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SOLAR-GEOPHYSICAL DATA

Number 657

(Issued in Two Parts)

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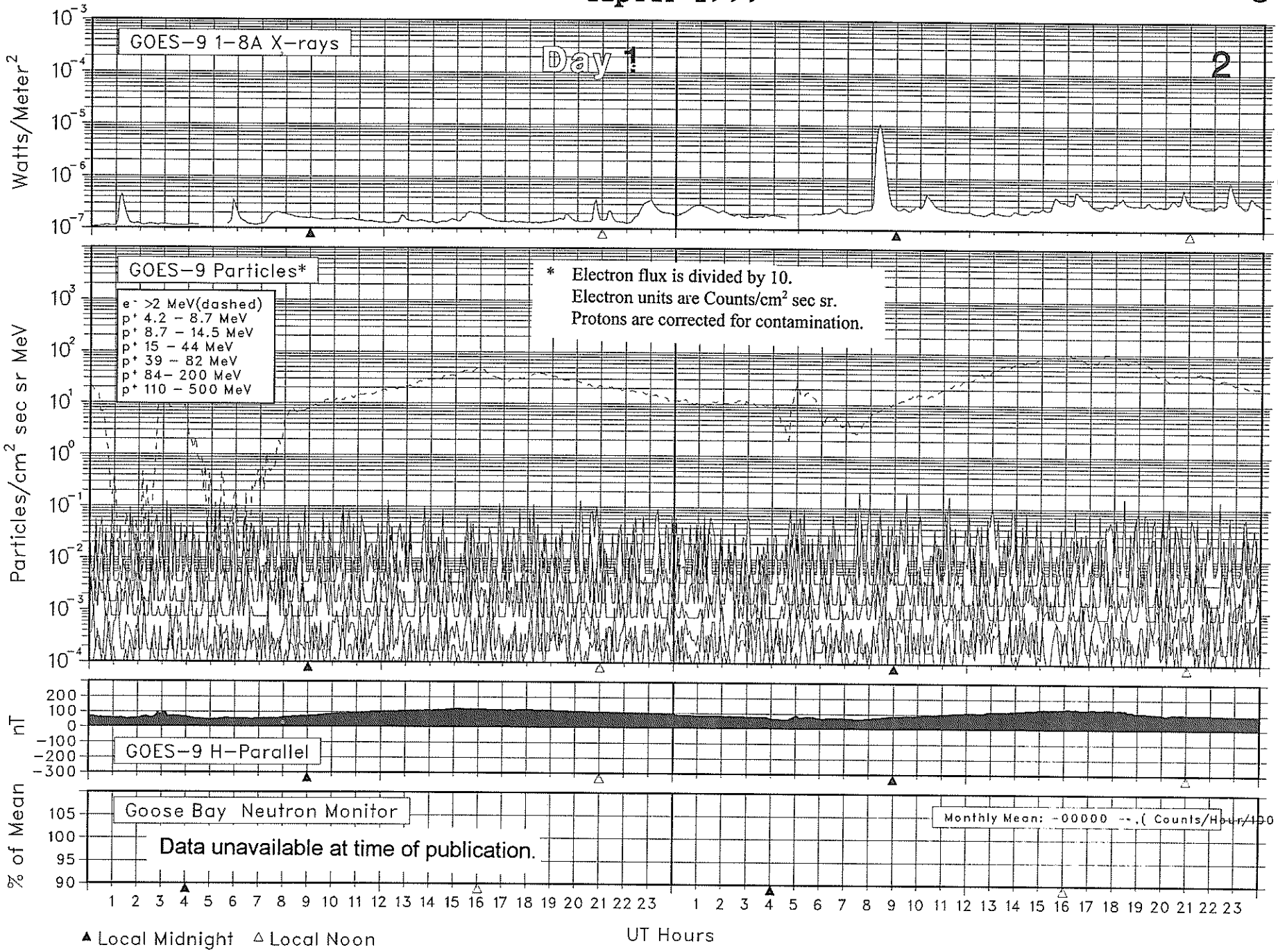

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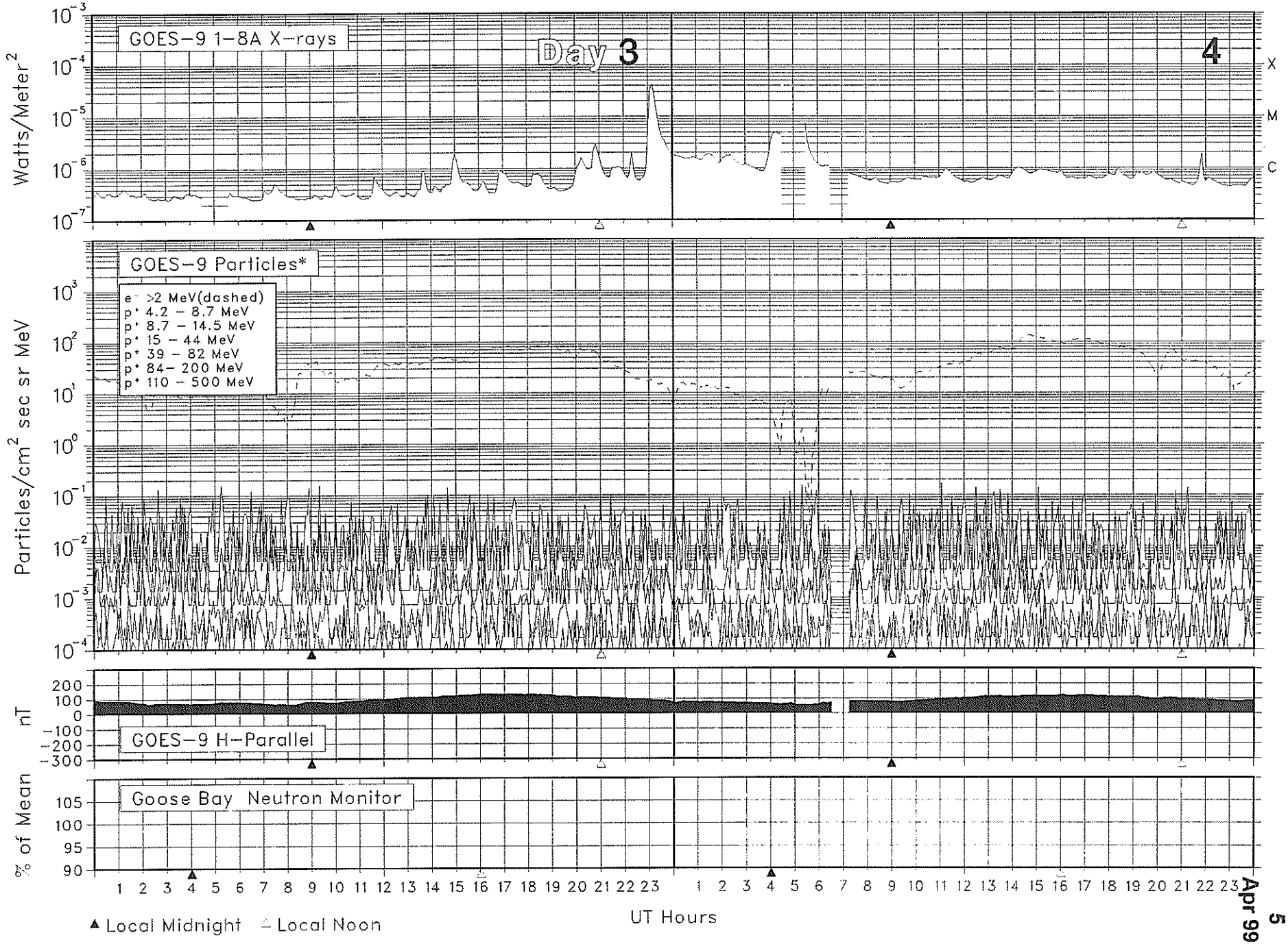

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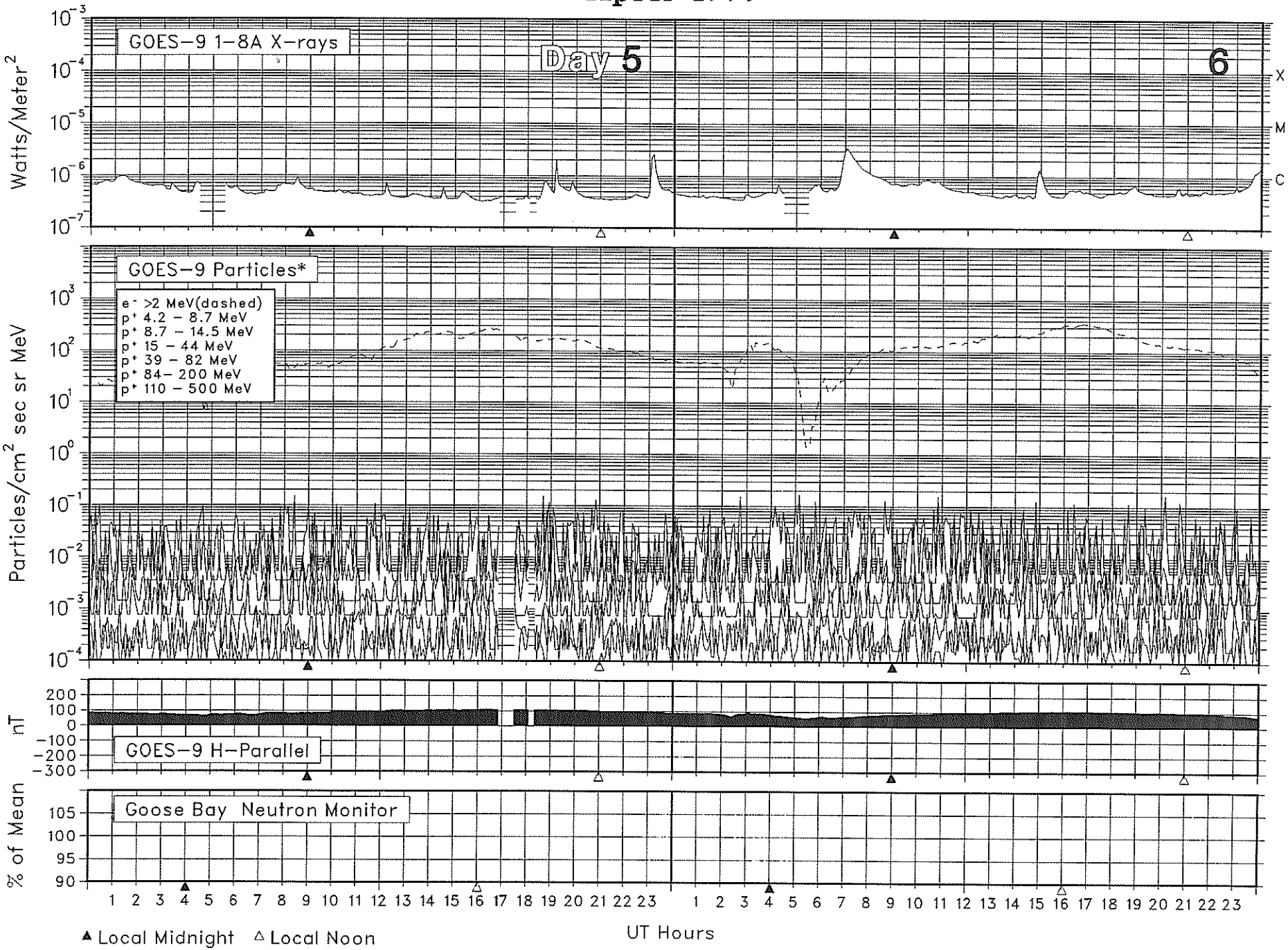

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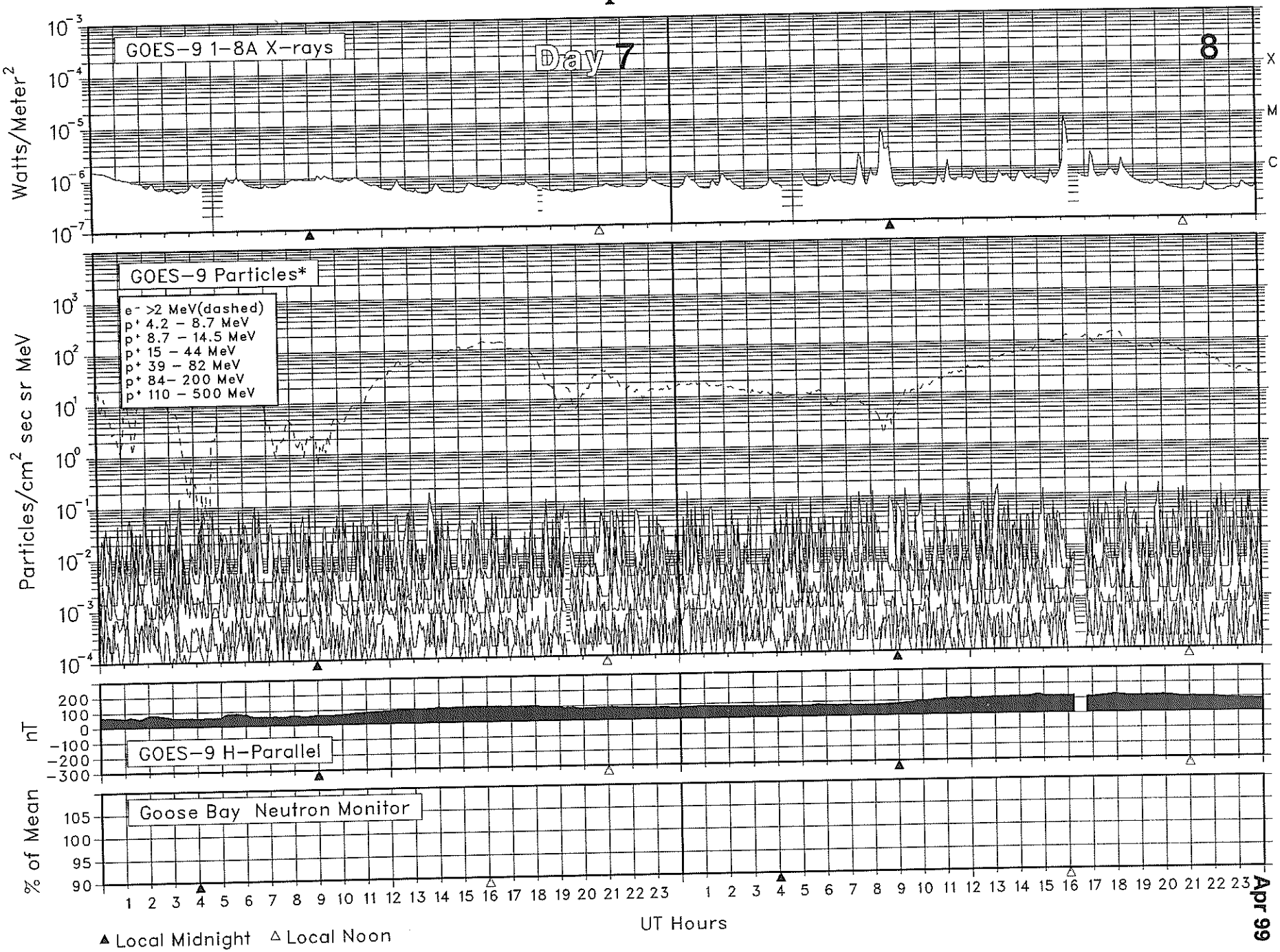

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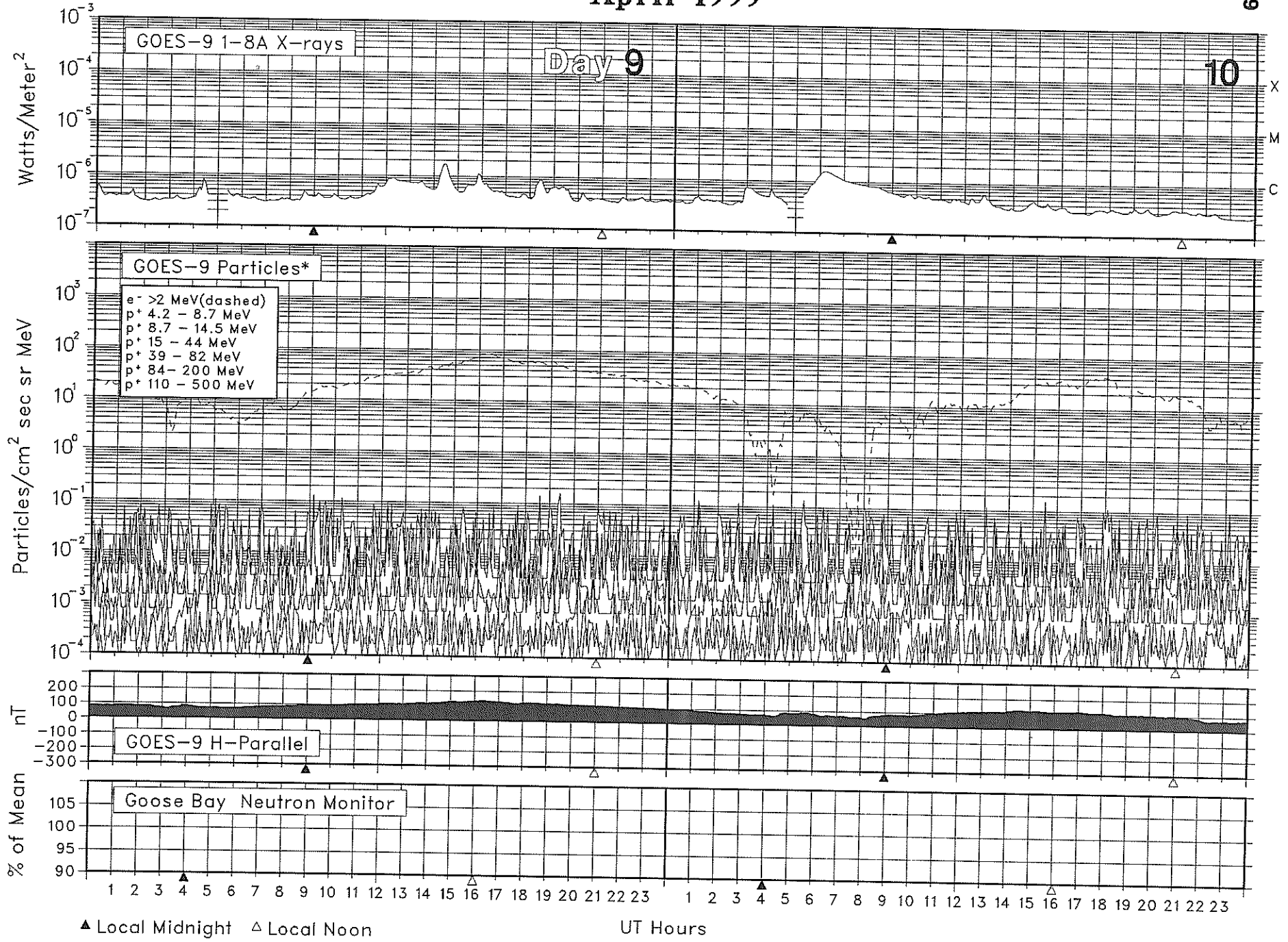

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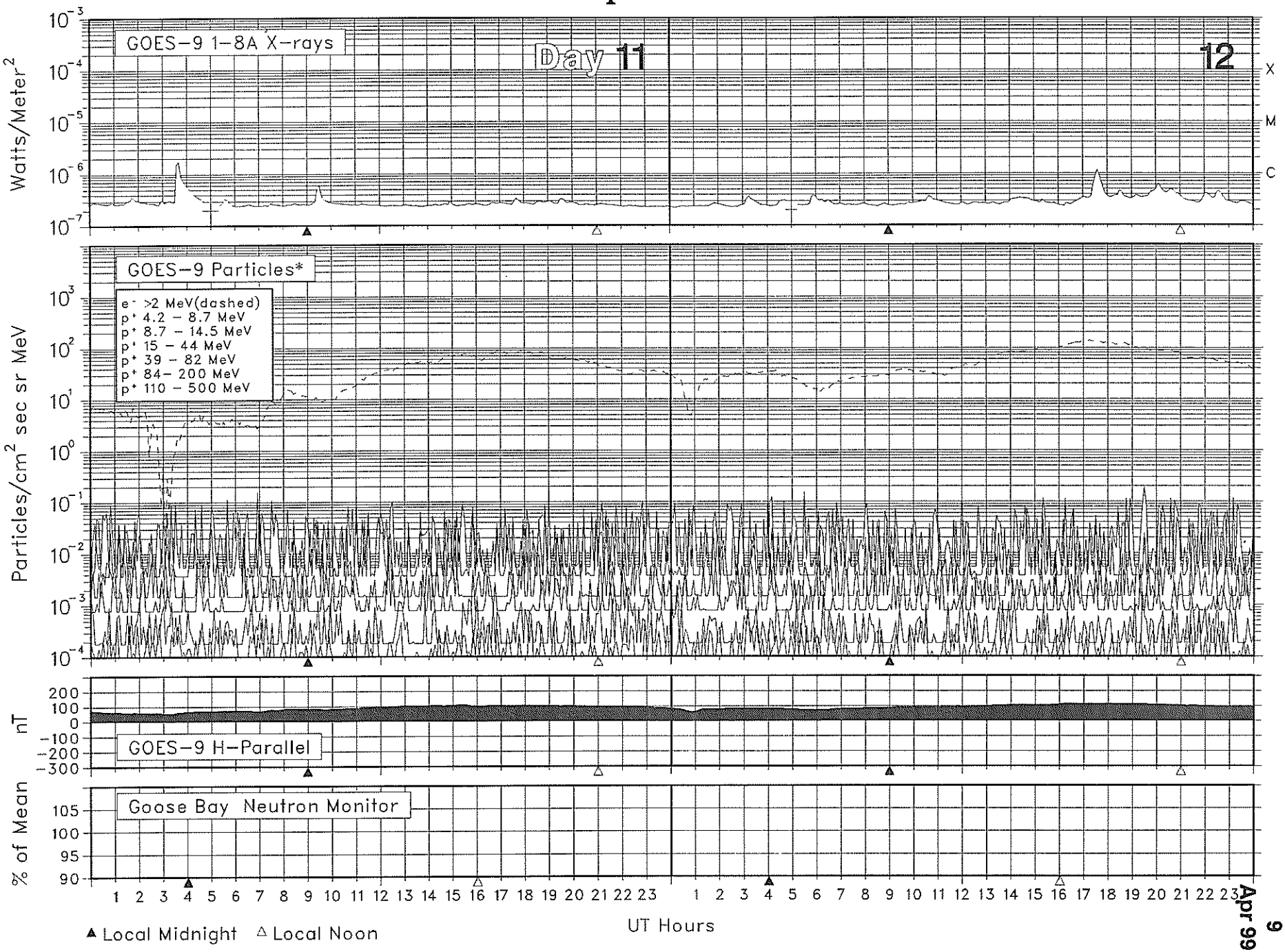

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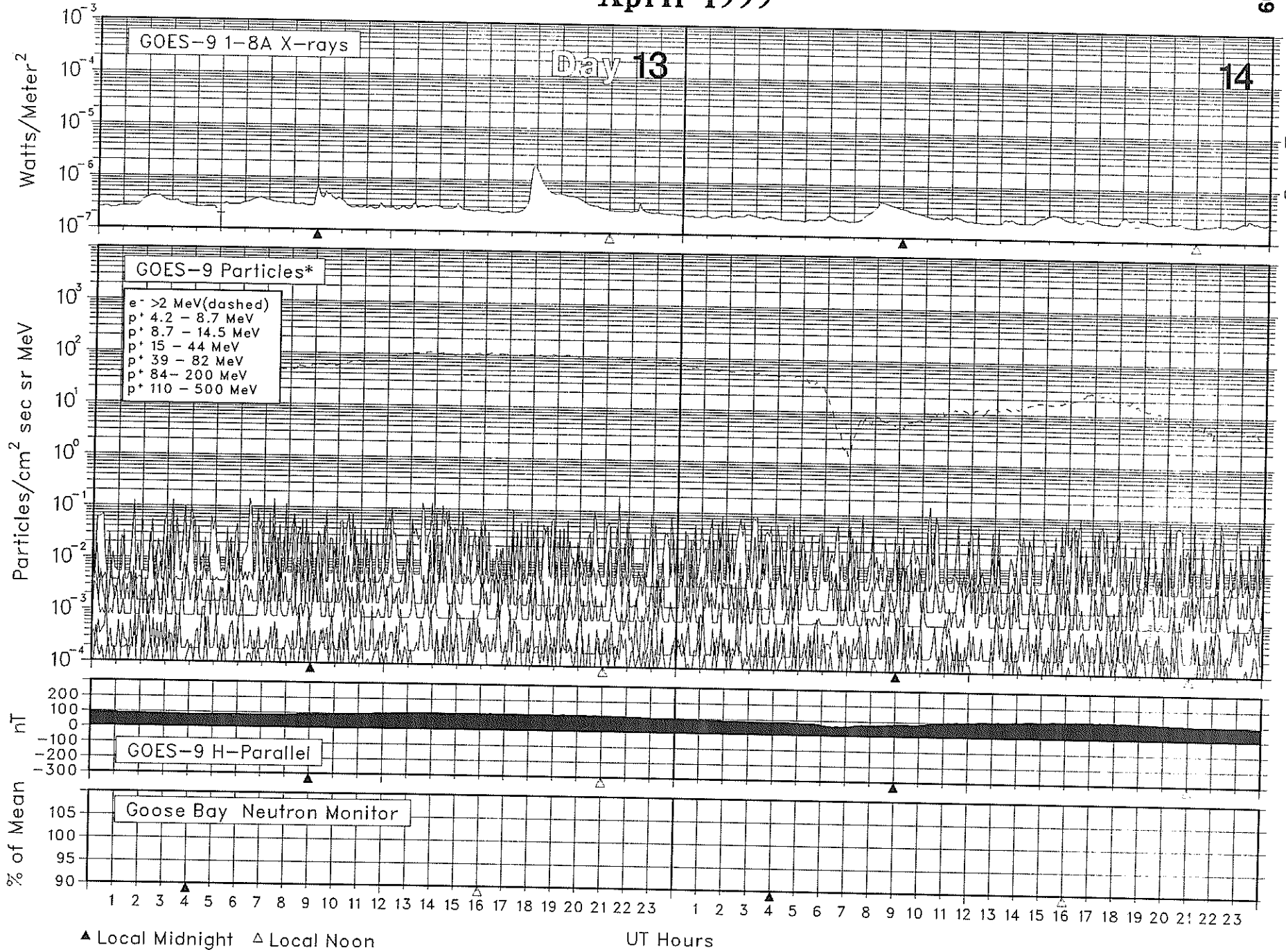

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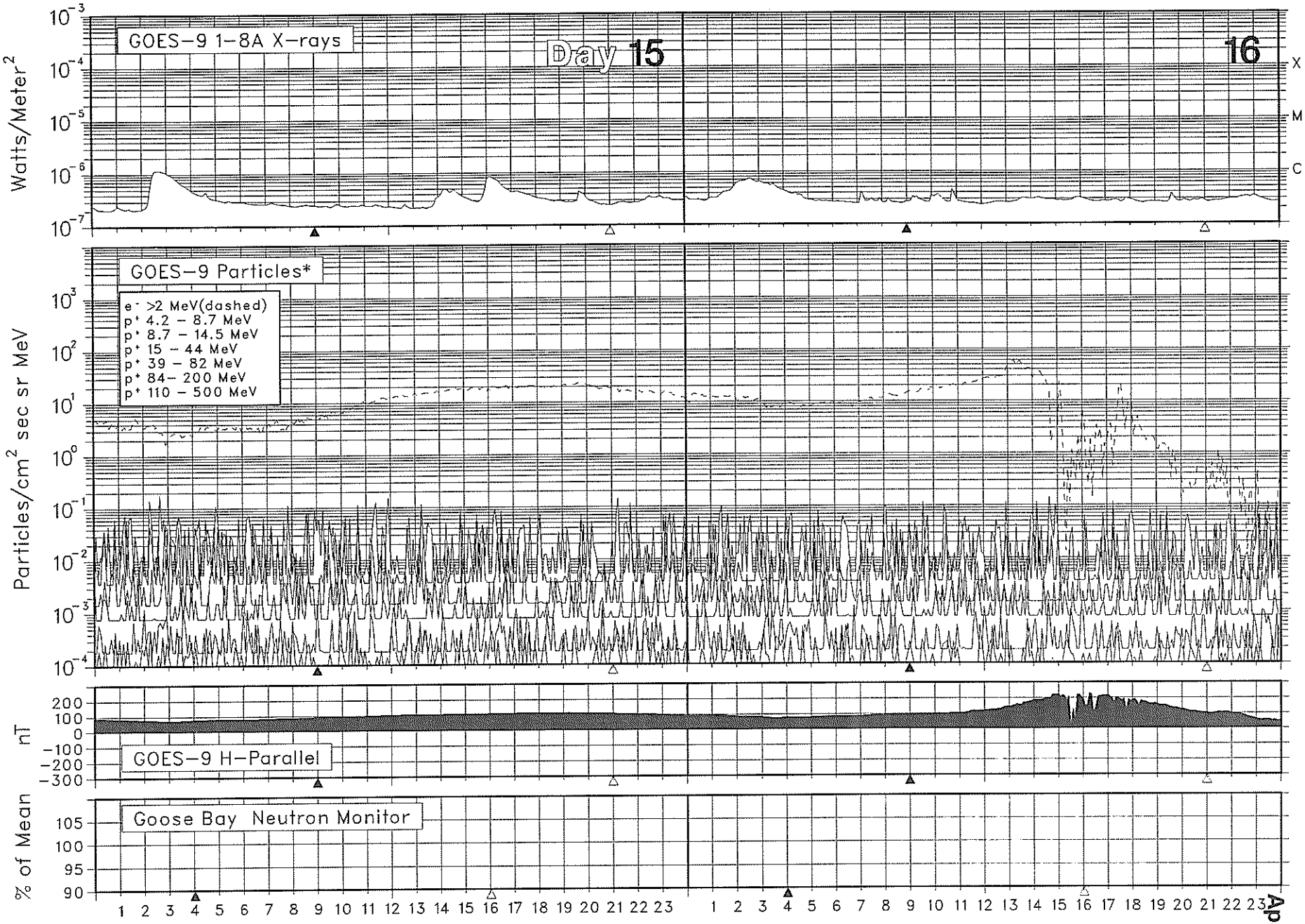

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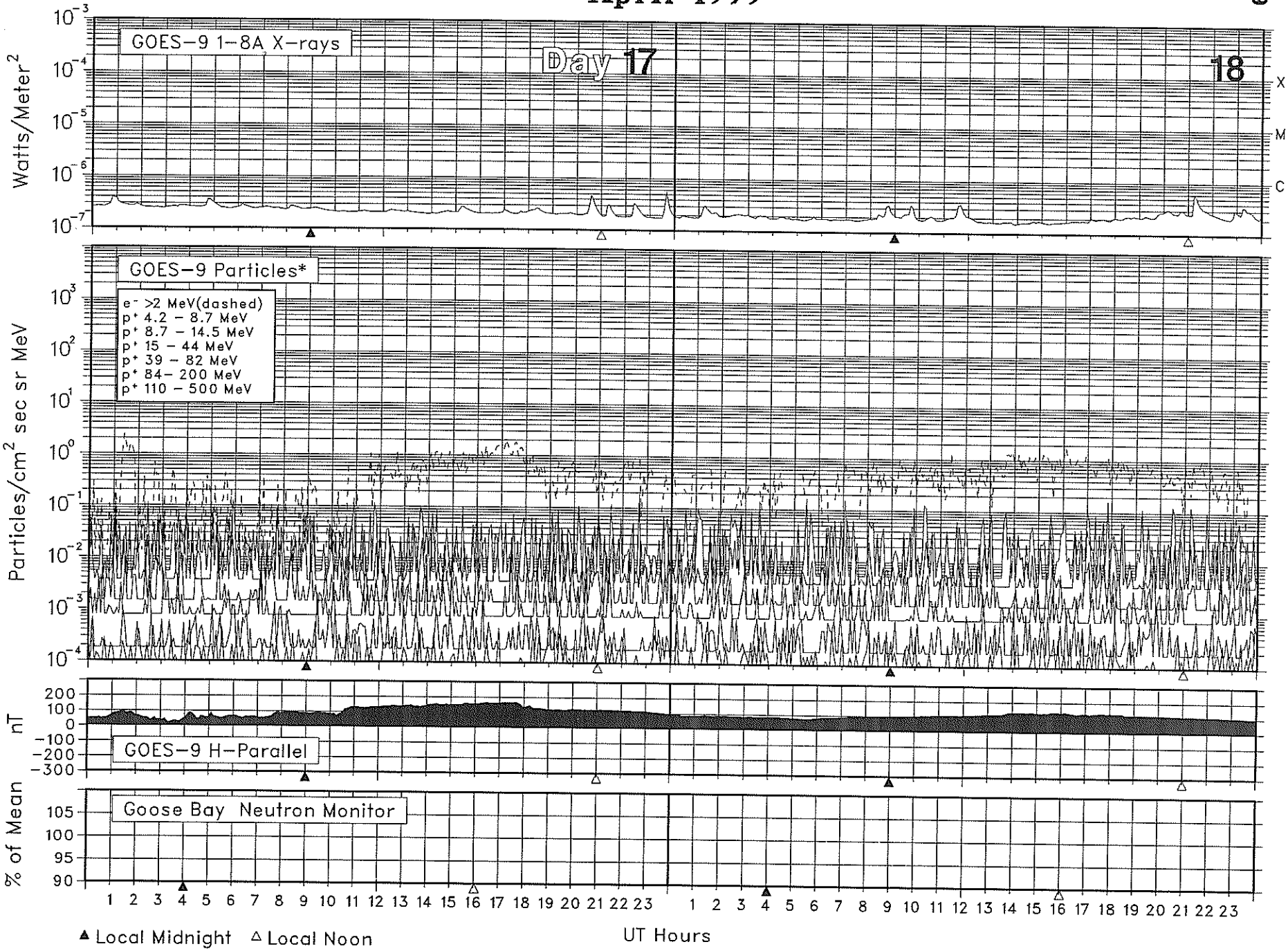

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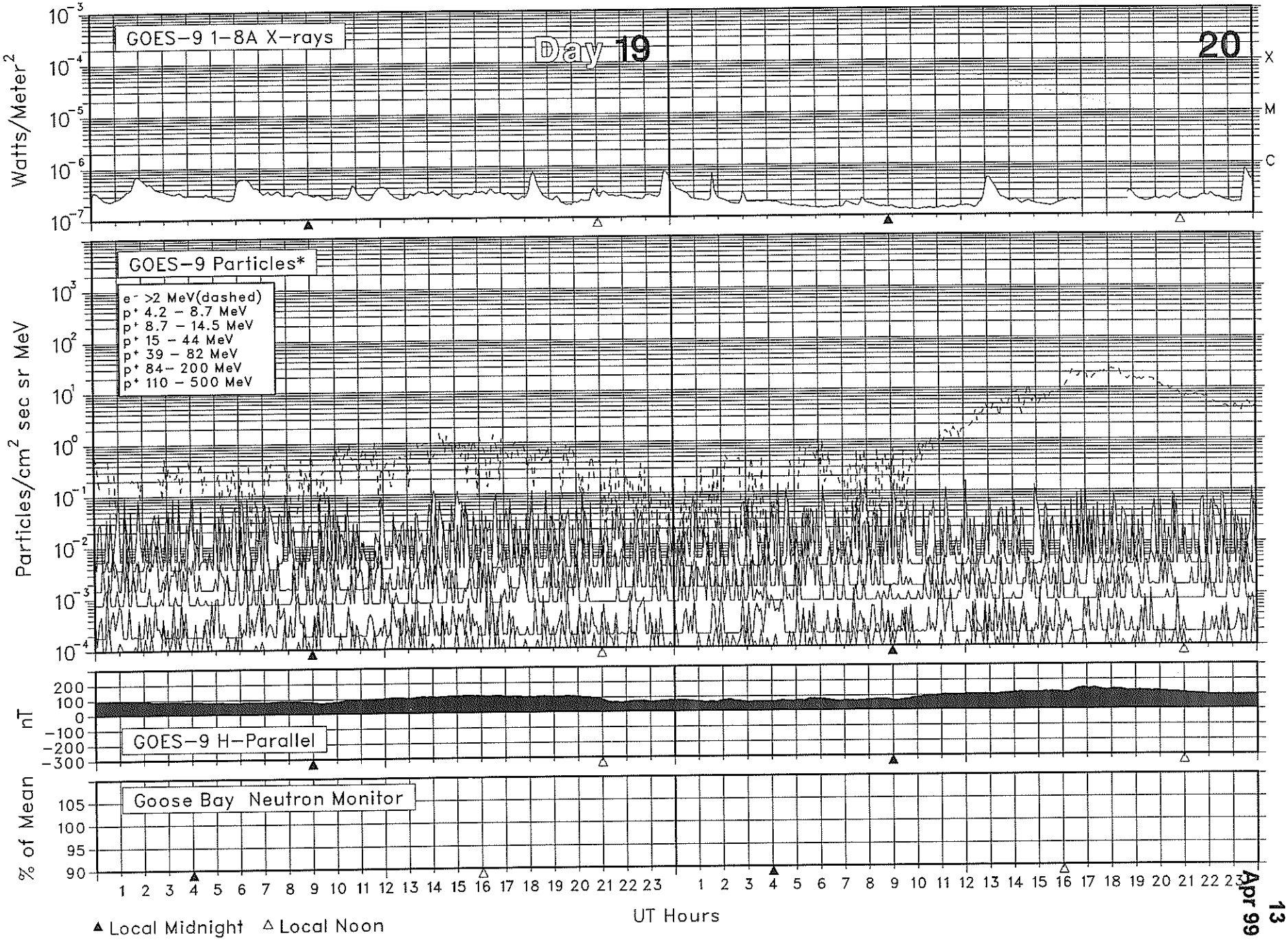

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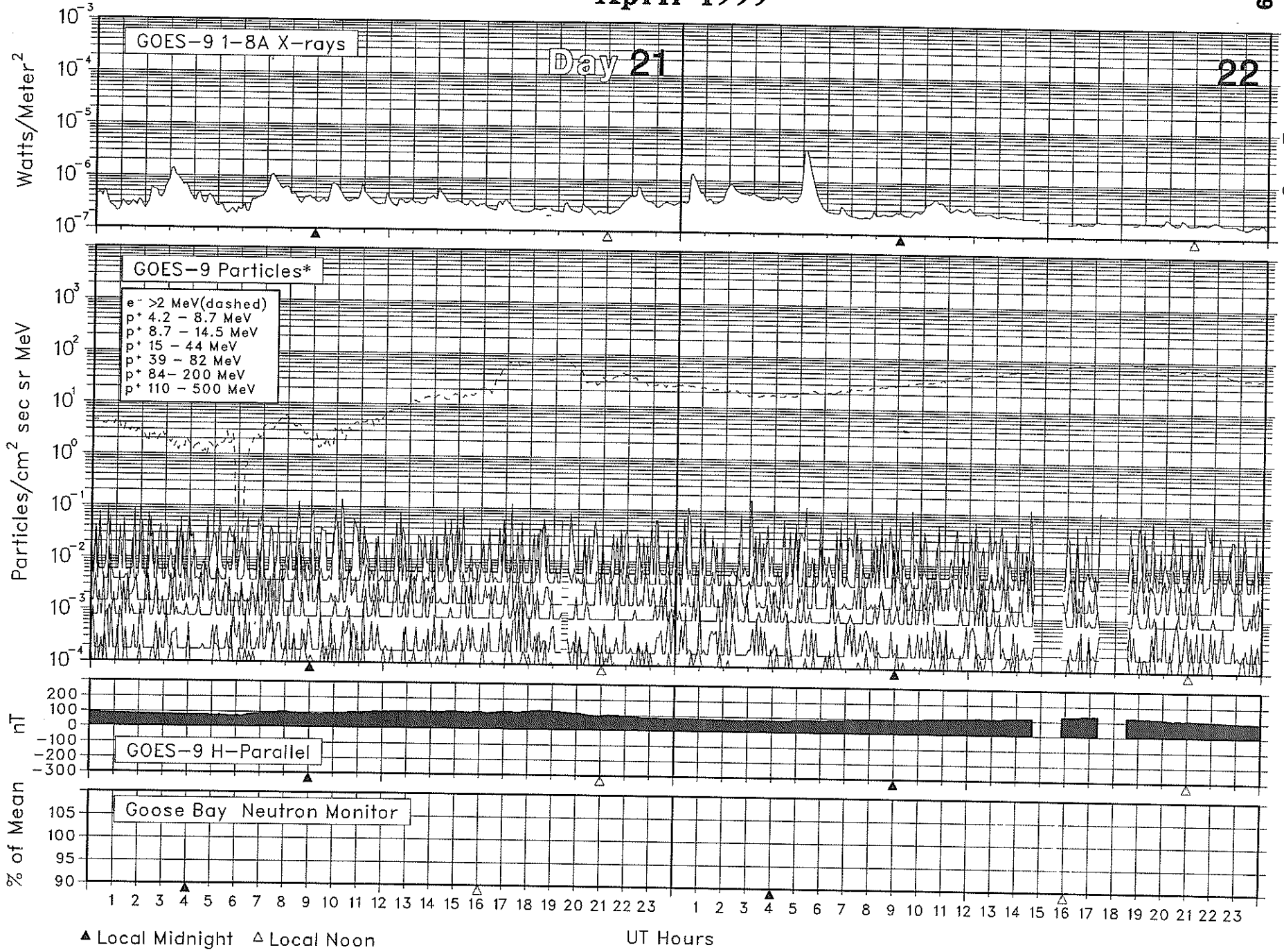

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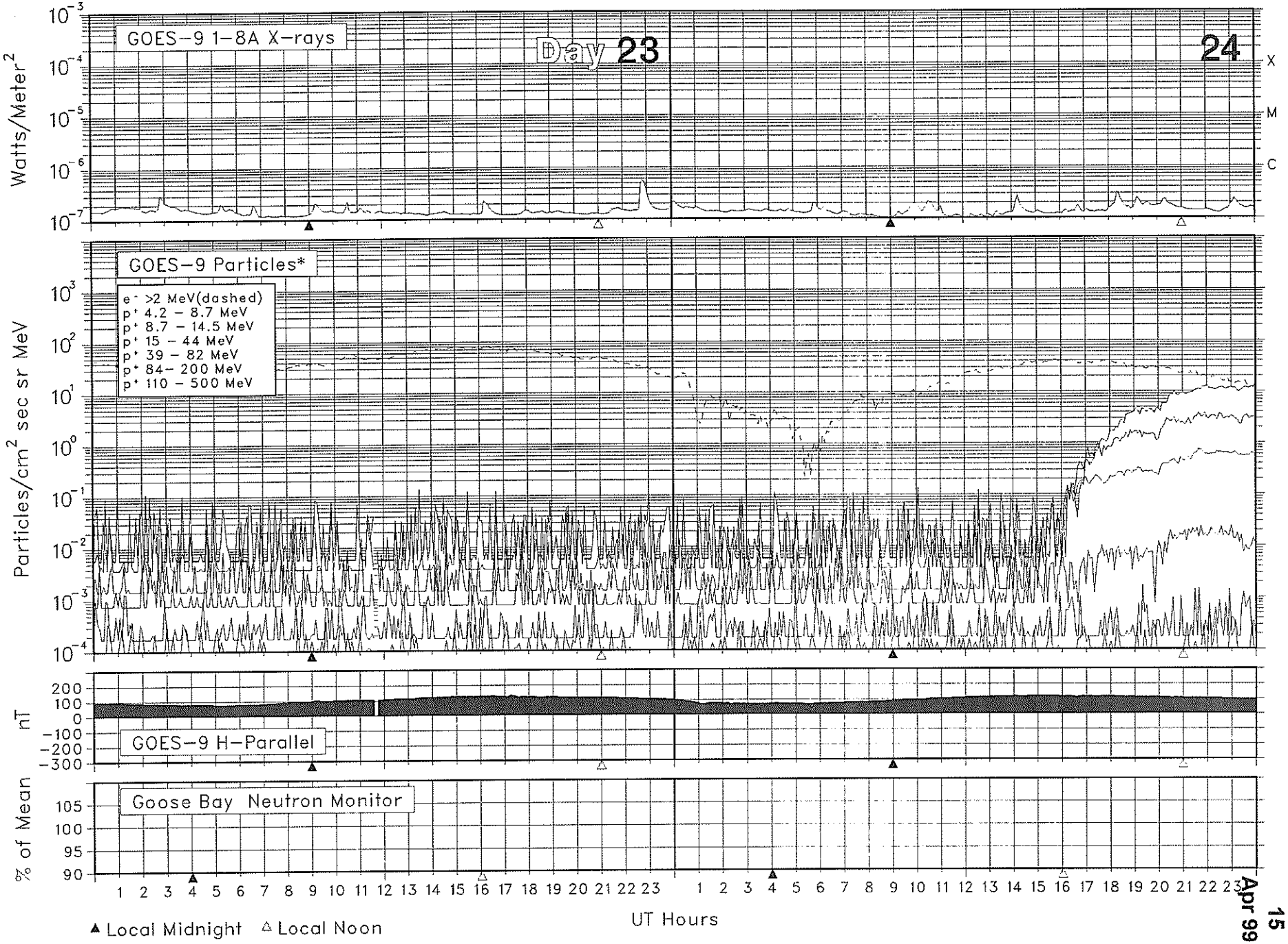

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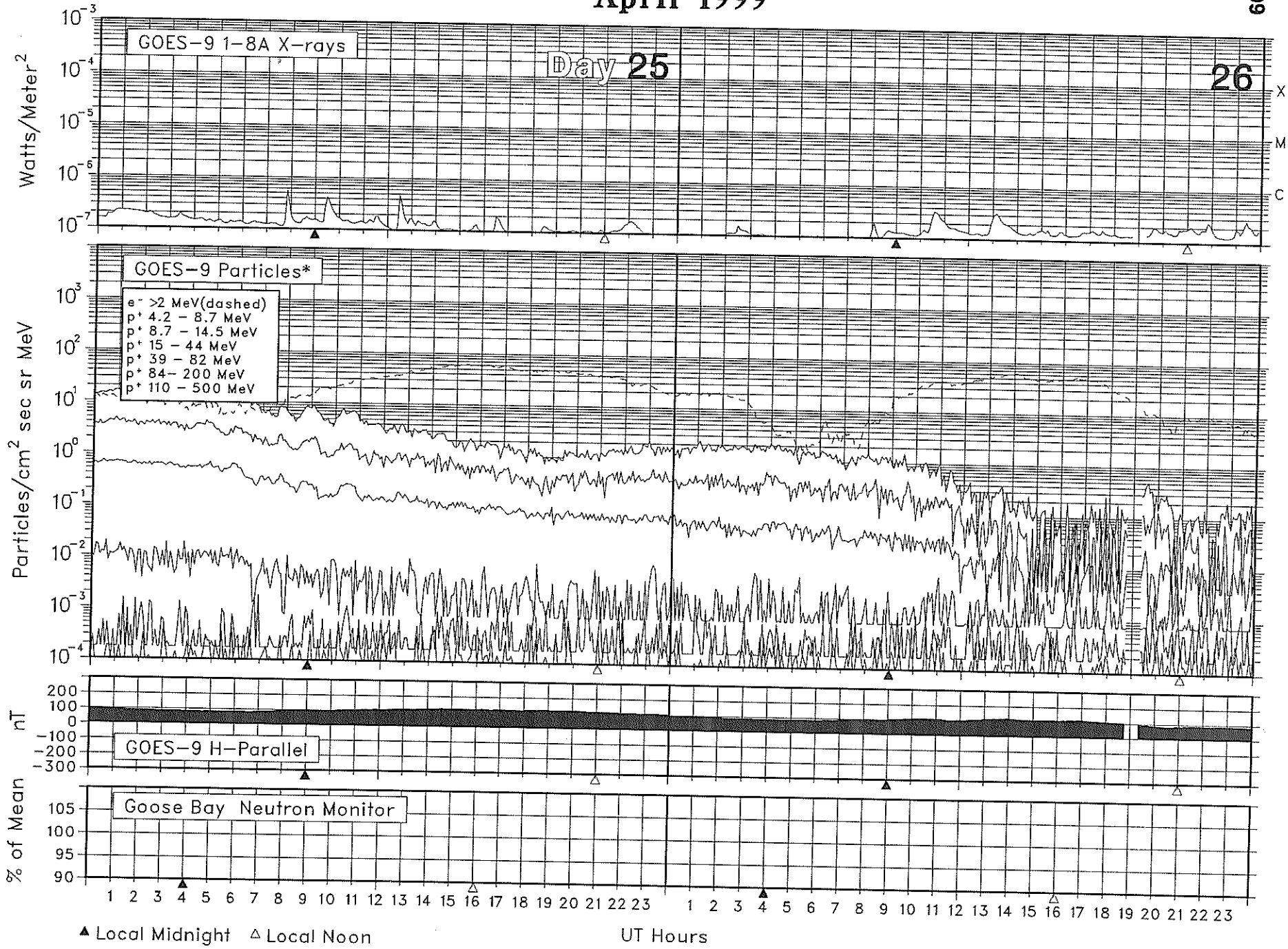

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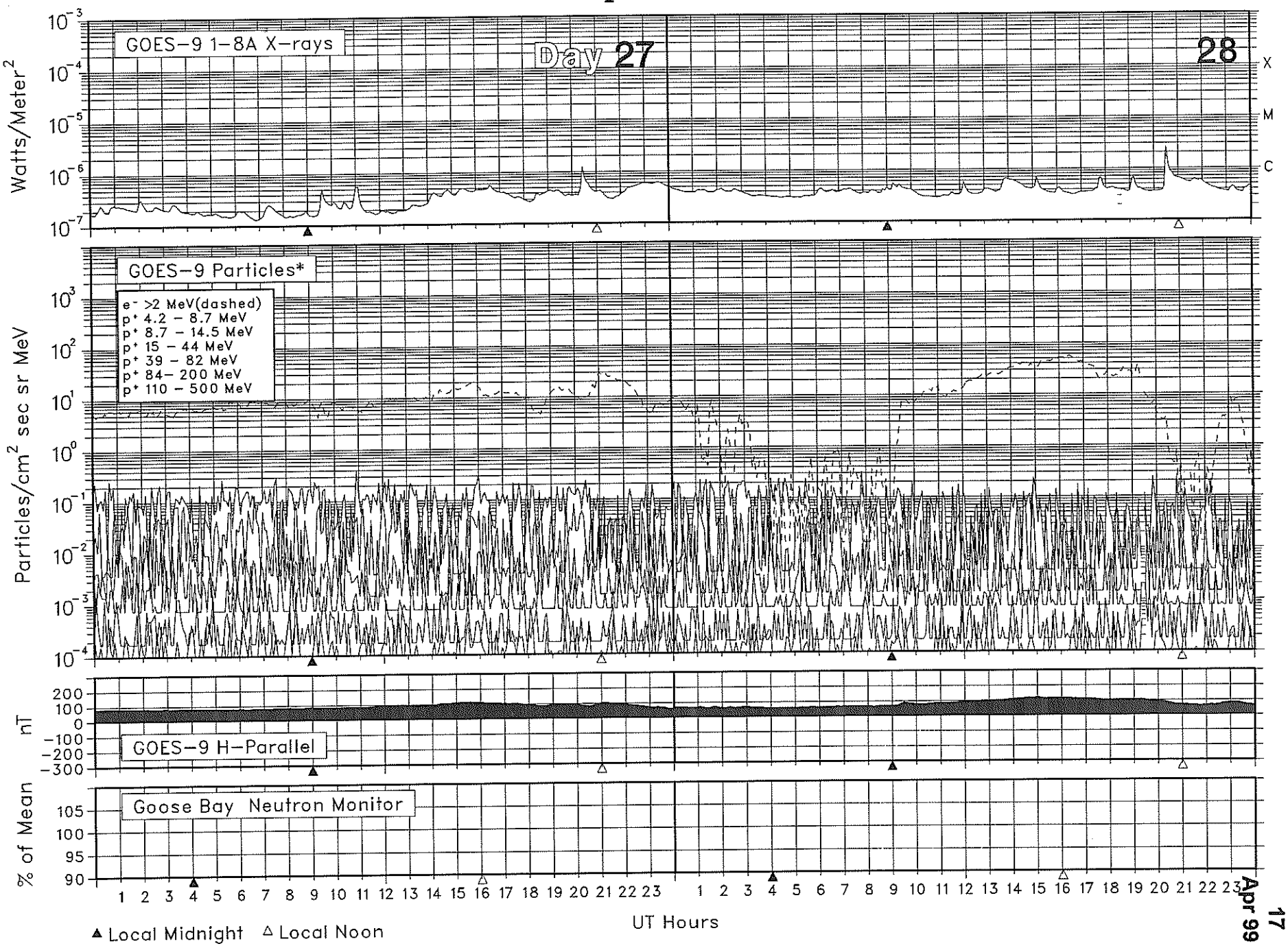

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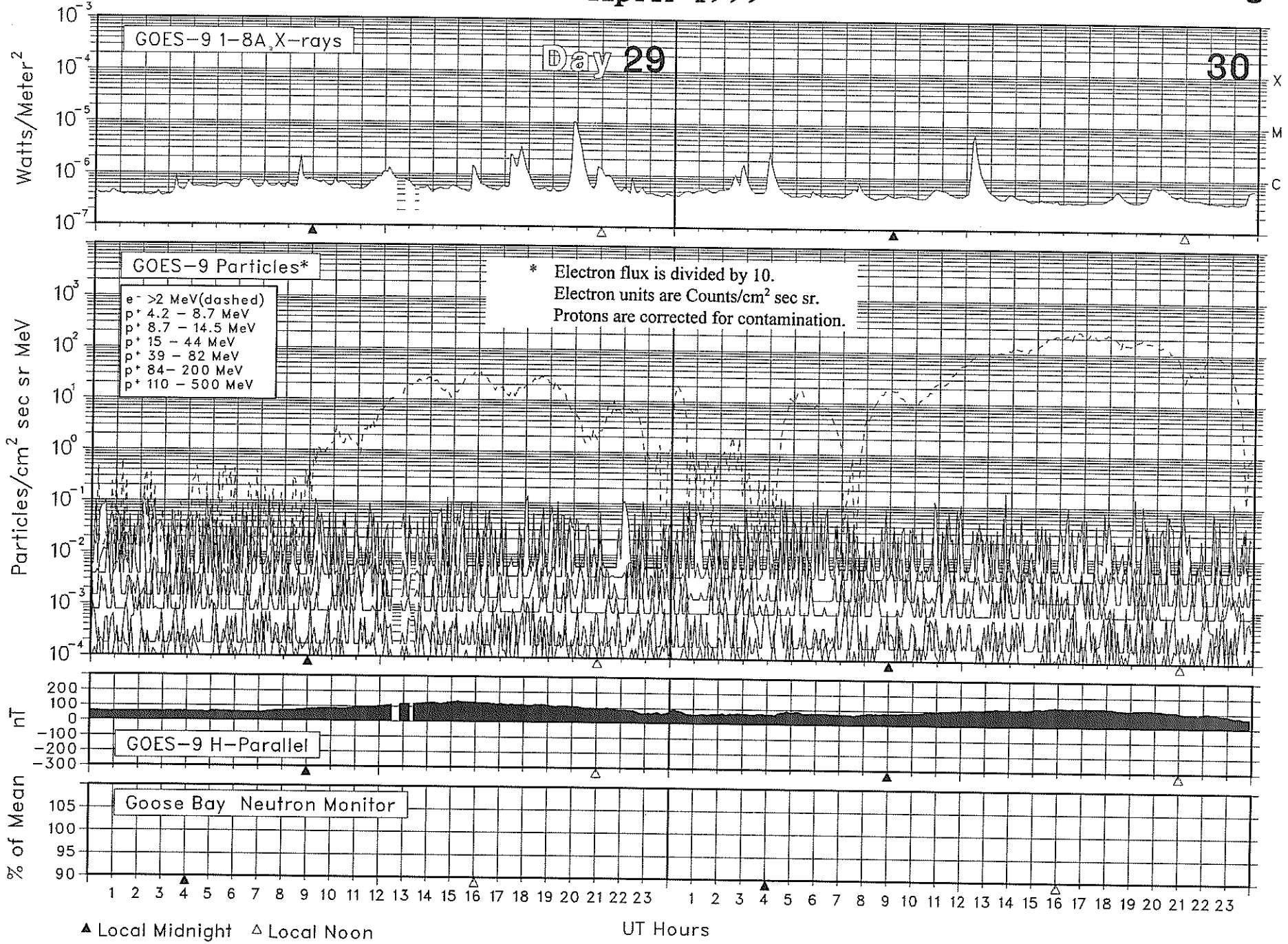


A L E R T P E R I O D S
The International Space Environment Service

APRIL 1999

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Region Forecast(1)	Geoadvice(1)
						Lat	Long	Optical	M	X			
091	01	31	70	102	12	N29	W50	0	0	0	01	Q	SOL: Quiet
						N19	W36	0	0	0	01	Q	MAG: Active
						N25	E16	0	0	0	01	Q	PRO: Quiet
						S27	E30	0	0	0	01	Q	
						S28	E47	0	0	0	01	Q	
						N10	W56	0	0	0	01	Q	
092	02	01	59	103	14	N29	W62	0	0	0	02	Q	SOL: Quiet
						N18	W48	0	0	0	02	Q	MAG: Active
						N27	E05	0	0	0	02	Q	PRO: Quiet
						S27	E18	0	0	0	02	Q	
						S28	E36	0	0	0	02	Q	
093	03	02	50	100	12	N30	W76	0	0	0	03	Q	SOL: Eruptive
						N18	W61	0	0	0	03	Q	MAG: Quiet
						S27	E05	0	0	0	03	Q	PRO: Quiet
						S28	E23	0	0	0	03	Q	
094	04	03	77	103	11	N18	W74	0	0	0	04	Q	SOL: Eruptive
						S28	E11	1	0	0	04	Q	MAG: Quiet
						S26	W02	8	0	0	04	Q	PRO: Quiet
						N12	E58	4	0	0	04	Q	
						N19	E77	2	1	0	04	Q	
095	05	04	90	116	13	N19	W84	0	0	0	05	Q	SOL: Active
						S28	W02	0	0	0	05	Q	MAG: Quiet
						S26	W15	3	0	0	05	E	PRO: Quiet
						N11	E45	1	0	0	05	Q	
						N20	E63	2	1	0	05	E	
096	06	05	111	133	13	S28	W15	0	0	0	06	Q	SOL: Active
						S26	W28	1	0	0	06	E	MAG: Quiet
						N12	E32	0	0	0	06	Q	PRO: Quiet
						N21	E49	4	0	0	06	E	
						N11	E51	0	0	0	06	Q	
097	07	06	119	137	8	S28	W27	0	0	0	07	Q	SOL: Eruptive
						S26	W42	2	0	0	07	E	MAG: Active
						N12	E18	5	0	0	07	Q	PRO: Quiet
						N21	E36	1	0	0	07	E	
						S34	E53	0	0	0	07	Q	
						S17	E59	0	0	0	07	Q	
098	08	07	121	141	11	S27	W40	0	0	0	08	Q	SOL: Eruptive
						S26	W55	1	0	0	08	Q	MAG: Active
						N11	E05	3	0	0	08	Q	PRO: Quiet
						N22	E24	4	0	0	08	E	
						S34	E39	0	0	0	08	Q	
						S17	E46	1	0	0	08	Q	
099	09	08	125	139	10	S26	W68	0	0	0	09	Q	SOL: Eruptive
						N12	W10	0	0	0	09	Q	MAG: Quiet
						N22	E12	8	1	0	09	E	PRO: Quiet
						S35	E24	0	0	0	09	Q	
						S17	E33	0	0	0	09	Q	
						S27	E52	0	0	0	09	Q	
100	10	09	139	136	7	S28	W82	0	0	0	10	Q	SOL: Eruptive
						N11	W23	0	0	0	10	Q	MAG: Quiet
						N23	W02	6	0	0	10	E	PRO: Quiet
						N14	E03	0	0	0	10	Q	
						S35	E11	0	0	0	10	Q	
						S17	E21	0	0	0	10	Q	
						S28	E38	0	0	0	10	Q	
						S18	E49	0	0	0	10	Q	
101	11	10	129	136	12	S26	W96	0	0	0	11	Q	SOL: Eruptive

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

APRIL 1999

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Region Forecast(1)	Geoadvice(1)
						Lat	Long	Optical	M	X			
						N11	W37	0	0	0	11	Q	MAG: Quiet
						N22	W16	3	0	0	11	Q	PRO: Quiet
						S16	E07	0	0	0	11	Q	
						S27	E25	0	0	0	11	Q	
						S18	E35	0	0	0	11	Q	
102	12	11	103	131	9	N11	W49	0	0	0	12	Q	SOL: Eruptive
						N21	W28	3	0	0	12	E	MAG: Quiet
						S17	W05	0	0	0	12	Q	PRO: Quiet
						S27	E12	0	0	0	12	Q	
						S18	E21	0	0	0	12	Q	
103	13	12	113	130	8	N22	W42	1	0	0	13	Q	SOL: Eruptive
						N14	W31	0	0	0	13	Q	MAG: Quiet
						S16	W19	0	0	0	13	Q	PRO: Quiet
						S28	W02	0	0	0	13	Q	
						S18	E09	0	0	0	13	Q	
						S33	E08	0	0	0	13	Q	
104	14	13	122	130	3	N21	W55	2	0	0	14	Q	SOL: Eruptive
						N13	W44	0	0	0	14	Q	MAG: Quiet
						S16	W33	0	0	0	14	Q	PRO: Quiet
						S27	W17	0	0	0	14	Q	
						S18	W05	0	0	0	14	Q	
						S33	W06	0	0	0	14	Q	
						S20	E06	1	0	0	14	Q	
105	15	14	107	120	7	N23	W66	1	0	0	15	Q	SOL: Eruptive
						S20	W49	0	0	0	15	Q	MAG: Quiet
						S27	W31	1	0	0	15	Q	PRO: Quiet
						S15	W20	0	0	0	15	Q	
						S34	W24	0	0	0	15	Q	
						S11	W10	1	0	0	15	Q	
						S21	E68	0	0	0	15	Q	
106	16	15	95	122	4	S17	W61	0	0	0	16	Q	SOL: Eruptive
						S27	W44	0	0	0	16	Q	MAG: Quiet
						S17	W34	0	0	0	16	Q	PRO: Quiet
						S33	W33	0	0	0	16	Q	
						S18	W20	0	0	0	16	Q	
						S19	E55	0	0	0	16	Q	
107	17	16	87	123	12	S27	W55	0	0	0	17	Q	SOL: Eruptive
						S18	W44	0	0	0	17	Q	MAG: Minor
						S32	W47	0	0	0	17	Q	PRO: Quiet
						S16	W31	0	0	0	17	Q	
						S20	E44	0	0	0	17	Q	
						N20	W21	0	0	0	17	Q	
108	18	17	99	116	35	S24	W69	1	0	0	18	Q	SOL: Eruptive
						S30	W58	3	0	0	18	Q	MAG: Quiet
						S16	W44	0	0	0	18	Q	PRO: Quiet
						S20	E30	0	0	0	18	Q	
						N22	W36	0	0	0	18	Q	
						S16	E66	0	0	0	18	Q	
						N17	W33	1	0	0	18	Q	
109	19	18	98	113	7	S27	W82	0	0	0	19	Q	SOL: Eruptive
						S33	W69	0	0	0	19	Q	MAG: Quiet
						S18	W56	0	0	0	19	Q	PRO: Quiet
						S18	E16	0	0	0	19	Q	
						N22	W51	1	0	0	19	Q	
						S14	E53	0	0	0	19	Q	
						N18	W47	0	0	0	19	Q	
110	20	19	90	110	9	S31	W85	0	0	0	20	Q	SOL: Eruptive
						S18	E03	0	0	0	20	Q	MAG: Active

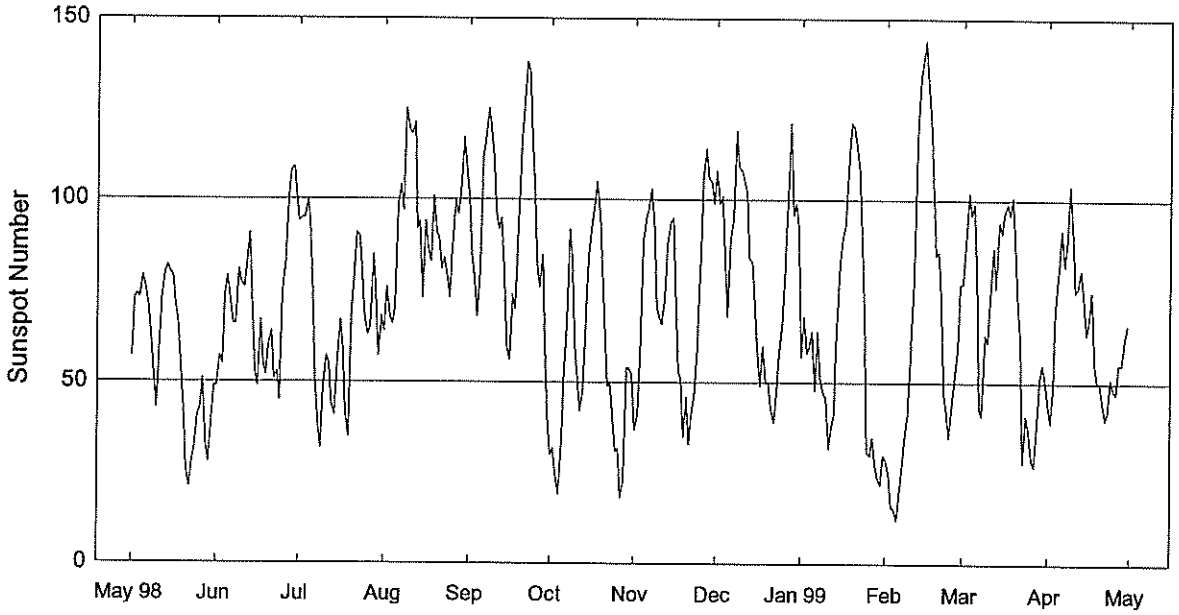
A L E R T P E R I O D S
The International Space Environment Service

APRIL 1999

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Region Forecast(1)	Geoadvice(1)
						Lat	Long	Optical	M	X			
						N22	W63	0	0	0	20	Q	PRO: Quiet
						S14	E40	2	0	0	20	Q	
						N20	E12	0	0	0	20	Q	
						N34	W07	0	0	0	20	Q	
111	21	20	79	105	24	S19	W11	0	0	0	21	Q	SOL: Quiet
						N22	W77	3	0	0	21	Q	MAG: Active
						S15	E29	1	0	0	21	Q	PRO: Quiet
						N19	E00	0	0	0	21	Q	
						N32	W19	0	0	0	21	Q	
112	22	21	79	103	13	S19	W25	1	0	0	22	Q	SOL: Eruptive
						N24	W88	5	0	0	22	Q	MAG: Quiet
						S15	E15	0	0	0	22	Q	PRO: Quiet
						N19	W15	0	0	0	22	Q	
						N34	W35	4	0	0	22	Q	
113	23	22	62	100	4	S20	W36	0	0	0	23	Q	SOL: Eruptive
						S15	E04	0	0	0	23	Q	MAG: Quiet
						N34	W46	0	0	0	23	Q	PRO: Quiet
114	24	23	71	98	5	S19	W50	0	0	0	24	Q	SOL: Eruptive
						S14	W10	0	0	0	24	Q	MAG: Quiet
						N34	W59	0	0	0	24	Q	PRO: Quiet
						N16	E63	0	0	0	24	Q	
115	25	24	89	101	5	S19	W62	0	0	0	25	Q	SOL: Quiet
						S14	W23	0	0	0	25	Q	MAG: Quiet
						N33	W76	0	0	0	25	Q	PRO: IP
						N16	E50	4	0	0	25	Q	
						N32	E42	0	0	0	25	Q	
						N22	E53	0	0	0	25	Q	
116	26	25	69	103	3	S13	W38	0	0	0	26	Q	SOL: Quiet
						N16	E38	0	0	0	26	Q	MAG: Quiet
						N31	E28	1	0	0	26	Q	PRO: Quiet
						N22	E39	1	0	0	26	Q	
117	27	26	69	105	6	S13	W51	0	0	0	27	Q	SOL: Quiet
						N16	E26	0	0	0	27	Q	MAG: Quiet
						N30	E16	0	0	0	27	Q	PRO: Quiet
						N22	E26	1	0	0	27	Q	
118	28	27	82	109	12	S13	W64	0	0	0	28	Q	SOL: Quiet
						N16	E13	0	0	0	28	Q	MAG: Active
						N31	E03	1	0	0	28	Q	PRO: Quiet
						N22	E13	4	0	0	28	Q	
119	29	28	76	110	16	S13	W76	0	0	0	29	Q	SOL: Quiet
						N18	E00	0	0	0	29	Q	MAG: Active
						N32	W09	1	0	0	29	Q	PRO: Quiet
						N22	W02	0	0	0	29	Q	
120	30	29	98	122	18	S13	W93	0	0	0	30	Q	SOL: Eruptive
						N17	W14	0	0	0	30	Q	MAG: Active
						N32	W21	3	0	0	30	Q	PRO: Quiet
						N22	W15	8	1	0	30	E	
						N15	E68	2	0	0	30	Q	
						N22	E35	0	0	0	30	Q	

STRATWARM ALERTS - NONE

International Relative Sunspot Numbers
May 1998 - Apr 1999

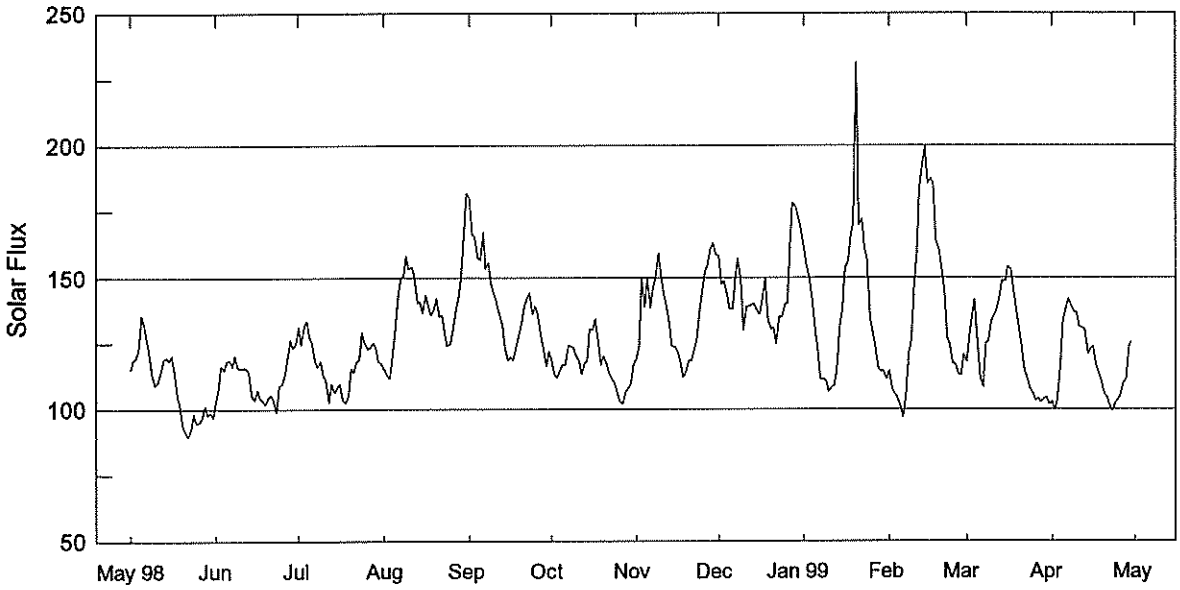


Day	May 98	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99*	Feb*	Mar*	Apr*
1	57	49	94	64	100	30	37	108	57	29	77	44
2	73	57	95	76	85	32	41	99	68	25	88	39
3	74	55	95	68	79	25	56	101	58	16	102	48
4	73	74	100	66	68	19	88	86	60	15	96	71
5	79	79	94	70	80	30	95	68	64	12	99	81
6	76	72	74	98	112	54	98	89	48	19	79	92
7	71	66	51	104	116	66	103	95	64	28	43	82
8	63	66	38	97	125	92	92	119	51	36	41	89
9	54	81	32	125	119	84	71	109	47	41	63	104
10	43	77	49	119	112	60	68	108	46	60	61	90
11	58	76	57	118	96	51	66	105	32	78	76	75
12	73	83	55	121	92	42	73	102	38	115	87	76
13	80	91	44	92	95	48	88	84	41	134	76	81
14	82	69	41	94	78	66	94	83	65	138	94	74
15	80	53	55	73	60	84	95	72	83	144	91	63
16	79	49	67	94	56	93	76	60	90	133	97	67
17	71	67	59	87	74	98	53	49	93	122	99	75
18	67	55	42	83	70	105	51	60	111	105	96	55
19	56	52	35	101	93	96	35	50	121	85	101	50
20	43	60	69	91	114	81	46	50	120	86	88	50
21	26	64	78	89	125	63	33	43	114	74	71	45
22	21	51	91	81	138	49	41	39	108	47	61	40
23	28	53	90	84	135	50	47	47	87	42	28	42
24	32	45	79	79	117	39	59	58	68	35	41	51
25	41	75	68	73	105	31	85	66	31	44	37	48
26	43	83	63	87	82	32	106	81	30	51	29	47
27	51	100	65	100	76	18	114	100	35	59	27	55
28	33	108	85	96	85	23	106	121	28	77	37	55
29	28	109	74	102	60	54	105	96	24		51	61
30	40	101	57	117	41	54	99	99	22		55	66
31	49		68	109		52		92	30		51	
Mean	56.3	70.7	66.6	92.2	92.9	55.5	74.0	81.9	62.4	66.1	69.1	63.9

* = Provisional.

Penticton 2800 MHz (10.7cm) Solar Flux
Mar 98 - Apr 99

Adjusted to 1 AU



Day	May 98	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb	Mar	Apr
1	115.1	103.0	131.1	115.4	180.2	119.1	119.5	158.2	161.6	114.5	118.0	102.9
2	118.8	107.7	124.4	112.9	166.3	112.9	124.1	147.4	154.8	107.7	127.6	99.4
3	119.3	116.4	131.9	111.7	165.5	112.0	149.3	148.7	149.4	105.8	134.6	102.7
4	123.2	115.0	133.5	119.2	157.3	114.9	139.0	144.0	142.0	104.3	141.6	116.0
5	135.7	118.4	127.6	130.5	156.8	117.1	150.1	138.3	132.0	100.9	125.4	132.7
6	132.4	118.5	125.2	142.2	167.1	116.9	138.4	138.1	121.6	96.6	112.6	137.6
7	125.6	116.4	118.5	149.1	153.5	124.1	145.8	148.7	111.3	106.5	108.3	141.7
8	120.2	120.5	116.2	150.9	155.8	123.8	149.9	157.1	111.7	121.1	125.0	139.5
9	112.8	115.7	118.2	158.3	147.4	123.2	159.3	149.3	111.0	125.9	125.3	136.7
10	109.3	115.3	112.9	153.3	143.6	120.3	150.8	129.8	106.7	148.4	133.6	136.9
11	110.2	115.8	111.3	154.1	140.4	118.5	144.1	138.8	108.2	159.3	135.3	131.3
12	114.4	115.7	102.6	150.9	136.6	113.4	138.7	138.9	109.1	183.6	138.5	130.7
13	119.1	113.9	109.7	140.4	132.3	117.5	132.6	139.7	114.7	193.4	142.7	130.3
14	119.8	105.1	106.3	140.6	123.3	118.4	123.8	139.9	132.4	199.6	148.7	121.0
15	118.6	103.6	108.2	136.8	118.6	130.4	123.7	137.2	138.0	185.5	148.4	122.7
16	120.4	107.3	109.7	143.3	119.9	130.1	121.8	136.1	153.4	187.3	154.1	123.8
17	113.0	103.9	103.6	139.7	118.6	134.4	118.0	141.5	156.2	185.3	152.9	116.6
18	104.6	103.3	102.4	135.8	123.7	125.0	112.2	149.8	165.4	164.2	146.7	113.8
19	101.5	101.8	105.2	137.9	128.0	116.8	113.7	133.6	170.3	160.5	138.1	110.9
20	94.1	104.4	115.4	141.9	133.3	120.2	118.6	130.4	231.3	153.6	131.6	105.8
21	91.2	105.4	113.9	135.2	139.4	117.2	118.3	130.9	169.7	144.0	123.1	104.4
22	89.6	103.8	117.8	135.9	142.1	113.8	123.0	124.6	172.3	127.0	115.0	101.4
23	92.6	98.9	119.1	129.3	144.1	111.4	126.7	135.2	160.8	124.3	112.2	99.3
24	98.0	108.8	129.2	123.9	136.2	109.6	136.7	134.9	156.8	117.3	107.6	102.0
25	94.7	109.7	125.5	124.8	139.2	106.3	145.6	139.6	133.9	117.1	106.4	103.8
26	94.9	112.8	122.8	129.6	136.2	102.8	152.3	140.2	129.1	113.4	103.1	105.8
27	96.6	119.1	123.2	137.8	128.0	101.8	154.7	161.4	121.6	112.9	104.1	110.0
28	101.1	126.1	125.1	142.0	123.0	106.4	160.4	178.3	115.2	120.7	102.7	111.3
29	97.6	123.3	123.1	149.4	116.3	108.0	163.2	176.8	114.2		103.8	123.9
30	98.8	125.0	118.3	166.4	121.8	109.9	158.9	173.1	114.5		104.4	125.3
31	96.8		117.2	181.8		117.0		168.8	111.5		101.7	
Mean	109.0	111.8	117.7	139.4	139.8	116.6	137.1	145.5	138.1	138.6	124.9	118.0

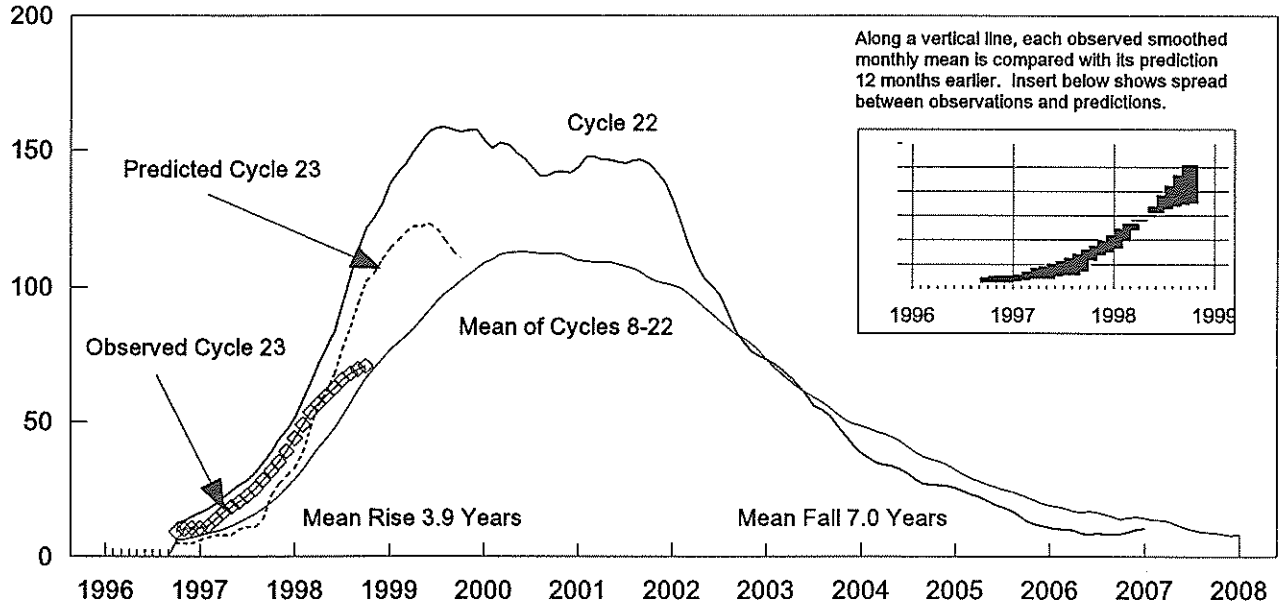
DAILY SOLAR INDICES
April 1999

Day	Day of Year	Bartels Cycle Day	Sunspot Numbers Int	Sunspot Numbers Amer	Obs Flux Penticton (2800)	Solar Flux Adjusted to 1 Astronomical Unit — SGMR (15400)	SGMR (8800)	SGMR (4995)	Pentic (2800)	SGMR (2695)	SGMR (1415)	SGMR (610)	SGMR (410)	SGMR (245)
1	91	2	44	43	103.0	504	247	145	102.9	95	81	53	37	17
2	92	3	39	42	99.5	506	267	152	99.4	104	85	55	39	17
3	93	4	48	59	102.7	501	233	161	102.7	107	87	56	39	17
4	94	5	71	71	115.9	517	238	170	116.0	122	96	65	45	25
5	95	6	81	84	132.6	--	--	--	132.7	--	--	--	--	
6	96	7	92	88	137.4	516	236	179	137.6	129	104	60	43	23
7	97	8	82	84	141.4	521	243	186	141.7	137	111	64	46	27
8	98	9	89	86	139.1	524	229	178	139.5	154	109	59	42	30
9	99	10	104	106	136.2	518	238	190	136.7	137	113	66	44	25
10	100	11	90	89	136.3	509	237	184	136.9	133	110	64	42	18
11	101	12	75	85	130.7	515	--	174	131.3	126	105	62	41	17
12	102	13	76	83	130.0	513	235	171	130.7	124	106	60	40	18
13	103	14	81	74	129.6	--	--	--	130.3	--	--	--	--	--
14	104	15	74	74	120.2	501	261	166	121.0	118	98	62	44	23
15	105	16	63	70	121.8	514	250	164	122.7	116	97	60	42	24
16	106	17	67	69	122.9	508	262	164	123.8	118	94	59	41	25
17	107	18	75	72	115.7	491	254	161	116.6	113	93	55	40	34
18	108	19	55	50	112.8	507	247	148	113.8	112	87	56	40	19
19	109	20	50	55	110.0	498	253	148	110.9	112	87	56	40	19
20	110	21	50	53	104.8	477	248	159	105.8	98	80	53	40	21
21	111	22	45	47	103.4	505	248	150	104.4	99	78	51	43	31
22	112	23	40	47	100.4	499	250	142	101.4	99	77	50	38	19
23	113	24	42	45	98.2	499	247	143	99.3	96	75	49	35	20
24	114	25	51	37	100.9	504	249	142	102.0	97	76	51	36	19
25	115	26	48	42	102.6	503	252	148	103.8	97	78	50	39	19
26	116	27	47	51	104.5	499	245	141	105.8	100	78	50	41	23
27	117	1	55	60	108.6	506	253	147	110.0	105	79	50	37	17
28	118	2	55	61	109.8	508	253	151	111.3	105	82	49	35	17
29	119	3	61	63	122.1	508	266	173	123.9	116	86	52	39	18
30	120	4	66	68	123.5	510	263	173	125.3	115	88	49	36	16
MEAN			63.9	65.2	117.2	506	248	161	118.0	113	90	55	40	21

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

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

Cycle 23 Smoothed Sunspot Numbers: Observed and Predicted



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

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
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	15	13	12	11	11	17
1996	10	10	10	9	8*	9	8	8	8	9**	10	10	8
1997	11	11	14	17	18	20	23	25	28	32	35	39	23
1998	44	49	53	57	59	63	65	68	69	71	75	78	63
											(4)	(7)	(1)
1999	82	85	89	93	97	100	103	106	108	111	113	115	100
	(9)	(10)	(10)	(10)	(12)	(14)	(18)	(23)	(27)	(31)	(33)	(35)	(19)
2000	116	117	118	118	118	118	118	119	118	117	117	116	118
	(38)	(39)	(40)	(41)	(41)	(41)	(40)	(40)	(40)	(40)	(40)	(40)	(40)

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

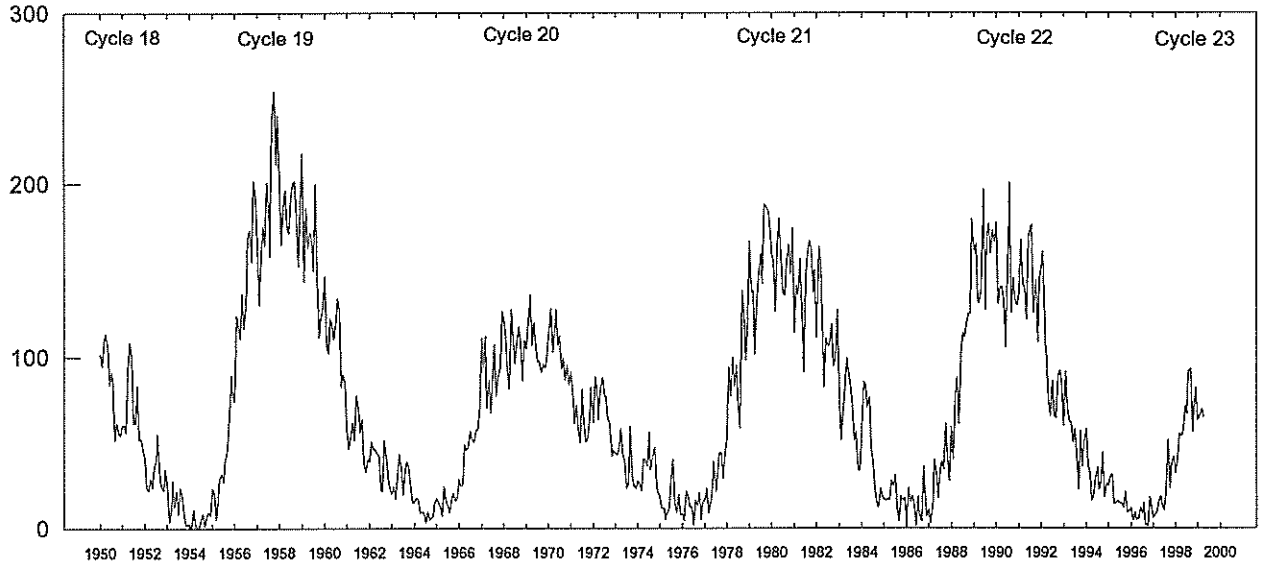
*** May 1996 marks Cycle 22's mathematical minimum. ** October 1996 marks the consensus minimum NGDC is now using.**

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 1998 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 1999 prediction. There exists a 90% chance that in October 1999, the actual smoothed number will fall somewhere between 80 and 143.

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 1999



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	21.1	9.0	10.0	17.5	
1996	11.5	4.4	9.2	4.8	5.5	11.8	8.2	14.4	1.6	0.9	17.9	13.3	8.6	m
1997	5.7	7.6	8.7	15.5	18.5	12.7	10.4	24.4	51.3	22.8	39.0	41.2	21.5	
1998	31.9	40.3	54.8	53.4	56.3	70.7	66.6	92.2	92.9	55.5	74.0	81.9	64.3	
1999	62.4	66.1	69.1	63.9									65.4	

Values are preliminary after Dec 98. For the yearly means, each 'M' marks a sunspot cycle maximum and each 'm' a minimum.

