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Part I (Prompt Reports)

NO. 514 JUNE 1987

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MAY 1987
APRIL 1987

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NATIONAL GEOPHYSICAL DATA CENTER
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NUMBER 514

(Issued in Two Parts)

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INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages MAY 1987

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat °Long	Flares Total	M	X	Date of Forecast	Location °Lat °Long	Region Forecast[1]	Geoalerts
121	01	30	043	076	004	N03 W45	1	0	0	01	N03 W45	Q	Solquiet, Magquiet.
						S28 W25	0	0	0		S28 W25	Q	
						S23 E73	0	0	0		S23 E73	Q	
122	02	01	041	078	008	N03 W58	4	0	0	02	N03 W58	E	Solquiet, Magquiet.
						S28 W38	1	0	0		S28 W38	Q	
						S23 E61	0	0	0		S23 E61	Q	
123	03	02	052	080	010	N03 W73	0	0	0	03	N03 W73	Q	Solquiet, Magquiet.
						S28 W51	0	0	0		S28 W51	Q	
						S23 E49	0	0	0		S23 E49	Q	
						N05 E18	0	0	0		N05 E18	Q	
124	04	03	060	083	010	N03 W86	0	0	0	04	N03 W86	Q	Solquiet, Magquiet.
						N34 W43	0	0	0		N34 W43	Q	
						S27 W65	0	0	0		S27 W65	Q	
						S23 E36	0	0	0		S23 E36	Q	
						N06 E03	0	0	0		N06 E03	Q	
125	05	04	037	083	008	S30 W78	0	0	0	05	S30 W78	Q	Solquiet, Magquiet.
						S23 E23	0	0	0		S23 E23	Q	
						S32 E79	0	0	0		S32 E79	Q	
126	06	05	025	085	008	S23 E09	0	0	0	06	S23 E09	Q	Solquiet, Magquiet.
						S32 E65	2	0	0		S32 E65	Q	
127	07	06	028	086	007	S23 W03	0	0	0	07	S23 W03	Q	Solquiet, Magquiet.
						S32 E54	3	0	0		S32 E54	Q	
128	08	07	035	087	010	S23 W17	0	0	0	08	S23 W17	Q	Solquiet, Magquiet.
						S32 E41	2	0	0		S32 E41	Q	
129	09	08	033	087	007	S22 W29	0	0	0	09	S22 W29	Q	Solquiet, Magquiet.
						S31 E27	2	0	0		S31 E27	Q	
130	10	09	036	086	006	S31 E14	0	0	0	10	S31 E14	Q	Solquiet, Magquiet.
						S06 E04	0	0	0		S06 E04	Q	
131	11	10	049	088	009	S22 W53	0	0	0	11	S22 W53	Q	Solquiet, Magquiet.
						S31 E03	0	0	0		S31 E03	Q	
						S20 E38	0	0	0		S20 E38	Q	
132	12	11	032	085	006	S31 W09	2	0	0	12	S31 W09	Q	Solquiet, Magquiet.
						S21 E26	0	0	0		S21 E26	Q	
133	13	12	039	084	003	S31 W20	0	0	0	13	S31 W20	Q	Solquiet, Magquiet.
						S23 E13	0	0	0		S23 E13	Q	
						N27 W22	0	0	0		N27 W22	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages **MAY 1987**

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat °Long	Flares Total	M	X	Date of Forecast	Location °Lat °Long	Region Forecast[1]	Geoalerts
134	14	13	023	086	007	S31 W31	0	0	0	14	S31 W31	Q	Solquiet, Magquiet.
						N28 W34	0	0	0		N28 W34	Q	
135	15	14	034	089	010	S30 W43	0	0	0	15	S30 W43	Q	Solquiet, Magquiet.
						S25 E82	0	0	0		S25 E82	Q	
						N27 E84	0	0	0		N27 E84	Q	
136	16	15	041	092	005	S31 W56	0	0	0	16	S31 W56	Q	Solquiet, Magquiet.
						S25 E64	0	0	0		S25 E64	Q	
						N29 E72	0	0	0		N29 E72	E	
137	17	16	065	096	005	S31 W69	0	0	0	17	S31 W69	Q	Solquiet, Magquiet.
						S20 W37	4	0	0		S20 W37	Q	
						S24 E52	3	0	0		S24 E52	Q	
						N29 E59	10	0	0		N29 E59	E	
138	18	17	067	095	005	S31 W82	0	0	0	18	S31 W82	Q	Solquiet, Magquiet.
						S20 W50	3	0	0		S20 W50	E	
						S24 E42	0	0	0		S24 E42	Q	
						N31 E47	3	0	0		N31 E47	E	
139	19	18	057	096	003	S19 W64	0	0	0	19	S19 W64	Q	Solquiet, Magquiet.
						S24 E28	0	0	0		S24 E28	Q	
						N30 E35	2	0	0		N30 E35	E	
140	20	19	068	098	004	S19 W79	5	0	0	20	S19 W79	Q	Solquiet, Magquiet.
						S24 E16	0	0	0		S24 E16	Q	
						N30 E22	5	0	0		N30 E22	E	
141	21	20	049	098	005	S24 E03	0	0	0	21	S24 E03	Q	Solquiet, Magquiet.
						N30 E09	5	0	0		N30 E09	E	
142	22	21	056	098	006	S23 W12	0	0	0	22	S23 W12	Q	Solquiet, Magquiet.
						N30 W03	7	0	0		N30 W03	E	

Presto: Sydney 21/0350 UT Culgoora Importance three Type II sweep IP 21/0345 UT.
Also Type IV present. Importance one bright flare region 4811 N23 E03.

143	23	22	040	098	007	N30 W16	4	0	0	23	N30 W16	E	Solquiet, Magquiet.
144	24	23	044	093	008	N30 W30	3	0	0	24	N30 W30	E	Solquiet, Magquiet.
145	25	24	038	096	013	N29 W41	11	1	0	25	N29 W41	E	Solquiet, Magquiet.
146	26	25	043	094	024	N29 W54	12	1	0	26	N29 W54	E	Solalert 26/27,
						N24 E32	1	0	0		N24 E32	Q	Magquiet.

Presto: Boulder Importance two bright flare 25/0340 UT fading by 25/0350 UT.
Tenflare 130 flux units 25/2257 UT. Duration 2 minutes.
Tenflare 180 flux units 25/2304 UT. Duration 9 minutes.

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages MAY 1987

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat °Long	Flares Total	Flares M	Flares X	Date of Forecast	Location °Lat °Long	Region Forecast[1]	Geoalerts
147	27	26	034	090	008	N28 W68	7	0	0	27	N28 W68	E	Solalert 27/28,
						N23 E19	0	0	0		N23 E19	Q	Magquiet.
148	28	27	036	085	012	N28 W83	7	0	0	28	N28 W83	Q	Solalert 28/28,
						N23 E06	0	0	0		N23 E06	Q	Magquiet.
149	29	28	032	083	012	N27 W99	1	0	0	29	N27 W99	Q	Solnil, Magquiet.
						N23 W08	0	0	0		N23 W08	Q	
150	30	29	016	077	025	N23 W21	0	0	0	30	N23 W21	Q	Solquiet, Magquiet.
151	31	30	016	076	010	N23 W32	0	0	0	31	N23 W32	Q	Solquiet, Magquiet.
152	01	31	012	075	013	N22 W44	0	0	0	01	N22 W44	Q	Solquiet, Magquiet.

[1]Q = quiet, E = eruptive, A = active, P = proton.
[2]Presto message is a rapid report of a major event.

INTERNATIONAL RELATIVE SUNSPOT NUMBERS

Day	Final Jun 86	Jul	Aug	Sep	Oct	Nov	Dec	Final Jan 87	Feb	Mar	Apr	Prov May
01	7	0	12	9	12	44	0	19	0	13	14	35
02	0	0	11	9	14	35	0	15	0	23	12	40
03	0	11	11	8	23	37	0	13	0	15	10	22
04	0	14	11	8	24	37	0	12	0	16	13	23
05	0	18	11	0	24	35	0	11	0	24	28	22
06	0	29	10	11	22	31	0	10	0	23	47	27
07	0	29	8	13	27	24	0	11	0	24	56	29
08	9	29	9	12	20	15	0	0	0	22	64	25
09	0	17	8	10	32	10	12	0	0	14	69	23
10	8	36	0	8	29	9	20	0	7	11	72	25
11	0	39	0	8	23	9	23	0	0	9	80	23
12	0	36	0	0	26	0	22	0	0	0	77	19
13	0	25	0	0	22	14	24	0	0	0	79	22
14	0	16	0	0	0	12	13	8	8	10	74	13
15	0	28	0	0	0	12	0	9	7	11	78	35
16	0	26	9	0	11	12	11	0	0	11	60	47
17	0	28	8	0	16	12	9	13	0	22	41	64
18	0	14	0	0	22	12	0	13	0	21	36	46
19	0	13	0	0	31	12	0	9	0	12	29	62
20	0	18	11	0	39	12	0	9	0	12	16	46
21	0	21	12	0	47	11	11	14	7	15	19	41
22	0	22	12	0	57	10	16	20	7	17	26	35
23	0	14	14	0	71	18	16	23	0	19	25	36
24	0	0	9	0	76	12	13	14	0	19	35	35
25	8	0	9	0	68	0	9	13	7	16	23	37
26	0	0	9	0	60	0	0	14	9	12	21	34
27	0	12	9	0	65	13	0	13	8	11	11	31
28	0	13	9	0	61	0	0	20	8	12	14	19
29	0	17	9	8	63	8	0	15		13	20	12
30	0	19	9	9	62	0	0	14		15	30	12
31		17	9		50		11	11		15		10
Mean	1.1	18.1	7.4	3.8	35.4	15.2	6.8	10.4	2.4	14.7	39.3	30.6

The yearly mean sunspot number equaled 13.4 in 1986.

Algonquin Radio Observatory — OTTAWA 2800 MHz (10.7 cm) SOLAR FLUX — Adjusted to 1 AU

Day	Jun 86	Jul	Aug	Sep	Oct	Nov	Dec	Jan 87	Feb	Mar	Apr	May
01	71.1	68.9	72.8	69.8	71.2	87.6*	70.7	71.6	69.2	72.8	72.5	79.3
02	69.8	68.7	72.3	69.2	71.6	84.1	70.6	70.5	69.8	73.3	71.9	80.2
03	69.9	68.9	72.9	69.3	72.1	80.8	70.2	69.1	70.0	71.6	72.4	82.8
04	69.3	69.3	71.6	69.4	70.7	82.3	69.2	69.0	68.3	73.3	74.0	84.4
05	69.3	71.1	71.7	69.6	71.1	81.5	70.0	70.3	67.5	73.7	77.6	86.1
06	69.8	73.9	72.1	69.5	72.4	80.6	69.1	69.3	67.7	75.6	89.4	87.9
07	70.0	72.1	71.9	69.9	74.3	76.9	68.2	69.7	69.1	75.5	94.4	88.1
08	70.2	71.6	71.3	69.4	74.8	73.5	69.1	68.2	68.9	76.9	94.8	89.1
09	71.1	72.5	71.3	69.4	74.6	71.9	70.8	68.0	69.2	73.6	100.5	87.3
10	70.3	75.0	70.5	69.3	73.3	70.4	72.3	67.4	69.3	71.4	100.0	89.5
11	70.1	74.7	68.6	68.8	73.2	69.9	73.0F	68.0	68.5	70.5	101.3	86.4
12	70.5	73.5	68.4	68.8	75.3	71.4	71.1	68.9	67.8	69.5	98.6	85.4
13	70.4	74.2	67.9	69.0	75.1	76.0*	71.5	69.7	68.0	69.6	99.3	87.4
14	72.1	74.6	68.2	70.0	75.0	74.1	71.4	71.1	68.3	71.1	97.7	91.2
15	71.3	74.0	69.5	71.5	71.8	75.1	70.9	71.5	69.3	70.5	97.8	93.6
16	70.7	74.4	69.4	70.5	79.1	75.0	70.8	70.7	68.4	71.0	95.3*	98.2
17	69.8	74.9	68.9	69.2	82.6	73.8	71.7	70.8	68.1	71.2	97.3	96.7
18	69.9	74.6	69.1	68.8	86.3	73.0	71.4	70.6	69.8	72.5	94.0	98.5
19	69.6	73.3	69.3	68.7	88.6	72.5	71.0	70.0	69.5	71.5	91.7	100.1
20	69.6	73.2	70.7	68.6	92.2	72.5	70.4	68.9	69.6	73.8	85.6	99.8
21	69.2	72.5	70.5	68.8	91.5	74.1	70.6	71.2*	70.7	74.2	78.3	99.9
22	69.7	73.2	70.1	68.3	94.4	74.5	71.4	73.6*	70.4	73.8	76.5	101.0
23	69.6	71.6	69.6	68.7	97.9	75.8	70.8	72.1	70.5	75.5	76.5	94.9
24	68.4	71.2	69.1	68.8	97.3	77.0	70.0	71.6	72.1	75.9	78.6	98.5
25	68.5	70.9	69.3	69.4	94.4	75.5	70.0	71.5	73.5	75.7	75.8	96.8
26	68.2	71.1	69.9	68.5	94.2	74.3	69.7	72.6	73.9	75.6	74.3	92.3
27	68.6	71.6	69.1	68.9	94.3	73.6	69.4	69.9	74.0	75.4	74.8	87.5
28	68.3	72.5	68.8	70.3	93.6	73.1	69.2	70.8	72.7*	75.0	74.3	85.1
29	68.3	74.0	68.8	71.5	91.4	72.4	69.2	70.6		75.3	73.6E	79.3
30	68.3	73.6	69.3	71.6	89.8	70.9	69.6	69.8		74.6	76.8	77.9
31		72.6	69.6		89.2		68.1	68.7		71.9G		77.3
Mean	69.7	72.5	70.1	69.4	82.4	75.5	70.4	70.2	69.8	73.3	85.5	89.8

* = corrected for burst in progress; E = corrected for snow on antenna; F = uncorrected for interference during calibration; G = corrected for ice on antenna. The yearly mean 2800 MHz flux equaled 74.0 in 1986.

DAILY SOLAR INDICES

May 1987

Day	Julian Day	Bartels Cycle Day	Sunspot Numbers Int	Sunspot Numbers Amer	Obs Flux Ottawa (2800)	Solar Flux Adjusted to 1 Astronomical Unit SGMR (15400)	SGMR (8800)	SGMR (4995)	Ottawa (2800)	SGMR (2695)	PALE (1415)	SGMR (610)	SGMR (410)	SGMR (245)
01	121	23	35	35	78.1	497	238	123	79.3	82	66	32	19	7
02	122	24	40	32	78.9	498	249	124	80.2	80	67	41	20	9
03	123	25	22	22	81.4	492	261	121	82.8	80	64	27	20	8
04	124	26	23	20	83.0	501	250	125	84.4	84	68	31	20	8
05	125	27	22	23	84.6	470	213	123	86.1	86	70	39	18	10
06	126	1	27	29	86.3	456	252	133	87.9	88	74	43	21	11
07	127	2	29	31	86.5	490	241	129	88.1	87	--	35	19	8
08	128	3	25	21	87.4	493	257	128	89.1	89	73	41	21	9
09	129	4	23	19	85.7	493	239	127	87.3	88	74	35	20	10
10	130	5	25	24	87.7	488	233	129	89.5	86	76	33	21	10
11	131	6	23	22	84.7	494	249	128	86.4	87	75	47	23	10
12	132	7	19	21	83.6	459	263	125	85.4	89	74	43	21	11
13	133	8	22	16	85.6	495	239	128	87.4	86	76	41	21	9
14	134	9	13	14	89.2	495	224	131	91.2	93	79	38	26	16
15	135	10	35	34	91.6	457	256	132	93.6	94	79	40	24	12
16	136	11	47	50	96.0	513	262	148	98.2	96	79	40	21	15
17	137	12	64	68	94.5	482	242	135	96.7	95	76	39	23	24
18	138	13	46	65	96.2	493	256	139	98.5	96	77	35	20	15
19	139	14	62	56	97.8	496	272	139	100.1	99	78	44	23	18
20	140	15	46	39	97.5	493	242	137	99.8	102	77	36	22	18
21	141	16	41	35	97.5	496	260	142	99.9	105	85	32	19	21
22	142	17	35	34	98.5	496	243	147	101.0	103	78	38	19	17
23	143	18	36	33	92.5	490	242	138	94.9	92	72	26	21	12
24	144	19	35	41	96.0	462	271	137	98.5	99	72	43	23	24
25	145	20	37	35	94.3	491	262	141	96.8	100	73	37	22	11
26	146	21	34	34	89.9	502	248	136	92.3	92	73	37	20	11
27	147	22	31	33	85.2	498	246	132	87.5	86	71	36	19	10
28	148	23	19	23	82.9	489	251	124	85.1	83	69	35	22	18
29	149	24	12	14	77.1	483	224	123	79.3	81	67	37	19	10
30	150	25	12	13	75.8	486	213	117	77.9	77	63	39	18	9
31	151	26	10	11	75.2	483	220	118	77.3	78	65	29	18	9
Mean			30.6	30.5	87.8	488	245	130	89.8	89	73	37	20	12

All sunspot numbers shown above are preliminary values.

The observed and the adjusted Ottawa fluxes tabulated here are the "Series C" daily values reported by the Algonquin Radio Observatory, Ottawa, Ontario, Canada. Numbers in parentheses in the column headings denote frequencies in MHz.

Equipment problems produced any gaps shown above in the Air Weather Service's Sagamore Hill (SGMR) observations.

OBSERVED AND PREDICTED SOLAR ACTIVITY INDICES

MAY 1987

Date	RELATIVE SUNSPOT NUMBERS International (Ri) Monthly Mean	International (Ri) Smoothed	American (Ra) Monthly Mean	American (Ra) Smoothed	Derived (Rs) Monthly Mean	Derived (Rs) Smoothed	2800 MHz RADIO FLUX Adjusted to 1 AU (Sa) Monthly Mean	(Sa) Smoothed
Aug 83	71.8	66	69.2	63	75.7	66	127.5	118
Sep	50.3	68	47.4	66	57.0	67	110.2	119
Oct	55.8	68	52.3	66	58.6	67	111.7	120
Nov	33.3	59	30.2	65	35.6	67	90.4	120
Dec	33.4	64	32.3	62	35.7	65	90.5	118
Jan 84	57.0	60	54.4	58	59.4	61	112.4	115
Feb	85.4	56	81.5	54	86.2	58	137.2	101
Mar	83.5	53	83.0	51	68.5	55	120.8	108
Apr	69.7	50	66.5	48	78.1	52	129.7	105
May	76.4	48	72.1	45	79.6	49	131.1	103
Jun	46.1	46	45.2	44	49.8	48	103.5	102
Jul	37.4	44	36.2	42	37.6	39	92.2	99
Aug	25.5	40	24.5	38	30.7	41	85.8	95
Sep	15.7	34	13.6	32	23.2	35	78.9	90
Oct	12.0	29	9.8	27	16.9	31	73.1	86
Nov	22.8	25	19.4	23	18.6	26	74.6	72
Dec	18.7	22	17.0	20	17.4	23	73.5	79
Jan 85	16.5	20	14.5	19	15.9	21	72.1	77
Feb	15.9	20	16.3	18	15.7	20	71.9	76
Mar	17.2	19	11.8	16	16.3	19	72.5	75
Apr	16.2	18	17.1	17	19.8	19	75.7	75
May	27.5	18	24.0	17	26.6	19	82.0	75
Jun	24.2	18	22.2	16	22.8	19	78.5	75
Jul	30.7	17	30.8	16	25.8	19	81.3	75
Aug	11.1	17	10.7	15	17.2	19	73.3	75
Sep	3.9	17	3.4	16	13.8	20	70.2	76
Oct	18.6	17	16.5	16	18.1	20	74.2	76
Nov	16.2	17	16.4	15	16.4	19	72.6	75
Dec	17.3	15	10.1	14	16.2	19	72.4	75
Jan 86	2.5	14	2.3	12	14.6	18	70.9	74
Feb	23.2	13	23.8	11	26.0	17	81.5	74
Mar	15.1	13	12.5	11	20.3	17	76.2	73
Apr	18.5	14	13.8	12	19.6	18	75.6	74
May	13.7	14	11.6	12	18.1	18	74.2	74
Jun	1.1	14	0.8	11	13.3	18	69.7	74
Jul	18.1	14	17.7	11	16.3	18	72.5	74
Aug	7.4	13	7.6	11	13.7	17	70.1	73
Sep	3.8	12	3.5	10	13.0	17	69.4	73
Oct	35.4	13*	19.8	11	27.0	17	82.4	73
Nov	15.2	15*	14.7	13	19.5	18	75.5	74
Dec	6.8	15(2)*	5.1	13	14.0	18	70.4	--
Jan 87	10.4	15(3)*	9.4	13	13.8	17	70.2	--
Feb	2.4	16(3)*	3.0	14	13.4	18	69.8	--
Mar	14.7	17(4)*	13.3	15	17.2	20	73.3	--
Apr	39.3†	18(5)*	37.9	16	30.3	21	85.5	--
May	30.6†	19(7)*	30.5	18	35.0	22	89.8	--
Jun	----	21(9)*	----	20	----	24	----	--
Jul	----	22(10)*	----	21	----	25	----	--
Aug	----	24(12)*	----	23	----	27	----	--
Sep	----	27(14)*	----	25	----	29	----	--
Oct	----	30(18)*	----	29	----	33	----	--
Nov	----	35(20)*	----	33	----	38	----	--

*An asterisk marks either a value of the observed 12-month running mean or of a predicted 12-month average that is based in part on preliminary observations.

Underlined entries indicate predicted values and parentheses enclose the absolute value of the 90% confidence limits. The two columns headed "Derived" represent a sunspot number computed from a linear regression equation between the 2800 MHz solar flux (adjusted to 1 astronomical unit) and the Zurich sunspot number.

SMOOTHED (OBSERVED AND PREDICTED) SUNSPOT NUMBERS: CYCLES 21 AND 22

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980	164	163	161	159	156	155	153	150	150	150	148	143
1981	140	142	143	143	143	142	140	141	143	142	139	138
1982	137	133	129	124	120	117	115	109	101	96	95	95
1983	93	90	86	82	77	71	66	66	68	68	67	64
1984	60	56	53	50	48	47	44	40	34	29	25	22
1985	21	20	19	18	18	18	17	17	17	17	17	15
1986	14	13	13	14	14	14	14	13	12*	13	15	15
												(2)
1987	15	16	17	18	19	21	22	24	27	30	35	39
	(3)	(3)	(4)	(5)	(7)	(9)	(10)	(12)	(14)	(18)	(20)	(23)
1988	42	45	48	51	54	59	65	69	73	77	79	81
	(26)	(28)	(32)	(34)	(36)	(40)	(44)	(47)	(51)	(54)	(56)	(56)
1989	85	90	94	101	107	111	114	117	120	121	122	122
	(56)	(59)	(62)	(64)	(67)	(68)	(69)	(73)	(76)	(77)	(78)	(78)

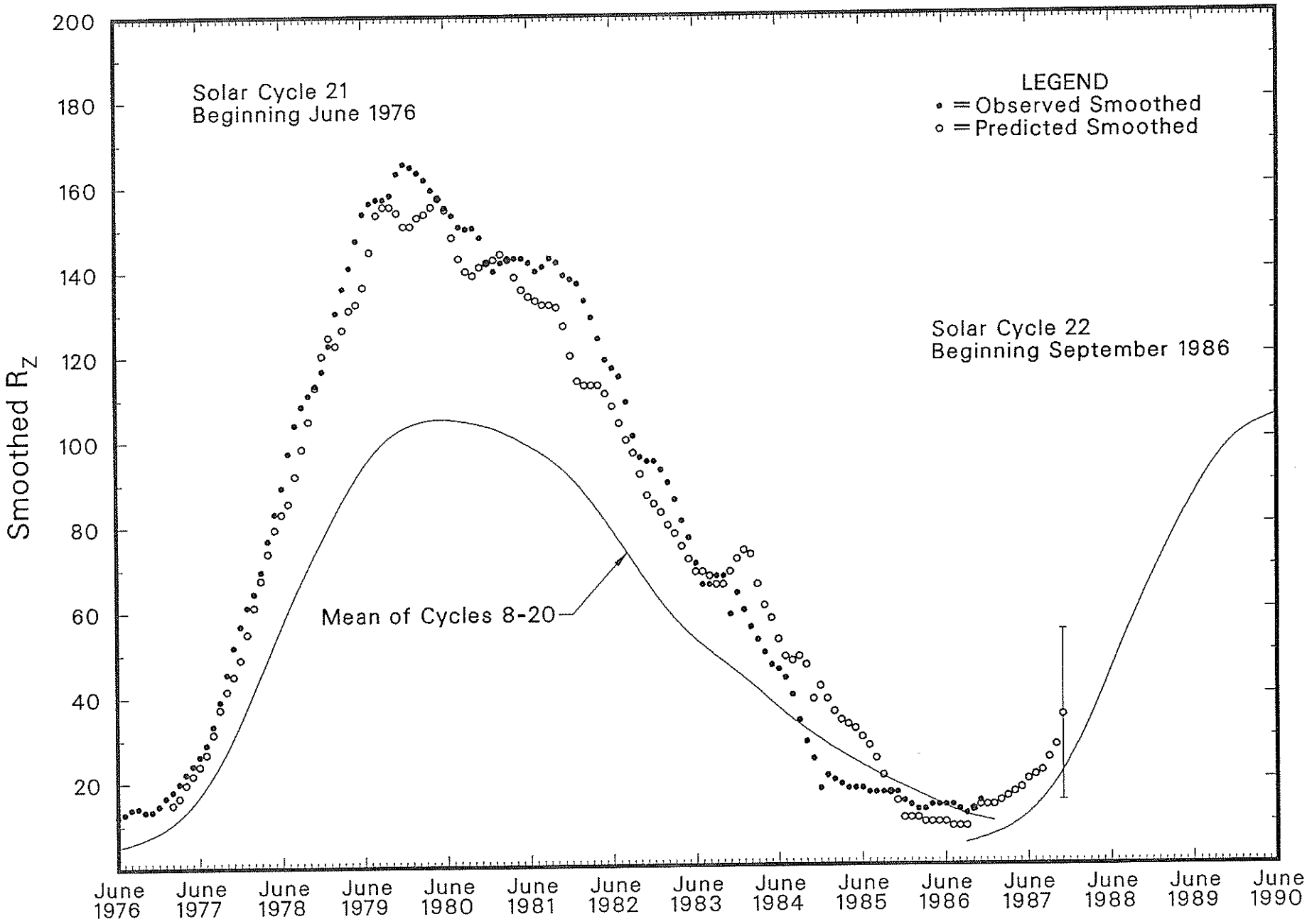
*September 1986 may be the onset of Sunspot Cycle 22.

For the end of Solar Cycle 21, and perhaps the beginning of Cycle 22, the table gives observed smoothed sunspot numbers up to the one calculated from the most recently measured monthly mean. These smoothed observed values are based on final, unsmoothed monthly means through March 1987 and on provisional numbers thereafter.

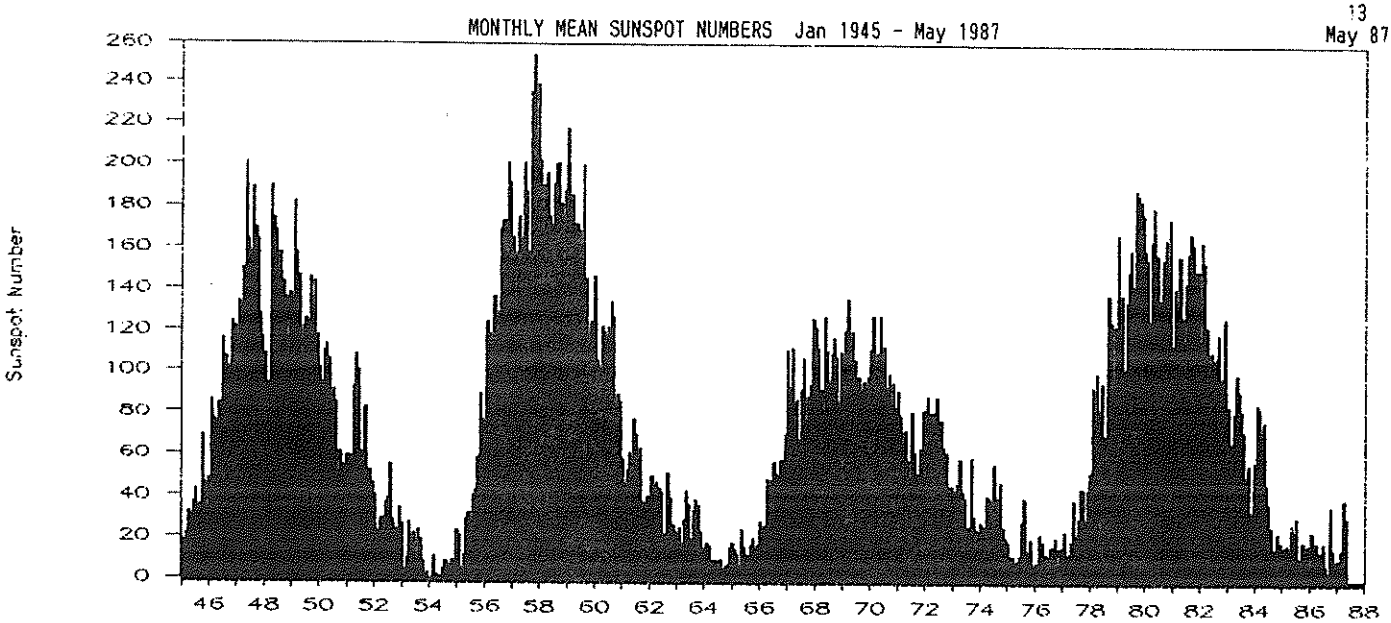
Table entries, with numbers in parentheses below them, denote predictions by the McNish-Lincoln method. (See page 9 in the March 1986 supplement to Solar-Geophysical Data.) Adding the number in parentheses to the predicted value generates the upper limit of the 90% confidence interval; subtracting the number from the predicted value generates the lower limit. Consider, for example, the November 1987 prediction. There exists a 90% chance that in November 1987 the actual smoothed sunspot number will fall somewhere between 15 and 55.

THE MCNISH-LINCOLN PREDICTION METHOD GENERATES USEFUL ESTIMATES OF SMOOTHED, MONTHLY MEAN SUNSPOT NUMBERS FOR NO MORE THAN 12 MONTHS AHEAD. Beyond a year the predictions regress rapidly toward the mean of all 14 cycles used in the computation. Moreover, the method is very sensitive to the date defined as the beginning of the current sunspot cycle, that is, to the date of the most recent sunspot minimum. The new-cycle predictions tabulated above are based on the assumption that the September 1986 value of 12.4 is the minimum. If a smoothed number lower than 12.4 occurs, the predictions will change.

OBSERVED AND ONE-YEAR-AHEAD PREDICTED SUNSPOT NUMBERS



MONTHLY MEAN SUNSPOT NUMBERS Jan 1945 - May 1987



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1945	18.5	12.7	21.5	32.0	30.6	36.2	42.6	25.9	34.9	68.8	46.0	27.4	33.2
1946	47.6	86.2	76.6	75.7	84.9	73.5	116.2	107.2	94.4	102.3	123.8	121.7	92.6
1947	115.7	133.4	129.8	149.8	201.3	163.9	157.9	188.8	169.4	163.6	128.0	116.5	151.6 M
1948	108.5	86.1	94.8	189.7	174.0	167.8	142.2	157.9	143.3	136.3	95.8	138.0	136.3
1949	119.1	182.3	157.5	147.0	106.2	121.7	125.8	123.8	145.3	131.6	143.5	117.6	134.7
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	112.3
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
1987	10.4	2.4	14.7	39.3*	30.6*								19.5*

*Preliminary

For the yearly means, each "M" marks a sunspot cycle maximum and each "m" a minimum.

H - ALPHA S O L A R F L A R E S

MAY 1987

Grp #	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	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Area Measurement Corr (Sq Deg)	Remarks
0001	HOLL	01	1835	1836	1839	N02	W54	4797	04	27.8	4	SF		3	C		12		
0002		01	1836	1844	1912	S28	W36	4803	04	29.1	36	SF					52		FH
	HOLL	01	1836	1844	1912	S28	W35	4803	04	29.1	36	SF		3	C		69		FH
	RAMY	01	1843E	1843U	1919D	S28	W36	4803	04	29.1	36D	SF		3	C		35		
0003	HOLL	01	1858	1903	1934	N01	W57	4797	04	27.6	36	1B	C 5.9	3	C		182		F
0004	HOLL	01	2118	2119	2123	N02	W55	4797	04	27.9	5	SF		3	C		18		
0005	HOLL	01	2302	2302	2307	N02	W56	4797	04	27.9	5	SF		3	C		26		
0006	YUNN	02	0031	0037	0115	N02	W60	4797	04	27.6	44	SN			C		32	.7	D
0007	YUNN	02	0050	0108U	0127	N03	W60	4797	04	27.6	37	SN			P	0108	48	1.0	
0008	YUNN	02	0145	0150	0156	N02	W60	4797	04	27.7	11	1B			C		161	3.3	
0009	YUNN	02	0203	0216	0245	N03	W61	4797	04	27.6	42	2B			C		273	5.8	
0010		05	16451	1646	1706	S31	E70	4806	05	11.2	21	SF					32		
	HOLL	05	1645	1646	1712	S31	E71	4806	05	11.3	27	SF		3	C		46		
	RAMY	05	1646	1646	1659	S31	E70	4806	05	11.2	13	SF		3	C		17		
0011	HOLL	05	1906	1909	1911	S31	E68	4806	05	11.2	5	SF		3	C		12		
0012	RAMY	06	1119	1119	1123	S30	E57	4806	05	10.9	4	SF		3	C		15		H
0013		06	13421	13451	1405	S30	E56	4806	05	11.0	23	SN					69		H
	RAMY	06	1342	1345	1406	S30	E57	4806	05	11.0	24	SN		3	C		75		H
	HOLL	06	1343	1346	1404	S29	E56	4806	05	11.0	21	SN		3	C		63		H
0014	RAMY	06	1813	1817	1821	S30	E53	4806	05	10.9	8	SF		2	C		21		
0015	KAND	07	1150E		1208	S32	E46		05	11.1	18D	SF			P		42	.6	D
0016	RAMY	07	1305	1307	1309	S30	E43	4806	05	10.9	4	SF		3	C		18		
0017	RAMY	07	1333	1333	1337	S30	E43	4806	05	10.9	4	SF		3	C		17		
0018		08	00351	00352	0042	S31	E36	4806	05	10.9	7	SF					33	.8	CEF
	HOLL	08	0035	0035	0043	S29	E36	4806	05	10.8	8	SF		3	C		25		
	LEAR	08	0036	0037	0040	S30	E35	4806	05	10.8	4	SF		3	C		25		F
	PURP	08	0037E	0037U	0037D	S33	E38	4806	05	11.0	4D	SN			P	0037	50	.8	EC
0019	SVTO	08	0511E	0519U	0525	S30	E33	4806	05	10.8	14D	SF		3	C		36		H
0020	SVTO	08	0751	0756	0804	S35	E34	4806	05	11.0	13	SF		3	C		32		F
0021	LEAR	11	0104E	0104	0108D	S33	E09	4806	05	11.7	4D	SF		4	C		35		
0022		11	0735	0736	0740	S34	W02	4806	05	11.1	5	1N					120	2.5	EH
	LEAR	11	0735E	0736	0738D	S34	W02	4806	05	11.1	3D	SF		4	C		32		
	KAND	11	0735	0736	0740	S33	W02		05	11.1	5	1N			P		208	2.5	EH
0023	YUNN	13	0638	0649	0713	S34	W28	4806	05	11.0	35	SN			P		24	.3	D
0024	YUNN	13	0725E	0729	0745	S31	W26	4806	05	11.2	20D	SN			P		47	.6	E
0025	YUNN	13	0817	0823	0840D	S33	W28	4806	05	11.1	23D	SN			P		16	.2	D
0026		14	0109*	0115*	0134	S22	E01	4808	05	14.1	25	SN					12	.2	DEG
	YUNN	14	0109	0115	0127	S22	E05	4808	05	14.4	18	SN			P		8	.1	DG
	YUNN	14	0122	0127	0141	S22	W03	4808	05	13.8	19	SN			C		16	.2	E
0027	PALE	15	0410	0417	0430D	S23	E60	4810	05	19.8	20D	SB	C 1.9	1	C		147		FU
0028	KAND	15	0846		0850D	S24	E75		05	21.1	4D	SF			P		21		D
0029	KAND	15	1015	1022	1029	S24	E71		05	20.9	14	SF			P		21		D

H - ALPHA SOLAR FLARES

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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Corr (Sq Deg)	Remarks
0030	KAND	15	1022		1038	N27	E85		05 22.0	16	SN			P		21		A
0031	LEAR	16	0416E	0418U	0440D	S25	E63	4810	05 21.0	24D	SB	C 1.9	3	C		147		FU
0032	SVTO	16	0623	0625	0634	N28	E62	4811	05 21.1	11	SF		3	C		29		
0033	SVTO	16	1039	1039	1045	N28	E70	4811	05 21.9	6	SB		3	C		35		
0034		16	1054*	1057*	1115	N28	E71	4811	05 22.0	21	SN	C 1.6				32		
	SVTO	16	1054	1057	1106	N29	E71	4811	05 22.0	12	SN		3	C		34		
	RAMY	16	1055	1057	1120	N28	E72	4811	05 22.1	25	SF		3	C		25		
	SVTO	16	1109	1113	1120	N28	E70	4811	05 21.9	11	SN	C 1.6	3	C		37		
0035		16	1145	1147	1208	N28	E71	4811	05 22.0	23	SB	C 1.2				38		
	SVTO	16	1145	1147	1208	N28	E70	4811	05 22.0	23	SB	C 1.2	3	C		46		
	RAMY	16	1148E	1148U	1201D	N28	E72	4811	05 22.1	13D	SN	C 1.2	3	C		29		
0036		16	1221B	1233	1240	N28	E71	4811	05 22.1	19	SN					22		F
	SVTO	16	1221	1233	1242	N28	E69	4811	05 21.9	21	SN		3	C		22		
	RAMY	16	1229	1233	1237	N28	E73	4811	05 22.2	8	SN		3	C		21		F
0037	RAMY	16	1247	1255U	1258	N28	E71	4811	05 22.1	11	SN		3	C		25		
0038	SVTO	16	1328	1329	1336	N27	E64	4811	05 21.5	8	SF		3	C		20		
0039	SVTO	16	1422	1427	1431	S20	W32	4808	05 14.1	9	SF		3	C		21		
0040		16	1535B	1536B	1542	N28	E58	4811	05 21.2	7	SF					18		F
	HOLL	16	1535	1536	1539	N28	E58	4811	05 21.2	4	SF		3	C		17		F
	HOLL	16	1541	1542	1545	N28	E57	4811	05 21.1	4	SF		3	C		18		
0041	HOLL	16	1740	1740	1747	S19	W33	4808	05 14.2	7	SF		3	C		11		
0042		16	1854B	1859	1914	S22	E54	4810	05 20.9	20	SF					20		H
	HOLL	16	1854	1859	1918	S21	E49	4810	05 20.5	24	SN		3	C		22		H
	PALE	16	1856	1859	1911	S22	E55	4810	05 21.0	15	SF		3	C		19		
	RAMY	16	1903E	1912U	1918D	S23	E58	4810	05 21.3	15D	SF		3	C		20		
0043	RAMY	16	1948	2020	2040	S20	W38	4808	05 13.9	52	SN		3	C		63		H
0044	HOLL	16	2235	2236	2243	S21	E47	4810	05 20.5	8	SF		3	C		43		
0045	HOLL	16	2255	2256	2305	S20	W40	4808	05 13.9	10	SF		3	C		27		
0046	HOLL	16	2344	2350		N33	E63	4811	05 22.0		SF		3	C		55		F
0047	HOLL	17	0033	0041	0053	S19	W36	4808	05 14.3	20	SF		3	C		21		F
0048	PALE	17	0146	0149	0156	N29	E53	4811	05 21.2	10	SB		3	C		83		EF
0049	YUNN	17	0607	0610	0627	S20	W40	4808	05 14.2	20	SN			C		94	1.3	
0050	YUNN	17	0739E	0756U	0758D	S18	W42	4808	05 14.1	19D	SB			P	0756	79	1.1	E
0051		17	0835B	0845*	0908	S21	W44	4808	05 14.0	33	SN	C 4.9				64	1.0	E
	PEKG	17	0835	0856	0906	S21	W42		05 14.1	31	SN			P	0856	67	1.0	E
	SVTO	17	0837	0845	0910	S21	W45	4808	05 13.9	33	SN	C 4.9	3	C		62		
0052		17	1228B	1231B	1239	S19	W42	4808	05 14.3	11	SF					20		FH
	RAMY	17	1228	1234	1240	S19	W42	4808	05 14.3	12	SF		3	C		17		FH
	SVTO	17	1231	1231	1238	S19	W43	4808	05 14.2	7	SF		3	C		23		
0053	RAMY	17	1457	1457	1504	N28	E48	4811	05 21.4	7	SF		3	C		28		
0054	RAMY	17	1614	1616	1621	N28	E49	4811	05 21.5	7	SF		3	C		16		
0055	KAND	18	1108	1115	1123	S18	W54		05 14.3	15	SN			P		125	2.1	D
0056	KAND	18	1115	1117	1118	N32	E45		05 22.0	3	SF			P		31	.6	D

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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Corr (Sq Deg)	Remarks
0057	RAMY	18	1638	1638	1651	N29	E39	4811	05	21.7	13	SN		3	C		38		
0058		18	2321	23242	2335	N24	E32	4811	05	21.4	14	SN	C 1.3				70	1.0	F
	PALE	18	2321	2324	2334	N24	E32	4811	05	21.4	13	SN	C 1.3	3	C		64		F
	PURP	18	2321E	2326	2336	N23	E33	4811	05	21.5	15D	SN			C	2326	75	1.0	
0059		19	0004	00042	0007	S19	W67	4808	05	13.9	3	SN	C 1.0				34		F
	PURP	19	0004E	0004	0016D	S18	W70	4808	05	13.7	12D	SN			P	0004	46		
	PALE	19	0004	0006	0007	S20	W64	4808	05	14.1	3	SF	C 1.0	3	C		23		F
0060	YUNN	19	0119E	0121U	0123D	N24	E31	4811	05	21.4	4D	SN			P	0121	24	.3	D
0061	YUNN	19	0119E	0121U	0205D	S23	W67	4808	05	13.9	46D	SN			P	0121	31		D
0062	LEAR	19	0217	0225	0234	N25	E28	4811	05	21.3	17	SF		3	C		33		F
0063	LEAR	19	0437	0441	0456	N26	E34	4811	05	21.8	19	SF		3	C		20		F
0064		19	05333	0539*	0602	S19	W67	4808	05	14.1	29	SF					28		
	LEAR	19	0533	0550	0602	S19	W69	4808	05	14.0	29	SF		3	C		35		
	SVTO	19	0536	0539	0603	S19	W65	4808	05	14.3	27	SF		3	C		22		
0065		19	0728*	0730*	0741	S19	W67	4808	05	14.2	13	SF					15		
	SVTO	19	0728	0730	0731	S19	W66	4808	05	14.3	3	SF		3	C		13		
	SVTO	19	0740	0741	0747	S19	W67	4808	05	14.2	7	SF		3	C		19		
	LEAR	19	0741	0741	0744	S19	W69	4808	05	14.0	3	SF		3	C		12		
0066	SVTO	19	1223	1226	1234	S19	W71	4808	05	14.1	11	SF	C 3.2	3	C		31		
0067	SVTO	19	1252	1257	1307	N29	E28	4811	05	21.7	15	SN	C 2.6	3	C		105		F
0068	PALE	19	1808E	1810	1837	N30	E25	4811	05	21.7	29D	SB	C 9.6	4	C		76		F
0069	PALE	19	2315	2318	2329	N31	E24	4811	05	21.9	14	SN		3	C		48		F
0070		20	0040	00417	0100	N27	E20	4811	05	21.6	20	1B					138	1.8	E
	YUNN	20	0040	0041	0047	N27	E19	4811	05	21.5	7	SB			C		102	1.3	E
	YUNN	20	0040	0048	0112	N27	E20	4811	05	21.6	32	1N			C		173	2.2	E
0071	YUNN	20	0207E	0207U	0213	S25	E17		05	21.4	6D	SN			P	0207	31	.4	H
0072	YUNN	20	0623E	0623	0633	N32	E21	4811	05	21.9	10D	SN			P		16	.2	D
0073	YUNN	20	0634	0637	0657	N28	E13	4811	05	21.3	23	SB			C		24	.3	D
0074	KAND	20	0923	0928U	0928D	N39	E18		05	21.8	5D	SN			P				DT
0075	SVTO	20	0929E	0941	1004	N24	E15	4811	05	21.5	35D	SN		3	C		46		F
0076	RAMY	20	1302E	1302	1358	N30	E15	4811	05	21.7	56D	1N	C 1.3	2	C		482		F
0077	RAMY	20	1509	1509	1515	N29	E16	4811	05	21.9	6	SF		3	C		11		
0078	RAMY	20	1635	1642	1650	N31	E17	4811	05	22.0	15	SF		3	C		19		
0079	RAMY	20	1916	1923	1939	N29	E12	4811	05	21.7	23	SF		3	C		18		
0080		21	0042*	0045*	0058	N28	E09	4811	05	21.7	16	SN					47	.6	DE
	YUNN	21	0042	0045	0056	N29	E08	4811	05	21.6	14	SN			P		63	.8	E
	YUNN	21	0054	0056	0100	N28	E10	4811	05	21.8	6	SN			C		31	.4	D
0081	YUNN	21	0122	0127	0206	N28	E08	4811	05	21.7	44	SN			C		94	1.1	E
0082	YUNN	21	0229	0231	0243	N34	E11	4811	05	22.0	14	SN			C		47	.6	D
0083		21	03144	03213	0355	N23	E04	4811	05	21.4	41	1B	C 7.6				187	3.3	EFZ
	MITK	21	0314	0324	0400	N24	E03	4811	05	21.4	46	1N			C	0324	290	3.3	E
	LEAR	21	0315	0324	0353	N23	E03	4811	05	21.4	38	1B	C 7.6	3	C		183		ZF
	PALE	21	0318	0321	0353	N23	E07	4811	05	21.7	35	SB	C 7.6	2	C		87		FE

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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Corr (Sq Deg)	Remarks
0084	LEAR	21	0517	0520	0530	N29	E05	4811	05 21.6	13	SF		3	C		32		
0085	YUNN	21	0702	0710	0732	N24	E05	4811	05 21.7	30	SN			C		47	.5	DT
0086		21	0755*	08029	0815	N25	E06	4811	05 21.8	20	SN					62	.8	DEFT
	YUNN	21	0755	0802	0816	N27	E05	4811	05 21.7	21	SB			C		126	1.5	ET
	KAND	21	0755	0805	0815	N25	E09		05 22.0	20	SF			P		42	.5	DFT
	YUNN	21	0800	0811	0824	N25	E07	4811	05 21.9	24	SF			C		63	.7	DT
	SVTO	21	0802E	0802U	0809	N27	E03	4811	05 21.6	7D	SN		3	C		50		
	KAND	21	0805		0810	N24	E06		05 21.8	5	SF			P		31	.4	DFT
0087	YUNN	21	0844	0846	0858D	N26	E03	4811	05 21.6	14D	SN			P		79	.9	ET
0088	LEAR	21	0911	0913	0930	N25	E04	4811	05 21.7	19	SF	C 1.0	3	C		45		F
0089	HOLL	21	1831E	1847	1858	N30	E00	4811	05 21.8	27D	SN	C 2.1	3	C		117		
0090	HOLL	21	2225E	2241U	2255	N26	E00	4811	05 21.9	30D	SF		3	C		52		
0091	HOLL	21	2344E	2348U	2357	N25	W04	4811	05 21.7	13D	SN		3	C		45		F
0092	YUNN	22	0204	0218	0246D	S23	W16		05 20.8	42D	1N			P		193	2.2	E
0093	YUNN	22	0208	0218	0246	N28	W04	4811	05 21.8	38	SN			C		94	1.1	E
0094	LEAR	22	0309	0310	0318	N28	W07	4811	05 21.6	9	SF		3	C		19		
0095	PURP	22	0411	0412	0413	N28	W05	4811	05 21.8	2	SF			C	0412	41	.5	
0096		22	05571	0603	0620	N25	W08	4811	05 21.6	23	SN					105	1.9	EF
	SVTO	22	0557	0603	0615	N26	W07	4811	05 21.7	18	SN		3	C		73		
	LEAR	22	0558	0603	0617	N25	W08	4811	05 21.6	19	SN		3	C		80		F
	YUNN	22	0606E	0607U	0627	N24	W08	4811	05 21.6	21D	SN			P	0607	161	1.9	E
0097	HOLL	22	1236	1238	1256	N29	W13	4811	05 21.5	20	SN	C 4.8	3	C		113		
0098	HOLL	22	1309	1314	1318	N28	W11	4811	05 21.7	9	SF		3	C		16		
0099	YUNN	23	0135	0139	0153	N29	W15	4811	05 21.9	18	SN			P		24	.3	D
0100	HOLL	23	1546	1549	1603	N29	W25	4811	05 21.7	17	SN		3	C		49		F
0101	SVTO	23	1557	1557	1601	N28	W32	4811	05 21.2	4	SF		3	C		28		
0102	RAMY	23	1843	1846	1849	N30	W29	4811	05 21.5	6	SF		3	C		43		
0103	HOLL	23	1903	1903	1908	N28	W28	4811	05 21.6	5	SN		3	C		35		
0104	PURP	23	2327	2333	2346D	N25	W33	4811	05 21.4	19D	SN			C	2333	35	.5	
0105	PURP	24	0010E	0010	0015	N26	W30	4811	05 21.7	5D	SN			P	0010	75	1.0	E
0106		24	0103*	0107*	0145	N26	W34	4811	05 21.4	42	1F	C 1.0				75		F
	LEAR	24	0103	0107	0149	N25	W33	4811	05 21.5	46	1F	C 1.0	3	C		133		F
	PALE	24	0126	0135	0141	N28	W34	4811	05 21.4	15	SF		3	C		17		
0107	PALE	24	0314	0318	0325	N33	W41	4811	05 20.9	11	SN		2	C		100		F
0108	SVTO	24	0907	0908	0912	N31	W32	4811	05 21.8	5	SB	C 1.3	3	C		154		
0109		24	1229	1231	1315D	N24	W41	4811	05 21.3	46D	SN					57		FH
	RAMY	24	1227E	1231U	1250D	N24	W42	4811	05 21.3	23D	SN		3	C		58		H
	SVTO	24	1229	1231	1315D	N24	W40	4811	05 21.4	46D	SF		3	C		56		F
0110		24	1518	1527	1548	N30	W36	4811	05 21.8	30	1B	M 1.2				288		F
	HOLL	24	1518	1527	1548	N28	W37	4811	05 21.7	30	1B	M 1.2	3	C		387		F
	RAMY	24	1519E	1525U	1549D	N33	W36	4811	05 21.8	30D	1B	M 1.2	3	C		189		F
0111	RAMY	24	1614	1615	1625	N26	W39	4811	05 21.6	11	SF		3	C		40		F

H - ALPHA S O L A R F L A R E S

MAY 1987

Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Corr (Sq Deg)	Remarks
0112		24	1704*	1710*	1741	N24	W44	4811	05 21.3	37	SN					77		F
	RAMY	24	1704	1717	1748	N24	W46	4811	05 21.1	44	1N		2	C		167		F
	PALE	24	1709	1710	1726	N24	W44	4811	05 21.3	17	SN		3	C		23		
	HOLL	24	1720	1744	1750	N24	W43	4811	05 21.4	30	SN		3	C		41		
0113		24	17513	1758*	1821	N25	W39	4811	05 21.7	30	SN	C 2.3				69		F
	HOLL	24	1751	1811	1822	N25	W39	4811	05 21.7	31	SN		3	C		65		F
	RAMY	24	1752	1758	1831	N26	W40	4811	05 21.6	39	SB	C 2.3	2	C		91		F
	PALE	24	1754	1758	1811	N25	W39	4811	05 21.7	17	SN	C 2.3	3	C		52		F
0114		24	19158	1925*	1950	N25	W40	4811	05 21.7	35	SN					125		FH
	RAMY	24	1915	1940	1952	N26	W40	4811	05 21.7	37	SN		3	C		77		FH
	PALE	24	1921	1925	1948	N24	W40	4811	05 21.7	27	1N		3	C		236		FH
	HOLL	24	1923	1940	1949	N25	W41	4811	05 21.6	26	SN		3	C		62		F
0115		24	20396	21126	2127	N26	W44	4811	05 21.4	48	1B	C 2.7				226		FH
	RAMY	24	2039	2112	2133	N25	W46	4811	05 21.3	54	1B	C 2.7	3	C		215		F
	PALE	24	2041	2112	2127	N24	W46	4811	05 21.3	46	1B	C 2.7	3	C		200		FH
	HOLL	24	2045	2118	2120	N29	W40	4811	05 21.7	35	1B	C 2.7	3	C		263		F
0116	LEAR	25	0317	0317	0324	N32	W39	4811	05 22.0	7	SF	C 1.6	2	C		30		F
0117		25	03291	03421	0403	N30	W48	4811	05 21.4	34	2B	M 1.3				496		
	LEAR	25	0329	0343	0353D	N30	W47	4811	05 21.4	24D	2B	M 1.3	2	C		434		
	PALE	25	0330	0342	0403	N30	W49	4811	05 21.3	33	2B	M 1.3	2	C		559		
0118	LEAR	25	0826	0827	0836	N29	W49	4811	05 21.5	10	SF		3	C		56		
0119	SVTO	25	1138	1140	1145	N30	W51	4811	05 21.5	7	SF		3	C		33		
0120		25	12025	12111	1224	N30	W52	4811	05 21.4	22	1N	C 1.4				136		FH
	RAMY	25	1202	1211	1224	N30	W52	4811	05 21.4	22	SN	C 1.4	3	C		99		H
	SVTO	25	1207	1212	1224	N30	W51	4811	05 21.5	17	1N	C 1.4	3	C		172		F
0121		25	12266	12331	1240	N26	W48	4811	05 21.8	14	SN					50		F
	RAMY	25	1226	1234	1243	N26	W49	4811	05 21.7	17	SN		3	C		45		
	SVTO	25	1232	1233	1237	N27	W47	4811	05 21.8	5	SN		3	C		54		F
0122		25	13182	13231	1332	N27	W52	4811	05 21.5	14	SF					80		F
	HOLL	25	1318	1323	1335	N29	W51	4811	05 21.5	17	SF		3	C		69		F
	SVTO	25	1320	1324	1330	N25	W52	4811	05 21.5	10	SF		3	C		92		
0123		25	13431	13451	1403	N30	W51	4811	05 21.6	20	SN	C 2.2				82		F
	HOLL	25	1343	1345	1403	N29	W49	4811	05 21.7	20	SN	C 2.2	3	C		96		F
	SVTO	25	1343	1346	1359	N31	W51	4811	05 21.5	16	SN	C 2.2	3	C		88		F
	RAMY	25	1344		1407	N30	W52	4811	05 21.5	23	SN	C 2.2	2	C		62		F
0124	RAMY	25	1435	1449	1510D	N23	E38		05 28.5	35D	SF		3	C		10		
0125		25	15135	15191	1532	N30	W53	4811	05 21.5	19	1N	C 1.6				130		FH
	HOLL	25	1513	1519	1523	N29	W53	4811	05 21.5	10	SN	C 1.6	3	C		99		F
	SVTO	25	1518	1520	1542	N31	W53	4811	05 21.4	24	1F	C 1.6	3	C		160		FH
0126		25	16094	16157	1706	N30	W54	4811	05 21.4	57	SN	C 4.2				98		FH
	SVTO	25	1609	1622	1706	N31	W54	4811	05 21.4	57	1N	C 4.2	3	C		184		F
	HOLL	25	1613	1615	1638D	N30	W54	4811	05 21.4	25D	SN	C 4.2	3	C		53		FH
	RAMY	25	1613	1615U	1642D	N29	W53	4811	05 21.5	29D	SN	C 4.2	2	C		58		F
0127		25	1850	1855	1926	N29	W56	4811	05 21.4	36	1N	C 5.9				110		F
	RAMY	25	1850	1855	1924D	N29	W56	4811	05 21.4	34D	1N	C 5.9	2	C		125		F
	PALE	25	1900E	1905U	1926	N29	W56	4811	05 21.4	26D	SN	C 5.9	2	C		95		F
0128		25	22206	2227	2231	N29	W54	4811	05 21.7	11	SN					55		
	RAMY	25	2220	2227	2228D	N29	W55	4811	05 21.6	8D	SN		3	C		65		
	HOLL	25	2226	2227	2231	N29	W53	4811	05 21.8	5	SN		3	C		45		
0129		25	23592	24043	2414	N36	W53	4811	05 21.7	15	1N	C 1.0				50		H
	LEAR	25	2359	2407	2414	N33	W52	4811	05 21.9	15	1N	C 1.0	3	C		75		H
	PALE	26	0001	0004	0004D	N38	W54	4811	05 21.6	3D	SF	C 1.0	2	C		24		H

H - ALPHA S O L A R F L A R E S

MAY 1987

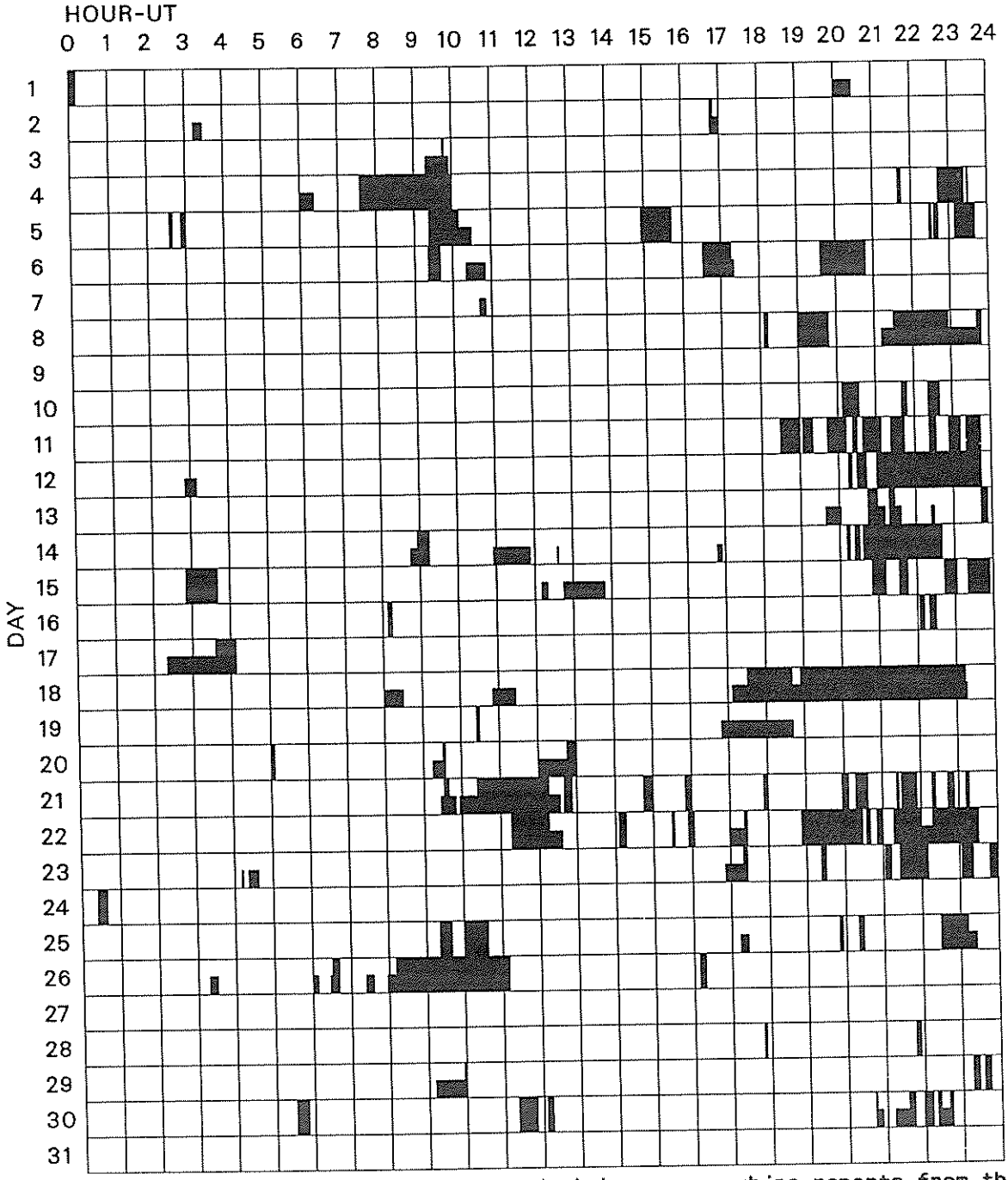
Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Corr (Sq Deg)	Remarks
0130		26	0059	0103	0109	N27	W58	4811	05	21.5	10	SF	C 1.5				38		F
	PALE	26	0039E	0039U	0111	N25	W57	4811	05	21.6	32D	SF	C 1.5	2	C		42		F
	LEAR	26	0059	0103	0107	N29	W60	4811	05	21.3	8	SF		3	C		33		
0131	SVTO	26	0610	0607	0624	N24	W59	4811	05	21.7	14	SN	C 2.8	3	C		22		F
0132		26	0743	0743	0750	N29	W60	4811	05	21.6	7	SN	C 1.3				26		F
	LEAR	26	0743	0743	0746	N29	W60	4811	05	21.6	3	SF	C 1.3	3	C		16		
	SVTO	26	0743	0743	0754	N29	W61	4811	05	21.5	11	SN	C 1.3	3	C		36		F
0133		26	16475	1653	1704	N25	W66	4811	05	21.6	17	SN					12		F
	RAMY	26	1647	1702U	1705	N25	W65	4811	05	21.7	18	SN		3	C		13		F
	SVTO	26	1652	1653	1702	N25	W66	4811	05	21.6	10	SF		3	C		12		
0134		26	19411	1946	2008	N28	W70	4811	05	21.3	27	1N	C 8.1				136		F
	HOLL	26	1941	1946	2006	N27	W68	4811	05	21.5	25	1N	C 8.1	3	C		126		F
	PALE	26	1942	1950U	2010	N29	W73	4811	05	21.1	28	1N	C 8.1	2	C		146		
0135	HOLL	26	2356	2356	2405	N28	W71	4811	05	21.4	9	SF	C 2.6	3	C		19		F
0136	HOLL	27	0132	0136U	0143	N22	W71	4811	05	21.6	11	SF	C 2.9	2	C		25		
0137	SVTO	27	0509	0531	0611	N26	W70	4811	05	21.8	62	SF		3	C		69		FH
0138	HOLL	27	1754	1756	1803	N30	W80	4811	05	21.4	9	SN	C 2.3	3	C		72		F
0139	PALE	27	1812	1813	1819	N28	W79	4811	05	21.6	7	SF		3	C		60		F
0140		27	1844*	1844*	1855	N28	W78	4811	05	21.7	11	SN					20		
	HOLL	27	1844	1844	1850	N29	W78	4811	05	21.7	6	SN		3	C		20		
	PALE	27	1858	1858	1900	N28	W79	4811	05	21.6	2	SN		3	C		20		
0141	PALE	27	2311	2312	2314	N24	W89	4811	05	21.1	3	SF		3	C		21		
0142	HOLL	28	0115	0115	0125	N26	W77	4811	05	22.1	10	SF		3	C		41		

"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.

INTERVALS OF NO FLARE PATROL OBSERVATION
FOR PRECEDING SOLAR FLARE TABLE

MAY 1987



Times of no flare patrol, shown here as shaded areas, combine reports from the observatories listed below. Portions of a panel completely shaded mark dates and times of no patrol of any kind, that is, of neither visual nor cinematographic; portions of a panel with only the bottom half shaded mark times of strictly visual patrol.

