U.S. DEPARTMENT OF COMMERCE
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ENVIRONMENTAL DATA SERVICE
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Solar - Geophysical Data

NO. 394 JUNE 1977

Part I (Prompt Reports)

DATA FOR
MAY 1977
APRIL 1977

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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SOLAR - GEOPHYSICAL DATA

No. 394

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

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MAY 1977 DATA

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ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

MAY 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

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121	01	30	13	76	08	S19E17	0	0	0		01	S19E17	Q	SOLQUIET MAGALERT 01/06
122	02	01	23	76	08	S19E04 N35E70	1 0	0 0	0 0		02	S19E04 N35E70	Q Q	SOLQUIET MAGALERT 02/06
123	03	02	20	77	42	N33E59	0	0	0		03	N33E59	Q	SOLQUIET MAGALERT 03/06
124	04	03	40	81	20	N31E49 S26W18	2 0	1 0	0 0		04	N31E49 S26W18	E Q	SOLQUIET MAGALERT 04/06
125	05	04	22	81	11	N30E34	3	0	0		05	N30E34	E	SOLQUIET MAGALERT 05
126	06	05	22	78	10	N31E18 S22W46	0 0	0 0	0 0		06	N31E18 S22W46	Q Q	SOLQUIET MAGQUIET
127	07	06	17	77	09	N31E07	2	0	0		07	N31E07	Q	SOLQUIET MAGQUIET
128	08	07	12	77	07	N31W07	3	0	0		08	N31W07	Q	SOLQUIET MAGQUIET
129	09	08	25	76	04	N31W19 S24E44	3 0	0 0	0 0		09	N31W19 S24E44	Q Q	SOLQUIET MAGQUIET
130	10	09	25	82	06	N31W26 S20E82	0 0	0 0	0 0		10	N31W26 S20E82	Q Q	SOLQUIET MAGQUIET
131	11	10	36	79	09	N31W45 S18E66 N20W42	0 0 0	0 0 0	0 0 0		11	N31W45 S18E66 N20W42	Q Q Q	SOLQUIET MAGQUIET
132	12	11	49	79	13	N30W58 N19W54 S22E04 S20E49	0 0 0 0	0 0 0 0	0 0 0 0		12	N30W58 N19W54 S22E04 S20E49	Q Q Q Q	SOLQUIET MAGQUIET
133	13	12	47	78	17	N32W71 N21W66 S23W07 S20E37	0 0 0 0	0 0 0 0	0 0 0 0		13	N32W71 N21W66 S23W07 S20E37	Q Q Q Q	SOLQUIET MAGQUIET
134	14	13	35	80	05	S23W19 S20E24 N30E24	0 0 0	0 0 0	0 0 0		14	S23W19 S20E24 N30E24	Q Q Q	SOLQUIET MAGQUIET
135	15	14	38	83	07	S21E11 S22E25 N30E10 S23W32	1 0 0 0	0 0 0 0	0 0 0 0		15	S21E11 S22E25 N30E10 S23W32	Q Q Q Q	SOLQUIET MAGALERT
136	16	15	38	83	12	S19W02 N32W02 S22E19	0 0 0	0 0 0	0 0 0		16	S19W02 N32W02 S22E19	Q Q Q	SOLQUIET MAGNIL
137	17	16	31	83	16	S19W11 S22W02	0 0	0 0	0 0		17	S19W11 S22W02	Q Q	SOLQUIET MAGQUIET
138	18	17	15	82	15	S19W24	0	0	0		18	S19W24	Q	SOLQUIET MAGQUIET
139	19	18	18	81	11	S20W40	0	0	0		19	S20W40	Q	SOLQUIET MAGQUIET
140	20	19	11	80	05	S23W59	1	0	0		20	S23W59	Q	SOLQUIET MAGQUIET
141	21	20	00	79	09	-	-	-	-		21	SPOTNIL		SOLQUIET MAGQUIET
142	22	21	33	81	05	N21W15 S25W31 N36W61	0 0 0	0 0 0	0 0 0		22	N21W15 S25W31 N36W61	Q Q Q	SOLQUIET MAGQUIET
143	23	22	12	82	08	N35W73	0	0	0		23	N35W73	Q	SOLQUIET MAGQUIET
144	24	23	00	80	08	-	-	-	-		24	SPOTNIL		SOLQUIET MAGQUIET
145	25	24	11	77	08	S19E22	0	0	0		25	S19E22	Q	SOLQUIET MAGQUIET
146	26	25	12	75	07	N19E65	1	0	0		26	N19E65	Q	SOLQUIET MAGQUIET
147	27	26	11	75	03	N19E52	0	0	0		27	N19E52	Q	SOLQUIET MAGQUIET
148	28	27	14	76	03	S22E19	0	0	0		28	S22E19	Q	SOLQUIET MAGALERT 29/31
149	29	28	25	77	07	S21E06 N20W01	0 0	0 0	0 0		29	S21E06 N20W01	Q Q	SOLQUIET MAGALERT 29/30
150	30	29	47	80	03	S22W05 N21W15 N22E70	0 1 0	0 0 0	0 0 0		30	S22W05 N21W15 N22E70	Q Q Q	SOLQUIET MAGALERT 30/01
151	31	30	39	88	05	N20W28 N22E56	1 0	0 0	0 0		31	N20W28 N22E56	Q Q	SOLQUIET MAGALERT MINOR 31/01
152	01	31	49	89	07	N17W40 N18E42	0 0	0 0	0 0		01	N17W40 N18E42	Q Q	SOLQUIET MAGALERT MINOR 01

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

RELATIVE SUNSPOT NUMBERS

ZURICH, R_z

	1976 FINAL							1977 PROVISIONAL				
DAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	0	9	10	17	30	0	0	20	15	0	7	15
2	0	8	16	20	28	0	0	32	19	8	11	14
3	0	10	17	12	30	0	0	25	19	8	10	22
4	0	8	13	11	30	0	0	22	16	8	7	23
5	0	8	16	17	25	0	0	21	18	8	7	16
6	0	10	14	10	24	0	0	13	7	9	8	16
7	0	7	24	9	30	0	7	0	7	8	7	12
8	10	0	27	9	7	0	19	0	26	20	0	19
9	10	0	31	18	14	0	22	0	21	20	0	25
10	7	0	24	22	0	0	19	0	23	19	0	29
11	7	0	23	24	0	0	22	14	25	19	8	34
12	8	0	28	20	13	0	16	19	48	9	12	35
13	8	0	26	18	17	0	12	23	68	8	16	26
14	15	0	15	10	23	0	32	22	61	7	22	33
15	18	0	8	16	25	7	34	20	45	0	34	26
16	15	0	15	14	28	7	36	18	49	0	33	21
17	18	0	19	8	31	14	34	30	44	0	32	20
18	24	0	22	8	24	20	24	26	37	0	29	12
19	23	0	25	7	20	13	15	7	25	0	22	0
20	20	0	20	0	19	12	8	0	10	0	12	11
21	30	0	17	0	15	8	9	15	9	0	20	14
22	31	0	8	0	22	13	9	24	9	10	19	7
23	22	0	9	7	28	11	9	34	9	8	18	7
24	25	0	15	7	30	10	17	35	8	7	8	7
25	16	0	10	16	30	9	22	17	8	14	0	0
26	17	0	14	17	29	9	25	8	8	8	14	7
27	9	0	7	18	24	8	16	0	0	9	8	13
28	11	0	8	18	19	8	17	13	0	16	16	16
29	11	0	9	23	15	8	19	11		8	9	20
30	10	0	10	30	8	0	19	8		8	8	30
31		0	9		0		12	10		8		40
MEAN	12.2	1.9	16.4	13.5	20.6	5.2	15.3	15.7	22.6	8.0	13.2	18.4

1976 yearly mean = 12.6

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

	1976							1977				
DAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	68.4	69.3	75.9	76.3	74.6	70.9	70.2	73.8	81.7*	72.6	74.8	77.2
2	67.9	69.1	77.8	75.3	73.9	69.1	71.6	76.5	82.1	75.4	76.3	78.5
3	68.1	69.5	82.3	75.7	73.8	69.8	71.2	76.0	80.9	74.8	76.6	81.9
4	68.4	68.6	82.3	75.9	73.1	69.9	71.3	75.5	78.7	76.9	75.8	81.4*
5	68.7	69.5	84.2	75.4	74.8	70.9	70.1	74.0	77.8	77.6	75.5	79.6
6	69.3	69.6	84.3	73.1	74.7	69.7	70.1	72.4	75.2	77.6	76.1	78.5
7	69.0	69.5	83.7	73.0	74.5	69.5	69.7	71.4	74.6	77.2	75.5*	77.1*
8	70.7	69.7	82.0	72.9	74.6	69.3	70.8	69.6	78.6	81.6	74.3	77.9
9	70.1	69.7	82.8	73.2	74.8	70.7	74.3	68.4	83.1	80.3	74.8	83.6
10	71.0	70.1	82.8	75.8	74.9	69.4	76.8	68.8	83.5	80.5	76.5	80.8
11	71.4	70.2	80.4	75.7	73.7	70.5	78.3	71.2	84.6	78.9	79.2	80.8
12	71.7	69.8	80.6	75.7	73.3	70.8	78.6	74.9	86.9*	78.6	80.2	79.7
13	72.0	69.8	78.7	74.3	72.6	69.4	78.1	77.5	88.5*	77.9	82.7	81.5
14	73.7	70.7	73.4	74.7	74.4	69.2	81.0	74.5	85.2	77.2	83.4	84.8
15	74.3	71.4	72.8	73.9	75.5	71.1	79.8	75.6	84.4	74.8	86.8	85.0
16	77.1	69.8	72.9	75.8	77.0	71.1	77.8	77.5	85.7	74.1	83.7	85.1
17	77.1	69.4	77.8	76.5	78.0	72.6	75.5	76.1	89.6*	74.1	83.6	84.1
18	77.9	70.6	78.2	74.3	77.3	75.6	73.8	75.4	86.5	73.9	80.8	82.9
19	76.9	70.2	76.1	73.3	76.6*	74.6*	72.9	76.9	82.8	74.6	79.8*	82.1
20	76.9	69.4	74.5	72.2	75.8	72.9	71.7	75.2	81.1	72.3	80.4*	81.3
21	77.7	70.1	73.2	70.9	73.5	73.2	71.8	74.0	78.6	72.8	80.8	81.4
22	76.9	70.1	72.3	70.5	75.4	73.3	73.4	76.8	75.9	74.6	80.1	82.9
23	76.5	68.7	70.8	72.0	80.1	72.5	73.7	78.7	75.9	74.7	77.5	82.4
24	75.2	69.4	70.9	72.5	80.1	72.9	74.2	77.4	74.2	74.8	76.5	79.2
25	74.9	68.8	70.6	73.4	84.7	72.7	75.6	74.9	74.3	74.0	76.4	77.4
26	74.3	68.5	70.1	72.8	80.4	72.1	75.6	76.0	72.3	75.1	75.4	76.8
27	72.8	69.4	71.5	73.3	77.4	73.7	75.2	75.3	72.0	74.5	74.9	77.9
28	71.8	69.4	72.8	73.6	73.8	71.7	74.5	77.1	72.6	74.4	74.2	79.1
29	71.3	69.4	73.3	71.9	72.1	69.7	74.8	76.1		75.4	74.8	81.7
30	70.3	70.7	73.0	72.6	72.1	69.7	75.1	76.3		74.6	76.6	89.9
31		72.3	73.8		70.4		76.4	79.6		74.1		92.0
MEAN	72.8	69.8	76.6	73.9	75.4	71.3	74.3	74.9	80.3	75.8	78.2	81.4

* adjusted for burst

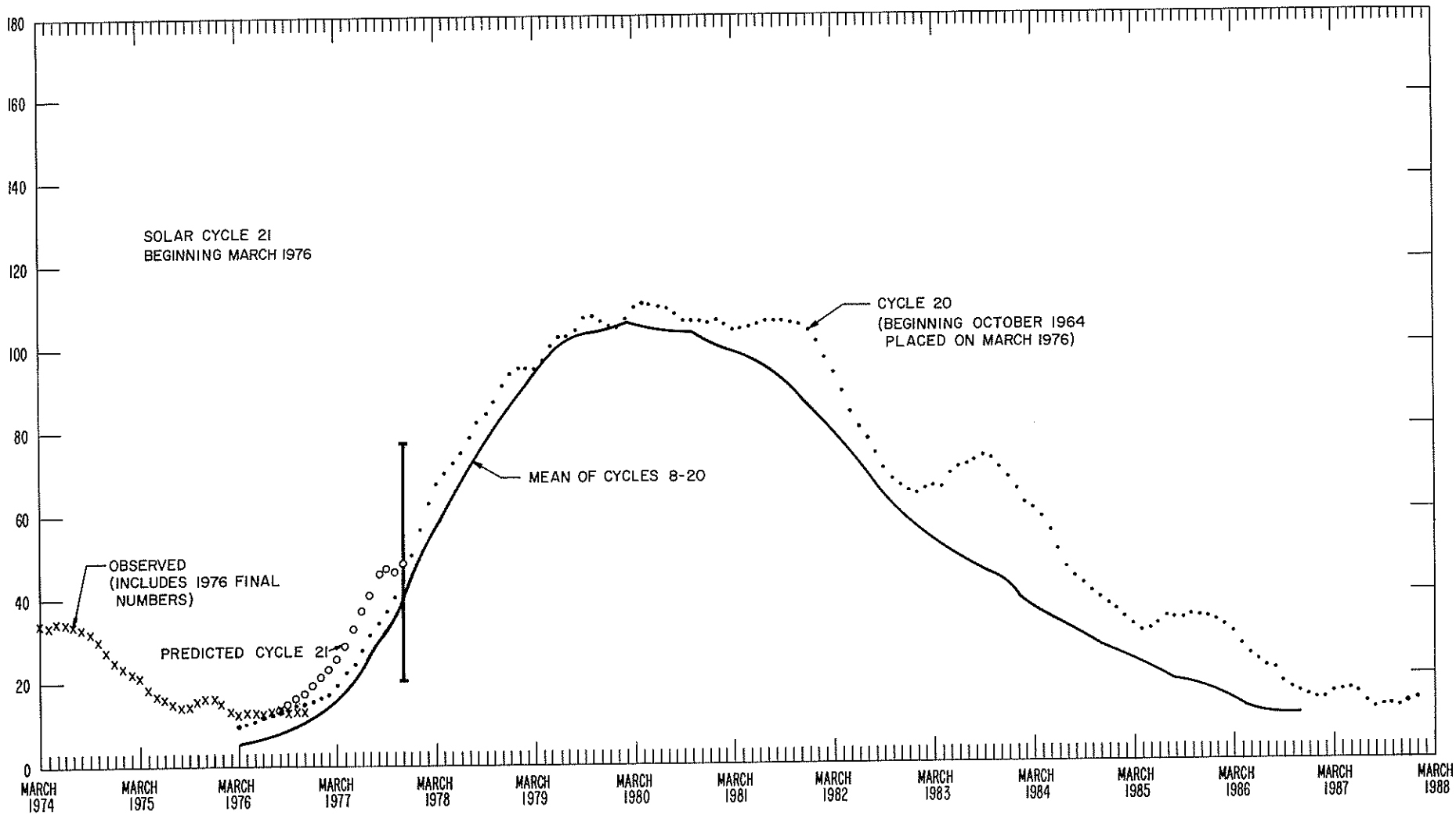
DAILY SOLAR INDICES

MAY 1977

MAY 1977	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	121	16	15	14	76.0	531	274	117	77.2	75.2	51.0	35.6	19.5	8.0
2	122	17	14	11	77.3	517		114	78.5	74.9	52.9	35.2	18.6	8.1
3	123	18	22	21	80.5	530	280	121	81.9	82.7	52.3	35.7	18.9	8.3
4	124	19	23	21	80.0*	521	278	121	81.4*	83.0	53.2	33.5	22.2	7.5
5	125	20	16	19	78.2	525	272	117	79.6	79.1	53.5	34.6	18.2	8.0
6	126	21	16	13	77.1	518	268	116	78.5	76.0	53.9	35.1	18.8	8.0
7	127	22	12	11	75.7*	532	272	116	77.1*	77.5	55.4	34.3	19.2	8.3
8	128	23	19	13	76.4	530	278	120	77.9	77.6	53.9	35.8	20.4	8.3
9	129	24	25	19	82.0	523			83.6		55.0	38.7	23.1	8.7
10	130	25	29	28	79.2				80.8		54.9	35.9	20.9	8.5
11	131	26	34	35	79.2	520	271	119	80.8	81.6	52.9	33.9	19.6	8.3
12	132	27	35	41	78.1	519	272	119	79.7	78.0	51.5	34.2	19.6	8.3
13	133	1	26	28	79.8	529	273	118	81.5	80.6	51.7	34.4	17.0	8.0
14	134	2	33	27	83.0	523	281	122	84.8	84.4	54.2	37.9	22.3	8.3
15	135	3	26	19	83.2	534	286	122	85.0	83.0	54.0	38.1	23.1	8.3
16	136	4	21	23	83.2	526	280	123	85.1	84.2	55.2	37.2	21.2	8.3
17	137	5	20	16	82.2		275	122	84.1	81.0	53.2	37.5	20.2	8.3
18	138	6	12	6	81.0		283	120	82.9	81.6	54.6	35.0	23.3	12.9
19	139	7	0	0	80.2	526	278	119	82.1	81.6	55.6	36.9	22.6	8.9
20	140	8	11	9	79.4		280	119	81.3	79.2	55.6	37.7	22.3	8.6
21	141	9	14	11	79.4			118	81.4	79.0	53.1	37.8	21.5	8.6
22	142	10	7	2	80.9			120	82.9	76.8	52.3	39.8	22.0	9.5
23	143	11	7	3	80.3		275	120	82.4	80.8	52.1	37.0	21.6	8.4
24	144	12	7	1	77.2		278	117	79.2	77.3	48.0	36.8	20.5	8.4
25	145	13	0	2	75.4		275	114	77.4	75.2	47.6	36.2	21.4	8.4
26	146	14	7	5	74.8		280	115	76.8	74.8	46.0	36.9	22.0	8.4
27	147	15	13	5	75.9		275	116	77.9	77.5	48.8	38.1	21.4	8.0
28	148	16	16	9	77.0		274	118	79.1	78.4	51.1	37.7	21.4	8.4
29	149	17	20	17	79.5		278	119	81.7	82.2	52.6	38.5	21.4	8.8
30	150	18	30	29	87.5		282	127	89.9	88.2	56.3	39.7	24.8	8.7
31	151	19	40	37	89.5		280	126	92.0	88.8	56.7	38.4	25.1	13.1
MEAN			18.4	16.0	79.6	526	277	119	81.4	80.0	52.9	36.6	21.1	8.7

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill data are due to equipment problems.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	13.9	14.1	13.3	13.3	15.0 (1)
1977	16.8 (3)	18.6 (4)	21.3 (6)	23.7 (8)	27.0 (10)	30.5 (12)	33.9 (15)	37.3 (18)	40.7 (21)	44.6 (25)	49.0 (28)	53.5 (31)
1978	58.0 (35)	63.1 (38)	67.8 (41)	71.4 (45)	74.6 (48)	77.7 (51)	80.9 (52)	85.0 (52)	89.9 (54)	94.0 (56)	97.8 (57)	101.4 (59)
1979	104.4 (59)	106.8 (61)	109.7 (64)	113.2 (67)	115.9 (68)	117.5 (69)	118.3 (70)	118.6 (71)	118.4 (71)	117.9 (70)	117.7 (68)	117.9 (66)
1980	118.4 (66)	118.1 (66)	116.9 (64)	115.6 (62)	114.4 (60)	113.8 (59)	113.6 (59)	113.0 (59)	112.9 (59)	113.3 (60)	112.7 (60)	110.9 (58)
1981	108.8 (56)	107.7 (55)	106.7 (52)	106.3 (50)	106.1 (49)	105.7 (47)	104.9 (47)	103.3 (44)	101.0 (42)	98.2 (40)	95.5 (39)	93.1 (39)
1982	91.2 (37)	89.2 (35)	86.6 (34)	83.1 (33)	79.3 (31)	76.4 (29)	72.9 (25)	70.2 (24)	67.2 (23)	64.1 (22)	62.1 (21)	60.8 (21)
1983	59.4 (21)	57.6 (21)	55.6 (22)	54.4 (22)	53.6 (23)	52.4 (25)	51.3 (26)	50.3 (27)	49.6 (27)	48.6 (27)	47.0 (27)	44.7 (26)
1984	42.0 (27)	39.9 (28)	38.8 (29)	37.5 (29)	35.8 (30)	34.3 (29)	33.1 (27)	32.1 (26)	30.9 (26)	29.7 (25)	28.5 (25)	27.5 (24)
1985	26.9 (25)	26.1 (24)	25.0 (23)	24.0 (22)	23.2 (21)	22.6 (21)	21.8 (21)	20.7 (22)	20.1 (22)	20.1 (22)	19.9 (22)	19.2 (21)
1986	18.2 (20)	17.2 (19)	16.2 (18)	15.1 (17)	14.3 (16)	13.7 (15)	13.3 (14)	13.0 (13)	12.6 (11)	12.3 (10)	12.2 (10)	12.4 (10)
1987	12.9 (11)	13.5 (12)	14.2 (13)	15.0 (14)	15.8 (15)							

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1976.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 20. Tests indicate that earlier cycles are from a different statistical population.

Hα SOLAR FLARES

MAY 1977

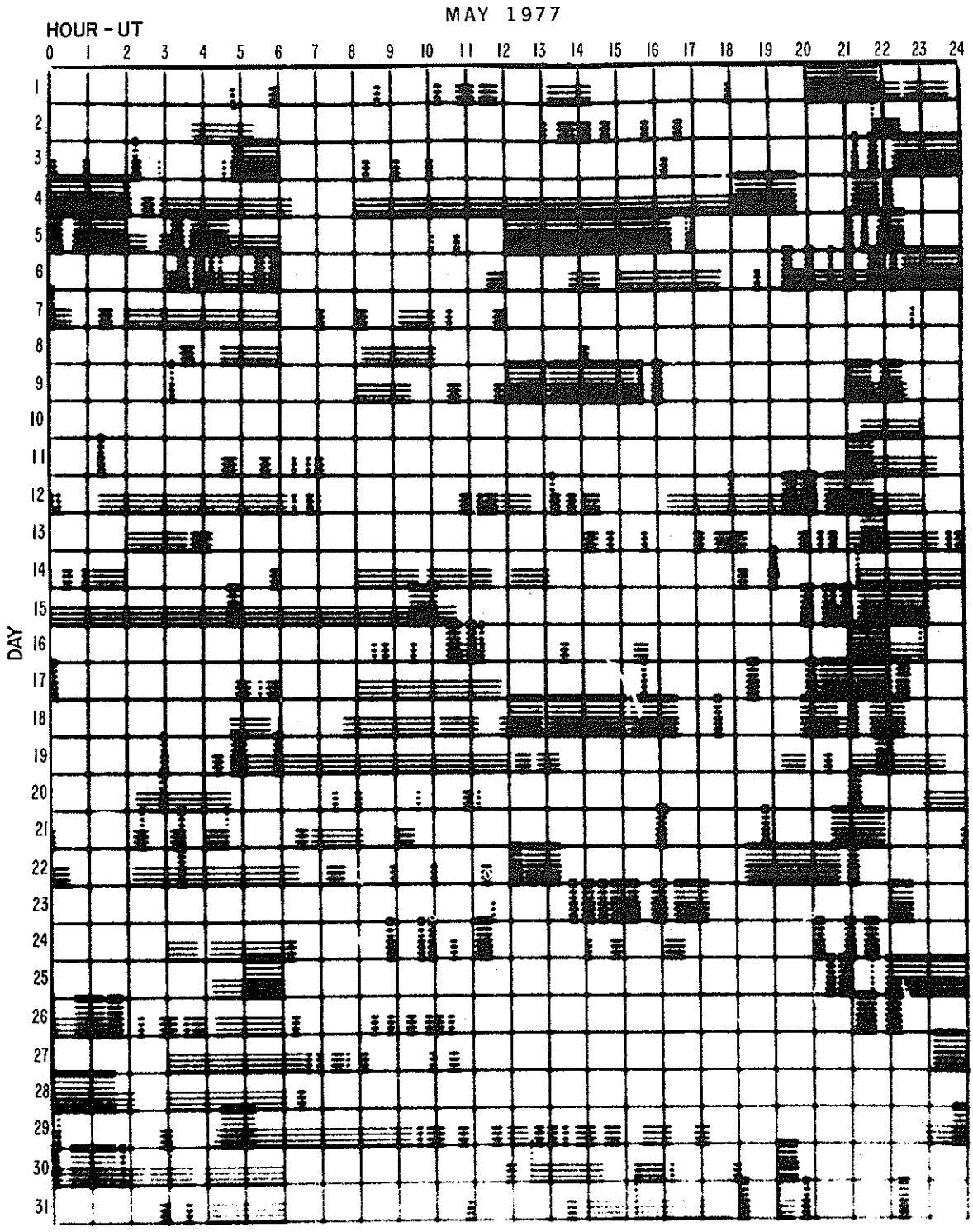
OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE MAY	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA MHL of Disk	CORR. AREA Sq. Deg.	
MITK	03	0140	0146	0201	N34	E64	.954		7.9	21	SF		C	0146	60		D
BUCA	03	0620		0653	N33	E60	.935	14749	7.8	33	1N		C	0627	107	3.0	
CATA	03	0705E	0710	0710D	N31	E58	.919		7.6	5D	SB	2		0710	56	1.3	
BUCA	03	0708		0735	N31	E60	.930		7.8	27	SN		C	0709	64	1.7	D
UPIC	03	0925E	0929U	0931	N34	E61	.942		8.0	6D	SF		P	0929	20	27.0	
CATA	03	0925	0925	1000D	N32	E57	.917		7.7	35D	SN	2		0925	56	1.3	
UPIC	03	0942	0942	0952	N35	E58	.930	14749	7.8	10	1F		P	0942	122	57.0	
MONT	03	1048	1058	1124	N33	E58	.925		7.8	36	SN		C	1058	110		
MCMA	03	1428	1450	1525	N32	E55	.906	14749	7.7	57	SN		C	1450	30	.5	E
CATA	03	1430E	1430	1440D	N34	E56	.917	14749	7.8	10D	1N	2		1430	84	2.0	
MCMA	03	1756	1810	1835	N32	E54	.900	14749	7.8	39	SB		C	1810	60	1.1	EH
RAMY	04	1120E	1125	1138	N34	E45	.854		7.8	18D	SN	3	C		178		FDE
RAMY	04	1640E	1641U	1652	N33	E42	.829		7.8	12D	SF	3	C		128		F
RAMY	04	1725E	1728U	1741D	N33	E42	.829		7.9	16D	SF	3	C		96		FDE
BUCA	06	0630		0717	N35	E24	.732	14749	8.1	47	1N		C	0637	214	3.1	
MANI	06	0633E	0640	0655	N33	E20	.690		7.8	22D	SN	2		0640	80	1.1	F
BUCA	06	0740		0805	N34	E23	.716		8.0	25	SN		C	0744	107	1.5	E
RAMY	06	2041E	2042	2049	N31	E 5	.610		7.2	8D	SF	2	C		95		DE
MANI	07	0249E	0251	0259	N31	E02	.605		7.3	10D	SF	2		0251	40	.5	
MCMA	07	1654	1655	1712	N36	E04	.674	14749	8.0	18	SN		C	1655	70	.7	E
MANI	07	2324E	2326	2340	N31	W08	.615		7.4	16D	SF	2		2326	60	.7	F
MITK	07	2348	2353	2402	N32	W10	.634		7.2	14	SN		C	2353	110	1.4	E
MANI	07	2350	2352	2359	N31	W31	.738		5.7	9	SF	2		2352	50	.6	FH
MONT	09	0931E	0931	1003D	S24	E90	.999		16.1	32D	SF		C	0931	20		
MCMA	09	1048E		1110	S24	E42	.696	14768	12.6	22D	SN		P	1053	35	.5	DH
ATHN	09	1053E	1054	1058	S25	E42	.700		12.6	5D	SF		1		33	80.0	
MCMA	09	1105	1112	1140	N32	W26	.712	14749	7.5	35	SN		C	1112	20	.3	DH
CATA	12	1525	1525	1540	S25	E48	.763		16.2	15	SF	2		1525	56	.9	
MCMA	16	1717	1721	1740	S18	W09	.263	14771	16.0	23	SF		C	1721	20	.2	EH
MITK	19	0019	0027	0059	S19	W39	.648		16.1	40	SB		C	0027	140	1.9	E
MCMA	19	1415		1434	S18	W48	.749	14771	16.0	19	SN		C	1427	25	.4	D
RAMY	19	1424E	1426U	1429	S18	W49	.760		15.9	5D	SF	3	C		48		
MONT	20	1034	1037	1044	S27	W11	.410		19.6	10	SF		C	1037	20		G
CATA	28	0615	0615	0620D	S21	E17	.396		29.5	5D	SF	2		0615	28	.3	
PALE	29	2023	2026	2035	N20	E74	.973		5.4	12	SF	3	C		25		F R
CATA	30	1040	1045	1100D	N17	W24	.528		28.6	20D	SB	2		1045	28	.3	
MONT	30	1040	1051	1104	N19	W23	.537		28.7	24	SN		C	1051	80		E
MCMA	30	1222E		1230D	N18	W25	.548	14785	28.6	8D	SF		P	1228	30	.4	D
WEND	30	1232		1242	N20	W26	.577		28.6	10	SN						
RAMY	30	1420E	1421U	1426D	N20	W25	.567		28.7	6D	SF	3	C		32		FDE
MCMA	30	1426E		1440	N18	W26	.559	14785	28.7	14D	SN		P	1426	25	.3	D
MCMA	30	1609		1622	N21	W23	.558	14785	28.9	13	SB		P	1609	25	.3	DH
MCMA	30	1654	1657	1830D	N19	W26	.568	14785	28.8	96D	SN		C	1657	50	.6	E
MCMA	30	1853		1859D	N20	E62	.910	14794	5.4	6D	SF		C	1858	15	.2	D
MCMA	31	1104	1111	1128	N22	W34	.673	14785	28.9	24	SN		C	1111	50	.7	EH
CATA	31	1105E	1115	1140D	N21	W36	.687		28.8	35D	SB	2		1115	56	.7	
CATA	31	1125	1130	1140D	N20	E52	.834		5.4	15D	SN	2		1130	28	.5	
MCMA	31	1128	1130	1145	N20	E54	.851	14794	5.5	17	SN		C	1130	25	.5	D

"Remarks":

A = Eruptive prominence whose base is less than 90° 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 a 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 calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα 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



Observatories included in total patrol:

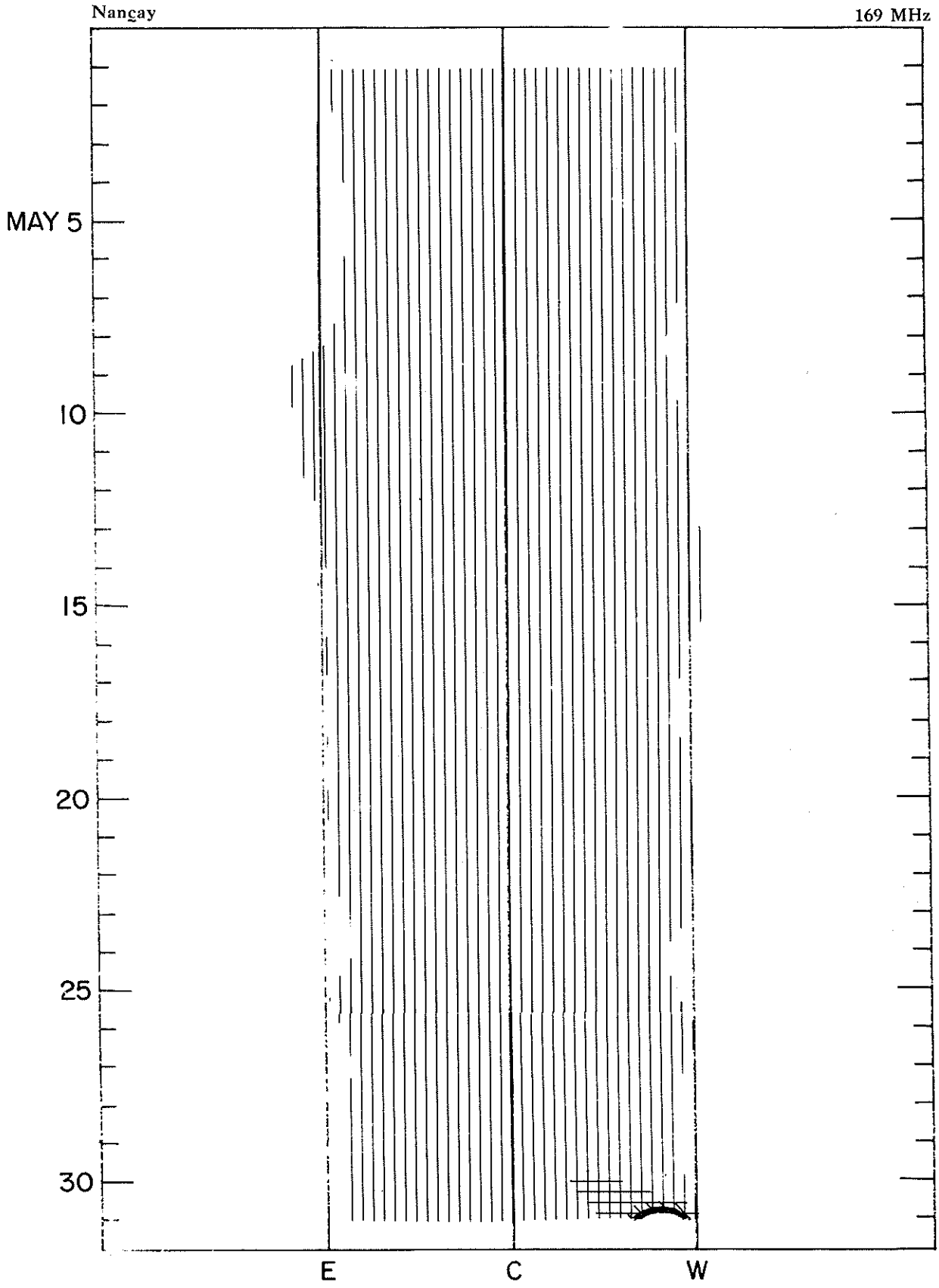
Athenes	Herstmonceux	Manila	Monte Mario	Ramey	Upice
Bucharest	Istanboul	McMath-Hulbert	Palehua	Tehran	Wendelstein
Catania	Kodaikanal	Mitaka			

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

12
May 77

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

MAY 1977

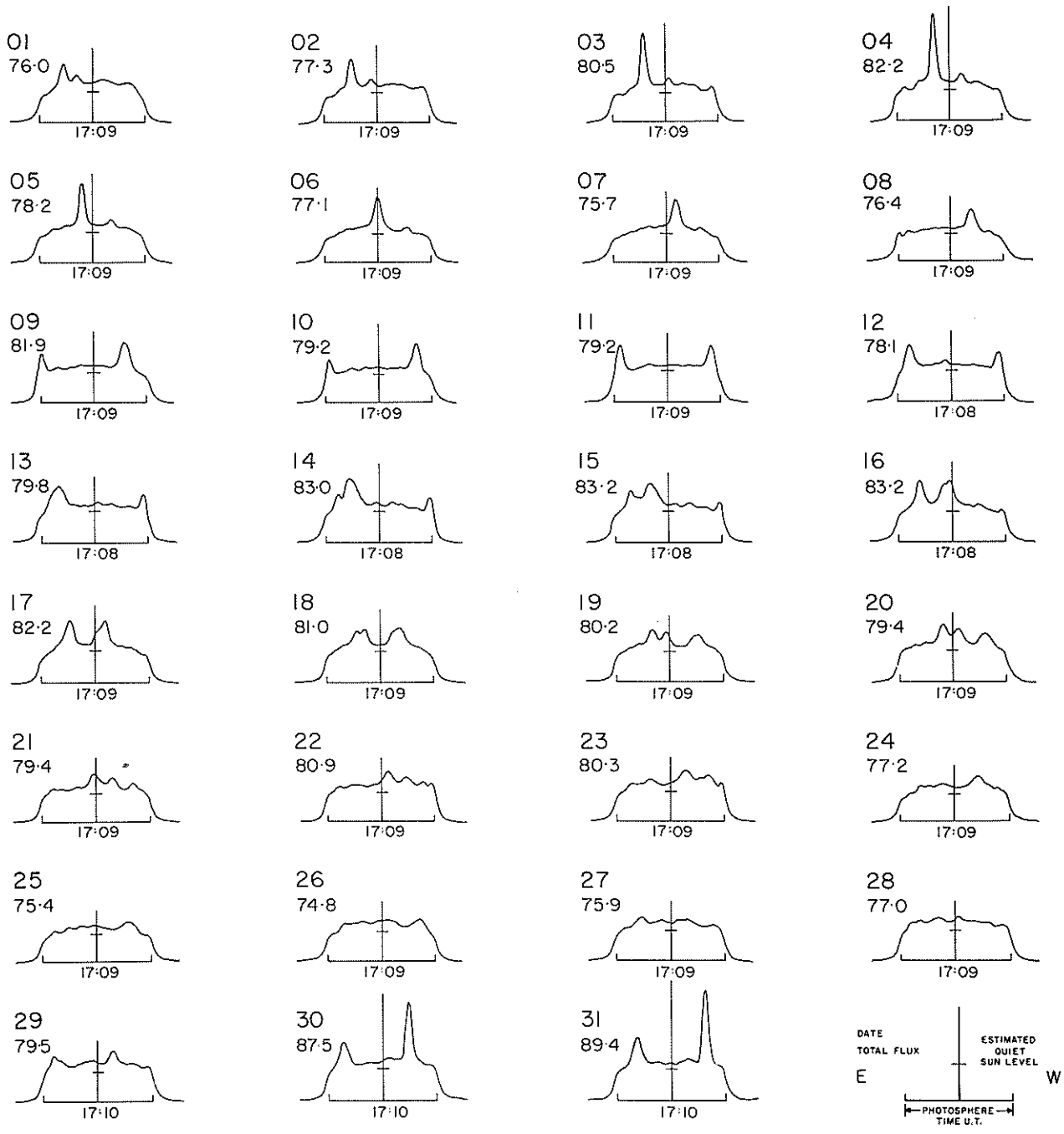


EAST-WEST SOLAR SCANS

MAY 1977

ALGONQUIN RADIO OBSERVATORY
CANADA

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution

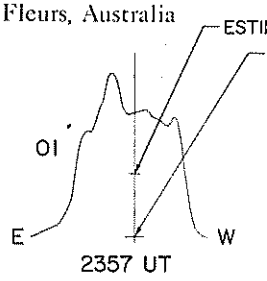


EAST-WEST SOLAR SCANS

MAY 1977

Fleurs, Australia

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



02
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03
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04
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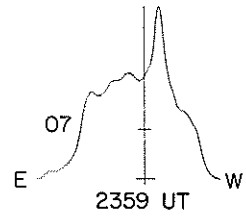

05
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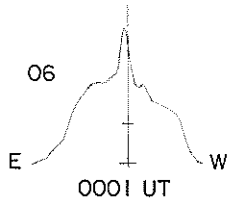

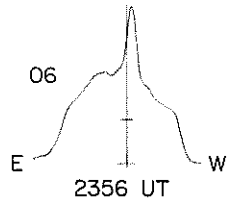

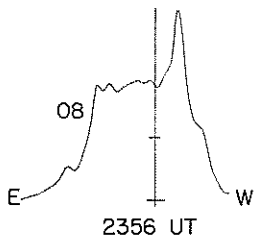

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11
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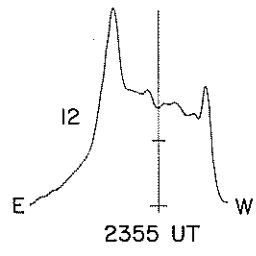

13
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14
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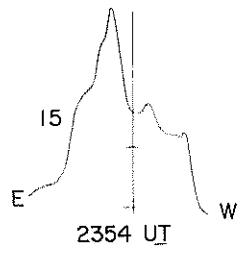

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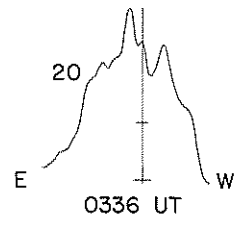

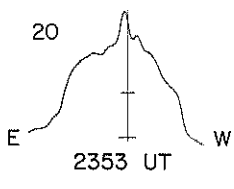

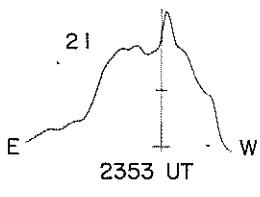

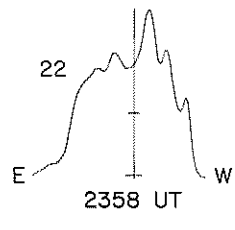

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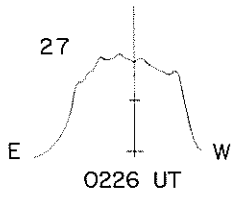

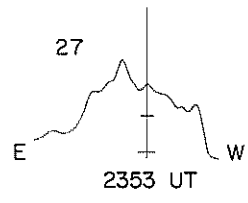

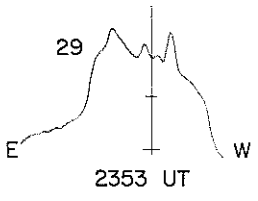

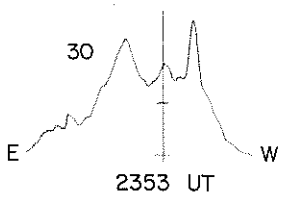

31
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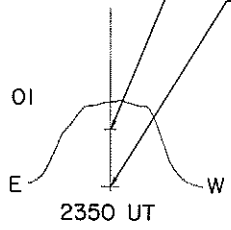
EAST-WEST SOLAR SCANS

MAY 1977

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL
COLD SKY LEVEL

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution

01


2350 UT

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03
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04
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05
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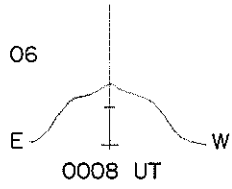
06


0008 UT

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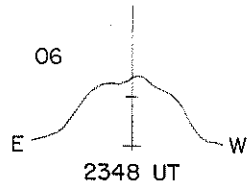

2348 UT

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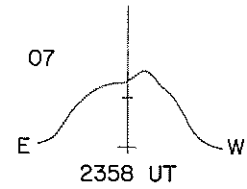

2358 UT

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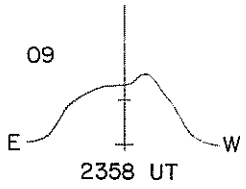

2358 UT

10
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11
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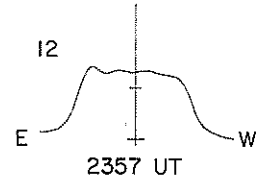

2357 UT

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14
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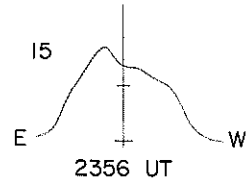

2356 UT

16
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17
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18
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19
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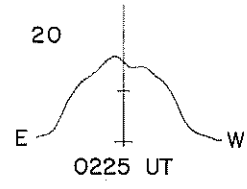
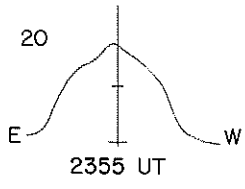
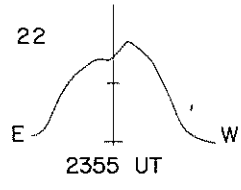


0225 UT

20


2355 UT

22


2355 UT

23
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24
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25
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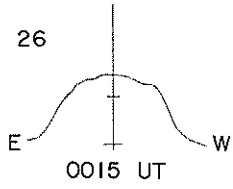
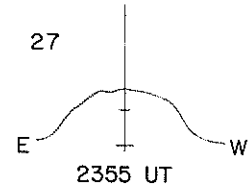
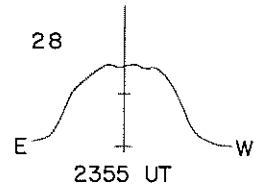
26


0015 UT

27


2355 UT

28


2355 UT

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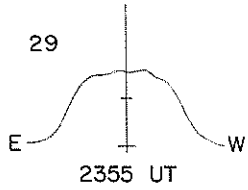

2355 UT

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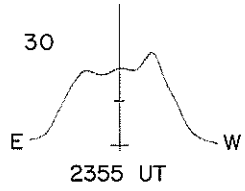


2355 UT

31
NO DATA

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1977

	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS	
				UT	UT	MINUTES	PEAK	MEAN			
3	2800	OTTA	40 F	1342	1343	2	2.8				
	2695	SGMR	20 GRF	1431.9	1452.9	83.1U	7	2.1U			1
	2800	OTTA	21 GRF	1445	1450	65	1.2	0.7			
	2800	OTTA	1 S	1448	1449	2	1.4	0.7			
	8800	SGMR	20 GRF	1449.1	1459.4	65.9U	6.4	1.9U			1
	2800	OTTA	21 GRF	1750	1815	45	1.2	0.6			
	2695	SGMR	20 GRF	1804.9	1812.5	25.1	5.5	1.7		SWF	2
	2800	OTTA	1 S	1805	1806.2	2.5	1.2	0.6			
	8800	SGMR	20 GRF	1805.1	1816.7	24.9	30.8	9.2		SWF	2
	2800	OTTA	1 S	1809.5	1812	5	1.8	1			
	2800	OTTA	20 GRF	1930	2100	160	2.6	1.4			
	2800	OTTA	27 RF	2218		80	1.6	1.2			
	2800	OTTA	24 R	2218	2223	5	1.6	0.8			
	2800	OTTA	24P R	2223		42	1.6				
	2695	PENT	26 FAL	2305	2338	33	-1.6	-0.8			
	2695	PENT	1 S	2345.5	2346	1	3.2	1.2			
4	2800	OTTA	20 GRF	1110	1116.2	35	1.8	0.8			
	2800	OTTA	27 RF	1233		137	1.2	1			
	2800	OTTA	24 R	1233	1305	32	1.2	0.9			
	2800	OTTA	24P R	1305		75	1.2				
	2800	OTTA	26 FAL	1420	1450	30	-1.2	-0.6			
	2800	OTTA	22 GRF	1530	1635	195	3	1.5			
	2800	OTTA	240 R	2015	2100	45	1.2	0.6			
	2800	OTTA	24P R	2100		240 D	1.2				
5	2800	OTTA	20 GRF	2057.8	2059	30	0.8	0.4			
	2800	OTTA	20 GRF	2150	2205	40	1.2	0.6			
6	2800	OTTA	21 GRF	1520	1523	12	1.2	0.6			
	2800	OTTA	40 F	1521	1522.5	2	2.2				
	2695	BOUL	23 GRF	1522	1523.5	1	4	1			
	2800	OTTA	8 S	2036.3	2036.3	0.1	4.4				
7	2800	OTTA	20 GRF	1650	1700	30	1.2	0.6			
	2695	PENT	1 S	2322	2322.3	2.5	8.4	4.2			
	2695	PENT	29 PBI	2324.5	2324.5	4.5	1.2	0.6			
9	2800	OTTA	240 R	1100	1210	70	4	2			
	2800	OTTA	26 FAL	1655	1705	10	-0.8	-0.4			
	2800	OTTA	26 FAL	1910	2000	50	-1.4	-0.7			
11	2800	OTTA	32 ABS	1825	1905	95	-1	-0.5			
12	2800	OTTA	1 S	1522	1522.5	2	1.6	0.8			
13	2695	BOUL	1 S	1758	1759.5	4	3	1			
14	2800	OTTA	20 GRF	1310	1330	50	1	0.5			
15	2695	PENT	240 R	2235	2250	15	1.2	0.6			
	2695	PENT	24P R	2250		160 D	1.2				
17	2800	OTTA	20 GRF	2204	2210	60	1.6	0.8			
19	2695	PENT	240AR	0013	0040	27	1.6	0.8			
	2695	BOUL	23 GRF	0015.5	0019.5	4.3	12	4			
	2695	PENT	21 GRF	0019	0021	21	2	1			
	2695	MANI	3	0021	0024	8.5	14.2	5.5			1
	2695	PENT	2 S/F	0022.2	0024	6	8.8	3			
	2695	PENT	24P R	0040		65 D	1.6				
20	2695	BOUL	2 SF	1748	1748.5	2.5	9	3			
	2695	BOUL	2 SF	1751.5	1753.5	2	7	2			
	2695	BOUL	2 SF	1804	1805	1	7	9			
	2695	BOUL	8 S	1830	1830.5	1.5	19	6			
	2695	BOUL	1 S	1833.5	1834	2	3	1			
22	2800	OTTA	20 GRF	1930	2000	70	1.2	0.6			
23	2695	BOUL	45 C	2046.5	2049.5	4	5	2			
	2695	BOUL	40 F	2107.5	2111	5	4	1			
24	2695	BOUL	40 F	1858	1901.5	6.5	6	2			
29	2695	PENT	240 R	2200	2255	55	1.8	0.9			
	2695	PENT	24P R	2255		160 D	1.8				
30	2800	OTTA	240AR	1038	1050	12	2.4	1.2			
	2800	OTTA	1 S	1044.5	1046.5	5.5	8.4	2			
	2695	SGMR	1 S	1045.2	1046.5	3.5	8	2.4			1
	2800	OTTA	24P R	1050		100	2.4				
	2800	OTTA	240 R	1225	1235	10	1.2	0.6			
	2800	OTTA	24P R	1235		85	1.2				

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1977

	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	2800	OTTA	21 GRF	1410	1425	60	2	1		
	2800	OTTA	1 S	1412	1413.5	3	1.4	0.7		
	2800	OTTA	2 S/F	1608.5	1608.8	2	1.6	1.2		
	2800	OTTA	27A RF	1735		230	2.4	2.2		
	2800	OTTA	24 R	1735	1755	20	2.4	1.2		
	2800	OTTA	24P R	1755		185	2.4			
	2800	OTTA	20 GRF	1900	1920	35	0.8	0.4		
	2800	OTTA	26 FAL	2100	2125	25	-1.4	-0.7		
	2800	OTTA	20 GRF	2139	2147	70	1.8	0.9		
31	2800	OTTA	27 RF	1100		205	1.4	1.2		
	2800	OTTA	24 R	1100	1105	5	1.4	0.7		
	2800	OTTA	24P R	1105	1340	155	1.4			
	2800	OTTA	26 FAL	1340	1425	45	-1.4	-0.7		
	2800	OTTA	20 GRF	1640	1655	50	1	0.5		
	2800	OTTA	32 ABS	1830	1900	130	-1.4	-0.7		

Observatories:

BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

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
32 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 +

SOLAR X-RAYS BY SATELLITE
SMS GOES
MAY 1977

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
5/ 1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.71	B	B	B	B	B	B	B	0.03
5/ 3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.03	B	B	B	B	B	B
5/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.02	B	B	B
5/ 9	B	B	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B
5/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	M	M	M	M	M	M	M	B
5/16	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B@	B	B	B	B	B	B	B	B
5/27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	M	B	B	B	B	B	B	B	B
5/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
MAY 1977

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
5/ 1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.07	B	B	B	B	B	B	B	0.02
5/ 3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.03	B	B	B	B	B	B
5/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/ 9	B	B	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B
5/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	M	M	M	M	M	M	M	B
5/16	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/19	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	M	B	B	B	B	B	B	B	B
5/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5/31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES-1

MAY 1977

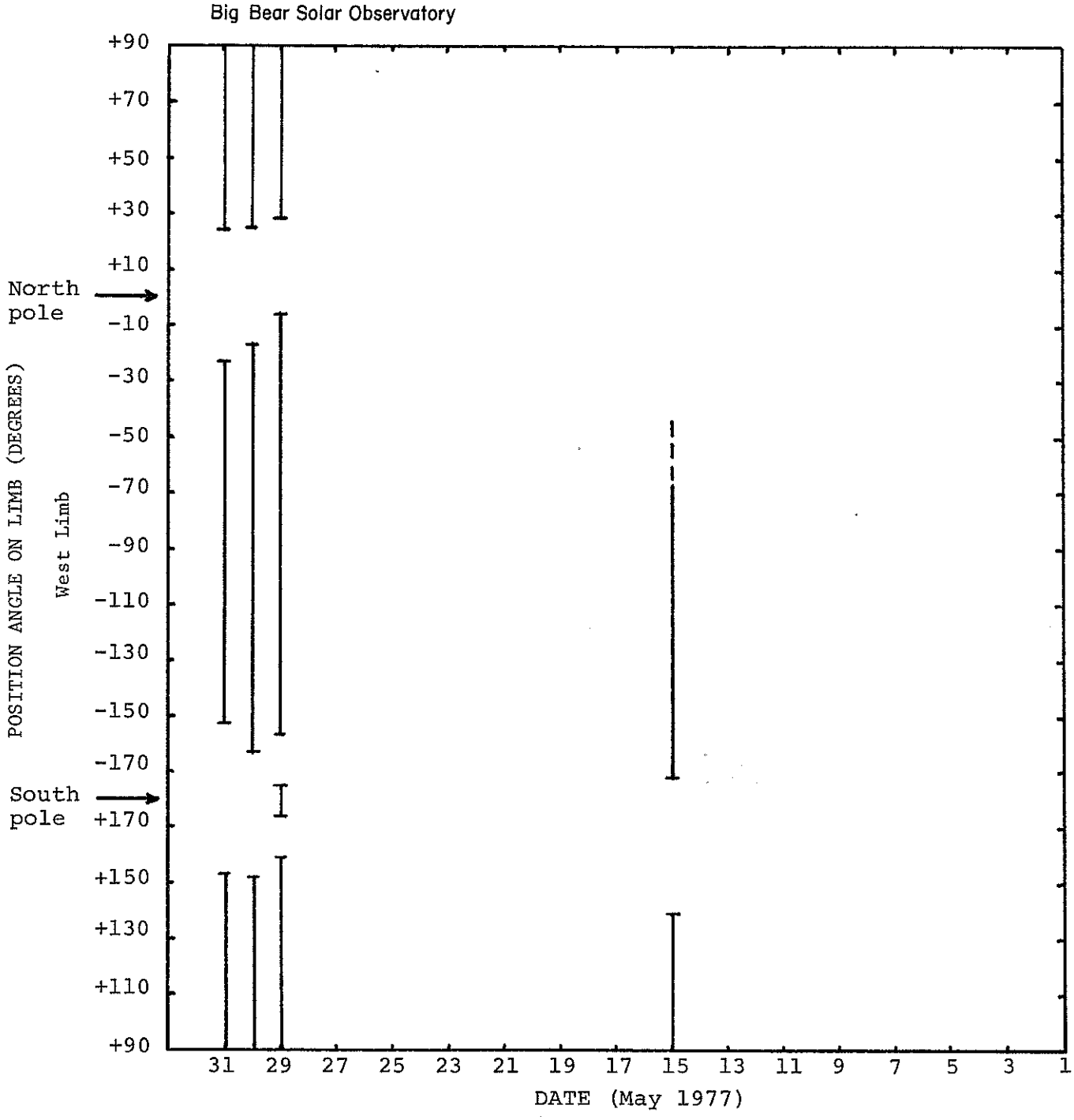
DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
3	1428	0.0E+00	1.6E-07	1452	5.4E-07	4.5E-06	1500	1.1E-07	2.2E-06
3	1802	4.7E-09	2.5E-07	1813	2.1E-06	1.2E-05	1819	4.2E-07	6.5E-06
3	2213	0.0E+00	1.4E-07	2227	1.9E-07	2.0E-06	2244	3.2E-08	1.0E-06
4	1103	0.0E+00	6.6E-08	1122	2.7E-07	2.8E-06	1129	4.2E-08	1.3E-06
4	1208	0.0E+00	8.7E-08	1215	2.4E-07	2.1E-06	1218	5.2E-08	9.2E-07
6	0630	6.0E-09	1.7E-07	0638	1.8E-07	2.0E-06	0646	4.1E-08	1.0E-06
30	1037	0.0E+00	1.1E-07	1045	1.9E-07	1.8E-06	1052	3.8E-08	8.9E-07
30	1410	3.0E-09	2.8E-07	1419	8.6E-08	1.2E-06	1433	2.1E-08	7.4E-07
30	1604	9.7E-10	2.3E-07	1610	8.6E-08	1.1E-06	1613	1.6E-08	6.1E-07
31	1101	0.0E+00	2.0E-07	1113	8.4E-08	1.3E-06	1118	1.4E-08	6.7E-07

Errata: The January - April 1977 X-ray event flux data appearing in SGD issues 390, 391, 392, and 393 Part I are 1000 times too large. A computer programming error printed the data in units of $Ergs/cm^2/s$ instead of $Watts/m^2/s$.

CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

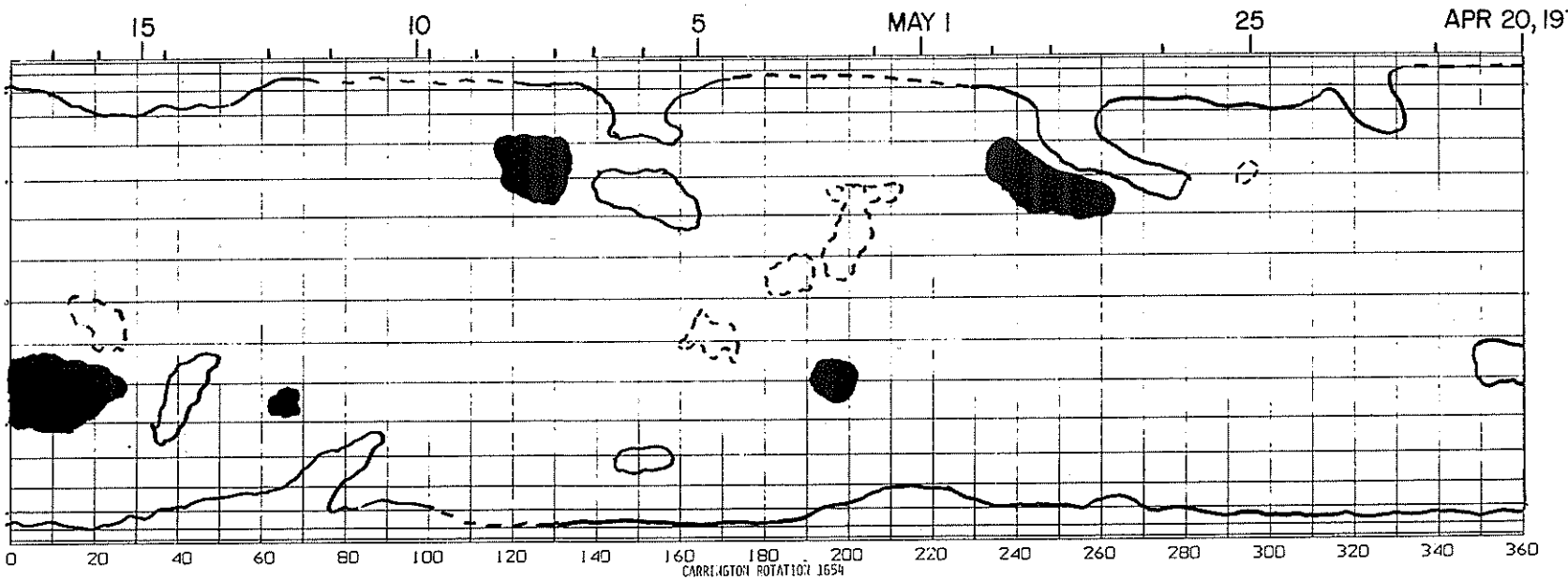
MAY 1977



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1654

KITT PEAK NATIONAL OBSERVATORY



PIONEER VI

MAY 1977

Date May 1977	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND AMES[1] U_{H^+} (km/sec)	AMES[1] TAU (days)	MIT U_{H^+} (km/sec)	MIT N_{H^+} (H^+/cc)	COSMIC RAY PROTONS[2] (particles/sec) 6-13 (Mev*)	13-175 (Mev**)	>175 (Mev)
3	1417-2200	1400	20.6	448.	2.15	451.	14.6	1.2	0.15	1.56
		1500		477.		445.	12.3	1.1	.11	1.55
		1600		448.		468.	11.9	1.2	.1	1.57
		1700		448.		428.	10.4	1.05	.13	1.55
		1800		448.		428.	9.2	1.1	.14	1.66
		1900		448.		431.	9.3	.98	.135	1.55
		2000		448.		428.	9.5	.87	.123	1.64
		2100		477.		440.	9.1	.98	.148	1.61
		2200		477.		430.	5.9	1.04	.123	1.61
5	1055-2130	1100		383.	2.22	372.	13.3	0.58	0.147	1.64
		1200		383.		366.	8.8	.57	.131	1.68
		1300		383.		374.	13.	.55	.163	1.46
		1400		383.		362.	12.	.59	.12	1.69
		1500		383.		360.	11.5	.62	.12	1.61
		1600		383.		372.	11.9	.55	.117	1.76
		1700		383.		372.	12.9	.61	.113	1.66
		1800		383.		390.	16.5	.57	.125	1.74
		1900		383.		373.	19.3	.58	.13	1.43
		2000		383.		375.	18.	.57	.145	1.43
		2100		383.		360.	18.	.44	.116	1.53
		2200		383.		360.	18.	--	--	--
15	0558-1000	0600	16.5	566.	1.77	566.	9.7	--	--	--
		0700		566.		570.	11.5	0.56	0.126	1.85
		0800		566.		570.	10.9	.53	.118	1.86
		0900		566.		549.	9.7	.55	.12	1.74
		1000		566.		612.	8.7	.56	.089	1.81
23	1316-2131	1300	13.	448.	1.82					
		1400		448.						
		1500		448.		402.	8.8	0.72	0.114	1.83
		1600		383.		389.	7.2	.69	.127	1.88
		1700		416.		397.	8.6	.7	.144	1.9
		1800		448.		392.	8.3	.67	.143	1.78
		1900		416.		385.	9.9	.64	.141	1.85
		2000		448.		408.	13.4	.52	.13	1.88
		2100		383.		415.	11.1	.65	.148	1.83
		2200		383.		383.	6.9	.73	.142	1.9

[1] Wolfe - NASA/ARC
[2] Simpson - University of Chicago

* Includes He 0.6-13 Mev/nucleons and electrons ∿0.5 Mev - see J. Retzler and J. A. Simpson, J. Geophys. Res., 74, 9, 2149-2160, 1969 for discussion of the electron response of Pioneer VII.

** Includes He >13 Mev/nucleons.
Q Used to indicate that a rate is at its quiescent level.

ESP = Earth-Sun Probe Angle.

† Peak velocity

Note: Data sampled hourly unless otherwise noted.

Note: This coverage was obtained as a result of PN-6 alignment with Helios.

PIONEER IX

MAY 1977

Date May 1977	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND[1]				IP B-FIELD[2]	IMF[3]		COSMIC RAY PROTONS[4] (particles/sec)	
				U_{H^+} (km/sec)	N_{H^+} (H^+/cc)	T_{H^+} (x10^{6}°K)	TAU (days)	400 Hz (mv)	|B| (γ)	φ (°)	>13.9 Mev	>40 Mev
6	1405-2200	1400	38.1	430.			3.64	0.152	9.1	171.	6.95	0.53
		1500		449.				.206	5.4	130.	6.82	.65
		1600		468.				.206	6.7	104.	6.94	.58
		1700		504.				.25	7.2	152.	6.95	.56
		1800		504.				.179	8.2	287.	6.88	.7
		1900		523.				.191	11.4	328.	6.91	.69
		2000		542.				.225	12.4	012.	6.98	.61
		2100		542.				.235	13.8	023.	6.86	.52
		2200		542.				.229	14.9	021.	6.9	.55
8	0941-2159	1000	37.	486.			3.73	0.117	5.3	333.	6.94	0.6
		1100		468.				.113	5.4	326.	6.92	.64
		1200		449.				.133	7.6	341.	6.91	.52
		1300		449.				.171	9.5	347.	6.91	.54
		1400		468.				.222	9.3	329.	6.84	.64
		1500		449.				.253	10.	337.	6.89	.67
		1600		430.				.329	9.	316.	6.88	.51
		1700		449.				.297	8.4	333.	6.83	.51
		1800		430.				.299	10.9	357.	6.81	.56
		1900		417.				.27	9.3	358.	6.85	.54
		2000		390.				.329	8.	314.	6.85	.59
		2100		449.				.242	9.1	020.	6.75	.72
		2200		449.				.206	8.5	346.	6.85	.66

[1] Wolfe - NASA/ARC
[2] Scarf - TRW, Inc.
[3] Sonett and Colburn - NASA/ARC
[4] Webber - Univ. of N.H.

* Peak velocity

Note: Data sampled hourly unless otherwise noted.

ESP = Earth-Sun Probe Angle.

Note: This coverage was obtained as a result of PN-9 alignment with Helios.

SOLAR WIND

Interplanetary Scintillations

MAY 1977

UCSD 74 MHZ SCINTILLATIONS

DAY	3C48		3C144		3C147		3C161		3C237		3C273		3C298		3C459	
	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR
1	422	7	374	3	376	19	504	15							313	28
2	659	27	328	13	467	46	548	6			535	10			323	36
3	492	18	335	9	431	39	537	36							386	1
4	419	7	319	6	463	1	444	23	323	27					418	42
5	545	52	416	1			714	212			408	11			499	57
6	652	4	347	2			687	25								
7	663	0			406	59	616	85							390	98
8	657	8	412	22	339	12										
9	645	18	399	8	481	98	393	1			404	46				
9							417	17								
10	550	9	543	50	375	25									337	36
11	495	13	344	3	418	7	473	41			343	3	362	67	401	20
12	572	3	349	8	369	38	568	12	398	55	431	6	411	18	443	74
13	596	7	340	15									257	5		
14	523	3	358	8			492	40			379	0	297	5	311	41
15	510	2	336	1	465	18	507	23					418	4	359	4
17							462	6								
18	647	27	287	0	618	58	463	78								
19	621	6	304	4	414	31	486	29								
20	492	6			497	63	489	56								
21	506	2	324	11			372	27					574	28	408	6
22	712	44	330	10			506	24			408	28				
23	770	7	429	2			542	56			480	1	364	6	528	147
24	780	22	415	41	493	13	557	84			346	32			485	71
25	749	15	366	4	393	18	464	11			428	38				
26	716	13	479	21	490	76	529	6								
27	578	12	481	20	457	12	573	20							360	50
28	532	63	597	*	468	17	459	*			366	49				
29	474	26	555	14	439	56	488	54			412	*				
30	439	5	520	0	482	91	586	68			275	5	400	30		
31	513	3	523	19	299	55	514	11	529	81	330	9	376	8	361	17

MAY	5				15				25			
	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON
3C48	19.	56.	0.40	34.	18.	43.	0.49	44.	18.	33.	0.59	43.
3C144	23.	-8.	0.62	-52.	22.	-9.	0.48	-61.	22.	-10.	0.33	-71.
3C147	22.	17.	0.74	-37.	21.	25.	0.64	-43.	21.	35.	0.55	-45.
3C161	0.	-24.	0.84	-26.	24.	-30.	0.76	-31.	23.	-37.	0.68	-34.
3C237	4.	-6.	1.12	-15.	3.	-5.	1.07	-16.	2.	-4.	1.02	-17.
3C273	6.	-3.	1.24	-9.	5.	-2.	1.22	-11.	4.	-1.	1.18	-13.
3C298	8.	0.	1.28	-4.	7.	1.	1.27	-6.	6.	2.	1.25	-8.
3C459	16.	6.	0.82	34.	16.	4.	0.90	25.	15.	3.	0.96	17.

NOTE:

* indicates data for which no error estimate is available since only two antennas were operating.

3C 161 observed at 0 hr. UT until May 9, at 23 hr. UT after May 9.

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	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
1945	OCT 24	–				TA		*				A*	*		*	AT–	AT–	AT	AT						*			
1946	NOV 20		*		TA		T*	T*		–	–	–		*	*				AT	AT					*			
1947	DEC 17	–						TA*			*	AT*	TA		*				T*		*			A*	TA*		*	
1948	1976 JAN 13	TA	T*		TA	TA	TA	AT			–	–	*		–	–		–	–							TA		
1949	FEB 9				–	–		–	TA		AT	A*			TA					T*				A*		TA	TA	*
1950	MAR 7							–	TA	A*		TA						*	*	AT			T*		–	TA		
1951	APR 3							*				*								AT	TA	T*	T*		*	AT	TA	A*	
1952	APR 30		AT					TA	AT	T*	–			–	–	–			A*	TA	AT	AT		A*			–	
1953	MAY 27	–						*	TA						–	*			–					T*				
1954	JUN 23						AT			AT		TA	T*	AT			TA	A*					AT	A*		TA	AT	AT		A*
1955	JUL 20		T*								TA	A*								AT	T*	TA	TA	TA–	TA	TA			
1956	AUG 16							TA	T*							*		AT				–	AT–	AT–	AT–	TA–	–	–	–
1957	SEP 12	–	–	AT–	–	–	–	–	–	–	–	AT	–	–	AT–	AT–	–			–	–	–			AT		–		
1958	OCT 9	AT	* A*		A*		*				TA	A*			*	–	–	–	*		TA	AT	AT	–			AT	
1959	NOV 5		AT	TA		TA		T*		*	AT*		–		*	–											*	
1960	DEC 2							TA		*						AT		*					– *			–	TA–	
1961	DEC 29	–	AT–	*	*	*			AT				*				*	A*		*	*		*					AT
1962	1977 JAN 25			–			–	–	TA–		A*			AT–				*	–			*	–		TA			
1963	FEB 21	AT	–	–	–	–	TA		TA			*		–								–		–				
1964	MAR 20		TA		AT					*			–	–						A*				–				
1965	APR 16			TA		TA–	AT	TA		TA		AT				–	–	TA		AT	AT			TA				AT
1966	MAY 13	TA	–	–		TA			TA											AT								

= definitely towards the sun = definitely away from the sun

T = towards the sun A = away from the sun * = effect doubtful or not discernible – = missing data

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.

STANFORD MEAN SOLAR MAGNETIC FIELD

BARTELS ROTATION	DATE	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
1947	DEC 12																											
1948	1978 JAN 8																											
1949	FEB 4																											
1950	MAR 2																											
1951	MAR 29																											
1952	APR 25																											
1953	MAY 22																											
1954	JUN 18																											
1955	JUL 15																											
1956	AUG 11																											
1957	SEP 7																											
1958	OCT 4																											
1959	OCT 31																											
1960	NOV 27																											
1961	DEC 24																											
1962	1977 JAN 20																											
1963	FEB 16																											
1964	MAR 15																											
1965	APR 11																											
1966	MAY 8																											

POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT ≤FIELD ≤2μT, ■ = FIELD <-2μT

No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT.

27 May 77

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

	1976							1977				
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY
DAY												
01	20	17	8	5	.	-2	-4	.	5	2	-7	-13
02	21	19	6	6	.	-3	-2	.	0	0	-17	-6
03	15	15	0	2	-1	-4	5	4	-6	-2	-16	-5
04	16	14	-8	8	1	1	13	15	-8	-9	-12	1
05	6	7	-14	7	7	1	21	.	-11	-17	-9	7
06	8	-1	-10	6	-5	7	23	3	-17	-22	-4	11
07	0	-1	-5	3	0	16	25	-7	-12	-20	0	7
08	.	1	-4	-2	2	25	18	-14	.	-13	5	-5
09	.	3	-3	1	6	23	13	-9	.	-9	8	.
10	-5	6	-5	.	13	12	8	-11	.	-3	2	-22
11	-3	6	2	0	19	.	-3	-8	21	3	-4	.
12	0	10	-1	2	21	9	-4	.	19	11	-7	-29
13	-6	9	1	8	24	.	-7	.	13	18	-14	-20
14	1	8	-2	12	29	4	-1	8	11	3	-8	-5
15	13	8	4	17	22	-2	0	6	9	.	-8	4
16	16	5	7	20	19	-4	0	9	-3	-9	-11	12
17	8	4	.	30	14	-3	6	6	-12	-12	-9	20
18	0	1	.	20	5	.	3	3	-13	-13	1	29
19	-6	0	.	15	-1	0	8	0	-20	-15	13	27
20	.	4	24	11	-9	.	6	-4	.	-12	18	19
21	-13	7	33	5	-5	11	5	.	.	-7	21	12
22	-7	14	33	-3	-1	9	1	-14	3	2	13	.
23	-4	23	25	-12	6	2	-10	-12	7	.	17	1
24	4	26	19	-10	12	5	-10	-12	12	15	9	-1
25	13	27	18	-6	14	-5	-14	-7	13	13	6	4
26	28	30	16	.	20	0	-16	-6	11	13	9	-10
27	26	24	11	.	8	-6	-16	0	9	10	7	-10
28	27	13	6	.	9	-5	-10	6	5	8	2	-10
29	23	20	6	.	9	-12	-5	8		4	-10	-4
30	25	15	8	4	4	-8	.	7		7	-11	3
31		12	1		-4		11	7		6		6

"." indicates no data available for that day.

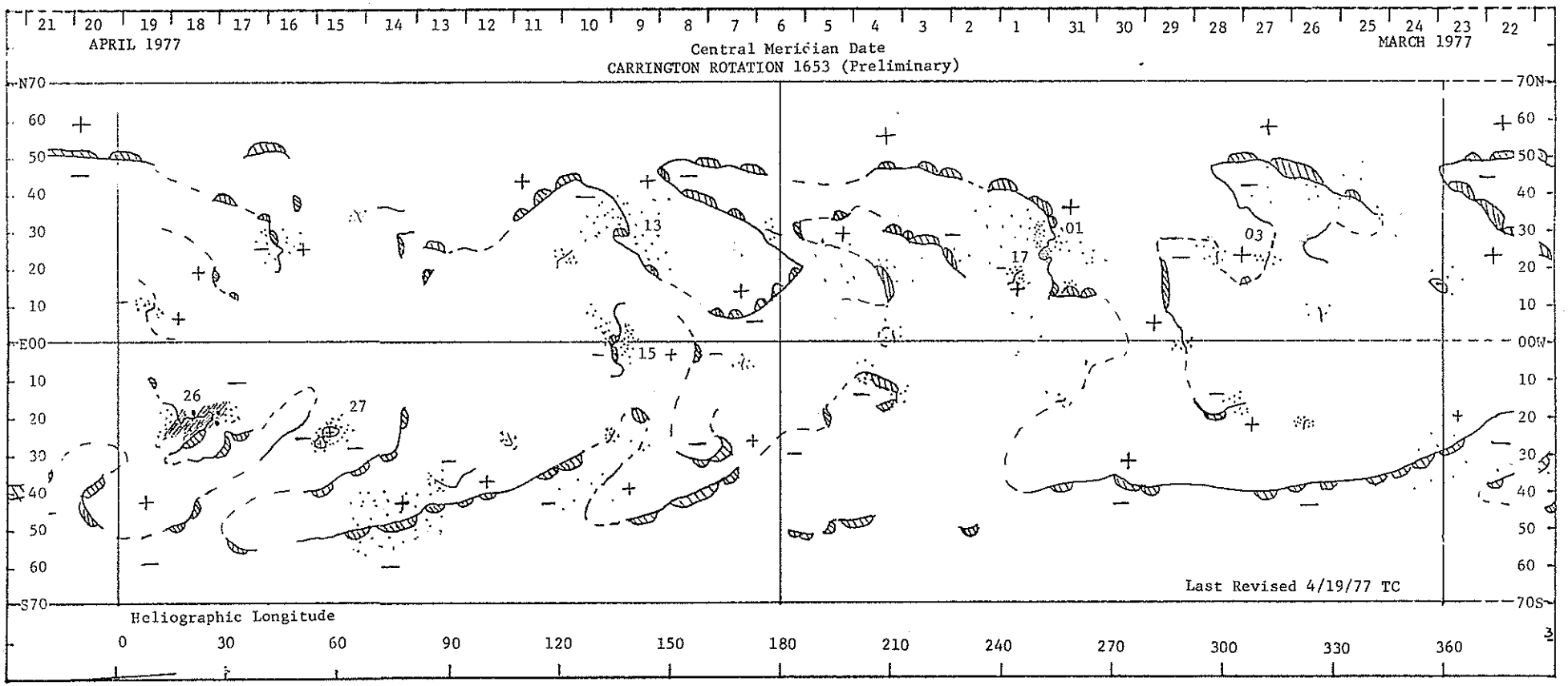
SGD 394 Part I (Prompt)

APRIL 1977 DATA

Contents

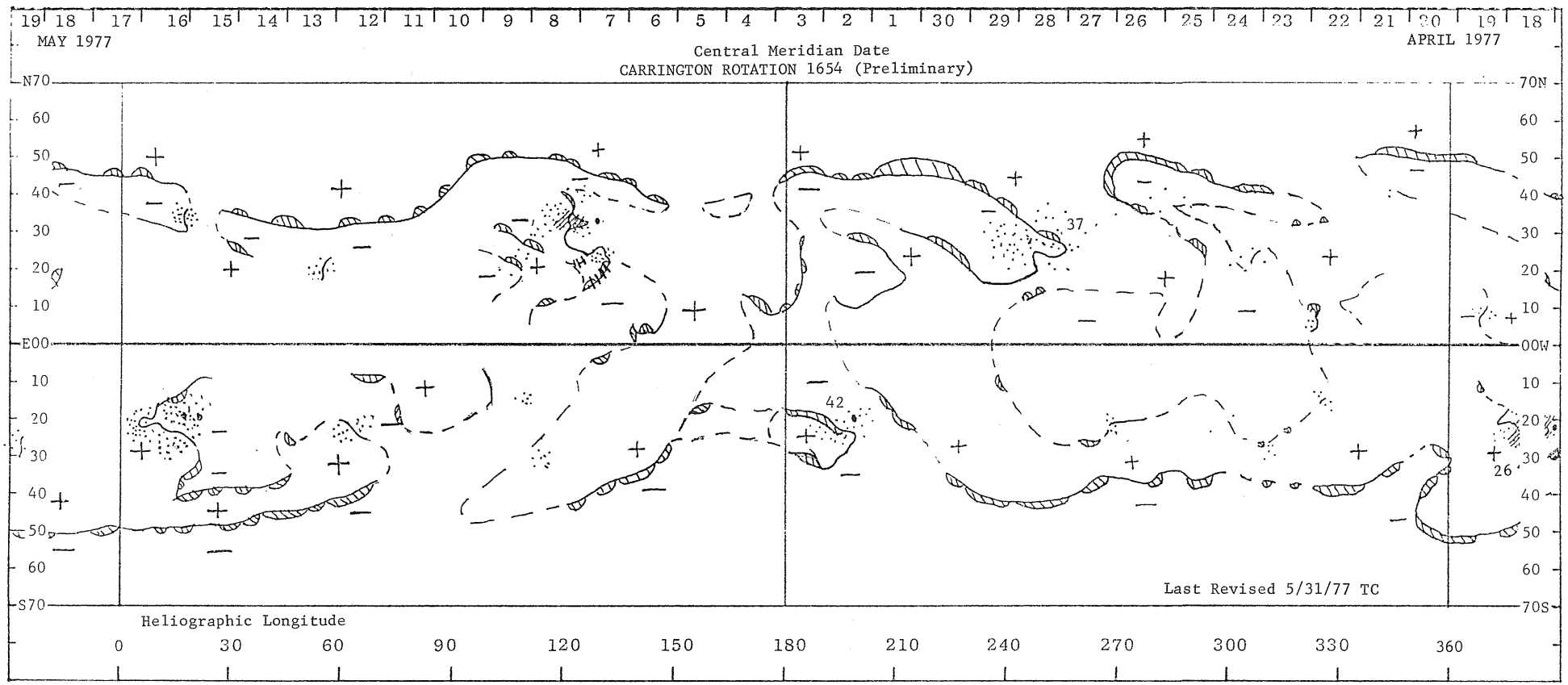
Hα SYNOPTIC CHART

CARRINGTON ROTATION 1653 (PRELIMINARY)



Hα SYNOPTIC CHART

CARRINGTON ROTATION 1654 (PRELIMINARY)



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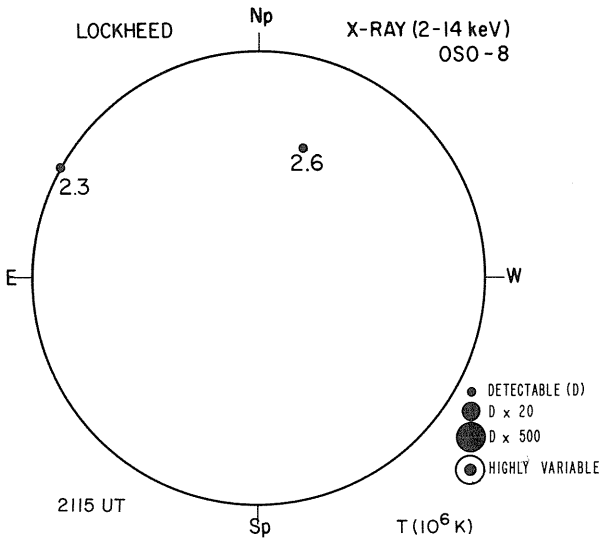
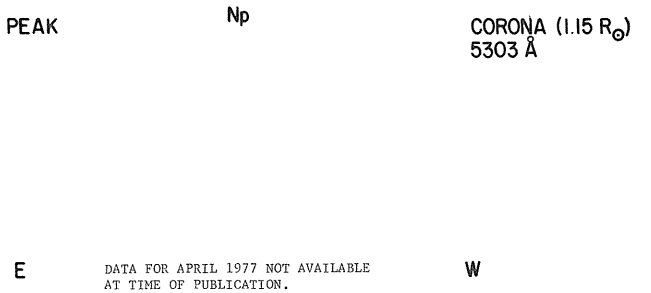
LOCKHEED X-RAY (2-14 keV) OSO-8



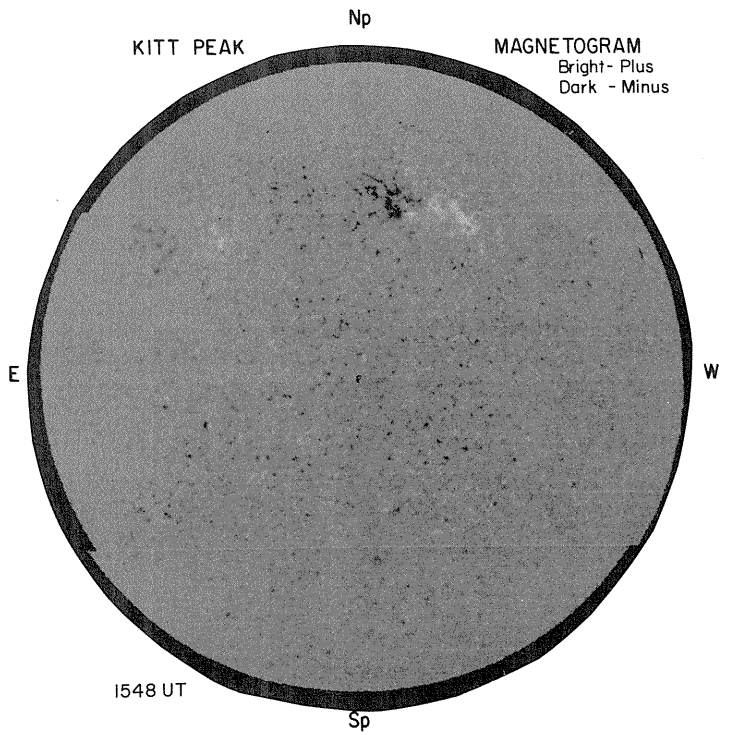
SACRAMENTO PEAK



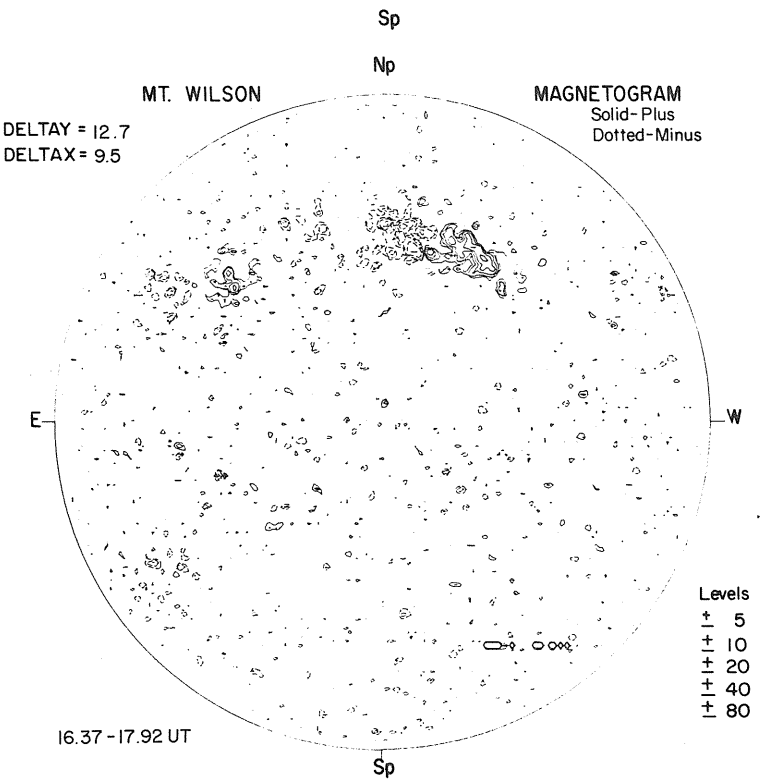
DATA FOR APRIL 1977 NOT AVAILABLE AT TIME OF PUBLICATION.

CORONA (1.15 $R_\odot$) 5303 Å

KITT PEAK MAGNETOGRAM Bright- Plus Dark - Minus



MT. WILSON MAGNETOGRAM Solid- Plus Dotted-Minus



01

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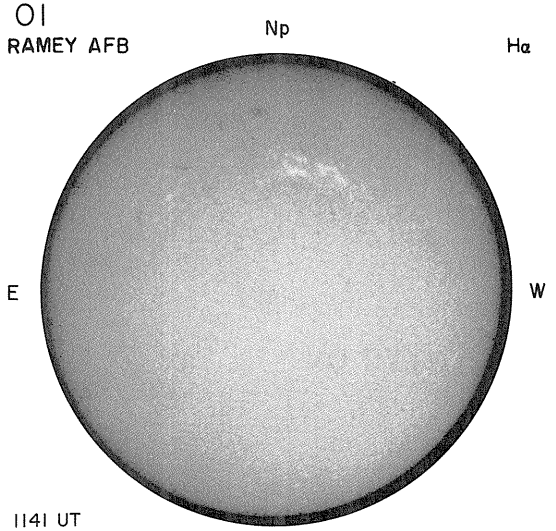
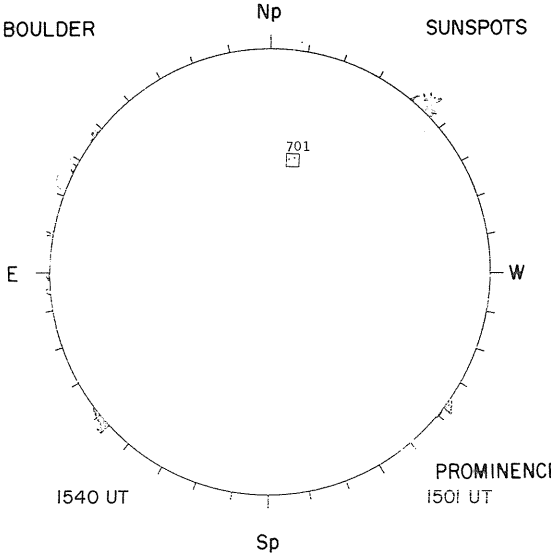
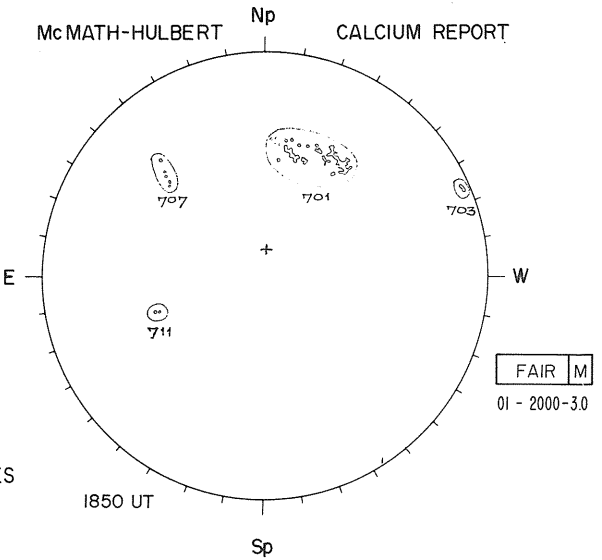


BOULDER



McMATH-HULBERT



NOSC LA POSTA

Np

2.0 CM

NO DATA

E

WEATHER

W

Sp

----UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

WEATHER

W

Sp

----UT

Ant. Temp. Unit 100°K

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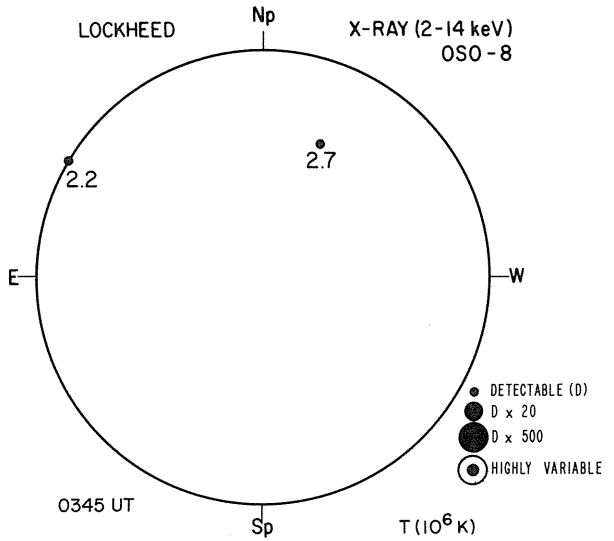
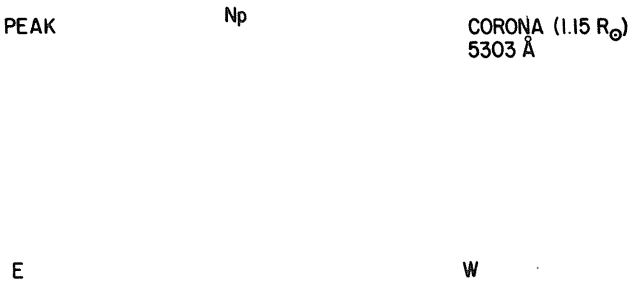
LOCKHEED

X-RAY (2-14 keV)
OSO-8



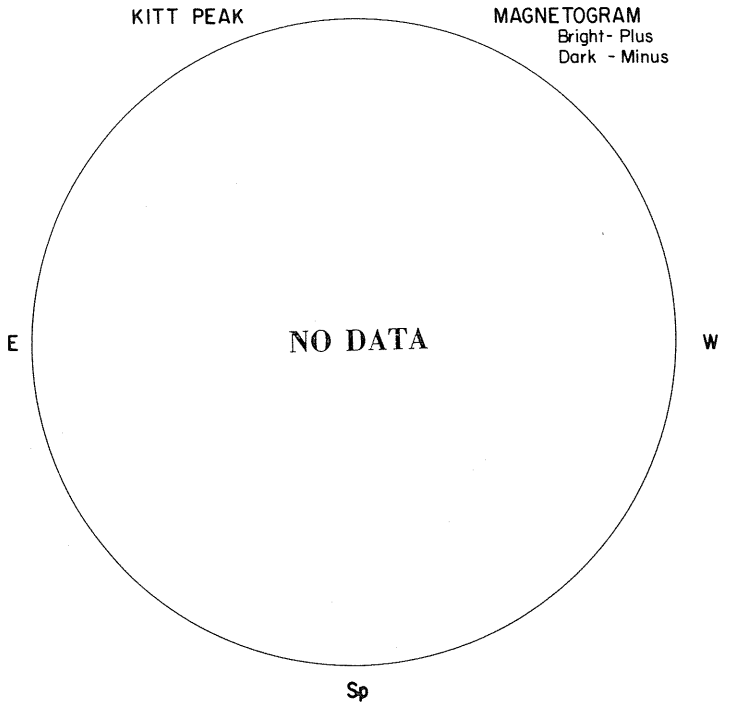
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

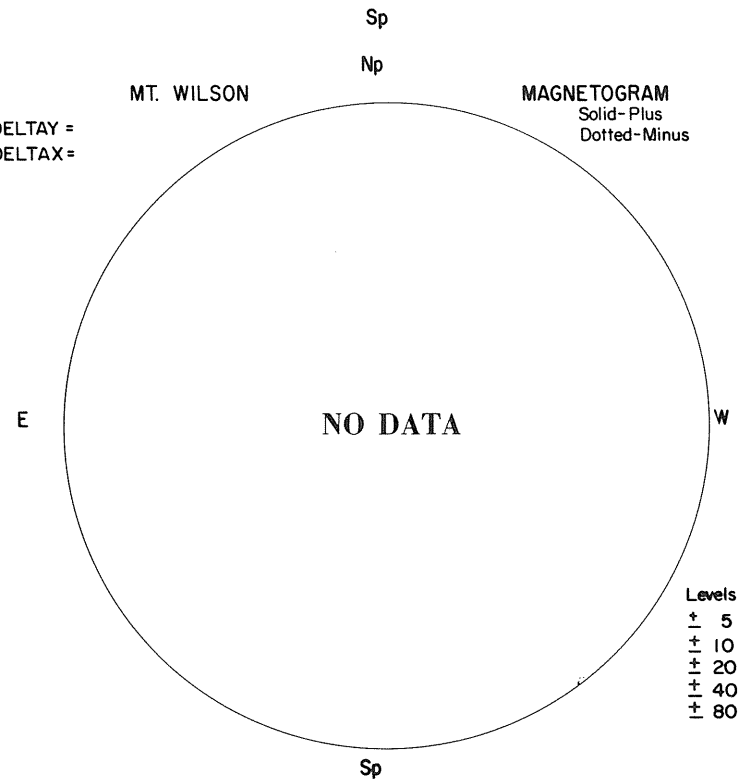
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

DELTAY =
DELTAX =

MAGNETOGRAM
Solid- Plus
Dotted-Minus



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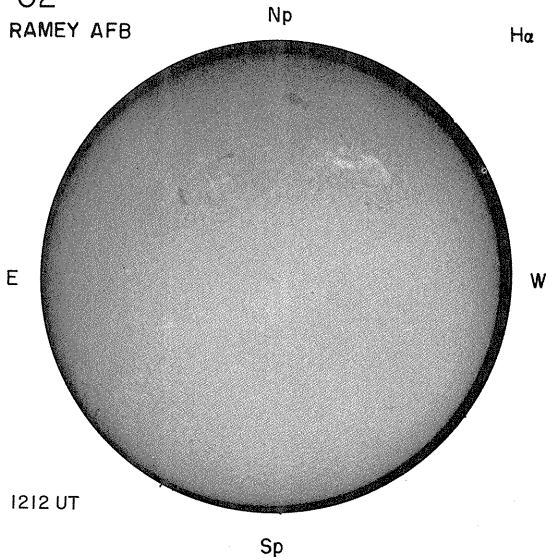
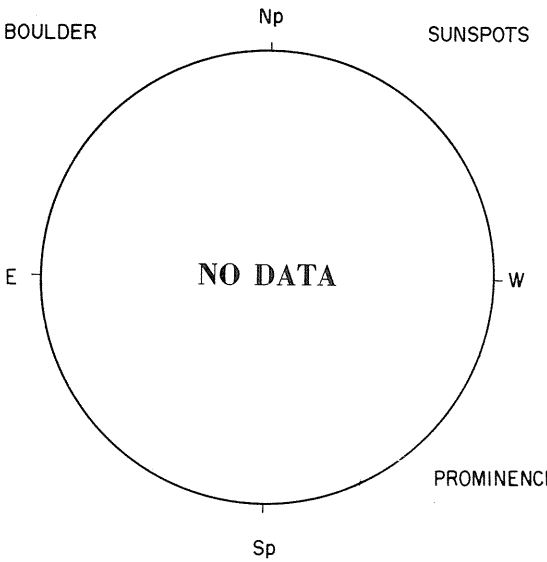


Hα

BOULDER

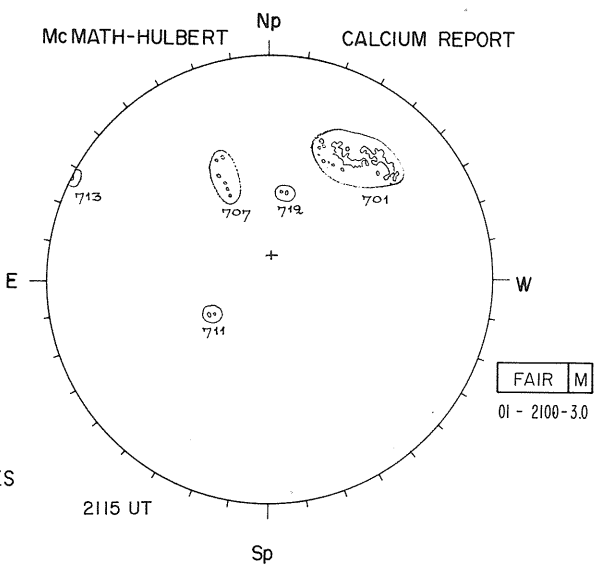


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT



FAIR | M

01 - 2100 - 3.0

NOSC LA POSTA

Np

2.0 CM

NO DATA

E

WEATHER

W

Sp

----UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

WEATHER

W

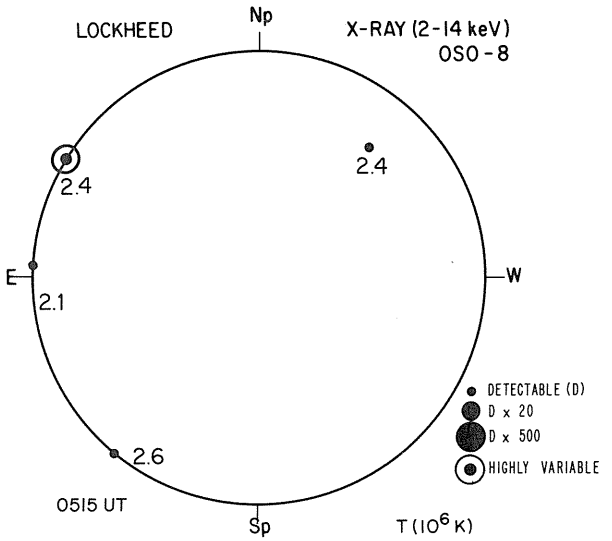
Sp

----UT

Ant. Temp. Unit 100°K

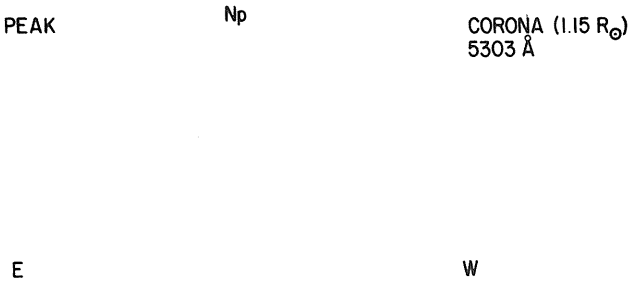
APRIL 3, 1977 (P =-26.27, B_o =-6.42, L_o =225.94)

LOCKHEED X-RAY (2-14 keV) OSO-8

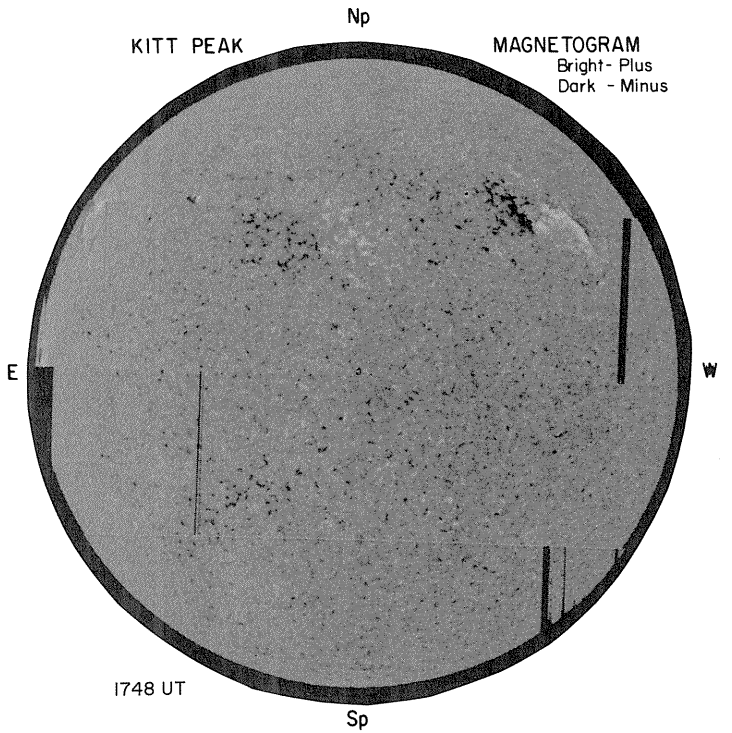


0515 UT T (10^6 K)

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus



1748 UT

MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

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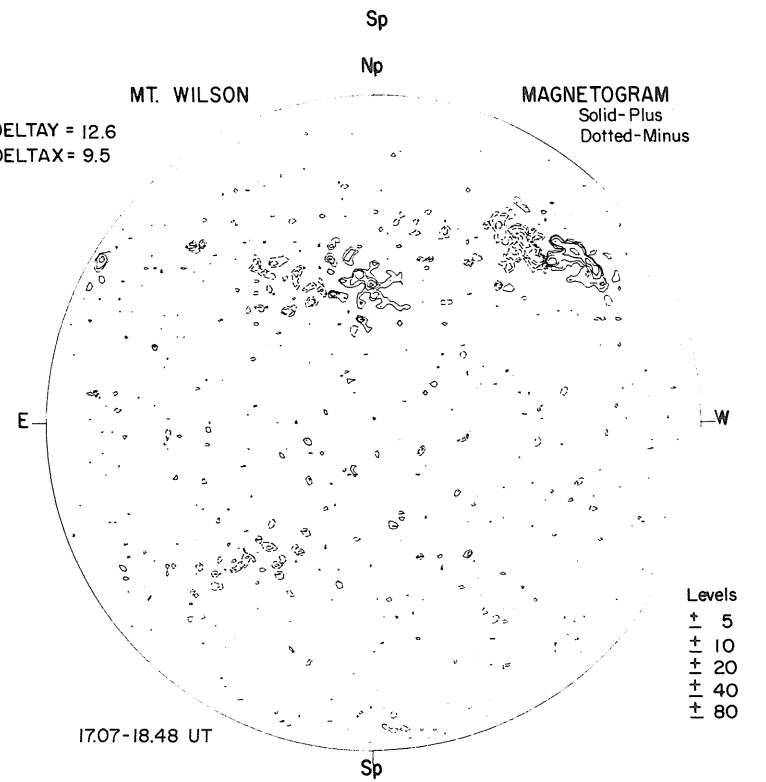
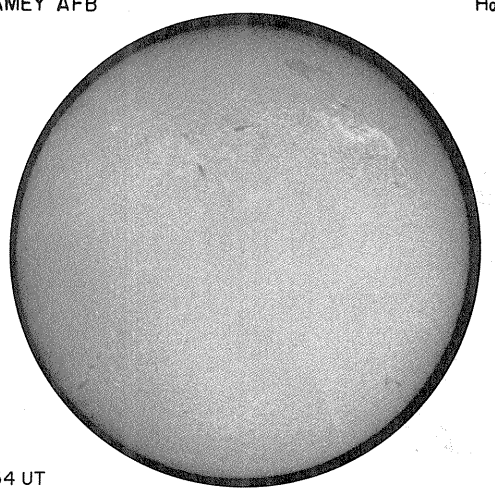
DELTAX = 9.5



17.07-18.48 UT

03

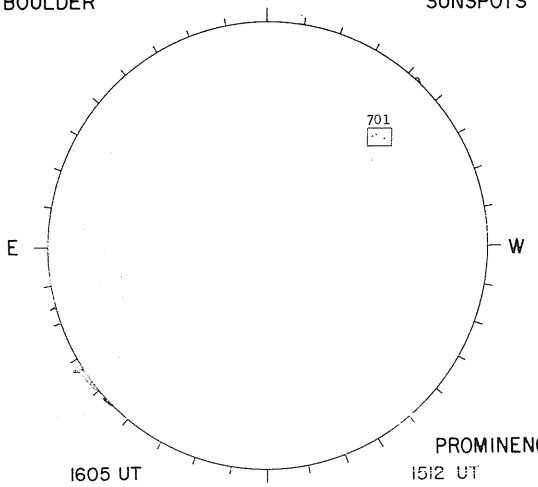
RAMEY AFB



1154 UT

BOULDER

SUNSPOTS



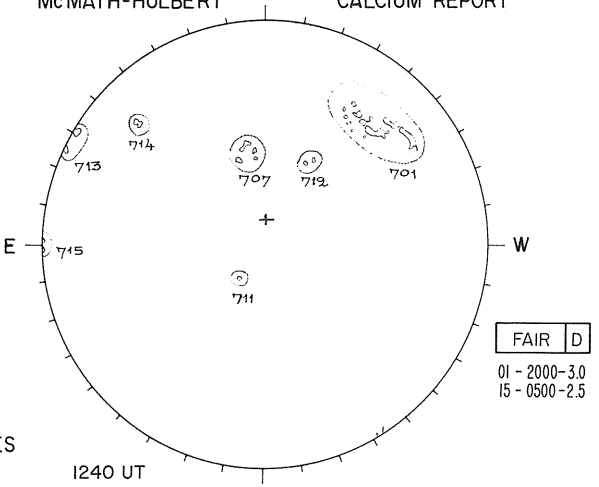
1605 UT

PROMINENCES

1512 UT

McMATH-HULBERT

CALCIUM REPORT



1240 UT

FAIR | D

01 - 2000-3.0
15 - 0500-2.5

NOSC LA POSTA

Np

2.0 CM

NO DATA

E

EQUIPMENT

W

Sp

---- UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

EQUIPMENT

W

Sp

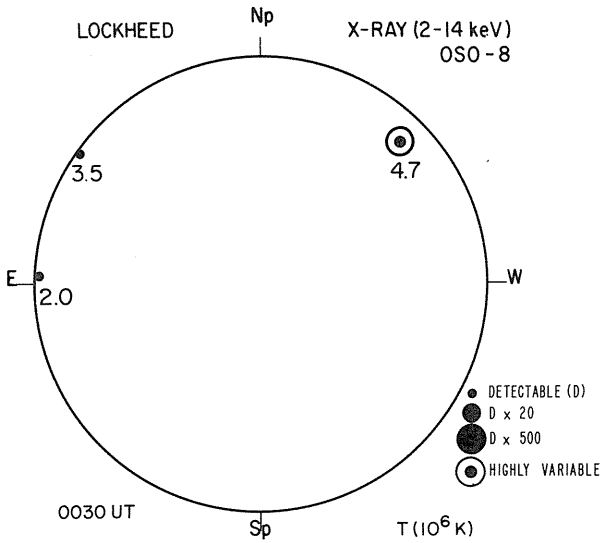
---- UT

Ant. Temp. Unit 100° K

APRIL 4, 1977 (P =-26.30, B_0 =-6.36, L_0 =212.75)

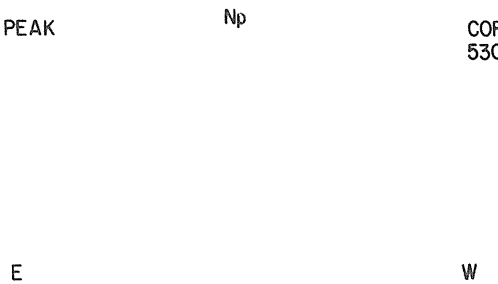
LOCKHEED

X-RAY (2-14 keV)
OSO-8



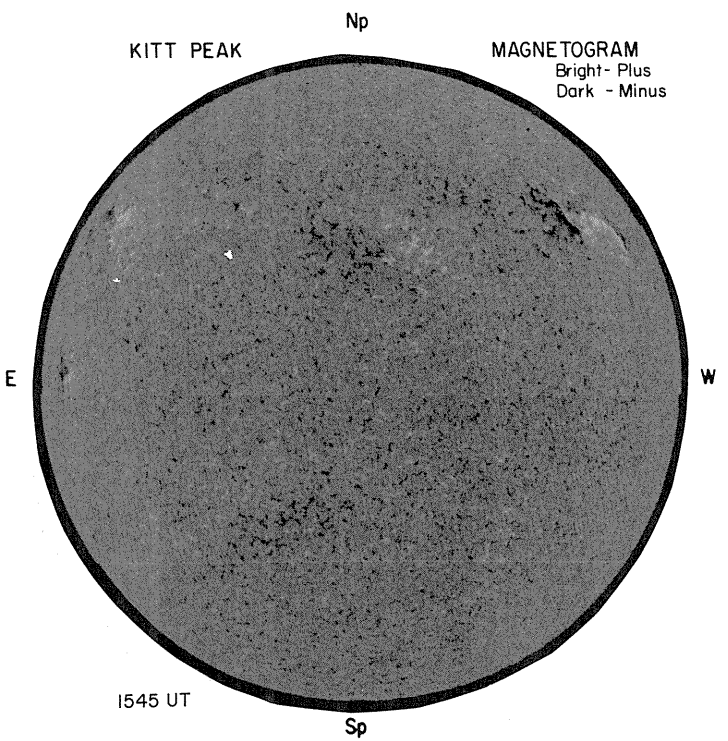
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

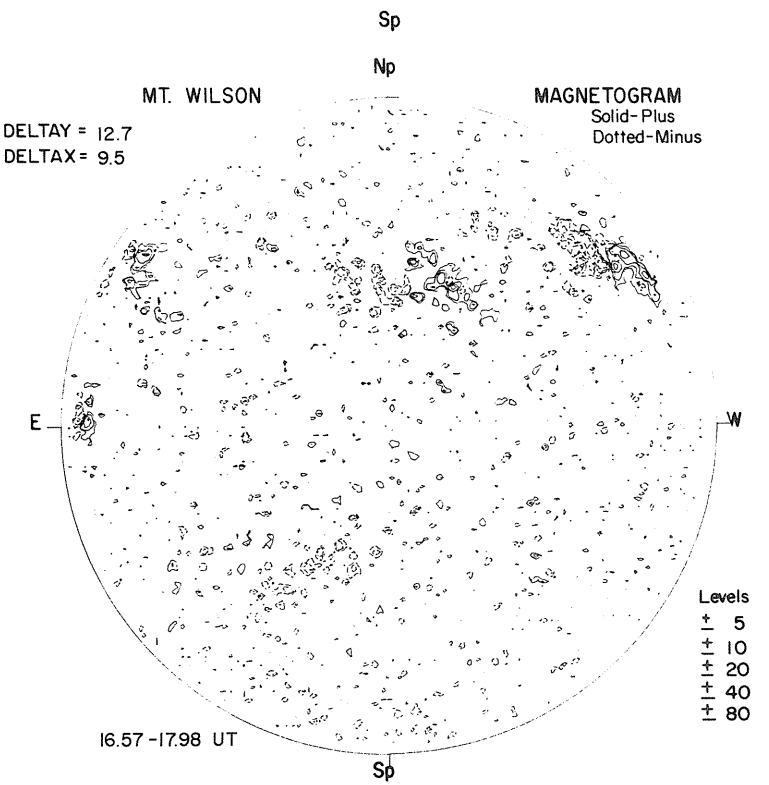
MAGNETOGRAM
Bright-Plus
Dark - Minus



MT. WILSON

DELTAY = 12.7
DELTAX = 9.5

MAGNETOGRAM
Solid-Plus
Dotted-Minus



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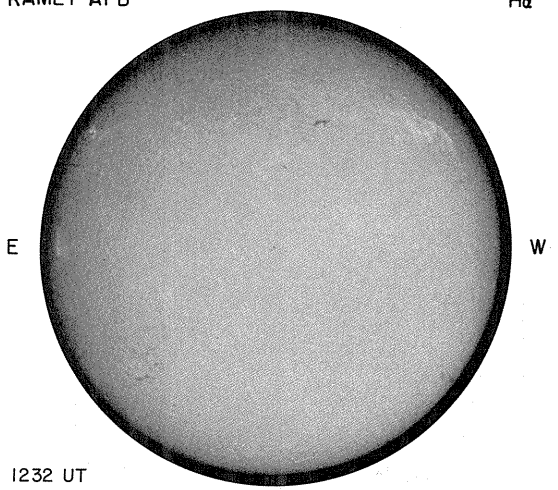
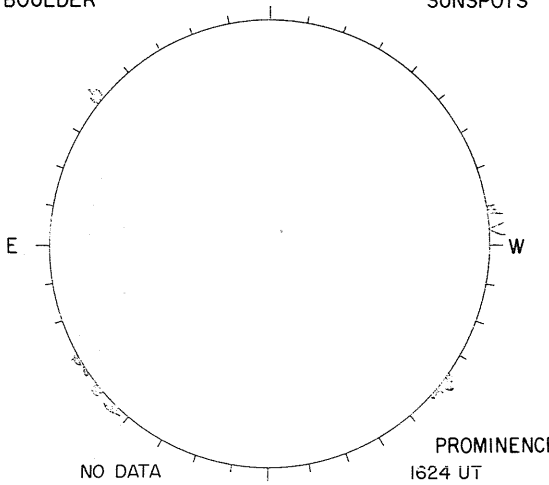
RAMEY AFB



Hα

1232 UT

BOULDER



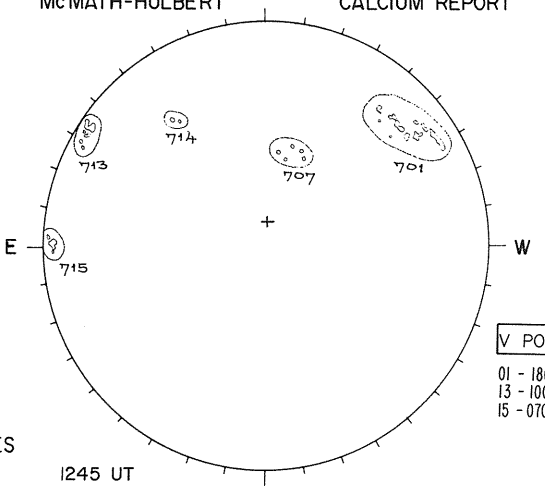
SUNSPOTS

NO DATA

PROMINENCES

1624 UT

McMATH-HULBERT



CALCIUM REPORT

V	POOR	D

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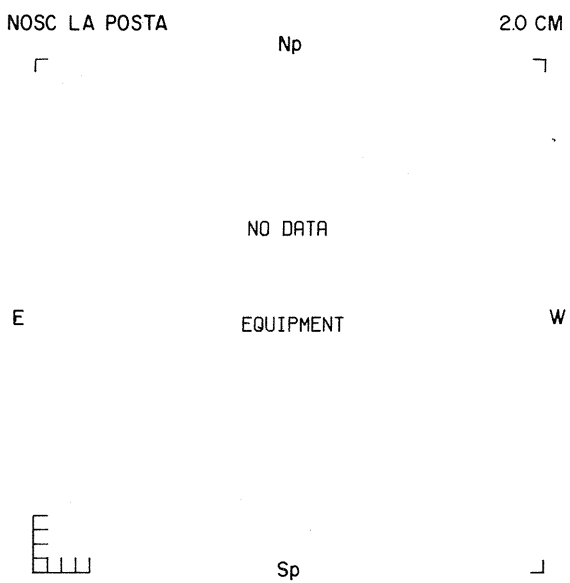
13 - 1000 - 2.5
15 - 0700 - 3.0