Hα S O L A R F L A R E S

APRIL 1999

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Obs See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	01	0106	0115	0122						16		B 4.7						3.3E-04
GOES		0547	0552	0558						11		B 4.1						1.9E-04
GOES		1929	1933	1939						10		B 2.1						1.2E-04
GOES		2036	2045	2049						13		B 4.3						2.3E-04
GOES		2115	2119	2124						9		B 2.5						1.2E-04
GOES	02	0806	0821	0829						23		M 1.1						9.3E-03
GOES		1011	1017	1026						15		B 4.9						4.0E-04
GOES		1526	1534	1541						15		B 4.3						3.6E-04
GOES		1618	1624	1632						14		B 6.2						4.4E-04
GOES		2042	2046	2049						7		B 7.1						2.4E-04
GOES		2234	2240	2247						13		B 9.9						5.9E-04
GOES	03	0703	0708	0714						11		B 4.1						2.4E-04
LEAR		0727	0731	0739	N10	E63		04	8.0	12	SF		3	E		21		
SVTO		0734	0734	0737	N11	E68		04	8.4	3	SF		3	E		17		
SVTO		1000	1001U	1008D	S28	E05		04	3.8	8D	SF		3	E		13		
GOES		1137	1142	1148	N10	E65	8507			11	SF	B 7.6						4.0E-04
RAMY		1141E	1144U	1154D	N10	E65		04	8.4	13D	SF		3	E		19		
SVTO		1201	1206	1210	S28	E04		04	3.8	9	SF		3	E		13		
SVTO		1225	1240	1304	S28	E04		04	3.8	39	SF		3	E		22		
RAMY		1226	1234	1236	S26	E05		04	3.9	10	SF		3	E		18		
RAMY		1237	1240	1257	S27	E05		04	3.9	20	SF		3	E		15		
SVTO		1301	1303	1308	N31	W13	8501	04	2.5	7	SF		3	E		16		
RAMY		1303	1304	1308	N31	W13	8501	04	2.5	5	SF		3	E		12		
RAMY		1329	1343	1353	S27	E05	8506	04	3.9	24	SF		3	E		66		H
SVTO		1330	1344	1350D	S26	E04	8506	04	3.9	20D	SF		3	E		46		H
GOES		1339	1344	1347	S27	E05	8506			8	SF	C 1.4						4.6E-04
HOLL		1341	1343	1351	S26	E05	8506	04	3.9	10	SF		3	E		38		
HOLL		1401	1417	1423	S26	E05	8506	04	4.0	22	SF		3	E		36		
RAMY		1409	1409	1420	S26	E04	8506	04	3.9	11	SF		3	E		15		
SVTO		1414E	1417U	1425D	S26	E04	8506	04	3.9	11D	SF		3	E		28		
GOES		1452	1501	1509	N11	E63	8507			17	SF	C 1.9						1.4E-03
RAMY		1454	1503	1509	N11	E63	8507	04	8.4	15	SF		3	E		16		
GOES		1646	1655	1715						29		B 9.3						1.3E-03
GOES		1812	1819	1840	N11	E66	8507			28	SF	B 8.2						1.2E-03
RAMY		1813	1815	1841	N11	E66	8507	04	8.7	28	SF		3	E		55		FH
HOLL		1815	1816	1820	N10	E57	8507	04	8.0	5	SF		3	E		18		
GOES		2000	2017	2026	S26	E02	8506			26	SF	C 1.6						1.9E-03
HOLL		2003	2010	2012	S27	E03	8506	04	4.1	9	SF		3	E		44		
HOLL		2013	2017	2026	S26	E02	8506	04	4.0	13	SF		3	E		29		F
GOES		2044	2050	2058	N18	E74	8506			14	SF	C 3.1						2.0E-03
RAMY		2047	2048	2058	N18	E74	8508	04	9.5	11	SF		3	E		44		
RAMY		2054	2054	2113	S28	E02	8506	04	4.0	19	SF		3	E		38		F
RAMY		2145	2146	2148D	S31	E12	8504	04	4.8	3D	SF		3	E		22		F
GOES		2216	2220	2223	S26	E01	8506			7	SF	C 2.8						7.2E-04
HOLL		2219	2220	2225	S26	E01	8506	04	4.0	6	SF		3	E		58		
GOES		2256	2310	2319	N29	E81				23	1F	M 4.3						3.3E-02
HOLL		2304	2316	2342	N29	E81	8508	04	10.3	38	1F		3	E		148		
SVTO	04	0506E	0509	0546	S28	W05	8506	04	3.8	40D	SF		2	E		48		F
GOES		0515	0525	0530	N18	E72	8508			15	1F	M 5.4						
SVTO		0519E	0528	0537	N18	E72	8508	04	9.7	18D	1F		2	E		136		H
SVTO		0528	0528	0537	N18	E72	8508	04	9.7	9	1F		2	E		136		H
RAMY		1415	1423	1432	N11	E51	8507	04	8.4	17	SF		3	E		12		
RAMY		1506	1506	1512	S26	W11	8506	04	3.8	6	SF		3	E		14		
RAMY		1525	1529	1545	S26	W11	8506	04	3.8	20	SF		3	E		12		F
GOES		2147	2150	2154						7		C 2.3						7.6E-04
SVTO	05	0828	0829	0835	N17	E57	8508	04	9.7	7	SF		3	E		23		H
GOES		0828	0831	0833	N17	E57	8508			5	SF	C 1.2						2.8E-04
RAMY		1116E	1118U	1120	S17	E80		04	11.5	4D	SF		2	E		36		
GOES		1206	1211	1215	N16	E53	8508			9	SF	B 8.0						3.4E-04
SVTO		1208	1211	1216	N16	E53	8508	04	9.5	8	SF		3	E		55		H
GOES		1430	1433	1435	N18	E52	8508			5	SF	B 6.9						1.7E-04
HOLL		1431	1431	1436	N18	E52	8508	04	9.6	5	SF		3	E		15		
SVTO		1432E	1433U	1434D	N16	E53	8508	04	9.6	2D	SF		3	E		10		
GOES		1837	1845	1854						17		B 8.0						7.3E-04

Hα SOLAR FLARES

APRIL 1999

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Obs See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	05	1909	1914	1916	N18	E52				7	SF	C 2.6						7.0E-04
GOES		1947	1951	1955						8		B 8.5						3.5E-04
GOES		2301	2309	2315	S28	W26	8506			14	SF	C 3.3						1.7E-03
HOLL		2305	2308	2320	S28	W26	8506	04	3.9	15	SF		3	E		40		F
GOES	06	0255	0259	0301						6		B 5.8						1.7E-04
GOES		0413	0417	0420						7		B 7.7						2.7E-04
GOES		0652	0705	0722	N22	E47	8508			30	SF	C 3.5						4.8E-03
SVTO		0700	0704	0725	N22	E47	8508	04	9.9	25	SF		3	E		28		F
SVTO		1008	1011	1019	S34	E57		04	11.0	11	SF		3	E		23		
SVTO		1009	1015	1037	S24	W36	8506	04	3.6	28	SF		3	E		17		
SVTO		1050	1051	1056	N10	E24	8507	04	8.2	6	SF		3	E		16		
SVTO		1219	1223	1238	N10	E24	8507	04	8.3	19	SF		3	E		12		
RAMY		1354	1358	1408	N10	E23	8507	04	8.3	14	SF		3	E		16		
SVTO		1354	1359	1407	N10	E23	8507	04	8.3	13	SF		3	E		10		
HOLL		1450	1453	1517	N10	E24	8507	04	8.4	27	SF		3	E		55		F
RAMY		1450	1454	1511	N10	E22	8507	04	8.3	21	SF		3	E		36		F
SVTO		1450	1454	1513	N10	E23	8507	04	8.3	23	SF		3	E		36		F
GOES		2035	2040	2042	N11	E18	8507			7	SF	B 7.5						2.7E-04
RAMY		2038	2039	2047	N11	E18	8507	04	8.2	9	SF		3	E		16		
GOES		2257	2300	2303						6		B 7.0						2.3E-04
GOES		2335	2403	2515						100		C 1.6						7.6E-03
LEAR	07	0218	0222	0224	N10	E16	8507	04	8.3	6	SF		3	E		18		
LEAR		0411	0411	0415	N10	E17	8507	04	8.4	4	SF		3	E		21		
GOES		0432	0435	0437						5		C 1.1						2.5E-04
GOES		0533	0536	0539						6		C 1.2						3.9E-04
LEAR		0558	0601	0605	N10	E14	8507	04	8.3	7	SF		3	E		18		
GOES		0920	0924	0927	N20	E34	8508			7	SF	C 1.3						4.9E-04
SVTO		0922	0923	0929	N20	E34	8508	04	10.0	7	SF		4	E		16		
SVTO		1234	1236	1246	N14	E37	8509	04	10.3	12	SF		4	E		10		
RAMY		1238	1243	1247	N21	E31	8508	04	9.9	9	SF		4	E		11		
RAMY		1325	1326	1330	N20	E30	8508	04	9.8	5	SF		4	E		14		
SVTO		1411	1414	1428	S20	E52	8511	04	11.6	17	SF		4	E		29		F
RAMY		1413	1413	1428	S18	E53	8511	04	11.6	15	SF		3	E		35		F
RAMY		2119	2121	2126	S28	W48	8506	04	4.1	7	SF		3	E		25		
GOES	08	0035	0039	0046						11		B 9.3						5.4E-04
GOES		0140	0144	0148						8		B 7.8						3.3E-04
GOES		0201	0208	0219						18		B 9.2						8.6E-04
GOES		0511	0519	0525	N23	E23	8508			14	SF	C 2.1						1.1E-03
LEAR		0515	0519	0532	N23	E23	8508	04	10.0	17	SF		4	E		19		
SVTO		0520E	0523U	0527	N21	E22	8508	04	9.9	7D	SF		2	E		57		F
SVTO		0637	0638	0640	N20	E21	8508	04	9.9	3	SF		3	E		16		
GOES		0739	0748	0754	N23	E22	8508			15	SF	C 2.2						1.3E-03
LEAR		0744	0748	0800	N23	E22	8508	04	10.0	16	SF		4	E		20		
SVTO		0746	0750	0757	N24	E12	8508	04	9.2	11	SF		3	E		19		F
GOES		0810	0816	0821	N22	E21	8508			11	SF	C 1.1						5.9E-04
SVTO		0813	0820	0828	N22	E21	8508	04	9.9	15	SF		3	E		21		F
GOES		0836	0843	0849	N22	E21	8508			13	SF	C 6.9						3.3E-03
LEAR		0839	0843	0913	N22	E21	8508	04	10.0	34	SF		3	E		36		
SVTO		0839	0901	0921	N22	E21	8508	04	10.0	42	SF		3	E		70		F
GOES		0857	0901	0903	N22	E21	8508			6	SF	C 3.5						1.0E-03
GOES		1100	1103	1107						7		B 8.4						3.1E-04
GOES		1121	1125	1128						7		C 1.8						5.1E-04
GOES		1229	1233	1236						7		C 1.1						3.7E-04
GOES		1326	1333	1340						14		B 9.1						6.3E-04
GOES		1533	1538	1542						9		C 1.0						4.4E-04
RAMY		1558	1611	1630	N23	E18	8508	04	10.0	32	SF		3	E		71		
GOES		1607	1613	1617	N23	E18				10	SF	M 1.1						4.4E-03
GOES		1714	1718	1721	N23	E15	8508			7	SF	C 3.4						7.4E-04
RAMY		1717	1718	1734D	N23	E15	8508	04	9.9	17D	SF		3	E		50		F
GOES		1826	1831	1835						9		C 1.5						6.3E-04
GOES		2155	2158	2200						5		B 5.6						1.4E-04
GOES	09	0001	0006	0011						10		B 6.2						3.3E-04
GOES		0127	0130	0133						6		B 5.5						1.8E-04
GOES		0412	0415	0418						6		B 6.0						1.9E-04

Hα S O L A R F L A R E S

APRIL 1999

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	09	0423	0428	0432	N24	E11	8508			9	SF	B 9.1						3.9E-04
LEAR		0427	0427	0433	N24	E11	8508	04	10.0	6	SF		3	E		16		F
GOES		0514	0520	0524	N22	E09	8508			10	SF	B 7.6						3.8E-04
LEAR		0517	0517	0527	N22	E09	8508	04	9.9	10	SF		3	E		11		F
GOES		1408	1429	1440	N22	E03	8508			32	SF	C 1.7						2.4E-03
HOLL		1416	1429	1439	N22	E03	8508	04	9.8	23	SF		3	E		86		F
RAMY		1418	1422	1442	N23	E06	8508	04	10.0	24	SF		3	E		24		
GOES		1544	1550	1558	N20	E03				14	SF	C 1.2						8.0E-04
RAMY		1549	1553	1605	N20	E03	8508	04	9.9	16	SF		3	E		39		
RAMY		1815	1818	1946	N23	E01	8508	04	9.8	91	SF		4	E		59		F
GOES		1815	1832	1835	N23	E01	8508			20	SF	B 9.6						9.8E-04
HOLL		1818	1818	1828	N23	E01	8508	04	9.8	10	SF		3	E		29		F
GOES		2006	2009	2011						5		B 4.9						1.3E-04
GOES		2011	2014	2016						5		B 6.1						1.6E-04
RAMY		2012	2013	2018	N19	E00	8508	04	9.8	6	SF		3	E		15		F
GOES	10	0050	0053	0057						7		B 5.1						1.9E-04
GOES		0253	0300	0324						31		B 8.1						1.3E-03
GOES		0528	0615	0730	N26	E01	8508			122	SF	C 1.5						8.5E-03
SVTO		0604	0632U	0703	N26	E01	8508	04	10.3	59	SF		3	E		12		F
RAMY		1442	1444	1447	N20	W11	8508	04	9.8	5	SF		4	E		22		
RAMY		1524	1524	1531	N20	W11	8508	04	9.8	7	SF		4	E		13		
GOES		1931	1934	1936						5		B 4.2						1.1E-04
GOES	11	0256	0259	0302						6		B 3.9						1.2E-04
GOES		0333	0339	0343	N20	W16	8508			10	SF	C 2.7						9.2E-04
LEAR		0337	0338	0344	N20	W16	8508	04	9.9	7	SF		3	E		24		
SVTO		0831	0834	0837	S19	E37		04	14.2	6	SF		3	E		11		
GOES		0924	0930	0935	N23	W27	8508			11	SF	B 6.7						3.6E-04
SVTO		0926	0928U	0948D	N23	W27	8508	04	9.3	22D	SF		3	E		28		
RAMY		1737	1737	1746	N22	W26	8508	04	9.7	9	SF		3	E		16		
GOES	12	0550	0554	0605	N24	W39	8508			15	SF	B 4.0						3.3E-04
SVTO		0551	0557	0603	N24	W39	8508	04	9.2	12	SF		3	E		13		
RAMY		1130E	1131U	1145D	S33	E16		04	13.7	15D	SF		3	E		10		
GOES		1723	1738	1745	S35	E13				22	SF	C 1.2						1.1E-03
RAMY		1726	1738	1757	S35	E13		04	13.8	31	SF		3	E		32		
HOLL		1730	1735	1745	S34	E13		04	13.8	15	SF		3	E		21		
RAMY		1946	1947	1957	S33	E08		04	13.4	11	SF		3	E		19		
RAMY		2003	2009	2018	S33	E11		04	13.7	15	SF		3	E		28		
RAMY		2033	2037	2037D	S33	E10		04	13.6	4D	SF		3	E		12		
GOES	13	0508	0644	0813						185		B 4.0						3.7E-03
GOES		0855	0900	0906						11		B 7.7						4.0E-04
GOES		0918	0921	0923						5		B 6.2						1.6E-04
RAMY		1135E	1136U	1150D	N23	W46	8508	04	9.9	15D	SF		3	E		11		
RAMY		1257	1300	1310	N23	W46	8508	04	10.0	13	SF		3	E		35		
GOES		1742	1755	1811	S19	E10				29	1F	C 1.9						2.5E-03
GOES		2212	2216	2219						7		B 4.5						1.6E-04
GOES	15	0217	0239	0333						76		C 1.1						4.3E-03
GOES		1547	1608	1642						55		B 8.5						2.2E-03
GOES		1943	1946	1959						16		B 4.9						3.9E-04
GOES	16	0708	0712	0716						8		B 4.9						1.8E-04
GOES		0959	1002	1004						5		B 4.5						1.1E-04
GOES		1048	1052	1056						8		B 5.4						2.0E-04
GOES		1937	1941	1947						10		B 3.8						2.1E-04
SVTO	17	0653	0654	0704	S28	W56	8512	04	12.9	11	SF		3	E		16		
SVTO		0654	0655	0706	S29	W50	8514	04	13.4	12	SF		3	E		16		
RAMY		1821	1822	1831	N17	W28	8519	04	15.6	10	SF		3	E		16		
GOES		2030	2038	2044	S31	W55	8514			14	SF	B 4.6						3.2E-04
RAMY		2033	2034	2042	S31	W55	8514	04	13.5	9	SF		3	E		15		
GOES		2112	2119	2125						13		B 3.4						2.2E-04
GOES		2217	2223	2232						15		B 3.5						2.7E-04
GOES		2335	2342	2347	S33	W55	8514			12	SF	B 6.0						3.1E-04
HOLL		2338	2342	2347	S33	W55	8514	04	13.6	9	SF		3	E		53		

Hα SOLAR FLARES

APRIL 1999

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	18	0840	0844	0849						9		B 3.8						1.9E-04
GOES		1133	1142	1147						14		B 3.7						2.8E-04
HOLL		1436	1437	1448	N17	W85		04	12.1	12	SF		2	E		25		
RAMY		1437	1441	1444	N17	W79		04	12.6	7	SF		3	E		18		
GOES		2041	2044	2047						6		B 3.7						1.1E-04
GOES		2112	2119	2123	N21	W52	8517			11	SF	B 7.6						3.5E-04
HOLL		2115	2116	2121	N21	W52	8517	04	14.9	6	SF		3	E		16		
GOES		2251	2255	2308						17		B 3.1						2.8E-04
GOES		2314	2317	2324						10		B 3.9						2.1E-04
GOES	19	0600	0619	0641						41		B 6.3						1.4E-03
HOLL		1512	1512	1516	S15	E47	8518	04	23.2	4	SF		3	E		15		
SVTO		1632	1636U	1722D	S16	E46	8518	04	23.2	50D	SF		3	E		33		
HOLL		1634	1635	1639	S15	E46	8518	04	23.2	5	SF		3	E		18		
GOES		1813	1822	1829						16		B 8.0						6.4E-04
GOES		2045	2050	2059						14		B 3.7						2.8E-04
GOES		2339	2350	2403						24		B 7.9						9.3E-04
GOES	20	0142	0146	0148	S15	E41	8518			6	SF	B 9.7						2.2E-04
LEAR		0145	0146	0150	S15	E41	8518	04	23.2	5	SF		4	E		21		
GOES		0259	0303	0306						7		B 3.7						1.3E-04
GOES		0752	0755	0805						13		B 2.2						1.6E-04
RAMY		1139	1141	1146	N21	W67	8517	04	15.3	7	SF		3	E		10		
RAMY		1149	1155	1158	N22	W73	8517	04	14.9	9	SF		3	E		24		
GOES		1258	1309	1323						25		B 5.5						6.8E-04
HOLL		1719	1721	1726	N22	W78	8517	04	14.7	7	SF		3	E		13		
RAMY		1721	1721	1734	N21	W79	8517	04	14.7	13	SF		3	E		12		
GOES		2333	2342	2356						23		B 7.8						7.9E-04
LEAR	21	0019	0021	0028	N25	W80	8517	04	14.8	9	SF		4	E		28		
GOES		0019	0022	0027	N25	W80	8517			8	SF	B 5.8						2.5E-04
HOLL		0021	0021	0026	N23	W83	8517	04	14.6	5	SF		3	E		17		
LEAR		0147	0147	0152	N25	W79	8517	04	14.9	5	SF		4	E		17		
GOES		0211	0217	0234						23		B 6.4						7.4E-04
GOES		0304	0309	0313						9		C 1.7						7.5E-04
GOES		0432	0441	0449						17		B 4.4						4.1E-04
GOES		0549	0552	0556						7		B 2.8						1.0E-04
GOES		0602	0605	0607	N24	W83	8517			5	SF	B 3.6						9.1E-05
LEAR		0605	0606	0608	N24	W83	8517	04	14.8	3	SF		3	E		18		
GOES		0621	0716	0734						73		C 1.1						2.7E-03
SVTO		0753	0754	0802	S20	W16	8516	04	20.1	9	SF		3	E		31		F
LEAR		0811	0811	0816	N24	W88	8517	04	14.5	5	SF		3	E		11		
GOES		1051	1055	1100						9		B 8.2						3.7E-04
RAMY		1152	1155	1159	N34	W29	8521	04	19.2	7	SF		3	E		22		
GOES		1152	1156	1200	N34	W29	8521			8	SF	B 5.8						2.2E-04
RAMY		1226	1232	1237	N34	W29	8521	04	19.2	11	SF		3	E		12		F
RAMY		1251	1259	1306	N33	W30	8521	04	19.1	15	SF		3	E		17		
RAMY		1334	1334	1342	N34	W30	8521	04	19.2	8	SF		3	E		13		
GOES		1403	1407	1411						8		B 7.4						2.9E-04
GOES		1646	1650	1652	N21	W88	8517			6	SF	B 4.7						1.5E-04
RAMY		1647	1649	1652	N21	W88	8517	04	14.9	5	SF		3	E		19		
GOES		1914	1918	1925						11		B 4.1						2.3E-04
GOES		1958	2002	2007						9		B 3.5						1.7E-04
GOES		2214	2219	2223						9		B 8.4						4.0E-04
GOES	22	0021	0029	0041						20		C 1.5						1.3E-03
GOES		0458	0509	0519						21		C 4.5						3.8E-03
GOES	23	0247	0253	0259						12		B 3.3						2.0E-04
GOES		0638	0645	0649						11		B 2.0						1.2E-04
GOES		0912	0916	0925						13		B 2.2						1.6E-04
GOES		1031	1036	1039						8		B 2.5						9.9E-05
GOES		1613	1618	1626						13		B 2.5						1.6E-04
GOES		2242	2249	2300						18		B 6.3						5.1E-04
GOES	24	0547	0556	0600						13		B 2.2						1.5E-04
GOES		1103	1106	1108						5		B 2.0						5.2E-05
GOES		1411	1415	1419	N17	E58	8522			8	SF	B 3.1						1.2E-04

Hα S O L A R F L A R E S

APRIL 1999

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
RAMY	24	1414	1415	1422	N17	E58	8522	04	29.0	8	SF		3	E		12		
RAMY		1814	1814	1826	N16	E55	8522	04	28.9	12	SF		3	E		13		
GOES		1817	1823	1829	N16	E55	8522			12	SF	B 3.4						2.1E-04
HOLL		1851	1852	1857	N16	E56	8522	04	29.0	6	SF		3	E		25		
HOLL		1910	1912	1917	N16	E53	8522	04	28.8	7	SF		3	E		28		
GOES	25	0746	0752	0757	N30	E39	8523			11	SF	B 5.9						2.6E-04
LEAR		0750	0751	0758	N30	E39	8523	04	28.4	8	SF		3	E		29		F
GOES		0924	0930	0942						18		B 4.5						3.6E-04
GOES		1226	1232	1238	N22	E46	8524			12	SF	B 5.2						2.4E-04
RAMY		1229	1230	1237	N22	E46	8524	04	29.0	8	SF		4	E		16		
GOES		1626	1633	1642						16		B 2.0						1.6E-04
GOES	26	0227	0231	0235						8		B 1.7						7.2E-05
GOES		0759	0806	0810						11		B 2.1						1.1E-04
GOES		1025	1039	1053						28		B 3.4						4.7E-04
GOES		1254	1310	1322						28		B 3.2						4.5E-04
RAMY		1647	1648	1659	N21	E29	8524	04	28.9	12	SF		3	E		14		
GOES		2149	2152	2158						9		B 2.6						1.3E-04
GOES	27	0159	0204	0212						13		B 3.5						2.4E-04
GOES		0931	0937	0942						11		B 5.6						2.7E-04
GOES		1059	1104	1107	N32	E10				8	SF	B 8.0						2.8E-04
GOES		2020	2026	2032	N22	E16				12	SF	C 1.3						6.5E-04
GOES	28	0915	0919	0922						7		B 6.2						2.3E-04
GOES		1206	1211	1216	N33	W03	8523			10	SF	B 5.9						3.0E-04
RAMY		1209	1210	1216	N33	W03	8523	04	28.3	7	SF		4	E		16		F
GOES		1338	1355	1430						52		B 6.6						1.8E-03
GOES		1508	1512	1515						7		B 7.8						2.7E-04
GOES		1743	1749	1754						11		B 7.6						4.1E-04
GOES		1904	1909	1913						9		B 8.2						3.5E-04
GOES		2027	2032	2035						8		C 3.8						9.2E-04
GOES	29	0316	0320	0323						7		C 1.1						3.3E-04
LEAR		0352	0353	0358	N30	W10	8523	04	28.4	6	SF		3	E		12		F
GOES		0825	0829	0835	N14	E77	8525			10	SF	C 2.5						1.0E-03
SVTO		0829	0829	0833	N16	E74		05	5.0	4	SF		3	E		20		
LEAR		0829	0830	0833	N14	E77		05	5.2	4	SF		4	E		24		
SVTO		0925	0927	0931	N33	W12	8523	04	28.4	6	SF		4	E		11		
SVTO		1142	1143	1147	N31	W15	8523	04	28.3	5	SF		3	E		14		
RAMY		1142	1144	1148	N30	W15	8523	04	28.3	6	SF		3	E		15		
GOES		1156	1211	1220	N22	W05	8524			24	SF	C 1.3						
RAMY		1206	1208	1231	N22	W05	8524	04	29.1	25	SF		3	E		28		
SVTO		1208	1210	1231	N23	W07	8524	04	29.0	23	SF		3	E		23		
GOES		1537	1543	1550	N22	W08				13	SF	C 1.7						9.8E-04
RAMY		1540	1541	1604	N22	W11	8524	04	28.8	24	SF		3	E		27		F
HOLL		1540	1542	1552	N22	W08	8524	04	29.0	12	SF		3	E		33		
GOES		1711	1717	1726	N22	W09	8524			15	SF	C 2.9						1.8E-03
RAMY		1714	1716	1810	N22	W10	8524	04	28.9	56	SF		3	E		32		
HOLL		1716	1719	1727	N22	W09	8524	04	29.0	11	SF		3	E		21		
RAMY		1722	1722	1726	N15	E74	8525	05	5.3	4	SF		3	E		20		
GOES		1734	1741	1747	N21	W08	8524			13	SF	C 3.7						2.2E-03
HOLL		1737	1740	1755	N21	W08	8524	04	29.1	18	SF		3	E		33		
GOES		1945	1954	2005	N22	W16				20	1B	M 1.1						9.4E-03
HOLL		1948	1955	2027	N22	W16	8524	04	28.6	39	1B		3	E		176		E
HOLL		2031	2033	2038	N22	W17	8524	04	28.5	7	SF		3	E		16		
GOES		2047	2052	2108	N21	W09	8524			21	SF	C 1.5						1.6E-03
HOLL		2049	2054	2114	N21	W09	8524	04	29.2	25	SF		3	E		42		
GOES		2214	2218	2221						7		C 1.2						3.8E-04
LEAR	30	0229	0232	0235	N15	E71	8525	05	5.5	6	SF		4	E		78		
GOES		0243	0250	0256	N21	W13	8524			13	SF	C 1.8						1.1E-03
LEAR		0246	0249	0259	N21	W13	8524	04	29.1	13	SF		4	E		17		E
GOES		0350	0355	0358	N22	W15	8524			8	SF	C 4.2						1.1E-03
LEAR		0354	0355	0408	N22	W15	8524	04	29.0	14	SF		4	E		28		E
GOES		0733	0736	0740						7		B 9.3						3.2E-04
RAMY		1210	1214	1238	N22	W20	8524	04	29.0	28	SN		3	E		60		F

Hα SOLAR FLARES

APRIL 1999

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	30	1210	1221	1225	N24	W17				15	1F	C 8.2						4.2E-03
SVTO		1213	1216	1237	N24	W17	8524	04	29.2	24	1F		3	E		100		FH

"Remarks"

A = Eruptive prominence whose base is less than 90 degrees from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by high-speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the H and K lines of Ca II.
P = Flare shows Helium D3 in emission.
Q = Flare shows Balmer continuum in emission.
R = Marked asymmetry in H-alpha line suggests ejection of high-velocity material.
S = Brightness follows disappearance of filament in same position.
T = Region active all day.
U = Two bright branches, parallel or converging.
V = Occurrence of an explosive phase; important, expansion within roughly 1 minute that often includes a significant intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide H-alpha line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

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

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

S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

APRIL 1999

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
03	8800	PALE	4 S/F	2302.0	2307.0	11.0	120.0			QL=4 ST=2 TYP=3
	2695	PALE	4 S/F	2303.0	2307.0	6.0	75.0			QL=4 ST=2 TYP=3
	8800	LEAR	4 S/F	2305.0	2306.0	3.0	69.0			QL=4 ST=2 TYP=3
04	2695	SVTO	4 S/F	0518.0	0521.0	4.0	190.0			QL=4 ST=2 TYP=3
	8800	LEAR	4 S/F	0520.0	0521.0	4.0	260.0			QL=4 ST=2 TYP=3
	8800	SVTO	4 S/F	0520.0	0521.0	4.0	250.0			QL=4 ST=2 TYP=3
29	8800	SGMR	4 S/F	1948.0	1951.0	6.0	63.0			QL=4 ST=2 TYP=3
	8800	PALE	8 S	1950.0	1950.0	2.0	68.0			QL=4 ST=2 TYP=3
	2695	PALE	8 S	1951.0	1951.0	U	21.0			QL=4 ST=2 TYP=3
30	8800	SGMR	4 S/F	1213.0	1215.0	3.0	74.0			QL=4 ST=2 TYP=3
	8800	SVTO	8 S	1215.0	1215.0	1.0	52.0			QL=4 ST=2 TYP=3

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

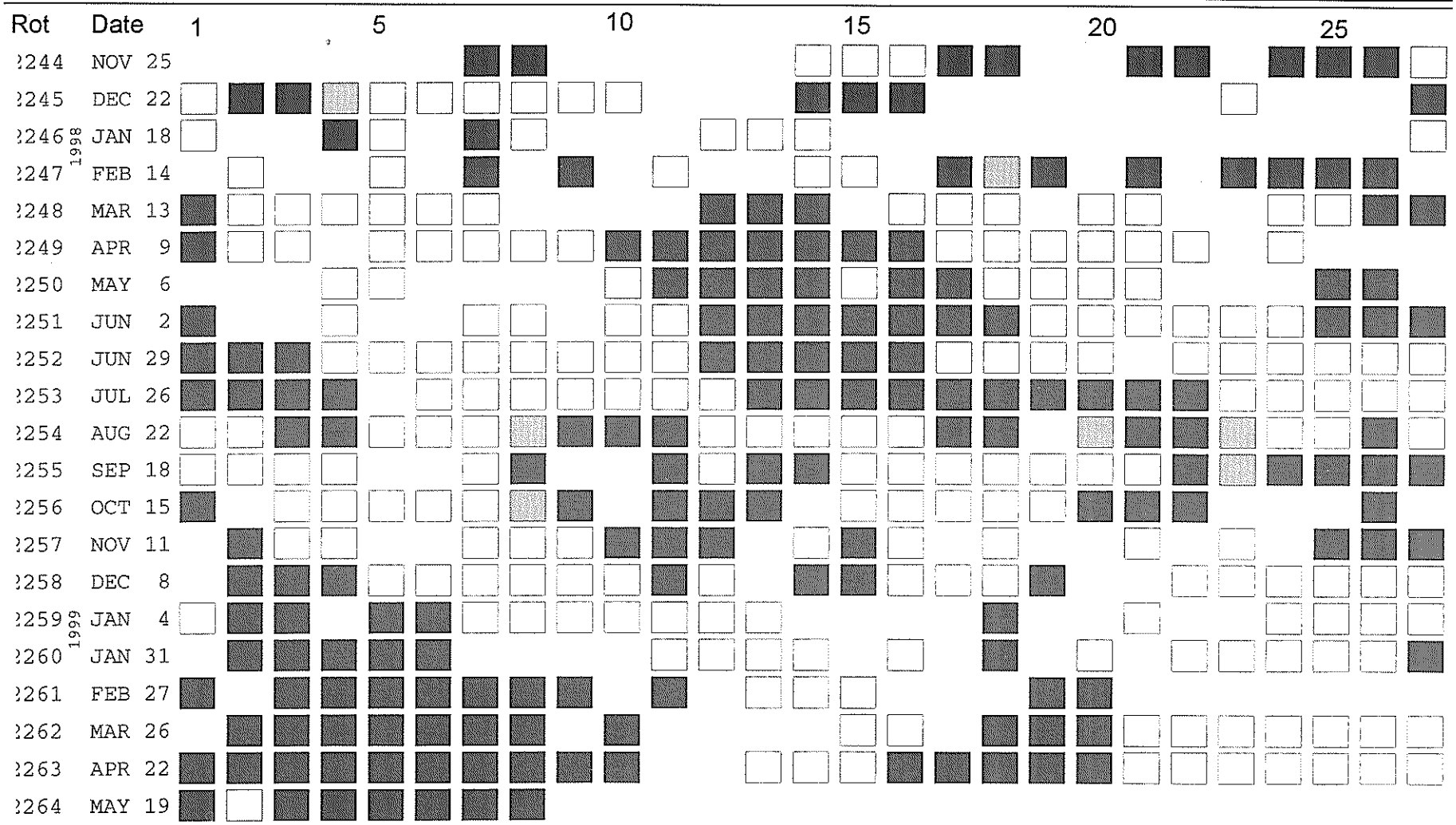
Explanation of Type Code:

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

1A Simple 1A	4A Simple 2AF	24PF Post Rise F	27F Rise and Fall F
3A Simple 2A	40 Rise Only	16A Fall A	27AF Rise and Fall AF
21A Simple 3A GRF	40F Rise Only F	260 Fall Only	31A Post Burst Decrease A
2A Simple 1AF	4P Post Rise	26F Fall F	32A Absorption A

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

STANFORD MEAN SOLAR MAGNETIC FIELD

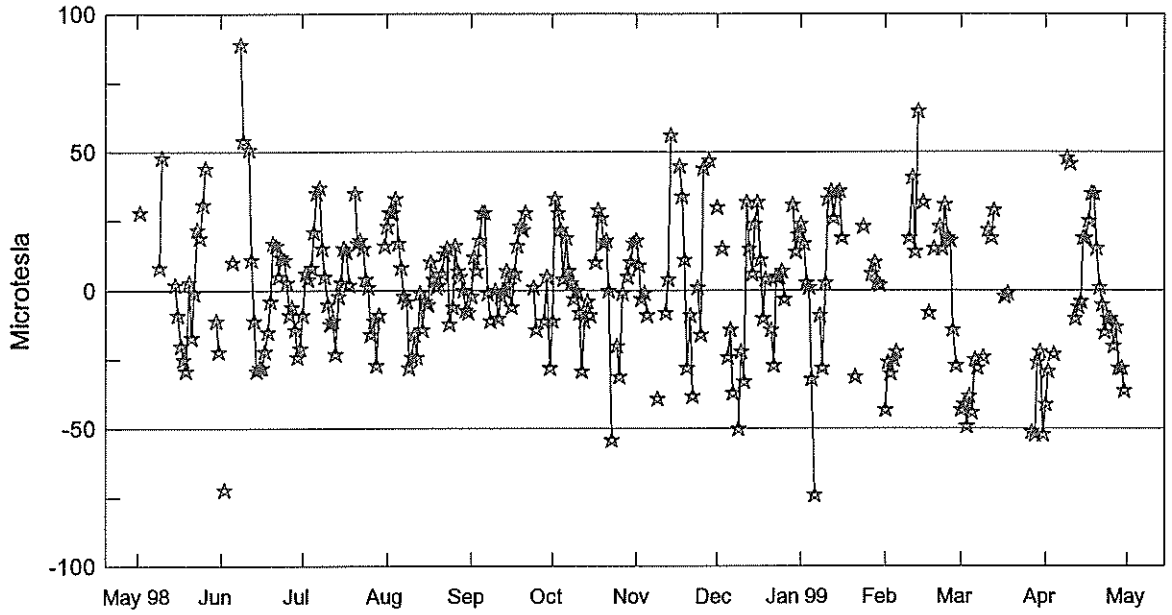


Mean Solar Magnetic Field Polarity: = field > 2 microT; = -2 microT ≤ field ≤ 2 microT

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

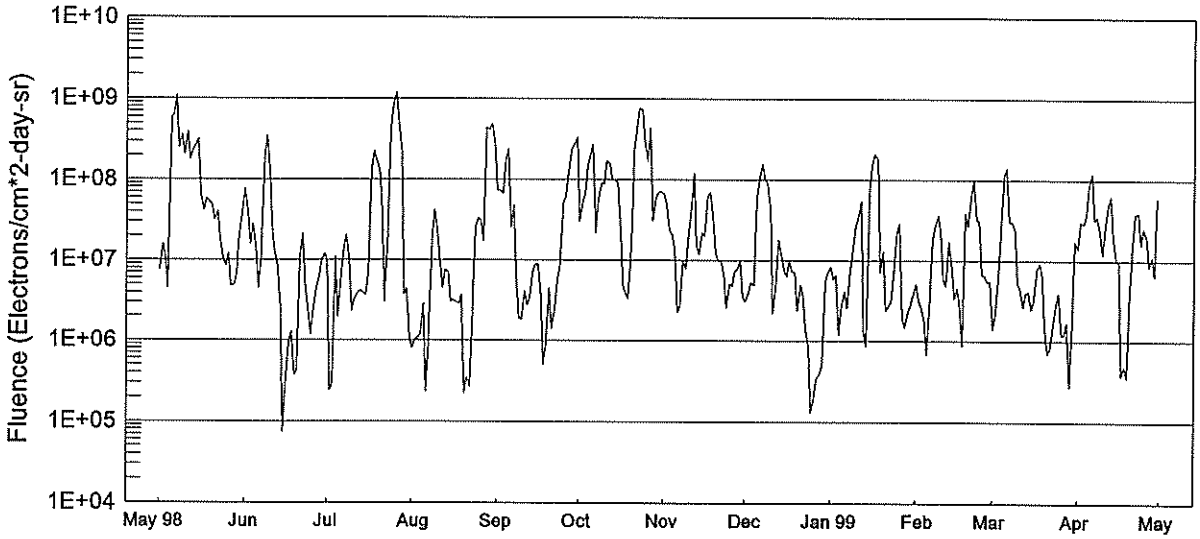
Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates are five days earlier, to mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

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



Day	May 98	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb	Mar	Apr
1	28	---	-9	23	-2	-11	18	30	24	-43	-43	-41
2	---	-72	6	28	12	33	9	---	17	-26	-41	-29
3	---	---	4	28	7	28	-3	15	3	-30	-49	---
4	---	---	8	33	18	22	-1	---	1	-25	-38	-23
5	---	10	21	17	28	4	-9	-24	-32	-22	-44	---
6	---	---	35	8	28	19	---	-14	-74	---	-25	---
7	---	---	37	-2	-1	7	---	-37	---	---	-28	---
8	---	89	15	-4	-11	3	---	---	-9	---	---	---
9	8	54	5	-28	---	-3	-39	-50	-28	---	-24	48
10	48	---	-5	-24	0	0	---	-22	3	19	---	46
11	---	51	-12	-16	-10	-8	---	-33	33	41	22	---
12	---	11	-11	-24	-2	-29	-8	32	36	14	19	-10
13	---	-11	-23	-1	0	-11	4	15	26	65	29	-6
14	---	-29	-2	-14	7	-4	56	6	35	---	---	-4
15	2	-28	3	-4	2	-9	---	24	36	32	---	19
16	-9	-28	15	-5	-6	---	---	32	19	---	---	19
17	-20	-22	14	10	6	10	45	11	---	-8	-2	25
18	-25	-15	2	4	16	29	34	-10	---	---	-1	35
19	-29	-4	---	1	23	26	11	4	---	15	---	35
20	3	17	35	2	22	17	-28	---	---	---	---	15
21	-17	16	17	6	28	18	-9	-14	-31	23	---	1
22	-1	5	18	13	---	0	-38	-27	---	15	---	-5
23	22	12	15	15	---	-54	---	5	---	31	---	-15
24	19	11	4	-12	1	---	1	5	23	19	---	-10
25	31	3	1	-6	-14	-20	-16	7	---	18	---	-10
26	44	-9	-16	16	---	-31	44	-3	---	-14	---	-20
27	---	-6	-11	7	---	-1	---	---	6	-27	-51	-13
28	---	-14	-27	5	-11	---	47	---	10	---	-52	-28
29	---	-24	-9	0	5	5	---	31	3		-26	-28
30	-11	-21	---	-7	-28	10	---	14	2		-22	-36
31	-22		16	-8		17		20	---		-52	

GOES Daily Electron Fluence
May 98 - Apr 99



Day	May 98	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb	Mar	Apr
1	7.6E+06	7.8E+07	9.6E+06	8.1E+05	7.4E+07	3.0E+07	6.6E+07	3.1E+06	8.3E+06	5.2E+06	1.4E+06	1.4E+07
2	1.6E+07	3.9E+07	2.4E+05	1.0E+06	7.4E+07	4.8E+07	5.1E+07	3.9E+06	5.9E+06	3.2E+06	2.2E+06	3.0E+07
3	1.1E+07	1.6E+07	2.8E+05	1.1E+06	6.8E+07	7.0E+07	2.3E+07	5.4E+06	6.5E+06	2.7E+06	7.2E+06	2.9E+07
4	4.5E+06	2.8E+07	1.1E+07	1.2E+06	1.7E+08	1.5E+08	2.1E+07	4.9E+06	1.2E+06	1.8E+06	2.9E+07	3.6E+07
5	5.7E+08	1.4E+07	2.0E+06	2.9E+06	2.4E+08	2.1E+08	1.4E+07	5.8E+07	2.7E+06	6.8E+05	1.1E+08	8.3E+07
6	6.4E+08	4.5E+06	6.5E+06	2.3E+05	2.6E+07	2.7E+08	2.3E+06	1.0E+08	4.1E+06	3.4E+06	1.4E+08	1.2E+08
7	1.1E+09	1.1E+07	1.3E+07	9.5E+05	4.8E+07	2.2E+07	2.7E+06	1.6E+08	2.6E+06	1.8E+07	3.0E+07	3.2E+07
8	2.5E+08	2.0E+08	2.0E+07	1.8E+07	4.9E+06	5.8E+07	9.9E+06	1.0E+08	6.8E+06	2.7E+07	3.0E+07	3.5E+07
9	3.6E+08	3.5E+08	1.0E+07	4.2E+07	1.9E+06	9.0E+07	8.0E+06	9.1E+07	1.2E+07	3.6E+07	2.4E+07	2.5E+07
10	2.1E+08	1.1E+08	2.3E+06	2.5E+07	1.8E+06	8.9E+07	1.9E+07	4.3E+07	2.7E+07	2.2E+07	5.3E+06	1.2E+07
11	3.9E+08	2.1E+07	3.2E+06	1.1E+07	4.1E+06	1.7E+08	4.5E+07	2.2E+06	3.4E+07	5.9E+06	4.4E+06	2.8E+07
12	1.8E+08	1.2E+07	3.8E+06	4.6E+06	2.8E+06	1.6E+08	1.2E+08	5.1E+06	5.5E+07	4.9E+06	2.7E+06	4.8E+07
13	2.3E+08	9.0E+06	4.2E+06	7.5E+06	3.4E+06	1.0E+08	1.5E+07	1.8E+07	1.3E+06	1.7E+07	4.0E+06	6.3E+07
14	2.7E+08	2.6E+06	3.9E+06	7.2E+06	7.6E+06	1.0E+08	1.2E+07	1.2E+07	8.6E+05	7.8E+06	4.1E+06	1.9E+07
15	3.2E+08	7.5E+04	3.6E+06	3.1E+06	8.9E+06	9.2E+07	2.2E+07	7.5E+06	7.7E+07	3.4E+06	2.5E+06	9.8E+06
16	6.5E+07	2.7E+05	6.6E+06	3.2E+06	8.9E+06	3.1E+07	2.0E+07	6.4E+06	1.6E+08	4.6E+06	3.2E+06	1.0E+07
17	4.2E+07	9.6E+05	1.3E+08	3.0E+06	3.5E+06	4.7E+06	6.4E+07	1.0E+07	2.1E+08	2.9E+06	7.9E+06	3.8E+05
18	5.9E+07	1.3E+06	2.3E+08	2.9E+06	5.0E+05	4.0E+06	7.0E+07	7.3E+06	1.8E+08	8.7E+05	9.2E+06	4.8E+05
19	5.3E+07	3.7E+05	1.7E+08	3.6E+06	9.0E+05	3.4E+06	3.7E+07	7.2E+06	7.1E+06	3.9E+07	6.6E+06	3.5E+05
20	4.9E+07	4.2E+05	1.3E+08	2.2E+05	4.5E+06	1.5E+07	1.2E+07	2.4E+06	1.3E+07	2.7E+07	1.2E+06	4.5E+06
21	3.2E+07	1.0E+07	4.0E+07	3.5E+05	1.4E+06	2.3E+08	9.8E+06	4.9E+06	2.4E+06	6.3E+07	7.0E+05	1.6E+07
22	4.0E+07	2.1E+07	3.0E+06	2.7E+05	2.5E+06	4.2E+08	1.0E+07	3.8E+06	2.7E+06	1.0E+08	8.2E+05	3.8E+07
23	1.8E+07	5.2E+06	2.1E+07	2.5E+06	5.6E+06	7.5E+08	6.6E+06	1.4E+06	3.2E+06	3.2E+07	1.5E+06	3.9E+07
24	1.1E+07	2.7E+06	4.1E+08	2.6E+07	8.7E+06	7.4E+08	2.6E+06	8.5E+05	7.8E+06	3.1E+07	2.8E+06	1.6E+07
25	8.5E+06	1.2E+06	8.5E+08	3.4E+07	5.2E+07	3.0E+08	5.1E+06	1.3E+05	2.1E+07	6.8E+06	4.0E+06	2.5E+07
26	1.2E+07	2.4E+06	1.2E+09	3.0E+07	6.2E+07	1.7E+08	4.8E+06	1.8E+05	2.9E+07	6.4E+06	1.2E+06	2.0E+07
27	4.8E+06	4.6E+06	4.9E+08	1.7E+07	1.2E+08	4.4E+08	7.3E+06	3.5E+05	2.0E+06	5.5E+06	1.2E+06	8.5E+06
28	4.9E+06	6.0E+06	2.2E+08	4.4E+08	2.4E+08	3.1E+07	8.0E+06	3.8E+05	1.5E+06	5.6E+06	1.7E+06	1.1E+07
29	6.5E+06	1.0E+07	3.8E+06	4.2E+08	2.7E+08	6.1E+07	1.0E+07	5.0E+05	2.3E+06		2.7E+05	6.4E+06
30	2.0E+07	1.2E+07	4.4E+06	4.9E+08	3.3E+08	6.9E+07	3.5E+06	5.4E+06	2.8E+06		1.7E+06	6.0E+07
31	4.1E+07		1.1E+06	2.7E+08		7.2E+07		7.1E+06	3.6E+06		1.7E+07	

NOTE: The electron detector responds significantly to protons above 32 MeV; therefore, electron data are contaminated when a proton event is in progress. These days are indicated with '-999' in the table and are not plotted. '—' indicates data not available.
NOTE: GOES9 data began April, 1996 and ended on 26 July, 1998. GOES8 is primary satellite as of 27 July, 1998.

CONTENTS

Prompt Reports Number 657 Part I

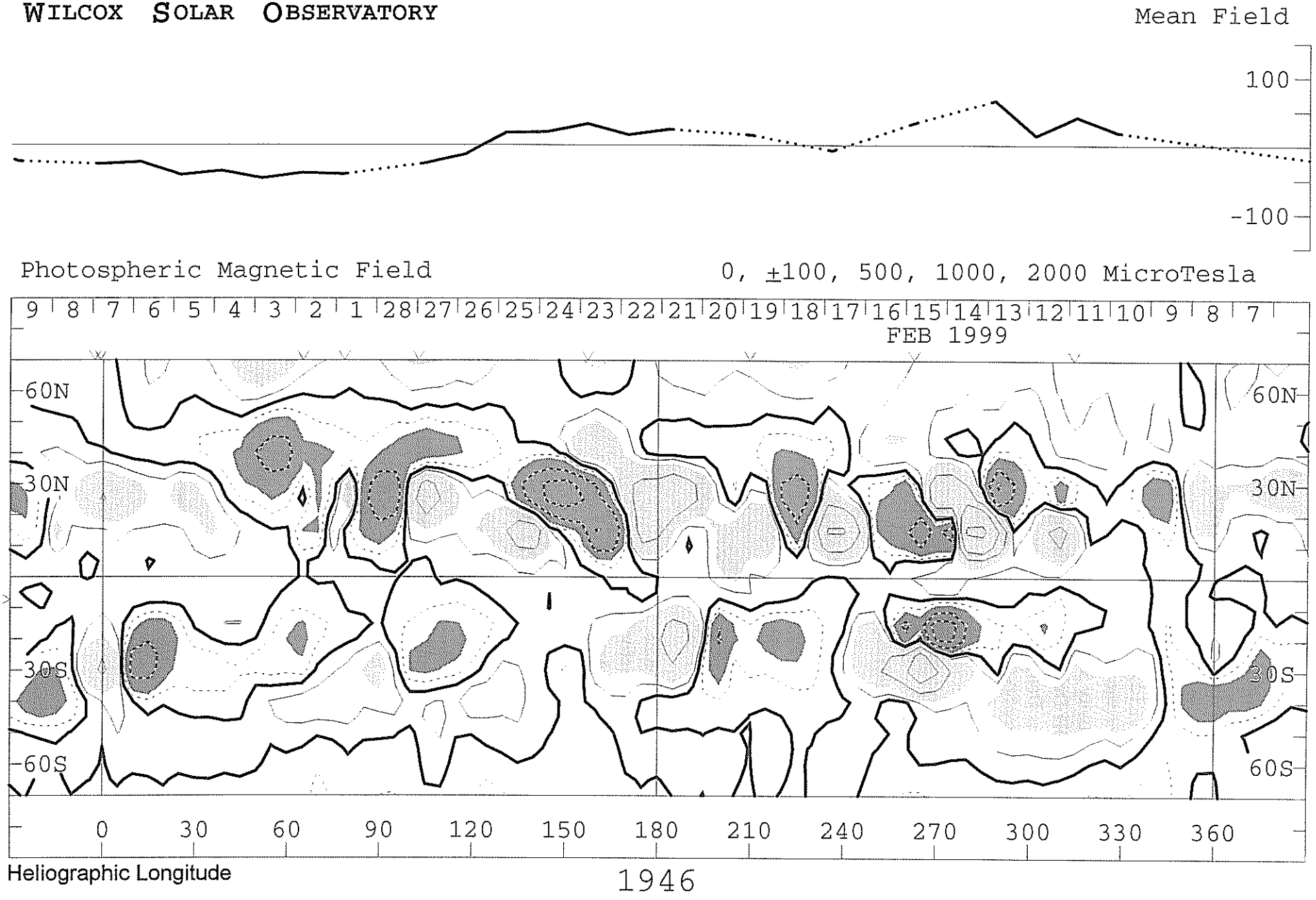
DATA FOR MARCH 1999

SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1946

(8 February to 7 March 1999)

WILCOX SOLAR OBSERVATORY



SOLAR MAGNETIC FIELD SYNOPTIC CHART

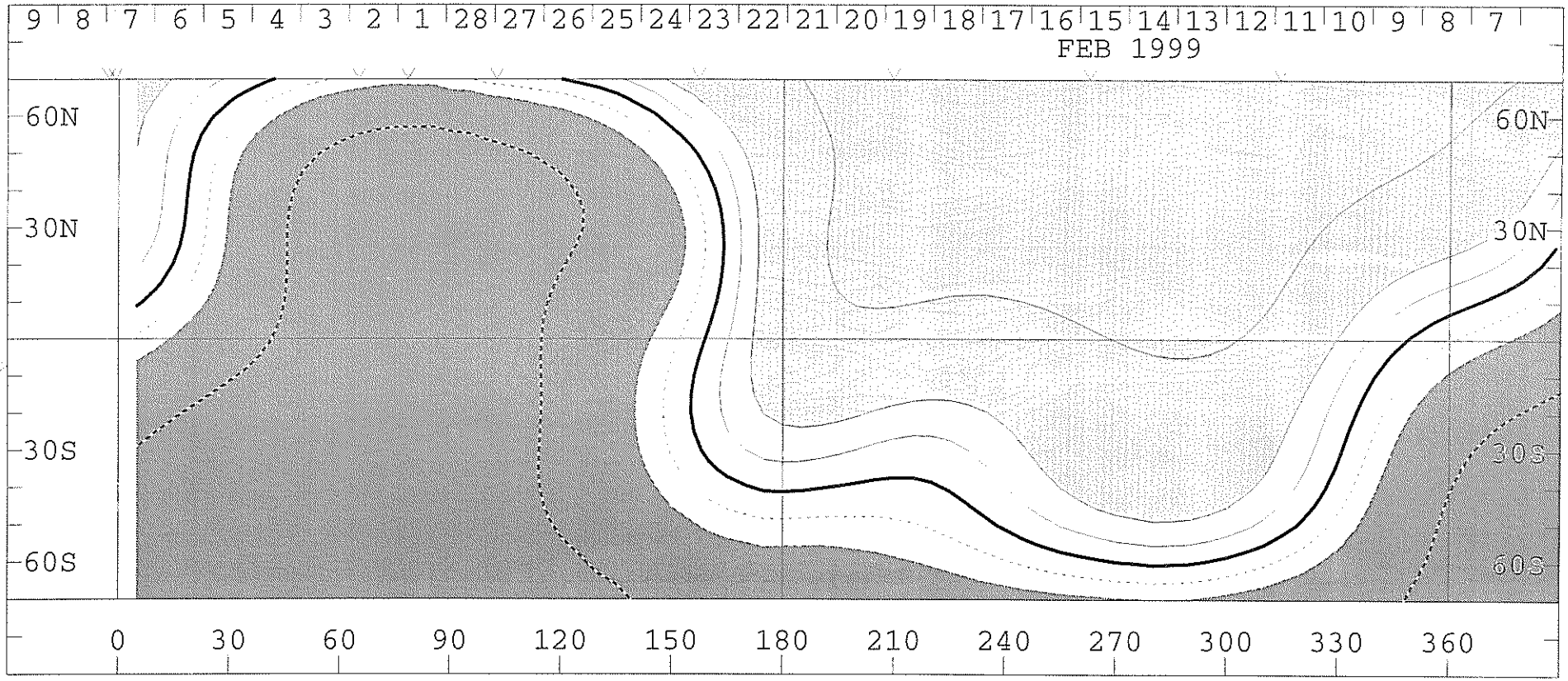
SOURCE SURFACE FIELD

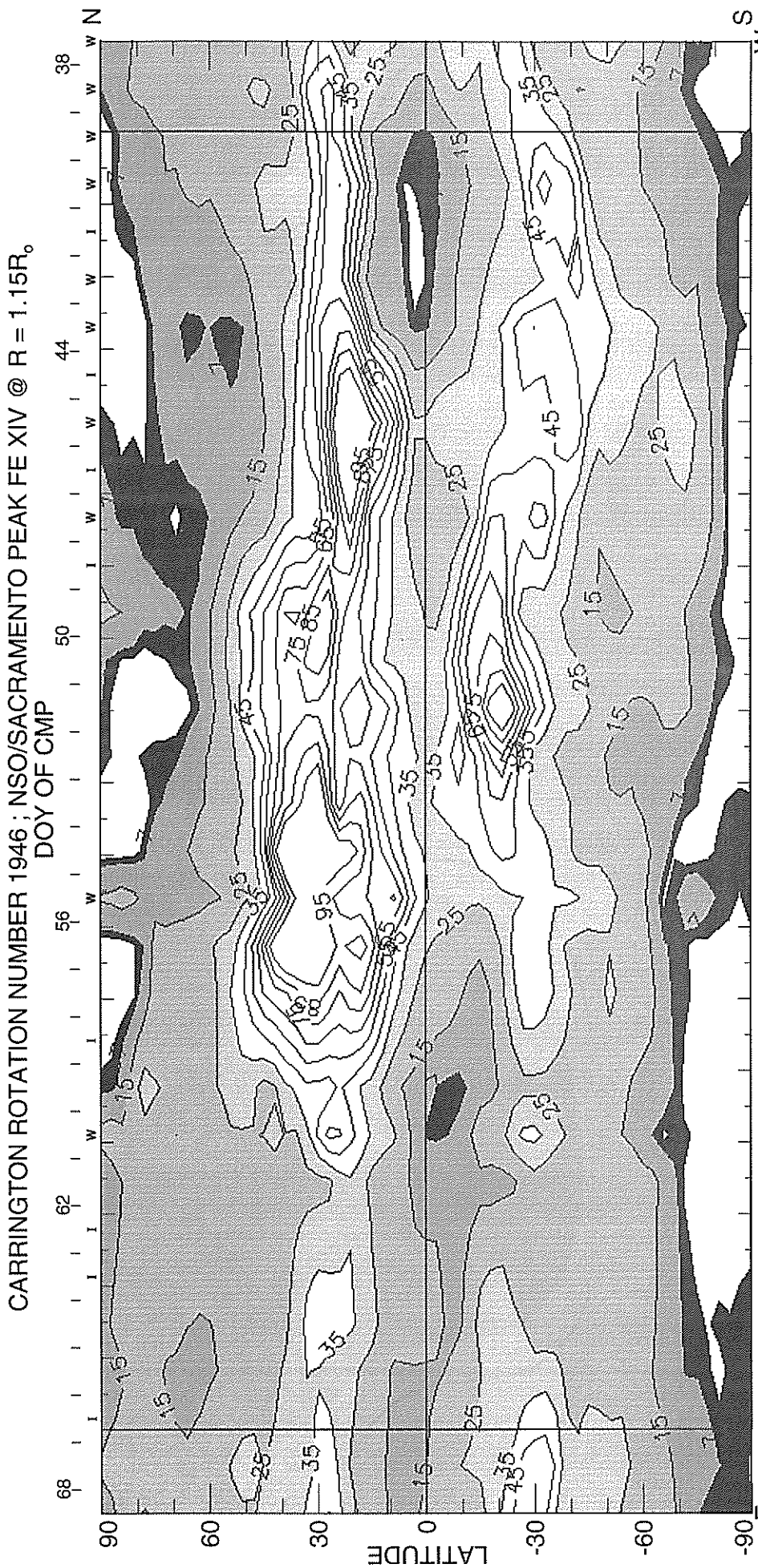
CARRINGTON ROTATION NUMBER 1946

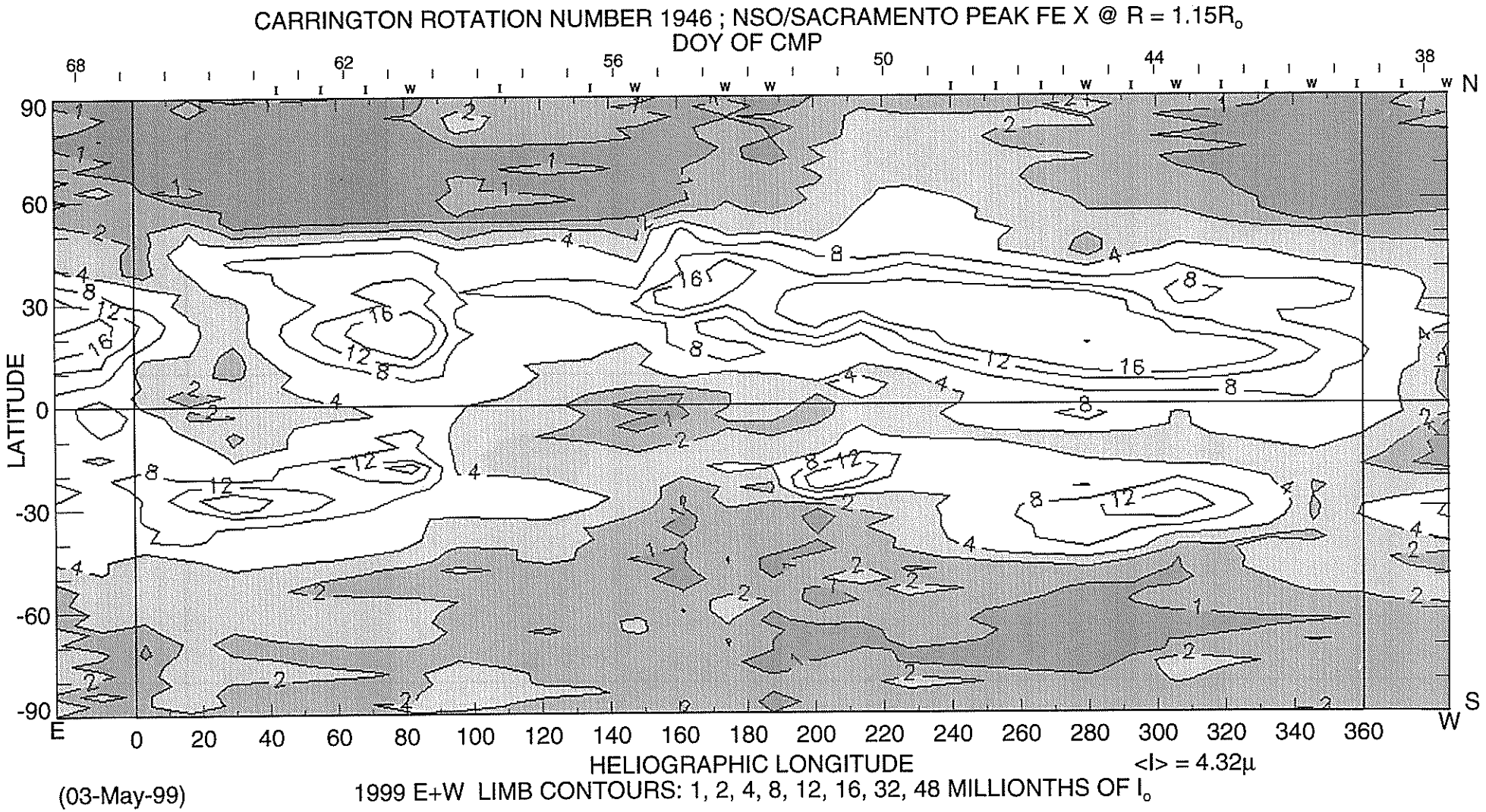
(8 February to 7 March 1999)

Wilcox Solar Observatory

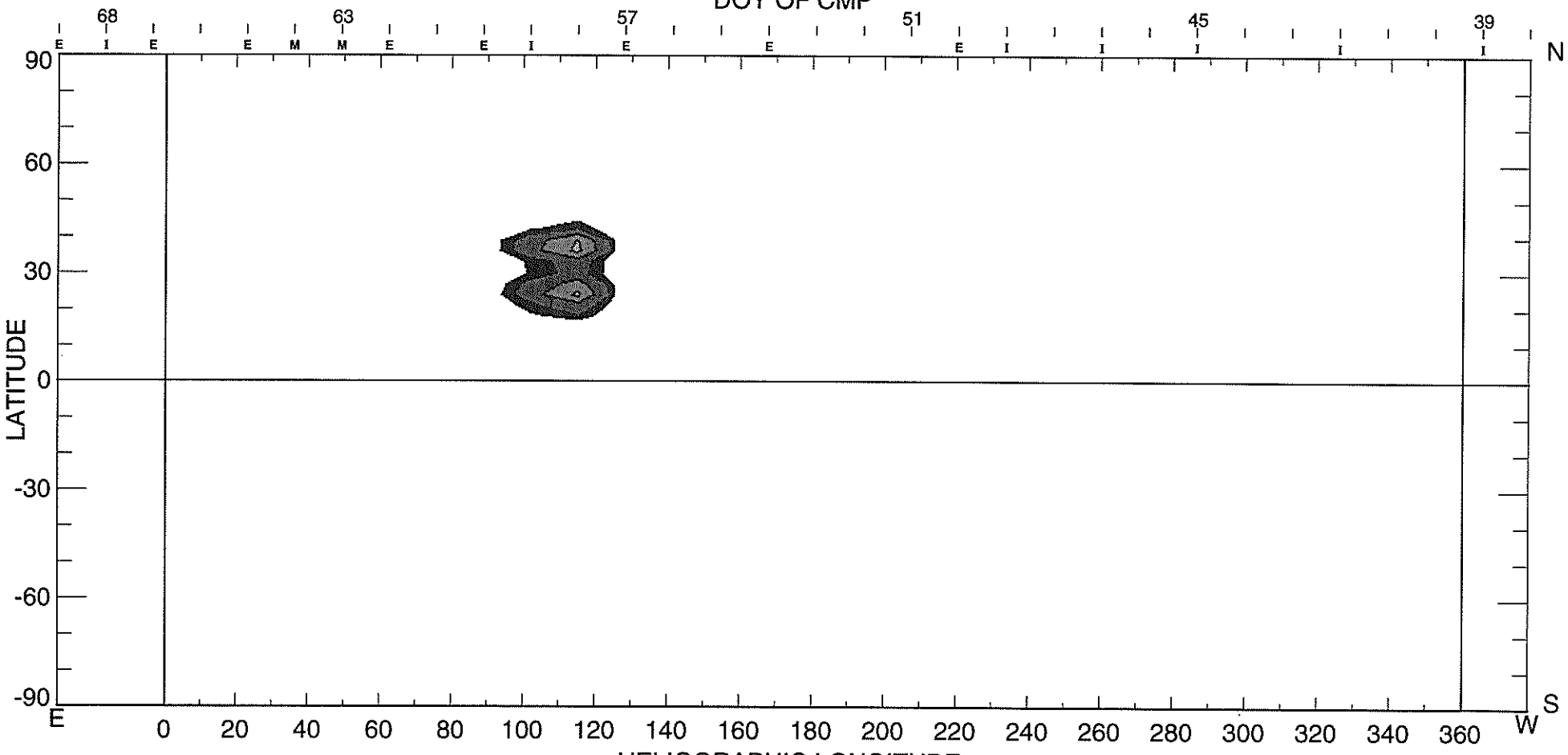
0, ±1, 2, 5, 10, 20 microTesla




CARRINGTON ROTATION NUMBER 1946 ; NSO/SACRAMENTO PEAK FE XIV @ R = 1.15R$_o$
DOY OF CMP
68 62 56 50 44 38
N
S
W
E
90 60 30 0 -30 -60 -90
LATITUDE
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
HELIOGRAPHIC LONGITUDE
<I> = 25.58μ
1999 E+W LIMB CONTOURS: 5, 7, 15, 25, 35, 45, 55, 65, 75, 85, 95 MILLIONTHS OF I$_o$
CORONAL HOLES ARE SHOWN AS WHITE BORDERED BY BLACK
(18-May-99)


CARRINGTON ROTATION NUMBER 1946 ; NSO/SACRAMENTO PEAK FE X @ R = 1.15R$_o$
DOY OF CMP
68
62
56
50
44
38
N
S
E
W
90
60
30
0
-30
-60
-90
LATITUDE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
HELIOGRAPHIC LONGITUDE
<I> = 4.32μ
(03-May-99)
1999 E+W LIMB CONTOURS: 1, 2, 4, 8, 12, 16, 32, 48 MILLIONTHS OF I$_o$

CARRINGTON ROTATION NUMBER 1946 ; NSO/SACRAMENTO PEAK CA XV @ R = 1.15R_o



(03-May-99) 1999 W+E LIMB CONTOURS: YELMIN, 1, 2, 3, 4, 6, 8 MILLIONTHS OF I_o

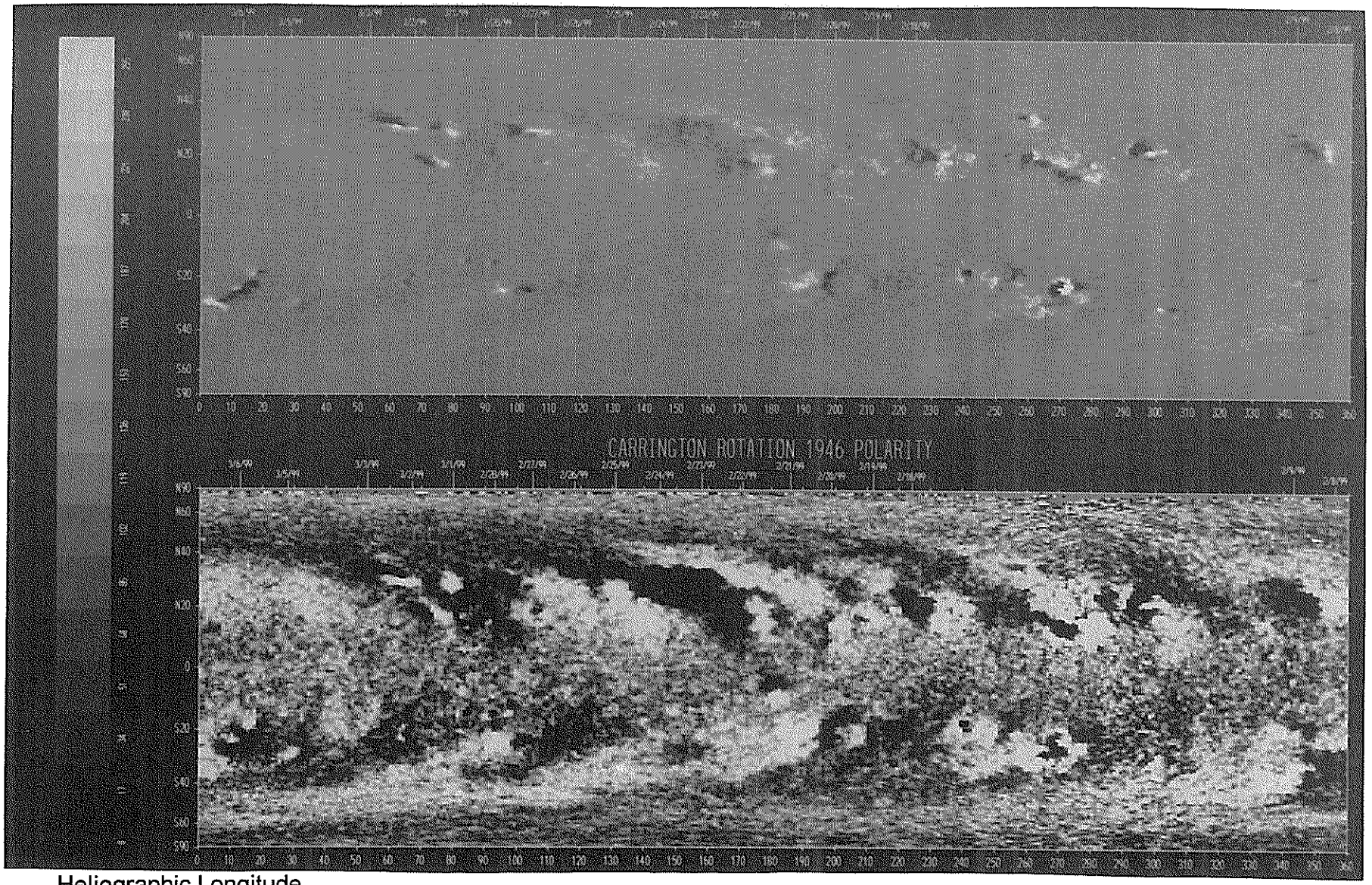
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1946

(8 February to 7 March 1999)

National Solar Observatory/Kitt Peak

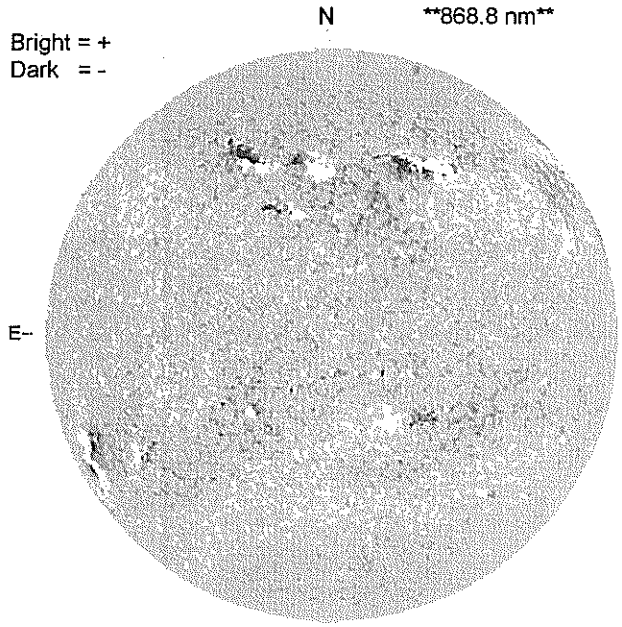
Dates of Observation



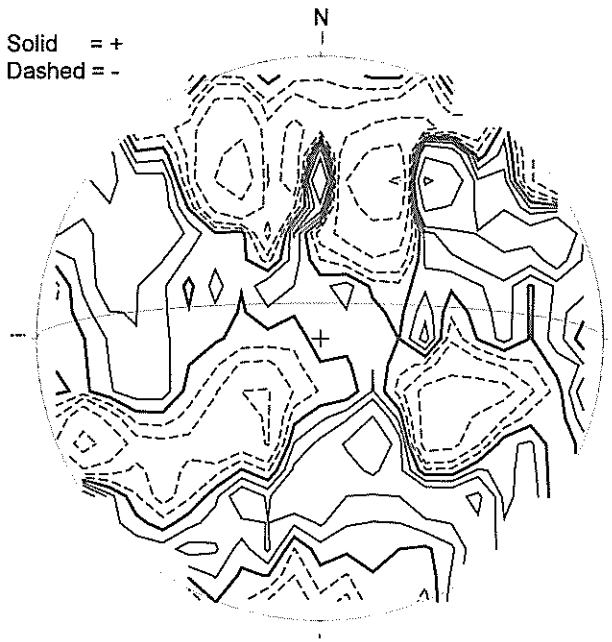
Heliographic Longitude

MARCH 1, 1999 (P= -21.42, Bo = -7.21, Lo = 88.66)

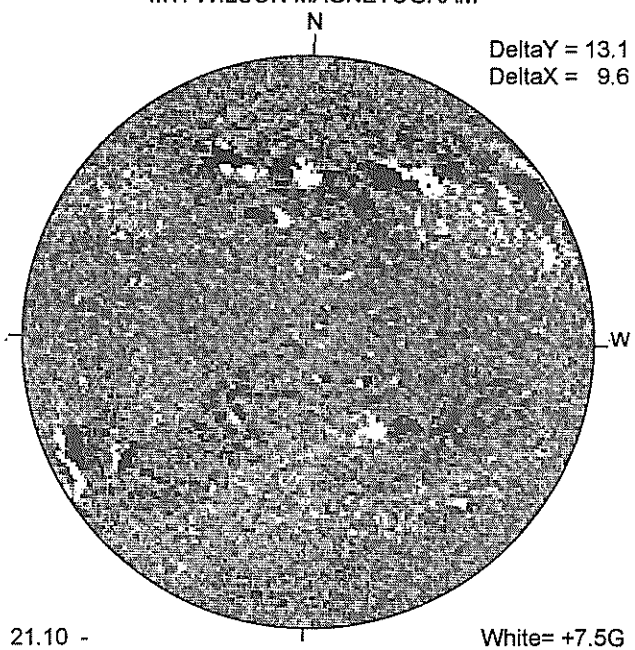
KITT PEAK MAGNETOGRAM



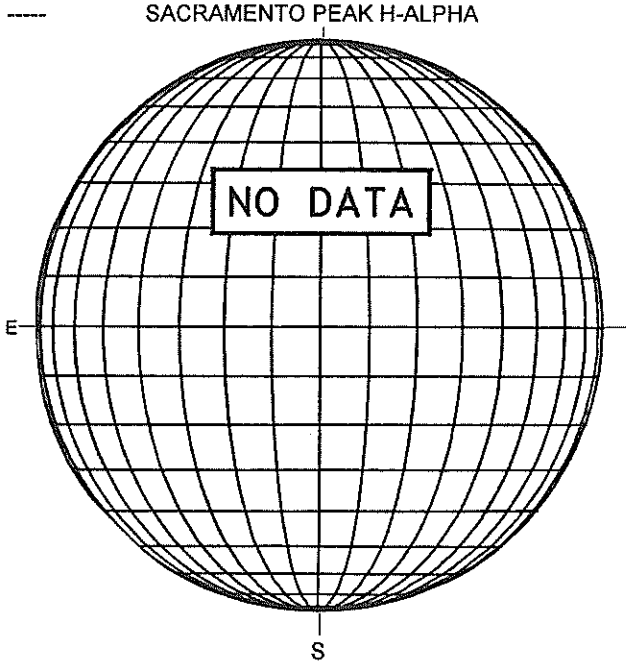
STANFORD MAGNETOGRAM



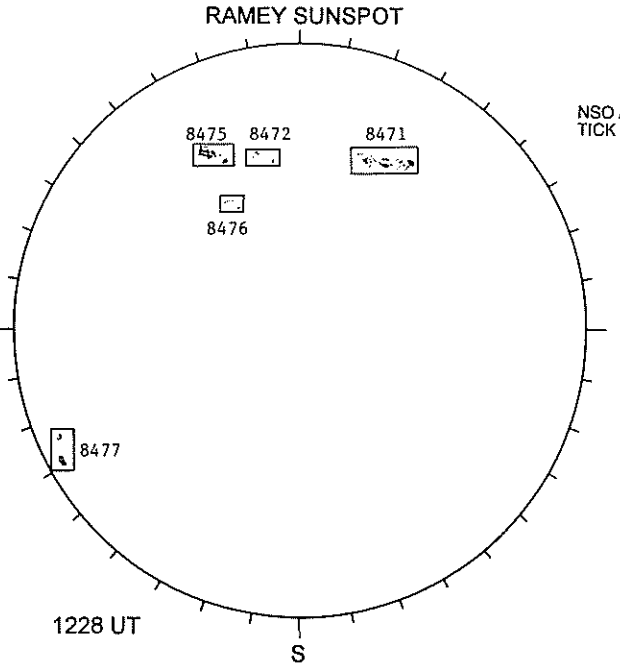
MT. WILSON MAGNETOGRAM



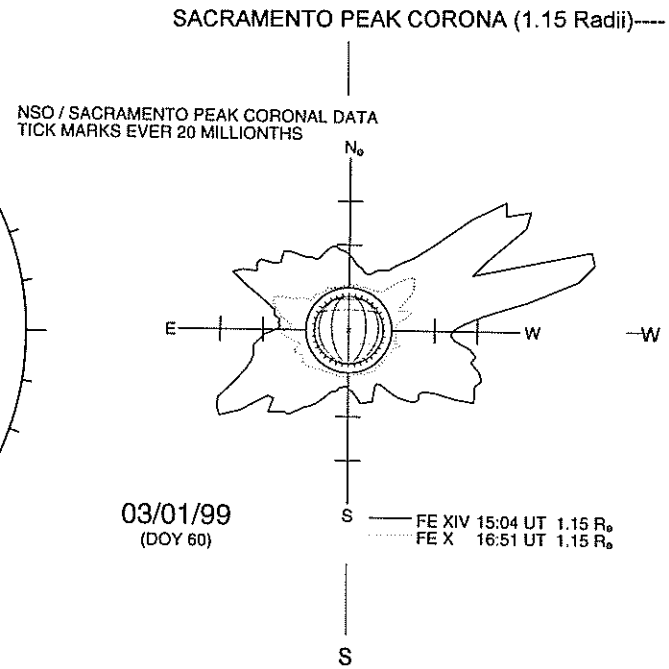
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT

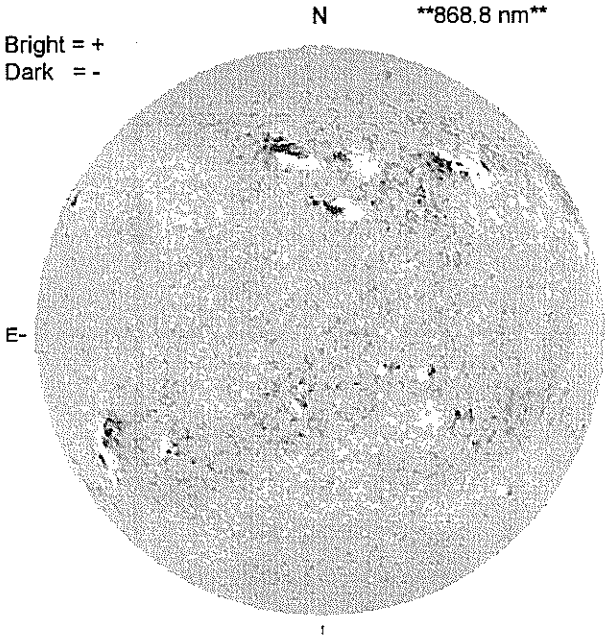


SACRAMENTO PEAK CORONA (1.15 Radii)



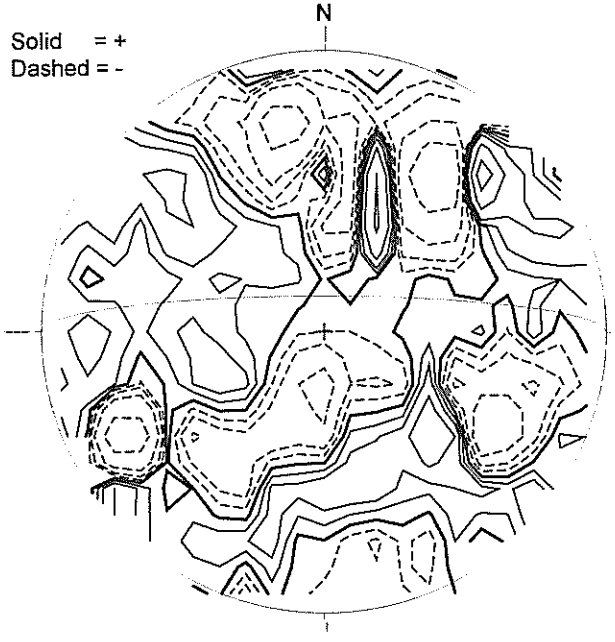
MARCH 2, 1999 (P= -21.67, Bo = -7.22, Lo = 75.49)

KITT PEAK MAGNETOGRAM



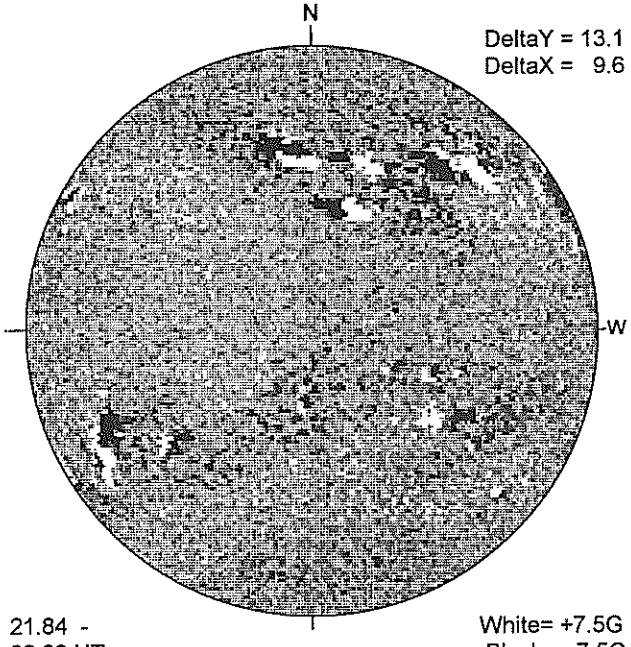
1611 UT

STANFORD MAGNETOGRAM



1905 UT

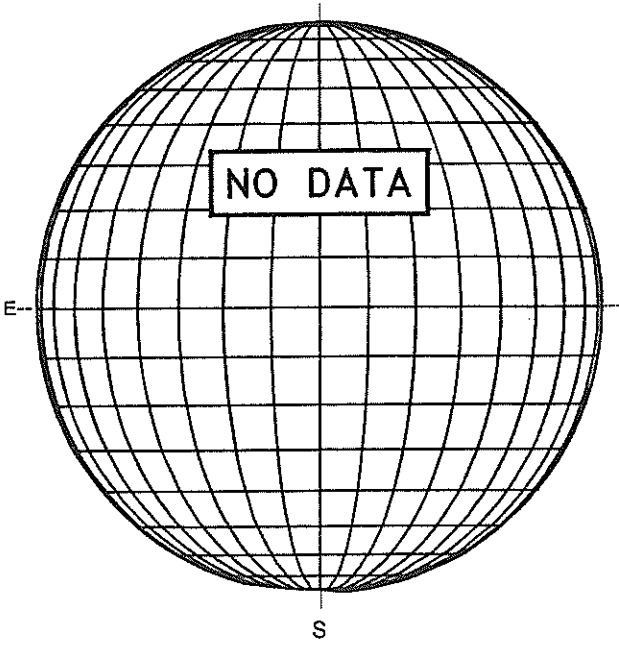
MT. WILSON MAGNETOGRAM



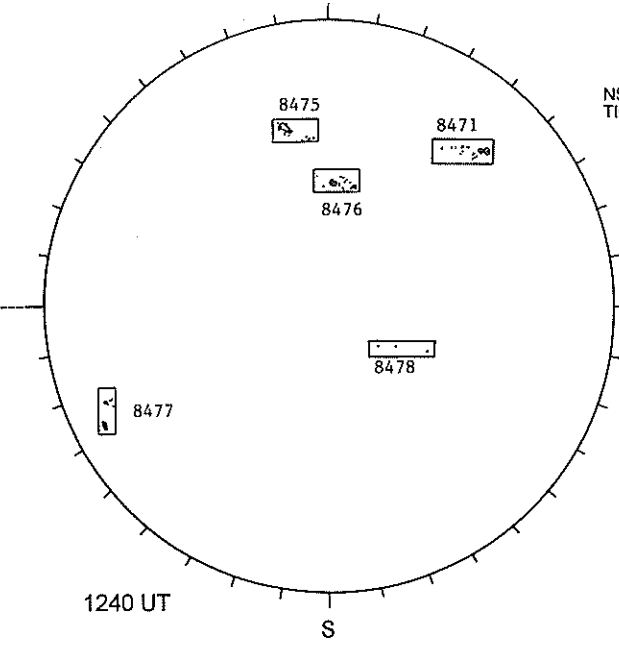
21.84 -
22.80 UT

White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



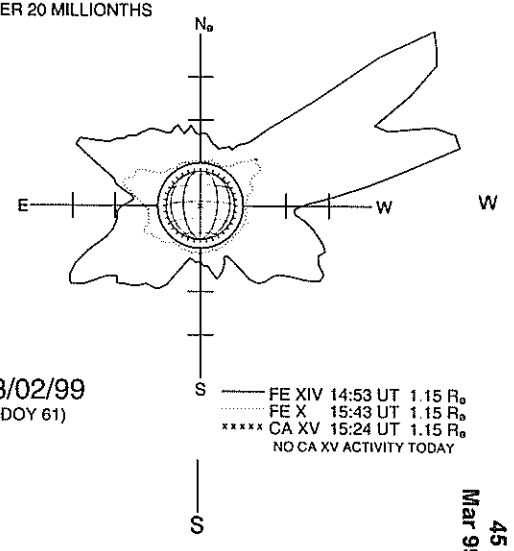
RAMEY SUNSPOT



1240 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



03/02/99
(DOY 61)

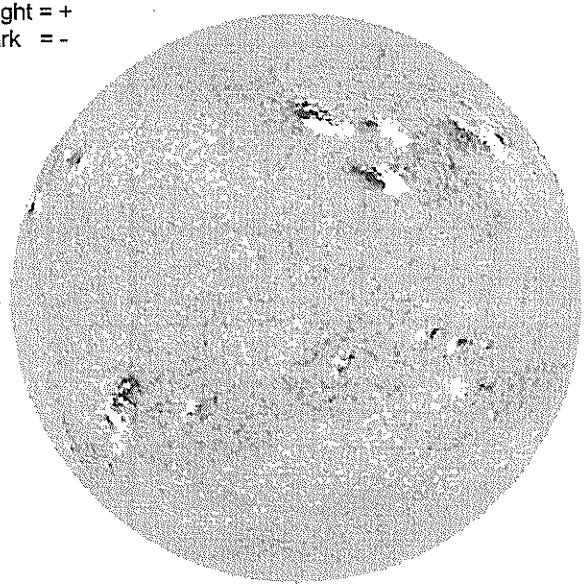
FE XIV 14:53 UT 1.15 $R_\odot$
FE X 15:43 UT 1.15 $R_\odot$
CA XV 15:24 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

MARCH 3, 1999 (P= -21.92, Bo = -7.23, Lo = 62.32)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -

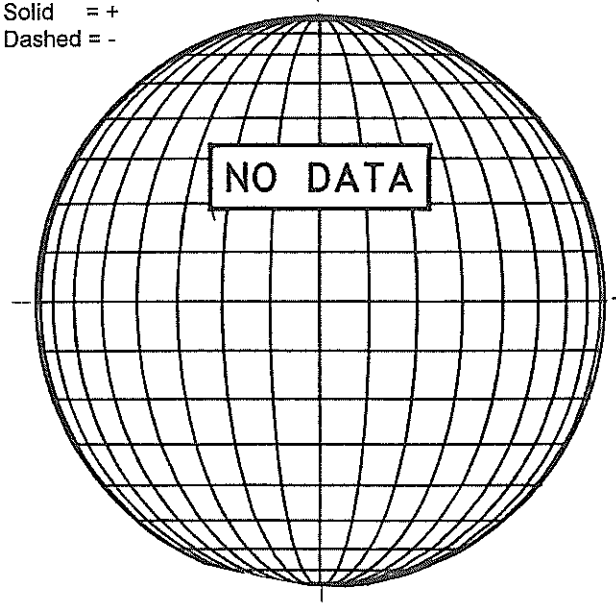


1626 UT

STANFORD MAGNETOGRAM

N

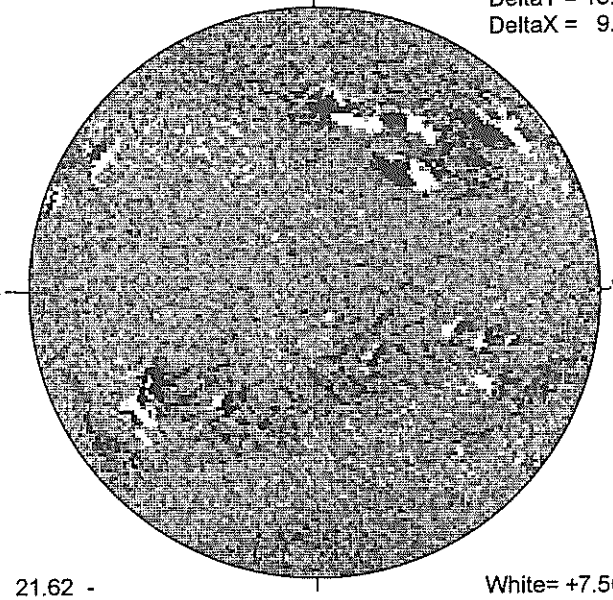
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

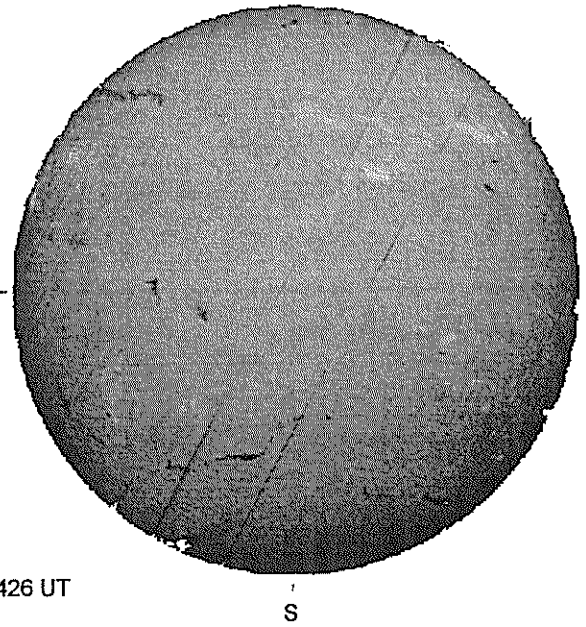
DeltaY = 13.1
DeltaX = 9.6



21.62 -
22.58 UT

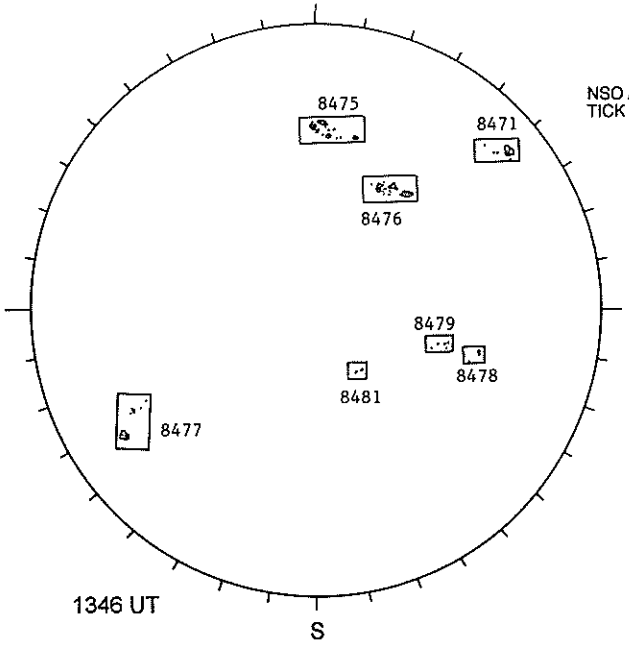
White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