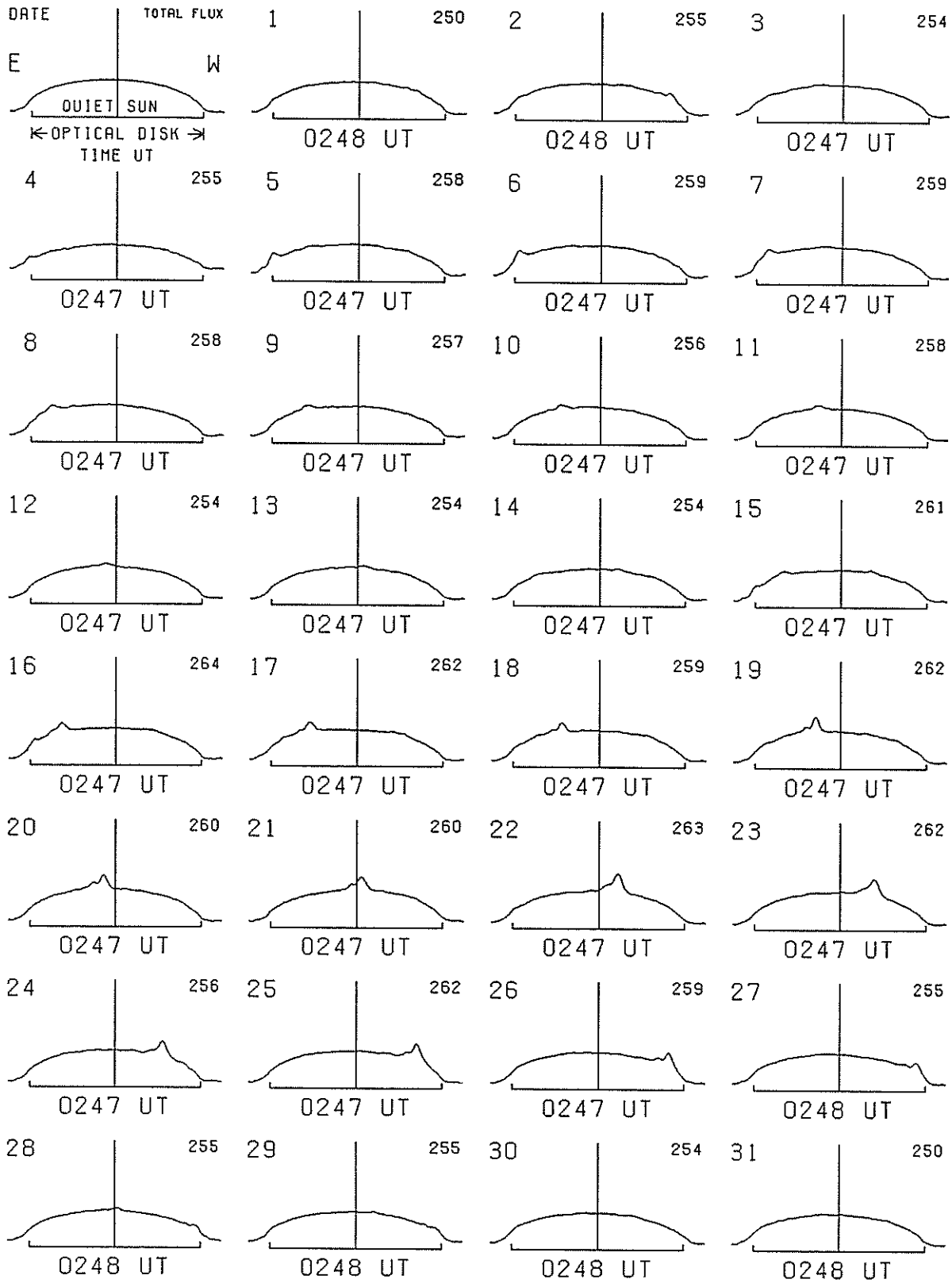
Bucharest	Istanbul	Learmonth	Peking	San Vito
Holloman	Kandilli	Mitaka	Purple Mt.	Urumqi
		Palehua	Ramey	Yunnan

EAST-WEST SOLAR SCANS

MAY 1987

TOYOKAWA, JAPAN

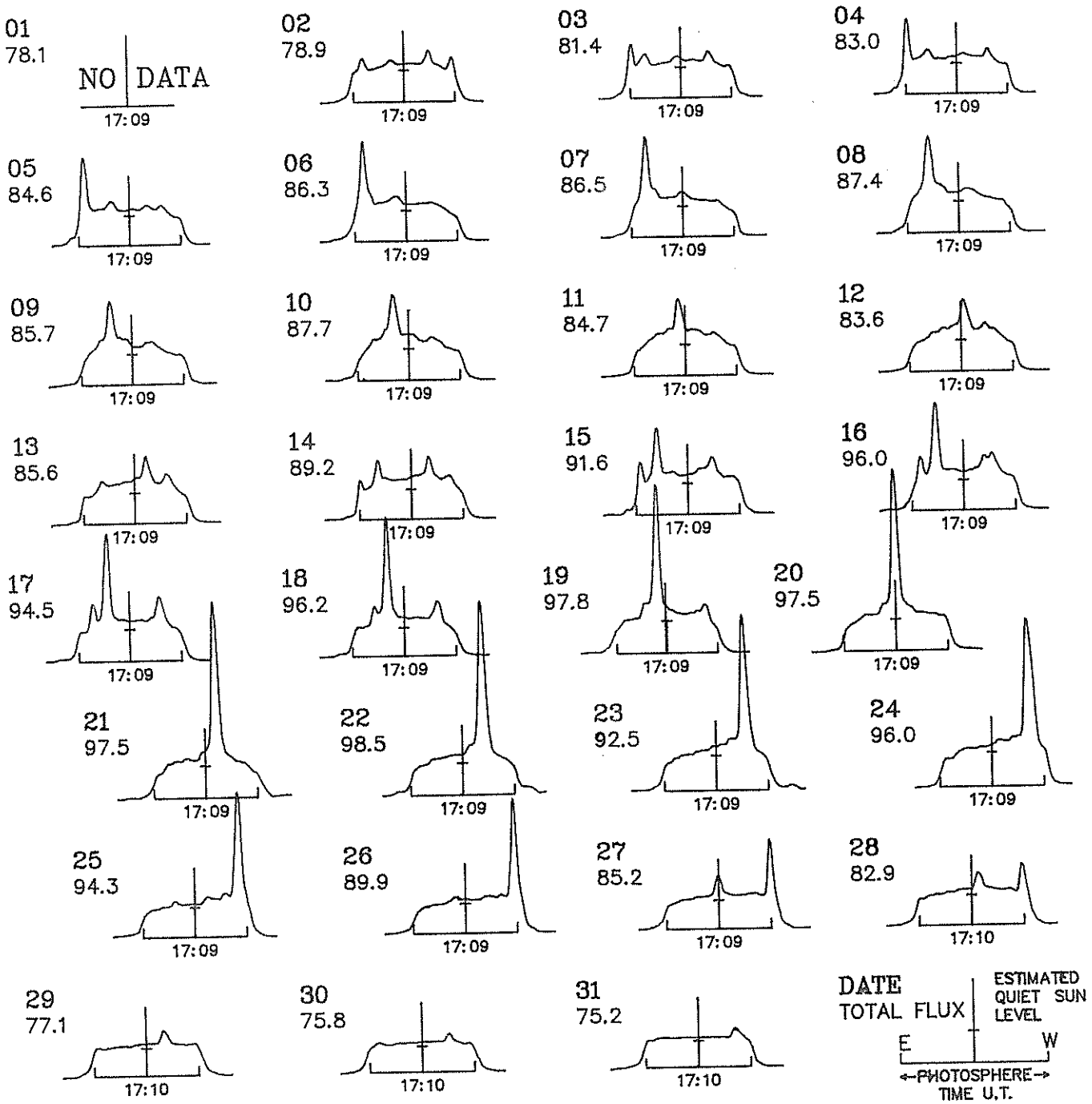
3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC



EAST – WEST SOLAR SCANS
MAY 1987

ALGONQUIN RADIO OBSERVATORY
CANADA

10.7 cm
Fan Beam with 1.5 minutes of arc
E – W Resolution

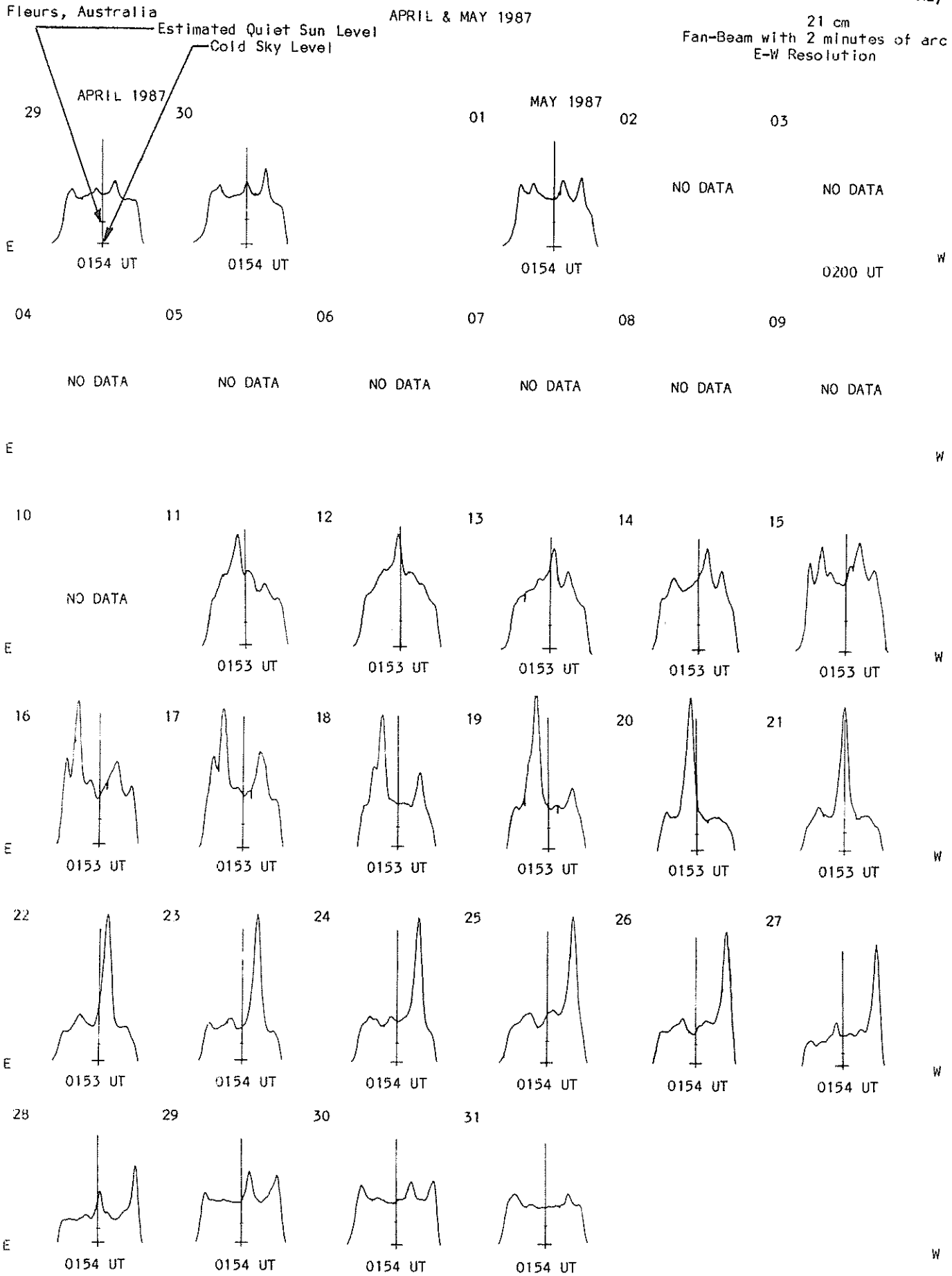


EAST-WEST SOLAR SCANS

Fleurs, Australia

APRIL & MAY 1987

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution

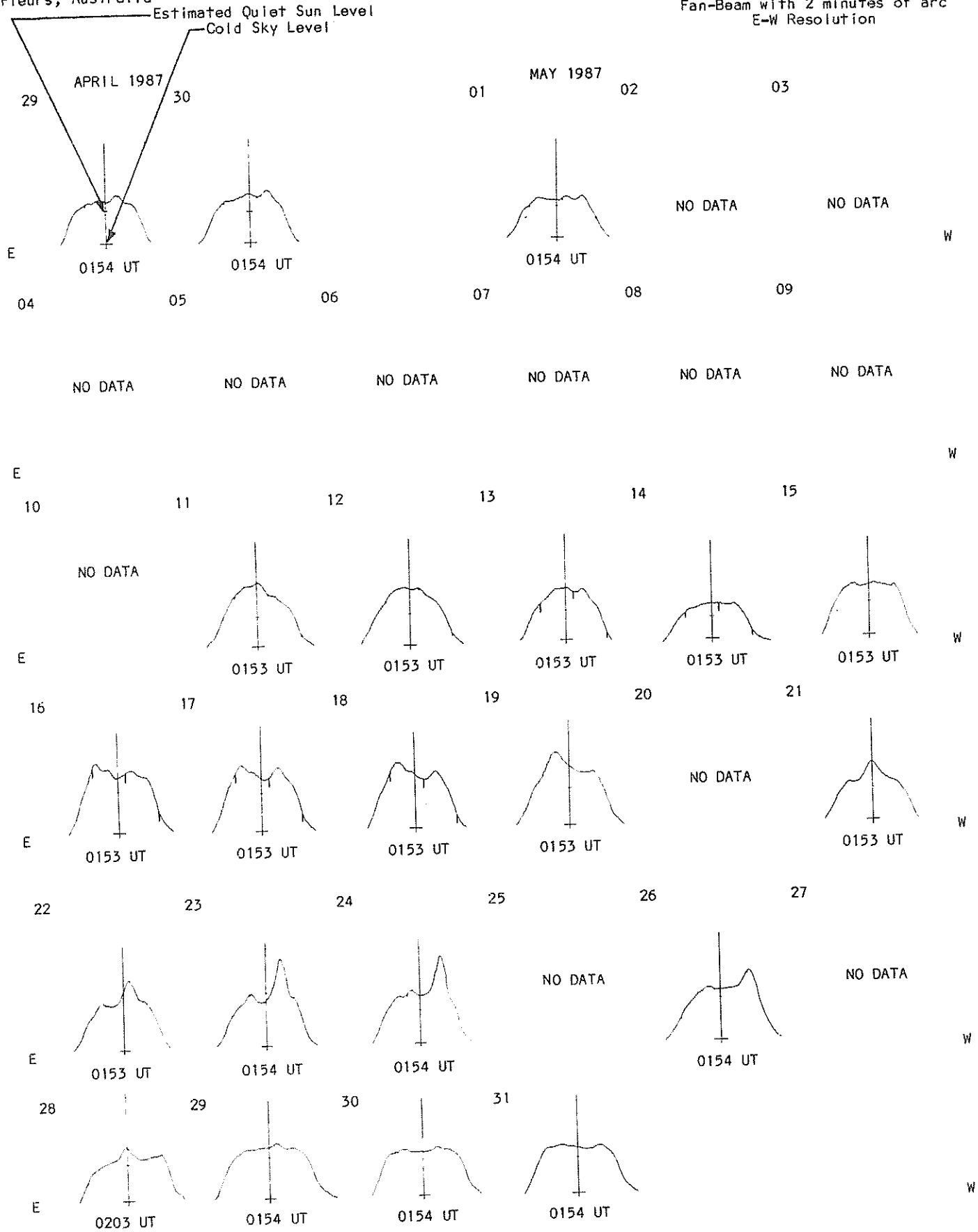


EAST-WEST SOLAR SCANS

APRIL & MAY 1987

Fleurs, Australia

43 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1987

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 -22 W/m 2 Hz)	Flux Density Mean (10 -22 W/m 2 Hz)	Int	Remarks
01	2800	OTTA	45	C	1858.0	1901.8	10.0	44.5	8.9		
	8800	PALE	8	S	1901.0E	1901.0	1.0D	18.0			QL=5 ST=2 TYP=3
	2695	SGMR	8	S	1901.0E	1901.0	1.0D	31.0			QL=5 ST=2 TYP=3
	2695	PALE	8	S	1901.0E	1901.0	1.0D	41.0			QL=5 ST=2 TYP=3
04	2800	OTTA	3	S	1940.4	1941.0	1.0	15.4	6.1		
13	2800	OTTA	1	S	2314.5	2315.0	3.5	4.7	1.4		
17	2695	SVTO	46	C	0837.0E	0848.0	24.0D	65.0			QL=5 ST=2 TYP=5
	2695	LEAR	46	C	0837.0E	0849.0	24.0D	78.0			QL=5 ST=2 TYP=5
	8800	SVTO	45	C	0841.0E	0844.0	26.0D	30.0			QL=5 ST=2 TYP=5
18	2800	OTTA	21	GRF	1633.5	1648.2	18.5	1.9	1.2		
	2800	OTTA	8	S	1642.2	1642.2	.3	2.9	2.9		
	8800	PALE	45	C	2320.0E	2322.0	5.0D	24.0			QL=5 ST=2 TYP=5
19	2800	OTTA	45	C	1225.5	1226.6	4.5	6.6	3.3		
	2800	OTTA	20	GRF	1251.6	1255.5	64.5	4.0	2.0		
	2800	OTTA	8	S	1251.7	1251.7	.2	6.8	6.1		
	2800	OTTA	8	S	1255.7	1255.7	.2	12.5	11.2		
	2800	OTTA	45	C	1759.5	1804.8	45.0	64.9	13.0		
	8800	PALE	8	S	1801.0E	1802.0	2.0D	40.0			QL=5 ST=2 TYP=3
	2695	SGMR	46	C	1803.0E	1805.0	6.0D	70.0			QL=5 ST=2 TYP=5
	2695	PALE	46	C	1803.0E	1805.0	5.0D	60.0			QL=5 ST=2 TYP=5
	8800	SGMR	46	C	1804.0E	1810.0	12.0D	68.0			QL=5 ST=2 TYP=5
	2800	OTTA	42	SER	2147.8	2148.2	20.0	5.2	2.6		
20	8800	SVTO	46	C	0940.0E	0941.0	11.0D	98.0			QL=5 ST=3 TYP=5
	2695	SVTO	4	S/F	0940.0E	0941.0	9.0D	40.0			QL=5 ST=3 TYP=3
	2800	OTTA	46F	C	1256.5	1334.9	90.0	43.9	8.8		
	8800	SVTO	8	S	1334.0E	1335.0	1.0D	35.0			QL=5 ST=2 TYP=3
	8800	SGMR	8	S	1334.0E	1335.0	1.0D	32.0			QL=5 ST=2 TYP=3
	2695	SGMR	8	S	1334.0E	1335.0	1.0D	30.0			QL=5 ST=2 TYP=3
	2695	SVTO	8	S	1334.0E	1335.0	1.0D	25.0			QL=5 ST=2 TYP=3
	2695	SGMR	46	C	1753.0E	1802.0		120.0			QL=1 ST=3 TYP=5
	2800	OTTA	46F	C	2118.5	2123.4	6.5	14.5	2.9		
	2695	PALE	4	S/F	2123.0E	2123.0	5.0D	18.0			QL=5 ST=2 TYP=3
21	2695	LEAR	46	C	0314.0E	0326.0	12.0D	59.0			QL=5 ST=2 TYP=5
	2695	LEAR	45	C	0315.0E	0326.0	20.0D	59.0			QL=5 ST=3 TYP=5
	2695	PALE	45	C	0317.0E	0325.0	11.0D	38.0			QL=5 ST=2 TYP=5
	8800	LEAR	45	C	0317.0E	0326.0	21.0D	50.0			QL=5 ST=3 TYP=5
	8800	PALE	45	C	0318.0E	0327.0	27.0D	45.0			QL=5 ST=2 TYP=5
	2695	LEAR	4	S/F	0342.0E	0344.0	6.0D	27.0			QL=5 ST=3 TYP=3
	2695	PALE	4	S/F	0343.0E	0344.0	4.0D	18.0			QL=5 ST=2 TYP=3
	8800	SVTO	4	S/F	0844.0E	0844.0		52.0			QL=5 ST=1 TYP=5
	2695	LEAR	8	S	0844.0E	0844.0	2.0D	10.0			QL=5 ST=2 TYP=3
	8800	LEAR	4	S/F	0844.0E	0844.0	7.0D	42.0			QL=5 ST=2 TYP=3
	2695	SVTO	8	S	0909.0E	0910.0	1.0D	25.0			QL=5 ST=2 TYP=3
	8800	SVTO	8	S	0909.0E	0910.0	1.0D	23.0			QL=5 ST=2 TYP=3
	2695	LEAR	8	S	0909.0E	0910.0	1.0D	19.0			QL=5 ST=2 TYP=3
	2800	OTTA	45	C	1752.0	1838.8	128.0	14.2	4.3		
	2695	SGMR	46	C	2003.0E	2004.0	11.0D	110.0			QL=1 ST=2 TYP=5
	2695	SGMR	8	S	2212.0E	2213.0	1.0D	22.0			QL=5 ST=2 TYP=3
	2800	OTTA	42	SER	2212.7	2213.2	47.0	16.4	3.3		
	8800	SGMR	8	S	2213.0E	2213.0	1.0D	39.0			QL=5 ST=2 TYP=3
22	8800	SVTO	20	GRF	1232.0E	1237.0	23.0D	36.0			QL=5 ST=2 TYP=2
	2800	OTTA	1	S	2129.8	2130.3	1.2	9.6	3.9		
	2695	SGMR	8	S	2131.0E	2132.0	2.0D	6.0			QL=5 ST=2 TYP=3
23	2800	OTTA	20	GRF	1141.0	1143.2	19.0	4.5	2.3		
24	2695	SVTO	4	S/F	0905.0E	0906.0	4.0D	23.0			QL=5 ST=2 TYP=3
	2695	LEAR	4	S/F	0906.0E	0906.0	25.0D	23.0			QL=5 ST=2 TYP=3
	2695	SGMR	4	S/F	1206.0E	1206.0	149.0D	14.0			QL=5 ST=2 TYP=3
	2800	OTTA	21	GRF	1211.0E	1211.0	670.0D	5.6	2.9		
	2800	OTTA	45	C	1237.0	1239.5	20.0	12.6	5.0		
	2695	SGMR	4	S/F	1243.0E	1243.0	714.0D	13.0			QL=5 ST=2 TYP=3
	8800	SGMR	8	S	1524.0E	1524.0	1.0D	49.0			QL=5 ST=3 TYP=3

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1987

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
24	8800	SVTO	8	S	1524.0E	1525.0	1.0D	36.0			QL=5 ST=2 TYP=3
	2695	SVTO	46	C	1524.0E	1525.0	1.0D	68.0			QL=5 ST=2 TYP=5
	2695	SGMR	46	C	1524.0E	1525.0	2.0D	63.0			QL=5 ST=3 TYP=5
	2800	OTTA	3	S	1524.5	1525.2	5.5	65.7	32.8		
	2800	OTTA	29	PBI	1530.0	1530.0	30.0	69.5	4.7		
	2800	OTTA	41	F	1920.5	1922.0	6.5	6.4	2.6		
25	8800	LEAR	4	S/F	0340.0E	0341.0	3.0D	24.0			QL=5 ST=2 TYP=3
	2695	SYDN	8	S	0437.0	0438.0	2.0	10.0			QL= ST= TYP=3
	2800	OTTA	22	GRF	1316.5	1323.6	22.0	7.2	3.6		
	8800	SGMR	8	S	1321.0E	1321.0	1.0D	27.0			QL=5 ST=2 TYP=3
	2800	OTTA	20	GRF	1342.3	1344.0	12.5	4.0	2.0		
	8800	SGMR	4	S/F	1532.0E	1532.0		24.0			QL=5 ST=2 TYP=3
	2800	OTTA	42	SER	1757.5	1802.5	88.0	2.4	1.0		
	2695	SGMR	46	C	2246.0E	2249.0	74.0D	81.0			QL=5 ST=1 TYP=5
	2695	SGMR	46	C	2256.0E	2257.0	2.0D	130.0			QL=5 ST=2 TYP=5
	2695	SGMR	46	C	2300.0E	2304.0	9.0D	180.0			QL=5 ST=2 TYP=5
26	2695	SYDN	4	S/F	0004.0	0006.0	33.0	14.0			QL= ST= TYP=3
	2695	PALE	8	S	0006.0E	0006.0	1.0D	20.0			QL=5 ST=2 TYP=3
	8800	PALE	46	C	0033.0E	0034.0		57.0			QL=5 ST=1 TYP=5
	8800	LEAR	46	C	0033.0E	0034.0	2.0D	69.0			QL=5 ST=2 TYP=5
	2695	LEAR	4	S/F	0034.0E	0034.0		14.0			QL=5 ST=2 TYP=3
	8800	PALE	8	S	0435.0E	0436.0	1.0D	30.0			QL=1 ST=2 TYP=3
	2800	OTTA	8	S	1720.0	1720.1	.1	4.7	4.7		
	2800	OTTA	45	C	1939.5	1945.9	10.5	16.2	4.1		
28	2800	OTTA	20	GRF	1050.0E	1232.0	160.0D	3.7	1.1		
29	2800	OTTA	20	GRF	2015.0	0147.4	330.0	5.3	2.1		

Observatories

ATHN = Athens
BERN = Berne
LEAR = Learmonth
MANI = Manila
OTTA = Ottawa
PALE = Palehua
PENT = Penticton
SGMR = Sagamore Hill
SVTO = San Vito

Explanation of Type Code:

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

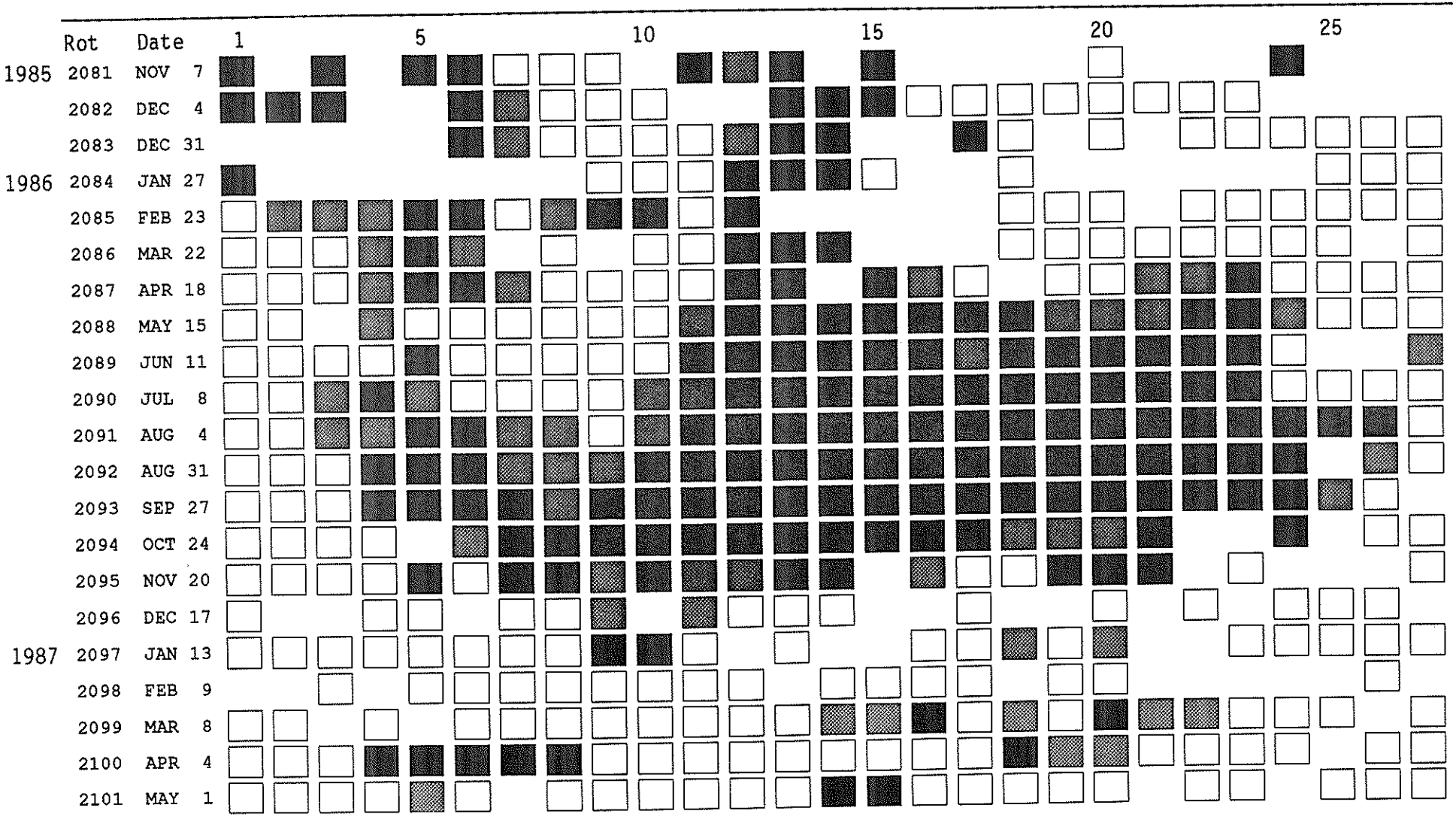
Remarks:
QL = Quality (1=poor to 6=excellent)
ST = Status (1=real time; 2=final; 3=correction; 4=deletion)
TYP= Type (1=noise storm;2=rise in base level;3=minor;4=group;5=major;6=major plus;7=Castelli U-type burst)

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

Day	1986 Jun	Jul	Aug	Sep	Oct	Nov	Dec	1987 Jan	Feb	Mar	Apr	May
1	-6	-6	3	4	-7	-11	-1	•	1	•	10	14
2	-2	-5	7	5	-7	-11	-10	11	•	•	•	17
3	1	-7	4	-6	-6	-12	-11	•	•	•	8	11
4	-1	2	10	-6	1	-5	•	•	9	•	13	5
5	-4	•	10	-3	-7	-10	0	6	10	•	10	0
6	-4	•	0	0	-6	-7	20	•	14	9	2	3
7	0	-1	-2	-2	-12	-7	4	9	16	•	-5	•
8	6	10	-5	-1	-15	-5	-9	•	15	14	-14	6
9	4	4	-4	-9	-11	-4	-4	12	•	15	-13	6
10	11	1	-2	-14	-15	-2	-5	13	•	•	-12	5
11	5	-5	1	-16	-18	-2	•	16	10	10	-5	20
12	11	0	3	-17	-10	-2	4	•	•	•	5	17
13	4	3	-1	-18	-8	-5	•	20	14	10	18	5
14	3	5	-12	-19	-9	•	•	25	8	23	30	-6
15	-3	5	-17	-15	-10	•	•	23	7	18	30	-4
16	6	2	-21	-10	-10	-21	14	17	15	22	25	2
17	6	-2	-23	-11	-15	•	23	13	13	22	19	4
18	6	-2	-21	-11	-21	6	•	11	11	17	13	3
19	6	-7	-18	-13	-10	13	•	15	12	13	6	4
20	6	-23	-13	-14	-7	19	22	11	11	7	2	7
21	-4	-21	-14	-15	1	34	6	-6	•	-1	-3	•
22	-19	-26	-13	-13	7	29	•	-4	2	1	-2	19
23	-23	-16	-15	-9	•	15	9	9	2	-3	1	21
24	-16	-12	-8	•	33	-3	8	•	5	2	2	•
25	-11	-8	-16	1	14	3	0	7	4	0	6	3
26	-8	-7	-9	4	11	-9	•	•	•	3	8	8
27	-2	-4	-9	6	6	-8	1	•	4	-3	10	8
28	-4	-5	-8	9	•	0	9	3	6	-2	•	12
29	-3	-3	-3	3	-1	-12	3	5		-1	12	17
30	-3	-22	5	-3	-6	-2	5	-2		7	12	16
31		2	12		-9		•	5		12		4

Dot symbol indicates no data available for the day.

STANFORD MEAN SOLAR MAGNETIC FIELD



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

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

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

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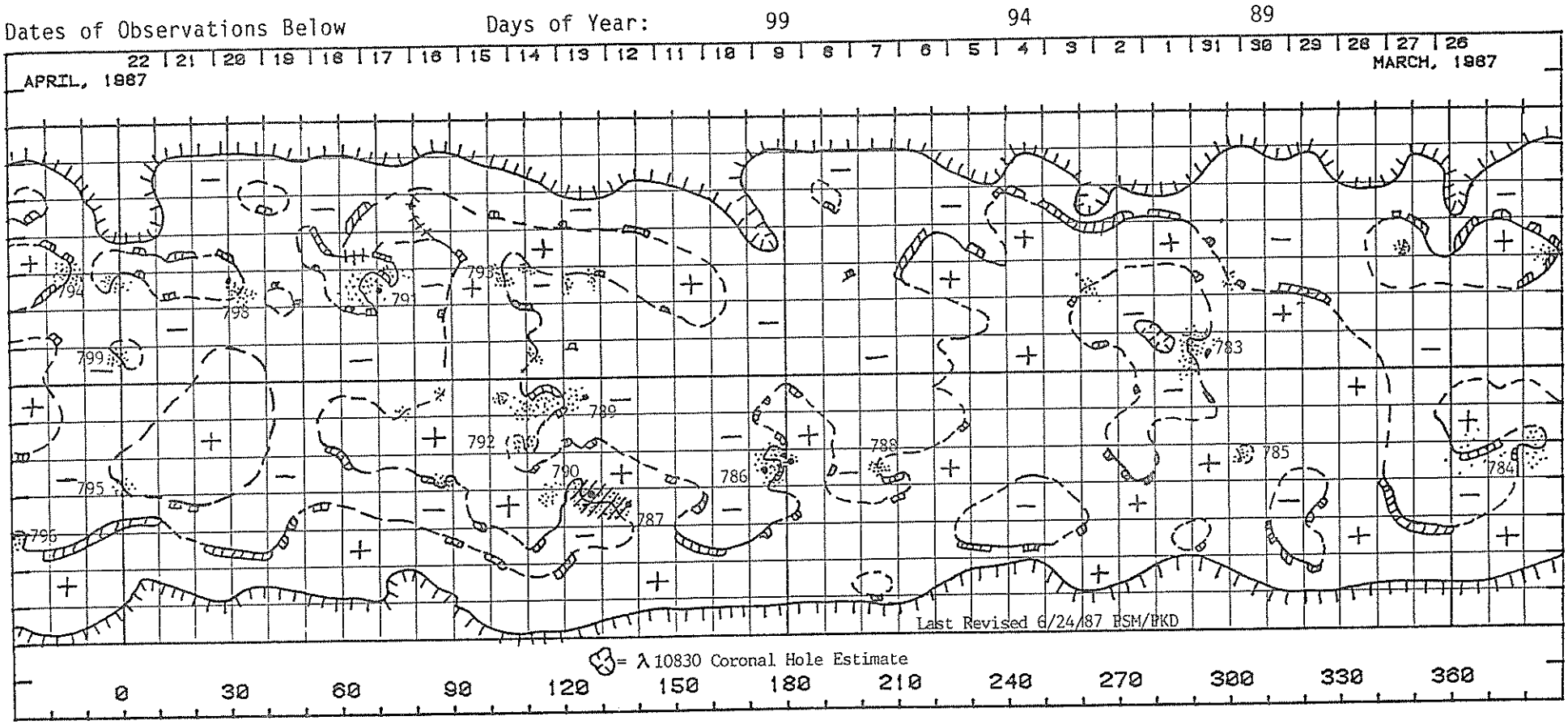
CARRINGTON ROTATION NUMBER 1787
(26 March to 23 April 1987)



Heliographic Longitude

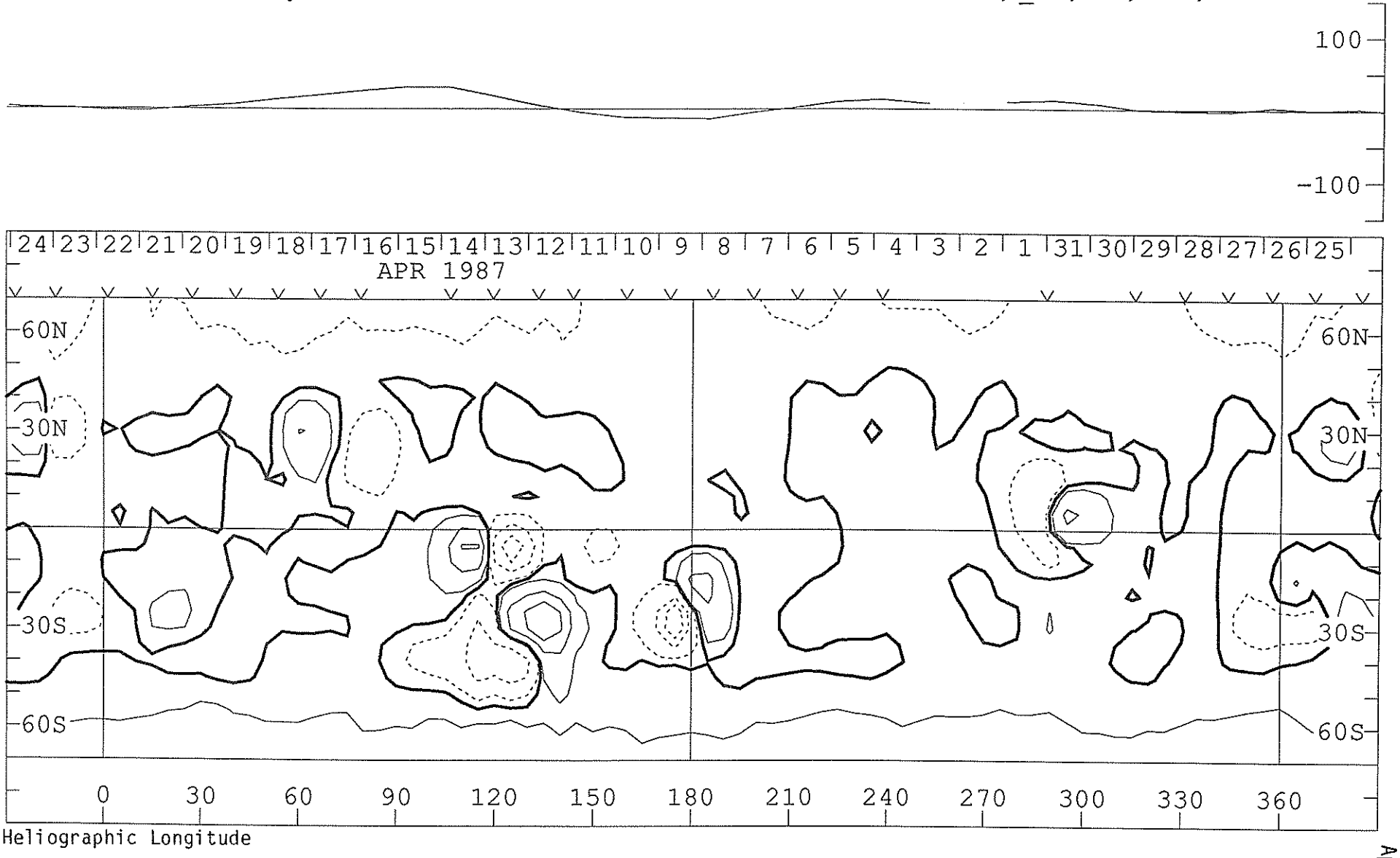
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1787

(26 March to 23 April 1987)

Stanford Solar Observatory

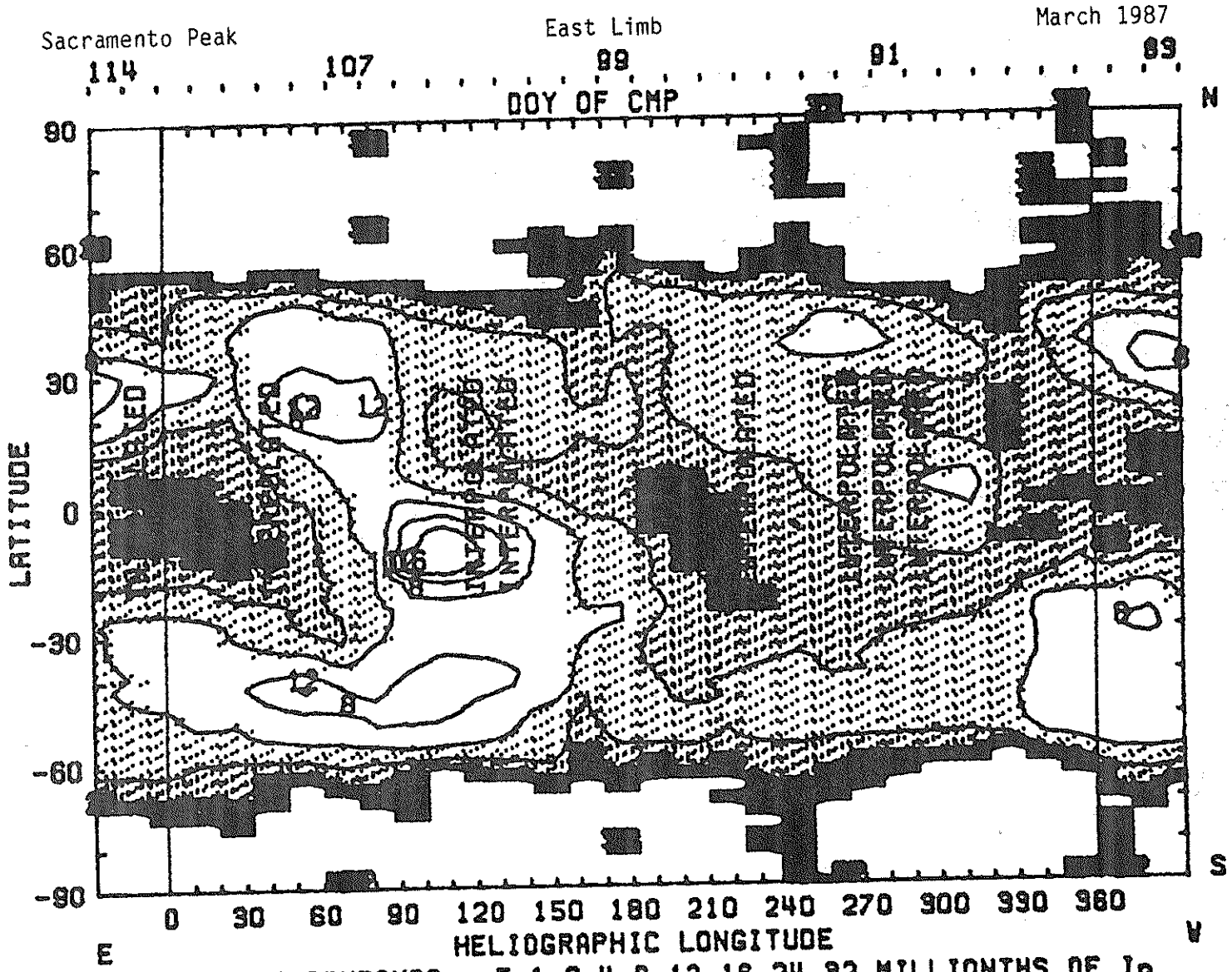
0, ±100, 500, 1000, 2000 microTesla



31
Apr 87

CORONAL GREEN LINE SYNOPTIC MAP

CARRINGTON ROTATION NUMBER 1787
(26 March to April 23 1987)

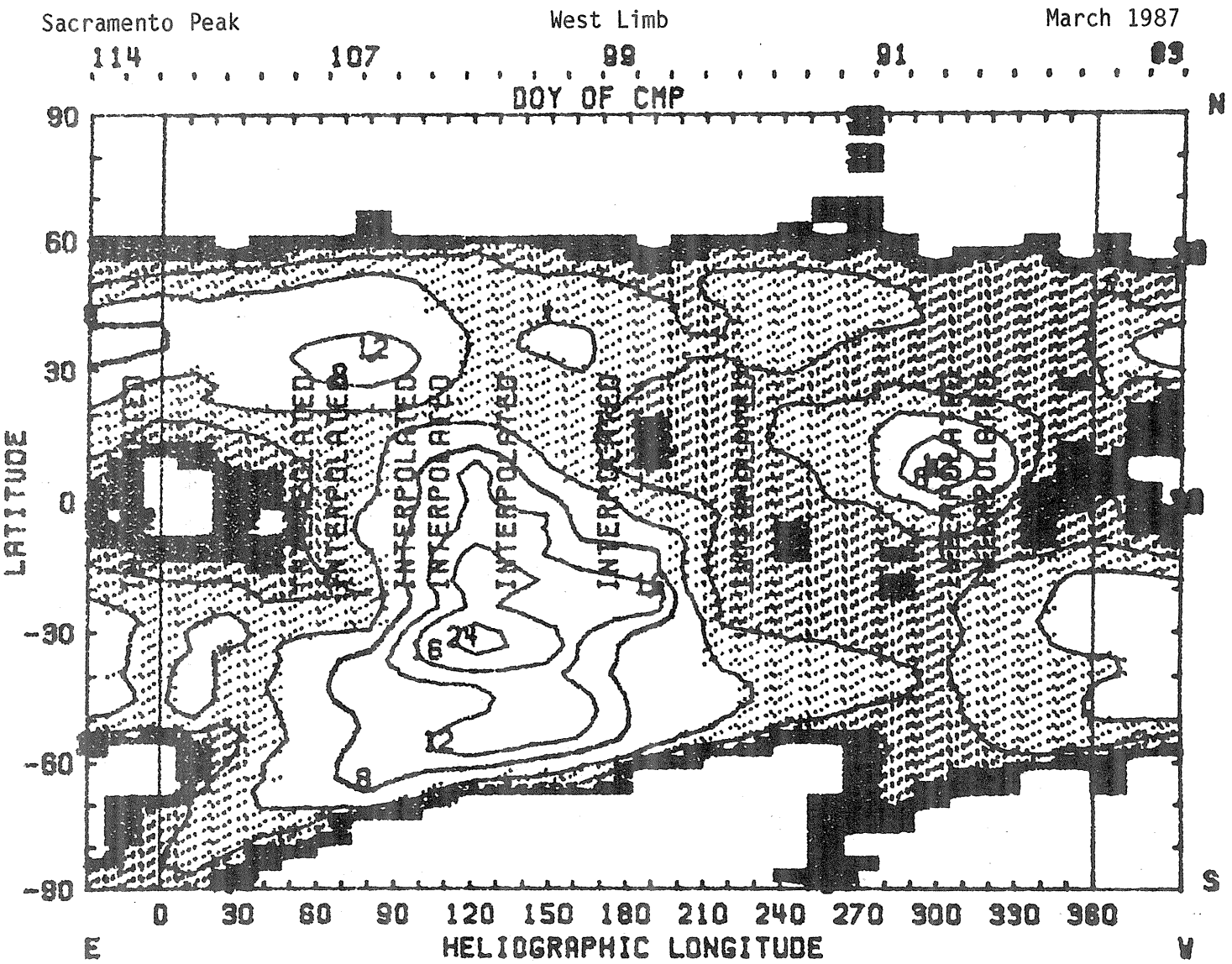


1987 E LIMB CONTOURS: .5,1,2,4,8,12,16,24,32 MILLIONTHS OF Io
CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK

CORONAL GREEN LINE SYNOPTIC MAP

CARRINGTON ROTATION NUMBER 1787

(26 March to 23 April 1987)



1987 W LIMB CONTOURS: .5,1,2,4,8,12,16,24,32 MILLIONTHS OF Io

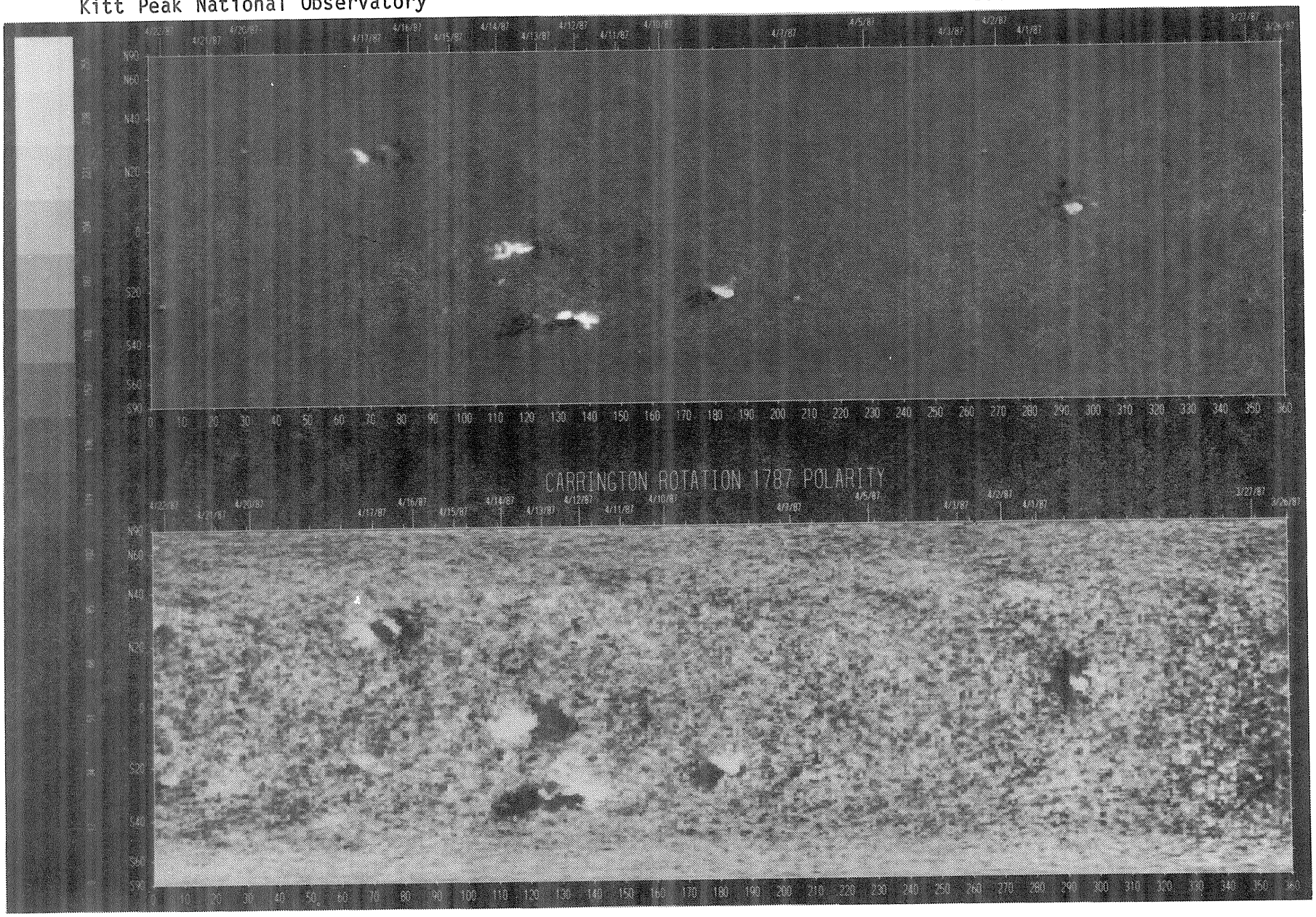
CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK

SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1787
(26 March to 23 April 1987)

Kitt Peak National Observatory

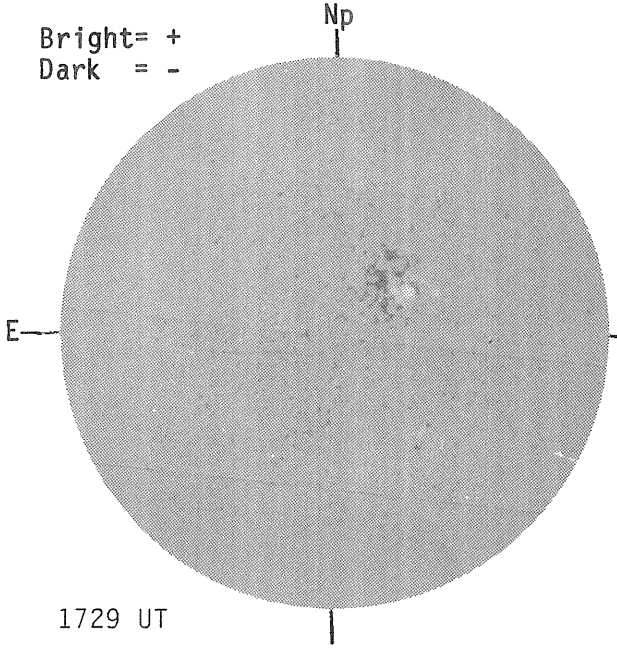
Dates of Observations



A P R I L 01, 1 9 8 7 (P=-26.09, B_0=-6.48, L_0= 290.49)

KITT PEAK MAGNETOGRAM

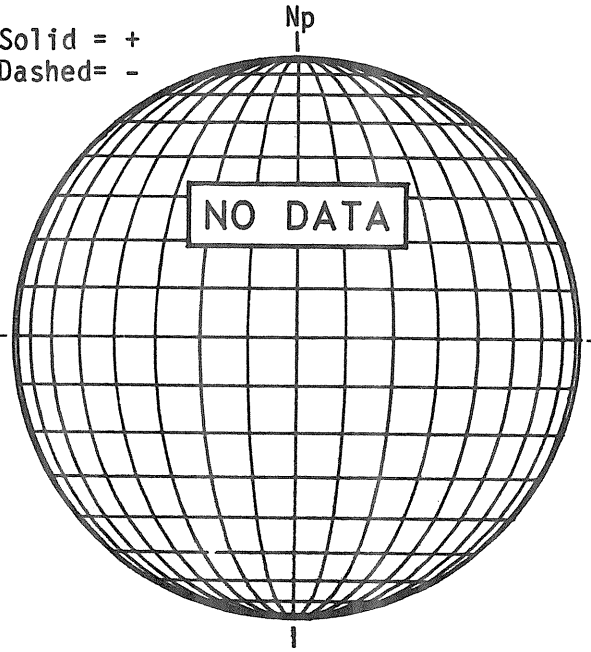
Bright= +
Dark = -



1729 UT

STANFORD MAGNETOGRAM

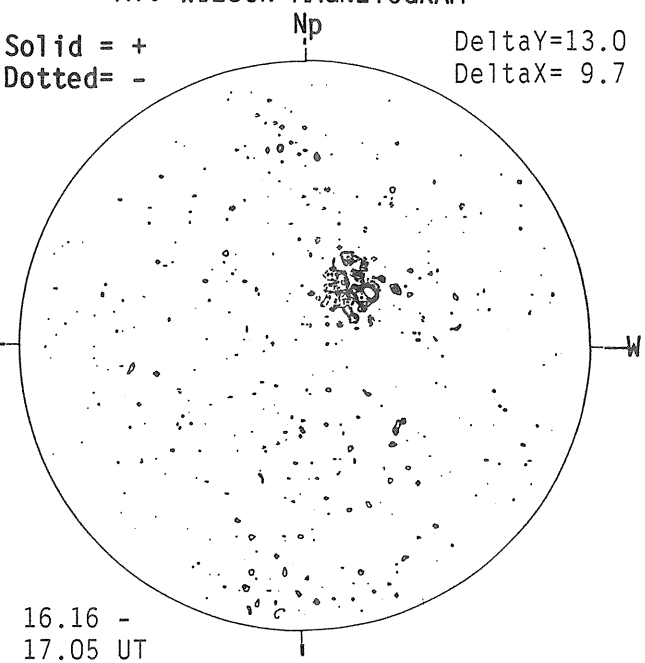
Solid = +
Dashed= -



MT. WILSON MAGNETOGRAM

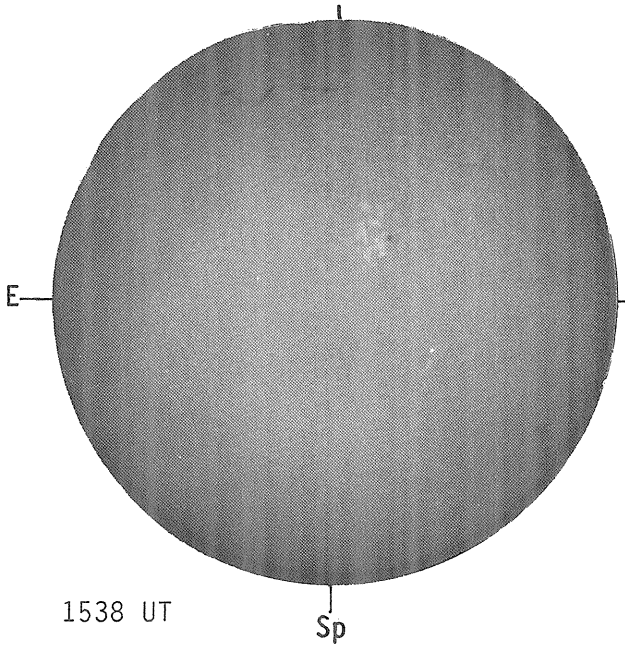
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.7



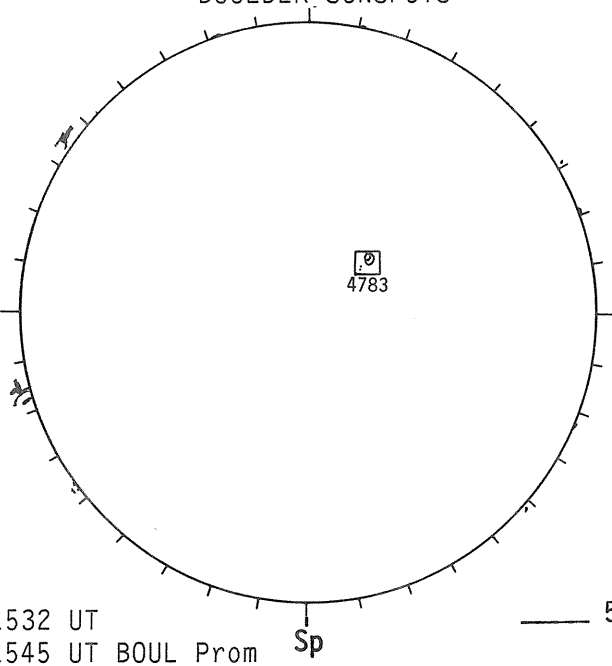
16.16 -
17.05 UT

SACRAMENTO PEAK H-ALPHA



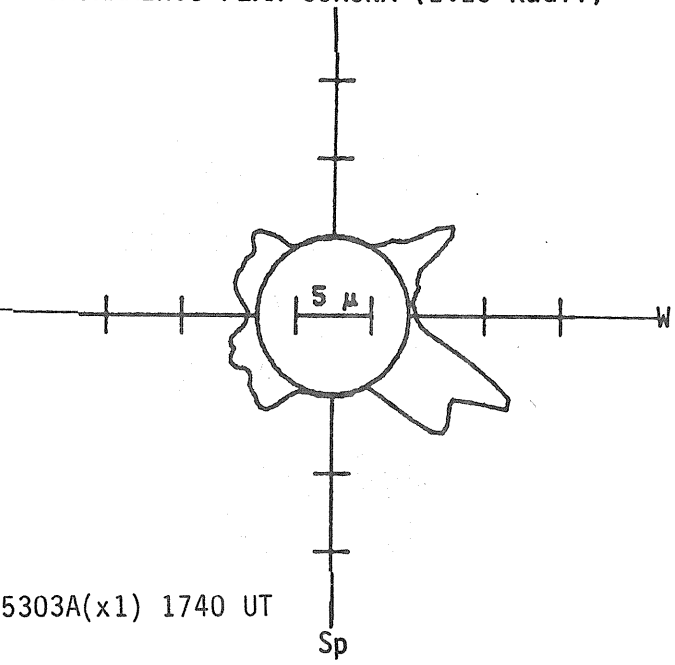
1538 UT

BOULDER SUNSPOTS



1532 UT
1545 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

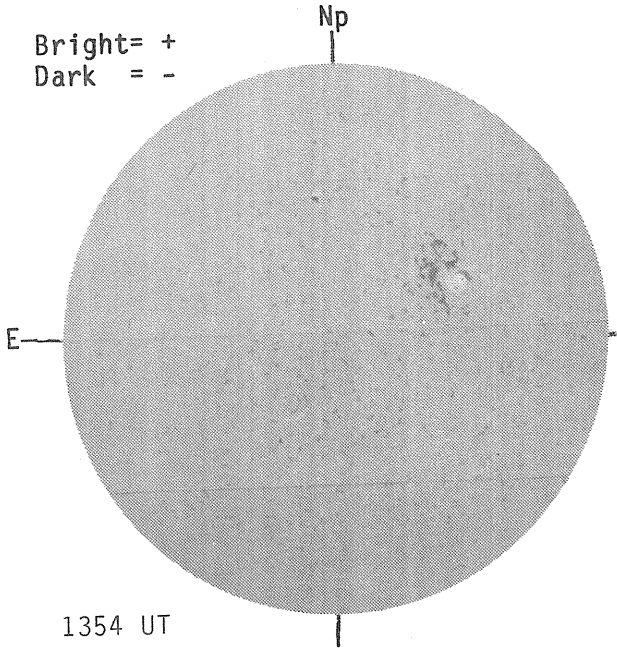


—— 5303A(x1) 1740 UT

A P R I L 02, 1 9 8 7 (P=-26.13, B_0=-6.43, L_0= 277.29)

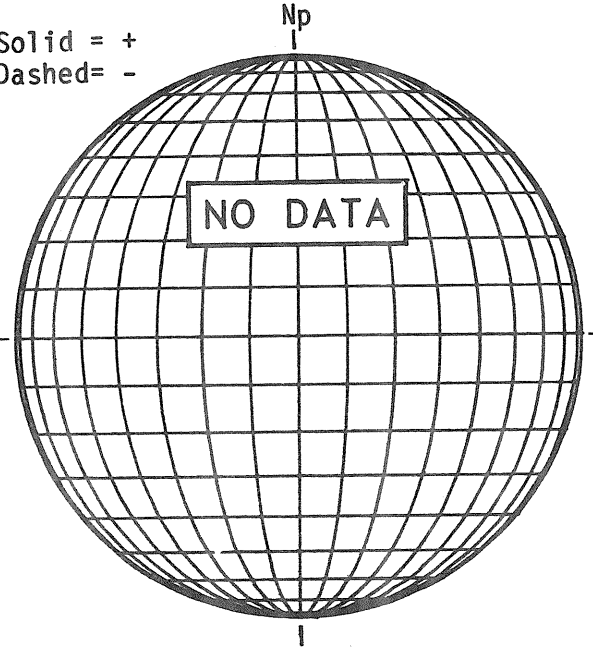
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

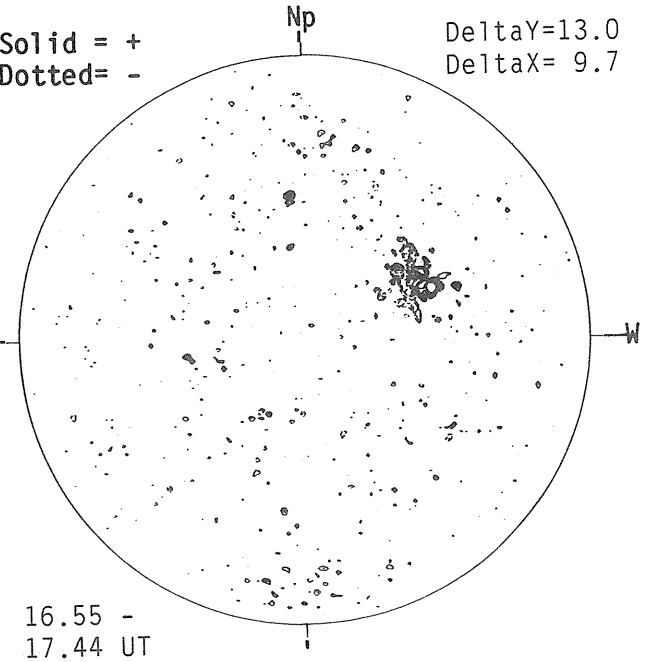
Solid = +
Dashed= -



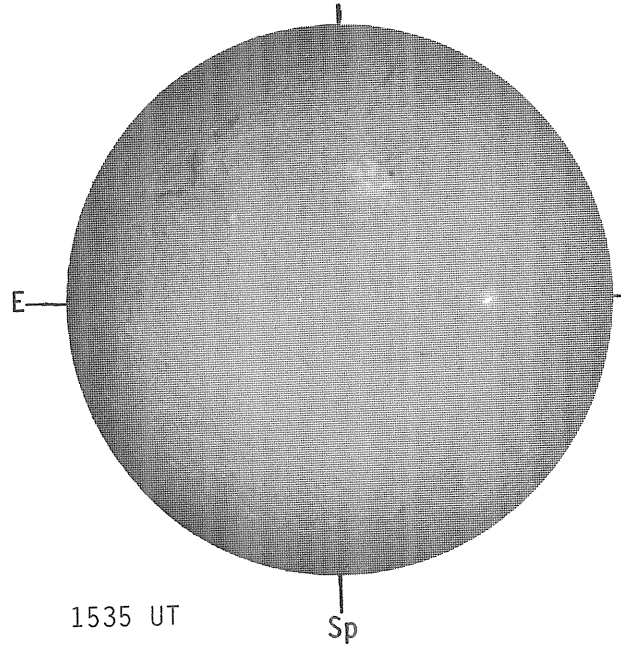
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

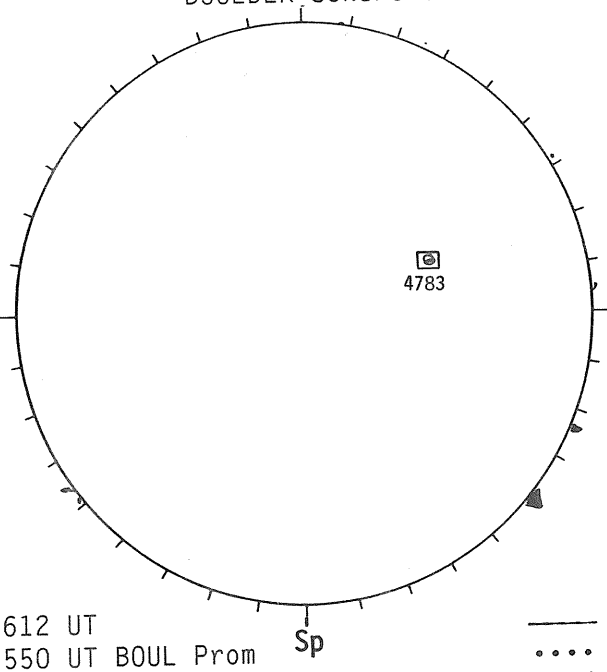
DeltaY=13.0
DeltaX= 9.7



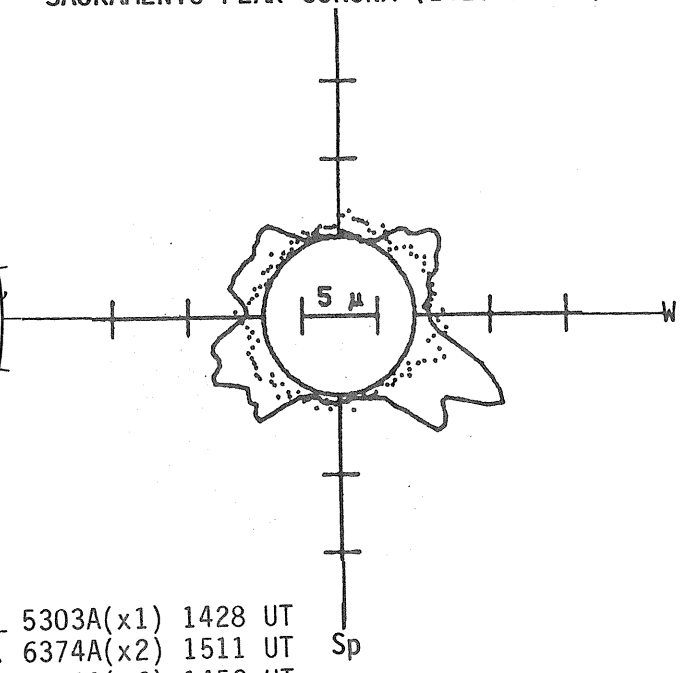
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

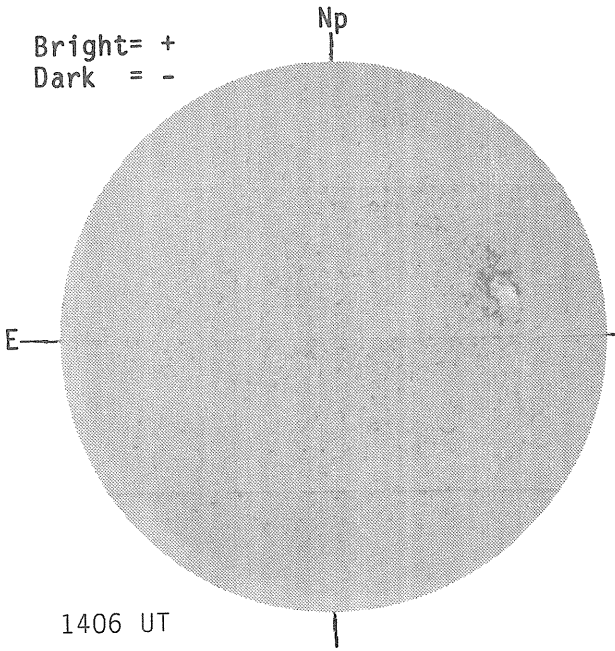


—— 5303A(x1) 1428 UT
.... 6374A(x2) 1511 UT
xxxx 5694A(x6) 1452 UT
NO 5694A ACTIVITY TODAY

A P R I L 03, 1 9 8 7 (P=-26.16, B_0=-6.38, L_0= 264.10)