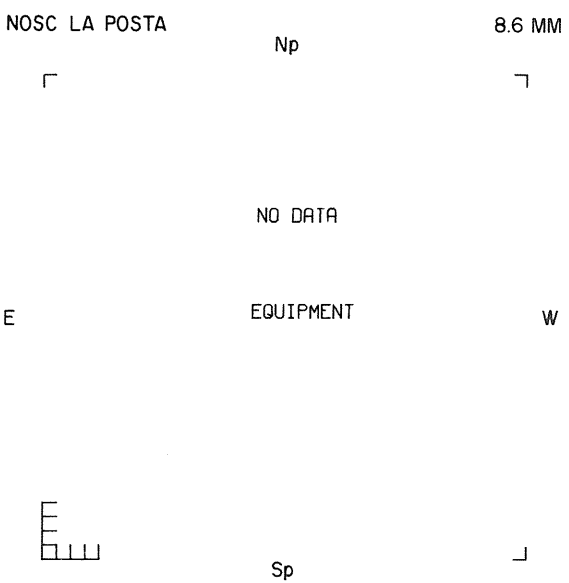
1245 UT

NOSC LA POSTA



2.0 CM

NOSC LA POSTA

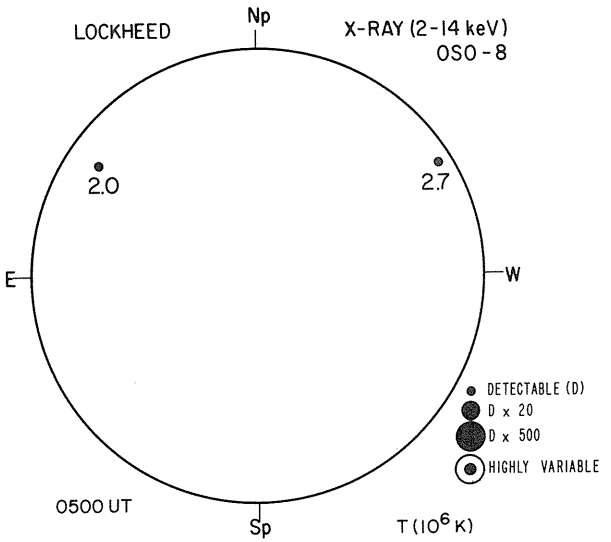


8.6 MM

APRIL 5, 1977 (P =-26.32, B_o =-6.30, L_o =199.55)

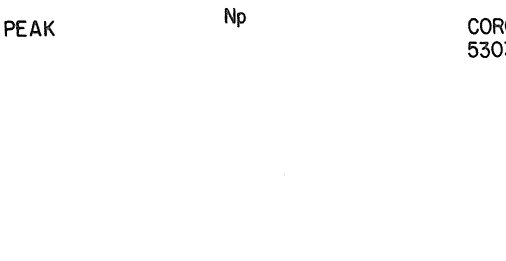
LOCKHEED

X-RAY (2-14 keV)
OSO-8



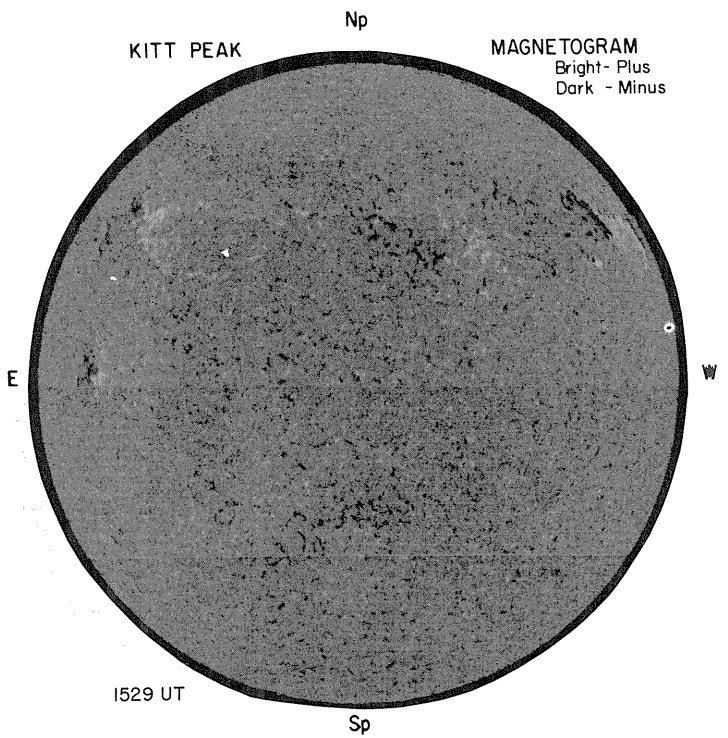
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

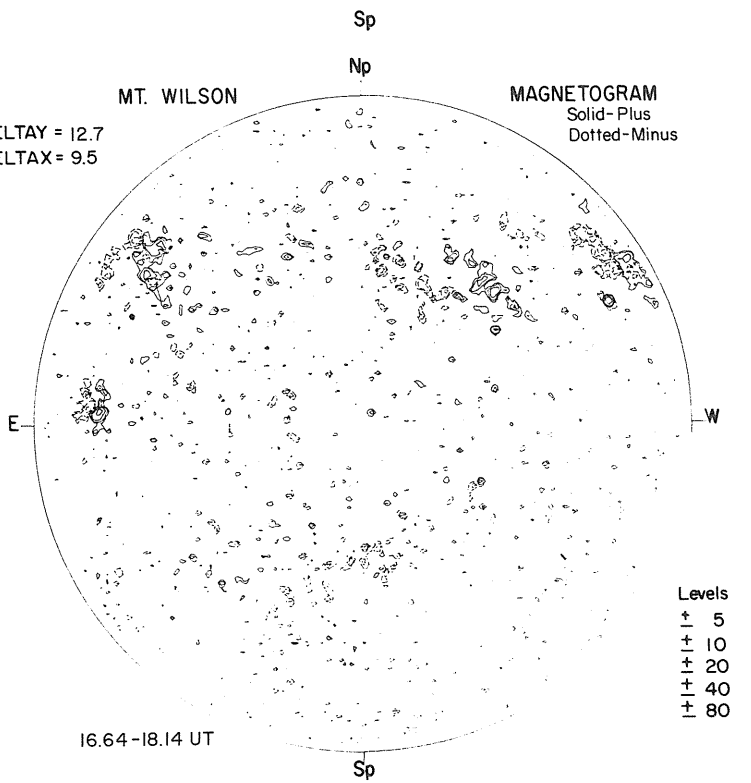
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

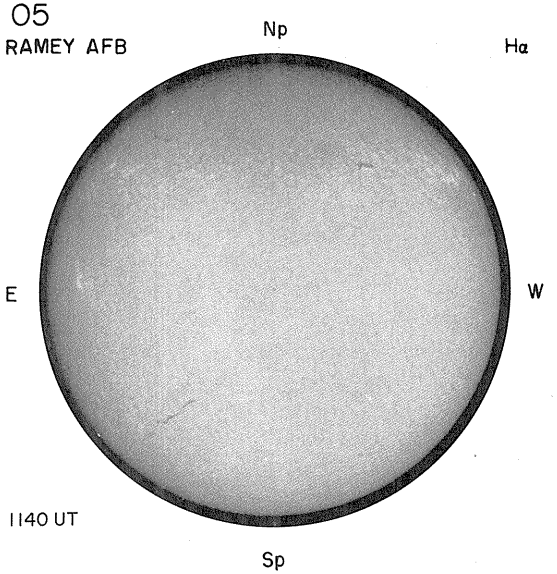
DELTAY = 12.7
DELTAX = 9.5

MAGNETOGRAM
Solid- Plus
Dotted-Minus



05

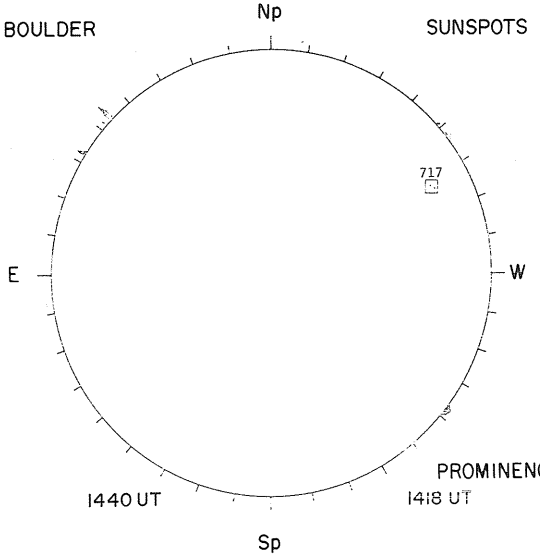
RAMEY AFB



1140 UT

Hα

BOULDER



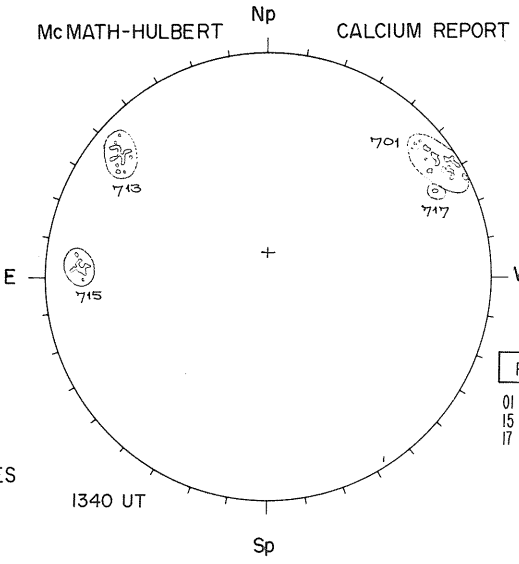
1440 UT

SUNSPOTS

1418 UT

PROMINENCES

McMATH-HULBERT



1340 UT

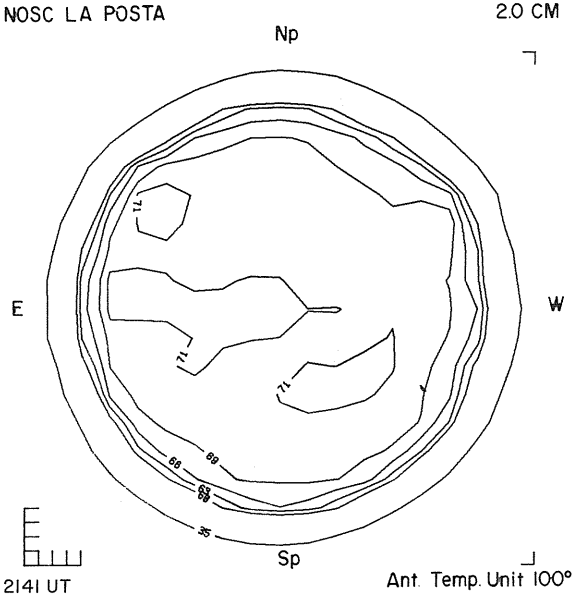
CALCIUM REPORT

POOR	S

01 - 2000-2.5
15 - 0700-2.5
17 - 0100-3.0

NOSC LA POSTA

2.0 CM

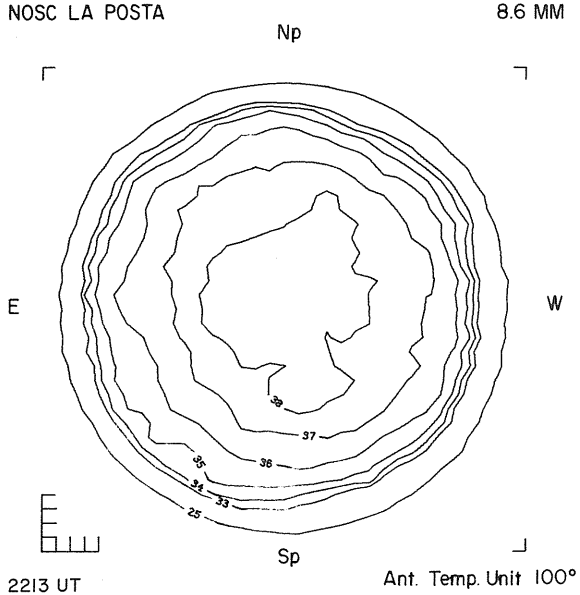


2141 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



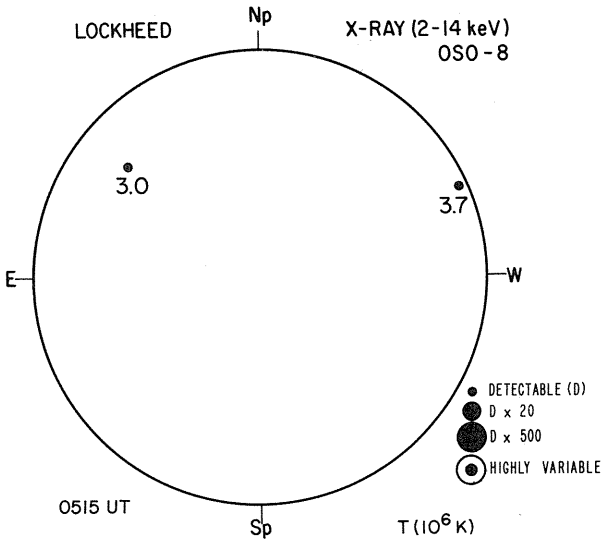
2213 UT

Ant. Temp. Unit 100° K

APRIL 6, 1977 (P =-26.33, B_o =-6.23, L_o =186.36)

LOCKHEED

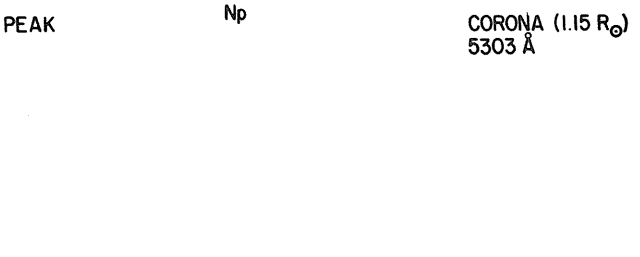
X-RAY (2-14 keV)
OSO-8



0515 UT

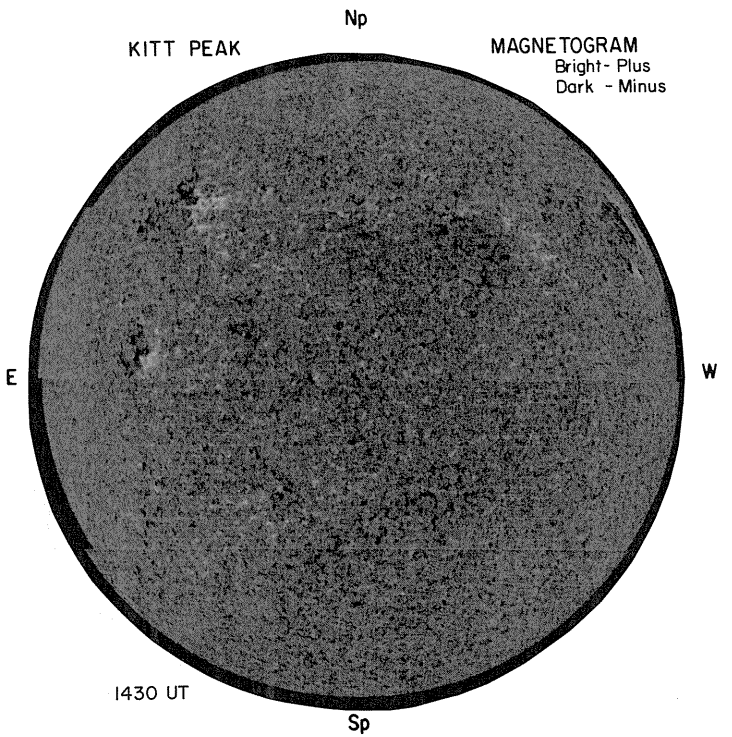
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

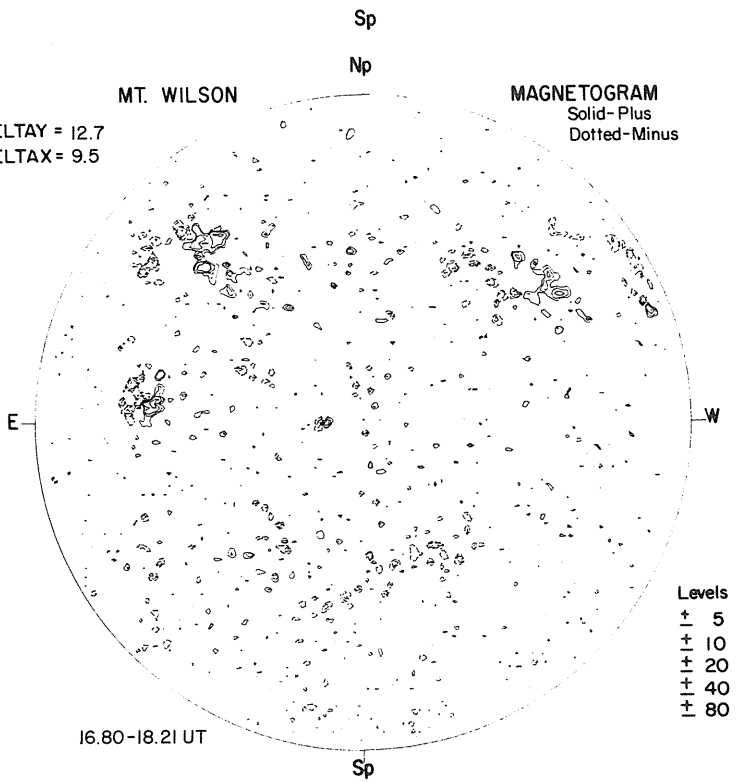


1430 UT

MT. WILSON

DELTAY = 12.7
DELTAX = 9.5

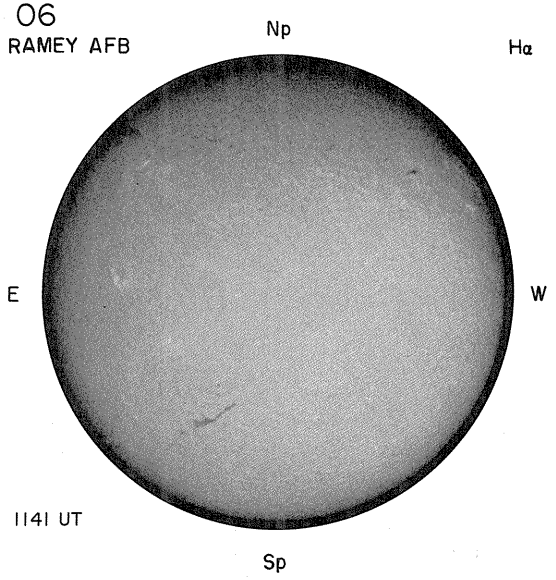
MAGNETOGRAM
Solid - Plus
Dotted - Minus



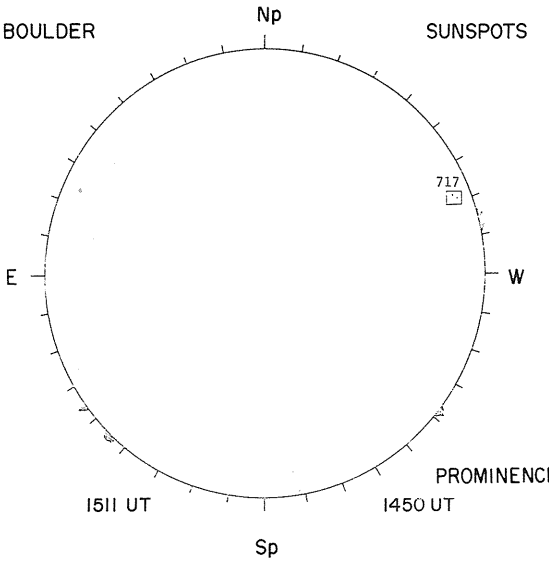
16.80-18.21 UT

06

RAMEY AFB



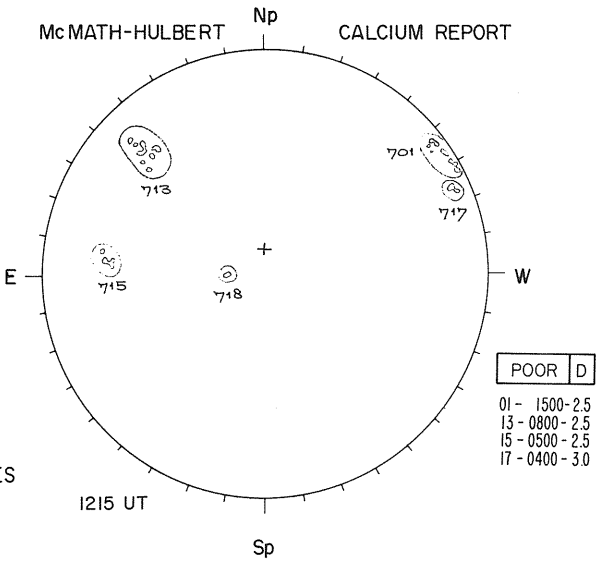
BOULDER



PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

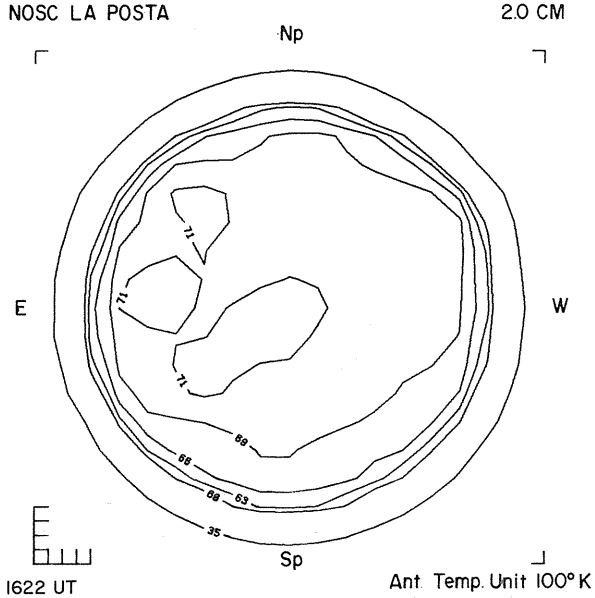


POOR	D

01 - 1500 - 2.5
13 - 0800 - 2.5
15 - 0500 - 2.5
17 - 0400 - 3.0

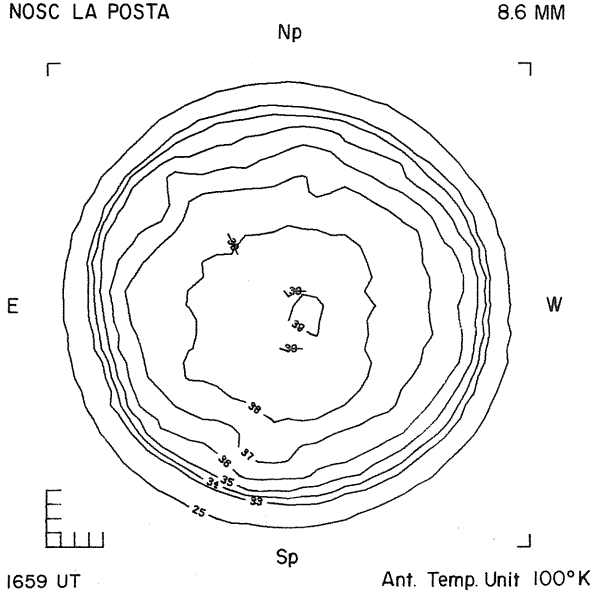
NOSC LA POSTA

2.0 CM



NOSC LA POSTA

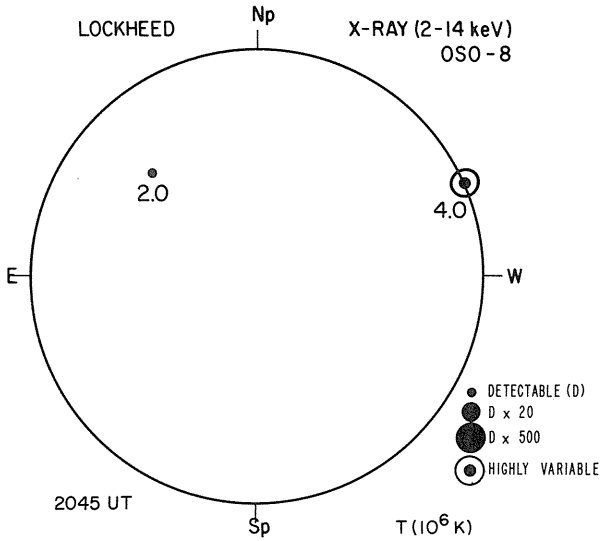
8.6 MM



APRIL 7, 1977 (P =-26.33, B_o =-6.17, L_o =173.16)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

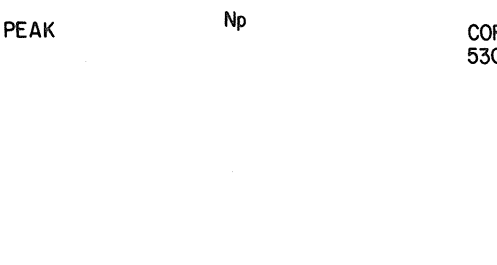


2045 UT

T(10^6 K)

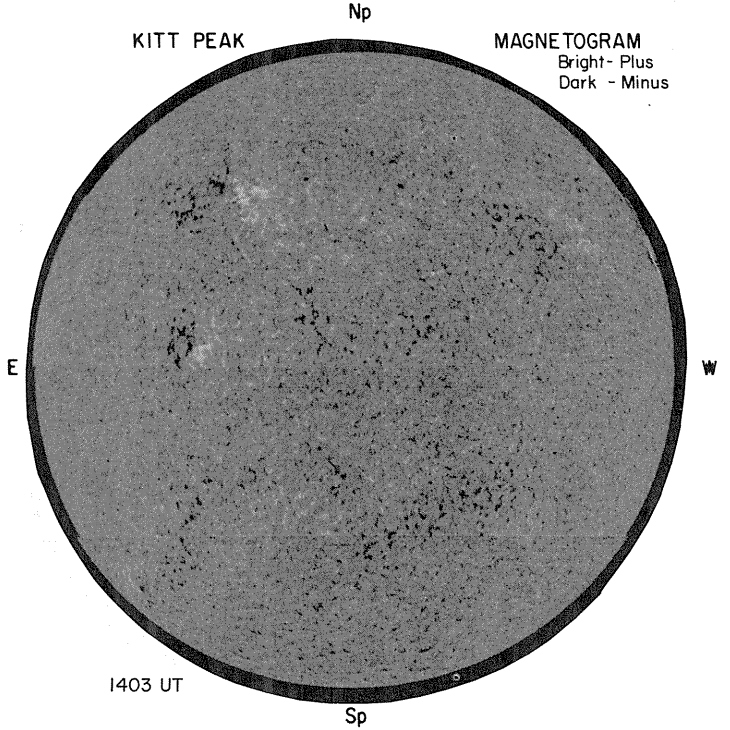
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright- Plus
Dark - Minus

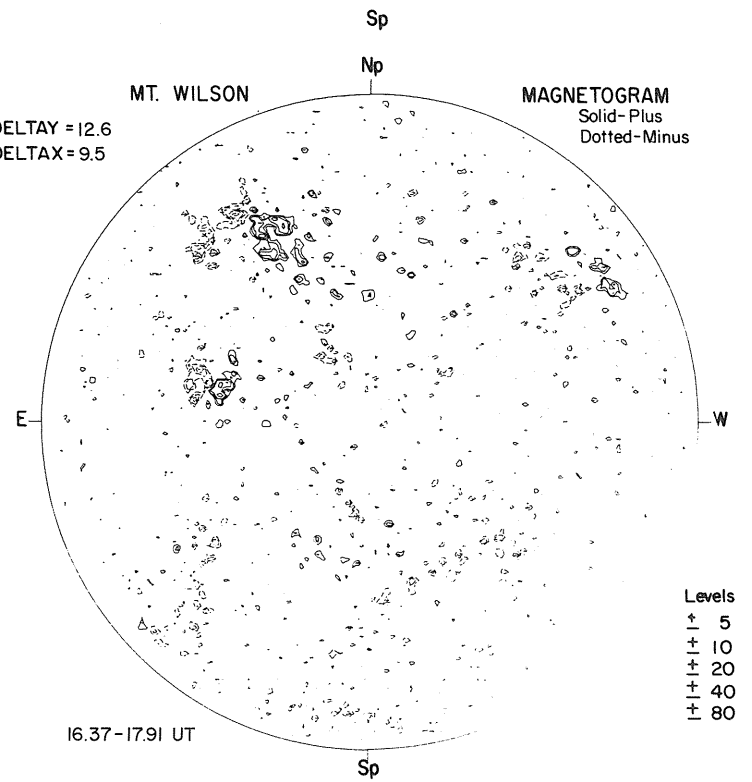


1403 UT

MT. WILSON

DELTAY = 12.6
DELTAX = 9.5

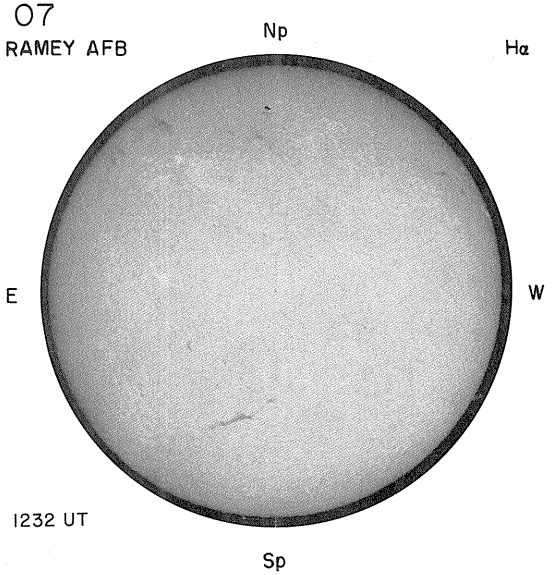
MAGNETOGRAM
Solid- Plus
Dotted-Minus



16.37-17.91 UT

07

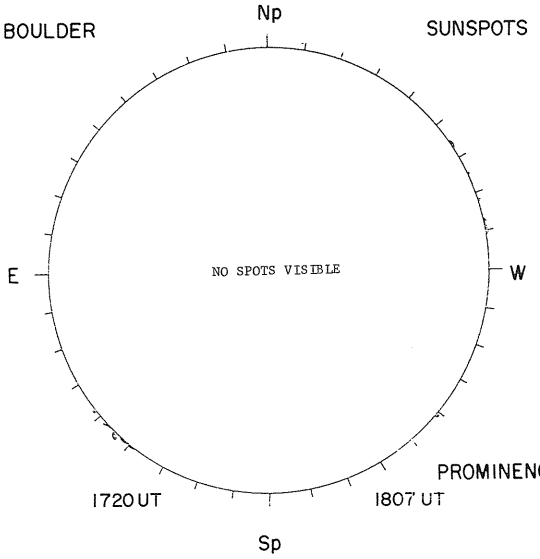
RAMEY AFB



1232 UT

Hα

BOULDER



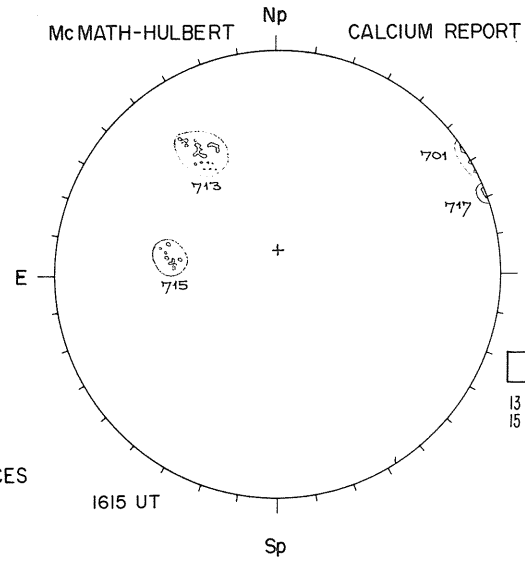
1720 UT

1807 UT

SUNSPOTS

PROMINENCES

McMATH-HULBERT



1615 UT

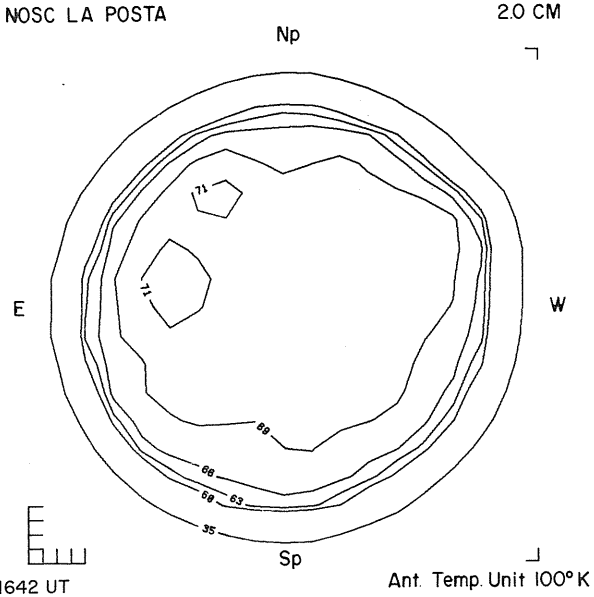
CALCIUM REPORT

FAIR	D

13 - 0800 - 2.5
15 - 0400 - 2.5

NOSC LA POSTA

2.0 CM

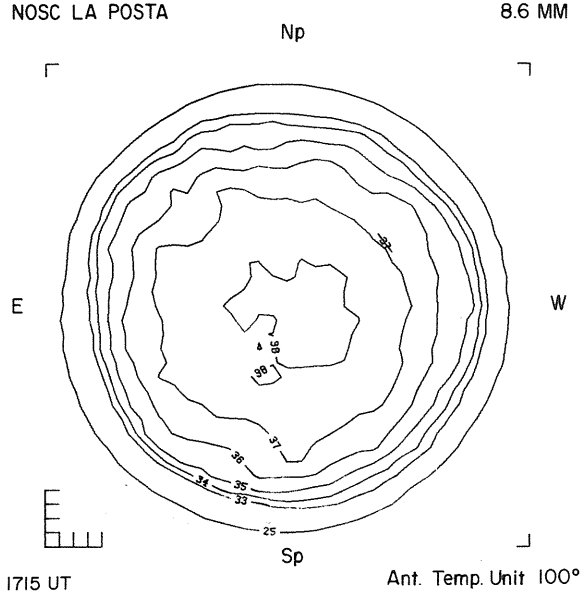


1642 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



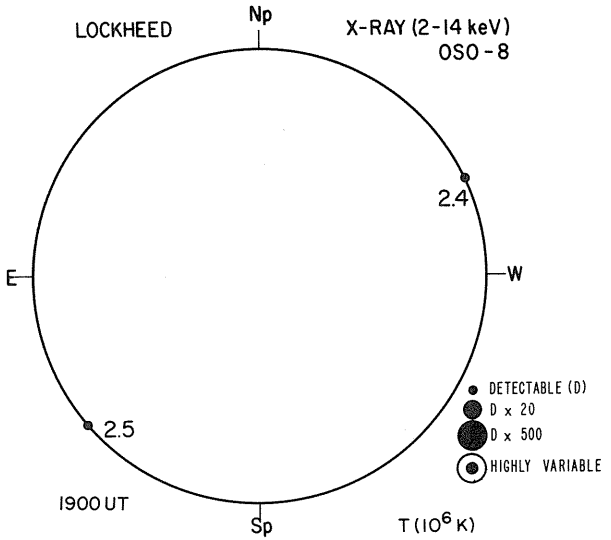
1715 UT

Ant. Temp. Unit 100° K

APRIL 8, 1977 (P =-26.32, B_o =-6.10, L_o =159.96)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

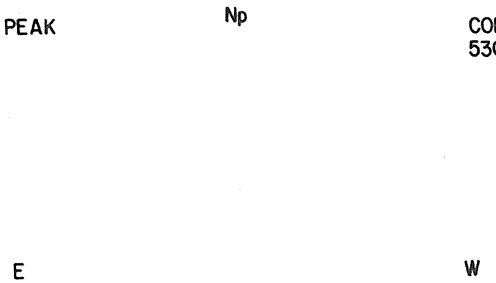


1900 UT

T (10^6 K)

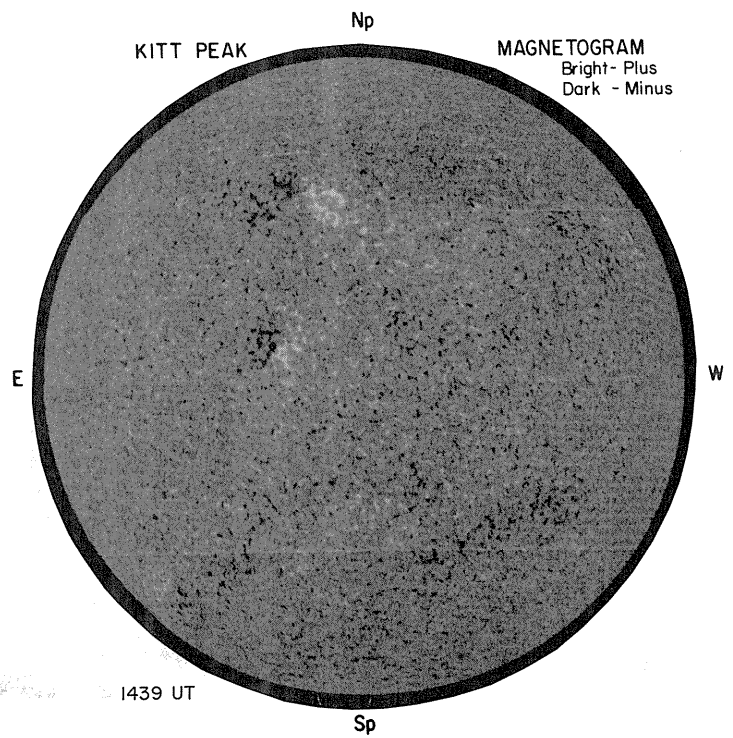
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright- Plus
Dark - Minus

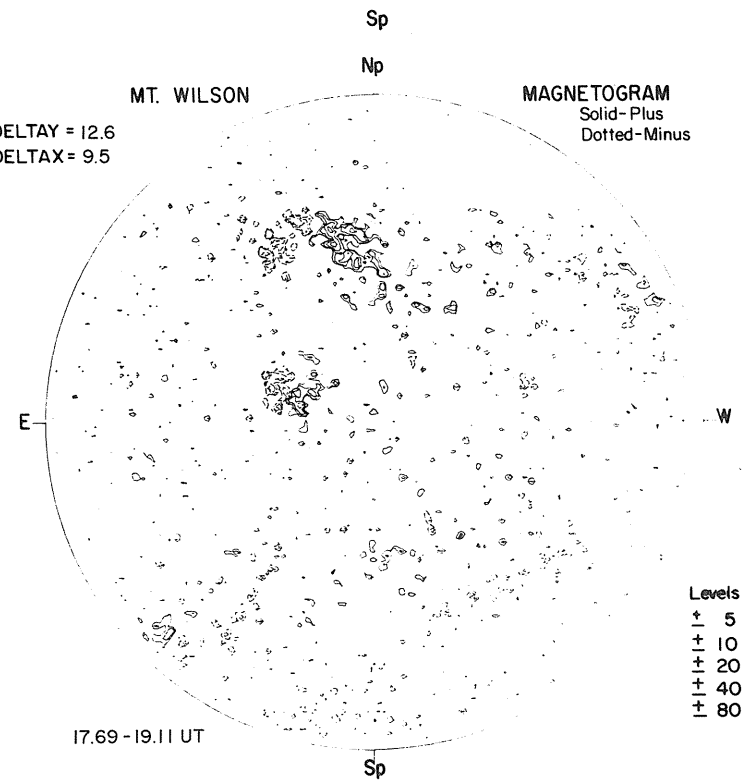


1439 UT

MT. WILSON

DELTAY = 12.6
DELTAX = 9.5

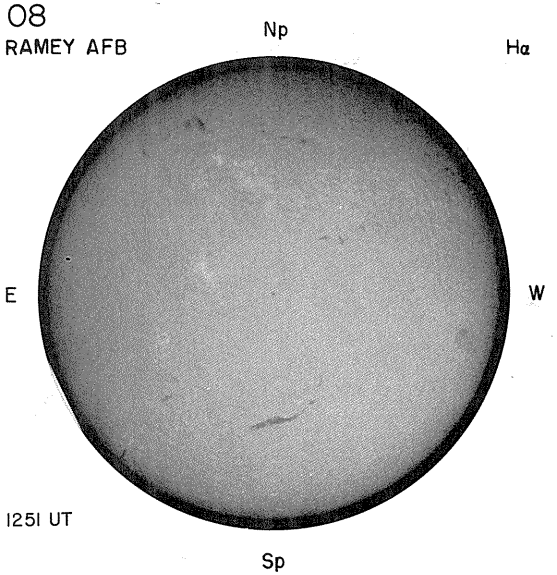
MAGNETOGRAM
Solid- Plus
Dotted-Minus



17.69 - 19.11 UT

08

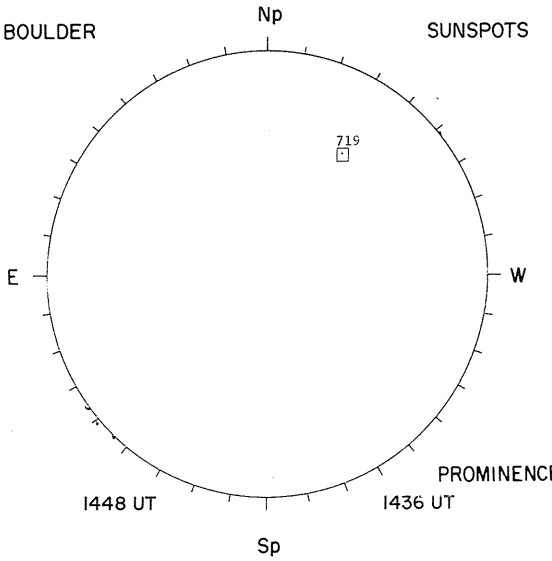
RAMEY AFB



1251 UT

Hα

BOULDER



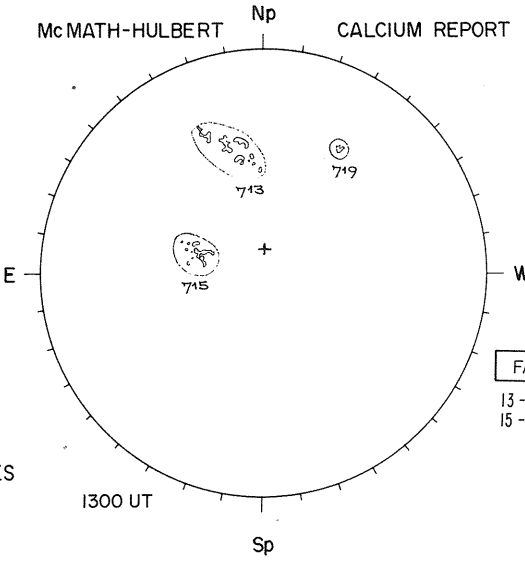
1448 UT

SUNSPOTS

1436 UT

PROMINENCES

McMATH-HULBERT



1300 UT

CALCIUM REPORT

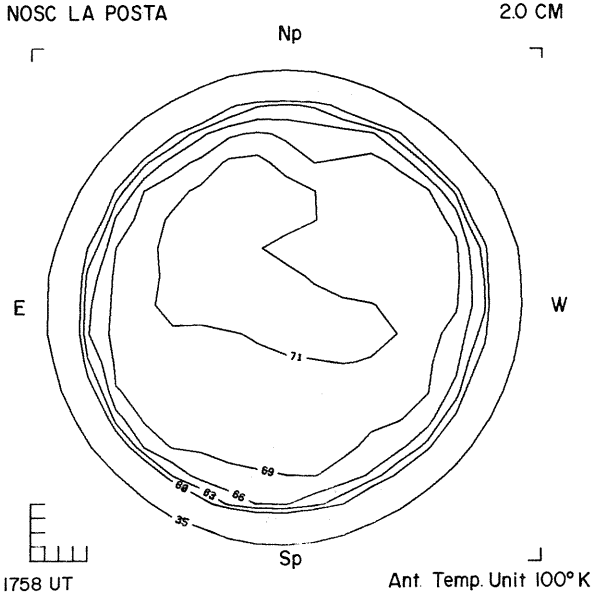
FAIR | S

13 - 0800 - 2.5

15 - 0400 - 2.5

NOSC LA POSTA

2.0 CM

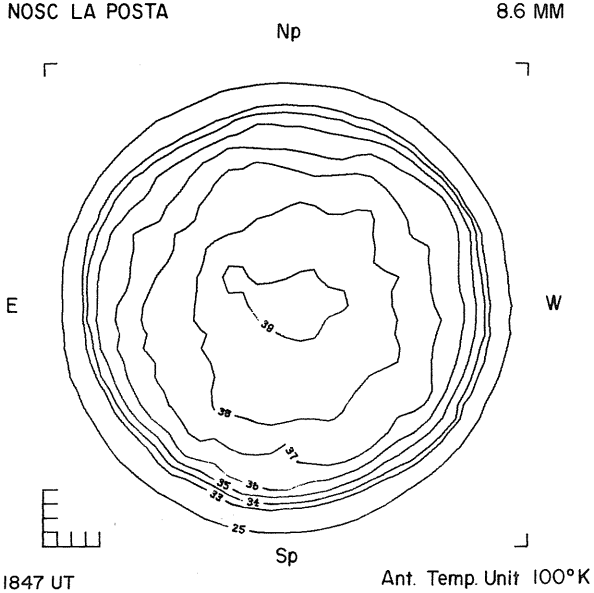


1758 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM

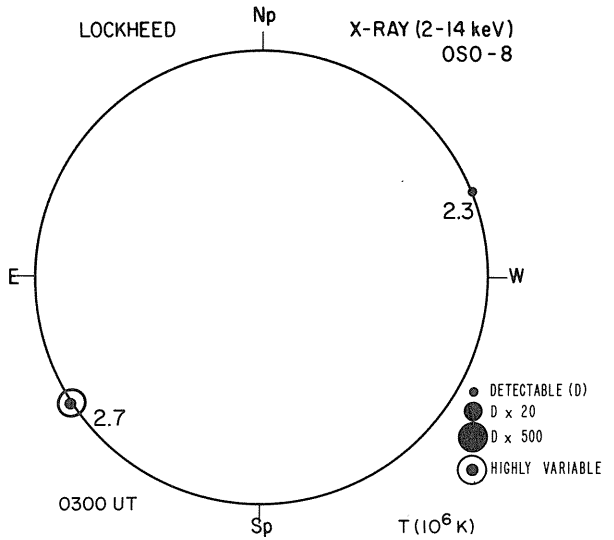


1847 UT

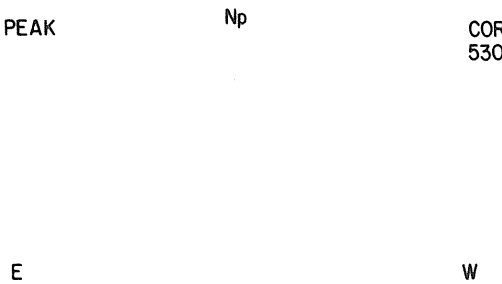
Ant. Temp. Unit 100° K

APRIL 9, 1977 (P =-26.31, B_o =-6.04, L_o =146.76)

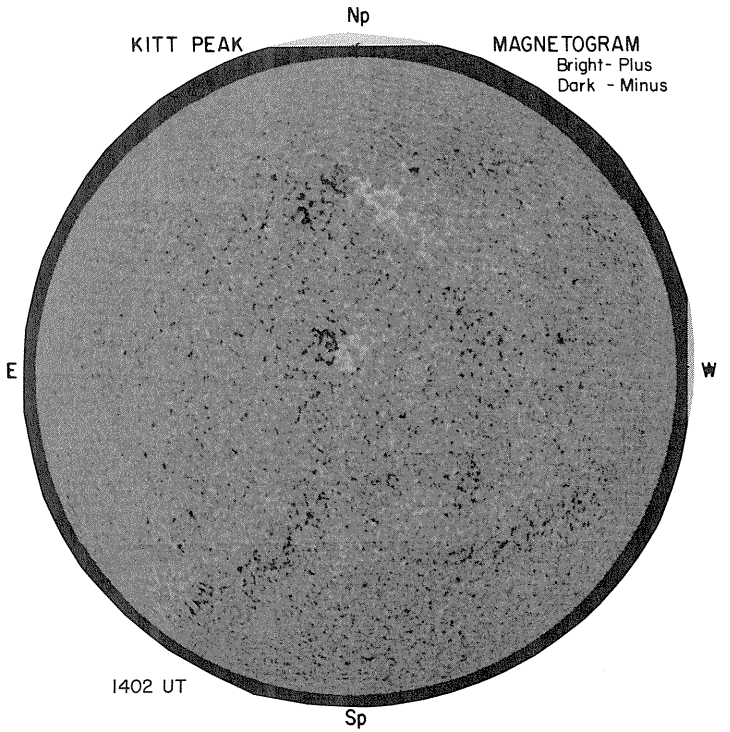
LOCKHEED X-RAY (2-14 keV) OSO-8



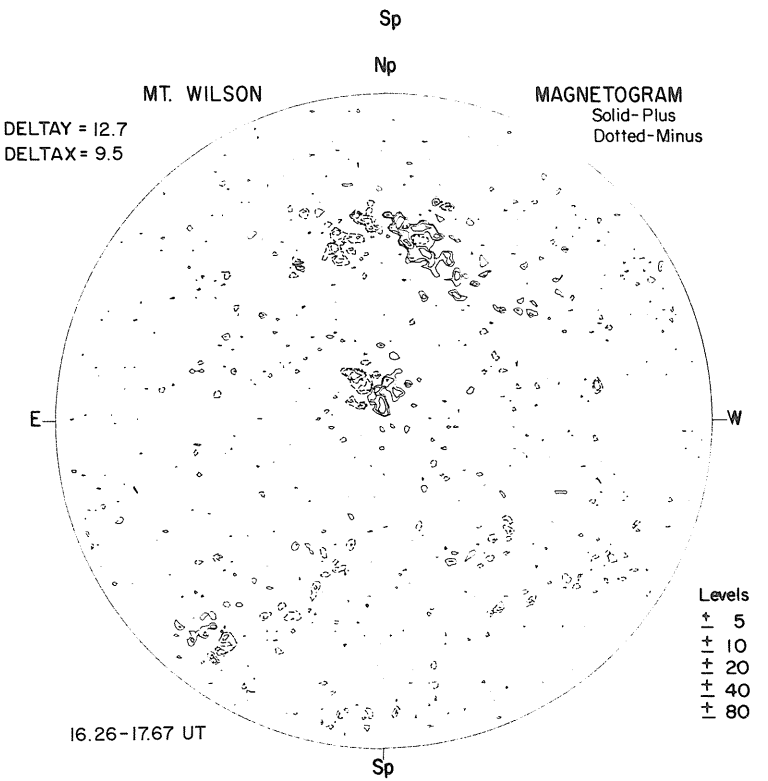
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM Bright-Plus Dark-Minus

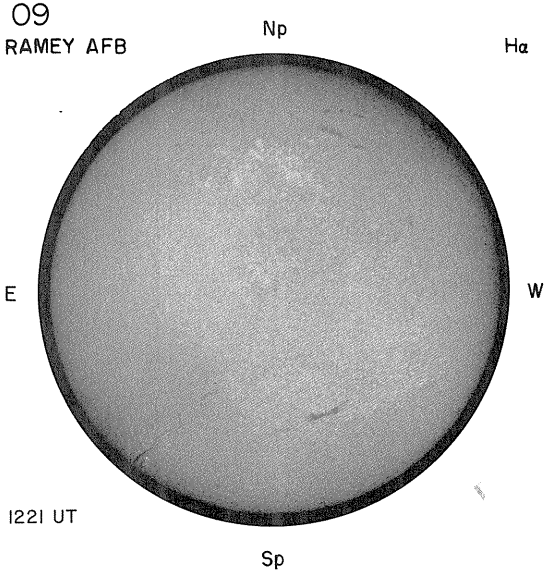


MT. WILSON MAGNETOGRAM Solid-Plus Dotted-Minus



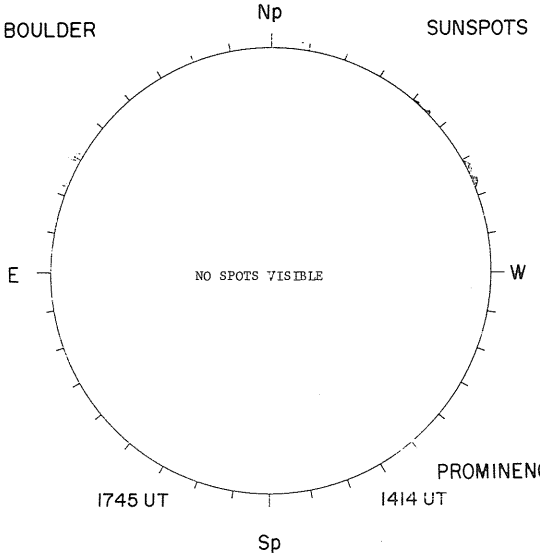
09

RAMEY AFB



1221 UT

BOULDER



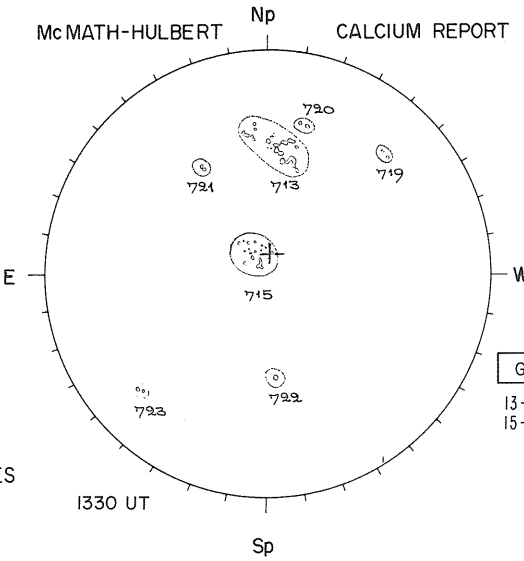
1745 UT

SUNSPOTS

1414 UT

PROMINENCES

McMATH-HULBERT



1330 UT

CALCIUM REPORT

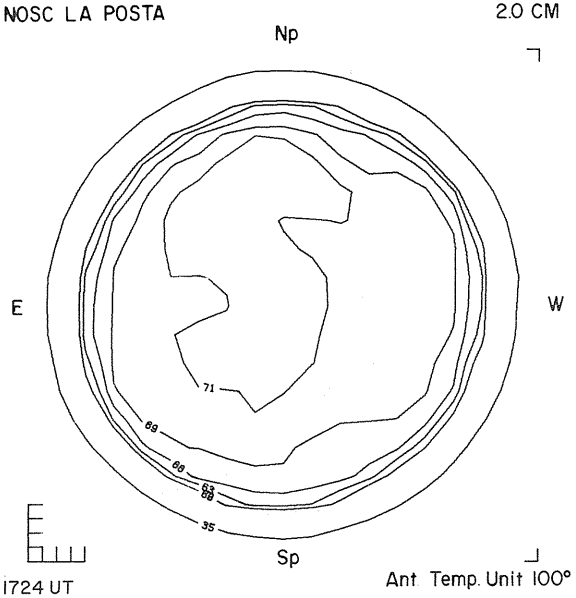
GOOD | M

13-0800-2.5

15-0400-2.5

NOSC LA POSTA

2.0 CM

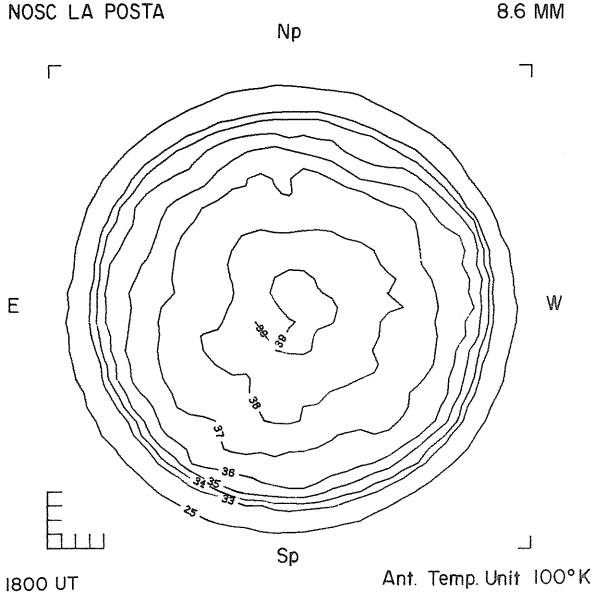


1724 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

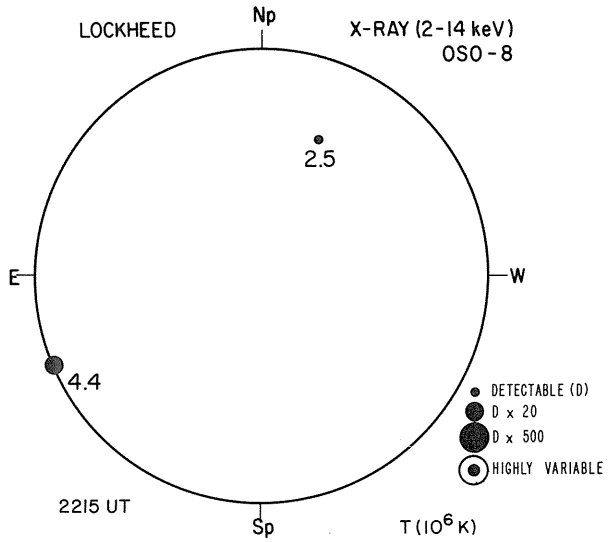
8.6 MM

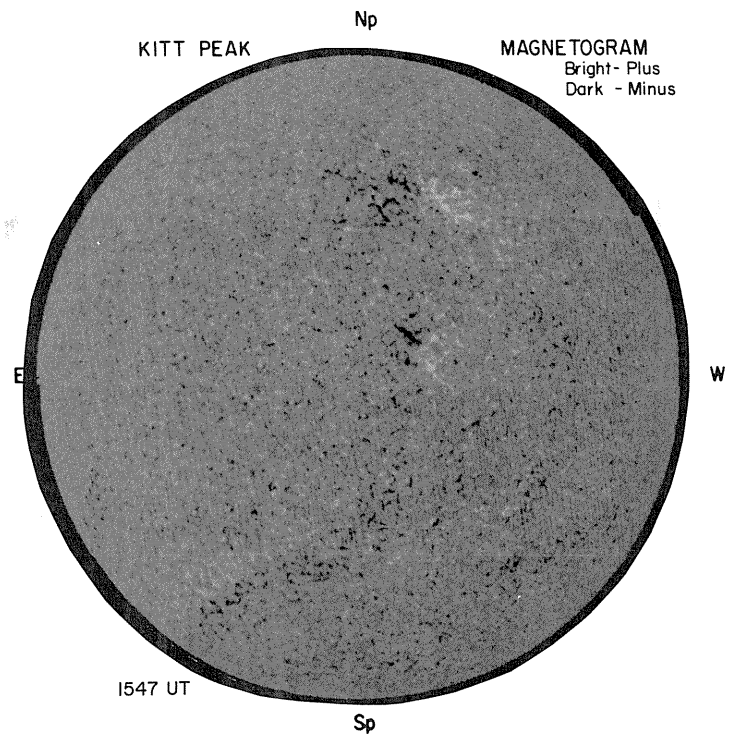


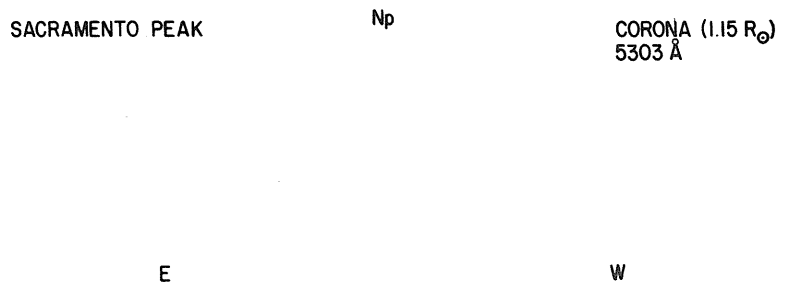
1800 UT

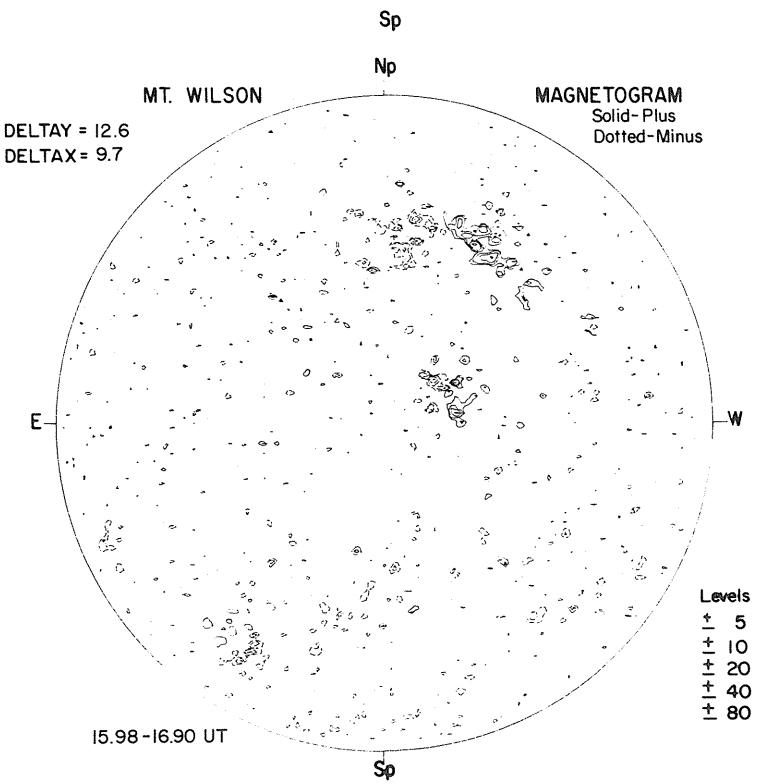
Ant. Temp. Unit 100°K

APRIL 10, 1977 (P =-26.29, B_o =-5.97, L_o =133.56)