1426 UT

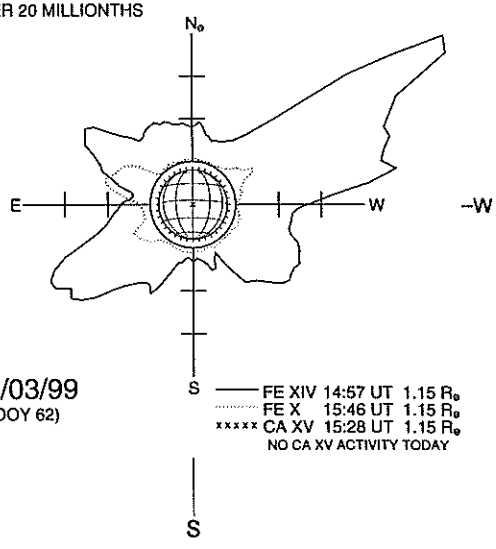
RAMEY SUNSPOT



1346 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



03/03/99
(DOY 62)

FE XIV 14:57 UT 1.15 $R_\odot$
FE X 15:46 UT 1.15 $R_\odot$
CA XV 15:28 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

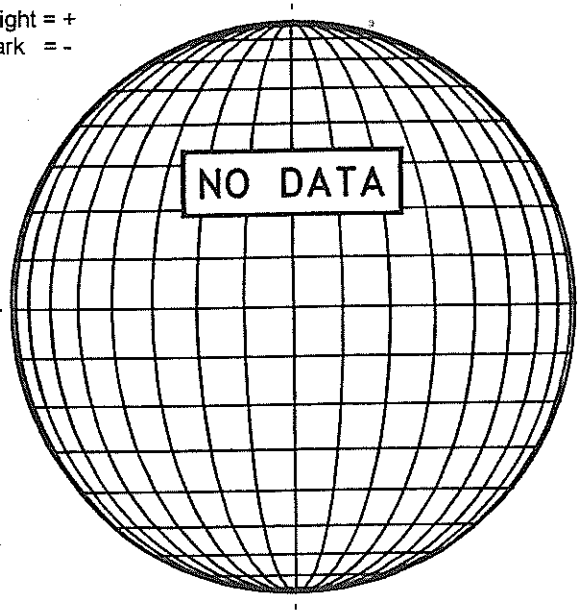
MARCH 4, 1999 (P= -22.16, Bo = -7.24, Lo = 49.14)

KITT PEAK MAGNETOGRAM

N

868.8 nm

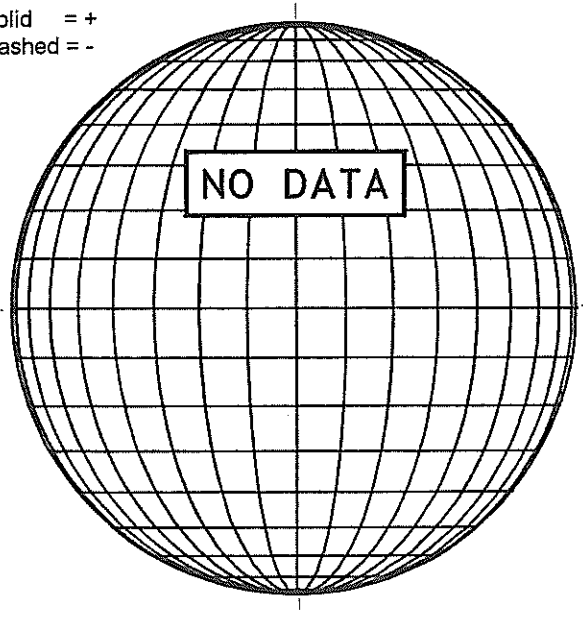
Bright = +
Dark = -



STANFORD MAGNETOGRAM

N

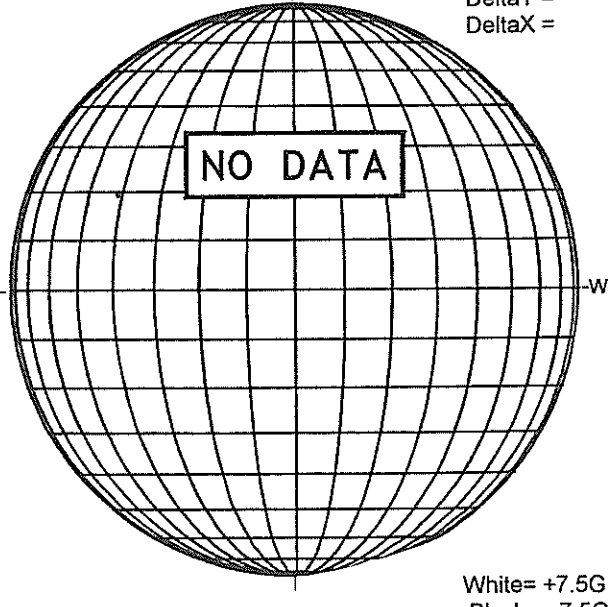
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

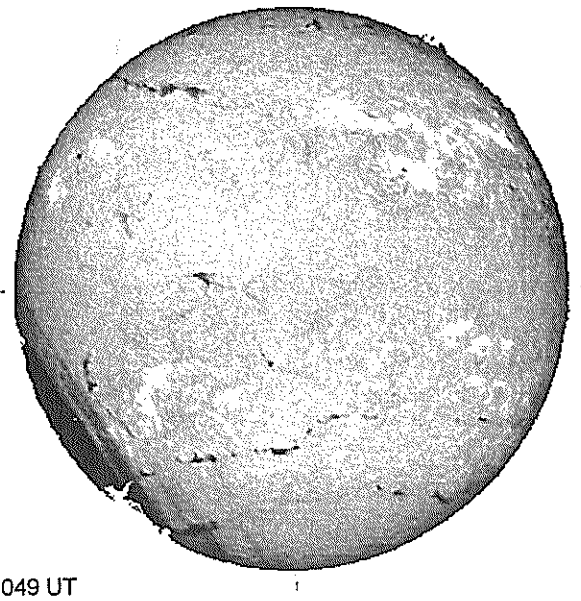
N

DeltaY =
DeltaX =



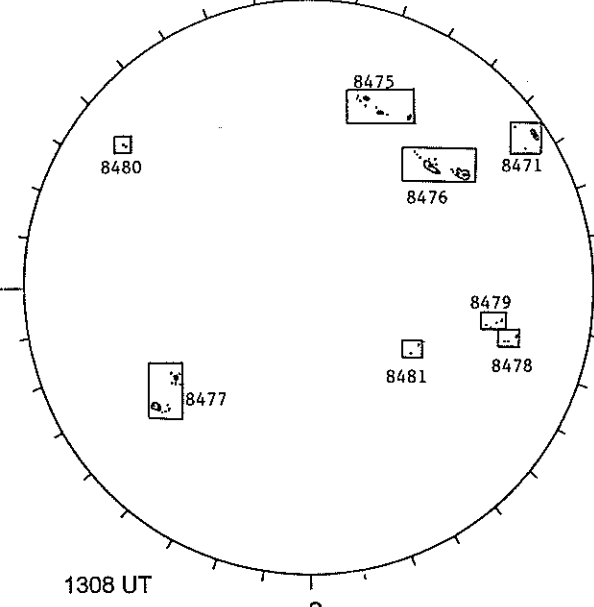
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



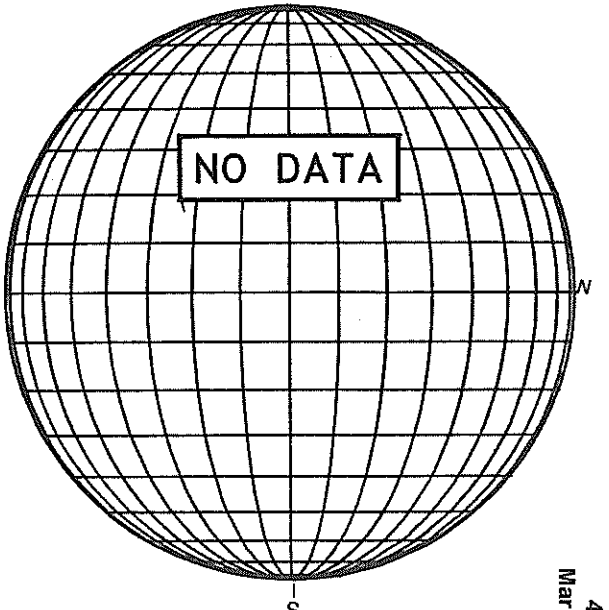
1049 UT

RAMEY SUNSPOT



1308 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



47
Mar 99

MARCH 5, 1999 (P= -22.39, Bo = -7.25, Lo = 35.97)

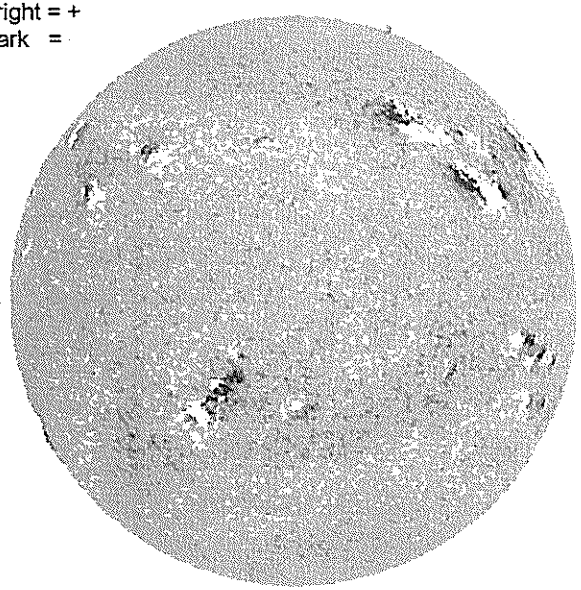
KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark =

E-

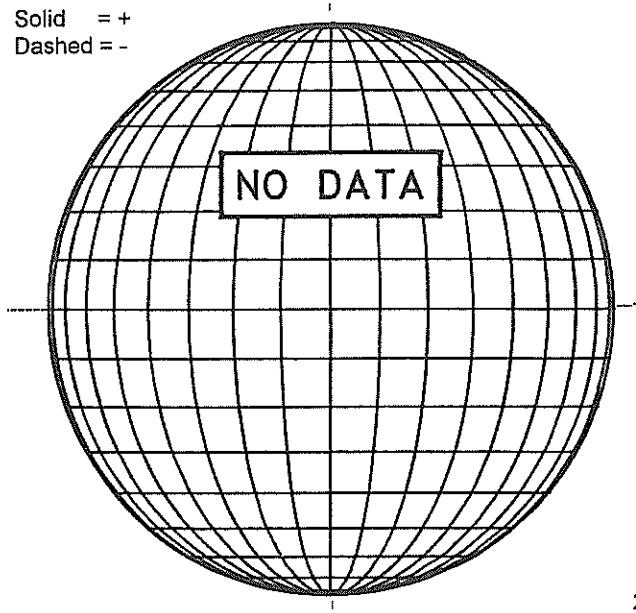


1459 UT

STANFORD MAGNETOGRAM

N

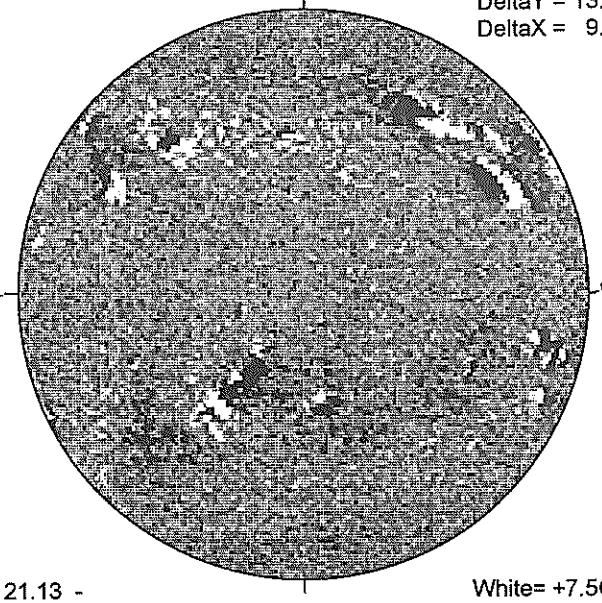
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

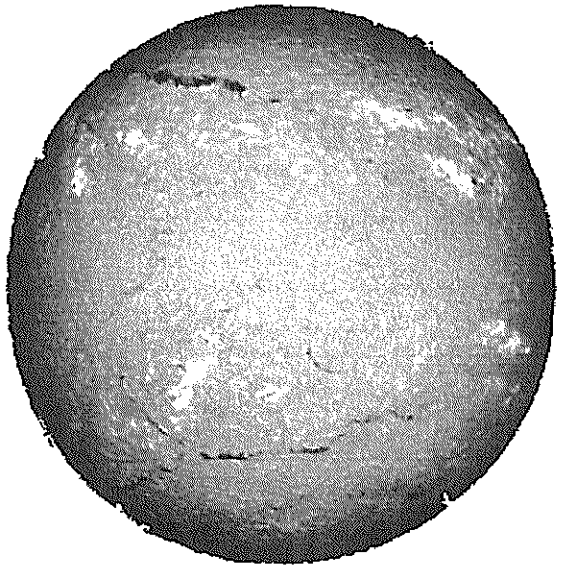


W

21.13 -
22.08 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

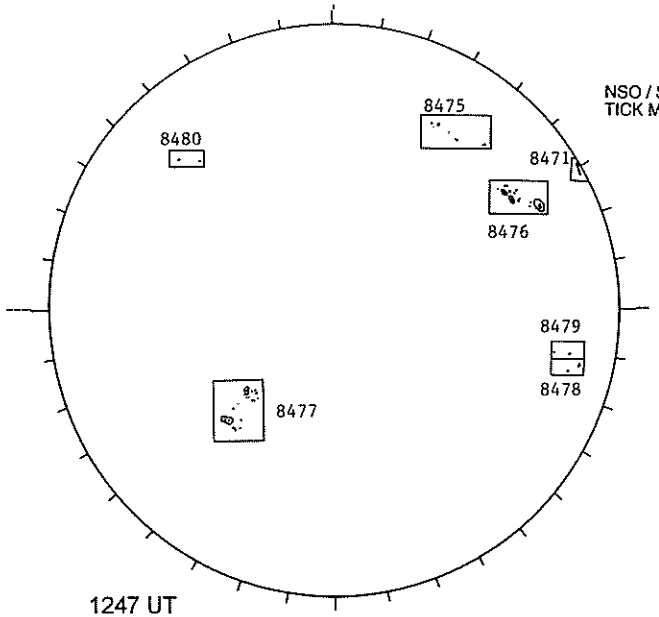


E—

1001 UT

S

RAMEY SUNSPOT

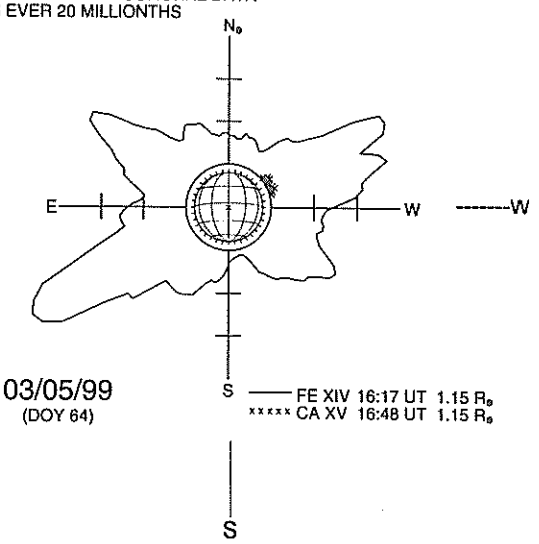


1247 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



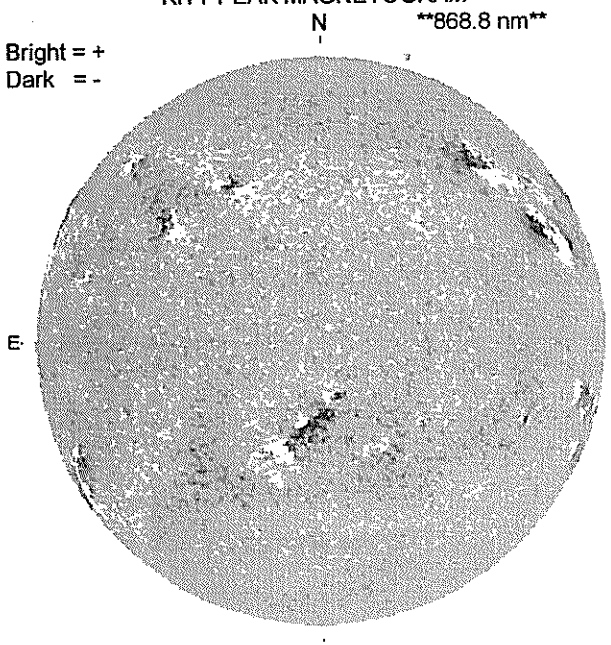
03/05/99
(DOY 64)

—— FE XIV 16:17 UT 1.15 R_o
xxxxx CA XV 16:48 UT 1.15 R_o

S

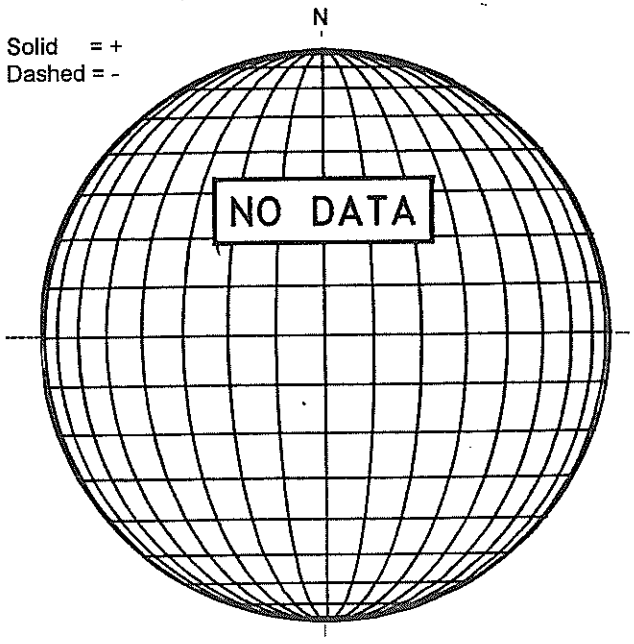
MARCH 6, 1999 (P= -22.62, Bo = -7.25 Lo = 22.79)

KITT PEAK MAGNETOGRAM

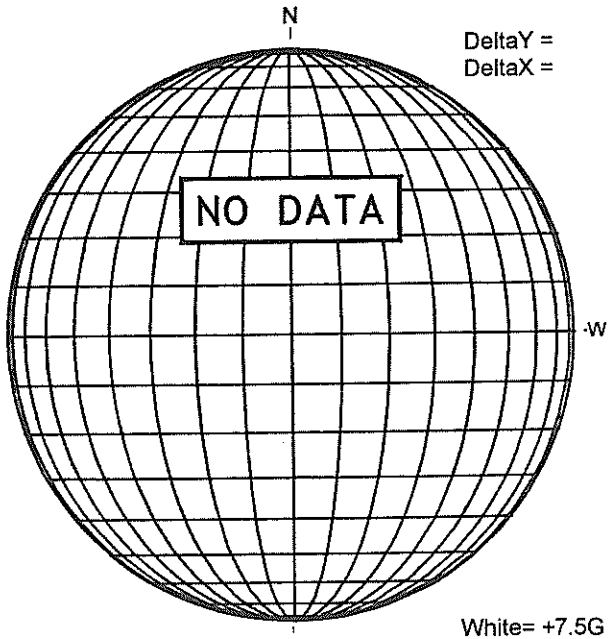


1701 UT

STANFORD MAGNETOGRAM

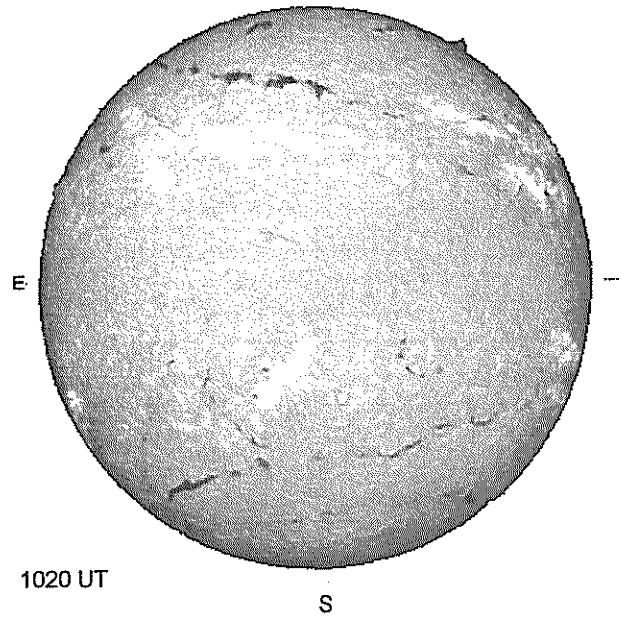


MT. WILSON MAGNETOGRAM



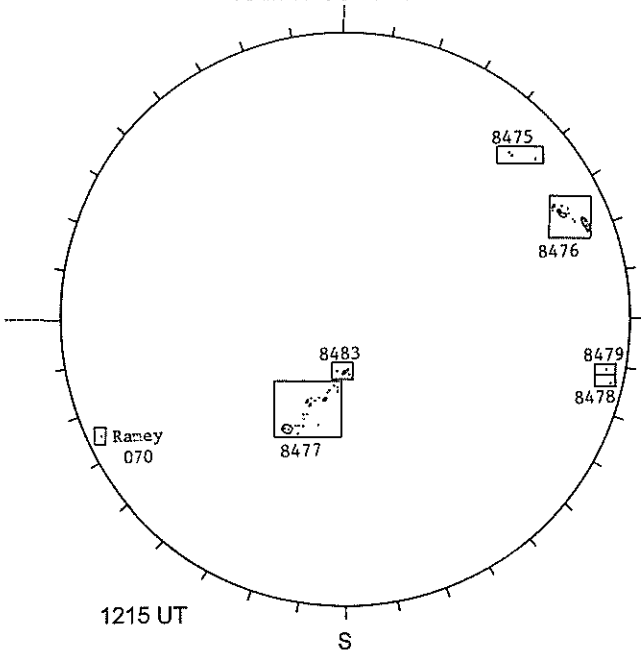
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



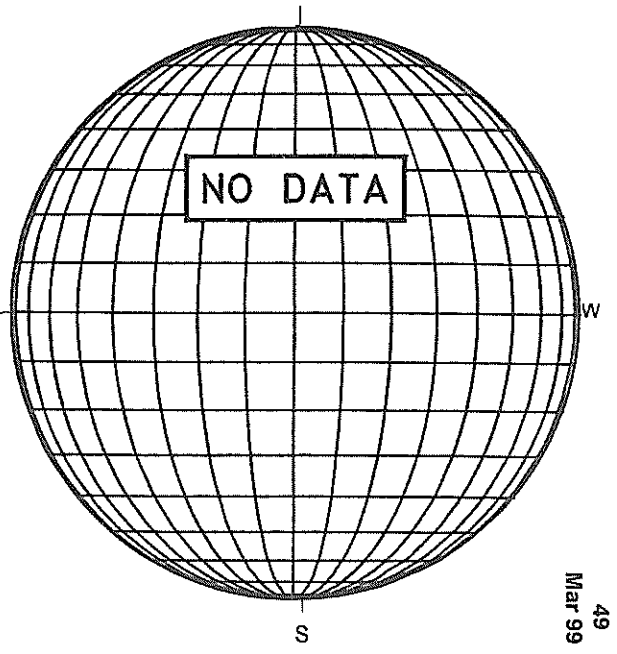
1020 UT

RAMEY SUNSPOT



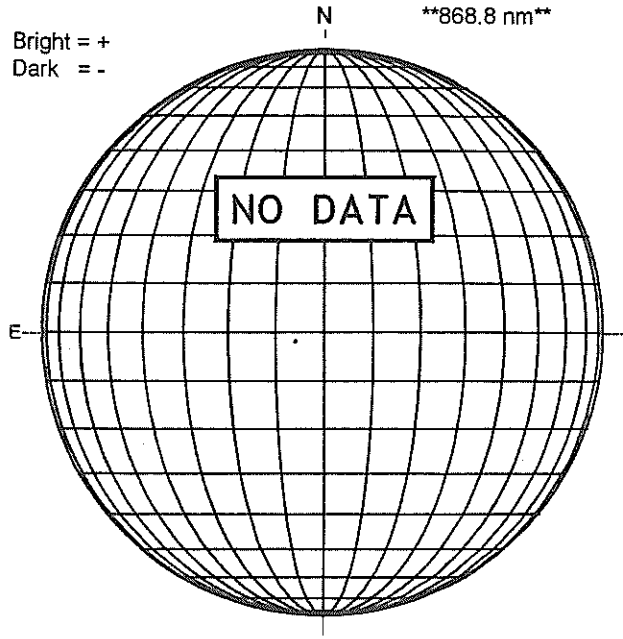
1215 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

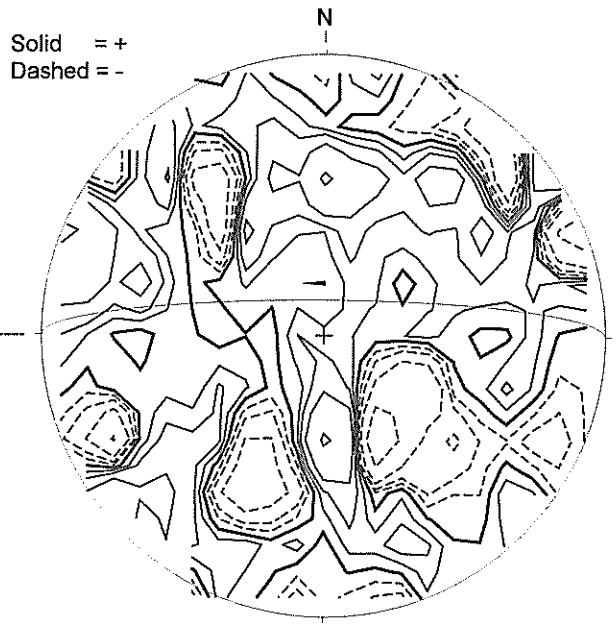


MARCH 7, 1999 (P= -22.84, Bo = -7.25 Lo = 9.62)

KITT PEAK MAGNETOGRAM

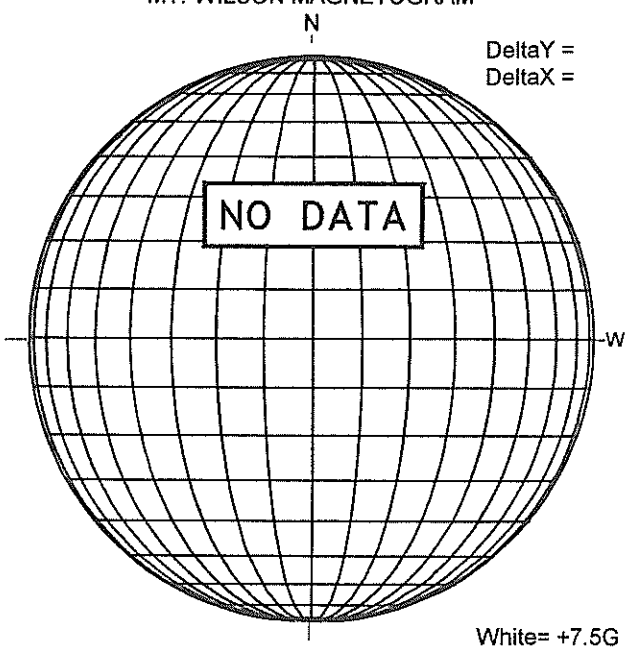


STANFORD MAGNETOGRAM



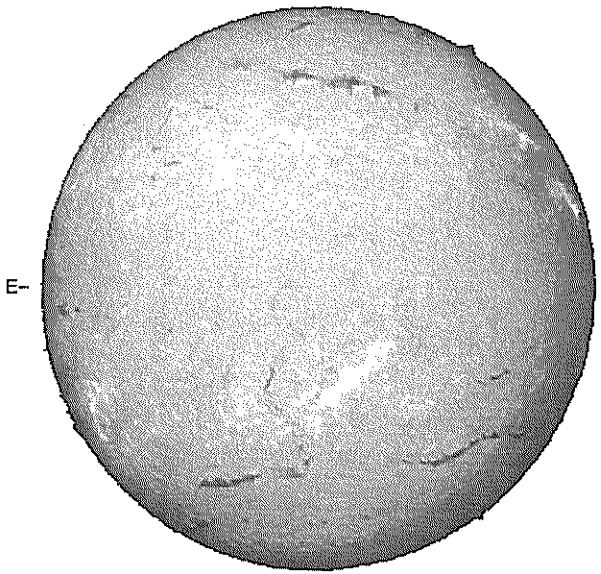
1911 UT

MT. WILSON MAGNETOGRAM



White= +7.5G
Black = -7.5G

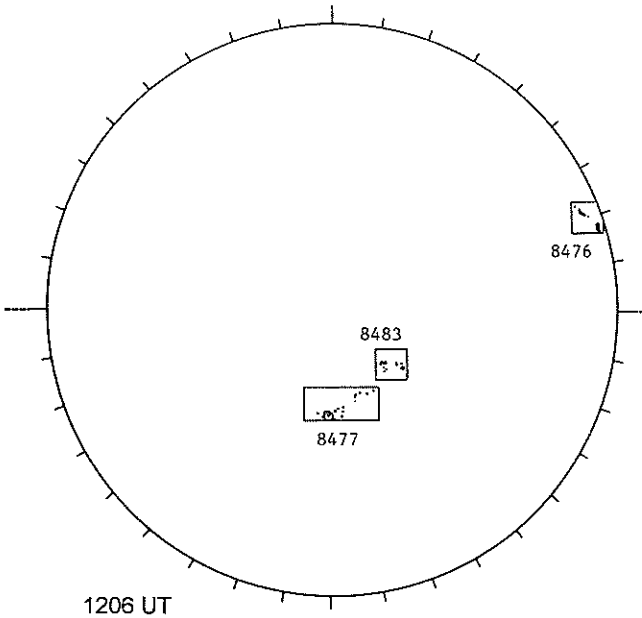
MEUDON H-ALPHA



1443 UT

S

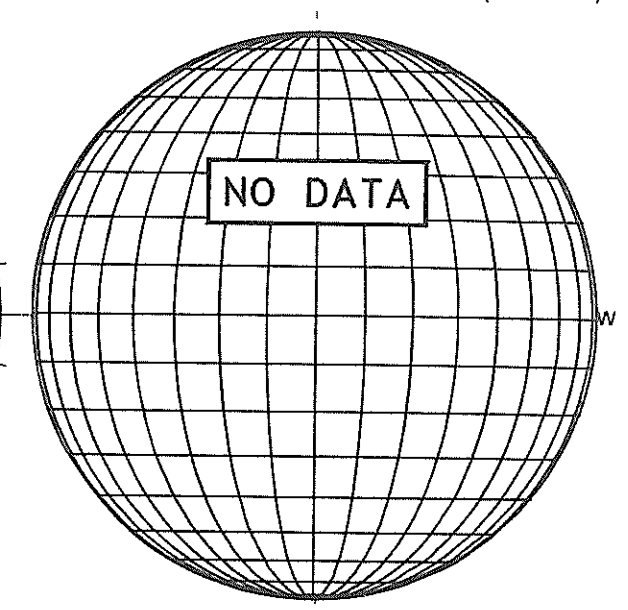
RAMEY SUNSPOT



1206 UT

S

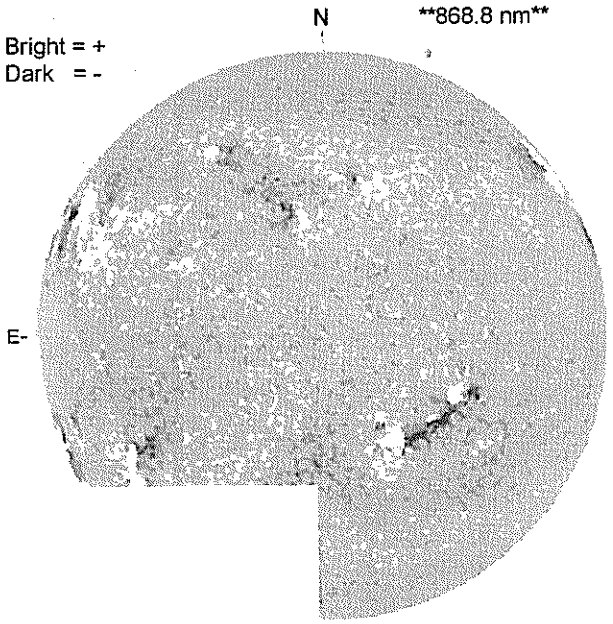
SACRAMENTO PEAK CORONA (1.15 Radii)



S

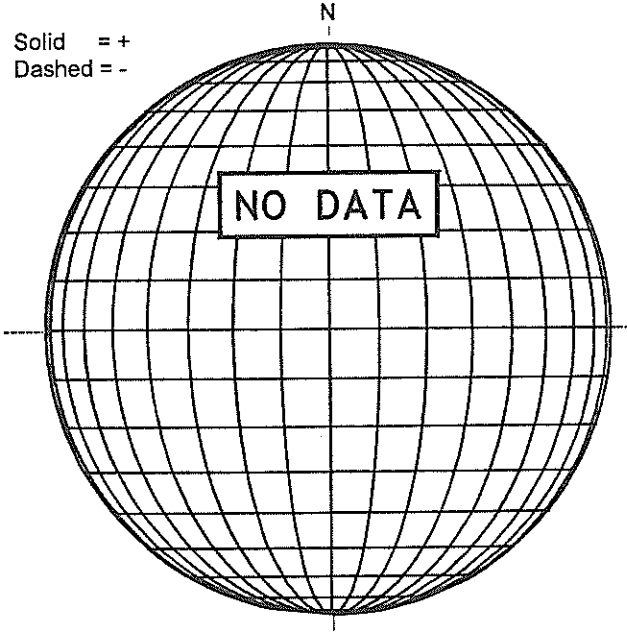
MARCH 8, 1999 (P= -23.05, Bo = -7.25, Lo = 356.44)

KITT PEAK MAGNETOGRAM

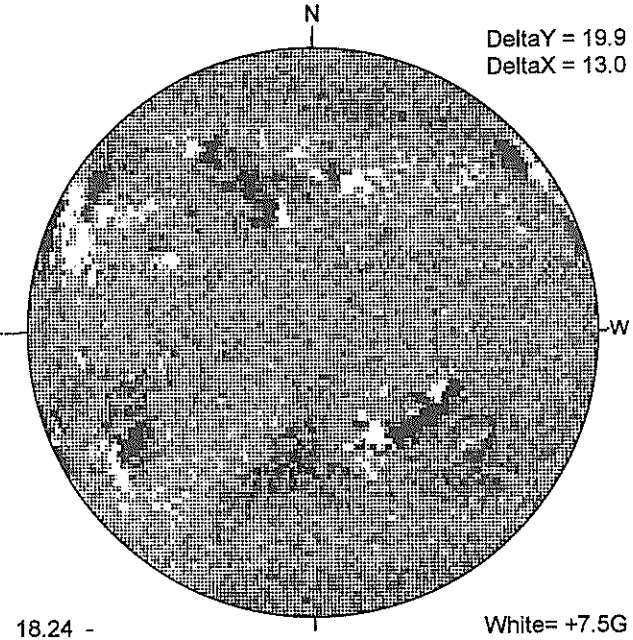


2027 UT

STANFORD MAGNETOGRAM



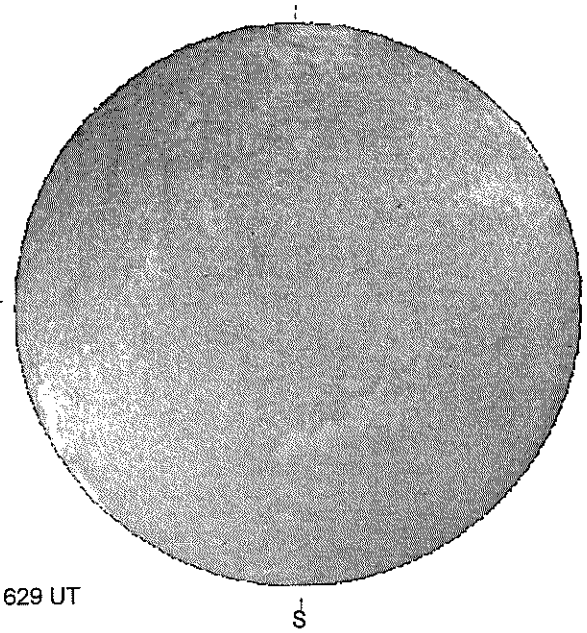
MT. WILSON MAGNETOGRAM



18.24 -
18.66 UT

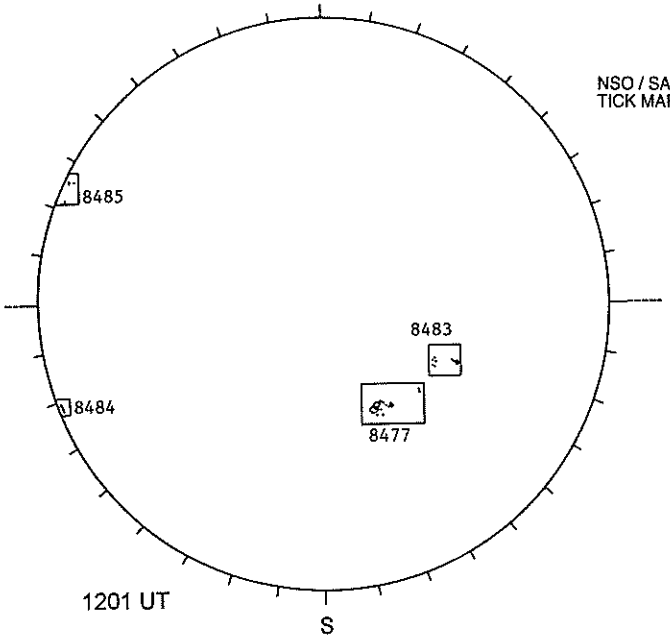
White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



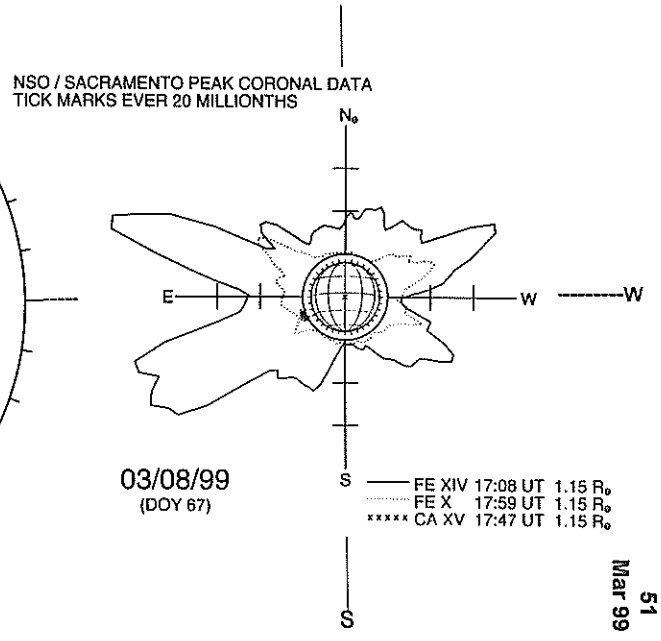
1629 UT

RAMEY SUNSPOT



1201 UT

SACRAMENTO PEAK CORONA (1.15 Radii)



03/08/99
(DOY 67)

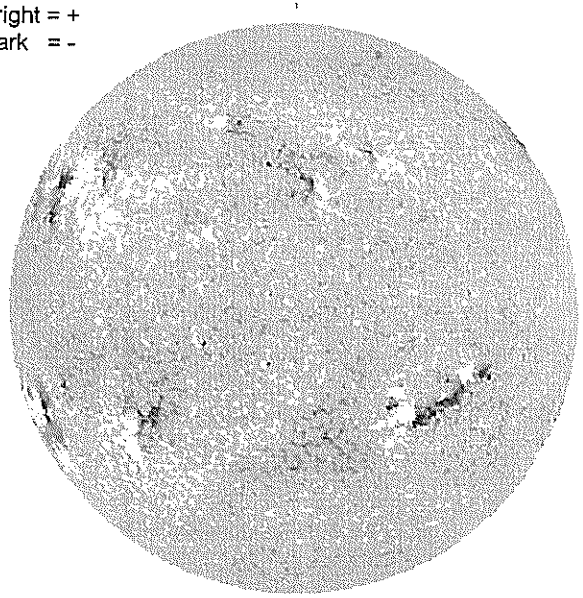
51
Mar 99

MARCH 9, 1999 (P= -23.26, Bo = -7.24, Lo = 343.27)

KITT PEAK MAGNETOGRAM

N **868.8 nm

Bright = +
Dark = -



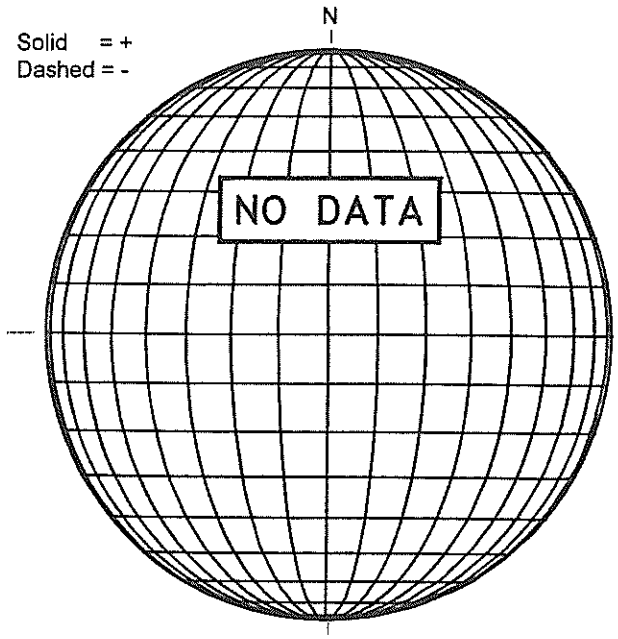
E

1502 UT

STANFORD MAGNETOGRAM

N

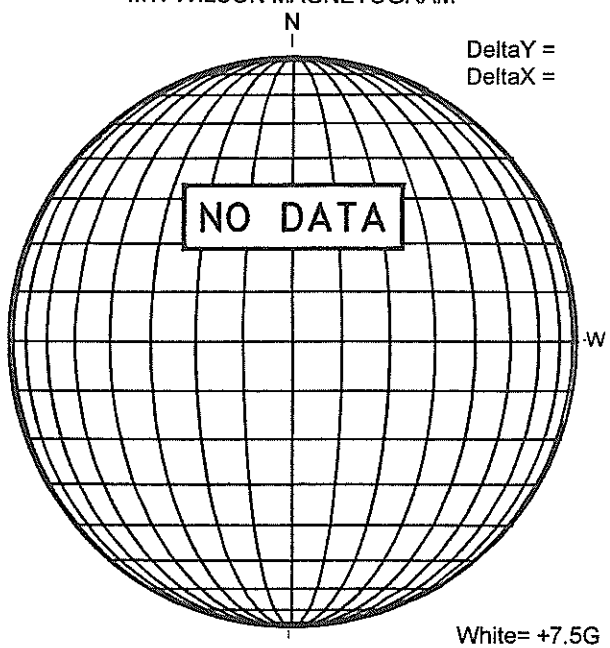
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

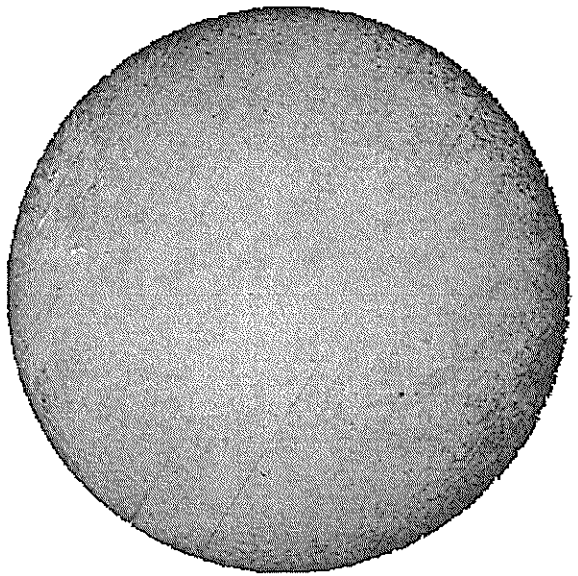
DeltaY =
DeltaX =



W

White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA

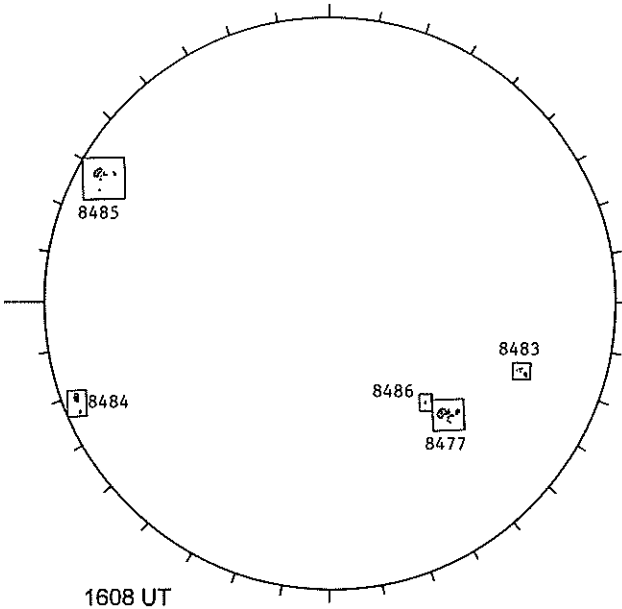


E

1440 UT

S

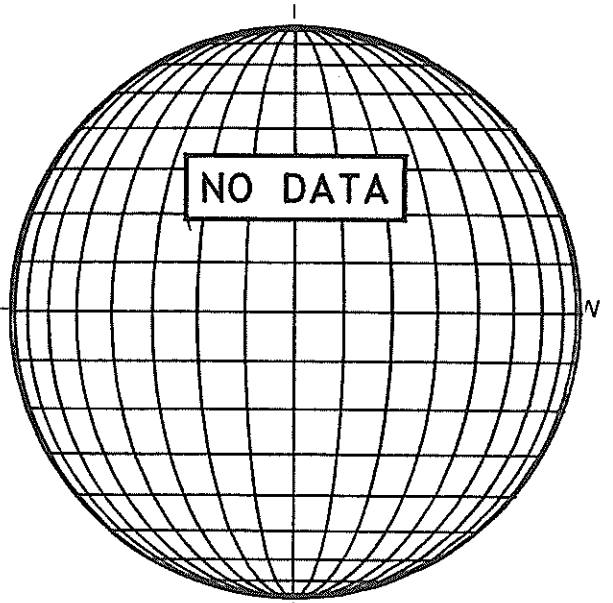
HOLLOMAN SUNSPOT



1608 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

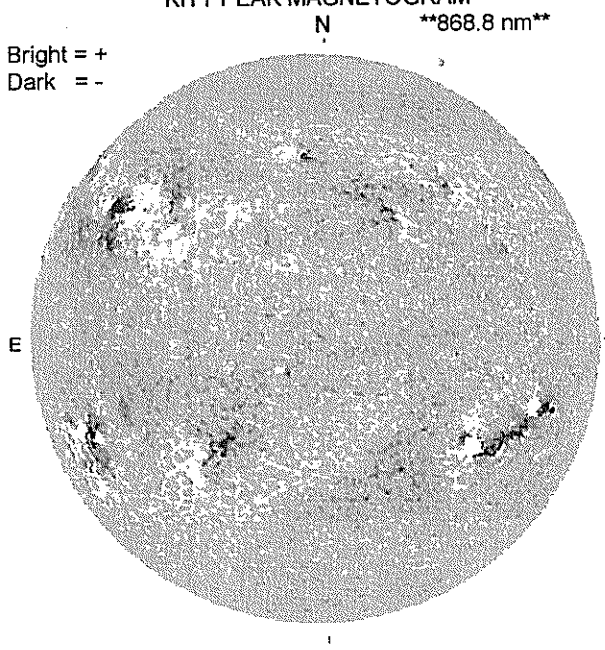


W

S

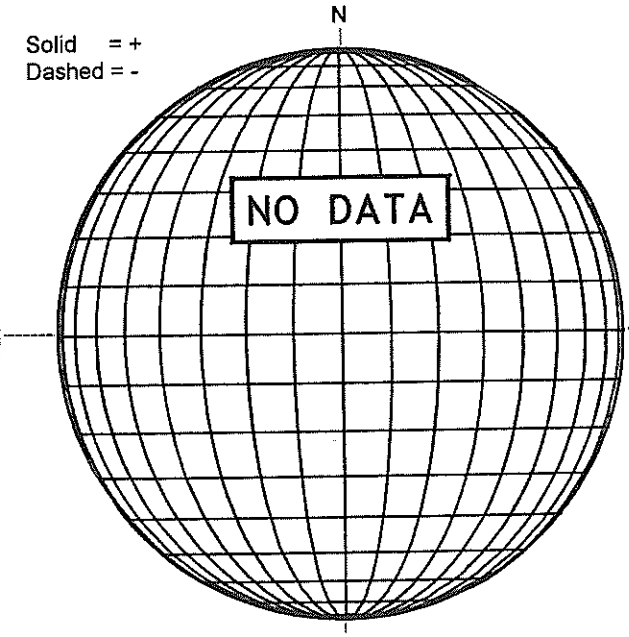
MARCH 10, 1999 (P= -23.46, Bo = -7.24, Lo = 330.09)

KITT PEAK MAGNETOGRAM

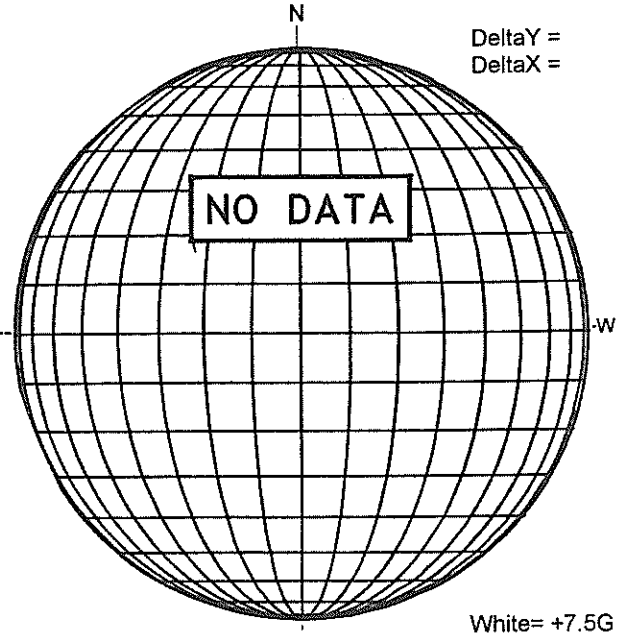


1454 UT

STANFORD MAGNETOGRAM

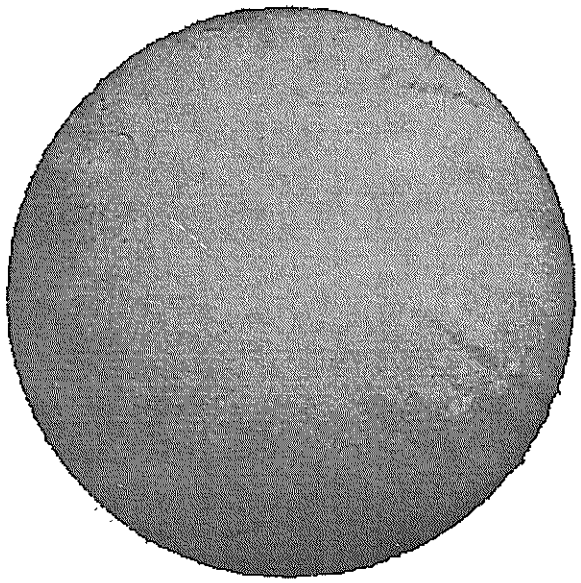


MT. WILSON MAGNETOGRAM



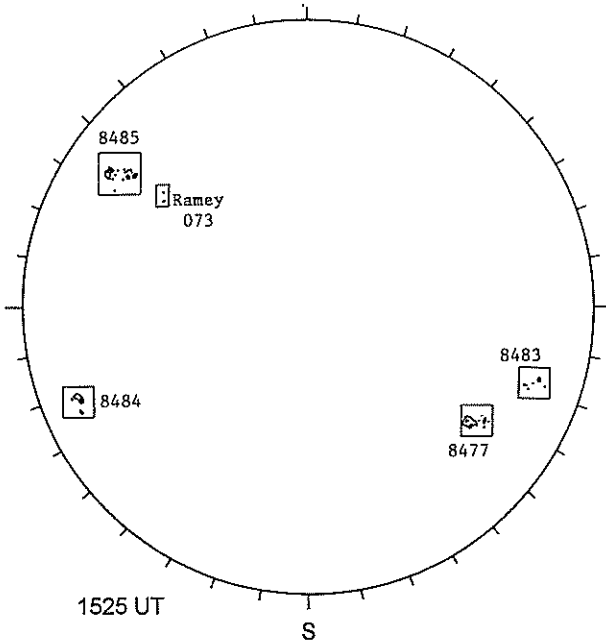
White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



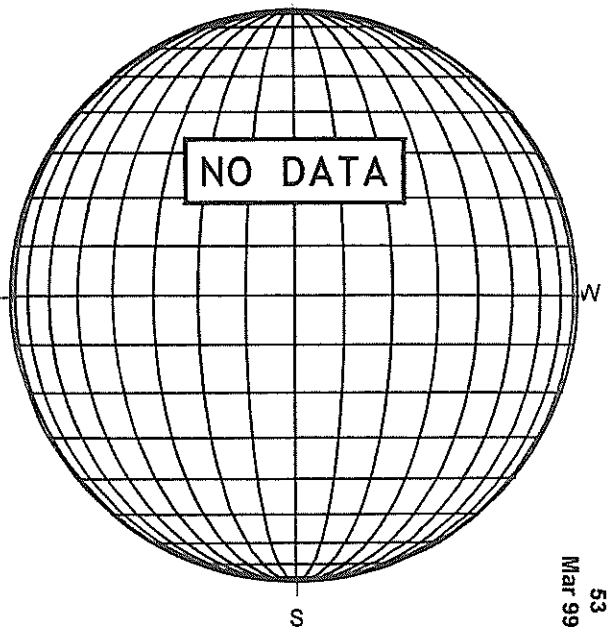
1500 UT

RAMEY SUNSPOT



1525 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

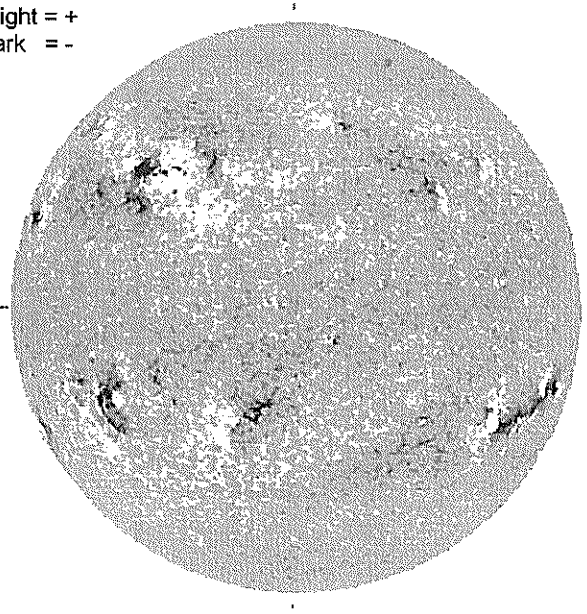


MARCH 11, 1999 (P= -23.65 Bo = -7.23, Lo = 316.91)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



E

1527 UT

STANFORD MAGNETOGRAM

N

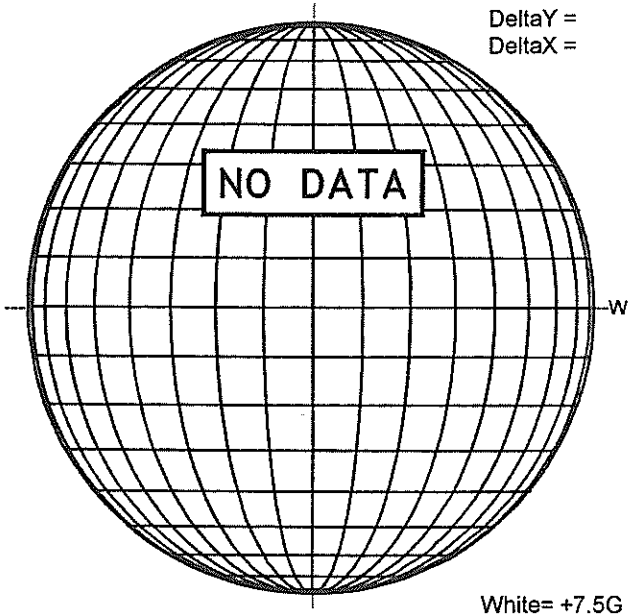
Solid = +
Dashed = -

1833 UT

MT. WILSON MAGNETOGRAM

N

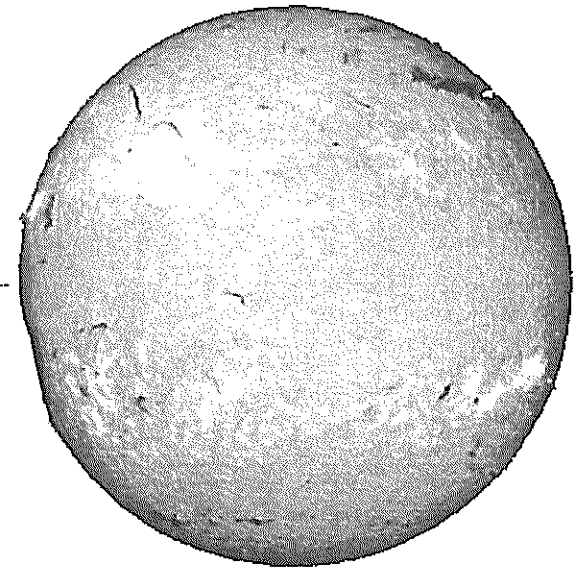
DeltaY =
DeltaX =



W

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

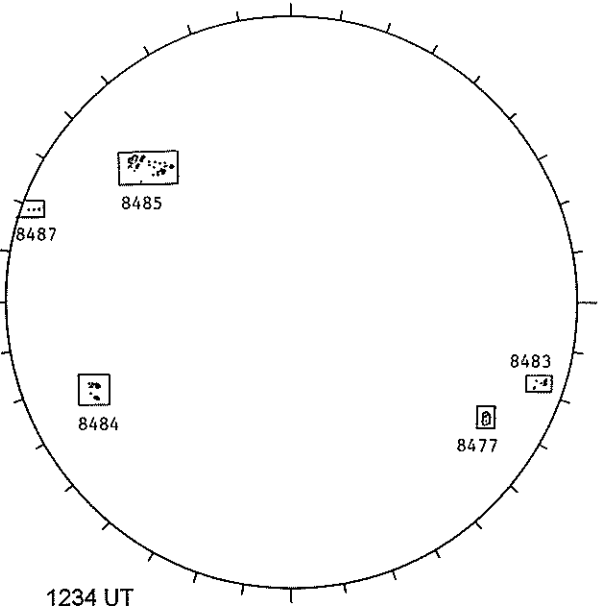


E

0835 UT

S

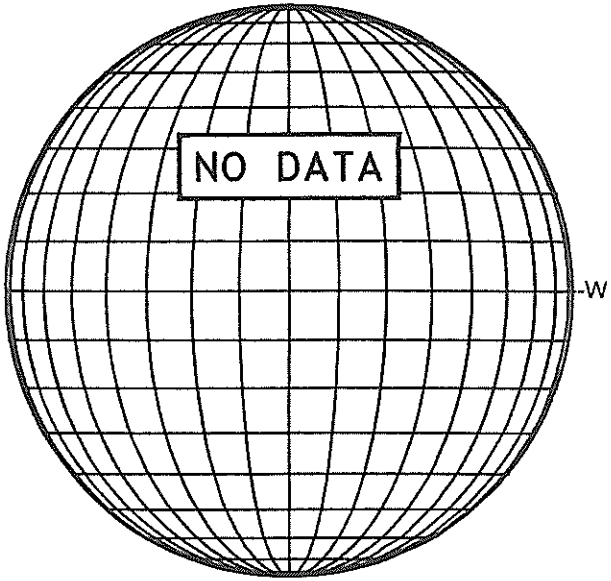
RAMEY SUNSPOT



1234 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

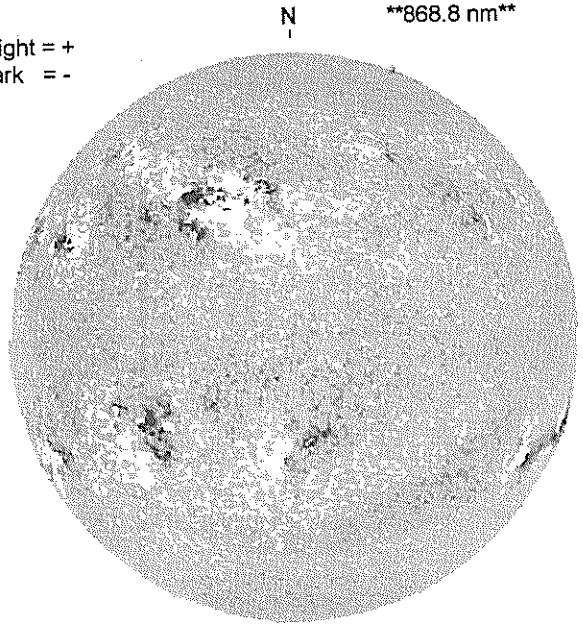


W

S

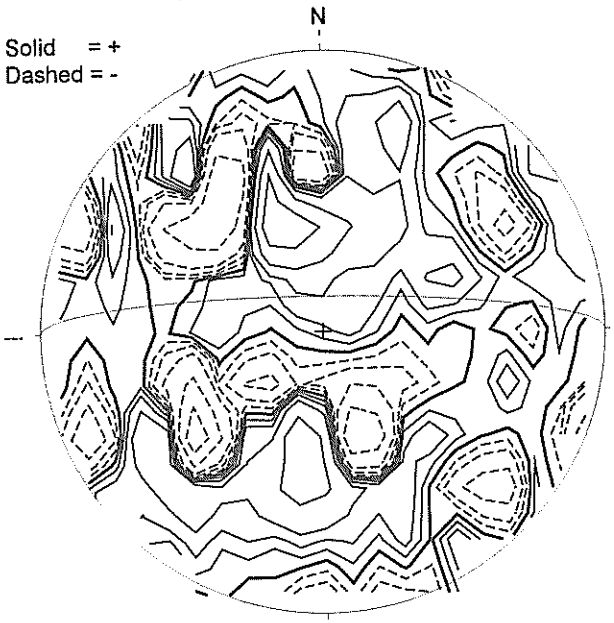
MARCH 12, 1999 (P= -23.84, Bo = -7.22, Lo = 303.74)

KITT PEAK MAGNETOGRAM



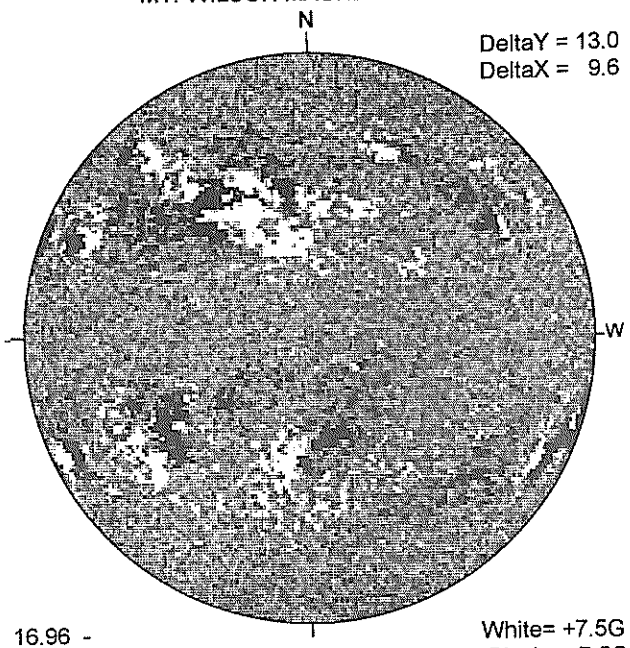
1615 UT

STANFORD MAGNETOGRAM



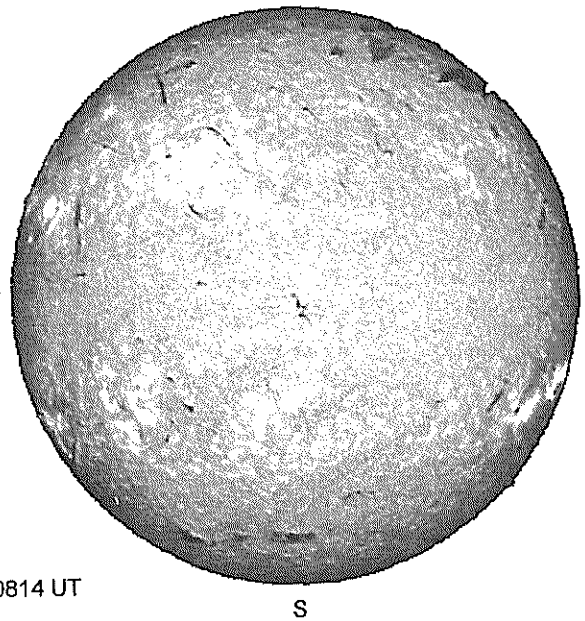
2118 UT

MT. WILSON MAGNETOGRAM



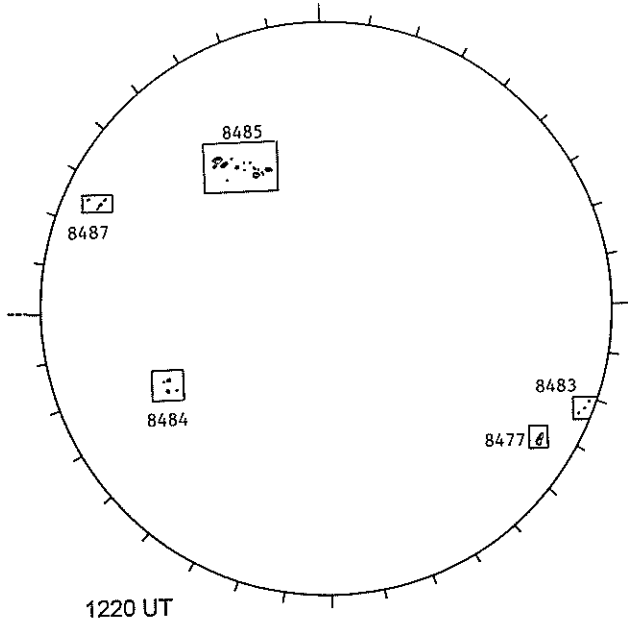
16.96 -
17.92 UT

MEUDON H-ALPHA



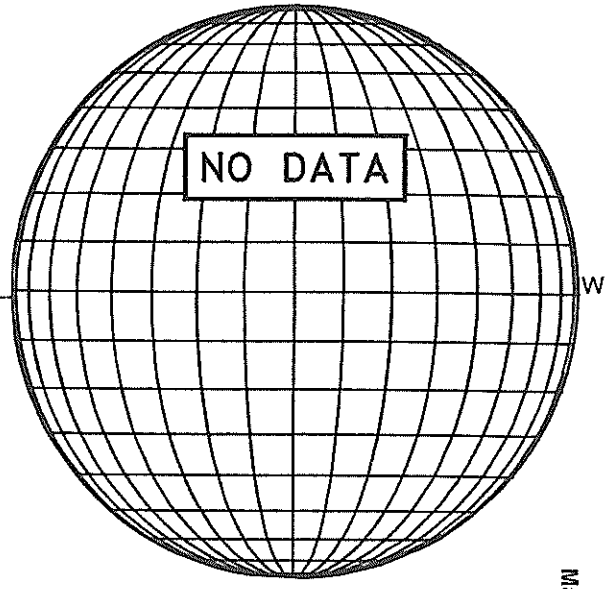
0814 UT

RAMEY SUNSPOT



1220 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



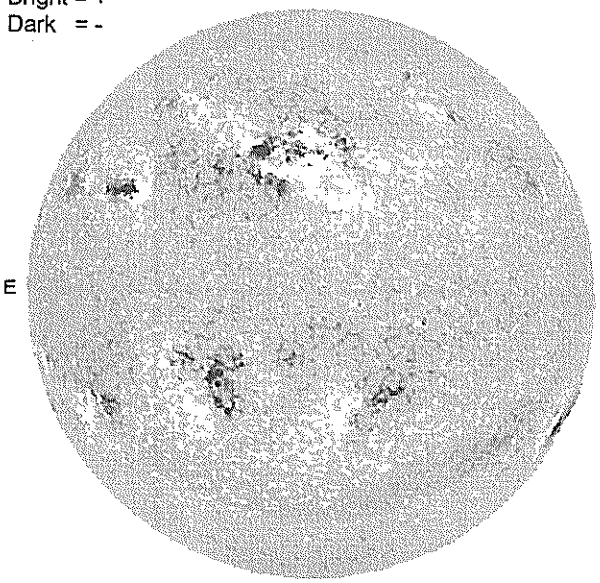
MARCH 13, 1999 (P= -24.02, Bo = -7.21, Lo = 290.56)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



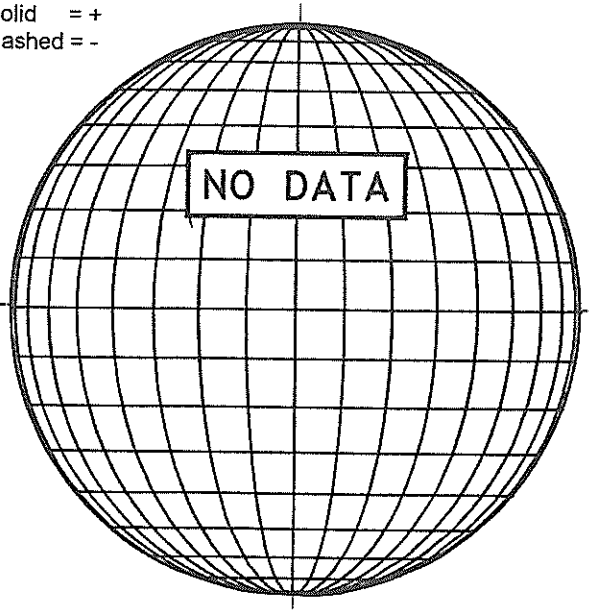
E

1516 UT

STANFORD MAGNETOGRAM

N

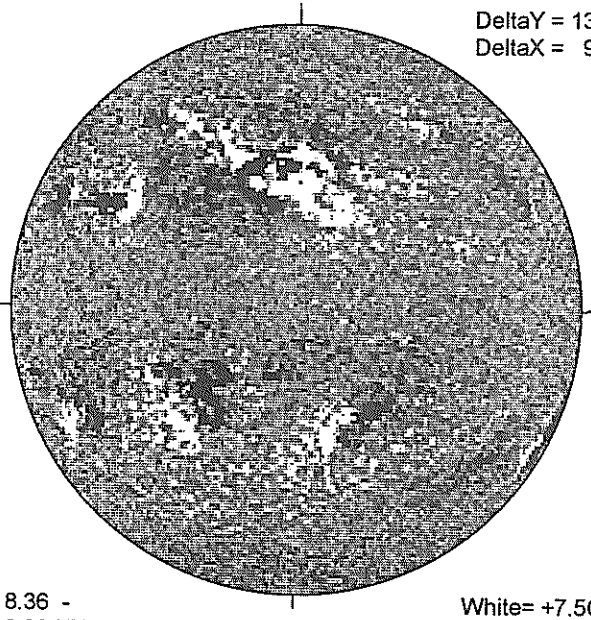
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.0
DeltaX = 9.6

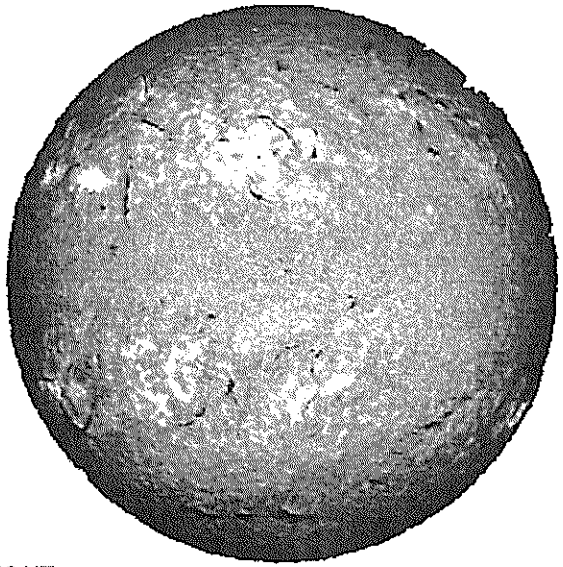


W

18.36 -
19.32 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

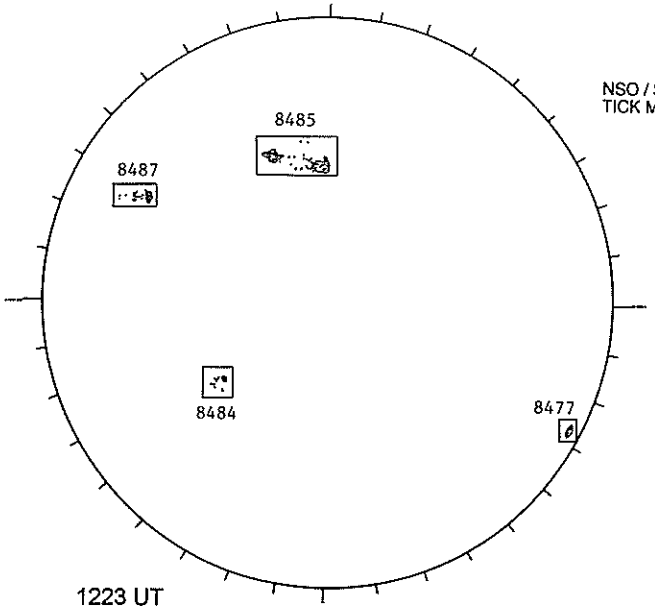


E

1006 UT

S

RAMEY SUNSPOT

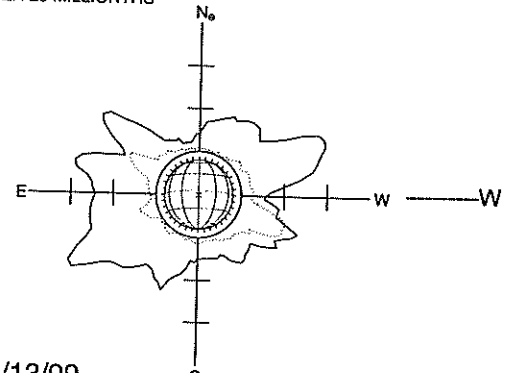


1223 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



03/13/99
(DOY 72)

FE XIV 15:31 UT 1.15 $R_\odot$
FE X 16:47 UT 1.15 $R_\odot$
xxxxx CA XV 16:36 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

S

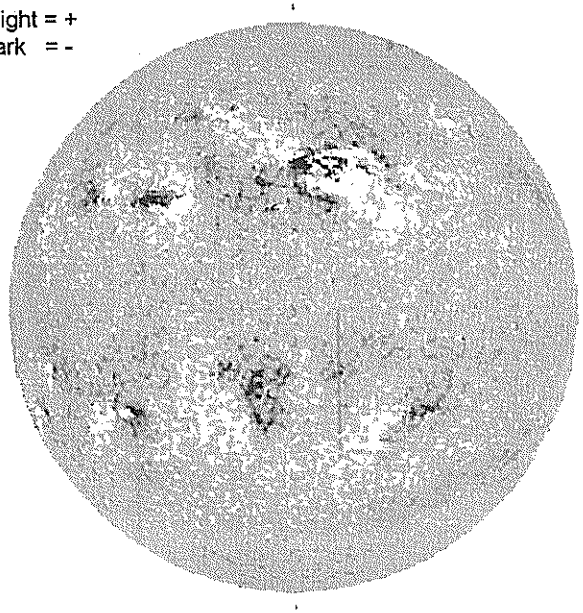
MARCH 14, 1999 (P= -24.19, Bo = -7.19, Lo = 277.38)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



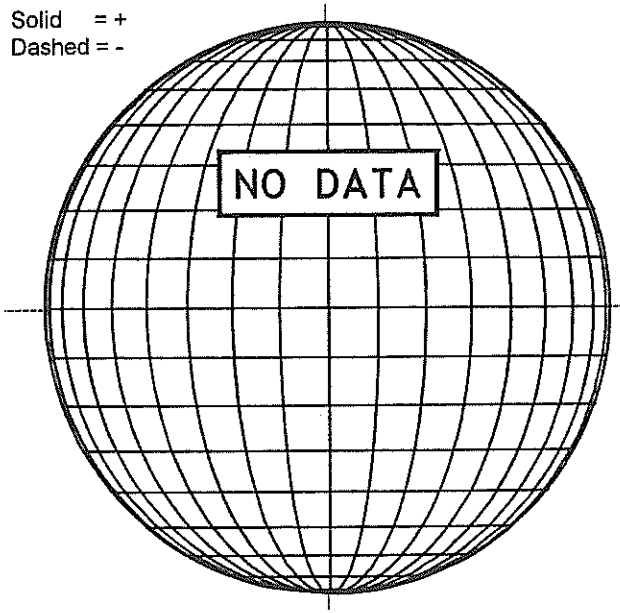
E-

1614 UT

STANFORD MAGNETOGRAM

N

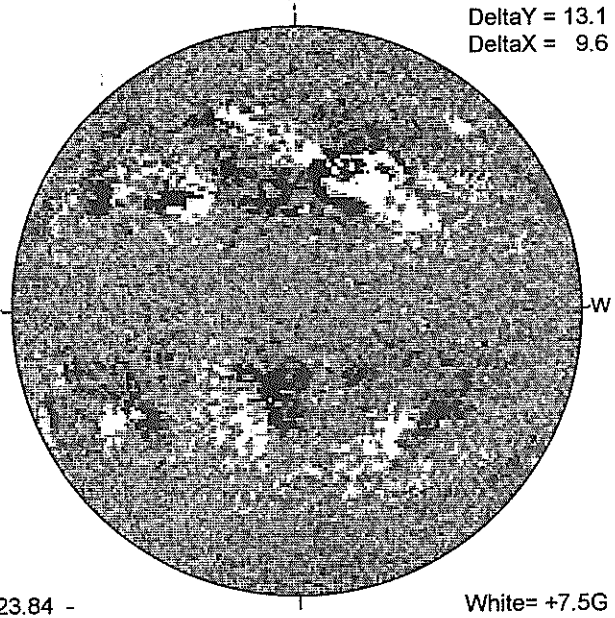
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

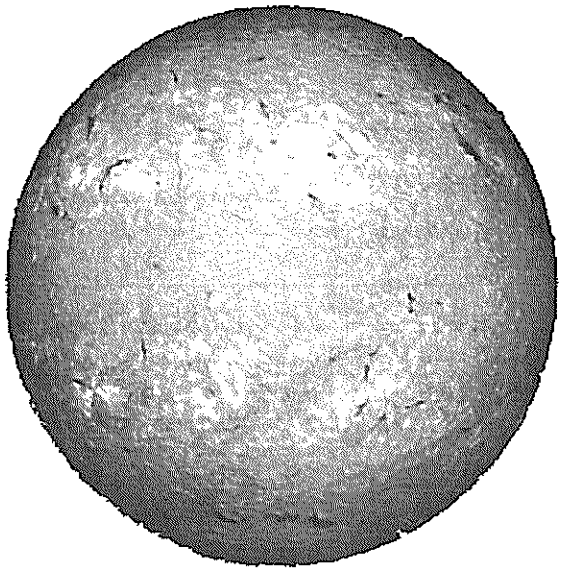


W

23.84 -
24.80 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

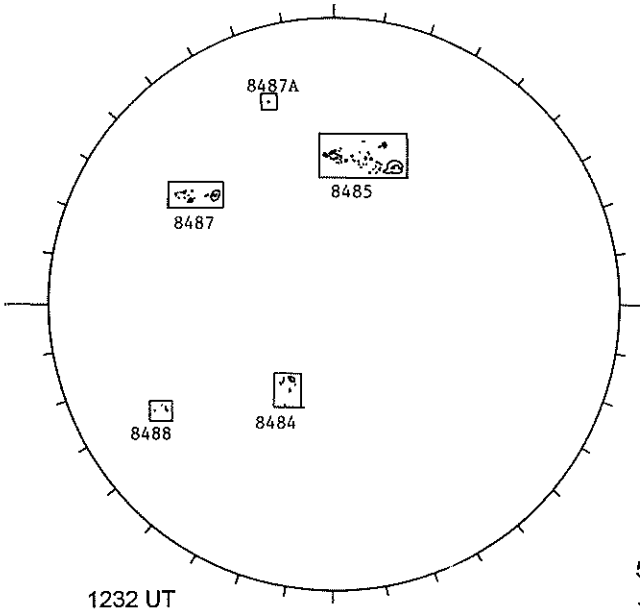


E-

0857 UT

S

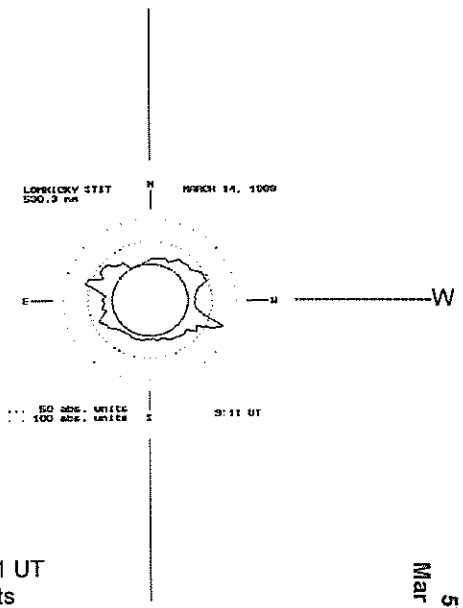
RAMEY SUNSPOT



1232 UT

S

LOMNICKY PEAK CORONA (1.04 Radii)



W

530.3 nm, 0911 UT
.... 50 abs. units
. . 100 abs. units

S

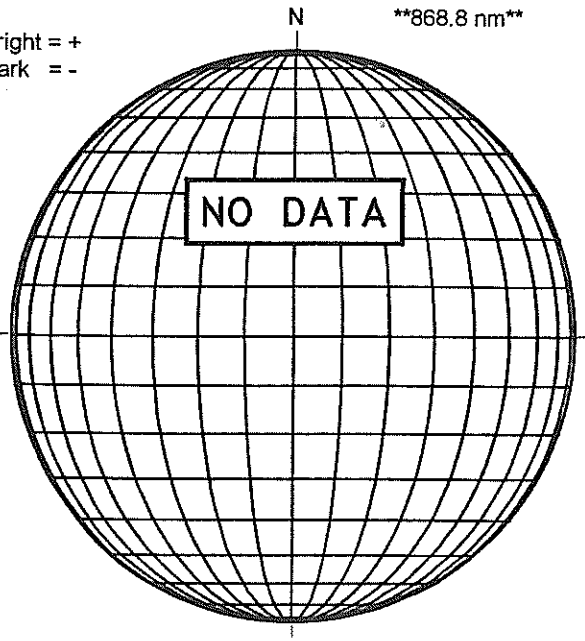
57
Mar 99

MARCH 15, 1999 (P= -24.36, Bo = -7.18, Lo = 264.20)

KITT PEAK MAGNETOGRAM

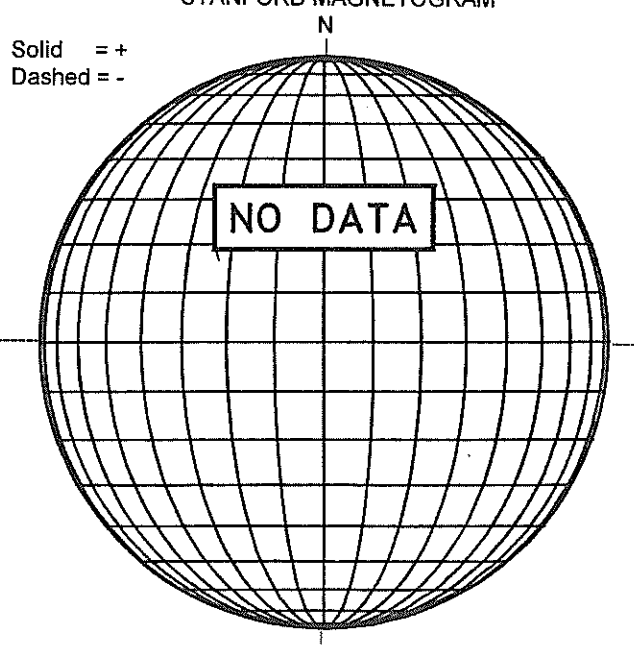
868.8 nm

Bright = +
Dark = -



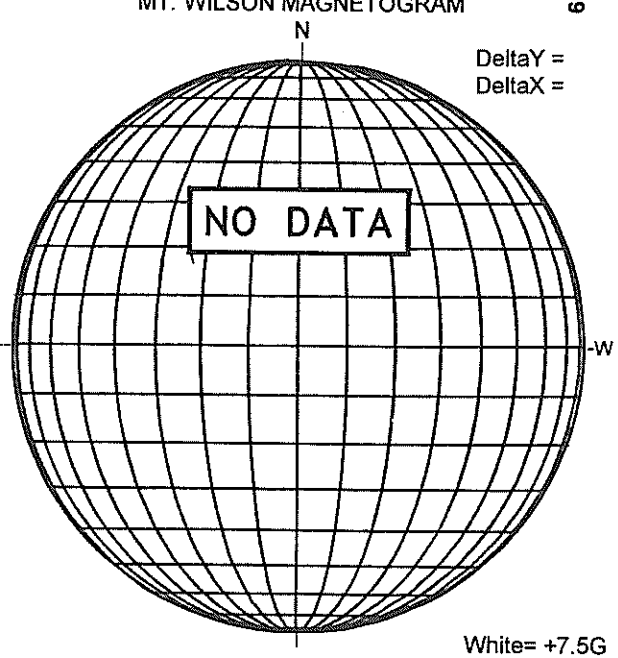
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



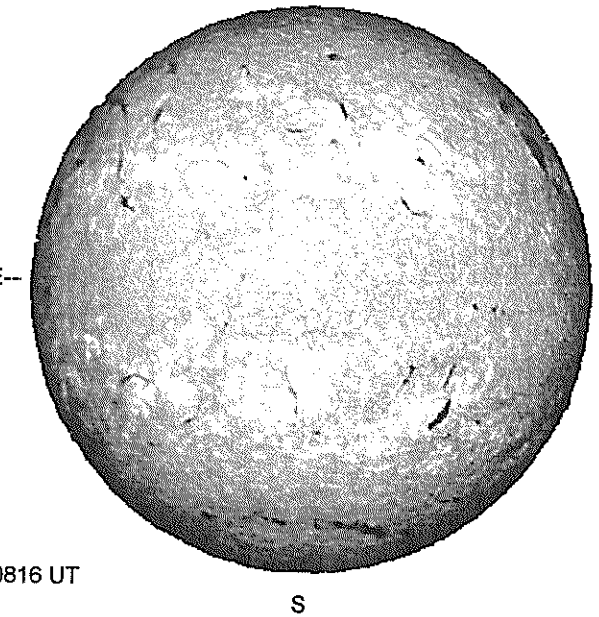
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



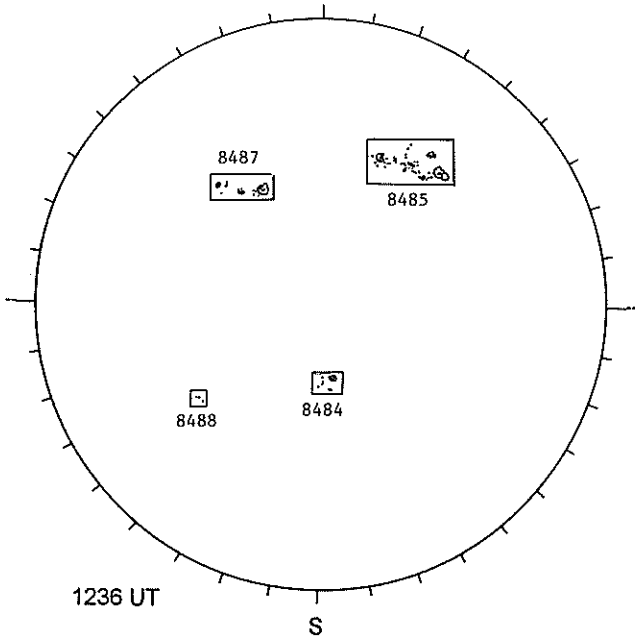
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



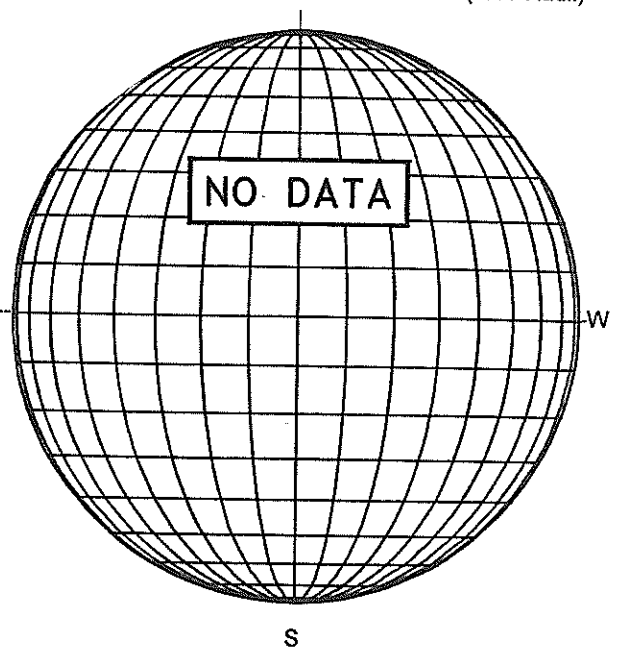
0816 UT

RAMEY SUNSPOT



1236 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

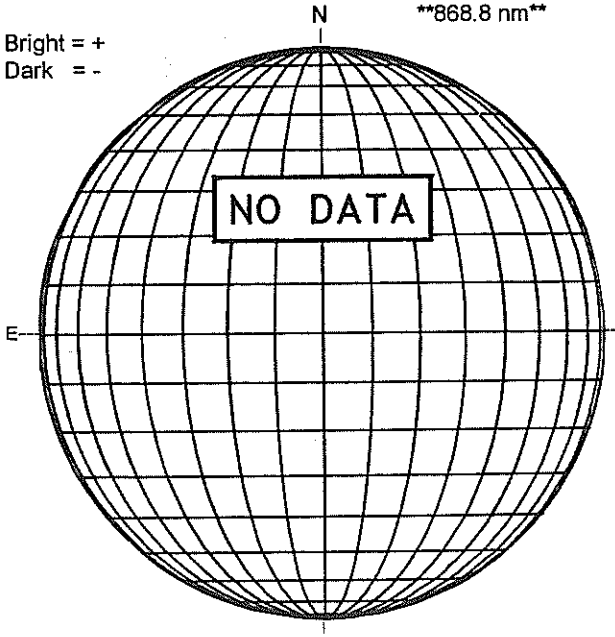


MARCH 16, 1999 (P= -24.52, Bo = -7.16, Lo = 251.02)