KITT PEAK MAGNETOGRAM

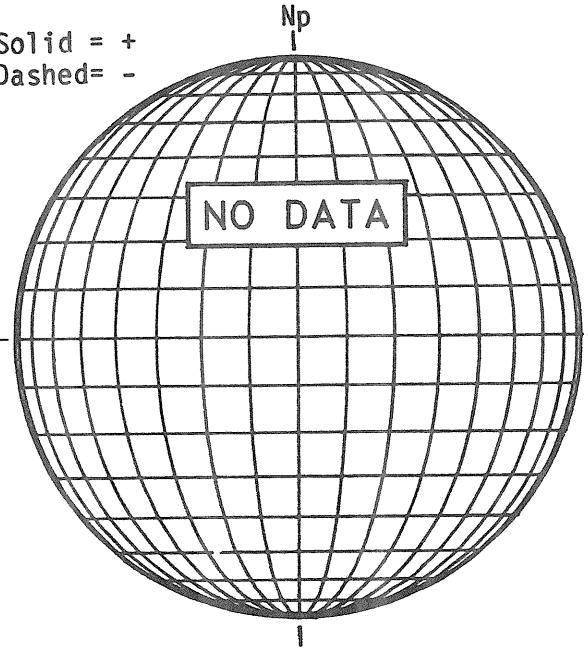
Bright= +
Dark = -



1406 UT

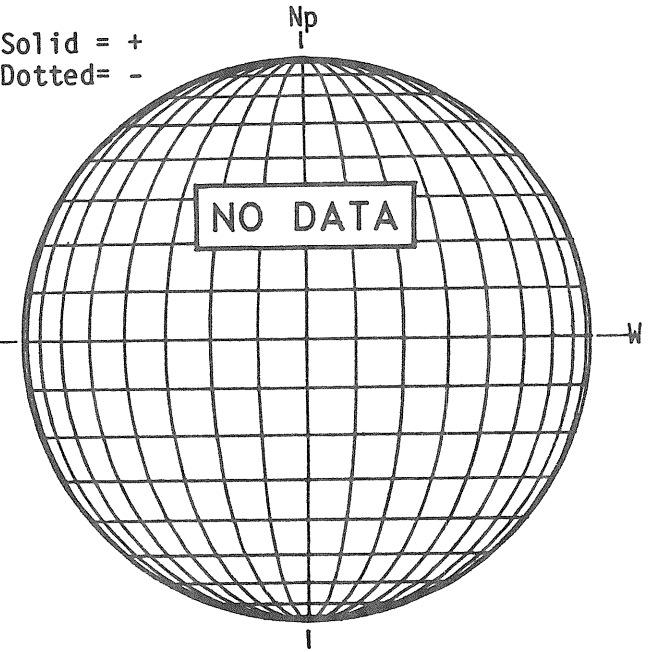
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

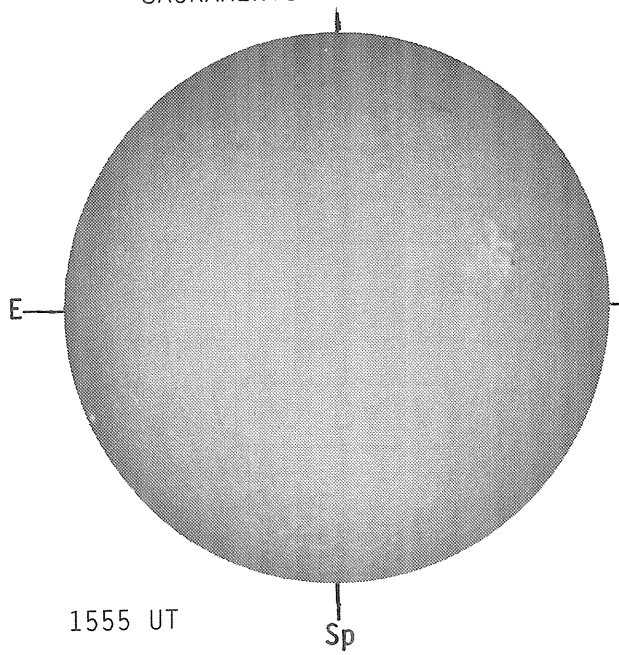


MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

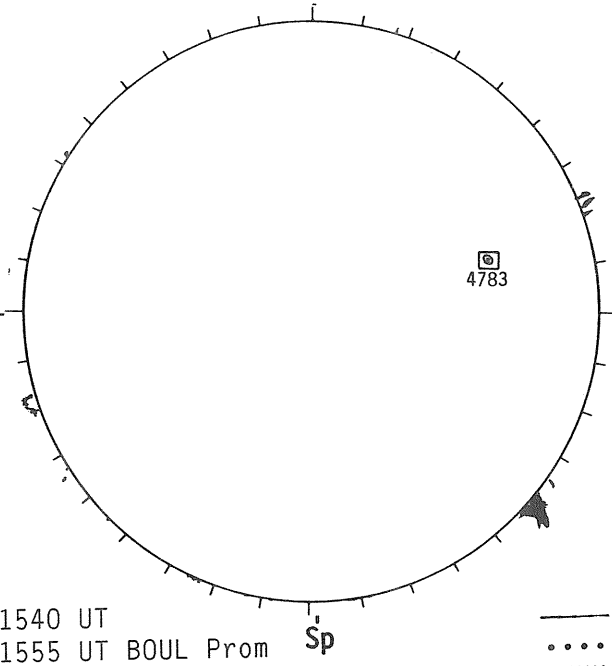


SACRAMENTO PEAK H-ALPHA



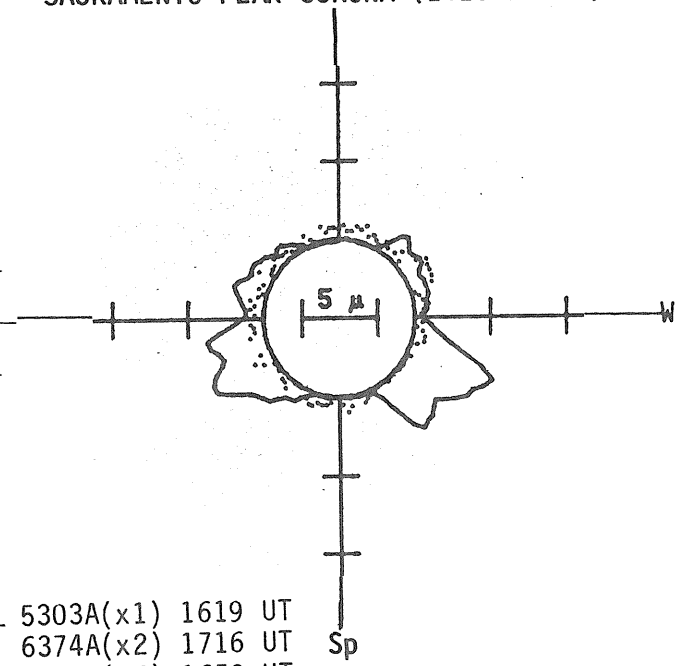
1555 UT

BOULDER SUNSPOTS



1540 UT
1555 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



—— 5303A(x1) 1619 UT
.... 6374A(x2) 1716 UT
xxxx 5694A(x6) 1659 UT
NO 5694A ACTIVITY TODAY

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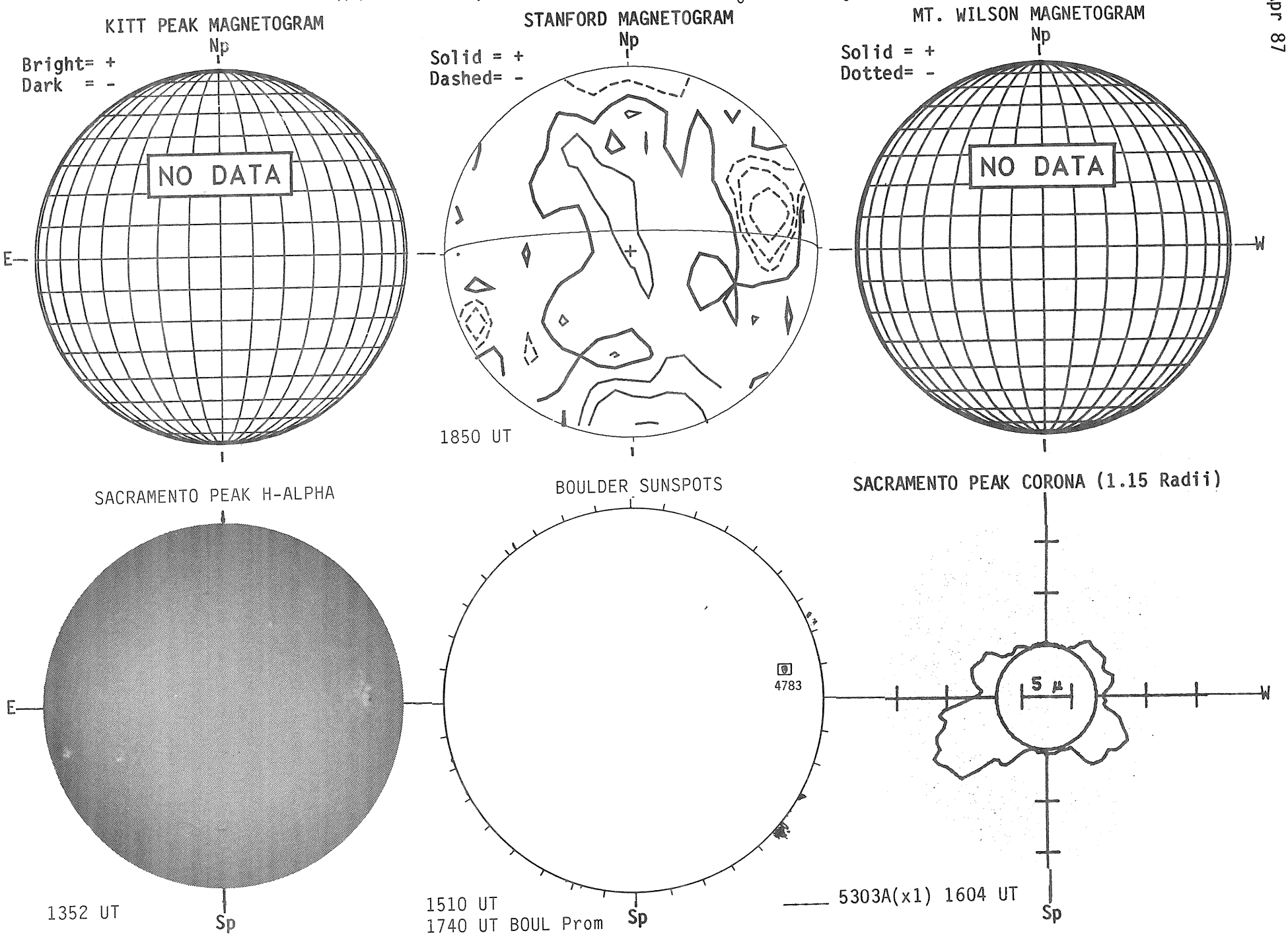
Apr 87

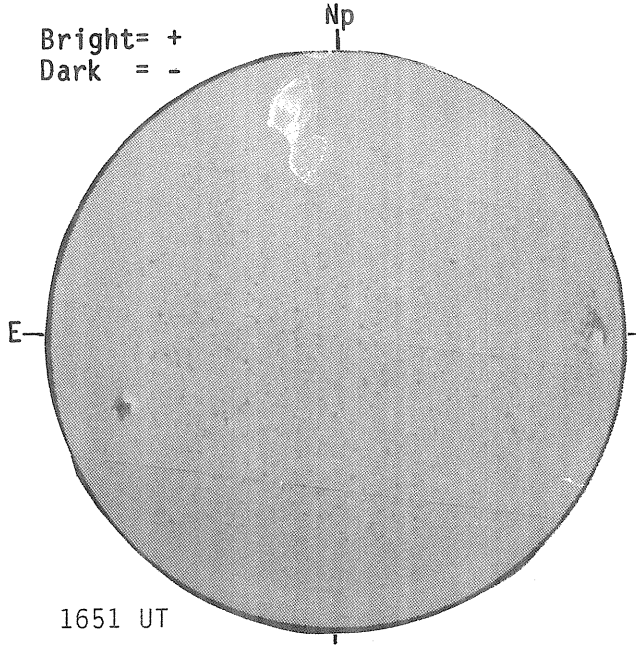
A P R I L 04, 1 9 8 7 (P=-26.19, B_0=-6.32, L_0= 250.91)



A P R I L 05, 1 9 8 7 (P=-26.21, B_0=-6.26, L_0= 237.71)

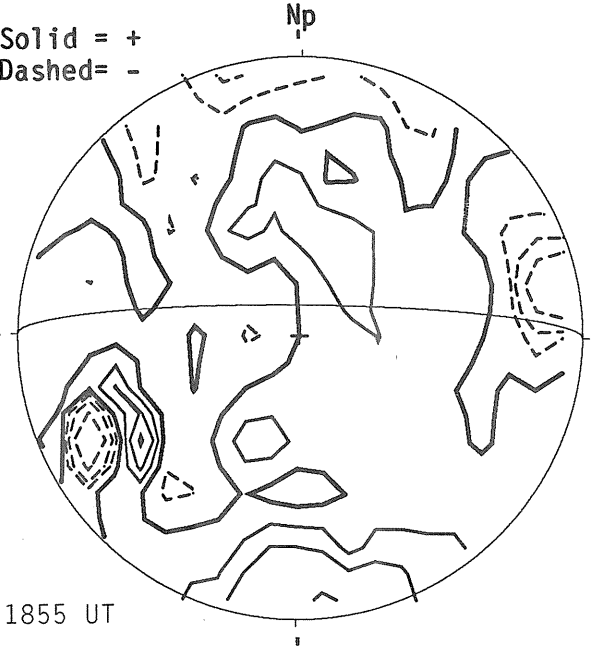
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

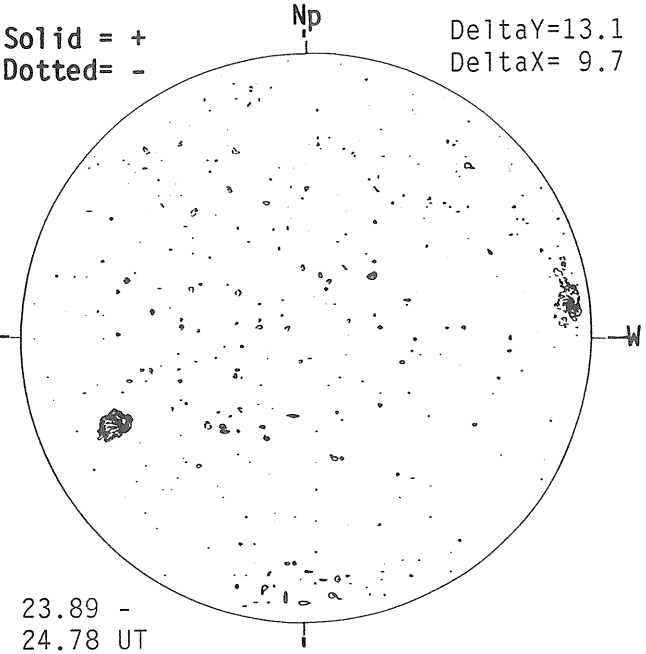
Solid = +
Dashed= -



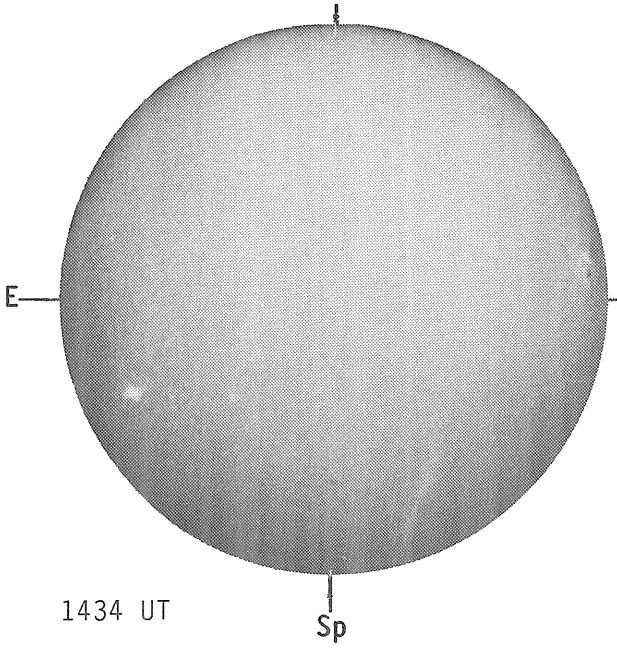
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

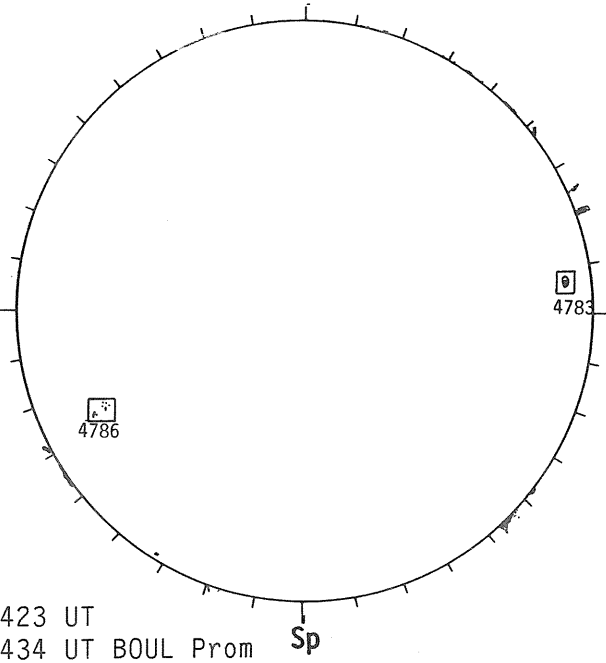
DeltaY=13.1
DeltaX= 9.7



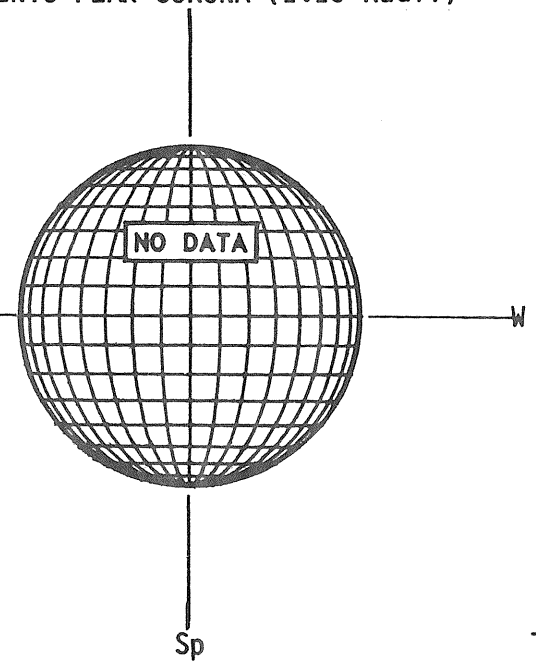
BOULDER H-ALPHA



BOULDER SUNSPOTS



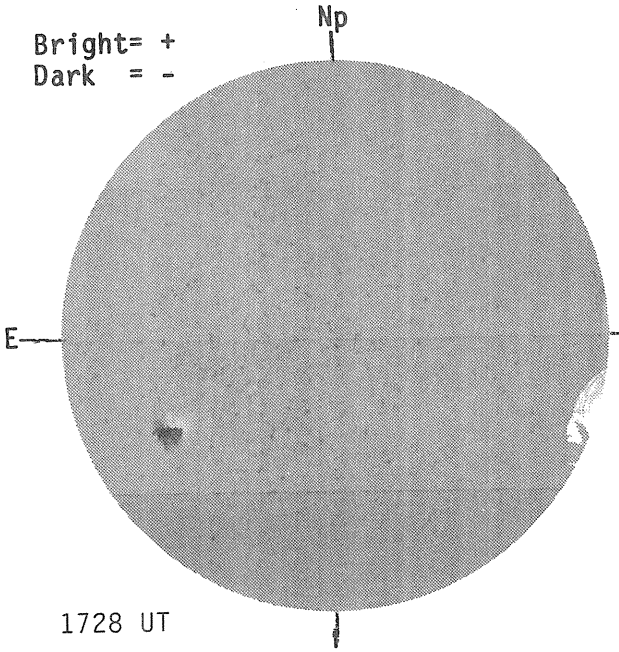
SACRAMENTO PEAK CORONA (1.15 Radii)



A P R I L 06, 1 9 8 7 (P=-26.22, B_0=-6.20, L_0= 224.52)

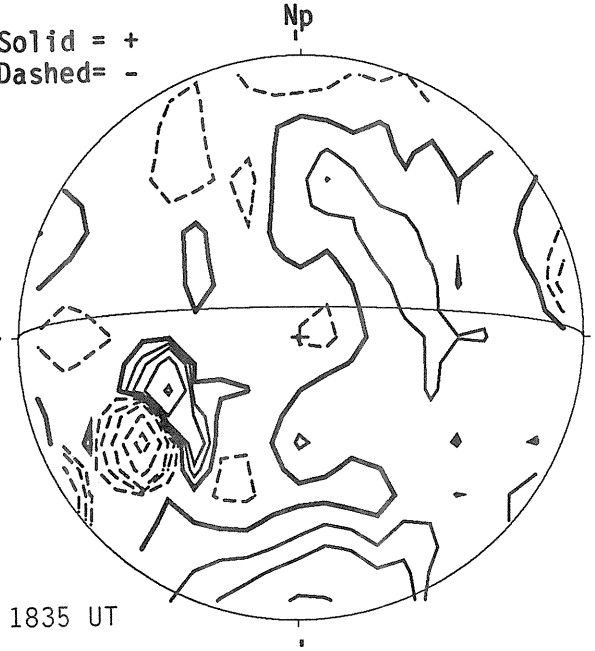
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

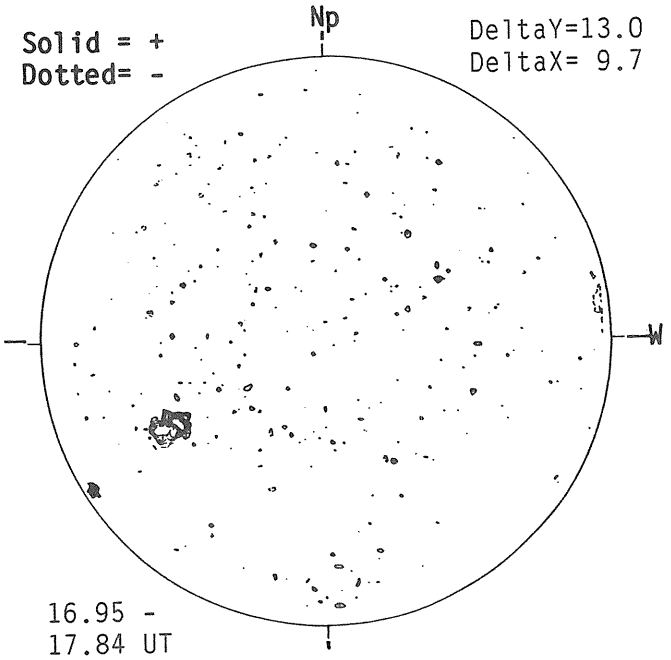
Solid = +
Dashed= -



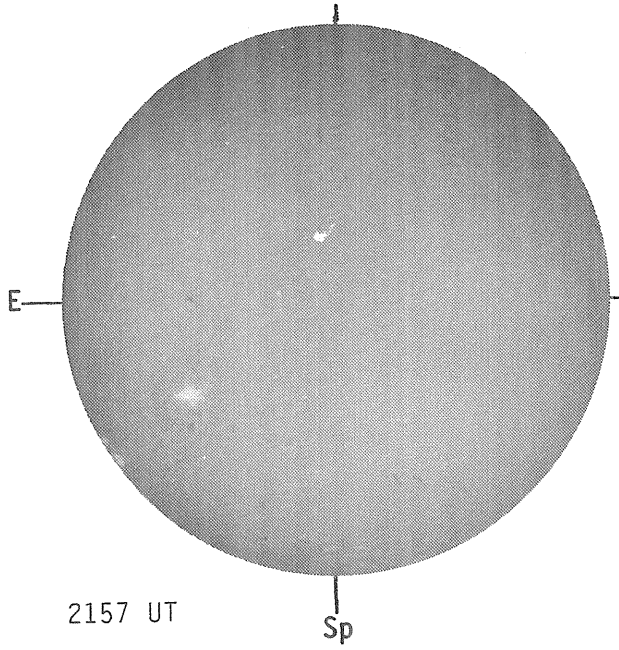
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

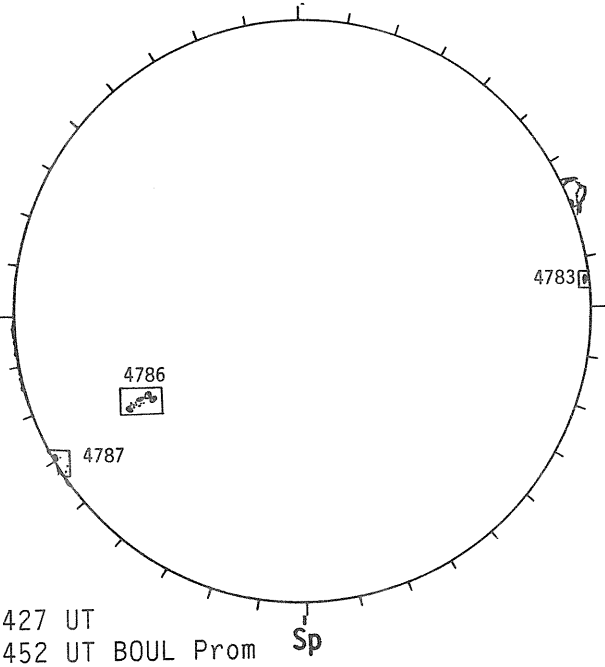
DeltaY=13.0
DeltaX= 9.7



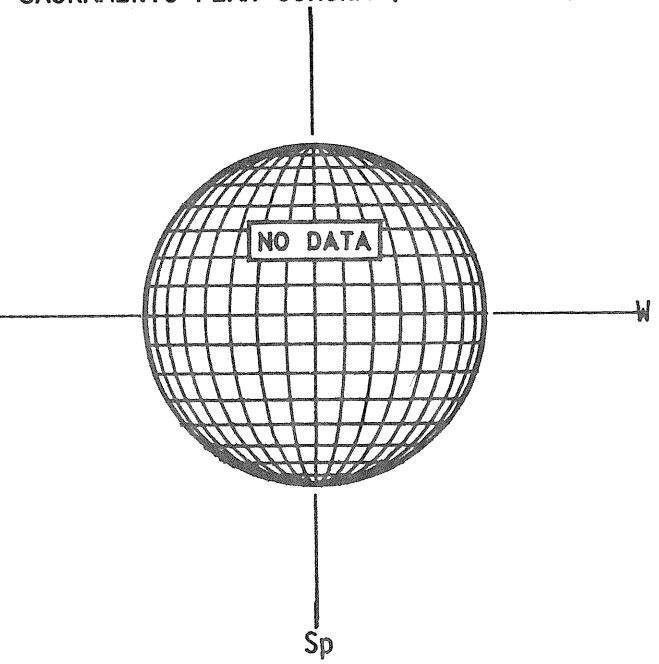
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



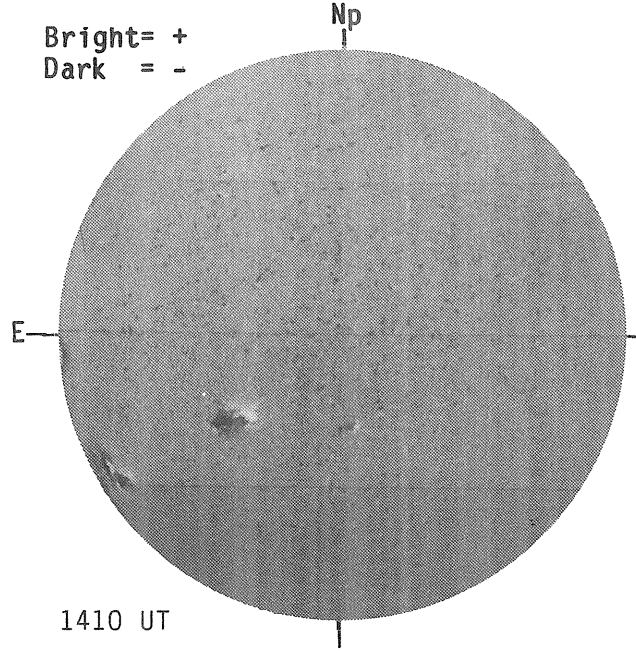
SACRAMENTO PEAK CORONA (1.15 Radii)



A P R I L 07, 1 9 8 7 (P=-26.23, B_0=-6.14, L_0= 211.32)

KITT PEAK MAGNETOGRAM

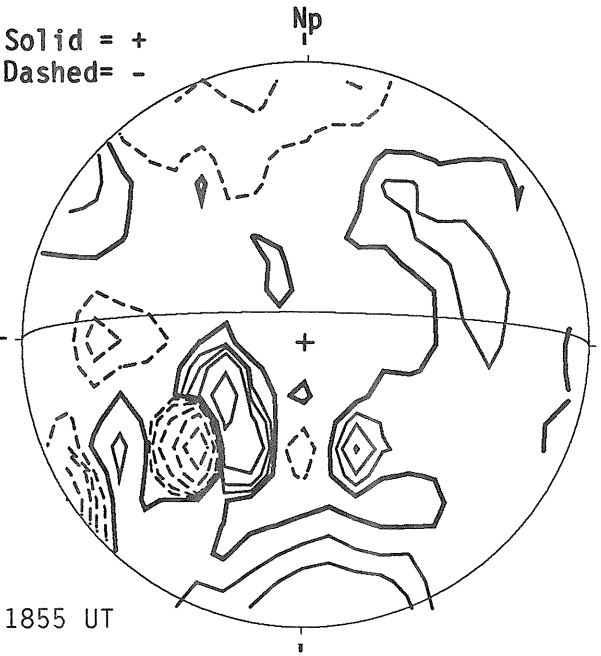
Bright= +
Dark = -



1410 UT

STANFORD MAGNETOGRAM

Solid = +
Dashed= -

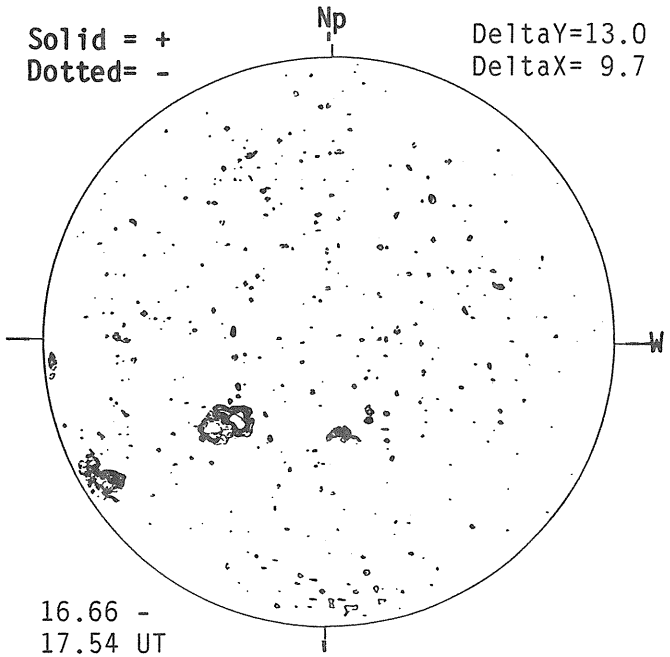


1855 UT

MT. WILSON MAGNETOGRAM

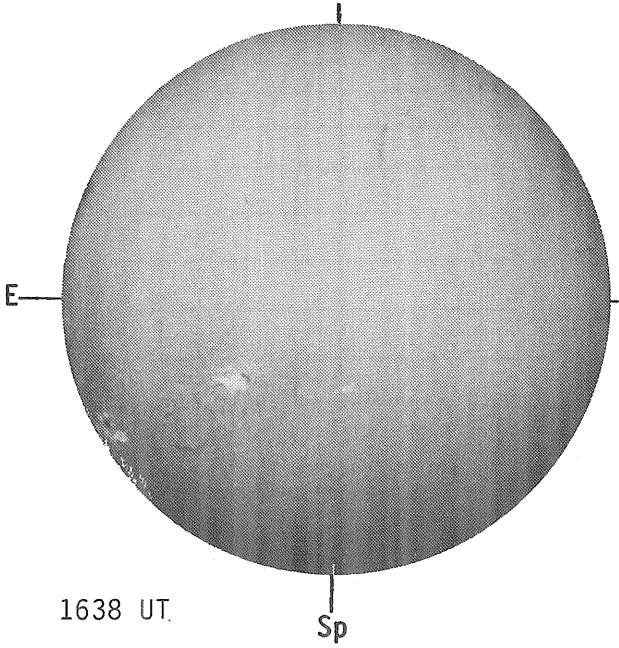
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.7



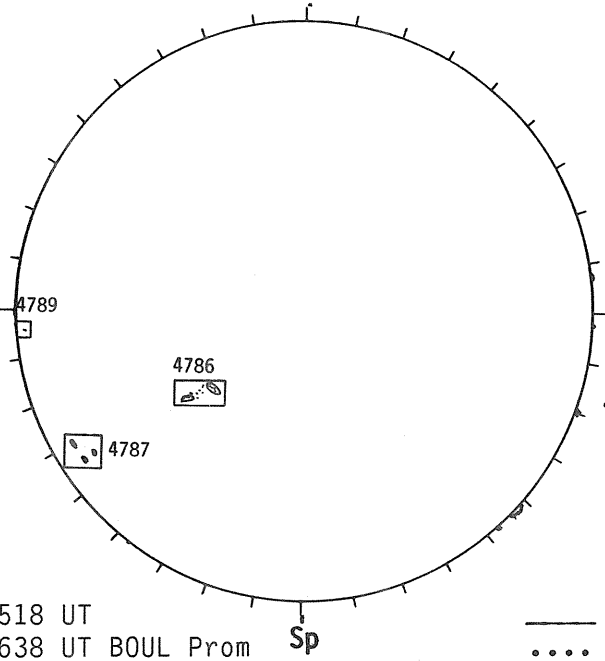
16.66 -
17.54 UT

BOULDER H-ALPHA



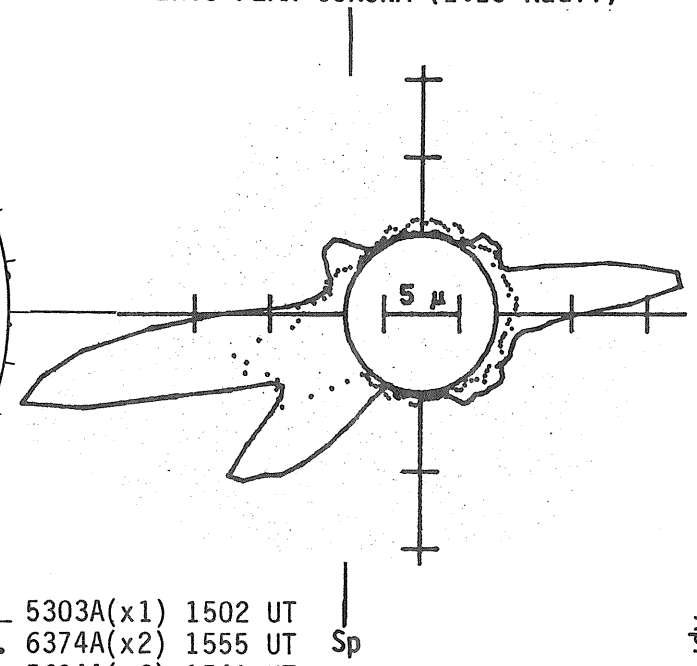
1638 UT

BOULDER SUNSPOTS



1518 UT
1638 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

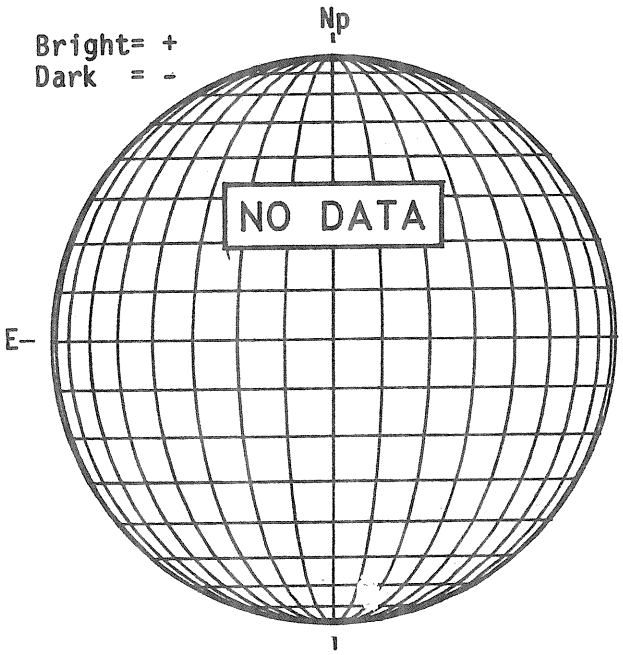


—— 5303A(x1) 1502 UT
.... 6374A(x2) 1555 UT
xxxx 5694A(x6) 1541 UT
NO 5694A ACTIVITY TODAY

A P R I L 08, 1 9 8 7 (P=-26.22, B_0=-6.07, L_0= 198.12)

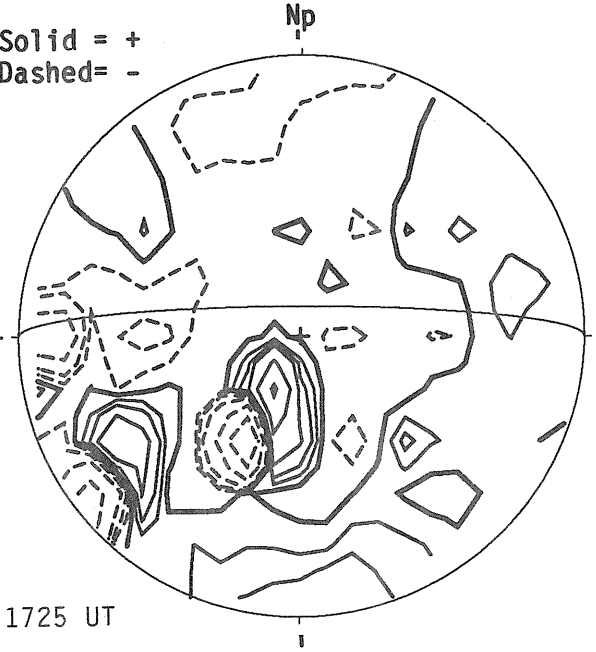
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

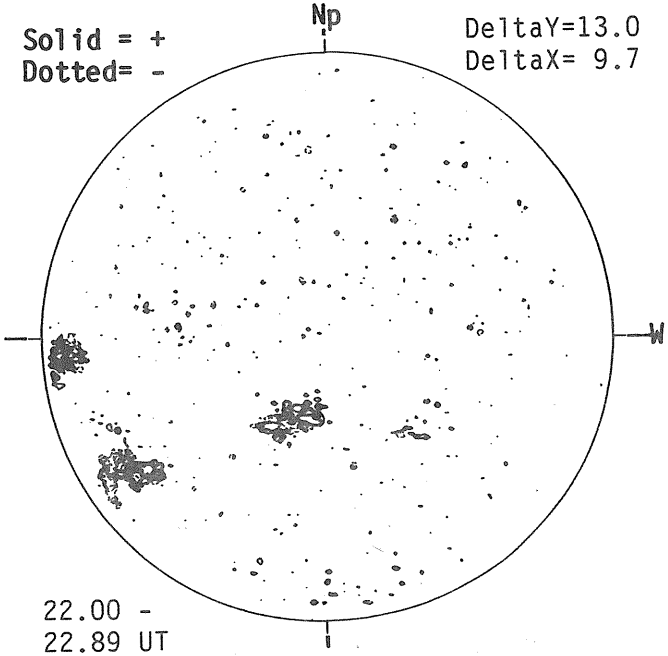
Solid = +
Dashed= -



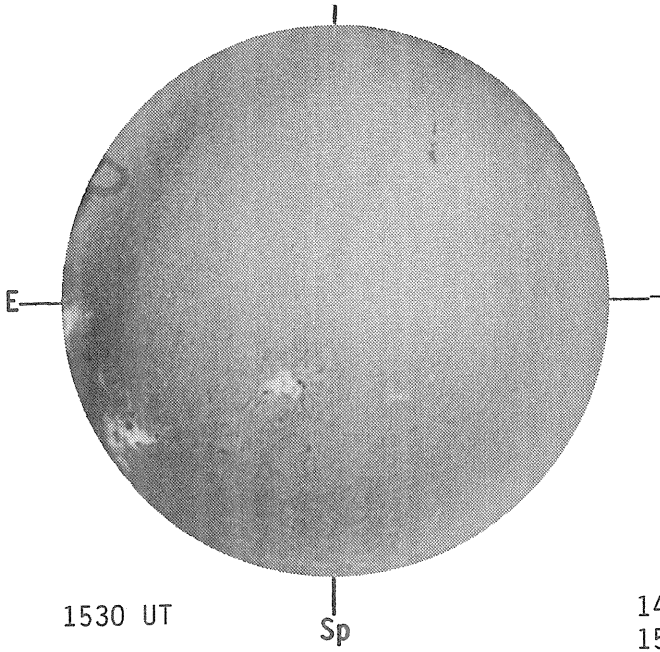
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

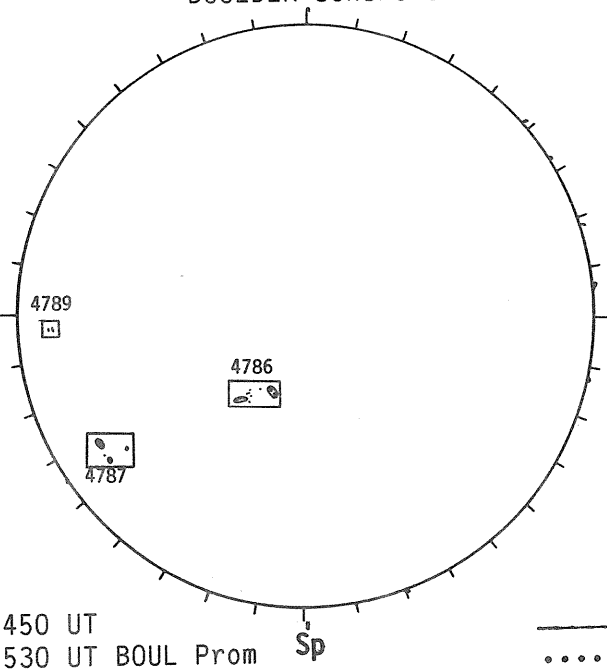
DeltaY=13.0
DeltaX= 9.7



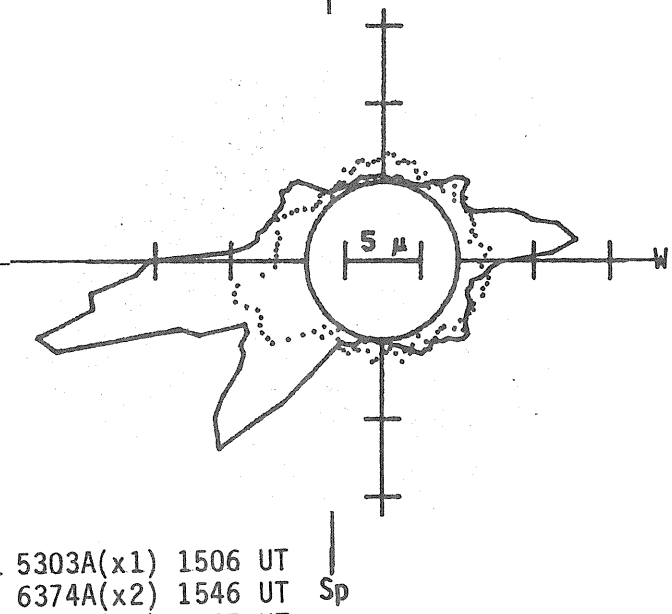
BOULDER H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

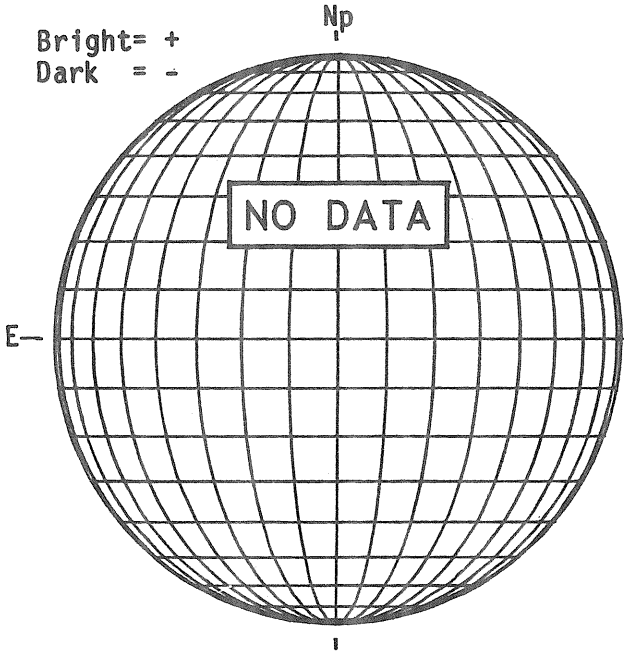


—— 5303A(x1) 1506 UT
.... 6374A(x2) 1546 UT
xxxx 5694A(x6) 1527 UT
NO 5694A ACTIVITY TODAY

A P R I L 09, 1 9 8 7 (P=-26.21, B_0=-6.01, L_0= 184.93)

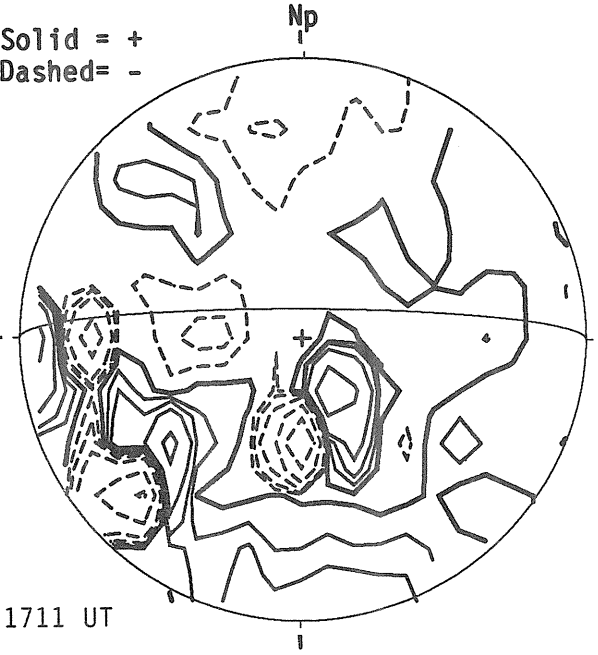
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

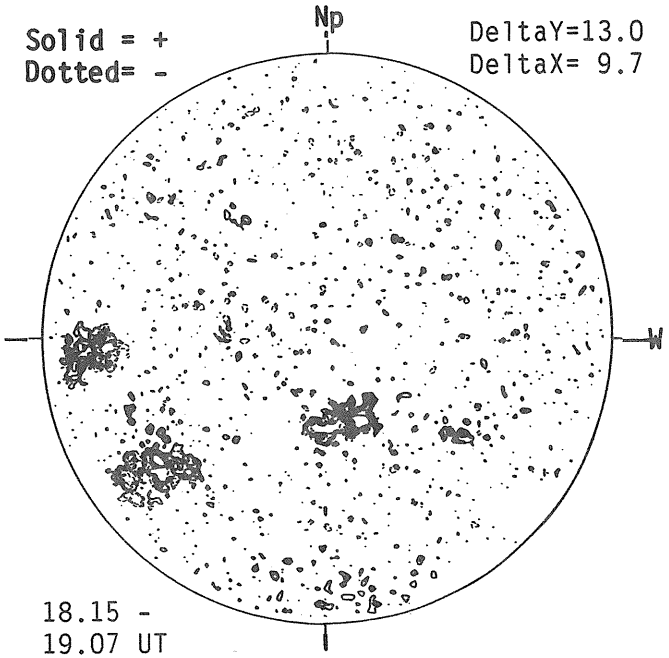
Solid = +
Dashed= -



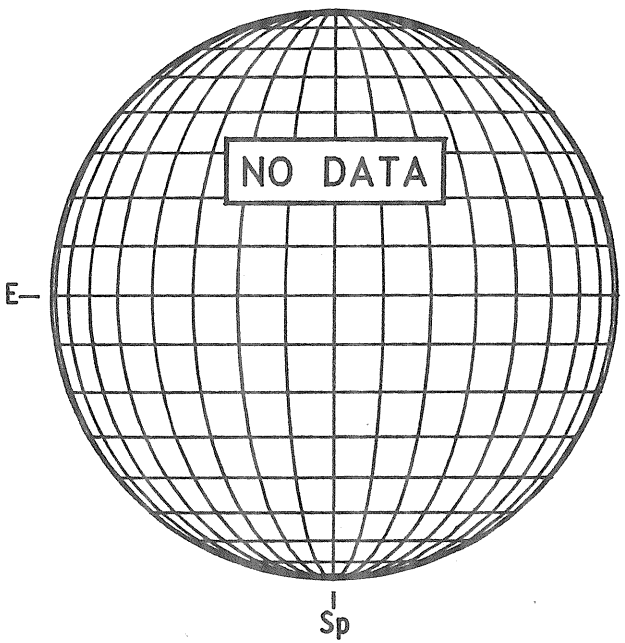
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

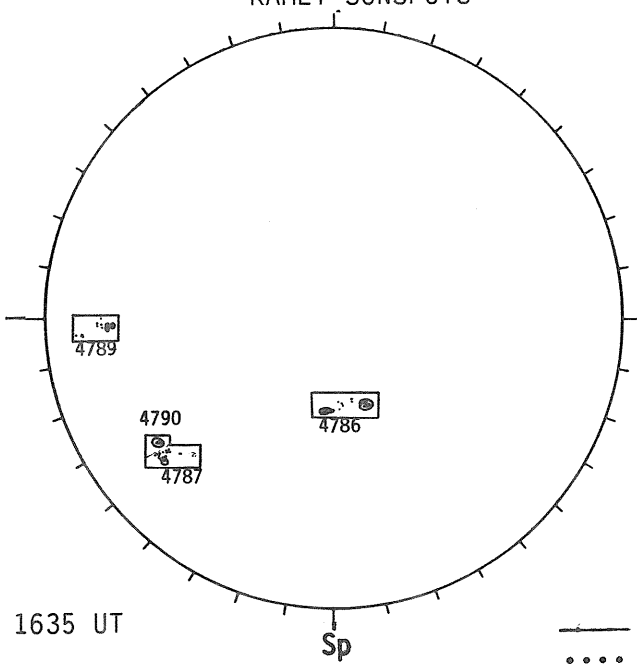
DeltaY=13.0
DeltaX= 9.7



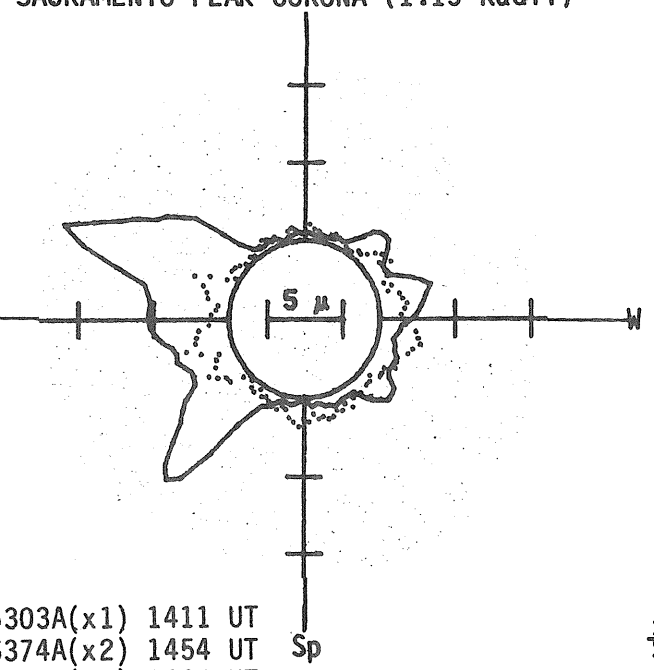
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOTS



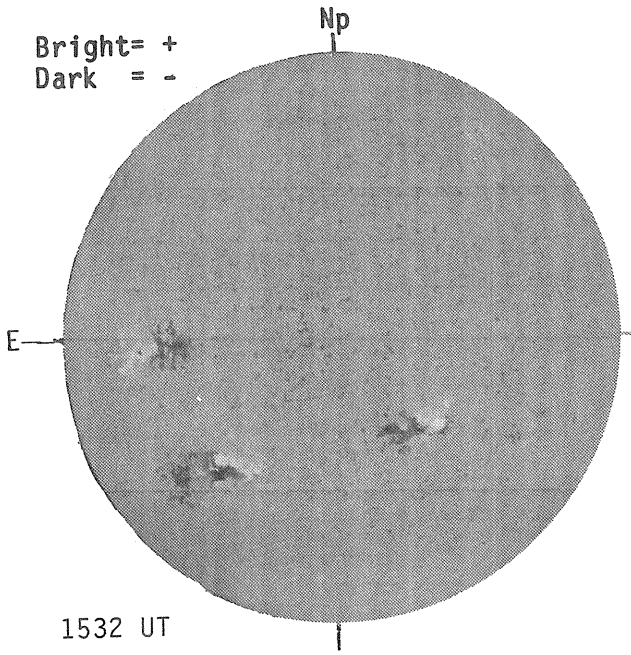
SACRAMENTO PEAK CORONA (1.15 Radii)



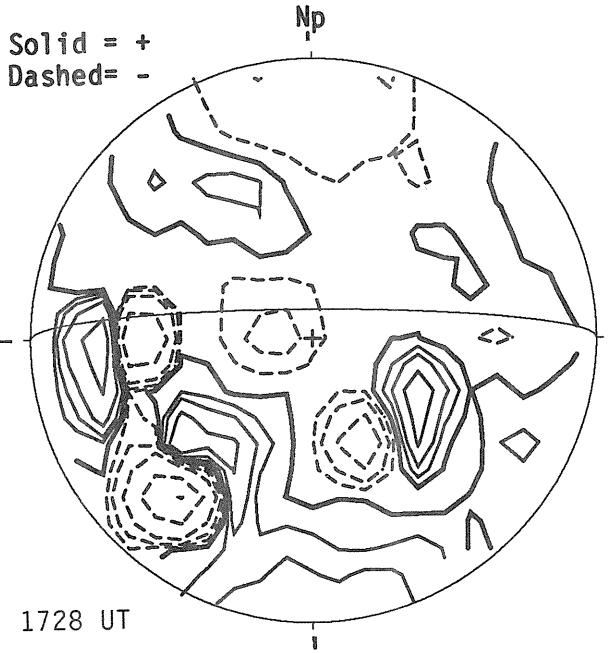
—— 5303A(x1) 1411 UT
.... 6374A(x2) 1454 UT
xxxx 5694A(x6) 1445 UT
NO 5694A ACTIVITY TODAY

A P R I L 10, 1 9 8 7 (P=-26.20, B_o=-5.94, L_o= 171.73)

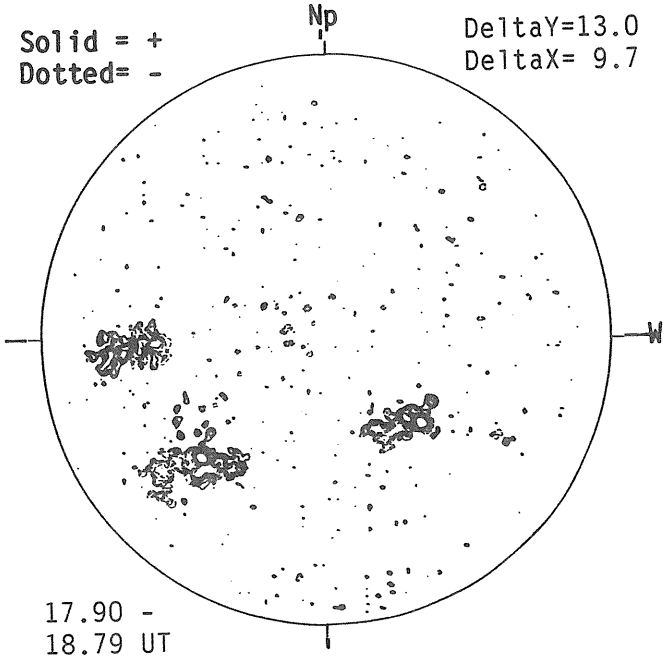
KITT PEAK MAGNETOGRAM



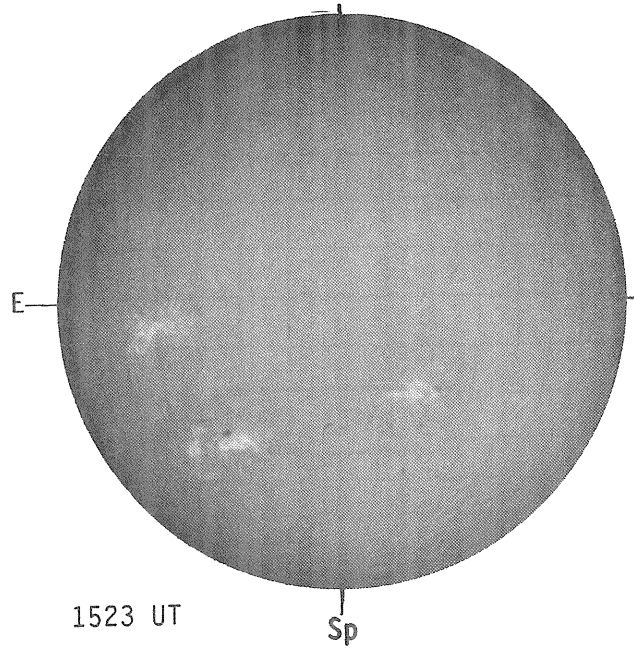
STANFORD MAGNETOGRAM



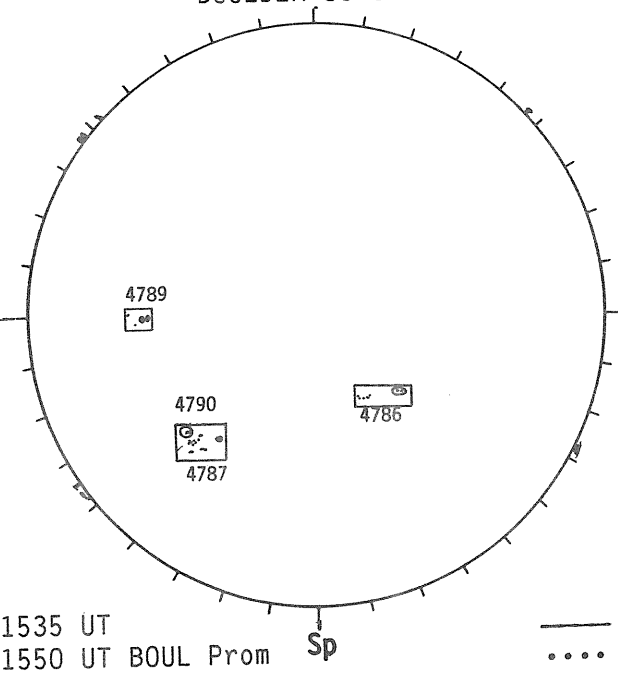
MT. WILSON MAGNETOGRAM



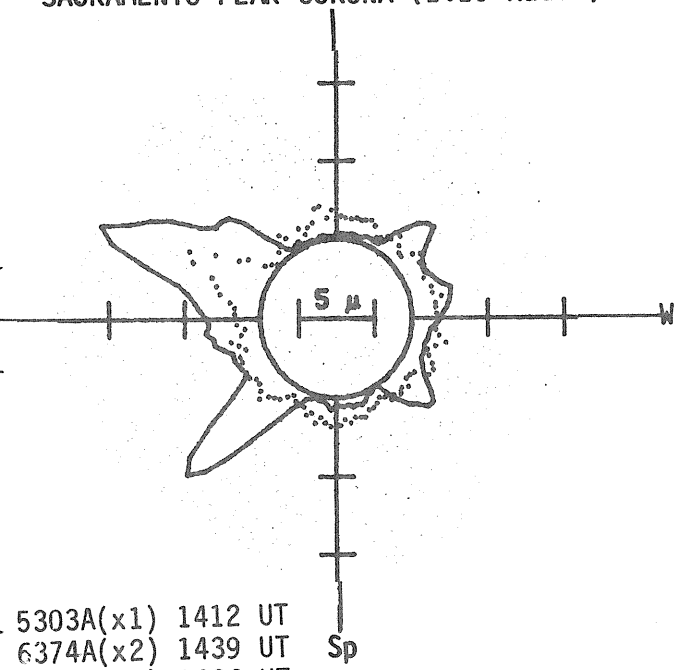
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

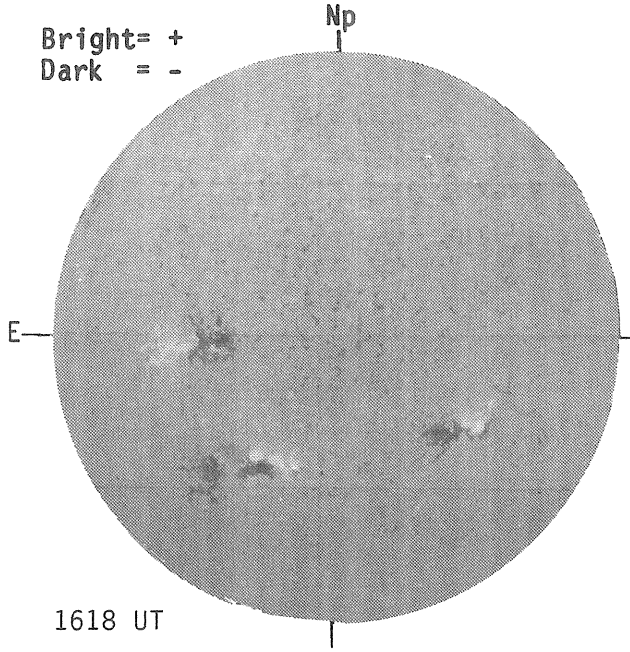


—— 5303A(x1) 1412 UT
.... 6374A(x2) 1439 UT
xxxx 5694A(x6) 1426 UT
NO 5694A ACTIVITY TODAY

A P R I L 11, 1 9 8 7 (P=-26.17, B_0=-5.87, L_0= 158.53)

KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

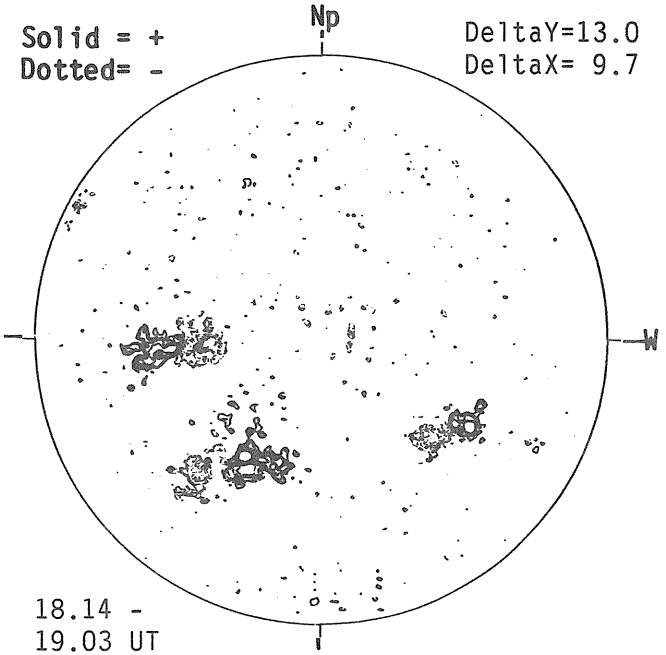
Solid = +
Dashed= -

2253 UT

MT. WILSON MAGNETOGRAM

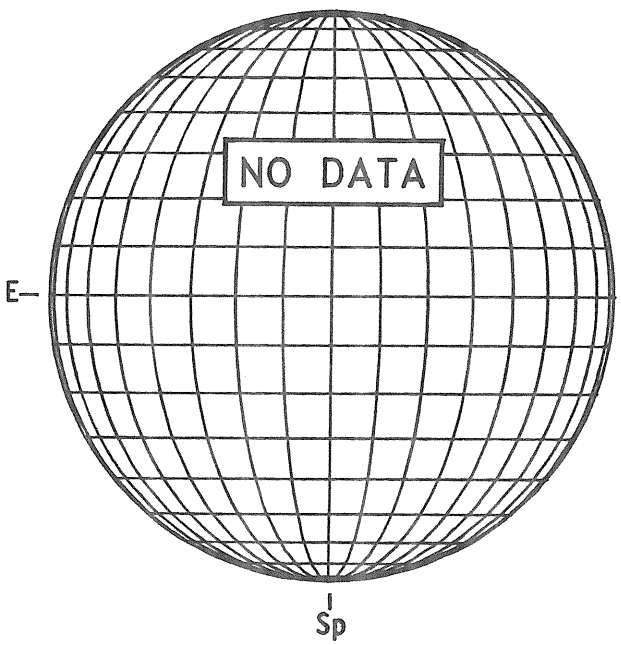
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.7