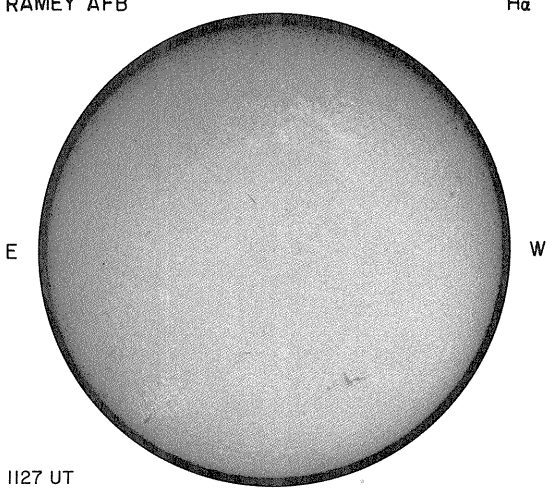




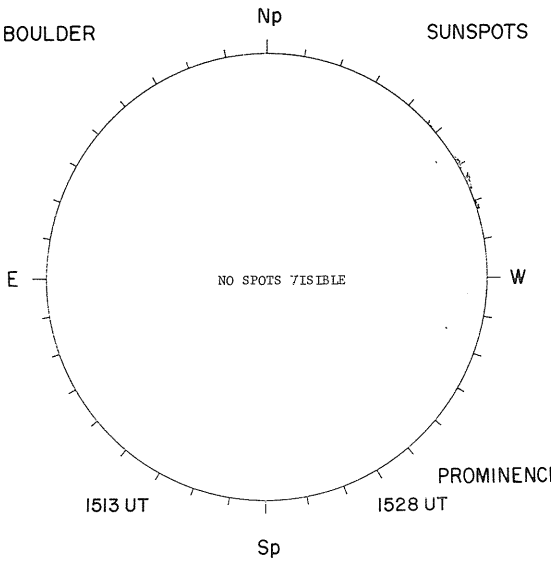


10

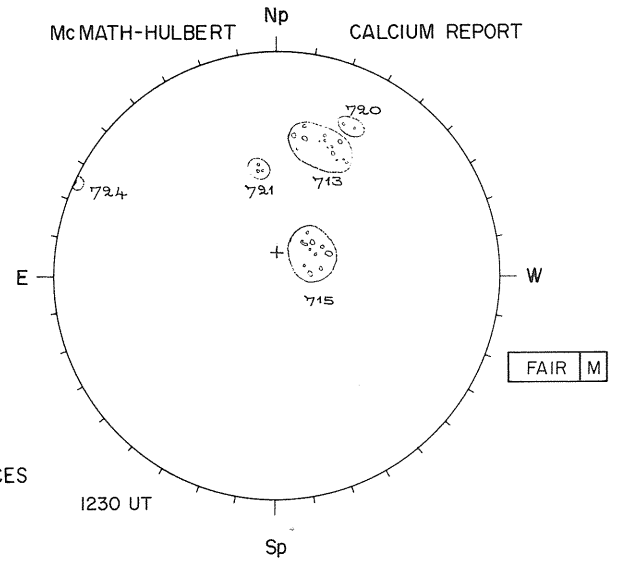
RAMEY AFB



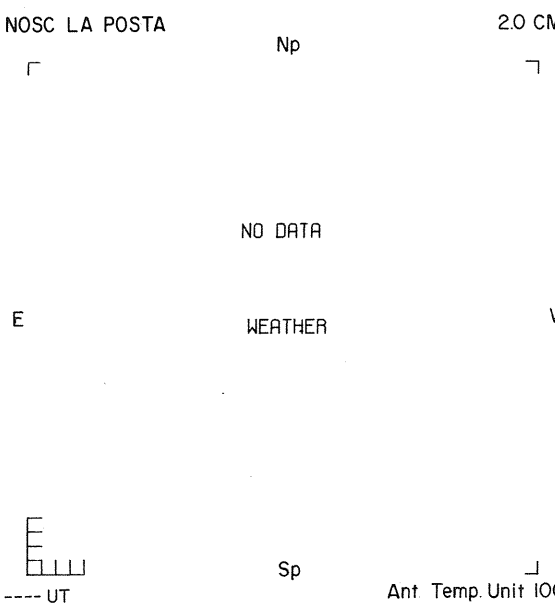
BOULDER SUNSPOTS



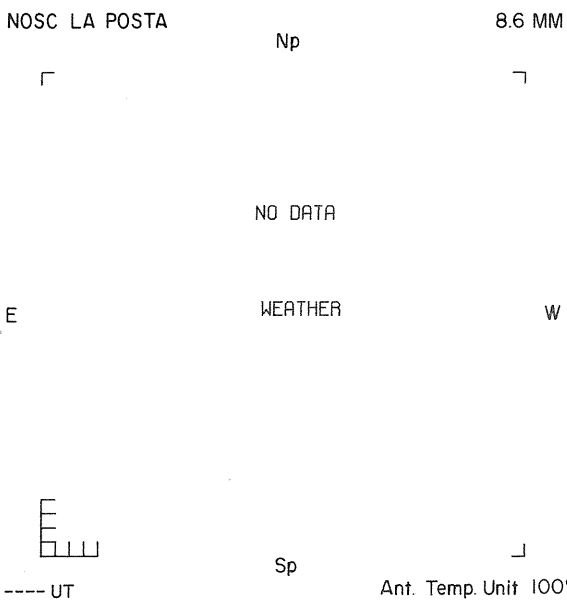
McMATH-HULBERT CALCIUM REPORT



NOSC LA POSTA



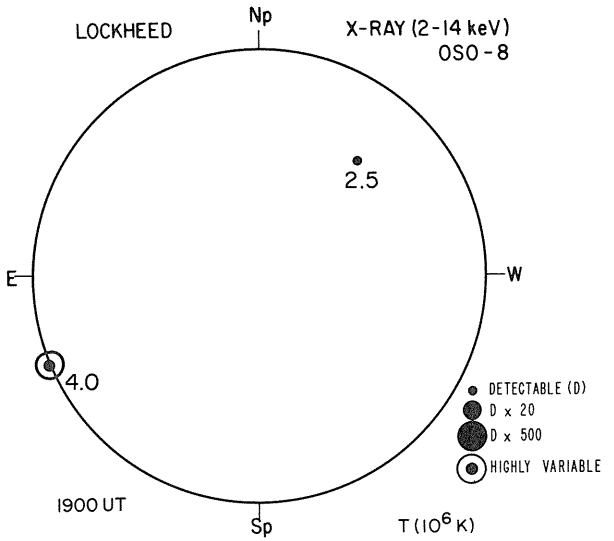
NOSC LA POSTA



APRIL 11, 1977 (P =-26.27, B_o =-5.89, L_o =120.36)

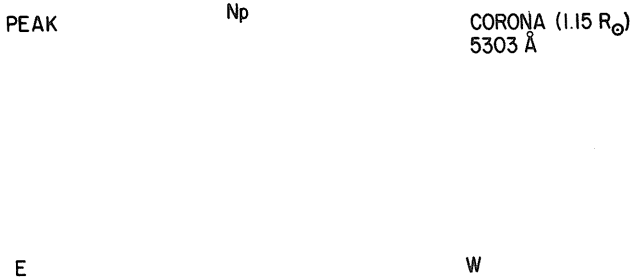
LOCKHEED

X-RAY (2-14 keV)
OSO-8



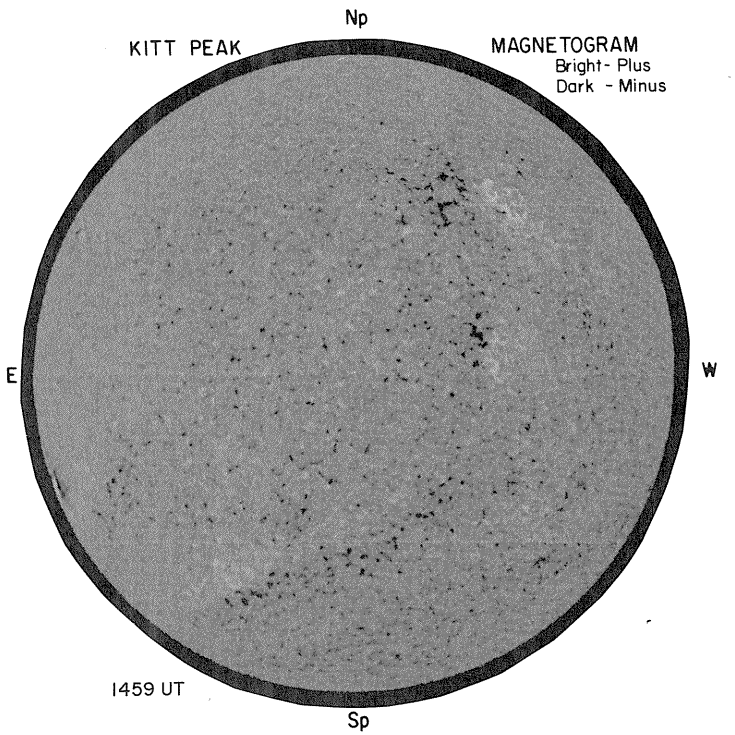
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

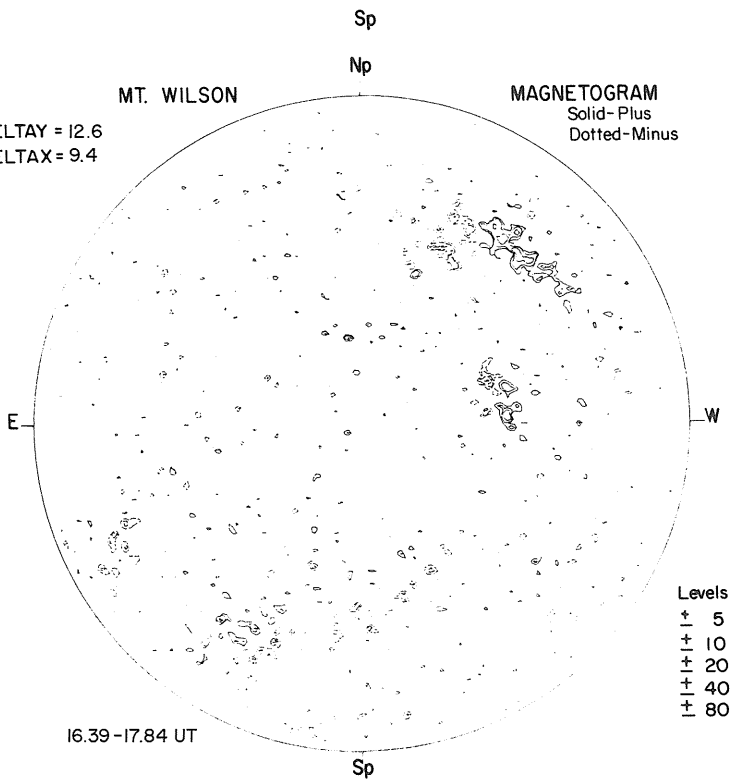
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

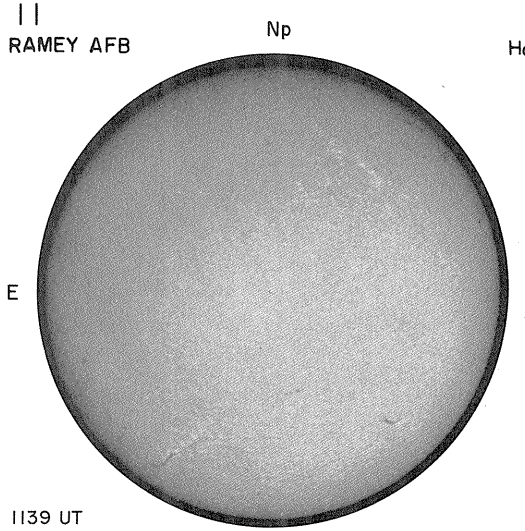
DELTAY = 12.6
DELTAX = 9.4

MAGNETOGRAM
Solid - Plus
Dotted - Minus



RAMEY AFB

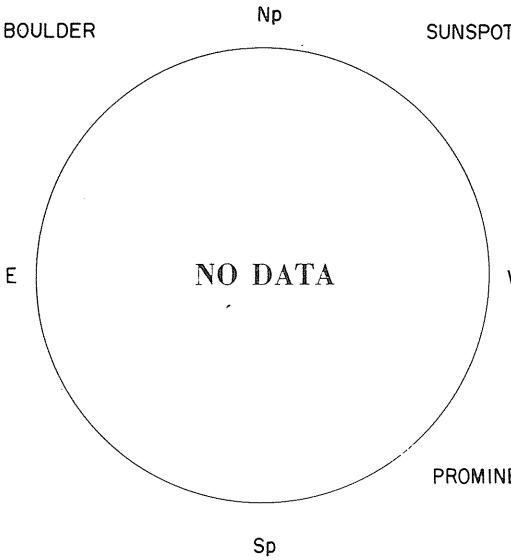
Hα



1139 UT

BOULDER

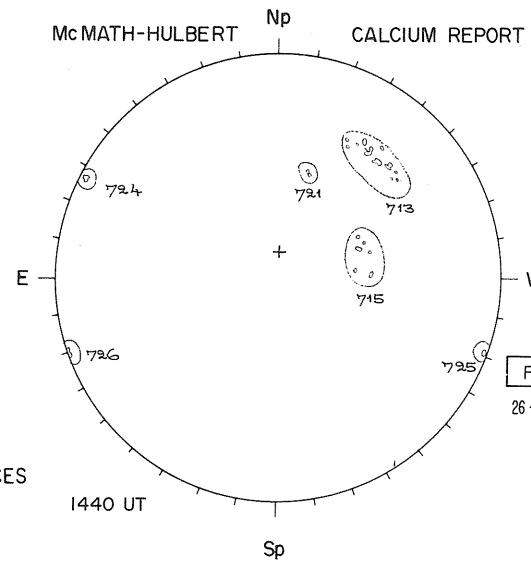
SUNSPOTS



PROMINENCES

McMATH-HULBERT

CALCIUM REPORT



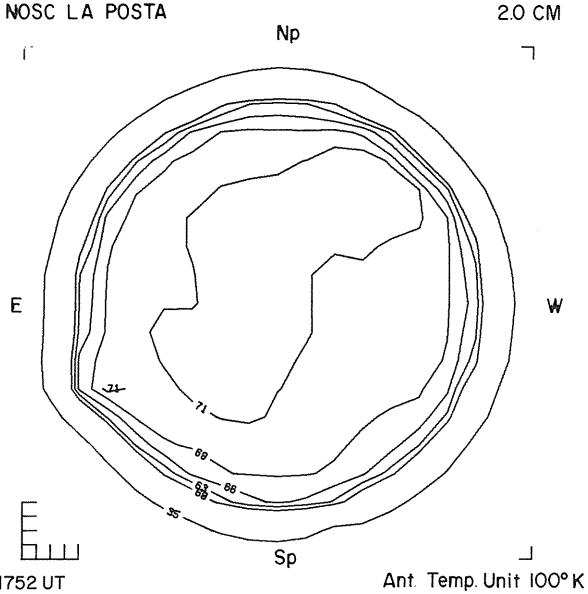
FAIR | S

26 - 0800 - 3.5

1440 UT

NOSC LA POSTA

2.0 CM

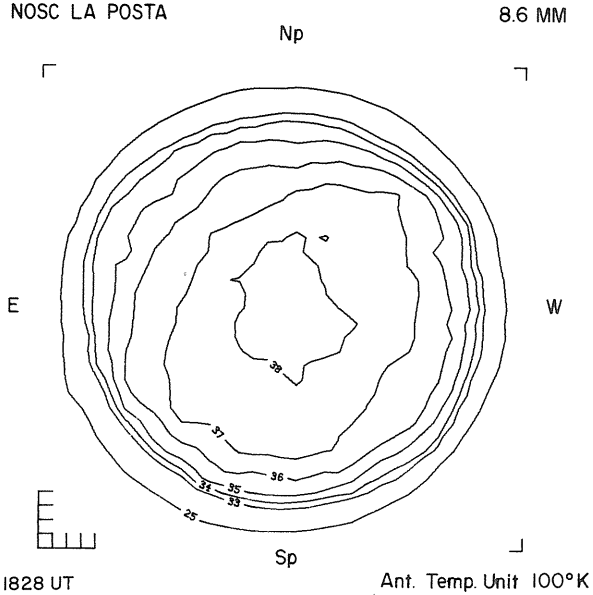


1752 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



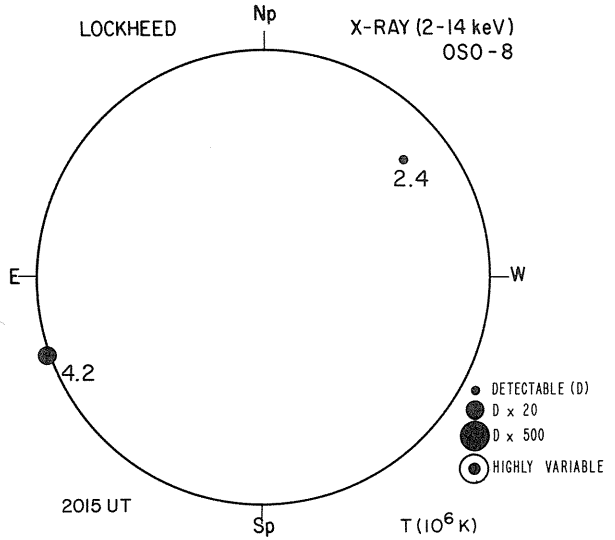
1828 UT

Ant. Temp. Unit 100°K

APRIL 12, 1977 (P =-26.23, B_o =-5.82, L_o =107.16)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

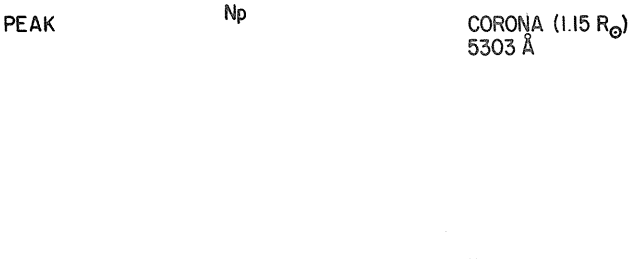


2015 UT

T(10^6 K)

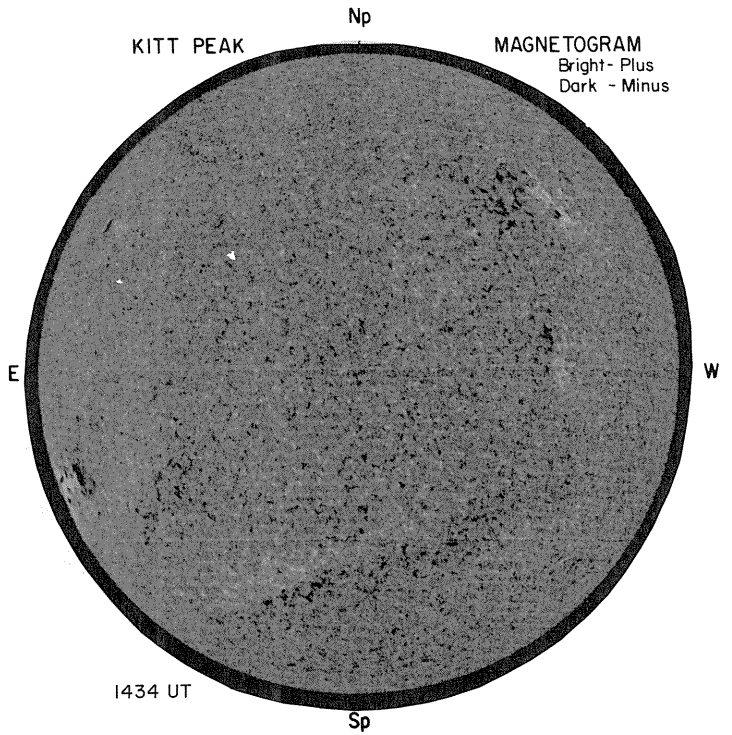
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

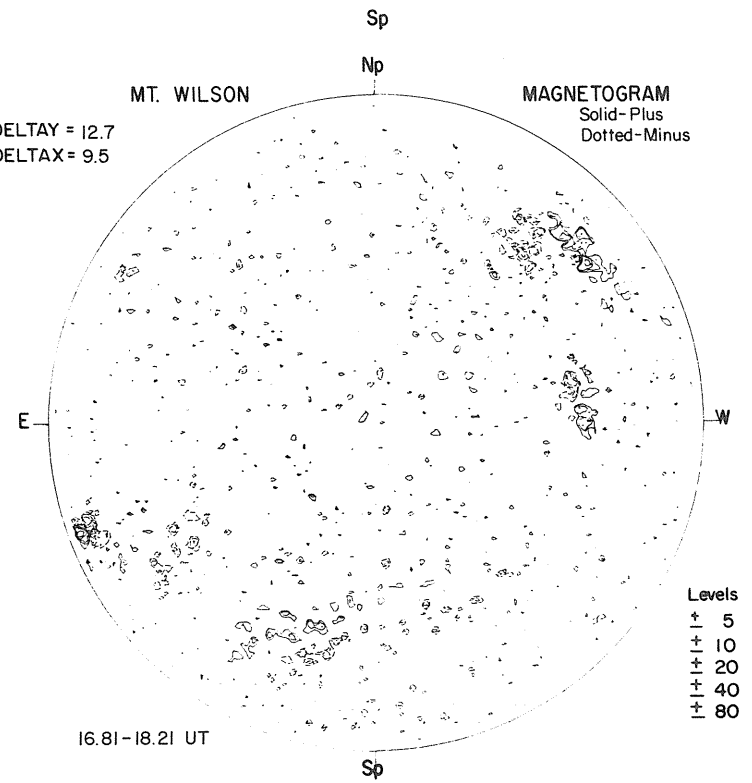


1434 UT

MT. WILSON

DELTAY = 12.7
DELTAX = 9.5

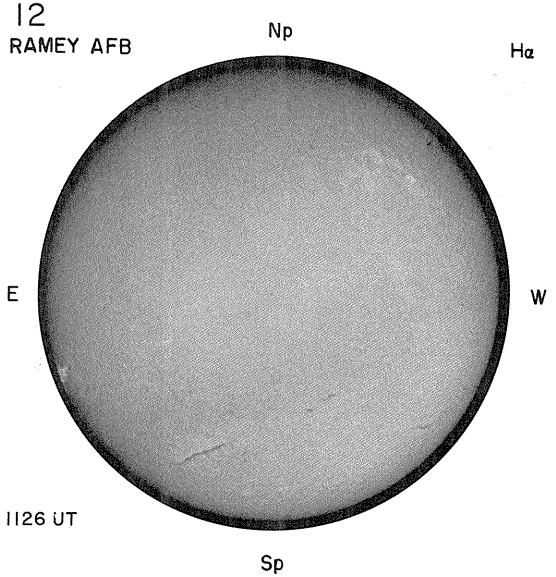
MAGNETOGRAM
Solid - Plus
Dotted - Minus



16.81 - 18.21 UT

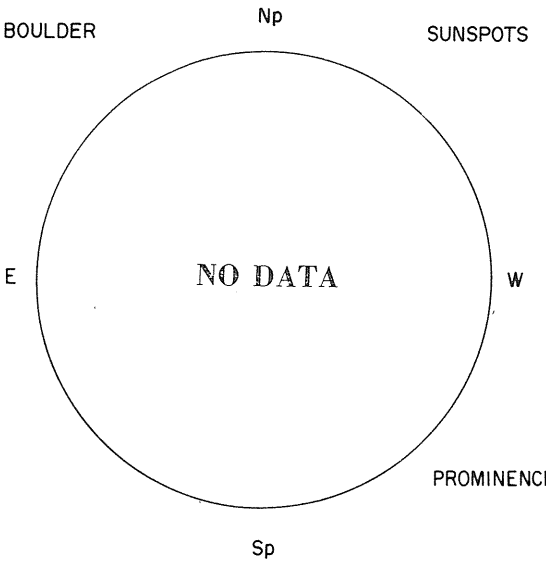
12

RAMEY AFB



1126 UT

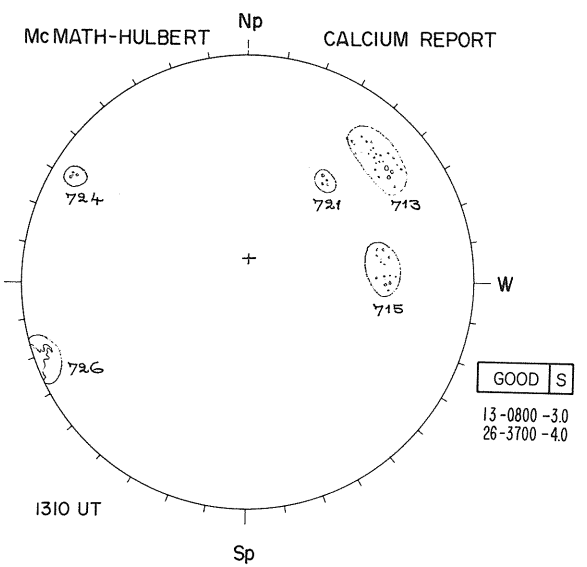
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT CALCIUM REPORT

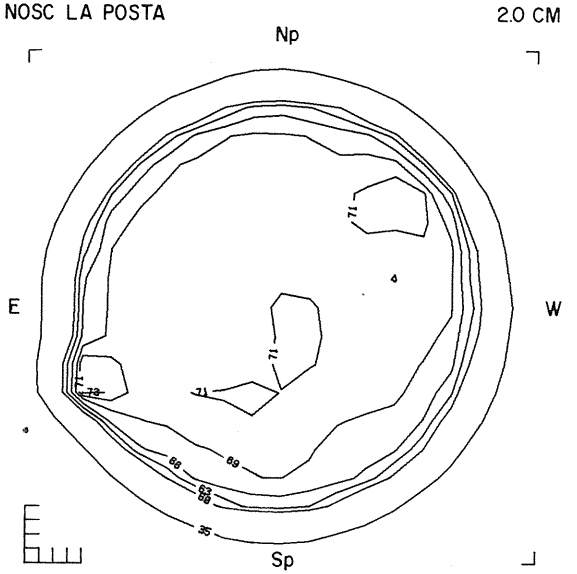


GOOD | S

13-0800 -3.0
26-3700 -4.0

1310 UT

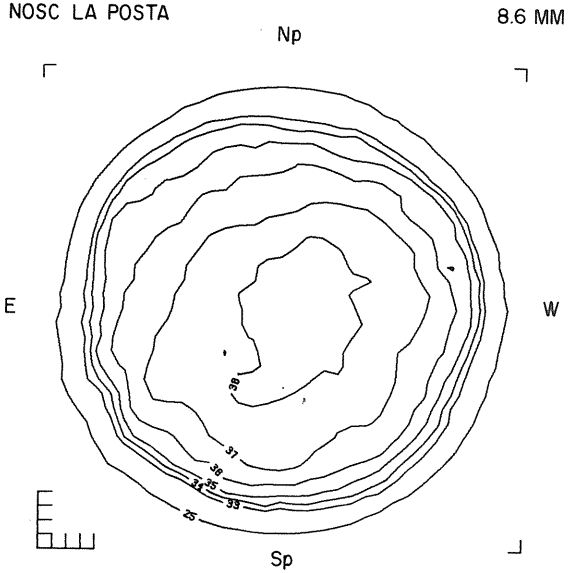
NOSC LA POSTA 2.0 CM



1700 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

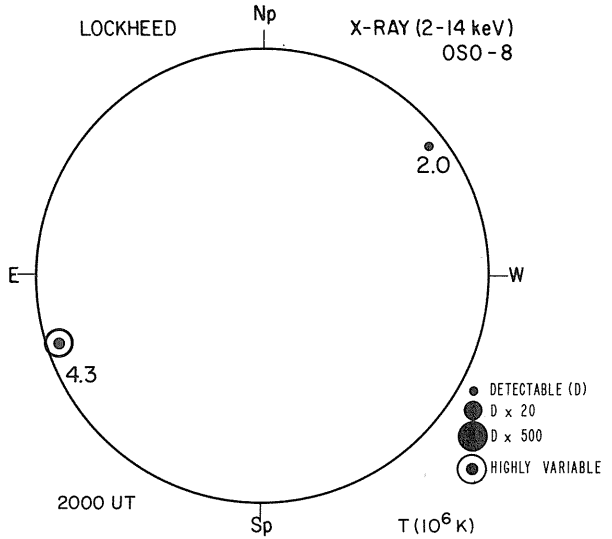


1734 UT

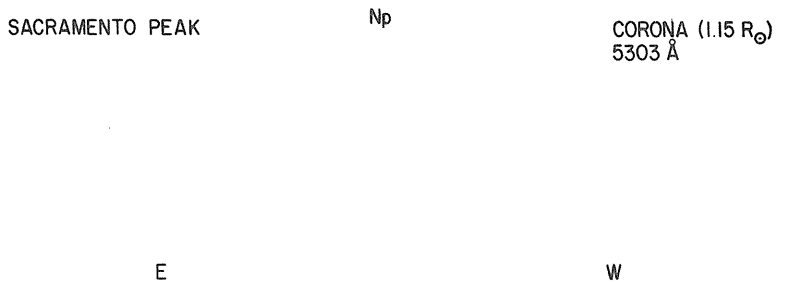
Ant. Temp. Unit 100°K

APRIL 13, 1977 (P =-26.19, B_o =-5.75, L_o =93.96)

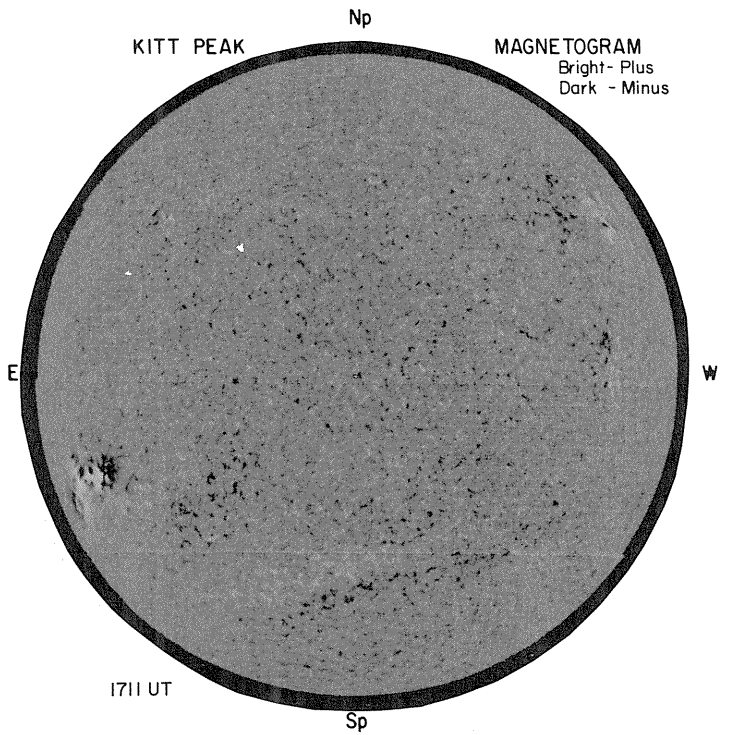
LOCKHEED X-RAY (2-14 keV) OSO-8



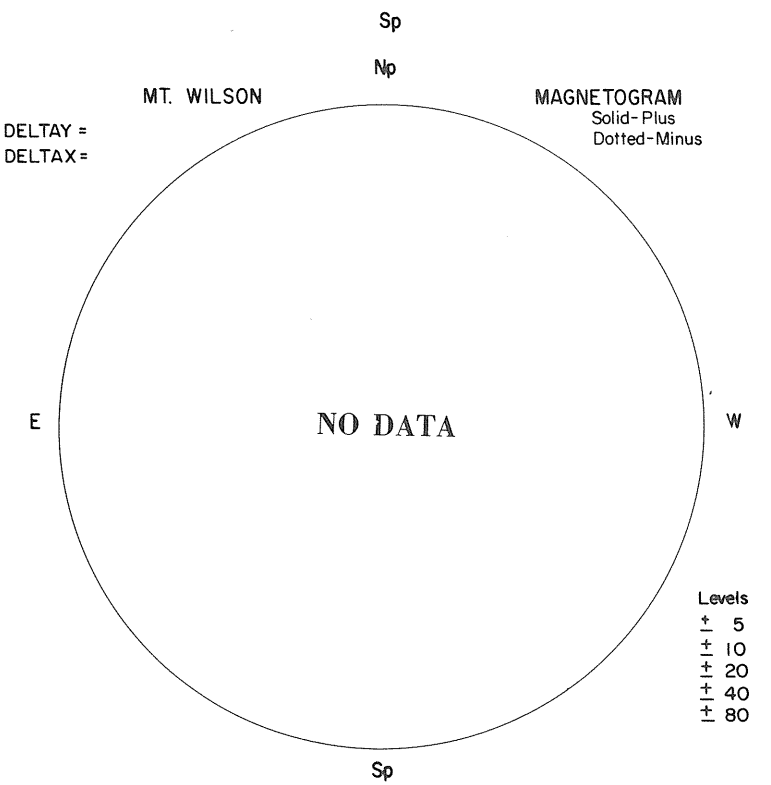
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright- Plus
Dark - Minus

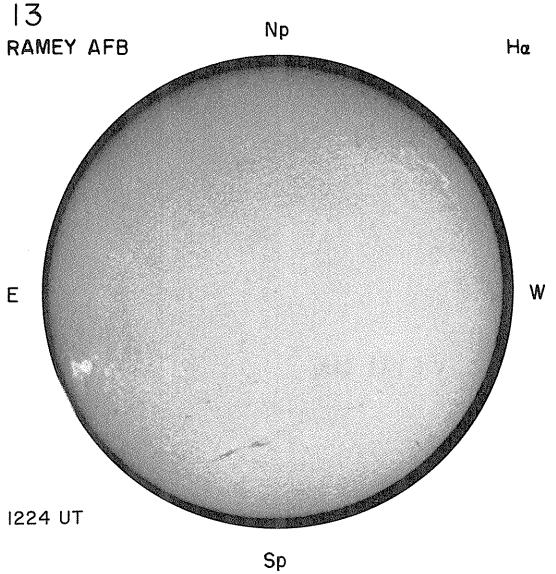


MT. WILSON MAGNETOGRAM
Solid- Plus
Dotted-Minus
DELTAY =
DELTAX =



13

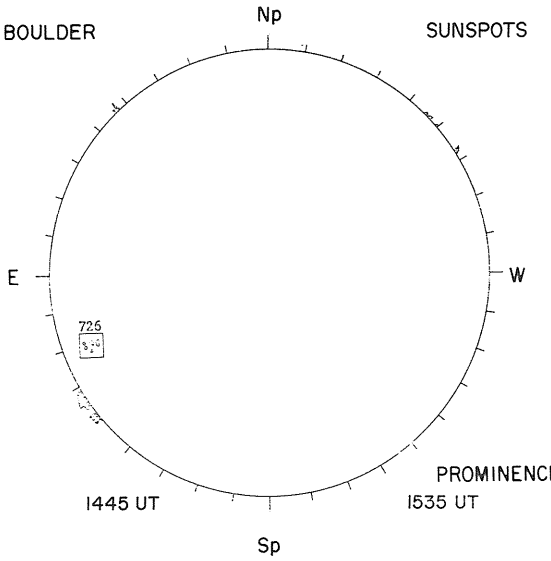
RAMEY AFB



1224 UT

Hα

BOULDER



1445 UT

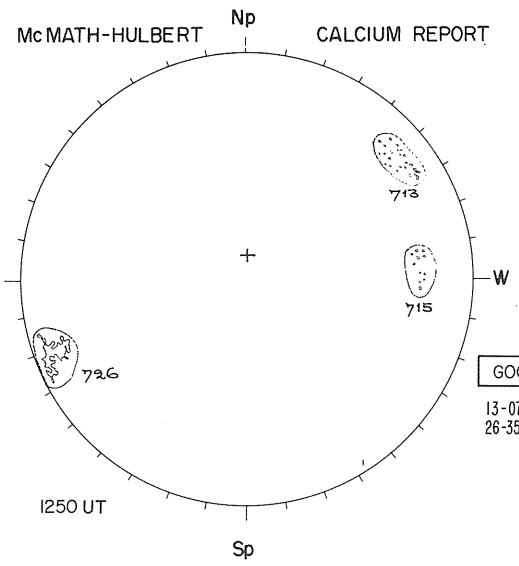
SUNSPOTS

PROMINENCES

1535 UT

McMATH-HULBERT

CALCIUM REPORT



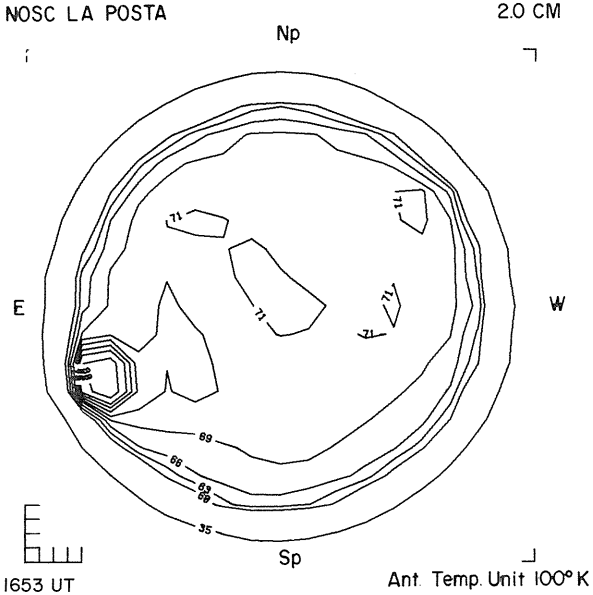
1250 UT

GOOD | S

13-0700 - 2.5
26-3500 - 3.5

NOSC LA POSTA

2.0 CM

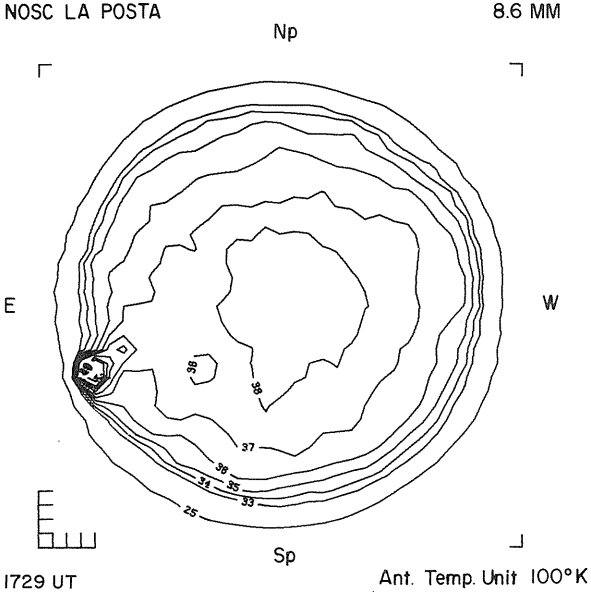


1653 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



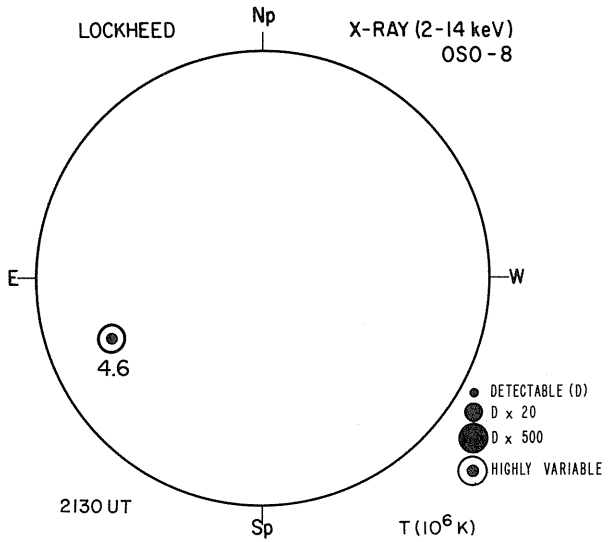
1729 UT

Ant. Temp. Unit 100° K

APRIL 14, 1977 (P =-26.14, B_o =-5.67, L_o =80.76)

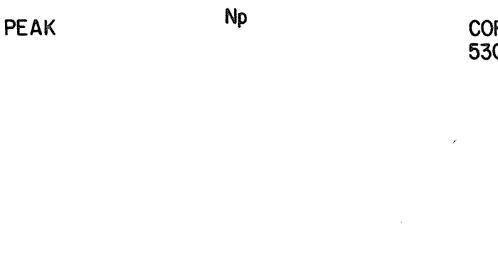
LOCKHEED

X-RAY (2-14 keV)
OSO-8



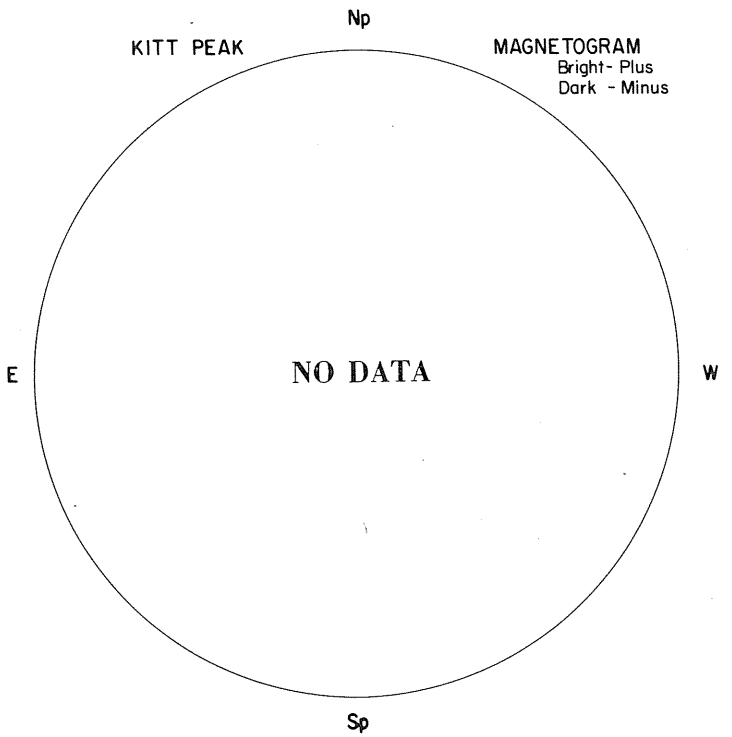
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

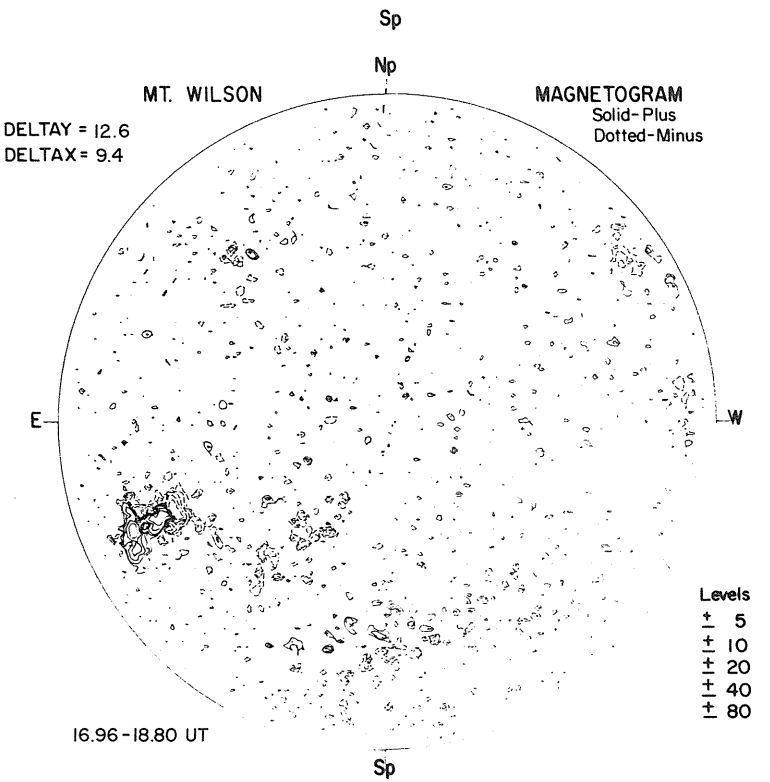
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

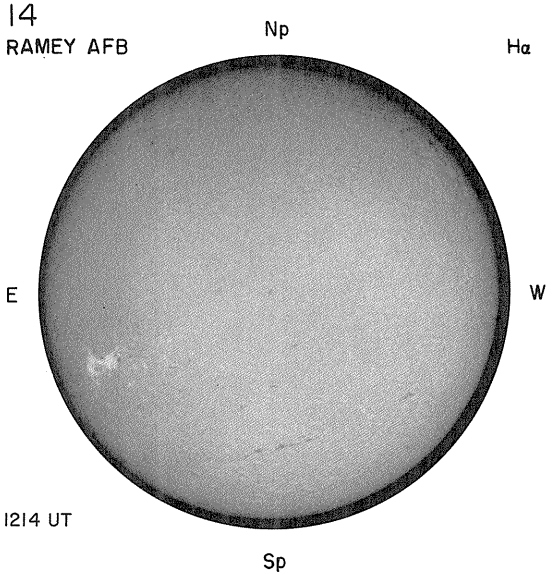
DELTAY = 12.6
DELTAX = 9.4

MAGNETOGRAM
Solid- Plus
Dotted-Minus



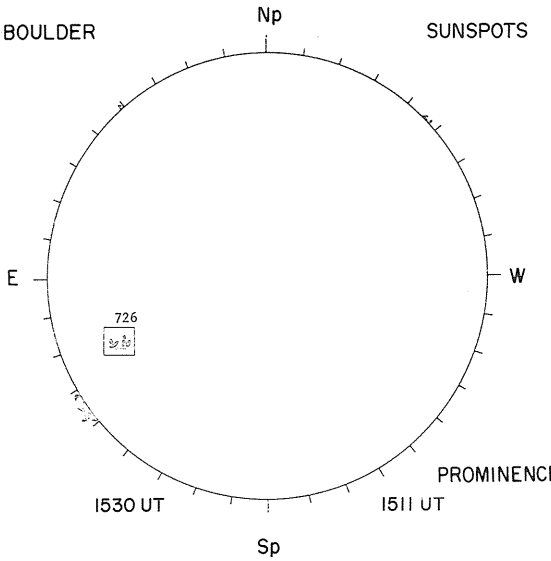
14

RAMEY AFB



1214 UT

BOULDER SUNSPOTS

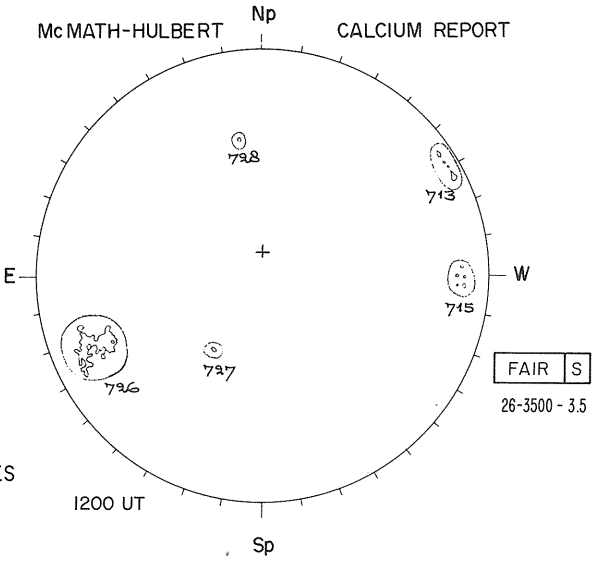


1530 UT

PROMINENCES

1511 UT

McMATH-HULBERT CALCIUM REPORT

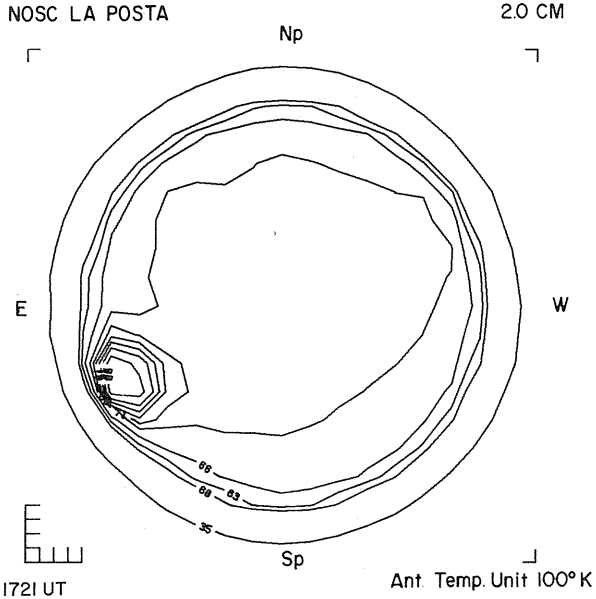


1200 UT

FAIR | S

26-3500 - 3.5

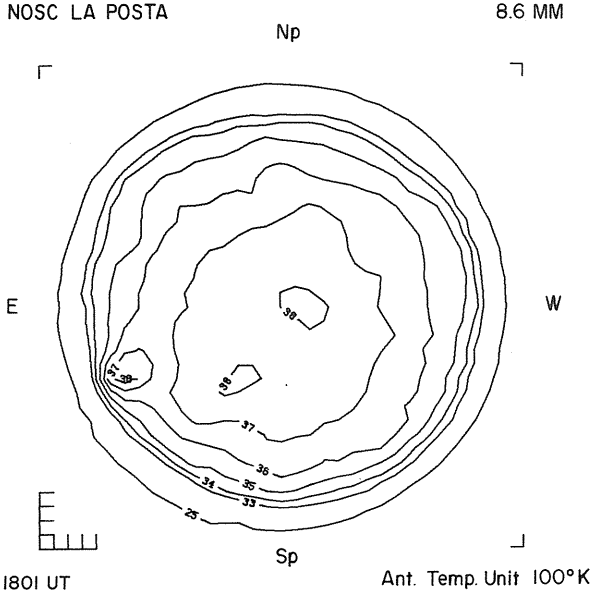
NOSC LA POSTA 2.0 CM



1721 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA 8.6 MM



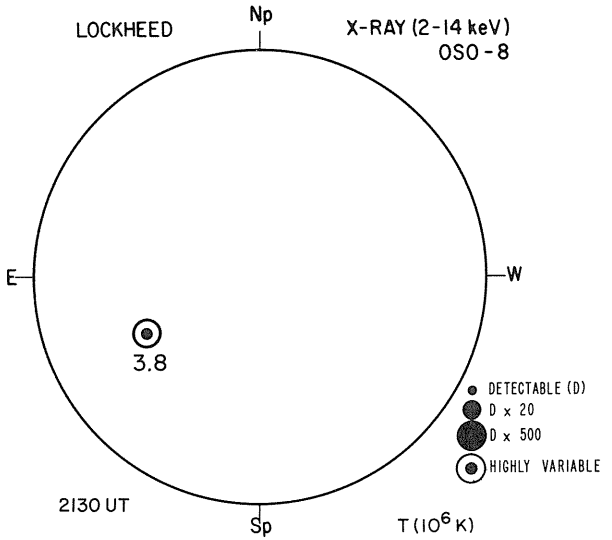
1801 UT

Ant. Temp. Unit 100° K

APRIL 15, 1977 (P =-26.09, B_o =-5.59, L_o =67.55)

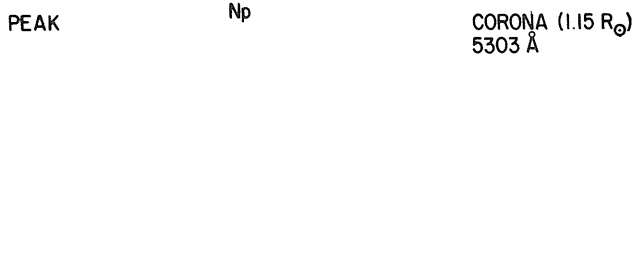
LOCKHEED

X-RAY (2-14 keV)
OSO-8



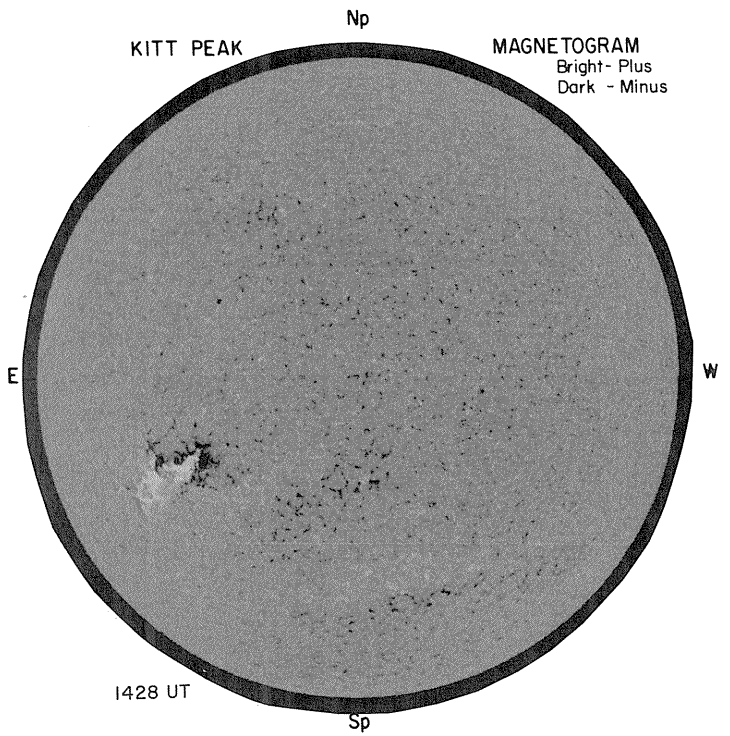
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