KITT PEAK MAGNETOGRAM

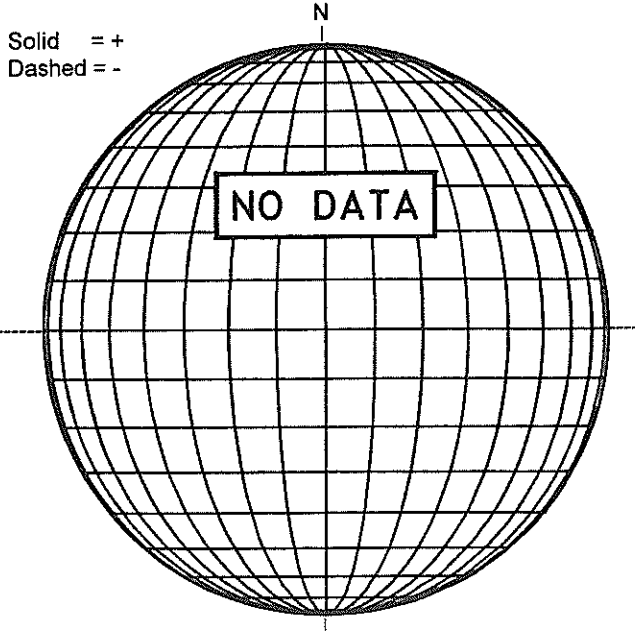
868.8 nm

Bright = +
Dark = -



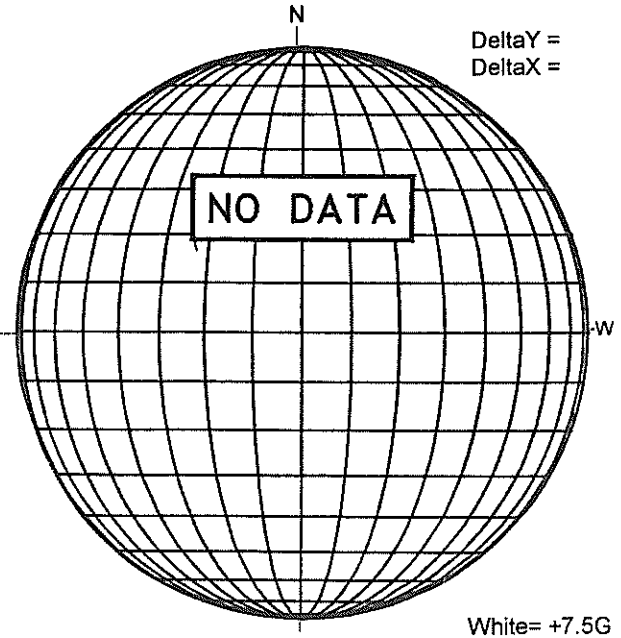
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



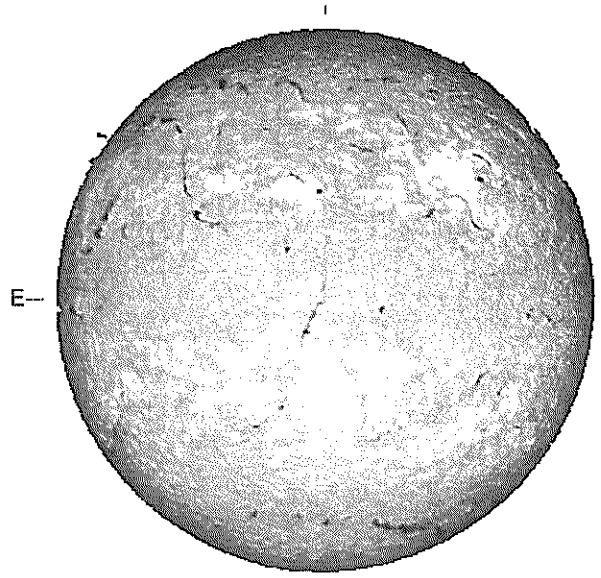
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



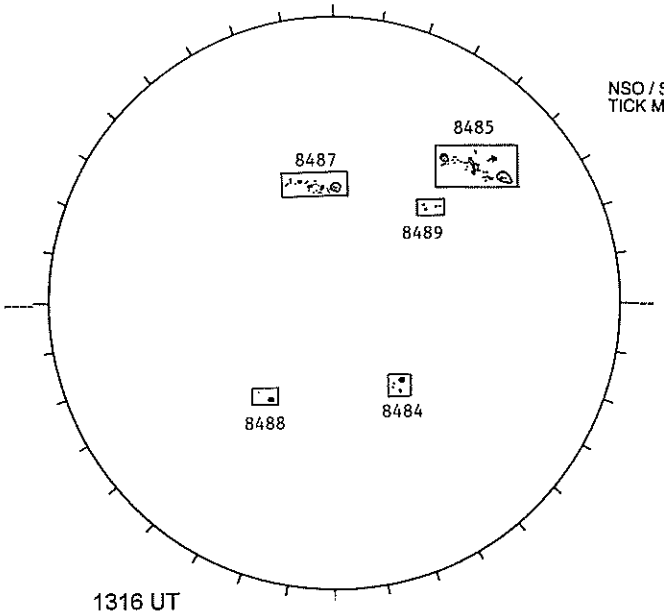
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



0834 UT

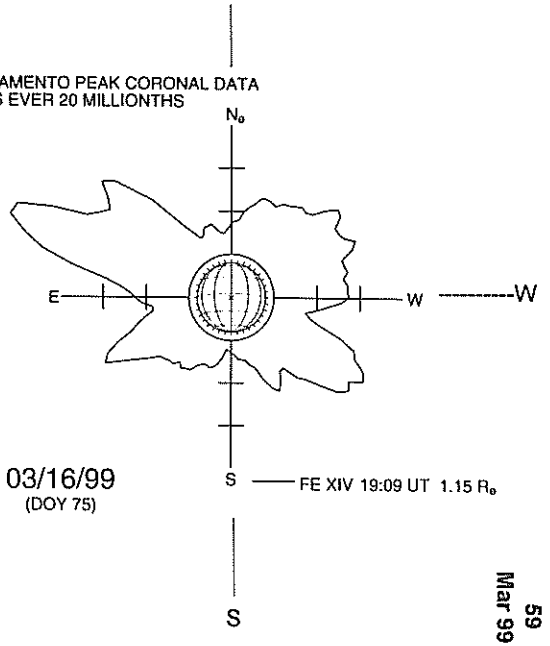
RAMEY SUNSPOT



1316 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



03/16/99
(DOY 75)

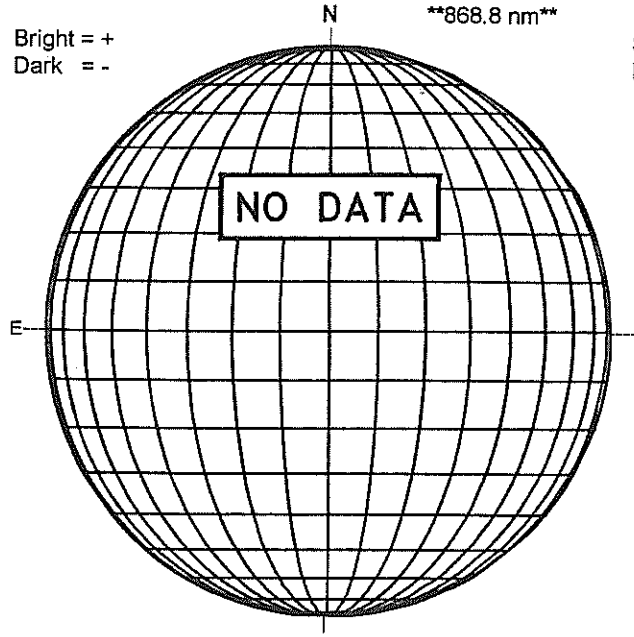
FE XIV 19:09 UT 1.15 R_o

MARCH 17, 1999 (P= -24.68, Bo = -7.13, Lo = 237.84)

KITT PEAK MAGNETOGRAM

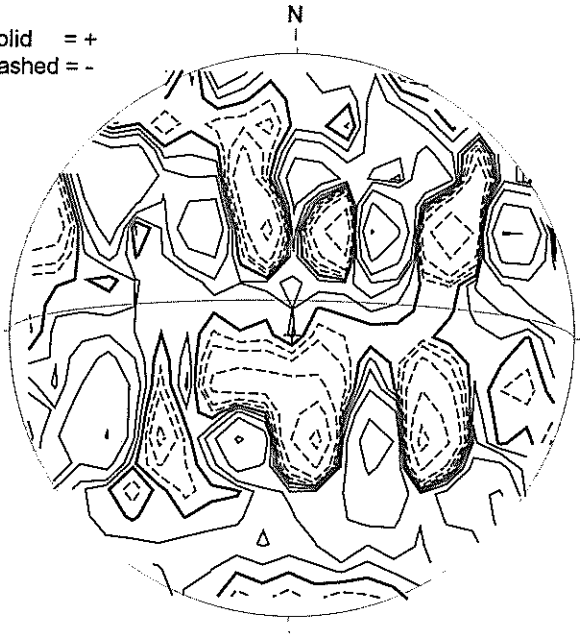
868.8 nm

Bright = +
Dark = -



STANFORD MAGNETOGRAM

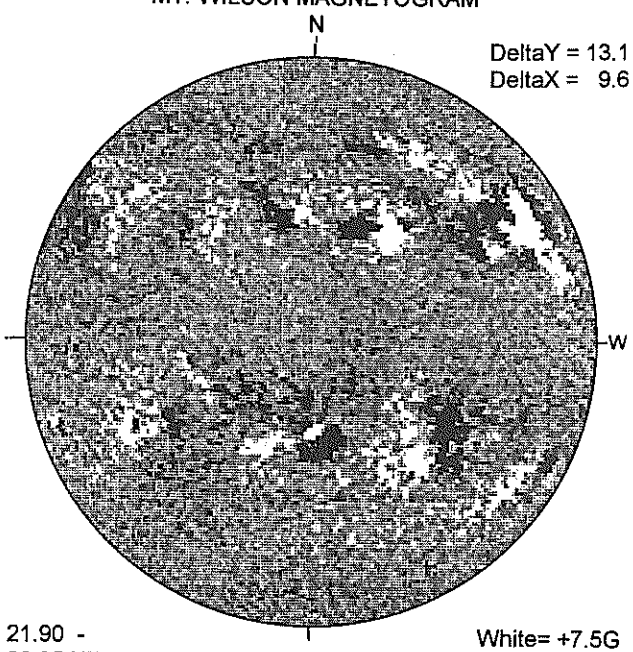
Solid = +
Dashed = -



2054 UT

MT. WILSON MAGNETOGRAM

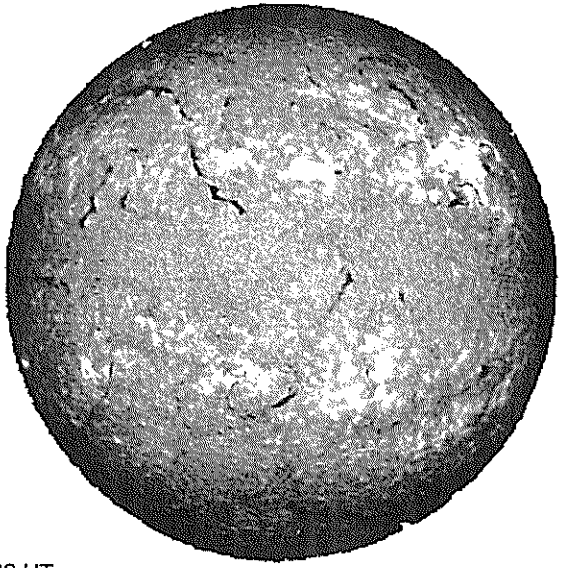
DeltaY = 13.1
DeltaX = 9.6



21.90 -
22.85 UT

White= +7.5G
Black = -7.5G

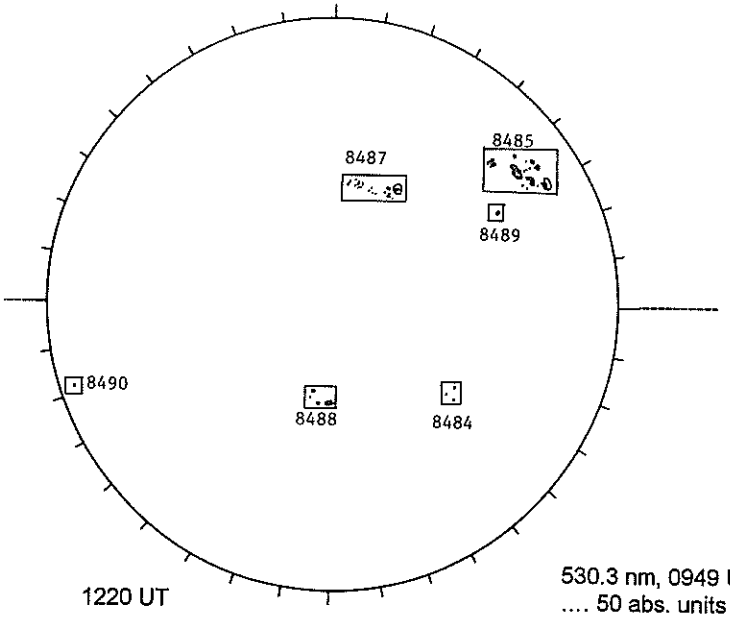
MEUDON H-ALPHA



0930 UT

S

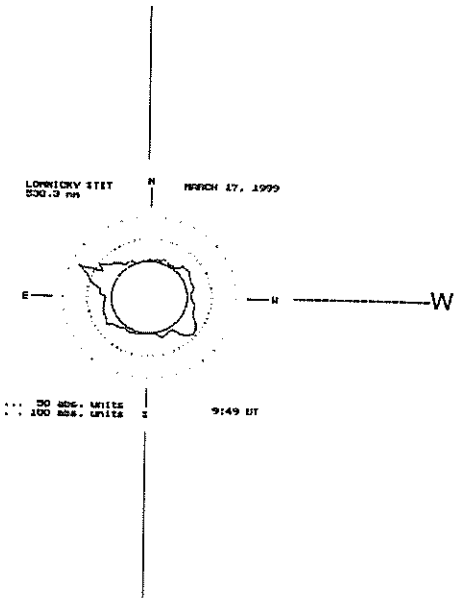
RAMEY SUNSPOT



1220 UT

S

LOMNICKY PEAK CORONA (1.04 Radii)



530.3 nm, 0949 UT
.... 50 abs. units
. . 100 abs. units

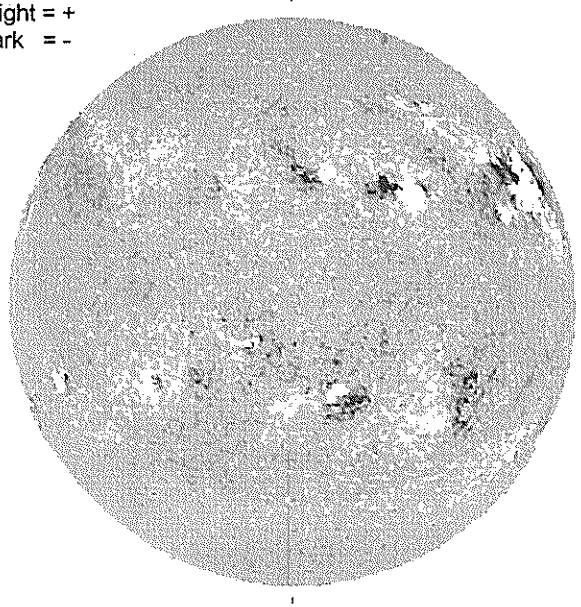
MARCH 18, 1999 (P= -24.82, Bo = -7.11, Lo = 224.66)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



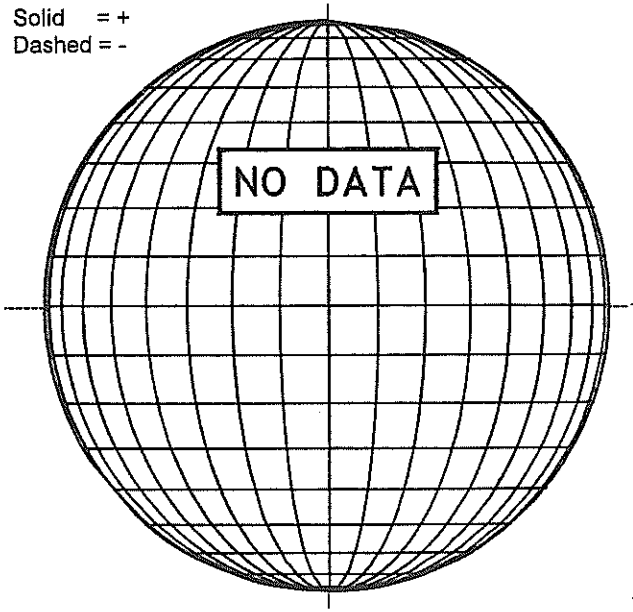
E-

1506 UT

STANFORD MAGNETOGRAM

N

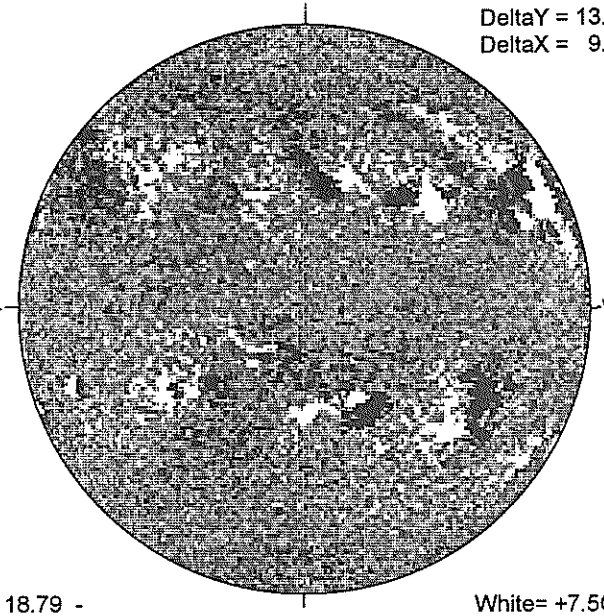
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.0
DeltaX = 9.6

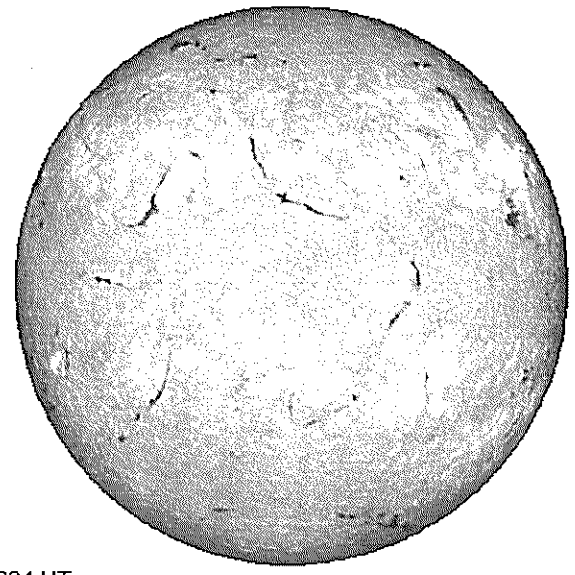


W

18.79 -
19.74 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

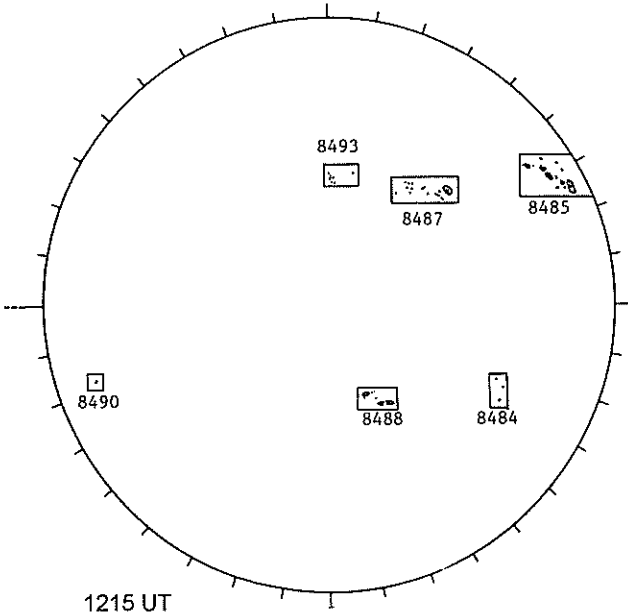


E-

0824 UT

S

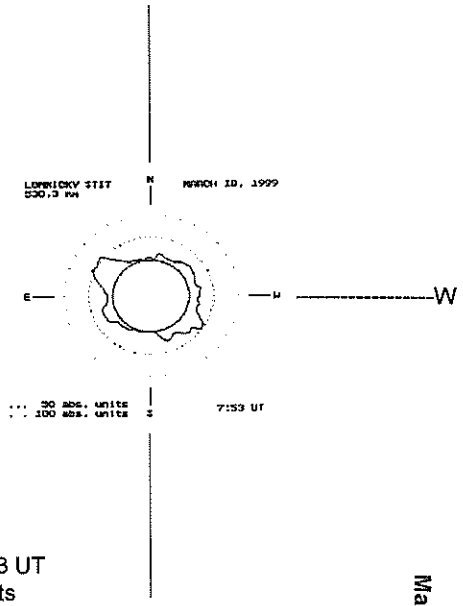
RAMEY SUNSPOT



1215 UT

S

LOMNICKY PEAK CORONA (1.04 Radii)----

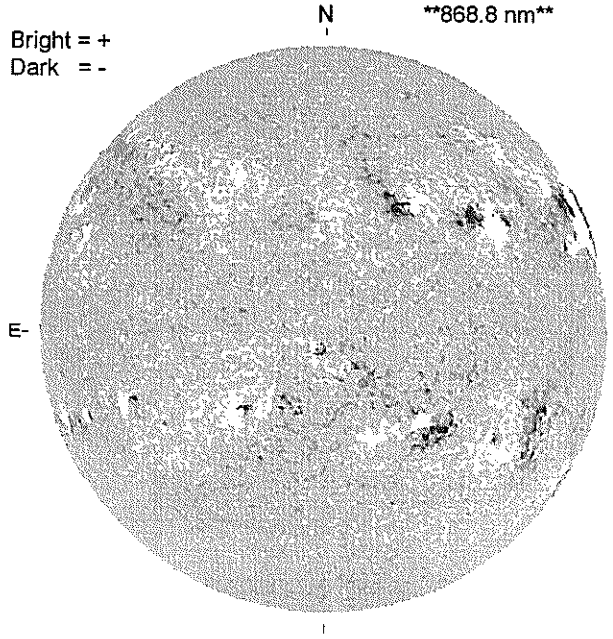


530.3 nm, 0753 UT
.... 50 abs. units
. . 100 abs. units

61
Mar 99

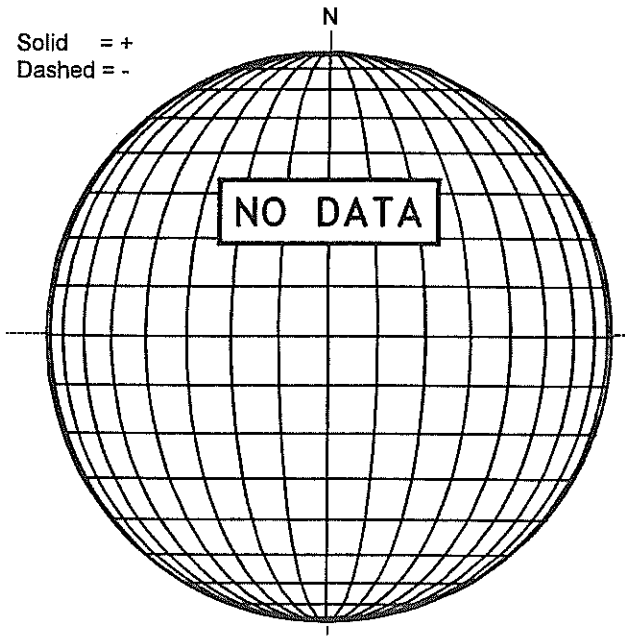
MARCH 19, 1999 (P= -24.96, Bo = -7.09, Lo = 211.48)

KITT PEAK MAGNETOGRAM

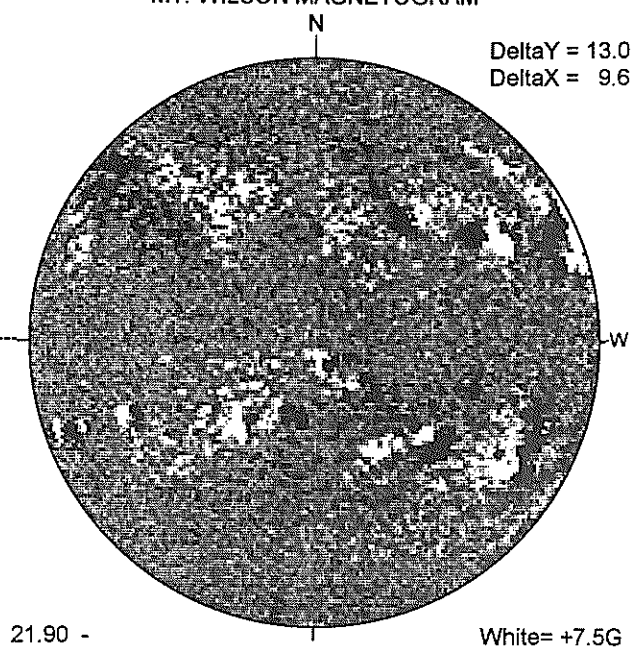


1450 UT

STANFORD MAGNETOGRAM



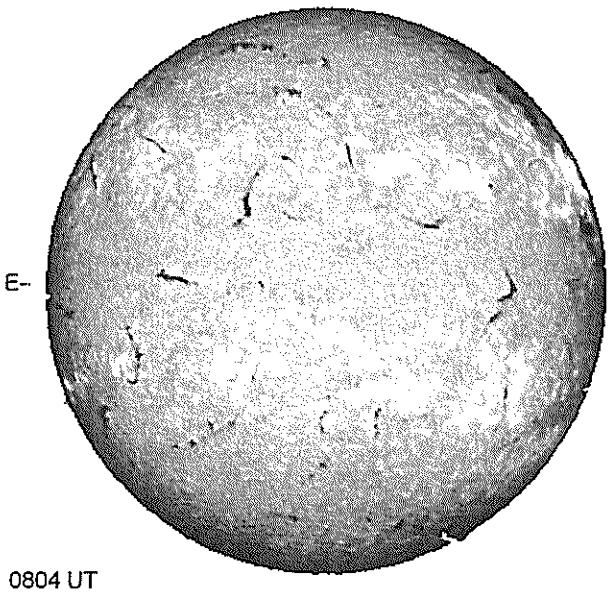
MT. WILSON MAGNETOGRAM



21.90 -
22.86 UT

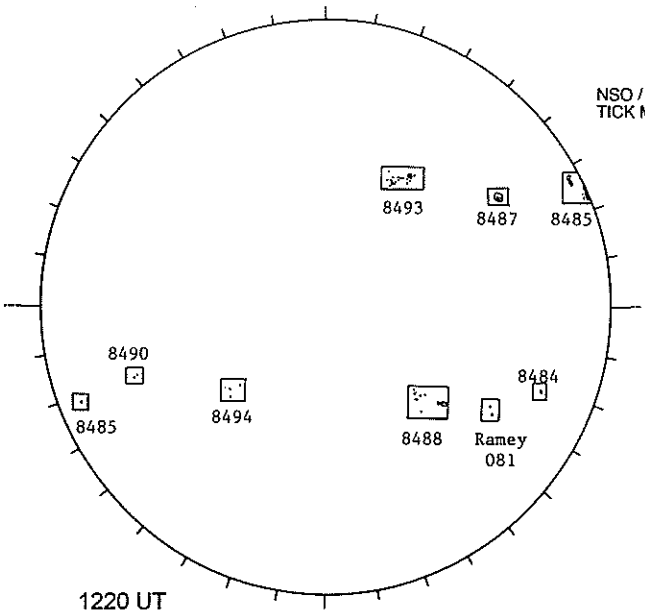
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



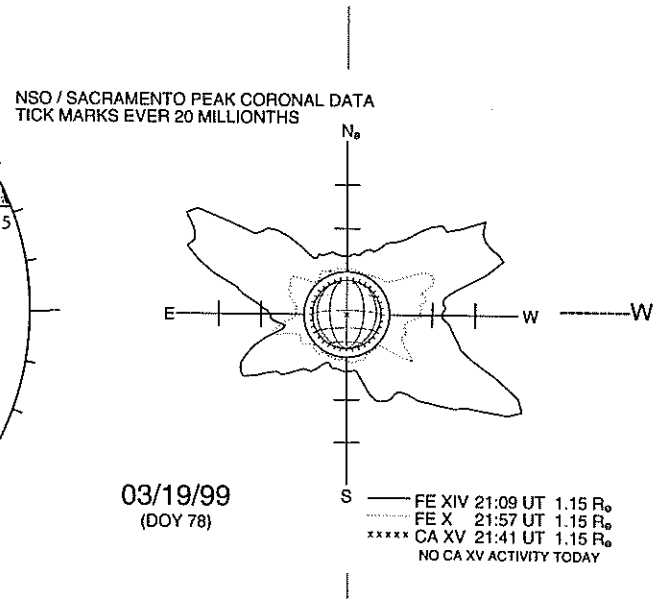
0804 UT

RAMEY SUNSPOT



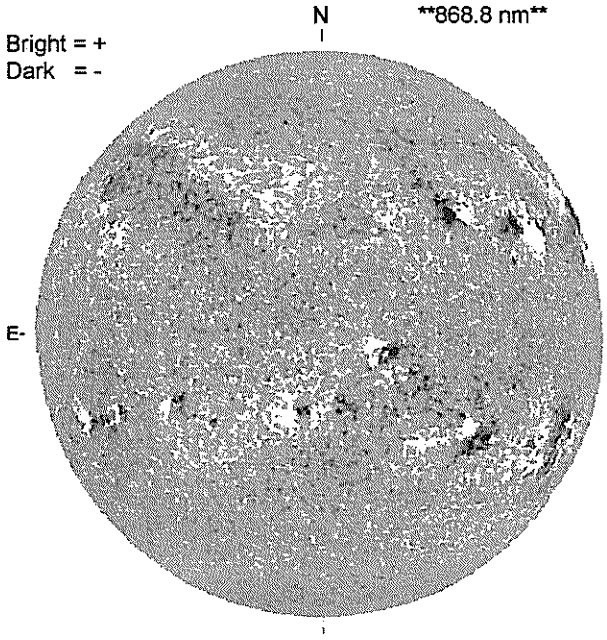
1220 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



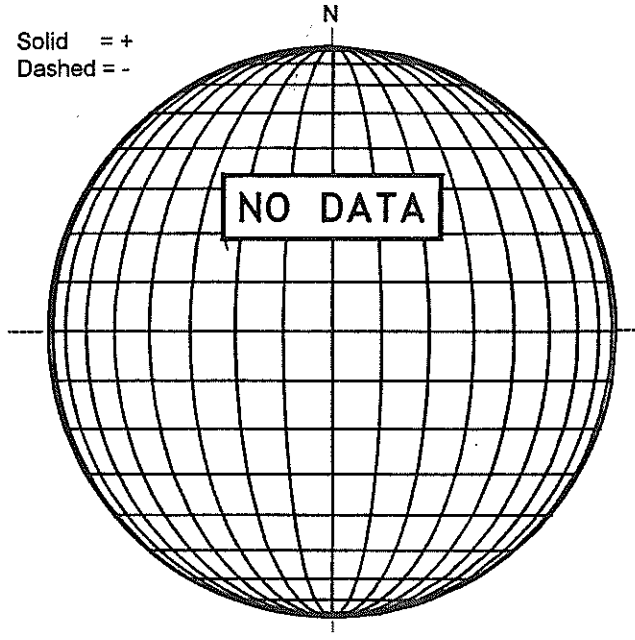
MARCH 20, 1999 (P= -25.10, Bo = -7.06, Lo = 198.29)

KITT PEAK MAGNETOGRAM

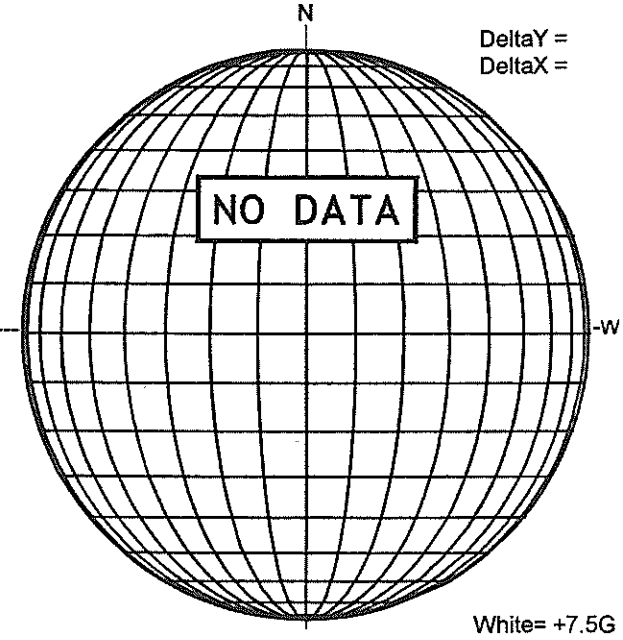


1453 UT

STANFORD MAGNETOGRAM

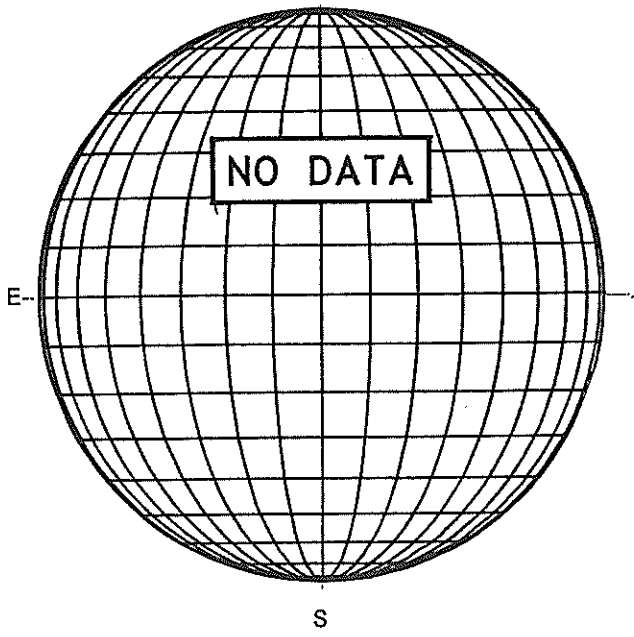


MT. WILSON MAGNETOGRAM

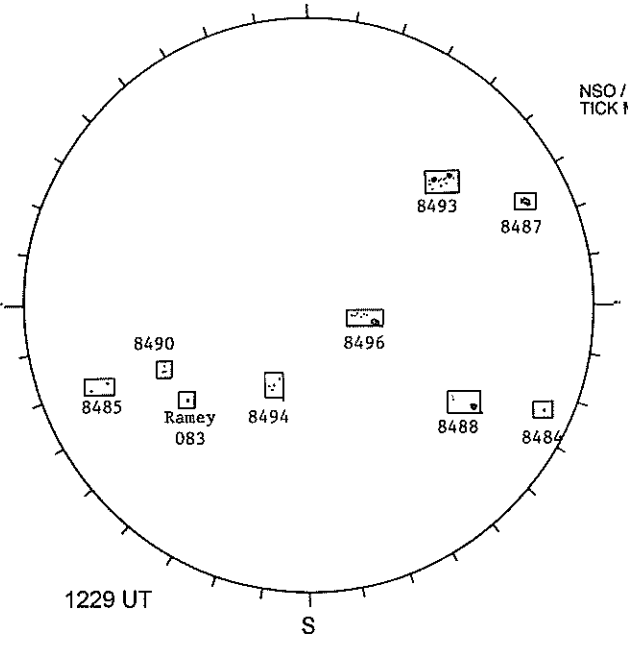


White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

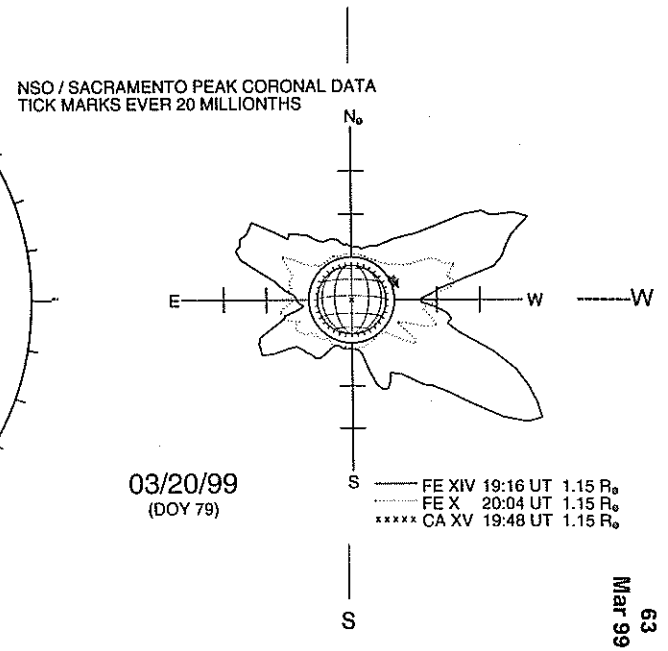


RAMEY SUNSPOT



1229 UT

SACRAMENTO PEAK CORONA (1.15 Radii)



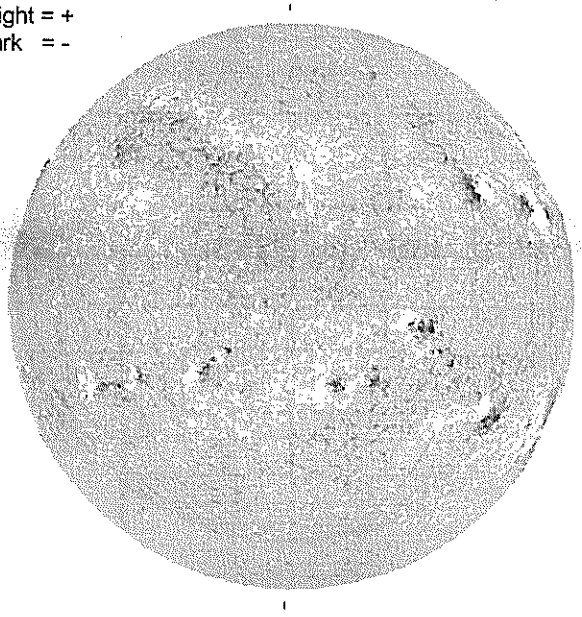
03/20/99
(DOY 79)

MARCH 21, 1999 (P= -25.22, Bo = -7.03, Lo = 185.11)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



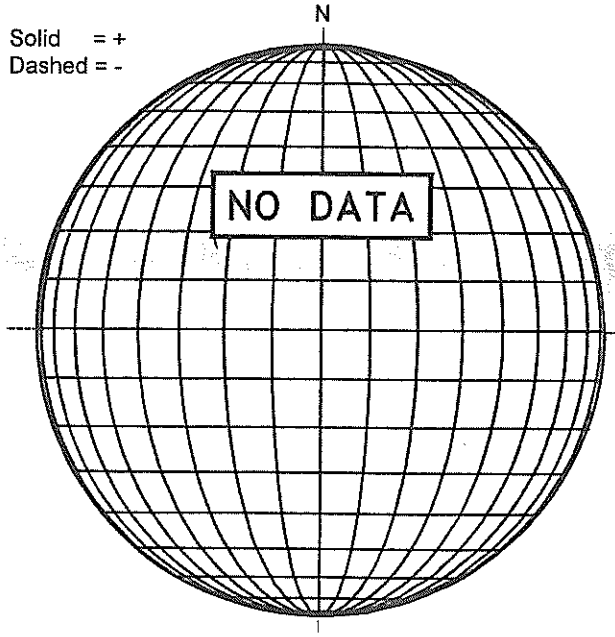
E--

1521 UT

STANFORD MAGNETOGRAM

N

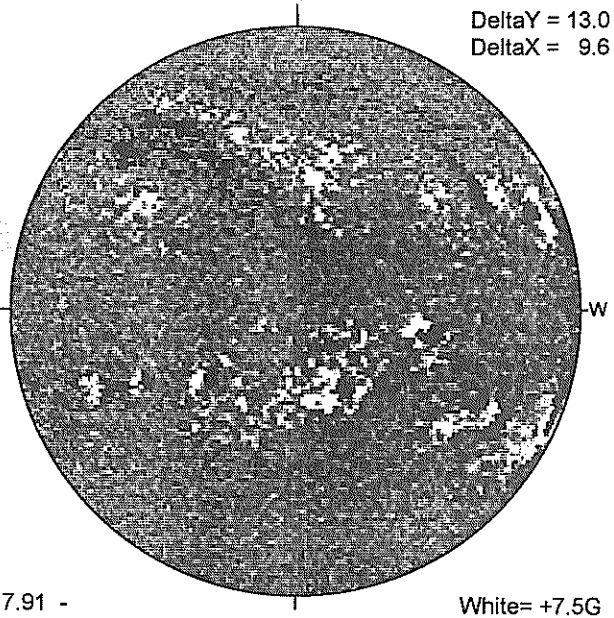
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.0
DeltaX = 9.6

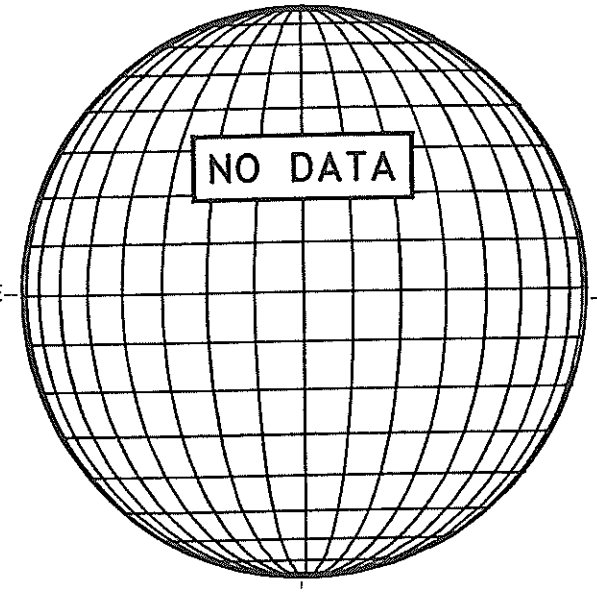


-W

17.91 -
18.86 UT

White= +7.5G
Black = -7.5G

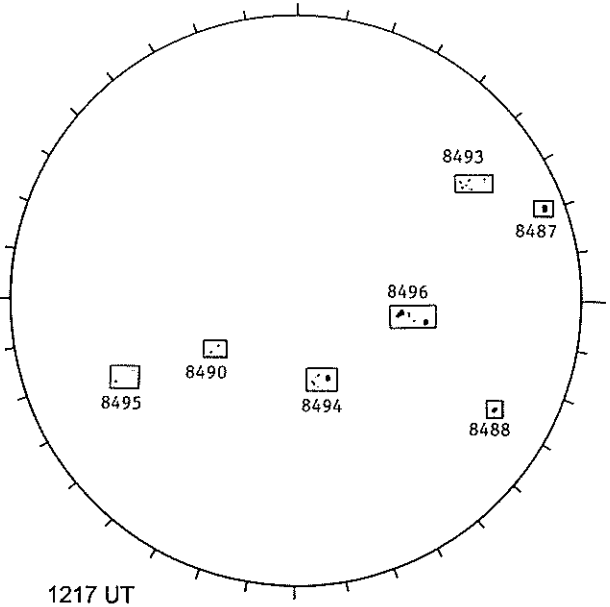
MEUDON H-ALPHA



E-

S

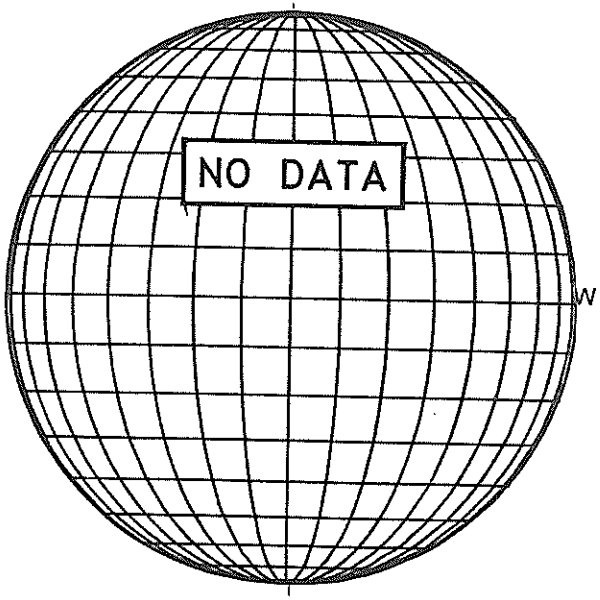
RAMEY SUNSPOT



1217 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

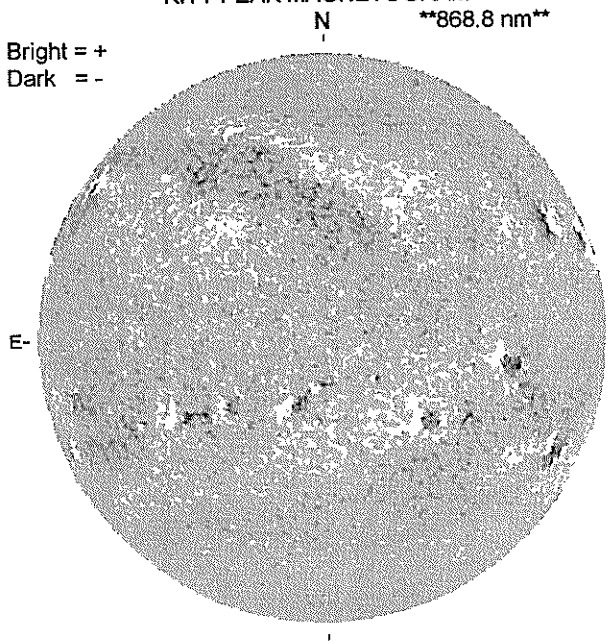


W

S

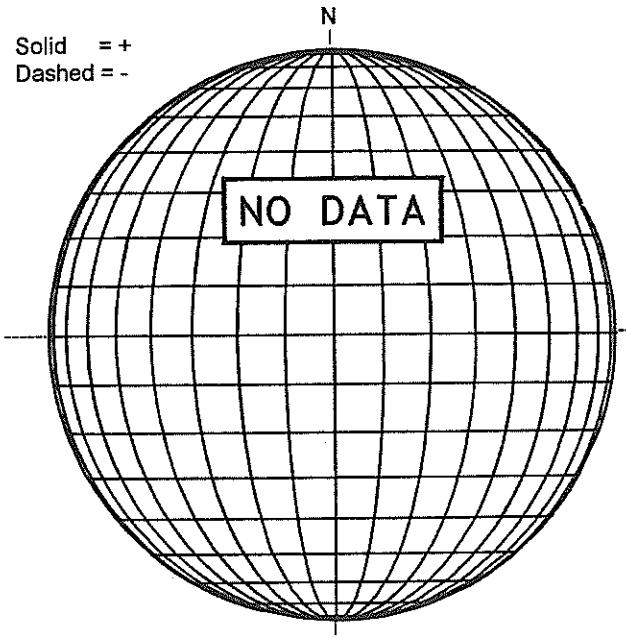
MARCH 22, 1999 (P= -25.34, Bo = -7.00, Lo = 171.93)

KITT PEAK MAGNETOGRAM

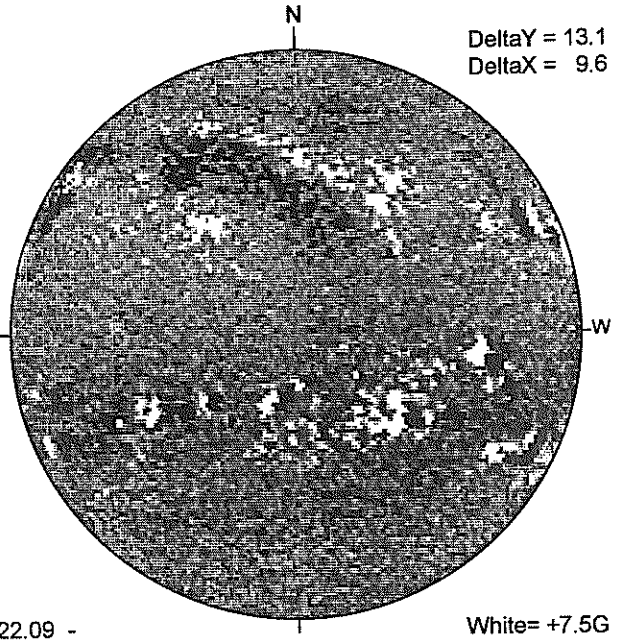


1722 UT

STANFORD MAGNETOGRAM



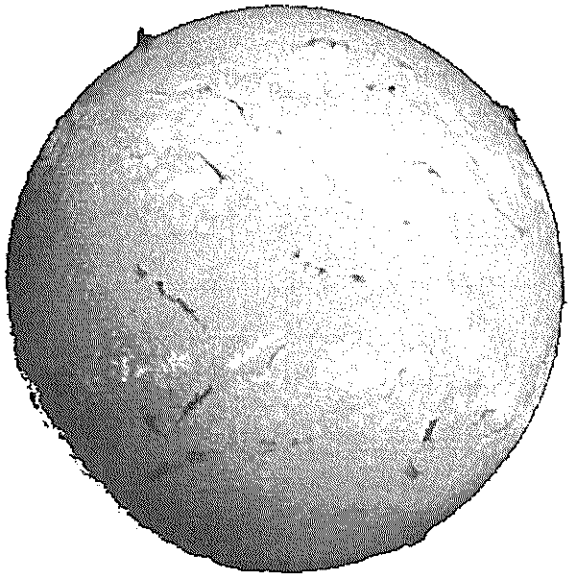
MT. WILSON MAGNETOGRAM



22.09 -
23.04 UT

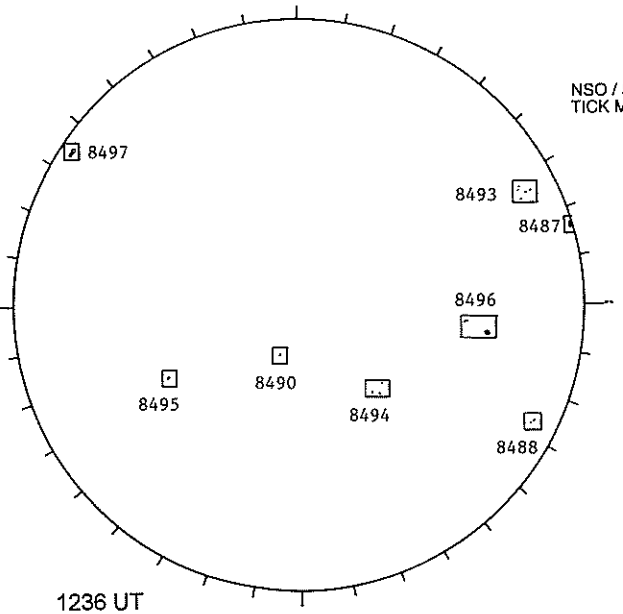
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



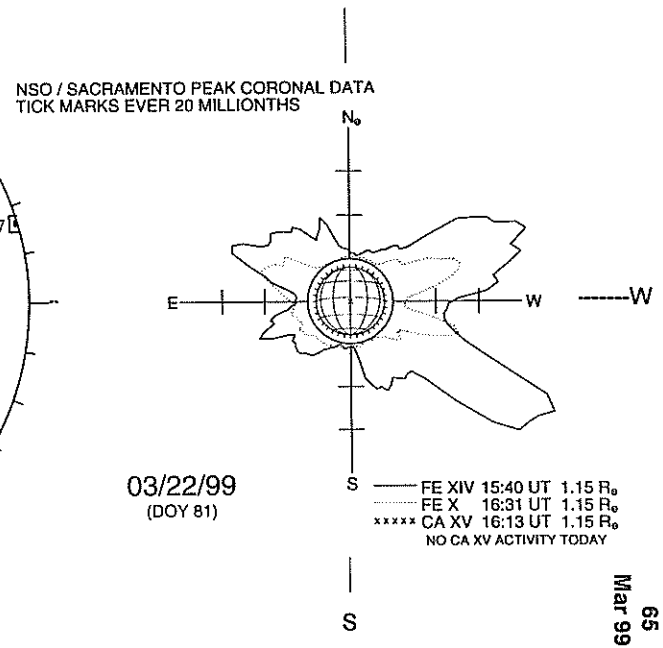
1323 UT

RAMEY SUNSPOT



1236 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



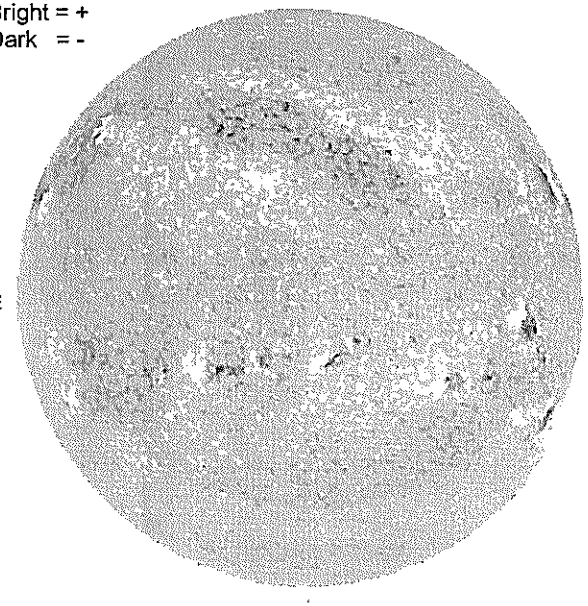
MARCH 23, 1999 (P= -25.45, Bo = -6.96, Lo = 158.74)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



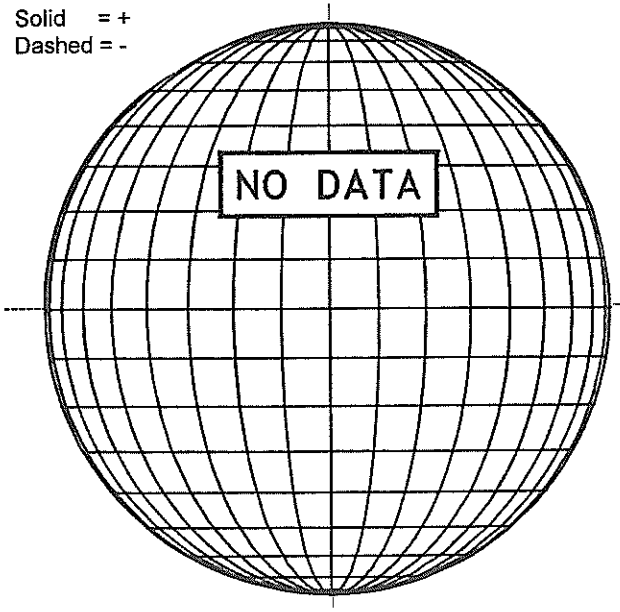
E

1552 UT

STANFORD MAGNETOGRAM

N

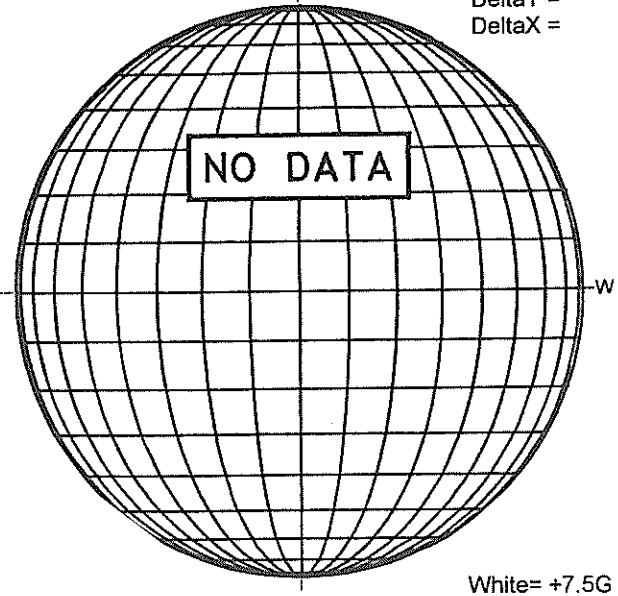
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

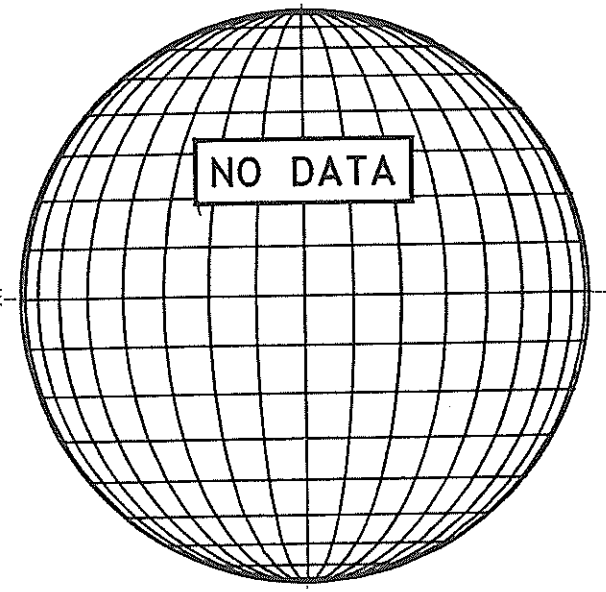
DeltaY =
DeltaX =



W

White= +7.5G
Black = -7.5G

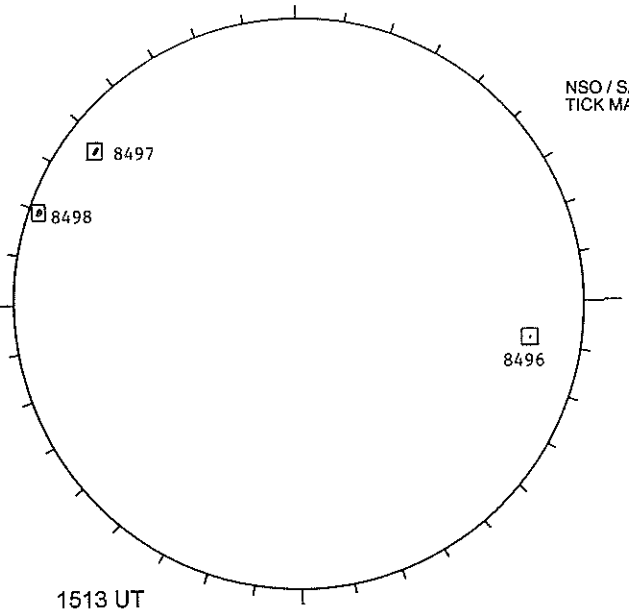
---- MEUDON H-ALPHA



E

S

RAMEY SUNSPOT

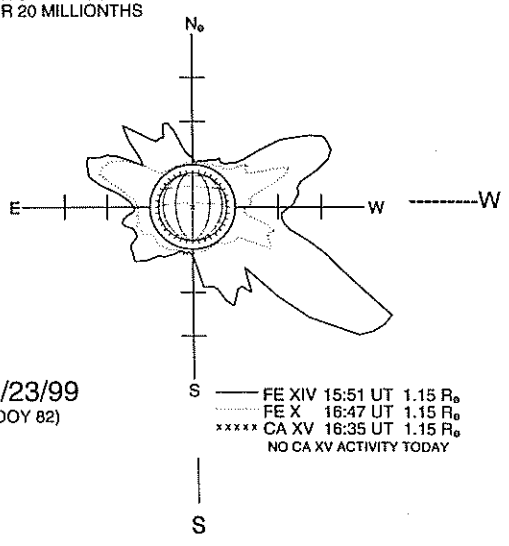


1513 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



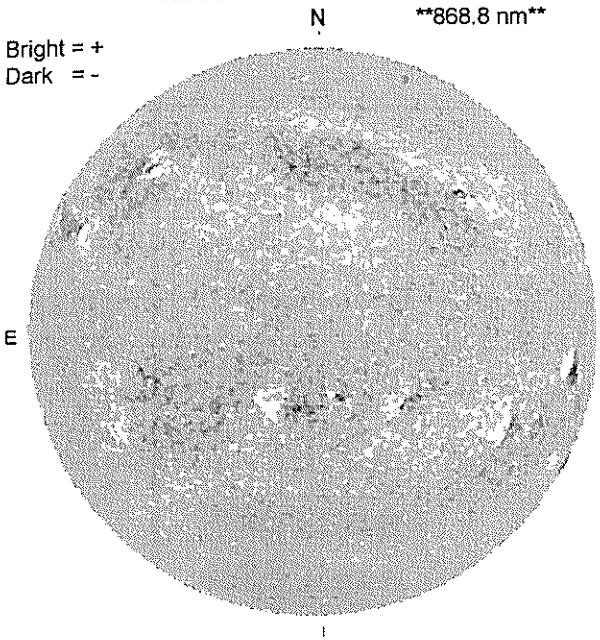
03/23/99
(DOY 82)

FE XIV 15:51 UT 1.15 $R_\odot$
FE X 16:47 UT 1.15 $R_\odot$
CA XV 16:35 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

S

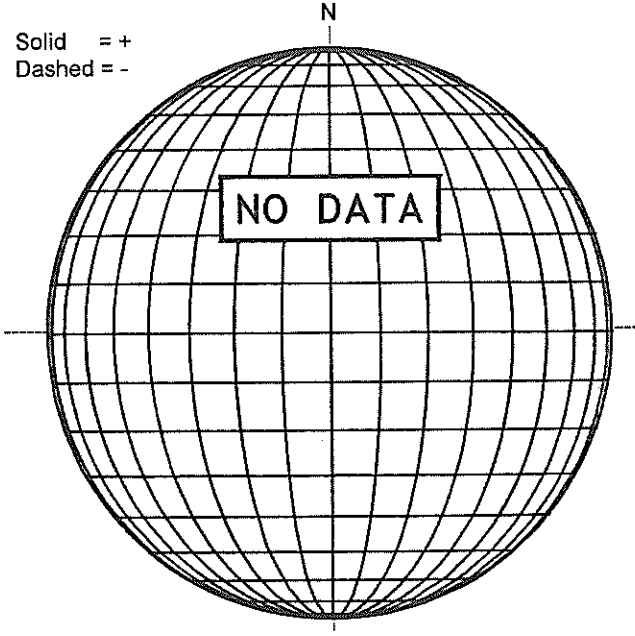
MARCH 24, 1999 (P= -25.56, Bo = -6.93, Lo = 145.56)

KITT PEAK MAGNETOGRAM

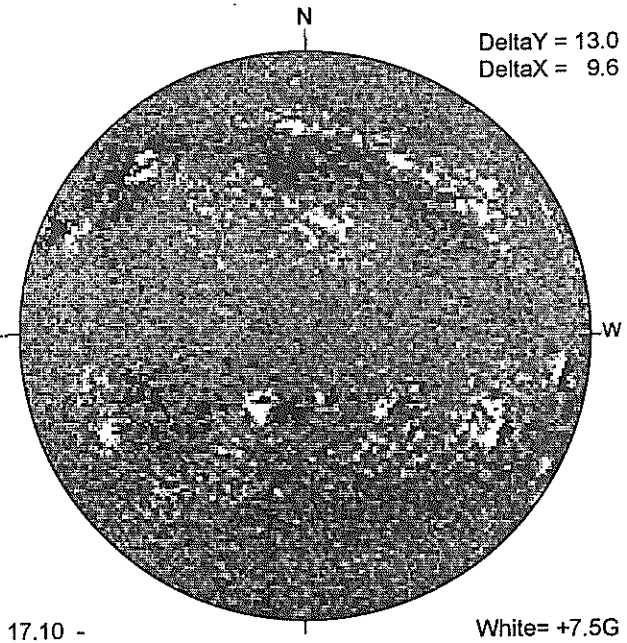


1742 UT

STANFORD MAGNETOGRAM



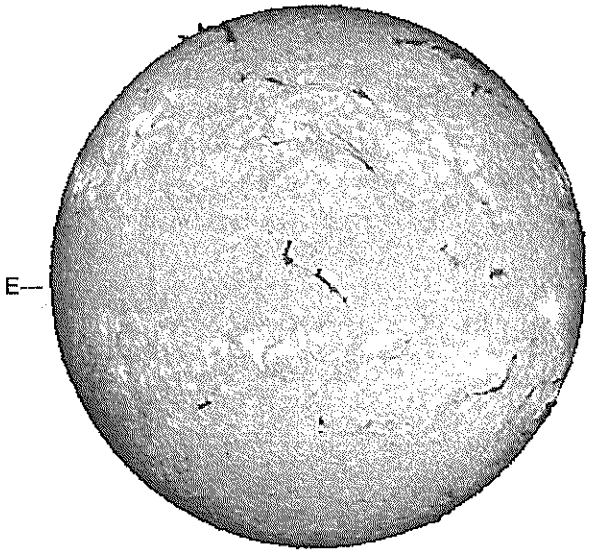
MT. WILSON MAGNETOGRAM



17.10 -
18.06 UT

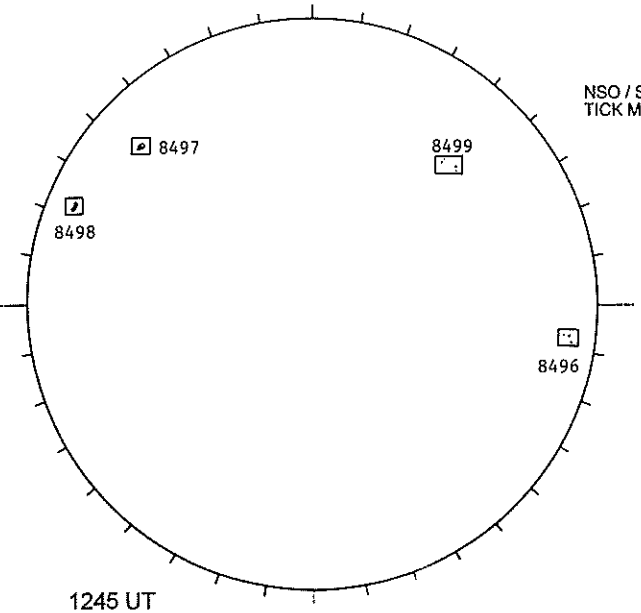
White= +7.5G
Black = -7.5G

----- MEUDON H-ALHPA



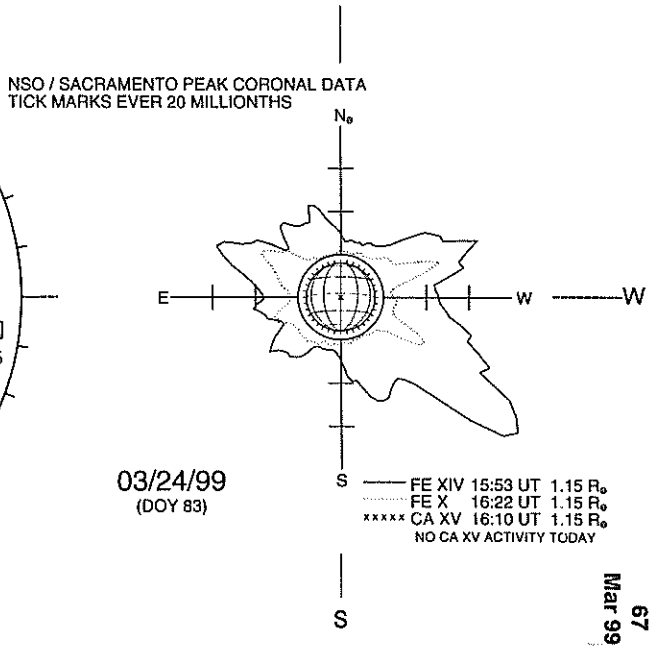
0854 UT

RAMEY SUNSPOT



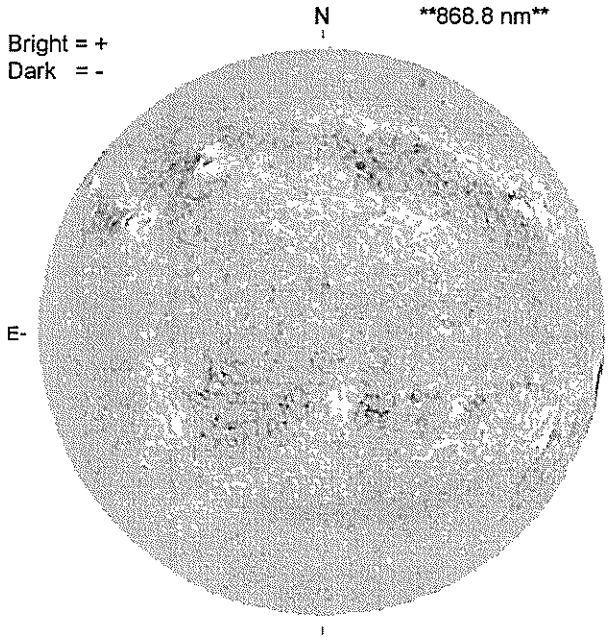
1245 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



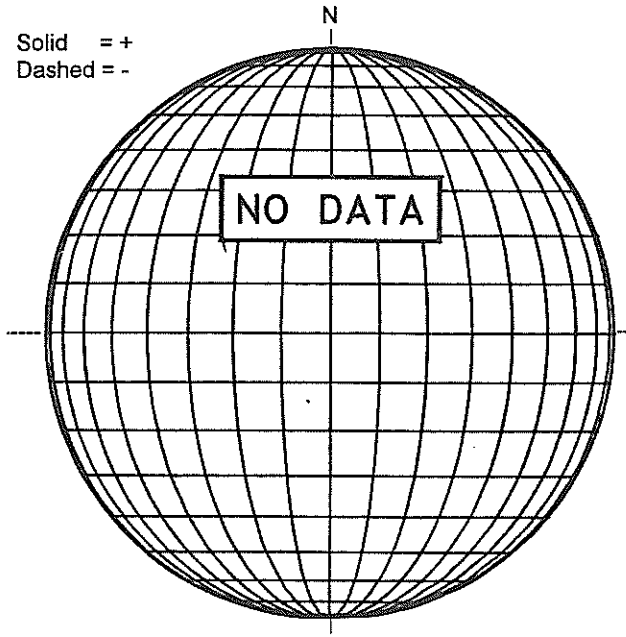
MARCH 25, 1999 (P= -25.66, Bo = -6.89, Lo = 132.37)

KITT PEAK MAGNETOGRAM

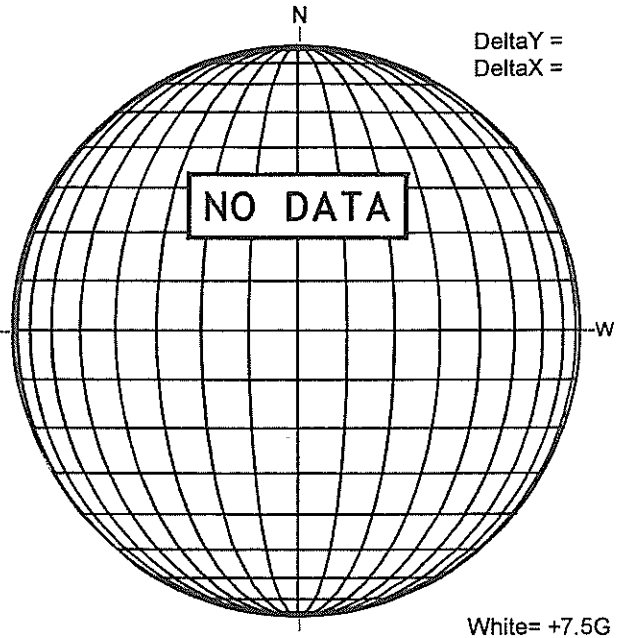


1836 UT

STANFORD MAGNETOGRAM

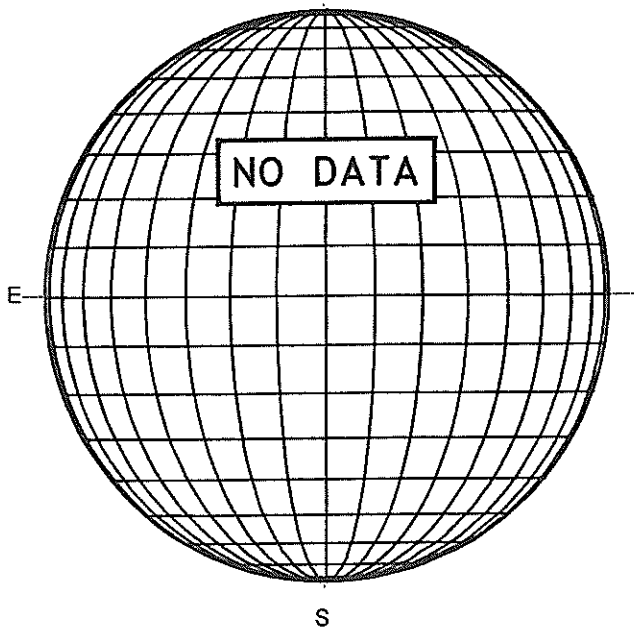


MT. WILSON MAGNETOGRAM

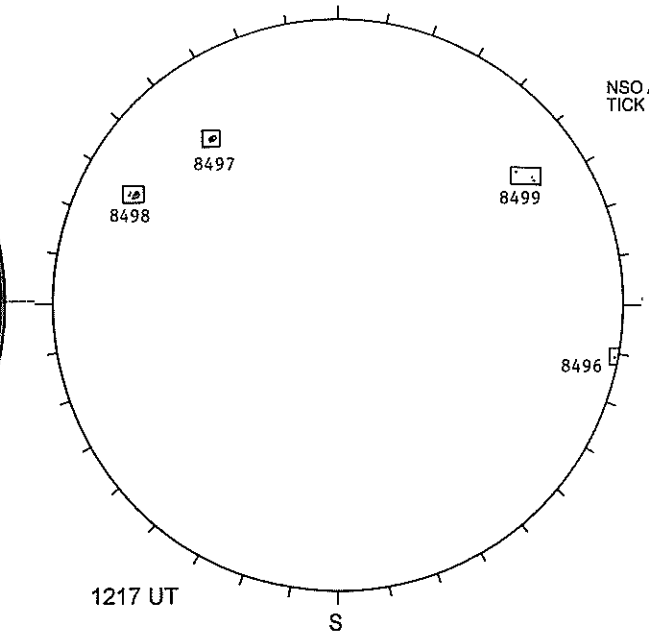


White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

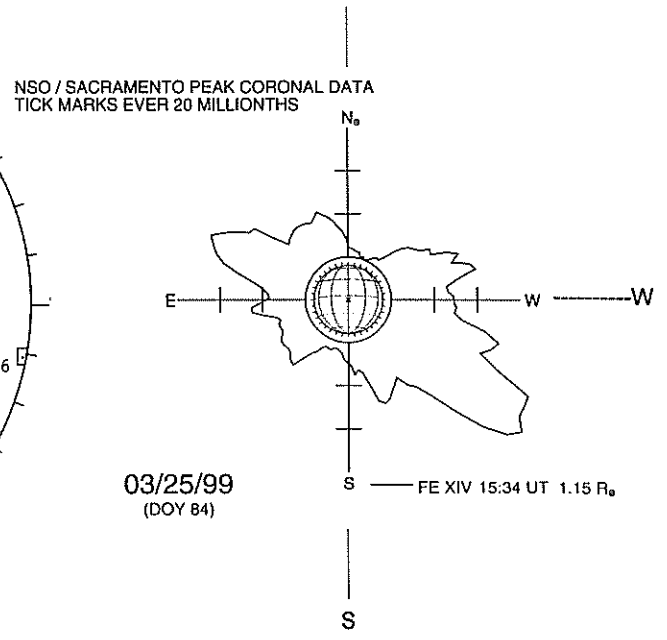


RAMEY SUNSPOT



1217 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

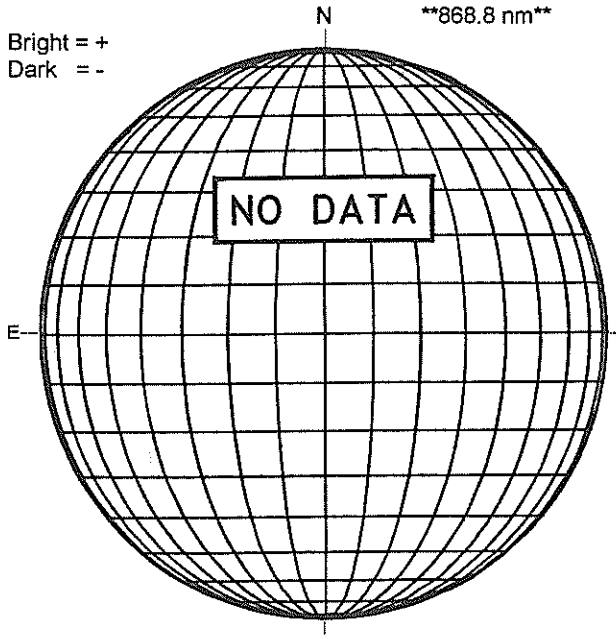


03/25/99
(DOY 84)

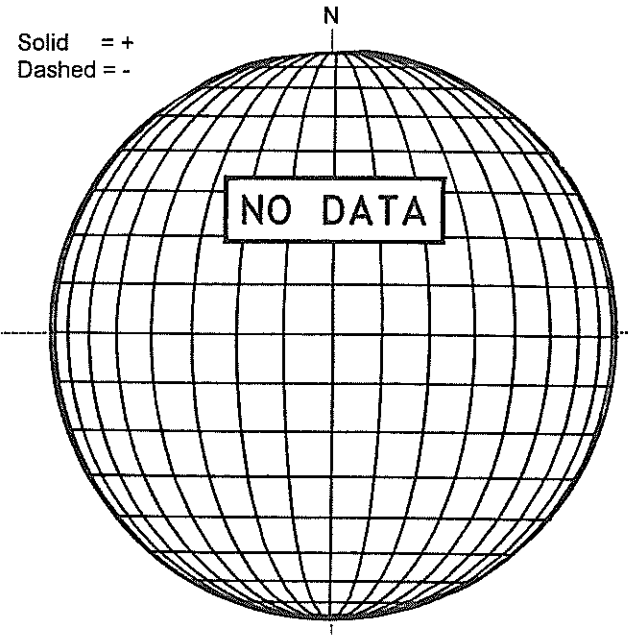
FE XIV 15:34 UT 1.15 $R_\odot$

MARCH 26, 1999 (P= -25.75, Bo = -6.85, Lo = 119.18)

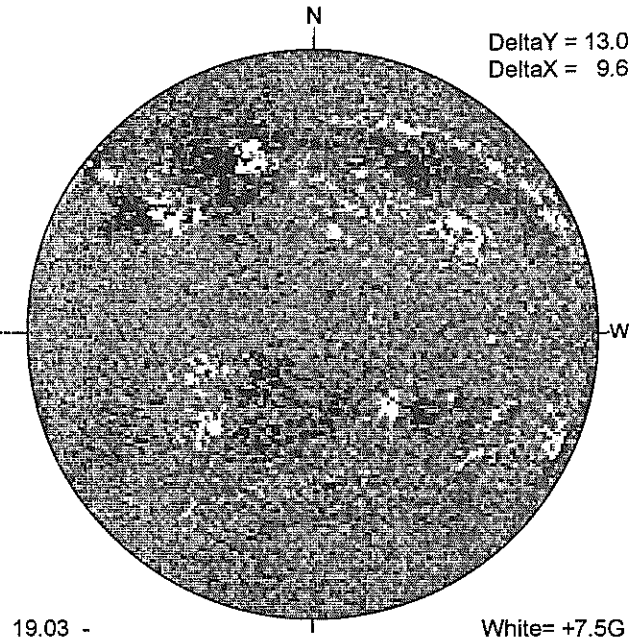
KITT PEAK MAGNETOGRAM



STANFORD MAGNETOGRAM



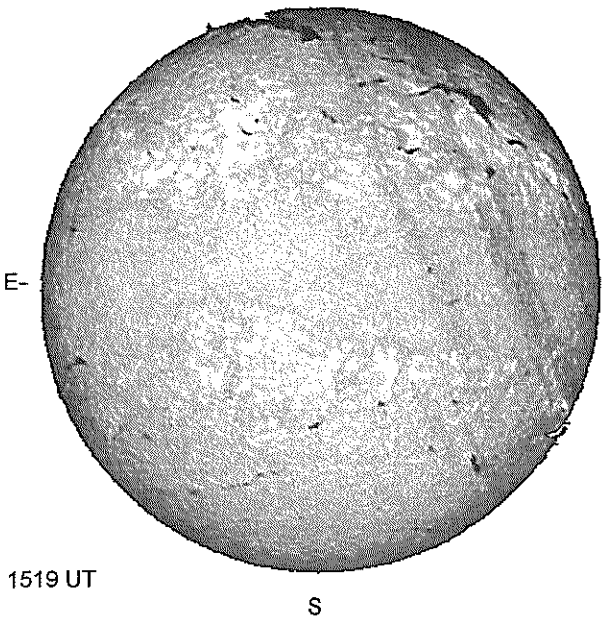
MT. WILSON MAGNETOGRAM



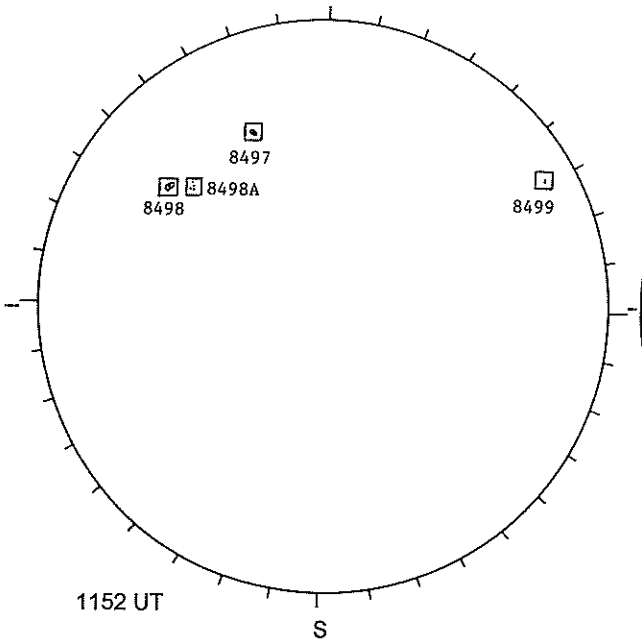
19.03 -
19.99 UT

White= +7.5G
Black = -7.5G

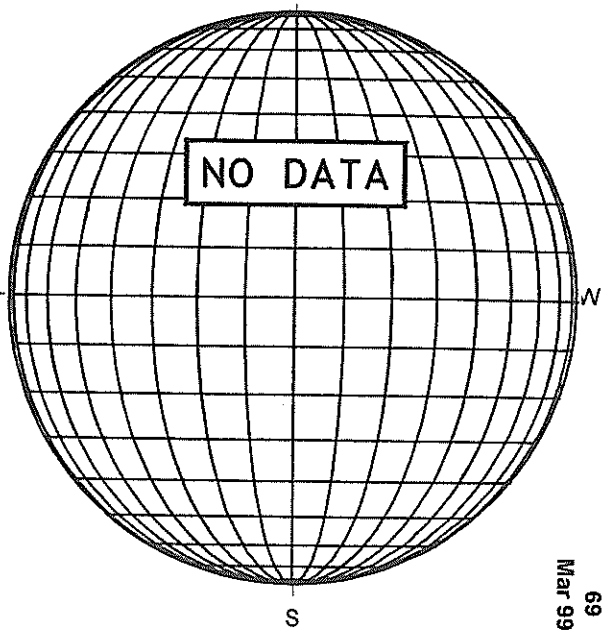
MEUDON H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----



69
Mar 99

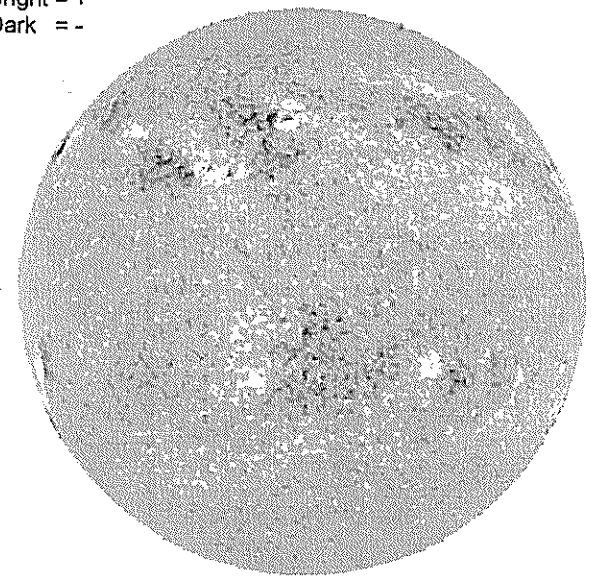
MARCH 27, 1999 (P= -25.83, Bo = -6.81, Lo = 106.00)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



E

1604 UT

STANFORD MAGNETOGRAM

N

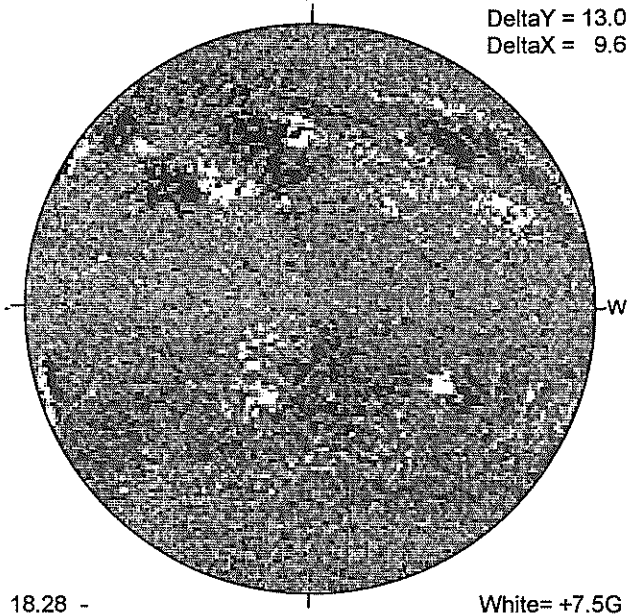
Solid = +
Dashed = -

2130 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.0
DeltaX = 9.6

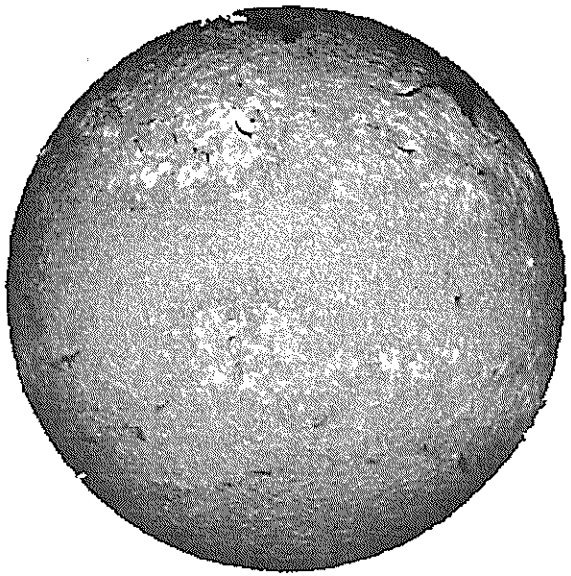


W

18.28 -
19.23 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

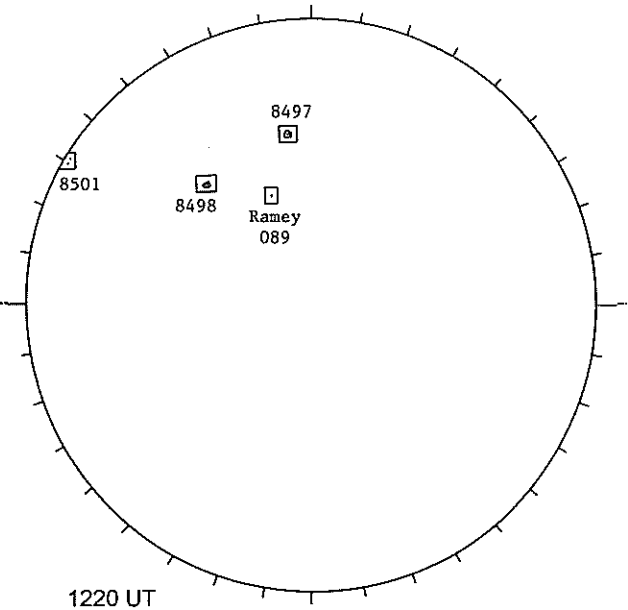


E-

0727 UT

S

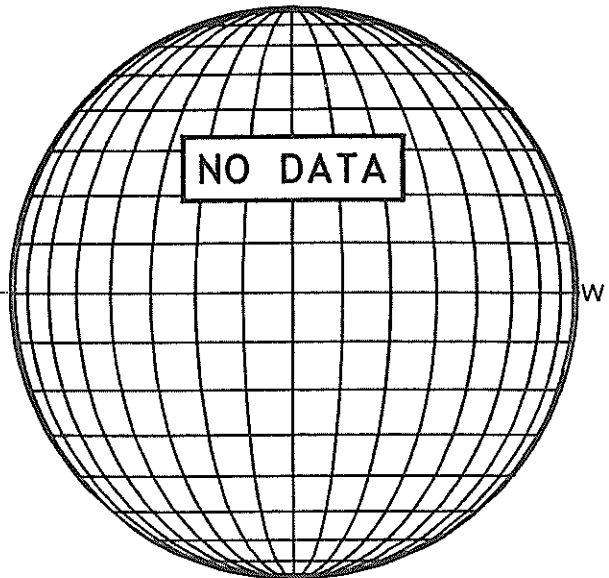
RAMEY SUNSPOT



1220 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

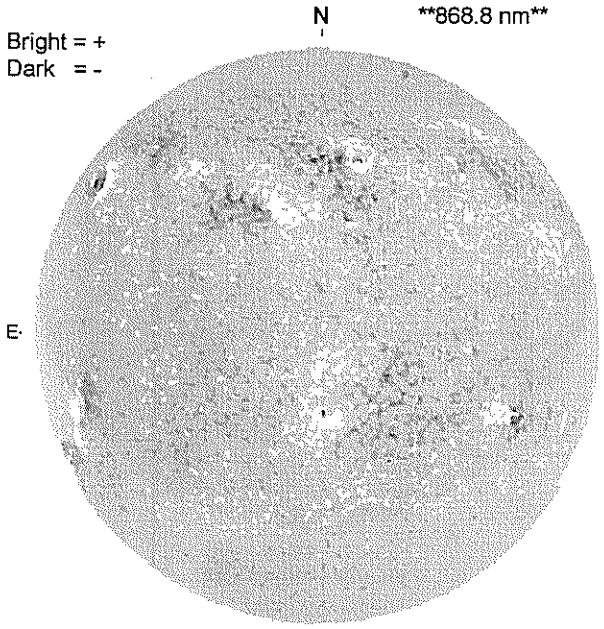


W

S

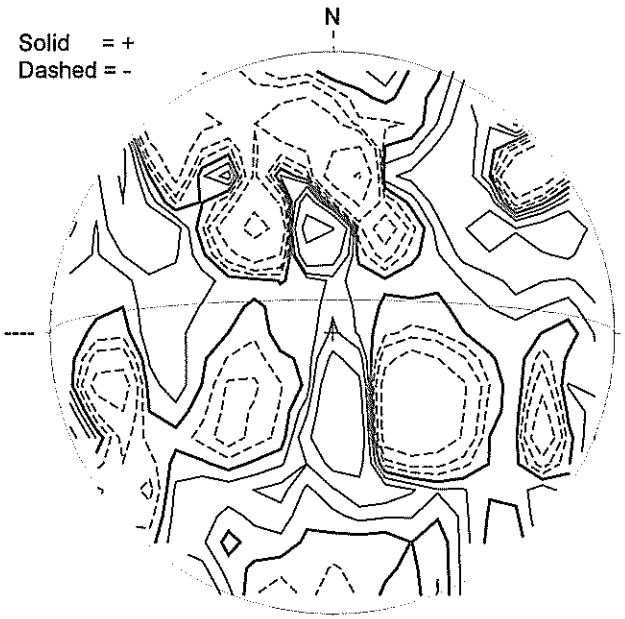
MARCH 28, 1999 (P= -25.91, Bo = -6.76, Lo = 92.81)