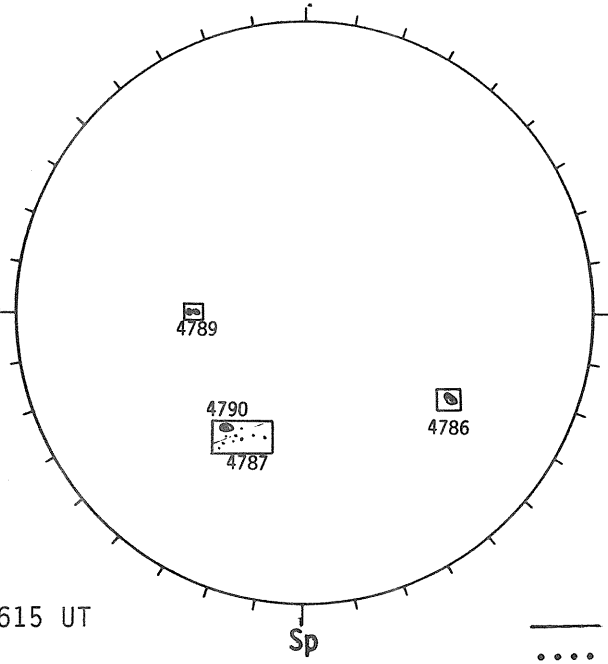


18.14 -
19.03 UT

SACRAMENTO PEAK H-ALPHA

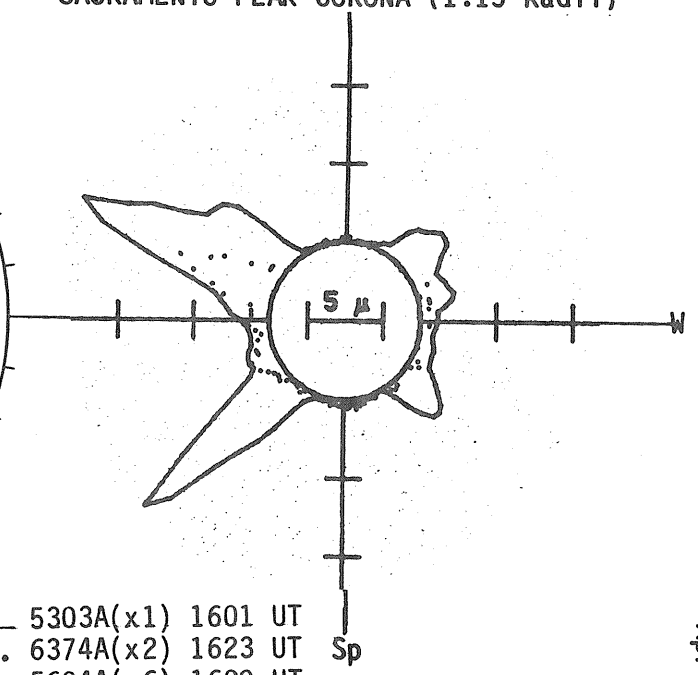


BOULDER SUNSPOTS



1615 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

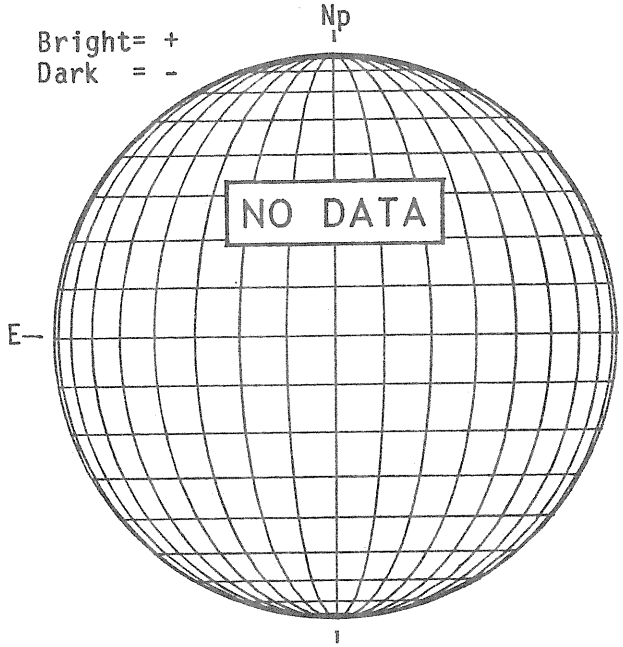


—— 5303A(x1) 1601 UT
.... 6374A(x2) 1623 UT
xxxx 5694A(x6) 1609 UT
NO 5694A ACTIVITY TODAY

A P R I L 12, 1 9 8 7 (P=-26.14, B_0=-5.80, L_0= 145.33)

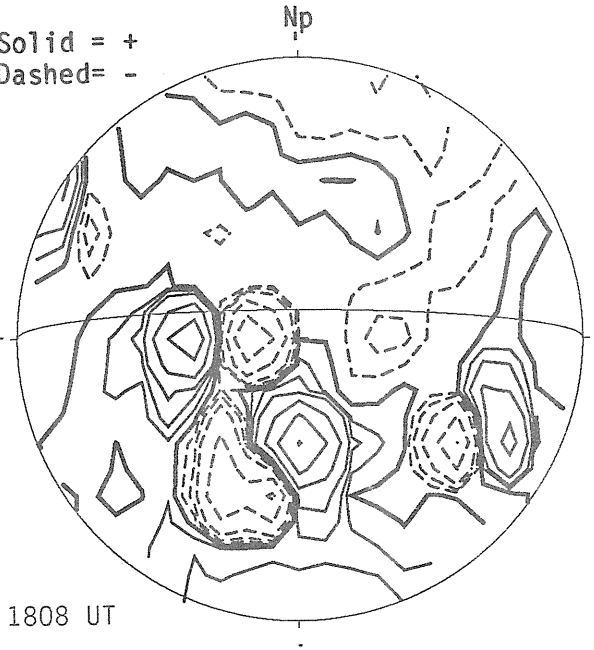
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

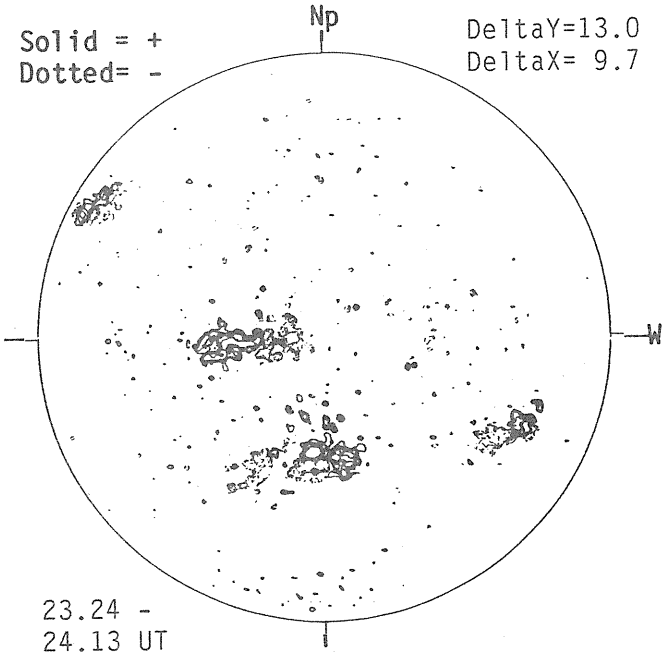
Solid = +
Dashed= -



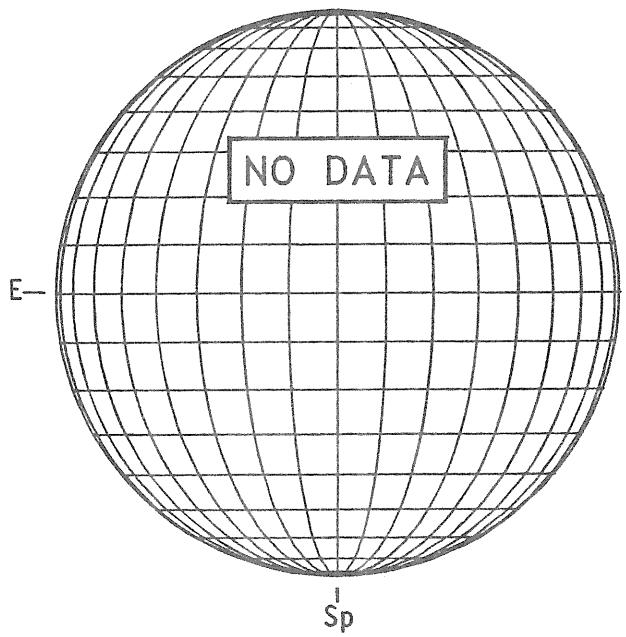
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

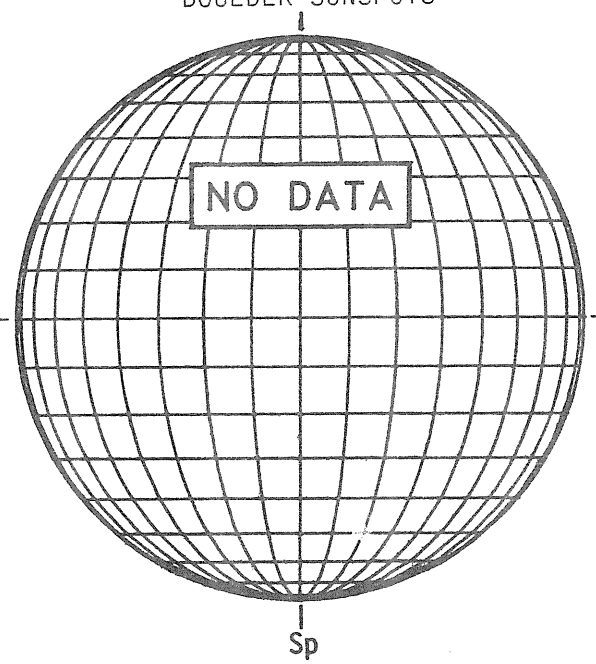
DeltaY=13.0
DeltaX= 9.7



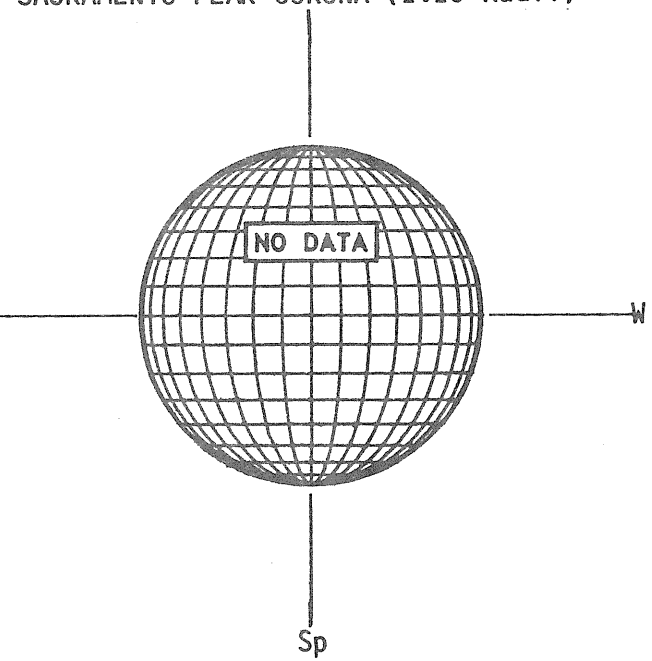
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



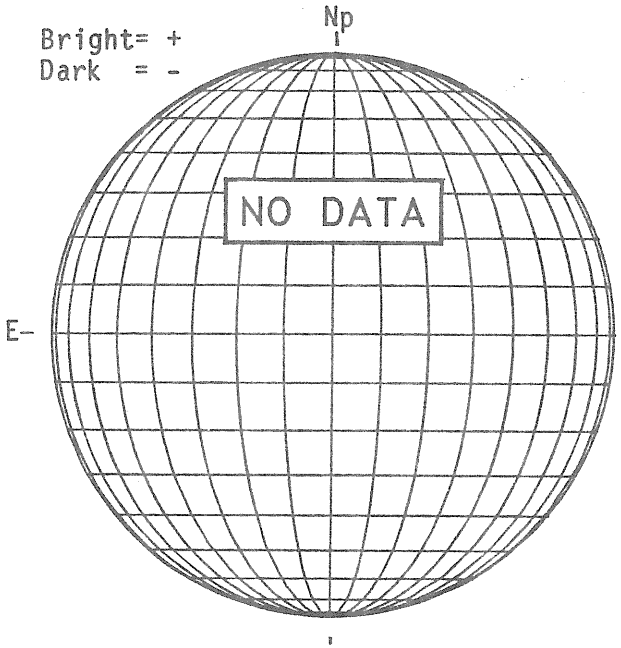
SACRAMENTO PEAK CORONA (1.15 Radii)



A P R I L 13, 1 9 8 7 (P=-26.10, B_0=-5.73, L_0= 132.12)

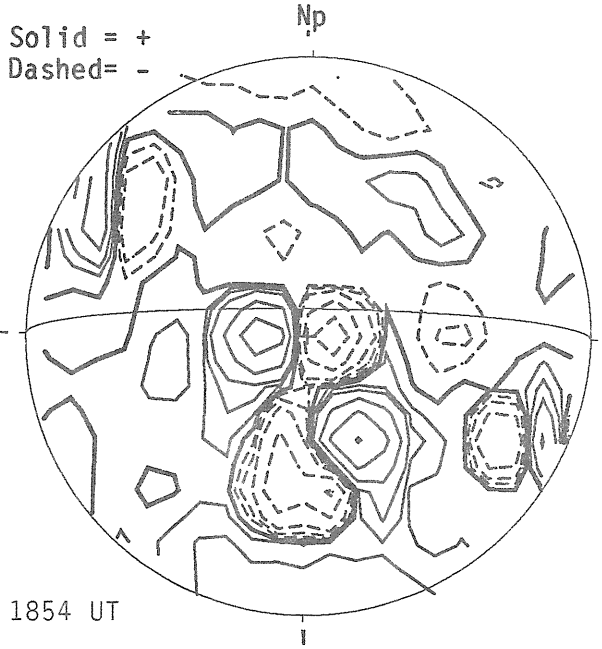
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

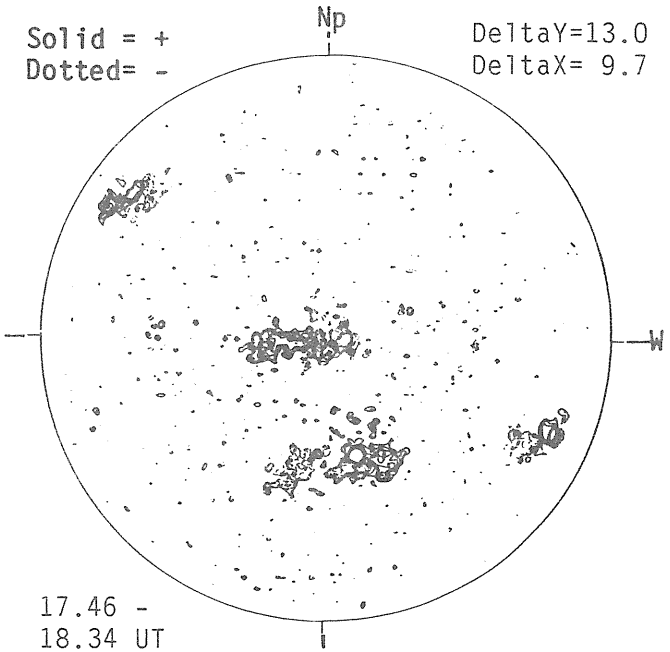
Solid = +
Dashed= -



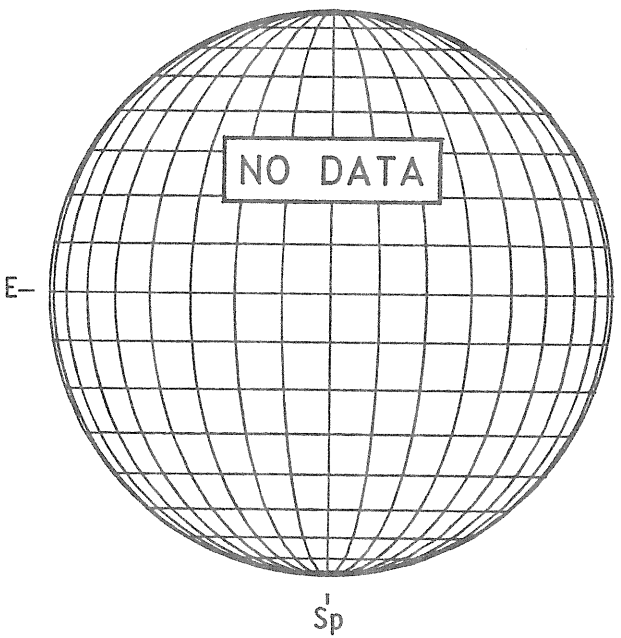
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

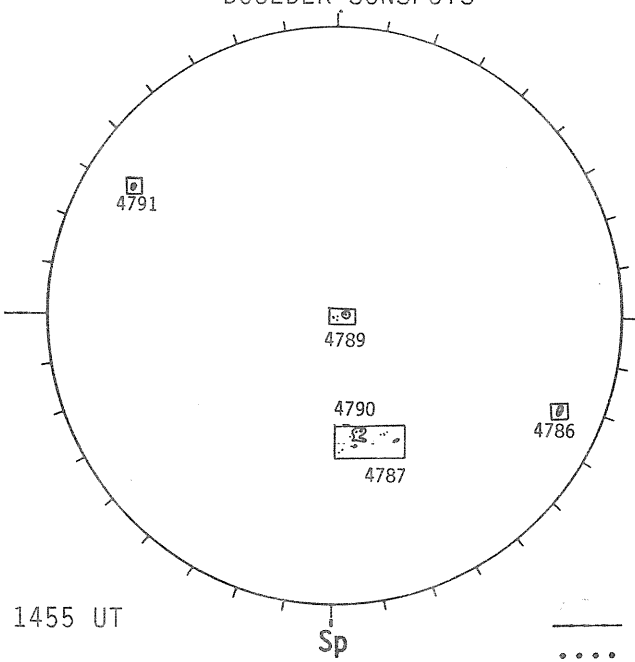
DeltaY=13.0
DeltaX= 9.7



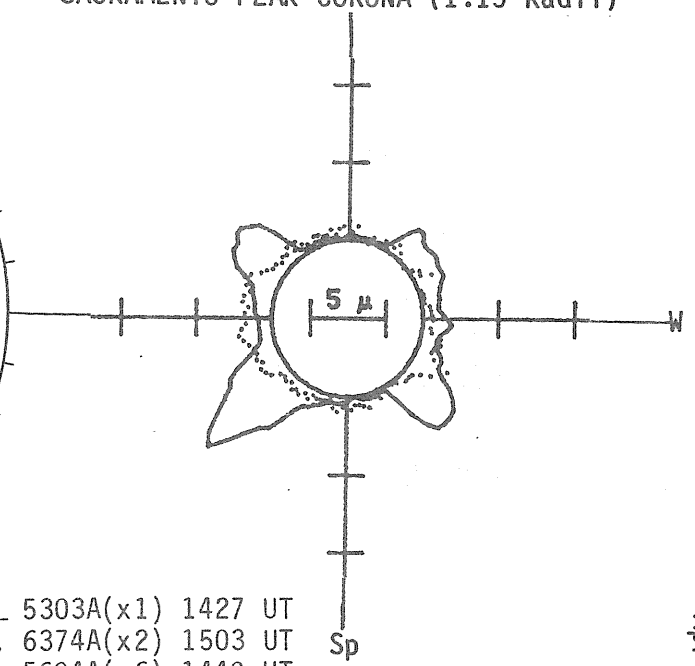
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

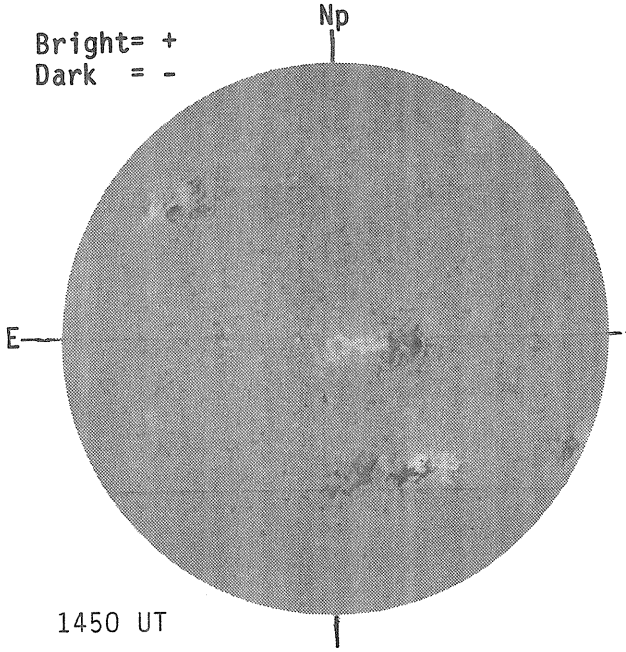


—— 5303A(x1) 1427 UT
.... 6374A(x2) 1503 UT
xxxx 5694A(x6) 1449 UT
NO 5694A ACTIVITY TODAY

A P R I L 14, 1 9 8 7 (P=-26.06, B_0=-5.66, L_0= 118.92)

KITT PEAK MAGNETOGRAM

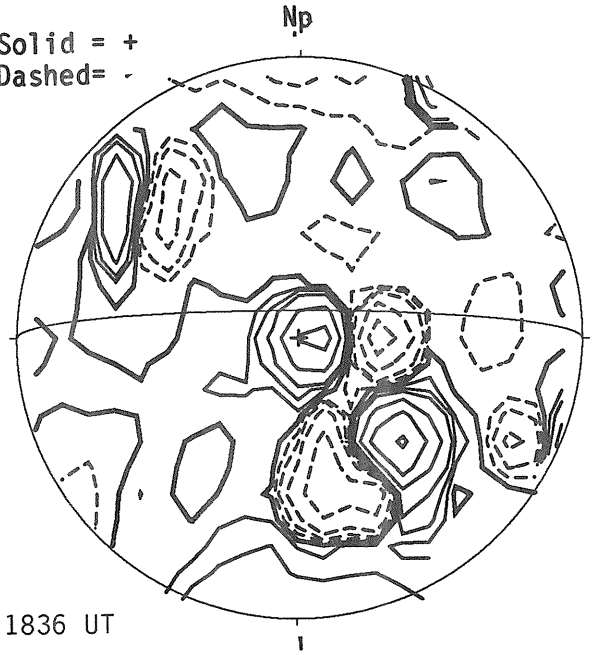
Bright= +
Dark = -



1450 UT

STANFORD MAGNETOGRAM

Solid = +
Dashed= -

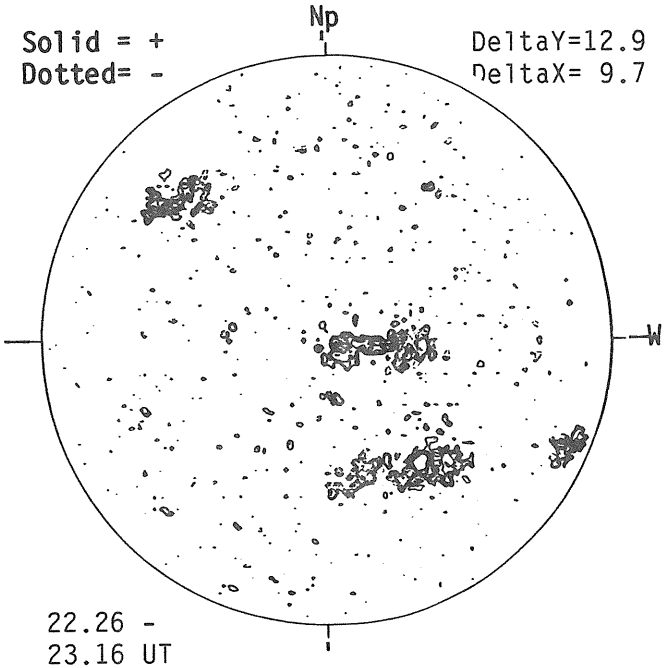


1836 UT

MT. WILSON MAGNETOGRAM

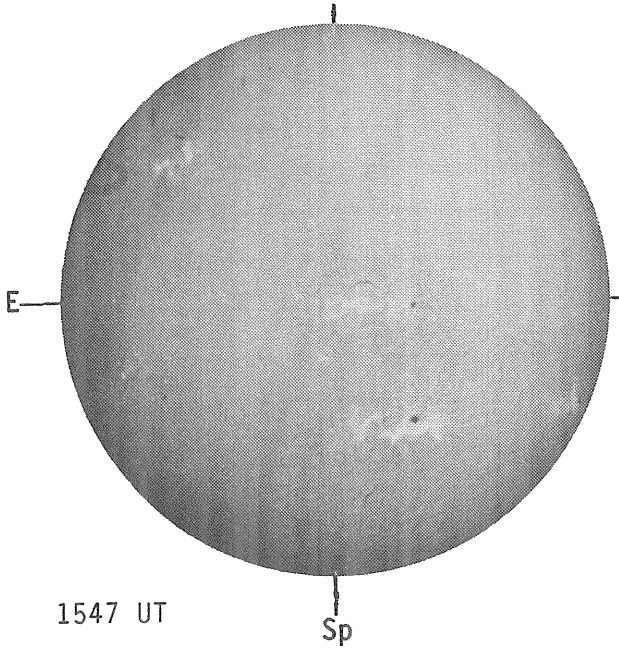
Solid = +
Dotted= -

DeltaY=12.9
DeltaX= 9.7



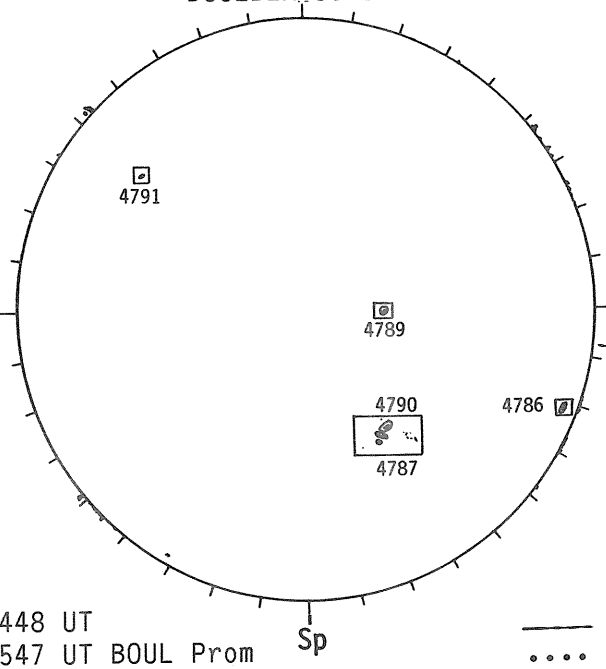
22.26 -
23.16 UT

BOULDER H-ALPHA



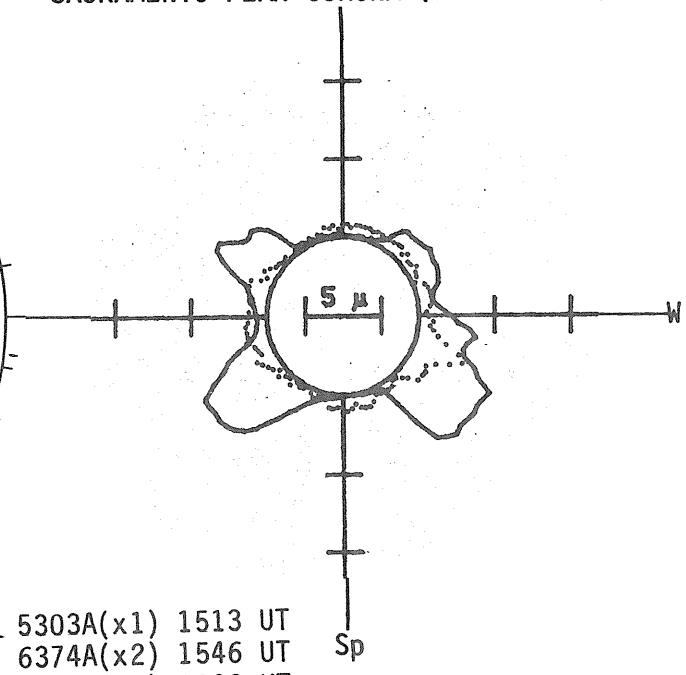
1547 UT

BOULDER SUNSPOTS



1448 UT
1547 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

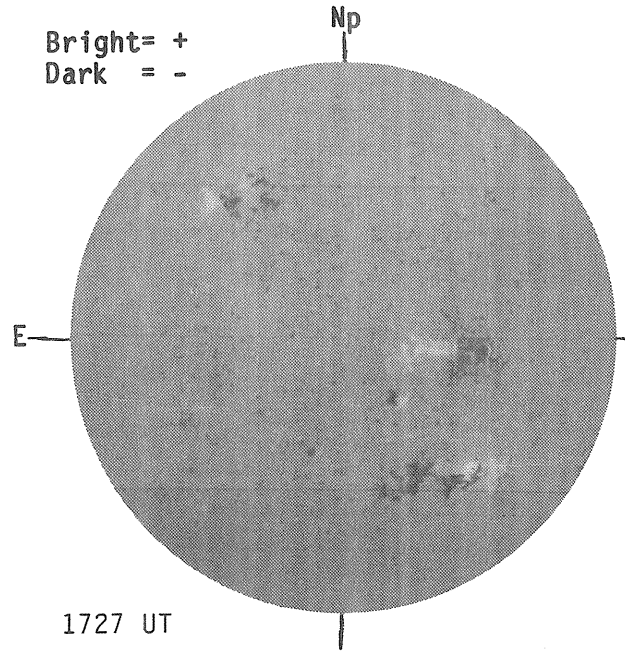


—— 5303A(x1) 1513 UT
.... 6374A(x2) 1546 UT
xxxx 5694A(x6) 1533 UT
NO 5694A ACTIVITY TODAY

A P R I L 15, 1 9 8 7 (P=-26.00, B_0=-5.58, L_0= 105.72)

KITT PEAK MAGNETOGRAM

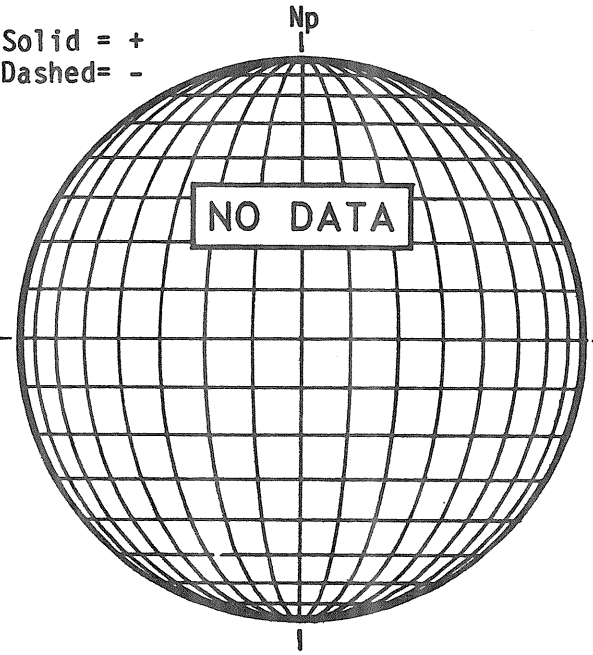
Bright= +
Dark = -



1727 UT

STANFORD MAGNETOGRAM

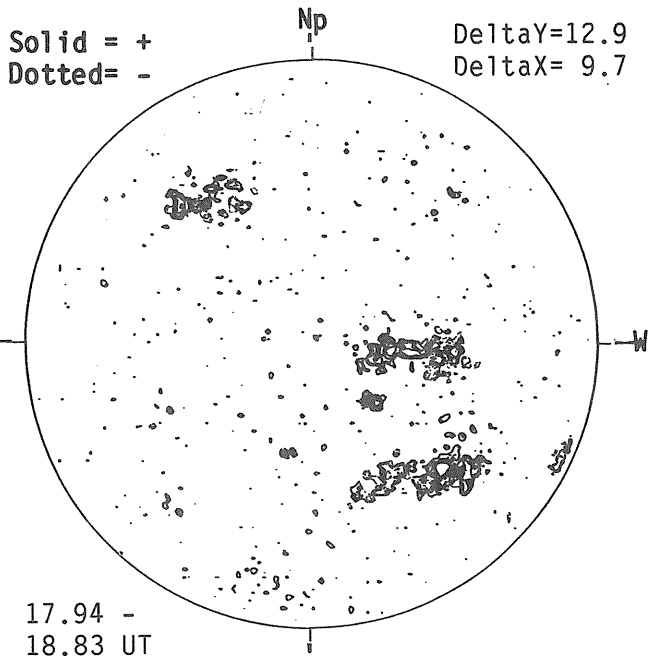
Solid = +
Dashed= -



MT. WILSON MAGNETOGRAM

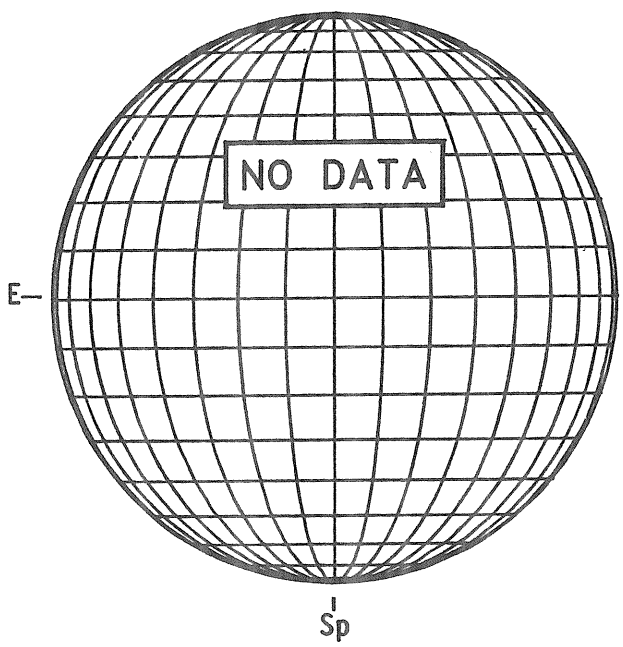
Solid = +
Dotted= -

DeltaY=12.9
DeltaX= 9.7

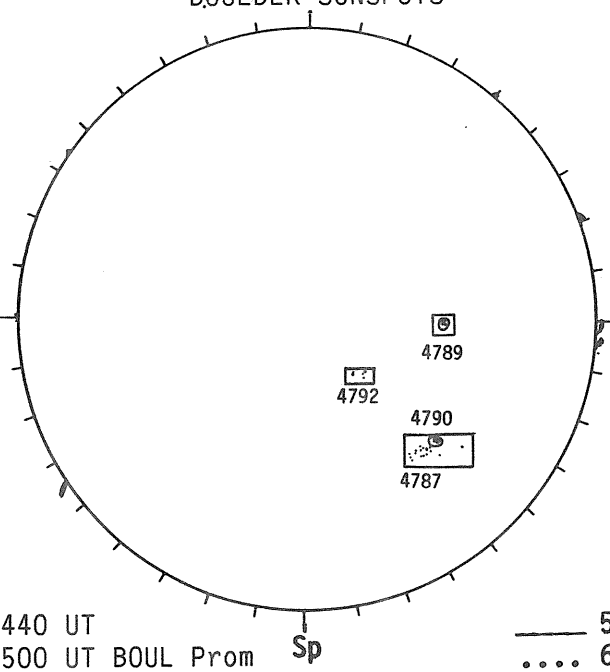


17.94 -
18.83 UT

SACRAMENTO PEAK H-ALPHA

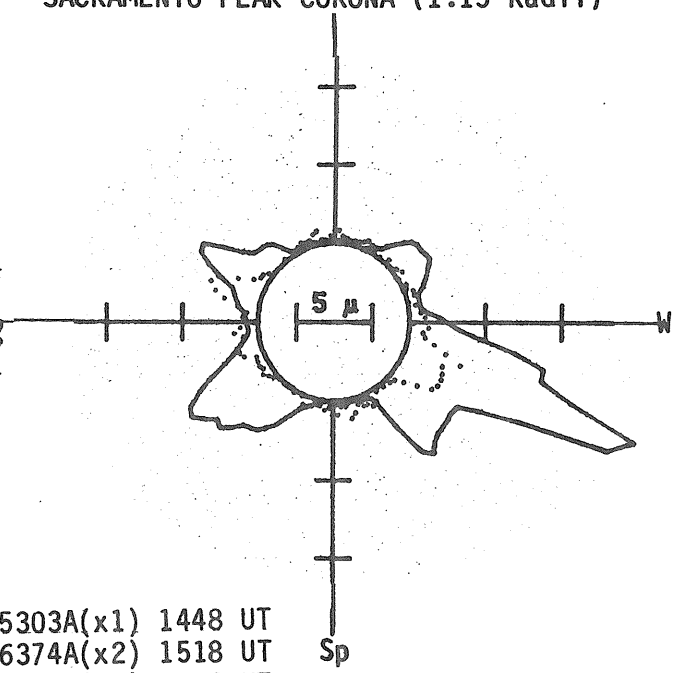


BOULDER SUNSPOTS



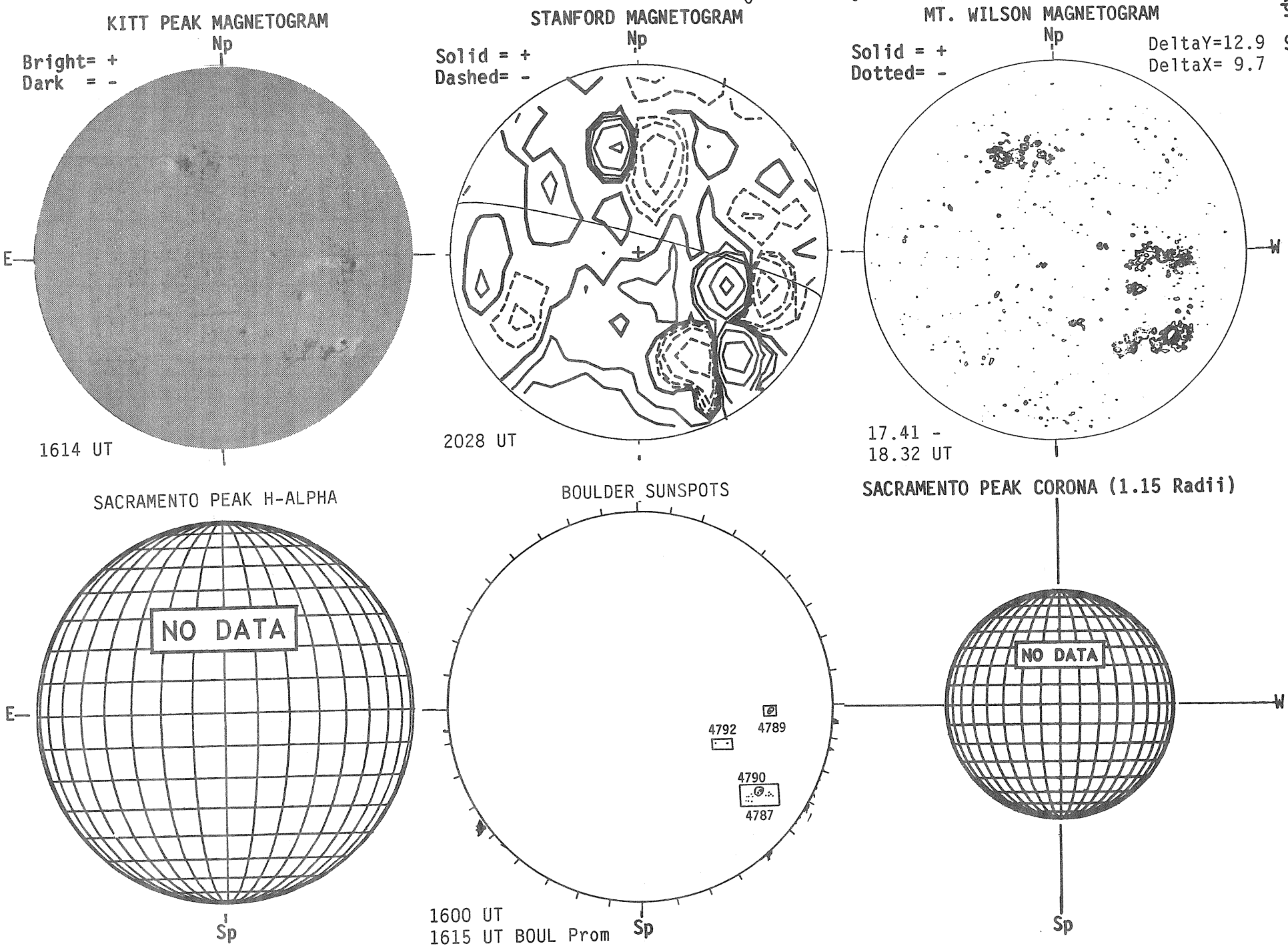
1440 UT
1500 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



—— 5303A(x1) 1448 UT
.... 6374A(x2) 1518 UT
xxxx 5694A(x6) 1504 UT
NO 5694A ACTIVITY TODAY

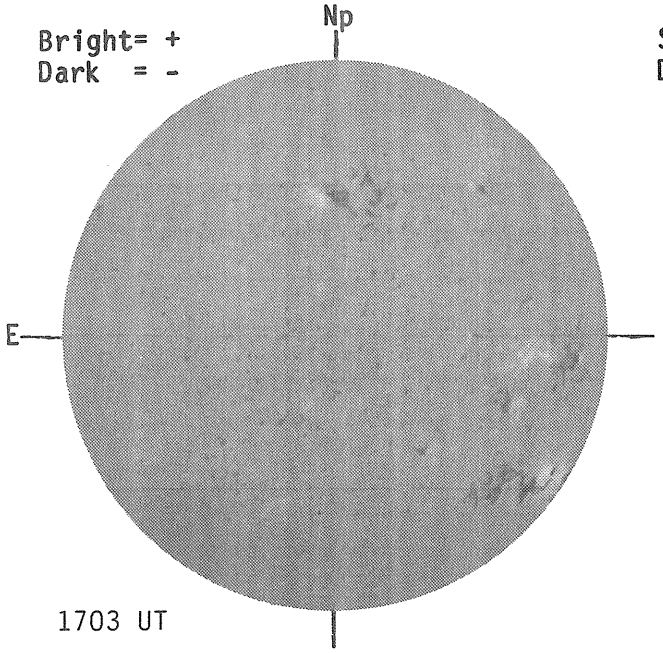
A P R I L 16, 1 9 8 7 (P=-25.94, B_0=-5.50, L_0= 92.51)



A P R I L 17, 1 9 8 7 (P=-25.87, B_0=-5.42, L_0= 79.31)

KITT PEAK MAGNETOGRAM

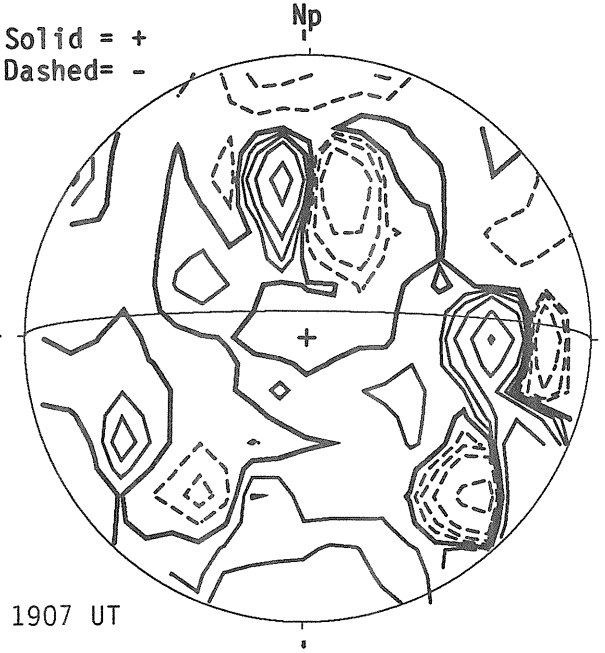
Bright= +
Dark = -



1703 UT

STANFORD MAGNETOGRAM

Solid = +
Dashed= -

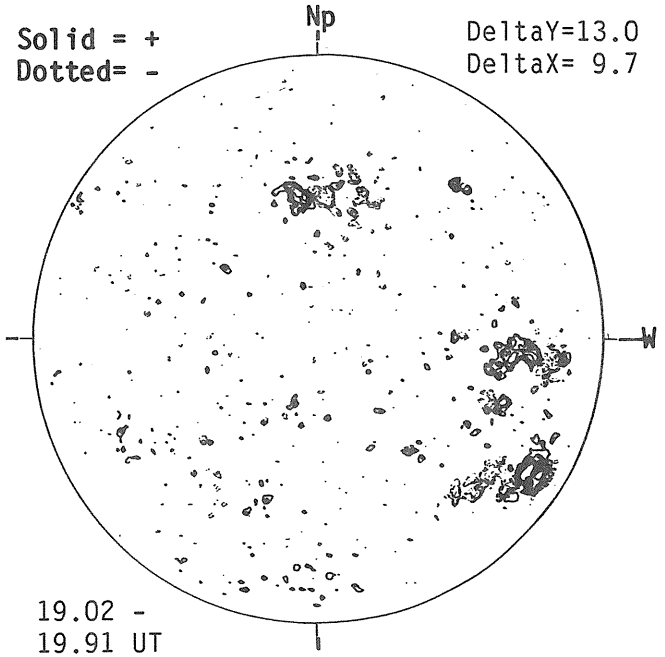


1907 UT

MT. WILSON MAGNETOGRAM

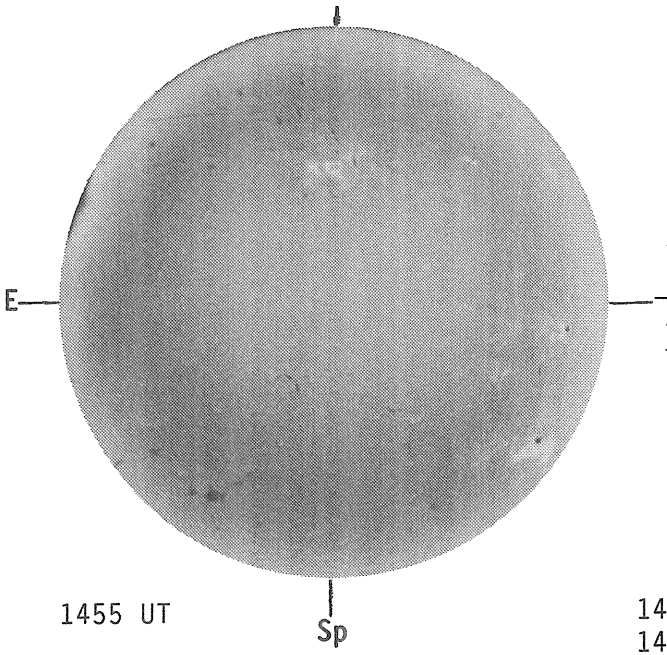
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.7



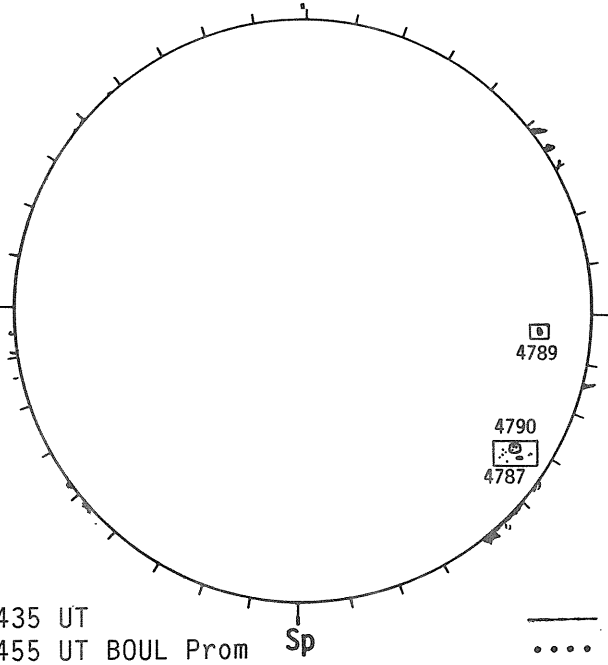
19.02 -
19.91 UT

BOULDER H-ALPHA



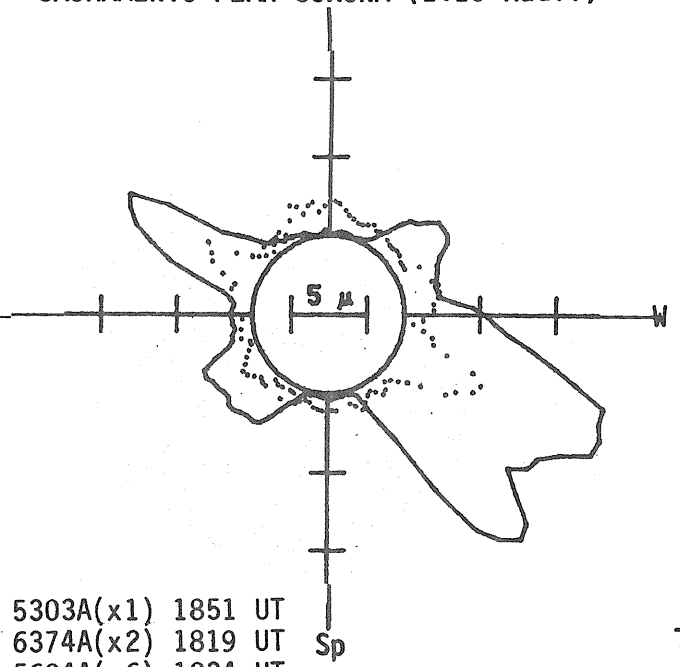
1455 UT

BOULDER SUNSPOTS



1435 UT
1455 UT BOUL Prom

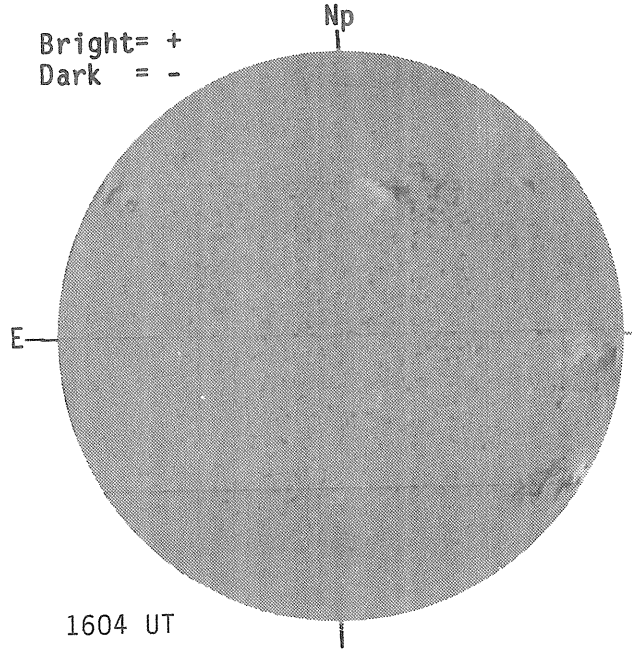
SACRAMENTO PEAK CORONA (1.15 Radii)



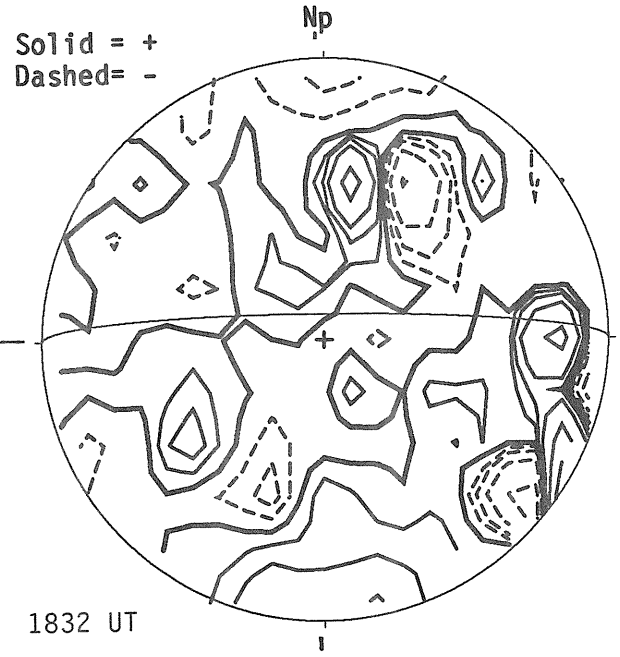
—— 5303A(x1) 1851 UT
.... 6374A(x2) 1819 UT
xxxx 5694A(x6) 1834 UT
NO 5694A ACTIVITY TODAY

A P R I L 18, 1 9 8 7 (P=-25.80, B_0=-5.34, L_0= 66.10)

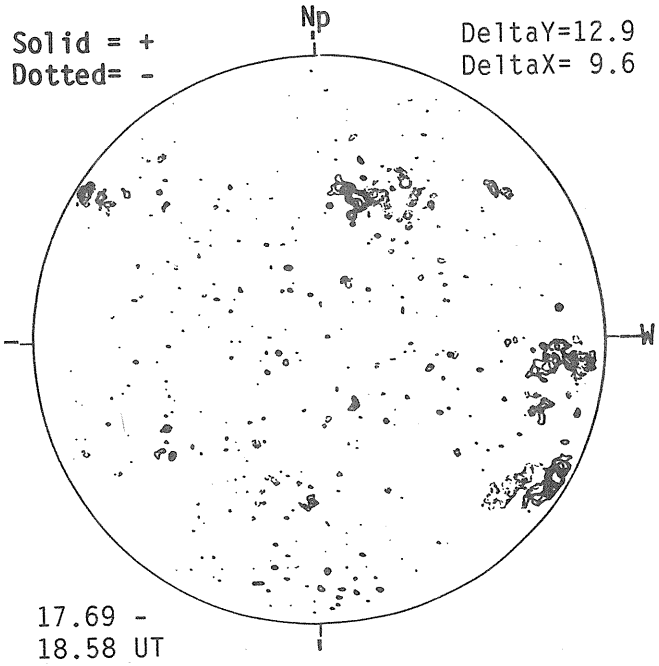
KITT PEAK MAGNETOGRAM



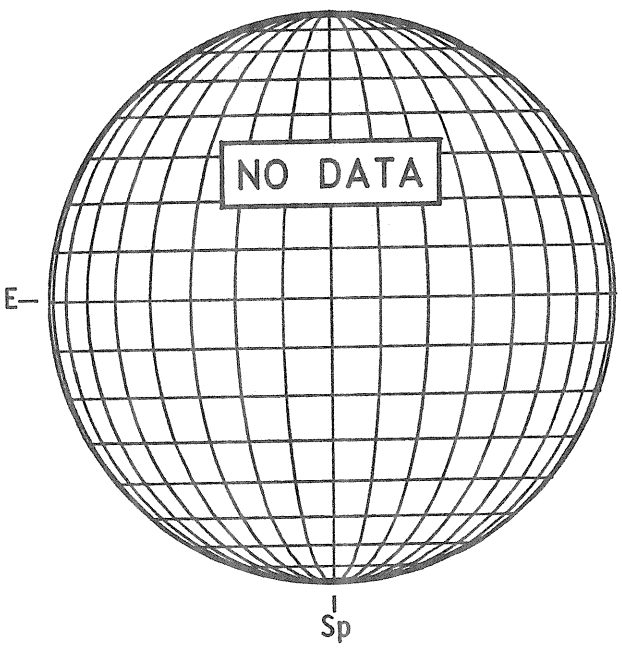
STANFORD MAGNETOGRAM



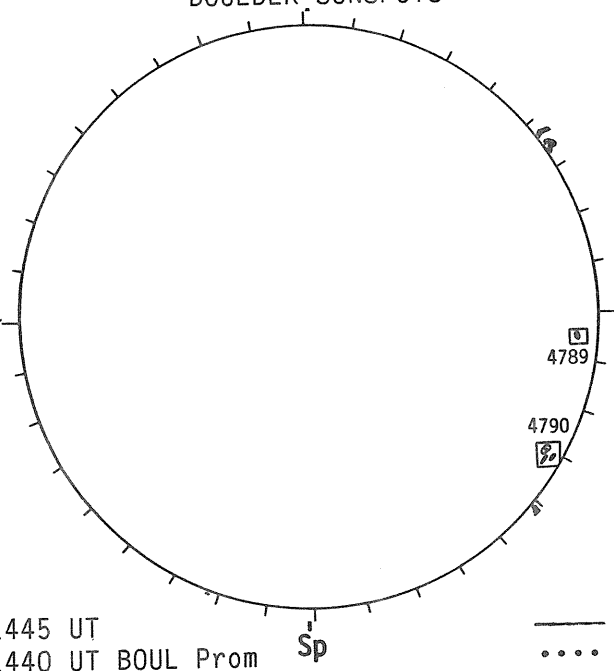
MT. WILSON MAGNETOGRAM



SACRAMENTO PEAK H-ALPHA

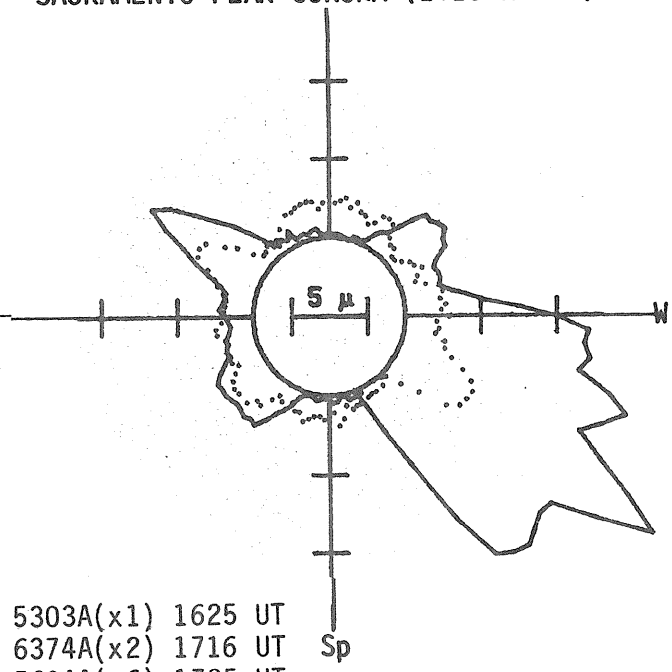


BOULDER SUNSPOTS



1445 UT
1440 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

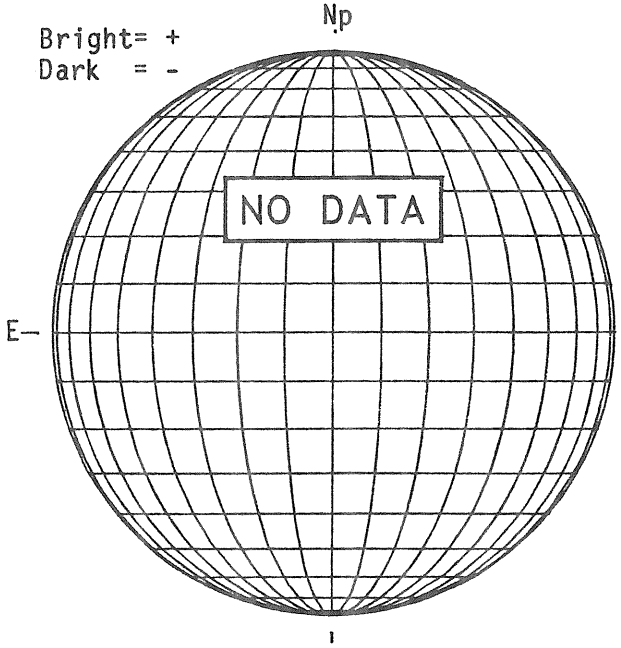


—— 5303A(x1) 1625 UT
.... 6374A(x2) 1716 UT
xxxx 5694A(x6) 1705 UT
NO 5694A ACTIVITY TODAY

A P R I L 19, 1 9 8 7 (P=-25.72, B_0=-5.26, L_0= 52.90)

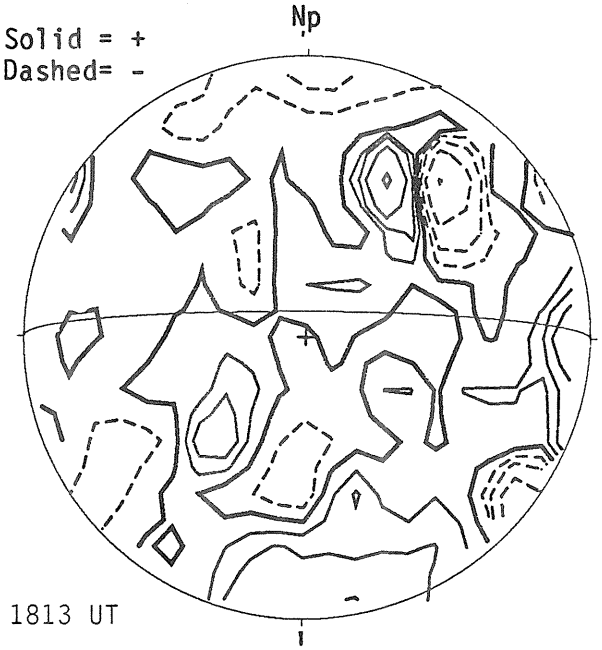
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

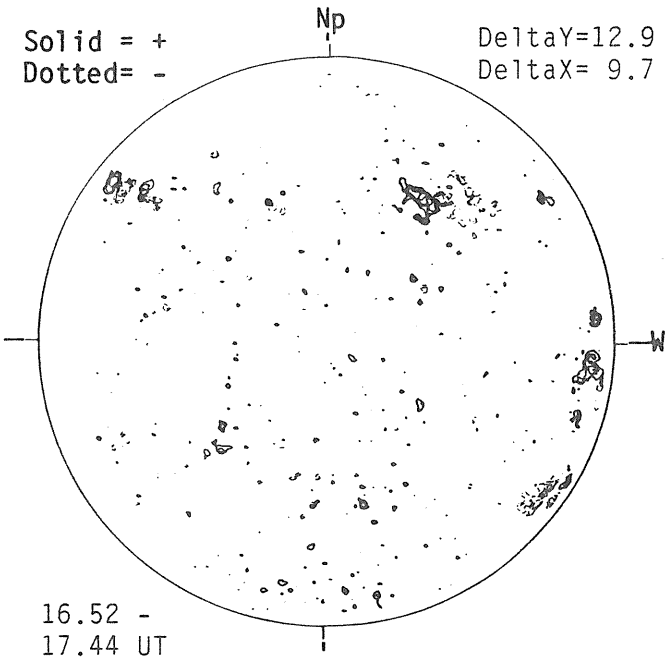
Solid = +
Dashed= -



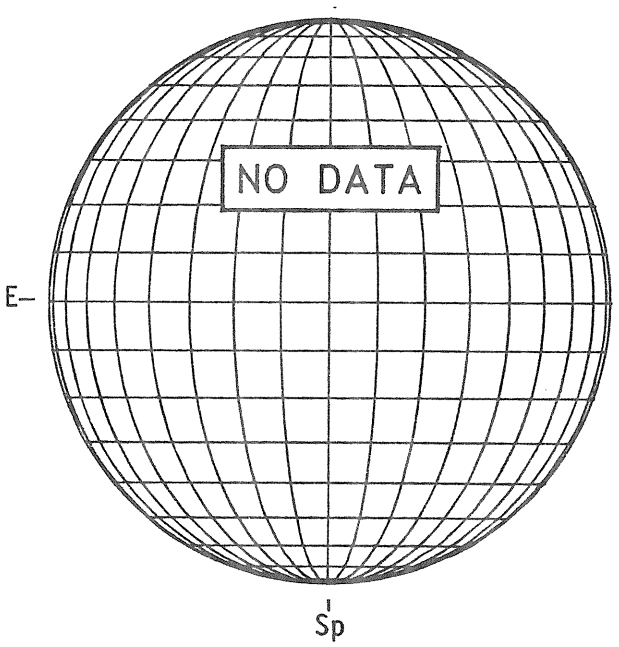
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

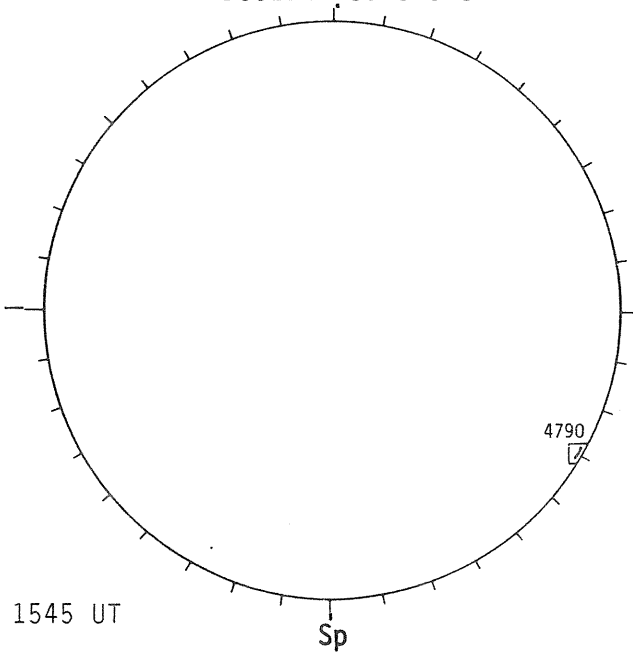
DeltaY=12.9
DeltaX= 9.7



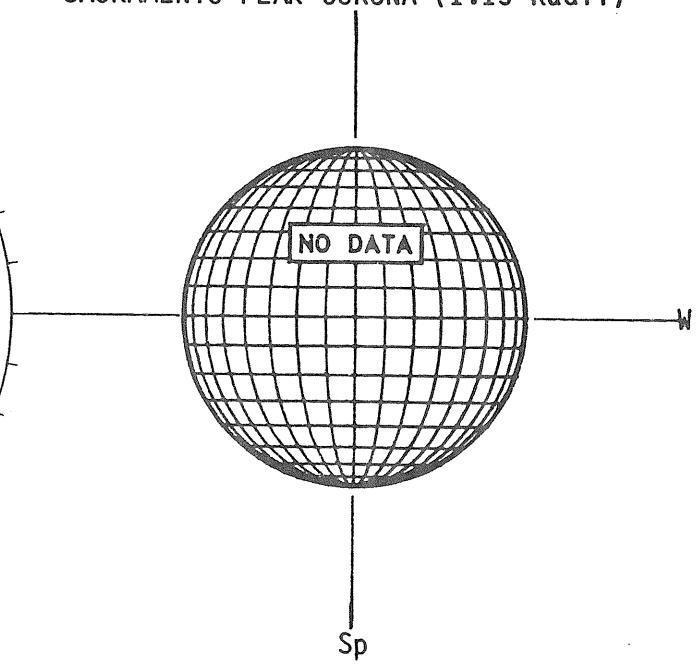
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS

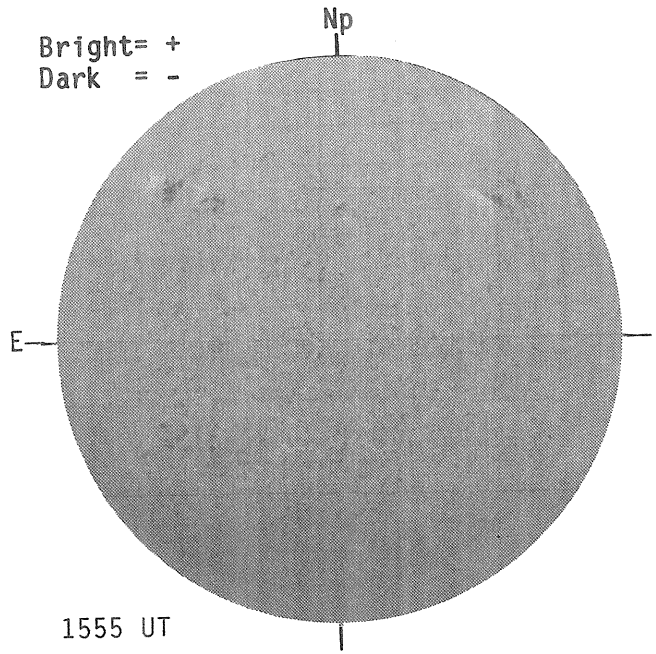


SACRAMENTO PEAK CORONA (1.15 Radii)