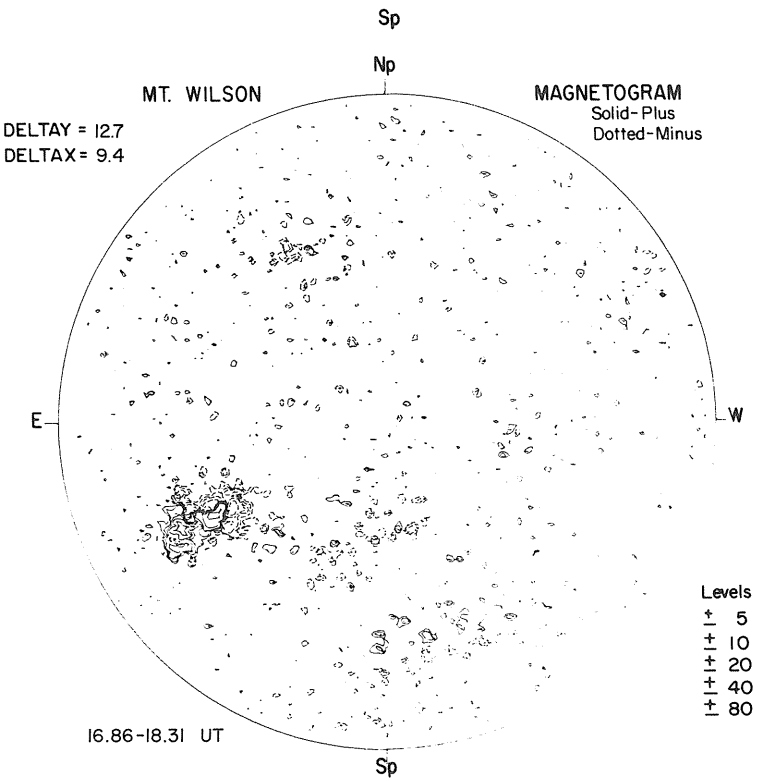
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

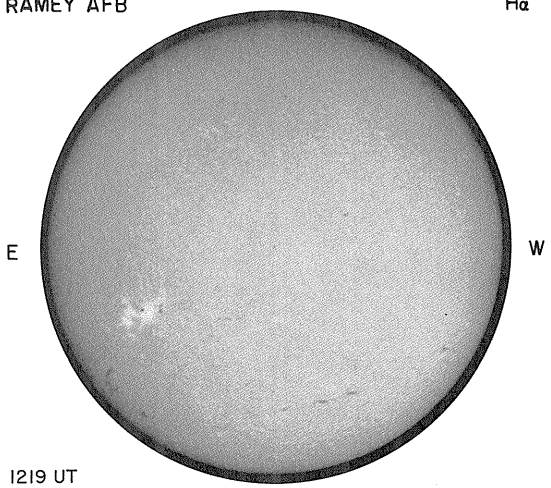
DELTAY = 12.7
DELTAX = 9.4

MAGNETOGRAM
Solid- Plus
Dotted-Minus



15

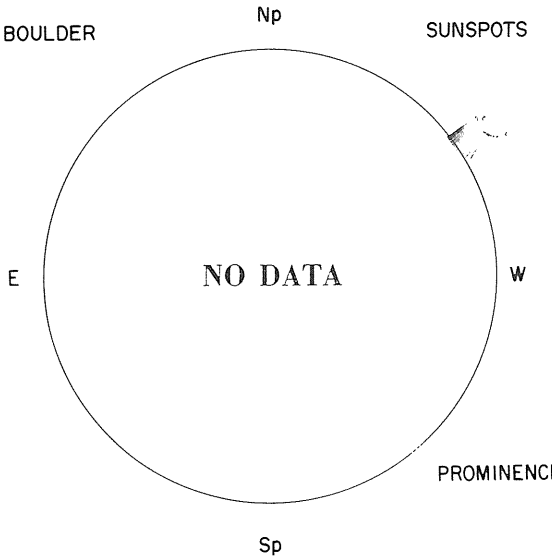
RAMEY AFB



1219 UT

Hα

BOULDER

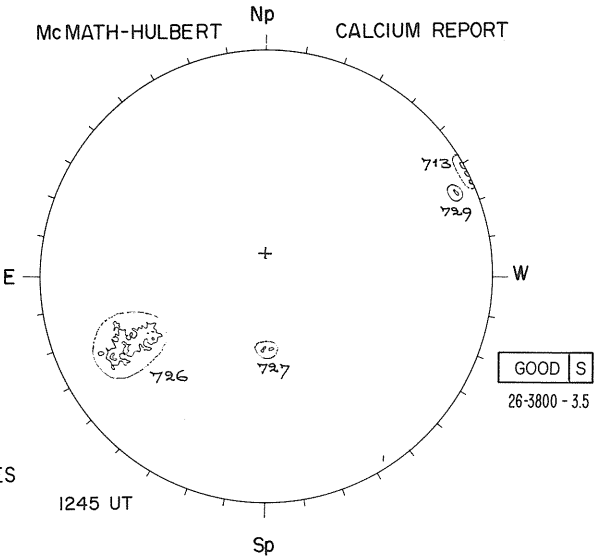


SUNSPOTS

PROMINENCES

McMATH-HULBERT

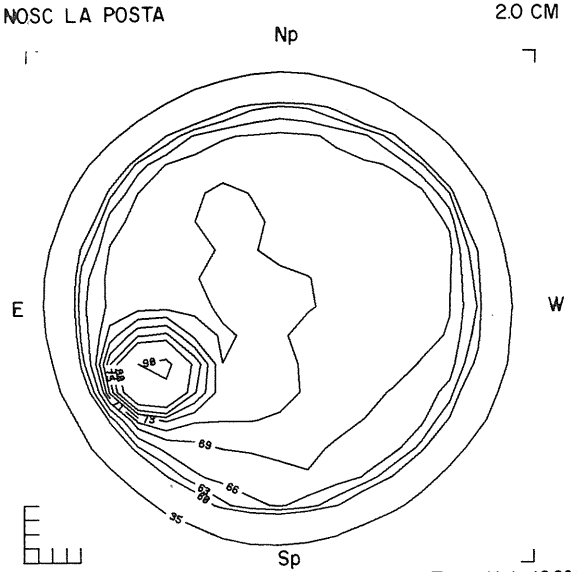
CALCIUM REPORT



1245 UT

NOSC LA POSTA

2.0 CM

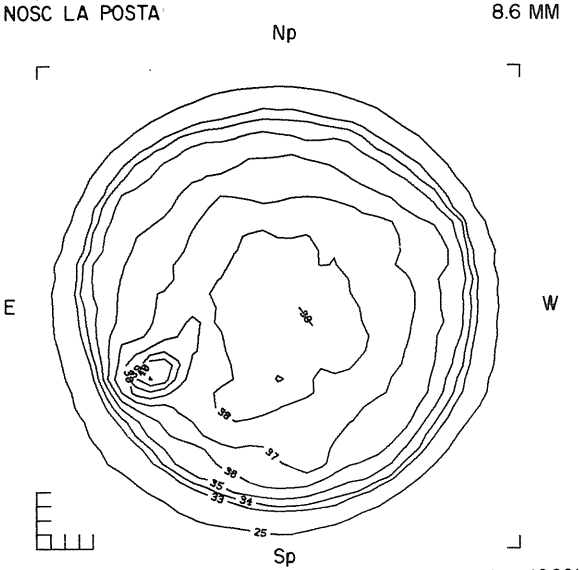


1725 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM

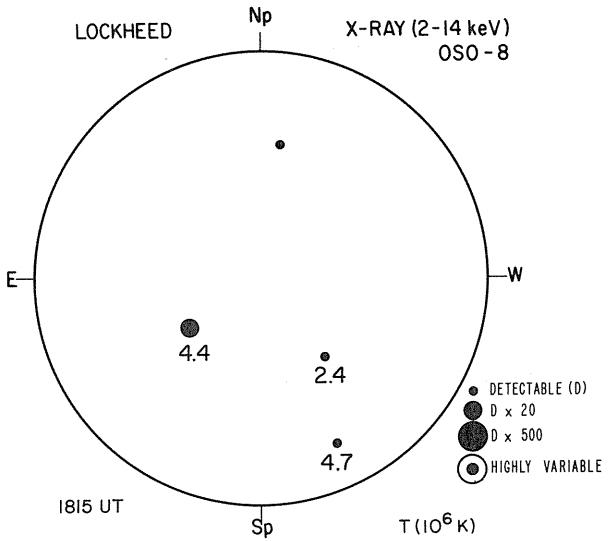


1800 UT

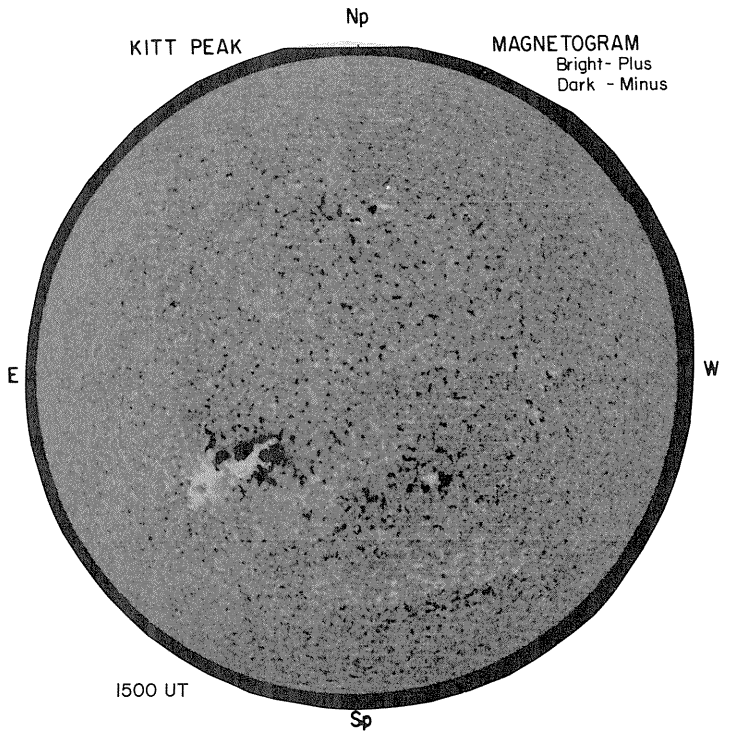
Ant. Temp. Unit 100° K

APRIL 16, 1977 (P =-26.03, B_o =-5.51, L_o =54.35)

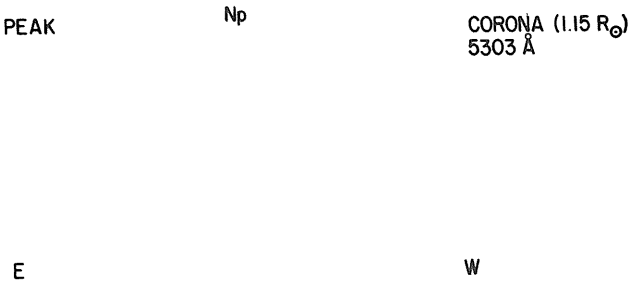
LOCKHEED X-RAY (2-14 keV) OSO-8



KITT PEAK MAGNETOGRAM Bright- Plus Dark - Minus

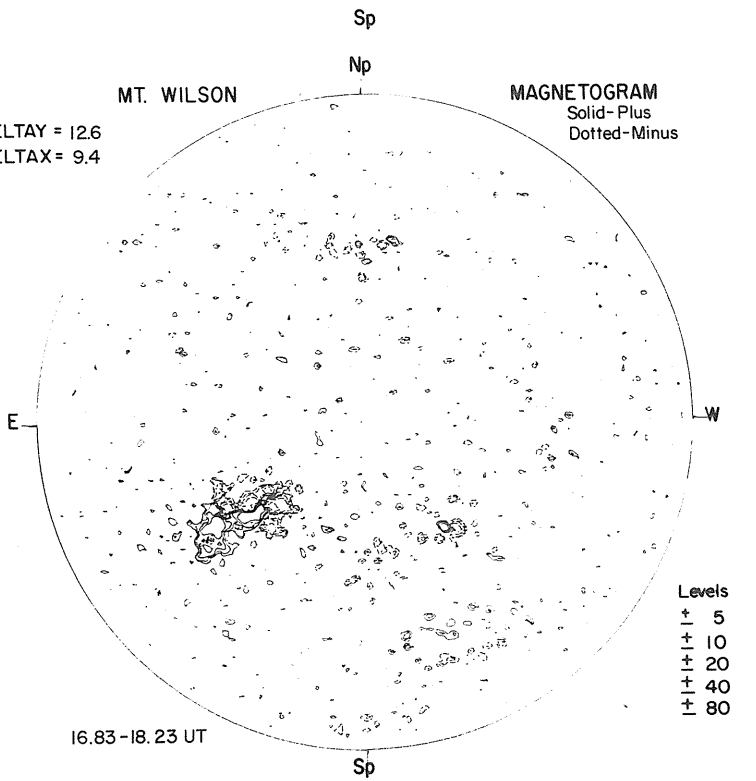


SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



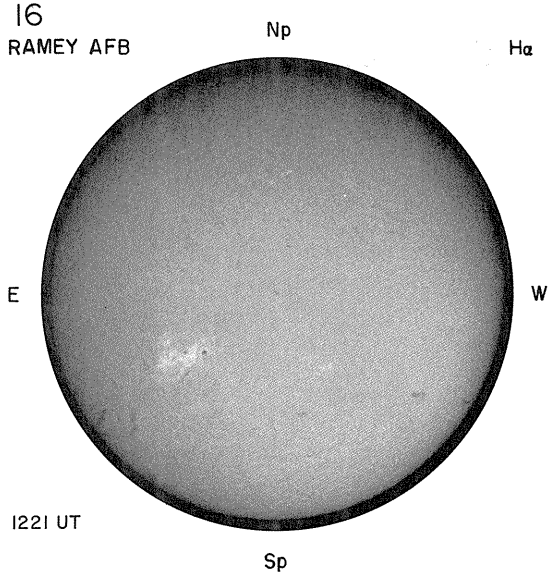
MT. WILSON MAGNETOGRAM Solid- Plus Dotted- Minus

DELTAY = 12.6
DELTAX = 9.4

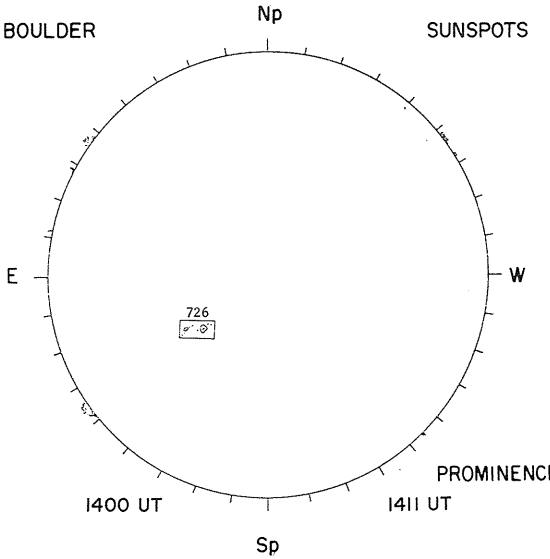


16

RAMEY AFB

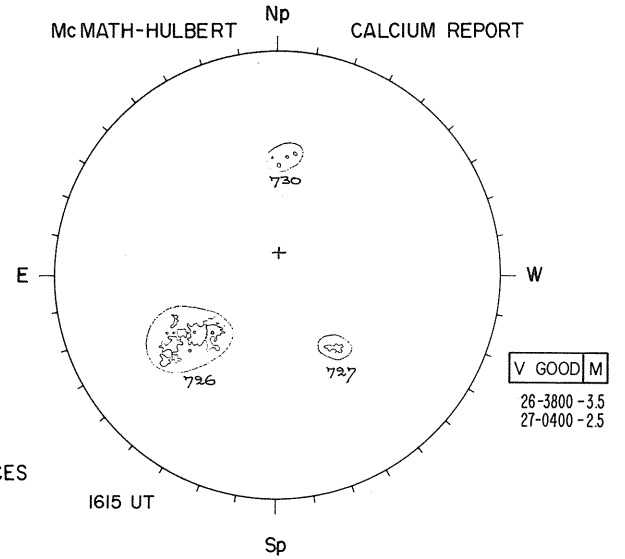


BOULDER SUNSPOTS

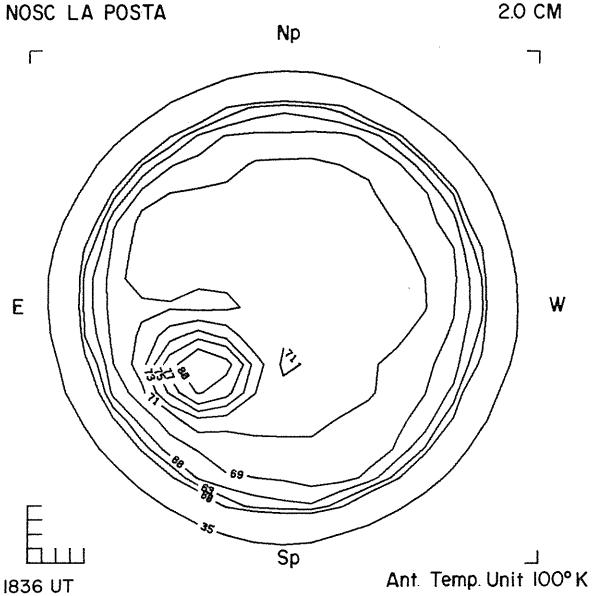


PROMINENCES

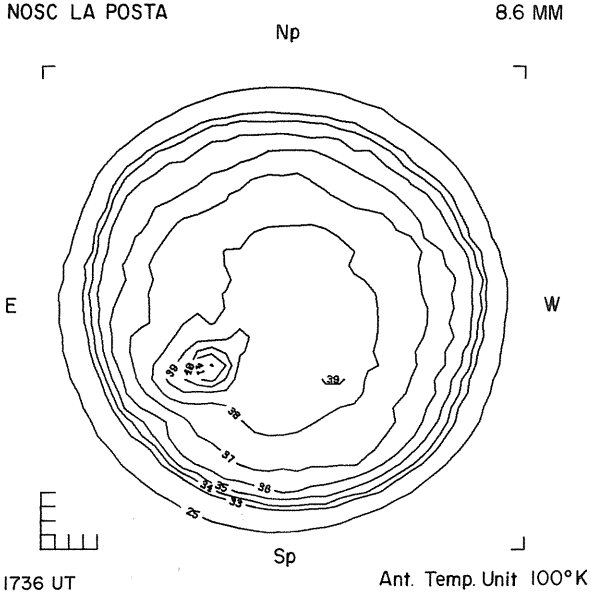
McMATH-HULBERT CALCIUM REPORT



NOSC LA POSTA 2.0 CM



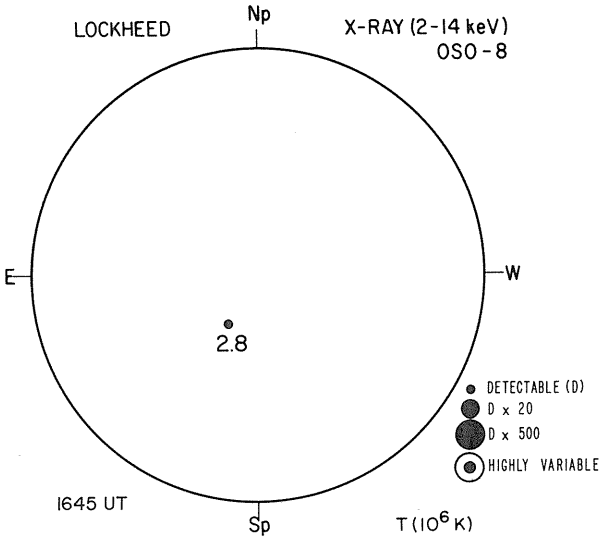
NOSC LA POSTA 8.6 MM



APRIL 17, 1977 (P =-25.96, B_o =-5.43, L_o =41.14)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

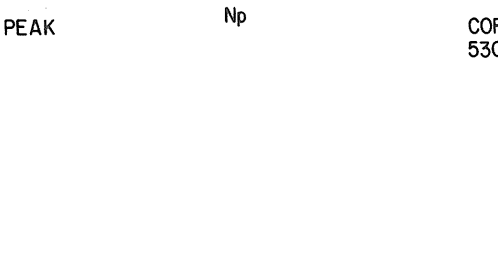


1645 UT

T (10^6 K)

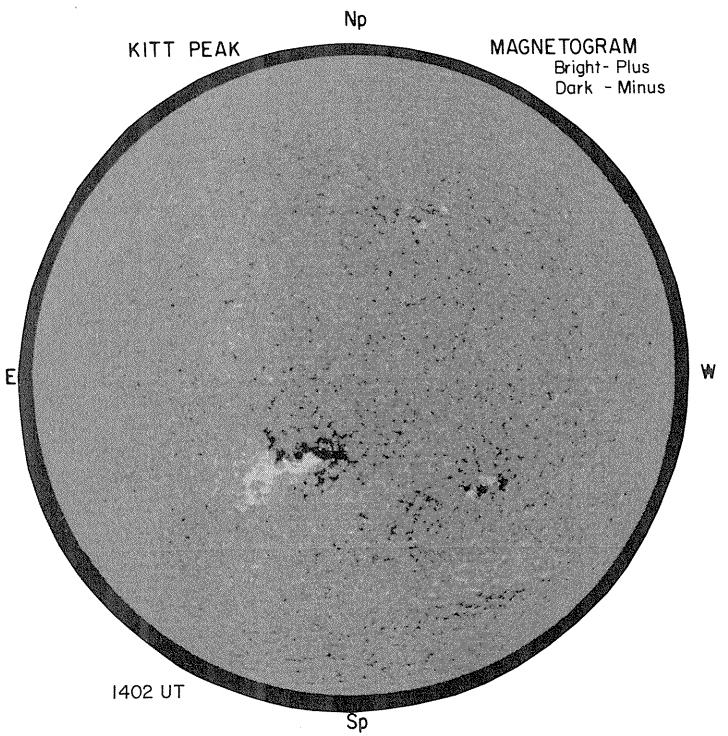
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright- Plus
Dark - Minus

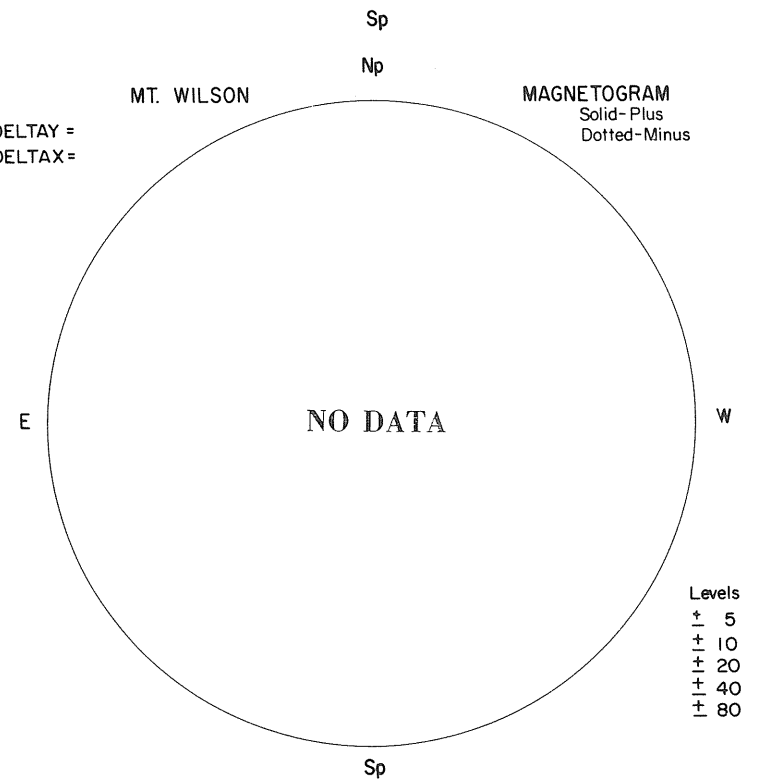


1402 UT

MT. WILSON

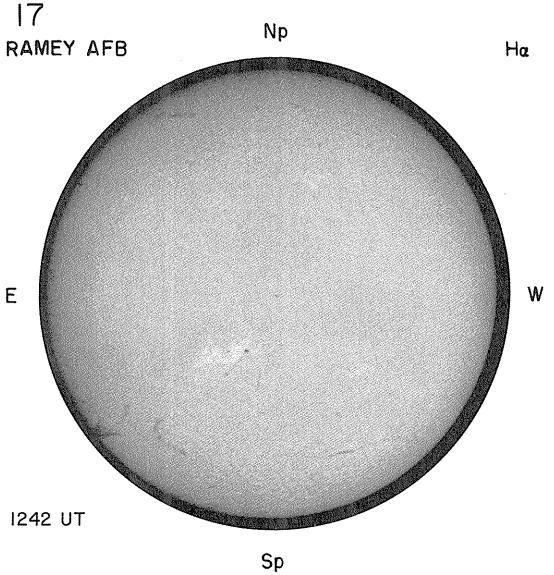
DELTAY =
DELTAX =

MAGNETOGRAM
Solid- Plus
Dotted-Minus



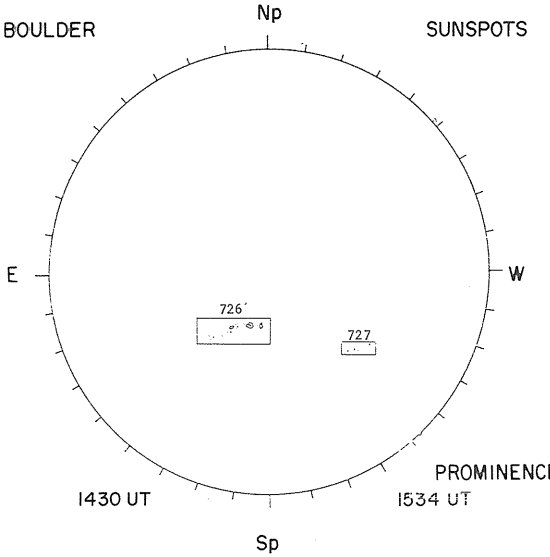
17

RAMEY AFB



1242 UT

BOULDER

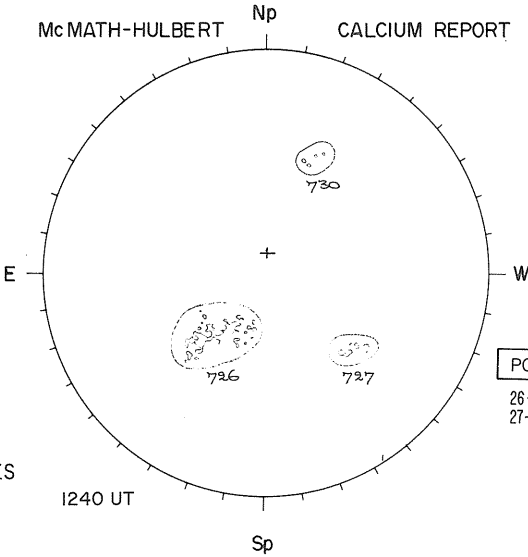


1430 UT

SUNSPOTS

1534 UT

McMATH-HULBERT



1240 UT

CALCIUM REPORT

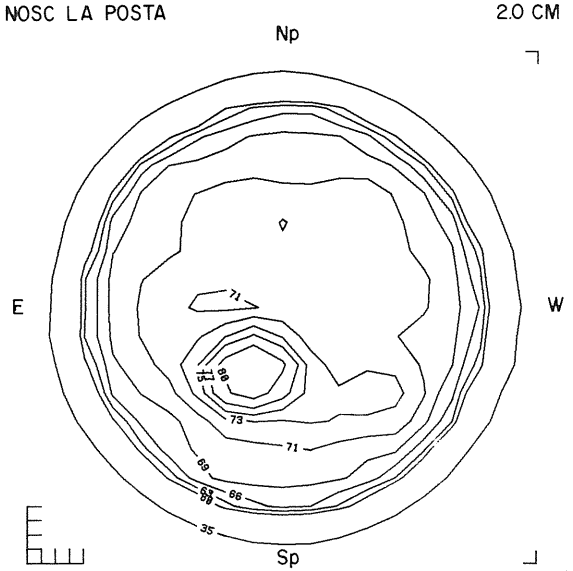
POOR	M

26-3200-3.0
27-0500-2.5

PROMINENCES

NOSC LA POSTA

2.0 CM

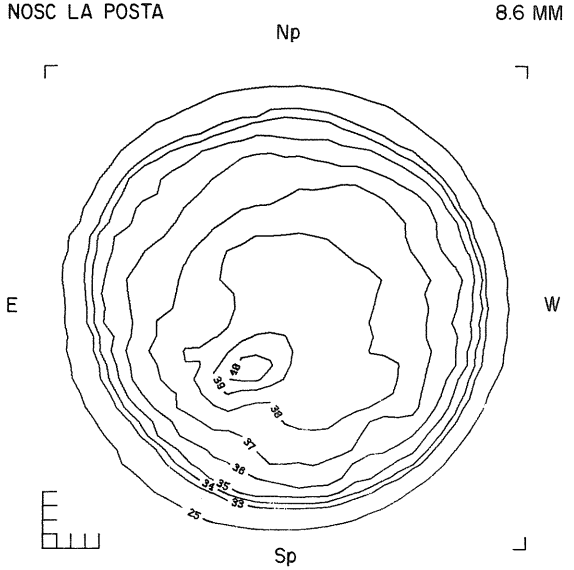


1931 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

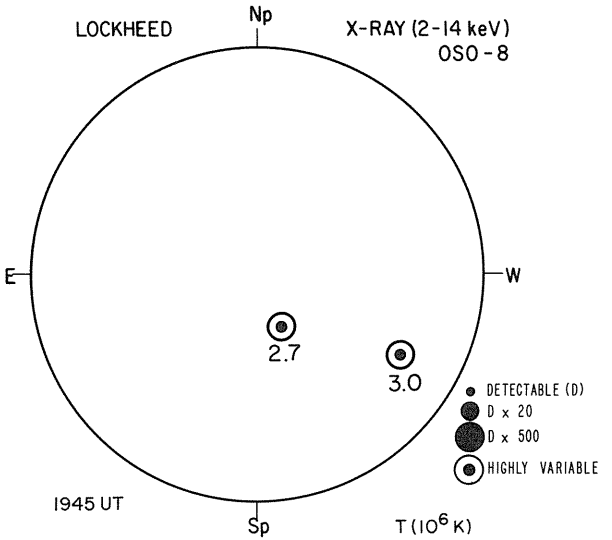


1832 UT

Ant. Temp. Unit 100°K

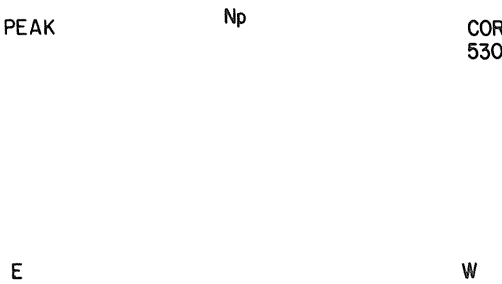
APRIL 18, 1977 (P =-25.88, B_o =-5.35, L_o =27.94)

LOCKHEED
X-RAY (2-14 keV)
OSO-8

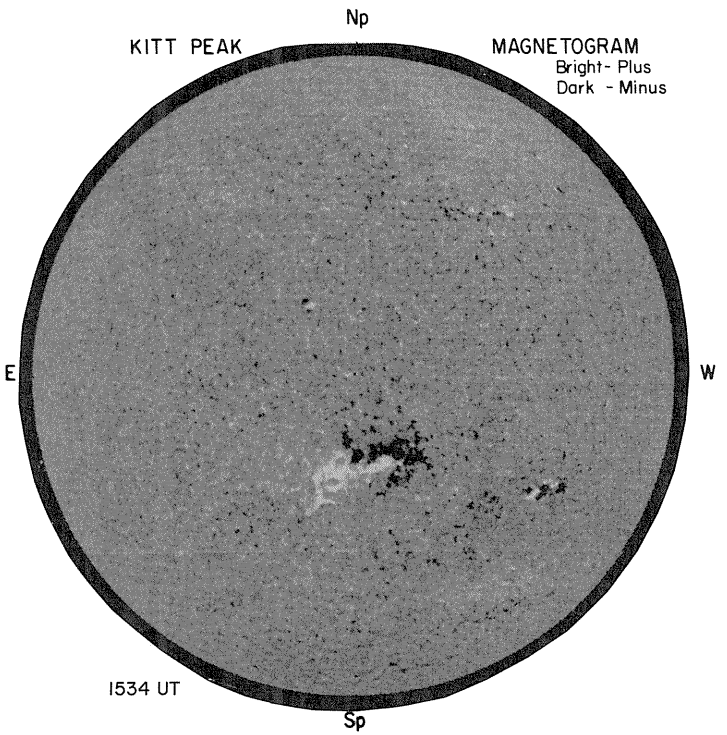


1945 UT
T(10^6 K)

SACRAMENTO PEAK
CORONA (1.15 $R_\odot$)
5303 Å

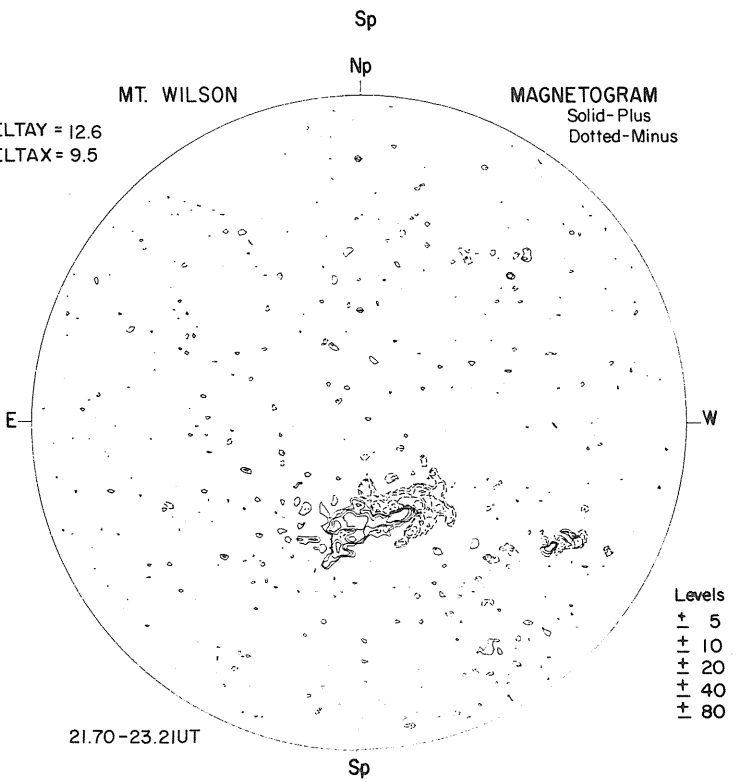


KITT PEAK
MAGNETOGRAM
Bright- Plus
Dark - Minus



1534 UT

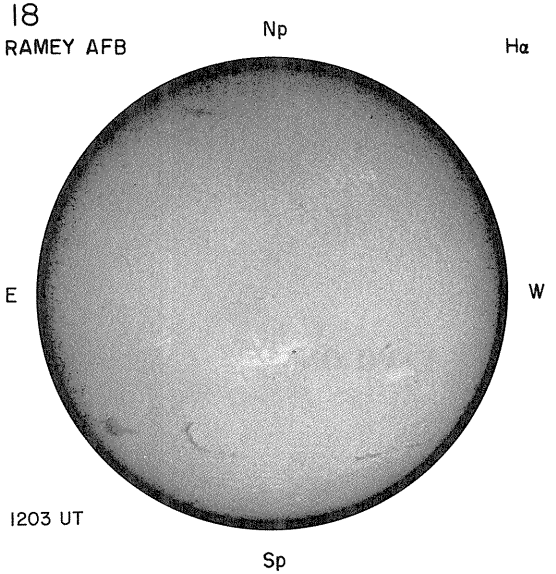
MT. WILSON
MAGNETOGRAM
Solid- Plus
Dotted-Minus
DELTAY = 12.6
DELTAX = 9.5



21.70-23.21UT

18

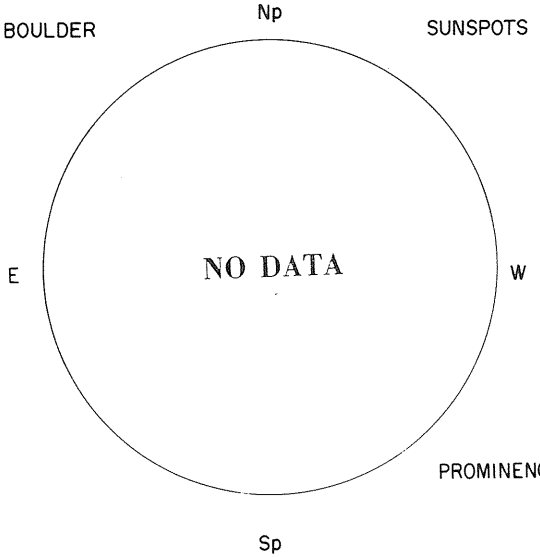
RAMEY AFB



1203 UT

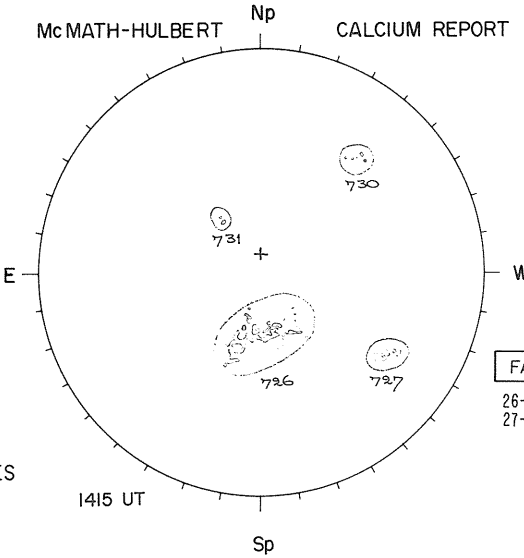
Hα

BOULDER



SUNSPOTS

McMATH-HULBERT



1415 UT

CALCIUM REPORT

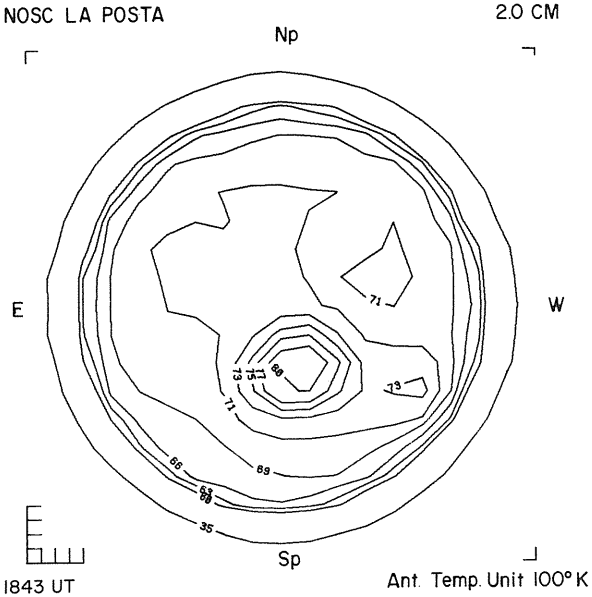
FAIR | D

26-3200 -3.5
27-0500 -2.5

PROMINENCES

NOSC LA POSTA

2.0 CM

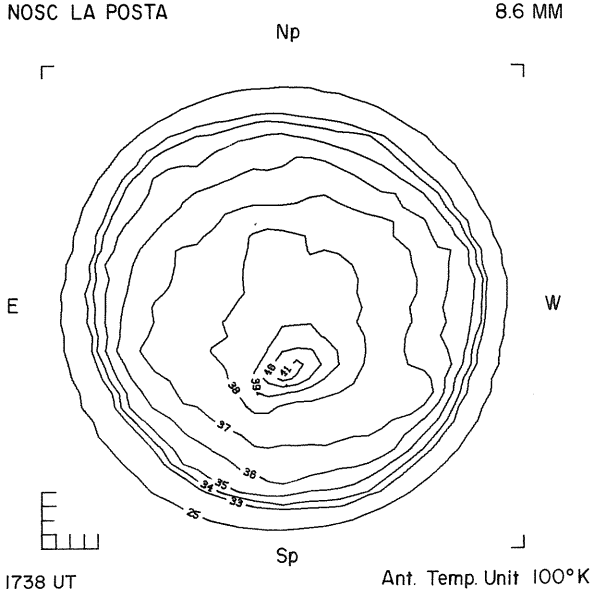


1843 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



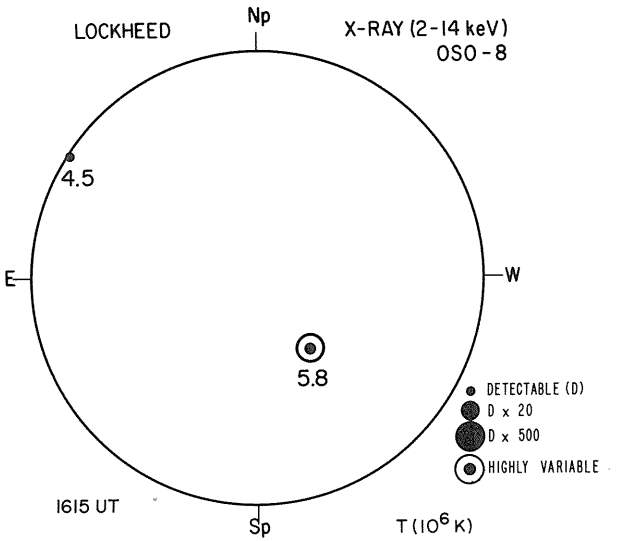
1738 UT

Ant. Temp. Unit 100° K

APRIL 19, 1977 (P =-25.79, B_o =-5.26, L_o =14.73)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

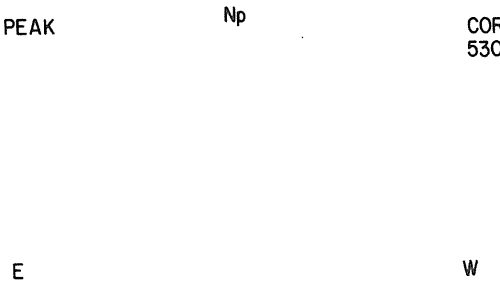


1615 UT

T (10^6 K)

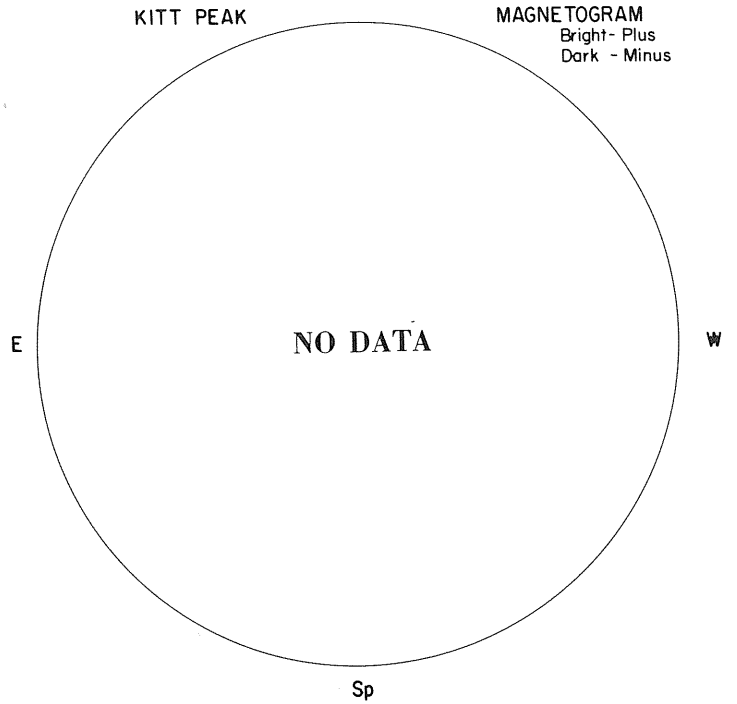
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

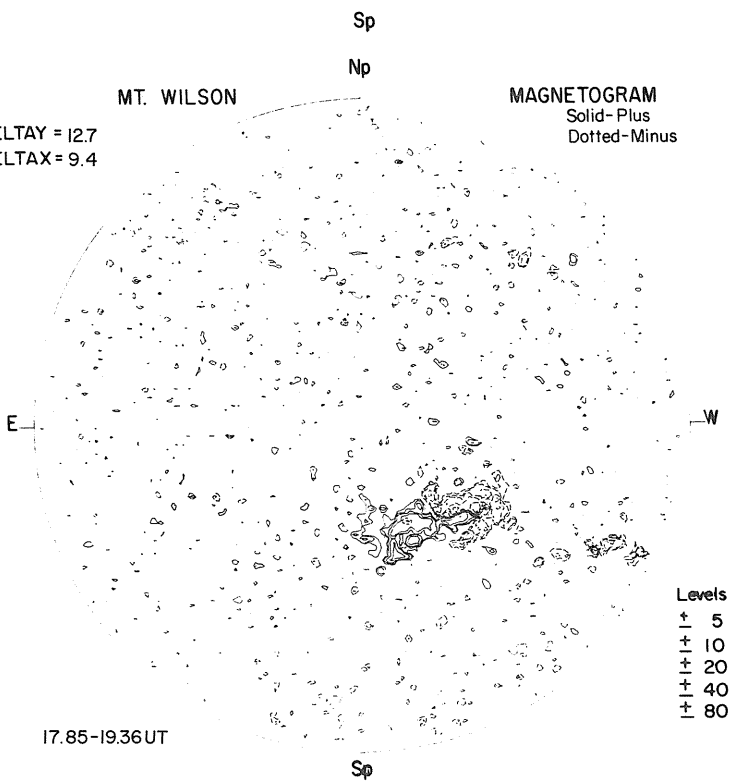
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

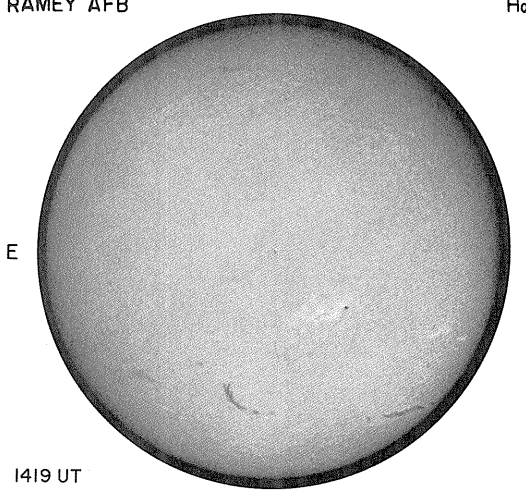
MAGNETOGRAM
Solid- Plus
Dotted-Minus

DELTAY = 12.7
DELTAX = 9.4



17.85-19.36 UT

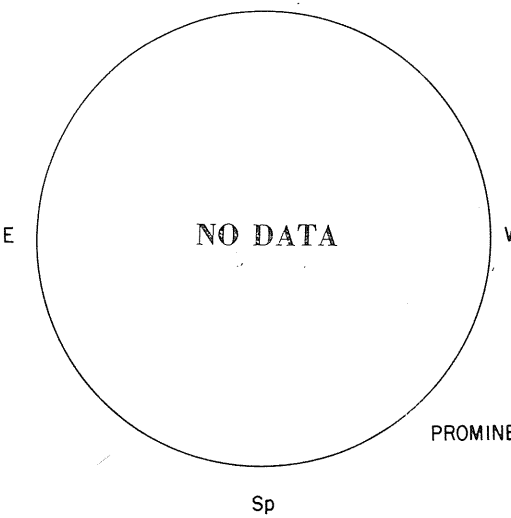
RAMEY AFB



1419 UT

BOULDER

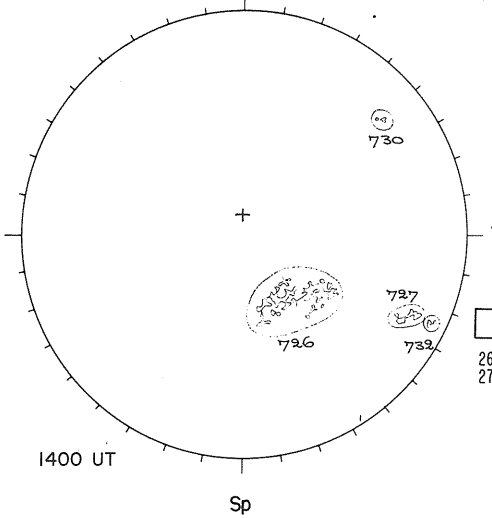
SUNSPOTS



PROMINENCES

McMATH-HULBERT

CALCIUM REPORT



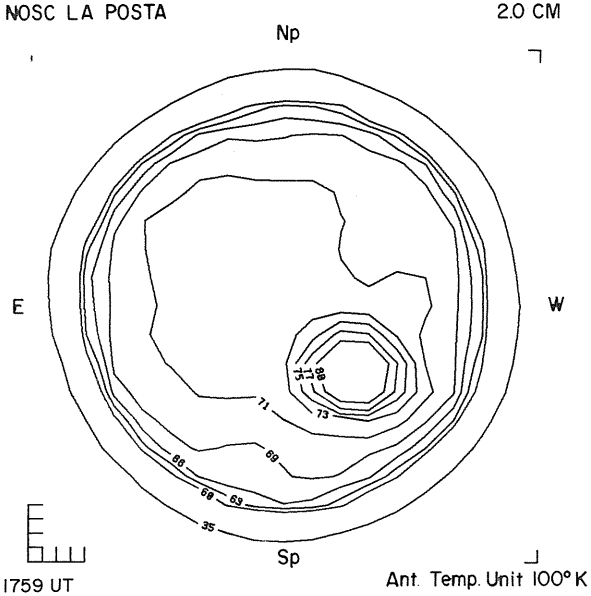
FAIR | S

26 - 3300 - 3.5
27 - 0400 - 2.5

1400 UT

NOSC LA POSTA

2.0 CM

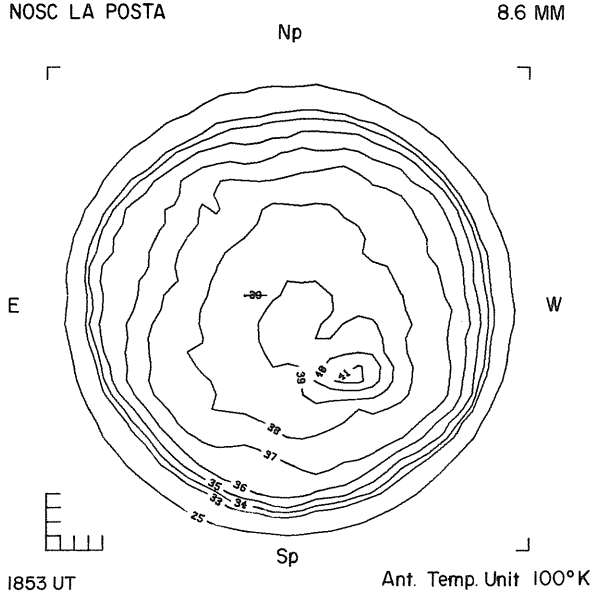


1759 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



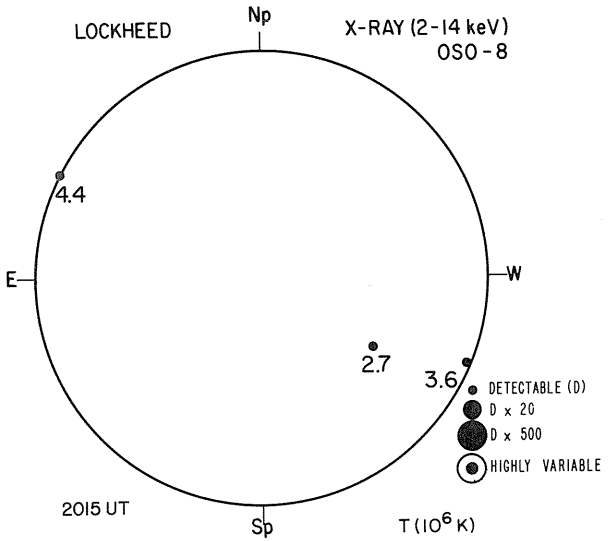
1853 UT

Ant. Temp. Unit 100° K

APRIL 20, 1977 (P =-25.70, B_o =-5.18 L_o =1.53)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

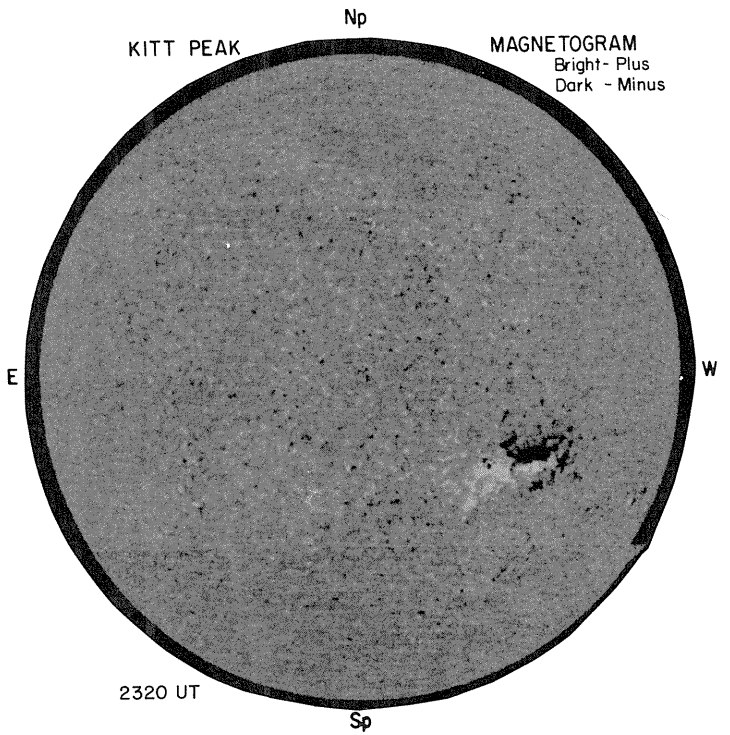


SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK

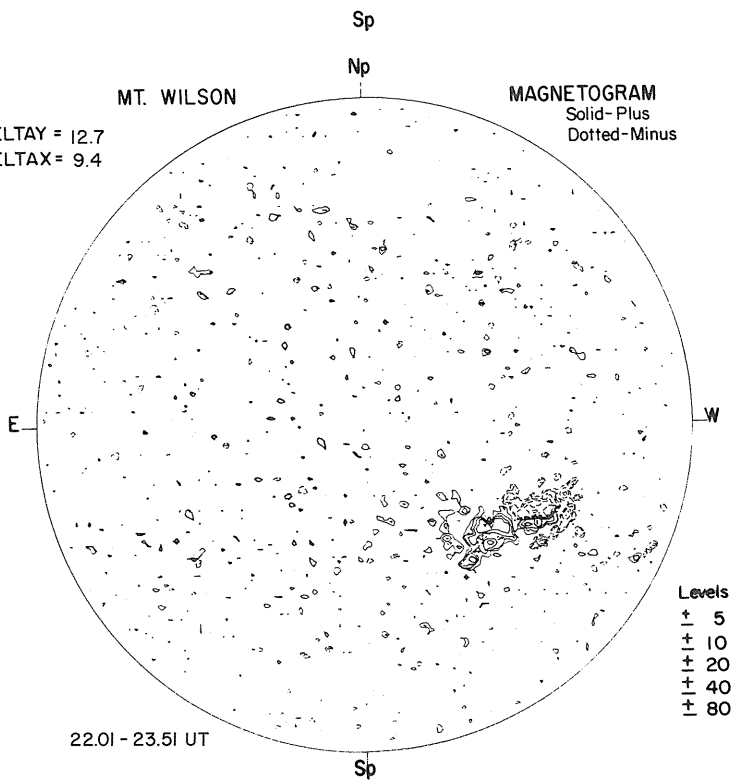
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