KITT PEAK MAGNETOGRAM



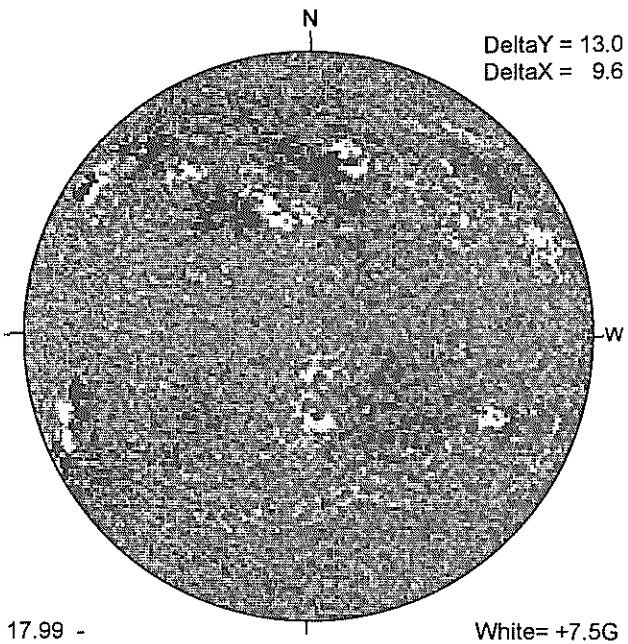
1649 UT

STANFORD MAGNETOGRAM



1909 UT

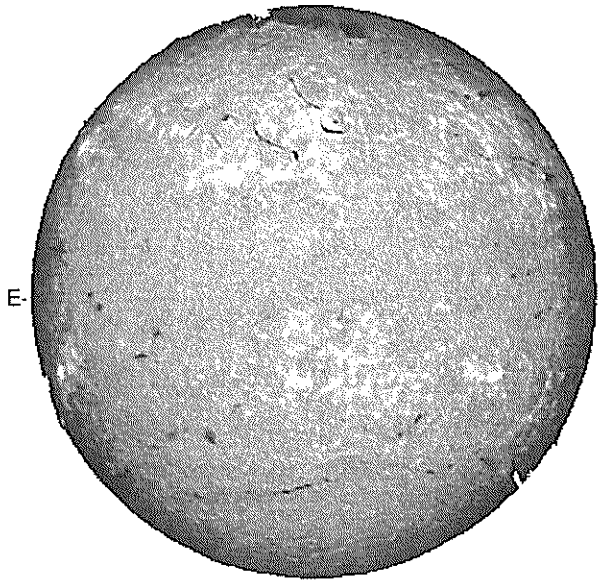
MT. WILSON MAGNETOGRAM



17.99 -
18.95 UT

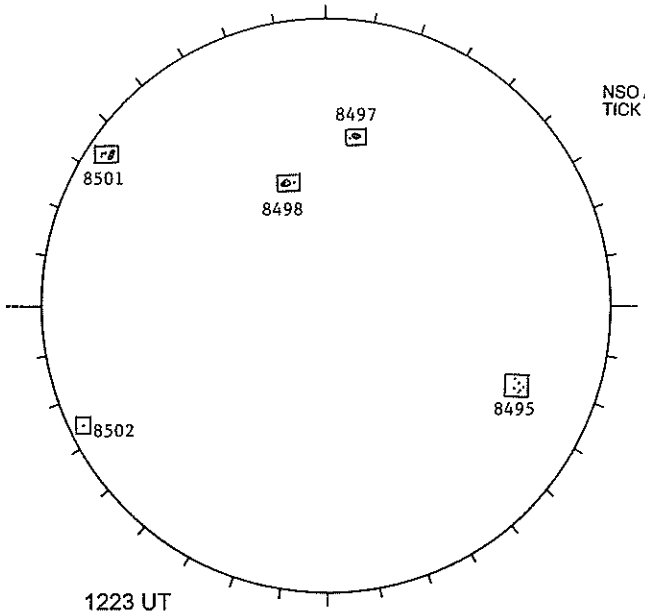
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



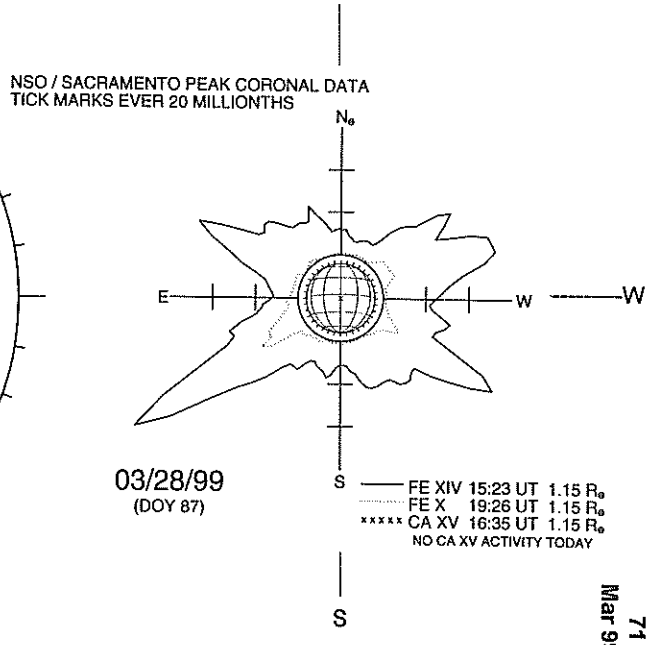
0746 UT

RAMEY SUNSPOT



1223 UT

SACRAMENTO PEAK CORONA (1.15 Radii)



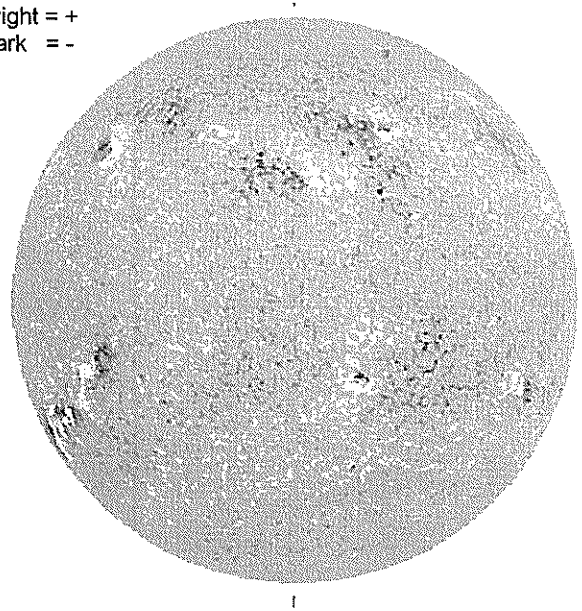
71
Mar 99

MARCH 29, 1999 (P= -25.98, Bo = -6.71, Lo = 79.62)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



1555 UT

STANFORD MAGNETOGRAM

N

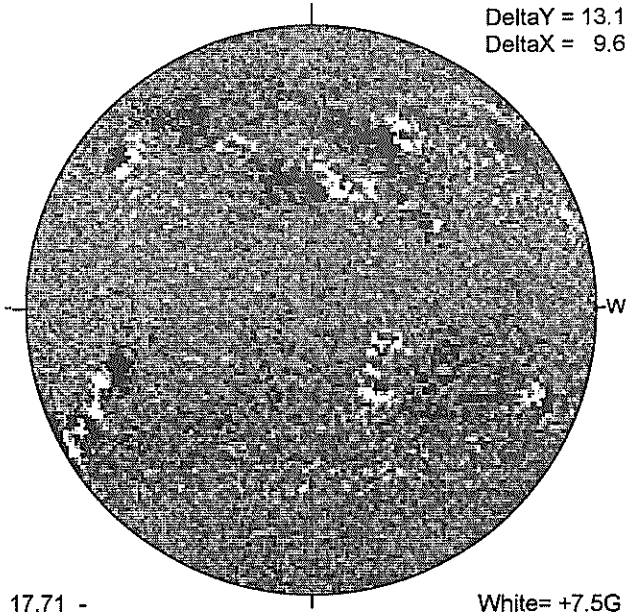
Solid = +
Dashed = -

2307 UT

MT. WILSON MAGNETOGRAM

N

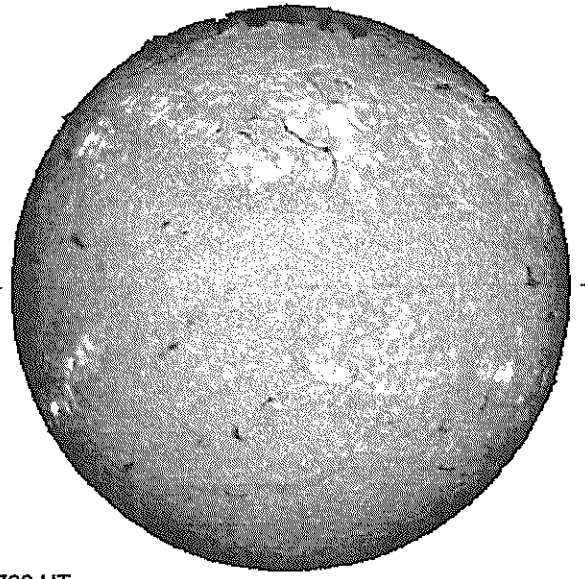
DeltaY = 13.1
DeltaX = 9.6



17.71 -
18.66 UT

White= +7.5G
Black = -7.5G

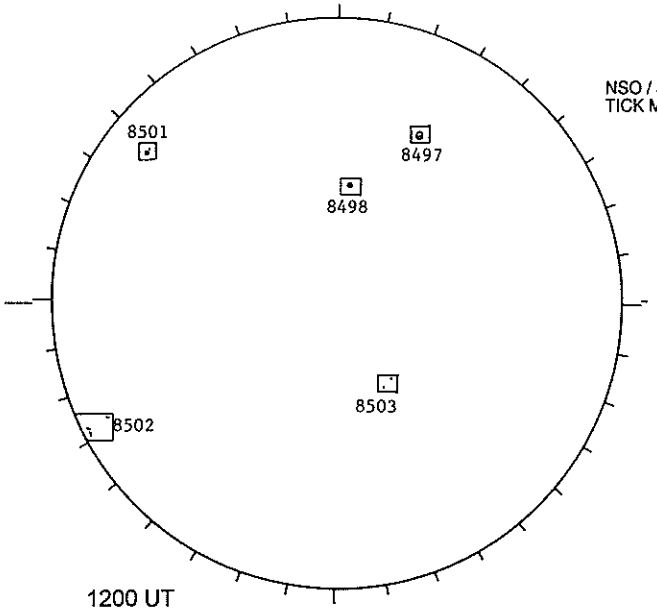
MEUDON H-ALPHA



0700 UT

S

RAMEY SUNSPOT

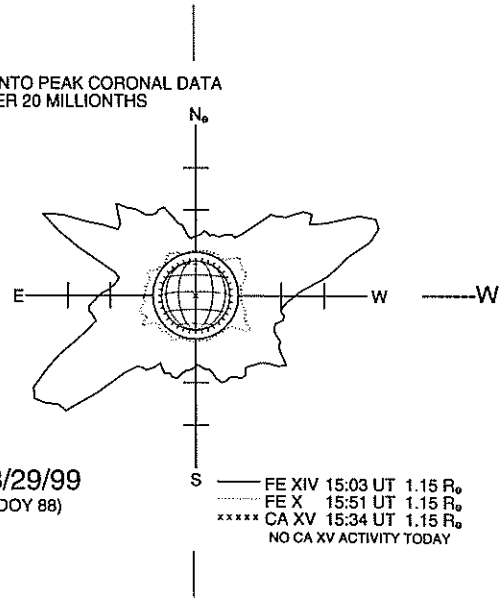


1200 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



03/29/99
(DOY 88)

FE XIV 15:03 UT 1.15 $R_\odot$
FE X 15:51 UT 1.15 $R_\odot$
CA XV 15:34 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

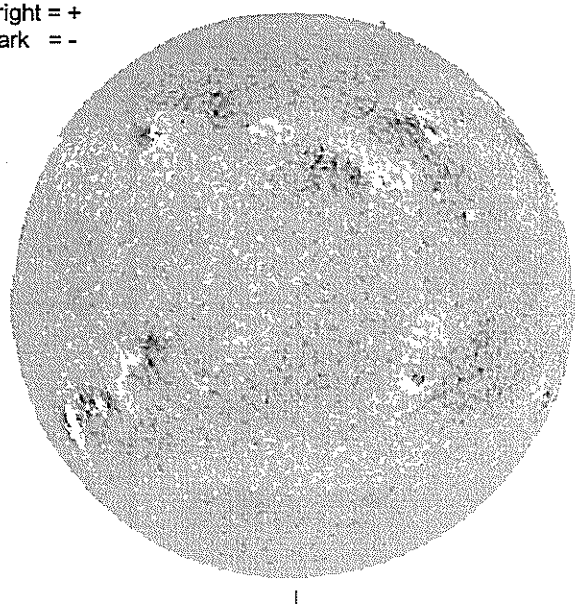
S

MARCH 30, 1999 (P= -26.05, Bo = -6.67, Lo = 66.43)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



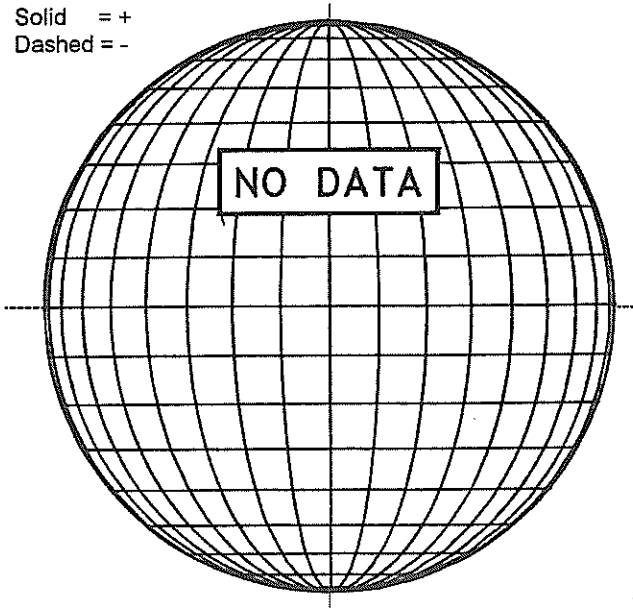
E-

1703 UT

STANFORD MAGNETOGRAM

N

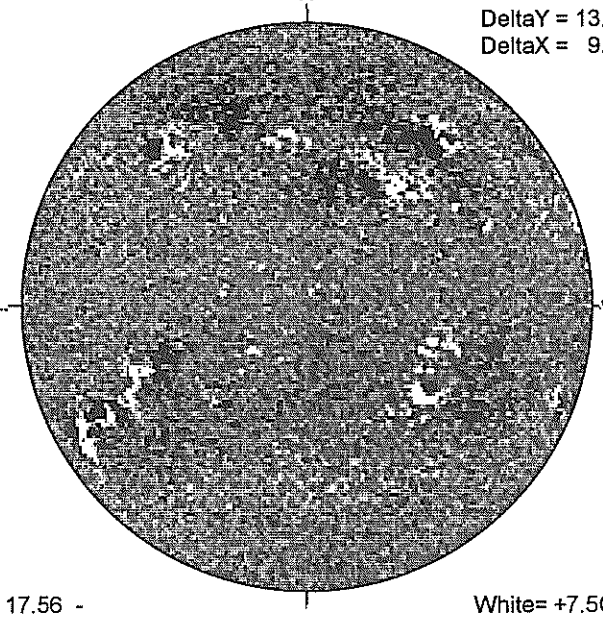
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.0
DeltaX = 9.6

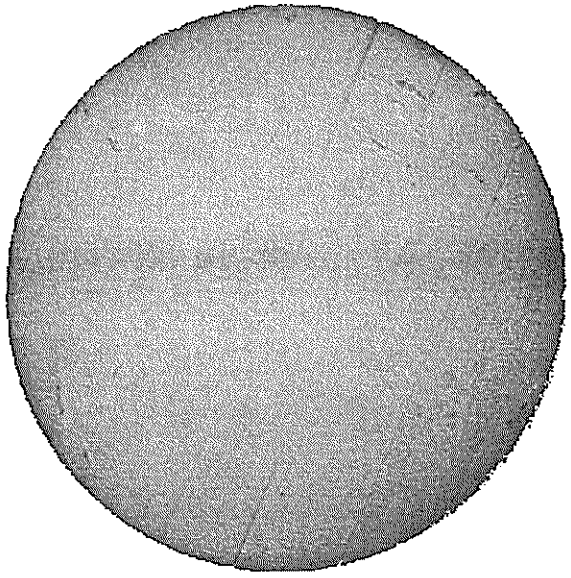


-W

17.56 -
18.51 UT

White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA

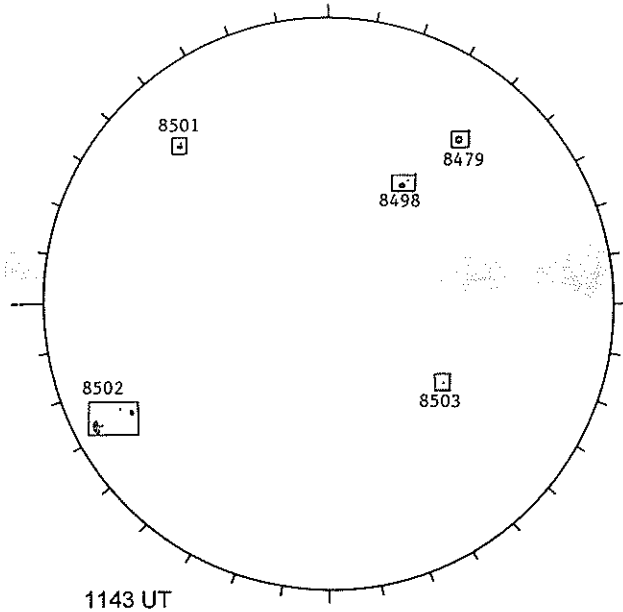


E--

1421 UT

S

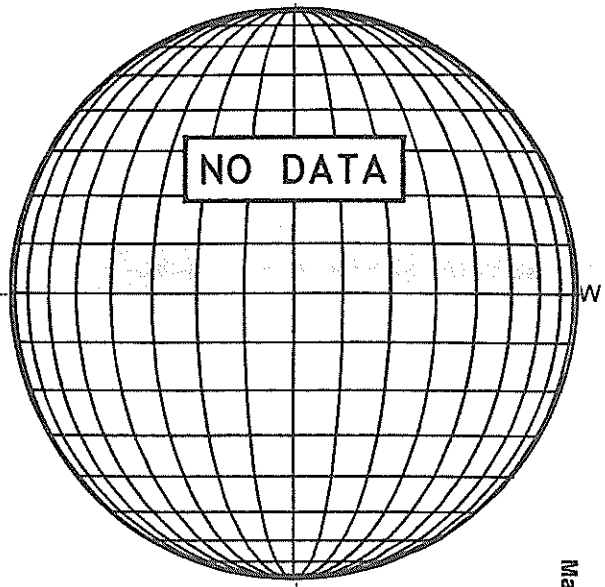
RAMEY SUNSPOT



1143 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----



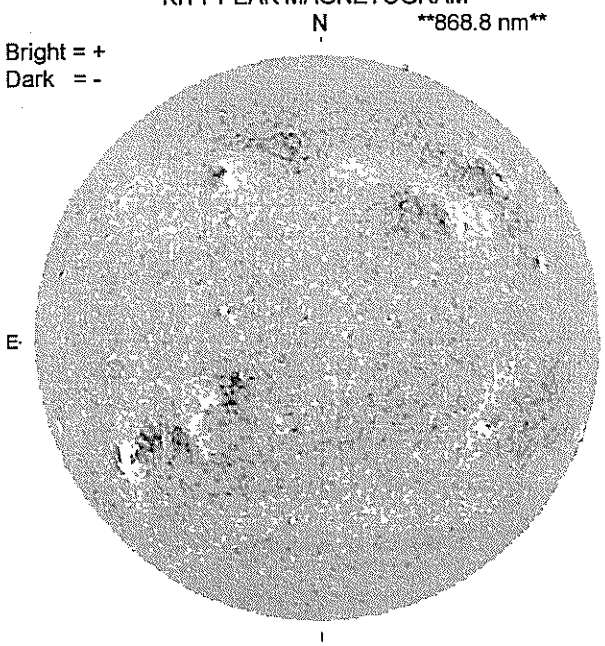
W

S

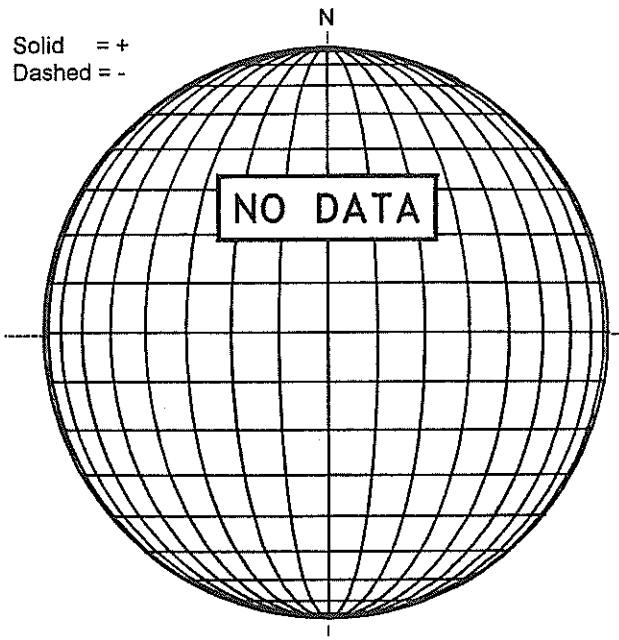
73
Mar 99

MARCH 31, 1999 (P= -26.10, Bo = -6.62, Lo = 53.24)

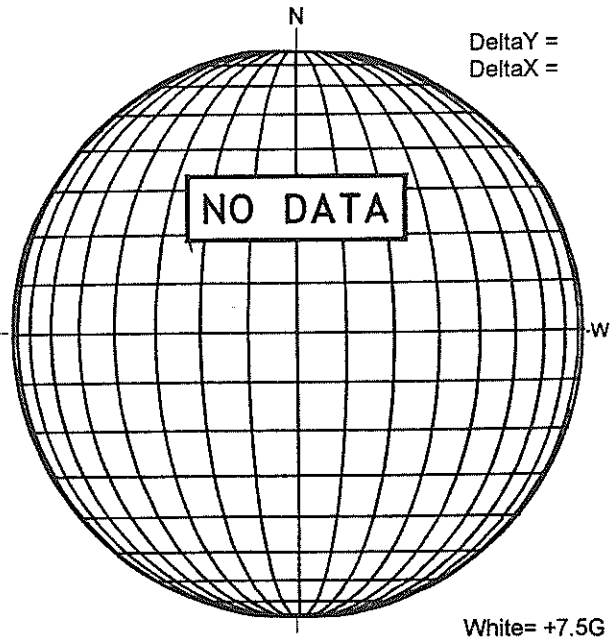
KITT PEAK MAGNETOGRAM



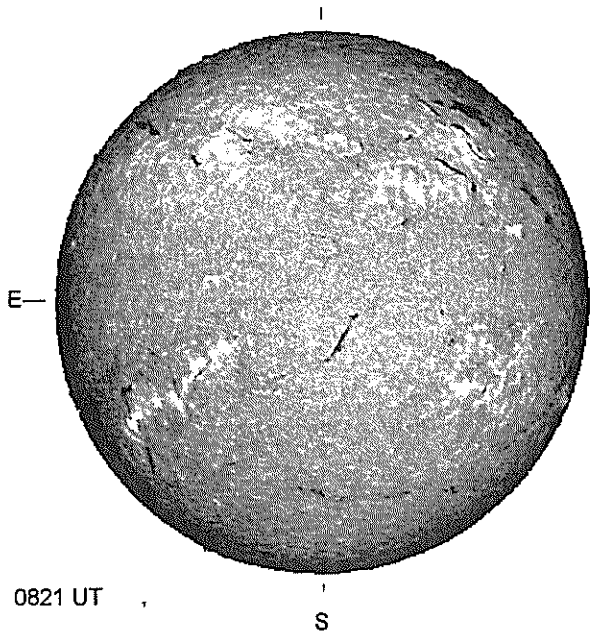
STANFORD MAGNETOGRAM



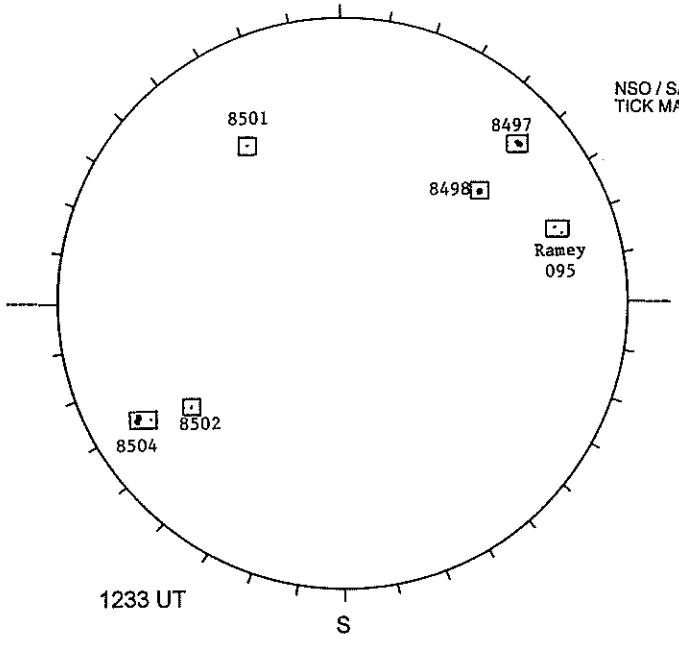
MT. WILSON MAGNETOGRAM



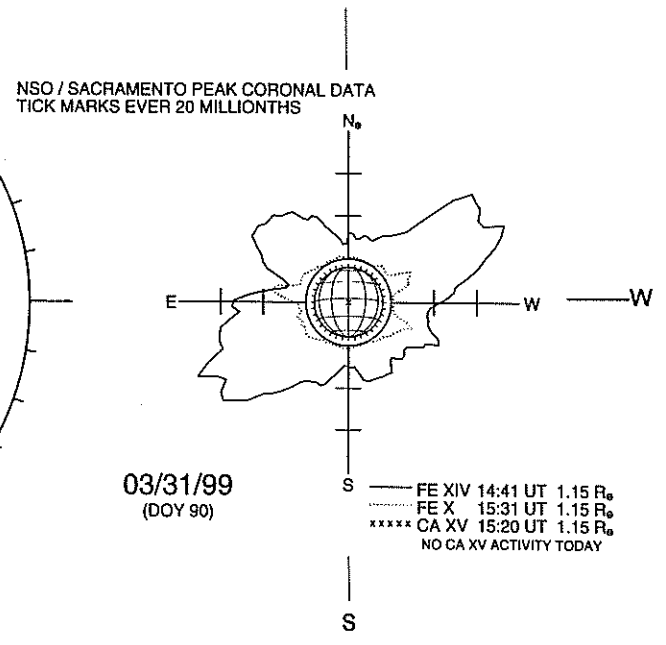
MEUDON H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



DAILY SOFT X-RAY IMAGES FROM YOHKOH

SXT daily images are on-line via ftp at the Hiraiso Communications Research Laboratory in Japan and at the Solar Data Analysis Center at GSFC. The following document explains everything.

Daily YOHKOH/SXT Images by FTP

This document explains the service which provides access to the daily Yohkoh Soft X-ray Telescope (SXT) full-disk images stored at Hiraiso Solar Terrestrial Research Center, C.R.L. Before using this service, please read this document.

1. Purpose and Rules

This service is provided by CRL under the following agreement with the Yohkoh Team (Project Manager: Yoshiaki Ogawara, ISAS; Project Scientist: Yutaka Uchida, Univ. Tokyo). Those who wish to use the data in a way not explicitly permitted below are requested to contact the Yohkoh Team.

i) The main purpose of this data service is to encourage broad scientific use of the Yohkoh data and observing capability through collaboration with the Yohkoh Team. Both observational and theoretical collaborations are welcome. Scientists outside the Yohkoh Team are requested to obtain specific permission when they write scientific papers based upon data from this service.

ii) Solar images from this service may be published or presented for purposes of illustration without special permission. In such cases the following acknowledgment is appropriate:

The solar X-ray image is from the Yohkoh mission of ISAS, Japan. The X-ray telescope was prepared by the Lockheed Palo Alto Research Laboratory, the National As tronomical Observatory of Japan, and the University of Tokyo with the support of NASA and ISAS.

iii) This data service is also intended to contribute to improving solar activity prediction, to assist other solar observers in their choice of targets, and for public education and information. Use of the images for these purposes is unrestricted.

2. Instrument

A full description of the SXT may be found in the book "The YOHKOH (SOLAR-A) Mission" (Z. Svestka and Y. Uchida, eds.), Kluwer Academic Publishers, 1991; or in the paper, "The Soft X-ray Telescope for the Solar-A Mission" (Tsuneta, et al. Solar Physics, vol. 136, pp. 37-67, 1991.

3. Description of Data

The stored SXT images data are taken through an Al/Mg composite filter with a mean wavelength of about 20 A for normal coronal temperatures. The images are composites of a short and a long exposure with a pixel size of 4.9 arcsec. Background has been removed and all images are normalized to an

exposure time of one second. The 8-bit numbers give the logarithm of the signal byte- scaled so that an actual signal of 10^6 equals 255. To recover the actual signal in data numbers, use the relation

data_number = 10^((6*NN)/255)

where NN is the datum in the stored image. Conversion to intensity depends upon temperature but is of the order of 5 x 10^20 ergs, at the Sun, per data_number.

The file format is the usual FITS format. The file names are in the style

sf_fits930515.151807,

where sf means SXT FFI image ,"930515" means 15-May-93, and "151807" means 15:18:07 UT.

4. How to connect and transfer data

Those who wish to access these data are requested to send an application to the manager of this data service via e-mail. At least, the following items should be included in an application;

* Full name
* Institution
* Postal Address
* e-mail address
* your host machine and OS
* software for SXT data processing and display
* expected frequency of data transfer

The format of the application is free. This information is necessary to deliver additional information and service in future, and helpful to update data service for more convenience. The application should be sent to the following address via e-mail;

akioka@planet.crl.go.jp
or akioka@planet.hi.crl.go.jp.

The data server is the usual anonymous ftp server program of UNIX. The IP address is 133.243.32.7. Therefore, a typical example for data access is ...

```
% ftp 133.243.32.7
name: anonymous
password : (your e-mail address)
ftp> cd sxt
ftp> binary
ftp> get <file name>
%
```

When you have logged in with the anonymous ftp account, you will find a directory named sxt. In this directory, you will find available sxt images and some documents which all users should read.

5. Practical Limitations

The domestic network in Japan is very crowded. Therefore, to assure continuation of this service we request potential users to follow the following limitations;

i) Please avoid to access during office hours in Japan (23:30 - 08:00 UT). Our advice is to access between 13:00 UT and 24:00 UT.

ii) Please do not try to transfer more than two images at once. We request the users not to obtain more than a few images per day. If you need more images, please contact the manager for special arrangements.

If the above rules are consistently violated, there is a possibility that we will have to terminate this service or apply more severe limitations, so please cooperate fully until we have more experience with the effect of this service upon the network.

If you have some request or comment, please feel free to send e-mail to one of the following persons:

Yutaka Uchida, Project Scientist, Yohkoh
Department of Astronomy, University of Tokyo
e-mail: uchida@dept.astron.s.u-tokyo.ac.jp

Maki Akioka, Manager, CRL Data Service
Hiraiso Solar Terrestrial Research Center
Communications Research Laboratory
e-mail: akioka@planet.hi.crl.go.jp

Received Aug. 25, 1993 from acton@sxt4.oscs.montana.edu

Submitted by L. Acton for the Yohkoh Team

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Solar DAC Node Name Changes

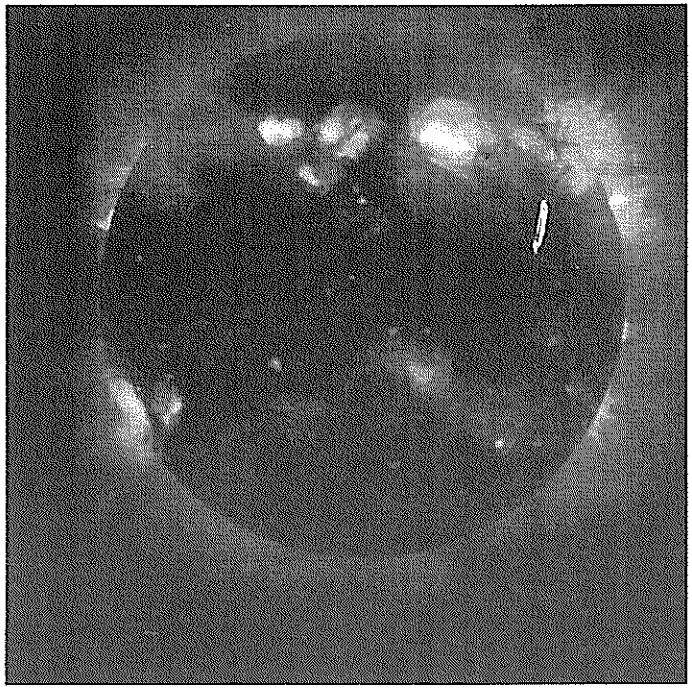
The NASA Goddard Solar Data Analysis Center (SDAC) nodes most familiar to the community will be undergoing some major changes in August and September, 1993. Nodes NEWMAX (newmax.gsfc.nasa.gov) and ISIS (isis.gsfc.nasa.gov) are being retired, and their functions combined on a single server, which will be known as SDAC (sdac.gsfc.nasa.gov). SDAC's IP (Internet) address will be 128.183.57.156, and its NSI/DECnet address will be 15.526.

Users of the BATSE solar flare database and other services of ISIS and NEWMAX should watch for messages warning of the actual changeover dates. (SDAC is a DEC 4000 Model 610 AXP, so users should see noticeable improvements in response.)

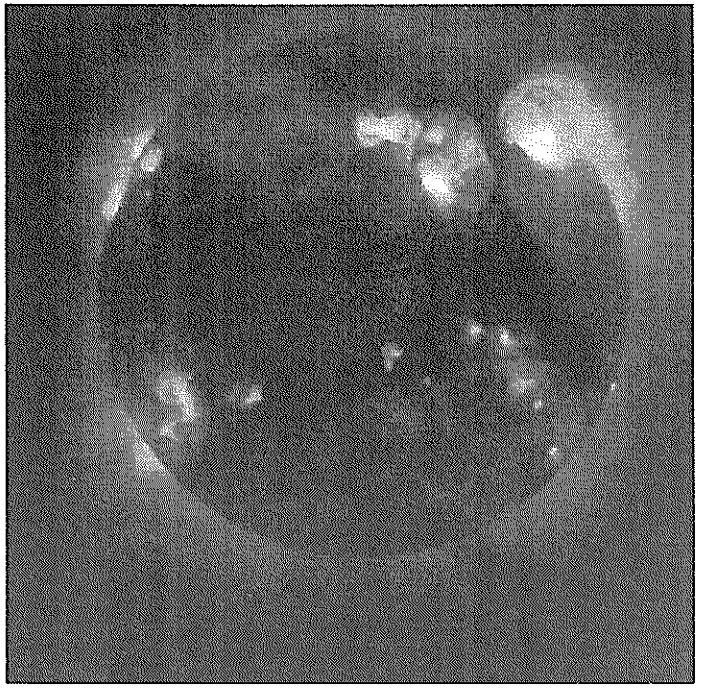
Received Aug. 10, 1993 from gurman@uvsp.gsfc.nasa.gov
--Joe Gurman

YOHKOH SOFT X-RAY TELESCOPE IMAGES

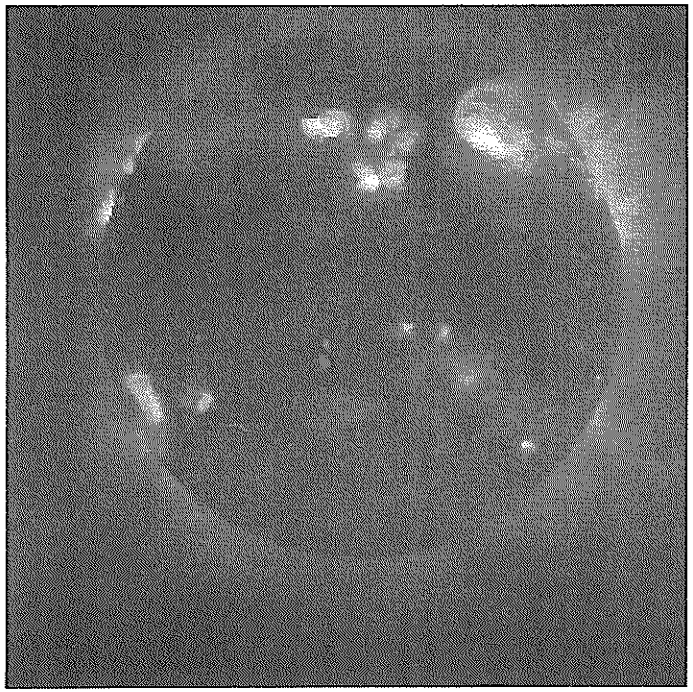
March
1999



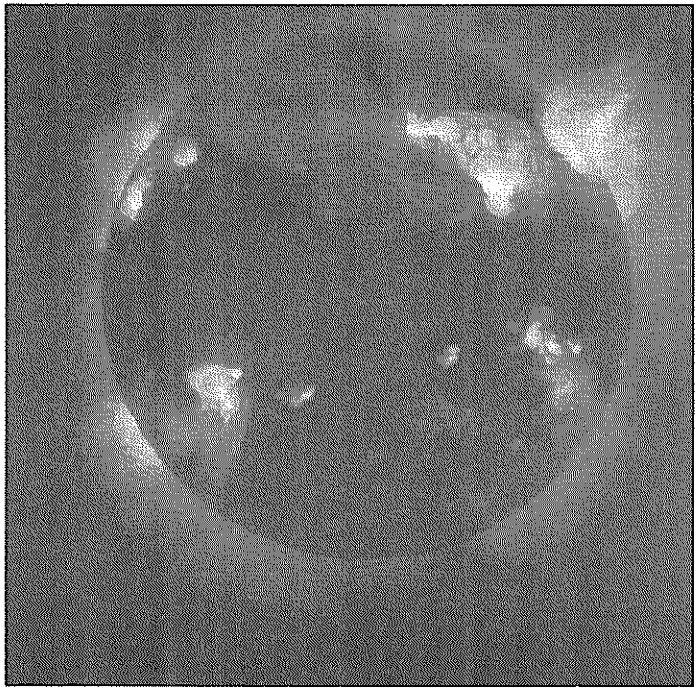
Day 1
12:16:29 UT



Day 3
12:07:21 UT



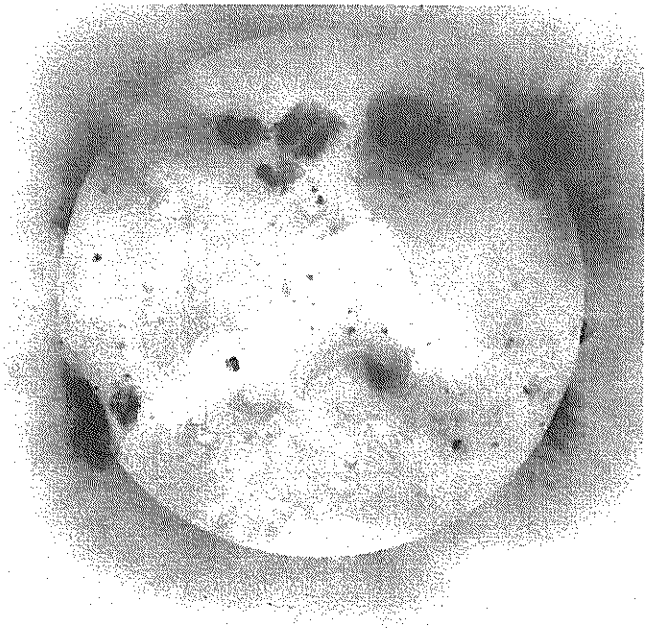
Day 2
10:24:09 UT



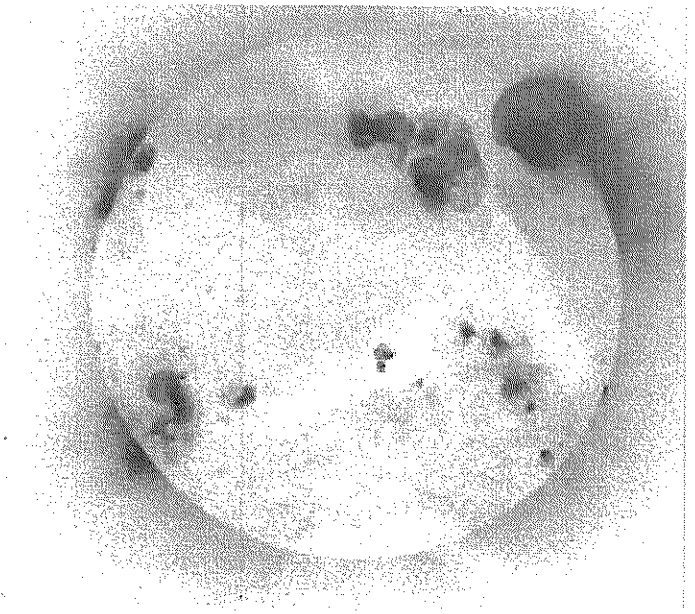
Day 4
11:28:00 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

March
1999

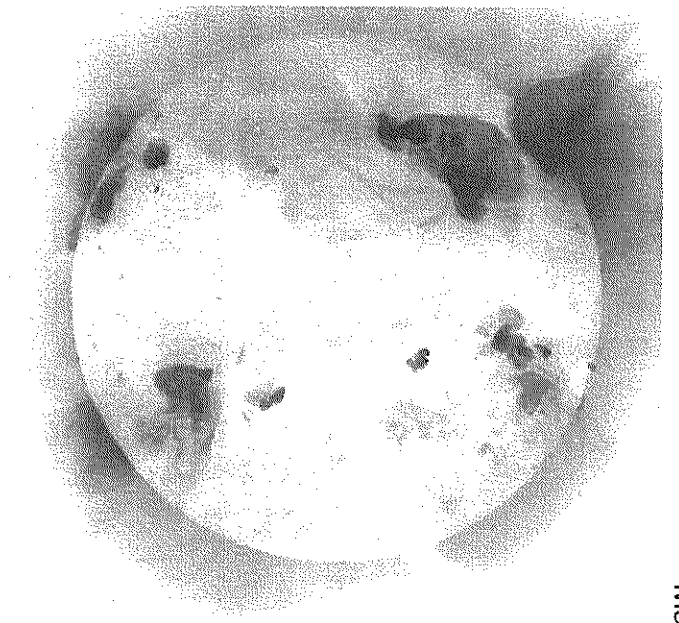


Day 1
12:16:29 UT



Day 3
12:07:21 UT

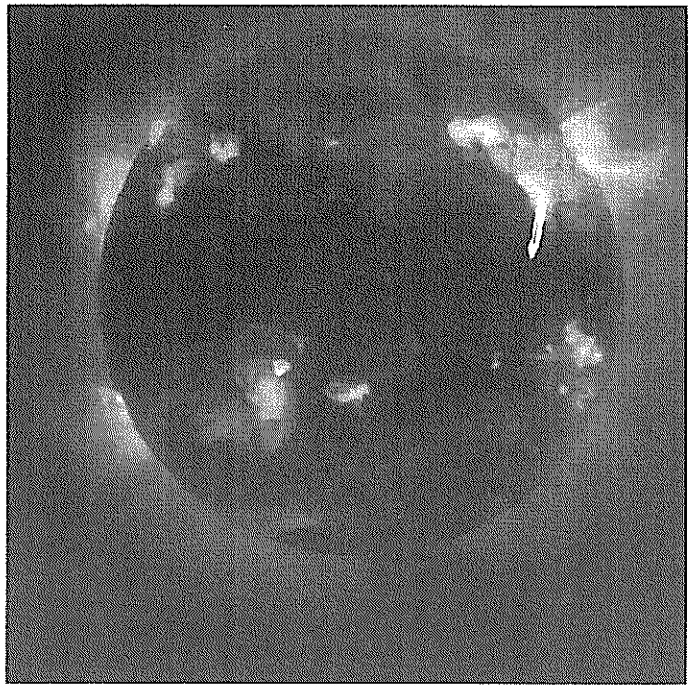
Day 2
10:24:09 UT



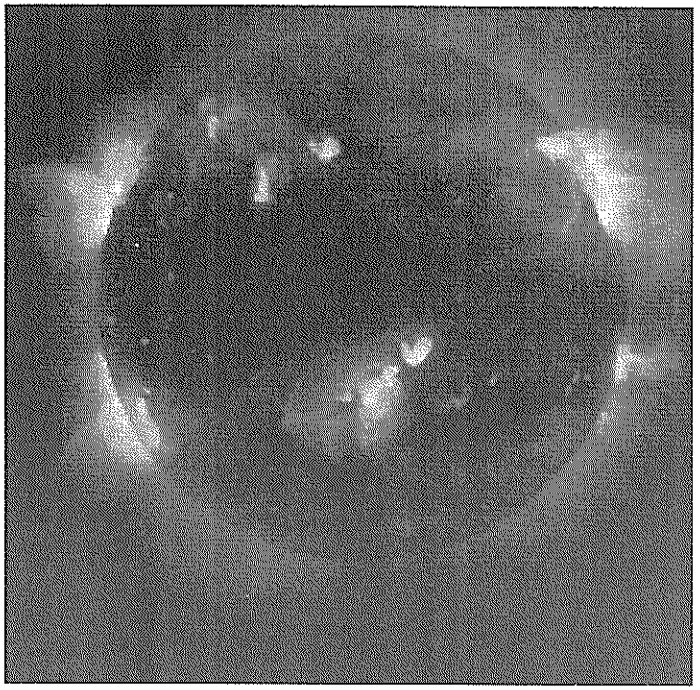
Day 4
11:28:00 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

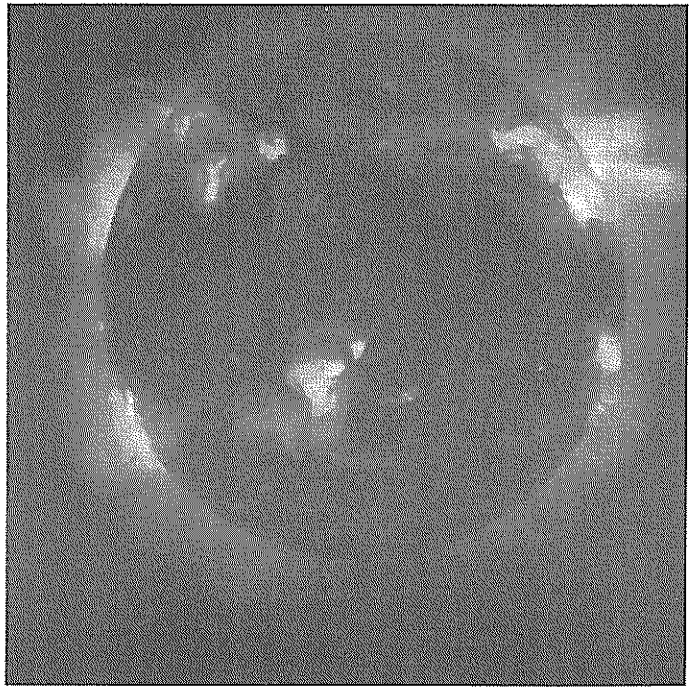
March
1999



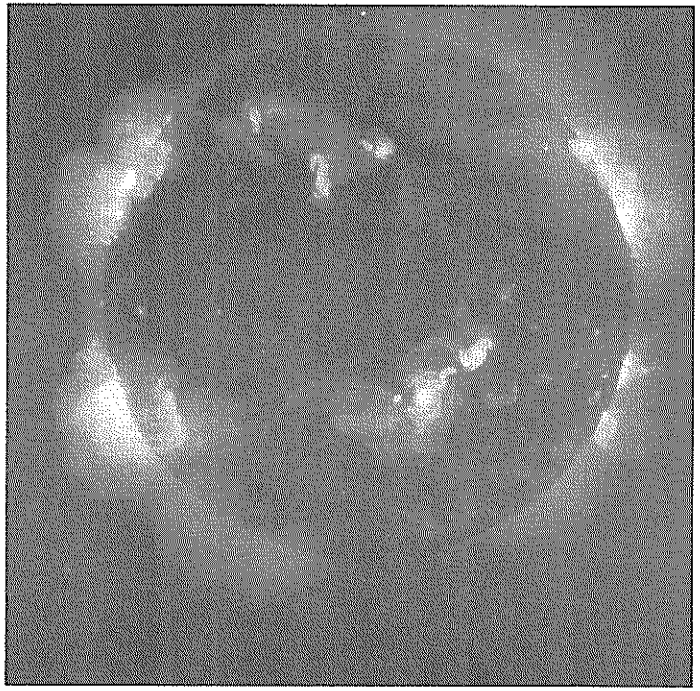
Day 5
12:42:16 UT



Day 7
13:02:16 UT



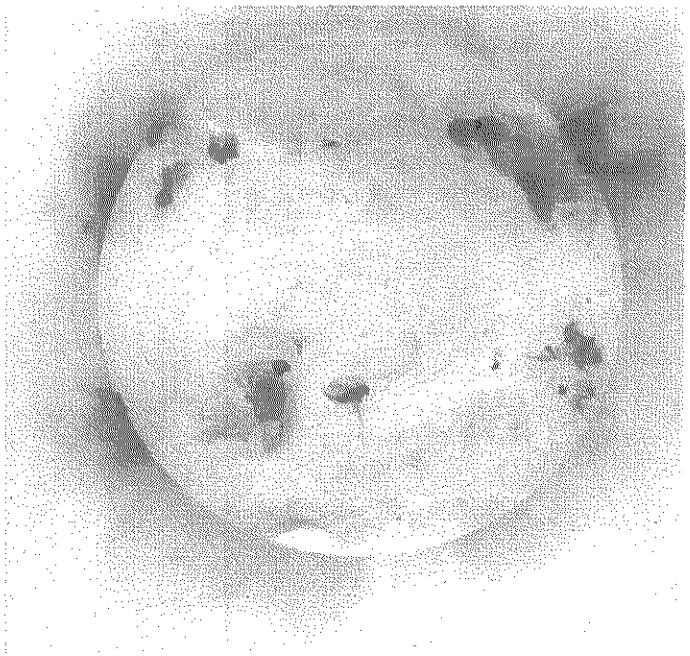
Day 6
12:02:02 UT



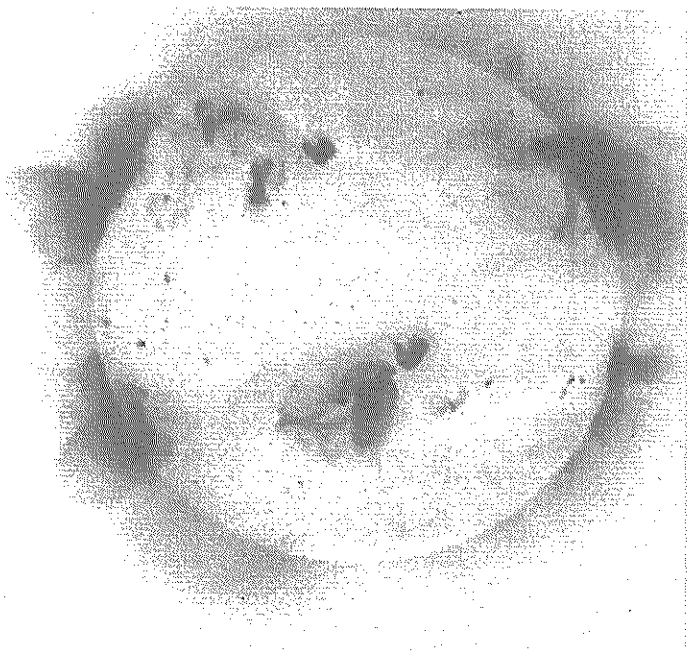
Day 8
10:50:42 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

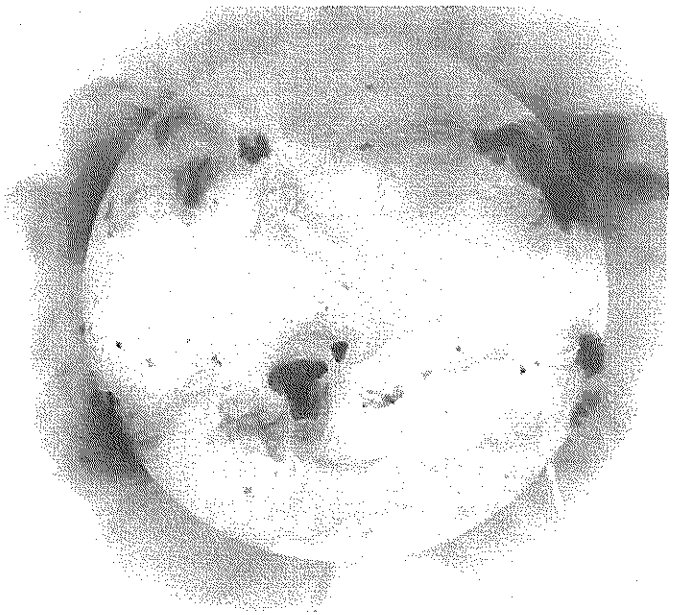
March 1999



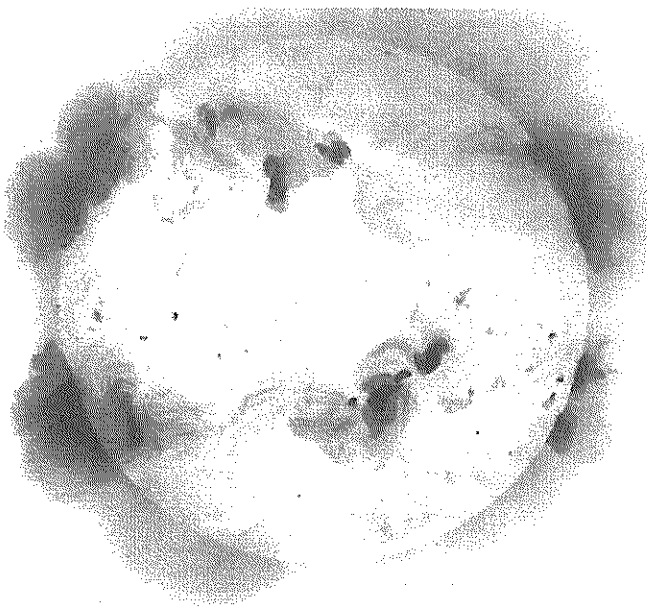
Day 5
12:42:16 UT



Day 7
13:02:16 UT



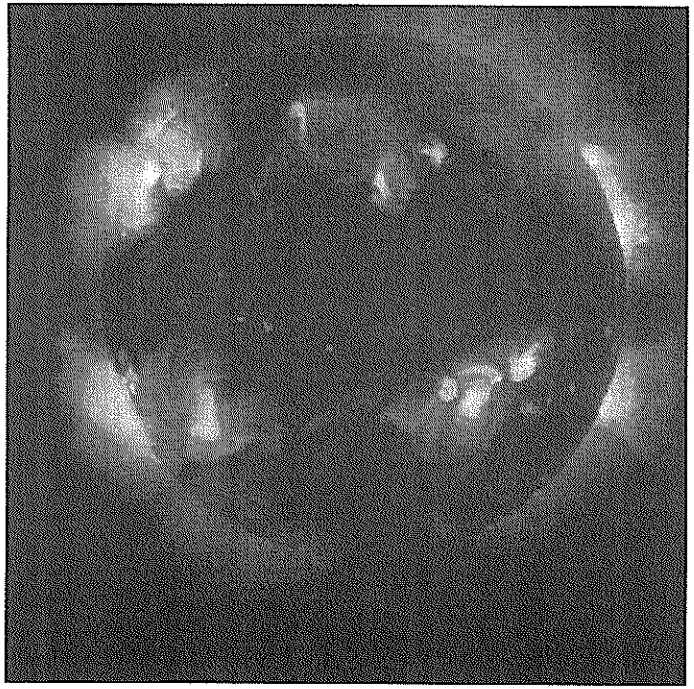
Day 6
12:02:02 UT



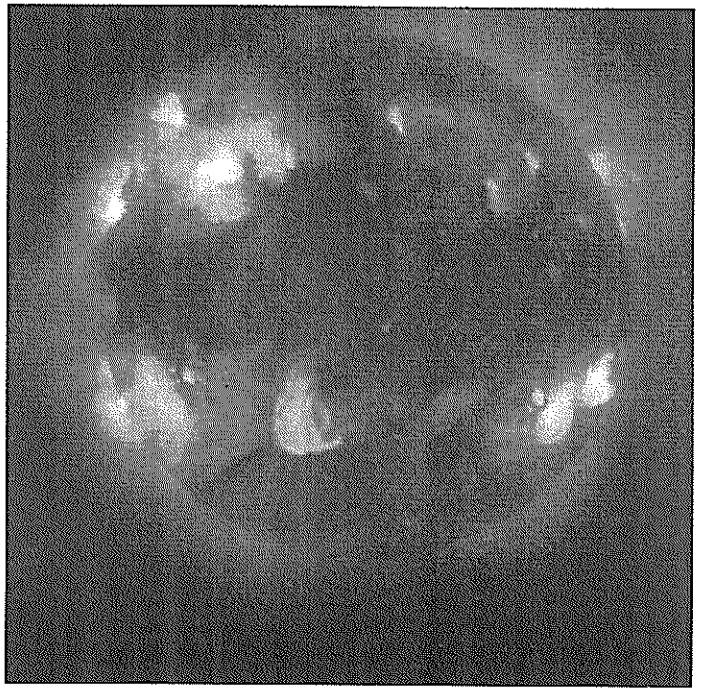
Day 8
10:50:42 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

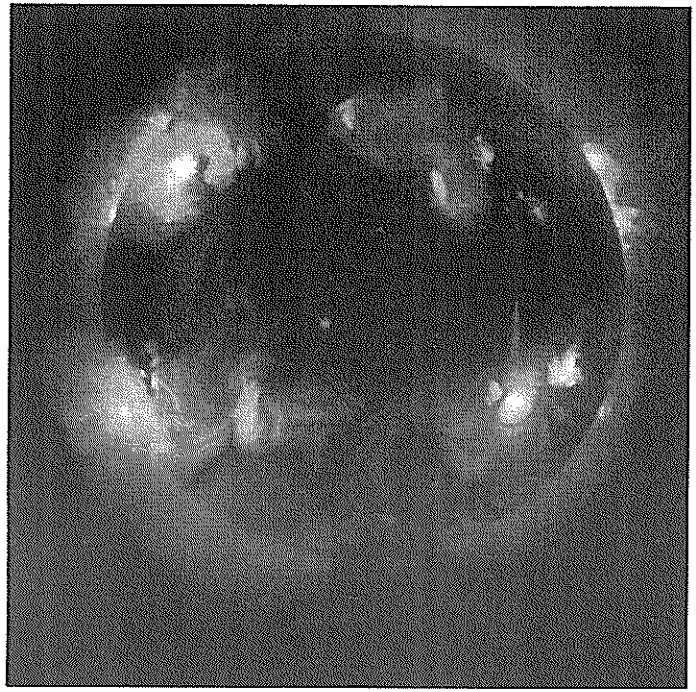
March
1999



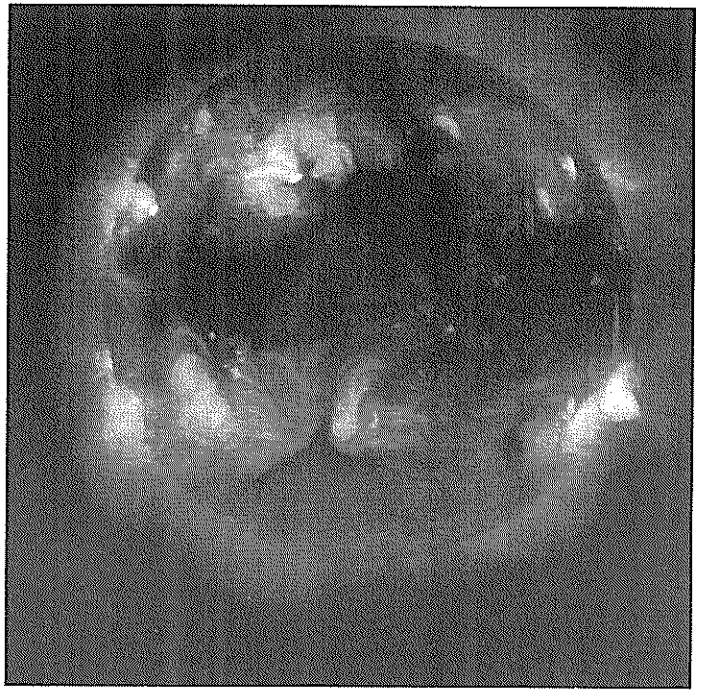
Day 9
12:47:25 UT



Day 11
12:36:07 UT



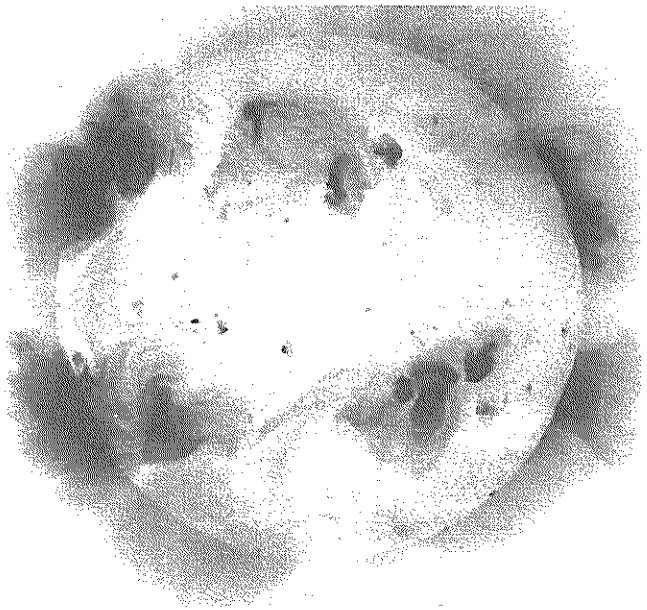
Day 10
12:17:13 UT



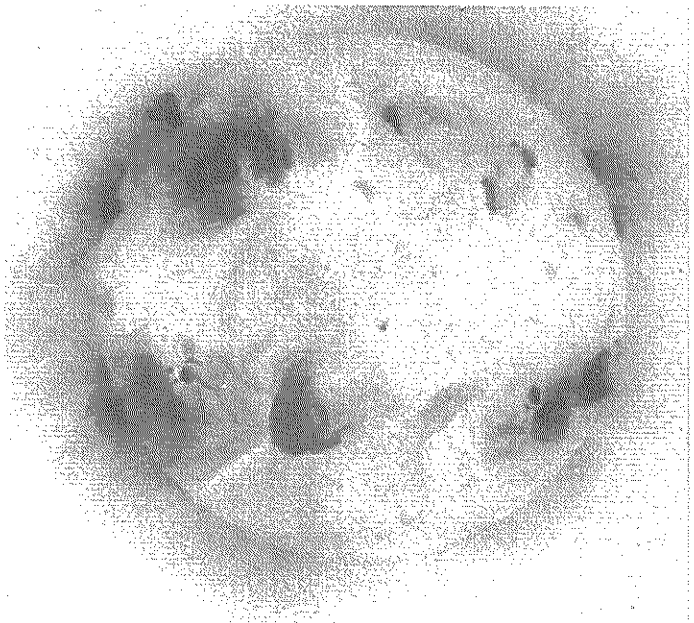
Day 12
11:54:35 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

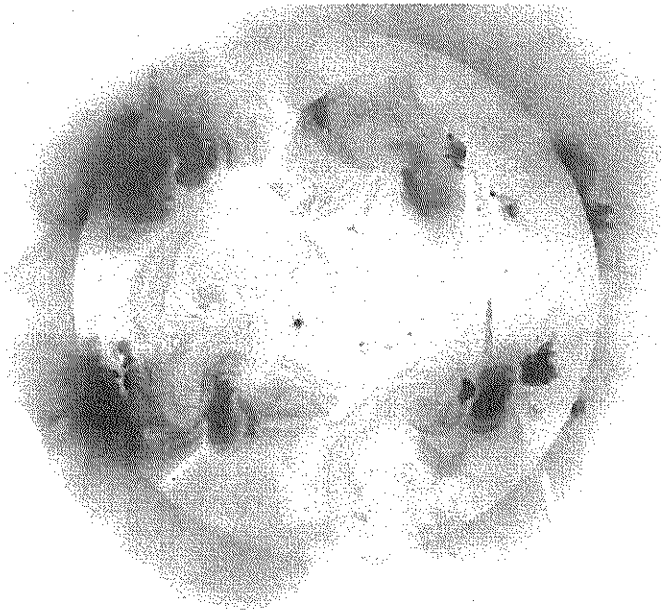
March 1999



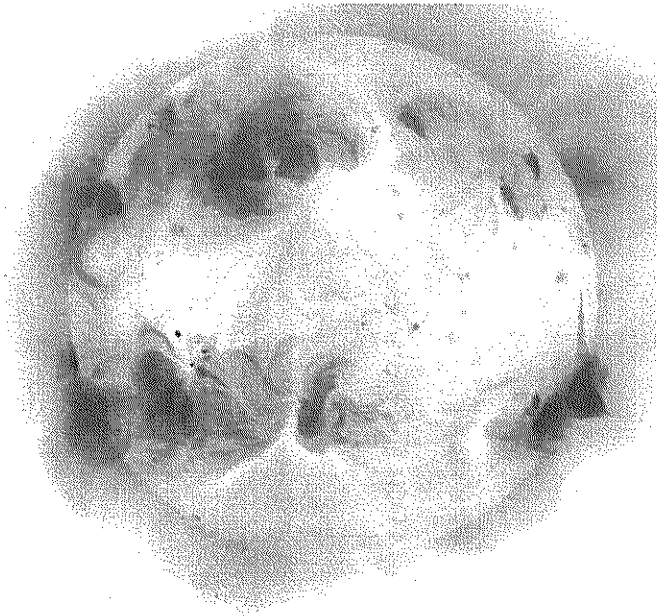
Day 9
12:47:25 UT



Day 11
12:36:07 UT



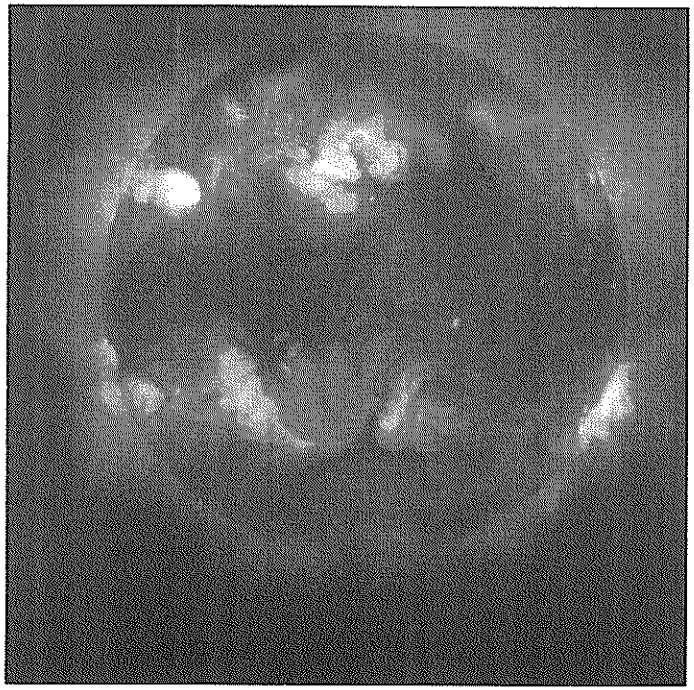
Day 10
12:17:13 UT



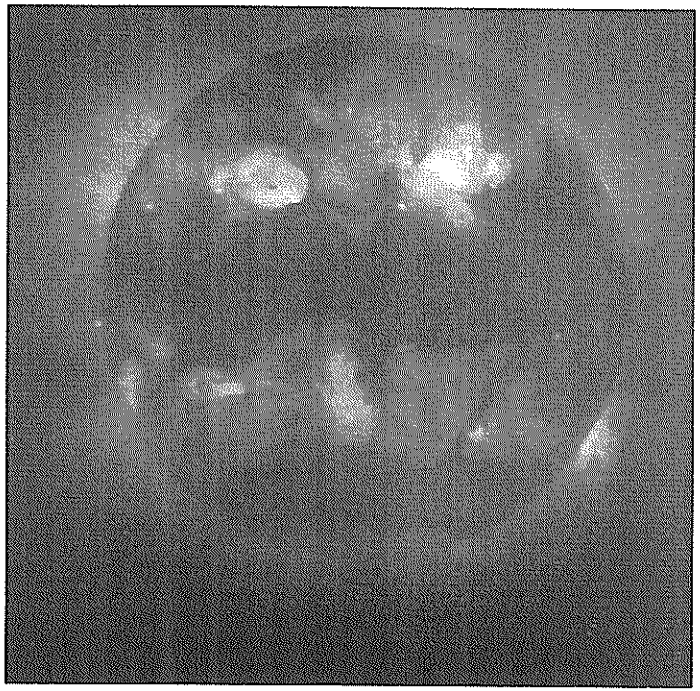
Day 12
11:54:35 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

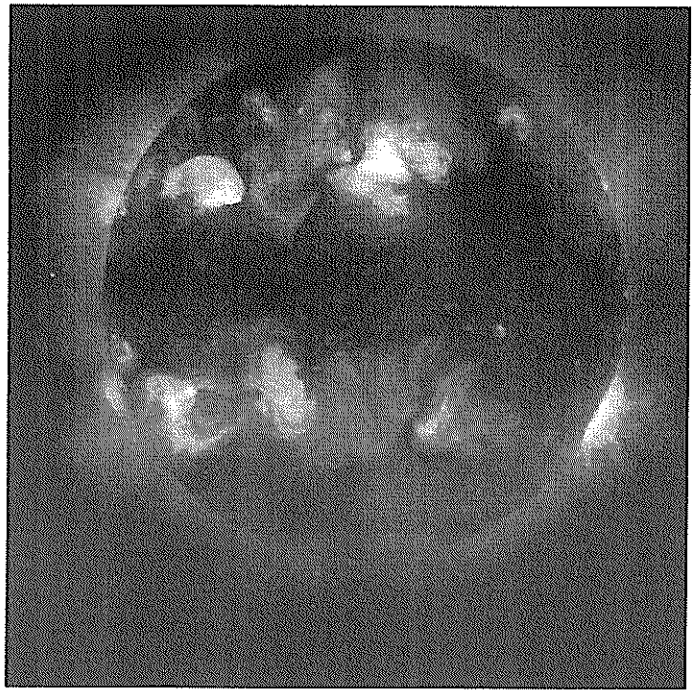
March
1999



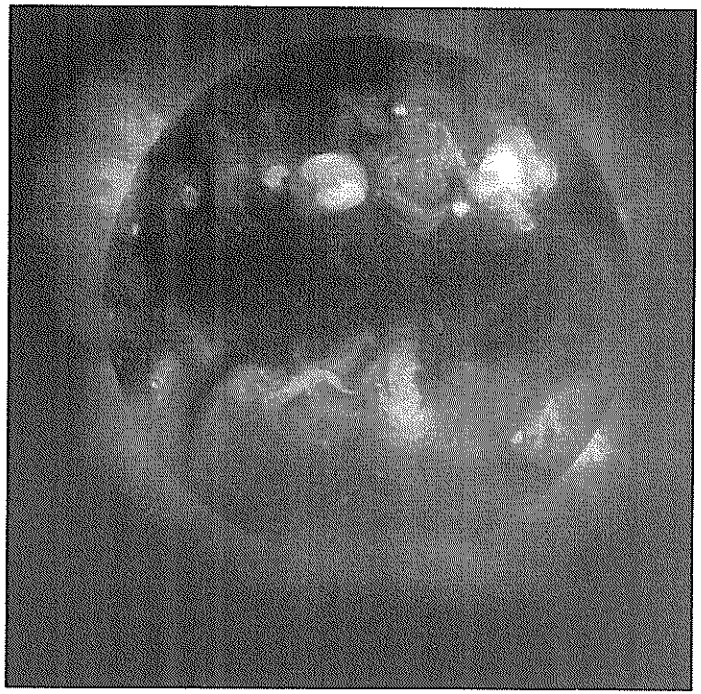
Day 13
11:59:56 UT



Day 15
11:49:10 UT



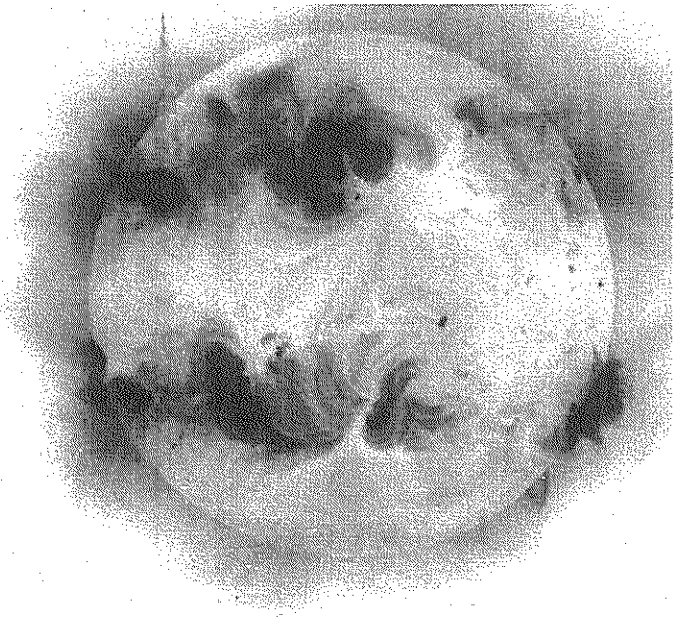
Day 14
07:36:10 UT



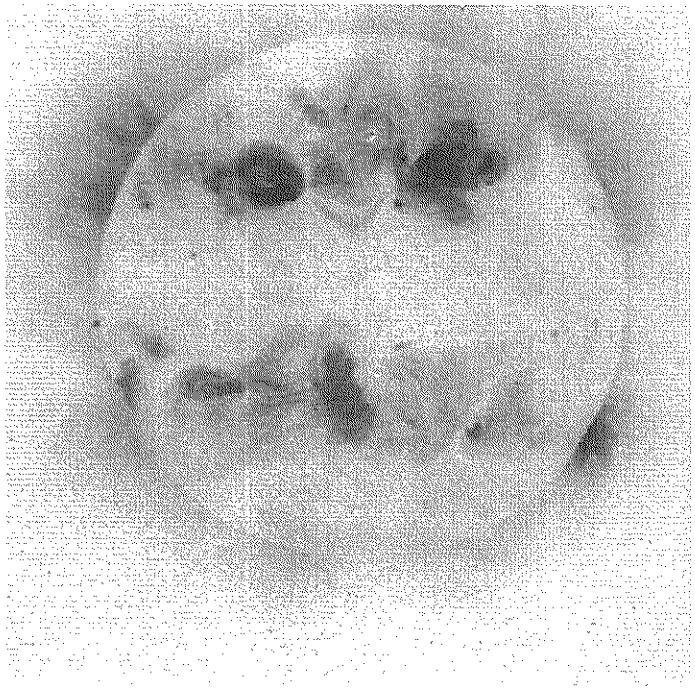
Day 16
11:22:32 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

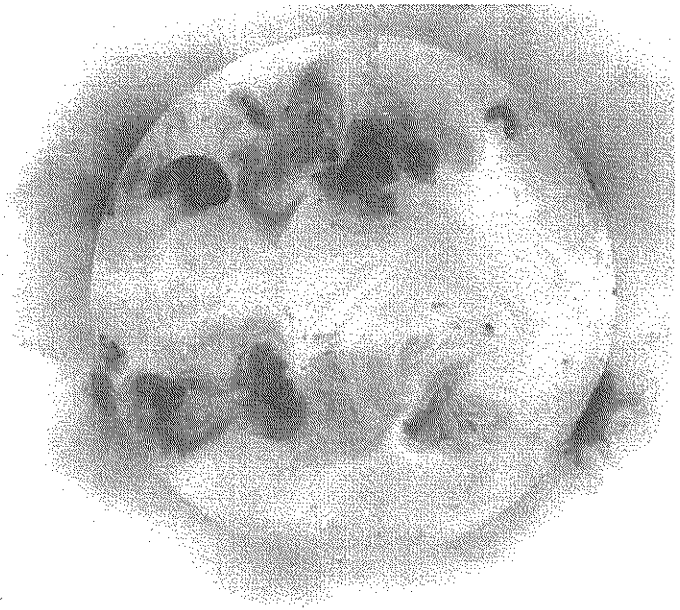
March 1999



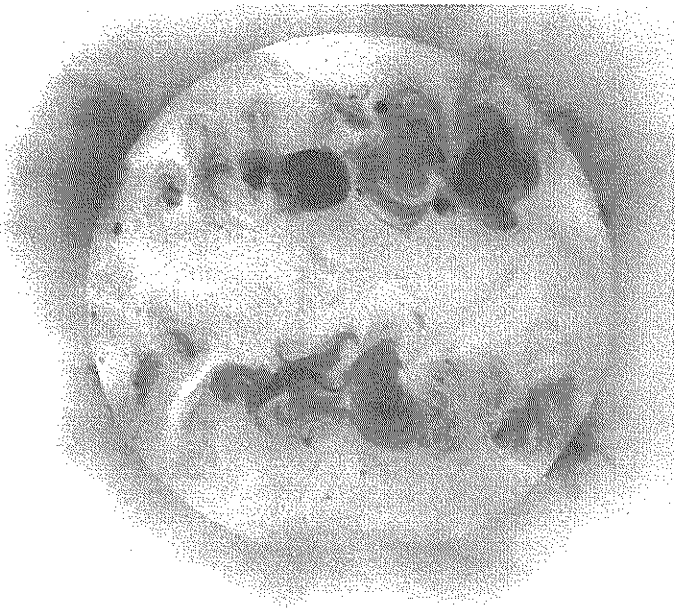
Day 13
11:59:56 UT



Day 15
11:49:10 UT



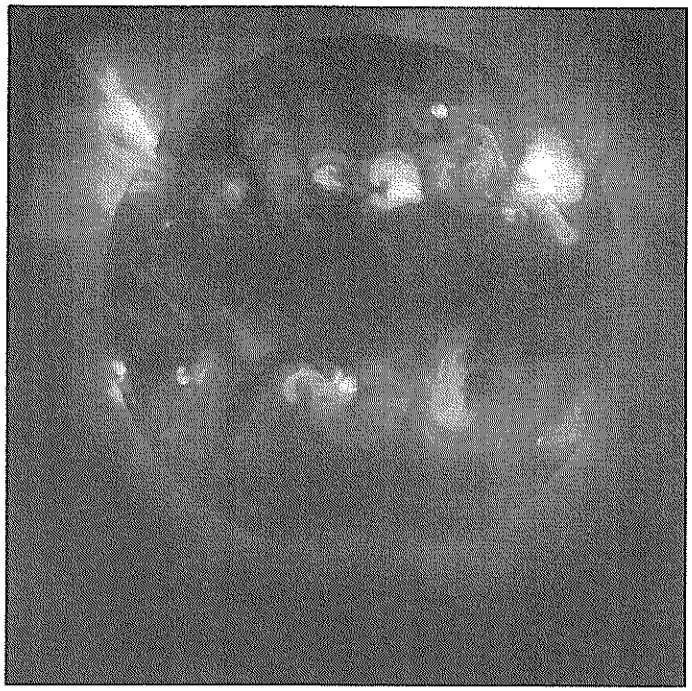
Day 14
07:36:10 UT



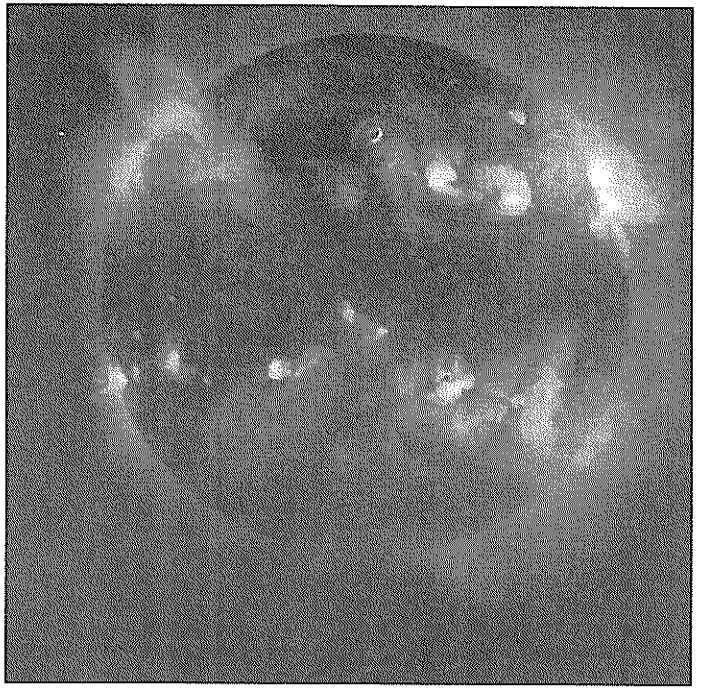
Day 16
11:22:32 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

March
1999

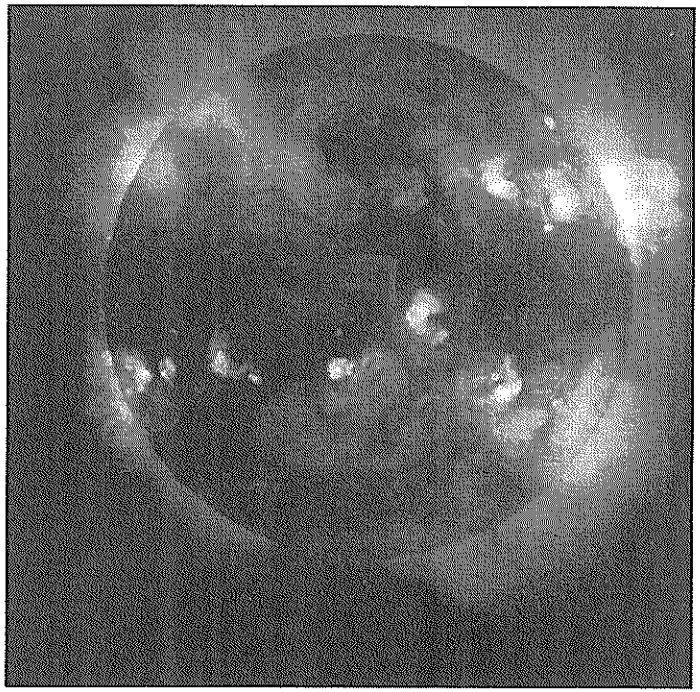


Day 17
11:25:06 UT



Day 19
12:03:11 UT

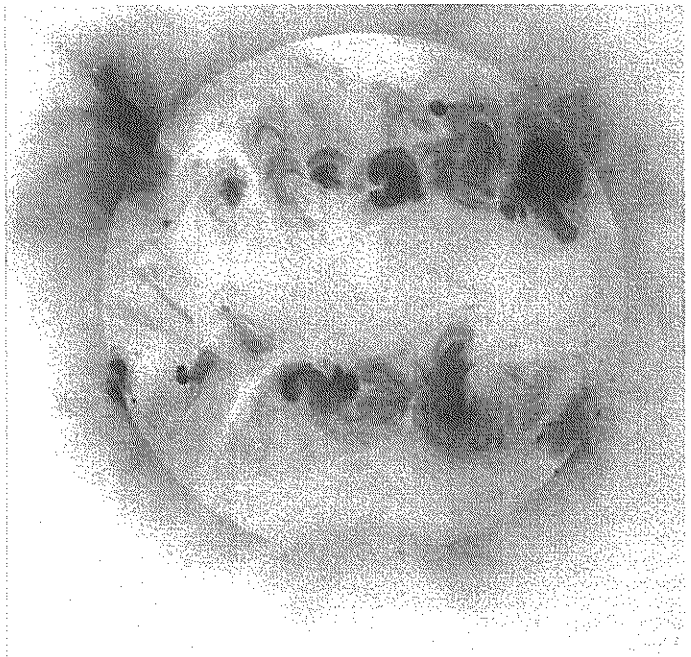
Day 18
11:44:01 UT



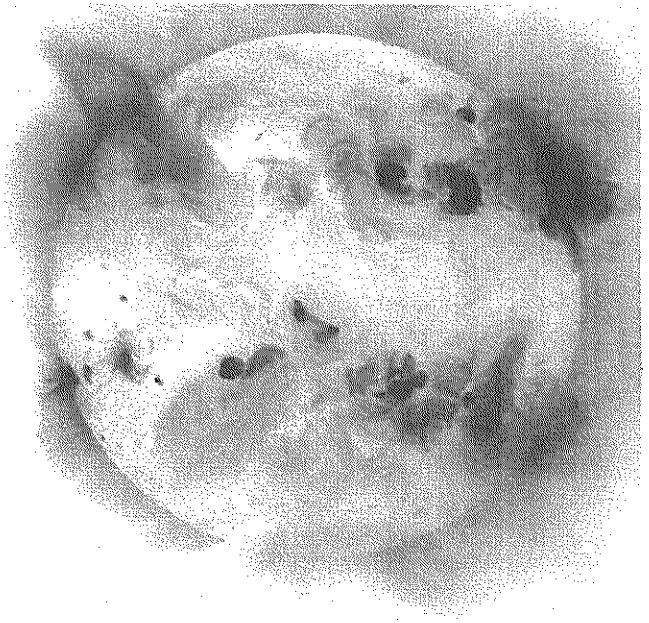
Day 20
12:08:33 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