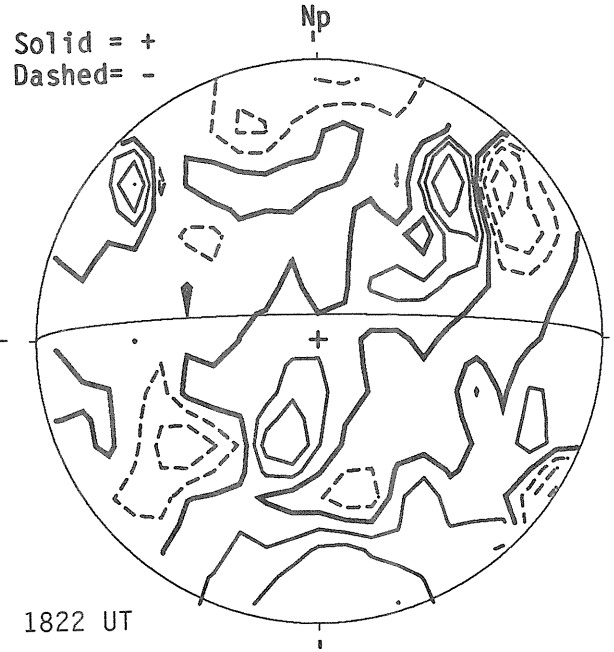


A P R I L 20, 1 9 8 7 (P=-25.63, B_0=-5.18, L_0= 39.69)

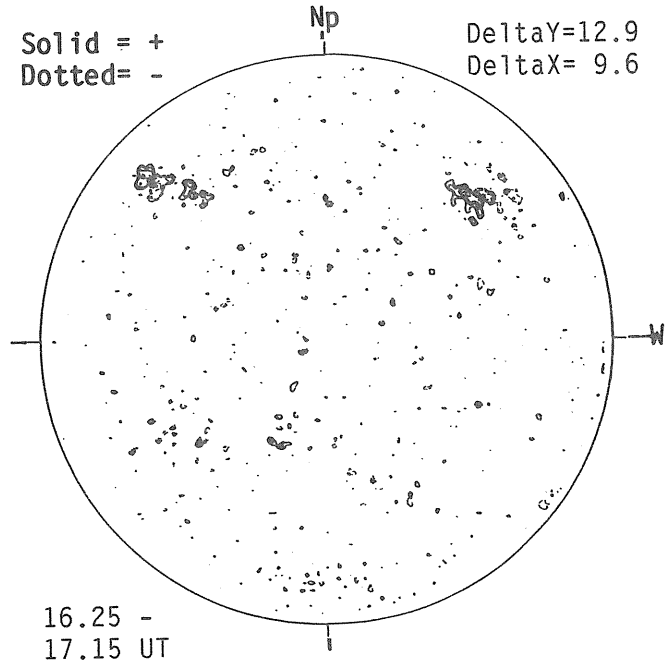
KITT PEAK MAGNETOGRAM



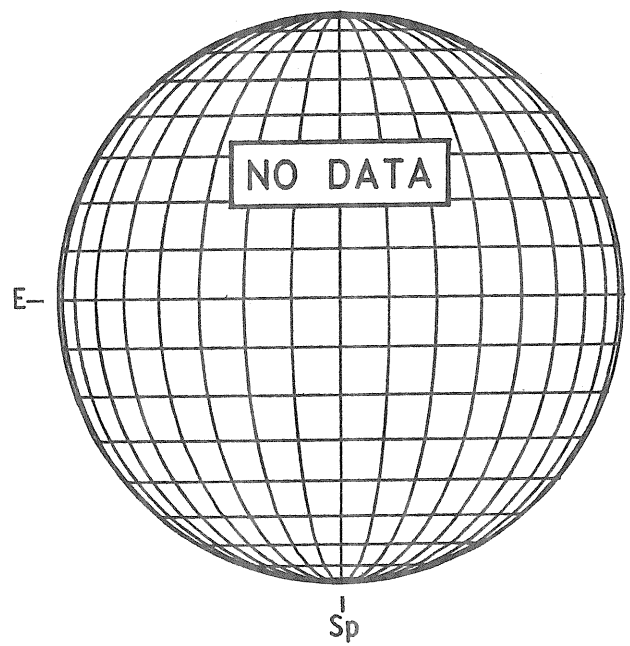
STANFORD MAGNETOGRAM



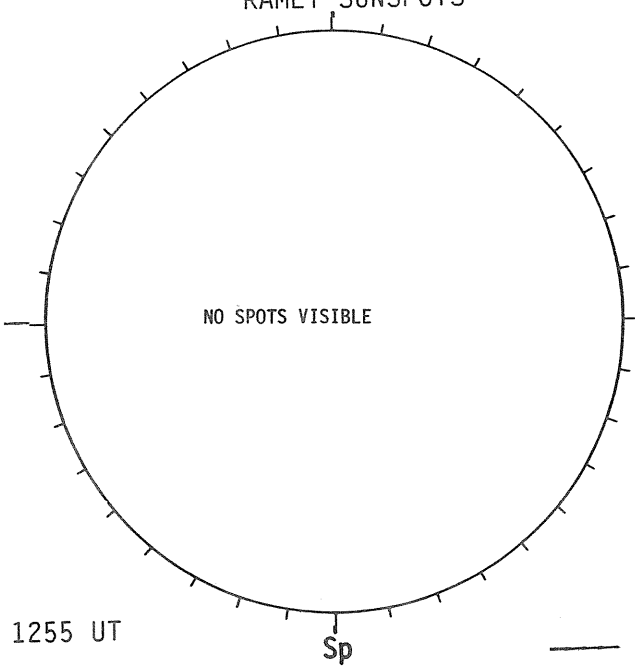
MT. WILSON MAGNETOGRAM



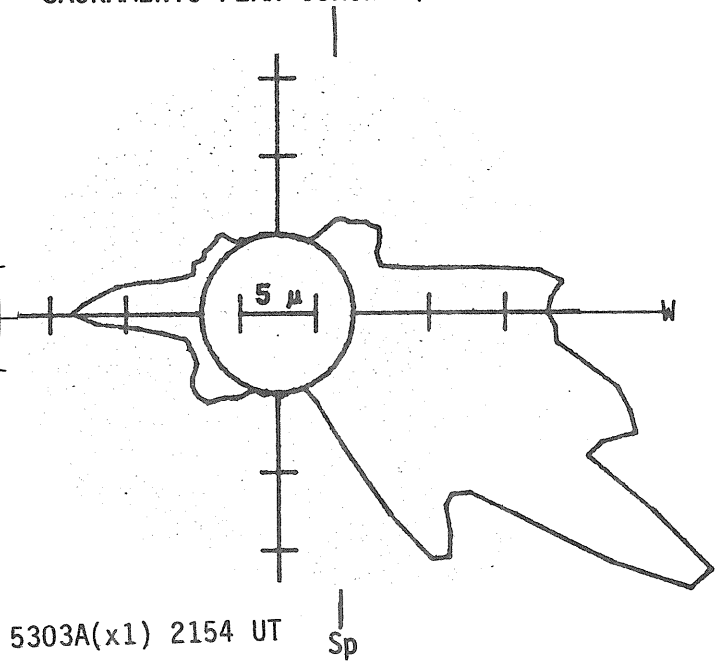
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOTS

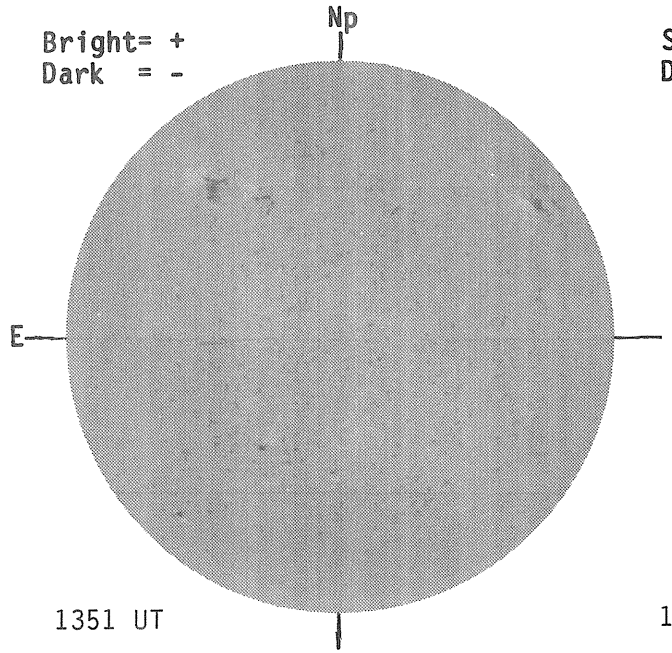


SACRAMENTO PEAK CORONA (1.15 Radii)

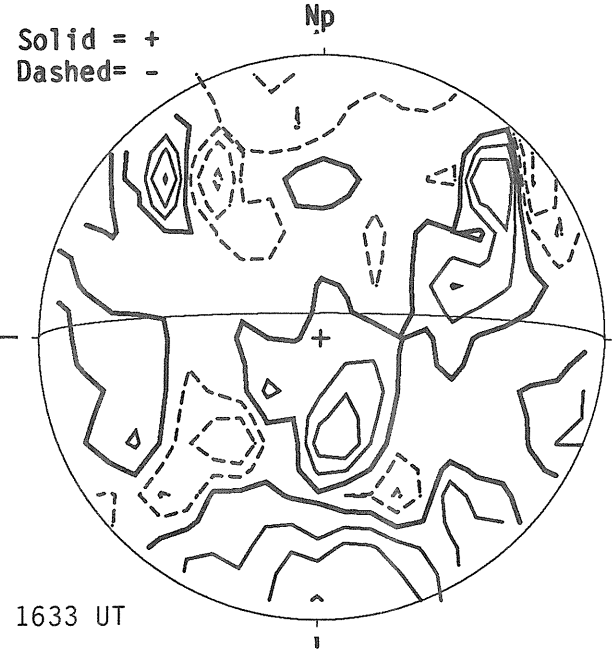


A P R I L 21, 1 9 8 7 (P=-25.53, B_0=-5.09, L_0= 26.48)

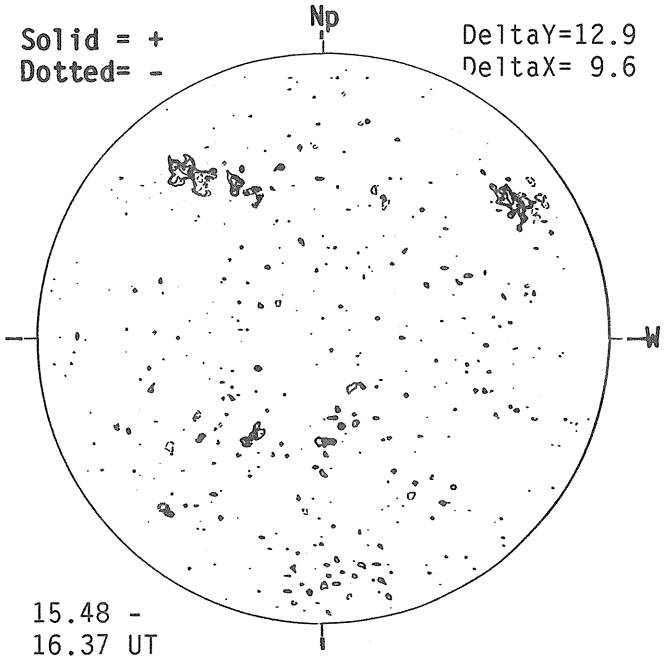
KITT PEAK MAGNETOGRAM



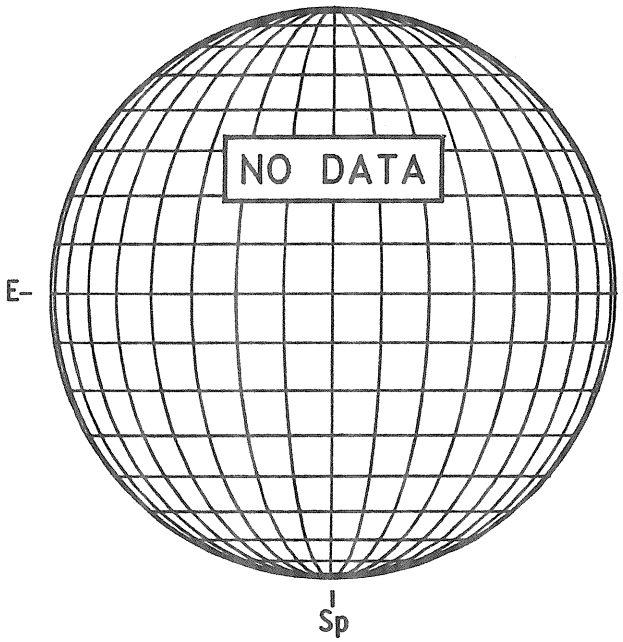
STANFORD MAGNETOGRAM



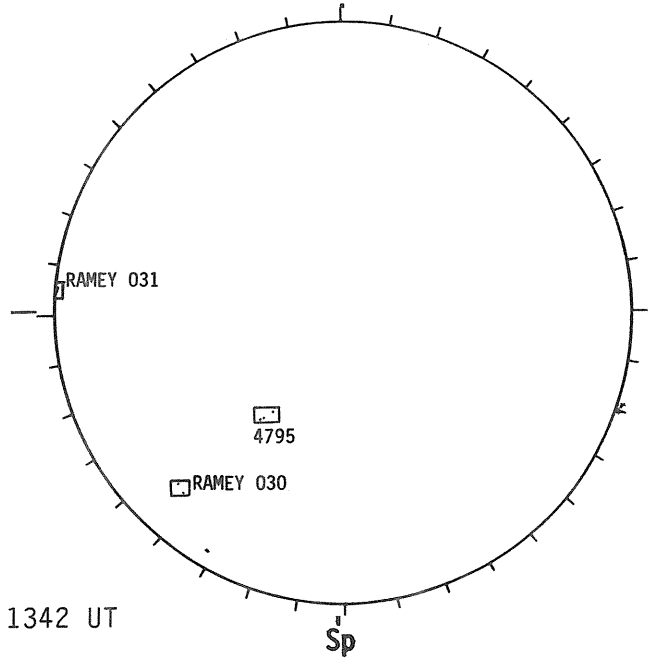
MT. WILSON MAGNETOGRAM



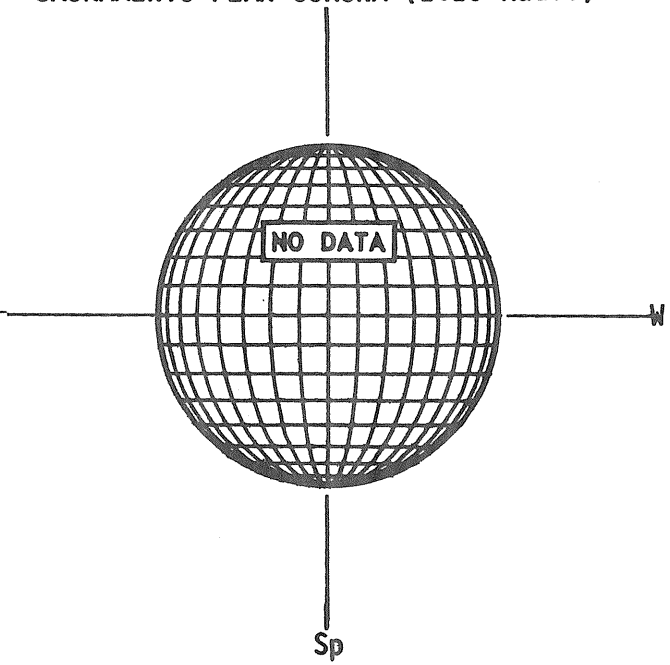
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOTS



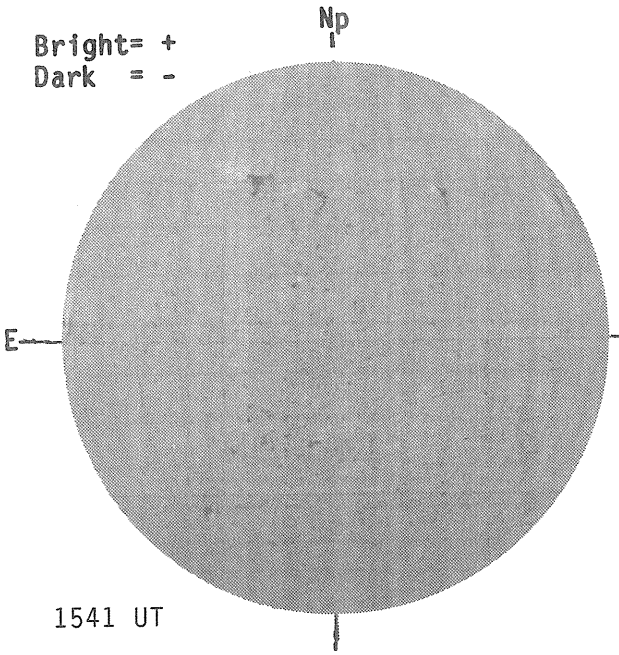
SACRAMENTO PEAK CORONA (1.15 Radii)



A P R I L 22, 1 9 8 7 (P=-25.42, B_0=-5.01, L_0= 13.27)

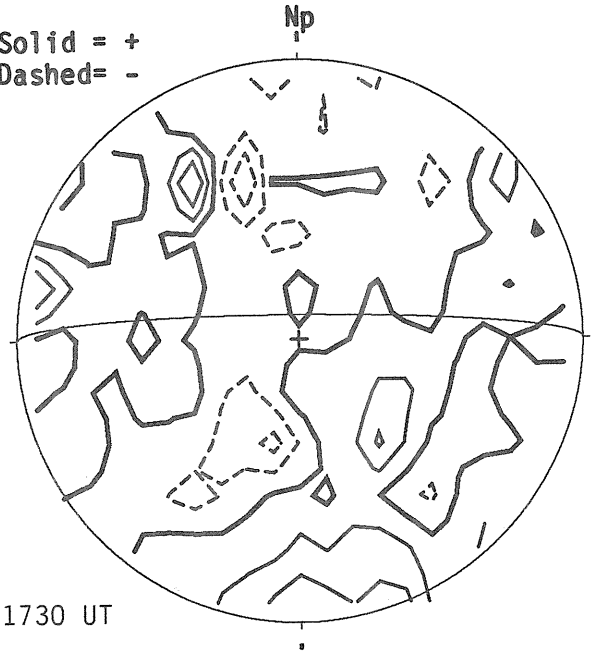
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



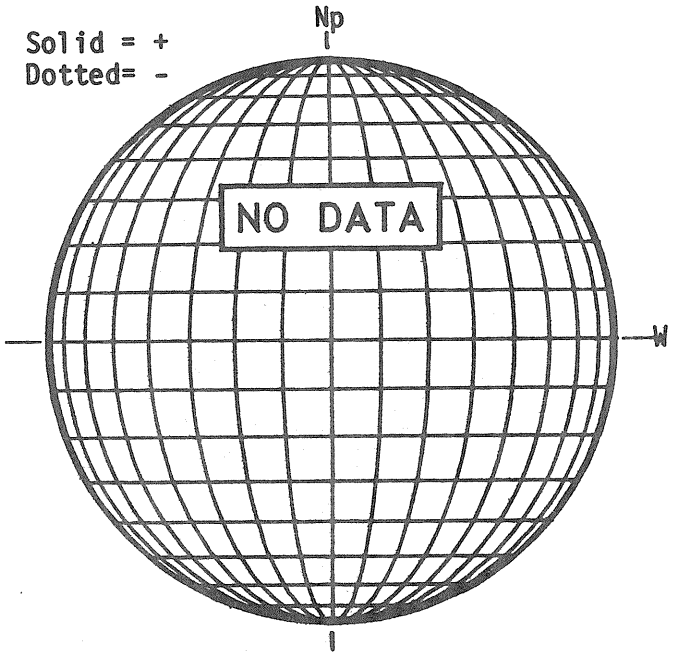
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

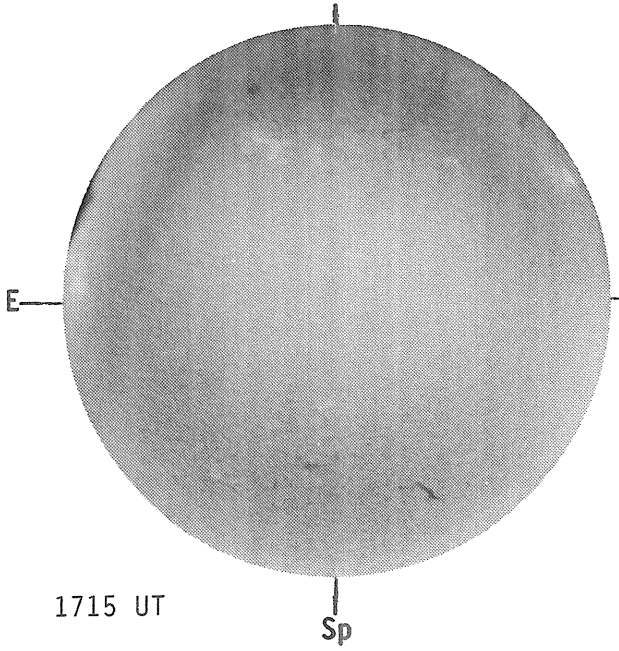


MT. WILSON MAGNETOGRAM

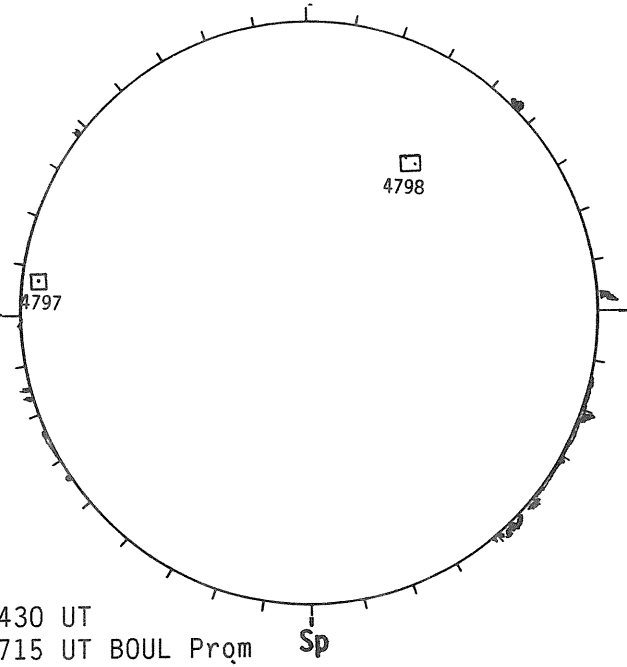
Solid = +
Dotted= -



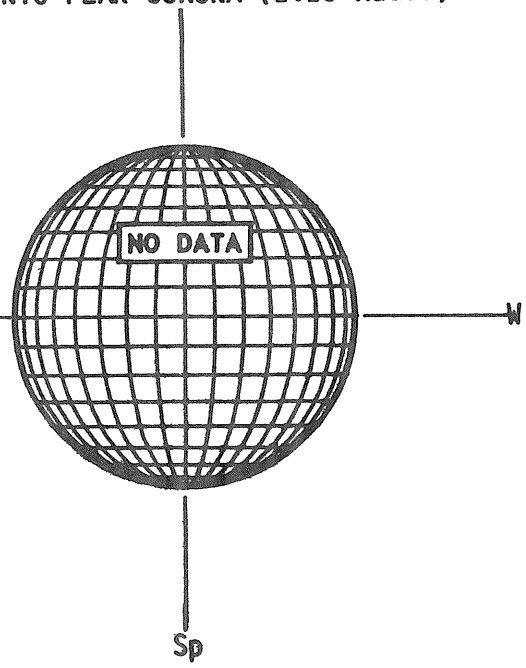
BOULDER H-ALPHA



BOULDER SUNSPOTS



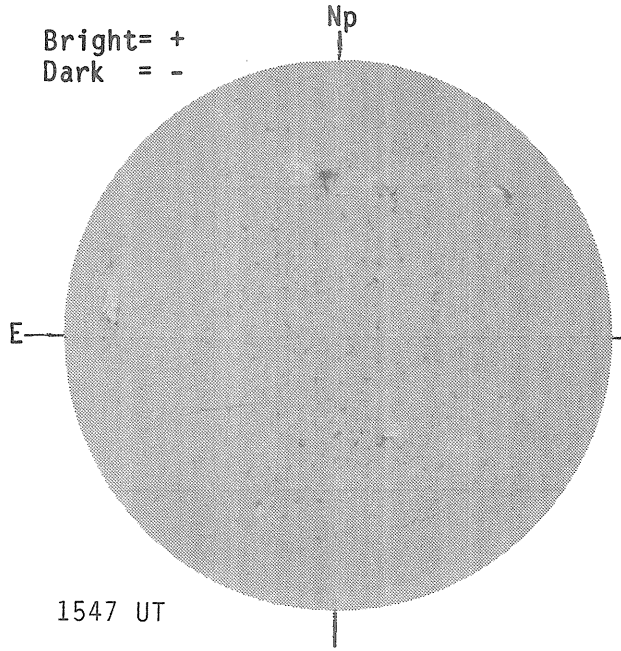
SACRAMENTO PEAK CORONA (1.15 Radii)



A P R I L 23, 1 9 8 7 (P=-25.31, B_o=-4.92, L_o= 0.06)

KITT PEAK MAGNETOGRAM

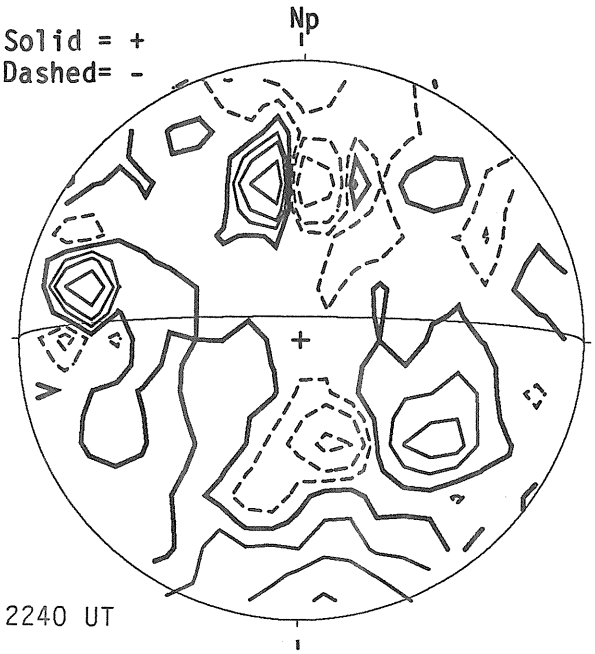
Bright= +
Dark = -



1547 UT

STANFORD MAGNETOGRAM

Solid = +
Dashed= -

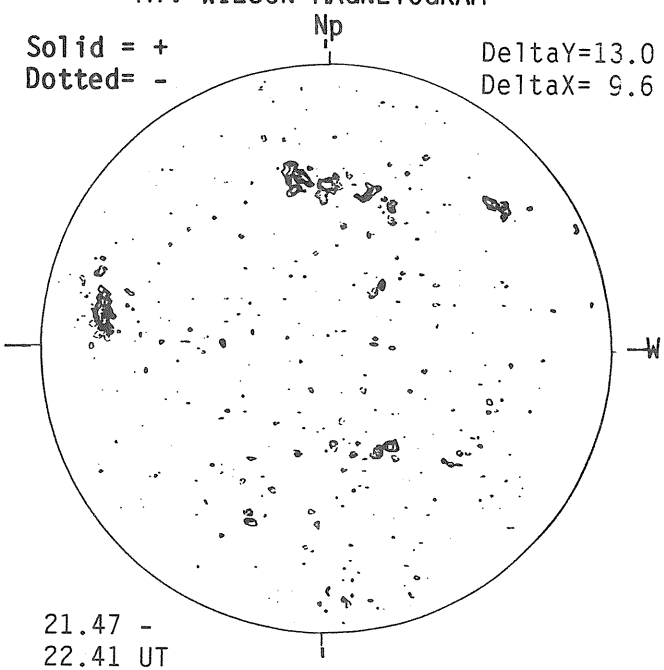


2240 UT

MT. WILSON MAGNETOGRAM

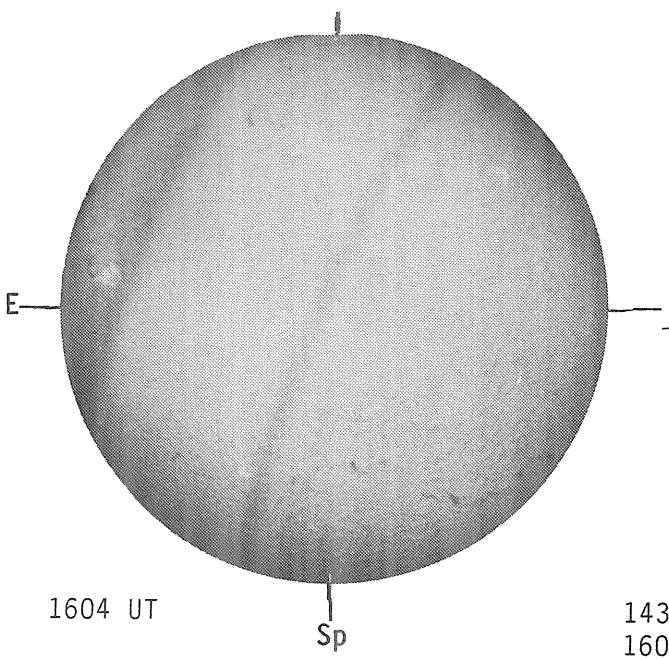
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.6



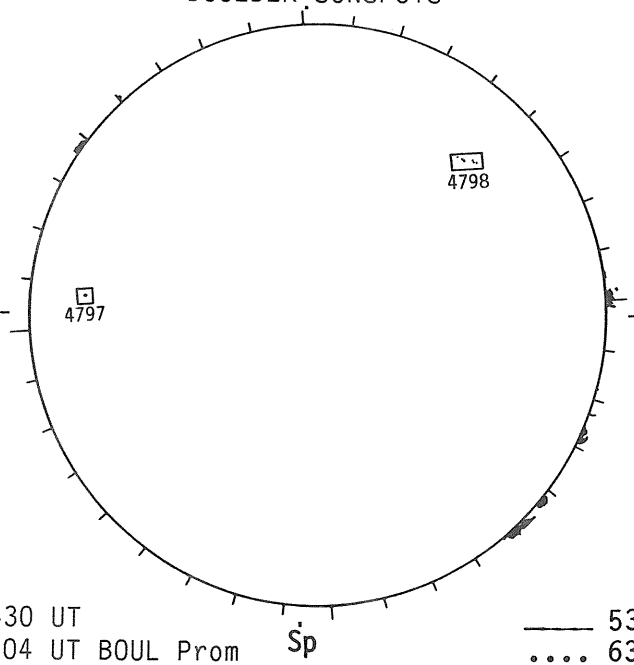
21.47 -
22.41 UT

BOULDER H-ALPHA



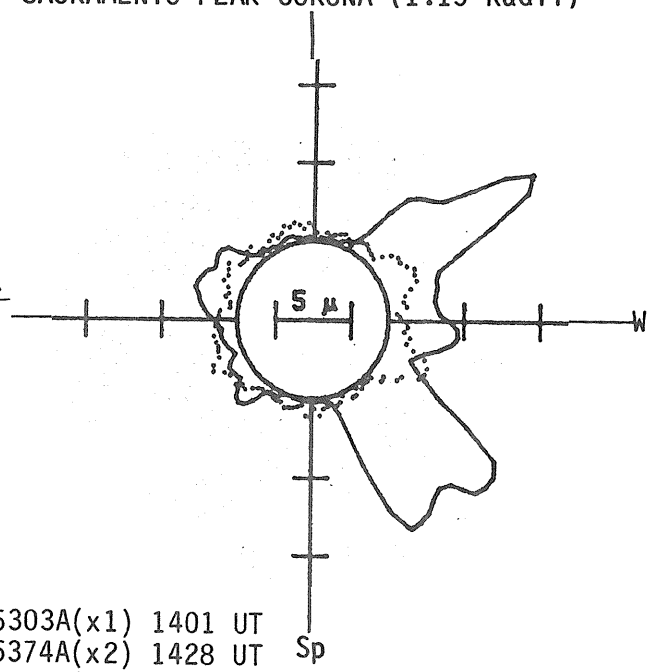
1604 UT

BOULDER SUNSPOTS



1430 UT
1604 UT BOUL Prom

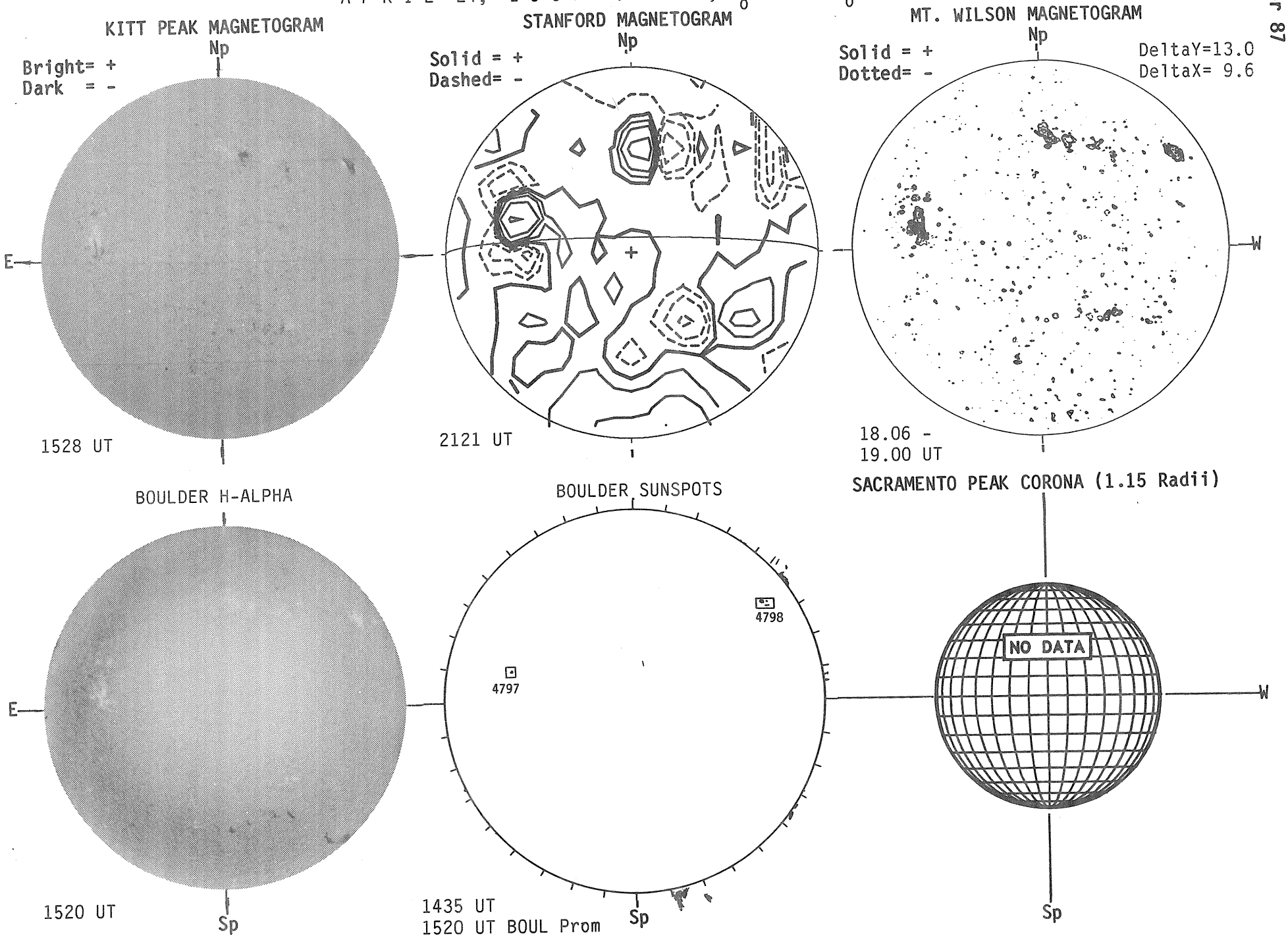
SACRAMENTO PEAK CORONA (1.15 Radii)



—— 5303A(x1) 1401 UT
.... 6374A(x2) 1428 UT
xxxx 5694A(x6) 1410 UT
NO 5694A ACTIVITY TODAY

57
Apr 87

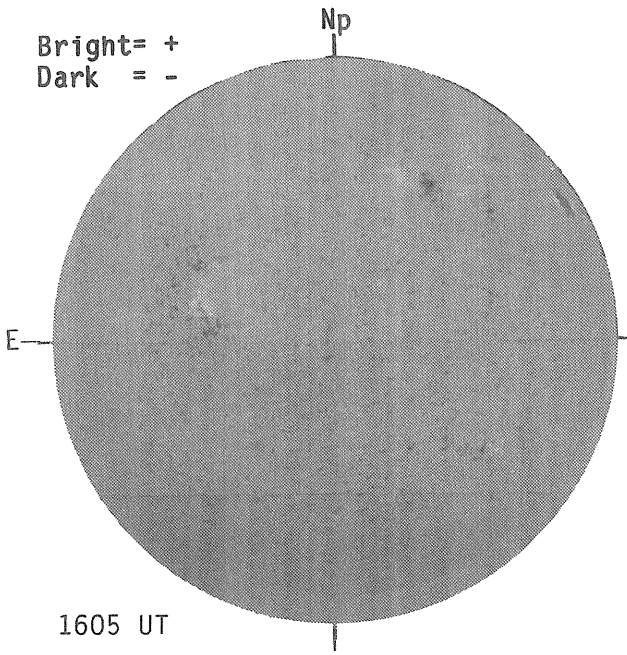
A P R I L 24, 1 9 8 7 (P=-25.19, B_0=-4.83, L_0= 346.85)



A P R I L 25, 1 9 8 7 (P=-25.07, B_0=-4.74, L_0= 333.64)

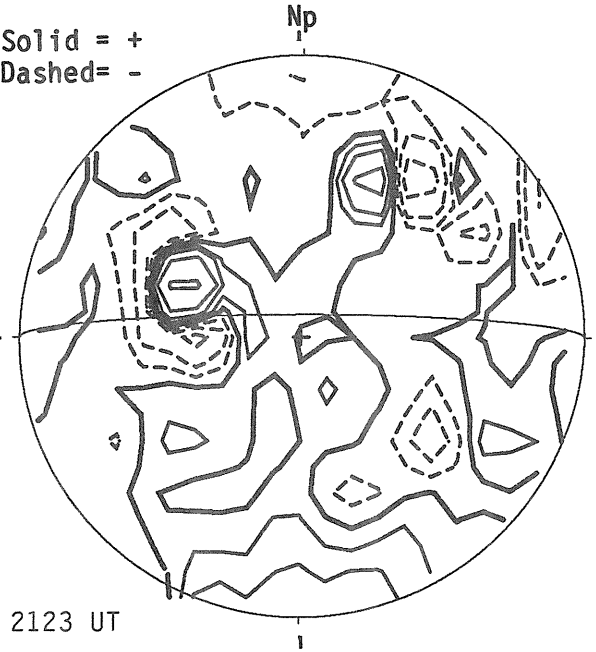
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

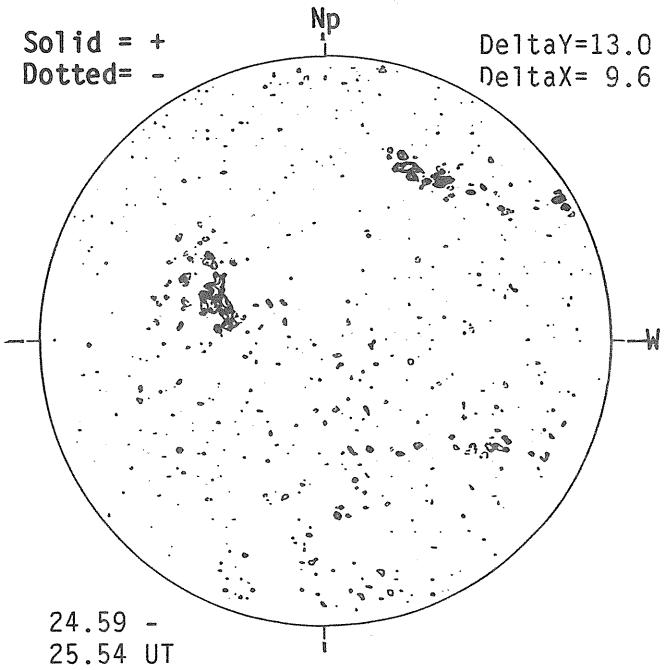
Solid = +
Dashed= -



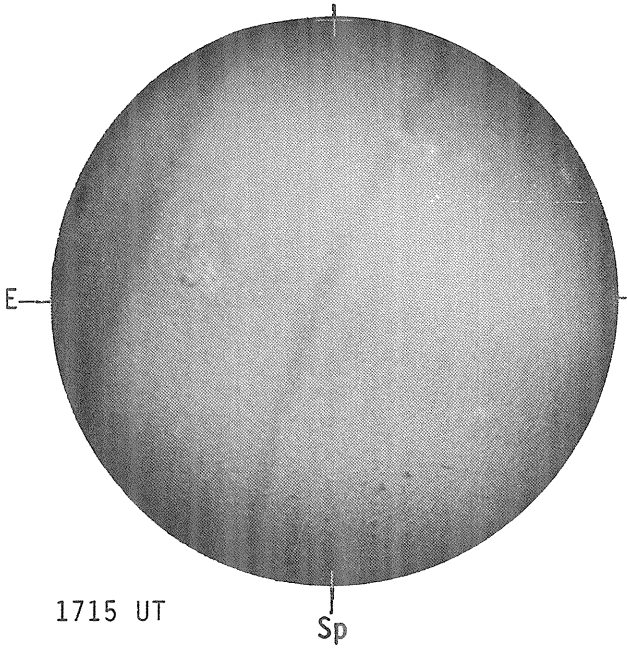
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

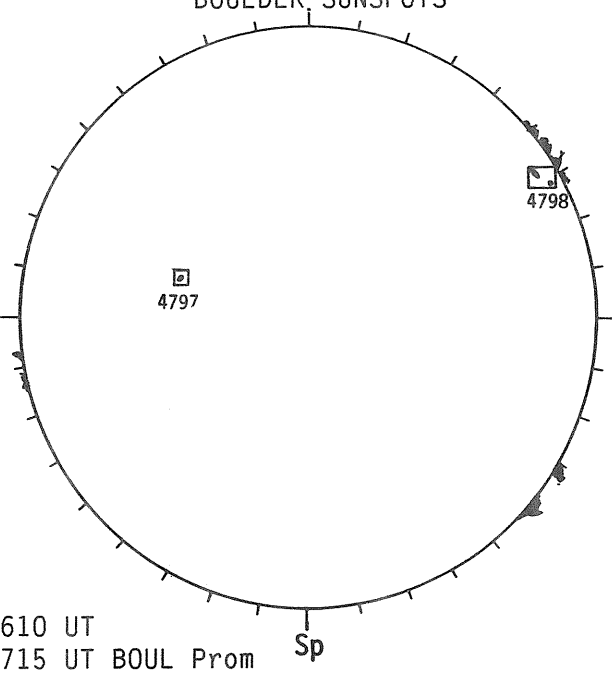
DeltaY=13.0
DeltaX= 9.6



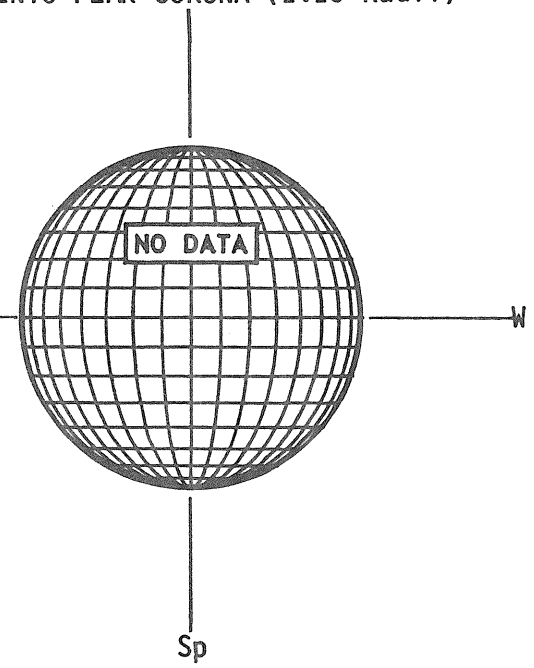
BOULDER H-ALPHA



BOULDER SUNSPOTS



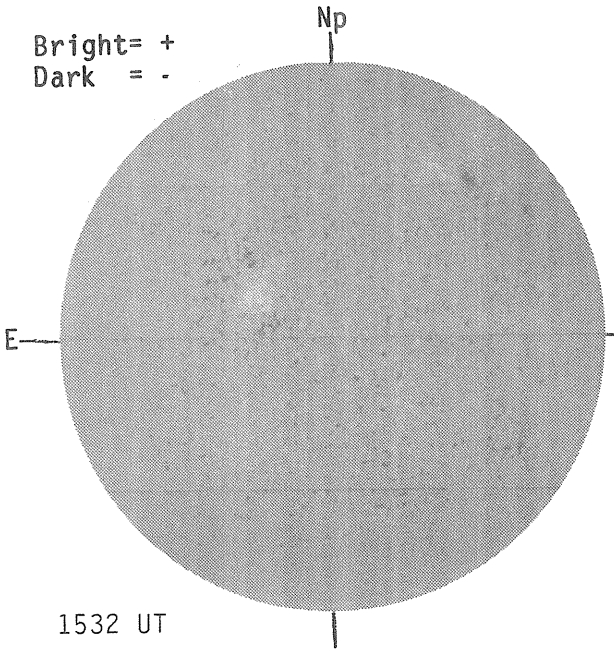
SACRAMENTO PEAK CORONA (1.15 Radii)



A P R I L 26, 1 9 8 7 (P=-24.93, B_0=-4.65, L_0= 320.43)

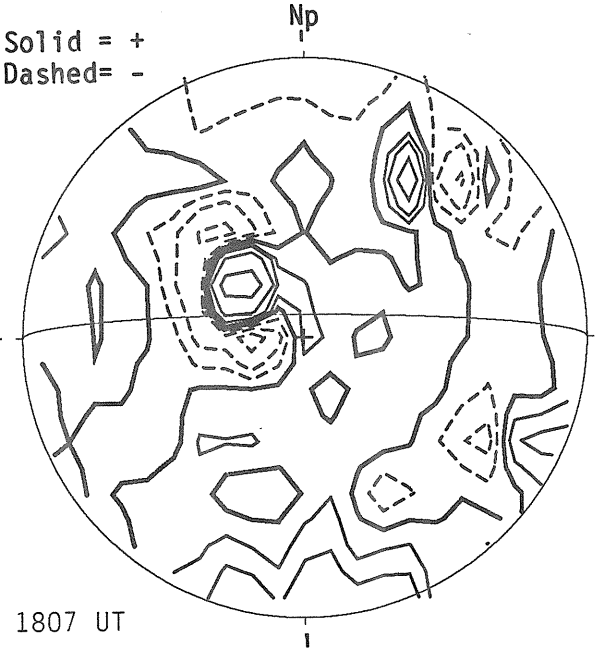
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

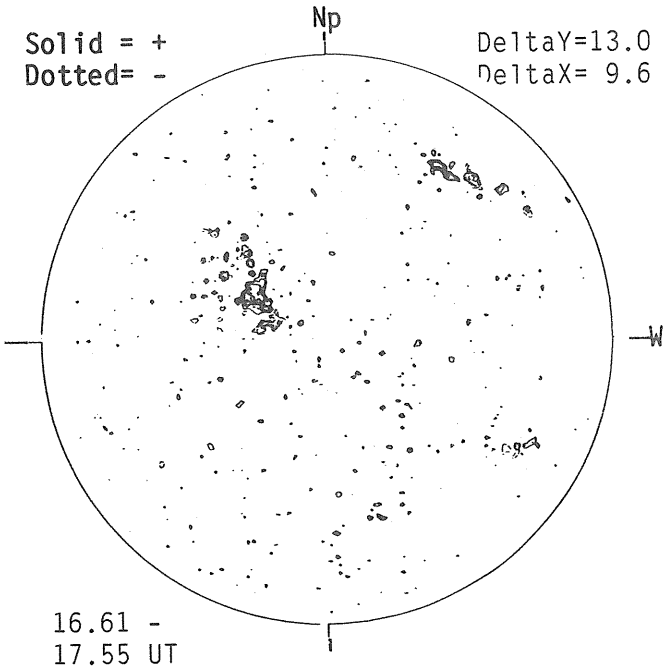
Solid = +
Dashed= -



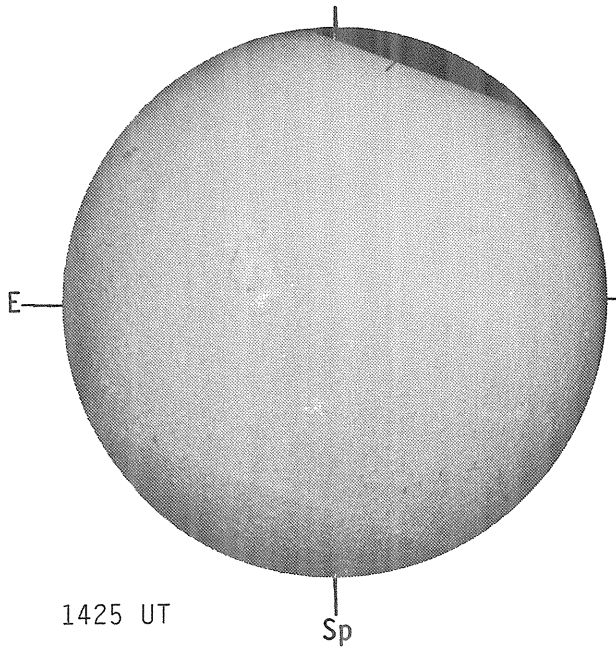
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

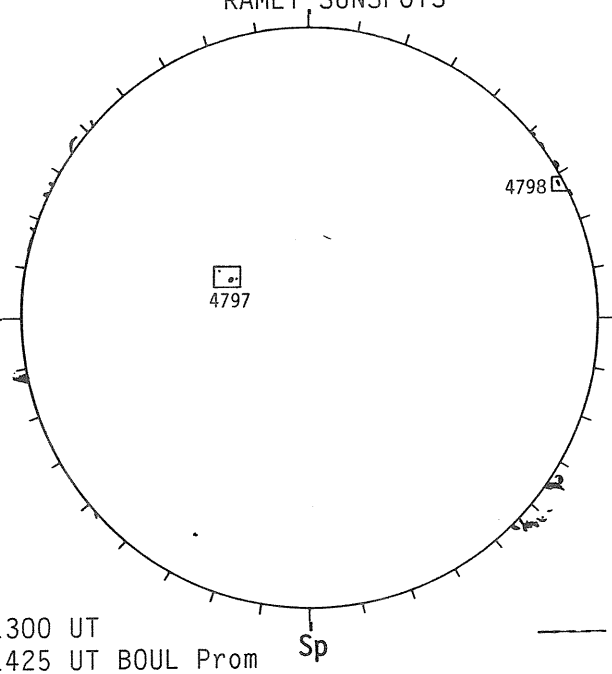
DeltaY=13.0
DeltaX= 9.6



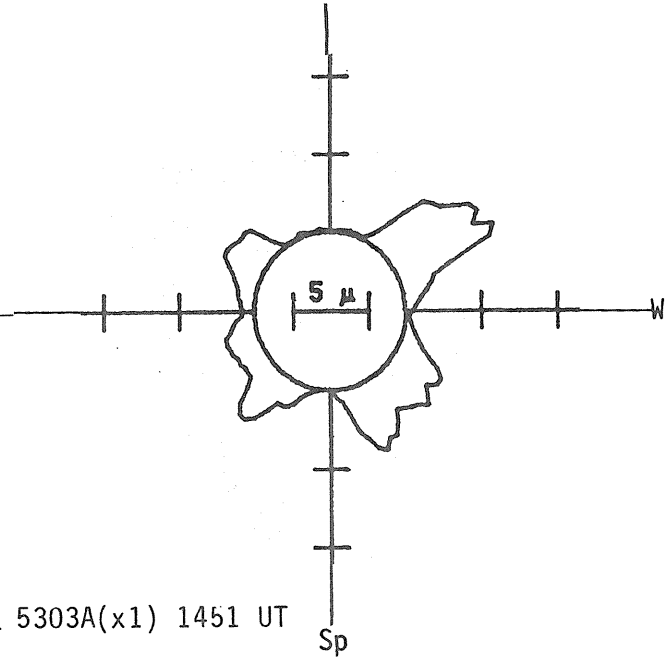
BOULDER H-ALPHA



RAMEY SUNSPOTS



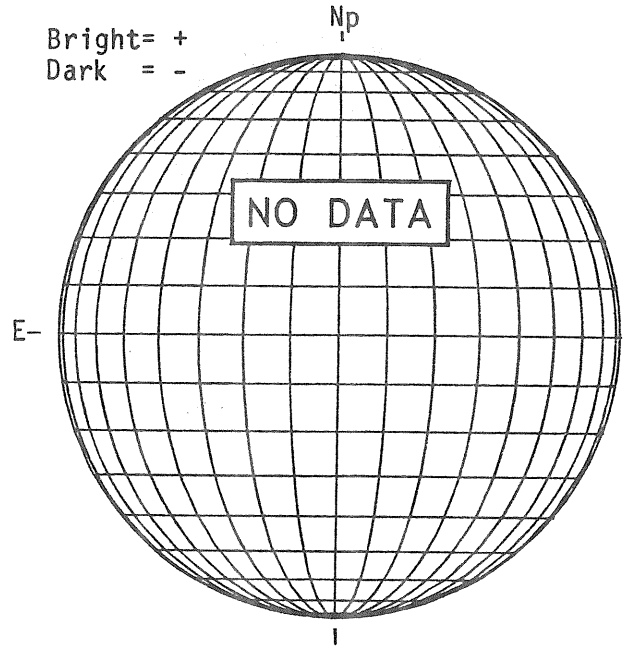
SACRAMENTO PEAK CORONA (1.15 Radii)



A P R I L 27, 1 9 8 7 (P=-24.79, B_0=-4.56, L_0= 307.22)

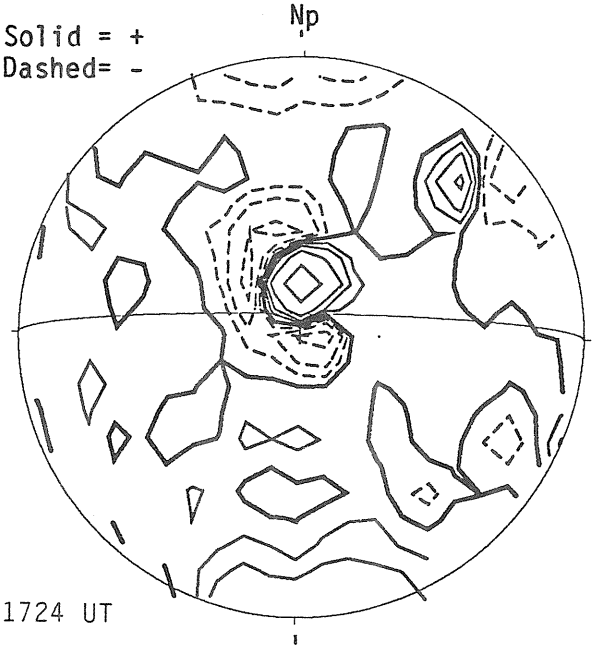
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

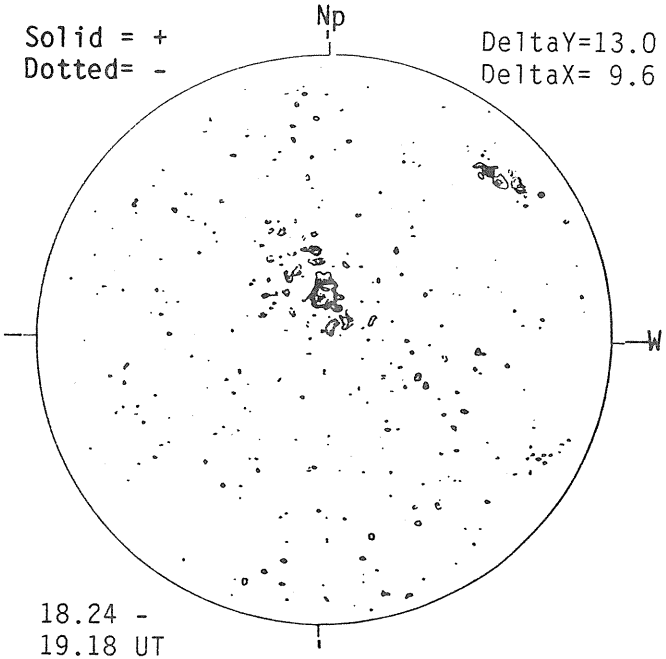
Solid = +
Dashed= -



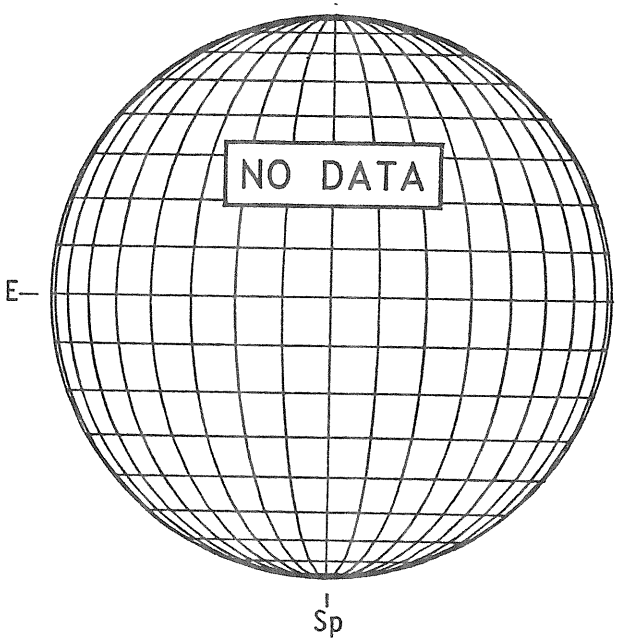
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

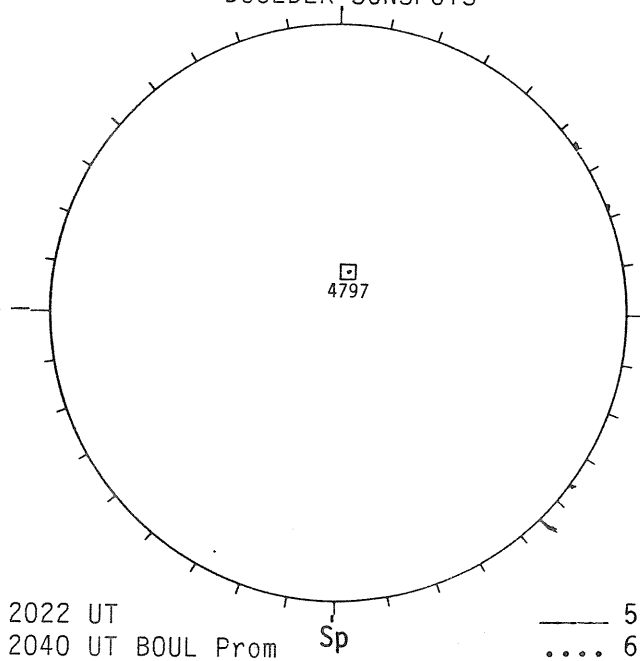
DeltaY=13.0
DeltaX= 9.6



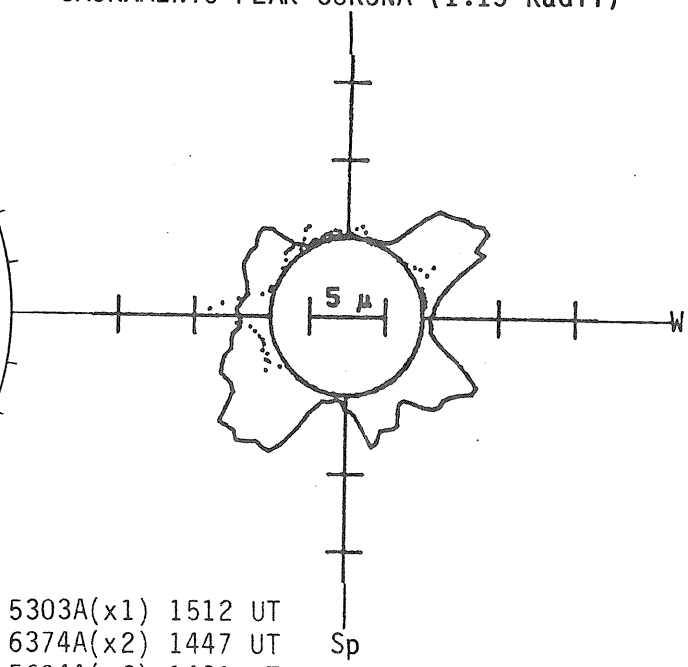
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS

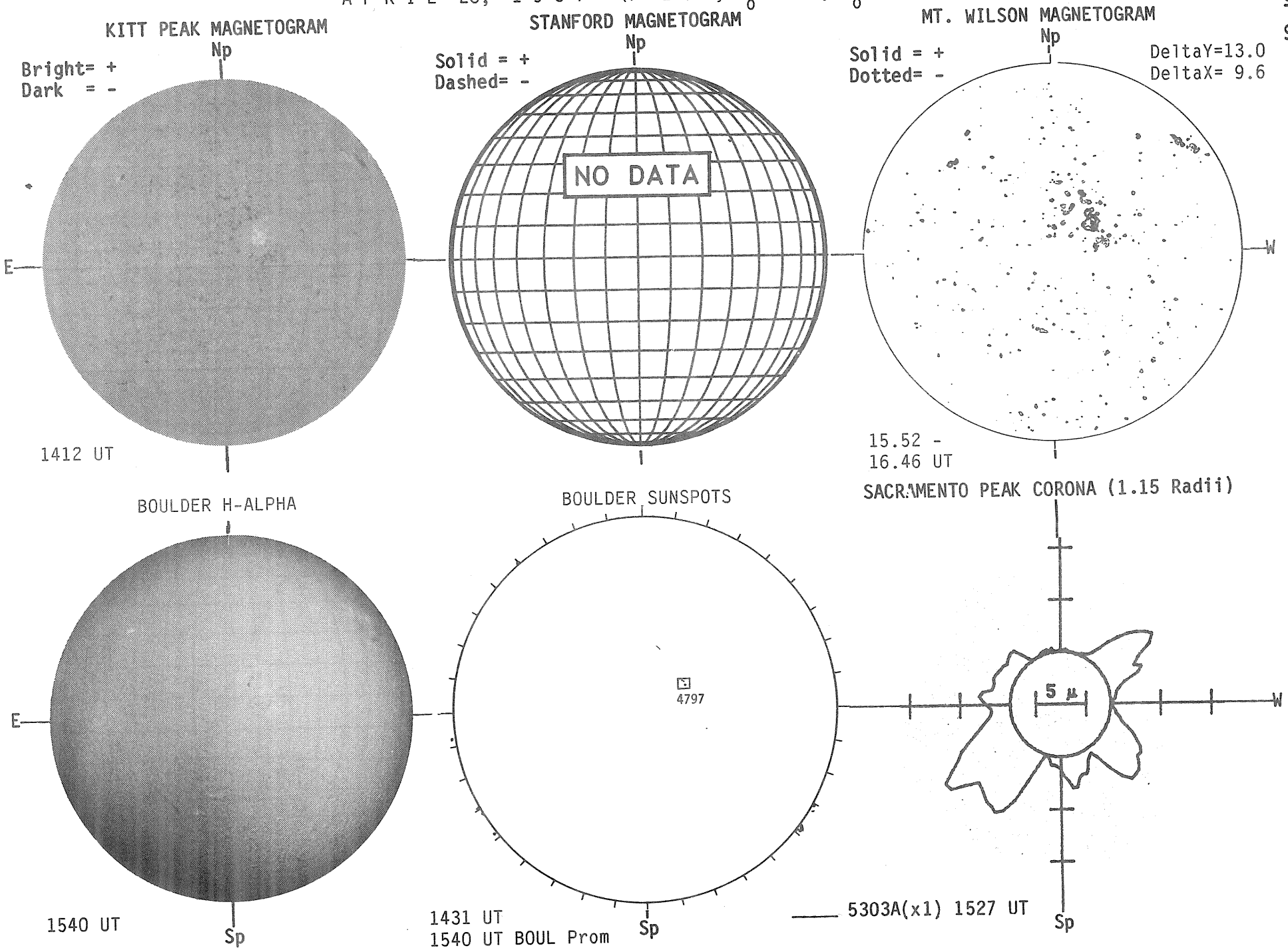


SACRAMENTO PEAK CORONA (1.15 Radii)



—— 5303A(x1) 1512 UT
.... 6374A(x2) 1447 UT
xxxx 5694A(x6) 1431 UT
NO 5694A ACTIVITY TODAY

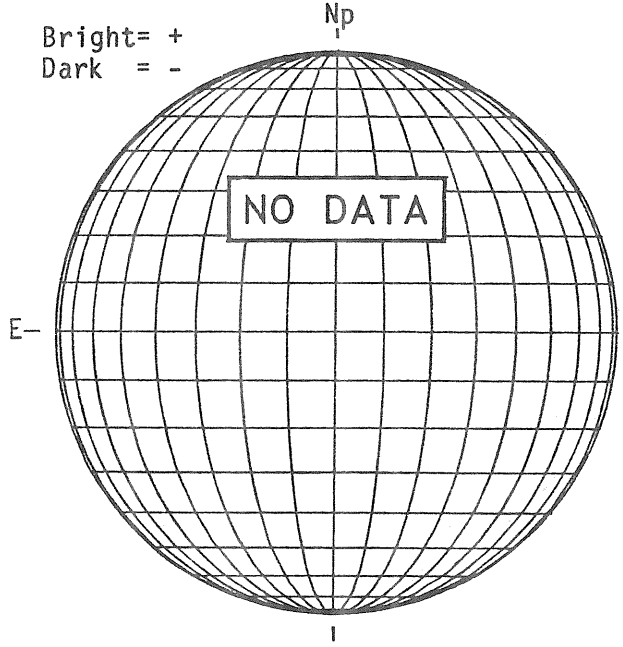
A P R I L 28, 1 9 8 7 (P=-24.64, B_0=-4.46, L_0= 294.01)



A P R I L 29, 1 9 8 7 (P=-24.49, B_0=-4.37, L_0= 280.79)