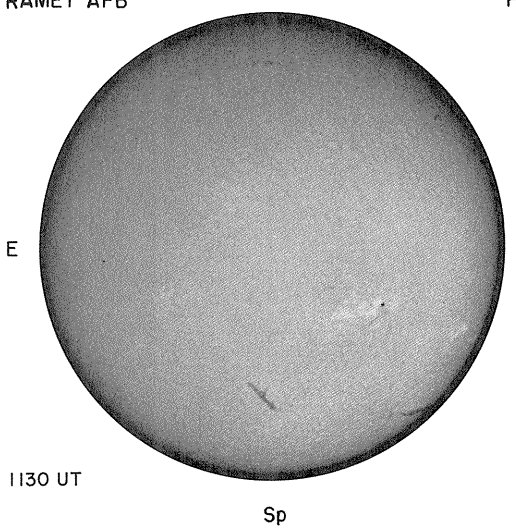
DELTAY = 12.7
DELTAX = 9.4

MAGNETOGRAM
Solid- Plus
Dotted-Minus



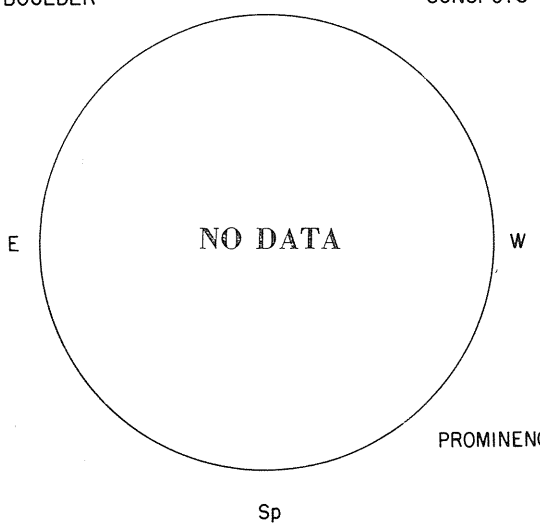
20

RAMEY AFB



1130 UT

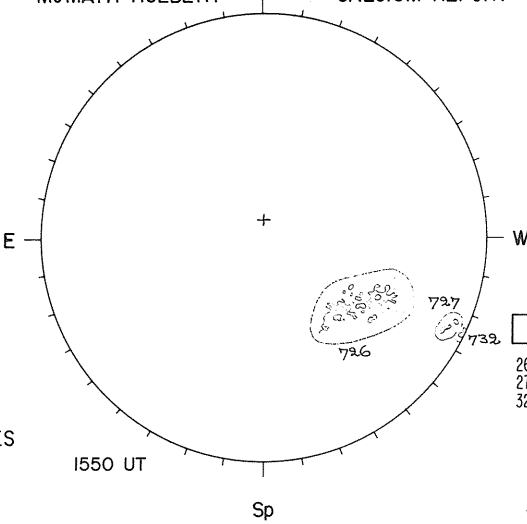
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT CALCIUM REPORT

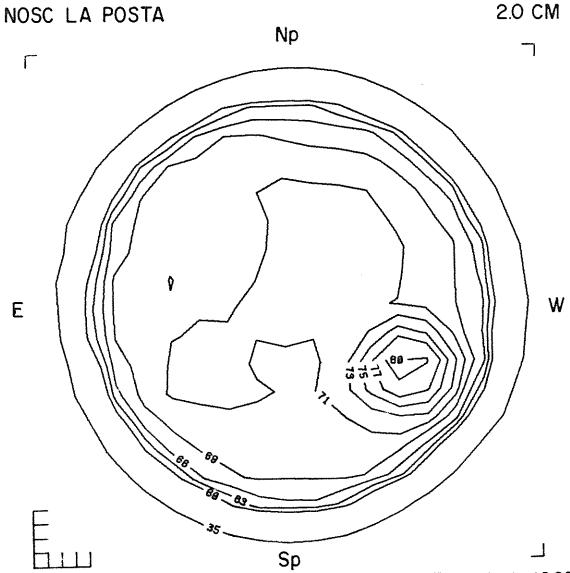


1550 UT

FAIR	M

26 - 3000 - 3.5
27 - 0400 - 2.5
32 - 0400 - 2.5

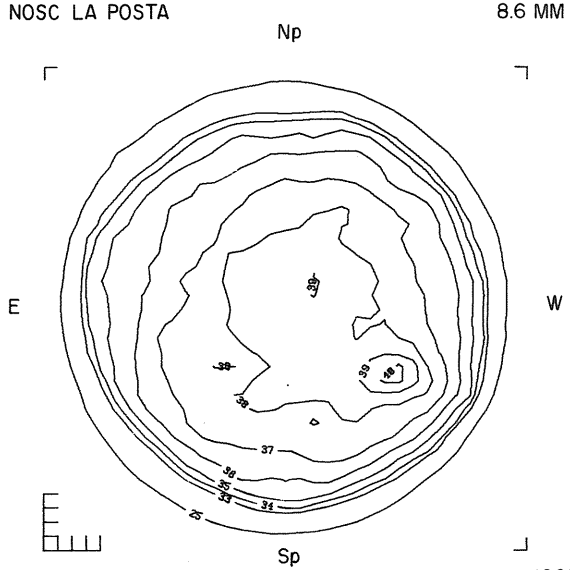
NOSC LA POSTA 2.0 CM



2100 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA 8.6 MM



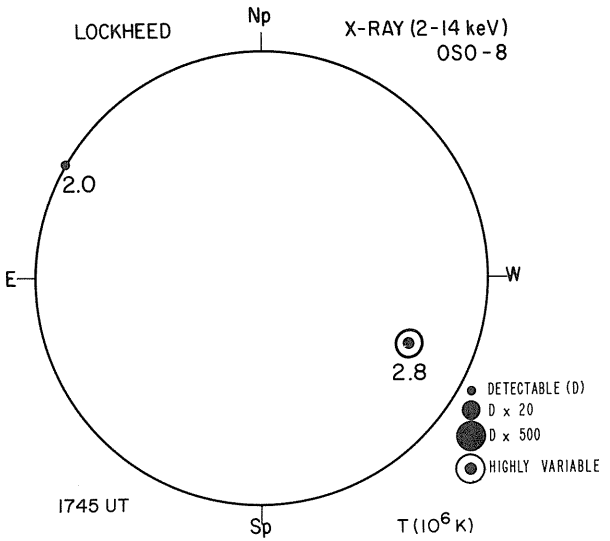
1904 UT

Ant. Temp. Unit 100° K

APRIL 21, 1977 (P =-25.60, B_0 =-5.09, L_0 =348.32)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

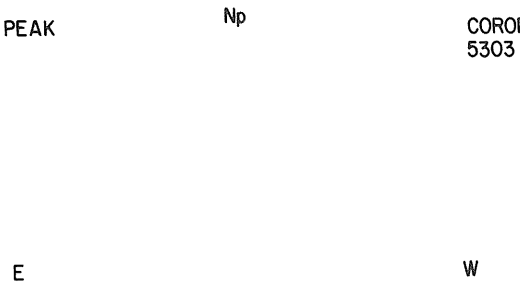


1745 UT

T(10^6 K)

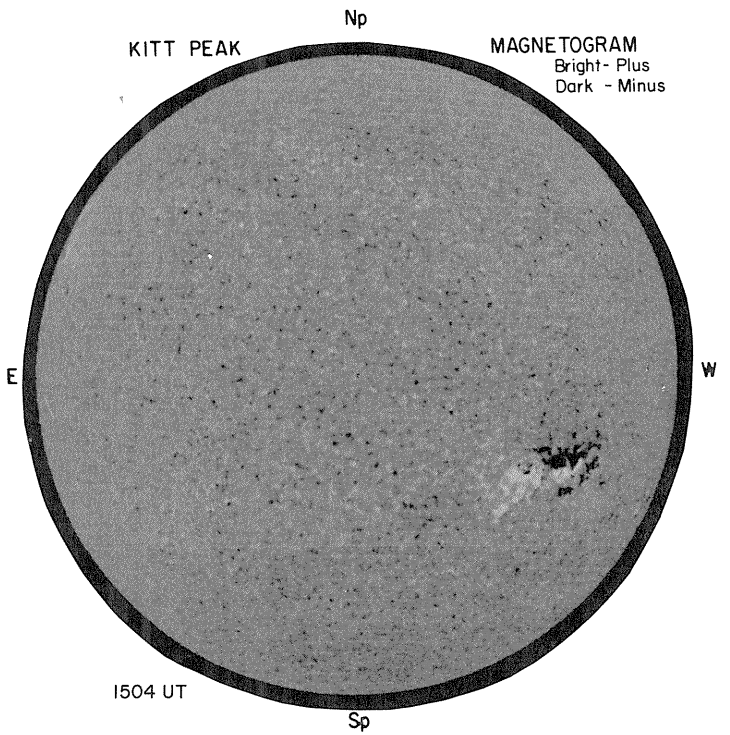
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright- Plus
Dark - Minus

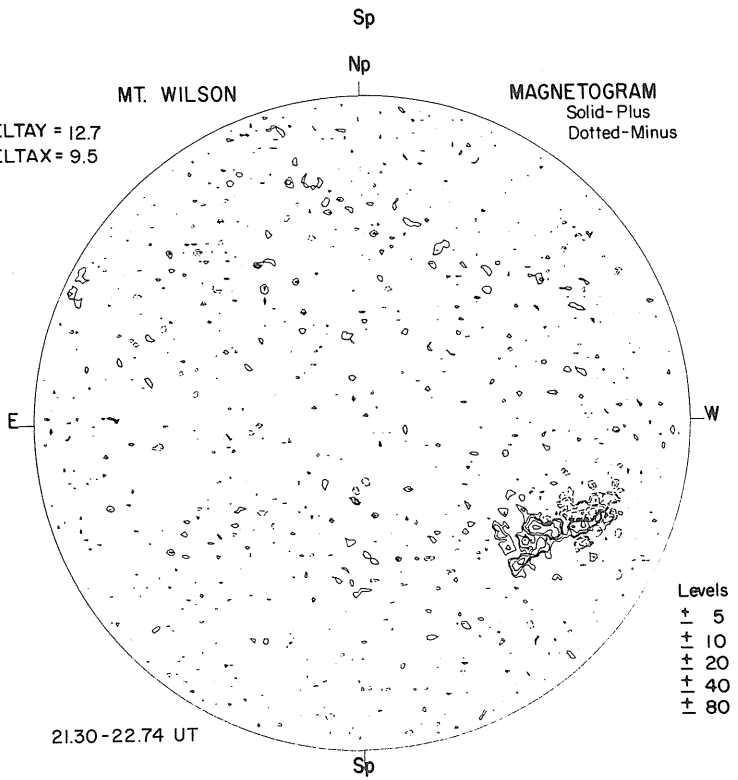


1504 UT

MT. WILSON

MAGNETOGRAM
Solid- Plus
Dotted-Minus

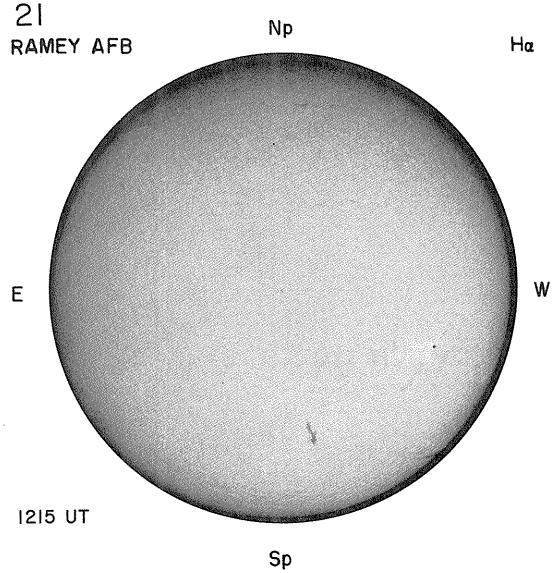
DELTAY = 12.7
DELTAX = 9.5



21.30-22.74 UT

21

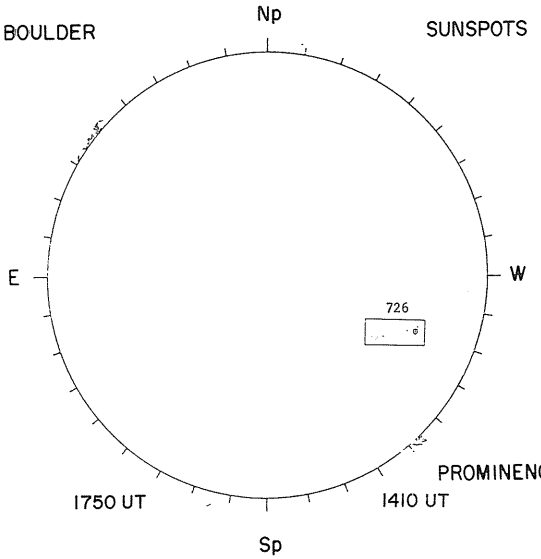
RAMEY AFB



1215 UT

Hα

BOULDER



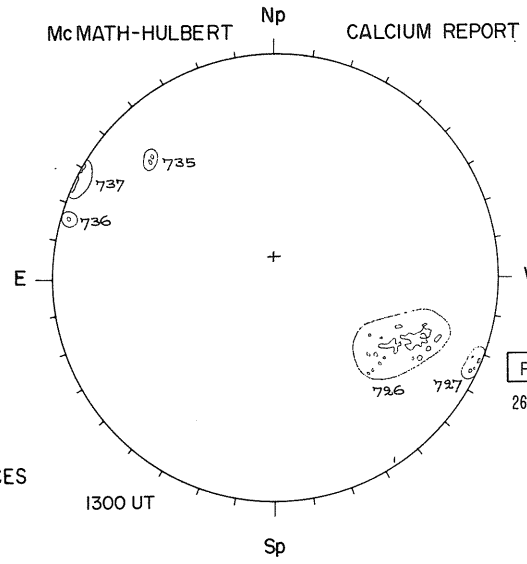
1750 UT

SUNSPOTS

1410 UT

PROMINENCES

McMATH-HULBERT



1300 UT

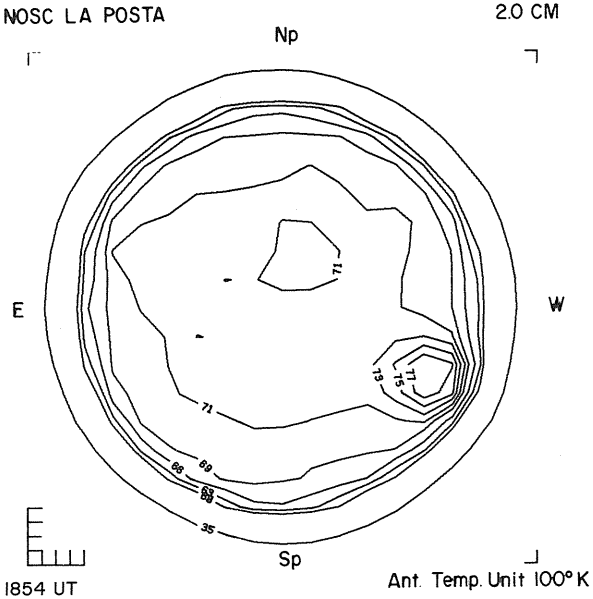
CALCIUM REPORT

POOR	S

26-3000-3.5

NOSC LA POSTA

2.0 CM

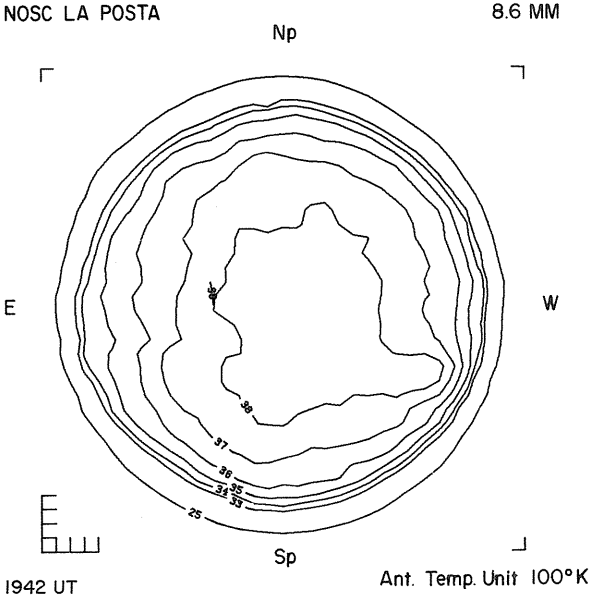


1854 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



1942 UT

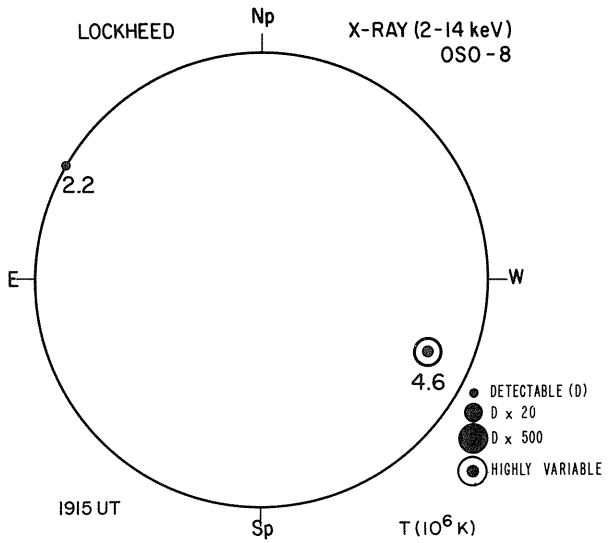
Ant. Temp. Unit 100° K

73
Apr 77

APRIL 22, 1977 (P =-25.49, B_o =-5.00, L_o =335.11)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

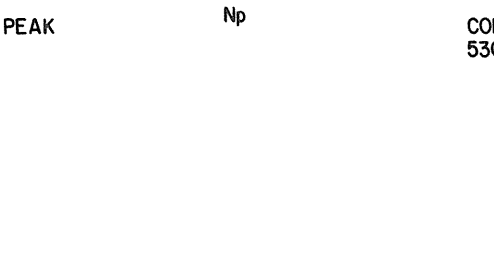


1915 UT

T(10^6 K)

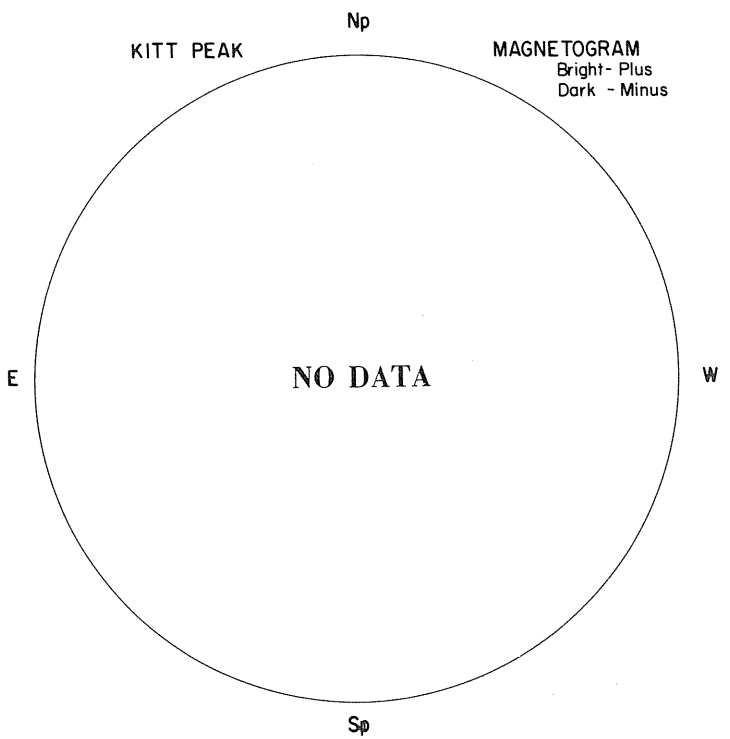
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

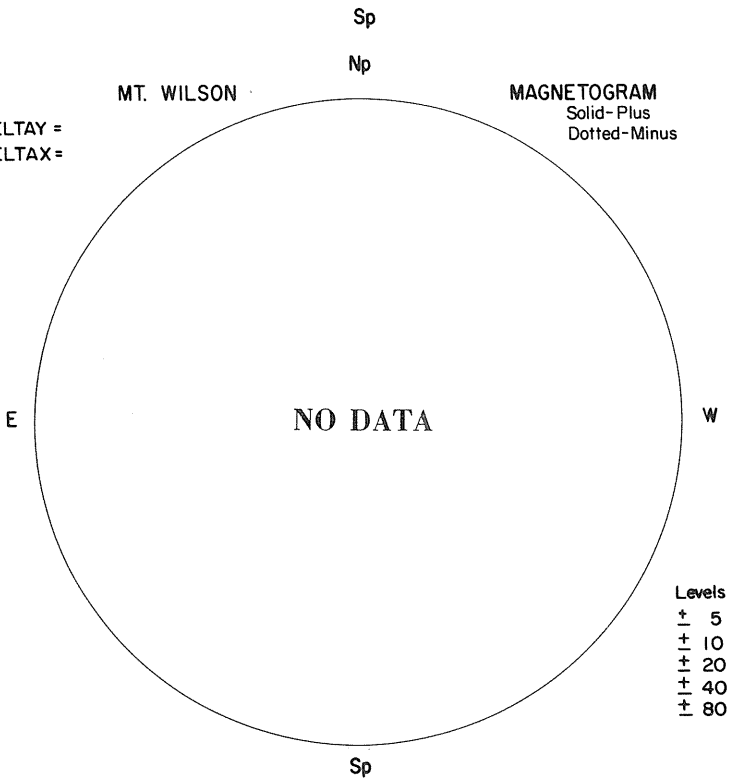
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

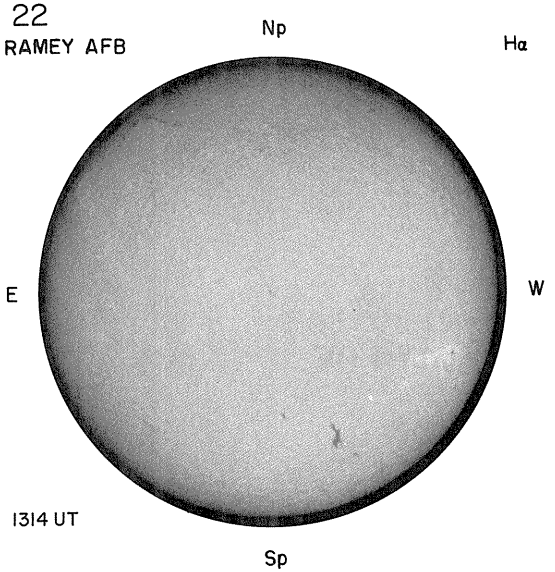
DELTAY =
DELTAX =

MAGNETOGRAM
Solid- Plus
Dotted- Minus



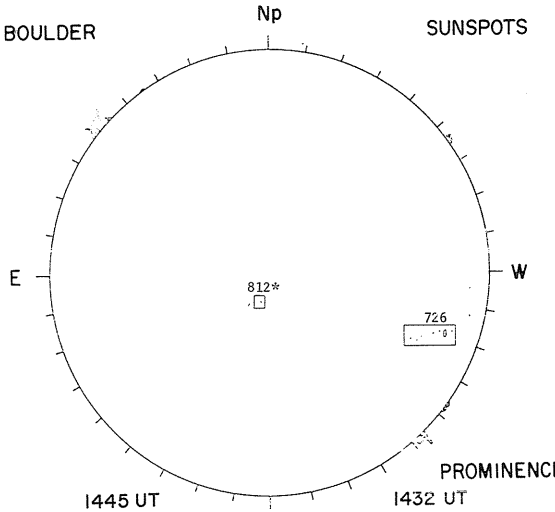
22

RAMEY AFB



1314 UT

Hα BOULDER



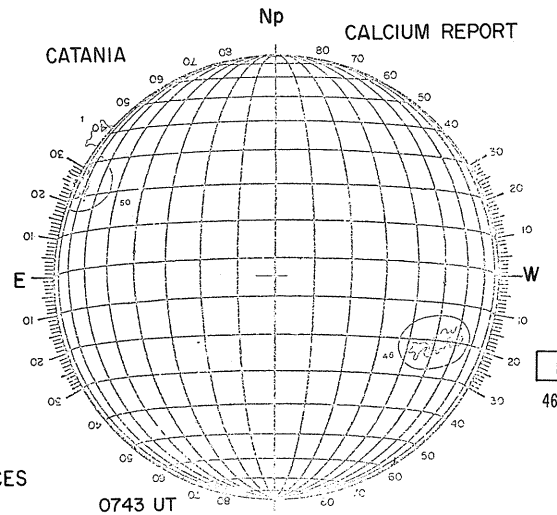
SUNSPOTS

PROMINENCES

1445 UT 1432 UT

* BOULDER REGION NUMBER

CATANIA CALCIUM REPORT

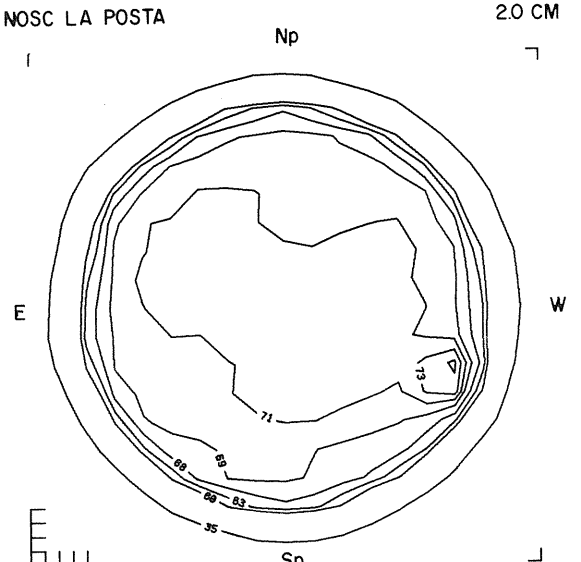


FAIR GD

46-2813 - --

0743 UT

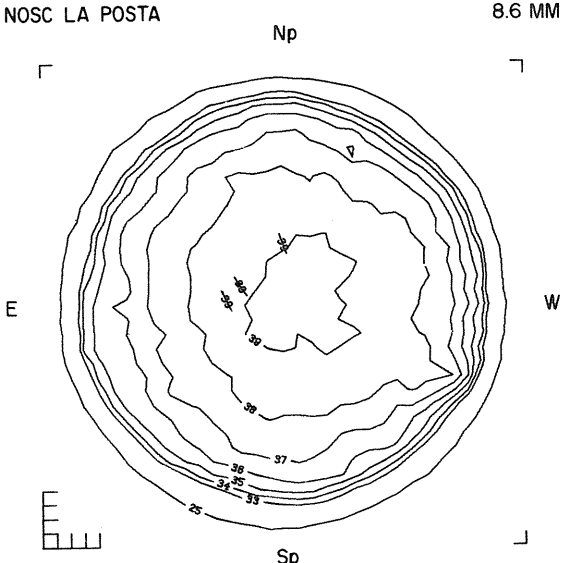
NOSC LA POSTA 2.0 CM



1913 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA 8.6 MM

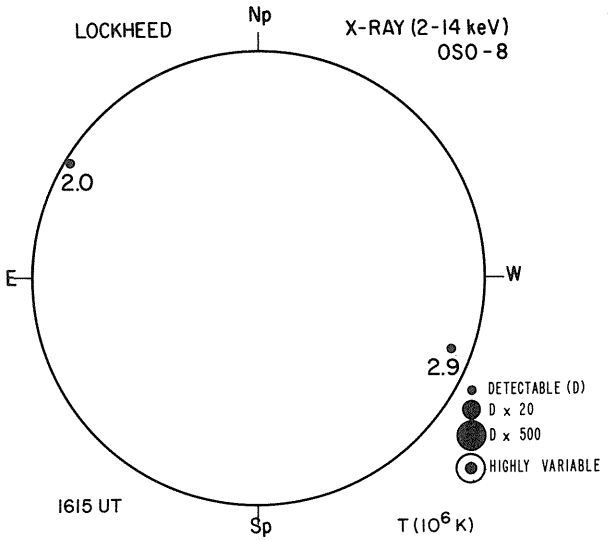


1955 UT

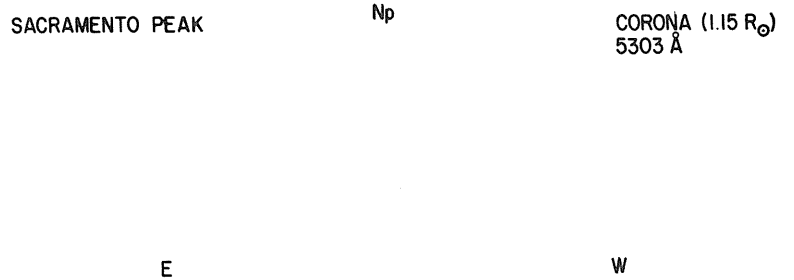
Ant. Temp. Unit 100° K

APRIL 23, 1977 (P =-25.38, B_o =-4.91 L_o =321.90)

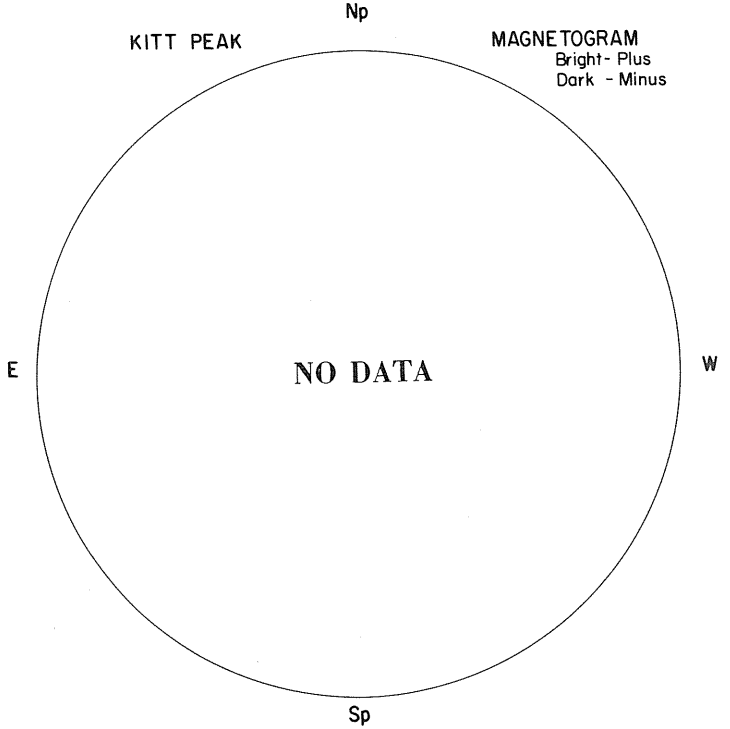
LOCKHEED



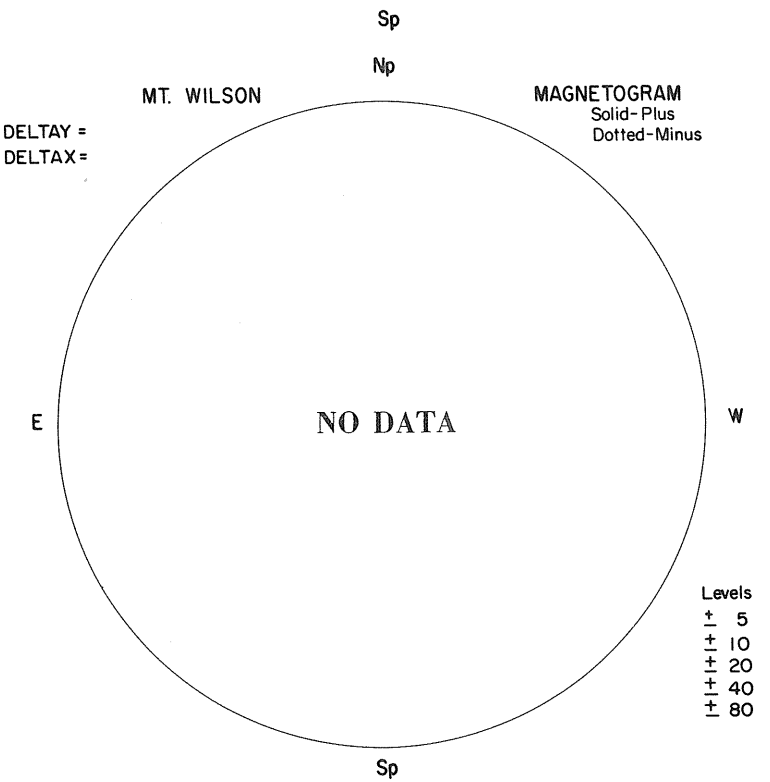
SACRAMENTO PEAK



KITT PEAK

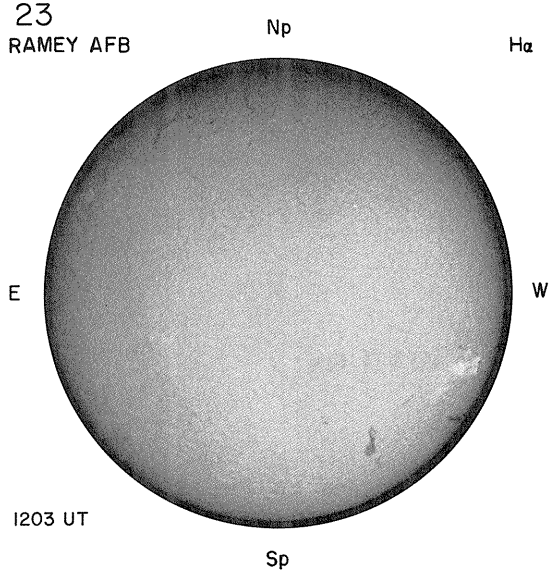


MT. WILSON



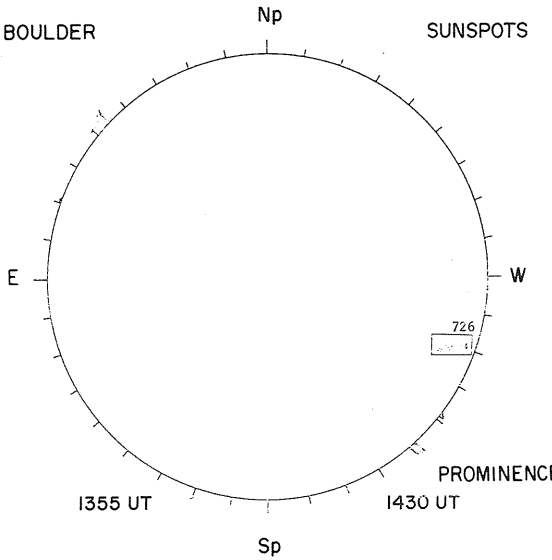
23

RAMEY AFB



1203 UT

BOULDER

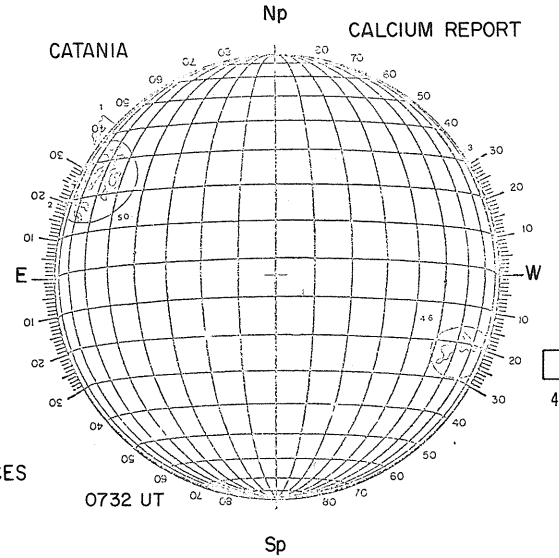


1355 UT

1430 UT

CATANIA

CALCIUM REPORT



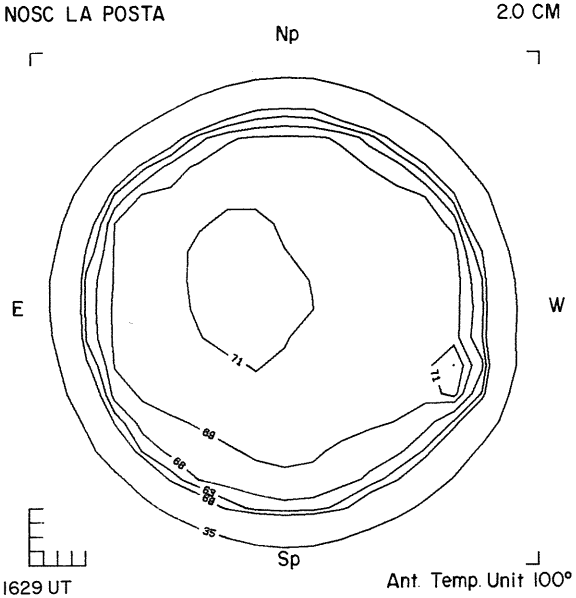
0732 UT

FAIR | GD

46-1878- ---

NOSC LA POSTA

2.0 CM

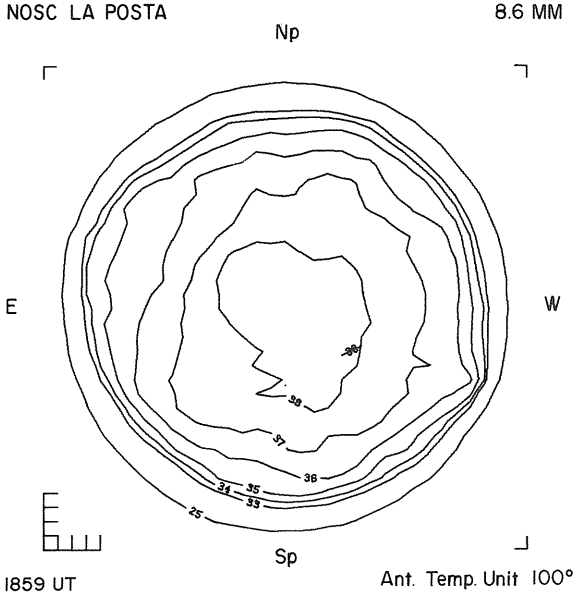


1629 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



1859 UT

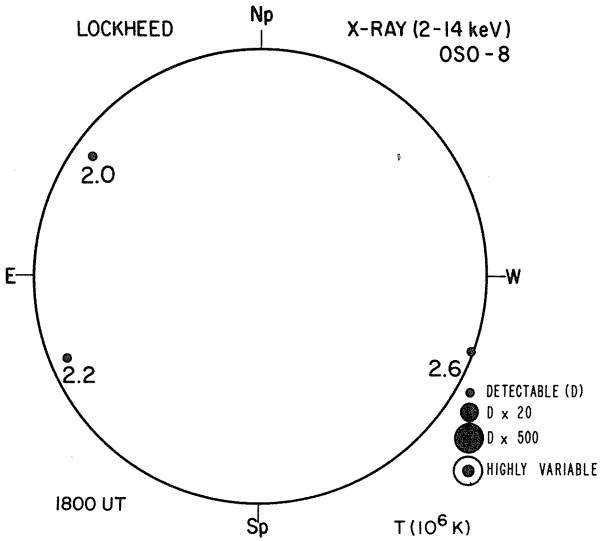
Ant. Temp. Unit 100° K

77 Apr 77

APRIL 24, 1977 (P =-25.26, B_o =-4.82, L_o =308.69)

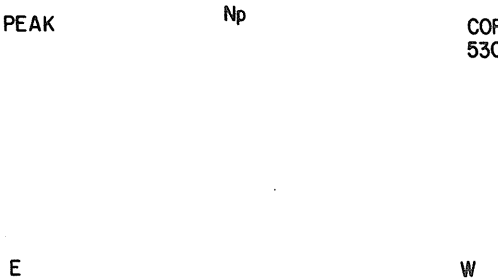
LOCKHEED

X-RAY (2-14 keV)
OSO-8



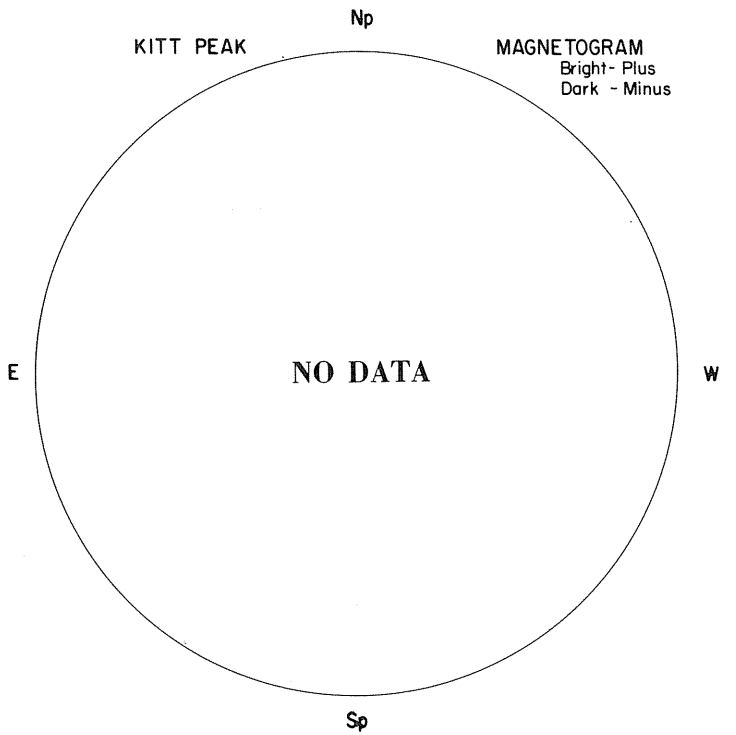
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

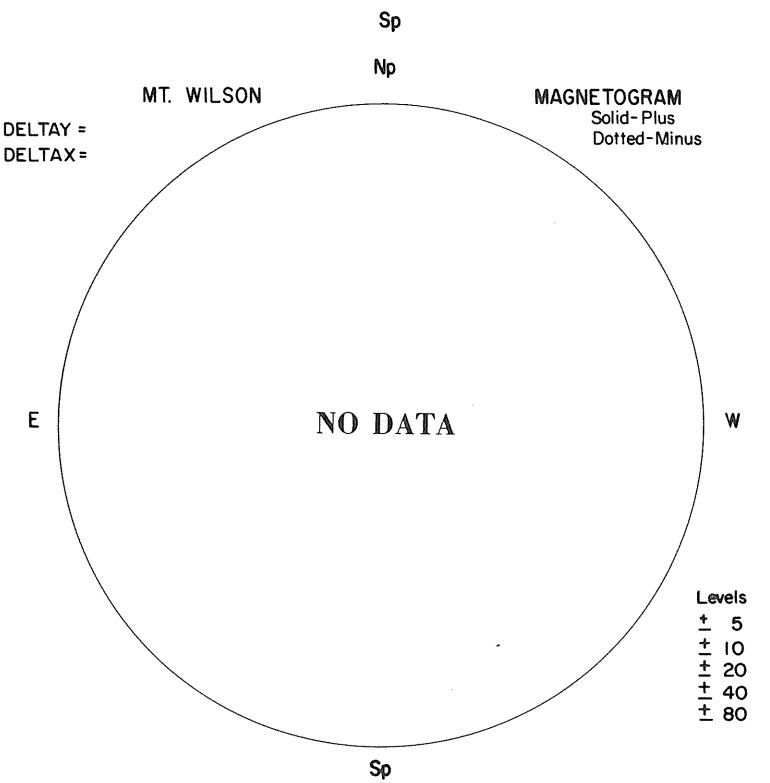
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

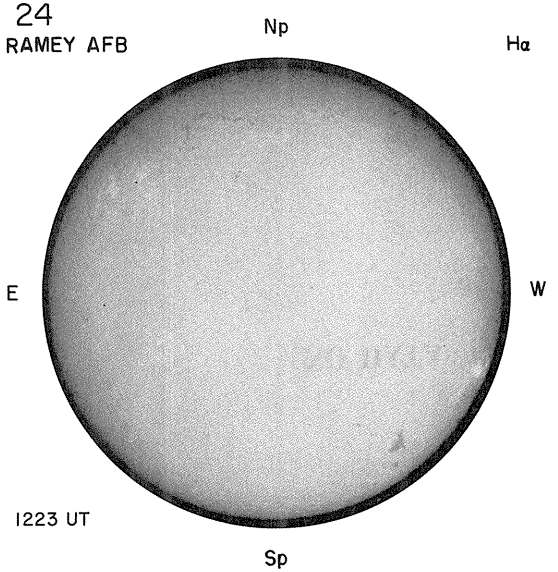
DELTAY =
DELTAX =

MAGNETOGRAM
Solid- Plus
Dotted-Minus

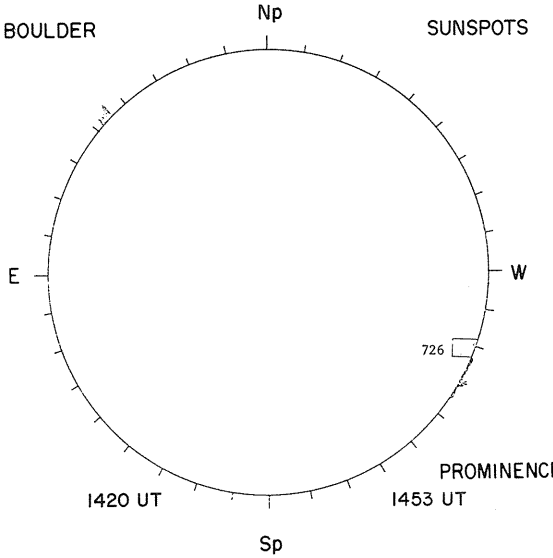


24

RAMEY AFB



BOULDER

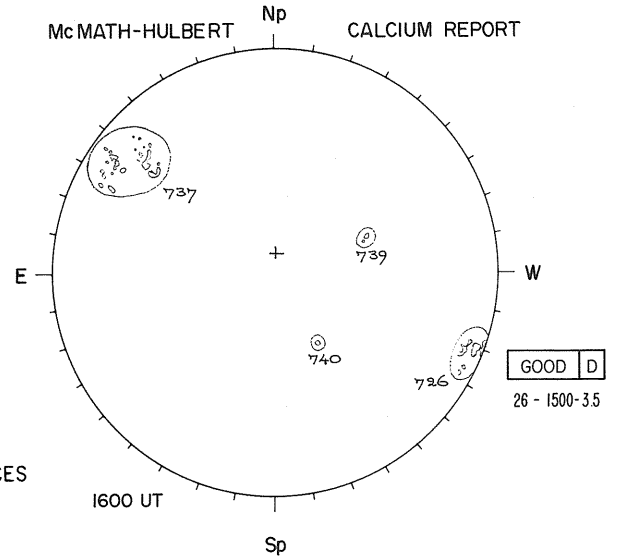


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

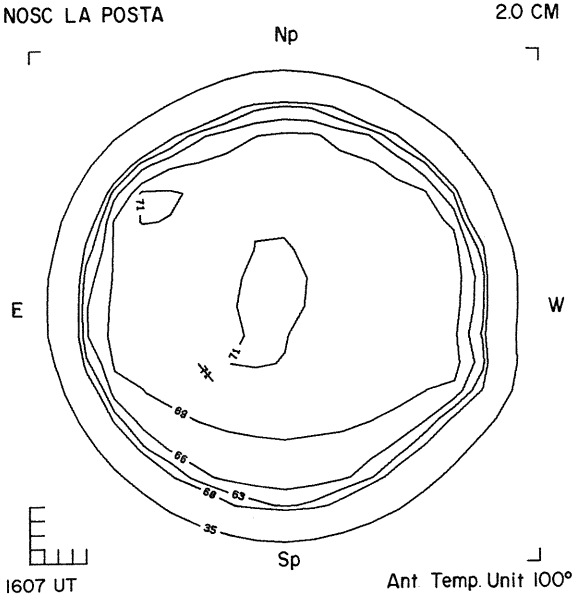


GOOD | D

26 - 1500-3.5

NOSC LA POSTA

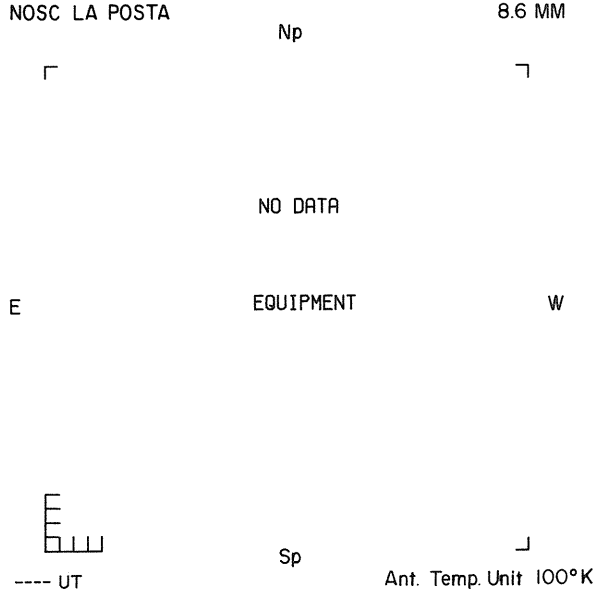
2.0 CM



Ant. Temp. Unit 100°K

NOSC LA POSTA

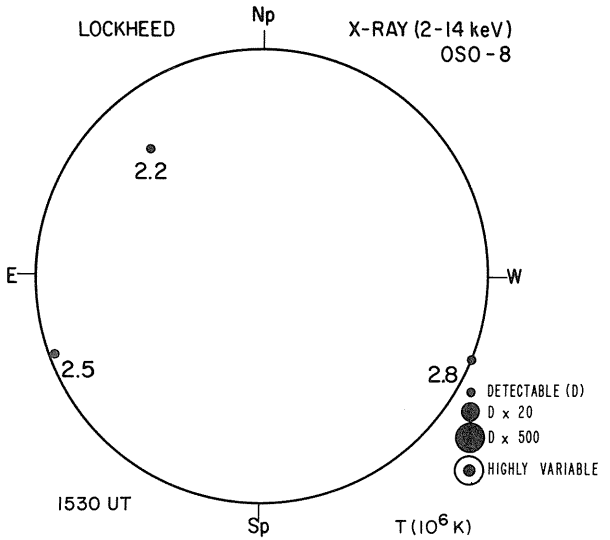
8.6 MM



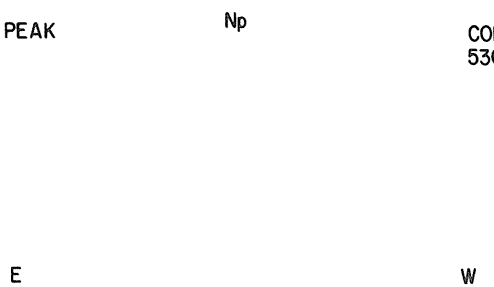
Ant. Temp. Unit 100°K

APRIL 25, 1977 (P =-25.13, B_o =-4.73, L_o =295.48)

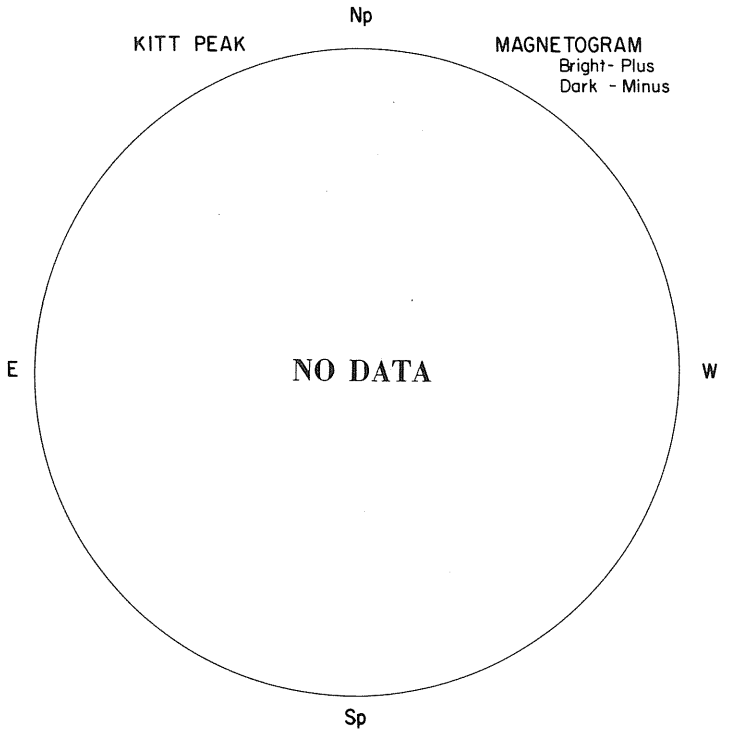
LOCKHEED
X-RAY (2-14 keV)
OSO-8



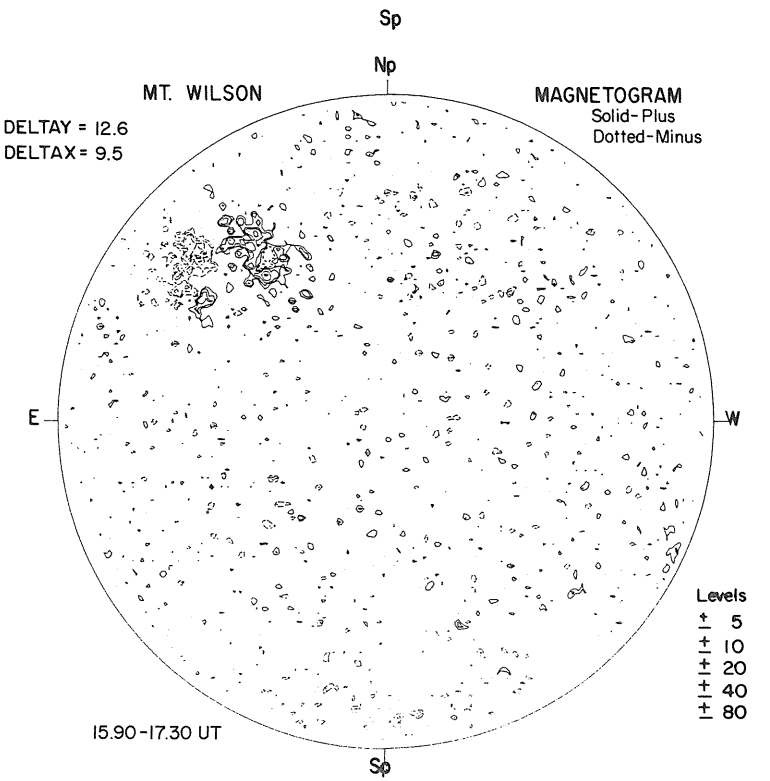
SACRAMENTO PEAK
CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK
MAGNETOGRAM
Bright- Plus
Dark - Minus

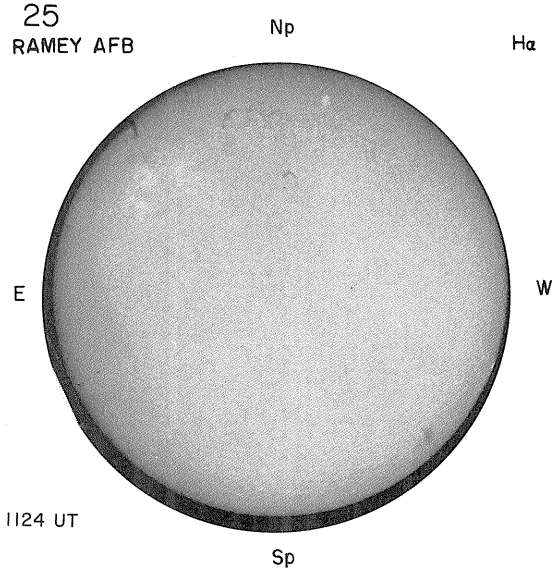


MT. WILSON
MAGNETOGRAM
Solid- Plus
Dotted-Minus
DELTAY = 12.6
DELTAX = 9.5



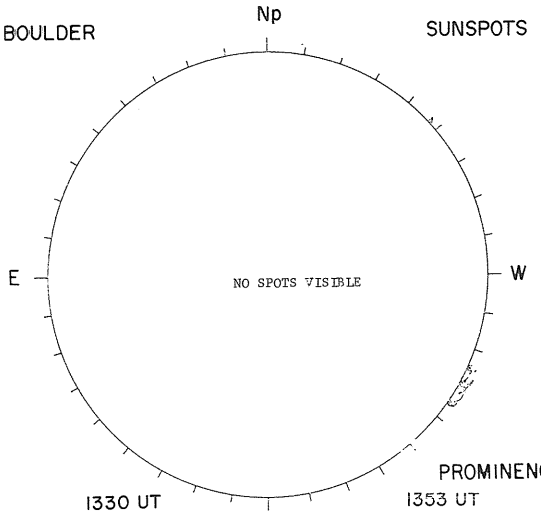
25

RAMEY AFB



1124 UT

Hα BOULDER



1330 UT

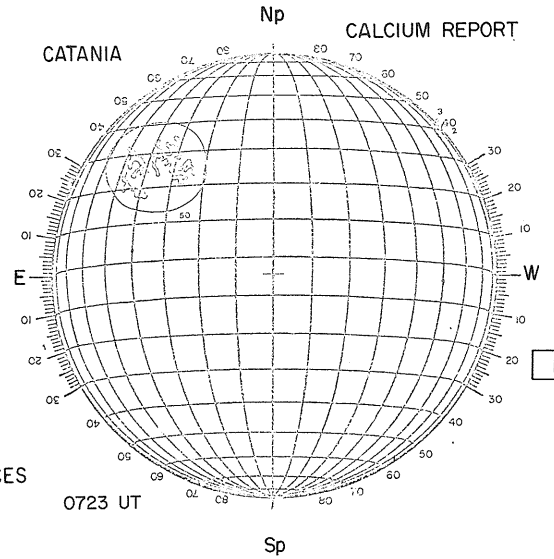
SUNSPOTS

PROMINENCES

1353 UT

CATANIA

CALCIUM REPORT

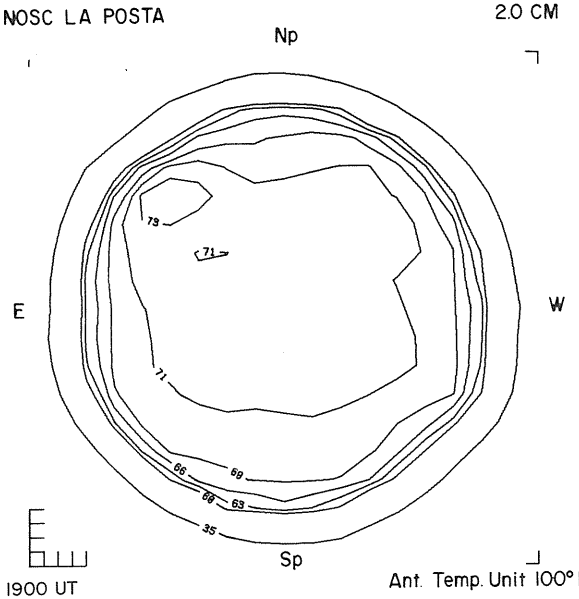


0723 UT

FAIR | GD

NOSC LA POSTA

2.0 CM

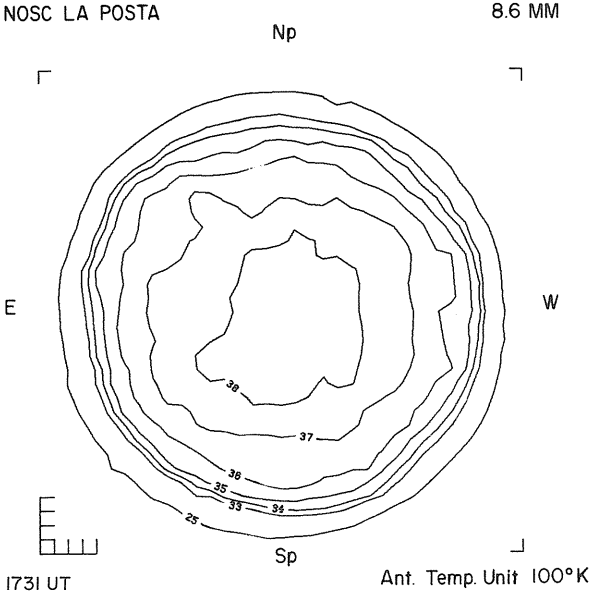


1900 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



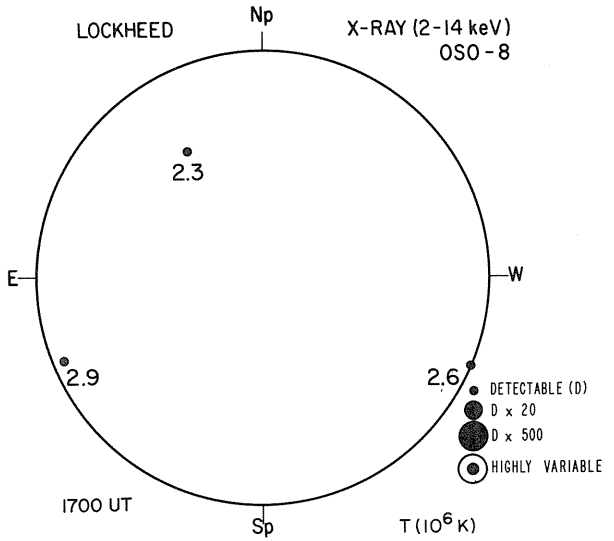
1731 UT

Ant. Temp. Unit 100° K

APRIL 26, 1977 (P =-24.99, B_o =-4.63, L_o =282.26)