March 1999

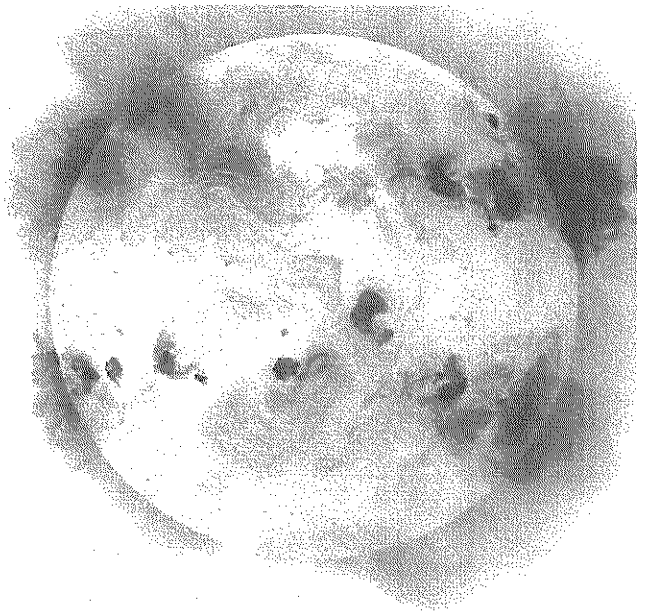


Day 17
11:25:06 UT



Day 19
12:03:11 UT

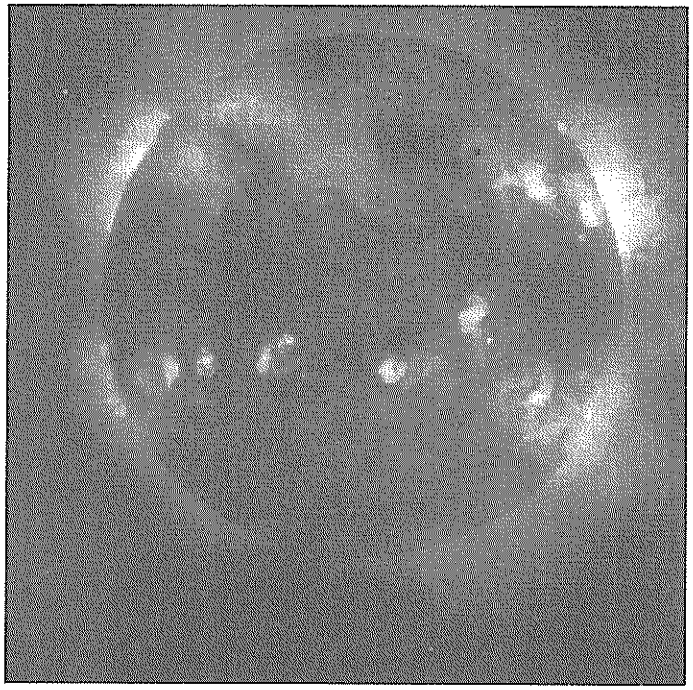
Day 18
11:44:01 UT



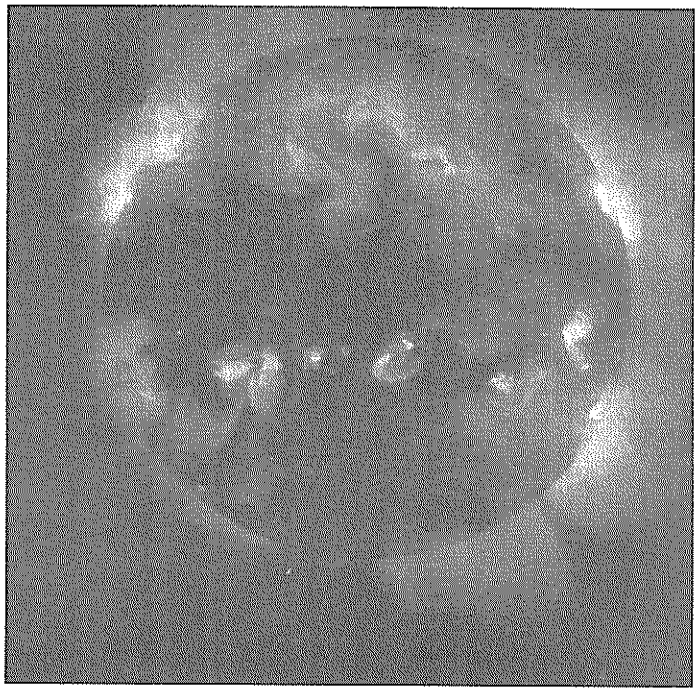
Day 20
12:08:33 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

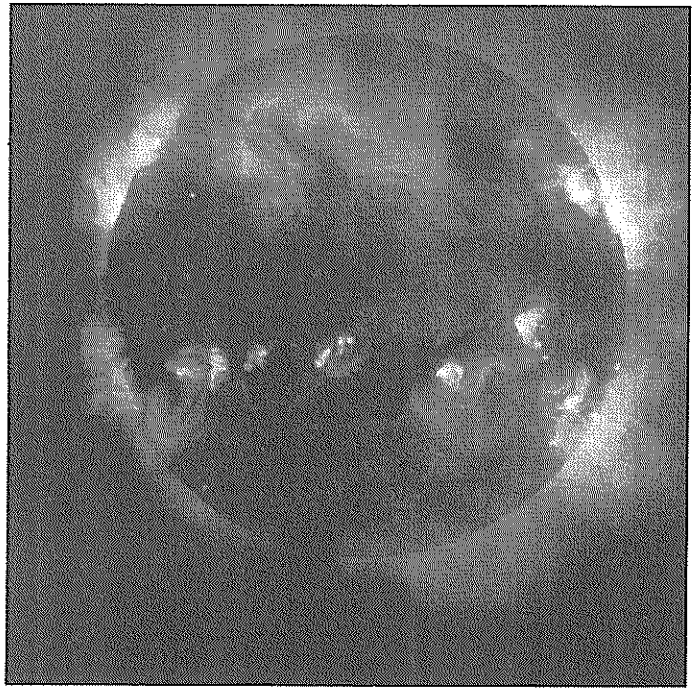
March
1999



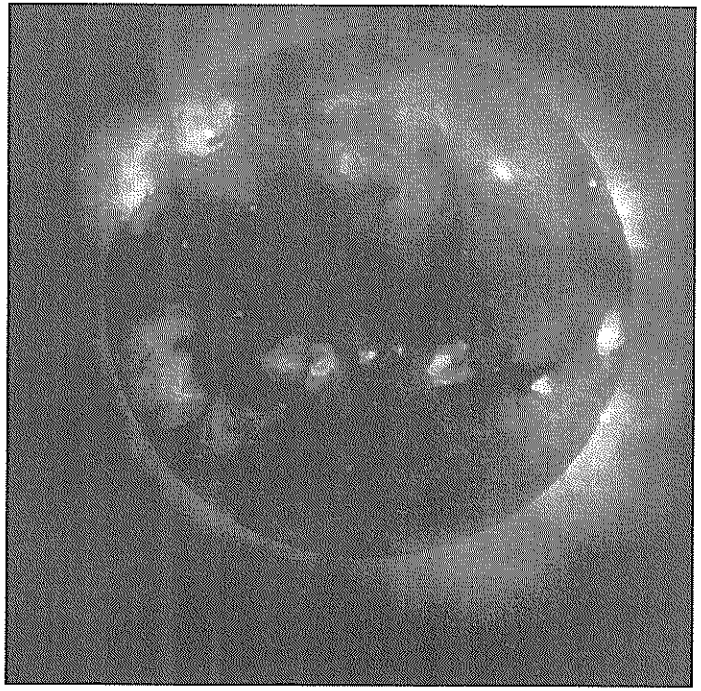
Day 21
12:27:01 UT



Day 23
12:58:06 UT



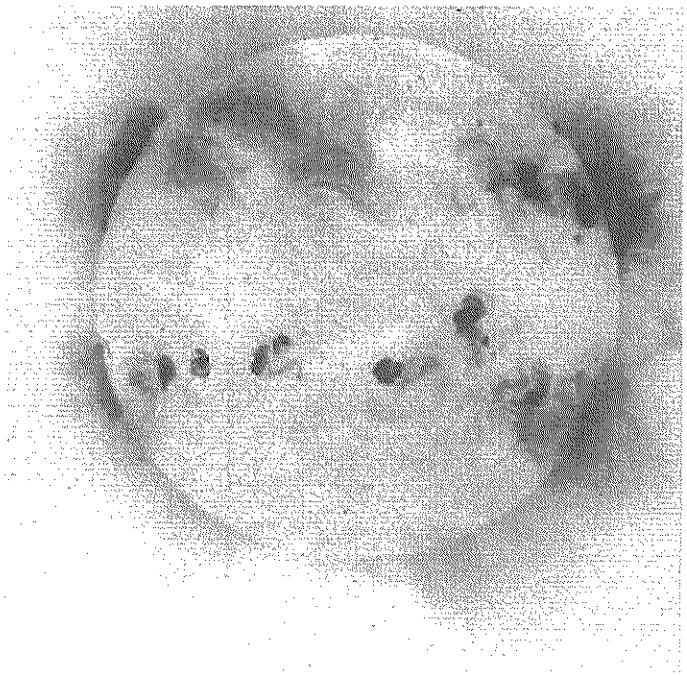
Day 22
12:35:03 UT



Day 24
11:32:24 UT

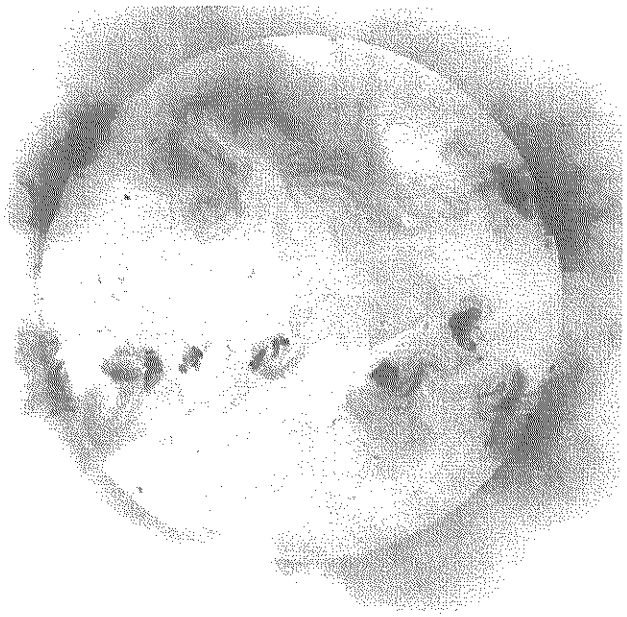
YOHKOH SOFT X-RAY TELESCOPE IMAGES

March
1999

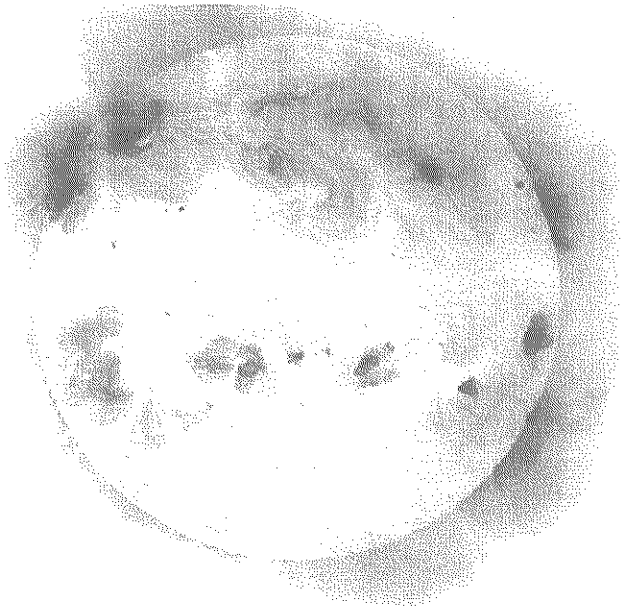


Day 21
12:27:01 UT

Day 23
12:58:06 UT



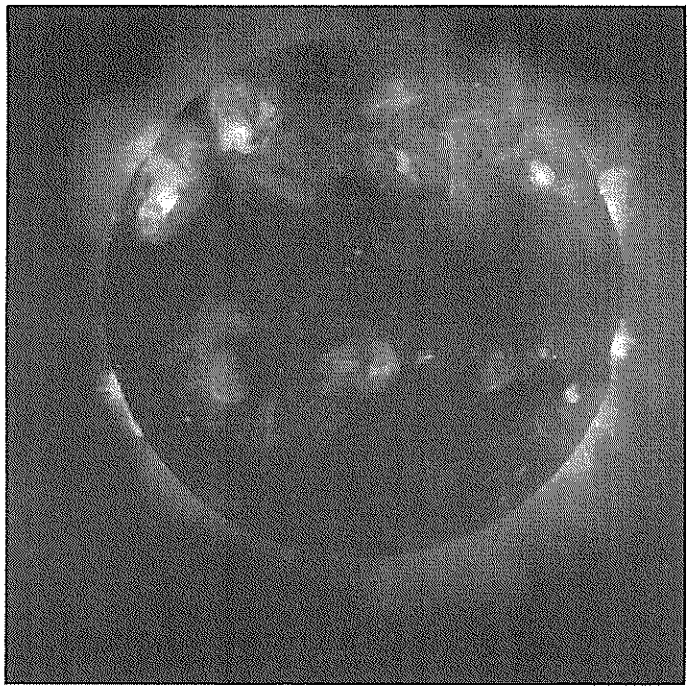
Day 22
12:35:03 UT



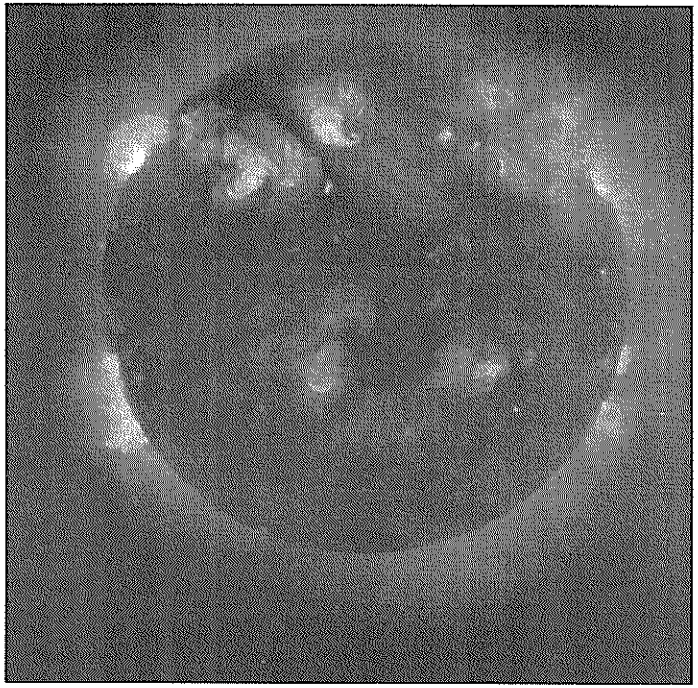
Day 24
11:32:24 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

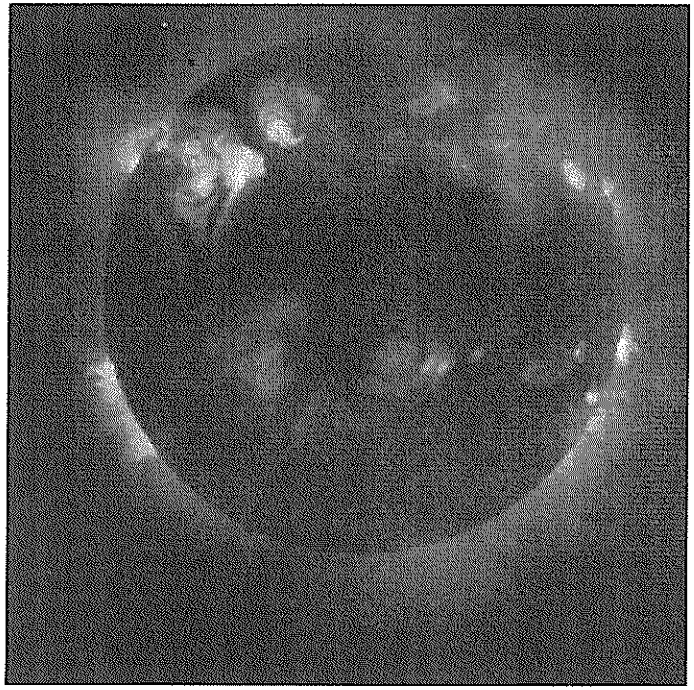
March
1999



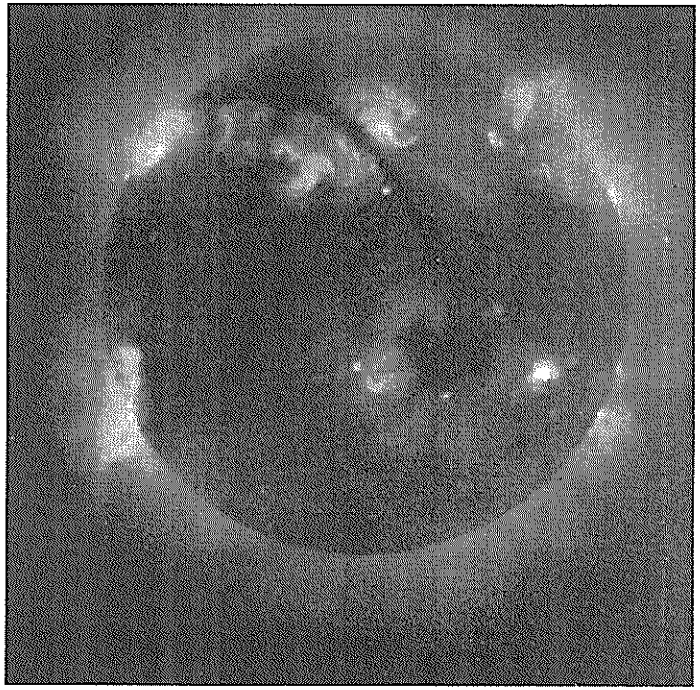
Day 25
13:16:52 UT



Day 27
12:00:14 UT



Day 26
12:00:36 UT

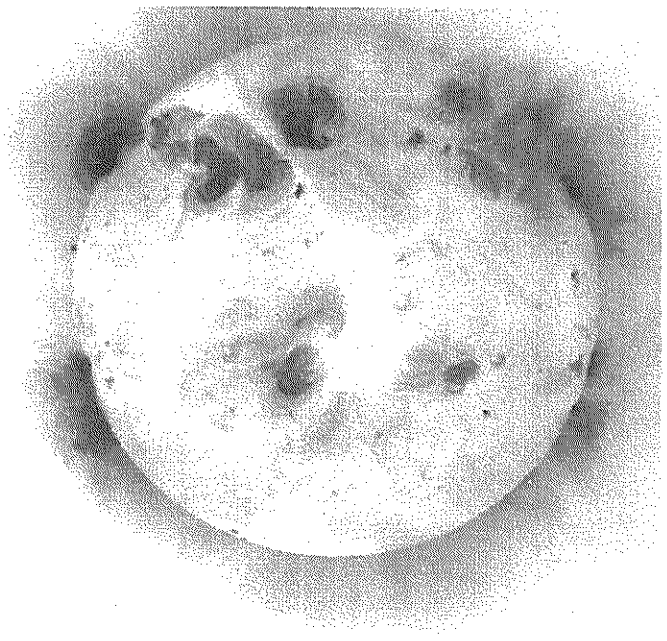


Day 28
12:34:43 UT

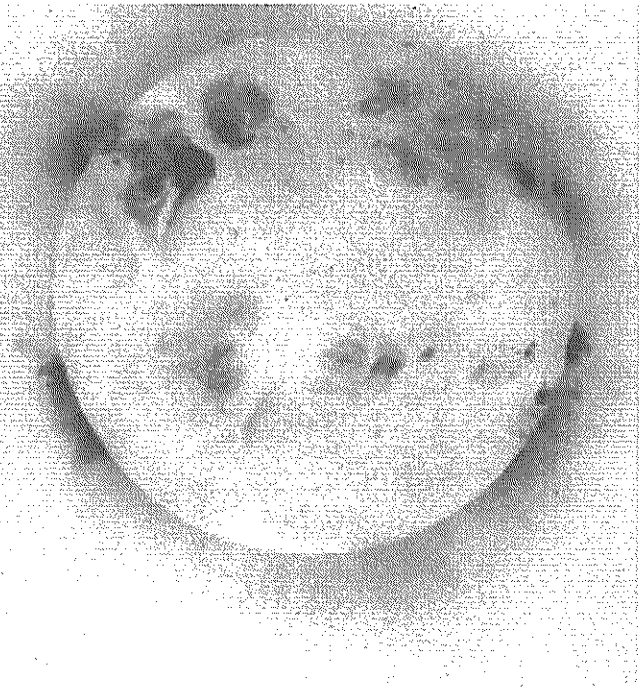
YOHKOH SOFT X-RAY TELESCOPE IMAGES

March 1999

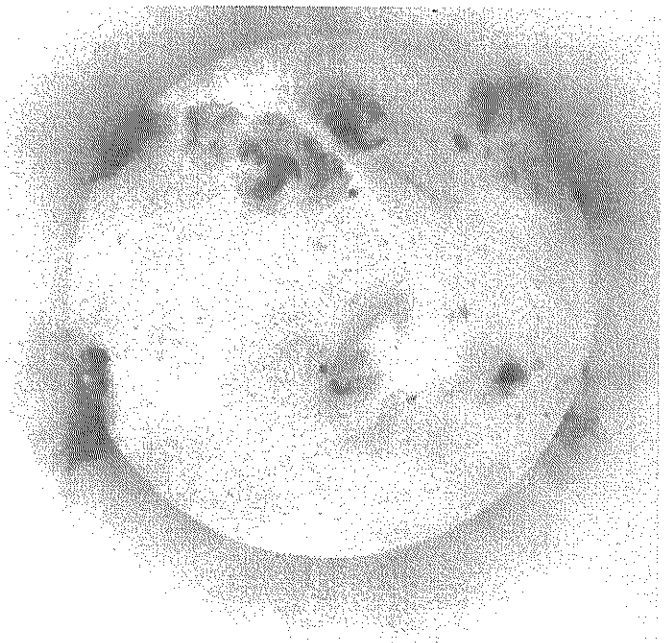
Day 25
13:16:52 UT



Day 27
12:00:14 UT



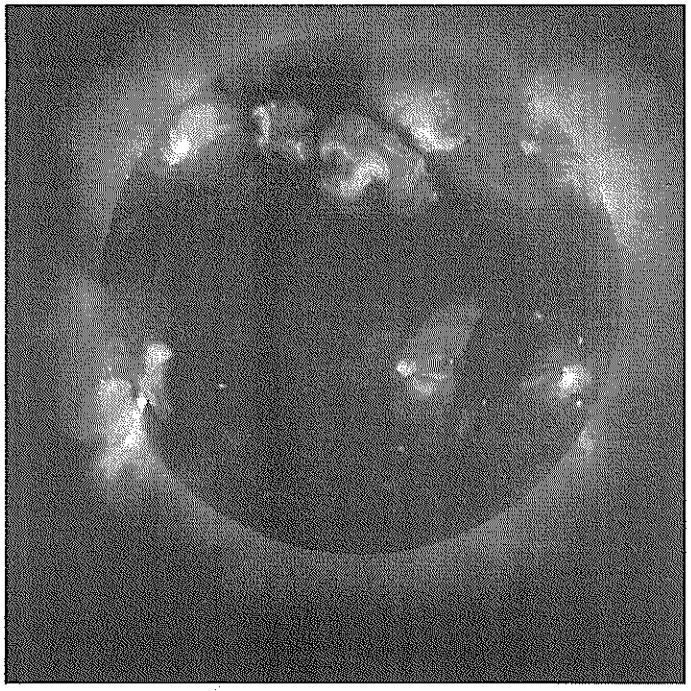
Day 26
12:00:36 UT



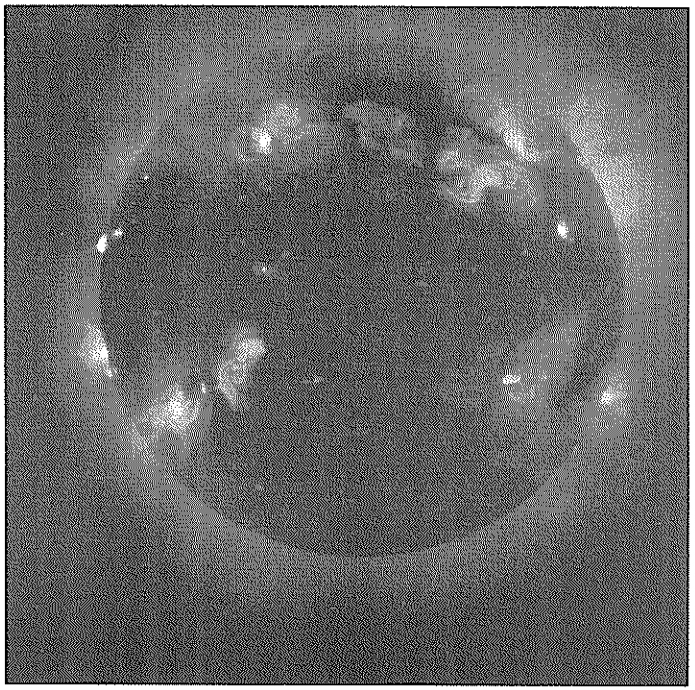
Day 28
12:34:43 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

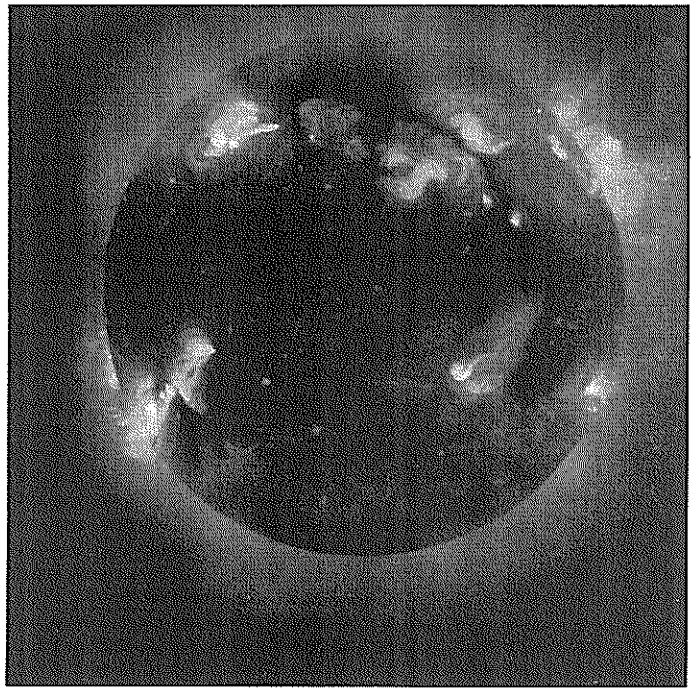
March
1999



Day 29
11:15:15 UT



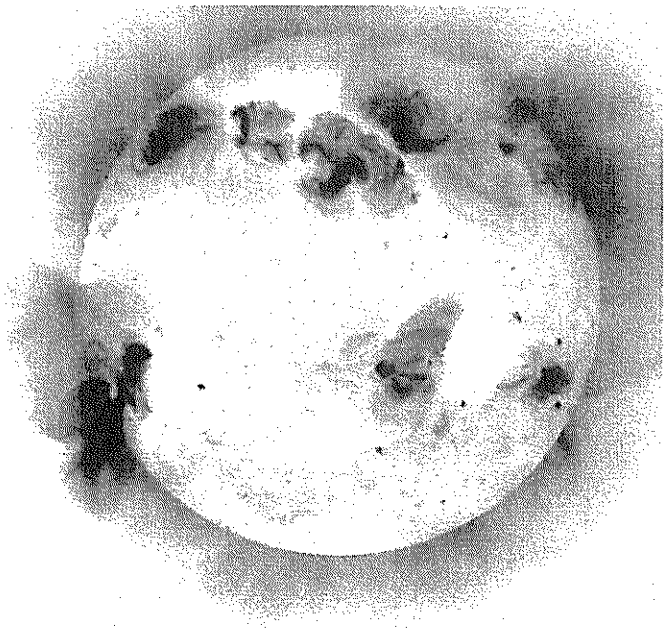
Day 31
11:47:59 UT



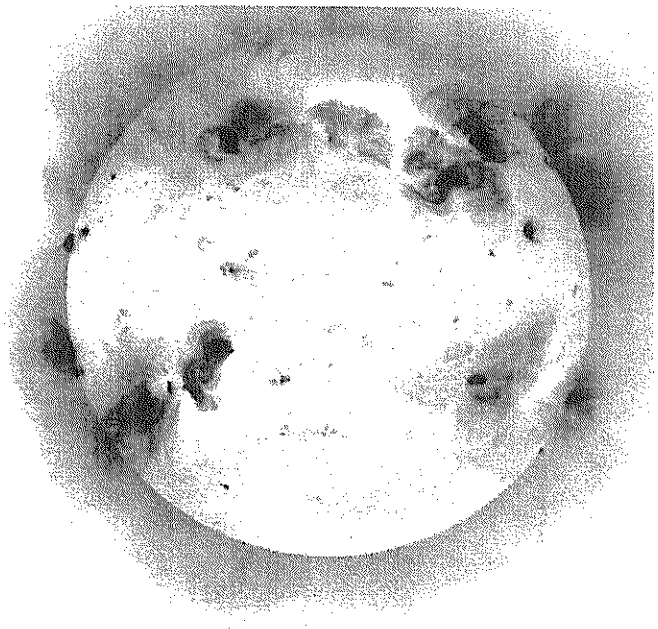
Day 30
09:48:23 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

March
1999



Day 29
11:15:15 UT



Day 31
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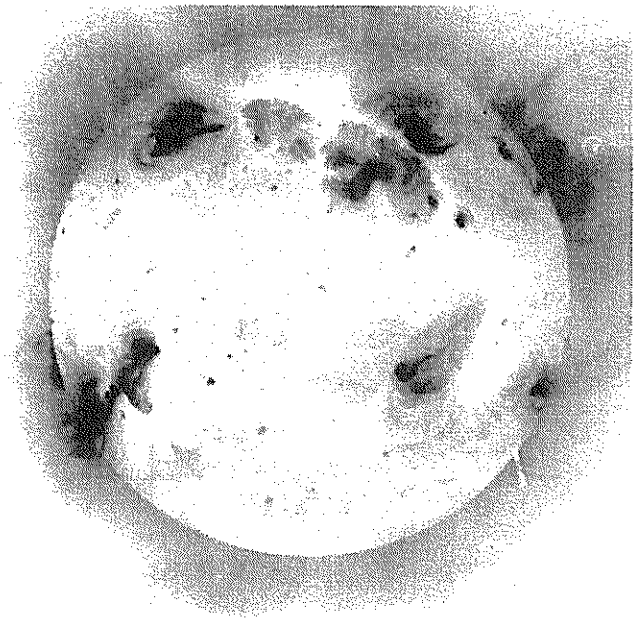
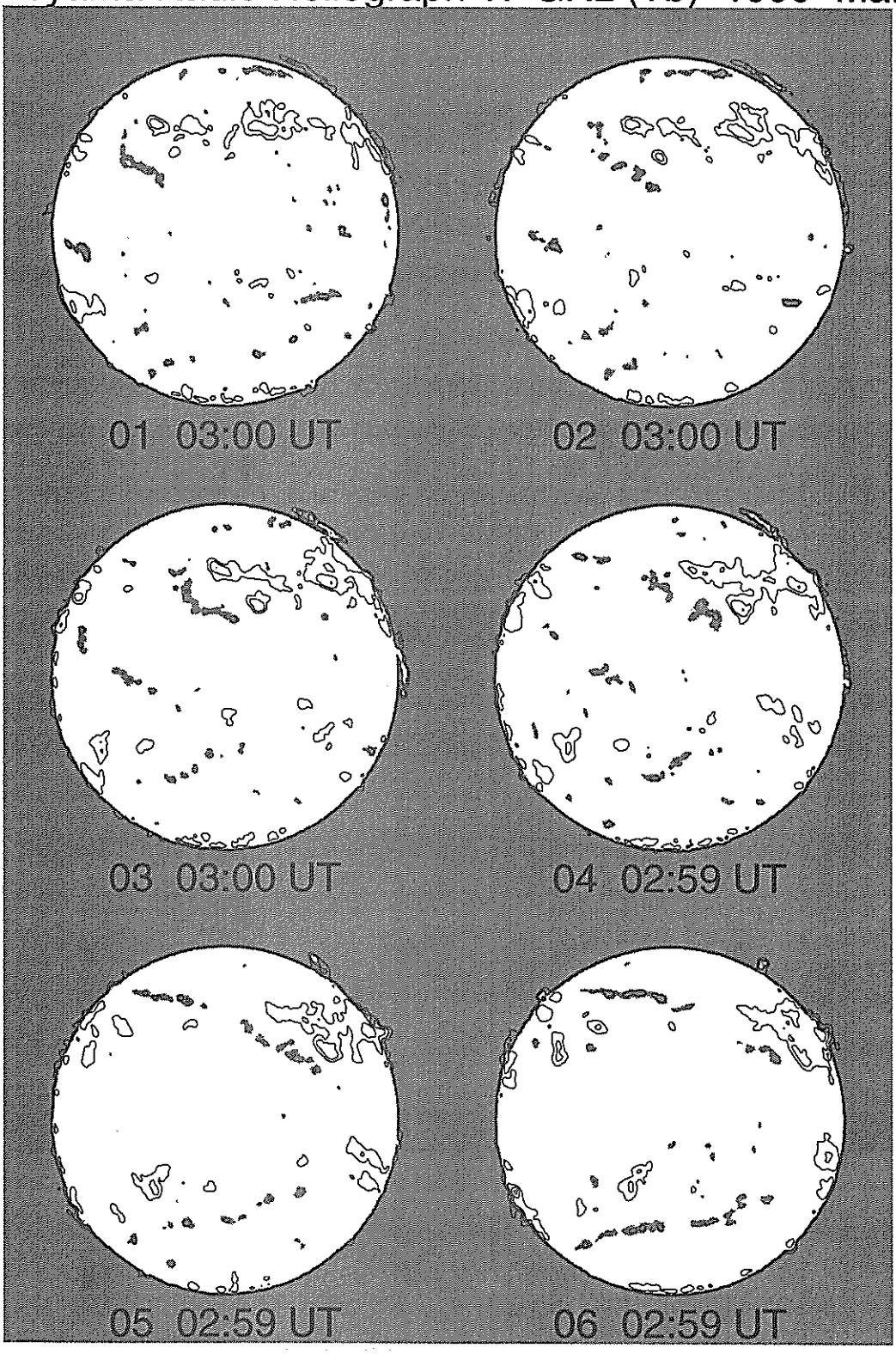


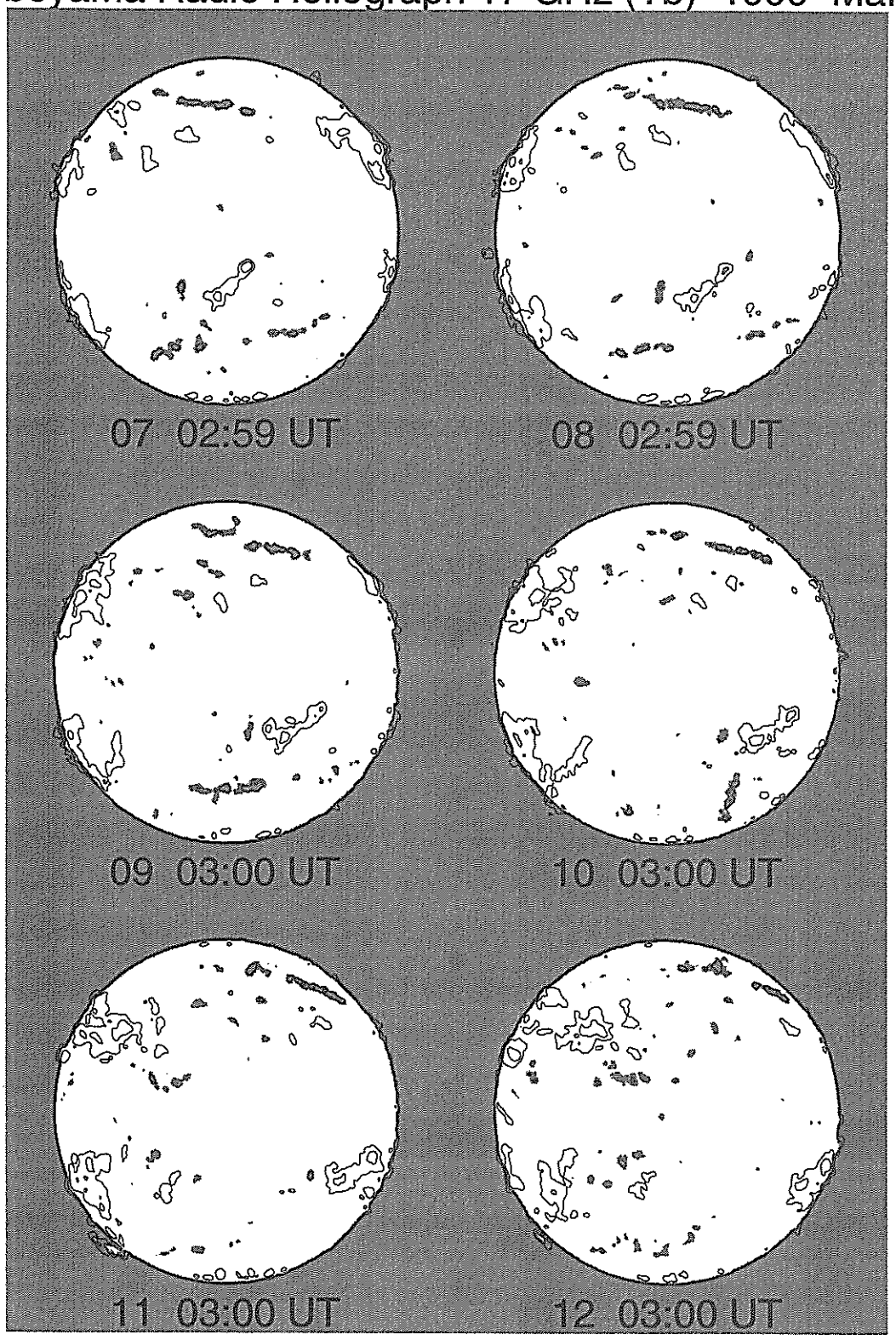
Day 30
09:48:23 UT

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 March



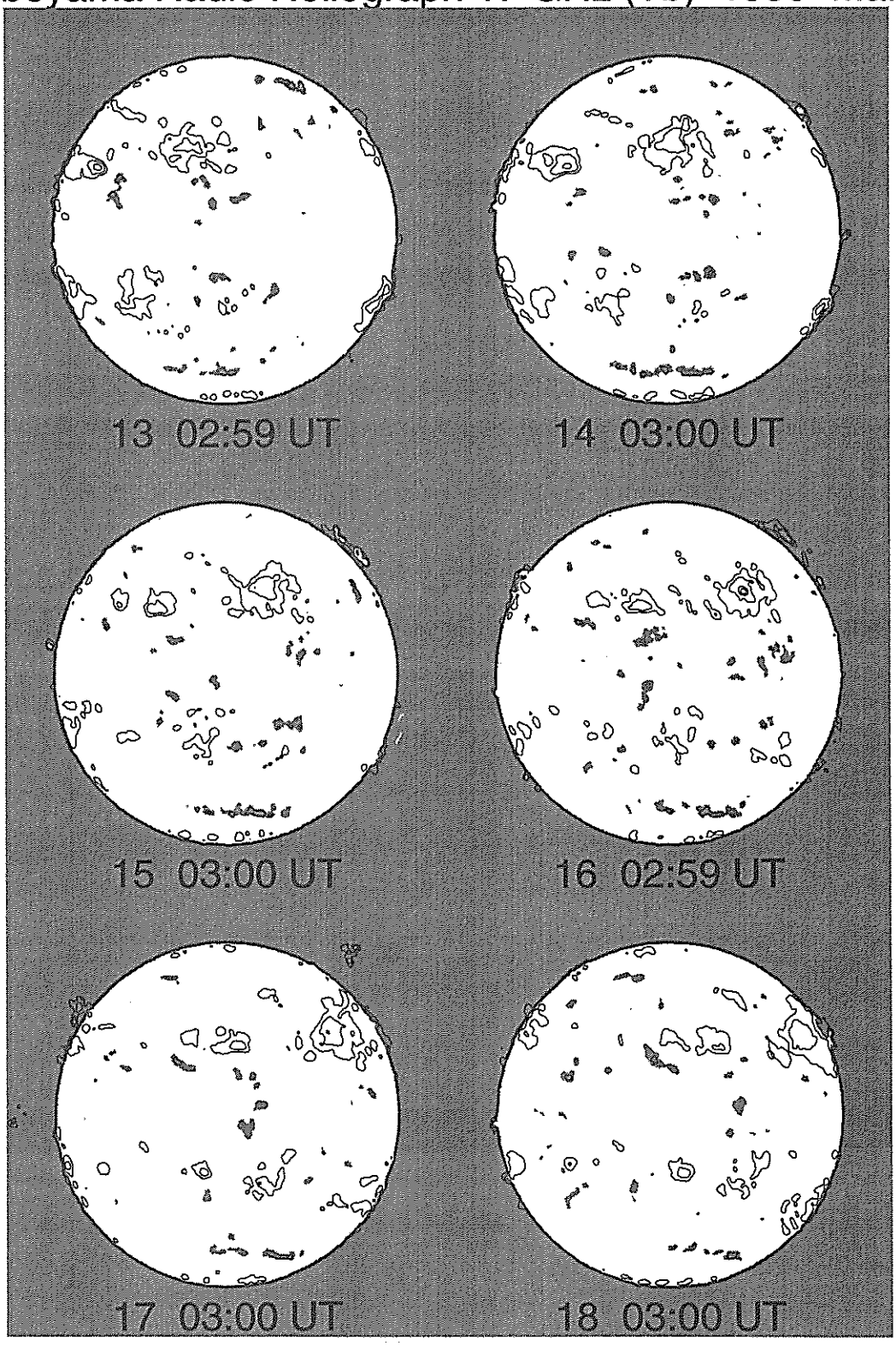
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 March



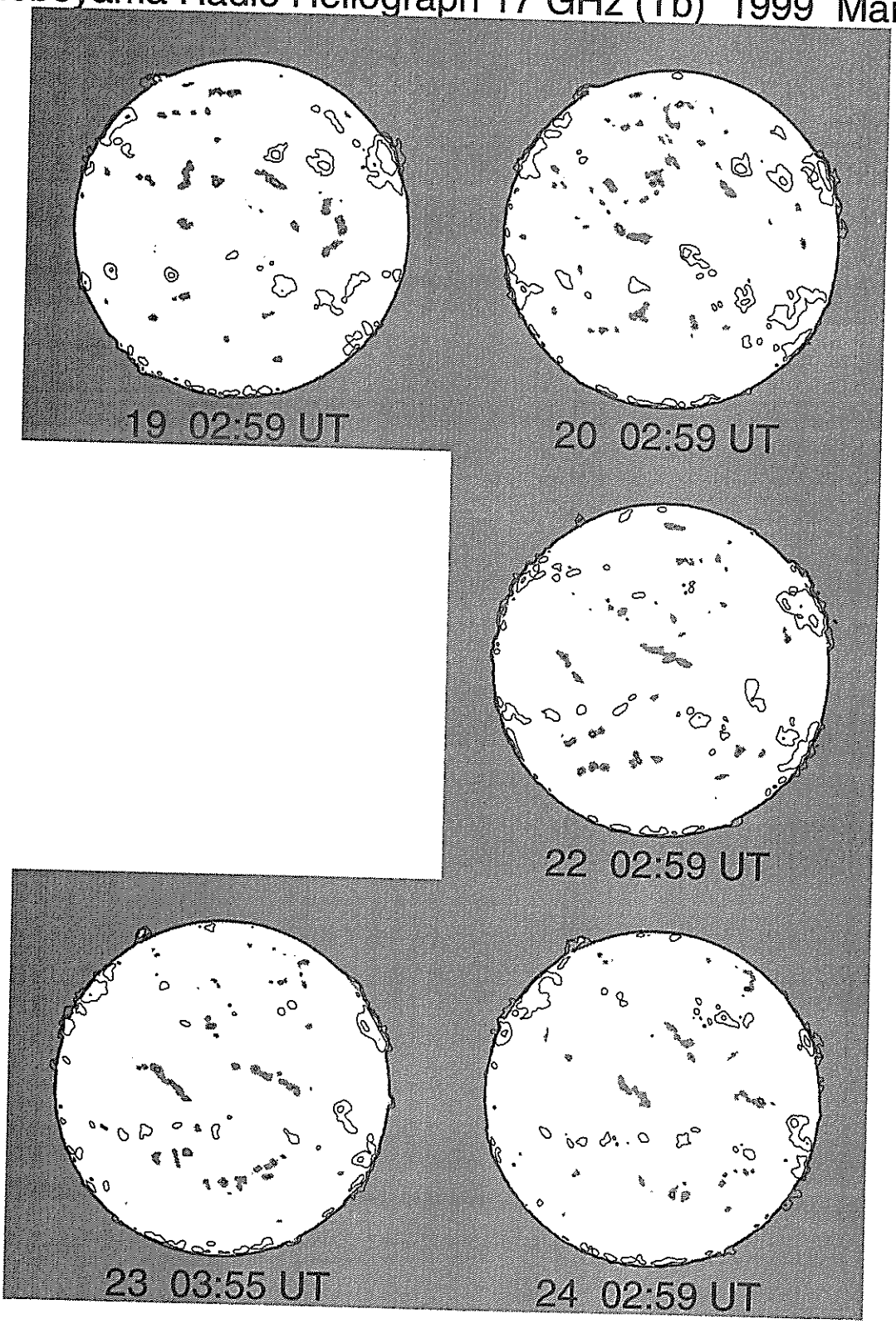
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 March



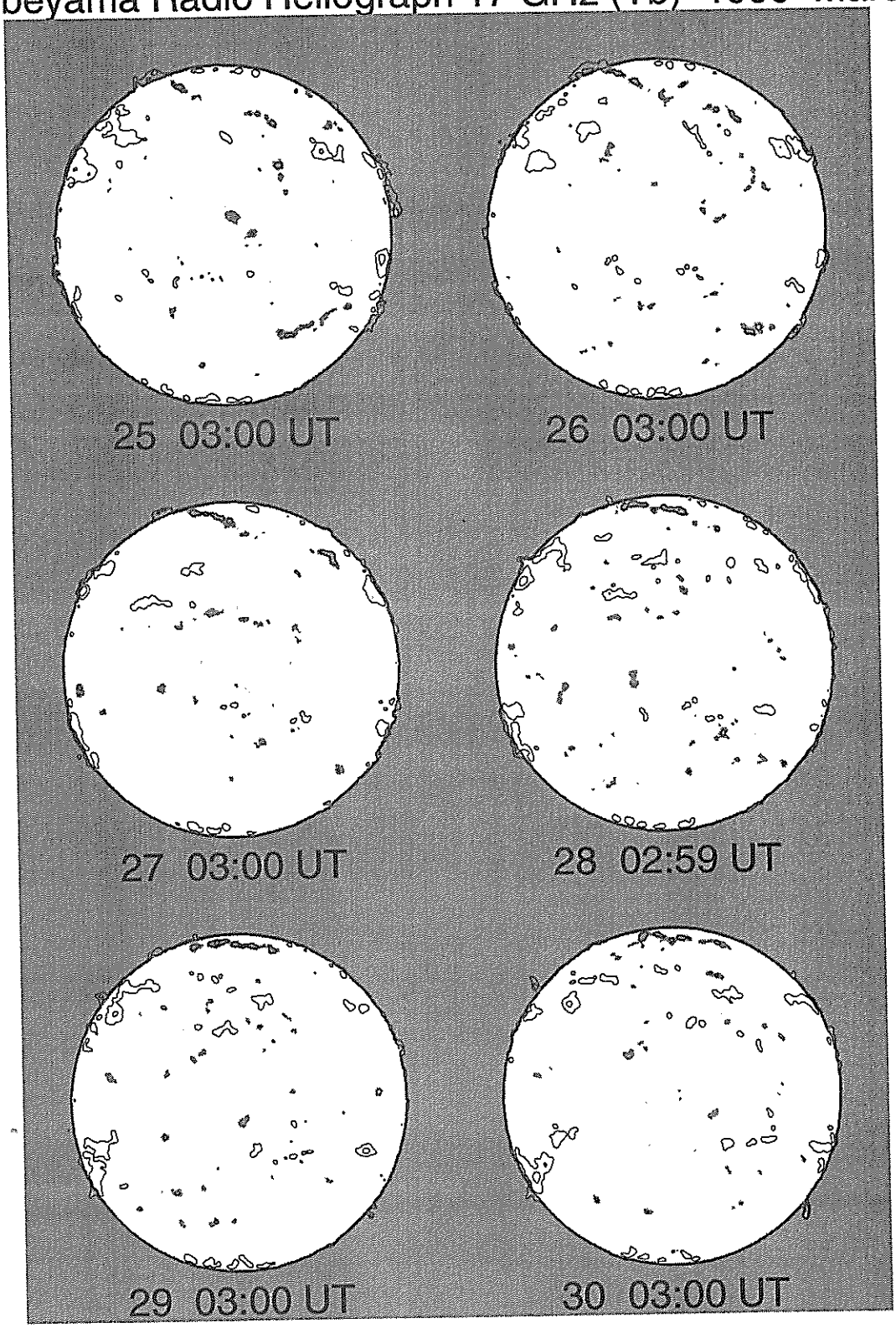
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 March



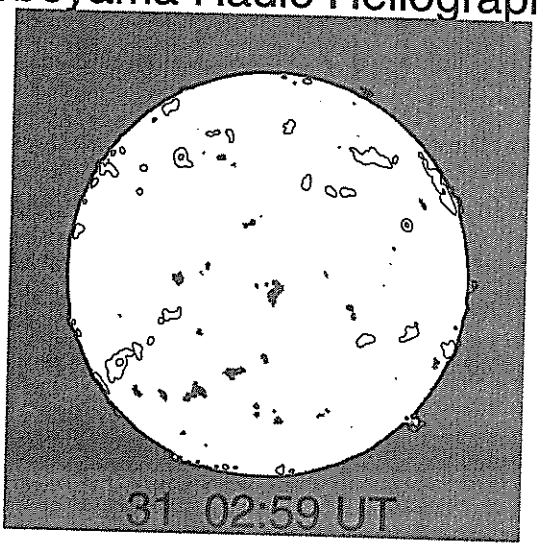
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 March



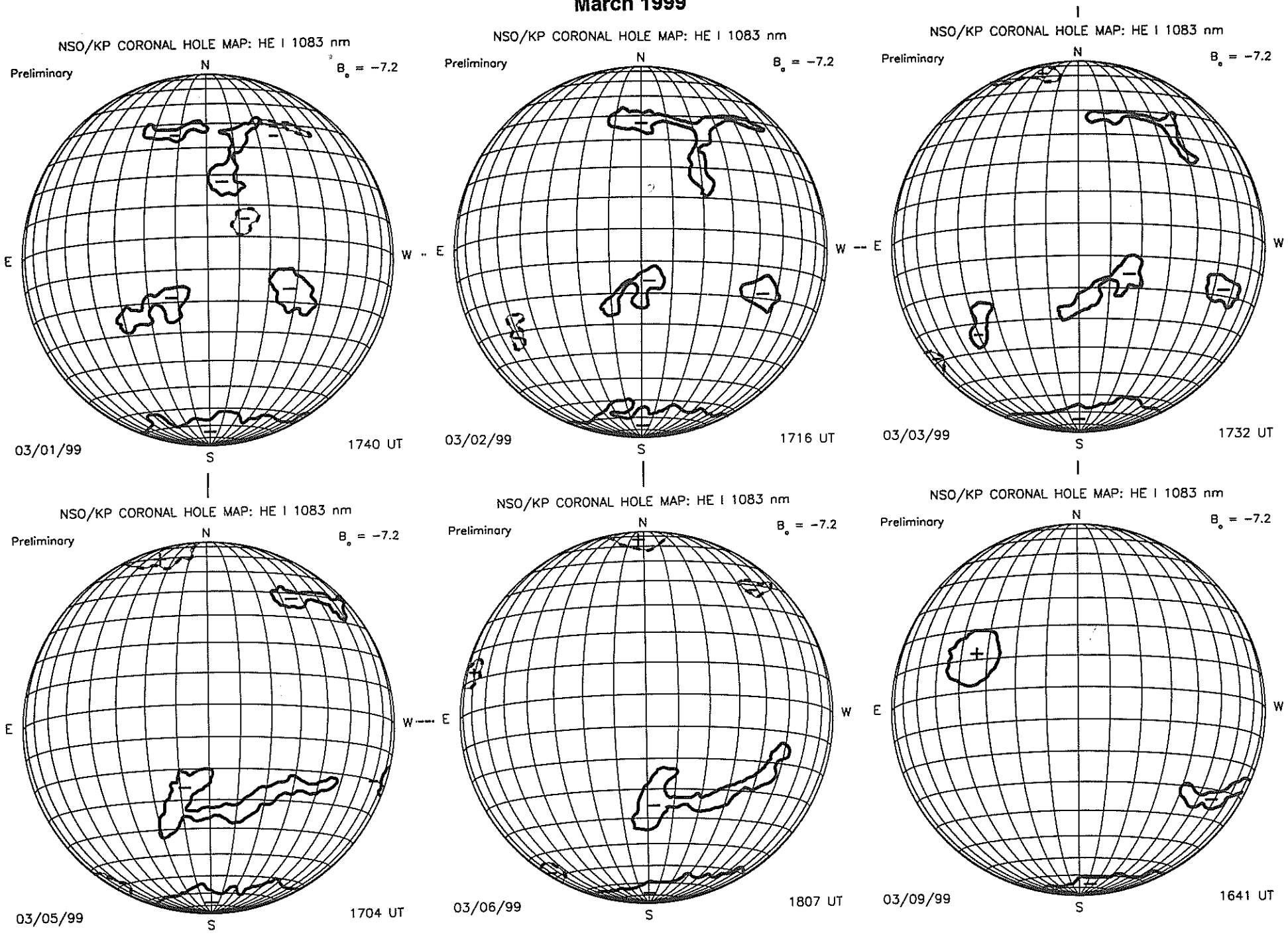
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 March

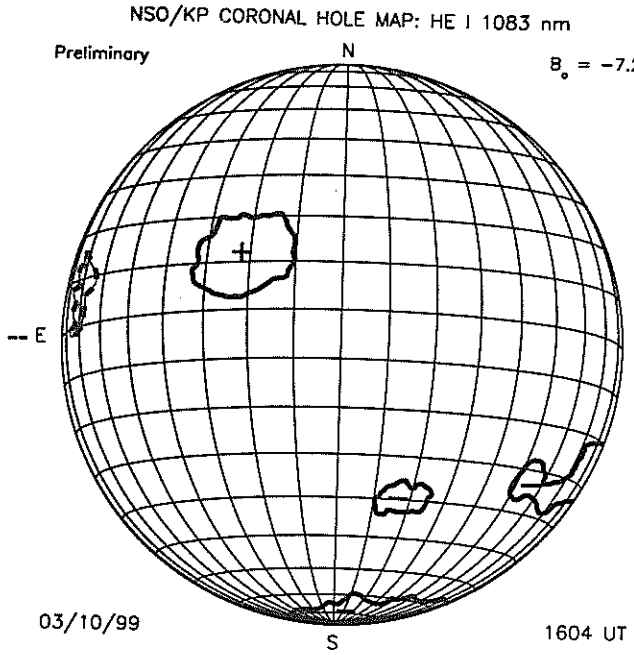


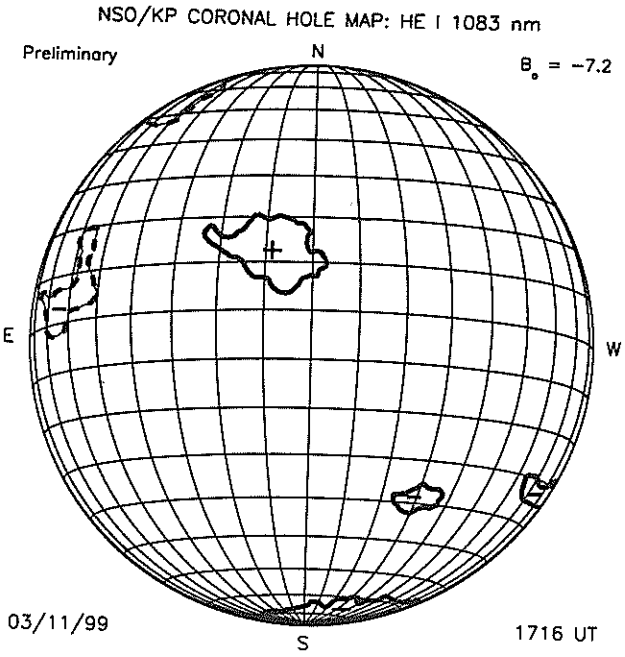
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

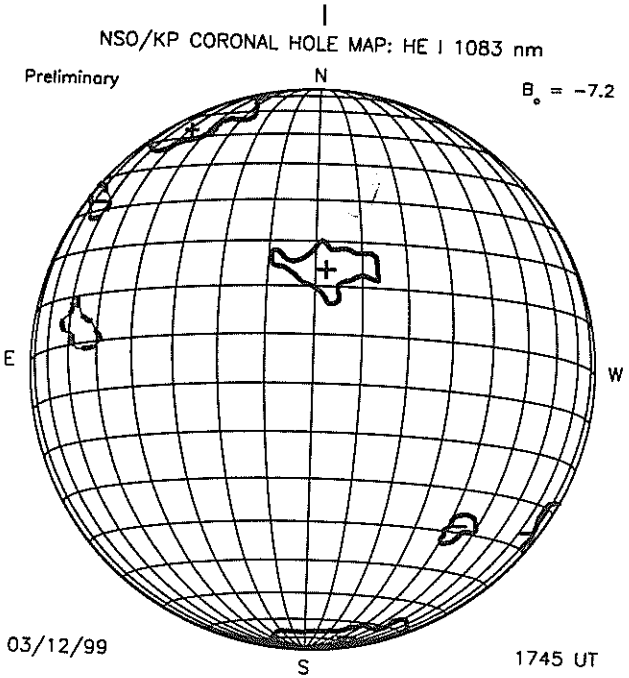
KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
March 1999

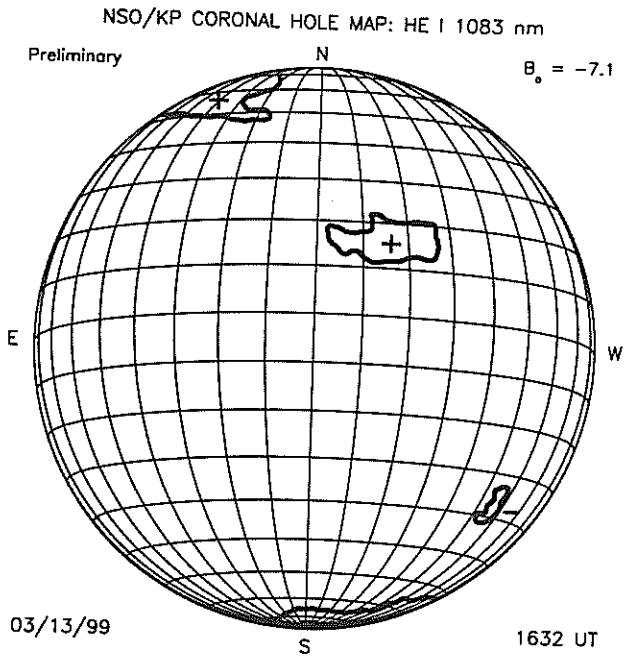


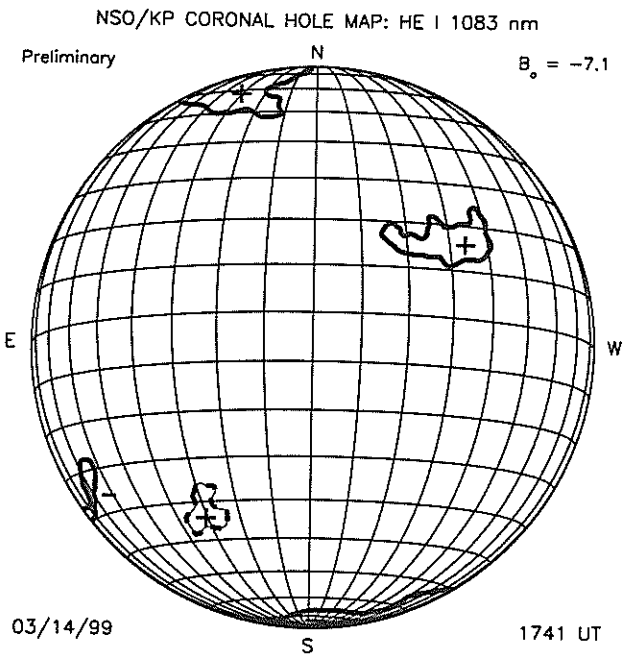
KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
March 1999

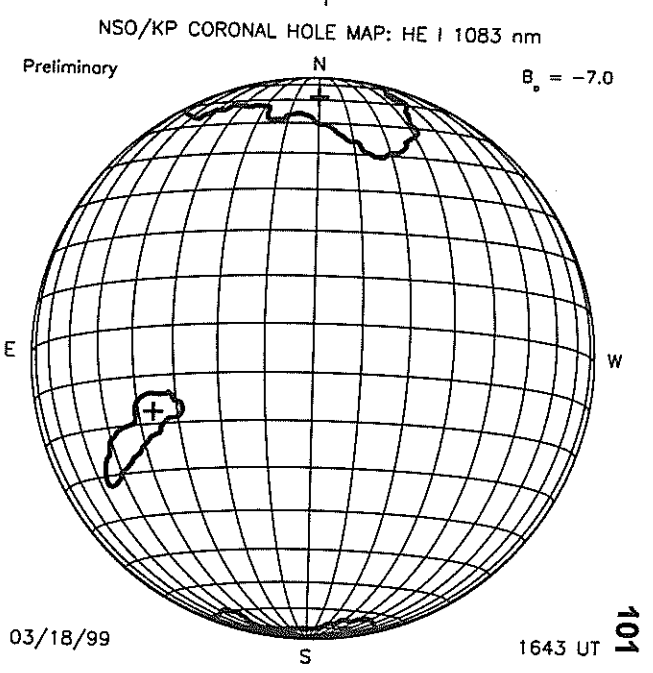




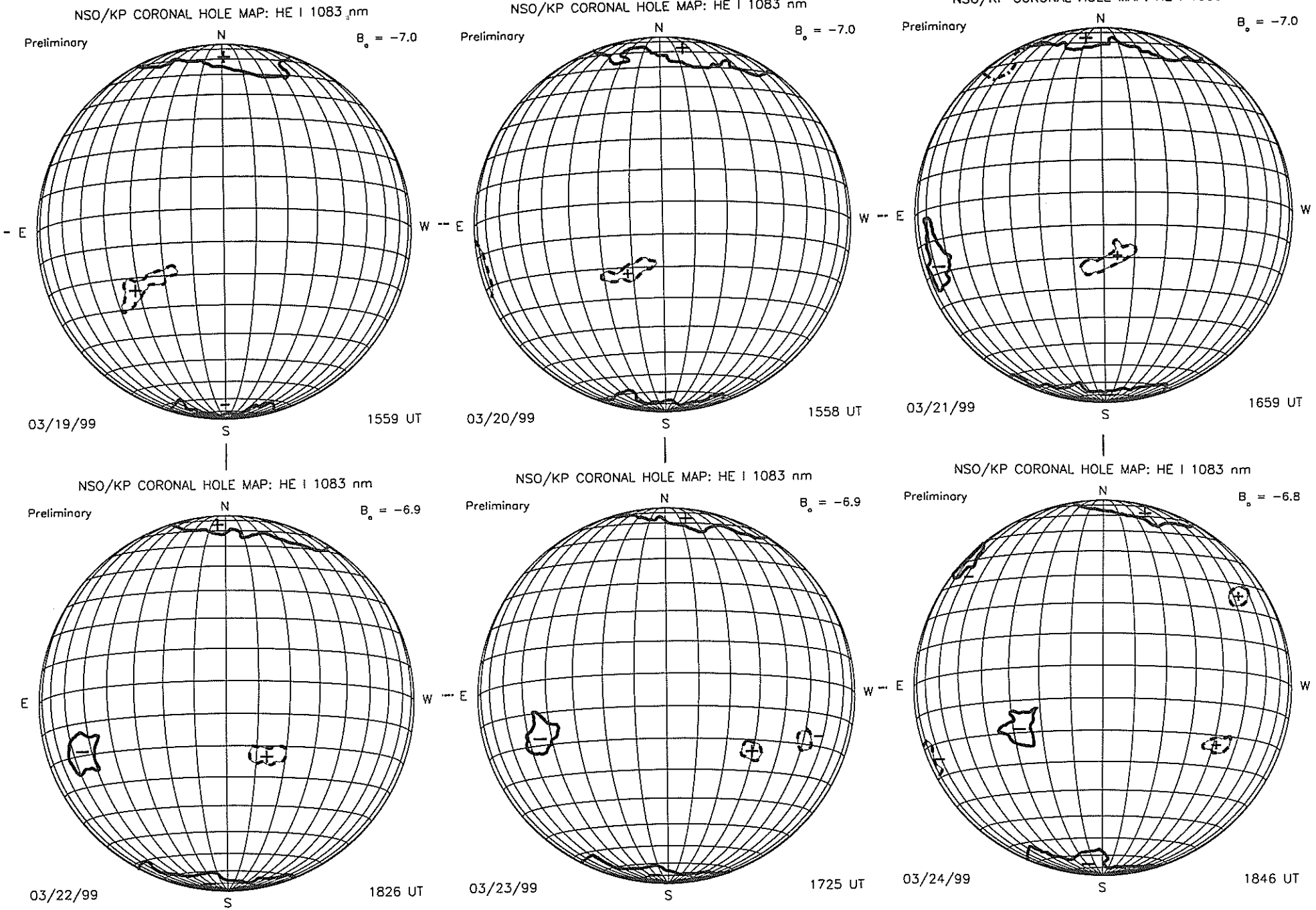




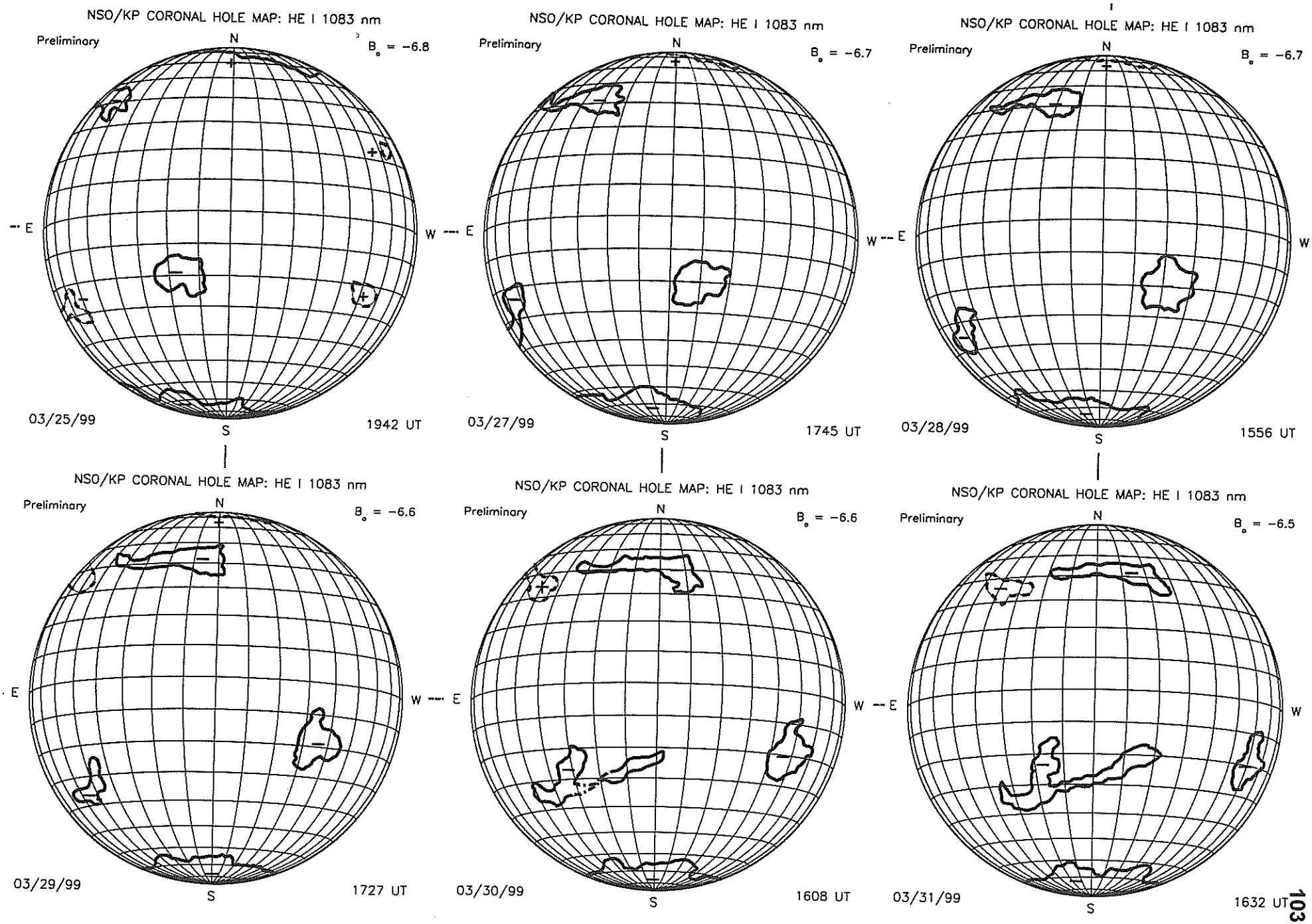




KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
March 1999



KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
March 1999



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

MARCH 1999

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
8478	29010	MWIL	03 01	1600	S15 W09	03 1.0	4	(B)					
8478		LEAR	03 02	0045	S14 W05	03 1.6		B	BXO	10	2	3	3
8478		KAND	03 02	0700	S14 W18	02 28.9			AX		2	1	4
8478		RAMY	03 02	1240	S14 W16	03 1.3		B	BXO	20	3	11	3
8478	29010	MWIL	03 02	1545	S15 W22	03 1.0	4	(B)					
8478		HOLL	03 02	1610	S15 W17	03 1.4		B	EAO	20	5	12	3
8478		LEAR	03 03	0021	S15 W27	03 1.0		B	CAO	30	5	4	4
8478		VORO	03 03	0026	S14 W26	03 1.0			BXI	50	8	6	3
8478		KAND	03 03	0830	S15 W32	02 28.9			AX		1	1	4
8478		RAMY	03 03	1346	S14 W36	02 28.8		B	BXO	10	5	4	3
8478	29010	MWIL	03 03	1545	S15 W36	02 28.9	4	(AP)					
8478		HOLL	03 03	1634	S15 W37	02 28.9		A	AX	10	2	1	3
8478		VORO	03 03	2330	S15 W37	03 1.2			BXO	26	4	7	2
8478		LEAR	03 04	0025	S15 W40	03 1.0		B	CRO	20	4	4	3
8478		KAND	03 04	1215	S15 W48	02 28.9			CSO		3	4	2
8478		RAMY	03 04	1308	S16 W48	02 28.9		B	BXO	10	4	4	3
8478		LEAR	03 05	0015	S15 W54	02 28.9		B	CRO	40	7	9	3
8478		KAND	03 05	0930	S15 W59	02 28.9			BXO		3	4	3
8478		RAMY	03 05	1247	S16 W60	03 1.0		B	BXO	10	2	5	4
8478	29010	MWIL	03 05	1600	S15 W63	02 28.9	4	(BP)					
8478		HOLL	03 05	1635	S14 W62	03 1.0		B	BXO	20	2	3	3
8478		VORO	03 05	2337	S14 W67	02 28.9			CRO	37	2	5	2
8478		LEAR	03 06	0150	S15 W67	03 1.0		B	DAO	40	3	6	3
8478		KAND	03 06	0800	S15 W75	02 28.6			AX		1		3
8478		RAMY	03 06	1215	S15 W74	02 28.9		A	AX		1		4
8479		HOLL	03 01	1550	S15 W04	03 1.3		B	BXO	20	4	10	4
8479	29011	MWIL	03 01	1600	S15 E01	03 1.7	3	(AF)					
8479		TACH	03 02	0548	S15 W08	03 1.6			BRO	40	2	2	3
8479		KAND	03 02	0700	S14 W09	03 1.6			BXO		2	4	4
8479	29011	MWIL	03 02	1545	S14 W14	03 1.6	4	(B)					
8479		LEAR	03 03	0021	S14 W19	03 1.6		B	CSO	20	4	4	4
8479		KAND	03 03	0830	S14 W23	03 1.6			BXO		3	4	4
8479		RAMY	03 03	1346	S16 W25	03 1.7		B	CRO	10	5	3	3
8479	29011	MWIL	03 03	1545	S14 W26	03 1.7	4	(B)					
8479		HOLL	03 03	1634	S14 W28	03 1.6		B	CSO	30	5	5	3
8479		LEAR	03 04	0025	S14 W32	03 1.6		B	CRO	20	4	5	3
8479		KAND	03 04	1215	S12 W42	03 1.3			DAO		4	6	2
8479		RAMY	03 04	1308	S13 W42	03 1.4		B	CRO	10	5	5	3
8479		LEAR	03 05	0015	S14 W46	03 1.5		B	CRO	30	4	5	3
8479		KAND	03 05	0930	S12 W56	03 1.2			AX		2	1	3
8479		RAMY	03 05	1247	S13 W55	03 1.4		B	BXO	10	2	6	4
8479	29015	MWIL	03 05	1600	S12 W60	03 1.1	4	(AP)					
8479		TACH	03 06	0611	S13 W69	03 1.0			BRO	5	2	6	2
8479		KAND	03 06	0800	S13 W70	03 1.0			AX		1		3
8479		RAMY	03 06	1215	S13 W69	03 1.3		A	AX		1		4
8472		RAMY	02 24	1223	N27 E69	03 1.9		A	AX		1		3
8472	29004	MWIL	02 24	1530	N29 E70	03 2.1	4	(AP)					
8472		HOLL	02 24	1538	N29 E67	03 1.9		A	AX		1		3
8472		LEAR	02 25	0005	N30 E61	03 1.8		A	AX		1		4
8472		VORO	02 25	0027	N29 E63	03 1.9			HRX	24	1		3
8472		TACH	02 25	0536	N29 E63	03 2.2			HSX	20	1	1	2
8472		KAND	02 25	0725	N29 E62	03 2.2			BXO		4	5	3
8472		RAMY	02 25	1208	N29 E58	03 2.0		B	BXO	10	4	6	4
8472	29004	MWIL	02 25	1530	N30 E57	03 2.1	4	(BP)					
8472		VORO	02 26	0515	N30 E50	03 2.1			CAI	66	4	5	2
8472		TACH	02 26	0516	N30 E49	03 2.1			CSI	36	6	5	3
8472		RAMY	02 26	1223	N29 E46	03 2.1		B	CSO	20	7	6	3
8472	29004	MWIL	02 26	1545	N30 E46	03 2.3	4	(BP)					
8472		HOLL	02 26	1724	N29 E43	03 2.1		B	BXO	70	9	8	3
8472		VORO	02 27	0025	N31 E41	03 2.2			BXI	90	6	8	2
8472		LEAR	02 27	0125	N30 E38	03 2.0		B	CSO	60	8	7	4
8472		TACH	02 27	0606	N28 E38	03 2.2			BRO	46	3	5	3
8472		KAND	02 27	0720	N30 E36	03 2.1			CRO		4	6	4
8472		RAMY	02 27	1337	N29 E33	03 2.1		B	BXO	30	8	7	3
8472	29004	MWIL	02 27	1545	N30 E32	03 2.2	4	(B)					
8472		HOLL	02 27	1650	N30 E31	03 2.1		B	BXO	20	10	7	3
8472		LEAR	02 28	0010	N30 E26	03 2.0		B	CRO	40	14	9	5

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

MARCH 1999

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
8472		VORO	02 28 0025	N30 E26	03 2.1			DAI	48	4	5	2
8472		TACH	02 28 0612	N30 E22	03 2.0			BXO	11	2	5	4
8472		KAND	02 28 0825	N29 E21	03 2.0			CSO		5	5	5
8472		RAMY	02 28 1215	N29 E21	03 2.1		B	CSO	20	10	7	4
8472	29004	MWIL	02 28 1545	N30 E19	03 2.1	5	(B)					
8472		HOLL	02 28 1603	N30 E18	03 2.1		B	CSO	20	7	8	3
8472		KAND	03 01 0830	N30 E11	03 2.2			BXO		2	2	4
8472		RAMY	03 01 1228	N30 E08	03 2.1		B	BXO	10	4	5	4
8472		HOLL	03 01 1550	N30 E04	03 2.0		B	BXO	10	3	4	4
8472	29004	MWIL	03 01 1600	N30 E06	03 2.1	3	(BF)					
8472		LEAR	03 02 0045	N31 E03	03 2.3		B	BXO	10	3	3	3
8476		KAND	02 28 0825	N19 E27	03 2.4			BXO		6	4	5
8476		RAMY	03 01 1228	N19 E14	03 2.6		B	BXO	10	4	3	4
8476		HOLL	03 01 1550	N19 E09	03 2.3		B	CRO	20	8	8	4
8476	29008	MWIL	03 01 1600	N19 E11	03 2.5	5	(B)					
8476		LEAR	03 02 0045	N18 E03	03 2.2		B	CRO	20	7	5	3
8476		TACH	03 02 0548	N17 E02	03 2.4			BRI	29	10	2	3
8476		KAND	03 02 0700	N18 E00	03 2.3			RXO		8	5	4
8476		RAMY	03 02 1240	N18 W05	03 2.1		B	DSO	120	19	9	3
8476	29012	MWIL	03 02 1545	N18 W05	03 2.3	5	(B)					
8476		HOLL	03 02 1610	N18 W05	03 2.3		B	DAO	60	18	7	3
8476		LEAR	03 03 0021	N18 W10	03 2.2		B	DSO	90	17	8	4
8476		VORO	03 03 0026	N18 W09	03 2.3			DAI	204	21	7	3
8476		KAND	03 03 0830	N18 W14	03 2.3			EAI		17	12	4
8476		RAMY	03 03 1346	N18 W17	03 2.3		B	DAI	230	25	9	3
8476	29012	MWIL	03 03 1545	N18 W18	03 2.3	5	(D)					
8476		HOLL	03 03 1634	N18 W20	03 2.2		B	DSC	160	21	9	3
8476		VORO	03 03 2330	N17 W23	03 2.2			DKI	475	17	7	2
8476		LEAR	03 04 0025	N18 W24	03 2.2		B	EAI	180	18	12	3
8476		KAND	03 04 1215	N18 W30	03 2.2			EAO		14	11	2
8476		RAMY	03 04 1308	N18 W30	03 2.3		B	EKO	360	18	12	3
8476		LEAR	03 05 0015	N18 W35	03 2.3		B	EKO	220	20	12	3
8476		KAND	03 05 0930	N18 W41	03 2.3			EKO		21	12	3
8476		RAMY	03 05 1247	N17 W43	03 2.3		B	EAI	390	28	11	4
8476	29012	MWIL	03 05 1600	N18 W45	03 2.2	5	(B)					
8476		HOLL	03 05 1635	N18 W45	03 2.3		B	ESC	400	23	12	3
8476		VORO	03 05 2337	N17 W50	03 2.2			DKI	669	17	10	2
8476		LEAR	03 06 0150	N17 W51	03 2.2		B	ESI	340	25	12	3
8476		TACH	03 06 0611	N17 W55	03 2.1			DAI	343	10	8	2
8476		KAND	03 06 0800	N17 W54	03 2.2			EHO		12	13	3
8476		RAMY	03 06 1215	N17 W55	03 2.3		B	EKO	360	15	13	4
8476		HOLL	03 06 2027	N18 W60	03 2.3		B	EAO	250	19	14	2
8476		LEAR	03 07 0019	N17 W61	03 2.4		B	EAO	330	11	14	4
8476		TACH	03 07 0845	N17 W68	03 2.2			CSO	190	4	10	4
8476		KAND	03 07 0930	N17 W69	03 2.1			ESO		8	14	3
8476		RAMY	03 07 1206	N17 W68	03 2.3		B	ESO	140	6	13	3
8476		HOLL	03 07 2217	N17 W75	03 2.2		B	DAO	120	6	10	1
8476		LEAR	03 08 0016	N18 W78	03 2.1		B	EAO	150	4	11	3
8476		VORO	03 08 0042	N16 W77	03 2.2			DKI	369	6	10	2
8472A		TACH	02 28 0612	N20 E26	03 2.2			AR	7	2	2	4
8472A		KAND	02 28 0825	N19 E27	03 2.4			BXO		6	4	5
8472A		RAMY	02 28 1215	N20 E25	03 2.4		B	BXO	10	7	5	4
8472A	29008	MWIL	02 28 1545	N19 E24	03 2.5	3	(B)					
8472A		HOLL	02 28 1603	N19 E23	03 2.4		B	CRO	10	11	5	3
8481		RAMY	03 03 1346	S19 W09	03 2.9		B	BXO		2	2	3
8481	29014	MWIL	03 03 1545	S19 W11	03 2.8	4	(AP)					
8481		HOLL	03 03 1634	S18 W12	03 2.8		B	BXO	10	2	1	3
8481		LEAR	03 04 0025	S19 W16	03 2.8		B	BXO	10	2	1	3
8481		RAMY	03 04 1308	S18 W23	03 2.8		B	BXO		2	3	3
8475		RAMY	02 26 1223	N34 E61	03 3.4		A	AX		3	1	3
8475		TACH	02 27 0606	N32 E56	03 3.7			AXX	10	1	1	3
8475		KAND	02 27 0720	N32 E52	03 3.4			BXO		2	1	4
8475		RAMY	02 27 1337	N32 E47	03 3.3		B	BXO	10	2	3	3
8475	29007	MWIL	02 27 1545	N32 E47	03 3.4	4	(B)					
8475		HOLL	02 27 1650	N32 E47	03 3.4		B	BXO	20	8	3	3

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

MARCH 1999

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
8475		LEAR	02	28	0010	N32	E42	03	3.3		B	CRO	40	8	5	5
8475		VORO	02	28	0025	N32	E42	03	3.3			CAO	65	2	0	2
8475		TACH	02	28	0612	N32	E38	03	3.3			AR	6	2	1	4
8475		KAND	02	28	0825	N31	E38	03	3.3			BXI		7	4	5
8475		RAMY	02	28	1215	N32	E36	03	3.4		B	CAO	30	10	8	4
8475	29007	MWIL	02	28	1545	N32	E33	03	3.3	4	(B)					
8475		HOLL	02	28	1603	N32	E32	03	3.2		B	BXO	20	15	7	3
8475		KAND	03	01	0830	N31	E23	03	3.2			DAO		19	8	4
8475		RAMY	03	01	1228	N32	E22	03	3.3		B	DAI	160	17	8	4
8475		HOLL	03	01	1550	N32	E18	03	3.1		B	DAO	80	16	8	4
8475	29007	MWIL	03	01	1600	N31	E20	03	3.2	4	(D)					
8475		LEAR	03	02	0045	N32	E14	03	3.1		B	DAO	120	14	8	3
8475		TACH	03	02	0548	N30	E10	03	3.0			CAI	309	14	6	3
8475		KAND	03	02	0700	N31	E10	03	3.1			DAO		6	9	4
8475		RAMY	03	02	1240	N30	E08	03	3.1		B	DAO	150	12	9	3
8475	29007	MWIL	03	02	1545	N32	E07	03	3.2	5	(BG)					
8475		HOLL	03	02	1610	N31	E06	03	3.1		B	DAC	180	18	10	3
8475		LEAR	03	03	0021	N31	E01	03	3.1		B	DAO	130	15	10	4
8475		VORO	03	03	0026	N31	E01	03	3.1			DAI	360	20	9	3
8475		KAND	03	03	0830	N31	W02	03	3.2			EAO		11	11	4
8475		RAMY	03	03	1346	N32	W05	03	3.2		B	EAO	130	23	12	3
8475	29007	MWIL	03	03	1545	N32	W06	03	3.2	5	(BG)					
8475		HOLL	03	03	1634	N30	W08	03	3.1		B	EAO	150	15	12	3
8475		VORO	03	03	2330	N31	W11	03	3.1			DAI	218	13	11	2
8475		LEAR	03	04	0025	N31	W11	03	3.1		B	EAO	140	13	12	3
8475		KAND	03	04	1215	N31	W18	03	3.1			EAO		10	13	2
8475		RAMY	03	04	1308	N32	W18	03	3.1		B	EAO	50	14	12	3
8475		LEAR	03	05	0015	N31	W24	03	3.1		B	ESO	100	12	12	3
8475		KAND	03	05	0930	N31	W29	03	3.1			ESO		5	14	3
8475		RAMY	03	05	1247	N32	W30	03	3.1		B	CRO	20	8	13	4
8475	29007	MWIL	03	05	1600	N30	W30	03	3.3	4	(B)					
8475		HOLL	03	05	1635	N31	W35	03	2.9		B	BXO	30	8	15	3
8475		VORO	03	05	2337	N32	W37	03	3.0			CAI	94	7	12	2
8475		LEAR	03	06	0150	N31	W40	03	2.9		B	CRO	40	5	12	3
8475		TACH	03	06	0611	N30	W41	03	3.0			BRO	15	2	9	2
8475		KAND	03	06	0800	N31	W40	03	3.2			CSO		3	13	3
8475		RAMY	03	06	1215	N29	W45	03	3.0		B	BXO	10	2	8	4
8475A		LEAR	03	05	0015	N27	E12	03	5.9		A	AX		3	2	3
8483	29016	MWIL	03	05	1600	S18	E11	03	6.5	3	(B)					
8483		VORO	03	05	2337	S19	E08	03	6.6			BXO	4	2	2	2
8483		RAMY	03	06	1215	S18	E01	03	6.6		B	CRO	20	5	3	4
8483		HOLL	03	06	2027	S18	W04	03	6.5		B	CSO	30	18	4	2
8483		LEAR	03	07	0019	S17	W08	03	6.4		B	DAO	90	13	4	4
8483		TACH	03	07	0845	S18	W11	03	6.5			BRO	42	4	4	4
8483		KAND	03	07	0930	S18	W13	03	6.4			DAO		9	5	3
8483		RAMY	03	07	1206	S18	W12	03	6.6		B	DSO	40	11	6	3
8483		HOLL	03	07	2217	S18	W18	03	6.5		B	DSO	40	7	6	1
8483		LEAR	03	08	0016	S18	W20	03	6.5		B	DAO	70	8	7	3
8483		VORO	03	08	0042	S19	W20	03	6.5			DAI	75	6	5	2
8483		TACH	03	08	0624	S18	W23	03	6.5			BRO	45	3	6	3
8483		KAND	03	08	0745	S18	W24	03	6.5			DAO		10	7	4
8483		RAMY	03	08	1201	S18	W27	03	6.4		B	CSO	200	8	6	4
8483	29016	MWIL	03	08	1600	S18	W28	03	6.5	4	(B)					
8483		HOLL	03	08	1622	S18	W28	03	6.5		B	CSO	40	6	8	3
8483		VORO	03	08	2330	S20	W32	03	6.5			CAI	59	6	11	2
8483		LEAR	03	09	0010	S18	W35	03	6.3		B	CAO	10	6	5	4
8483		TACH	03	09	0523	S19	W39	03	6.2			AR	27	4	2	3
8483		KAND	03	09	0940	S18	W42	03	6.2			HS		1	2	3
8483		HOLL	03	09	1608	S19	W45	03	6.2		B	DSO	20	4	5	2
8483		VORO	03	09	2309	S19	W50	03	6.1			BXO	37	2	2	2
8483		LEAR	03	10	0015	S18	W49	03	6.3		B	DSO	40	8	4	5
8483		TACH	03	10	0435	S18	W50	03	6.4			AR	12	2	1	3
8483		KAND	03	10	0715	S19	W54	03	6.2			CRO		3	7	4
8483	29016	MWIL	03	10	1515	S18	W58	03	6.2	4	(BP)					
8483		HOLL	03	10	1517	S18	W58	03	6.2		B	CSO	20	3	4	3
8483		RAMY	03	10	1525	S19	W55	03	6.4		B	CSO	30	6	7	3
8483		VORO	03	10	2358	S19	W60	03	6.4			CAI	59	5	7	2

SUNSPOT GROUPS
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8483		LEAR	03 11 0005	S18 W60	03 6.4		B	CAO	40	4	5	4
8483		TACH	03 11 0630	S18 W64	03 6.4			CAO	38	7	5	2
8483		KAND	03 11 0800	S20 W66	03 6.3			BXO		7	9	4
8483		RAMY	03 11 1234	S19 W67	03 6.4		B	DSO	80	5	6	3
8483		HOLL	03 11 1448	S21 W70	03 6.2		B	DAO	90	4	8	3
8483		VORO	03 11 2313	S20 W76	03 6.1			DAO	198	3	7	2
8483		LEAR	03 12 0025	S19 W75	03 6.3		B	DAO	90	8	9	4
8483		TACH	03 12 0455	S17 W78	03 6.3			BRO	15	2	7	3
8483		KAND	03 12 0950	S21 W78	03 6.4			CSO		3	8	5
8483		RAMY	03 12 1220	S23 W76	03 6.6		B	CRO	30	3	7	3
8483		HOLL	03 12 1559	S22 W80	03 6.5		B	DSO	60	3	4	3
8477A		VORO	03 03 0026	S24 E51	03 6.9			BXI	26	5	1	3
8477A		VORO	03 03 2330	S25 E39	03 7.0			AXX	43	5		2
8477A	29017	MWIL	03 05 1600	S25 E16	03 6.9	4	(B)					
8477A		VORO	03 05 2337	S24 E13	03 7.0			BXI	104	11	3	2
8477A		VORO	03 07 2358	S25 W14	03 6.9			BXI	14	5	2	2
8477		KAND	02 28 0825	S25 E87	03 7.1			CSO		3	4	5
8477		RAMY	02 28 1215	S27 E84	03 7.0		B	CSO	40	4	11	4
8477	29009	MWIL	02 28 1545	S26 E82	03 7.0	4	(B)					
8477		HOLL	02 28 1603	S23 E80	03 6.8		A	AX	10	3	2	3
8477		KAND	03 01 0830	S25 E73	03 7.0			HS		1	3	4
8477		KAND	03 01 0830	S30 E80	03 7.6			HS		1	3	4
8477		RAMY	03 01 1228	S26 E68	03 6.8		B	DSO	80	5	8	4
8477		HOLL	03 01 1550	S25 E70	03 7.1		B	DAO	120	5	9	4
8477	29009	MWIL	03 01 1600	S27 E70	03 7.1	4	(B)					
8477		LEAR	03 02 0045	S26 E65	03 7.1		B	DAO	130	4	9	3
8477		TACH	03 02 0548	S27 E63	03 7.1			CAO	110	4	6	3
8477		KAND	03 02 0700	S25 E61	03 7.0			BXO		2	3	4
8477		KAND	03 02 0700	S30 E63	03 7.2			HS		1	3	4
8477		RAMY	03 02 1240	S25 E57	03 6.9		B	DSO	110	5	3	3
8477	29009	MWIL	03 02 1545	S27 E58	03 7.2	5	(B)					
8477		HOLL	03 02 1610	S27 E58	03 7.2		B	CSO	80	4	8	3
8477		LEAR	03 03 0021	S26 E52	03 7.0		B	DSO	130	5	8	4
8477		VORO	03 03 0026	S30 E58	03 7.6			HKX	173	1		3
8477		KAND	03 03 0830	S25 E47	03 7.0			BXI		6	4	4
8477		KAND	03 03 0830	S30 E54	03 7.6			HS		2	2	4
8477		RAMY	03 03 1346	S26 E45	03 7.1		B	EAO	110	7	12	3
8477	29009	MWIL	03 03 1545	S28 E46	03 7.2	5	(B)					
8477		HOLL	03 03 1634	S26 E45	03 7.2		B	DSO	90	3	7	3
8477		VORO	03 03 2330	S30 E46	03 7.6			HAX	199	2		2
8477		LEAR	03 04 0025	S26 E39	03 7.0		B	DSO	120	7	8	3
8477		KAND	03 04 1215	S24 E30	03 6.8			CRI		8	8	2
8477		KAND	03 04 1215	S30 E37	03 7.4			CSI		9	5	2
8477		RAMY	03 04 1308	S27 E33	03 7.1		B	EAO	140	18	12	3
8477		LEAR	03 05 0015	S26 E27	03 7.1		B	EAO	140	18	11	3
8477		KAND	03 05 0930	S25 E20	03 6.9			BXO		12	4	3
8477		KAND	03 05 0930	S30 E26	03 7.4			CSO		9	6	3
8477		RAMY	03 05 1247	S27 E21	03 7.2		BG	EAO	150	23	12	4
8477	29009	MWIL	03 05 1600	S30 E22	03 7.4	5	(BF)					
8477		HOLL	03 05 1635	S26 E19	03 7.2		B	ESO	150	21	11	3
8477		VORO	03 05 2337	S30 E20	03 7.5			HAX	189	3		2
8477		LEAR	03 06 0150	S26 E13	03 7.1		B	ESO	140	20	11	3
8477		TACH	03 06 0611	S27 E11	03 7.1			CAI	242	6	9	2
8477		KAND	03 06 0800	S24 E08	03 6.9			DAO		11	5	3
8477		KAND	03 06 0800	S30 E14	03 7.4			CAI		5	6	3
8477		RAMY	03 06 1215	S26 E06	03 7.0		BG	FSO	190	22	16	4
8477		HOLL	03 06 2027	S26 E04	03 7.2		B	CSO	100	22	11	2
8477		VORO	03 06 2358	S30 E07	03 7.5			HSX	199	6		2
8477		LEAR	03 07 0019	S25 E03	03 7.2		B	CSO	90	18	13	4
8477		TACH	03 07 0845	S29 E02	03 7.5			HR	106	3	4	4
8477		KAND	03 07 0930	S29 E01	03 7.5			CSI		11	8	3
8477		RAMY	03 07 1206	S26 W04	03 7.2		B	CSO	100	15	12	3
8477		HOLL	03 07 2217	S28 W03	03 7.7		B	CSO	80	4	4	1
8477		LEAR	03 08 0016	S26 W11	03 7.1		B	CSO	150	8	12	3
8477		VORO	03 08 0042	S29 W06	03 7.5			HAX	168	7		2
8477		TACH	03 08 0624	S29 W11	03 7.4			CAO	265	3	3	3
8477		KAND	03 08 0745	S29 W11	03 7.5			CAO		6	6	4