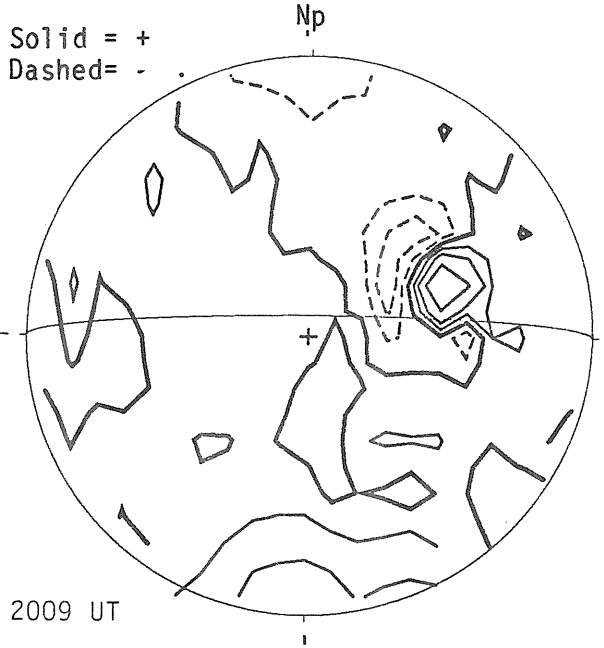
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

Solid = +
Dashed= -

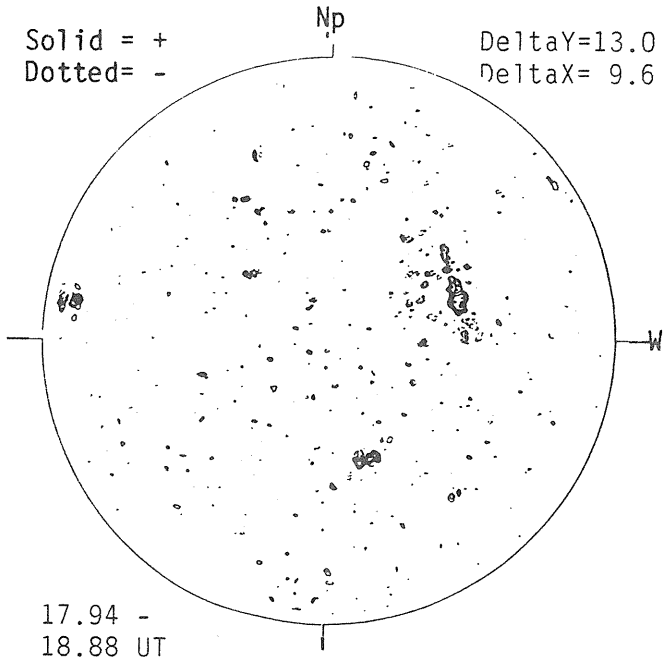


2009 UT

MT. WILSON MAGNETOGRAM

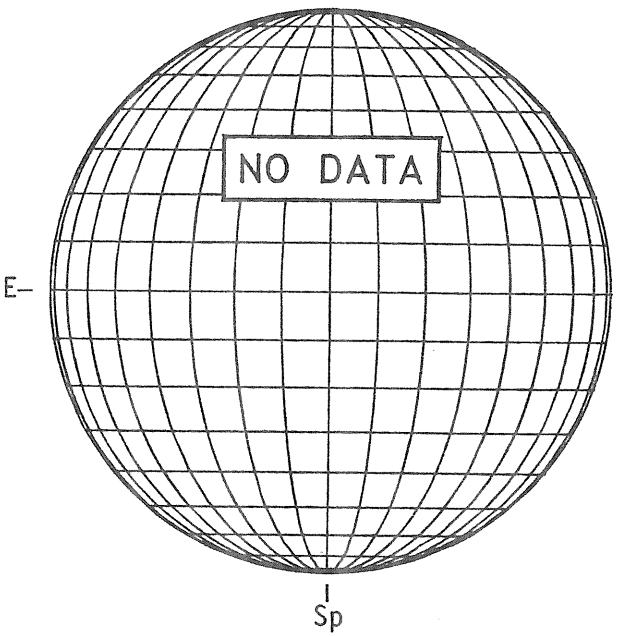
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.6

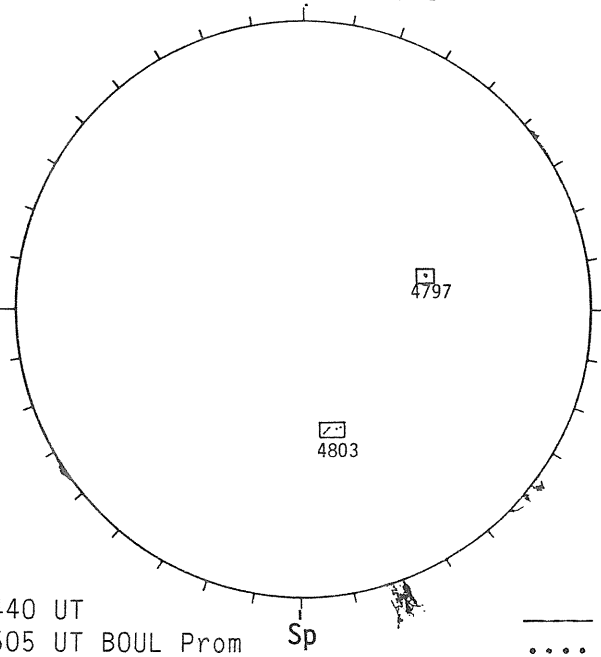


17.94 -
18.88 UT

SACRAMENTO PEAK H-ALPHA

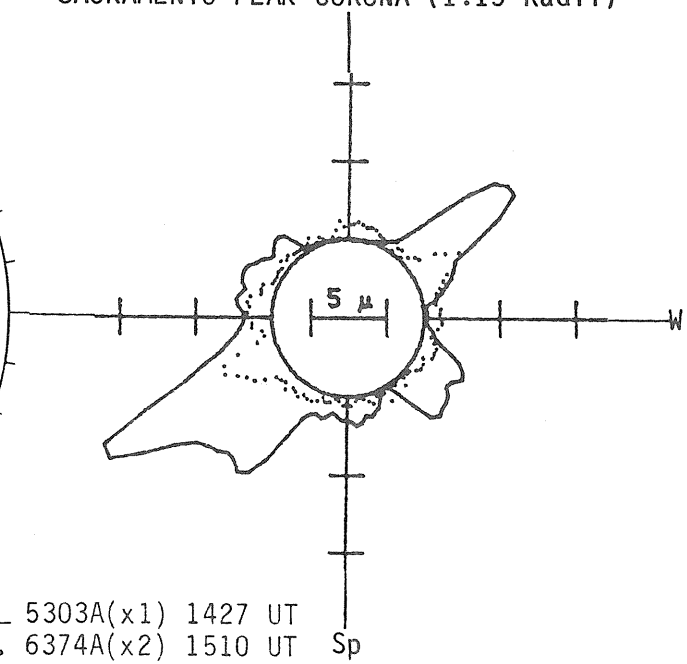


BOULDER SUNSPOTS



1440 UT
1505 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



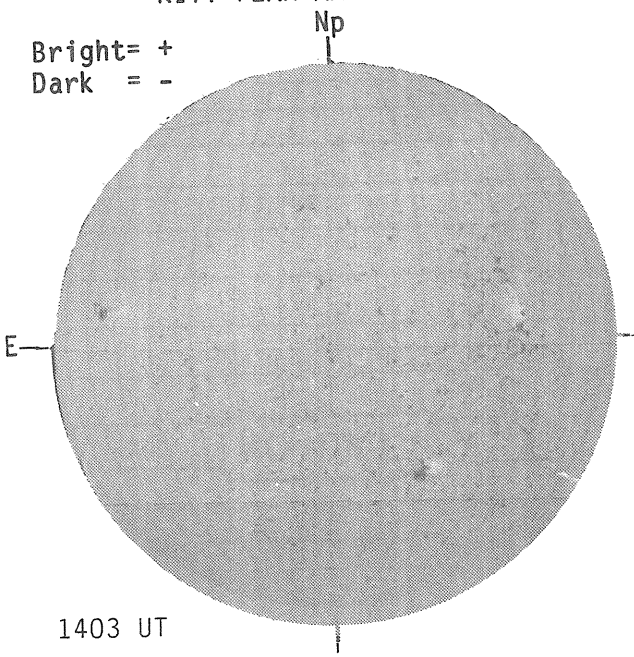
____ 5303A(x1) 1427 UT
.... 6374A(x2) 1510 UT
xxxx 5694A(x6) 1452 UT
NO 5694A ACTIVITY TODAY

63
Apr 87

A P R I L 30, 1 9 8 7 (P=-24.32, B_0=-4.27, L_0= 267.58)

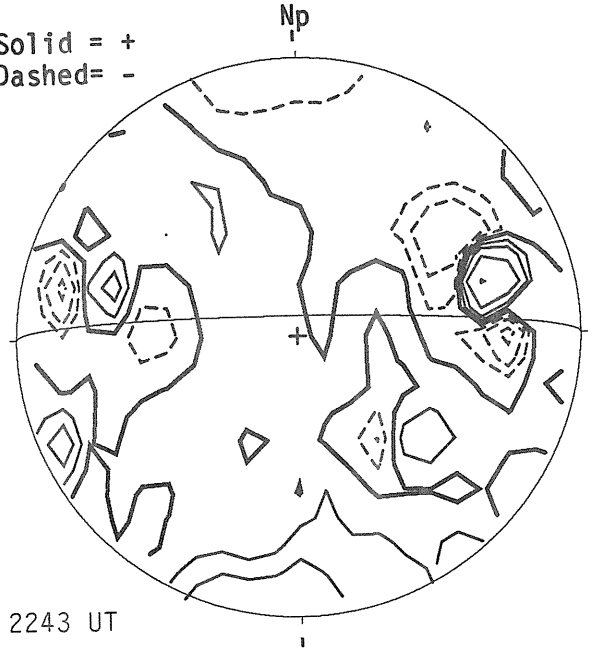
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



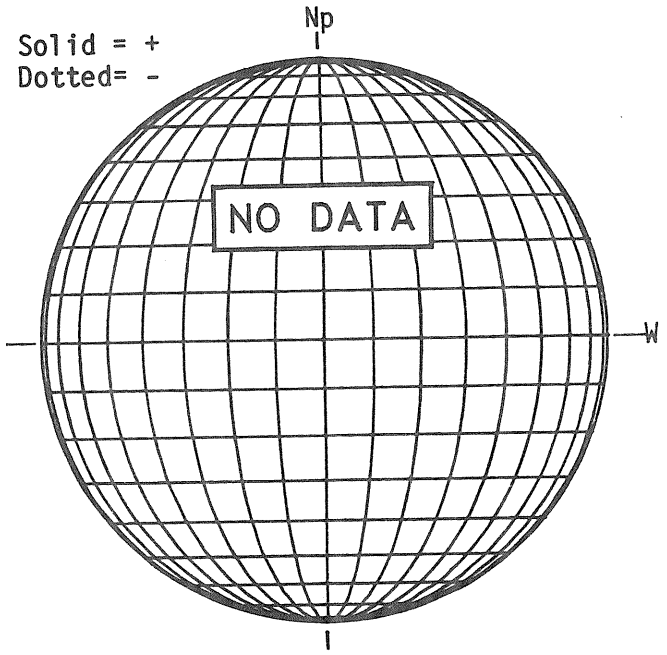
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

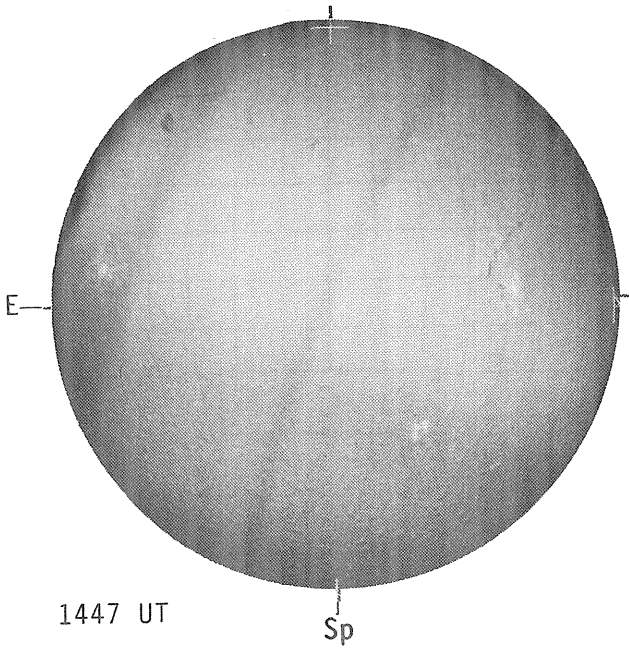


MT. WILSON MAGNETOGRAM

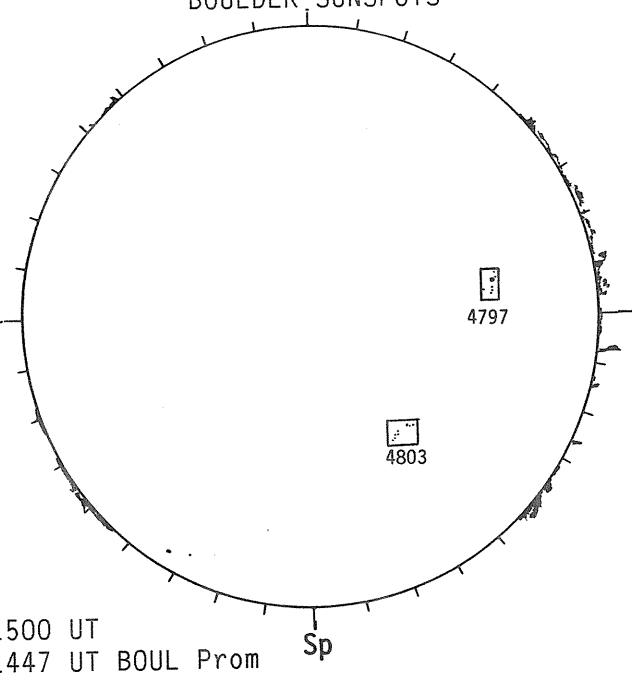
Solid = +
Dotted= -



BOULDER H-ALPHA

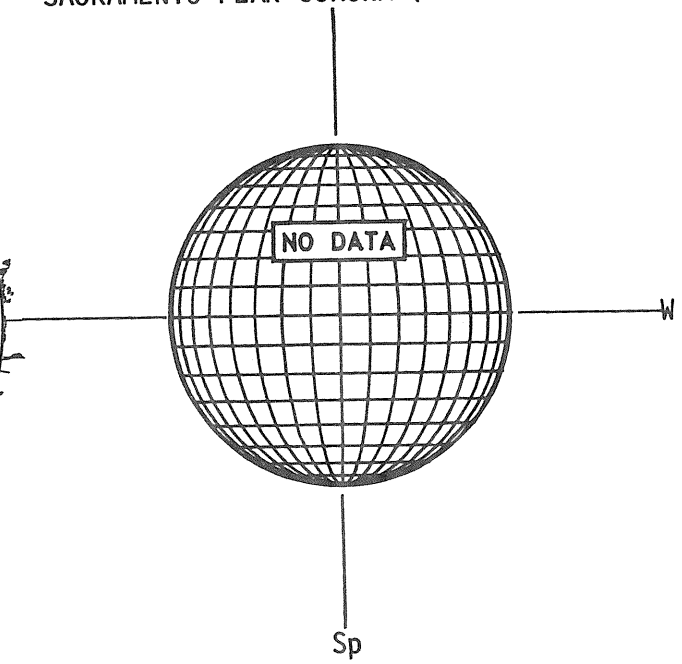


BOULDER SUNSPOTS



1500 UT
1447 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



S U N S P O T G R O U P S
(ORDERED BY CENTRAL MERIDIAN PASSAGE DATE)

APRIL 1987

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
4788		SVTO	04	07	0745	S24	E02	04	7.5		A	AX	20	3	3	4
4788		RAMY	04	07	1306	S24	W02	04	7.4		B	BXO	10	4	3	3
4788	24374	MWIL	04	07	1430	S24	W02	04	7.4	4	(B)					
4788		HOLL	04	07	1608	S24	W03	04	7.4		B	BXO	10	3	3	3
4788		PALE	04	07	1817	S24	W04	04	7.4		B	BXO	10	3	4	3
4788		LEAR	04	08	0133	S23	W08	04	7.4		B	BXO	10	3	4	2
4788		CULG	04	08	0425	S25	W10	04	7.4		A	AX		1		3
4788		SVTO	04	08	0846	S24	W13	04	7.4		A	AX	10	1	1	3
4788		RAMY	04	08	1335	S25	W14	04	7.5		B	BXO	10	2	3	3
4788		HOLL	04	08	1440	S24	W16	04	7.4		A	AX	10	1	1	3
4788	24374	MWIL	04	08	1500	S24	W16	04	7.4	4	(AP)					
4788		PALE	04	08	1828	S24	W19	04	7.3		A	AX		1		3
4788		LEAR	04	09	0013	S24	W22	04	7.3		A	AX	10	1	1	3
4786		RAMY	04	04	1400	S22	E64	04	9.5		B	BXO	20	3	2	4
4786	24372	MWIL	04	04	1445	S23	E65	04	9.6	3	(AF)					
4786		HOLL	04	04	1619	S23	E63	04	9.5		B	BXO	20	3	4	3
4786		PALE	04	04	1823	S23	E60	04	9.4		B	BXO	20	4	4	3
4786		LEAR	04	05	0016	S22	E59	04	9.5		B	BXO	30	7	5	3
4786		SVTO	04	05	1014	S22	E54	04	9.6		B	BXO	40	7	7	1
4786		BOUL	04	05	1423	S23	E48	04	9.3		B	BXO	50	7	4	2
4786	24372	MWIL	04	05	1445	S22	E52	04	9.6	4	(B)					
4786		PALE	04	05	1759	S23	E49	04	9.5		B	CRO	50	10	7	3
4786		HOLL	04	05	1858	S22	E48	04	9.5		B	DAO	70	12	5	3
4786		LEAR	04	06	0016	S22	E45	04	9.5		B	DRI	80	22	7	3
4786		CULG	04	06	0400	S22	E45	04	9.6				90	20	7	3
4786		SVTO	04	06	0953	S23	E40	04	9.5		B	DAI	180	22	8	3
4786		BOUL	04	06	1427	S22	E36	04	9.4		B	DSC	430	20	8	2
4786	24372	MWIL	04	06	1445	S22	E38	04	9.5	5	(B)					
4786		HOLL	04	06	1610	S22	E36	04	9.4		B	DAI	310	17	8	3
4786		RAMY	04	06	1900	S22	E35	04	9.5		B	DSC	380	24	8	2
4786		PALE	04	06	1930	S23	E35	04	9.5		B	DAI	440	28	10	2
4786		LEAR	04	07	0018	S22	E33	04	9.5		B	DHI	310	15	8	3
4786		SVTO	04	07	0745	S23	E28	04	9.5		B	DKI	600	22	9	4
4786		RAMY	04	07	1306	S22	E25	04	9.5		B	DHI	450	26	10	3
4786	24372	MWIL	04	07	1430	S23	E25	04	9.5	5	(B)					
4786		BOUL	04	07	1518	S22	E22	04	9.3		B	DAI	190	16	8	2
4786		HOLL	04	07	1608	S23	E24	04	9.5		B	DKI	410	23	10	3
4786		PALE	04	07	1817	S23	E23	04	9.5		B	DKI	460	28	10	3
4786		LEAR	04	08	0133	S24	E18	04	9.4		B	DHI	320	18	10	2
4786		CULG	04	08	0425	S23	E17	04	9.5		B	DAO	660	15	10	3
4786		SVTO	04	08	0846	S23	E15	04	9.5		B	DAI	590	25	10	3
4786		RAMY	04	08	1335	S23	E13	04	9.6		B	DKO	330	23	10	3
4786		HOLL	04	08	1440	S24	E12	04	9.5		B	EKO	430	18	12	3
4786		BOUL	04	08	1450	S22	E12	04	9.5		B	DKI	250	14	9	4
4786	24372	MWIL	04	08	1500	S23	E12	04	9.5	6	(B)					
4786		PALE	04	08	1828	S25	E10	04	9.5		BG	EKI	370	22	12	3
4786		LEAR	04	09	0013	S24	E06	04	9.5		B	ESO	320	14	11	3
4786		CULG	04	09	0405	S23	E07	04	9.7		B	DAO	400	7	10	2
4786		SVTO	04	09	1050	S23	E00	04	9.4		B	ESO	350	16	11	2
4786	24372	MWIL	04	09	1500	S23	W03	04	9.4	6	(B)					
4786		HOLL	04	09	1545	S23	W01	04	9.6		B	EHO	380	15	12	3
4786		RAMY	04	09	1635	S23	W02	04	9.5		B	EHO	300	15	12	4
4786		LEAR	04	10	0228	S23	W08	04	9.5		B	EHO	240	16	12	3
4786		CULG	04	10	0445	S23	W10	04	9.4		B	EAO	200	6	12	2
4786		SVTO	04	10	0605	S23	W10	04	9.5		B	CSO	240	8	12	3
4786		HOLL	04	10	1447	S24	W14	04	9.5		B	EHO	200	9	12	3
4786	24372	MWIL	04	10	1500	S24	W16	04	9.4	6	(B)					
4786		BOUL	04	10	1535	S22	W14	04	9.6		B	DSO	210	9	9	2
4786		RAMY	04	10	1549	S24	W15	04	9.5		B	EHO	270	11	12	3
4786		PALE	04	10	2243	S25	W19	04	9.5		B	CSO	140	10	12	2
4786		LEAR	04	11	0058	S23	W20	04	9.5		B	CSO	160	11		3
4786		CULG	04	11	0500	S23	W22	04	9.5		B	EHO	230	10	12	3
4786		RAMY	04	11	1426	S25	W28	04	9.4		B	CHO	210	9	13	3
4786	24372	MWIL	04	11	1445	S24	W28	04	9.5	5	(B)					
4786		HOLL	04	11	1525	S24	W27	04	9.5		B	CSO	180	8	13	4
4786		BOUL	04	11	1615	S22	W33	04	9.1		B	DAO	200	2	3	2
4786		LEAR	04	12	0031	S23	W38	04	9.1		A	HH	110	1	3	3

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(ORDERED BY CENTRAL MERIDIAN PASSAGE DATE)

APRIL 1987

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
4786		CULG	04	12	0430	S24	W37	04	9.3		B	CHO	160	6	12	3
4786		SVTO	04	12	1036	S23	W41	04	9.3		B	CHO	250	6	12	3
4786	24372	MWIL	04	12	1500	S23	W44	04	9.2	5	(BP)					
4786		HOLL	04	12	1903	S24	W48	04	9.1		A	HS	220	2	2	3
4786		LEAR	04	13	0023	S23	W51	04	9.1		A	HH	240	2	3	3
4786		CULG	04	13	0515	S23	W55	04	9.0		A	HH	140	1	3	3
4786		SVTO	04	13	0748	S23	W56	04	9.0		A	HK	30	1	3	3
4786		BOUL	04	13	1455	S22	W58	04	9.2		A	HA	110	2	1	2
4786		HOLL	04	13	1458	S23	W59	04	9.1		A	HS	190	2	2	3
4786	24372	MWIL	04	13	1500	S23	W59	04	9.1	5	(AP)					
4786		PALE	04	13	1945	S22	W63	04	9.0		A	HS	160	2	2	3
4786		LEAR	04	14	0029	S22	W65	04	9.0		A	HH	200	2	2	3
4786		CULG	04	14	0520	S23	W66	04	9.1		A	HS	140	1	2	2
4786		RAMY	04	14	1400	S23	W70	04	9.2		A	HS	220	1	3	1
4786		BOUL	04	14	1448	S22	W72	04	9.1		A	HS	130	1	2	2
4786		HOLL	04	14	1602	S22	W74	04	9.0		A	HS	120	1	1	3
4786	24372	MWIL	04	14	1630	S23	W72	04	9.1	5	(AP)					
4786		PALE	04	14	2115	S22	W75	04	9.1		A	HS	120	1	2	2
4786		LEAR	04	15	0130	S22	W79	04	9.0		B	CSO	150	2	2	4
4786	24372	MWIL	04	15	1445	S22	W84	04	9.2	4	(AP)					
4786		HOLL	04	15	1525	S23	W86	04	9.0		A	HS	60	1	1	4
4786		RAMY	04	15	1550	S22	W85	04	9.1		A	HS	50	1	2	3
4787		HOLL	04	05	1858	S32	E89	04	12.8		A	AX		1		3
4787		SVTO	04	06	0953	S32	E80	04	12.7		B	CAO	140	4	6	3
4787		BOUL	04	06	1427	S32	E75	04	12.5		B	CSO	90	3	6	2
4787	24373	MWIL	04	06	1445	S31	E78	04	12.8	4	(BP)					
4787		HOLL	04	06	1610	S33	E78	04	12.9		B	CAO	150	3	7	3
4787		RAMY	04	06	1900	S31	E76	04	12.8		B	CSO	60	3	9	2
4787		PALE	04	06	1930	S32	E79	04	13.1		B	CHO	200	3	8	2
4787		LEAR	04	07	0018	S33	E73	04	12.8		B	DSO	200	7	10	3
4787		SVTO	04	07	0745	S33	E69	04	12.8		B	EAO	500	5	13	4
4787		RAMY	04	07	1306	S31	E66	04	12.7		B	DHI	340	6	10	3
4787	24373	MWIL	04	07	1430	S32	E68	04	13.0	5	(BP)					
4787		BOUL	04	07	1518	S32	E62	04	12.5		B	DSO	110	5	9	2
4787		HOLL	04	07	1608	S33	E64	04	12.7		B	DHO	300	7	10	3
4787		PALE	04	07	1817	S33	E65	04	12.9		B	DSO	350	5	10	3
4787		LEAR	04	08	0133	S33	E63	04	13.1		B	DSO	250	6	8	2
4787		CULG	04	08	0425	S33	E56	04	12.6		B	DSO	80	3	9	3
4787		SVTO	04	08	0846	S33	E57	04	12.9		B	DAO	420	9	10	3
4787		RAMY	04	08	1335	S32	E55	04	12.9		B	EHO	360	13	11	3
4787		HOLL	04	08	1440	S32	E55	04	13.0		BG	EHO	430	11	12	3
4787		BOUL	04	08	1450	S32	E51	04	12.6		B	DHO	160	4	9	4
4787	24373	MWIL	04	08	1500	S32	E55	04	13.0	6	(B)					
4787		PALE	04	08	1828	S35	E52	04	12.9		B	DSO	390	9	11	3
4787		LEAR	04	09	0013	S33	E50	04	13.0		B	ESO	140	10	13	3
4787		CULG	04	09	0405	S33	E48	04	13.0		B	ESO	140	5	12	2
4787		SVTO	04	09	1050	S33	E43	04	12.9		B	DSO	200	15	8	2
4787	24373	MWIL	04	09	1500	S32	E42	04	12.9	6	(B)					
4787		HOLL	04	09	1545	S32	E43	04	13.1		B	ESO	120	16	11	3
4787		RAMY	04	09	1635	S32	E40	04	12.8		B	ESO	120	14	11	4
4787		LEAR	04	10	0228	S33	E36	04	13.0		B	EAO	230	15	13	3
4787		CULG	04	10	0445	S32	E35	04	13.0		B	ESO	120	10	11	2
4787		SVTO	04	10	0605	S33	E33	04	12.9		B	DSO	220	15	9	3
4787		HOLL	04	10	1447	S32	E30	04	13.0		B	EKI	320	22	12	3
4787	24373	MWIL	04	10	1500	S32	E29	04	12.9	6	(D)					
4787		BOUL	04	10	1535	S33	E26	04	12.7		B	DAI	60	8	9	2
4787		RAMY	04	10	1549	S32	E28	04	12.9		B	EKI	260	17	12	3
4787		PALE	04	10	2243	S32	E25	04	12.9		BG	EHI	560	21	13	2
4787		LEAR	04	11	0058	S32	E25	04	13.0		B	EHI	190	23	12	3
4787		CULG	04	11	0500	S32	E23	04	13.0		B	EAI	130	14	13	3
4787		RAMY	04	11	1426	S33	E15	04	12.8		B	FKC	170	30	21	3
4787	24373	MWIL	04	11	1445	S32	E18	04	13.0	6	(D)					
4787		HOLL	04	11	1525	S32	E18	04	13.1		B	ESI	230	32	13	4
4787		BOUL	04	11	1615	S32	E16	04	12.9		B	BXI	110	6	13	2
4787		LEAR	04	12	0031	S33	E08	04	12.7		B	EAO	70	14	14	3
4787		CULG	04	12	0430	S33	E09	04	12.9		B	EAO	160	13	14	3
4787		SVTO	04	12	1036	S33	E07	04	13.0		B	EAI	110	22	14	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
4787	24373	MWIL	04	12	1500	S32	E04	04	12.9	6	(D)					
4787		HOLL	04	12	1903	S32	E01	04	12.9		BG	EAI	160	23	14	3
4787		LEAR	04	13	0023	S34	E02	04	13.2		B	DAO	50	12	10	3
4787		CULG	04	13	0515	S33	W03	04	13.0		B	EAI	120	15	14	3
4787		SVTO	04	13	0748	S33	W05	04	12.9		B	EAO	100	20	14	3
4787		BOUL	04	13	1455	S31	W13	04	12.6		B	CAO	30	8	4	2
4787		HOLL	04	13	1458	S33	W09	04	12.9		B	EAO	120	19	14	3
4787	24373	MWIL	04	13	1500	S32	W10	04	12.8	6	(D)					
4787		PALE	04	13	1945	S33	W13	04	12.8		B	EAI	100	14	15	3
4787		LEAR	04	14	0029	S33	W12	04	13.1		B	EAO	60	14	14	3
4787		CULG	04	14	0520	S33	W16	04	12.9		B	EAI	90	11	14	2
4787		RAMY	04	14	1400	S35	W24	04	12.7		B	DAI	80	10	7	1
4787		BOUL	04	14	1448	S33	W20	04	13.0		B	CAO	60	9	10	2
4787		HOLL	04	14	1602	S32	W26	04	12.6		B	CSO	20	9	6	3
4787	24373	MWIL	04	14	1630	S32	W23	04	12.9	6	(BG)					
4787		PALE	04	14	2115	S32	W26	04	12.8		B	CSO	30	13	15	2
4787		LEAR	04	15	0130	S33	W27	04	12.9		B	DRI	80	13	9	4
4787		BOUL	04	15	1440	S33	W33	04	13.0		B	CAO	40	6	14	3
4787	24373	MWIL	04	15	1445	S32	W31	04	13.2	5	(BP)					
4787	24373	MWIL	04	15	1445	S32	W39	04	12.5	3	(AP)					
4787		HOLL	04	15	1525	S32	W40	04	12.5		A	AX	20	3	2	4
4787		RAMY	04	15	1550	S32	W39	04	12.6		A	AX	20	5	2	3
4787		CULG	04	16	0520	S32	W42	04	12.9		B	EAO	100	7	14	3
4787		RAMY	04	16	1345	S32	W50	04	12.6		A	AX	10	6	2	3
4787	24373	MWIL	04	16	1445	S32	W43	04	13.2	6	(BP)					
4787	24373	MWIL	04	16	1445	S32	W50	04	12.7	4	(B)					
4787		BOUL	04	16	1600	S32	W46	04	13.0		B	BXO	90	5	12	2
4787		HOLL	04	16	1720	S31	W54	04	12.5		A	AX	10	4	3	3
4787		PALE	04	16	1910	S31	W56	04	12.4		A	AX	20	3	2	2
4787		LEAR	04	17	0046	S32	W55	04	12.7		B	CRO	40	7	7	3
4787		CULG	04	17	0500	S31	W59	04	12.6		B	CSO	40	4	5	2
4787		SVTO	04	17	0715	S31	W59	04	12.6		B	DAI	70	8	5	3
4787		RAMY	04	17	1258	S33	W65	04	12.4		B	CAO	40	5	3	3
4787		BOUL	04	17	1435	S34	W60	04	12.8		B	DAI	180	6	13	3
4787	24373	MWIL	04	17	1445	S31	W60	04	12.9	5	(BG)					
4787		HOLL	04	17	1515	S32	W65	04	12.5		B	CRO	70	8	8	3
4787		PALE	04	17	2315	S31	W66	04	12.8		B	DAO	20	6	8	2
4787		CULG	04	18	0445	S31	W72	04	12.5		B	DSO	140	2	7	2
4787	24373	MWIL	04	18	1415	S32	W74	04	12.7	5	(AP)					
4787	24373	MWIL	04	19	1415	S32	W82	04	13.1	3	AP					
4789		RAMY	04	07	1306	S05	E79	04	13.4		B	DSO	20	2	4	3
4789	24375	MWIL	04	07	1430	S06	E79	04	13.5	4	(AP					
4789		BOUL	04	07	1518	S06	E76	04	13.3		B	BXO	20	2	1	2
4789		HOLL	04	07	1608	S06	E78	04	13.5		B	DSO	70	2	4	3
4789		PALE	04	07	1817	S06	E78	04	13.6		B	DSO	110	2	4	3
4789		LEAR	04	08	0133	S04	E75	04	13.7		B	DSO	20	2	2	2
4789		CULG	04	08	0425	S05	E70	04	13.4		B	DSO	30	2	3	3
4789		SVTO	04	08	0846	S06	E71	04	13.7		B	CAO	240	4	7	3
4789		RAMY	04	08	1335	S05	E63	04	13.3		B	CSO	80	7	12	3
4789		HOLL	04	08	1440	S04	E67	04	13.6		B	CSO	110	6	5	3
4789		BOUL	04	08	1450	S04	E64	04	13.4		B	BXO	20	2	3	4
4789	24375	MWIL	04	08	1500	S06	E65	04	13.5	5	(AP)					
4789		PALE	04	08	1828	S07	E68	04	13.9		B	ESO	120	4	11	3
4789		LEAR	04	09	0013	S07	E64	04	13.8		B	ESO	160	6	12	3
4789		CULG	04	09	0405	S05	E60	04	13.6		B	DSO	40	2	1	2
4789		SVTO	04	09	1050	S07	E60	04	13.9		B	DSO	120	8	8	2
4789	24375	MWIL	04	09	1500	S06	E55	04	13.7	5	(BP)					
4789		HOLL	04	09	1545	S05	E56	04	13.8		B	CSO	190	9	10	3
4789		RAMY	04	09	1635	S05	E55	04	13.8		B	EAO	110	13	12	4
4789		LEAR	04	10	0228	S05	E51	04	13.9		B	ESO	170	9	14	3
4789		CULG	04	10	0445	S05	E51	04	14.0		B	ESO	100	3	13	2
4789		SVTO	04	10	0605	S07	E48	04	13.8		B	CSO	120	6	8	3
4789		HOLL	04	10	1447	S06	E45	04	14.0		B	CSO	90	17	12	3
4789	24375	MWIL	04	10	1500	S06	E42	04	13.8	5	(B)					
4789		BOUL	04	10	1535	S06	E47	04	14.2		B	CAO	60	6	5	2
4789		RAMY	04	10	1549	S05	E43	04	13.9		B	CSO	100	21	12	3
4789		PALE	04	10	2243	S06	E36	04	13.6		B	CSO	160	8	8	2

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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
4789		LEAR	04	11	0058	S05	E36	04	13.7		B	CSO	60	10	7	3
4789		CULG	04	11	0500	S04	E33	04	13.7		B	DAI	110	6	7	3
4789		RAMY	04	11	1426	S06	E26	04	13.5		B	CAI	90	13	6	3
4789	24375	MWIL	04	11	1445	S06	E26	04	13.6	5	(BP)					
4789		HOLL	04	11	1525	S06	E28	04	13.7		B	CSO	110	14	6	4
4789		BOUL	04	11	1615	S05	E23	04	13.4		B	DSO	100	2	3	2
4789		LEAR	04	12	0031	S06	E18	04	13.4		B	CAO	80	5	3	3
4789		CULG	04	12	0430	S06	E17	04	13.4		B	DAO	110	8	5	3
4789		SVTO	04	12	1036	S06	E14	04	13.5		B	DAO	120	9	5	3
4789	24375	MWIL	04	12	1500	S06	E12	04	13.5	6	(BP)					
4789		HOLL	04	12	1903	S04	E09	04	13.5		B	CAO	180	7	4	3
4789		LEAR	04	13	0023	S05	E06	04	13.5		B	CAO	90	5	4	3
4789		CULG	04	13	0515	S06	E05	04	13.6		B	CSO	100	9	7	3
4789		SVTO	04	13	0748	S06	E03	04	13.5		B	CAO	180	6	4	3
4789		BOUL	04	13	1455	S06	W01	04	13.5		B	CSO	100	5	4	2
4789		HOLL	04	13	1458	S04	W01	04	13.5		B	CSO	180	7	6	3
4789	24375	MWIL	04	13	1500	S06	W03	04	13.4	5	(BG)					
4789		PALE	04	13	1945	S06	W04	04	13.5		B	CSO	100	8	6	3
4789		LEAR	04	14	0029	S08	W08	04	13.4		B	CAO	100	6	3	3
4789		CULG	04	14	0520	S05	W08	04	13.6		B	CSO	100	2	3	2
4789		RAMY	04	14	1400	S08	W16	04	13.4		B	CSO	160	4	3	1
4789		BOUL	04	14	1448	S06	W16	04	13.4		A	HS	110	2	2	2
4789		HOLL	04	14	1602	S07	W16	04	13.5		A	HS	110	2	2	3
4789	24375	MWIL	04	14	1630	S06	W17	04	13.4	5	(AP)					
4789		PALE	04	14	2115	S06	W19	04	13.5		A	HS	100	1	2	2
4789		LEAR	04	15	0130	S07	W22	04	13.4		B	CAO	80	4	2	4
4789		BOUL	04	15	1440	S06	W28	04	13.5		B	HS	170	2	2	3
4789	24375	MWIL	04	15	1445	S06	W29	04	13.4	5	(AP)					
4789		HOLL	04	15	1525	S07	W30	04	13.4		A	HS	90	2	2	4
4789		RAMY	04	15	1550	S08	W29	04	13.5		B	CSO	180	2	2	3
4789		CULG	04	16	0520	S05	W37	04	13.4		A	HS	120	1	1	3
4789		RAMY	04	16	1345	S08	W42	04	13.4		A	HS	200	1	2	3
4789	24375	MWIL	04	16	1445	S06	W43	04	13.4	5	(AP)					
4789		BOUL	04	16	1600	S06	W42	04	13.5		B	HS	120	1	2	2
4789		HOLL	04	16	1720	S06	W45	04	13.3		A	HS	100	1	2	3
4789		PALE	04	16	1910	S05	W45	04	13.4		A	HS	100	1	4	2
4789		LEAR	04	17	0046	S07	W48	04	13.4		A	HH	50	2	3	3
4789		CULG	04	17	0500	S05	W52	04	13.3		A	HS	100	1	1	2
4789		SVTO	04	17	0715	S07	W52	04	13.4		B	CSO	130	2	3	3
4789		RAMY	04	17	1258	S07	W55	04	13.4		A	HH	80	1	3	3
4789		BOUL	04	17	1435	S06	W56	04	13.4		A	HS	100	1	2	3
4789	24375	MWIL	04	17	1445	S06	W54	04	13.6	5	(AP)					
4789		HOLL	04	17	1515	S07	W58	04	13.3		A	HA	110	1	2	3
4789		PALE	04	17	2315	S05	W60	04	13.5		A	HS	70	1	2	2
4789		CULG	04	18	0445	S06	W69	04	13.0		A	HS	50	1	1	2
4789		SVTO	04	18	0632	S07	W66	04	13.3		A	HS	90	1	2	3
4789	24375	MWIL	04	18	1415	S07	W69	04	13.4	4	(AP)					
4789		RAMY	04	18	1424	S08	W71	04	13.3		A	HS	40	1	2	3
4789		BOUL	04	18	1445	S07	W68	04	13.5		B	HS	180	1	2	3
4789		HOLL	04	18	1459	S06	W71	04	13.3		A	HS	100	1	2	3
4789		PALE	04	18	1912	S05	W74	04	13.3		A	HA	50	1	2	3
4789		CULG	04	19	0445	S06	W80	04	13.2		A	HS		1	1	3
4789		SVTO	04	19	0717	S06	W78	04	13.5		A	HS	90	1	2	3
4789		RAMY	04	19	1250	S08	W84	04	13.2		A	HX	40	1	2	3
4789	24375	MWIL	04	19	1415	S07	W85	04	13.2	2	AP					
4790		CULG	04	08	0425	S29	E62	04	13.0		A	HS	90	1	2	3
4790		BOUL	04	08	1500	S30	E56	04	13.0		B	CSO	250	5	4	3
4790		LEAR	04	09	0013	S30	E52	04	13.1		A	HH	260	1	3	3
4790		CULG	04	09	0405	S30	E51	04	13.2		A	HS	150	1	1	2
4790		SVTO	04	09	1050	S31	E46	04	13.1		A	HS	300	1	3	2
4790		HOLL	04	09	1545	S30	E45	04	13.2		B	CHO	240	2	4	3
4790		RAMY	04	09	1635	S30	E45	04	13.2		B	CHO	290	2	4	4
4790		LEAR	04	10	0228	S29	E37	04	13.0		B	CHO	200	3	6	3
4790		CULG	04	10	0445	S30	E38	04	13.2		B	CSO	150	2	4	2
4790		SVTO	04	10	0605	S32	E38	04	13.3		B	CSO	270	2	3	3
4790		HOLL	04	10	1447	S30	E32	04	13.1		A	HH	240	1	3	3
4790		BOUL	04	10	1535	S29	E29	04	12.9		B	DKC	300	13	5	2

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NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo	Day	(UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
4790		RAMY	04	10	1549	S30	E33	04	13.2		B	CHO	280	2	4	3
4790		CULG	04	11	0500	S29	E26	04	13.2		B	DHC	320	12	10	3
4790		RAMY	04	11	1426	S30	E18	04	13.0		B	CHO	260	9	6	3
4790		HOLL	04	11	1525	S30	E25	04	13.6		B	CHO	320	11	13	4
4790		BOUL	04	11	1615	S30	E17	04	13.0		B	CSI	280	4	5	2
4790		LEAR	04	12	0031	S31	E18	04	13.4		B	CKO	160	10	15	3
4790		CULG	04	12	0430	S30	E12	04	13.1		B	DHC	300	13	9	3
4790		SVTO	04	12	1036	S30	E12	04	13.4		B	CHO	320	8	13	3
4790		HOLL	04	12	1903	S31	E11	04	13.7		B	CKO	350	8	13	3
4790		LEAR	04	13	0023	S32	E09	04	13.7		B	CKO	200	8	14	3
4790		CULG	04	13	0515	S31	E04	04	13.5		B	FKI	290	12	20	3
4790		SVTO	04	13	0748	S34	E05	04	13.7		B	CKO	490	12	14	3
4790		BOUL	04	13	1455	S31	W01	04	13.5		B	DAO	250	14	7	2
4790		HOLL	04	13	1458	S31	W01	04	13.5		B	CKO	350	8	14	3
4790		PALE	04	13	1945	S32	W04	04	13.5		B	CKO	340	12	14	3
4790		LEAR	04	14	0029	S31	W04	04	13.7		B	CKO	210	9	12	3
4790		CULG	04	14	0520	S32	W09	04	13.5		B	DKC	300	16	10	2
4790		RAMY	04	14	1400	S33	W20	04	13.0		B	EHI	440	15	12	1
4790		BOUL	04	14	1448	S30	W20	04	13.0		B	CAI	370	10	4	2
4790		HOLL	04	14	1602	S33	W16	04	13.4		B	DHO	370	17	8	3
4790		PALE	04	14	2115	S31	W21	04	13.2		B	DHO	250	8	6	2
4790		LEAR	04	15	0130	S32	W23	04	13.2		BG	DKI	380	23	8	4
4790		BOUL	04	15	1440	S31	W28	04	13.4		B	DKI	300	12	9	3
4790		HOLL	04	15	1525	S34	W29	04	13.3		B	DHO	360	16	10	4
4790		RAMY	04	15	1550	S34	W30	04	13.3		B	DKO	380	20	9	3
4790		CULG	04	16	0520	S30	W41	04	13.0		B	CHO	280	2	5	3
4790		RAMY	04	16	1345	S34	W43	04	13.1		B	DKO	300	18	9	3
4790		BOUL	04	16	1600	S30	W45	04	13.1		B	DKI	450	10	9	2
4790		HOLL	04	16	1720	S32	W44	04	13.2		B	DHO	310	10	9	3
4790		PALE	04	16	1910	S33	W48	04	13.0		B	DHO	320	10	8	2
4790		LEAR	04	17	0046	S33	W49	04	13.1		B	EHO	160	8	11	3
4790		CULG	04	17	0500	S30	W52	04	13.1		B	CAO	180	4	5	2
4790		SVTO	04	17	0715	S31	W52	04	13.2		B	DHI	320	14	7	3
4790		RAMY	04	17	1258	S33	W56	04	13.1		B	DAI	200	20	8	3
4790		BOUL	04	17	1435	S31	W57	04	13.1		B	DKI	320	7	7	3
4790		HOLL	04	17	1515	S32	W57	04	13.1		B	CAO	310	12	6	3
4790		PALE	04	17	2315	S31	W59	04	13.3		B	CKI	320	12	10	2
4790		CULG	04	18	0445	S30	W64	04	13.2		B	CAO	180	2	5	2
4790		SVTO	04	18	0632	S31	W69	04	12.8		BD	EKI	570	16	13	3
4790		RAMY	04	18	1424	S32	W74	04	12.7		B	EKI	260	10	12	3
4790		BOUL	04	18	1445	S31	W72	04	12.9		B	EKI	690	4	13	3
4790		HOLL	04	18	1459	S32	W73	04	12.8		B	EKI	470	7	12	3
4790		PALE	04	18	1912	S28	W76	04	12.9		BD	DKO	420	3	10	3
4790		CULG	04	19	0445	S31	W83	04	12.6		B	DSO		4	9	3
4790		SVTO	04	19	0717	S31	W83	04	12.7		BD	EKO	590	6	13	3
4790		RAMY	04	19	1250	S33	W85	04	12.8		B	DKI	100	6	10	3
4790		BOUL	04	19	1545	S30	W85	04	13.0		B	DKC	150	1	10	1
4790		PALE	04	19	1943	S29	W85	04	13.1		A	HK	320	2	8	2
4790A	24376	MWIL	04	11	1445	S30	E30	04	14.0	5	(AF)					
4790A		CULG	04	12	0430	S31	E26	04	14.2		B	BXO	10	2	3	3
4790A	24376	MWIL	04	12	1500	S32	E18	04	14.0	4	(AF)					
4790A	24376	MWIL	04	13	1500	S32	E05	04	14.0	3	(BF)					
4790B		RAMY	04	19	1250	N03	W68	04	14.4		A	AX		1		3
4792		CULG	04	09	0405	S16	E70	04	14.5		A	AX		1		2
4792	24380	MWIL	04	12	1500	S19	E26	04	14.6	4	(AF)					
4792		LEAR	04	15	0130	S18	W04	04	14.7		B	BXO	10	3	1	4
4792		BOUL	04	15	1440	S17	W11	04	14.8		B	BXO	30	5	4	3
4792	24380	MWIL	04	15	1445	S17	W11	04	14.8	3	(B)					
4792		HOLL	04	15	1525	S17	W11	04	14.8		B	BXO	20	4	4	4
4792		RAMY	04	15	1550	S17	W11	04	14.8		B	BXO	20	6	4	3
4792		CULG	04	16	0520	S16	W20	04	14.7		B	DRO	20	3	4	3
4792		RAMY	04	16	1345	S18	W24	04	14.7		B	BXO	10	3	5	3
4792	24380	MWIL	04	16	1445	S17	W25	04	14.7	3	(B)					
4792		BOUL	04	16	1600	S15	W26	04	14.7		B	BXO	20	2	6	2
4792		HOLL	04	16	1720	S16	W26	04	14.7		B	BXO	10	2	5	3

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4792		PALE	04	16	1910	S16	W30	04	14.5		A	AX	10	1	1	2
4792		LEAR	04	17	0046	S18	W33	04	14.5		A	AX	10	1	1	3
4793	24381	MWIL	04	17	1445	N28	W32	04	15.1	4	(BP)					
4793		HOLL	04	17	1515	N28	W35	04	14.9		A	AX	10	1	1	3
4793		SVTO	04	18	0632	N28	W44	04	14.8		A	AX		1		3
4793	24381	MWIL	04	18	1415	N28	W47	04	14.9	2	(AP)					
4793		HOLL	04	18	1459	N28	W48	04	14.9		A	AX		1		3
4791		RAMY	04	11	1426	N26	E78	04	17.7		A	HS	10	1	1	3
4791	24377	MWIL	04	11	1445	N25	E74	04	17.3	4	(AP)					
4791		HOLL	04	11	1525	N24	E78	04	17.7		A	HS	30	1	1	4
4791		LEAR	04	12	0031	N25	E71	04	17.5		A	HS	60	1	2	3
4791		CULG	04	12	0430	N26	E76	04	18.1		A	HS	60	1	2	3
4791		SVTO	04	12	1036	N25	E66	04	17.5		A	HS	60	1	2	3
4791	24377	MWIL	04	12	1500	N24	E64	04	17.6	5	(AP)					
4791		HOLL	04	12	1903	N24	E63	04	17.7		A	HS	100	1	2	3
4791		LEAR	04	13	0023	N25	E60	04	17.7		A	HS	50	1	2	3
4791		CULG	04	13	0515	N26	E58	04	17.7		A	HS	40	1	2	3
4791		SVTO	04	13	0748	N25	E57	04	17.7		A	HH	10	1	3	3
4791		BOUL	04	13	1455	N23	E50	04	17.4		A	HA	30	2	1	2
4791		HOLL	04	13	1458	N24	E51	04	17.6		A	HS	110	1	2	3
4791	24377	MWIL	04	13	1500	N24	E51	04	17.6	5	(AP)					
4791		PALE	04	13	1945	N23	E50	04	17.7		A	HS	40	1	2	3
4791		LEAR	04	14	0029	N25	E48	04	17.7		A	HS	70	1	2	3
4791		CULG	04	14	0520	N22	E45	04	17.7		A	HS	50	1	2	2
4791		RAMY	04	14	1400	N25	E40	04	17.7		B	CAO	60	3	7	1
4791		BOUL	04	14	1448	N23	E37	04	17.5		A	HA	40	2	1	2
4791		HOLL	04	14	1602	N24	E43	04	18.0		B	CSO	60	3	8	3
4791	24377	MWIL	04	14	1630	N24	E38	04	17.6	5	(AP)					
4791		PALE	04	14	2115	N23	E36	04	17.6		A	HS	30	2	2	2
4791		LEAR	04	15	0130	N24	E36	04	17.8		B	CRO	40	4	7	4
4791	24377	MWIL	04	15	1445	N23	E26	04	17.6	4	(AP)					
4791		HOLL	04	15	1525	N25	E25	04	17.6		A	AX	10	5	3	4
4791		RAMY	04	15	1550	N25	E25	04	17.6		B	CAO	20	4	2	3
4791		CULG	04	16	0520	N23	E20	04	17.8		B	CSO	20	2	2	3
4791		RAMY	04	16	1345	N24	E12	04	17.5		B	BXO	10	3	1	3
4798		SVTO	04	22	0620	N27	W20	04	20.7		A	AX	20	3	3	4
4798		RAMY	04	22	1355	N26	W26	04	20.5		B	CRO	10	4	3	3
4798	24384	MWIL	04	22	1415	N27	W25	04	20.6	4	(B)					
4798		BOUL	04	22	1430	N27	W24	04	20.7		B	BXO	20	2	3	4
4798		HOLL	04	22	1655	N27	W26	04	20.7		B	BXO	10	3	3	4
4798		PALE	04	22	1843	N27	W27	04	20.7		B	BXO	10	2	4	2
4798		LEAR	04	23	0010	N26	W30	04	20.7		B	BXO	30	3	4	1
4798		CULG	04	23	0440	N28	W32	04	20.7		A	AX		1		2
4798		SVTO	04	23	0903	N27	W36	04	20.6		B	BXO	20	6	5	3
4798	24384	MWIL	04	23	1410	N26	W38	04	20.6	4	(B)					
4798		BOUL	04	23	1430	N27	W37	04	20.7		B	CRO	60	5	6	2
4798		RAMY	04	23	1527	N27	W40	04	20.5		B	CRO	20	9	5	2
4798		HOLL	04	23	1545	N27	W39	04	20.6		B	CRO	20	7	4	4
4798		PALE	04	23	1734	N28	W42	04	20.4		B	CRO	30	7	6	3
4798		CULG	04	24	0430	N27	W47	04	20.5		B	CRO	80	4	4	2
4798		SVTO	04	24	0620	N27	W47	04	20.6		B	DAO	70	6	6	4
4798		RAMY	04	24	1410	N26	W52	04	20.5		B	DRO	50	11	5	4
4798		BOUL	04	24	1435	N27	W50	04	20.7		B	CSO	130	6	4	3
4798		HOLL	04	24	1500	N27	W52	04	20.6		B	DSO	110	11	5	4
4798	24384	MWIL	04	24	1600	N27	W52	04	20.6	5	(B)					
4798		PALE	04	24	1815	N27	W54	04	20.5		B	DSO	40	5	6	3
4798		LEAR	04	25	0008	N27	W57	04	20.6		B	DAO	90	3	6	4
4798		CULG	04	25	0430	N27	W60	04	20.5		B	DSO	90	4	7	2
4798		SVTO	04	25	0632	N27	W61	04	20.5		B	CSO	120	4	8	3
4798	24384	MWIL	04	25	1410	N27	W65	04	20.5	5	(B)					
4798		RAMY	04	25	1528	N27	W68	04	20.3		B	DRO	30	2	8	2
4798		BOUL	04	25	1610	N27	W64	04	20.7		B	DRO	80	3	8	2
4798		HOLL	04	25	1648	N27	W66	04	20.5		B	CAO	80	6	7	3
4798		PALE	04	25	2135	N27	W67	04	20.8		B	CAO	50	2	8	1
4798		LEAR	04	26	0215	N28	W70	04	20.6		B	CSO	30	3	5	2

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4798		RAMY	04	26	1300	N27	W75	04	20.7		A	HR	10	1	3	4
4798	24384	MWIL	04	26	1405	N27	W76	04	20.7	4	B)					
4798		BOUL	04	26	1410	N27	W80	04	20.3		B	DRO	60	2	2	2
4798		HOLL	04	26	1428	N28	W78	04	20.5		B	CAO	70	3	4	3
4795	24383	MWIL	04	20	2014	S26	E27	04	22.9	3	(B)					
4795		CULG	04	21	0600	S25	E20	04	22.8		B	CRO	20	3	3	3
4795		SVTO	04	21	0605	S25	E22	04	22.9		A	AX	10	3	3	2
4795		RAMY	04	21	1342	S25	E18	04	23.0		B	BXO	10	3	3	4
4795	24383	MWIL	04	21	1400	S26	E16	04	22.8	3	(B)					
4795		PALE	04	21	2120	S27	E13	04	22.9		A	AX		1		3
4795		SVTO	04	22	0620	S26	E08	04	22.9		A	AX	10	2	1	4
4795		RAMY	04	22	1355	S26	E05	04	23.0		B	BXI	10	3	2	3
4795	24383	MWIL	04	22	1415	S26	E04	04	22.9	4	(AP)					
4795		HOLL	04	22	1655	S26	E03	04	22.9		B	BXO	10	3	2	4
4795		PALE	04	22	1843	S27	E03	04	23.0		B	BXO	10	2	2	2
4795		HOLL	04	23	1545	S26	W09	04	22.9		A	AX		1		4
4795		PALE	04	23	1734	S25	W12	04	22.8		B	BXO	10	2	2	3
4795		SVTO	04	24	0620	S26	W17	04	22.9		A	AX		1		4
4795		RAMY	04	24	1410	S26	W21	04	22.9		A	AX		1	1	4
4795		HOLL	04	24	1500	S26	W21	04	23.0		A	AX		1		4
4795	24383	MWIL	04	24	1600	S26	W22	04	23.0	3	(AP)					
4795		PALE	04	24	1815	S26	W23	04	23.0		A	AX		1		3
4795A		SVTO	04	22	0620	N12	E07	04	22.8		A	AX	10	2	1	4
4795A		HOLL	04	22	1655	N08	E06	04	23.1		A	AX		1		4
4794	24382	MWIL	04	18	1415	N31	E72	04	24.3	2	(B					
4794		RAMY	04	18	1424	N31	E71	04	24.2		A	AX	10	1	1	3
4794		HOLL	04	18	1459	N30	E73	04	24.4		A	AX	10	1	1	3
4794		PALE	04	18	1912	N30	E66	04	24.0		A	AX		1		3
4794		SVTO	04	19	0717	N31	E65	04	24.4		A	AX	10	2		3
4794		RAMY	04	19	1250	N32	E61	04	24.4		A	AX		1		3
4794		SVTO	04	20	0840	N29	E51	04	24.3		A	AX	10	1	1	3
4794		PALE	04	21	2120	N31	E25	04	23.9		A	AX		1		3
4794A		SVTO	04	24	0620	S27	E07	04	24.8		A	AX		1		4
4796		SVTO	04	21	0605	S42	E52	04	25.5		A	AX		1		2
4796		RAMY	04	21	1342	S39	E47	04	25.4		B	BXO	10	2	2	4
4796		PALE	04	21	2120	S43	E42	04	25.3		A	AX		1		3
4796		SVTO	04	22	0620	S39	E40	04	25.5		A	AX	10	1	1	4
4796A		PALE	04	28	1827	S36	W22	04	27.0		B	BXO	10	2	3	4
4800		SVTO	04	24	0620	N13	E43	04	27.5		A	AX		1		4
4800		RAMY	04	24	1410	N12	E39	04	27.5		A	AX		1	1	4
4800		HOLL	04	24	1500	N12	E38	04	27.5		A	AX		1		4
4800	24387	MWIL	04	24	1600	N12	E38	04	27.5	3	(B)					
4797		RAMY	04	21	1342	N05	E82	04	27.7		A	HR	40	1	2	4
4797		PALE	04	21	2120	N03	E79	04	27.8		A	AX	20	1	1	3
4797		CULG	04	22	0500	N05	E73	04	27.7		A	AX		1		1
4797		SVTO	04	22	0620	N03	E73	04	27.7		B	CSO	80	4	6	4
4797		RAMY	04	22	1355	N05	E69	04	27.7		B	CSI	10	4	2	3
4797	24385	MWIL	04	22	1415	N05	E70	04	27.8	5	(AP)					
4797		BOUL	04	22	1430	N05	E70	04	27.8		A	AX	30	1	1	4
4797		HOLL	04	22	1655	N04	E67	04	27.7		A	HS	40	2	1	4
4797		PALE	04	22	1843	N03	E68	04	27.9		A	HS	50	1	2	2
4797		LEAR	04	23	0010	N07	E64	04	27.8		B	CSO	10	7	3	1
4797		CULG	04	23	0440	N05	E60	04	27.7		A	AX		1		2
4797		SVTO	04	23	0903	N04	E59	04	27.8		B	CSO	50	5	3	3
4797	24385	MWIL	04	23	1410	N04	E56	04	27.8	5	(BP)					
4797		BOUL	04	23	1430	N04	E53	04	27.6		A	HR	30	1	1	2
4797		RAMY	04	23	1527	N04	E56	04	27.8		B	CSO	10	4	3	2
4797		HOLL	04	23	1545	N04	E56	04	27.8		B	CSO	20	4	4	4
4797		PALE	04	23	1734	N03	E54	04	27.8		A	HSO	40	2	1	3
4797		CULG	04	24	0430	N05	E47	04	27.7		A	HS	30	1	1	2

S U N S P O T G R O U P S
(ORDERED BY CENTRAL MERIDIAN PASSAGE DATE)

APRIL 1987

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
4797		SVTO	04	24	0620	N03	E47	04	27.8		B	CSO	30	2	4	4
4797		RAMY	04	24	1410	N04	E42	04	27.7		A	HS	10	2	1	4
4797		BOUL	04	24	1435	N05	E41	04	27.7		A	HA	30	1	1	3
4797		HOLL	04	24	1500	N04	E41	04	27.7		A	HS	20	1	1	4
4797	24385	MWIL	04	24	1600	N04	E41	04	27.7	5	(AP)					
4797		PALE	04	24	1815	N03	E40	04	27.7		A	HS	20	1	1	3
4797		LEAR	04	25	0008	N04	E37	04	27.8		A	HR	10	1	1	4
4797		CULG	04	25	0430	N05	E34	04	27.7		A	HS	20	1	1	2
4797		SVTO	04	25	0632	N04	E32	04	27.7		A	HR	20	3	3	3
4797	24385	MWIL	04	25	1410	N03	E28	04	27.7	5	(AP)					
4797		RAMY	04	25	1528	N04	E28	04	27.7		B	CSO	20	2	4	2
4797		BOUL	04	25	1610	N04	E26	04	27.6		A	HS	20	1	2	2
4797		HOLL	04	25	1648	N03	E28	04	27.8		A	HS	20	1	1	3
4797		PALE	04	25	2135	N02	E25	04	27.8		A	HA	10	1	1	1
4797		LEAR	04	26	0215	N03	E22	04	27.7		A	HS	10	3	1	2
4797		RAMY	04	26	1300	N04	E16	04	27.7		B	CSO	20	4	4	4
4797	24385	MWIL	04	26	1405	N04	E15	04	27.7	4	(AP)					
4797		BOUL	04	26	1410	N04	E13	04	27.6		A	AX	10	1	1	2
4797		HOLL	04	26	1428	N03	E15	04	27.7		A	AX	10	1	1	3
4797		PALE	04	26	2020	N04	E12	04	27.7		A	HS	10	1	1	2
4797		LEAR	04	27	0058	N03	E08	04	27.6		A	HS	20	1	1	3
4797		CULG	04	27	0500	N04	E08	04	27.8		A	HS	20	1	1	3
4797		RAMY	04	27	1322	N03	E03	04	27.8		B	CSO	20	4	4	3
4797	24385	MWIL	04	27	1415	N03	E03	04	27.8	6	(BP)					
4797		HOLL	04	27	1450	N02	E02	04	27.8		B	CRO	30	2	4	3
4797		PALE	04	27	1730	N03	E01	04	27.8		B	CSO	20	2	3	2
4797		BOUL	04	27	2022	N03	W02	04	27.7		A	AX	10	1	1	2
4797		RAMY	04	28	1323	N04	W11	04	27.7		A	HR	10	4	3	3
4797	24385	MWIL	04	28	1410	N04	W12	04	27.7	5	(AP)					
4797		BOUL	04	28	1507	N04	W13	04	27.6		B	BXO	10	3	3	2
4797		HOLL	04	28	1547	N05	W12	04	27.8		A	HR	10	3	2	3
4797		PALE	04	28	1827	N05	W14	04	27.7		A	AX	20	5	3	4
4797		LEAR	04	29	0150	N03	W18	04	27.7		A	AX	10	1	1	2
4797		SVTO	04	29	0618	N04	W21	04	27.7		A	HS	10	1	1	2
4797		RAMY	04	29	1251	N03	W25	04	27.7		A	HR	10	1	1	3
4797	24385	MWIL	04	29	1410	N04	W26	04	27.6	5	(BP)					
4797		BOUL	04	29	1440	N03	W25	04	27.7		A	AX	10	1	1	4
4797		HOLL	04	29	1510	N04	W26	04	27.7		B	BXO	20	4	1	4
4797		PALE	04	29	1828	N04	W26	04	27.8		A	AX	20	3	2	4
4797		LEAR	04	30	0035	N03	W32	04	27.6		B	BXO	20	3	4	2
4797		CULG	04	30	0500	N02	W34	04	27.7		B	CSO	10	2	1	3
4797		SVTO	04	30	0610	N03	W35	04	27.6		A	HS	20	2	2	3
4797		RAMY	04	30	1357	N02	W39	04	27.7		B	CRO	20	5	3	4
4797		BOUL	04	30	1500	N03	W38	04	27.8		B	CRI	50	13	4	2
4797		HOLL	04	30	1505	N04	W40	04	27.6		B	CRO	20	8	3	4
4797	24385	MWIL	04	30	1845	N03	W42	04	27.6	3	(BP)					
4797		PALE	04	30	1915	N04	W42	04	27.7		B	CRO	30	5	2	2
4797		LEAR	05	01	0228	N03	W47	04	27.7		B	CSO	20	4	2	3
4797		BOUL	05	01	1340	N03	W48	04	28.1		B	BXO	50	4	2	3
4797		RAMY	05	01	1355	N03	W53	04	27.7		B	CRO	30	6	4	3
4797	24385	MWIL	05	01	1425	N03	W54	04	27.6	4	(B)					
4797		HOLL	05	01	1554	N03	W54	04	27.7		B	BXO	40	7	5	3
4797		PALE	05	01	2330	N03	W57	04	27.8		B	BXO	30	6	4	3
4797		LEAR	05	02	0050	N03	W60	04	27.6		B	BXO	20	2	2	3
4797		SVI	05	02	0758	N02	W65	04	27.6		B	BXO	40	5	5	3
4797		BOUL	05	02	1400	N03	W64	04	27.9		B	CRO	40	3	3	3
4797		RAMY	05	02	1415	N03	W68	04	27.6		B	CRO	20	4	3	3
4797		HOLL	05	02	1455	N02	W68	04	27.6		B	BXO	30	2	3	3
4797	24385	MWIL	05	02	1600	N02	W68	04	27.6	3	(B)					
4797		PALE	05	02	1730	N03	W69	04	27.7		A	AX	10	2	2	3
4797		SVI	05	03	0830	N03	W77	04	27.7		B	BXO	30	2	6	3
4797		RAMY	05	03	1525	N03	W80	04	27.8		A	AX	10	1	1	2
4803		PALE	04	28	1827	S28	E04	04	29.1		B	BXO	10	2	3	4
4803		LEAR	04	29	0150	S30	E01	04	29.1		B	BXO	10	2	3	2
4803		SVTO	04	29	0618	S29	W03	04	29.0		B	BXO		2	3	2
4803		RAMY	04	29	1251	S28	W06	04	29.1		B	BXO	10	7	3	3
4803	24389	MWIL	04	29	1410	S29	W07	04	29.0	4	(B)					

S U N S P O T G R O U P S
(ORDERED BY CENTRAL MERIDIAN PASSAGE DATE)