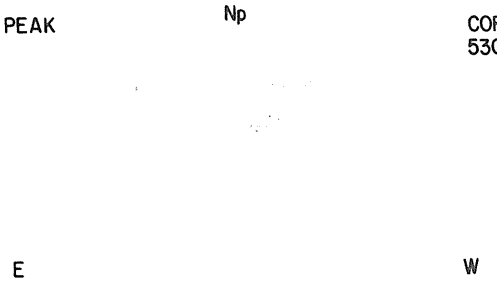
LOCKHEED

X-RAY (2-14 keV)
OSO-8



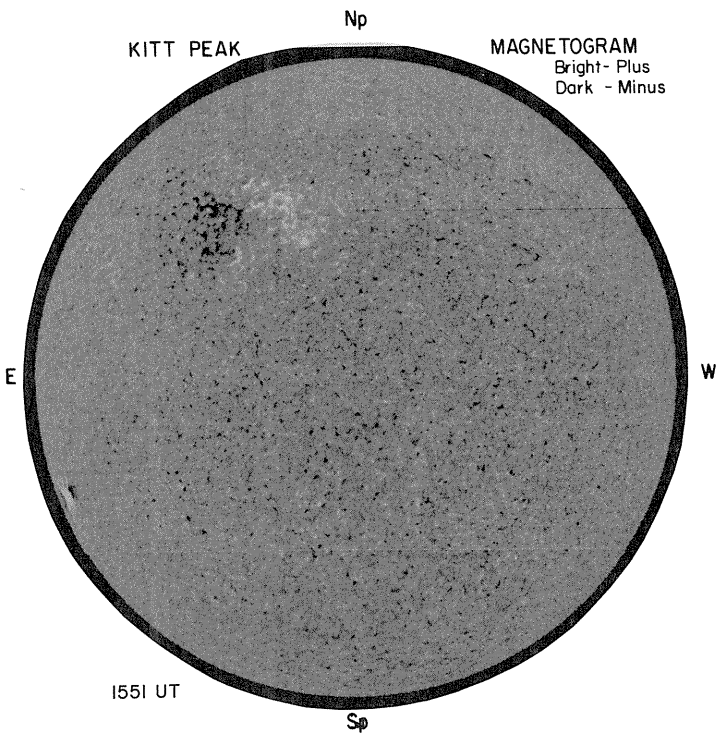
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

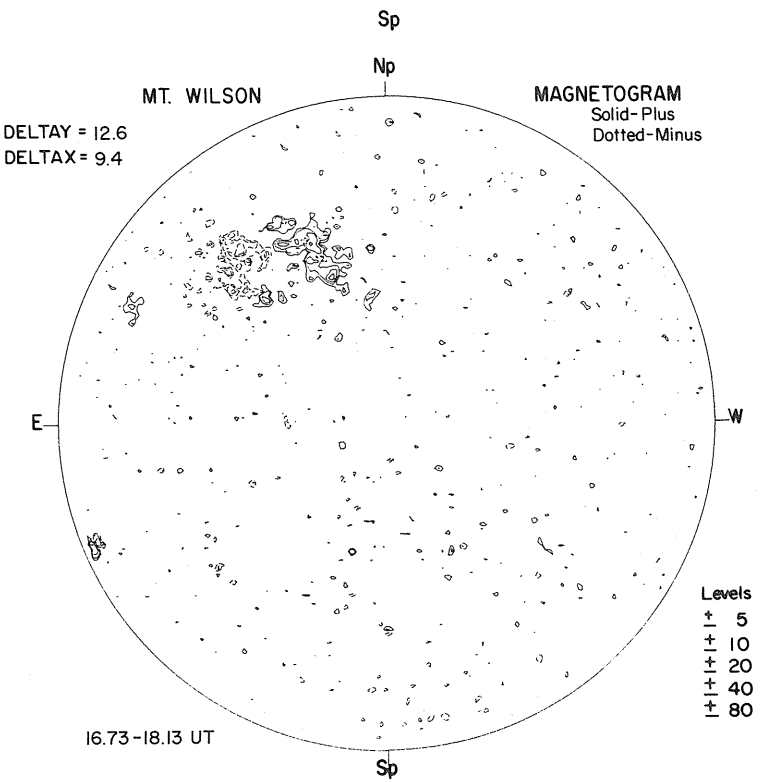
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

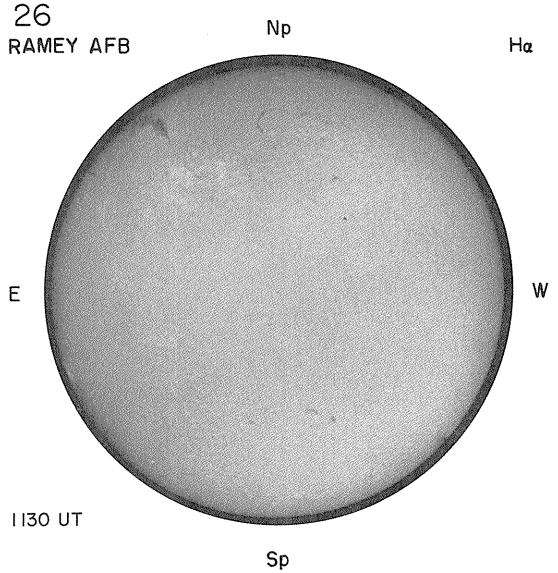
MAGNETOGRAM
Solid- Plus
Dotted-Minus

DELTAY = 12.6
DELTAX = 9.4



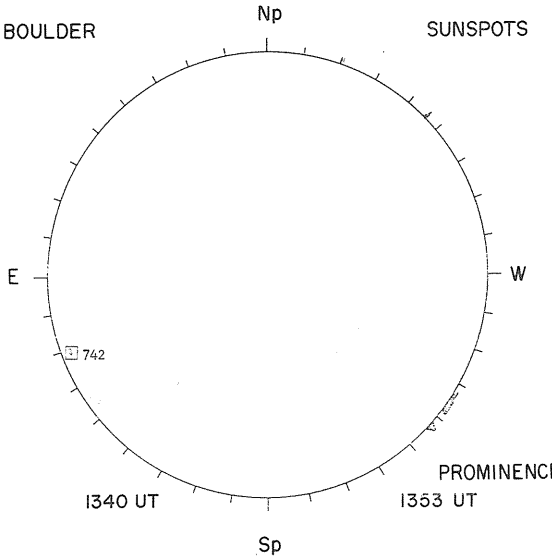
26

RAMEY AFB



1130 UT

BOULDER



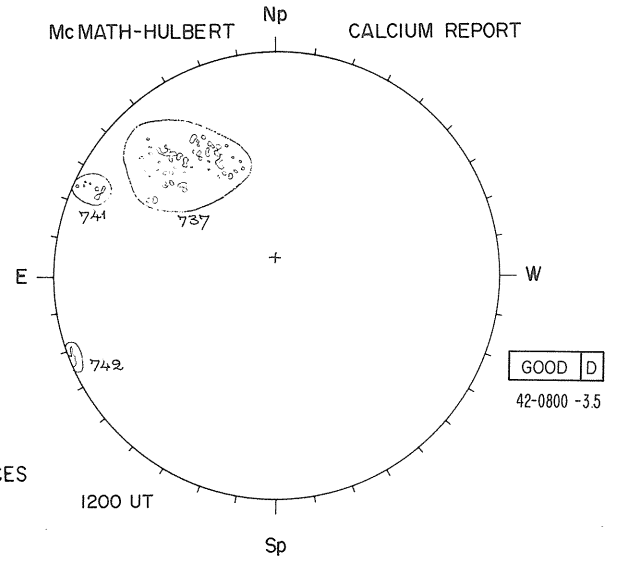
1340 UT

PROMINENCES

1353 UT

McMATH-HULBERT

CALCIUM REPORT



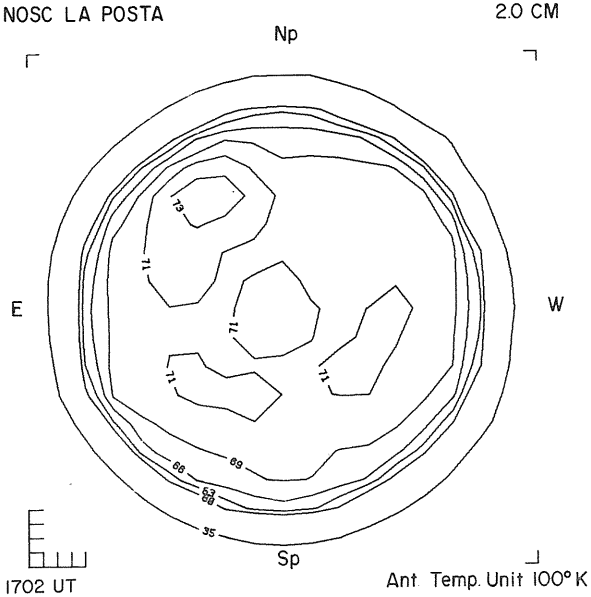
1200 UT

GOOD | D

42-0800 -3.5

NOSC LA POSTA

2.0 CM

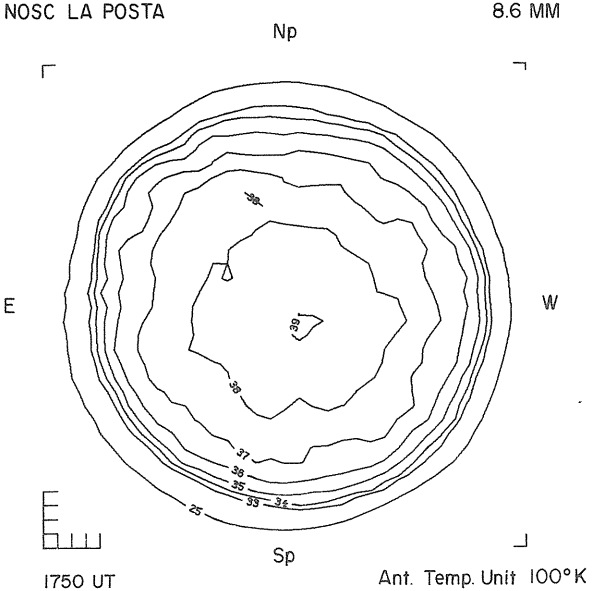


1702 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



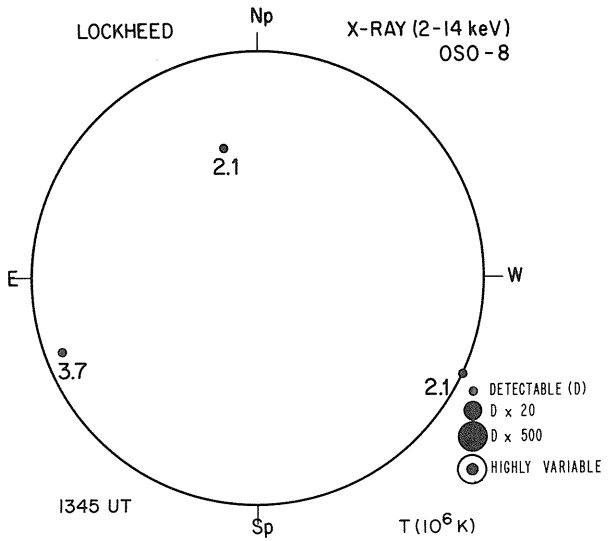
1750 UT

Ant. Temp. Unit 100°K

APRIL 27, 1977 (P =-24.85, B_o =-4.54, L_o =269.05)

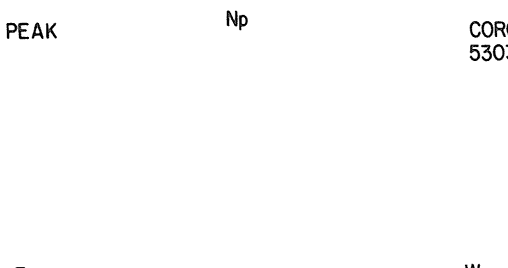
LOCKHEED

X-RAY (2-14 keV)
OSO-8



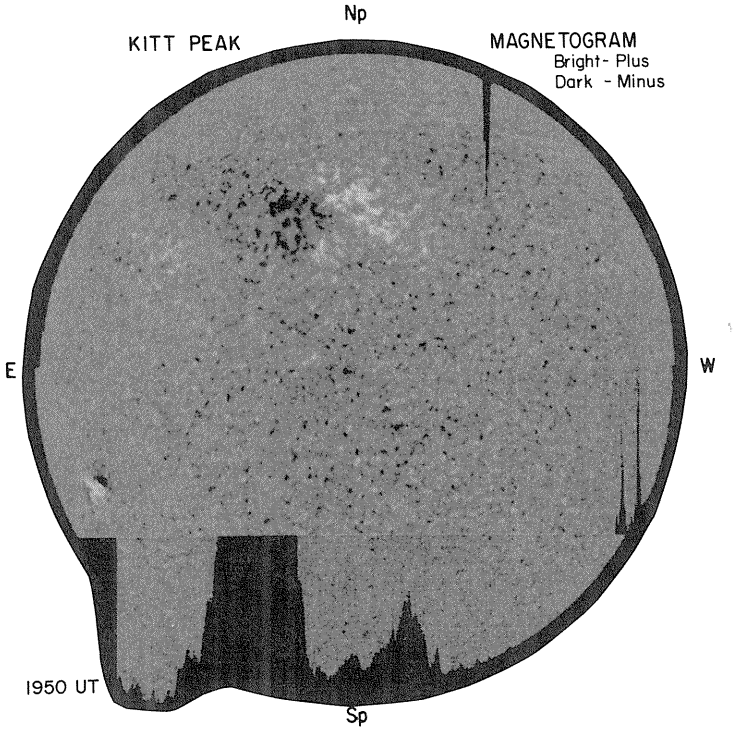
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

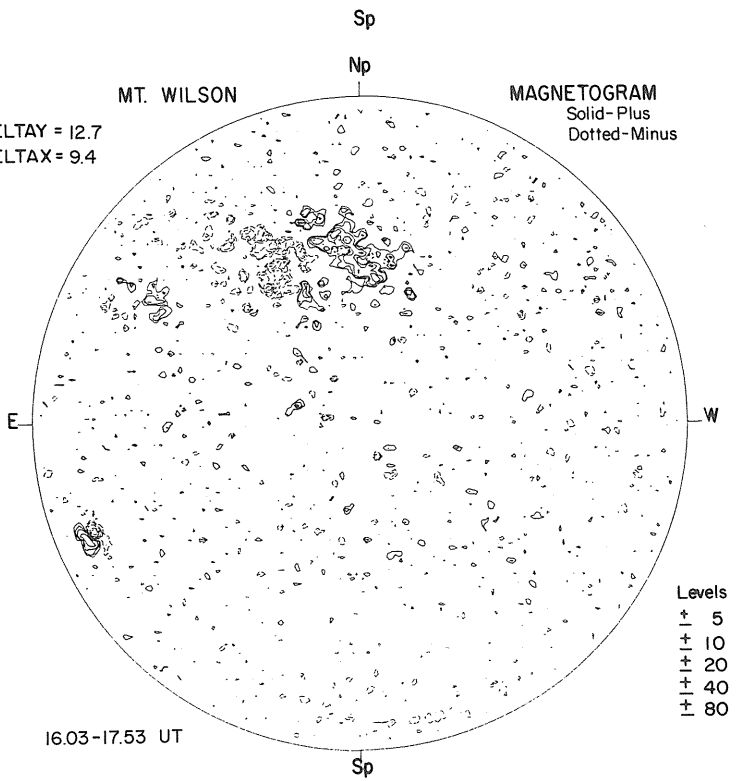
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

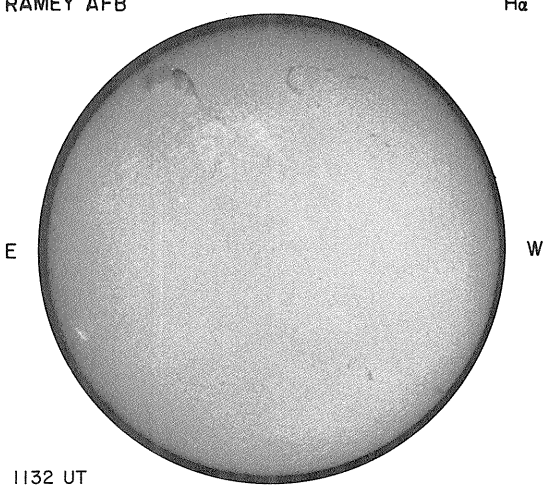
MAGNETOGRAM
Solid-Plus
Dotted-Minus

DELTAY = 12.7
DELTAX = 9.4



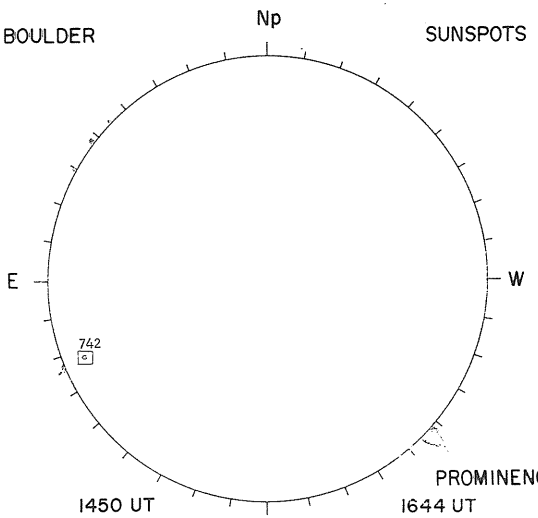
27

RAMEY AFB



1132 UT

BOULDER



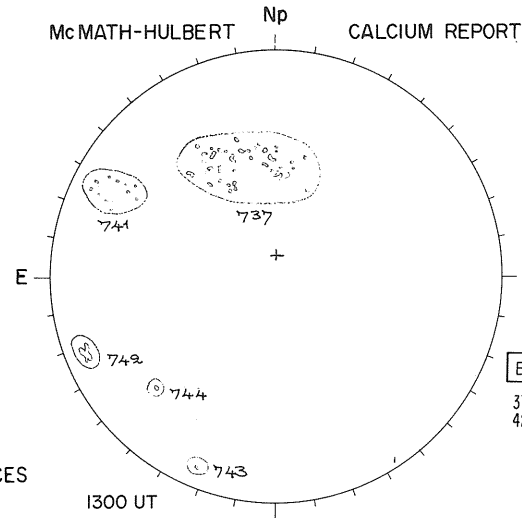
SUNSPOTS

PROMINENCES

1450 UT

1644 UT

McMATH-HULBERT



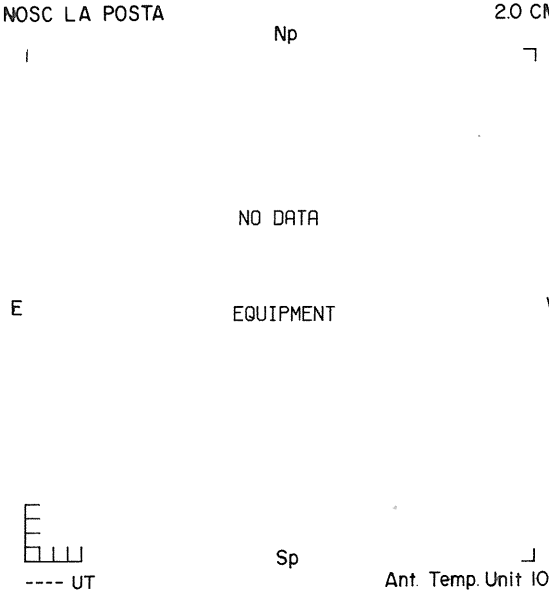
CALCIUM REPORT

EXCEL | S

37 - 2000 - 2.5
42 - 1000 - 3.5

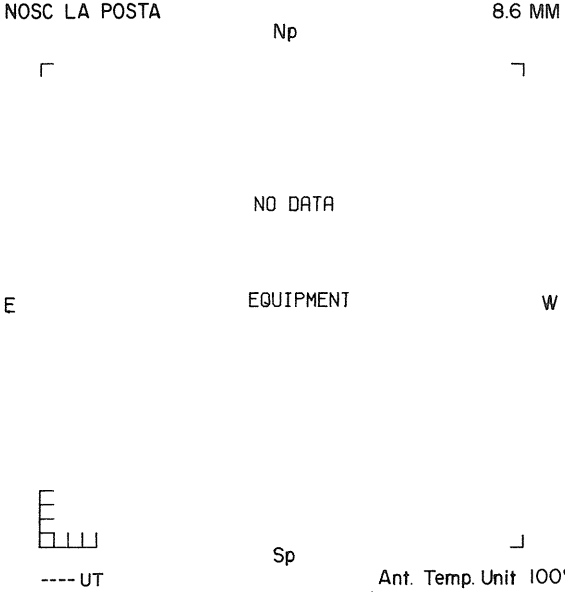
1300 UT

NOSC LA POSTA



2.0 CM

NOSC LA POSTA

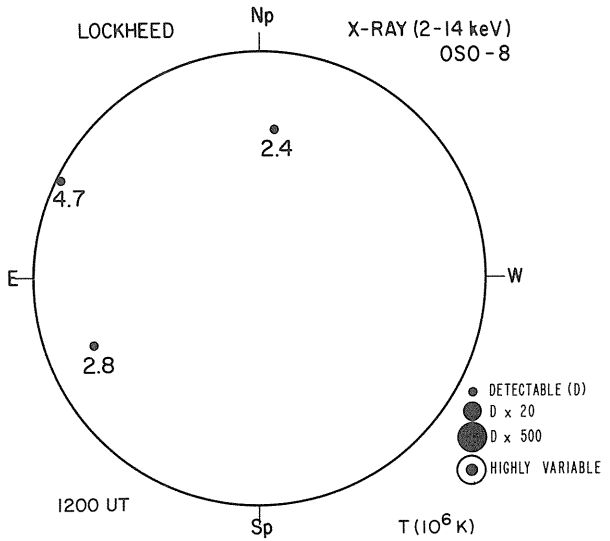


8.6 MM

APRIL 28, 1977 (P =-24.70, B_o =-4.44, L_o =255.84)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

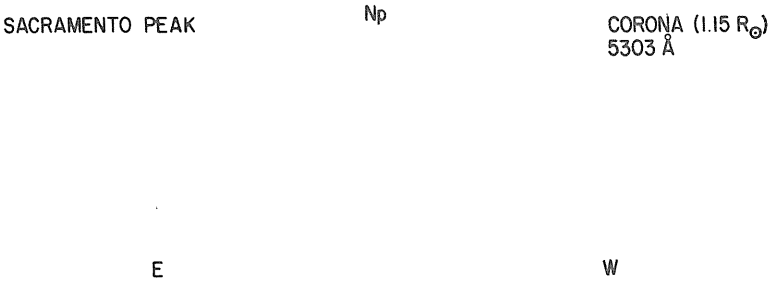


1200 UT

T (10^6 K)

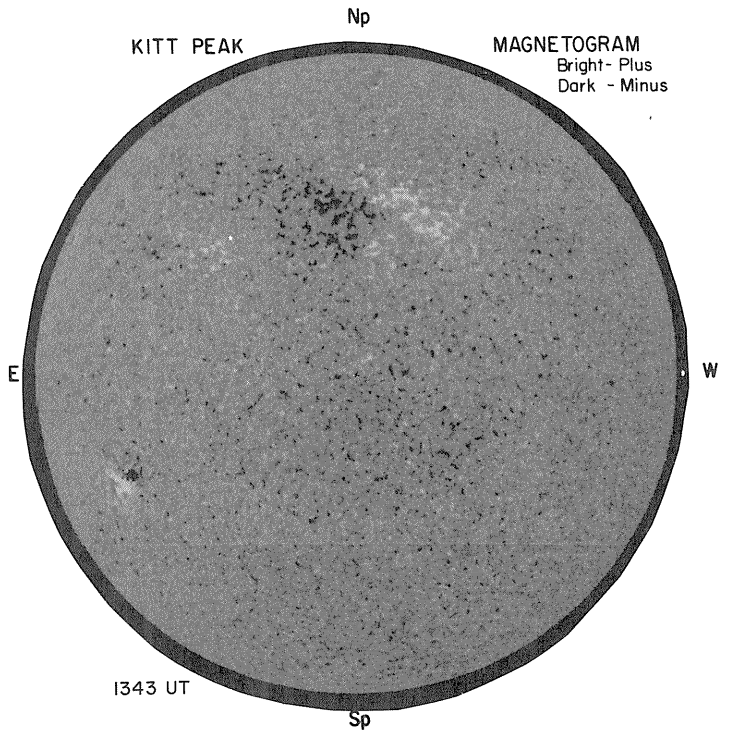
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright- Plus
Dark - Minus

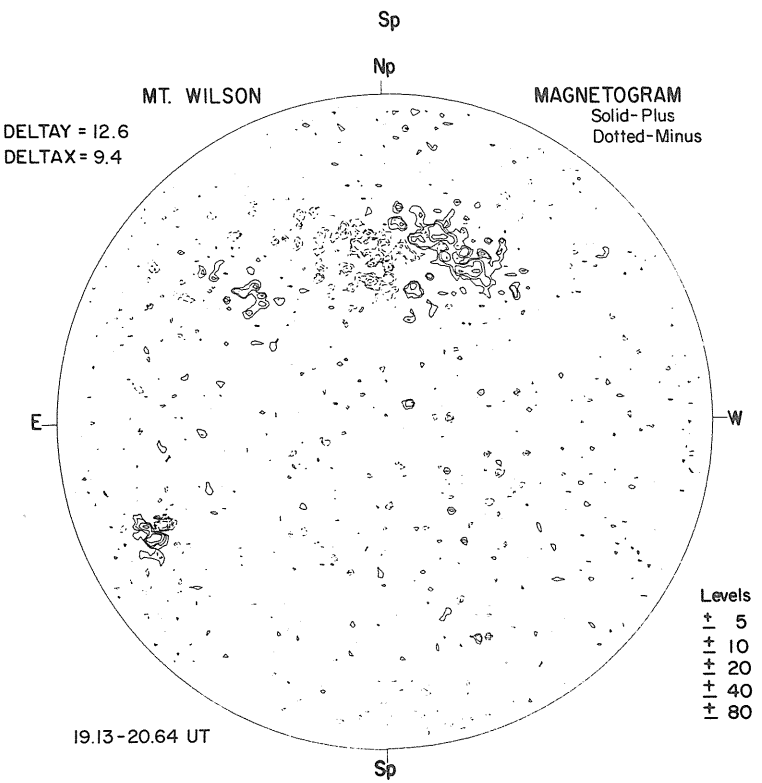


1343 UT

MT. WILSON

DELTAY = 12.6
DELTAX = 9.4

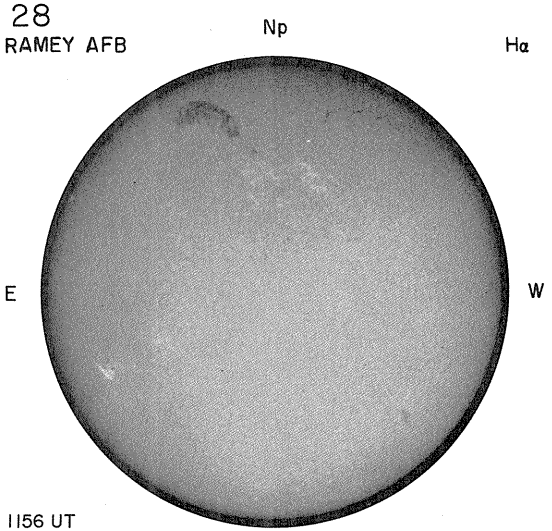
MAGNETOGRAM
Solid- Plus
Dotted-Minus



19.13-20.64 UT

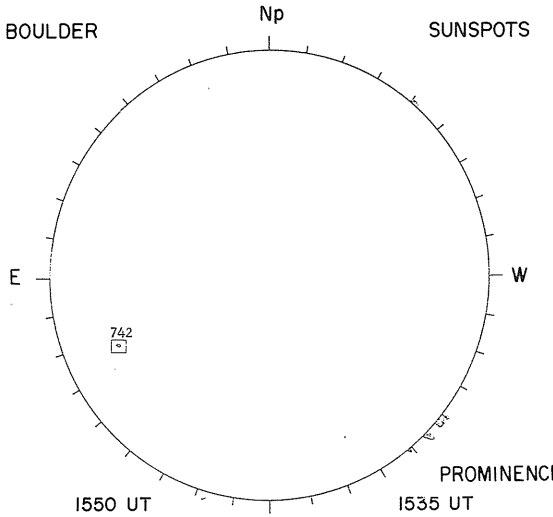
28

RAMEY AFB



1156 UT

BOULDER SUNSPOTS

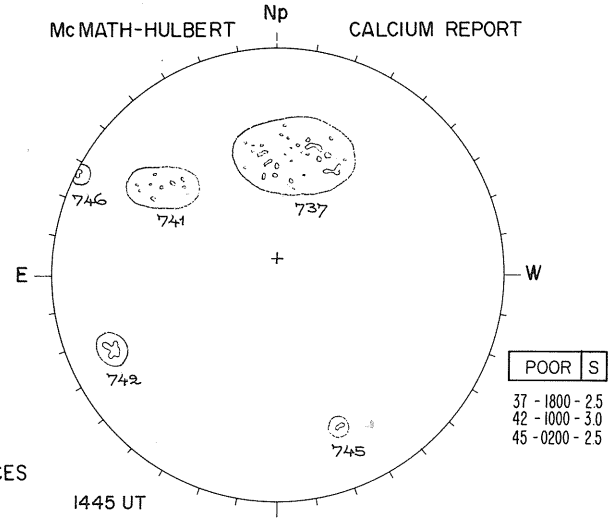


1550 UT

PROMINENCES

1535 UT

McMATH-HULBERT CALCIUM REPORT



1445 UT

POOR	S

37 - 1800 - 2.5
42 - 1000 - 3.0
45 - 0200 - 2.5

NOSC LA POSTA

Np

2.0 CM

NO DATA

E EQUIPMENT W

Sp

---- UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

Np

8.6 MM

NO DATA

E EQUIPMENT W

Sp

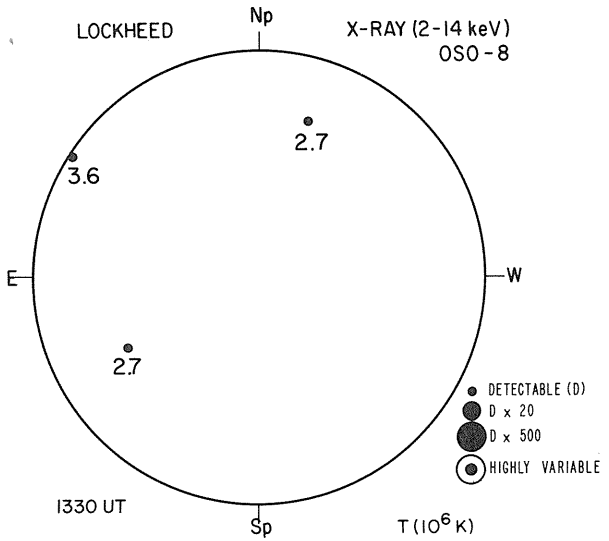
----UT

Ant. Temp. Unit 100° K

87
Apr 77

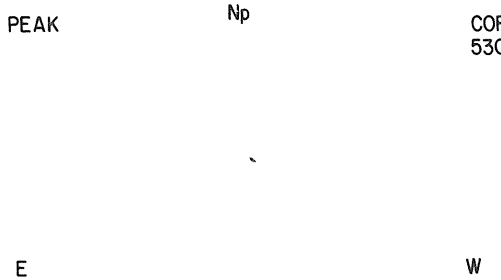
LOCKHEED

X-RAY (2-14 keV)
OSO-8



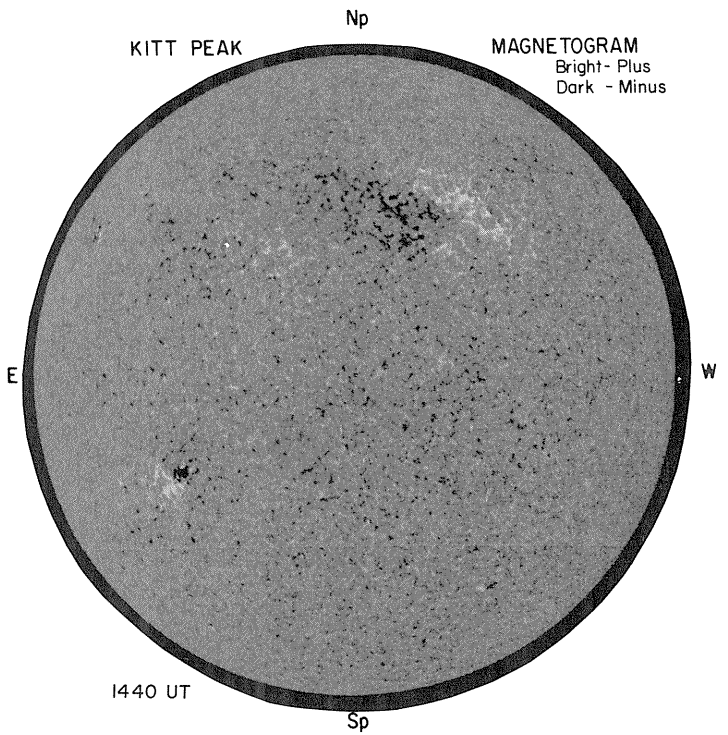
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

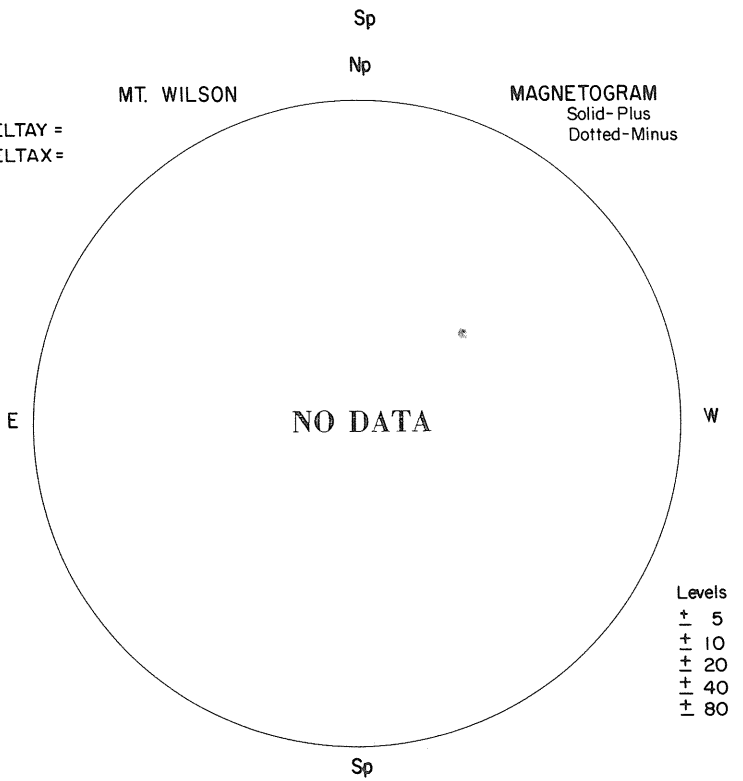
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

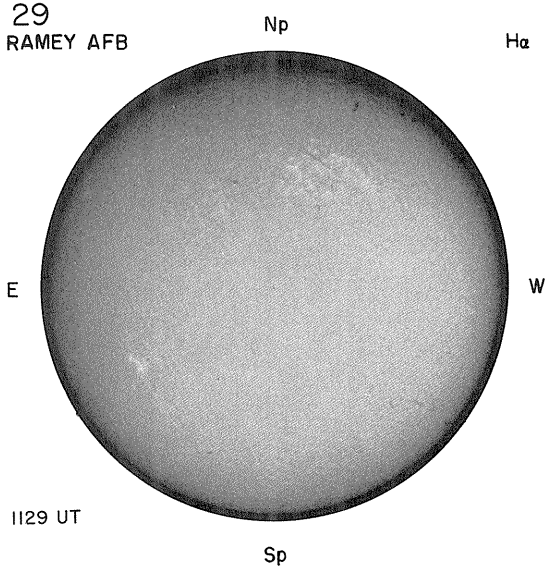
DELTAY =
DELTAX =

MAGNETOGRAM
Solid- Plus
Dotted-Minus



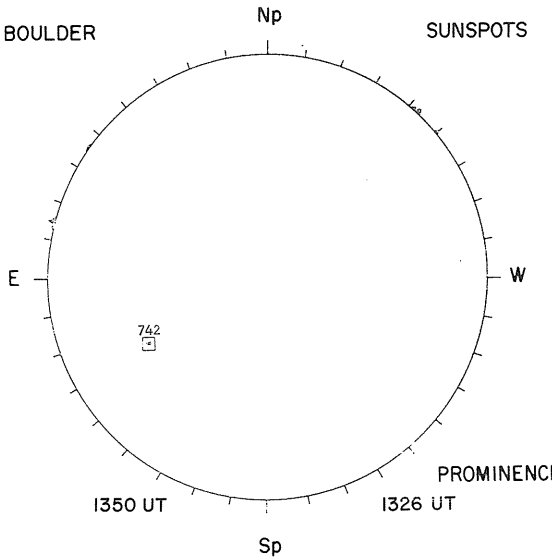
29

RAMEY AFB



Hα

BOULDER

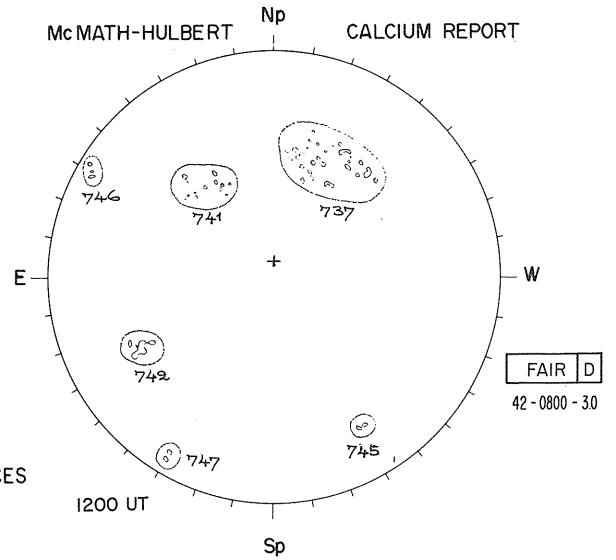


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT



FAIR | D

42 - 0800 - 3.0

NOSC LA POSTA

Np

2.0 CM

NO DATA

E

EQUIPMENT

W

Sp

---- UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

EQUIPMENT

W

Sp

---- UT

Ant. Temp. Unit 100° K

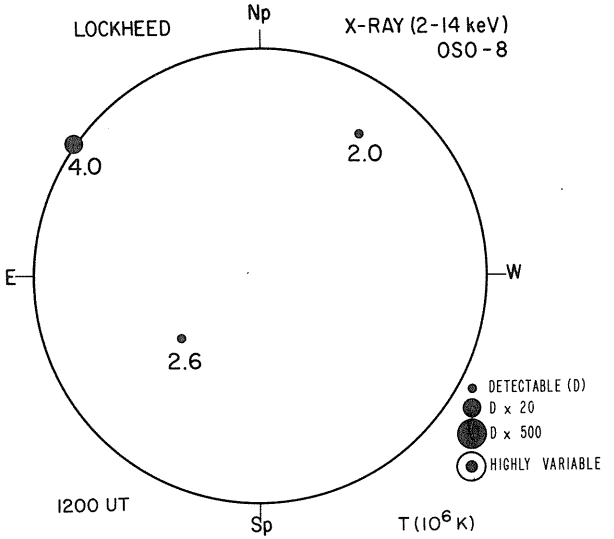
89

Apr 77

APRIL 30, 1977 (P =-24.37, B_o =-4.24, L_o =229.41)

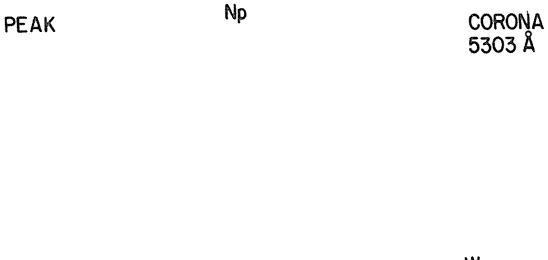
LOCKHEED

X-RAY (2-14 keV)
OSO-8



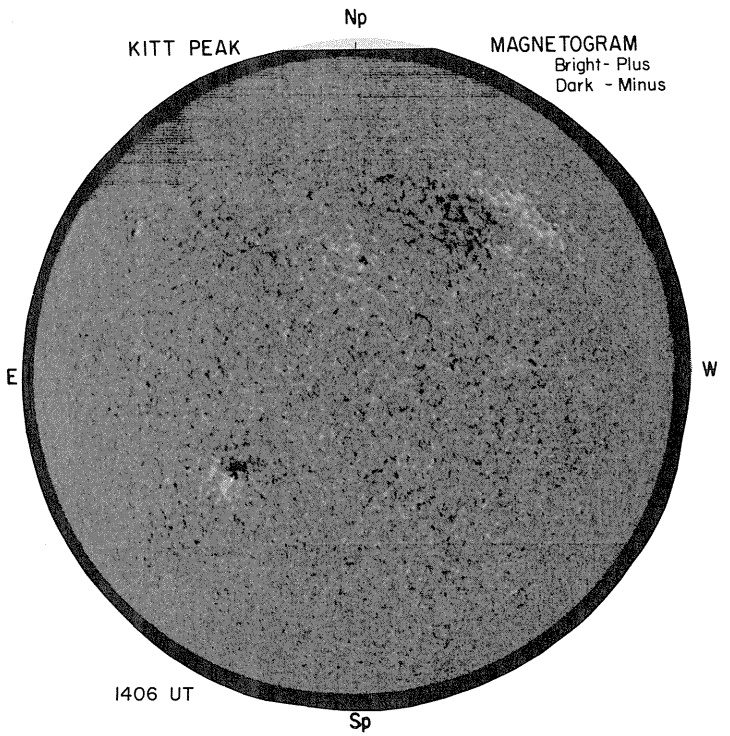
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

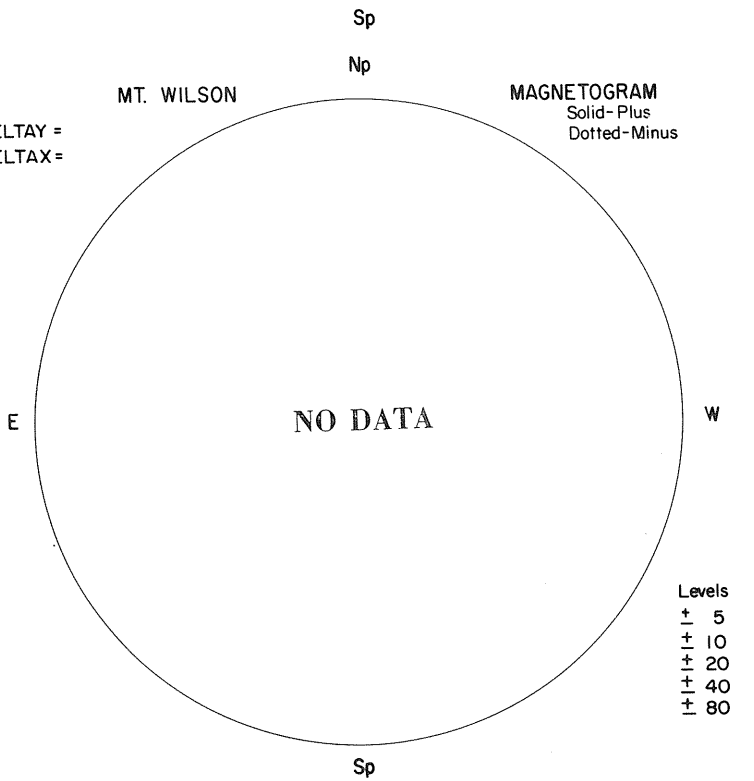
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

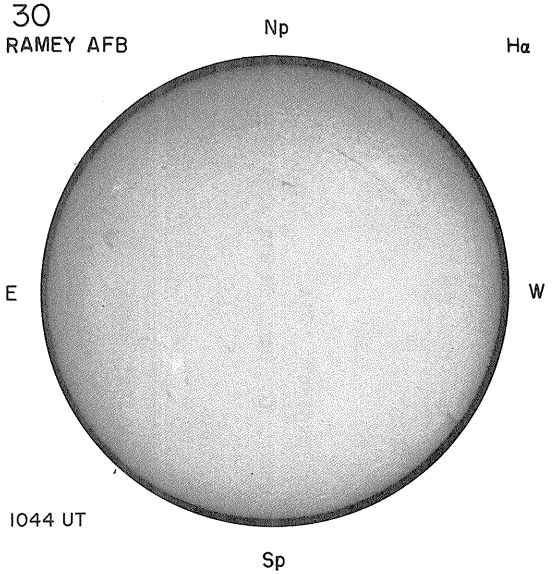
DELTAY =
DELTAX =

MAGNETOGRAM
Solid-Plus
Dotted-Minus



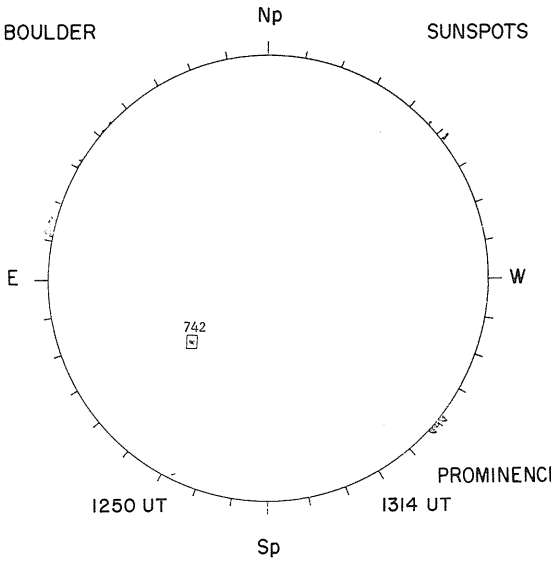
30

RAMEY AFB



1044 UT

BOULDER SUNSPOTS

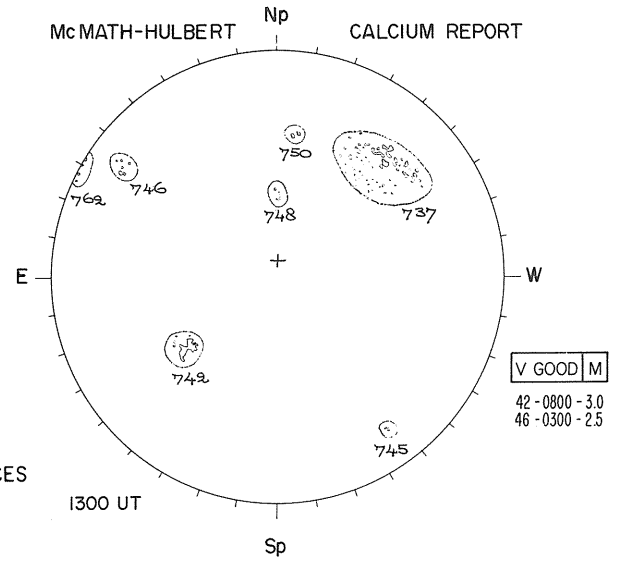


1250 UT

1314 UT

PROMINENCES

McMATH-HULBERT CALCIUM REPORT



1300 UT

V GOOD | M

42 - 0800 - 3.0

46 - 0300 - 2.5

NOSC LA POSTA

Np

2.0 CM

NO DATA

E

EQUIPMENT

W

Sp

---- UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

EQUIPMENT

W

Sp

---- UT

Ant. Temp. Unit 100° K

REGIONS OF SOLAR ACTIVITY

APRIL 1977

MCMATH REGION 14717 CMP DATE 1.6

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	5	14717	N20 W53	244	100	3.0	19769	N18 W51	241	(B)	4	B	10	2	BXO
77	4	6	14717	N20 W66	245	400	3.0	19769	N18 W65	242	(B)	4	B	10	2	BXO
77	4	7	14717	N20 W82	245	500	2.0	19769	N18 W80	243	B	3				

MCMATH REGION 14706 CMP DATE 2.3

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	3	29	14706	N18 E50	234	100	1.0									

MCMATH REGION 14712 CMP DATE 2.6

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	2	14712	N17 W04	230	100	1.0									
77	4	3	14712	N17 W12	230	100	1.0									

MCMATH REGION 14709 CMP DATE 3.0

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	3	30	14709	N00 E46	225	100	1.5									

MCMATH REGION 14707 CMP DATE 3.9 RETURN OF REGION 14674 ROTATION 3

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	3	29	14707	N20 E73	211	400	1.0									
77	3	30	14707	N20 E59	212	300	1.0									
77	3	31	14707	N22 E43	212	300	1.5									

MCMATH REGION 14711 CMP DATE 4.1

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	1	14711	S15 E30	211	100	1.5									
77	4	2	14711	S15 E16	210	100	1.5									
77	4	3	14711	S15 E07	211	100	1.5									

MCMATH REGION 14710 CMP DATE 5.3

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	3	31	14710	S31 E59	196	200	2.5									

MCMATH REGION 14725 CMP DATE 5.5

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	11	14725	S21 W80	191	100	1.0									

MCMATH REGION 14714 CMP DATE 6.6

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	3	14714	N28 E40	178	200	2.0									
77	4	4	14714	N28 E27	178	200	1.0									

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MCMATH REGION 14719 CMP DATE 6.8

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	8	14719	N29 W23	174	200	2.0	19770	N27 W24	174	(AF)	3	8	0	1	AXX
77	4	9	14719	N29 W36	174	100	1.0									

MCMATH REGION 14718 CMP DATE 7.2

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	6	14718	S06 E09	176	100	2.0									

MCMATH REGION 14720 CMP DATE 8.7

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	9	14720	N36 W11	149	100	2.0									
77	4	10	14720	N36 W23	149	100	1.5									

MCMATH REGION 14722 CMP DATE 9.4

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	9	14722	S34 W02	140	100	1.0									

MCMATH REGION 14713 CMP DATE 9.5 RETURN OF REGION 14679 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	2	14713	N27 E88	138	400	2.0									
77	4	3	14713	N27 E78	140	1000	2.0									
77	4	4	14713	N27 E66	139	1000	2.5									
77	4	5	14713	N28 E52	139	800	2.0									
77	4	6	14713	N27 E39	140	800	2.5									
77	4	7	14713	N27 E24	139	800	2.5									
77	4	8	14713	N27 E12	139	800	2.5									
77	4	9	14713	N27 W02	140	800	2.5									
77	4	10	14713	N27 W14	140	600	2.0									
77	4	11	14713	N27 W29	140	700	2.0									
77	4	12	14713	N27 W43	141	800	3.0	19772	N26 W43	140	(AF)	3				
77	4	13	14713	N27 W55	140	700	2.5									
77	4	14	14713	N27 W68	141	500	2.0									
77	4	15	14713	N27 W81	141	200	1.0									

MCMATH REGION 14715 CMP DATE 9.7

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	3	14715	S01 E85	133	500	2.5									
77	4	4	14715	S01 E74	131	700	3.0									
77	4	5	14715	S01 E59	132	700	2.5									
77	4	6	14715	S01 E46	133	500	2.5									
77	4	7	14715	S01 E29	134	400	2.5									
77	4	8	14715	S01 E16	135	400	2.5									
77	4	9	14715	S01 E02	136	400	2.5									
77	4	10	14715	S01 W10	136	300	2.0									
77	4	11	14715	N00 W22	133	300	2.0									
77	4	12	14715	N00 W36	134	200	1.5									
77	4	13	14715	S01 W50	135	200	1.0									
77	4	14	14715	S01 W64	137	100	1.0									

MCMATH REGION 14729 CMP DATE 10.8

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	15	14729	N20 W63	123	100	2.0	19774	N20 W65	123	X	1				

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APRIL 1977

MCMATH REGION 14721 CMP DATE 11.0

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	9	14721	N22 E19	119	100	2.0									
77	4	10	14721	N22 E06	120	100	1.5									
77	4	11	14721	N22 W08	119	100	1.5									
77	4	12	14721	N22 W21	119	100	1.0									

MCMATH REGION 14723 CMP DATE 13.0

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	9	14723	S36 E45	93	100	1.0									

MCMATH REGION 14732 CMP DATE 14.6

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	19	14732	S25 W66	72	300	2.0	19776	S26 W69	73	X	1				
77	4	20	14732	S25 W80	72	400	2.5									

MCMATH REGION 14728 CMP DATE 15.1

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	14	14728	N31 E08	65	100	1.0									

MCMATH REGION 14727 CMP DATE 15.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	14	14727	S25 E14	59	100	1.5	19773	S25 E11	60	AP	1				
77	4	15	14727	S25 E00	60	100	2.0	19773	S25 W04	62	(AP)	3	M	30	7	BXO
77	4	16	14727	S25 W15	60	400	2.5	19773	S25 W15	60	(BF)	4				
77	4	17	14727	S25 W26	59	500	2.5	19773	S26 W25	56	(BF)	4	B	20	4	BXO
77	4	18	14727	S25 W38	57	500	2.5	19773	S26 W39	57	(B)	3				
77	4	19	14727	S25 W52	58	400	2.5									
77	4	20	14727	S25 W66	58	400	2.5									
77	4	21	14727	S25 W79	60	300	2.0									

MCMATH REGION 14730 CMP DATE 16.4

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	16	14730	N24 W03	48	200	1.5	19775	N26 W05	50	(AP)	2				
77	4	17	14730	N25 W15	46	200	1.5									
77	4	18	14730	N26 W28	47	200	1.5									
77	4	19	14730	N27 W41	47	200	1.0									

MCMATH REGION 14724 CMP DATE 17.1

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	10	14724	N24 E88	38	100	1.0									
77	4	11	14724	N25 E72	39	300	1.0									
77	4	12	14724	N26 E60	38	100	1.0									

MCMATH REGION 14726 CMP DATE 18.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	11	14726	S21 E87	24	800	3.5	19771	S20 E80	31	(AP)	4	R	50	1	HSX
77	4	12	14726	S21 E77	21	3700	4.0	19771	S20 E72	25	(B)	4	M	220	5	DAO
77	4	13	14726	S22 E65	20	3500	3.5	19771	S20 E59	25	(Y)	4	B	300	16	DAI

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APRIL 1977

MCMATH REGION 14726 (CONT) CMP DATE 18.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	14	14726	S22 E54	19	3500	3.5	19771	S20 E46	25	(Y)	4	B	370	13	DAI
77	4	15	14726	S22 E41	19	3800	3.5	19771	S20 E33	25	(Y)	5				
77	4	16	14726	S22 E27	18	3800	3.5	19771	S20 E20	25	(Y)	5	B	300	9	DAI
77	4	17	14726	S22 E15	18	3200	3.0	19771	S19 E07	24	(Y)	4	B	170	19	EAI
77	4	18	14726	S22 E02	17	3200	3.5	19771	S20 W05	23	(Y)	5				
77	4	19	14726	S22 W12	18	3300	3.5	19771	S20 W16	20	(BP)	5	M	140	3	DSO
77	4	20	14726	S22 W26	18	3000	3.5	19771	S20 W33	24	(BY)	5	M	120	9	EAO
77	4	21	14726	S21 W40	21	3000	3.5	19771	S22 W39	20	(BP)	3	B	100	7	CSI
77	4	22	14726					19771	S22 W55	19	BP	3	B	100	7	CSO
77	4		14726						S12 E02				B	0	1	AXX
77	4	23	14726					19771	S22 W65	19	(B)	2	B	100	10	CAI
77	4	24	14726	S22 W75	15	1500	3.5	19771	S20 W88	29	(AP)	2	B	30	2	BXO

MCMATH REGION 14731 CMP DATE 19.3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	18	14731	N09 E10	9	200	1.5									

MCMATH REGION 14739 CMP DATE 22.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	24	14739	N05 W24	324	100	2.0									

MCMATH REGION 14740 CMP DATE 23.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	24	14740	S22 W11	311	100	1.5									

MCMATH REGION 14735 CMP DATE 24.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	21	14735	N29 E39	302	200	1.0									

MCMATH REGION 14745 CMP DATE 26.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	28	14745	S46 W23	270	200	2.5									
77	4	29	14745	S45 W33	269	200	1.5									
77	4	30	14745	S45 W44	266	100	1.0									

MCMATH REGION 14736 CMP DATE 27.1

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	4	21	14736	N15 E73	268	100	1.0									

MCMATH REGION 14752 CMP DATE 27.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	5	02	14752	N01 W68		300	1.0									
77	5	03	14752	N02 W80		200	1.0									

REGIONS OF SOLAR ACTIVITY

APRIL 1977

MCMATH REGION 14756 CMP DATE 28.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	5	03	14756	S27 W72		300	1.5								

MCMATH REGION 14737 CMP DATE 28.3 RETURN OF REGION 14717 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	4	21	14737	N27 E89	252	700	1.0								
77	4	24	14737	N27 E45	255	1800	2.0								
77	4	25	14737						S21 E85			M	90	1	HSX
77	4	26	14737	N27 E23	253	1800	2.0								
77	4	27	14737	N26 E10	251	2000	2.5								
77	4	28	14737	N27 W04	251	1800	2.5								
77	4	29	14737	N27 W17	253	1800	2.0								
77	4	30	14737	N27 W30	252	1800	2.0								
77	5	01	14737	N27 W41		1800	2.0								
77	5	02	14737	N27 W54		1800	2.0								
77	5	03	14737	N27 W65		1400	1.5								

MCMATH REGION 14757 CMP DATE 28.4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	5	03	14757	N08 W53		100	1.5								

MCMATH REGION 14750 CMP DATE 30.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	4	30	14750	N34 W04	226	100	1.0								
77	5	01	14750	N34 W16		100	1.5								
77	5	02	14750	N34 W32		200	1.0								

MCMATH REGION 14748 CMP DATE 30.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	4	30	14748	N19 W01	223	200	2.0	19778	N17 W02	223	X	2			
77	5	01	14748	N19 W13		300	1.5								
77	5	03	14748	N19 W37		200	1.0								

MCMATH REGION 14744 CMP DATE 30.6

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	4	27	14744	S34 E40	221	100	1.5								

MCMATH REGION 14753 CMP DATE 30.9

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	5	02	14753	S01 W24		100	1.0								

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on April 22, 23 and 25, 1977. Sunspot observations were made at Mt. Wilson for the entire month of April 1977.