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

MARCH 1999

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
8477		RAMY	03 08 1201	S26 W16	03 7.2		BG	ESO	100	17	11	4
8477	29009	MWIL	03 08 1600	S29 W15	03 7.5	5	(BF)					
8477		HOLL	03 08 1622	S28 W13	03 7.7		BG	DSO	140	20	9	3
8477		VORO	03 08 2330	S28 W18	03 7.6			DHI	262	24	9	2
8477		LEAR	03 09 0010	S28 W20	03 7.4		B	DAO	80	19	5	4
8477		TACH	03 09 0523	S27 W20	03 7.7			CAI	266	16	8	3
8477		KAND	03 09 0940	S25 W20	03 7.8			DAO		3	2	3
8477		KAND	03 09 0940	S28 W24	03 7.5			DAO		12	7	4
8477		HOLL	03 09 1608	S29 W28	03 7.5		B	DSC	130	14	6	2
8477		VORO	03 09 2309	S29 W33	03 7.4			CAI	231	4	4	2
8477		LEAR	03 10 0015	S28 W33	03 7.4		B	DAO	90	11	5	5
8477		TACH	03 10 0435	S27 W32	03 7.7			CAI	242	6	8	3
8477		KAND	03 10 0715	S29 W38	03 7.3			DAO		3	7	4
8477	29009	MWIL	03 10 1515	S28 W41	03 7.4	5	(BF)					
8477		HOLL	03 10 1517	S28 W42	03 7.3		B	DSO	170	5	8	3
8477		RAMY	03 10 1525	S29 W42	03 7.3		B	DAO	260	10	8	3
8477		VORO	03 10 2304	S29 W46	03 7.3			HHX	386	14	4	2
8477		LEAR	03 11 0005	S28 W46	03 7.4		B	DAO	130	9	7	4
8477		TACH	03 11 0630	S27 W49	03 7.4			CAO	306	4	5	2
8477		KAND	03 11 0800	S29 W50	03 7.4			CAO		5	7	4
8477		RAMY	03 11 1234	S29 W50	03 7.6		A	HS	240	2	4	3
8477		HOLL	03 11 1448	S29 W55	03 7.3		B	CSO	240	4	7	3
8477		VORO	03 11 2313	S29 W58	03 7.4			HHX	296	2		2
8477		LEAR	03 12 0025	S28 W58	03 7.5		B	CSO	210	5	6	4
8477		TACH	03 12 0455	S27 W59	03 7.6			HA	200	2	2	3
8477		KAND	03 12 0950	S30 W63	03 7.4			CAO		3	6	5
8477		RAMY	03 12 1220	S32 W59	03 7.8		A	HS	130	2	2	3
8477	29009	MWIL	03 12 1515	S28 W65	03 7.5	4	(AF)					
8477		HOLL	03 12 1559	S30 W65	03 7.5		A	HH	180	2	3	3
8477		LEAR	03 13 0024	S28 W68	03 7.7		A	HH	160	2	3	3
8477		VORO	03 13 0315	S30 W72	03 7.5			HAX	224	1		2
8477		KAND	03 13 0900	S29 W74	03 7.6			HA		2	2	3
8477		RAMY	03 13 1223	S28 W76	03 7.6		A	HS	180	2	2	4
8477	29009	MWIL	03 13 1515	S28 W78	03 7.5	4	(AF)					
8477		HOLL	03 13 1602	S30 W79	03 7.4		A	HS	160	1	2	2
8477		LEAR	03 14 0056	S28 W82	03 7.6		A	HA	180	1	2	4
8477		VORO	03 14 0153	S30 W87	03 7.2			HAX	440	1		2
8486	29018	MWIL	03 08 1600	S24 W11	03 7.8	3	(B)					
8486		LEAR	03 09 0010	S25 W15	03 7.8		B	CAO	10	6	3	4
8486		HOLL	03 09 1608	S27 W22	03 7.9		A	AX		1		2
8486		LEAR	03 10 0015	S25 W27	03 7.9		B	BXO	10	3	2	5
8480	29013	MWIL	03 02 1545	N25 E68	03 7.9	4	(AP)					
8480		HOLL	03 02 1610	N25 E70	03 8.1		A	AX		1		3
8480		LEAR	03 03 0021	N25 E64	03 8.0		B	BXO	20	2	4	4
8480		VORO	03 03 0026	N25 E65	03 8.0			AXX	25	1		3
8480	29013	MWIL	03 03 1545	N25 E56	03 8.0	4	(AP)					
8480		HOLL	03 03 1634	N24 E55	03 7.9		A	AX		1		3
8480		RAMY	03 04 1308	N25 E44	03 7.9		A	AX		2	1	3
8480		LEAR	03 05 0015	N25 E37	03 7.9		A	AX	10	2	1	3
8480		KAND	03 05 0930	N25 E32	03 7.9			AX		1		3
8480		RAMY	03 05 1247	N26 E33	03 8.1		B	BXO		3	7	4
8480	29013	MWIL	03 05 1600	N25 E33	03 8.2	4	(BP)					
8480		HOLL	03 05 1635	N26 E31	03 8.1		B	BXO	10	2	5	3
8480		VORO	03 05 2337	N25 E25	03 7.9			AXX	6	1		2
8480		LEAR	03 06 0150	N25 E22	03 7.8		A	AX	10	1	1	3
8480		LEAR	03 07 0019	N26 E13	03 8.0		A	AX		1		4
8482		LEAR	03 06 0150	S26 E74	03 11.8		A	AX	10	1	1	3
8482		KAND	03 06 0800	S27 E75	03 12.2			AX		1		3
8482		RAMY	03 06 1215	S26 E71	03 12.0		A	AX		1		4
8482		LEAR	03 07 0019	S27 E67	03 12.2		B	BXO	10	4	5	4
8482		AND	03 12 0950	S28 W01	03 12.3			XO		4	3	K
8482C		VORO	03 18 0703	N17 W75	03 12.6			BXO	50	2	9	2
8485C		RAMY	03 10 1525	N16 E32	03 13.1		A	AX		1		3

S U N S P O T G R O U P S
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MARCH 1999

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
8482A		HOLL	03 08 1622	S34 E57	03 13.2		B	BXO	10	2	3	3
8482B		VORO	03 19 0040	N23 W76	03 13.2			HRX	61	1		2
8485		VORO	03 08 0042	N24 E78	03 14.0			CAI	216	4	7	2
8485		RAMY	03 08 1201	N22 E72	03 14.0		B	BXO	10	4	8	4
8485	29019	MWIL	03 08 1600	N19 E70	03 14.0	3	(AP)					
8485	29020	MWIL	03 08 1600	N23 E74	03 14.4	4	(B)					
8485		HOLL	03 08 1622	N23 E71	03 14.1		B	DAO	60	4	9	3
8485		LEAR	03 09 0010	N21 E65	03 14.0		B	CAO	60	6	8	4
8485		TACH	03 09 0523	N21 E64	03 14.1			CAI	56	5	6	3
8485		KAND	03 09 0940	N21 E65	03 14.4			CSO		5	8	3
8485		HOLL	03 09 1608	N23 E58	03 14.1		B	CAO	210	13	9	2
8485		VORO	03 09 2309	N19 E54	03 14.1			AXX	18	1		2
8485		VORO	03 09 2309	N23 E53	03 14.0			CAO	280	6	7	2
8485		LEAR	03 10 0015	N21 E52	03 14.0		B	DAO	200	15	10	5
8485		TACH	03 10 0435	N21 E52	03 14.2			CAI	217	8	9	3
8485		KAND	03 10 0715	N22 E51	03 14.2			ESO		11	12	4
8485	29019	MWIL	03 10 1515	N19 E46	03 14.1	4	(AP)					
8485	29020	MWIL	03 10 1515	N23 E46	03 14.2	5	(B)					
8485		HOLL	03 10 1517	N22 E46	03 14.2		B	EAO	250	13	11	3
8485		RAMY	03 10 1525	N23 E45	03 14.1		B	EAO	330	17	11	3
8485		VORO	03 10 2304	N20 E42	03 14.2			AXX	18	1		2
8485		VORO	03 10 2304	N24 E41	03 14.1			DAI	502	18	11	2
8485		LEAR	03 11 0005	N22 E40	03 14.1		B	EAO	220	20	12	4
8485		TACH	03 11 0630	N20 E30	03 13.6			CAI	357	20	9	2
8485		KAND	03 11 0800	N23 E35	03 14.0			EAO		18	13	4
8485		RAMY	03 11 1234	N23 E33	03 14.1		BG	EAO	370	21	12	3
8485		HOLL	03 11 1448	N22 E32	03 14.1		B	EAO	310	25	14	3
8485		VORO	03 11 2313	N19 E29	03 14.2			AXX	10	1		2
8485		VORO	03 11 2313	N23 E27	03 14.0			DKI	571	11	11	2
8485		LEAR	03 12 0025	N22 E26	03 14.0		BG	EAI	260	25	14	4
8485		TACH	03 12 0455	N21 E26	03 14.2			DAI	438	14	10	3
8485		KAND	03 12 0950	N21 E23	03 14.2			EAO		16	14	5
8485		RAMY	03 12 1220	N25 E17	03 13.8		BG	EAI	280	15	13	3
8485	29020	MWIL	03 12 1515	N22 E19	03 14.1	5	(B)					
8485		HOLL	03 12 1559	N22 E18	03 14.0		BG	EAI	420	35	15	3
8485		LEAR	03 13 0024	N22 E13	03 14.0		BG	EAI	280	34	14	3
8485		VORO	03 13 0315	N23 E12	03 14.1			DAI	589	13	13	2
8485		KAND	03 13 0900	N21 E07	03 13.9			FKO		36	16	3
8485		RAMY	03 13 1223	N23 E06	03 14.0		BG	EKO	500	45	15	4
8485	29020	MWIL	03 13 1515	N22 E06	03 14.1	5	(D)					
8485		HOLL	03 13 1602	N23 E04	03 14.0		BG	EKO	460	32	16	2
8485		LEAR	03 14 0056	N23 W01	03 14.0		G	FHC	550	43	16	4
8485		VORO	03 14 0153	N23 W00	03 14.1			DAI	852	14	10	2
8485		RAMY	03 14 1232	N24 W06	03 14.0		BG	FKI	500	54	17	3
8485	29020	MWIL	03 14 1530	N22 W08	03 14.0	5	(BG)					
8485		HOLL	03 14 1734	N23 W08	03 14.1		BG	FHC	480	42	16	2
8485		VORO	03 14 2340	N24 W15	03 13.8			EKI	924	32	13	2
8485		LEAR	03 15 0035	N23 W13	03 14.0		G	FKC	460	35	17	3
8485		KAND	03 15 0810	N21 W19	03 13.9			FKI		40	17	3
8485		RAMY	03 15 1236	N23 W19	03 14.1		G	FKI	570	63	18	4
8485		HOLL	03 15 1615	N22 W21	03 14.1		BG	FKC	500	36	18	1
8485		LEAR	03 16 0020	N23 W26	03 14.0		G	FKI	580	53	18	4
8485		KAND	03 16 0910	N21 W31	03 14.0			FKC		41	18	2
8485		RAMY	03 16 1316	N24 W32	03 14.1		G	FSI	550	47	18	3
8485		HOLL	03 16 1557	N22 W35	03 14.0		BG	FKC	720	50	18	3
8485	29020	MWIL	03 16 2345	N22 W39	03 14.0	5	(D)					
8485		LEAR	03 17 0020	N23 W39	03 14.0		BG	FKI	530	41	18	4
8485		TACH	03 17 0510	N24 W40	03 14.1			DAI	686	30	5	3
8485		SVTO	03 17 1113	N24 W45	03 14.0		G	FAC	540	30	19	2
8485		RAMY	03 17 1220	N24 W45	03 14.0		BG	FAI	620	34	19	4
8485	29020	MWIL	03 17 1500	N23 W48	03 13.9	5	(D)					
8485		TACH	03 18 0535	N24 W54	03 14.1			DAI	373	10	16	2
8485		RAMY	03 18 1215	N24 W58	03 14.0		BG	FAO	360	20	18	4
8485	29020	MWIL	03 18 1500	N22 W59	03 14.1	3	B					
8485		LEAR	03 19 0335	N21 W70	03 13.8		B	FKO	350	10	18	2
8485		RAMY	03 19 1220	N23 W71	03 14.0		B	EAO	170	12	13	4
8485		HOLL	03 19 1610	N21 W75	03 13.9		B	DAO	150	4	8	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
8485	29020	MWIL	03	19	1630	N22	W76	03	13.8	3	B					
8489	29024	MWIL	03	14	1530	N13	E03	03	14.9	3	(B)					
8489		LEAR	03	16	0020	N13	W15	03	14.9		B	CRO	100	2	3	4
8489		KAND	03	16	0910	N13	W20	03	14.9			BXO		2	4	2
8489		RAMY	03	16	1316	N14	W21	03	15.0		B	BXO	10	4	4	3
8489		HOLL	03	16	1557	N12	W22	03	15.0		B	BXO	10	4	4	3
8489	29024	MWIL	03	16	2345	N13	W28	03	14.9	4	(B)					
8489		LEAR	03	17	0020	N13	W27	03	15.0		B	CRO	20	5	4	4
8489		TACH	03	17	0510	N14	W31	03	14.9			AXX	10	1	1	3
8489		RAMY	03	17	1220	N14	W36	03	14.8		A	AX		1		4
8489	29024	MWIL	03	17	1500	N13	W38	03	14.7	4	(AP)					
8489		VORO	03	18	0703	N10	W51	03	14.5			AXX	5	1		2
8489		VORO	03	19	0040	N12	W60	03	14.5			HAX	34	1		2
8484A		KAND	03	13	0900	S29	E23	03	15.2			AX		2		3
8484A		VORO	03	14	0153	S31	E13	03	15.1			AXX	8	1		2
8484A	29023	MWIL	03	14	1530	S29	E11	03	15.5	4	(BP)					
8484A		KAND	03	15	0810	S30	W03	03	15.1			AX		1		3
8484		VORO	03	07	2358	S23	E81	03	14.2			DAO	291	3	1	2
8484		RAMY	03	08	1201	S22	E80	03	14.6		A	HX	40	1	2	4
8484	29021	MWIL	03	08	1600	S23	E84	03	15.1	3	AP					
8484		HOLL	03	08	1622	S21	E82	03	15.0		A	HH	60	1	3	3
8484		LEAR	03	09	0010	S25	E75	03	14.8		A	HA	150	3	4	4
8484		TACH	03	09	0523	S26	E76	03	15.1			CSO	170	2	4	3
8484		KAND	03	09	0940	S23	E77	03	15.3			DAO		3	4	3
8484		HOLL	03	09	1608	S22	E72	03	15.2		B	DSO	190	2	5	2
8484		VORO	03	09	2309	S23	E68	03	15.2			CAO	260	2	1	2
8484		LEAR	03	10	0015	S24	E64	03	14.9		B	DAO	160	6	4	5
8484		TACH	03	10	0435	S24	E68	03	15.4			DSO	140	2	3	3
8484		KAND	03	10	0715	S23	E65	03	15.3			DSO		3	3	4
8484	29021	MWIL	03	10	1515	S23	E60	03	15.2	5	(BP)					
8484		HOLL	03	10	1517	S23	E59	03	15.2		B	CSO	70	3	4	3
8484		RAMY	03	10	1525	S23	E60	03	15.3		B	DAO	160	5	5	3
8484		VORO	03	10	2304	S22	E56	03	15.3			HAX	222	5		2
8484		LEAR	03	11	0005	S23	E52	03	15.0		B	DAO	140	9	7	4
8484		TACH	03	11	0630	S23	E51	03	15.2			HAO	150	3	1	2
8484		KAND	03	11	0800	S22	E52	03	15.3			DAO		7	4	4
8484		RAMY	03	11	1234	S23	E48	03	15.2		B	DAO	100	8	5	3
8484		HOLL	03	11	1448	S23	E48	03	15.3		B	CSO	100	9	5	3
8484		VORO	03	11	2313	S24	E43	03	15.3			DAO	159	3	1	2
8484		LEAR	03	12	0025	S23	E41	03	15.2		B	DAO	130	8	5	4
8484		TACH	03	12	0455	S25	E39	03	15.2			CAI	124	5	1	3
8484		KAND	03	12	0950	S23	E37	03	15.3			DAO		12	7	5
8484		RAMY	03	12	1220	S20	E35	03	15.2		B	DSO	60	5	4	3
8484	29021	MWIL	03	12	1515	S24	E34	03	15.3	4	(AP)					
8484		HOLL	03	12	1559	S22	E35	03	15.3		B	DSO	80	12	5	3
8484		LEAR	03	13	0024	S22	E30	03	15.3		B	DSO	80	9	5	3
8484		VORO	03	13	0315	S24	E29	03	15.4			CAO	136	3	1	2
8484		KAND	03	13	0900	S23	E26	03	15.4			DAO		8	5	3
8484		RAMY	03	13	1223	S23	E24	03	15.4		B	DSO	60	13	4	4
8484	29021	MWIL	03	13	1515	S24	E22	03	15.3	5	(AP)					
8484		HOLL	03	13	1602	S23	E23	03	15.4		B	DSO	60	10	4	2
8484		LEAR	03	14	0056	S24	E17	03	15.3		B	DSO	70	12	6	4
8484		VORO	03	14	0153	S24	E16	03	15.3			CAO	94	3	1	2
8484		RAMY	03	14	1232	S25	E11	03	15.4		B	DSO	60	12	6	3
8484	29021	MWIL	03	14	1530	S24	E09	03	15.3	5	(AP)					
8484		HOLL	03	14	1734	S24	E09	03	15.4		B	DSO	60	5	3	2
8484		VORO	03	14	2340	S24	E05	03	15.4			DAO	97	3	2	2
8484		LEAR	03	15	0035	S23	E04	03	15.3		A	HA	60	5	3	3
8484		KAND	03	15	0810	S23	E00	03	15.3			CAO		5	4	3
8484		RAMY	03	15	1236	S23	W02	03	15.4		B	CSO	40	8	4	4
8484		HOLL	03	15	1615	S23	W03	03	15.4		B	CSO	40	5	3	1
8484		LEAR	03	16	0020	S23	W09	03	15.3		B	CSO	50	8	3	4
8484		KAND	03	16	0910	S24	W13	03	15.4			DAO		3	4	2
8484		RAMY	03	16	1316	S23	W14	03	15.5		B	CSO	20	5	4	3
8484		HOLL	03	16	1557	S25	W17	03	15.3		B	CSO	30	5	4	3
8484	29021	MWIL	03	16	2345	S24	W22	03	15.3	4	(AP)					

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8484		LEAR	03 17 0020	S23 W21	03 15.4		B	CSO	30	7	3	4
8484		TACH	03 17 0510	S23 W24	03 15.4			BRO	61	3	1	3
8484		SVTO	03 17 1113	S23 W29	03 15.2		B	CRO	10	2	3	2
8484		RAMY	03 17 1220	S23 W27	03 15.4		B	DSO	20	3	3	4
8484	29021	MWIL	03 17 1500	S24 W30	03 15.3	4	(AP)					
8484		TACH	03 18 0535	S23 W35	03 15.5			BRO	13	3	3	2
8484		RAMY	03 18 1215	S23 W40	03 15.4		B	BXO	10	3	4	4
8484	29021	MWIL	03 18 1500	S23 W42	03 15.4	5	(AP)					
8484		LEAR	03 19 0335	S24 W48	03 15.4		A	HS	20	1	1	2
8484		RAMY	03 19 1220	S22 W54	03 15.4		A	AX		1		4
8484		HOLL	03 19 1610	S23 W55	03 15.4		A	AX	10	1	1	4
8484	29021	MWIL	03 19 1630	S22 W57	03 15.3	4	(AP)					
8484		RAMY	03 20 1229	S25 W65	03 15.5		A	AX		1		4
8484		HOLL	03 20 1620	S25 W68	03 15.4		A	AX		1		3
8487A		RAMY	03 14 1232	N38 E17	03 15.9		A	AX		1		3
8488A		VORO	03 14 0153	S27 E35	03 16.8			AXX	15	1		2
8488A		VORO	03 19 0040	S26 W30	03 16.7			CAI	111	7	6	2
8488A		LEAR	03 19 0335	S28 W35	03 16.4		B	BXO	10	2	3	2
8488A		RAMY	03 19 1220	S26 W40	03 16.4		A	AX		2	2	4
8488A		HOLL	03 19 1610	S28 W42	03 16.4		A	AX	10	2	2	4
8488A	29031	MWIL	03 19 1630	S27 W43	03 16.3	4	(AP)					
8487		TACH	03 11 0630	N17 E78	03 17.2			AXX	10	1	1	2
8487		KAND	03 11 0800	N17 E74	03 16.9			BXO		3	6	4
8487		RAMY	03 11 1234	N17 E69	03 16.8		B	BXO	20	3	9	3
8487		HOLL	03 11 1448	N17 E68	03 16.8		B	BXO	10	3	6	3
8487		VORO	03 11 2313	N17 E67	03 17.0			DAI	155	3	5	2
8487		LEAR	03 12 0025	N16 E62	03 16.7		B	CAO	60	7	8	4
8487		TACH	03 12 0455	N14 E67	03 17.3			CAO	55	2	9	3
8487		KAND	03 12 0950	N17 E60	03 17.0			CAO		10	8	5
8487		RAMY	03 12 1220	N19 E56	03 16.8		B	CSO	60	4	8	3
8487	29022	MWIL	03 12 1515	N16 E58	03 17.0	4	(BP)					
8487		HOLL	03 12 1559	N17 E56	03 16.9		B	CAO	150	12	9	3
8487		LEAR	03 13 0024	N17 E51	03 16.9		B	CAO	80	12	9	3
8487		VORO	03 13 0315	N17 E51	03 17.0			CAO	148	6	7	2
8487		KAND	03 13 0900	N16 E45	03 16.8			CAO		18	12	3
8487		RAMY	03 13 1223	N17 E45	03 16.9		B	DAO	80	20	10	4
8487	29022	MWIL	03 13 1515	N16 E44	03 17.0	5	(BG)					
8487		HOLL	03 13 1602	N17 E44	03 17.0		B	EAO	190	13	11	2
8487		LEAR	03 14 0056	N17 E37	03 16.8		B	DAI	190	21	8	4
8487		VORO	03 14 0153	N17 E36	03 16.8			CAO	398	7	8	2
8487		RAMY	03 14 1232	N16 E31	03 16.9		B	ESO	170	21	11	3
8487	29022	MWIL	03 14 1530	N16 E30	03 16.9	5	(D)					
8487		HOLL	03 14 1734	N16 E28	03 16.8		B	ESI	210	17	11	2
8487		VORO	03 14 2340	N17 E24	03 16.8			DAI	367	11	10	2
8487		LEAR	03 15 0035	N16 E24	03 16.8		B	ESI	180	15	12	3
8487		KAND	03 15 0810	N16 E20	03 16.8			EAO		13	12	3
8487		RAMY	03 15 1236	N16 E17	03 16.8		B	EAI	200	21	12	4
8487		HOLL	03 15 1615	N17 E16	03 16.9		B	ESO	220	7	12	1
8487		LEAR	03 16 0020	N16 E11	03 16.8		B	EAI	190	17	12	4
8487		KAND	03 16 0910	N16 E05	03 16.8			EAI		15	12	2
8487		RAMY	03 16 1316	N17 E04	03 16.8		B	ESI	160	27	11	3
8487		HOLL	03 16 1557	N17 E03	03 16.9		B	ESO	180	25	12	3
8487	29022	MWIL	03 16 2345	N17 W03	03 16.8	5	(B)					
8487		LEAR	03 17 0020	N16 W03	03 16.8		B	ESI	190	20	12	4
8487		TACH	03 17 0510	N17 W04	03 16.9			CAI	370	14	7	3
8487		SVTO	03 17 1113	N17 W08	03 16.8		B	EAI	180	16	12	2
8487		RAMY	03 17 1220	N17 W08	03 16.9		B	ESO	180	25	13	4
8487	29022	MWIL	03 17 1500	N17 W11	03 16.8	5	(BP)					
8487		TACH	03 18 0535	N17 W18	03 16.9			CAO	267	7	8	2
8487		RAMY	03 18 1215	N17 W19	03 17.1		B	CSO	150	17	14	4
8487	29022	MWIL	03 18 1500	N17 W24	03 16.8	6	(B)					
8487		VORO	03 19 0040	N17 W35	03 16.4			CAI	162	3	3	2
8487		LEAR	03 19 0335	N16 W32	03 16.7		B	CAO	150	9	12	2
8487		RAMY	03 19 1220	N17 W39	03 16.5		A	HS	190	2	3	4
8487		HOLL	03 19 1610	N16 W42	03 16.5		A	HK	140	2	3	4
8487	29022	MWIL	03 19 1630	N17 W39	03 16.7	5	(BP)					

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
8487		LEAR	03 20 0356	N17 W48	03 16.5		A	HA	110	3	3	2
8487		TACH	03 20 0750	N18 W50	03 16.5			HA	200	3	2	2
8487		RAMY	03 20 1229	N17 W52	03 16.6		A	HS	100	2	2	4
8487		HOLL	03 20 1620	N17 W56	03 16.4		A	HS	80	3	2	3
8487		SVTO	03 21 0950	N17 W66	03 16.4		B	CSO	110	2	3	3
8487		KAND	03 21 1150	N17 W67	03 16.4			HS		1	3	3
8487	29022	MWIL	03 21 1500	N16 W68	03 16.5	4	(AP)					
8487		HOLL	03 21 1542	N16 W67	03 16.6		B	CSO	60	3	9	2
8487		VORO	03 21 2345	N16 W74	03 16.4			HAX	119	2		2
8487		SVTO	03 22 0555	N17 W79	03 16.2		B	CSO	40	2	5	3
8487		KAND	03 22 0730	N17 W80	03 16.2			HS		1	2	3
8487		RAMY	03 22 1236	N15 W79	03 16.5		B	BXO	30	1	2	5
8487	29022	MWIL	03 22 1515	N16 W80	03 16.6	4	(AP)					
8488		RAMY	03 14 1232	S27 E43	03 17.9		B	CRO	10	4	4	3
8488	29025	MWIL	03 14 1530	S26 E40	03 17.7	4	(AP)					
8488		HOLL	03 14 1734	S27 E39	03 17.8		B	CSO	20	3	3	2
8488		LEAR	03 15 0035	S27 E33	03 17.6		A	AX		4	3	3
8488		KAND	03 15 0810	S26 E31	03 17.7			BXO		2	2	3
8488		RAMY	03 15 1236	S26 E28	03 17.7		B	BXO		3	3	4
8488		LEAR	03 16 0020	S27 E20	03 17.6		B	BXO		3	2	4
8488		KAND	03 16 0910	S23 E17	03 17.7			HA		1	1	2
8488		RAMY	03 16 1316	S25 E16	03 17.8		B	CAO	20	2	3	3
8488		HOLL	03 16 1557	S26 E14	03 17.7		B	CSO	40	4	5	3
8488	29025	MWIL	03 16 2345	S27 E08	03 17.6	4	(BP)					
8488		LEAR	03 17 0020	S27 E08	03 17.6		B	CSO	30	7	5	4
8488		TACH	03 17 0510	S26 E06	03 17.7			CAO	99	8	2	3
8488		SVTO	03 17 1113	S25 E02	03 17.6		B	CSO	20	6	5	2
8488		RAMY	03 17 1220	S26 E03	03 17.7		B	DAO	60	9	5	4
8488	29025	MWIL	03 17 1500	S26 E01	03 17.7	4	(BP)					
8488		TACH	03 18 0535	S26 W06	03 17.8			DAI	137	5	5	2
8488		RAMY	03 18 1215	S26 W11	03 17.6		B	DSO	110	18	7	4
8488	29025	MWIL	03 18 1500	S26 W11	03 17.8	5	(B)					
8488		LEAR	03 19 0335	S27 W18	03 17.7		B	DAO	110	14	8	2
8488		RAMY	03 19 1220	S26 W25	03 17.6		B	CAO	60	18	9	4
8488		HOLL	03 19 1610	S27 W25	03 17.7		B	DSO	120	9	8	4
8488	29025	MWIL	03 19 1630	S25 W26	03 17.7	4	(B)					
8488		LEAR	03 20 0356	S26 W33	03 17.6		B	DSO	50	5	7	2
8488		TACH	03 20 0750	S24 W33	03 17.8			CSI	90	3	7	2
8488		RAMY	03 20 1229	S25 W37	03 17.6		B	CSO	30	6	7	4
8488		HOLL	03 20 1620	S28 W42	03 17.4		A	HS	20	2	1	3
8488		SVTO	03 21 0950	S27 W52	03 17.3		A	HS	30	3	2	3
8488		KAND	03 21 1150	S26 W52	03 17.4			HA		1	1	3
8488	29025	MWIL	03 21 1500	S26 W54	03 17.4	4	(AP)					
8488		HOLL	03 21 1542	S27 W54	03 17.4		A	AX	10	2	1	2
8488		SVTO	03 22 0555	S27 W62	03 17.4		A	AX		1		3
8488		RAMY	03 22 1236	S26 W66	03 17.4		A	HS		2	2	5
8493	29027	MWIL	03 17 1500	N19 E08	03 18.2	4	(BF)					
8493		TACH	03 18 0535	N19 E00	03 18.2			BRO	17	3	4	2
8493		RAMY	03 18 1215	N19 W03	03 18.3		B	BXO	20	8	6	4
8493	29027	MWIL	03 18 1500	N19 W05	03 18.2	4	(B)					
8493		VORO	03 19 0040	N19 W13	03 18.0			CAI	106	9	5	2
8493		LEAR	03 19 0335	N19 W13	03 18.1		B	BXO	20	6	5	2
8493		RAMY	03 19 1220	N19 W15	03 18.4		B	CRO	40	22	8	4
8493		HOLL	03 19 1610	N19 W18	03 18.3		B	CSO	60	15	6	4
8493	29027	MWIL	03 19 1630	N19 W18	03 18.3	4	(B)					
8493		LEAR	03 20 0356	N20 W26	03 18.2		B	DSO	60	10	6	2
8493		TACH	03 20 0750	N21 W27	03 18.2			BAO	65	7	5	2
8493		RAMY	03 20 1229	N20 W30	03 18.2		B	DRO	30	15	6	4
8493		HOLL	03 20 1620	N20 W33	03 18.1		B	CSO	20	7	5	3
8493		SVTO	03 21 0950	N20 W43	03 18.1		B	CRO	20	4	5	3
8493		KAND	03 21 1150	N20 W43	03 18.2			CRO		2	5	3
8493	29027	MWIL	03 21 1500	N19 W44	03 18.3	4	(B)					
8493		HOLL	03 21 1542	N19 W45	03 18.2		B	BXO	10	3	6	2
8493		VORO	03 21 2345	N20 W52	03 18.0			AXX	5	1		2
8493		SVTO	03 22 0555	N19 W52	03 18.3		B	BXO	20	5	5	3
8493		KAND	03 22 0730	N21 W55	03 18.1			AX		2	2	3
8493		RAMY	03 22 1236	N19 W57	03 18.2		B	BXO	10	5	5	5

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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
8493	29027	MWIL	03	22	1515	N20	W57	03	18.3	4	(BP)					
8496A	29028	MWIL	03	18	1500	S15	E09	03	19.3	4	(AP)					
8496A		HOLL	03	19	1610	S15	W07	03	19.1		A	AX		1		4
8496A	29028	MWIL	03	19	1630	S15	W07	03	19.1	3	(AP)					
8496B		VORO	03	18	0703	S33	E13	03	19.3			BXI	22	3	3	2
8496B		VORO	03	19	0040	S33	E02	03	19.2			BXO	19	2	4	2
8496C		VORO	03	18	0703	N13	E16	03	19.5			DAI	109	10	5	2
8496C		VORO	03	19	0040	N13	E07	03	19.5			DAI	173	5	5	2
8496		VORO	03	19	0040	S10	E04	03	19.3			CAI	58	4	4	2
8496		HOLL	03	19	1610	S11	E01	03	19.7		B	BXO	20	5	3	4
8496	29032	MWIL	03	19	1630	S11	E01	03	19.8	4	(B)					
8496		LEAR	03	20	0356	S08	W07	03	19.6		B	DAO	40	9	6	2
8496		TACH	03	20	0750	S09	W08	03	19.7			CAI	143	6	4	2
8496		RAMY	03	20	1229	S09	W12	03	19.6		B	CAO	50	10	6	4
8496		HOLL	03	20	1620	S10	W14	03	19.6		B	CSO	20	9	6	3
8496		SVTO	03	21	0950	S11	W25	03	19.5		B	DAO	60	9	6	3
8496		KAND	03	21	1150	S10	W25	03	19.6			DSO		4	8	3
8496	29032	MWIL	03	21	1500	S10	W26	03	19.7	5	(B)					
8496		HOLL	03	21	1542	S11	W28	03	19.5		B	DSO	50	4	7	2
8496		VORO	03	21	2345	S10	W32	03	19.6			CAO	82	3	7	2
8496		KAND	03	22	0730	S10	W35	03	19.7			CSO		3	8	3
8496		RAMY	03	22	1236	S10	W38	03	19.7		B	CSO	30	4	6	5
8496	29032	MWIL	03	22	1515	S10	W40	03	19.6	5	(B)					
8496		VORO	03	23	0005	S12	W48	03	19.4			HAX	40	1		2
8496		KAND	03	23	0800	S11	W51	03	19.5			CRO		2	3	3
8496		RAMY	03	23	1513	S11	W55	03	19.5		A	AX		1		3
8496	29032	MWIL	03	23	1530	S11	W56	03	19.4	4	(AP)					
8496		HOLL	03	23	1540	S13	W56	03	19.4		A	HS	20	1	1	3
8496		VORO	03	23	2317	S12	W62	03	19.3			AXX	6	1		2
8496		SVTO	03	24	0730	S11	W65	03	19.4		B	DRO	30	6	7	3
8496		KAND	03	24	0800	S11	W64	03	19.5			BXO		6	6	4
8496		RAMY	03	24	1245	S10	W65	03	19.6		B	BXO	20	3	5	4
8496	29032	MWIL	03	24	1500	S11	W68	03	19.5	4	(BP)					
8496		HOLL	03	24	1558	S11	W68	03	19.5		B	BXO	30	5	5	3
8496		TACH	03	25	0405	S11	W76	03	19.4			AR	6	2	1	3
8496		HOLL	03	25	1520	S11	W85	03	19.2		A	AX		1		4
8494B		VORO	03	18	0703	S28	E33	03	20.9			CAI	241	4	6	2
8494B		VORO	03	19	0040	S30	E22	03	20.7			CAI	249	15	10	2
8494	29029	MWIL	03	18	1500	S22	E32	03	21.1	4	(B)					
8494		LEAR	03	19	0335	S23	E26	03	21.1		B	BXO	20	5	5	2
8494		RAMY	03	19	1220	S22	E21	03	21.1		B	BXO	10	6	5	4
8494		HOLL	03	19	1610	S22	E19	03	21.1		B	BXO	20	6	5	4
8494	29029	MWIL	03	19	1630	S23	E18	03	21.1	4	(B)					
8494		RAMY	03	20	1229	S23	E07	03	21.0		B	BXO	10	5	4	4
8494		HOLL	03	20	1620	S23	E06	03	21.1		B	BXO	10	3	3	3
8494		SVTO	03	21	0950	S24	W06	03	20.9		B	CRO	30	8	4	3
8494		KAND	03	21	1150	S24	W06	03	21.0			CSO		6	5	3
8494	29029	MWIL	03	21	1500	S24	W08	03	21.0	4	(B)					
8494		HOLL	03	21	1542	S24	W08	03	21.0		B	CSO	20	5	4	2
8494		SVTO	03	22	0555	S23	W15	03	21.1		B	CRO	10	4	2	3
8494		RAMY	03	22	1236	S23	W18	03	21.1		B	BXO		3	3	5
8494	29029	MWIL	03	22	1515	S23	W20	03	21.1	3	(AF)					
8494		KAND	03	23	0800	S25	W28	03	21.2			AX		3	1	3
8494A		VORO	03	18	0703	N13	E43	03	21.5			AXX	4	1		2
8494A		VORO	03	19	0040	N13	E35	03	21.7			BXO	29	2	1	2
8499		SVTO	03	24	0730	N23	W30	03	22.0		B	CRO	30	7	5	3
8499		KAND	03	24	0800	N22	W30	03	22.0			BXO		8	4	4
8499		RAMY	03	24	1245	N23	W32	03	22.1		B	BXO	20	5	4	4
8499	29039	MWIL	03	24	1500	N22	W33	03	22.1	4	(B)					
8499		HOLL	03	24	1558	N22	W35	03	22.0		B	CSO	30	5	6	3
8499		TACH	03	25	0405	N23	W39	03	22.2			DAO	110	3	5	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
8499		KAND	03	25	0745	N21	W42	03	22.1			DAO		2	5	3
8499		HOLL	03	25	1520	N22	W46	03	22.1		B	DSO	70	3	6	4
8499		TACH	03	26	0500	N25	W51	03	22.2			AXX	15	1	1	4
8499		SVTO	03	26	0617	N22	W55	03	22.0		B	BXO	10	2	7	3
8499		KAND	03	26	0710	N24	W53	03	22.2			AX		1	1	3
8499		RAMY	03	26	1152	N23	W55	03	22.2		A	AX		1		3
8499	29039	MWIL	03	26	1610	N24	W58	03	22.2	4	(AF)					
8499		HOLL	03	26	1640	N23	W59	03	22.1		A	AX		1		1
8490	29026	MWIL	03	16	2345	S20	E80	03	23.1	2	AP					
8490		SVTO	03	17	1113	S21	E72	03	23.0		A	AX		1		2
8490		RAMY	03	17	1220	S19	E72	03	23.0		A	AX		1		4
8490	29026	MWIL	03	17	1500	S19	E71	03	23.0	4	(BP)					
8490		TACH	03	18	0535	S19	E64	03	23.1			AXX	5	1	1	2
8490		RAMY	03	18	1215	S19	E60	03	23.1		A	AX		1		4
8490	29026	MWIL	03	18	1500	S19	E58	03	23.0	4	(BP)					
8490		VORO	03	19	0040	S19	E50	03	22.8			AXX	13	1		2
8490		LEAR	03	19	0335	S18	E51	03	23.0		B	BXO	20	4	3	2
8490		RAMY	03	19	1220	S19	E45	03	22.9		A	AX		2	1	4
8490		HOLL	03	19	1610	S19	E45	03	23.1		A	AX	10	2	1	4
8490	29026	MWIL	03	19	1630	S19	E44	03	23.0	4	(AP)					
8490		LEAR	03	20	0356	S19	E38	03	23.1		A	HS	30	1	1	2
8490		TACH	03	20	0750	S19	E35	03	23.0			AXX	20	1	1	2
8490		RAMY	03	20	1229	S19	E32	03	23.0		B	BXO		3	1	4
8490		HOLL	03	20	1620	S19	E32	03	23.1		A	AX	10	3	1	3
8490		SVTO	03	21	0950	S18	E17	03	22.7		B	CRO	10	4	3	3
8490		KAND	03	21	1150	S16	E16	03	22.7			BXO		4	3	3
8490	29034	MWIL	03	21	1500	S16	E15	03	22.8	4	(B)					
8490		HOLL	03	21	1542	S17	E15	03	22.8		B	BXO	10	2	3	2
8490		VORO	03	21	2345	S17	E10	03	22.7			BXO	15	2	3	2
8490		SVTO	03	22	0555	S16	E06	03	22.7		B	BXO	10	2	4	3
8490		KAND	03	22	0730	S16	E05	03	22.7			BXO		3	5	3
8490		RAMY	03	22	1236	S17	E04	03	22.8		A	AX		1		5
8495B		RAMY	03	20	1229	S25	E28	03	22.7		A	AX		1		4
8495B		KAND	03	22	0730	S20	E06	03	22.8			AX		1	1	3
8495A	29035	MWIL	03	21	1500	S20	E23	03	23.4	4	(AF)					
8495A	29035	MWIL	03	23	1530	S20	W04	03	23.3	3	(AF)					
8495		VORO	03	18	0703	S26	E74	03	24.0			EKI	278	5	10	2
8495	29030	MWIL	03	18	1500	S21	E71	03	24.1	3	(AP)					
8495		VORO	03	18	2358	S21	E64	03	23.9			AXX	18	1		2
8495		VORO	03	19	0040	S19	E65	03	24.0			EKI	639	9	21	2
8495		LEAR	03	19	0335	S19	E73	03	24.7		A	AX	20	1	1	2
8495		RAMY	03	19	1220	S22	E67	03	24.7		A	AX		1		4
8495		HOLL	03	19	1610	S21	E68	03	24.9		A	AX		1		4
8495	29030	MWIL	03	19	1630	S21	E61	03	24.4	3	(AP)					
8495	29033	MWIL	03	19	1630	S23	E66	03	24.8	4	(AP)					
8495		LEAR	03	20	0356	S22	E57	03	24.5		B	BXO	20	2	8	2
8495		TACH	03	20	0750	S21	E54	03	24.5			BRO	18	2	7	2
8495		RAMY	03	20	1229	S21	E52	03	24.5		B	BXO		2	7	4
8495		HOLL	03	20	1620	S21	E52	03	24.7		B	BXO		2	6	3
8495		SVTO	03	21	0950	S21	E40	03	24.5		B	BXO	10	2	6	3
8495		KAND	03	21	1150	S20	E39	03	24.5			BXO		2	7	3
8495	29030	MWIL	03	21	1500	S20	E35	03	24.3	4	(AP)					
8495	29033	MWIL	03	21	1500	S22	E42	03	24.8	4	(AP)					
8495		HOLL	03	21	1542	S20	E37	03	24.5		B	BXO	10	2	8	2
8495		VORO	03	21	2345	S21	E37	03	24.8			AXX	11	1		2
8495		KAND	03	22	0730	S20	E32	03	24.8			AX		1	1	3
8495		RAMY	03	22	1236	S21	E29	03	24.7		A	AX		2	1	5
8495	29033	MWIL	03	22	1515	S22	E28	03	24.8	4	(AP)					
8495		VORO	03	23	0005	S22	E23	03	24.8			AXX	6	1		2
8495		TACH	03	28	0434	S21	W39	03	25.2			AR	11	2	1	4
8495		SVTO	03	28	0701	S23	W42	03	25.0		A	AX	10	2	2	3
8495		RAMY	03	28	1223	S22	W45	03	25.0		B	BXO	10	8	3	4
8495		HOLL	03	28	1431	S22	W47	03	25.0		B	BXO	10	5	4	3
8495	29043	MWIL	03	28	1515	S22	W47	03	25.0	3	(BP)					

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

MARCH 1999

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
8495C	29037	MWIL	03 22 1515	S23 E46	03 26.2	4	(AF)					
8500		SVTO	03 30 0610	N10 W34	03 27.7		A	AX		1		3
8500		SVTO	03 31 0726	N12 W47	03 27.8		B	BXO	10	2	2	3
8500		RAMY	03 31 1233	N10 W50	03 27.8		B	BXO		2	3	4
8497	29036	MWIL	03 21 1500	N29 E79	03 27.8	2	AP					
8497		RAMY	03 22 1236	N30 E66	03 27.7		A	HS	50	1	2	5
8497	29036	MWIL	03 22 1515	N29 E67	03 27.9	5	(AP)					
8497		KAND	03 23 0800	N29 E59	03 27.9			HS		1	2	3
8497		RAMY	03 23 1513	N29 E53	03 27.8		A	HS	40	1	2	3
8497	29036	MWIL	03 23 1530	N29 E54	03 27.9	5	(AP)					
8497		HOLL	03 23 1540	N30 E53	03 27.8		A	HS	30	1	2	3
8497		SVTO	03 24 0730	N28 E45	03 27.8		A	HS	70	1	2	3
8497		KAND	03 24 0800	N29 E44	03 27.8			HS		1	2	4
8497		RAMY	03 24 1245	N28 E43	03 27.9		A	HS	70	1	2	4
8497	29036	MWIL	03 24 1500	N29 E41	03 27.8	5	(AP)					
8497		HOLL	03 24 1558	N28 E41	03 27.9		A	HS	60	1	2	3
8497		TACH	03 25 0405	N29 E34	03 27.8			HSX	150	1	2	3
8497		KAND	03 25 0745	N30 E32	03 27.8			HS		1	2	3
8497		HOLL	03 25 1520	N29 E29	03 27.9		A	HS	80	1	2	4
8497		TACH	03 26 0500	N30 E22	03 27.9			HSX	110	1	2	4
8497		SVTO	03 26 0617	N30 E20	03 27.8		A	HS	70	1	2	3
8497		KAND	03 26 0710	N29 E21	03 27.9			HS		1	2	3
8497		RAMY	03 26 1152	N30 E18	03 27.9		A	HS	50	1	2	3
8497	29036	MWIL	03 26 1610	N29 E15	03 27.8	4	(AP)					
8497		HOLL	03 26 1640	N30 E16	03 27.9		A	HS	40	1	1	1
8497		TACH	03 27 0420	N30 E09	03 27.9			HSX	110	1	2	2
8497		SVTO	03 27 0722	N29 E08	03 27.9		A	HA	70	1	2	3
8497		KAND	03 27 0730	N30 E08	03 27.9			HA		1	2	3
8497		RAMY	03 27 1220	N29 E05	03 27.9		A	HS	80	1	2	4
8497	29036	MWIL	03 27 1515	N29 E04	03 27.9	5	(AP)					
8497		HOLL	03 27 1608	N29 E03	03 27.9		A	HS	60	1	1	2
8497		TACH	03 28 0434	N29 W04	03 27.9			HSX	120	1	2	4
8497		SVTO	03 28 0701	N29 W05	03 27.9		A	HS	70	1	2	3
8497		RAMY	03 28 1223	N29 W06	03 28.0		A	HS	70	2	2	4
8497		HOLL	03 28 1431	N30 W09	03 27.9		A	HS	70	1	2	3
8497	29036	MWIL	03 28 1515	N29 W08	03 28.0	5	(AP)					
8497		LEAR	03 29 0640	N29 W18	03 27.9		A	HS	100	1	2	3
8497		SVTO	03 29 0713	N30 W18	03 27.9		A	HS	50	1	2	3
8497		RAMY	03 29 1200	N29 W19	03 28.0		A	HS	70	1	1	4
8497		HOLL	03 29 1503	N30 W22	03 27.9		A	HS	50	1	2	4
8497	29036	MWIL	03 29 1530	N29 W21	03 28.0	5	(AP)					
8497		TACH	03 30 0504	N30 W27	03 28.1			HSX	120	1	2	3
8497		SVTO	03 30 0610	N29 W29	03 28.0		A	HS	30	1	2	3
8497		RAMY	03 30 1143	N29 W31	03 28.0		A	HS	70	1	2	4
8497	29036	MWIL	03 30 1530	N29 W33	03 28.0	5	(AP)					
8497		LEAR	03 31 0141	N29 W38	03 28.1		A	HS	40	1	2	3
8497		SVTO	03 31 0726	N30 W42	03 28.0		A	HS	70	1	2	3
8497		RAMY	03 31 1233	N29 W45	03 28.0		A	HS	50	1	2	4
8497		LEAR	04 01 0118	N29 W51	03 28.1		A	HS	40	1	2	3
8497		TACH	04 01 0404	N30 W51	03 28.2			HSX	80	1	1	3
8497		SVTO	04 01 0820	N29 W54	03 28.2		A	HS	120	1	3	3
8497		RAMY	04 01 1152	N29 W56	03 28.2		A	HS	60	1	2	3
8497		HOLL	04 01 1513	N28 W59	03 28.1		A	HS	70	1	2	3
8497	29036	MWIL	04 01 1530	N29 W58	03 28.2	4	AP					
8497		LEAR	04 02 0116	N29 W62	03 28.3		A	HA	100	1	3	4
8497		TACH	04 02 0412	N29 W67	03 28.0			HSX	50	1	2	3
8497		SVTO	04 02 0805	N31 W69	03 28.0		A	HS	60	1	2	3
8497		KAND	04 02 1220	N30 W71	03 28.0			HS		1	2	3
8497		RAMY	04 02 1327	N30 W72	03 28.0		A	HS	40	1	2	3
8497	29036	MWIL	04 02 1500	N29 W70	03 28.2	4	(AP)					
8489B		RAMY	03 27 1220	N16 E08	03 28.1		A	AX		1		4
8489B	29041	MWIL	03 27 1515	N16 E07	03 28.2	3	(AP)					
8489B		HOLL	03 27 1608	N15 E07	03 28.2		A	AX		1		2
8498A		RAMY	03 26 1152	N18 E29	03 28.7		B	BXO		4	2	3
8498A	29040	MWIL	03 26 1610	N18 E27	03 28.7	3	(B)					

S U N S P O T G R O U P S
(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
8503		LEAR	03 29 0640	S22 W08	03 28.7		A	AX		1		3
8503		RAMY	03 29 1200	S23 W11	03 28.6		B	BXO	10	6	3	4
8503		HOLL	03 29 1503	S24 W13	03 28.6		B	BXO	10	4	3	4
8503		SVTO	03 30 0610	S23 W21	03 28.6		B	BXO	10	3	3	3
8503		RAMY	03 30 1143	S22 W26	03 28.5		A	AX		1		4
8503A		SVTO	03 22 0555	S17 E85	03 28.7		A	AX	10	3	2	3
8503A	29044	MWIL	03 29 1530	S13 W13	03 28.7	4	(B)					
8498		KAND	03 23 0800	N18 E80	03 29.4			HS		1	2	3
8498		RAMY	03 23 1513	N18 E70	03 29.0		A	HS	60	1	2	3
8498	29038	MWIL	03 23 1530	N18 E73	03 29.2	5	(AP)					
8498		HOLL	03 23 1540	N18 E71	03 29.0		A	HS	30	1	2	3
8498		SVTO	03 24 0730	N17 E64	03 29.2		A	HS	70	1	2	3
8498		KAND	03 24 0800	N18 E63	03 29.1			HS		1	2	4
8498		RAMY	03 24 1245	N17 E60	03 29.1		A	HS	40	1	2	4
8498	29038	MWIL	03 24 1500	N18 E60	03 29.2	5	(AP)					
8498		HOLL	03 24 1558	N17 E59	03 29.1		A	HS	80	1	2	3
8498		TACH	03 25 0405	N17 E52	03 29.1			HSX	60	1	2	3
8498		KAND	03 25 0745	N18 E52	03 29.3			CSO		2	4	3
8498		HOLL	03 25 1520	N17 E46	03 29.1		A	HA	60	3	2	4
8498		TACH	03 26 0500	N18 E39	03 29.2			HSX	50	1	2	4
8498		SVTO	03 26 0617	N19 E38	03 29.2		A	HS	80	1	2	3
8498		KAND	03 26 0710	N18 E38	03 29.2			HS		1	2	3
8498		RAMY	03 26 1152	N18 E35	03 29.1		A	HS	50	1	2	3
8498	29038	MWIL	03 26 1610	N18 E32	03 29.1	4	(AP)					
8498		HOLL	03 26 1640	N18 E30	03 29.0		B	CSO	30	3	8	1
8498		TACH	03 27 0420	N17 E24	03 29.0			CSO	125	2	5	2
8498		SVTO	03 27 0722	N18 E25	03 29.2		A	HS	50	1	2	3
8498		KAND	03 27 0730	N18 E23	03 29.1			CSO		3	7	3
8498		RAMY	03 27 1220	N18 E22	03 29.2		A	HA	50	2	2	4
8498	29038	MWIL	03 27 1515	N18 E21	03 29.2	5	(AP)					
8498		HOLL	03 27 1608	N18 E20	03 29.2		A	HS	40	1	1	2
8498		TACH	03 28 0434	N18 E13	03 29.2			HSX	100	1	2	4
8498		SVTO	03 28 0701	N18 E12	03 29.2		A	HS	30	1	2	3
8498		RAMY	03 28 1223	N19 E08	03 29.1		A	HS	60	3	3	4
8498		HOLL	03 28 1431	N18 E08	03 29.2		A	HS	50	1	2	3
8498	29038	MWIL	03 28 1515	N18 E08	03 29.2	5	(AP)					
8498		LEAR	03 29 0640	N18 W01	03 29.2		A	HS	60	1	2	3
8498		SVTO	03 29 0713	N18 W02	03 29.1		A	HS	40	1	2	3
8498		RAMY	03 29 1200	N17 W03	03 29.3		A	HS	20	1	1	4
8498		HOLL	03 29 1503	N18 W05	03 29.2		A	HS	40	1	2	4
8498	29038	MWIL	03 29 1530	N18 W05	03 29.3	5	(AP)					
8498		TACH	03 30 0504	N18 W12	03 29.3			HA	82	3	2	3
8498		SVTO	03 30 0610	N18 W13	03 29.3		B	CAO	20	2	3	3
8498		RAMY	03 30 1143	N18 W16	03 29.3		B	CSO	40	2	3	4
8498	29038	MWIL	03 30 1530	N18 W18	03 29.3	5	(AP)					
8498		LEAR	03 31 0141	N23 W22	03 29.4		B	CSO	30	2	3	3
8498		SVTO	03 31 0726	N18 W29	03 29.1		B	CSO	30	2	3	3
8498		RAMY	03 31 1233	N17 W30	03 29.2		A	HS	10	1	1	4
8498		LEAR	04 01 0118	N19 W37	03 29.3		A	HS	20	1	1	3
8498		TACH	04 01 0404	N18 W37	03 29.4			HSX	50	1	1	3
8498		SVTO	04 01 0820	N17 W40	03 29.4		A	HS	40	1	2	3
8498		RAMY	04 01 1152	N17 W42	03 29.4		A	HS	20	1	1	3
8498		HOLL	04 01 1513	N17 W45	03 29.3		A	HS	20	1	1	3
8498	29038	MWIL	04 01 1530	N18 W44	03 29.4	3	AP					
8498		LEAR	04 02 0116	N17 W48	03 29.5		A	HS	70	2	1	4
8498		TACH	04 02 0412	N17 W52	03 29.3			HSX	25	1	1	3
8498		SVTO	04 02 0805	N18 W54	03 29.3		A	HS	20	1	1	3
8498		KAND	04 02 1220	N18 W58	03 29.2			CRO		2	5	3
8498		RAMY	04 02 1327	N18 W57	03 29.3		A	HS	10	1	1	3
8498	29038	MWIL	04 02 1500	N18 W56	03 29.5	4	(AP)					
8498		LEAR	04 03 0610	N20 W64	03 29.5		A	HS	30	1	1	2
8498		SVTO	04 03 0740	N18 W66	03 29.4		A	HR	30	1	2	2
8498		KAND	04 03 1035	N17 W67	03 29.4			HR		1	2	2
8498		RAMY	04 03 1246	N17 W67	03 29.5		A	HS	20	1	1	3
8498		HOLL	04 03 1635	N17 W71	03 29.4		A	AX	10	1		3
8498		LEAR	04 04 0045	N19 W72	03 29.6		A	AX	10	1	1	3

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 1999

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	0530	0540	0615	2	1					1	0528	C2.0	8471
01	1157	1206	1215	1	1		1				No flare		
01	1331	1337	1409	2	5	1	3	1		1	1329	C3.1	8471
01	1500	1508	1515	1	1		1				No flare		
02	1208	1213	1236	2+	5	1	3	1		2	1204	C6.3	8475
02	1320	1326	1337	1-	3					2	1322	C1.6	8476
02	1501	1517	1540	2-	5		2			4	1447	C6.2	8471
02	1548	1550	1559	1-	3					2	1549		8475
03	1650	1654	1708	1-	1					1	1649	C1.1	8476
04	0507	0513	0538	1+	1					1	0507	C3.3	8475
04	0838	0930	0955	1	1		1				No flare		
04	1427	1430	1500	2	1		1				No flare		
05	0815	0835	0845	1+	1					1	0819	C1.0	
05	1913	1923	2010	2	3					2	1909	C3.7	8477
06	1401	1410	1429	1-	5		1			3	1401	C1.4	
07	0900U	0940U	0958U	2	1		1				No flare		
07	1334	1356	1430	1	1		1				No flare		
08	0635	0639	0711	2	3		1			1	0630	M2.6	8484
09	0734	0840U	0940	2	1		1				No flare		
09	1309	1333	1356	1	1		1				*		
11	0642	0645	0700	1-	1					1	0638	C1.7	8487
11	0823	0827	0836	2+	5	1	1	1		1	0821	C5.0	8487
11	0919	0947U	1018	1	1		1				0911	B7.2	
11	1004	1007	1028	1+	1					1	1002	C2.0	
11	1415	1421	1501	1	3		2				1414		8487
11	1714	1718	1745	1+	5					3	1714	C2.8	8483
11	2032	2035	2121	2-	5					4	2030	C6.1	8487
12	0650	0653	0715	1	1					1	0646	C2.3	8487
12	0755	0758	0812	1-	5					2	0755	C2.6	
12	1016	1023	1037	2-	5		3	1			*		
12	1127	1133	1157	1	1		1				*		
12	1208	1222	1252	1	1		1				No flare		
12	1303	1340	1432	1	3		2				1326	B7.7	8487
12	1545	1553	1615	1+	1					1	1548	C1.0	8485
12	1723	1729	1821	2	5					5	1720	C9.4	8487
12	2036	2040	2054	1-	3					2	2033	C3.2	8487
13	1051	1053	1108	2	5	1	3	1		1	1048	C4.3	
13	1120	1120U	1130	1-	1					1	1114	C2.7	8487
13	1301	1319	1341	1+	3		2				No flare		
13	1308	1400U	1400U	1	1		1				No flare		
13	1505	1508	1542	1	1		1				1519		8487
13	2024	2031	2126	2	5					6	2022	M1.9	8487
14	0716	0732U	0807	1	1		1				No flare		
14	0911	0914	0928	2	5		3	1		1	0908	M1.1	8487
14	0948	1012	1042	2-	5	1	3	1		1	0908	M1.1	8487
14	1159	1207	1230	2	1		1				No flare		
14	1340	1346	1425	3-	5	1	3	1		5	1338	C7.5	8487
14	1547	1555U	1630	1	1		1				1555		8485
14	1606	1611	1618	1-	3					2	1606		8485
15	0812	0832	0854	1	1		1				0822	C1.6	8485
15	1230	1255	1310	2	1					1	1231	C1.3	
15	1448	1503	1613	1	1		1				*		
15	1619	1625U	1703	1	1		1				No flare		
16	0623	0634	0703	2+	3		2			1	0618	M1.6	8485
16	0812	0858	0918	1	1		1				0848	B6.8	

* = no flare patrol.

MARCH 1999

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	0933	0953	1028	1+	3		2			2	0932	C4.1	8485
16	1158	1207	1233	1	1		1				1158	C2.3	
16	1325	1331	1355	1+	5	1	3	1		4	1321	C3.7	8485
16	1558	1608	1621	1	1		1				1600	C1.4	8485
16	1713	1720	1748	2-	3					3	1708	C2.0	8485
16	1825	1831	1856	1+	3					4	1822	C4.6	8485
16	1858	1904	1934	2-	3					4	1857	C5.0	8485
16	1926	1931	1947	1	3					2	1925	C2.7	
16	1947	1952	2005	1-	3					2	1947	C2.4	
16	2015	2022	2030	1-	1					1	2007	C3.4	8485
16	2104	2109	2137	2-	5					5	2101	M1.1	8485
16	2137	2141	2222	2	5					7	2134	M6.2	8485
17	0900	0932	1012	1+	1		1				*		
17	0951	0955	1032	3-	5	1	3	1		2	0950	M3.2	8485
17	1133	1142	1205	2	5	1	3	1		1	1130	C4.8	8485
17	1205	1215	1225	1	1					1	1207	C2.2	8485
17	1225	1231	1252	1	3					2	1224	C2.5	8485
17	1358	1412	1435	1	5		1			2	1359	C1.8	8485
17	1444	1451	1510	2-	5	1	3	1		7	1442	M1.2	8485
17	2149	2154	2234	2	5					3	2145	C9.5	
18	0400	0407	0445	2	1					1	0358	C5.2	
18	0522	0525	0553	1	1					1	0519	C3.0	
18	0727	0730	0759	1	3		1			1	0718	C3.1	
18	0827	0833	0928	3	5	1	3	1		1	0825	M3.3	
18	0941	0956	1016	1	1		1				*		
18	1305	1330	1340	2	1					1	1304	C2.1	8485
18	1414	1427	1456	2-	5	1	3	1		6	1408	C5.3	8485
18	1601	1606	1627	1	5		1			4	1559	C1.6	8485
18	1743	1746	1812	1+	5					4	1738	C2.0	8485
18	1826	1829	1852	1	5					3	1822	C1.5	8485
18	2004	2008	2029	1	5					3	2002	C2.0	
19	1031	1106	1137	1	3		2				No flare		
20	0844	0856U	0915	1	1		1				*		
20	1258	1304	1335	1	1		1				No flare		
20	1408	1415	1500	1	1		1				No flare		
23	1423	1431	1458	1	3		2				No flare		
23	1526	1533	1611	1	3		2				No flare		
24	1206	1246	1320	1	1		1				1245	B3.4	
24	1420	1428	1448	1	1		1				No flare		
26	1010	1032	1055	1	1		1				*		
26	1215	1229	1259	1	1		1				No flare		
26	1446	1455	1524	1	1		1				No flare		

* = no flare patrol.

OBSERVATORIES REPORTING FOR MARCH 1999

Cambridge, England, UK	SES	Rimavska Sobota, Slovakia	SEA
Columbia City, Indiana, USA	SES	Rochester, New Hampshire, USA	SES
Edenvale, Rep of S. Africa	SES	Sun City Center, FL, USA	SES
Houston, Texas, USA	SES	Tucson, Arizona, USA	SES
Hudson, Ohio, USA	SES	Upice, Czech Republic	SEA
Koniz, Switzerland	SES	Vlasim, Czech Republic	SEA
Panska Ves, Czech Republic	SES, SEA, SWF	Ziar nad Hronom, Slovakia	SEA
Parma, Ohio, USA	SES	Zilina, 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 1999

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
01	0000	0815	CULG								
	0000	0837	HIRA								
	0656	1502	ONDR								
	0704	1200	IZMI								
	0630	1550	POTS	1332.9	1333.2	III	G	1	110U	170U	
			PALE	2000.0	2002.0	III		1	25	55	
			SGMR	2000.0	2002.0	III		1	30	55	
	2040	2400	CULG								
	2102	2400	HIRA								
02	0000	0838	HIRA								
			LEAR	0024.0	0025.0	III		2	30	80	
			PALE	0024.0	0025.0	III		1	25	50	
	0000	0815	CULG	0025.0	0026.0	III	G	1	20	150	
	0630	1550	POTS	0630 E	1550 U	I	S	2	110U	450	
	0654	1200	IZMI	0924.0	0929.0U	I	N	1	80	135	
			IZMI	1158.6	1159.2	III	G	1	45X	75U	
			POTS	1158.7	1158.9	III	B	2	40X	70	
			POTS	1207.4	1215.9	III	GG,C,RS	3	40X	300U	
			SGMR	1208.0	1210.0	III		2	30	80	
			POTS	1208.1	1210 U	DCIM		2	200U	800X	
	0855	1531	ONDR	1208.3	1210.5	DCIM		2	2000X	4375X	
			POTS	1431.1	1433.8	III	G	2	110U	170U	
			POTS	1442.5	1442.7	III	B	2	40X	75	
			POTS	1455.8	1456.1	DCIM		1	275	400	
			SGMR	1542.0	1542.0	III		2	30	55	
			PALE	1816.0	1817.0	III		1	45	55	
			PALE	1828.0	2037.0	CONT		1	40	55	
			SGMR	1901.0	1923.0	III	N	1	30	60	
			PALE	1902.0	1902.0	III		1	25	60	
	2040	2400	CULG	2040.0E	2400.0D	III	S	1	20	180	
	2101	2400	HIRA								
			LEAR	2313.0	0759.0	CONT		2	30	80	
03	0000	0815	CULG	0000.0E	0535.0	III	S	1	20	180	
			CULG	0229.0	0230.0	III	G	3	20	180	
			LEAR	0229.0	0229.0	III		2	30	80	
			PALE	0229.0	0237.0	III		1	25	75	
			PALE	0229.0	0254.0	III	N	1	25	75	
	0000	0839	HIRA	0229.2	0229.4	III	B	2	50	180	
			CULG	0236.0	0253.0	III	N	2	23	180	
			LEAR	0236.0	0253.0	III	N	2	30	80	
			LEAR	0323.0	0324.0	III		2	30	55	
			CULG	0332.0	0356.0	III	N	2	30	100	
			HIRA	0333.0	0340.0	III	GG	1	50	90	
			HIRA	0348.4	0348.6	III	B	1	40	120	
			CULG	0450.0	0454.0	III	G	2	20	150	
			HIRA	0450.0	0450.2	III	B	1	30	120	
			CULG	0455.0	0815.0D	I	S	1	100	180	
			CULG	0521.0	0522.0	III	G	2	18X	180	
			HIRA	0521.4	0522.2	III	G	1	30	130	
			CULG	0554.0	0815.0D	III	N	1	20	180	
			POTS	0630 E	1550 U	III	N	1	110U	170U	
	0630	1550	POTS	0630 E	1550 U	I	S,C,DC	2	110U	350	
	0700	1200	IZMI	0700.0E	1200.0D	I	S,C	2	85	270	
			IZMI	0705.0U	1104.0U	III	N	1	45X	135	
			POTS	0708	1423	III	N	1	40X	90U	
			IZMI	0740.1	0740.3	III	G	2	45X	135	
			POTS	0740.1	0740.4	III	B	2	40X	170U	
	0817	1532	ONDR								
			SGMR	1345.0	1349.0	III		1	30	80	
			POTS	1345.3	1349.9	III	GG	3	40X	250	
			SGMR	1418.0	1459.0	III	N	2	30	80	
			POTS	1418.6	1419.1	III	G	2	40X	250	
			POTS	1431.3	1436.6	III	GG	3	40X	350	
			POTS	1453.0	1459.3	III	GG	3	40X	350	
			SGMR	1701.0	1702.0	III		1	30	60	
			PALE	1907.0	1907.0	III		1	40	60	
			PALE	1947.0	1947.0	III		1	25	55	

SOLAR RADIO EMISSION
Spectral Observations

MARCH 1999

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
03			SGMR	1947.0	1948.0	III		1	30	55	
			PALE	2020.0	2026.0	III		1	25	60	
	2040	2400	CULG	2040.0E	2400.0D	III	S	1	30	180	
	2100	2400	HIRA								
			LEAR	2314.0	0941.0	CONT		2	30	80	
04	0000	0840	HIRA								
	0000	0815	CULG	0000.0E	0208.0	III	S	1	30	180	
			CULG	0208.0	0400.0	III	S	2	30	180	
			CULG	0400.0	0815.0D	III	S	1	30	180	
	0630	1550	POTS	0630 E	1550 U	I	S,C,DC	2	70	400	
	0701	1200	IZMI	0701.0E	1200.0D	I	S,C	2	45	270X	
			IZMI	0701.3U	1200.0D	III	N	1	45X	180	
			POTS	0722.4	0723.2	III	G	2	40X	90U	
			POTS	0741	1546	III	N	1	40X	90U	
			POTS	0750.9	0751.2	III	B	2	40X	90U	
			POTS	0818.9	0821.5	III	G	2	40X	90U	
	0838	1534	ONDR								
			POTS	1013.1	1016.1	DCIM		2	200U	400	
			IZMI	1015.6	1015.7	III	B	2	185	270X	
			POTS	1439.5	1440.4	DCIM		2	250	450	
			POTS	1442.3	1443.7	DCIM		2	250	475	
			SGMR	1544.0	1547.0	III		1	30	60	
			SGMR	1927.0	1928.0	III		1	30	50	
			PALE	1928.0	1929.0	III		1	25	45	
	2040	2400	CULG	2040.0E	2400.0D	III	S	1	30	150	
	2058	2400	HIRA								
05	0000	0841	HIRA								
	0000	0815	CULG	0000.0E	0815.0D	III	S	1	30	170	
	0630	1550	POTS	0630 E	1550 U	I	S,C,DC	3	40X	400	
	0647	1537	ONDR								
	0700	0730	IZMI	0700.0E	0730.0D	I	S	1	85	245	
			POTS	0850.4	0850.8	III	G	2	110U	300	
			POTS	0909.7	0909.9	III	B	1	40X	70	
			POTS	1005.3	1005.5	III	B	2	40X	70	
			POTS	1022.0	1022.2	III	B	1	40X	70	
			POTS	1041.6	1041.8	III	B	1	40X	70	
			POTS	1134.8	1134.9	III	B	1	40X	60	
			POTS	1153.0	1153.3	III	B	2	40X	90U	
			POTS	1208	1550 U	III	N	1	40X	90U	
			POTS	1317.1	1321.6	III	G	2	40X	90U	
			POTS	1338.7	1338.8	III	B	2	40X	65	
			POTS	1414.4	1414.7	III	B	2	40X	65	
			POTS	1424.0	1427.4	III	G	2	40X	90U	
			SGMR	1425.0	1439.0	III	N	1	30	55	
			POTS	1436.6	1439.5	III	G	3	40X	170U	
			POTS	1445.8	1546.0	III	G	3	110U	170U	
			SGMR	1755.0	1756.0	III		1	30	80	
			PALE	1756.0	1756.0	III		1	25	60	
			SGMR	1825.0	1826.0	III		1	30	80	
			PALE	1844.0	1849.0	III		1	25	75	
			SGMR	1844.0	1849.0	III		1	30	80	
			PALE	1911.0	1915.0	III		2	25	75	
			PALE	1911.0	1915.0	IV		2	25	75	
			SGMR	1911.0	1915.0	III		1	30	80	
	2040	2400	CULG	2040.0E	2115.0	III	S	1	30	160	
	2057	2400	HIRA								
			CULG	2120.0	2123.0	III	G	1	20	180	
			PALE	2120.0	2123.0	III		1	25	75	
			SGMR	2120.0	2120.0	III		1	30	80	
			CULG	2132.0	2132.0	III	B	1	20	70	
06	0000	0842	HIRA								
	0000	0550	CULG	0050.0	0550.0D	I	S	1	60	150	
			LEAR	0242.0	0535.0	CONT		1	59	80	
			LEAR	0612.0	0612.0	III		2	30	67	
	0625	0805	CULG	0625.0E	0805.0D	I	S	1	60	140	
	0645	1538	ONDR								

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

MARCH 1999

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
06	0645	1200	IZMI	0645.3E	1200.0D	I	S	2	50	190	
			LEAR	0646.0	0930.0	CONT		1	30	80	
			IZMI	0932.2	0932.3	III	B	2	150	270	
	2056	2400	HIRA								
	2040	2400	CULG	2255.0	2303.0	III	G	1	20	90	
			CULG	2337.0	2400.0D	I	S	1	60	90	
07	0000	0815	CULG	0000.0E	0029.0	I	S	1	60	90	
			CULG	0108.0	0108.0	III	B	1	30	70	
			LEAR	0108.0	0108.0	III		1	30	57	
			LEAR	0306.0	0307.0	III		2	30	65	
			PALE	0306.0	0307.0	III		1	40	55	
			CULG	0343.0	0349.0	III	G	1	18	80	
			LEAR	0344.0	0349.0	III		1	30	80	
			CULG	0450.0	0507.0	III	N	1	18	60	
			LEAR	0450.0	0450.0	III		2	30	65	
			LEAR	0458.0	0506.0	III		2	30	58	
			CULG	0533.0	0604.0	CONT		1	40	100	
			LEAR	0535.0	0640.0	CONT		1	30	80	
	0643	1541	ONDR								
			LEAR	0654.0	0659.0	III		2	30	65	
	0650	0711	IZMI	0654.1	0654.3	III	G	1	45X	90	
			IZMI	0659.2	0659.3	III	B	1	45X	90	
			IZMI	0702.0U	0711.0D	I	S	1	90	135	
			IZMI	0705.7	0705.8	III	B	1	45X	90	
			CULG	0738.0	0739.0	III	G	2	30	260	
			LEAR	0738.0	0740.0	III		2	30	80	
	0000	0842	HIRA	0738.0	0738.8	III	G	2	50	260	
			LEAR	0928.0	0931.0	III		2	30	70	
			SGMR	1324.0	1330.0	III		1	30	57	
			SGMR	1622.0	1624.0	V		2	30	60	
	2040	2400	CULG								
	2054	2400	HIRA								
08			CULG	0638.0	0651.0	II	SH	3	50	450	ESS 700
			HIRA	0638.0	0642.5	II	SH	3	100	440	ESS 750
	0000	0815	CULG	0638.0	0650.0	II	FN	3	25	200	SWF
	0000	0843	HIRA	0638.0	0642.5	II	FN	3	60	160	ESS 750
	0638	1200	IZMI	0638.6E	0642.3	II	HARM	2	50	270	
			IZMI	0639.1	0639.4	III	G	2	50	120	
	0641	1541	ONDR								
			IZMI	0642.8U	0653.0U	III	N	2	45X	180	
			IZMI	0644.0U	0657.0U	I	N	1	60	270X	
	1250	1550	POTS	1256.7	1258.1	III	G	3	40X	600	
			SGMR	1257.0	1318.0	III	N	1	30	60	
			POTS	1302	1527	I	S,W	1	130	325	
			POTS	1316.6	1317.8	III	G,UG	3	40X	400	
			POTS	1351.4	1351.8	III	G	2	110U	170U	
			SGMR	1436.0	1436.0	III		1	30	48	
			POTS	1436.4	1436.6	III	B	2	40X	60	
			POTS	1526.5	1526.7	DCIM		2	240	375	
			POTS	1541.3	1541.5	III	G	2	110U	400	
			SGMR	1648.0	1650.0	V		2	30	65	
	2040	2400	CULG								
	2053	2400	HIRA								
09	0000	0844	HIRA								
			LEAR	0542.0	0543.0	III		2	31	54	
	0000	0815	CULG	0547.0	0547.0	III	B	1	23	60	
	0638	1544	ONDR								
	0700	1200	IZMI								
	0630	1550	POTS	0740	1440	I	S,W	1	130	400	
			POTS	1442.8	1443.1	III	G	2	115	160	
			SGMR	1553.0	1555.0	III		1	30	60	
			SGMR	1644.0	1644.0	III		1	30	60	
			PALE	1944.0	1944.0	III		1	40	55	
			SGMR	1944.0	1944.0	III		1	30	60	
	2051	2400	HIRA								
	2040	2400	CULG	2155.0	2155.0	III	B	1	100	180	

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

MARCH 1999

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
10	0000	0845	HIRA								
			LEAR	0322.0	0323.0	III		1	31	50	
	0000	0815	CULG	0322.0	0324.0	III	G	1	30	440	
			CULG	0428.0	0428.0	III	B	1	30	70	
	0636	1546	ONDR								
			LEAR	0939.0	0941.0	III		1	35	60	
	0630	1550	POTS	0939.3	0942.0	III	GG	2	40X	225	
	0650	1200	IZMI	0939.3	0941.8	III	GG	2	45X	165	
			SGMR	1348.0	1348.0	III		1	30	50	
			POTS	1432.0	1435.1	III	G	2	40X	170U	
			SGMR	1433.0	1435.0	III		1	30	60	
			POTS	1453.6	1453.7	III	B	1	110U	170U	
			PALE	2044.0	2104.0	III	N	/	25	75	
			SGMR	2044.0	2045.0	III		1	30	60	
	2040	2400	CULG	2045.0	2045.0	III	B	1	25	150	
			CULG	2104.0	2104.0	III	B	1	23	70	
			CULG	2151.0	2151.0	III	B	1	25	80	
			PALE	2151.0	2152.0	III		1	25	55	
			PALE	2241.0	2249.0	III		2	25	70	
			CULG	2242.0	2251.0	III	GG	2	18X	180	
			LEAR	2245.0	2249.0	III		2	30	80	
	2050	2400	HIRA	2245.0	2249.0	III	G	2	25X	240	
			CULG	2258.0	2259.0	III	G	1	60	100	
			CULG	2329.0	2330.0	III	G	1	20	140	
			LEAR	2329.0	2330.0	III		1	30	61	
			PALE	2329.0	0009.0	III	N	1	25	55	
			CULG	2344.0	2344.0	III	B	1	20	100	
			LEAR	2344.0	2344.0	III		1	31	80	
11			LEAR	0004.0	0010.0	III		2	30	80	
	0000	0815	CULG	0005.0	0010.0	III	G	2	18	180	
	0000	0846	HIRA	0006.0	0008.5	III	G	1	25X	250	
			LEAR	0103.0	0109.0	III		1	30	57	
			CULG	0104.0	0104.0	III	B	1	30	90	
			LEAR	0212.0	0214.0	III		2	30	60	
			PALE	0213.0	0213.0	III		1	25	60	
			CULG	0214.0	0214.0	III	B	1	20	90	
			CULG	0320.0	0322.0	III	G	1	23	130	
			LEAR	0320.0	0321.0	III		2	30	55	
			PALE	0320.0	0320.0	III		1	25	55	
			CULG	0425.0	0425.0	III	B	1	20	120	
			LEAR	0425.0	0425.0	III		1	30	70	
	0607	1612	POTS	0607 E	1612 U	I	S,C,DC	2	110U	400	
			POTS	0609	1612 U	III	N	1	110U	170U	
			POTS	0634	1510	III	N	1	40X	90U	
			POTS	0634	1510	III	N	2	110U	170U	
			CULG	0634.0	0649.0	III	N	1	23	260	
			LEAR	0634.0	0635.0	III		1	30	60	
			LEAR	0639.0	0701.0	III	N	2	30	80	
			POTS	0639.4	0649.0	III	GG,RS	3	40X	325	
			HIRA	0644.6	0644.8	III	B	1	50	240	
			POTS	0741	1515	III	N	2	40X	90U	
			CULG	0741.0	0743.0	III	G	1	30	90	
	0700	1200	IZMI	0741.4	0742.5	III	G	2	45X	120	
			LEAR	0742.0	0742.0	III		2	30	80	
			IZMI	0742.2	0742.4	CONT		2	50	70	
			CULG	0804.0	0806.0	III	G	2	23	100	
			HIRA	0804.0	0806.0	III	G	1	30	120	
			IZMI	0804.0	0804.2	III	G	2	45X	135	
			IZMI	0804.0	0804.3	V		2	45	70	
			LEAR	0804.0	0914.0	III	N	2	30	80	
			POTS	0804.0	0804.4	III	B	3	40X	135	
			IZMI	0805.1	0805.8	III	G	2	45X	160	
			IZMI	0808.1	0808.2	III	B	1	55	85	
			IZMI	0816.3	0816.6	III	G	1	45	230	
			POTS	0816.3	0824.5	III	G,RS	3	40X	400	
			IZMI	0818.8	0819.0	III	G	1	45	270X	
			IZMI	0819.7	0820.1	III	G	1	45X	90	
	0634	1547	ONDR	0823.3	0824.0	DCIM	GG,SP	2	800X	930	

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OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
11		POTS	0823.6	0824.2	DCIM		2	450	700	
		IZMI	0823.7	0823.9	III	G,HARM	2	50	170	
		IZMI	0824.1	0824.3	III	G	2	45X	270	
		IZMI	0824.2	0824.3	V		2	45	100	
		IZMI	0825.1	0825.9	III	G	1	45X	145	
		IZMI	0851.7	0852.5	II	G	2	45X	125	
		IZMI	0904.2	0904.4	III	B	1	45X	95	
		IZMI	0908.3	0908.5	III	G	2	45X	150	
		POTS	0908.3	0917.4	III	G	3	40X	450	
		IZMI	0913.0	0913.2	III	B	2	45X	180	
		IZMI	0913.9	0914.3	III	G,HARM	2	45X	270X	
		POTS	0914.2	0914.4	V		3	40X	50	
		IZMI	0916.7	0917.1	III	G	1	95	260	
		IZMI	0933.1	0933.2	III	B	1	200	270X	
		POTS	0933.1	0935.5	III	G	1	200U	375	
		IZMI	0936.7	0936.9	III	B	1	45	125	
		IZMI	0941.1	0943.4	UNCLF		1	45X	95	
		IZMI	0954.4	0954.6	III	G	1	45X	125	
		IZMI	0959.7	0959.9	III	B	1	45X	85	
		IZMI	1001.7	1013.9	III	N	1	45X	220	
		POTS	1001.7	1014.0	III	GG,RS	3	40X	450	
		IZMI	1003.0	1003.4	III	G	2	45X	270X	
		LEAR	1003.0	1010.0	III		2	30	80	
		IZMI	1003.1	1003.2	V	HARM	2	60	150	
		IZMI	1004.8	1005.0	III	G	2	45	175	
		IZMI	1009.1	1011.1	III	GG	2	45X	270X	
		IZMI	1009.2	1010.5	V	G	2	45X	145	
		POTS	1009.4	1010.0	V		3	40X	70	
		IZMI	1021.8	1022.0	III	B	1	45X	90	
		IZMI	1024.6	1024.8	III	B	2	45X	165	
		IZMI	1031.4	1033.9	III	GG	2	45X	270X	
		POTS	1031.4	1033.7	III	G	3	40X	275	
		IZMI	1051.5	1052.4	III	G	2	45X	270X	
		POTS	1051.5	1052.4	III	G,RS	3	40X	375	
		IZMI	1051.7	1052.2	CONT		1	45	90	
		IZMI	1056.2	1056.6	III	B	1	45	90	
		IZMI	1100.2	1101.2	III	G	2	45X	270X	
		POTS	1100.4	1101.0	III	G	3	40X	300	
		IZMI	1113.5	1113.7	III	B	1	45X	100	
		IZMI	1121.3	1121.4	III	B	1	45	95	
		SGMR	1126.0	1126.0	III		1	35	55	
		IZMI	1126.3	1126.9	III	G	2	45X	270X	
		POTS	1126.3	1127.0	III	G	3	40X	350	
		IZMI	1138.4	1138.7	III	B	2	45X	125	
		SGMR	1145.0	1146.0	III		2	30	80	
		IZMI	1145.7	1146.0	III	G	3	45X	190	
		POTS	1145.7	1145.9	DCIM	U	2	270	400	
		POTS	1145.7	1146.2	III	B	3	40X	250	
		IZMI	1147.2	1147.4	III	B	1	45	90	
		SGMR	1155.0	1159.0	III		2	30	80	
		IZMI	1155.4	1159.1	III	GG	2	45X	270X	
		IZMI	1155.5	1157.9	V	G	2	45X	125	
		POTS	1155.5	1200.3	III	GG,RS	3	40X	600	
		POTS	1157.0	1158.4	V		3	40X	70	
		SGMR	1324.0	1331.0	III		1	30	80	
		POTS	1329.3	1329.4	DCIM		1	400	550	
		POTS	1330.5	1331.6	III	G	2	40X	300	
		SGMR	1504.0	1515.0	III	N	1	30	80	
		SGMR	1619.0	1803.0	III	N	2	30	80	
		PALE	1716.0	1717.0	III		1	25	75	
		PALE	1947.0	1959.0	III		1	25	75	
		SGMR	1947.0	1959.0	III	N	1	30	80	
		PALE	2109.0	2109.0	III		1	25	75	
	2040 2400	CULG	2109.0	2109.0	III	B	1	30	130	
	2050 2400	HIRA	2204.5	2206.0	III	G	1	30	160	
		CULG	2223.0	2226.0	III	G	2	30	180	
		CULG	2248.0	2248.0	III	B	1	30	100	
		PALE	2248.0	2248.0	III		1	25	55	
		HIRA	2334.6	2334.8	III	B	1	200	320	

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12	0000	0815	CULG	0005.0	0006.0	III	G	1	30	240	
			CULG	0125.0	0125.0	III	B	1	50	120	
			CULG	0143.0	0203.0	III	N	2	20	180	
			LEAR	0143.0	0254.0	III	N	3	30	80	
	0000	0847	HIRA	0150.0	0150.2	III	B	1	30	180	
			HIRA	0155.0	0156.5	III	G	1	25X	180	
			CULG	0223.0	0224.0	III	G	2	50	270	
			HIRA	0223.2	0223.6	III	B	2	80	320	
			CULG	0254.0	0300.0	III	G	1	20	80	
			CULG	0343.0	0343.0	III	B	1	20	70	
			LEAR	0343.0	0343.0	III		1	30	53	
			CULG	0350.0	0353.0	III	G	1	25	160	
			LEAR	0350.0	0352.0	III		1	30	80	
			HIRA	0350.5	0352.0	III	G	1	50	220	
			PALE	0351.0	0351.0	III		1	40	60	
			LEAR	0452.0	0455.0	III		2	30	80	
			CULG	0453.0	0455.0	III	G	1	30	180	
			LEAR	0545.0	0546.0	III		1	30	50	
			CULG	0546.0	0546.0	III	B	1	30	80	
	0607	1612	POTS	0607 E	1612 U	I	S,C,DC	2	110U	400	
			LEAR	0612.0	0619.0	III		2	30	80	
			CULG	0619.0	0619.0	III	B	2	20	150	
			SVTO	0619.0	0654.0	III	N	2	35	85	
			POTS	0619.1	0619.4	III	B	3	40X	400	
			LEAR	0637.0	0638.0	III		1	30	60	
			CULG	0638.0	0655.0	III	N	2	18X	300	
			LEAR	0640.0	0654.0	III	N	3	30	80	
			POTS	0641.2	0654.3	III	GG	3	40X	450	
			HIRA	0648.4	0648.8	III	B	1	30	300	
			LEAR	0700.0	0700.0	III		1	30	60	
	0700	1200	IZMI	0700.0U	1200.0D	III	N	1	45X	180U	
			POTS	0725	1154	III	N	2	110U	170U	
			POTS	0725	1550	III	N	1	40X	90U	
			IZMI	0725.9	0726.1	III	B	1	45X	125	
			CULG	0726.0	0807.0	III	N	1	25	150	
			LEAR	0726.0	0738.0	III	N	2	30	65	
			POTS	0734	1609	III	N	2	40X	90U	
			SVTO	0734.0	0806.0	III	N	2	35	85	
			POTS	0735	1208	III	N	1	110U	170U	
			IZMI	0735.6	0735.8	III	B	1	45X	140	
			LEAR	0742.0	0806.0	III	N	3	30	80	
			IZMI	0742.6	0742.9	III	G	2	45X	135	
			POTS	0742.7	0806.7	III	GG,RS	3	40X	600	
			IZMI	0747.9	0753.5	III	GG	2	45X	270X	
			IZMI	0755.8	0801.7	III	GG	2	45X	270X	
			IZMI	0756.0	0758.6	V	G	2	45	80	
	0631	1550	ONDR	0756.4	0756.5	DCIM		1	800X	1570	
			HIRA	0756.5	0757.5	III	G	1	40	310	
			IZMI	0806.4	0806.6	III	B	2	45X	160	
			IZMI	0848.1	0848.4	III	GG,RS	2	60	245	
			POTS	0848.1	0848.6	III	G	3	110U	275	
			LEAR	0854.0	0907.0	III	N	2	30	80	
			SVTO	0854.0	0907.0	III	N	2	35	85	
			IZMI	0854.5	0856.6	III	GG	2	45X	270X	
			POTS	0854.6	0907.3	III	GG	3	40X	800X	
			IZMI	0854.8	0856.9	V	G	2	45	90	
	0631	1550	ONDR	0855.3	0856.1	DCIM	GG	2	800X	2000X	
			IZMI	0858.2	0900.2	III	GG	2	45X	270	
			IZMI	0902.8	0902.9	III	B	1	45X	150	
			POTS	0922.4	0922.9	III	G	3	115	250	
			POTS	0929.7	0929.8	III	B,U	3	130	220	
			IZMI	0947.6	0948.5	III	GG	2	50	180	
			POTS	0947.6	0948.4	III	GG	3	110U	220	
			SVTO	1000.0	1021.0	III	N	2	35	85	
			IZMI	1000.4	1000.7	III	G	2	45X	135	
			POTS	1000.4	1000.8	III	G	2	40X	150	
			POTS	1015.6	1022.7	III	GG	3	40X	600	
			IZMI	1016.7	1022.6	III	GG	2	45X	270X	
			LEAR	1017.0	1020.0	III		2	30	80	