APRIL 1987

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
4803		BOUL	04	29	1440	S28	W07	04	29.1		B	BXO	20	5	5	4
4803		HOLL	04	29	1510	S28	W08	04	29.0		B	BXO	10	9	4	4
4803		PALE	04	29	1828	S27	W09	04	29.1		B	BXO	10	5	4	4
4803		LEAR	04	30	0035	S29	W08	04	29.4		B	BXO	20	6	5	2
4803		CULG	04	30	0500	S29	W13	04	29.2		B	CSO	10	2	5	3
4803		SVTO	04	30	0610	S29	W16	04	29.0		B	DRO	20	6	5	3
4803		RAMY	04	30	1357	S28	W20	04	29.0		B	CRO	20	7	4	4
4803		BOUL	04	30	1500	S28	W20	04	29.1		B	DRO	40	9	5	2
4803		HOLL	04	30	1505	S28	W21	04	29.0		B	BXO	10	9	4	4
4803	24389	MWIL	04	30	1845	S28	W23	04	29.0	3	(B)					
4803		PALE	04	30	1915	S27	W23	04	29.0		B	BXO	20	4	4	2
4803		LEAR	05	01	0228	S29	W25	04	29.2		B	BXO	10	3	4	3
4803		BOUL	05	01	1340	S27	W32	04	29.2		B	BXO	40	4	4	3
4803		RAMY	05	01	1355	S28	W33	04	29.1		B	CRO	20	5	4	3
4803	24389	MWIL	05	01	1425	S28	W34	04	28.9	3	(BP)					
4803		HOLL	05	01	1554	S28	W33	04	29.2		B	BXO	30	6	5	3
4803		PALE	05	01	2330	S27	W38	04	29.1		B	CRO	50	6	6	3
4803		LEAR	05	02	0050	S28	W38	04	29.2		B	DSO	30	3	4	3
4803		SVI	05	02	0758	S27	W43	04	29.1		B	BXO	30	5	7	3
4803		BOUL	05	02	1400	S28	W45	04	29.2		B	CRO	40	5	5	3
4803		RAMY	05	02	1415	S28	W45	04	29.2		B	CRO	30	5	5	3
4803		HOLL	05	02	1455	S28	W47	04	29.0		B	BXO	20	5	6	3
4803	24389	MWIL	05	02	1600	S28	W46	04	29.1	4	(BF)					
4803		PALE	05	02	1730	S28	W48	04	29.1		B	BXO	10	4	5	3
4803		CULG	05	03	0445	S27	W53	04	29.2		B	DRO	30	4	6	2
4803		SVI	05	03	0830	S29	W57	04	29.0		B	BXO	20	4	7	3
4803	24389	MWIL	05	03	1400	S28	W58	04	29.1	3	(B)					
4803		RAMY	05	03	1525	S28	W59	04	29.1		B	BXO	20	4	5	2
4803		HOLL	05	03	1528	S28	W59	04	29.1		B	BXO	20	4	7	3
4803		PALE	05	03	1745	S28	W63	04	28.8		B	BXO	20	2	4	3
4803		RAMY	05	04	1330	S30	W72	04	29.0		A	AX	10	1	1	4
4803	24389	MWIL	05	04	1415	S28	W75	04	28.7	3	(AP)					
4801		SVI	05	03	0830	N34	W34	04	30.6		A	AX	10	1	1	3

Stations reporting:

BOUL = Boulder
HOLL = Holloman
MWIL = Mt. Wilson
RAMY = Ramey
CULG = Culgoora
LEAR = Learmonth
PALE = Palehua
SVTO = San Vito

SUDDEN IONOSPHERIC DISTURBANCES

APRIL 1987

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide-spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Known Flare	X-ray Class	NOAA/SESC Region
01	1107	1111	1114	1-	1		1				No flare		
01	1236	1239	1242	1-	1		1				No flare		
01	1428	1512	1528	1	3		3				No flare		
03	1155	1158	1208	1	3		3				No flare		
03	1449	1500	1521	1	1		1				No flare		
05	0007	0011	0042	1-	3			1	1		0006 UT	C1.0	4786
05	0209	0224	0229	1-	1				1		No flare		
05	0244	0252	0355	1-	3			1	1		0238 UT	C1.1	
05	1933	1941	2012	2	3			2		8	1934 UT	M1.1	4787
06	0317	0335	0357	1-	1				1		No flare		
06	0429	0435	0646	2+	3	1		1	1		0429 UT	C9.2	4787
06	1112	1117	1150	1-	3				1	1	1121 UT	C1.2	4787
06	1202	1209U	1256	1	1		1				1204 UT		4787
06	2302	2309	2334	1-				1			2301 UT	C1.1	4787
07	0521	0522	0552	1-	1			1			No flare		
07	2040	2044	2112	1	3					3	2039 UT	C2.0	4787
08	1530	1536	1550	1-	1				1		No flare		
09	0146	0149	0203	1-	1			1			0143 UT		4789
09	0235	0242	0313	1-	1			1			0232 UT	C1.0	4789
09	0631	0648	0731	1-	3	1		1	1	2	0637 UT	C2.6	4789
09	0927	0935	0950	1-	1				1		0922 UT	C1.0	
10	1030	1040	1050	1-	3	1			1		1031 UT	C1.3	4787
10	1122	1128	1150	1-	3	1			1	1	1124 UT	C1.2	4786
10	1815	1817	1855	2	3					8	1819 UT	C5.5	4786
10	2139	2145	2153	1-	1			1			2152 UT	C1.1	4786
10	2359	0008	0015	1-	1			1			No flare		
11	0118	0120	0133	1-	1			1			No flare		
11	0249	0257	0313	1-	3			1	1		0245 UT		4789
11	0329	0332	0336	1-	1			1			No flare		
11	0414	0421	0443	1-	3			1	1		0416 UT		4786
11	0512	0518	0539	1-	3			1	1	1	0512 UT	C2.1	4786
11	2314	2328	2345	1-	1			1			2320 UT		4789
12	0347	0353	0423	1-	1			1			No flare		
12	0555	0602	0622	1-	1			1			No flare		
12	0738	0748	0821	1-	1			1			No flare		
14	0840	0843	0918	1-	1			1			No flare		
14	1028	1035U	1050	2	3		2				No flare		
15	0234	0233	0321	1-	3			1	1		0232 UT	C1.8	4790
15	0733	0739	0909	2+	5	4	3	1	2	4	0736 UT	C6.6	4787
15	1147	1220	1320	1	3	1	2		1	1	1136 UT	C3.5	4787
15	1816	1835	1915	2	1		1				1807 UT		4790
16	0145	0148	0214	1-	3			1	1		0143 UT	C1.9	
16	0220	0222	0235	1-	3			1	1		0218 UT	C1.3	
16	1037	1042	1055	1-	3	1			1		1035 UT		4790
16	1315	1318	1335	1-	3	1			1		1313 UT		No data
16	1512	1518	1535	1-	5	2	3		1	11	1511 UT	C3.0	4790
16	1600	1617	1705	2	5	2	4		1	11	1558 UT	M1.0	4787

APRIL 1987

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide-spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Known Flare	X-ray Class	NOAA/SESC Region
17	0204	0239	0348	1-	3			1	1		0200 UT	C1.9	
17	0232	0233	0254	1-	2			1	1		No flare		
17	1720	1729	1800	1	3					4	1721 UT	C1.6	4787
17	1920	1930	2000	1	3					3	1923 UT	C1.1	4787
17	2336	2351	0013	2	3	2		1			2336 UT	C5.2	4790
18	0147	0151	0209	1-	1			1			0140 UT	C1.0	
18	0441	0503	0530	1-	3	1		1			0438 UT	C1.7	
18	0713	0719	0755	1-	3			1	1	1	0713 UT	C1.2	
18	1113	1140	1220	1-	3	1	2		1	1	No flare		
18	1355	1406	1420	1	5	2	5		1	7	1353 UT	C3.5	4790
18	1430	1455	1540	1-	3	1					1437 UT	C2.8	
18	2151	2158	2240	1-	3	1		1			2147 UT	C2.8	
19	1207	1212	1235	1-	3	1	1		1		1205 UT	C1.3	4790
19	1440	1448	1510	1-	3	1	2		1	3	1437 UT	C1.8	
19	1945	1947	2012	1	1					1	No flare		
20	0116	0119	0141	1-	3			1	1		No flare		
20	0215	0219	0300	1-	3	1		1			0214 UT	C3.2	
20	0847	0854	0909	1-	1			1			No flare		
22	1429	1435	1509	1				1		1	1420 UT		4797
22	1450	1505	1515	1	1		1				1444 UT		4797
24	0633	0636	0713	1	3		2				No flare		
24	0736	0739	0800	1	3	2	1	2		5	0734 UT	C3.7	4798
25	1134	1148	1217	1	1		1				No flare		
26	1208	1227	1305	1	1		1				No flare		

* No flare patrol

OBSERVATORIES REPORTING FOR APRIL 1987**

Ayrshire, Scotland	SES	Maui, Hawaii, USA	SWF
Darmstadt, German Federal Republic	SWF	Panska Ves, Czechoslovakia	SEA, SWF, SES
Edenvale, Republic of S. Africa	SES	Paterson, New Jersey, USA (A03)	SES
Farsta, Sweden	SES	Paterson, New Jersey, USA (A46)	SES
Hiraiso, Japan	SWF	Rimavska Sobota, Czechoslovakia	SEA
Houston, Texas, USA	SES	Sao Paulo, Brasil	SPA, SES
Inubo, Japan	SPA	Sofia, Bulgaria	SES
Juliusruh, German Democratic Rep.	SWF	Somesworth, New Hampshire, USA	SES
Kandilli, Turkey	SEA	Tavares, Florida, USA	SES
Kuhlungsborn, German Democratic Rep.	SPA, SEA	Tucson, Arizona, USA	SES
Latrobe, Pennsylvania, USA	SES	Upice, Czechoslovakia	SEA
Lintong, Peoples Republic of China	SPA	Valley Cottage, New York, USA	SES
Louisville, Kentucky, USA	SES		

**Observations are not necessarily continuous.

S I D s by N O A A/S E S C R E G I O N S

APRIL 1987

Day:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Events in Region #																														
4786					1					3	2																			
4787					1	4	1			1					2	1	2													
4789									3		2																			
4790															2	2	1	1	1											
4797																						2								
4798																								1						
Events with X-ray					3	3	1		3	4	1				3	4	4	6	2	1				1						
Events with no flare reported	3		2		1	1	1	1		1	1	3		2			1	1	1	2				1	1	1				
Events with no flare patrol																														
Events with flare but no region number																1														
Daily Event Totals	3		2		4	5	2	1	4		6	3	5	2	4	6	5	7	3	3		2		2	1	1				

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

APRIL 1987

Observation Day	Start (UT)	End (UT)	Sta	Decimetric Band Start (UT)	End (UT)	Int (1-3)	Metric Band Start (UT)	End (UT)	Int (1-3)	Dekametric Band Start (UT)	End (UT)	Int (1-3)	Spectral Type
01	0541	1414	WEIS										
02			CULG							0345.0	0346.0	1	V
			LEAR				0346.0	0347.0	2				III
			LEAR				0408.0	0410.0	2				III
			CULG				0409.0	0410.0	1				V
			CULG				0413.0	0414.0	1				III
			LEAR				0511.0	0513.0	2				III
			CULG				0513.0	0514.0	1				V
			LEAR				0613.0	0615.0	2				III
			CULG				0614.0	0615.0	1				V
			LEAR				0708.0	0709.0	1				III
			CULG				0713.0	0714.0	1				III
			LEAR				0818.0	0828.0	2				S
			SVTO				0818.0	0819.0	1				III
			LEAR				0951.0	0952.0	1				III
			SVTO				0951.0	0951.0	1				III
			SGMR				1218.0	1218.0	1				V
			SGMR				1351.0	1352.0	1				V
			SGMR				1633.0	1633.0	1				V
			PALE				2122.0	2124.0	2				III
			CULG				2123.0	2125.0	2				V
03			LEAR				0401.0	0401.0	1				III
			CULG							0419.0	0421.0	1	III
			CULG							0501.0	0501.0	1	III
			CULG				0624.0	0624.0	1				III
			LEAR				0624.0	0625.0	1				III
			CULG				0656.0	0657.0	1				III
			LEAR				0657.0	0658.0	1				III
			CULG				0711.0	0715.0	1				III
			LEAR				0716.0	0716.0	1				III
			SGMR				1425.0	1431.0	1				V
			SGMR				1441.0	1442.0	1				V
			PALE				2029.0	2030.0	1				V
			CULG							2207.0	2207.0	1	III
			CULG				2228.0	2229.0	3				V
04			PALE				0015.0	0016.0	1				III
			LEAR				0016.0	0016.0	1				III
			PALE				0032.0	0038.0	1				III
			LEAR				0034.0	0037.0	2				III
			PALE				0228.0	0230.0	1				III
			LEAR				0240.0	0242.0	2				III
			LEAR				0251.0	0252.0	1				III
			LEAR				0303.0	0303.0	2				III
			CULG				0312.0	0313.0	3				III
			LEAR				0327.0	0328.0	1				III
			LEAR				0328.0	0328.0	1				III
			LEAR				0440.0	0445.0	2				V
			LEAR				0532.0	0534.0	1				III
			LEAR				0851.0	0858.0	2				III
			LEAR				0915.0	0915.0	1				III
			SGMR				1201.0	1202.0	1				V
			SGMR				1300.0	1301.0	1				V
			SGMR				1724.0	1724.0	1				V
			SGMR				1823.0	1833.0	1				V
			PALE				1831.0	1832.0	1				III
05			LEAR				0237.0	0247.0	2				V
			PALE				0237.0	0238.0	1				III
			CULG				0239.0	0249.0	1				III
			CULG				0603.0	0603.0	1				III
			LEAR				0720.0	0720.0	1				III
			CULG				0721.0	0721.0	1				III
			SGMR				1303.0	1303.0	1				V
			SGMR				1347.0	1349.0	1				V
			SGMR				1402.0	1402.0	1				V
			SGMR				1507.0	1512.0	2				V
			SGMR				1516.0	1517.0	1				V
			SGMR				1803.0	1803.0	1				V

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1987

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
05			SGMR				1808.0	1817.0	1				V
			SGMR				1853.0	1854.0	1				V
			PALE				1854.0	1854.0	2				V
			PALE				1919.0	1920.0	1				III
			SGMR				1919.0	1939.0	2				V
			PALE				1933.0	1937.0	2				V
			SGMR				1933.0	2252.0	1				CONT
			PALE				1940.0	1950.0	1				V
			PALE				2030.0	2041.0	1				S
			PALE				2117.0	2130.0	1				S
06			LEAR				0048.0	0049.0	2				III
			PALE				0048.0	0049.0	1				V
			LEAR				0103.0	0104.0	2				III
			PALE				0103.0	0104.0	1				V
			LEAR				0322.0	0329.0	1				III
			LEAR				0427.0	0437.0	2				II
			LEAR				0705.0	0706.0	1				III
			SVTO				0706.0	0706.0	1				III
			SGMR				1320.0	1320.0	1				V
			SVTO				1320.0	1320.0	1				III
			SGMR				1438.0	1440.0	1				V
			SVTO				1438.0	1439.0	1				III
			SGMR				1615.0	1616.0	1				V
			SGMR				1642.0	1644.0	1				V
			PALE				1831.0	1843.0	2				S
			SGMR				1831.0	1832.0	2				V
			PALE				1903.0	1919.0	1				S
			SGMR				1912.0	2253.0	1				CONT
			CULG				2120.0	2121.0	1				III
			CULG				2128.0	2129.0	1				III
			CULG				2259.0	2259.0	1				III
			PALE				2259.0	2259.0	1				III
07			LEAR				0350.0	0351.0	2				III
			CULG				0353.0	0353.0	1				III
			PALE				2039.0	2042.0	2				V
			SGMR				2039.0	2046.0	2				V
			PALE				2045.0	2106.0	2				II
			CULG				2046.0	2055.0	2				II
			CULG				2046.0	2058.0	2				II
			CULG				2103.0	2103.0	1				III
			CULG				2141.0	2141.0	1				III
08			CULG				0435.0	0710.0	1				S
			SGMR				1401.0	1401.0	1				III
			SGMR				1401.0	2022.0	1				CONT
			CULG				2128.0	2128.0	1				III
			CULG				2156.0	2156.0	1				III
			CULG				2233.0	2233.0	1				III
			CULG				2303.0	2303.0	1				III
09			LEAR				0118.0	0125.0	2				III
			LEAR				0232.0	0236.0	2				III
			LEAR				0842.0	0844.0	2				III
			SVTO				0843.0	0843.0	1				III
	0610	0802	WEIS				0843.7	0844.0	2				IIIG
	0843	1742	WEIS				1448.9	1458.9	2				IIIB
			SGMR				1743.0	1744.0	1				V
			PALE				1938.0	1938.0	1				III
10			LEAR				0029.0	0030.0	1				III
			PALE				0029.0	0030.0	1				III
	0522	1607	WEIS										
	1643	1743	WEIS										
11			CULG				0416.0	0420.0	1				III
			SVTO				0511.0	0512.0	1				III
			CULG				0513.0	0515.0	2				III
			LEAR				0514.0	0514.0	1				III
	0522	1745	WEIS				1719.4	1719.5	1				IIIB

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

APRIL 1987

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
11			WEIS				1731.4	1731.6	1				IIIG
12			LEAR				0124.0	0131.0	1				III
			LEAR				0211.0	0212.0	1				III
	0518	1746	WEIS										
13	0518	1620	WEIS				1330.4	1330.9	1				IIIG
			WEIS				1333.8	1336.0	2				IIIG
			WEIS				1354.5	1355.5	2				IIIG
			WEIS				1417.2	1417.3	1				IIIB
			WEIS				1448.1	1448.2	1				IIIB
			WEIS				1454.4	1454.5	2				IIIB
			SGMR				1459.0	2204.0	1				CONT
			WEIS				1514.0	1530.0	2				IIIGG
			WEIS				1539.8	1539.9	2				IIIG
14	0514	1748	WEIS										
15			LEAR				0150.0	0230.0	2				IV
	0513	1237	WEIS										
			SVTO				0632.0	0632.0	1				III
			SVTO				0632.0	0632.0	3				III
	1328	1750	WEIS										
			SVTO				1348.0	1456.0	1				CONT
			PALE				2049.0	2050.0	1				III
16	0510	1751	WEIS										
			SVTO				1207.0	1207.0	1				III
			SGMR				1640.0	1640.0	1				V
			SGMR				1658.0	1659.0	1				V
			PALE				1820.0	1822.0	1				V
17			CULG				0028.0	0430.0	1				S
			LEAR				0030.0	0031.0	1				III
	0510	1753	WEIS				0842.4	0843.9	1				IIIG
			LEAR				0844.0	0844.0	1				III
			WEIS				1001.4	1002.3	1				IIIG
			WEIS				1210.1	1210.3	2				IIIB
			SGMR				1237.0	1243.0	1				V
			WEIS				1237.0	1245.5	3				IIIGG
			WEIS				1507.0	1507.2	2				IIIG
			WEIS				1711.8	1711.9	2				IIIB
			PALE				1736.0	1737.0	1				III
			PALE				1818.0	2311.0	1				CONT
			CULG				2031.0	2210.0	1				S
			PALE				2339.0	2340.0	1				V
18			CULG				0025.0	0730.0	1				III
			LEAR				0055.0	0632.0	1				CONT
			PALE				0058.0	0436.0	1				CONT
			LEAR				0309.0	0310.0	2				V
			LEAR				0450.0	0458.0	2				V
			SVTO				0456.0	0457.0	1				III
			SVTO				0512.0	0537.0	1				CONT
	0507	1150	WEIS				0915.2	0915.8	2				IIIG
			LEAR				0932.0	0932.0	1				III
			WEIS				1052.6	1052.8	1				IIIB
			WEIS				1057.0	1057.7	1				IIIB
			SVTO				1102.0	1103.0	1				V
			WEIS				1102.9	1103.2	3				IIIB
			WEIS				1126.8	1128.9	3				IIIGG
			SGMR				1127.0	1129.0	1				V
			SGMR				1439.0	1439.0	1				V
	1205	1754	WEIS				1440.0	1440.1	1				IIIB
			SGMR				1451.0	2306.0	1				CONT
			WEIS				1452.2	1454.7	1				IIIG
			WEIS				1529.3	1529.7	1				IIIG
			WEIS				1651.6	1713.4	1				IIIGG
			CULG				2119.0	2135.0	1				III
			PALE				2125.0	2136.0	1				S
			PALE				2148.0	2314.0	1				CONT

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1987

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
19			LEAR				0214.0	0214.0	1				III
			CULG				0452.0	0455.0	2				III
			LEAR				0452.0	0456.0	3				III
			SVTO				0453.0	0505.0	1				CONT
			CULG				0500.0	0508.0	2				II
			LEAR				0502.0	0508.0	2				IV
	0507	1755	WEIS				0507.3	0507.7	2				RS
			LEAR				0518.0	0520.0	2				V
			SVTO				0518.0	0519.0	1				V
			CULG				0519.0	0520.0	1				III
			SVTO				0522.0	0522.0	1				III
			CULG				0523.0	0555.0	1				S
			SGMR				1403.0	1403.0	1				V
			WEIS				1403.1	1404.4	2				IIIG
			SGMR				1440.0	1443.0	1				V
			WEIS				1440.9	1442.4	3				IIIG
			SGMR				1445.0	1445.0	1				V
			PALE				2045.0	2046.0	1				V
			SGMR				2045.0	2045.0	1				V
20			SVTO				0412.0	0413.0	1				III
	0503	1756	WEIS										
21	0504	1022	WEIS										
	1031	1227	WEIS										
	1329	1758	WEIS										
			PALE				1823.0	1828.0	1				III
22	0500	1216	WEIS										
	1308	1735	WEIS										
	1737	1759	WEIS										
23	0500	1801	WEIS										
24	0457	1104	WEIS										
	1106	1803	WEIS										
25	0456	1804	WEIS										
26	0453	1804	WEIS										
27			CULG				0006.0	0013.0	2				S
			LEAR				0006.0	0012.0	1				III
			PALE				0006.0	0012.0	1				III
	0453	0814	WEIS										
	0846	1806	WEIS										
28	0450	1806	WEIS										
29	0450	1315	WEIS										
	1328	1555	WEIS										
30	0814	0842	WEIS										
	0853	1809	WEIS										

The symbols used under the column heading SPECTRAL TYPE have the following definitions:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of burst
C = Underlying continuum (particularly with Type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity
DCIM = Fast drift

Stations Reporting:

BLEN = Bleien LEAR = Learmonth PALE = Palehua SGMR = Sagamore Hill WEIS = Weissenau

COSMIC RAY INDICES
(Neutron Monitor)

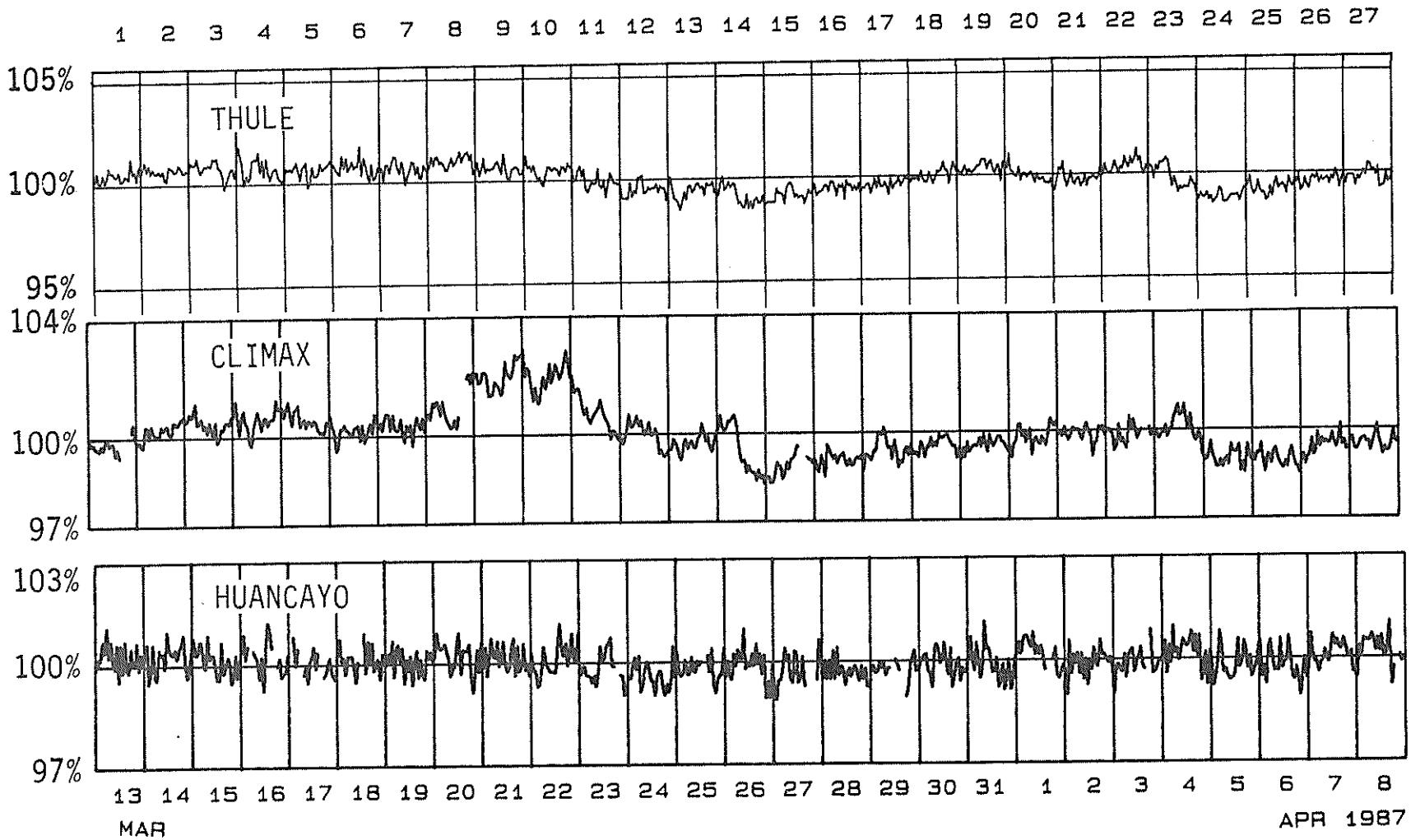
APRIL 1987

Day	THULE Average (cts/h)/100	ALERT Average (cts/h)/100	DEEP RIVER Average (cts/h)/300	KIEL Average (cts/h)/100	CLIMAX Average (cts/h)/100	PREDIGTSTUHL Average (cts/h)/100	TOKYO Average (cts/h)/256	HUANCAYO Average (cts/h)/100
1	4624	7530.4	7274.2	6480.7	4321.2		3717.8	1807.4
2	4619	7526.2	7305.0	6499.0	4324.2		3707.8	1802.0
3	4645	7562.5	7294.5	6485.7	4323.2		3708.0	1801.6
4	4619	7540.7	7279.0	6477.5	4332.5		3706.2	1807.6
5	4575	7481.6	7212.6	6446.1	4287.8		3696.5	1801.0
6	4594	7488.8	7244.5	6432.8	4284.9		3696.9	1800.3
7	4610	7515.6	7295.8	6453.6	4304.0		3699.1	1805.8
8	4617	7534.6	7313.8	6467.8	4308.7		3711.4	1807.9
9	4627	7547.8	7318.3	6468.5	4315.0		3698.6	1803.0
10	4618	7533.4	7296.2	6457.7	4305.6		3687.4	1801.3
11	4625	7557.5	7307.2	6472.7	4320.5		3694.5	1799.7
12	4639	7581.0	7327.8	6482.1	4322.5		3695.3	1801.0
13	4623	7557.7	7302.5	6443.9	4315.9		3707.4	1801.7
14	4605	7529.6	7272.2	6428.3	4294.8		3712.3	1798.9
15	4600	7533.7	7287.6	6411.3	4291.2		3720.6	1801.9
16	4596	7516.1	7264.4	6410.3	4267.4		3716.7	1796.9(18)
17	4595	7522.2	7281.7	6417.5	4288.6		3718.0	1799.7
18	4584	7519.7	7275.6	6425.5	4292.2		3723.3	1799.3
19	4576	7507.3	7239.4	6430.8	4284.2		3716.5	1798.2
20	4565	7485.2	7208.5	6421.9	4269.8		3705.2	1797.4
21	4592	7515.8	7232.3	6421.3	4264.3		3696.0	1798.9
22	4580	7510.7	7242.1	6392.1	4259.0		3694.2	1796.9
23	4603	7553.7	7244.1	6399.3	4260.1		3702.2	1798.3
24	4601	7545.7	7260.4	6430.8	4276.2		3708.5	1801.9
25	4609	7549.5	7274.5	6447.9	4284.5		3704.4	1801.9
26	4610	7564.9	7276.7	6437.2	4274.5		3694.9	1800.3
27	4609	7552.2	7298.7	6433.8	4283.0		3712.7	1802.1
28	4606	7536.2	7307.4	6426.4	4280.4		3707.7	1802.7
29	4611	7537.3	7321.7	6451.3	4297.2		3716.9	1804.7
30	4596	7503.9	7322.4	6444.8	4295.6		3713.5	1804.4
Mean	4606	7531.4	7279.4	6443.3	4294.1		3706.4	1801.5

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

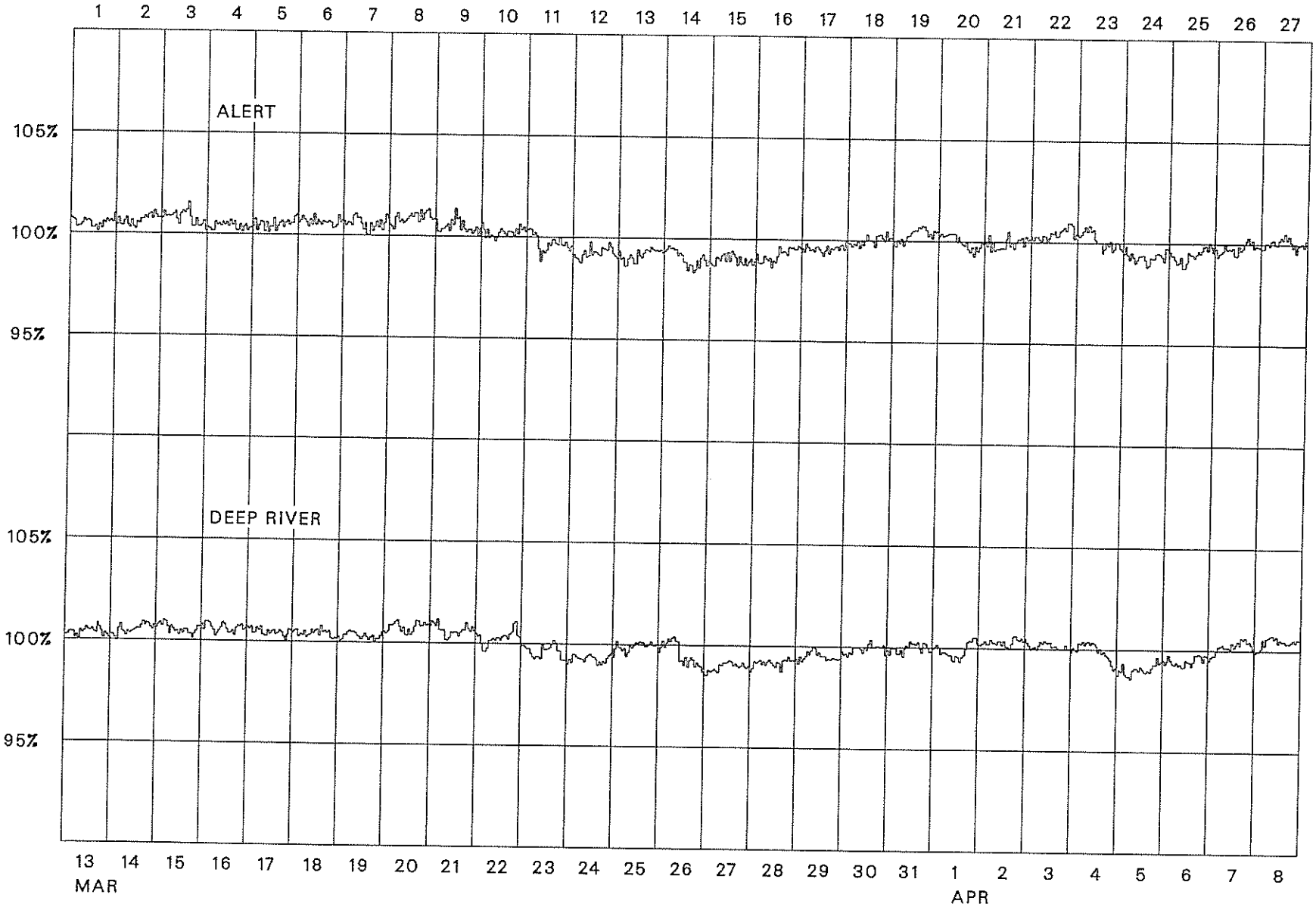
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2099 (March 1987-April 1987)



COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2099 (March 1987-April 1987)



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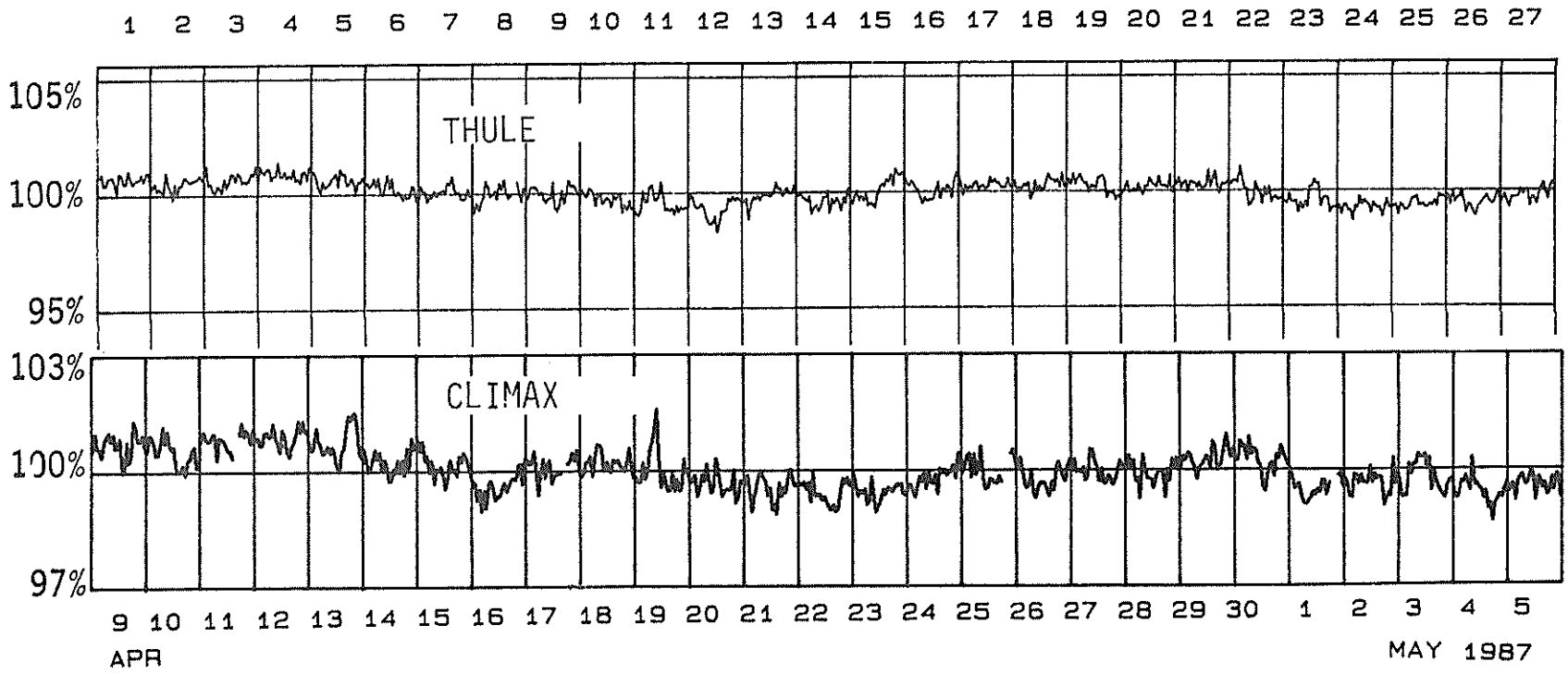
Apr 87

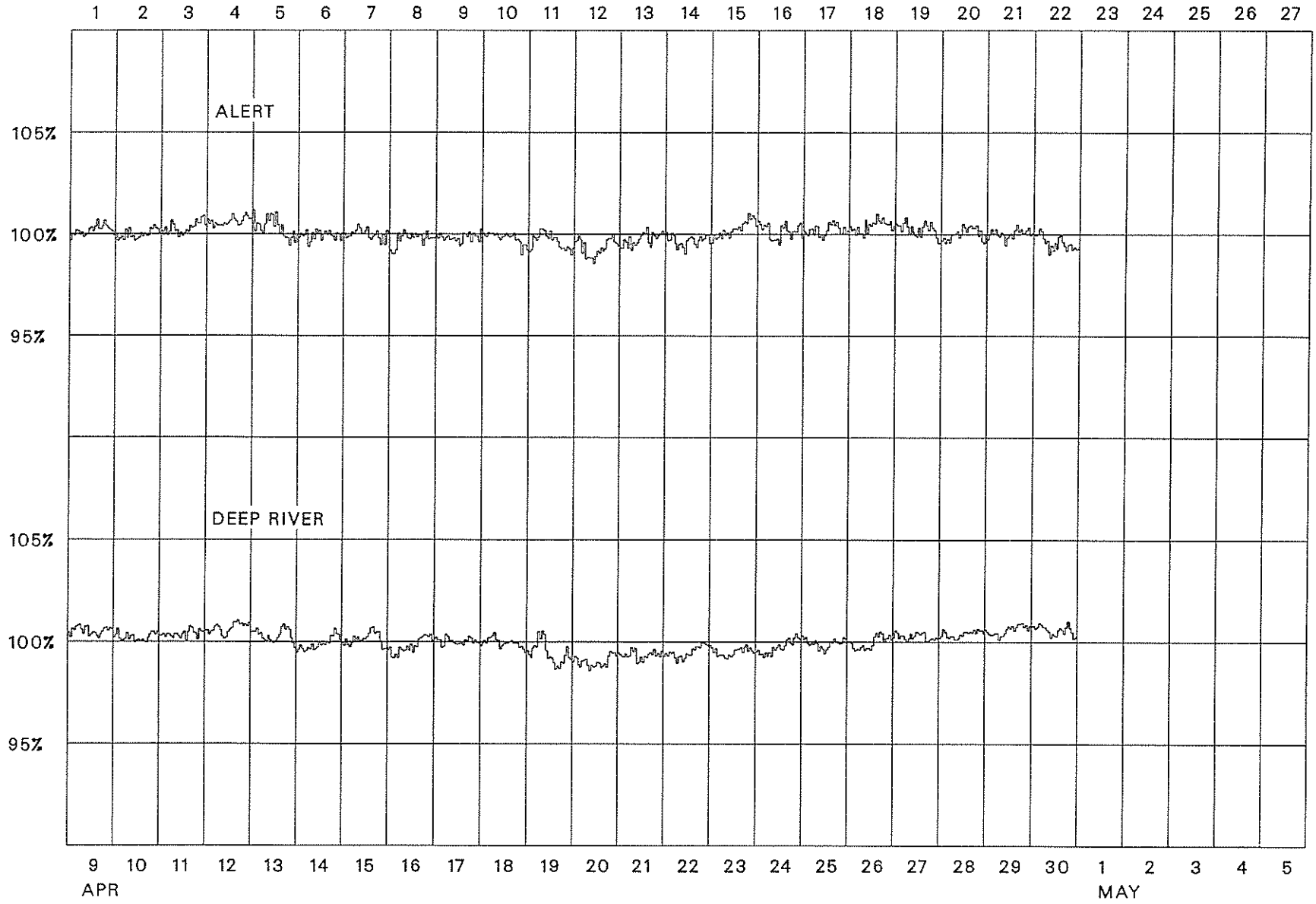
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2100 (April 1987-May 1987)



COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2100 (April 1987-May 1987)



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GEOMAGNETIC ACTIVITY INDICES

April 1987

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	aa Provisional Am	N	S	M	
1		3-	4-	3+	2	2-	2-	2	1	18	10	0.6	2+	3	3	3-	2-	2-	2	0+	17	19	16	21	14	
2	Q10	1-	2	1+	2-	1	1+	0+	0+	9-	4	0.1	1-	2-	1+	2-	1+	1+	1-	0	7	9	10	11	8	CC
3	Q1	0	0	0+	0+	0+	0+	1-	0+	2+	2	0.0	0	0	0	0+	0+	0	0+	0+	2	4	2	3	4	CK
4	D1*	1-	4-	2	4+	5-	3+	1+	1+	21+	16	0.9	0	4-	2+	4-	4+	3	1+	1+	29	23	29	24	28	
5	D3*	3	3+	2	1+	3-	3+	3-	3-	21	12	0.7	3-	3	2	1+	3-	3-	3-	3-	21	25	14	18	21	
6		2-	3-	1-	2-	3-	2+	1	2-	14+	7	0.4	1+	2+	0+	2-	2+	2-	1	1+	11	13	11	10	14	C
7	D2*	3+	4-	4-	2	3-	3	1+	1-	20+	13	0.7	3	3+	3+	2+	2+	3	2-	1-	23	25	20	26	19	
8	D5*	1+	2	3	3-	2+	2+	3+	3	20	11	0.6	1-	1+	3-	3-	2-	2-	3+	2+	17	21	16	14	24	
9		1+	2-	1+	2+	2+	2	3+	2-	16	8	0.4	1+	1+	1	2	2+	2-	3+	2-	15	18	13	10	22	
10		4+	4	2-	2-	1-	1-	1-	0	14-	10	0.6	4-	3+	2-	2-	0+	1-	1-	0	15	22	11	28	5	
11		1-	2+	2+	2	3-	2-	1-	2-	14	7	0.3	1-	2+	2	2-	3-	1+	1-	2-	12	16	13	12	17	C
12		1	2+	1-	1-	1+	1	0+	2	9+	5	0.2	1	2	0+	1	1+	0+	0+	2-	7	8	10	9	9	CK
13	D4*	2	1+	2-	3-	1-	4+	3	3+	19	12	0.7	2-	1+	2	2+	1-	4-	3	3-	20	27	14	15	27	
14		0+	1	1	2	3	2+	2-	1	12+	6	0.3	1-	1-	1+	2-	3	2	2+	1	12	14	13	7	20	K
15		2	1+	1-	1	2	2	2	1+	12+	6	0.3	2-	1-	0+	1-	2-	2-	2	1+	9	13	7	8	13	CK
16	Q7	1-	1+	1+	1	1+	1	0	1+	8	4	0.1	0+	1+	1+	1	1-	1-	0	1	5	7	3	6	4	CC
17		2+	1-	0+	1-	2-	2-	1+	1-	9+	5	0.2	2	1-	0+	0+	1	1+	1	1-	7	12	4	7	10	CC
18	Q4	1-	1-	1-	1+	1	1	1	1	7+	4	0.1	0+	1-	1-	1+	1	1-	1	1	6	9	4	8	5	CK
19		2	2+	3+	3-	1+	1	2-	1+	16-	8	0.4	1+	3-	3+	3+	1+	1	1+	1	17	18	20	27	11	
20		1+	4-	4-	4	2	1+	0+	0+	17-	12	0.7	1+	3+	3+	4-	2	1	0	0+	20	22	29	41	10	
21	Q5	0	2	2-	1	0+	0+	0	0	5+	3	0.0	0+	1+	2-	1+	0	0	0	0	5	8	3	7	4	CC
22		0	2	1	1+	1+	1	1+	2-	10-	4	0.2	0	1+	1	1+	1	1	1+	2	8	12	6	7	12	CC
23	Q3	1-	2-	1-	1-	1-	1-	1-	1	7-	4	0.1	1-	2-	0+	0+	1-	0+	1-	1+	5	9	4	6	7	CK
24		2+	2+	2+	2+	3+	1+	2+	2-	18	9	0.5	2	2+	2+	3	3	1-	2+	2	19	19	18	19	18	K
25	Q8	1-	1+	1+	1	1+	1+	1	1+	9+	4	0.2	1-	1-	1+	1	1-	1+	1	1	7	9	5	6	9	CC
26	Q9	1+	1+	0+	1	2	1	1	1-	9-	4	0.1	1+	1	0	1	2-	1-	1	0+	6	9	6	6	9	CK
27		1	1+	3	3-	2-	3	2	2-	16+	9	0.5	1	2-	3-	3	2-	3	2	2	18	18	19	20	17	K
28	Q2	2-	0	0	0+	0+	0	0+	1	4-	2	0.0	1+	0	0	0+	0+	0	0+	1	3	8	3	6	5	CC
29		1+	1-	1-	1	0+	1	2+	1+	9-	4	0.2	1	1	0+	1	0+	1-	2	1	6	12	4	7	9	CC
30	Q6	1-	1-	1-	1-	1-	1+	1+	2-	8-	4	0.1	0+	1+	1-	1-	1-	1+	1+	2-	7	10	5	6	9	CC
Mean											7	0.34									11.9	14.7	11.1	12.9	

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	S_a	Prov R_I	R_a	R_s	IMF	
1	2+	3-	3-	2+	2-	2-	2+	1	17	2+	3	3	3-	1+	1+	1+	0	17	72.5	14	13	16	-	-
2	1-	1+	1+	2-	1+	2-	1-	0+	8	1-	2-	1	2-	1	1+	0+	0	7	71.9	12	11	16	-	-
3	0	0	0+	1-	1-	0	1	0+	3	0	0	0	0	0	0	0	0	0	72.4	10	11	16	-	-
4	0+	4-	2	4	5-	3+	2-	2-	31	0	4-	3-	4-	4	3	1-	1	26	74.0	13	14	18	-	-
5	3-	3	2	2-	3-	3	3-	3-	24	3-	3+	2	1	2	2	2+	2+	18	77.6	28	27	22	-	-
6	1+	2+	1-	2	3-	2+	1+	1+	13	1	2	0+	2-	2	1+	1-	1+	9	89.4	47	40	35	-	-
7	3	3+	3+	3-	3-	3	2-	1	25	3	3	3+	2+	2	3-	2-	0+	21	94.4	56	68	40	-	-
8	1-	1+	3	3-	2+	2	3+	3-	20	1-	1+	2+	2+	1	2-	3	2+	15	94.8	64	67	40	-	-
9	1+	1+	1+	2+	3-	2	3+	2	16	1	1+	1	2-	2-	1+	3	2-	13	100.5	69	69	47	-	-
10	4-	3+	2	2	1-	1	1	0	16	4	4-	2-	1+	0	0+	0+	0	15	100.0	72	75	46	-	-
11	1	2+	2+	2-	3-	2-	1+	2	15	0+	2	2-	2-	3-	1	0+	1	10	101.3	80	86	47	-	-
12	1+	2+	0+	1	1+	1-	1-	2+	9	1	2-	0+	1	1+	0	0	1	5	98.6	77	78	44	-	-
13	2	1+	2+	3-	1	4	3+	3+	25	2-	1+	2+	2-	0	3+	3-	2+	15	99.3	79	73	45	-	-
14	1-	1	1+	2	3	2+	2+	2-	14	0+	0	1-	1+	3	1+	2	0+	10	97.7	74	76	44	-	-
15	2	1	1-	1	2	2	2+	2-	12	2-	0+	0	1-	1	1+	2-	1-	6	97.8	78	74	44	-	-
16	1-	1+	1+	1+	1+	1+	0	1+	8	0+	1	1	1	0	0	0	0+	3	95.3*	60	64	41	-	-
17	2+	1-	1-	1	2-	2-	1+	1-	9	2-	1-	0	0	1-	1-	0+	1-	4	97.3	41	45	43	-	-
18	0+	1	1	1+	2-	1+	1+	2-	9	0+	1-	1-	1	0	0	1-	0	3	94.0	36	35	40	-	-
19	1+	3-	3	3-	2-	2-	2	1+	18	1	2+	4-	4-	1	0+	1	1-	17	91.7	29	24	37	-	-
20	1+	3+	4-	4-	2	1+	0+	1-	21	1-	4-	3+	4-	2	1-	0	0+	19	85.6	16	11	30	-	-
21	1-	2-	2	2-	0+	0+	0+	0	6	0+	1+	1+	1-	0	0	0	0	3	78.3	19	19	23	-	-
22	0	1+	1+	2-	1+	2-	2-	2+	11	0+	1+	0+	1	0+	0+	1+	1+	6	76.5	26	25	21	-	-
23	1	2-	1-	1-	1	1	1	1+	7	1-	2-	0+	0+	0+	0	0	1	4	76.5	25	27	21	-	-
24	2-	2+	2	3	3	1	3-	2	19	2+	2+	2+	3	3+	1-	2	2-	19	78.6	35	28	23	-	-
25	1-	1	1+	1+	1+	2-	2-	1+	9	1-	1-	1+	1-	0	1-	0+	0+	4	75.8	23	23	20	-	-
26	1+	1+	0+	1+	2	1+	1+	1	9	1	1-	0	1-	1+	0+	1-	0	4	74.3	21	21	18	-	-
27	1+	2-	3	3+	2	3	2+	2+	21	1-	2-	2+	3	2-	3-	1+	2-	15	74.8	11	11	19	-	-
28	1+	0	0+	0+	1-	0+	1-	1+	4	1+	0	0	0	0	0	0	0+	1	74.3	14	12	18	-	-
29	1	1-	1-	1+	0+	1+	2+	1+	8	1	1	0+	1-	0	0	2-	0+	4	73.6d	20	24	17	-	-
30	1-	1	1	1	1+	1+	2	2+	9	0	1+	0+	0	0	1+	1	1+	5	76.8	30	32	21	-	-
Mean									13.9									9.9	85.5	39.3	39.4	30.3		

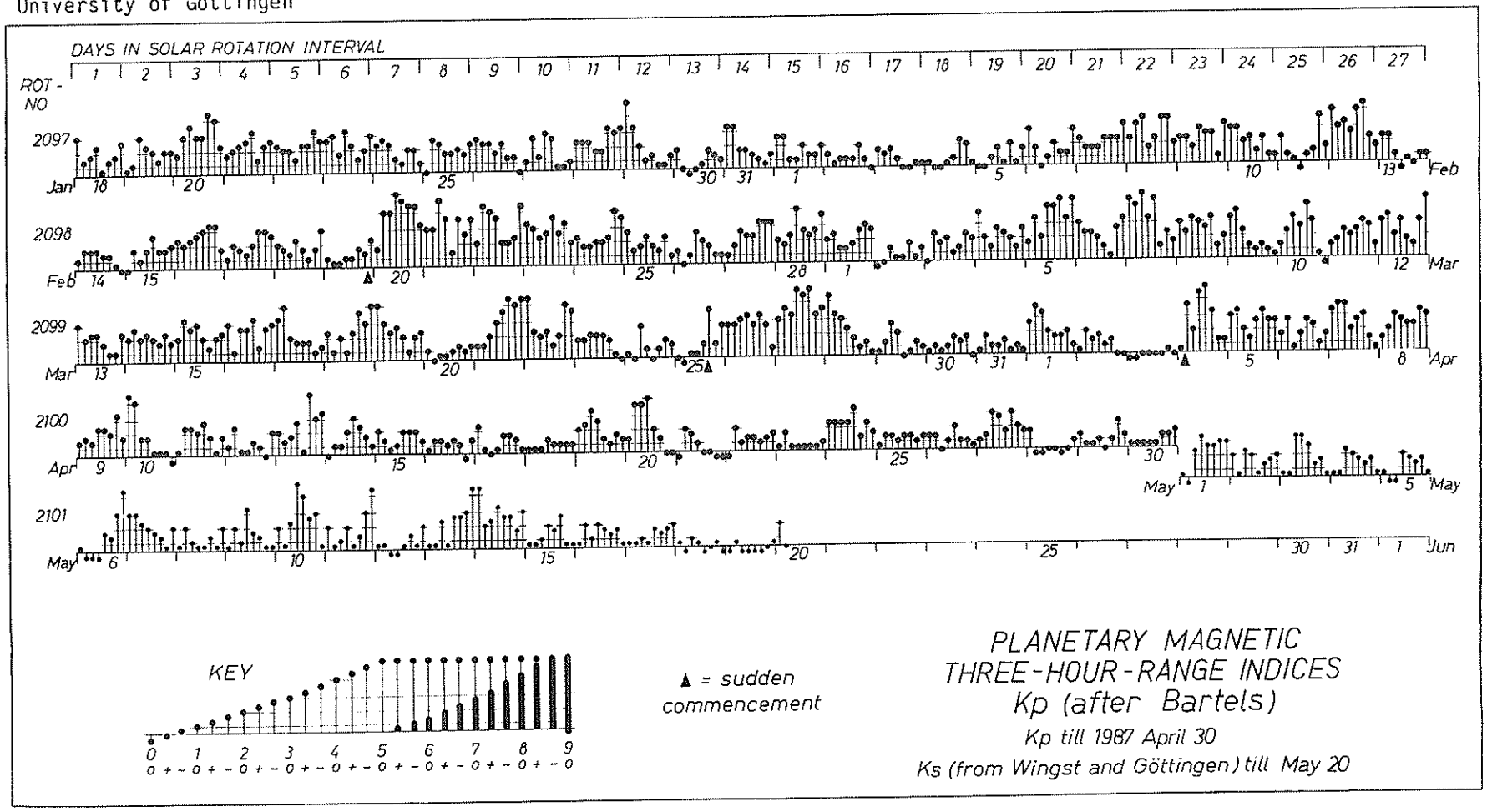
DAILY AVERAGE INDICES Ap

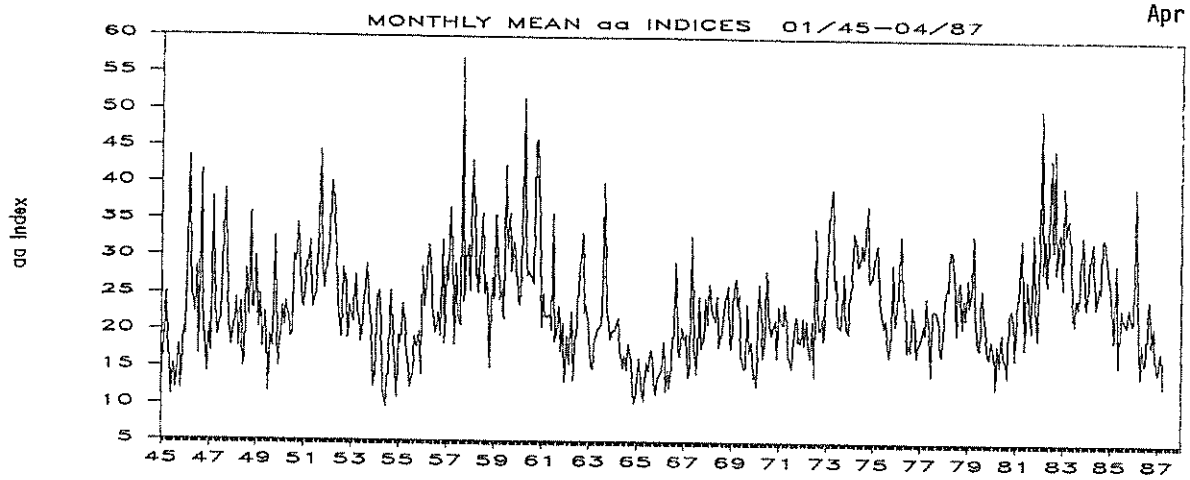
DAY	1986 MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	1987 JAN	FEB	MAR	APR
1	5	15	7	6	9	7	13	13	18	7	9	10
2	43	8	13	5	16	23	6	8	10	4	3	4
3	40	10	8	19	7	9	16	6	6	4	6	2
4	17	7	7	20	7	7	67	7	3	4	10	16
5	17	5	7	9	9	19	20	4	3	4	21	12
6	67	6	5	6	8	12	12	4	3	7	10	7
7	12	12	4	4	5	5	6	6	5	9	21	13
8	7	7	6	7	5	6	4	4	7	14	12	11
9	5	7	6	10	6	6	3	6	10	11	9	8
10	6	13	6	6	6	3	5	12	6	8	11	10
11	6	6	4	7	16	4	14	8	5	7	8	7
12	7	6	6	10	89	2	9	4	10	18	14	5
13	4	6	7	10	22	28	5	12	6	4	8	12
14	3	6	4	5	12	31	5	20	5	5	8	6
15	4	5	4	6	18	14	12	4	5	6	10	6
16	7	5	5	4	7	6	11	12	12	12	12	4
17	8	8	8	5	14	6	8	5	10	9	10	5
18	5	9	6	3	20	13	6	6	8	7	12	4
19	8	5	4	4	21	21	4	6	7	5	11	8
20	5	6	3	15	18	14	5	7	18	29	4	12
21	6	6	6	29	11	11	3	11	10	19	18	3
22	3	8	7	29	4	6	2	14	10	18	15	4
23	8	5	5	25	43	5	12	22	11	14	6	4
24	7	7	15	22	22	2	46	10	7	12	5	9
25	10	3	17	17	26	4	49	11	7	7	6	4
26	8	5	20	12	27	3	17	14	7	6	13	4
27	7	28	16	13	20	16	9	9	7	12	26	9
28	3	18	9	12	13	9	5	3	11	13	12	2
29	4	11	17	22	13	15	10	3	10		5	4
30	10	9	11	27	5	14	14	4	4		4	4
31	17		12	16		6		7	8		4	
MEAN	12	8	8	12	17	11	13	8	8	10	10	7

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

University of Gottingen

Kp through April 30, 1987





Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1945	16.1	16.4	25.0	19.1	15.4	11.1	15.3	12.1	15.6	17.9	12.0	20.2	16.3
1946	19.2	30.2	43.5	25.0	24.1	22.3	28.6	16.7	41.7	19.6	19.3	14.3	25.4
1947	20.6	17.1	37.9	23.3	19.1	21.1	21.4	32.9	39.1	31.3	20.7	17.9	25.2
1948	20.8	21.0	24.2	17.7	23.7	15.0	16.2	28.3	22.0	36.1	23.1	23.0	22.6
1949	29.8	20.4	24.7	17.6	22.4	17.9	11.8	19.2	17.8	32.7	24.6	15.1	21.2
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									15.5

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

APRIL 1987

Sta	Geomag Lat	Commencement Day	Commencement Time (UT)	Type	SC Amplitudes D (Min)	SC Amplitudes H (Gamma)	SC Amplitudes Z (Gamma)	Maximum 3-Hour K Index Day(3-Hour Periods)	K	Ranges D (Min)	Ranges H (Gamma)	Ranges Z (Gamma)	End Day	End Hour (UT)
COL	64.6N	04	0316	SC*	16	164	31	04(5)	6	95	900	460	04	20
FRD	49.6N	04	0316	SC	- 1	46	- 8	04(5)	5	15	85	29	06	--
BJI	28.5N	04	0315	SC	2	43	2	04(4)	5	5	134	26	04	21
JAI	17.3N	04	0313	SC	- 0.7	35	5		-	5	136	22	04	24
KRC	16.4N	04	0318	SC	- 1	38	18		-	--	--	--	10	11
SHL	14.7N	04	0313	SC	0.5	39	7		-	5	149	25	04	24
UJJ	13.5N	04	0313	SC	- 0.4	42	- 10		-	3	138	17	04	24
ABG	09.5N	04	0313	SC	- 0.3	39	- 5	04(4,5)	5	4	150	24	04	24
HYB	07.6N	04	0314	SC	- 0.2	43	- 3	04(2,5,6)	5	4	162	14	05	22
GUA	04.0N	04	0317	SC*	0.2	46	- 14	04(4)	5	--	140	40	04	20
TRD	01.1S	04	0313	SC	0.3	65	49		-	2	208	117	04	24
PMG	18.6S	04	0317	SC*	0.3*	37	34	04(5)	5	5	150	80	05	15
CNB	43.9S	04	0316	SC*	2.5*	35	5	04(5)	5	14	85	35	04	16
KGL	56.5S	04	0316	SC	2	16	16	04(5,6)	6	19	224	160	04	17
HYB	07.6N	12	2100	..	..	..	..	13(6,7)	5	5	124	33	13	23
KRC	16.4N	13	0600	..	..	..	..	13(3,6,7,8) 14(5)	4	4	88	30	14	22
GUA	04.0N	19	0212	..	..	..	..	19(3)	5	--	140	30	19	16
HYB	07.6N	23	2300	..	..	..	..	24(5)	5	3	97	14	24	22

Stations Reporting:

ABG = ALIBAG
BJI = BEIJING
CNB = CANBERRA
COL = COLLEGE
FRD = FREDERICKSBURG
GNA = GNANGARA
GUA = GUAM
HER = HERMANUS
HYB = HYDERABAD
JAI = JAIPUR
KRC = KARACHI
KGL = KERGUELEN
PMG = PORT MORESBY
SHL = SHILLONG
SIT = SITKA
TRD = TRIVANDRUM
UJJ = UJJAIN
WIT = WITTEVEEN

RADIO PROPAGATION QUALITY INDICES

APRIL 1987

Day	Bracknell	Teheran	New York	Tokyo	Johannesburg	Canberra
	For Circuits from Norddeich to:					
1	6.3	7.7	6.0	8.3	7.0	7.5
2	6.5	8.2	5.9	9.0	8.5	7.1
3	5.8	7.3	7.3	8.8	7.5	6.3
4	6.7	8.3	6.7	9.5	7.6	7.6
5	6.2	8.8	6.4	8.1	8.3	7.6
6	6.5	7.5	7.1	9.1	8.1	7.5
7	7.3	8.3	6.7	9.2	9.2	8.3
8	7.1	8.8	7.0	9.8	9.0	8.8
9	6.8	8.3	7.3	9.5	8.4	8.1
10	7.2	8.0	7.4	9.1	7.4	8.0
11	7.4	8.6	7.5	9.5	8.9	9.0
12	7.9	8.7	7.3	9.7	8.5	8.5
13	7.6	8.3	7.1	9.9	8.0	8.1
14	6.6	7.3	6.5	9.5	7.8	7.5
15	6.9	7.5	7.2	9.8	7.3	8.0
16	6.9	7.4	6.5	9.8	8.0	8.5
17	7.3	7.7	7.6	9.6	7.2	8.4
18	7.2	7.3	7.6	9.3	7.9	7.8
19	6.6	7.1	5.4	9.1	7.6	7.1
20	6.6	7.4	5.6	8.9	6.4	7.0
21	7.3	7.1	6.3	9.0	7.1	6.7
22	6.6	7.4	6.2	9.1	7.0	6.3
23	6.8	7.8	6.4	8.8	7.4	6.4
24	6.4	6.7	5.6	8.6	5.5	6.9
25	5.9	5.9	6.2	7.2	5.2	6.0
26	5.4	4.7	5.9	7.4	3.8	6.0
27	5.8	6.2	5.8	6.6	3.2	6.4
28	6.3	5.4	6.2	7.5	3.4	5.3
29	6.0	6.6	6.8	7.9	3.0	6.5
30	6.5	5.5	7.3	7.1	3.8	6.3
Mean	6.7	7.4	6.6	8.8	6.9	7.3

CALCULATION OF QUALITY INDICES (Q)

From all 24 hourly field strength values and from all frequencies of the same circuit a median field strength value is calculated (FD). This daily value is compared with the average value (FA) of the preceeding 27 days (1 sun rotation).

$$Q = 6.0 + 20 \log(FD/FA)/3.0$$

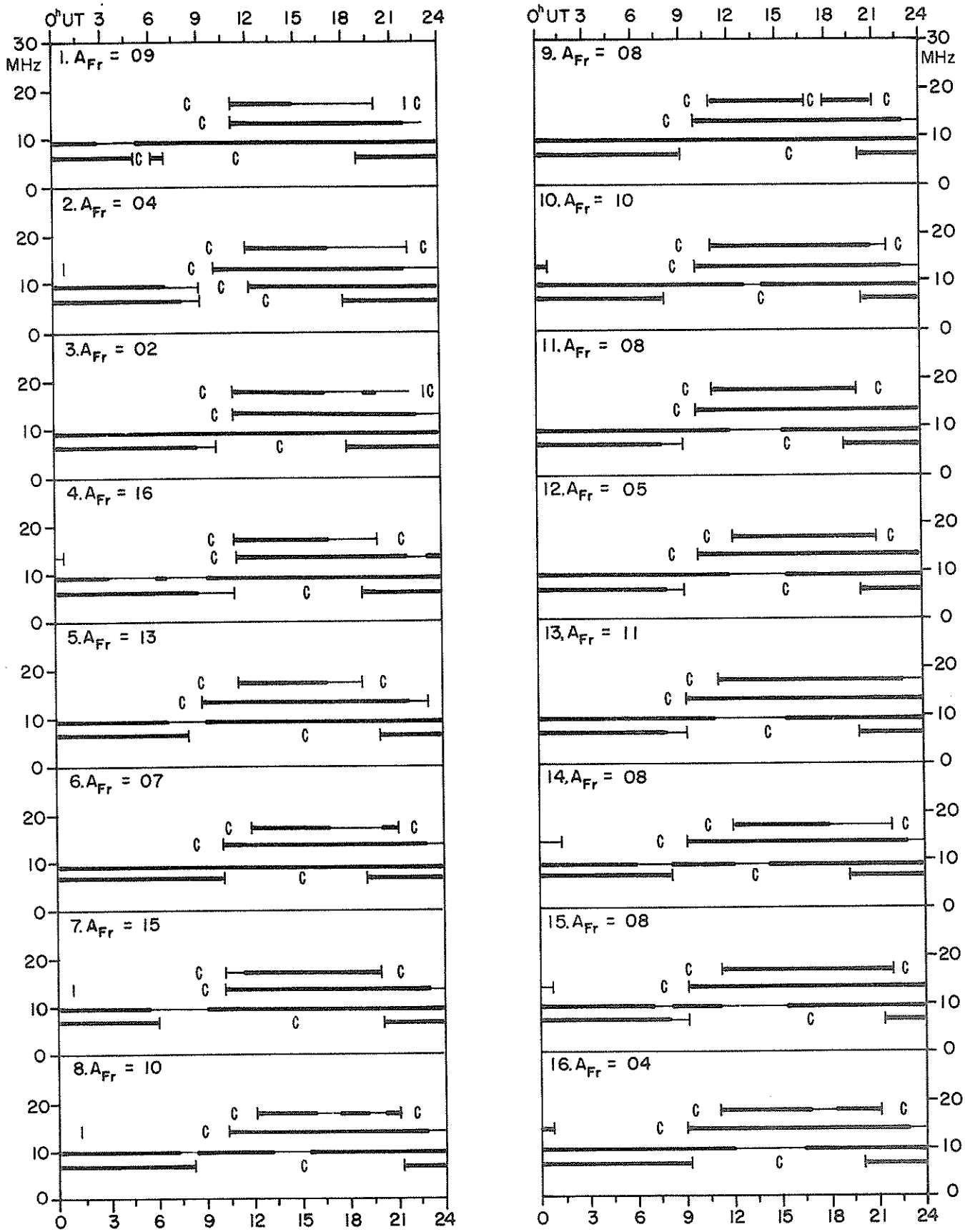
The quality indices vary from 0.0 to 9.9 where 6.0 is normal. Conditions are "normal" (index = 6.0), if they correspond to the average of the preceeding 27 days.

