD DATA CENTER A
FOR
SOLAR-TERRESTRIAL PHYSICS

The ICSU Panel on WDCs has recommended that it would be appropriate courtesy to acknowledge in publications that data were obtained from the originating station or investigator through the intermediary of the WDCs. The following statement is suggested:

"Data used in this study were provided by WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder Colorado 80303, USA."