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OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
12		IZMI	1017.1	1020.6	V	G	2	45	180	
0631	1550	ONDR	1017.3	1017.4	DCIM	G	1	2000X	4375X	
0631	1550	ONDR	1017.3	1020.2	DCIM	G	2	800X	2000X	
		POTS	1017.8	1018.7	V		3	40X	70	
		SVTO	1118.0	1120.0	III		1	35	69	
		POTS	1118.7	1126.1	III	G	3	40X	170U	
		SVTO	1121.0	1130.0	IV		2	35	76	
		SGMR	1122.0	1126.0	III		1	30	60	
		IZMI	1122.1	1126.1	III	GG	2	45X	150	
		SVTO	1152.0	1324.0	III	N	2	35	79	
		IZMI	1158.0	1158.3	III	G	2	45X	130	
		POTS	1158.0	1207.9	III	GG	3	40X	250	
		SGMR	1158.0	1324.0	III		1	30	80	
		IZMI	1159.8	1200.0	III	G	2	45X	145	
		POTS	1217.6	1218.2	III	B	3	40X	150	
		POTS	1231.3	1239.6	III	GG	3	40X	400	
		POTS	1328.3	1328.6	DCIM		2	380	800X	
		POTS	1417.1	1417.2	DCIM		2	400	650	
		SGMR	1437.0	1437.0	III		1	30	50	
		POTS	1437.9	1438.0	III	B	2	200U	325	
		SGMR	1541.0	1631.0	III	N	3	30	80	
		SVTO	1544.0	1609.0	III	N	2	35	79	
		POTS	1544.1	1545.1	III	G	3	40X	250	
		POTS	1608.7	1609.3	DCIM		1	200U	450	
		POTS	1609.0	1609.4	III	G	3	40X	80	
		PALE	1724.0	1727.0	III		3	25	70	
		SGMR	1724.0	1729.0	V		3	30	80	
		PALE	1938.0	1940.0	III		2	25	75	
		SGMR	1938.0	1940.0	III		2	30	75	
		PALE	2036.0	2041.0	V		3	25	75	
		SGMR	2036.0	2039.0	V		3	30	80	
2040	2340	CULG	2255.0	2255.0	III	B	1	18X	70	
		LEAR	2320.0	2321.0	III		2	30	80	
		CULG	2321.0	2322.0	III	G	2	18X	150	
2048	2400	HIRA	2321.0	2322.0	III	G	1	25X	150	
		LEAR	2337.0	2343.0	III		3	30	80	
		CULG	2338.0	2339.0	III	G	2	18X	150	
		HIRA	2338.0	2338.5	III	B	1	25X	180	
13		LEAR	0026.0	0035.0	III		2	30	80	
		PALE	0026.0	0026.0	III		1	30	60	
		PALE	0035.0	0035.0	III		1	25	55	
		LEAR	0139.0	0146.0	III		2	30	61	
		LEAR	0228.0	0228.0	III		1	30	53	
		LEAR	0316.0	0320.0	III		3	30	80	
		PALE	0318.0	0320.0	III		3	40	75	
0000	0848	HIRA	0319.0	0320.5	III	G	1	25X	140	
		LEAR	0416.0	0417.0	III		2	30	65	
		LEAR	0500.0	0503.0	III		3	30	80	
		HIRA	0501.0	0503.0	III	G	2	25X	300	
		SVTO	0524.0	0642.0	CONT		1	35	58	
		LEAR	0528.0	0528.0	III		1	35	50	
		LEAR	0539.0	0548.0	III		2	30	80	
		SVTO	0547.0	0548.0	III		1	35	62	
		LEAR	0548.0	0558.0	III		1	30	60	
		LEAR	0548.0	0558.0	III	N	1	30	60	
0607	1612	POTS	0615	1612 U	I	S	2	110U	400	
		LEAR	0632.0	0633.0	III		2	30	65	
		POTS	0632.0	0633.2	III	G	2	40X	275	
		SVTO	0632.0	0633.0	III		2	36	63	
		LEAR	0647.0	0650.0	III		2	30	70	
		SVTO	0647.0	0648.0	III		2	45	67	
		POTS	0647.5	0648.8	III	G	2	40X	120	
		POTS	0708.5	0708.6	III	B	2	110U	170U	
		POTS	0714.7	0714.8	III	B	1	110U	170U	
		POTS	0722.3	0722.5	III	B	1	110U	160	
		LEAR	0810.0	0813.0	III		3	30	80	
		SVTO	0810.0	0813.0	III		2	35	83	
0650	0853	IZMI	0810.0	0810.2	III	B	1	45X	70	

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OBSERVATION Start (UT)	OBSERVATION End (UT)	Day	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
		13	POTS	0810.1	0813.9	III	G	3	40X	325	
			IZMI	0811.2	0812.5	III	GG	2	45X	270X	
			HIRA	0811.4	0811.8	III	B	1	50	240	
			IZMI	0811.4	0812.4	V	G	2	45X	75	
			POTS	0811.6	0812.4	V		3	40X	60	
0629	1551		ONDR	0907.1	0910.5	DCIM	G	1	800X	2000X	
			POTS	0916.3	0917.9	III	G	2	110U	170U	
			POTS	0942.0	0942.7	III	G,U	2	140	350	
			SVTO	1008.0	1429.0	CONT		1	35	75	
1027	1200		IZMI	1040.9	1200.0U	III	N	1	45X	135	
			POTS	1049.1	1049.3	III	G	2	110U	145	
			POTS	1058.0	1058.6	UNCLF		2	40X	70	
			POTS	1111.4	1112.2	III	G	2	120	170U	
			POTS	1117.0	1117.1	III	B	2	110U	145	
			SVTO	1132.0	1137.0	III		1	35	75	
			POTS	1132.3	1134.1	III	G	2	40X	300	
			IZMI	1132.7	1134.0	III	G	2	45X	270X	
			SGMR	1133.0	1134.0	III		1	30	55	
			POTS	1209.1	1212.5	DCIM		2	300	700	
0629	1551		ONDR	1212.2	1212.3	DCIM		1	1070	1920	
			POTS	1214	1335	III	N	1	40X	90U	
			SGMR	1231.0	1326.0	III	N	1	30	60	
			POTS	1231.6	1231.8	III	B	3	40X	55	
			POTS	1253.7	1253.9	III	B	2	40X	55	
			POTS	1344.0	1345.1	DCIM		2	225	400	
			POTS	1539.2	1539.5	III	G	2	110U	275	
			POTS	1549.2	1549.9	DCIM		1	275	400	
			PALE	2006.0	2006.0	III		1	25	55	
2047	2400		HIRA								
			PALE	2108.0	2108.0	III		1	45	55	
			SGMR	2108.0	2109.0	III		1	30	50	
		14	LEAR	0017.0	0930.0	CONT		1	30	55	
			LEAR	0206.0	0206.0	III		1	45	65	
			PALE	0206.0	0206.0	III		1	50	60	
			LEAR	0305.0	0306.0	III		2	30	80	
			PALE	0305.0	0306.0	III		2	40	75	
0000	0849		HIRA	0305.6	0305.8	III	B	1	25X	300	
0607	1612		POTS	0607 E	1612 U	I	S	2	110U	400	
			SVTO	0626.0	0715.0	III	N	3	36	84	
			POTS	0626.4	0627.7	III	G,C	3	40X	300	
			LEAR	0627.0	0627.0	III		3	30	80	
			HIRA	0627.2	0627.4	III	B	1	30	200	
			POTS	0638	1502	III	N	1	40X	90U	
			IZMI	0647.0E	1200.0D	I	N	1	105	245	
0647	1200		IZMI	0647.0E	1200.0D	III	N	1	45X	120	
			IZMI	0648.2	0648.3	III	B	2	45X	95	
			POTS	0648.2	0648.4	III	B	2	40X	90U	
			SVTO	0656.0	1402.0	CONT		1	35	55	
			POTS	0712.5	0717.3	III	G	2	40X	275	
			IZMI	0714.3	0717.7	III	GG	2	45X	135	
			SVTO	0901.0	0921.0	III	N	1	35	80	
			POTS	0901.6	0906.2	III	GG	3	40X	250	
			IZMI	0901.8	0902.3	III	G	2	45X	140	
			IZMI	0905.3	0905.5	III	GG	2	45X	245	
			IZMI	0906.1	0906.2	III	G	2	60	230	
			POTS	0920.0	0921.3	III	GG	3	40X	170U	
			IZMI	0920.1	0921.3	III	G	2	45X	180	
			POTS	0932.3	0936.5	III	G	2	40X	170U	
0627	1552		ONDR	0937.4	0950.1	DCIM	G	1	2000X	4365X	
0627	1552		ONDR	0947.3	0950.0	DCIM	G	1	800X	2000X	
			POTS	0947.5	0949.7	DCIM		2	400	800X	
			POTS	0948.7	0950.1	III	G	2	40X	170U	
			POTS	1006.3	1007.7	III	G	2	40X	170U	
			SGMR	1409.0	1502.0	III	N	1	30	65	
			POTS	1418.5	1430.6	III	GG	2	40X	70	
			SVTO	1421.0	1442.0	III	N	1	36	48	
			POTS	1429.3	1429.9	III	G	2	170U	325	
			POTS	1431.9	1442.7	III	G	2	40X	65	

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Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	FREQUENCY Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
14	2046	2400	HIRA								
	2040	2400	CULG	2151.0	2400.0	I	S	1	55	120	
15	0000	0810	CULG	0327.0	0327.0	III	B	1	30	120	
			CULG	0331.0	0333.0	III	G	1	30	90	
			LEAR	0332.0	0332.0	III		1	30	50	
			LEAR	0332.0	0528.0	IV		1	30	55	
			CULG	0336.0	0344.0	II	SH	2	80	160	SWF ESS 400
	0000	0850	HIRA	0336.5	0343.5	II	SH	3	80	140	ESS 400
			CULG	0337.0	0344.0	II	FN	2	45	90	
			CULG	0340.0	0342.0	III	G	2	25	100	
			HIRA	0340.0	0342.0	II	FN	3	40	70	ESS 400
			LEAR	0340.0	0342.0	III		2	30	80	
			PALE	0341.0	0343.0	III		1	40	55	
			PALE	0341.0	0343.0	II		1	40	55	ESS 0400
	0607	1612	POTS	0607 E	1612 U	I	S,C,DC	2	110U	350	
			LEAR	0607.0	0953.0	CONT		1	30	52	
	0625	1556	ONDR								
			CULG	0645.0	0649.0	III	G	2	30	140	
			SVTO	0645.0	1306.0	CONT		2	35	85	
	0655	1200	IZMI	0645.0U	0650.0	III	GG	2	45X	90U	
			POTS	0645.3	0655 U	II	SH,H	3	110U	150	
			HIRA	0645.4	0645.8	III	B	2	40	120	
			POTS	0645.5	0646.5	II	F,H	3	40X	70	
			LEAR	0646.0	0648.0	III		2	30	80	
			CULG	0651.0	0653.0	II	FN	1	55	75	
			CULG	0651.0	0655.0	II	SH	1	95	140	
			HIRA	0651.5	0655.5	II		1	90	130	ESS 400
			IZMI	0652.5	0655.9	II		2	95	125	
			IZMI	0655.0E	1200.0D	I	S	1	105	245	
			IZMI	0655.0E	1200.0D	III	N	1	45X	120	
			CULG	0658.0	0757.0	CONT		1	40U	90	
			IZMI	0708.9	0709.0	III	B	2	45X	135	
			POTS	0720	1601	III	N	1	40X	90U	
			IZMI	0827.9	0833.9	III	GG	2	45X	135	
			LEAR	0828.0	0836.0	III		2	30	80	
			POTS	0828.4	0832.1	III	GG	2	40X	160	
			IZMI	0835.0	0836.0	III	G	2	45X	110	
			POTS	0835.9	0836.1	III	B	2	40X	90U	
			POTS	0908.1	0908.2	III	B	2	40X	70	
			IZMI	1003.5	1003.6	III	G	2	80	230	
			SGMR	1208.0	1210.0	III		1	30	80	
			POTS	1208.1	1210.4	III	G	3	40X	170U	
			SGMR	1501.0	1655.0	CONT		1	30	60	
	2043	2400	HIRA								
			LEAR	2340.0	0301.0	CONT		2	30	62	
	2040	2400	CULG	2354.0	2400.0D	III	S	1	30	90	
16	0000	0851	HIRA								
	0000	0810	CULG	0000.0E	0157.0	III	S	1	30	90	
			PALE	0030.0	0146.0	CONT		1	25	75	
			PALE	0035.0	0143.0	III	N	1	25	60	
			LEAR	0546.0	0730.0	CONT		1	30	55	
	0607	1612	POTS	0607 E	1612 U	I	S,C,DC	3	40X	300	
			IZMI	0645.0E	1032.0U	I	N	1	105	230	
	0645	1200	IZMI	0645.0E	1200.0D	III	N	1	45X	90	
			POTS	0719	1534	III	N	1	40X	90U	
			IZMI	0803.5U	0809.8	CONT	,FS	2	205	225	
			IZMI	0808.4	0809.9	III	GG	1	185	225	
			IZMI	0824.1	0827.7	CONT	,FS	2	200	225	
			IZMI	0825.8	0826.1	III	B	1	185	215	
			IZMI	1032.0	1200.0D	I	S	2	45X	270U	
			SVTO	1044.0	1635.0	CONT		3	35	85	
			POTS	1106.9	1107.1	DCIM		2	300	500	
	0622	1557	ONDR	1201.2	1201.5	DCIM		1	2930	4500X	
			SGMR	1203.0	1535.0	CONT		1	30	80	
	2040	2400	CULG								
	2041	2400	HIRA								

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17			LEAR	0003.0	0008.0	III		2	30	80	
			PALE	0008.0	0008.0	III		2	25	55	
	0000	0810	CULG	0008.0	0009.0	III	G	1	18X	90	
			LEAR	0345.0	0353.0	III		2	30	80	
			CULG	0348.0	0348.0	III	B	2	18X	110	
			PALE	0348.0	0348.0	III		1	45	60	
	0000	0851	HIRA	0348.0	0348.2	III	B	1	25X	120	
			CULG	0428.0	0428.0	III	B	1	30	90	
			LEAR	0428.0	0428.0	III		1	30	65	
			LEAR	0509.0	0512.0	III		2	30	80	
			CULG	0511.0	0512.0	III	G	1	20	90	
			CULG	0605.0	0605.0	III	B	1	23	90	
			LEAR	0605.0	0605.0	III		1	30	65	
	0607	1612	POTS	0607 E	1612 U	I	S,C,DC	2	80	325	
			CULG	0649.0	0756.0	I	S	1	100	170	
			IZMI	0700.0E	1200.0D	III	N	1	45X	130U	
	0700	1200	IZMI	0700.0E	0930.0U	I	N	1	105	240	
			POTS	0724	1531	III	N	1	40X	90U	
			LEAR	0724.0	0725.0	III		1	35	50	
			SVTO	0724.0	0725.0	III		1	37	84	
			LEAR	0819.0	0822.0	III		1	44	57	
			SVTO	0819.0	0820.0	III		1	35	51	
			POTS	0836.0	0836.3	DCIM		2	350	500	
			IZMI	0930.0U	1200.0D	I	S	2	80	270U	
	0620	1558	ONDR	0952.3	0956.5	DCIM		2	800X	2000X	
			ONDR	0952.5	0955.1	DCIM		1	1765	2000X	
			SVTO	1151.0	1221.0	CONT		1	35	80	
			ONDR	1226.5	1228.0	DCIM		1	2000X	4400X	
			ONDR	1400.2	1406.2	DCIM	G	1	2000X	4400X	
			ONDR	1404.0	1406.2	DCIM		1	1255	2000X	
			ONDR	1445.1	1446.2	DCIM		1	2985	4400X	
	2040	2400	HIRA								
	2040	2400	CULG	2040.0E	2356.0	III	S	1	55U	150	
			PALE	2046.0	2156.0	CONT		1	25	75	
			PALE	2158.0	2158.0	III		2	25	60	
18	0000	0852	HIRA								
	0000	0810	CULG	0110.0	0127.0	III	N	1	25	120	
			CULG	0338.0	0745.0	III	S	1	55U	150	
			LEAR	0402.0	0906.0	CONT		1	30	80	
			SVTO	0532.0	0904.0	CONT		2	35	85	
			LEAR	0557.0	0604.0	III		2	30	80	
			CULG	0600.0	0600.0	III	B	1	20	70	
	0607	1612	POTS	0607 E	1612 U	I	S,C,DC	2	110U	350	
			IZMI	0647.0E	1200.0D	III	N	1	45X	90	
	0647	1200	IZMI	0647.0E	1200.0D	I	S	2	80	240	
	0618	1559	ONDR	0828.4	0834.2	DCIM	G	2	2000X	4400X	
			SVTO	1043.0	1044.0	III		2	36	81	
			SVTO	1300.0	1300.0	III		1	36	41	
			POTS	1300.2	1300.4	III	B	2	40X	90U	
			POTS	1325.0	1325.4	III	G	2	110U	400	
			POTS	1409.1	1418.5	III	GG,C	2	40X	170U	
			SVTO	1411.0	1420.0	V		2	35	85	
			ONDR	1412.0	1416.5	DCIM		2	2000X	4400X	
			SGMR	1413.0	1420.0	V		1	30	80	
			ONDR	1414.3	1416.3	DCIM	G	1	965	2000X	
			SGMR	1433.0	1434.0	III		1	30	50	
			POTS	1435.9	1436.0	III	B	2	40X	60	
	2038	2400	HIRA								
	2040	2400	CULG								
19	0000	0810	CULG								
	0000	0853	HIRA								
			LEAR	0547.0	0547.0	III		2	30	75	
	0607	1612	POTS	0607 E	1612 U	I	S,C,DC	2	110U	400	40-90 Mhz no obser
	0616	1601	ONDR								
	0701	1200	IZMI	0701.0E	1140.0U	I	N	1	85	230	
			IZMI	0702.6	0702.7	III	B	1	45X	100	
			IZMI	0745.4	0745.6	III	B	1	45X	70	

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19			IZMI	0825.3	0825.5	III	G	2	55	270	
			SVTO	0856.0	0858.0	III		2	35	83	
			LEAR	0857.0	0858.0	III		2	30	80	
			IZMI	0857.1	0858.1	III	G	2	45X	170	
			IZMI	0857.7	0858.2	V	G	2	45	135	
	2037	2400	HIRA								
	2040	2400	CULG								
20	0000	0854	HIRA								
			LEAR	0043.0	0043.0	III		1	30	48	
			PALE	0043.0	0043.0	III		1	25	55	
			LEAR	0120.0	0120.0	III		2	30	80	
			PALE	0120.0	0120.0	III		2	30	55	
	0000	0810	CULG	0120.0	0120.0	III	B	1	20	100	
			LEAR	0425.0	0425.0	III		1	30	65	
	0607	1612	POTS	0607 E	1612 U	I	S	1	110U	300	40-90 Mhz no obser
	0613	1604	ONDR								
	0700	1010	IZMI	0700.0E	1010.0D	I	N	1	145	230	
			IZMI	0837.3	0838.1	III	G	1	165	245	
			POTS	0907.8	0908.7	III	G	2	110U	225	
			LEAR	0908.0	0908.0	III		1	30	52	
			SVTO	0908.0	0908.0	III		1	36	44	
			SVTO	1057.0	1057.0	III		1	35	65	
	1103	1200	IZMI	1103.0E	1200.0D	I	N	1	145	230	
			POTS	1157.1	1157.5	III	G	3	110U	225	
			PALE	1958.0	2004.0	III		2	25	75	
			SGMR	1958.0	1959.0	III		2	30	80	
	2036	2400	HIRA								
	2040	2400	CULG	2224.0	2226.0	III	G	1	23	90	
21			LEAR	0014.0	0026.0	III	N	2	30	80	
			PALE	0014.0	0015.0	III		1	25	75	
	0000	0810	CULG	0014.0	0024.0	III	N	1	20	90	
			PALE	0021.0	0023.0	III	N	1	25	75	
	0000	0855	HIRA	0021.4	0021.5	III	B	1	25X	160	
			CULG	0109.0	0114.0	III	G	1	20	90	
			LEAR	0109.0	0113.0	III		2	30	80	
			PALE	0113.0	0113.0	III		1	25	75	
			HIRA	0113.6	0113.8	III	B	1	25X	120	
			CULG	0310.0	0310.0	III	B	1	30	70	
			CULG	0319.0	0319.0	III	G	1	20	80	
			CULG	0554.0	0555.0	III	G	1	23	90	
			SVTO	0554.0	0555.0	III		1	36	51	
	0543	1630	POTS	0554.4	0555.2	III	G	2	110U	170U	40-90 MHz no obser
			SVTO	0610.0	0610.0	III		1	37	59	
	0611	1605	ONDR								
			CULG	0611.0	0611.0	III	B	1	20	70	
			CULG	0644.0	0644.0	III	B	1	23	70	
			SVTO	0644.0	0644.0	III		1	35	45	
			POTS	0644.3	0644.4	III	B	2	110U	140	
	0658	0853	IZMI	0658.1	0659.2	III	G	1	45X	90	
			IZMI	0734.9	0735.8	III	G	2	45X	135	
			POTS	0734.9	0735.7	III	G	2	110U	170U	
			CULG	0735.0	0740.0	III	G	1	25	80	
			SVTO	0735.0	0735.0	III		1	36	69	
			POTS	0737	0740	I	S	2	110U	120	
			IZMI	0737.9	0738.0	III	B	1	45X	95	
			IZMI	0739.4	0739.4	III	B	1	45X	95	
			IZMI	0800.2	0800.6	III	G	1	45	95	
			POTS	0849.9	0852.8	III	G	2	110U	225	
			IZMI	0851.2	0852.6	III	GG	2	45X	150	
			SVTO	0852.0	0853.0	III		2	35	78	
			IZMI	0852.5	0852.7	V		2	45	70	
			SVTO	1228.0	1228.0	III		2	36	73	
			POTS	1228.1	1228.6	III	G	2	110U	170U	
			POTS	1518	1558	I	S,W	1	130	160	
			SGMR	1634.0	1635.0	III		1	30	60	
			PALE	1655.0	1656.0	III		1	35	50	
			SGMR	1655.0	1656.0	III		1	30	60	

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21	2034	2400	HIRA								
	2040	2400	CULG								
			PALE	2139.0	2139.0	III		1	25	60	
22	0000	0856	HIRA								
	0000	0810	CULG	0151.0	0151.0	III	B	1	35	70	
			CULG	0309.0	0310.0	III	G	1	25	90	
			LEAR	0310.0	0528.0	CONT		1	30	60	
	0609	1607	ONDR								
	0646	1200	IZMI								
	0543	1630	POTS	0712	0716	I	S,W	1	150	170U	40-90 MHz no obser
			POTS	1202.6	1203.2	III	G	2	110U	155	
			SGMR	1622.0	1623.0	III		1	30	60	
			PALE	1922.0	1931.0	III		1	25	55	
			SGMR	1922.0	1923.0	III		1	30	60	
	2033	2400	HIRA								
	2040	2400	CULG								
23	0000	0810	CULG								
	0000	0857	HIRA								
	0607	1608	ONDR								
	0657	1200	IZMI								
	0543	1630	POTS	0738.2	0738.3	III	B	1	110U	160	40-90 MHz no obser
			POTS	0814	0816	I	S,W	1	140	170U	
			POTS	0825.5	0826.1	III	G	1	130	170U	
			POTS	1123.8	1127.0	III	G	2	110U	170U	
			POTS	1154.0	1154.3	III	B	1	110U	170U	
			SGMR	1334.0	1336.0	III		1	30	80	
			SVTO	1334.0	1336.0	III		1	35	72	
			POTS	1334.7	1337.1	III	GG	2	110U	250	
			PALE	1735.0	1735.0	III		1	25	75	
			SGMR	1735.0	1735.0	III		1	30	60	
	2031	2400	HIRA								
	2040	2400	CULG								
24	0000	0800	CULG								
	0000	0857	HIRA								
	0543	1630	POTS								
	0604	1608	ONDR								40-90 MHz no obser
	0650	1200	IZMI								
	1228	1450	POTS	1250	1251	I	S,W	1	130	150	40-90 MHz no obser
			POTS	1345	1346	I	S	2	150	170U	
	2030	2400	HIRA								
	2040	2400	CULG	2253.0	2253.0	III	B	1	30	80	
25	0000	0858	HIRA								
	0000	0800	CULG	0350.0	0350.0	III	B	1	20	80	
	0602	1611	ONDR								
	0656	1002	IZMI								
			PALE	1859.0	1859.0	III		2	25	65	
			SGMR	1859.0	1900.0	III		2	30	80	
	2028	2400	HIRA								
	2040	2400	CULG								
26	0000	0800	CULG								
	0000	0859	HIRA								
	0600	1614	ONDR								
	0646	1200	IZMI								
			PALE	1718.0	1718.0	III		1	35	55	
			SGMR	1738.0	1739.0	V		1	30	48	
	2027	2400	HIRA								
			PALE	2122.0	2123.0	III		1	29	37	
	2040	2400	CULG	2123.0	2123.0	III	B	1	30	60	
27	0000	0810	CULG								
	0000	0900	HIRA								
	0558	1615	ONDR								
	0700	1200	IZMI								
	2025	2400	HIRA								

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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
27	2040	2400	CULG								
28	0000	0901	HIRA								
	0000	0800	CULG	0004.0	0008.0	III	G	1	30	100	
			CULG	0023.0	0023.0	III	B	1	100	180	
			CULG	0133.0	0134.0	III	G	1	35	180	
			PALE	0258.0	0300.0	III		2	25	75	
			PALE	0330.0	0346.0	III	N	2	35	75	
	0555	1615	ONDR								
	0608	1001	IZMI	0828.1	0828.7	III	G	2	45X	245	
	1030	1200	IZMI								
			PALE	1654.0	1655.0	III		1	25	75	
	2024	2400	HIRA								
	2058	2400	CULG	2146.0	2146.0	III	B	1	25	50	
			CULG	2200.0	2200.0	III	B	1	28	90	
			CULG	2239.0	2241.0	III	G	1	35	180	
			CULG	2335.0	2335.0	III	B	1	30	70	
29	0000	0902	HIRA								
	0000	0800	CULG	0007.0	0008.0	III	G	1	30	140	
			CULG	0031.0	0031.0	III	B	1	20	80	
			PALE	0031.0	0032.0	III		1	30	55	
			PALE	0056.0	0058.0	III		2	25	55	
			CULG	0057.0	0058.0	III	G	2	18X	150	
			CULG	0232.0	0232.0	III	B	1	25	75	
			CULG	0415.0	0415.0	III	B	1	35	100	
	0553	1618	ONDR								
			CULG	0606.0	0610.0	III	G	1	30	90	
			SVTO	0609.0	0609.0	III		1	51	85	
	0601	1200	IZMI	0609.3	0910.8	III	G	2	45X	180	
			IZMI	0707.7	0708.4	III	G	1	45	170	
			CULG	0739.0	0739.0	III	B	1	40	90	
			SVTO	0855.0	0856.0	III		1	35	47	
			IZMI	0855.9	0856.6	III	B	1	45X	90	
			SGMR	1204.0	1210.0	III		1	30	80	
			SVTO	1204.0	1211.0	III		2	35	83	
			SVTO	1533.0	1537.0	V		2	35U	84U	
			SGMR	1534.0	1538.0	V		1	30	60	
			PALE	1950.0	1952.0	III		1	25	50	
	2022	2400	HIRA								
	2040	2400	CULG								
30	0000	0800	CULG								
	0000	0903	HIRA								
	0551	1619	ONDR								
	0557	1200	IZMI	0858.5	0858.7	III	G	1	50	135	
	0650	1628	POTS	0858.5	0858.7	III	G	2	110U	170U	40-90 MHz no obser
			POTS	0949.3	0949.4	III	G	2	110U	170U	
			POTS	1121.2	1121.7	III	G	1	110U	170U	
			POTS	1425	1426	I	S,W	1	150	170U	
			POTS	1519.6	1520.0	DCIM		2	250	500	
			POTS	1522.2	1523.3	DCIM		2	450	750	
			POTS	1540	1543	I	S	1	130	170U	
	2021	2400	HIRA								
	2040	2400	CULG								
31	0000	0800	CULG								
	0000	0904	HIRA								
	0549	1621	ONDR								
	0555	1200	IZMI								
	0543	1630	POTS	1240	1244	I	S,W	1	150	170U	40-90 MHz no obser
			POTS	1309.4	1309.6	III	G	1	110U	350	
			POTS	1424.6	1424.7	III	B	1	130	170U	
			SVTO	1441.0	1442.0	III		2	36U	65U	
			POTS	1501	1514	I	S,W	1	140	170U	
			PALE	1850.0	1853.0	V		3	25	75	
			SGMR	1850.0	1854.0	V		3	30	80	
	2020	2400	HIRA								
	2040	2400	CULG	2128.0	2128.0	III	B	1	30	50	

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

MARCH 1999

OBSERVATION Start Day (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
31		CULG	2347.0	2347.0	III	B	1	30	60	

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:

BLEN = Bleien
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 1999

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
02/03/99	-0.16	+0.45	I	9H48 E	15H32 D
02/03/99	+0.09	+0.22	I	12H30	15H32 D
03/03/99	+0.51	+0.34	III	12H13 E	15H32 D
04/03/99	+0.65	+0.17	IV	9H42 E	15H32 D
05/03/99	+0.82	+0.17	IV	8H47 E	15H32 D
06/03/99	+1.07	+0.23	II	8H22 E	15H22 D
06/03/99	+1.07	+0.65	III	8H22 E	15H22 D
07/03/99	+1.12	+0.12	I	8H22 E	15H22 D
07/03/99	+1.21	+0.59	I	8H22 E	13H20
11/03/99	+1.26	-0.11	I	12H27	15H30 D
12/03/99	-0.40	+0.85	I	8H45 E	15H30 D
12/03/99	+1.27	-0.29	III	8H45 E	15H30 D
13/03/99	-0.96	+0.48	I	8H40 E	15H29 D
13/03/99	-0.25	+0.73	I	11H51	15H29 D
14/03/99	-0.28	+0.29	I	8H39 E	15H29 D
14/03/99	+0.00	+0.76	I	8H39 E	15H29 D
14/03/99	+0.12	+1.02	I	13H00	15H29 D
15/03/99	-0.22	+0.68	II	8H30 E	12H00
15/03/99	+0.33	+0.79	III	8H30 E	15H29 D
15/03/99	+0.79	+1.02	II	8H30 E	13H00
16/03/99	+0.03	+0.59	IV	9H45 E	15H29 D
17/03/99	+0.16	+0.54	IV	8H31 E	15H28 D
18/03/99	+0.26	-0.34	III	8H35 E	15H28 D
18/03/99	+0.48	+0.54	II	8H35 E	15H28 D
18/03/99	+1.07	+1.04	II	14H08	15H28 D
19/03/99	+0.76	+0.40	II	10H30 E	15H28 D
19/03/99	+1.12	+1.01	I	10H30 E	15H28 D
20/03/99	+1.43	+0.64	III	8H28 E	14H00

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

SOLAR RADIO NOISE STORM AT 327 MHZ
FROM NANCAY RADIOHELIOGRAPH
MARCH 1999

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
02/03/99	-0.08	+0.67	I	9H48 E	15H32 D
02/03/99	+0.17	+0.33	I	12H50	15H32 D
02/03/99	+0.82	+0.56	II	9H48 E	15H32 D
03/03/99	+0.43	+0.36	III	12H13 E	15H32 D
03/03/99	+0.14	+0.53	II	13H02	15H32 D
03/03/99	+0.20	+0.83	II	12H13 E	15H32 D
04/03/99	+0.67	+0.31	I	9H42 E	15H32 D
04/03/99	+1.26	+0.45	I	9H42 E	15H32 D
05/03/99	+0.90	+0.39	II	8H47 E	15H32 D
06/03/99	+1.02	+0.31	I	8H22 E	15H22 D
07/03/99	+1.13	+0.33	I	8H22 E	15H22 D
10/03/99	+0.59	-0.40	I	8H31 E	15H30 D
11/03/99	-0.57	+0.62	I	8H31 E	15H30 D
11/03/99	+0.76	-0.48	I	8H31 E	15H30 D
12/03/99	-0.37	+0.68	I	8H45 E	15H30 D
12/03/99	+0.90	-0.47	II	8H45 E	15H30 D
12/03/99	+1.22	-0.39	II	8H45 E	15H30 D
13/03/99	-0.22	+0.65	I	8H40 E	15H29 D
13/03/99	+1.01	-0.50	I	8H40 E	15H29 D
14/03/99	-0.37	+0.40	I	8H39 E	15H29 D
14/03/99	-0.34	+0.40	I	8H39 E	15H29 D
14/03/99	+0.02	+0.62	I	8H39 E	15H29 D
14/03/99	+1.07	-0.51	I	8H30 E	15H29 D
15/03/99	-0.14	+0.34	I	8H30 E	15H29 D
15/03/99	+0.20	+0.65	I	8H30 E	15H29 D
16/03/99	+0.05	+0.51	II	9H45 E	15H29 D
16/03/99	+0.39	+0.59	II	9H45 E	15H29 D
17/03/99	+0.22	+0.57	I	8H31 E	15H28 D
18/03/99	+0.22	-0.37	I	8H35 E	15H28 D
18/03/99	+0.53	+0.48	I	8H35 E	15H28 D
18/03/99	+1.16	+0.59	I	8H35 E	15H28 D
19/03/99	+0.78	+0.45	II	10H30 E	15H28 D
20/03/99	+0.95	+0.40	I	8H28 E	15H27 D
20/03/99	+1.24	+0.56	I	8H28 E	12H50

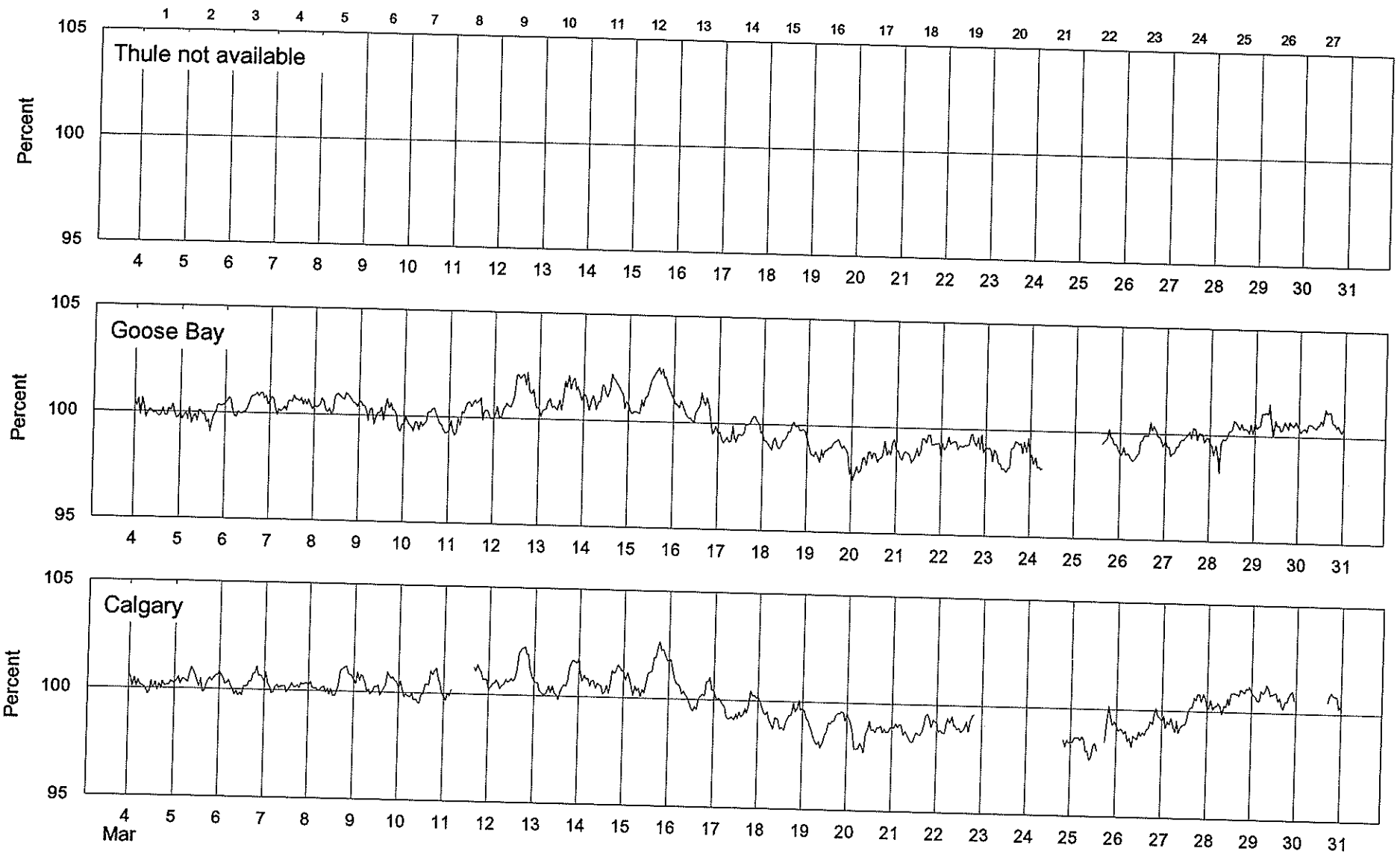
OTHERS DAYS: NO DETECTABLE NOISE STORM

COSMIC RAY INDICES
(Neutron Monitor)
MARCH 1999

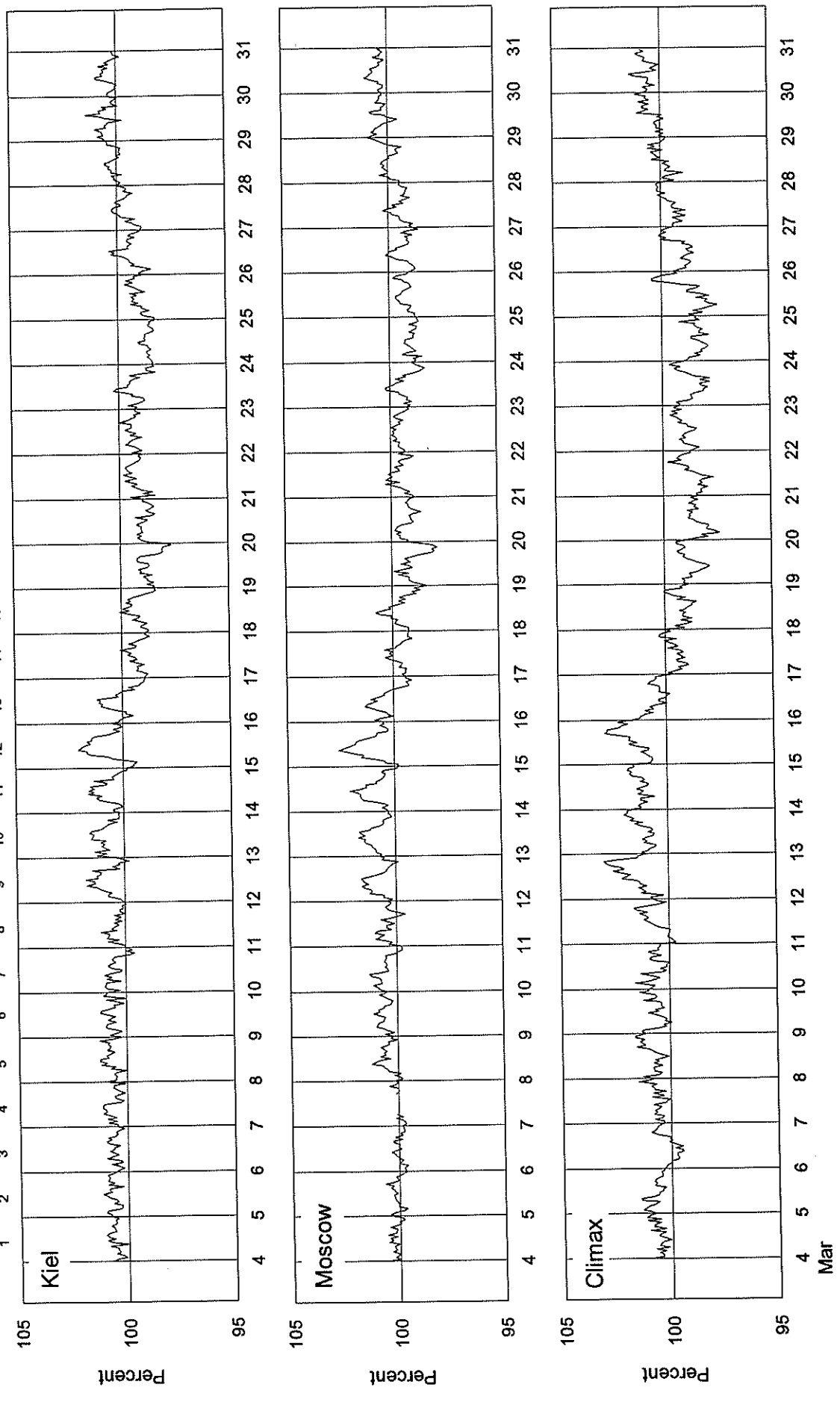
Day	THULE Average (cts/h)/100	GOOSE BAY Average (cts/h)/100	CALGARY Average (cts/h)/300	KIEL Average (cts/h)/100	MOSCOW Average (cts/h)/64	CLIMAX Average (cts/h)/100	BEIJING Average (cts/h)/256	HALEAKALA Average (cts/h)/1000
1	No data	7015.7 (3)	3852.8	6111.0	8994.1	4113.8	1978.5	3548.3
2	at time of	6969.1	3836.3	6061.4	8909.7	4079.1	1962.3	3531.1
3	publication	7008.0	3828.3	6078.2	8942.2	4078.2	1955.2	3534.6
4		6991.3	3827.2	6073.6	8896.4	4077.2	1948.7	3537.6
5		6979.0	3836.7	6081.1	8891.9	4082.8	1960.4 (7)	3539.7
6		7019.5	3833.0	6071.0	8873.7	4055.4	1958.9 (22)	3526.0
7		7021.0	3828.3	6074.6	8876.3 (14)	4076.4	1967.9	3539.6
8		7028.4	3833.5	6082.7	8920.9	4087.4	1965.0	3532.5
9		6998.5	3835.8	6076.8	8934.6	4078.1	1967.2	3542.9
10		6969.7	3828.8	6066.6	8929.4	4078.6	1974.5	3559.0
11		7000.3	3843.0 (13)	6059.2	8912.2	4075.5	1973.8	3556.9
12		7059.2	3858.7	6084.8	8951.1	4121.1	1973.4	3565.6
13		7058.3	3842.5	6091.0	8963.9	4099.3	1966.5	3554.2
14		7075.1	3852.7	6080.7	8961.1	4104.6	1967.2	3554.1
15		7085.5	3865.8	6083.3	8977.8	4116.5	1971.3	3558.2
16		7025.6	3837.7	6041.3	8908.5	4074.1	1957.8	3522.3
17		6962.5	3808.8	5993.0	8850.0	4034.5	1945.3	3505.6
18		6949.6	3796.7	5990.4	8848.7	4021.0	1947.1	3509.2
19		6907.9	3779.8	5954.2	8781.9	4005.7	1959.3	3505.4
20		6885.5	3768.8	5965.3	8814.5	3988.0	1979.6	3501.1
21		6918.5	3778.0	5992.0	8841.9	3995.9	1990.1	3485.9
22		6939.0	3785.7 (21)	5997.7	8845.6	4012.4	1992.3	3495.4
23		6910.8	(24)	5989.4	8816.2	3999.0	1987.9	3485.6 (48)
24		6881.9 (8)	3760.8 (4)	5952.2	8783.8	3985.8	1984.9	3497.4
25		6962.2 (9)	3768.7 (21)	5980.7	8812.2	3998.8	1988.2	3508.1
26		6952.0	3786.0	6000.3	8812.9	4018.2	1994.3	3511.8
27		6968.9	3814.7	6013.0	8825.8	4035.3	2001.8	3506.0
28		6985.3	3843.3	6043.1	8875.7	4048.9	2013.1	3520.1
29		7032.7	3850.3	6066.8	8911.7	4067.4	2021.2	3534.8
30		7030.4	3848.5 (7)	6058.1	8920.8	4078.8	2017.8	3536.4
31		7036.6 (15)	3849.3	6047.5	8911.3	4094.9	2017.8	3538.8
Mean		6988.0	3822.7	6040.7	8887.0	4057.4	1977.1	3527.7

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.

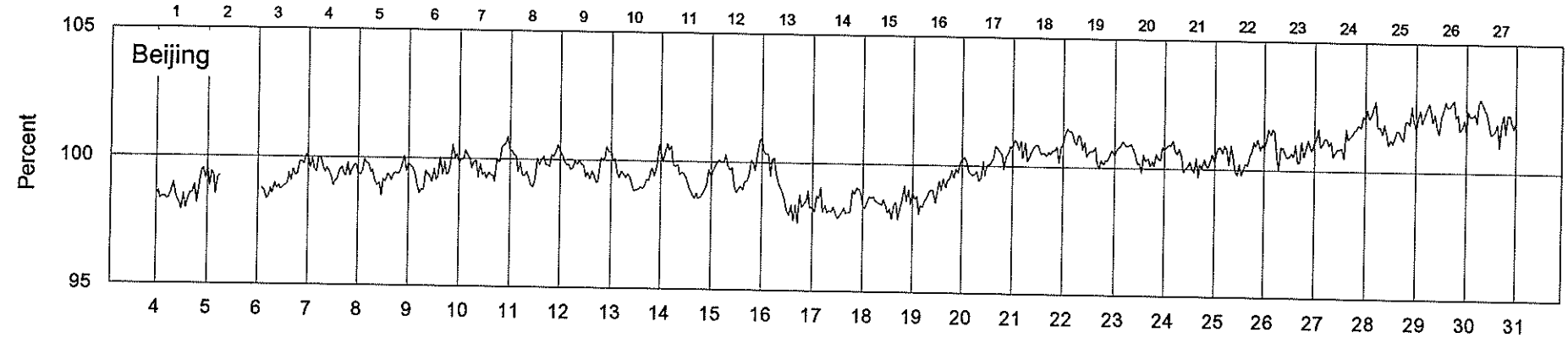
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2261 - Beginning 4 Mar 99

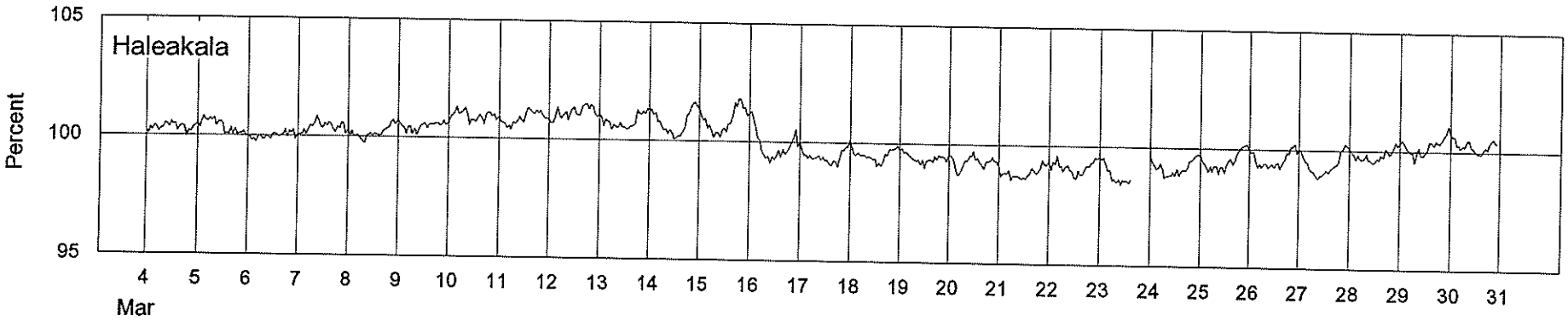


COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2261 - Beginning 4 Mar 99

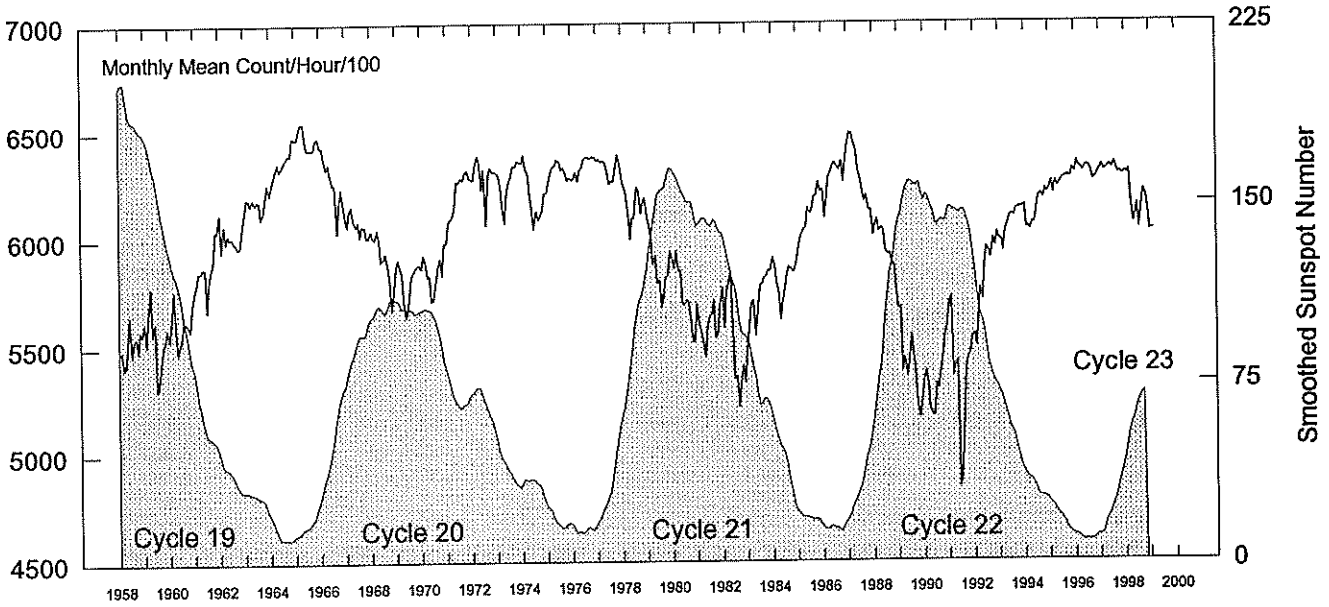


COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2261 - Beginning 4 Mar 99





Kiel Neutron Monitor Pressure-Corrected Values
Jan 1958 - Mar 1999



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	6312	6177	6069	6101	6154	6042	6149	6220	6190	6124	6178
1999	6034	6040	6041										6038

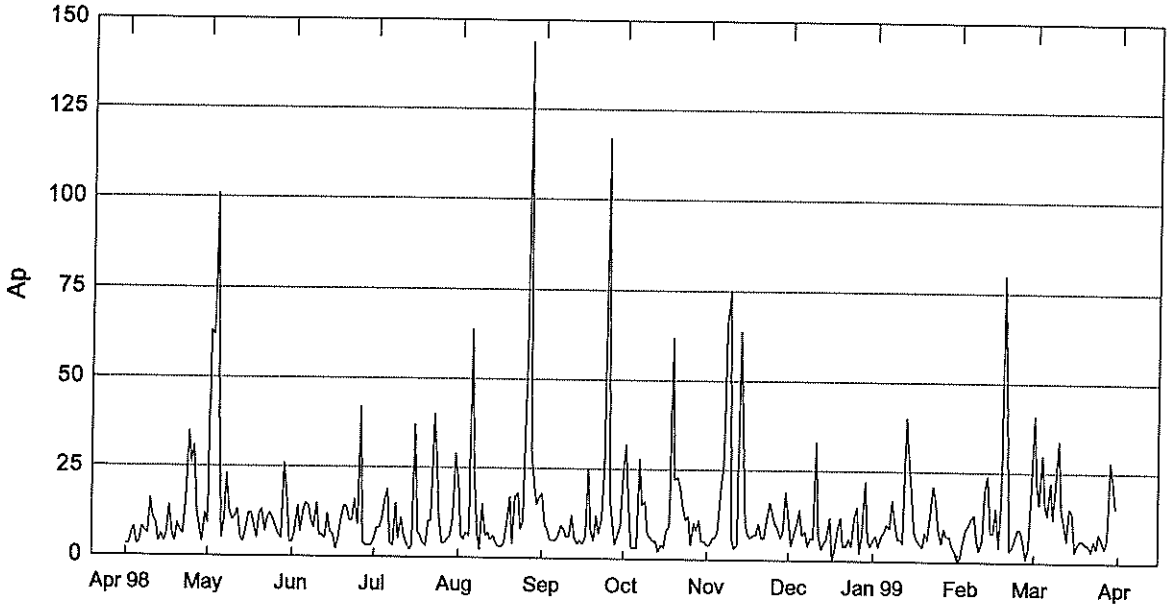
Multiply table entries by 100 to obtain hourly counting rate. Kiel, Germany: N54, E10, Alt= 54 m, Cutoff Rigidity= 2.32GV.

Geomagnetic Activity Indices
March 1999

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	D1	6-	5+	4-	3	5	5-	5	4+	37-	41	1.5	5o	4+	3+	3-	4+	4+	4+	4o	57	60	51	46	67	
2		6-	4	3	2-	3	3+	3-	3-	26	22	1.1	5-	3+	3o	2-	3-	3o	3-	2+	32	39	30	37	31	
3		2-	3-	2	3	2	4	5-	3+	23+	16	0.9	1+	2o	2o	3-	2+	4-	4+	3+	28	40	22	17	46	
4	D2	3	4-	5	4-	4	5	5-	4-	33-	30	1.3	2+	3o	4+	4-	4-	5-	4+	3+	49	61	54	39	76	
5		5-	3+	3+	3-	2	4-	2-	1-	22	16	0.9	4+	3-	4-	3o	2o	4-	2-	1o	29	29	22	31	20	
6		2+	3	1-	2	2	2+	3+	5-	20+	13	0.8	2-	2+	1-	2+	2-	2-	3+	4+	23	34	18	16	36	
7	D5	4-	4+	5-	4-	2	4-	3+	3-	28	22	1.1	3+	4o	4+	4-	2-	3+	3o	3o	39	36	29	35	31	
8		3-	4-	2-	2-	1+	2	2+	4+	20-	12	0.7	3-	3o	2-	1+	1o	2-	3-	4-	20	22	15	16	21	
9		4-	4	4	3+	4+	3+	3+	2-	28-	21	1.1	3o	3+	3+	4-	4+	3o	3+	2o	37	36	40	37	39	
10	D3	5	6+	5-	5	2+	3-	3-	2+	31	34	1.3	4o	5-	4+	5-	2+	2+	3-	2o	45	52	37	69	20	
11		3+	3+	3+	3	4-	3	2	2-	23+	15	0.8	3-	3-	3+	3-	3+	3o	2+	2-	26	28	23	28	23	
12		1+	2+	2+	3	3-	2+	3+	3-	20	11	0.6	1+	3-	2+	3+	3-	2+	3+	3-	24	19	22	19	22	
13		1+	0	0	2-	3+	1+	1+	2+	11+	6	0.3	1+	0o	0o	2-	3+	1+	2-	2+	13	15	11	7	20	K
14		3	3-	1+	3-	4	3	3	4-	23+	15	0.9	3-	2-	1+	3o	4o	3-	3o	3+	26	31	21	14	38	
15		4-	4+	4-	3-	2+	2-	1	2-	21	14	0.8	3o	4-	3+	3-	3-	2o	1o	2-	25	27	21	36	12	
16	Q2	0+	0+	1+	1+	1-	1	0+	1	6+	3	0.1	0+	0+	1o	1+	1-	1o	0+	1-	5	7	5	6	6	CC
17	Q7	1	0	1-	1+	1+	3-	2-	1-	9+	5	0.2	1-	0+	1o	1+	1o	3-	2o	1+	9	13	8	8	13	CC
18		1	2-	2	2	2-	2+	2	0+	13	6	0.3	1o	2-	2-	2+	1+	2o	2o	1-	12	14	11	12	14	CC
19		1-	1	2-	1+	2	2	3	1	13-	6	0.3	1-	0+	1+	1+	2o	2-	3o	1+	11	16	12	7	21	K
20	Q5	1+	1	1	1+	1+	2-	2	0+	10	5	0.2	1o	1o	1-	2-	2-	1+	2o	0o	8	8	12	10	10	CK
21	Q6	0+	1	1	2	3-	1	1	0	9	5	0.2	0+	1-	1o	2o	3-	1+	2-	0o	9	10	9	8	12	CC
22	Q1	0+	0	0	0+	2-	1+	1	0+	5	3	0.0	0+	0o	0o	0o	1o	1+	1+	1-	4	8	5	3	10	CC
23	Q8	1-	1-	1-	2-	2	2	2-	2+	12-	6	0.2	1-	1-	1-	2-	2o	2-	2-	2+	10	14	11	9	17	CC
24	Q3	0+	1	1	2	1	1-	0+	0+	7-	4	0.1	0+	1+	1o	2o	1o	1-	0+	1-	6	10	7	11	6	CC
25		0+	0	0+	2-	1	3+	3+	3-	13-	8	0.4	0o	0o	0+	2-	1+	3-	3+	3-	14	19	13	6	25	K
26	Q10	1	2	2	3-	2+	1	0+	0+	12-	6	0.3	1o	2-	2+	3-	2+	1+	0o	0+	12	9	17	15	11	K
27	Q4	1-	2-	1+	0+	1-	0+	1-	2+	8	4	0.1	0+	1+	1+	0o	1-	0o	0+	2o	6	11	5	8	9	CC
28	Q9	2-	2-	2+	2-	2-	1+	1+	1	13-	6	0.3	1+	1+	3-	2-	2-	1+	1o	1o	11	13	11	14	10	C
29	D4	3+	3	4+	4-	6-	4-	4	4-	31+	28	1.2	3o	3-	4+	3o	5o	3+	4-	3+	47	55	37	34	57	
30		4	3-	4	4-	3+	4	4-	3+	29-	22	1.1	3+	2+	4o	4o	4-	3+	4-	3+	42	36	46	44	39	
31		4-	3-	2+	2	3	3-	3-	4+	23+	15	0.9	3o	2+	2+	2+	3o	2+	3o	4+	28	33	22	18	37	
Mean											14	0.65									22.8	26.1	20.9		23.5	

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	5-	4+	3o	3-	4+	5-	4+	4o	58	5o	5-	3+	3-	4+	4o	4o	4o	57	118.0	77	74	65	
2	5-	4-	3o	2-	3o	3+	2+	2+	34	5-	3o	3o	1+	3-	3-	3-	2+	30	127.6	88	99	76	
3	1+	2+	2+	3o	2+	4-	4o	3o	28	1+	2o	1+	3-	2o	4-	4+	3+	28	134.6	102	101	83	
4	2+	3-	5-	4-	4-	5-	4+	3o	48	3-	3+	4o	4-	3+	5-	5-	4-	50	141.6	96	101	91	
5	4o	3o	4o	3+	2o	4-	1+	1o	32	4+	3-	3o	2+	2o	3+	2o	1+	26	125.4	99	92	73	
6	2o	2+	1o	3-	2o	2-	4-	4o	24	1+	2+	0+	2+	1+	2o	3+	5-	23	112.6	79	65	60	
7	3o	4o	5-	4-	2o	4-	3o	3o	40	3+	4o	4+	4-	1+	3o	3o	3o	38	108.3	43	44	55	
8	2+	3o	2o	2-	1+	2o	2o	3+	19	3-	3o	1+	1+	1o	2-	3-	4+	22	125.0	41	49	73	
9	3o	4-	3+	4o	4+	3o	4-	2-	39	3o	3o	3o	3+	5-	3o	3o	2+	35	125.3	63	66	73	
10	4+	5o	5-	5-	2+	2+	2+	2o	48	4-	4+	4o	5-	2o	2o	3o	2+	42	133.6	61	64	82	
11	3-	3o	4-	3-	4-	3o	2+	2-	29	3-	3-	3o	3-	3o	3o	2o	2-	25	135.3	76	67	84	
12	1o	2+	3-	4-	3o	3-	3o	3-	25	1+	3-	2+	3+	2+	2o	3+	3-	24	138.5	87	73	88	
13	1+	0o	0o	2-	3+	1+	2-	2+	12	1+	0o	0+	2-	3+	1+	2-	2+	13	142.7	76	84	92	
14	3-	2o	1+	3o	4+	3o	3o	4-	30	3-	1+	1+	3o	3+	3-	3-	3o	23	148.7	94	86	99	
15	3o	4-	3+	3-	3o	2o	1o	2-	25	3o	4-	3+	3-	3-	2-	1+	2-	24	148.4	91	79	98	
16	0o	0o	1+	2-	1-	1+	0+	1-	5	1-	1-	1-	1+	0+	1-	0+	0+	4	154.1	97	97	104	
17	1-	0o	1o	2-	1+	3o	2o	1+	10	1o	1-	1o	1+	1-	2+	2-	1o	9	152.9	99	99	103	
18	1o	2-	2-	3-	2-	2+	2o	0+	13	1+	2-	2-	2o	1+	2-	2-	1-	11	146.7	96	91	96	
19	1-	0+	2-	1+	2+	2o	3o	1+	13	1o	0+	1+	1+	2-	2-	3-	1+	11	138.1	101	91	87	
20	1o	1-	1-	2-	2o	2-	2o	0+	9	1o	1+	1-	1+	1+	1+	2-	0o	7	131.6	88	76	80	
21	0+	0+	1o	2+	3-	2-	2-	0o	10	0+	1o	1o	1+	2+	1-	1+	0o	7	123.1	71	80	71	
22	0+	0o	0o	0o	2-	2-	1+	1o	5	0+	0o	0o	0o	1-	1o	1o	0+	3	115.0	61	37	62	
23	1o	0+	1-	1+	2o	2+	2-	2+	10	0+	1-	0+	2-	2-	1o	2-	2+	9	112.2	28	32	59	
24	0+	1-	1o	2o	1+	1+	0+	1-	7	0+	2o	1o	2o	0+	0o	0o	0+	6	107.6	41	37	54	
25	0o	0o	0+	2-	1+	3o	4-	3-	16	0o	0o	1-	2o	1o	2+	3o	2+	12	106.4	37	34	53	
26	1o	1+	2+	3o	2+	2-	0o	0o	13	1o	2o	2o	2+	2+	1o	0o	1-	11	103.1	29	29	49	
27	0+	1+	1+	0+	1o	0+	0+	2+	7	1-	1o	1o	0o	0+	0o	1-	2-	5	104.1	27	25	50	
28	2-	2-	2+	2o	2o	2-	1+	1+	13	1o	1o	3-	1+	1+	1o	1o	1-	9	102.7	37	37	49	
29	3o	2+	4+	3o	5+	4-	4-	3+	47	3-	3o	4+	3+	5o	3o	4-	4-	46	103.8	51	53	50	
30	3+	2+	4+	4o	4-	3+	4-	3o	41	3o	2+	4o	4+	4-	3+	4-	3+	42	104.4	55	52	51	
31	3o	3-	3-	2+	3o	2+	3-	4o	28	3o	2+	2o	2+	3-	2o	3o	5-	29	101.7	51	51	48	
Mean									23.8									22.0	124.9	69.1	66.6	72.9	

Daily Average Indices Ap
Apr 1998 - Mar 1999

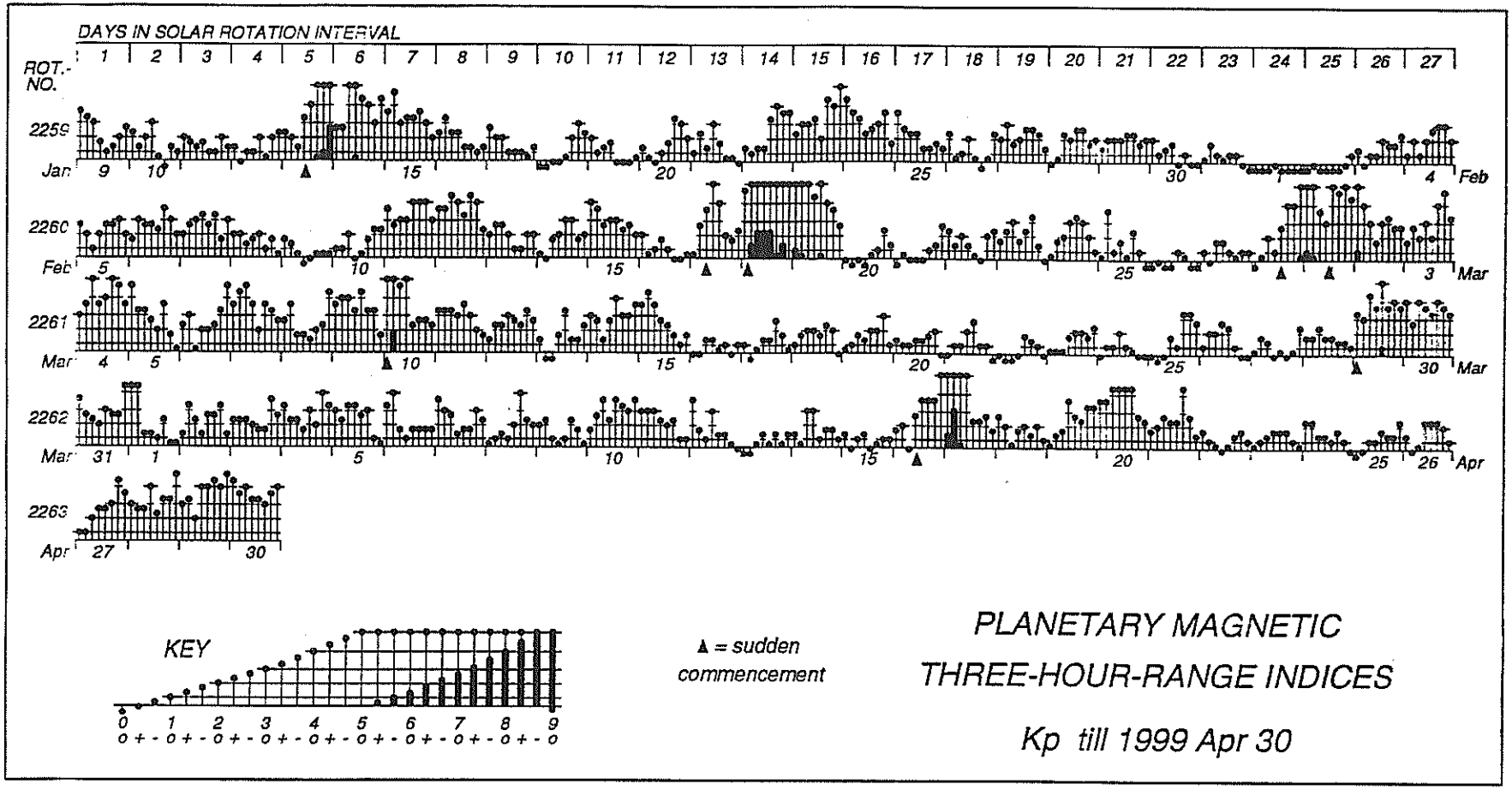


Day	Apr 98	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb	Mar
1	3	9	4	5	21	18	24	4	11	6	0	41
2	3	63	7	8	6	9	32	4	4	7	1	22
3	6	62	14	8	5	8	14	6	7	4	5	16
4	8	101	7	10	7	5	3	6	10	7	9	30
5	3	42	12	16	6	5	3	8	14	8	10	16
6	4	5	15	19	64	5	3	20	7	10	12	13
7	8	10	14	4	24	6	28	26	8	9	13	22
8	7	23	10	3	7	9	15	66	4	17	6	12
9	6	13	8	15	2	8	16	75	6	11	3	21
10	16	10	15	5	15	6	7	6	6	6	6	34
11	11	11	6	11	6	6	6	3	33	6	20	15
12	9	13	6	6	7	12	5	4	7	5	24	11
13	4	5	5	4	5	6	5	64	3	40	8	6
14	6	4	12	2	6	4	2	41	5	29	8	15
15	4	7	7	3	4	5	4	10	6	20	15	14
16	6	12	6	37	3	4	3	7	12	8	4	3
17	14	12	2	7	3	6	8	6	0	6	17	5
18	6	9	5	6	4	25	9	7	3	5	80	6
19	4	5	11	4	9	8	62	7	9	4	40	6
20	9	12	14	3	17	5	22	10	12	8	3	5
21	7	13	14	10	4	12	23	6	4	6	4	5
22	6	7	10	10	17	7	20	6	4	14	6	3
23	15	11	10	40	18	11	15	11	6	21	9	6
24	35	12	16	28	8	28	11	16	4	17	9	4
25	26	10	9	11	10	117	12	13	12	9	6	8
26	31	8	42	4	49	17	4	10	15	5	1	6
27	12	6	4	4	144	10	10	9	2	9	4	4
28	8	5	3	5	30	4	8	6	7	7	17	6
29	4	26	3	6	20	7	11	8	22	7		28
30	12	18	3	11	15	9	5	19	6	4		22
31		4	4	29	17		5		4	3		15
Mean	10	18	10	11	18	13	13	16	8	10	12	14

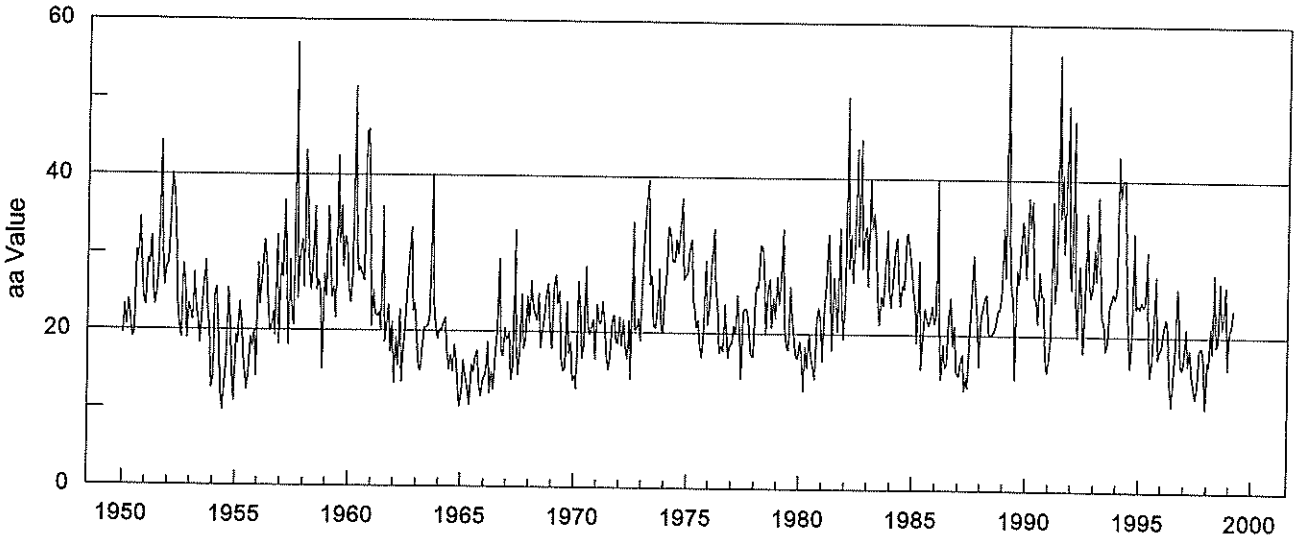
PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

GeoForschungsZentraum Potsdam

Kp through March 31, 1999



Monthly Mean aa Index Jan 1950 - Mar 1999

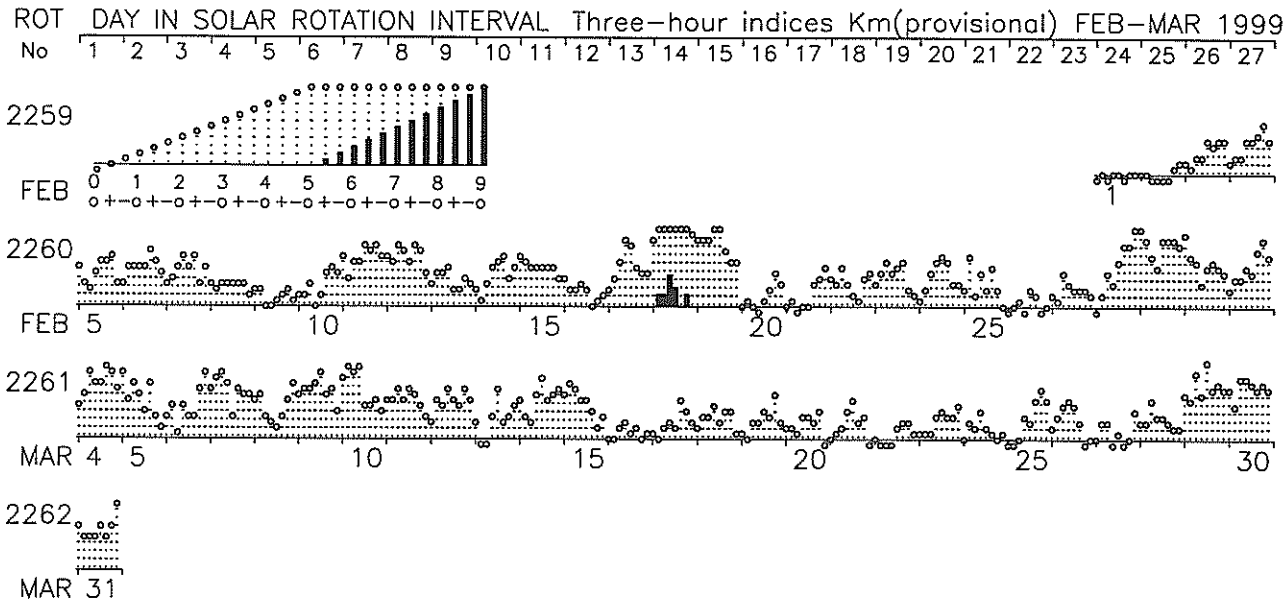


Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4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

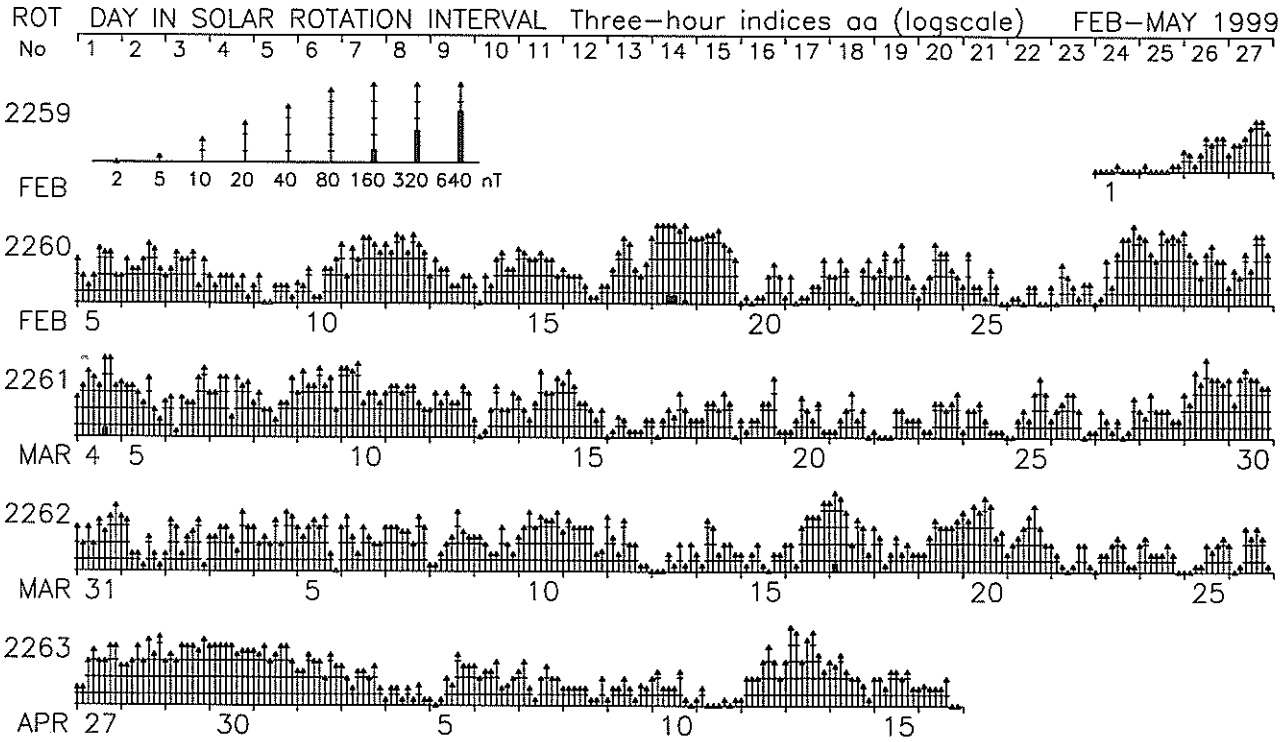
PLANETARY GEOMAGNETIC ACTIVITY

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

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



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



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

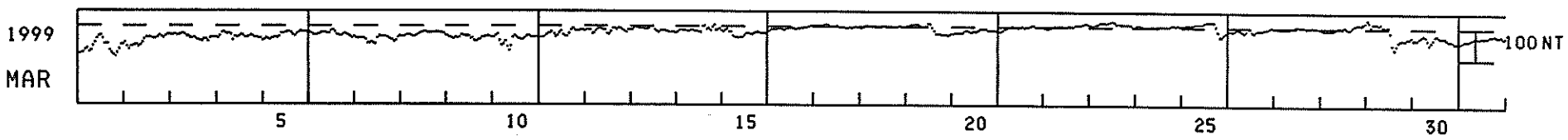
WDC-C2 FOR GEOMAGNETISM, KYOTO UNIVERSITY

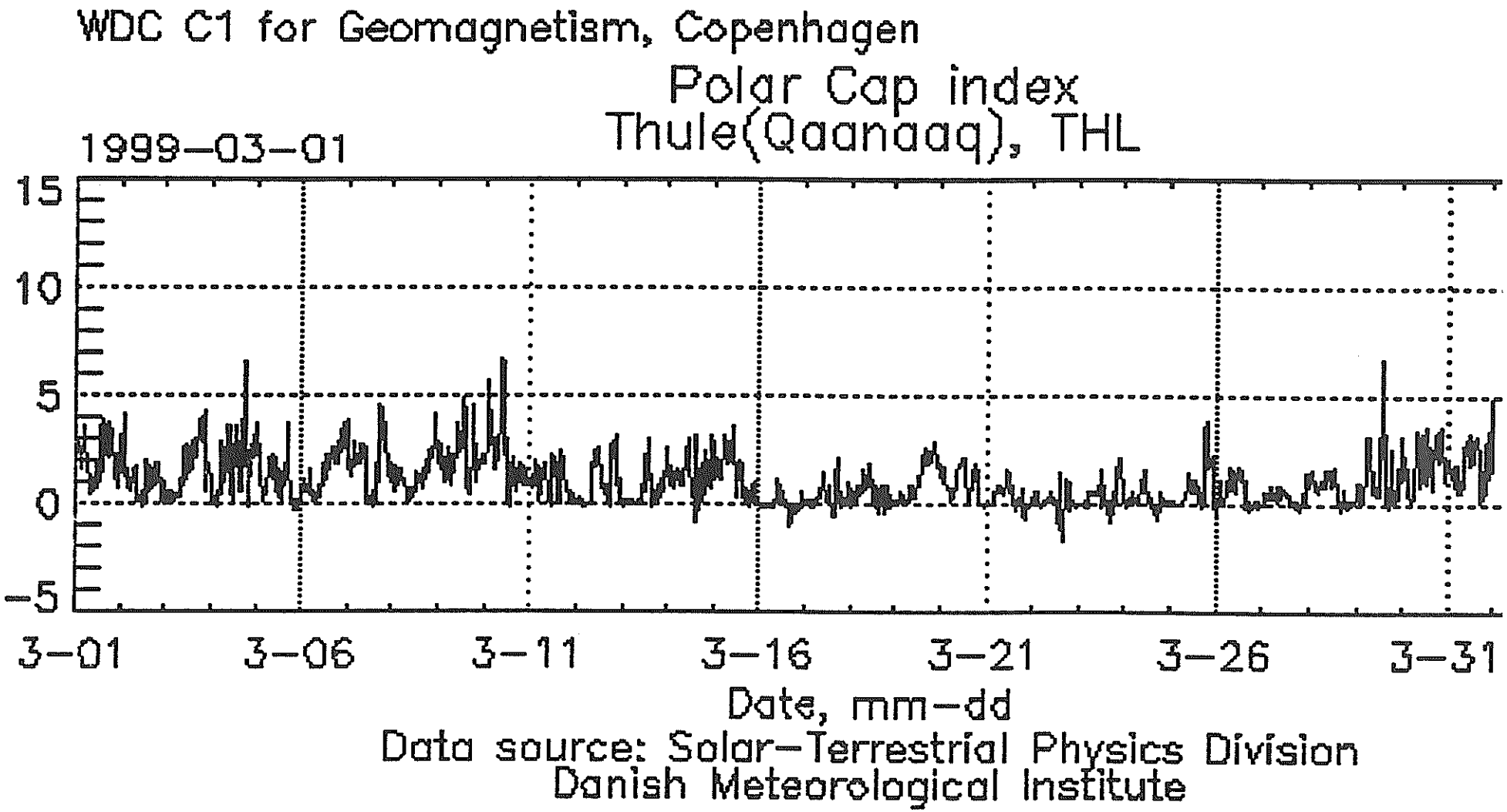
HOURLY EQUATORIAL DST VALUES(PROVISIONAL)

MARCH 1999

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-87	-85	-83	-76	-72	-82	-77	-62	-51	-39	-31	-28	-39	-55	-55	-56	-78	-85	-91	-97	-85	-74	-59	-59
2	-52	-64	-74	-64	-62	-60	-58	-64	-60	-52	-41	-35	-34	-34	-37	-40	-39	-34	-28	-32	-37	-30	-27	-27
3	-26	-26	-24	-28	-26	-24	-23	-26	-32	-31	-37	-38	-36	-42	-44	-45	-48	-42	-42	-47	-37	-35	-35	-35
4	-38	-30	-21	-18	-23	-25	-22	-27	-44	-32	-36	-32	-26	-28	-35	-34	-33	-29	-30	-36	-35	-37	-38	-45
5	-44	-37	-39	-44	-39	-37	-35	-37	-33	-23	-23	-20	-17	-17	-19	-27	-30	-24	-19	-15	-17	-17	-18	-20
6	-21	-23	-26	-29	-27	-25	-21	-19	-21	-23	-22	-13	-12	-17	-26	-28	-30	-26	-22	-26	-28	-32	-37	-32
7	-37	-40	-38	-38	-37	-43	-54	-54	-50	-54	-55	-37	-31	-32	-32	-33	-35	-39	-42	-44	-50	-45	-34	-31
8	-32	-32	-29	-26	-27	-31	-33	-30	-27	-23	-20	-17	-16	-19	-21	-20	-20	-19	-17	-17	-21	-21	-22	-28
9	-31	-35	-38	-39	-36	-38	-34	-27	-28	-30	-31	-30	-39	-38	-45	-48	-43	-41	-36	-33	-33	-30	-32	-34
10	-35	-29	-25	-46	-60	-56	-48	-65	-78	-62	-35	-28	-35	-39	-42	-41	-38	-30	-28	-33	-35	-34	-33	-33
11	-34	-35	-32	-27	-23	-19	-16	-25	-33	-29	-19	-13	-27	-30	-30	-23	-12	-6	-11	-13	-14	-11	-10	-13
12	-10	-10	-9	-22	-20	-13	-7	-6	-8	-10	-10	-22	-25	-16	-6	-6	-9	-4	-5	-9	-13	-17	-9	-9
13	-9	-5	-1	-4	-5	-5	-5	-7	-8	-5	0	0	-9	-13	-17	-12	-11	-11	-13	-16	-17	-16	-16	-19
14	-16	-11	-10	-12	-12	-14	-13	-10	-11	-13	-14	-15	-17	1	3	-7	-6	-12	-1	5	-10	-9	-5	-11
15	-15	-10	-8	-16	-16	-29	-33	-33	-36	-33	-32	-27	-19	-20	-23	-25	-21	-18	-16	-17	-19	-20	-20	-18
16	-14	-10	-7	-7	-8	-6	-6	-8	-9	-5	-4	-4	-4	-6	-7	-6	-6	-4	-3	-1	-1	1	3	3
17	3	4	5	4	6	8	7	5	2	2	2	3	1	-1	-2	-1	-3	-3	-2	-3	-2	0	-1	-2
18	-3	-1	4	4	4	2	4	0	-1	-1	-2	3	4	2	0	0	0	-2	0	2	3	2	1	1
19	3	6	7	7	8	9	8	4	1	0	4	11	9	-1	-12	-20	-23	-22	-24	-24	-24	-27	-25	-21
20	-19	-18	-18	-18	-18	-17	-12	-10	-11	-15	-14	-14	-14	-10	-5	-5	-5	-6	-10	-10	-9	-10	-12	-12
21	-13	-13	-10	-6	-3	2	2	3	1	2	-1	0	3	-1	0	2	3	5	6	1	1	2	1	0
22	-2	-3	-3	-1	2	4	4	4	3	4	2	1	3	4	3	3	8	8	8	8	9	11	11	10
23	7	5	7	10	12	16	16	15	14	16	17	21	18	11	11	11	9	9	9	10	9	7	2	4
24	7	7	5	4	2	2	2	3	3	2	4	4	4	4	3	4	3	4	7	7	5	7	6	6
25	6	7	8	7	7	10	12	12	12	12	12	15	17	17	18	19	19	6	-11	-29	-29	-23	-16	-12
26	-10	-10	-11	-8	-4	-5	-7	-11	-15	-9	1	-1	-12	-15	-9	-7	-8	-7	-6	-3	-3	1	3	2
27	0	-2	-2	-3	-2	-4	-4	-3	0	2	3	5	5	4	3	3	1	0	2	4	2	2	1	-2
28	-3	-6	-7	-6	-5	-5	-5	-4	0	3	2	2	5	0	-4	-1	6	9	11	13	12	12	16	21
29	28	20	8	16	16	15	12	16	7	6	5	8	-11	-51	-66	-54	-42	-38	-36	-38	-35	-31	-30	-26
30	-35	-34	-35	-28	-24	-21	-24	-35	-50	-42	-33	-23	-19	-26	-29	-29	-29	-33	-37	-37	-39	-45	-46	-44
31	-46	-42	-38	-37	-38	-36	-30	-29	-26	-29	-28	-27	-28	-27	-27	-22	-23	-21	-20	-24	-24	-22	-29	-27




WDC C1 for Geomagnetism, Copenhagen
Polar Cap index
Thule(Qaanaaq), THL
1999-03-01
15
10
5
0
-5
3-01
3-06
3-11
3-16
3-21
3-26
3-31
Date, mm-dd
Data source: Solar-Terrestrial Physics Division
Danish Meteorological Institute

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

MARCH 1999

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)	Ranges K	D (Min)	H (Gamma)	Z (Gamma)	End Day	Hour (UT)
HER	33.6S	01	09--	..	..	..	..	01(7,8)	5	24	124	114	02	08
KRC	16.4N	03	1026	..	..	..	..	04(6)	6	5	105	51	05	07
UJJ	13.6N	03	1000	..	..	..	..		-	3	88	21	05	18
NGP	11.3N	03	1000	..	..	..	..		-	3	112	22	05	18
ABG	09.4N	03	1000	..	..	..	..	03(6) 04(6,7)	5	3	111	29	05	18
HYB	07.6N	03	0900	..	..	..	..	03(6) 04(3,4)	5	3	105	25	05	20
PND	02.0N	03	1000	..	..	..	..		-	3	118	78	05	18
ETT	00.7S	03	0100	..	..	..	..		-	--	182	77	05	20
TRD	01.1S	03	1000	..	..	..	..		-	3	196	102	05	18
HER	33.6S	03	17--	..	..	..	..	03(7)	5	13	64	72	04	01
HER	33.6S	04	05--	..	..	..	..	04(6,7)	5	31	100	91	05	19
HER	33.6S	06	17--	..	..	..	..	06(8)	5	18	61	55	07	11
KRC	16.4N	09	0357	..	..	..	..	10(2,3,4)	5	5	77	42	10	22
BJI	28.8N	10	0129	SC	16	6	0	10(3)	6	102	101	30	10	24
UJJ	13.6N	10	0100	..	..	..	..		-	5	99	28	11	22
NGP	11.3N	10	0100	..	..	..	..		-	5	117	26	11	22
ABG	09.4N	10	0100	..	..	..	..	10(2,3,4) 11(3) 14(5)	5	5	107	36	11	22
HYB	07.6N	10	0130	SC	- 0.2	9	- 1	10(3,4)	5	3	69	12	10	23
PND	02.0N	10	0100	..	..	..	..		-	4	128	45	11	22
ETT	00.7S	10	0131	SC	0	10	8		-	--	192	57	11	22
TRD	01.1S	10	0100	..	..	..	..		-	4	205	95	11	22
HYB	07.6N	11	0230	..	..	..	..	11(2,3,5,6) 12(2,4,5,7,8)	4	5	118	37	12	23
ETT	00.7S	12	0100	..	..	..	..		-	--	190	45	13	20
KRC	16.4N	25	0258	..	..	..	..	25(6)	5	5	98	45	26	16
HYB	07.6N	28	2200	..	..	..	..	29(5,6)	6	4	223	31	30	22
ETT	00.7S	28	0500	..	..	..	..		-	--	305	75	30	23
BJI	28.8N	29	01--	..	..	..	..	29(5)	6	11	142	32	29	24
KRC	16.4N	29	0156	..	..	..	..	29(5)	7	7	186	57	31	06
UJJ	13.6N	29	0000	..	..	..	..		-	5	179	37	30	22
NGP	11.3N	29	0000	..	..	..	..		-	4	214	39	30	22
ABG	09.4N	29	0000	..	..	..	..	29(5)	7	4	209	43	30	22
PND	02.0N	29	0000	..	..	..	..		-	3	237	78	30	22
TRD	01.1S	29	0000	..	..	..	..		-	2	317	118	30	22

Stations:

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

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

MARCH 1999

Storm Sudden Commencements (SSC)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
10	0130	A: WNG NAG COI BJI	12	0258-0314	NAG (ssc. BJI, si: HRB)
		B: DOU HRB GCK* EBR	14	0122-0150	MMB+
		C: NGK* BDV* MMB* SPT KAK* KNY* QUE	17	0951-1003	BDV+
		HYB ETT	18	0830-0845	HYB
29	0152	A: COI*	19	0741-0803	NAG
		B: WNG DOU			
		C: NGK BDV GCK*			

REPORTING OBSERVATORIES (up to the 4th of May 1999):
SOD NUR WNG NGK VAL DOU BDV CLF HRB NAG GCK MMB EBR COI BJI SPT KAK KNY QUE HYB ETT GNA HER CNB

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

☆U.S. GOVERNMENT PRINTING OFFICE:1999-773-002/29026

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."