SCALE FOR QUALITY INDICES

0.0 - 1.0 = very poor
1.1 - 3.0 = poor
3.1 - 5.0 = fair
5.1 - 7.0 - normal
7.1 - 9.0 = good
9.1 - 9.9 = very good

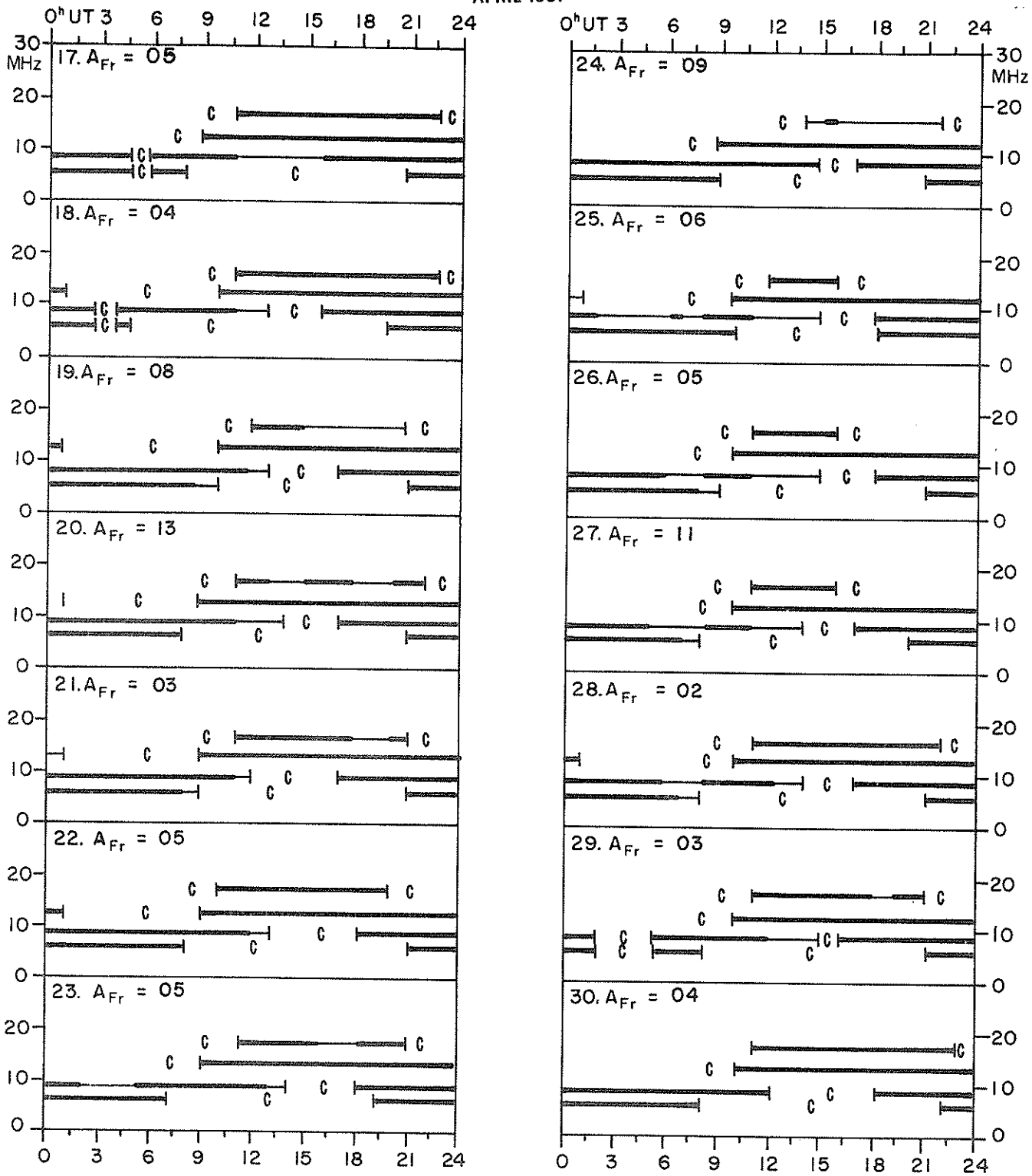
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

APRIL 1987



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

APRIL 1987



Field strengths from four frequencies, 6.4, 8.6, 13.0, and 17.0 MHz, observed on a Norddeich-New York circuit are represented above. Heavy solid lines represent field strengths ≥ -12 dB above 1 μV/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB and -40 dB above 1 μV/m are represented by the fine line.

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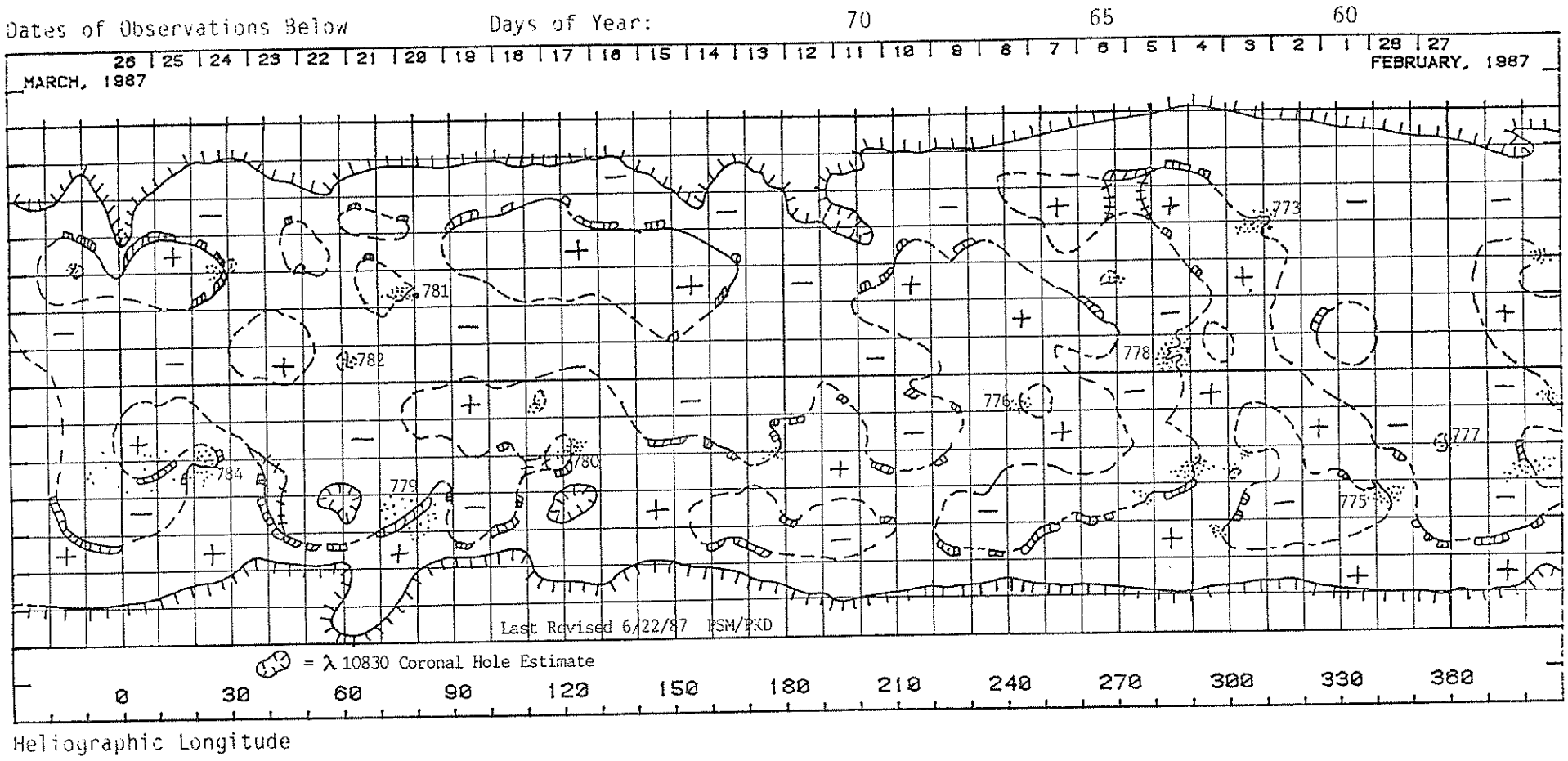
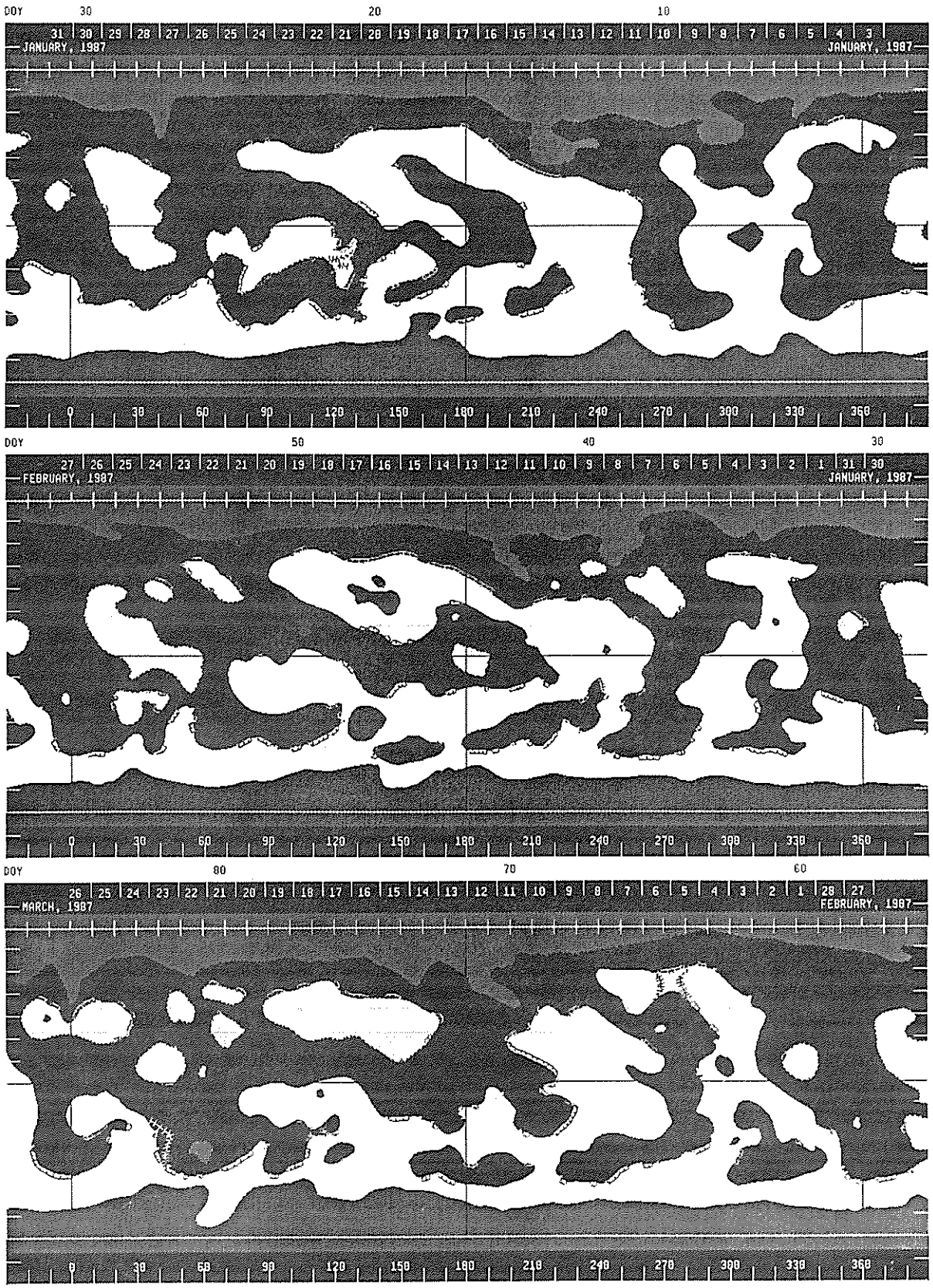
PRELIMINARY H-ALPHA SOLAR SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1786
(27 February to 26 March 1987)



SHADED H-ALPHA SOLAR SYNOPTIC CHARTS

Carrington Rot. 1784-1786 3 Jan to 26 Mar 1987



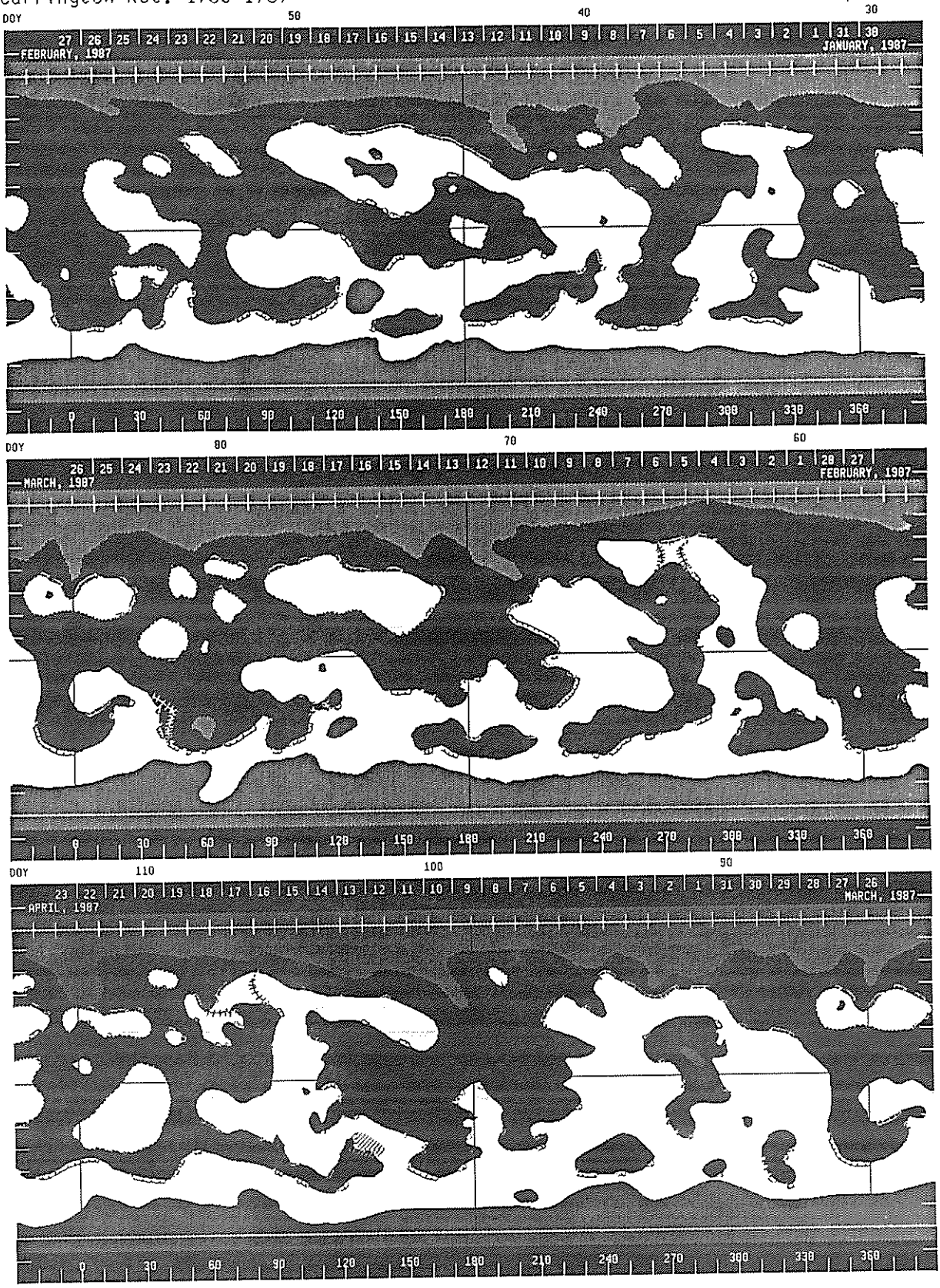
□ = Positive Polarity ■ = Negative Polarity ■ = 10830 Coronal Hole Estimate

Heliographic Longitude

98
Late
Jan-Apr 87

SHADED H-ALPHA SOLAR SYNOPTIC CHARTS

Carrington Rot. 1785-1787 — 31 Jan to 23 Apr 1987



= Positive Polarity = Negative Polarity = 10830 Coronal Hole Estimate

Heliographic Longitude

PIONEER VENUS ORBITER
ONE HOUR MAGNETIC FIELD AVERAGES AT APOAPSIS
VENUS SOLAR ORBITAL COORDINATES

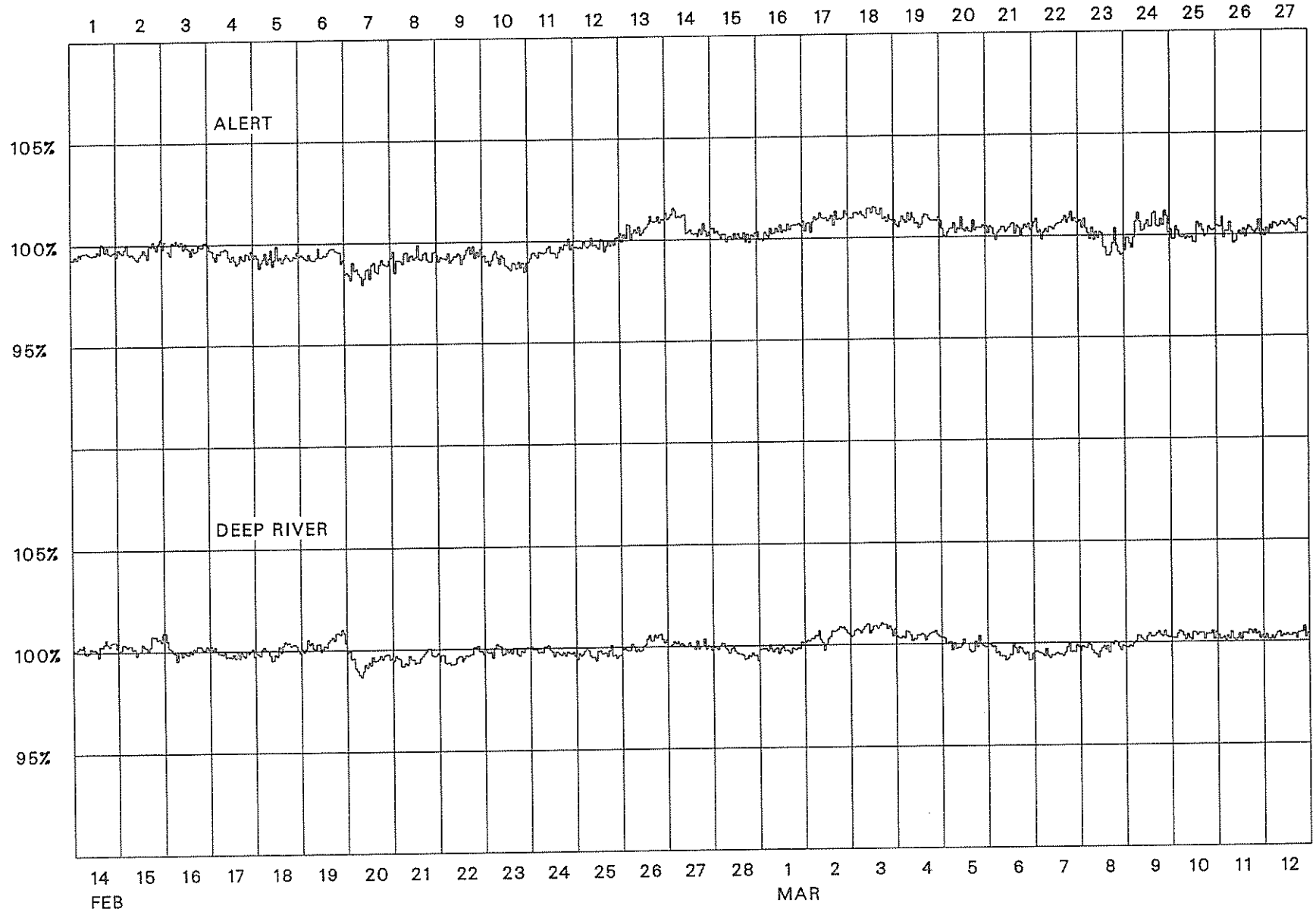
UNIVERSAL TIME				NANOTESLAS BXvso	BYvso	BZvso	BT	REGION W=WAKE
86	274	OCT 1	11:40:00	2.95	-5.42	5.40	10.14	W
86	275	OCT 2	11:40:00	7.06	-.65	.19	9.33	W
86	276	OCT 3	11:40:00					
86	277	OCT 4	11:40:00	4.74	.05	.04	4.74	W
86	278	OCT 5	11:40:00	-5.07	-.38	3.70	6.94	W
86	279	OCT 6	11:40:00	2.98	-1.17	-.69	4.25	W
86	280	OCT 7	11:40:00	-.29	-2.05	.38	3.71	W
86	281	OCT 8	11:40:00	-1.20	-.37	1.38	2.81	W
86	282	OCT 9	11:40:00	3.96	-3.56	.05	5.74	W
86	283	OCT 10	11:40:00	-6.26	2.97	-2.55	7.42	W
86	284	OCT 11	11:40:00	2.26	-4.53	3.06	10.18	W
86	285	OCT 12	11:40:00	6.48	-9.53	-2.61	12.05	W
86	286	OCT 13	11:40:00	7.19	-3.53	.21	8.90	
86	287	OCT 14	11:40:00					
86	288	OCT 15	11:40:00	4.30	-1.28	-.78	5.50	W
86	289	OCT 16	11:40:00	3.17	1.00	-5.00	6.47	W
86	290	OCT 17	11:40:00	12.12	-4.36	-.34	13.34	W
86	291	OCT 18	11:40:00					
86	292	OCT 19	11:40:00	5.42	-.11	-2.01	7.62	W
86	293	OCT 20	11:40:00	-8.37	-.51	-.79	10.07	W
86	294	OCT 21	11:40:00	.50	-.15	.99	5.77	W
86	295	OCT 22	11:40:00	-2.07	-1.52	-3.22	8.77	W
86	296	OCT 23	11:40:00					
86	297	OCT 24	11:40:00					
86	298	OCT 25	11:40:00					
86	299	OCT 26	11:40:00					
86	300	OCT 27	11:40:00					
86	301	OCT 28	11:50:00					
86	302	OCT 29	11:50:00	-12.93	2.88	-1.20	15.09	W
86	303	OCT 30	11:50:00					
86	304	OCT 31	11:50:00					

Source: Institute of Geophysics and Planetary Physics, UCLA

100
Late
Mar 87

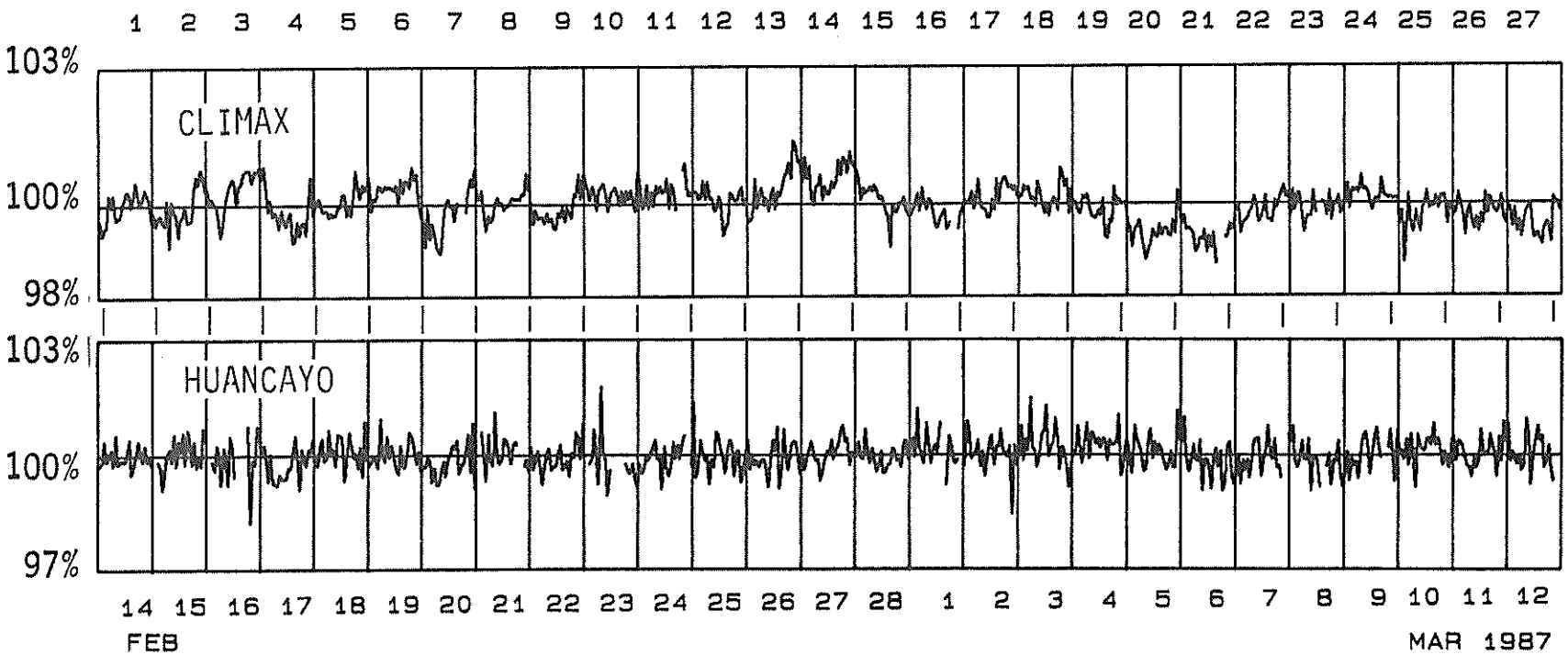
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2098 (February 1987-March 1987)



COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2098 (February 1987-March 1987)



101
Late
Mar 87

COSMIC RAY INDICES
(Neutron Monitor)

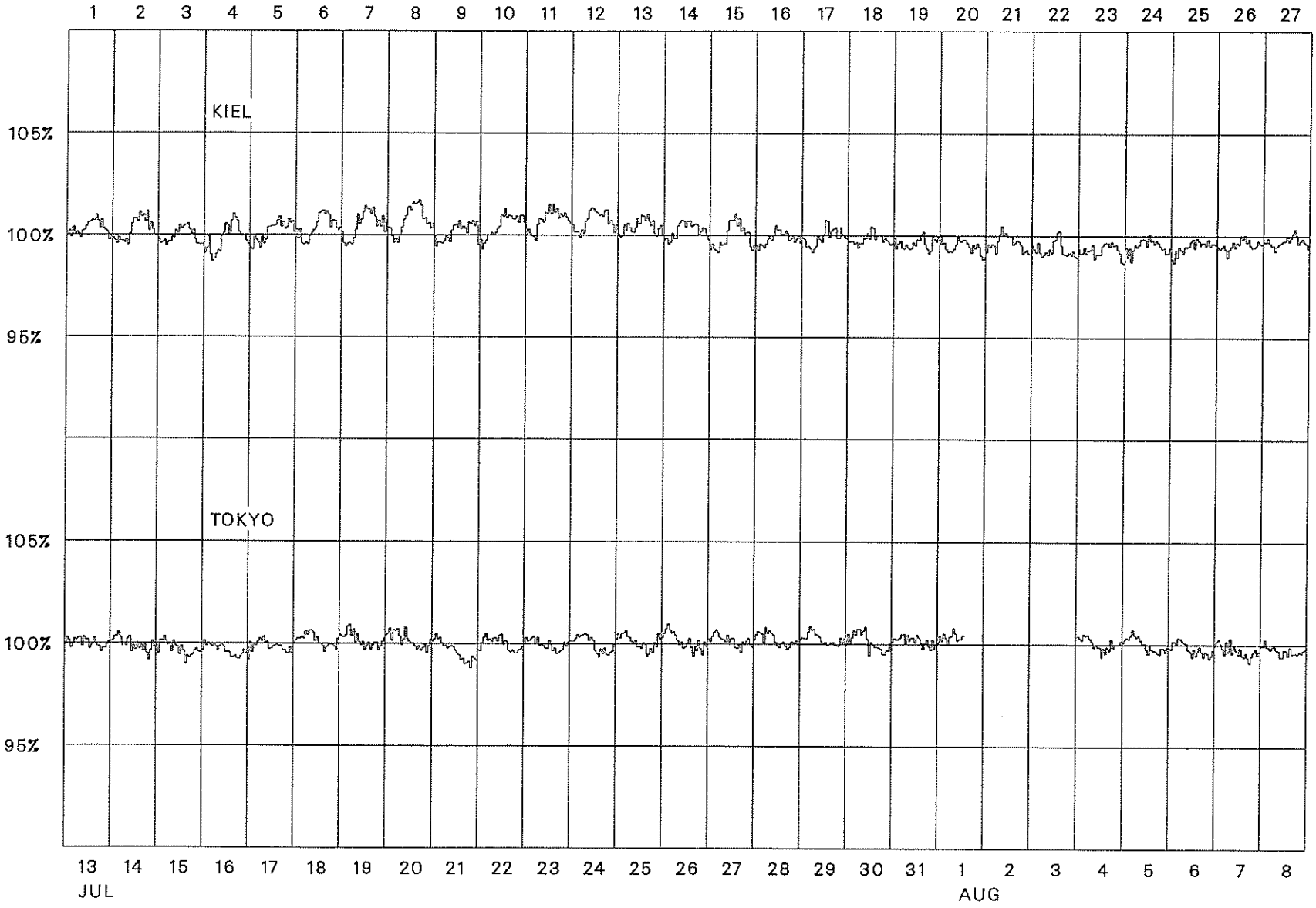
MARCH 1987

Day	THULE Average (cts/h)/100	ALERT Average (cts/h)/100	DEEP RIVER Average (cts/h)/300	KIEL Average (cts/h)/100	CLIMAX Average (cts/h)/100	PREDIGTSTUHL Average (cts/h)/100	TOKYO Average (cts/h)/256	HUANCAYO Average (cts/h)/100
1	4650	7564.0	7271.6	6466.2	4324.2		3731.0	1808.2(38)
2	4661	7602.5	7317.5	6502.6	4338.0		3733.9	1806.0
3	4673	7619.4	7340.4	6515.4	4338.8		3731.8	1809.1
4	4671	7597.5	7314.7	6534.2	4325.7		3727.3	1809.9
5	4654	7565.0	7280.4	6490.0	4304.9		3725.3	1806.7
6	4654	7560.7	7252.1	6470.6	4300.5		3719.0	1802.2
7	4659	7574.9	7251.2	6473.4	4326.2		3699.9	1804.0
8	4657	7521.8	7264.8	6462.9	4327.5		3718.0	1802.5
9	4654	7563.1	7298.4	6476.3	4338.9		3730.5	1806.0
10	---	7538.7	7309.2	6486.0	4322.7		3728.2	1807.9
11	---	7548.0	7305.5	6483.5	4322.3		3718.1	1806.8
12	4664	7567.0	7306.1	6494.5	4314.5		3722.9	1806.0
13	4648	7569.7	7309.9	6494.5	4319.4(38)		3711.9	1808.4
14	4657	7580.8	7320.4	6508.1	4338.5		3711.7	1808.3
15	4662	7590.5	7323.5	6534.6	4348.1		3714.9	1806.2
16	4659	7561.0	7328.7	6526.7	4353.8		3718.0	1807.9
17	4657	7570.7	7317.0	6519.0	4353.4		3714.0	1803.5(36)
18	4660	7580.0	7313.6	6527.1	4337.1		3716.7	1806.5
19	4656	7576.0	7305.6	6527.4	4342.6		3712.6	1804.8
20	4672	7598.3	7338.0	6545.7	4369.0		3719.9	1807.6
21	4654	7567.5	7329.5	6509.5	4413.5		3723.4	1806.1
22	4649	7547.5	7303.0	6486.1	4413.7		3712.1	1805.6
23	4624	7510.8	7257.0	6450.1	4359.8		3693.0	1800.4
24	4603	7473.6	7230.8	6405.9	4328.3		3692.8	1796.6
25	4599	7468.9	7276.1	6434.8	4314.5		3704.7	1800.3
26	4587	7457.8	7252.1	6441.2	4304.6		3707.5	1801.8
27	4587	7454.2	7206.6	6420.3	4280.6		3698.8	1799.2(38)
28	4602	7474.6	7223.0	6456.9	4289.0		3693.2	1797.9
29	4609	7499.6	7247.4	6451.4	4302.6		3686.7	1799.3
30	4629	7531.2	7275.9	6451.5	4308.7		3685.4	1801.9
31	4643	7555.0	7280.6	6464.2	4308.7		3706.7	1802.0
Mean	4643	7548.1	7288.7	6484.2	4331.6		3713.1	1804.5

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

COSMIC RAY INDICES
(Neutron Monitor)

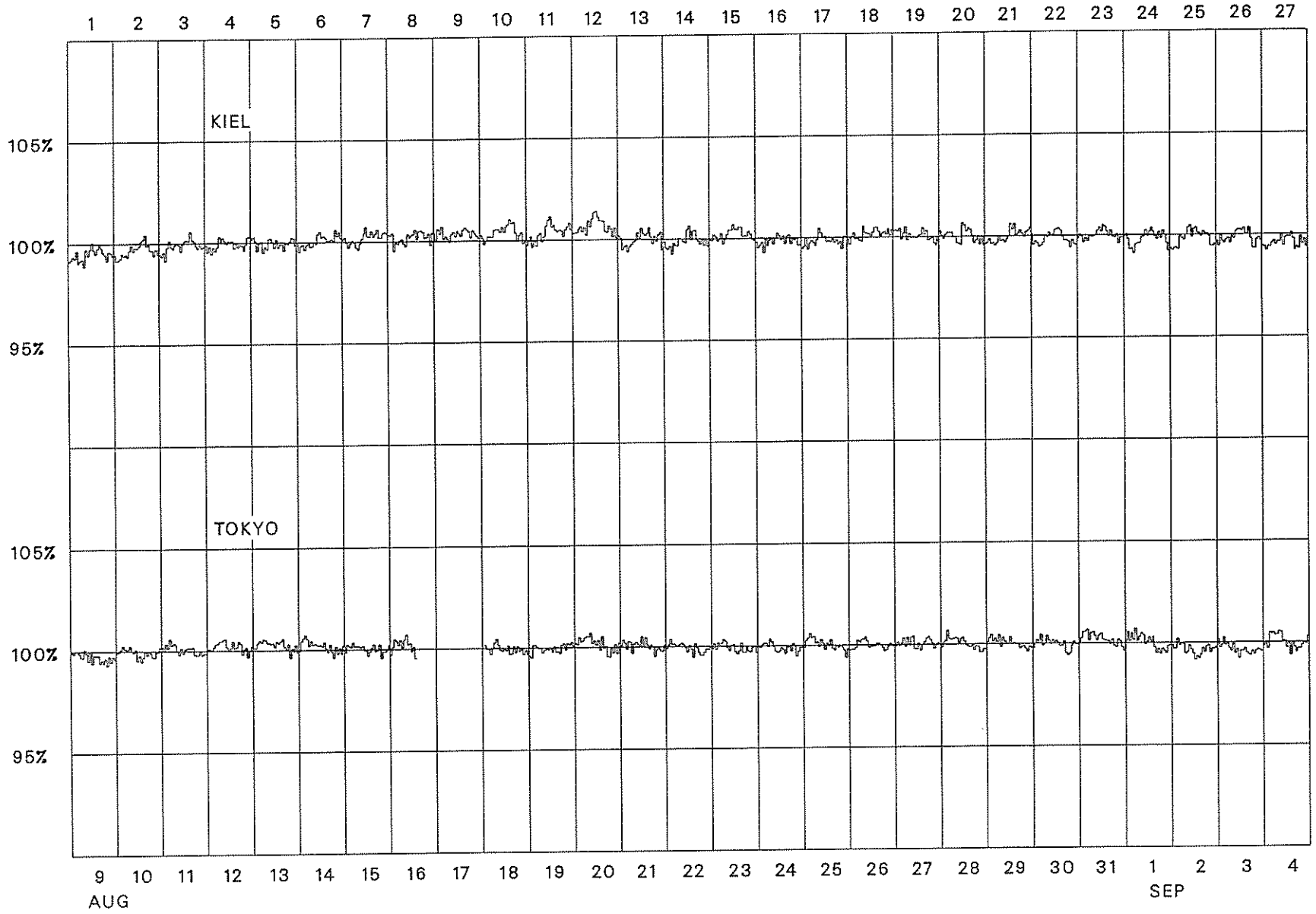
Bartels Rotation 2090 (July 1986-August 1986)



103
Late
Jul 86

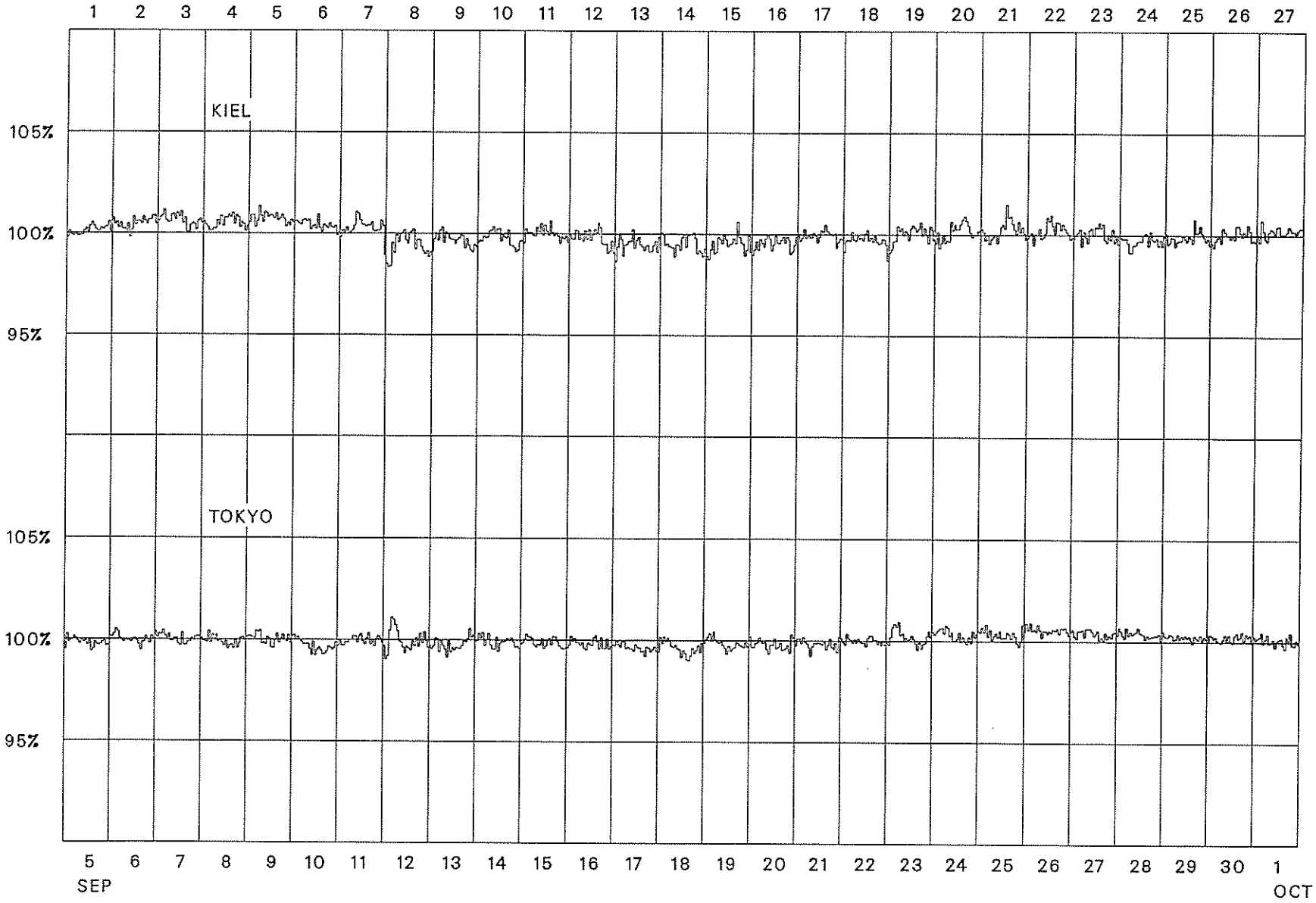
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2091 (August 1986-SeptembeR 1986)



COSMIC RAY INDICES
(Neutron Monitor)

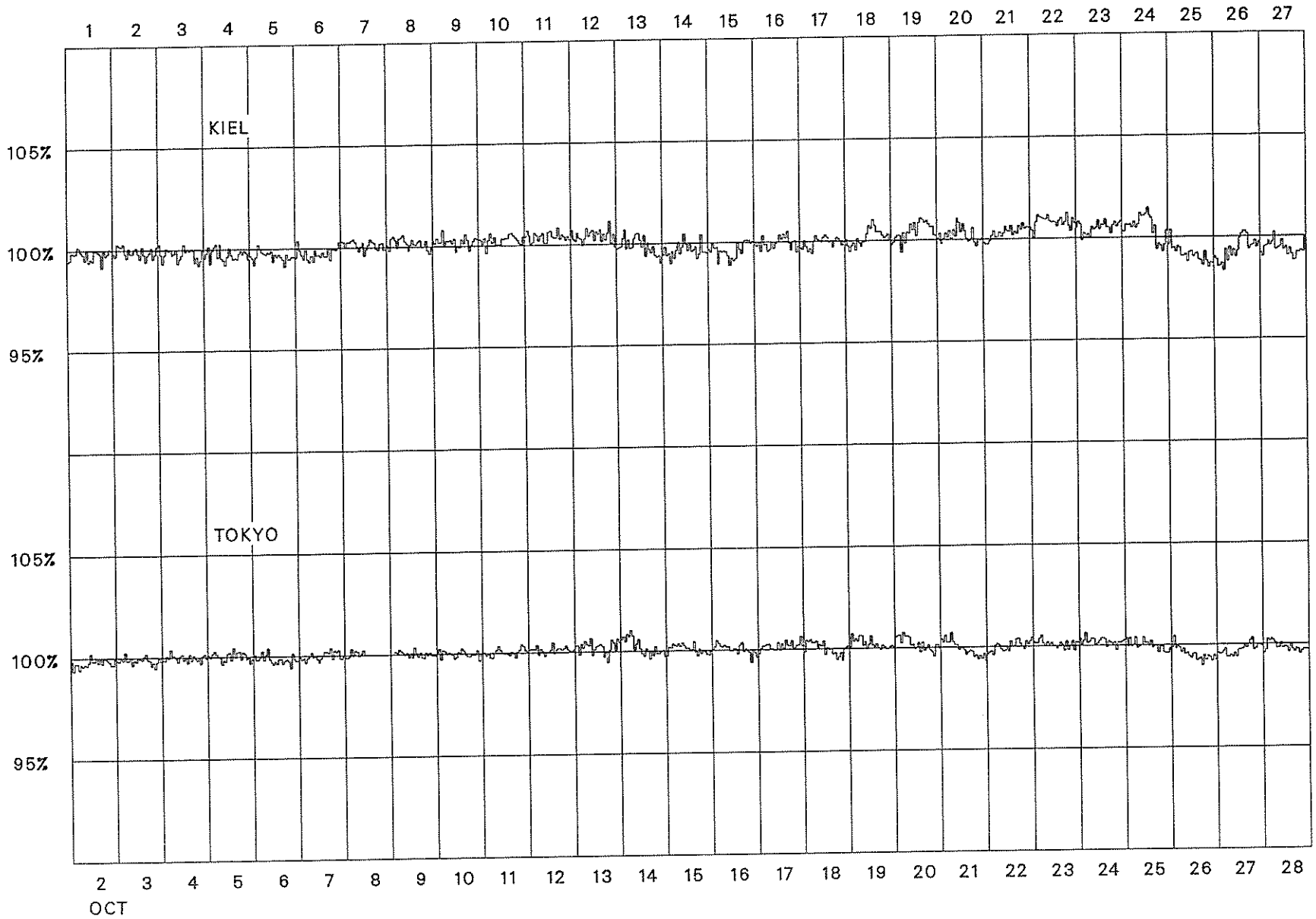
Bartels Rotation 2092 (SeptembeR 1986-October 1986)



105
Late
Sep 86

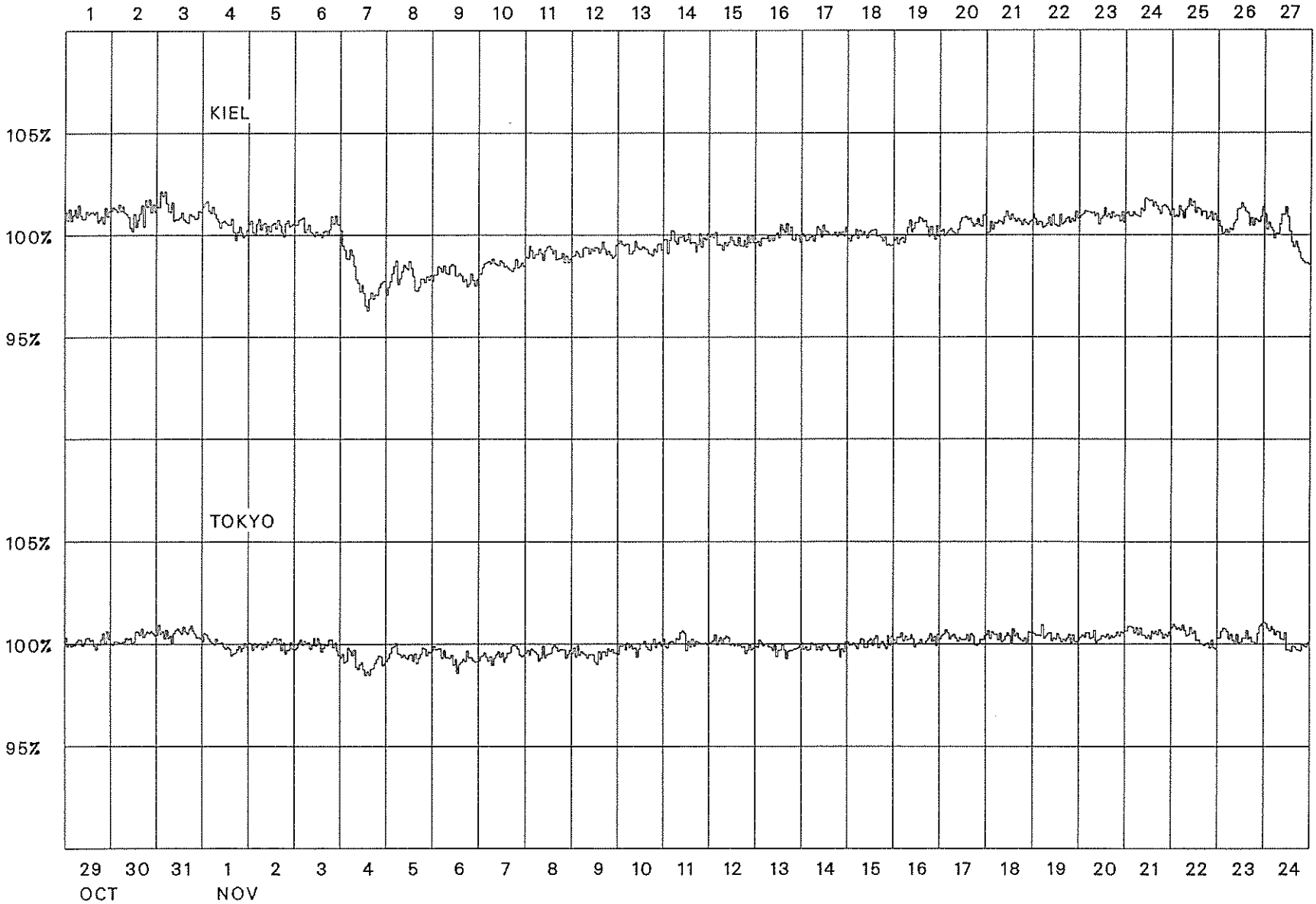
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2093 (October 1986)



COSMIC RAY INDICES
(Neutron Monitor)

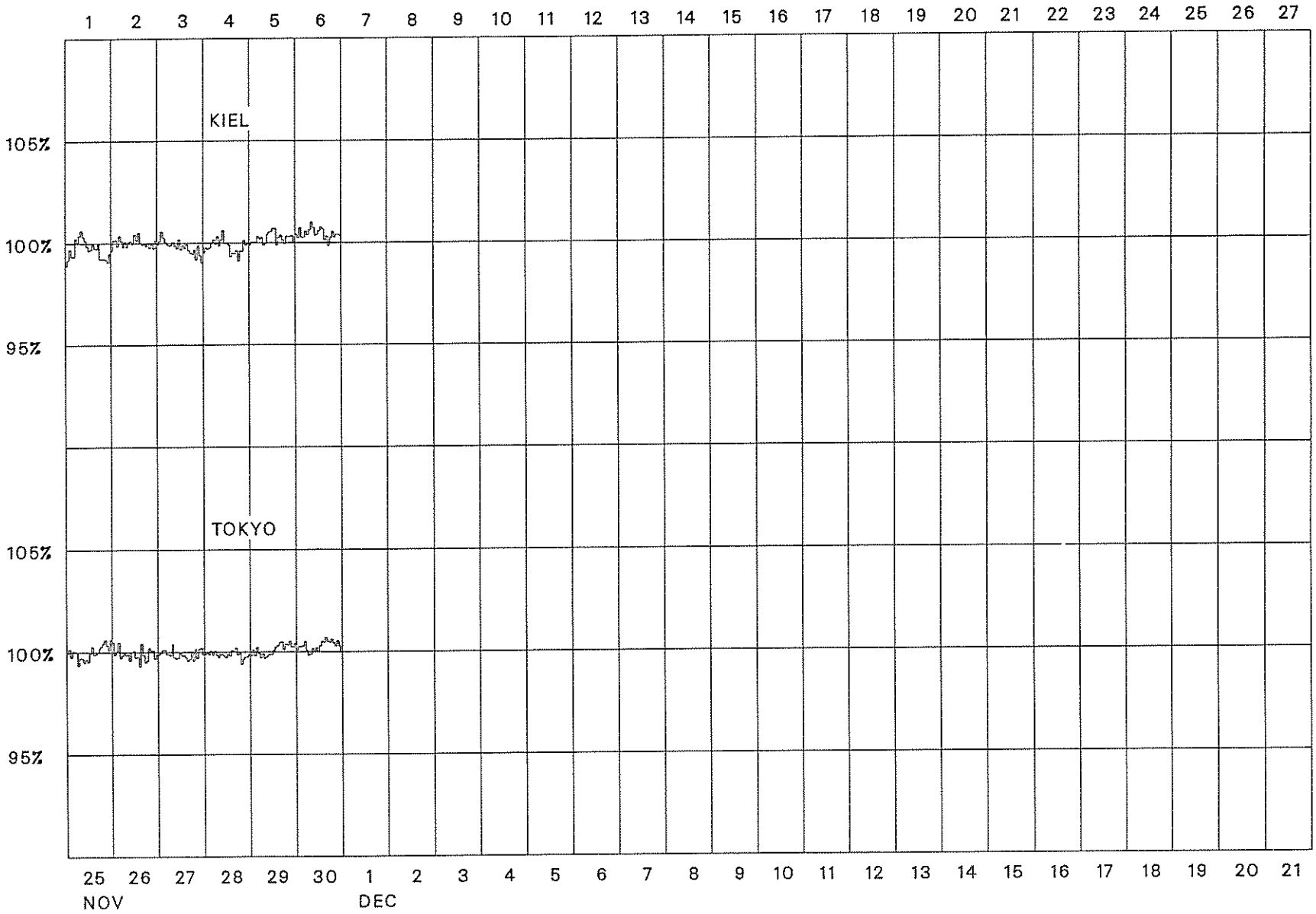
Bartels Rotation 2094 (October 1986-November 1986)



107
Late
Nov 86

COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2095 (November 1986-December 1986)



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

FEBRUARY 1987

Storm Sudden Commencements (ssc)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
19	2151	B: WNG COI FRD MPO GNA; C: WIT VAL CLF CAO	06	1106-1120	MPO
			11	0007-0016	QUE
			11	1321-1338	NCK QUE
			12	1411-1416	NCK
			23	0656-0715	MPO

Reporting Observatories:

SOD COL DOB NUR WNG WIT VAL NGK BDV CLF NCK GCK MMB AQU EBR
COI SPT FRD ALM KAK KNY QUE LNP MPO GNA CAO AMS CZT KGL DUM

*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, ordinary, but unmistakable; and C means very poor, doubtful.

R9	Rot.-No.	1st day	C9	
222 ,,2 2,3	19	O29	7334,, 3432,, .43 ,53 ,,3 23, 2,2,	2..446
,,,2,2 442	77	J25	2..446 525 3.2 455 634 233 2,2 4,,	,25 432
,,,,,,2,,,		F21	,25 432 .23 ,,,,,, 365 553 3,, 23,	33, 433
,,, ,,,,,2	1964	M20	33, 433 424 4,,,3 637 765 442 ,33	4 22 763
32, ,,2 223	65	A16	422 763 ,,3 5.. ,52 474 533 ,,, 255	,24 553
22, ,,2 333	66	M13	,24 553 ,2.2,2 ,,, 2,, 224 ,,2 ,,,	,2. ,,2
22, ,,5533	67	J9	,2. ,,2 .22 323 ,33 2,, ,3, 243 22,	644 442
22, ,,232,	68	J6	644 442 .25 364 25633 ,,,, ..742,	,,2 654
222 333 323	69	A2	,,2 654 353 633 332 636 2,, ,36342	,,,,,,2
322 244 443	1970	A29	,,,,,2 ,,, ,2335, 632 22, 777753	355 2..
453 443 444	71	S25	355 2.. ,,2 222 ,,, .36445 2356,,	5,,,,7
333 422 224	72	O22	5,, ,,7722 ,,, ,22 ,,, ,2, 567 642	,,, ,,,
42, ,24 454	73	N18	,,, ,,, .453,,3,7 245 ,,,,.6542	,23 ...
332 345752	1974	O15	,23 ,,, ,,, ,,3 ,32 ,,, 237 663 555	2.2 ..4
232 235 778	19	J11	2.2 ..4 23, ,,,, ,,33,2 665 444 344	,34 2,3
776 445 666		F7	,34 2,3 237 323 333 5,, 367 7664..	225 43,
665 556 544	78	M6	225 43, .33 466 542 244 ,.7744 423	477 52,
567 767 776	1978	A2	477 52, ,,6765752 ,56522 574 544	.77 878
566 556 655	79	A29	,77 878 2,2 473 653 2,, 2,, 266 563	,,, 253
676 434 577	1980	M26	,,, 253 27666 2 32 .642 ,,, ,23 436	455 674
887 446 776	81	J22	455 674 366 ,,3 773 442 2,, 57, ,,5	3,, 22,
532 334 556	82	J19	3,, 22, 2,, ,,,,,, 46542, ,,353,	..253.
433 447 887	83	A15	..253. ,,,,,2. 686 675 532 24, 563	33, ,,,
678 888 776	84	S11	33, ,,,2.. ,23 336 677 834 324 2.,	,34 ,42
788 887 777	85	O8	,34 ,42 ,,, ,65 232 ,,2 554 465 333	,,, 242
777 565 577	86	N4	,,, 242 437 532 ,,, 354 635 764 ,,,	3., 33,
778 888 656	1987	O1	3.. 33, ,,,,,, 266 427 663 52, 524	456 525
888 888 88■	19	D28	456 525 575 562 4.. 2,2 432 353 346	566 534
■88 788 888		J24	566 53443, 225 24, 22, 34. .3, ,54	.76644
876 888 888	79	F20	.76 644 564 353 646 ,,475, 2.2 35,	3,, 734
887 787 557	1991	M19	3,, 734 565 674 566 777 333 23, 434	543 ...
765 677 788	92	A15	543 ,,, 575 483 667 654 ,,, ,324,5	2233..
■7 777 78■	93	M12	2233,, 353 363 666 436 3,, ,,, ,66	444 3,2
■7 777 78■	94	J8	444 3,2 224 4,, 246522 53. ,22 .42	256 2,,
■8 778 888	95	J5	256 2,, .34 443 443 52, ,,, 453 62.	433 425
777 677 ■	96	A1	433 425 32, 2257 2, ,23 675 3,3 543	374 32,
888 8■ 8■	97	A28	374 32, 234 4,, ,24 223 243 7,55,,	455 444
■ 8■ ■	98	S24	455 444 53, 32, 666 542 23, 22, ,,,	34, 342
■8 ■ ■	99	O21	34, 342 ,23 ,,4 332 ..3 45, 3264.3	2,, 21.
■8 77■ ■	2000	N17	2,, 2,, .54 ,,, .42 324 2,, 2,, ,,,	,23 3,,
■7 778 8■	2001	D14	,23 3,, ..4 ... 334 652 635 432 ,,,	.3, 52,
■8 777 8■	19	J10	.3, 52, 23. ,,, ,,, ,,666 2 ,32 ...	634 3..
■8 8777 ■		F6	634 3.. ..566, 32, ,,2 ,44 43, ,,,	,,2 ,,2
875 547 8■	80	M4	,,2 ,,2 ,,, ,,, ,,, 2,54,, ,6, ,23	5.. 23,
88■ ■8 878	2005	M31	5.. 23, 654 556 652 533 ,,, ,2, ,2,	,,, 22.
888 888 8■	06	A27	,,, 22. ,,, 322 526544 ,,, ,2, ,,3	362 ...
■8 888 888	07	M24	362 ,,, 345 ,2, .46546766 2,2 ..2	,,, ,32
■ 766 668	08	J20	,,, 324.. ,2, ..2 43342. 3,2 2,,	,64 24,
■8 775 568	09	J17	,64 24, ,,7644 ,2, .25 2,5 3.2 222	,,, 635
■ 878 ■8	2010	A13	,,, 635 632 3,, ,35 ,,, 22, 333 222	3,, 542
776 88■ ■7	11	S9	3,, 542 224 ,,2 .2, ,,, ,,2 ,,, ,65	433 456
8■ ■8 78■	12	O6	433 456 3,34.. 53. 257 453 ... 364	3,3 ,,,
■ 777 778	13	N2	3,3 ,,, ,24 53, 354 344 432 234 555	455 252
887 7■ ■	2014	N29	455 252 ,,, 233 44, 234 .47563 ,,2	,3. 234
■8 677 756	19	D26	,3. 234 422 422 ,3, 25. ,,2 32. ...	222 222
778 888 887		J22	222 222 442 545 426 754 5.3 3,. 33,	,,2 ,,3
878 8■8 877	81	F18	,,,3 566 536 623 735 3.2 ,36754	552 22,
678 888 8■	2018	M17	552 22, ..6643 546534 3.3 232 268	862 454
■ 766 88■	19	A13	862 454 777 665 577 452 42, ,,, ,36	674 357
887 666 654	2020	M10	674 357747 573 ,556 2, 3,, 222 4,,	474 ,,,
456 767 788	21	J6	474 ,,, ,,, 352 232 2,, 344 326445	223 542
756 888 8■	22	J3	223 542 ,,3 522 ,26 223 ,663876 2,	235 453
877 788 8■	23	J30	235 453 442 ,,4 422 232 652 243 764	265 544
■ ■8 888	24	A26	265 544 ,52 342 ,33 253 332 2,5622	4.2 365
88■ ■ 8■	2025	S22	4.2 365 ,44 256 4,, 665 673 475 25,	576 765
■76 7■ ■8	26	O19	576 765 523 533 ,2, 2,3 256 ,466.6	546 644
765 47■ ■	27	N15	546 644 435 262 ,,, ,,2 232 ..4 32,	53, ..2
■65 557 776	2028	D12	53, ,,2 42, ,,, 32, ,36652 253 ,33	2.. ,,,

R9	Rot.-No.	1st day	C9	
645 876 8■	19	J8	2.. ,,,, .34 34. ,4655 2 234 366776	766 654
■8 877 788	82	F4	766 654 677 775 ,66 665 766 773 378	434 ..3
■7 888 88■		M3	434 ..3 543 233 ,,4 533 562 353 ,,3	455 775
887 887 668	2032	M30	455 775 55, 337743 ,23 532 565 247	265 665
754 555 467	33	A26	265 665 675 4,, ,2, 2,, 252 353 22,	..2 677
776 677 888	34	M23	..2 677 666 552 ,,4 424 767 766 3,,	652 555
875 333 48■	35	J19	652 555 446 656 53, ..4 543 267 ■6	765 663
■5 225 688	36	J16	765 663 437 566 555 637 645 68, 566	53, ,,4
766 567 788	37	A12	53, ,,4 423 464 555 336 642 356 6■7	373 444
667 777 888	38	S8	373 444 433 366 678 653 774 236 623	2565,4
556 546 876	39	O5	2565,4 446 624 554 432 ,,4 643 666	665 223
666 777 775	2040	N1	665 223 .32 354 533 2,3 3,666 7764	663 ..2
578 ■8 756	2041	N28	663 ..2 33. 665 754 ,23 477 676 765	425 554
765 576 666	19	D25	425 554 232 32, ..2 573 522 566 644	322 543
556 765 322		J21	322 543 324 533 ,27■77 555 566 666	443 765
234 666 542	83	F17	443 765 44, ,22 576 663 2,2 ,67 664	335 663
565 544 445	2045	M16	335 663 223 73. 666 654 444 666 552	367 765
546 678 766	46	A12	367 765 323 344 766 436 654 366 423	,27765
777 677 655	47	M9	,27765 527 3,3 676 732 3,, 233 2,,	,3, 356
665 667 765	48	J5	,3, 356 347 342 465 455 4,, 323 3,,	222 ,44
555 566 764	49	J2	222 ,44 33, .45 ,,5 652 2,2 563 ,23	452 ,64
675 566 544	2050	J29	452 ,64 ,,, 573 ,,6623 ... 236 465	66, 245
444 555 333	51	A25	66, 245 64, ,,, ,54 433 32, 566 375	33. 266
344 356 775	52	S21	33. 266 432 .35 572 534 ,2, .655377	72, 455
322 ,23 553	53	O18	72, 4555,, ,,2652565, ,,3 676 675	656 665
33, ,,2 235	54	N14	656 665 62, .34 524 554 2., 4663.5	655 64,
543 22, ,,2	2055	O11	655 64, ,,2 ,,3 343 443 266 655 664	,,, 43,
344 455 776	19	J7	,,, 43, 2,, ,2, 523 3,, 242 556 545	574 222
567 654 676		F3	574 222 255 367 5,24,4 424 224 623	666 2.6
544 567 666	84	M1	666 2.6 663 423 5,2 455 3.2 553 645	776 667
675 422 455	2059	M28	776 667 777 367 624 445 2,2 235 3,,	,68 645
777 436 765	2060	A24	,68 645 254 336 3,, 562 323 2,6 356	766 644
565 532 235	61	M21	766 644 222 42, 366 533 354 3,, .57	366 4,,
544 334 554	62	J17	366 4,, 353 235 334 333 332 324 337	666 754
222 3,, 223	63	J14	666 754 322 232 ,45 324 764 42, ,44	234 255
322 ,23 334	64	A10	234 255 43, 42. ,25 526 654 333 377	3,3 364
2,, ,,, ,,,	65	S6	3,3 364 434 22, .65 358 777 643 3,3	5,2 575
,,2 ,22 ,,,	66	O3	5,2 575 566 644 45. 777 776 654 222	,,6 355
,,, 22, ,34	67	O30	,,6 355 345 535 522 478 655 554 323	2,, 364
322 222 22,	68	N26	2,, 364 656 555 2,2 546 266 642 ,42	4,, 646
22, ,,, ,22	2069	D23	4,, 646 656 644 2,, ,57 655 422 22,	,,336,
43, ,22 ,2,	19	J19	,,336, 2,3 764 443 2.5 756 564 334	2,3 .23
,22 ,,, ,,2	85	F15	2,3 .23 222 53, 574 542 7656.2 ,2.	,43 232
,2, 232 22,		M14	,43 232 ,,, ,,, 224 ,22 5454,, 246	33, ,2,
,,, ,23 222	2073	A10	33, ,2, 2,, 578 334 566 747 26, 223	222 ,,3
333 333 ,,,	74	M7	222 ,,3 324 322 2,2 ,,, 22, ,,, ,5,	,,, 664
234 32, ,,,	75	J3	,,, 664 563 2,, ,,2 ..4 ,,, ,35 354	24. ,64
235 52, ,,,	76	J30	24. ,64 554 223 754 2,5 322 ,,3 334	43, 365
332 2,, ,,,	77	J27	43, 365 3,, ,,, ,,2 ,67 332 233 336	425 444
,,, ,,, ,,,	78	A23	425 444 436 ,,, ,,2 233 3,, ,65 63,	665 324
,,, ,,, ,,,	79	S19	665 324 554 ,,, ,,3 377 64, ,43 525	445 4,4
235 3,, ,22	2080	O16	445 4,4 432 2,, ,3, ,46 643 4,, 452	.64 434
333 ,,, ,,2	81	N12	.64 434 44. ,2. ,,, 526 744 232 ,,,	,43 263
224 3,, ,,,	2082	D9	,43 263 2,2 373 ,,, 2,2 36, 756 52,	.56 343
,,, ,,, ,,,	19	J5	.56 343 ,,, ,,, ,2, 463 436 366 542	,,, ,23
344 32, ,,,	86	F1	,,, ,23 7■8 355 45, ,24 246 665 565	653 322
233 2,, ,,,		F28	653 322 665 ,,, 252 2,, 22, 453 563	542 ,22
,,, ,,, 2,2	2086	M27	542 ,22 ,4. 2,, ,35 ,2, ,,2 ,23 ,23	332 2.3
432 2,, ,,2	87	A23	332 2.3 2,, 774 473 2,, ,2. ..2 2,2	,,, 2,2
222 ,,, ,,,	88	M20	,,, 2,2 22. .34 423 2,, 32, 3,, ,,,	,22 ,,,
,,, ,,, 223	89	J16	,22 ,,, 2,2 ..6532 242 22, ,,, ,,,	,,, ,2,
222 ,,2 ,,,	2090	J13	,,, ,2, ,,, ,,4 454 243 3,, 552 ,,2	3,, 23,
,,, ,,, ,,,	91	A9	3,, 23, ,,, ,,4 666 543 435 642 4,2	22, ,,,
,,, ,,, ,,,	92	S5	22, ,,, 475 35, 455 53. 756 653 4,2	52, 53,
222 2,2 455	93	O2	52, 53, ,,, ..664, ,45 43, ,,, ,42	44, 3,4
433 2,, ,,,	94	O29	44, 3,4 753 ,,, ,42 ,,3 32, ,,, .37	742 ,34
,,, ,,2 ,,,	95	N25	742 ,34 42, ,,, ,,, 32. 35. 3,, ,23	452 342
,,, ,,, ,,,	2096	O22	452 342 ... ,53 ,,, ,,, 3,, 3,, ,32	225 223

For the meaning of the symbols see the keys on previous C9 diagrams

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:

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