DAILY CALCIUM PLAGE INDEX

APRIL 1977

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
77	4	1	5.7	77	4	11	1.9	77	4	21	7.7
77	4	2	5.3	77	4	12	4.6	77	4	22	*
77	4	3	5.4	77	4	13	5.5	77	4	23	*
77	4	4	4.8	77	4	14	7.0	77	4	24	3.6
77	4	5	3.8	77	4	15	9.4	77	4	25	*
77	4	6	3.7	77	4	16	12.1	77	4	26	3.7
77	4	7	2.6	77	4	17	9.9	77	4	27	6.1
77	4	8	3.0	77	4	18	11.8	77	4	28	6.4
77	4	9	3.3	77	4	19	11.3	77	4	29	5.8
77	4	10	1.9	77	4	20	9.2	77	4	30	5.7

* NO OBSERVATIONS

SUDDEN IONOSPHERIC DISTURBANCES

APRIL 1977

DAY	UNIVERSAL TIME START	END	MAX	INP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
07	0250	0333	0310	1-	1				1				0246	14717
11	2115	2302	2128	1	5	1		1	2		9		NF	
12	0948	1100	0954	3-	5	6		4	3		3		0944	14726
13	1232	1304	1300	1	1			1					1227	14726
13	1730	1757D	1757	1	5	3			2	1	10		1727E	14726
13	2126	2207D	2137	1	5	3		1	2	1	10		2130	14726
13	2207E	2333D	2221	1	5	2		1	2	1			2218E	14726
13	2233E	0203	2344	2	5	2		1	2	1	10		2234	14726
14	0534	0640	0543	2+	5	3		3	2		3		NF	
14	2112	2118	2114	1-	5	1			1		4		2105	14726
14	2211	2235	2214	1-	5				1		4		2211	14726
15	0854	0945	0904	1+	5	3		3	3		2		0851	14726
16	0712	0834	0746	1-	1				1				0711	14726
16	1727	1815	1733	1	5	2			1	1	10		1722	14726
16	2109	2216	2120	1-	5	1		1	2	1	11		2109	14726
16	2309	0218	2330	1	5	1			3	1	8		2307	14726
17	1042	1140	1056	1	5	2		3	3		2		1040	14726
19	0739	0816	0745	1-	5			2	2		1		0735	14726
19	1209	1228	1210	1	1			1					*	
19	1503	1600	1525	1	1			1	1				*	

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-14	0000-2400 A29
01-10	0000-2400 A32
01-05	0000-2400 A36
01-03	0000-2400 A41
01	2025-2115 UM (10 kHz), 2307-2400 UM (10 kHz)
02	0025-0125 UM (10 kHz), 0857-0950 UM (10 kHz), 0857-0950 UM (13 kHz)
04	0435-0520 UM (10 kHz), 1942-2108 UM (10 kHz)
05	1939-2110 UM (10 kHz)
06	0121-0219 UM (10 kHz), 1945-2109 UM (10 kHz)
07-12	0000-2400 A37
07	1951-2123 UM (10 kHz)
08	0000-0055 UM (10 kHz), 0510-0625 UM (10 kHz)
09	0000-2400 A41, 1626-1845 TM, 1948-2022 UM (10 kHz)
10-18	0000-2400 A28
10	0000-2400 A41, 1950-2103 UM (10 kHz)
11	0202-0330 UM (10 kHz), 0536-0631 UM (10 kHz)
12	0511-0644 UM (10 kHz), 1943-2104 UM (10 kHz)
13-30	0000-2400 A36
13	0317-0635 UM (10 kHz)
14	0042-0152 UM (10 kHz), 0213-0442 UM (10 kHz) 1940-2115 UM (10 kHz)
15	1941-2037 UM (10 kHz)
16	0132-0623 UM (10 kHz), 1945-2105 UM (10 kHz)
17	1940-2101 UM (10 kHz), 2003-2110 UM (13 kHz)
18	1938-2039 UM (10 kHz)
19	1424-1526 TM, 2156-2236 TM
20	0000-0057 TM, 1432-1504 TM, 1643-1816 TM
21	1107-2235 UM (10 kHz), 1110-2235 UM (13 kHz)
22-25	1430-1143 MC
22	0000-2400 A32, 1109-2400 UM (10 kHz), 1111-2400 UM (13 kHz)
23	0000-0139 UM (10 kHz), 0000-0245 UM (13 kHz), 0841-0955 UM (13 kHz), 1136-2116 UM (10 kHz), 1140-2250 UM (13 kHz)
24	0000-2400 A41, 1107-2303 UM (10 kHz), 1107-2303 UM (13 kHz)
25	1222-1447 UM (10 kHz), 1225-1445 UM (13 kHz)
27	0000-2400 A32, 0710-0810 UM (10 kHz)
30	0000-2400 A26, 1835-2400 UM (10 kHz), 1839-2400 UM (13 kHz)

STATIONS REPORTING FOR APRIL 1977

AAVSO (A1, A19, A21, A29, A30, A31, A34, A35, A36, A37, A40, A41) (SES)
(A1, A26, A31, A32) (SEA) (A31) (SWF)
BEARLY (BY) (SWF)
DARMSTADT (DA) (SWF)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
KUHLUNGSBORN (KU) (SWF, SEA, SPA)
MANILA (MA) (SPA)
MCMATH (MC) (SWF, SCNA)
PANSKA VES (PU) (SWF, SEA, SES)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
SOMERTON (SO) (SWF)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
[illegible] (SPA)

SID's BY McMATH REGION

APRIL 1977

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
REGION																														
17								1																						
26												1	5	2	1	4	1		1											
X-RAY																														
UNKNOWN											1			1																
NO FP																			2											

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1977

APR 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01	0000	0736	CULG										
	0000	1005	MANI										
	0530	0546	DURN										
	0537	1715	WEIS										
	0629	1738	DURN										
	1030	2305	SGMR										
	1315	2345	HARV										
	2036	2400	CULG										
	2153	2400	MANI										
02	0000	1005	MANI										
	0000	0736	CULG										
	0529	1740	DURN										
	1028	2220	SGMR							1415.2	1416.5	1	V
			SGMR							1826.9	1827.3	1	III
	1315	2345	HARV				1827	1828	3	1827	1828	3	IIIG,U
	2036	2400	CULG										
	2153	2400	MANI										
03	0000	1005	MANI										
	0000	0735	CULG				0140.5		1				IIIB
	0528	1742	DURN										
	1026	2308	SGMR										
	1057	1718	WEIS				1413.7	1414.0	1				IIIG
	2035	2400	CULG				2048.5						IIIB,W
			CULG				2139.5						IIIB,W
			CULG				2145	2150	1				IS
			CULG	2152.5	2156	1	2152.5	2156	1				IIIG
	2152	2400	MANI										
	1315	2345	HARV				2153		1	2153		1	IIIB
	2035	2400	CULG				2249.5	2250.5	1				IIIB
			CULG				2315	2316					IIIG,W
04	0000	0717	CULG										
	0000	0134	MANI										
	0148	1005	MANI										
	0526	1743	DURN										
	1025	2309	SGMR										
	0531	1719	WEIS				1213.7	1214.4	1				IIIB
	1315	2345	HARV										
	2035	2400	CULG										
	2151	2400	MANI										
05	0000	1005	MANI										
	0000	0734	CULG				0031						IIIB,W
	0527	1509	DURN										
	0528	0808	WEIS										
	0811	1721	WEIS										
	1300	2345	HARV										
	1300	2310	SGMR										
	2035	2400	CULG										
	2151	2400	MANI										
06	0000	1005	MANI										
	0000	0734	CULG										
	0528	1308	WEIS										
	0554	1746	DURN										
	1021	2311	SGMR										
	1300	2345	HARV										
	1337	1558	WEIS										
	1602	1722	WEIS										
	2035	2400	CULG										
	2151	2400	MANI										
07	0000	1005	MANI										
	0000	0734	CULG										
	0523	1749	DURN										
	0525	1723	WEIS										
	1019	2312	SGMR										
	1300	2345	HARV										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1977

APR 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
07	2034	2400	CULG										
	2153	2400	MANI										
08	0000	1005	MANI										
	0523	0933	WEIS				0605.2	0605.7	2				IIIG
	0000	0734	CULG				0605	0606	1				IIIG,V
			CULG				0608	0612					IIW
			CULG				0622.5						IIIB,W
			CULG				0638						IIIB,W
	0521	1750	DURN				0851.0	0852.1	1				III
	0937	1015	WEIS										
	1018	2313	SGMR										
	1054	1725	WEIS										
	1300	2345	HARV										
	2034	2400	CULG										
	2152	2400	MANI										
09	0000	1005	MANI										
	0520	1752	DURN										
	0000	0733	CULG				0530.5						IIIB,W
			CULG				0545.5	0546					IIIG,W
	0615	0727	WEIS										
	0924	1640	WEIS										
	1016	2314	SGMR										
	1300	2345	HARV										
	2035	2400	CULG										
	2152	2400	MANI										
10	0000	1005	MANI										
	0000	0733	CULG										
	0518	0850	DURN										
	1014	2315	SGMR										
	1019	1753	DURN										
	1300	2345	HARV										
	2033	2400	CULG										
	2152	2400	MANI										
11	0000	0401	MANI										
	0000	0733	CULG										
	0605	1005	MANI										
	0515	1755	DURN	0948.4	0948.6	1							IIIG
	1013	2317	SGMR										
	1300	2345	HARV										
	2033	2400	CULG										
	2152	2400	MANI										
12	0000	1005	MANI										
	0000	0732	CULG										
	0513	1757	DURN	0949	0955.5	3							OCIM
			DURN	0952.6	0952.9	3							IIIG,RS,U
			DURN	0958	1005.2	3	0959	1005.2	3				IC
	1011	2318	SGMR										
			DURN	1020.9	1022.6	2	1020.9	1022.6	3				IC
	1300	2345	HARV										
	2033	2400	CULG										
	2146	2400	MANI										
13	0000	1005	MANI										
	0000	0732	CULG										
	0512	1758	DURN	0550.3	0551	2							IIIG
	0715	0758	DWIN										
	1009	2319	SGMR										
	0836	1308	DWIN				1018.0	1018.5	1				IIIG
			DWIN				1056.8	1058.2	1				IIIG
			DWIN				1210.0	1212.2	1				IIIGG
			DWIN				1248.7	1248.8	1				IIIG
	1300	2345	HARV				1444		2	1444		2	IIIG
			HARV				1841		1	1841		1	IIIB
	2033	2400	CULG				2033	2115					IIIS,W
	2146	2400	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1977

APR 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
14	0000	1005	MANI										
	0000	0732	CULG				0057	0058					IIIG,W
			CULG				0249	0249.5					IIIG,W
			CULG							0542	0605	1	SWF
	0509	1354	DURN	0548.5	0548.9								DCIM,W
			CULG	0554	0557	1							FAST DRIFT
			DURN	0555.8	0556.3	3	0555.6	0556.3	3				IIIG
			CULG				0557	0650					IIIN,W
			CULG				0600	0635	1				CONT
			CULG				0610	0623	1				UNCLF.
	0701	1454	DWIN				0956.6						IIIB
			DWIN				1001.0		1				IIIB
	1008	2320	SGMR										
			DWIN				1159.4	1159.6	1				IIIG
			DWIN				1218.1	1218.5	1				IIIG
	1343	1733	WEIS										
	1300	2345	HARV				1802		1	1802		1	IIIB
			HARV				1820		1	1820		1	IIIB
	2033	2400	CULG				2045	2400					IIIN,W
			CULG				2106		1				IIIB,U
	2146	2400	MANI										
15	0000	1005	MANI										
	0000	0732	CULG				0049.5		1				IIIB
			CULG				0059.5		1				IIIB
	0510	1734	WEIS										
	0735	1419	DWIN				0735	1419	1				IN
	1300	2345	HARV				1739		2	1739		2	IIIG
	0507	1759	DURN	1741.5	1741.9		1741.5	1741.9					IIIG,W
	1006	2321	SGMR							1821.7	1821.9	1	III
			HARV				1821	1822	3	1821	1822	3	IIIG
			SGMR							1911.8	1912.3	2	V
			HARV				1912		3	1912		3	IIIG,V
			SGMR							1919.7	1920.1	2	V
			HARV				1920		3	1920		3	IIIG
	2032	2400	CULG				2032	2400					IIIN,W
			CULG				2052.5		2				IIIB
			HARV				2052	2053	2	2052	2053	2	IIIG
	2145	2400	MANI										
			CULG				2155	2156.5	1				IIIG
			CULG				2219.5	2220.5	2				IIIG
			HARV				2220		1	2220		1	IIIB,W
			CULG				2302	2302.5	1				IIIG
			CULG				2320.5	2321	2				IIIG
			HARV				2320		1	2320		1	IIIG,W
16	0000	0732	CULG				0000	0224	1				IIIN
			CULG				0003.5	0006	2				IIIGG
			CULG				0011	0012	2				IIIG
			CULG				0016	0018	2	0017	0017.5	1	IIIG
			CULG				0200.5	0201	2				IIIG
			CULG				0210.5	0211	2	0210.5	0211	2	IIIG
	0000	1005	MANI							0210.9	0211.3	2	III
	0508	1829	WEIS				0544.5	0545.5	2				IIIG
	0506	1800	DURN	0544.6	0545.5	1	0544.6	0545.2	2				IIIG
			CULG	0545	0545.5	1	0544.5	0546	1				IIIG
			DURN	0724	1450	1	0724	1450	1				IC,DC,N
			DURN	0729.7	0731.0	1	0729.7	0731.0	1				IIIG
			DURN				0851.2	0851.2	3				III
	1005	2322	SGMR										
			WEIS				1132.0	1548.0	2				IN
	1300	2345	HARV										
	2032	2400	CULG				2032	2400					IS,W
	2146	2400	MANI										
			CULG							2310	2330	1	S.W.F.
			CULG	2312	2321	1							CONT
			CULG				2318	2400					IIIN,W
			CULG				2318	2335					II, W
			CULG	2320	2325		2318	2327					IIIG,W
17	0000	0731	CULG				0000	0135	1				IS

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1977

APR 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
17			CULG				0000	0148					IIIN,W
	0000	1005	MANI										
			CULG	0040	0105								IS,W
			CULG				0135	0731					IS,W
	0505	1800	DURN										
	0506	1737	WEIS										
	1003	2323	SGMR										
	1300	2345	HARV										
	2031	2400	CULG				2102						IIIB,W
	2145	2400	MANI										
			CULG				2207	2209					IIIG,W
			CULG	2210	2212.5	1							IIIG
			CULG				2216	2217					IIIG,W
			CULG				2223	2224	1				IIIG
			CULG				2234	2239	1				IIIGG
			CULG				2337		2				IIIB
18	0000	1006	MANI										
	0000	0731	CULG				0013	0014	1				IIIG
			CULG				0240	0252	1				IIIG
			CULG				0303		1				IIIB
			CULG				0317		1				UNCLF.
			CULG				0346						IIIB,W
	0504	0558	WEIS										
	0504	1802	DURN										
	0715	1538	WEIS										
	1001	2324	SGMR										
	1300	2345	HARV										
	2143	2400	MANI										
	2031	2400	CULG				2231	2234.5	2				IIIG
			CULG				2258		1				IIIB
			CULG				2354.5						IIIB,W
19	0000	0731	CULG										
	0000	1006	MANI										
	0503	1439	WEIS										
	0503	0606	DURN										
	0618	1804	DURN										
	1000	2326	SGMR										
	0745	1435	DWIN				1022.4	1022.5	1				IIIG
	1300	2300	HARV										
	2032	2400	CULG										
	2143	2400	MANI										
20	0000	1006	MANI										
	0000	0731	CULG				0540.5	0542	1				IIIG
			CULG				0549.5	0551.5					IIIG,W
	0500	1740	WEIS				0824.8	0825.3	1				IIIG
	0501	1805	DURN				0825.2	0825.3	2				IIIG
	0958	2327	SGMR										
	0829	1343	DWIN				1049.0	1051.0	2				IIIG
	1300	2330	HARV										
	2031	2400	CULG										
	2143	2400	MANI										
21	0000	1006	MANI										
	0000	0730	CULG	0004	0004.5	1							IIIG
			CULG	0257	0257.5	1							IIIG,U
			CULG	0325	0325.5	1	0325	0325.5	1				IIIG
			CULG				0332						IIIB,W
			CULG	0409.5	0411	1							IIIG
			CULG	0411.5		1	0411.5		1				IIIB
			CULG	0630.5	0631.5	1							IIIG
	0500	1806	DURN	0630.8	0634.9	3	0630.8	0634.9	3				IIIG
	0459	0931	WEIS	0630.9	0631.6	2							IIIG
			WEIS				0634.8	0634.9	1				IIIB
			CULG	0635									IIIB,W
			CULG	0643.5									IIIB,W
			WEIS				0648.3	0648.5	1				IIIB
			CULG	0648.5									IIIB,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1977

APR 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
21	0841	1406	DWIN				1043.5	1044.2	3				IIIG
			DURN	1043.6	1043.8	2	1043.5	1043.9	3				IIIG
			DWIN				1203.9	1204.0	1				IIIG
			DWIN				1246.0		1				IIIB
			DHIN				1306.6	1306.7	1				IIIG
	0934	1742	WEIS				1343.5	1344.4	2				IIIG
			DURN	1348.8	1351.2	3	1350.6	1351.2	3				IIIG
			DWIN				1349.5	1350.0	1				IIIG
			DHIN				1350.6	1351.3	3				IIIG
			DWIN				1355.6	1356.3	2				IIIG
			DURN	1537.3	1538.2	3	1537.6	1538.2	3				IIIGG,U
			WEIS				1538.0	1538.5	3				IIIG
	0957	2328	SGMR							1538.2	1538.4	1	III
	1300	2330	HARV				1538		2	1538		2	IIIG,U
			WEIS				1539.7	1539.8	1				IIIG
			WEIS				1543.3	1547.0	2				II
			HARV				1544	1545	1				UNCL
			DURN	1629.2	1629.8		1629.7	1629.7					IIIG,DCIMW
	2031	2400	CULG	2037.5	2038	1	2037.5	2038	1				IIIG,U
			CULG				2040	2042	1				IIIG,U
			CULG	2040	2042	1							FAST DRIFT
			CULG	2047	2047.5		2047	2047.5					IIIG,W
	2143	2400	MANI										
			CULG	2149.5		1							IIIB
			CULG	2200.5	2202								IIIG,W
			CULG	2205.5	2208	1							IIIG
			CULG	2216.5	2221.5	1	2216.5	2221.5	2				IIIGG
			HARV				2219		1				IIIG
			CULG				2229	2235	1				II
			CULG	2249	2251	1	2249	2251	1				IIIG
			CULG	2252	2252.5	1	2252	2252.5	1				IIIG
			CULG	2254.5	2255	1	2254.5	2255	1				IIIG
			CULG	2257.5	2258	1	2257.5	2258	1				IIIG
			CULG				2302	2302.5	1				IIIG
			CULG				2313.5						IIIB,W
			CULG	2315	2316	1	2315	2316	1				IIIG
			CULG	2358	2359	1	2358.5	2359	1				IIIG
22	0000	1006	MANI										
	0000	0730	CULG	0041.5		1	0041.5		1				IIIB
	0752	1342	DWIN				0857.5	0857.9	2				IIIG
			DWIN				0938.4	0938.9	1				IIIG
			DWIN				0941.1	0941.2	1				IIIG
			DWIN				0943.9	0944.0	1				IIIG
	0955	2329	SGMR										
	0752	1342	DWIN				1029.4	1029.6	2				IIIG
			DWIN				1057.5		1				IIIB
			DWIN				1126.4		1				IIIB
			DWIN				1154.5	1154.5	1				IIIG
			DWIN				1206.0	1207.9	2				IIIGG
			DWIN				1246.3	1248.8	2				IIIGG
	1300	2330	HARV										
			DWIN				1322.2		1				IIIB
			DWIN				1337.4	1337.6	1				IIIG
	0457	1640	WEIS				1344.6	1344.7	1				IIIB
			WEIS				1347.9	1348.0	1				IIIB
	0459	1807	DURN	1731.7	1732.0	2	1731.7	1732.0	2				IIIG
	2143	2400	MANI										
	2031	2400	CULG				2254.5	2255					IIIG,W
			CULG				2256.5						IIIB,W
			CULG				2328						IIIB,W
23	0000	1006	MANI										
	0000	0730	CULG	0149	0150								IIIG,W
			CULG	0153.5	0155								IIIG,W
	0458	0946	DURN										
	0727	1745	WEIS										
	0954	2330	SGMR										
	1240	1810	DURN										
	1300	2330	HARV										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1977

APR 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
23	2142	2400	MANI										
	2140	2400	CULG				2156.5		1				IIIB
24	0000	0730	CULG										
	0000	1006	MANI										
	0454	1411	WEIS										
	0457	1812	DURN										
	0952	2331	SGMR										
	1300	2245	HARV										
	1516	1746	WEIS										
	2140	2400	MANI										
	2030	2400	CULG				2257	2259					IIIG,W
			CULG				2326						IIIB,W,U
25	0000	1006	MANI										
	0000	0730	CULG				0111						IIIB,W
	0455	1814	DURN										
	0552	1749	WEIS				0738.5	0739.0	1				IIIG
	0951	2332	SGMR										
	1300	2340	HARV										
	2030	2303	CULG										
	2140	2400	MANI										
	2340	2400	CULG										
26	0000	1006	MANI										
	0000	0543	CULG				0212						IIIB,W
			CULG				0312						IIIB,W
			CULG				0424.5	0425					IIIG,W
	0454	1816	DURN										
	0626	0730	CULG				0647						IIIB,W
	0551	0906	WEIS				0820.6	0821.0	1				IIIB
	0940	1750	WEIS										
	0949	2333	SGMR										
	1300	2245	HARV				2007	2008	1	2007	2008	1	IIIG
	2140	2400	MANI										
27	0000	0414	MANI										
	0000	0730	CULG				0357						IIIB,W
			CULG				0527.5	0529	2				IIIG,V,U
			CULG				0533	0535.5	1				IIIG,V,U
	0625	1006	MANI										
	0948	2335	SGMR										
	1300	2245	HARV										
	0453	1500	DURN	1317.3	1317.4	2	1317.3	1317.4	2				III,G
	0713	1447	WEIS				1317.5	1318.1	2				IIIB
	1503	1750	WEIS										
	2030	2400	CULG										
	2139	2400	MANI										
28	0000	0350	MANI										
	0000	0730	CULG				0024.5						IIIB,W
	0444	1750	WEIS										
	0451	1819	DURN										
	0552	1006	MANI										
	0946	2336	SGMR										
	1300	2245	HARV										
	2139	2400	MANI										
	2030	2400	CULG				2214	2215					IIIG,W
			CULG				2219	2220.5	1				IIIG,V
			CULG				2225	2226	1				IIIG
			CULG				2229	2231					IIIG,W
			CULG				2234.5	2236					IIIG,W
			CULG				2347	2347.5	1				IIIG
29	0000	0130	MANI										
	0000	0712	CULG				0124.5	0125					IIIG,W
	0303	1006	MANI										
			CULG				0410.5						IIIB,W
	0450	1820	DURN										
	0945	2337	SGMR										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1977

APR 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
29	0446	1753	WEIS				1200.1	1200.2	1				IIIB
	1300	2245	HARV										
			WEIS				1640.8	1640.9	2				IIIG
	2030	2400	CULG				2056	2057.5	1				IIIG
			CULG				2118		1				IIIB
	2139	2340	MANI										
			CULG				2146	2147.5	1				IIIG
	2356	2400	MANI										
30	0000	1006	MANI							0046.8	0048.0	2	III
	0000	0730	CULG	0047	0047.5	1	0046.5	0048	2				IIIG,V,U
			CULG				0101	0102	2				IIIG,U
			CULG				0347.5	0348					IIIG,W
	0448	1821	DURN										
			CULG				0540						IIIB,W
	0944	2338	SGMR										
	1247	2245	HARV										
	0444	1534	WEIS				1326.2	1327.4	1				IIIG
			WEIS				1332.9	1332.2	1				IIIB
	1545	1755	WEIS										
	2030	2400	CULG				2030	2400					IS,W
	2138	2400	MANI										

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
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

SELECTED SOLAR EVENTS

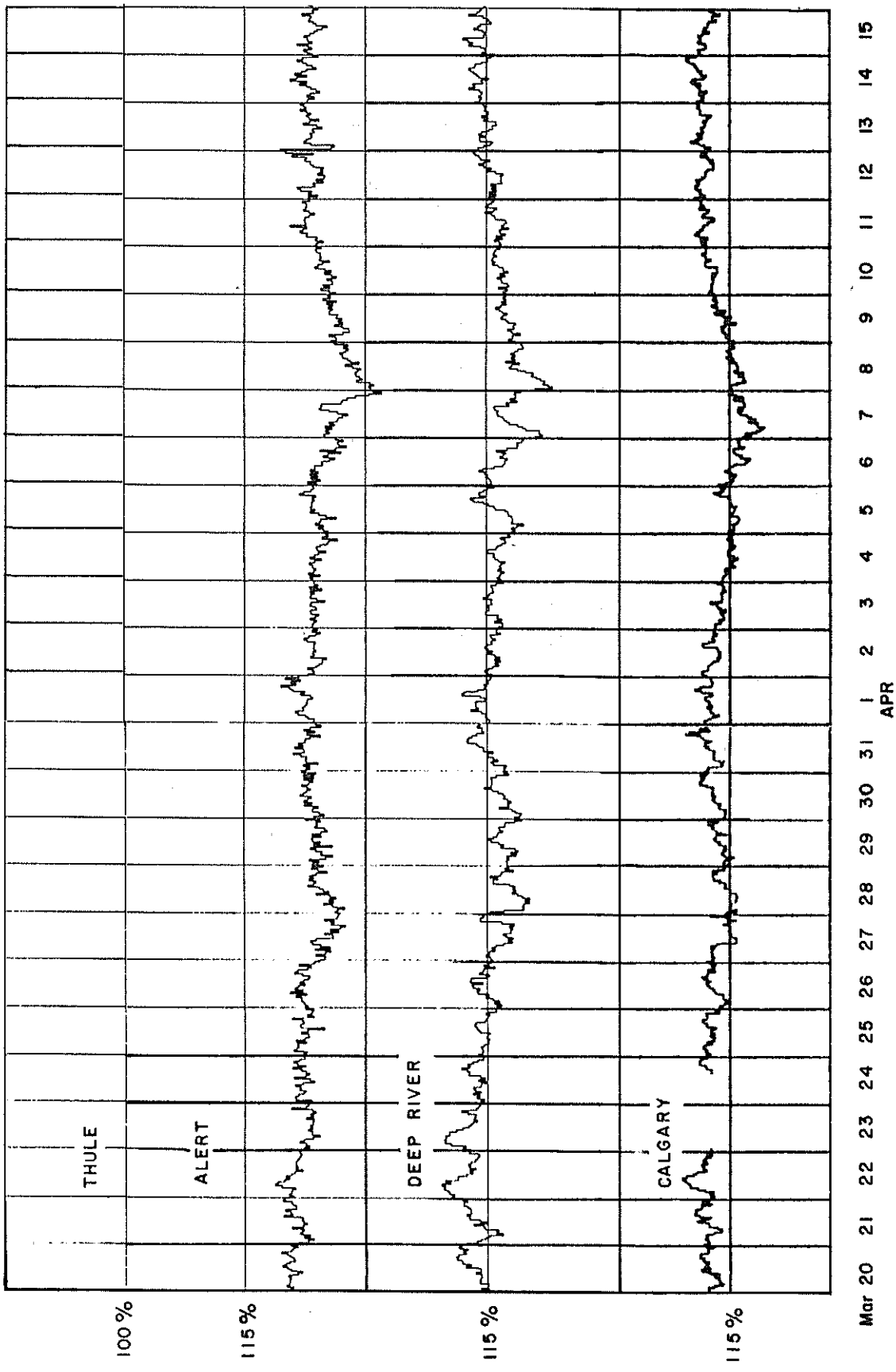
APRIL 1977

Culgoora

UT Date 197.7 APRIL	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
15	2300	0500	80 160	.8	100	r	1	IS,W	Type I and minor III activity persisted from this region until 17th
16	0003	0006	43.25 80 160	.4	140	-	3 2 2	IIIGG	
17	2316	2335	80 160	.4	145	-	2	II	
30	0046	0048	43.25 80 160	.9 .8 .8	85	-	3	IIIG,V,U	

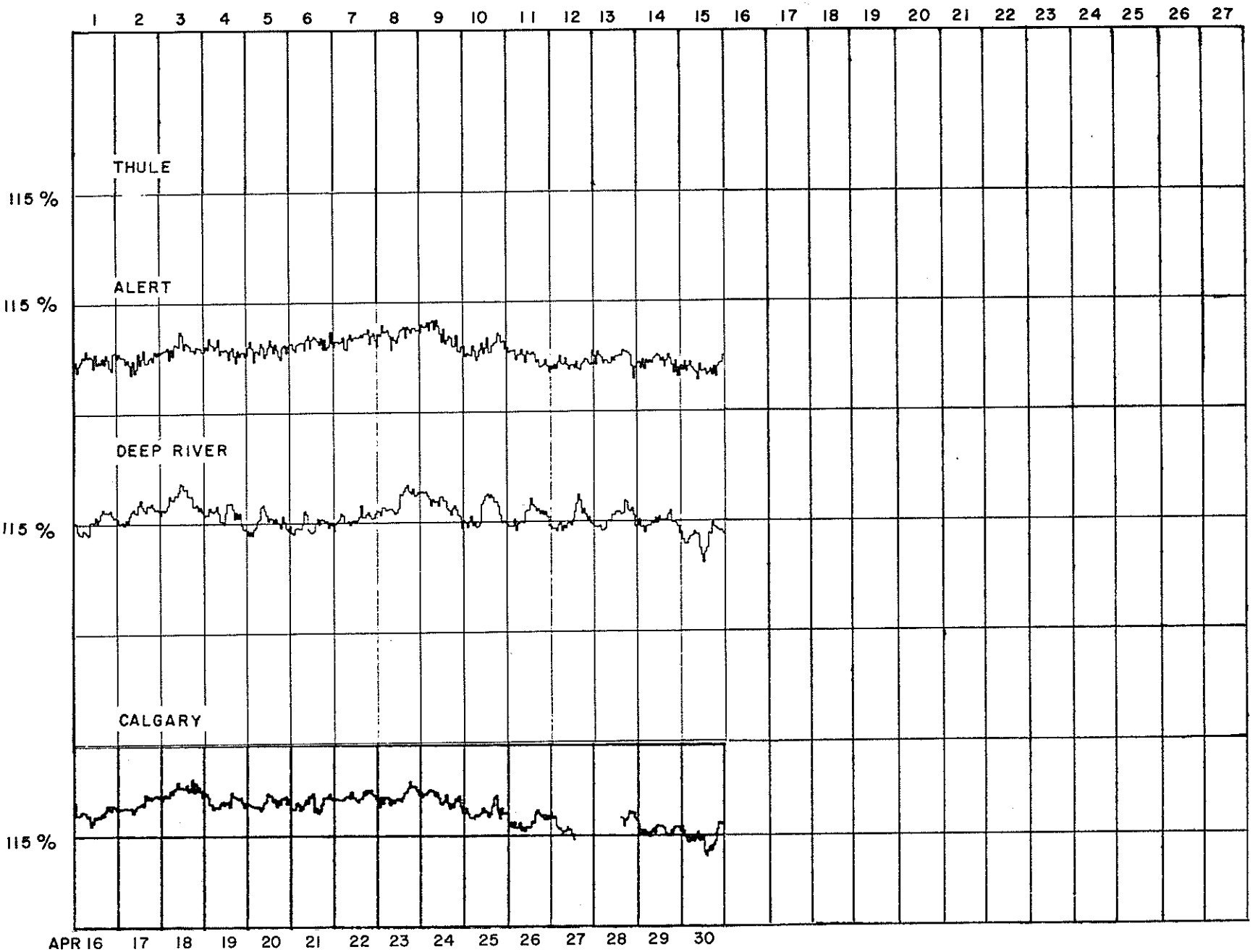
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1964 (March - April 1977)



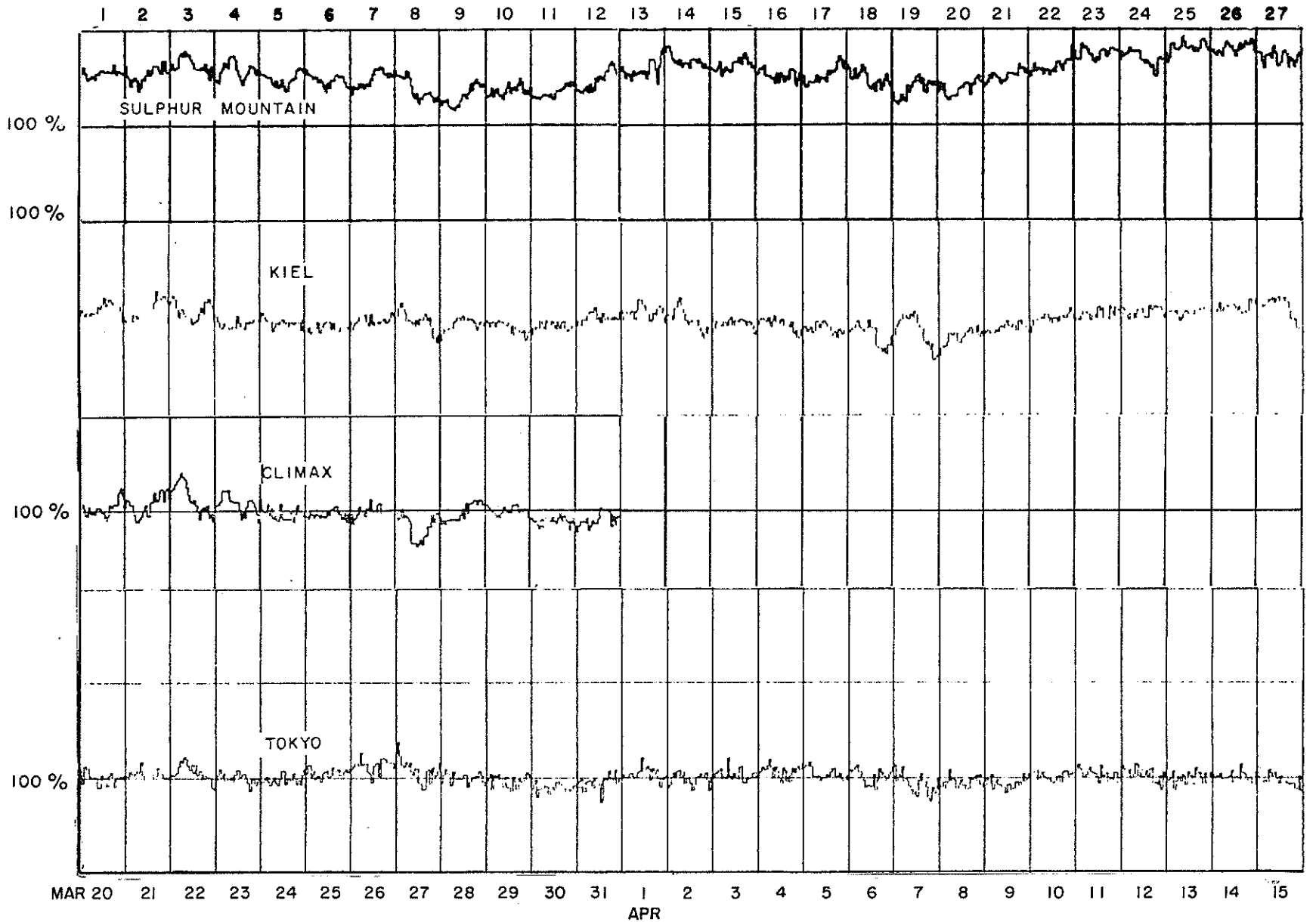
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1965 (April 1977)

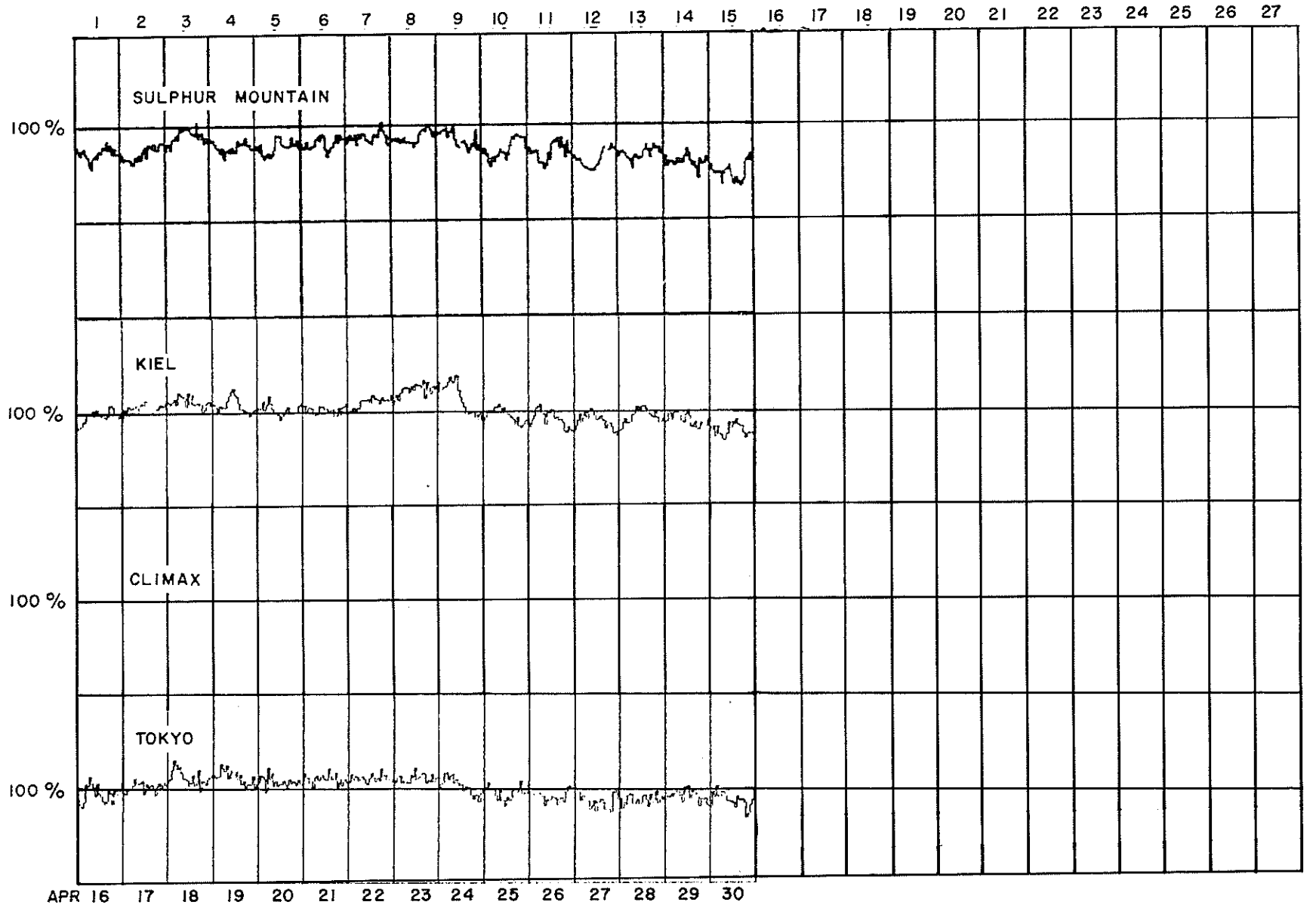


COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1964 (March - April 1977)



COSMIC RAY INDICES
(Neutron Monitors)
Bartels Rotation 1965 (April 1977)



COSMIC RAY INDICES

(Neutron Monitors)

APRIL 1977

APR. 1977	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr
1	Data not available at time of publication	7522.6	7087.7	11834.9	9038.0	6390.7	4277.7	3672.2
2		7486.5	7060.0	11813.3	9080.5	6362.5	4284.3	3662.8
3		7487.5	7058.5	11765.0	9057.7	6348.8	4265.4	3670.2
4		7475.0	7042.6	11707.0	9012.2	6346.3	4249.2	3677.7
5		7481.5	7045.2	11702.0	9014.4	6329.5	4225.9	3672.8
6		7457.1	7040.8	11671.7	8995.2	6309.2	4218.2	3668.3
7		7418.8	7005.0	11612.3	8947.8	6325.0	4209.1	3652.3
8		7377.5	6976.0	11677.9	8951.5	6301.1	4200.5	3655.6
9		7429.2	7022.0	11749.8	9009.0	6331.1	4228.9	3653.7
10		7457.5	7040.9	11822.9	9051.3	6365.0	4258.6(36)	3668.1
11		7504.5	7047.4	11859.3	9115.0	6379.4	4276.2	3671.4
12		7493.5	7065.5	11860.7	9090.0	6387.1	4270.0	3671.3
13		7498.0	7077.8	11872.1	9141.0	6382.9	4280.9	3663.8
14		7507.7	7095.0	11897.5	9137.5	6398.0	4286.1	3665.6
15		7495.6	7091.6	11849.6	9094.1	6399.0	4288.5	3658.2
16		7507.8	7082.8	11857.2	9105.2	6361.9	4260.6	3662.5
17		7509.1	7107.3	11920.9	9102.8	6388.8	4303.4	3675.4
18		7544.2	7140.7	12006.3	9181.0	6407.9	4316.0	3694.4
19		7536.5	7100.8	11932.1	9129.6	6395.2	4327.0	3693.9
20		7537.3	7078.4	11927.8	9126.9	6380.3	4312.3	3685.6
21		7557.3	7069.4	11920.3	9143.0	6379.0	4303.6	3690.5
22		7569.0	7086.9	11963.8	9169.1	6401.5	4305.2	3691.5
23		7584.6	7133.5	11968.1	9169.4	6444.0	4302.4	3691.7
24		7582.2	7127.3	11949.4	9159.5(23)	6418.0	4287.1(36)	3676.5
25		7540.1	7101.2	11863.2	9109.2	6356.6	4285.6(18)	3664.2
26		7510.8	7089.7	11797.2	9098.2	6344.4	4250.7	3657.8
27		7490.2	7081.1	11760.3(14)	9057.7(22)	6337.0	4233.6	3648.1
28		7504.5	7085.5	11825.3(9)	9085.9	6351.0	4245.2	3649.6
29		7493.6	7071.4	11743.2	9049.8	6338.0	4243.7	3657.5
30		7474.1	7028.5	11688.8	8996.5	6303.6	4221.7	3650.5
MEAN		7501.1	7071.4	11827.3	9080.6	6365.4	4266.5	3669.1

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel and Climax Scaling Factors = 100.
Deep River Scaling Factor = 300.
Tokyo Scaling Factor = 128.

GEOMAGNETIC ACTIVITY INDICES

APRIL 1977

Day	Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa *				Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M		
1	Q3	0+	1+	2+	1-	1-	1	1	0+	8-	1-	1+	3-	1-	1+	1+	1	0+	4	6	11	10	8	CC	0.1
2	Q5	1-	1+	1+	2	0+	1	0+	3-	10-	1+	1	1+	2	1	1	0+	3-	5	12	10	11	12	CK	0.2
3		4	3-	3-	2+	1+	1+	2	3	19+	3+	2	2+	2+	1+	1+	2+	3-	12	23	17	23	18		0.7
4		5+	4+	4+	2+	3+	3-	3+	3+	29	5-	4-	4-	2	3-	2+	3+	3	24	42	32	39	34		1.2
5		4-	2+	3-	2-	2-	2	3	3+	20+	3+	2-	2+	2+	2-	2+	3	3	12	22	19	20	22		0.7
6	Q3	4	4	3	2-	4-	6-	6+	7	35+	4-	3	3	2-	3-	5	5	6-	49	74	49	23	101		1.6
7	Q2	7-	6	5+	4	4+	3-	5+	3-	37	5	5-	5-	4-	4	3-	4	3	48	60	52	65	48		1.6
8	Q4	4+	3+	4+	4-	3+	5-	4-	4+	32-	4+	3	4-	4-	3+	4-	3+	4	27	45	37	38	45		1.2
9		4+	4	4	3	4-	4-	3-	3	28+	4	4-	4-	3-	3+	3	2+	3	22	33	34	38	29		1.1
10		3	4-	3-	1+	2+	4-	3	2	22-	3+	3	2+	1	2+	3	3-	2+	13	25	21	21	26		0.8
11		3+	3+	2	1+	3	2+	3+	4-	22+	3	2+	2	2-	3-	3-	3	3+	14	29	19	18	31		0.8
12		3	1+	0	1+	2	2-	2	4-	15	3-	1+	0	1+	2	2-	2+	4-	8	20	14	12	23		0.5
13	Q7	2+	0+	2-	1	1+	1+	1	2	11	2	1-	2-	1	1+	1-	1	2	5	11	10	9	12	C	0.2
14		3+	1+	4-	2	1-	2-	2+	4-	19-	3	1+	3+	3-	1+	2+	3-	3	12	21	23	24	20		0.7
15		3+	4-	3	2-	2	1	1-	2-	17	3-	3	3	1+	2	1	1-	1+	10	18	15	22	11		0.6
16		1+	3+	2	1+	3+	4	4+	4-	23+	1+	3	2	2-	2+	4-	4+	4-	17	35	27	16	46		0.9
17		3+	3-	2+	2+	1+	1+	2	2	17+	3+	2+	3-	2+	1+	1	2-	2-	9	18	14	20	13		0.5
18	Q0A	2	2-	1-	2+	3-	3	2	2-	16	2	2-	1	3-	2+	2+	2+	1+	8	19	15	14	21		0.4
19	Q1	3+	6-	6+	6-	5	4+	4-	5-	39-	3	5	6-	5	5-	4	3+	4	48	60	64	77	48		1.6
20	Q5	4+	4-	4+	5-	3	5	3+	3	31+	4	3	4	4	3	4+	3	3-	28	45	42	44	43		1.2
21		3+	3	4-	2	1+	2-	3-	2+	20	3-	2+	3+	2+	1	2-	3-	2+	12	22	14	21	16		0.7
22	Q8	2-	2-	3-	1	1-	2-	2-	0+	11+	2-	2-	2+	1+	1-	2	2-	1	6	11	10	11	10	CC	0.3
23	Q6	1-	2	2-	1+	1+	1	2-	2-	11+	1-	2+	2	1+	2-	1+	2-	1+	5	14	12	12	14	CC	0.2
24		2	1+	1+	3-	2+	4	3-	3-	19	2-	1+	2	3-	2+	3+	2+	2+	11	22	21	12	31		0.6
25		0-	5	4-	3	1+	2	1	1+	23	5	4+	3+	3-	1	1+	1	1+	22	29	26	45	11		1.1
26	Q2	1+	1+	1+	1	1-	1+	1-	1-	8+	1	2-	2-	2-	1-	1+	1	1-	4	11	10	11	10	CC	0.1
27	Q1	1+	1+	1-	1+	1	1-	0+	1	6-	1+	1+	1	1+	1	1-	0+	1+	4	9	8	10	7	CC	0.1
28	Q4	1	1	0+	1-	0+	1+	2	2+	9	1-	1-	1-	1-	1-	1+	2-	2	4	13	9	9	13	C	0.2
29		3+	4-	4	3+	4-	2-	3-	4-	26	3	3+	4	3+	3+	2-	3-	3	18	33	34	36	31		1.0
30	Q9A	2	3	1+	2-	2-	2-	2	2+	16-	2-	3-	2-	1+	2	2-	2	2+	8	16	18	15	20		0.4
																		Mean	16	26.7	22.9	24.9			0.71

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	0+	1+	3-	0+	1+	1+	1	0+	1	2-	3-	1	1+	1	1-	0+
2	1	1-	1+	2-	1-	1+	0	3-	1+	1+	2-	2	1	1	0+	2+
3	3	2-	2+	3-	1+	2-	2+	3-	3+	2+	2+	2+	1+	1	2+	3-
4	3-	4-	4-	2	3	3-	3	3+	5-	3+	4-	2	3-	2+	4-	3
5	3+	2-	2+	2+	2	2	3	3-	3+	2-	2+	2+	2-	3-	3	3
6	3+	3+	3	2-	3-	5	5	6-	4-	3	3+	1+	2+	5	5	5+
7	5+	5-	5	4-	4	3-	5-	2+	5	5-	5-	3+	4	2+	4-	3+
8	4	3-	4-	4-	3	4-	3	3+	5-	3	4-	4-	3+	4-	3+	5-
9	3+	4-	4	3-	3+	3-	2+	3-	4+	4-	3+	2+	3+	3+	2+	3
10	3	3	2+	1+	2+	3	3-	2-	4-	3-	2+	1	2+	3	3-	3-
11	3-	3-	1+	1+	3-	3-	3	3	3	2+	2+	2-	3-	3-	3	4-
12	2+	1	0	1+	2	2	2+	3	3+	1+	0+	1	2	2-	2+	4
13	2	0+	2-	1	1+	1	1+	2	2-	1	2-	1	1	0+	1	2
14	3-	1	3+	3	1	2+	3-	3-	3+	2-	3+	3-	2-	2	3-	4-
15	3-	3	3-	2-	2	1+	0+	1+	3-	3+	3	1+	2-	1	1-	2-
16	1+	3-	2	2	3-	3+	4	3	2-	3+	2	1+	2	4	5-	4
17	3	2+	3-	2+	1+	1	2-	2-	4-	2+	2+	2+	2-	1	1+	2-
18	2	1+	1	3-	3-	3-	2+	1+	2+	2-	1	2+	2+	2-	2	2-
19	3	5	6-	5-	4	4-	3+	4-	3+	5	6-	5	5-	4	4-	4+
20	4-	3	5-	4+	3	4+	3	3	4+	3+	4-	4-	3	4+	3	3-
21	2+	2+	3+	3-	1	2-	3-	2+	3	3-	3+	2	1	1+	3-	2+
22	2-	2-	3-	1+	1-	2	2-	1-	2-	1+	2+	1+	1	2	2-	1
23	1-	2+	2	1+	2-	1+	2-	2-	1-	2+	2	1+	1+	2-	2-	1+
24	2-	1+	2	3-	3-	3+	3-	2+	1+	1+	2	3-	2+	3+	2-	2+
25	5-	4	3+	3-	1	2-	1	2-	5	5-	3+	2+	1	1+	1	1
26	1	2	2	2	1-	2-	1+	1	1	2-	1+	1+	0+	1	1-	0+
27	1	1	1	1+	1	1-	0+	2-	2-	1+	1	1+	1+	0+	0+	1
28	0+	1-	1-	1	1-	2-	2	2+	1	1	0+	0+	1-	1+	1+	2-
29	3	3+	4	3	3	2	3-	3	3	4-	4	4-	4-	1+	3-	3+
30	2-	3	2	2-	2+	2-	2	3-	2	3-	2-	1	2-	2-	2+	2

* Errata: Note that the N and M values of aa published in these tables for January 1974 through January 1977 values were slightly in error. The correct values (resulting in some modifications in the classification of the days C and K) will be given in a supplementary IAGA Bulletin and the Bulletin 32 series. The magnetic tape deposited in World Data Center A for Solar-Terrestrial Physics has been corrected.

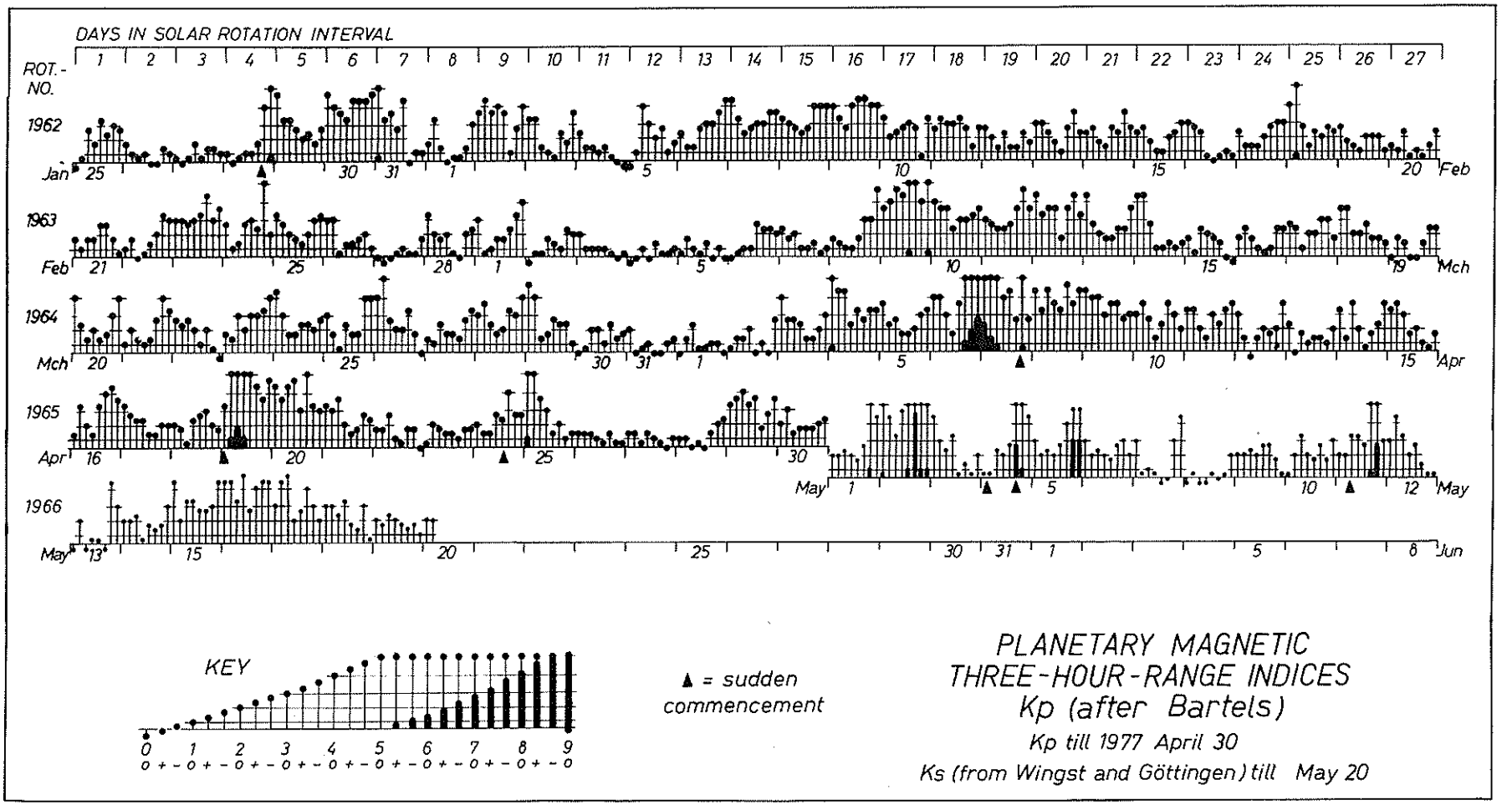
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap <6 but one Kp >3o or two Kp values >3-"). An * means "not really disturbed" (Ap<20).

Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

DAILY AVERAGE INDICES Ap

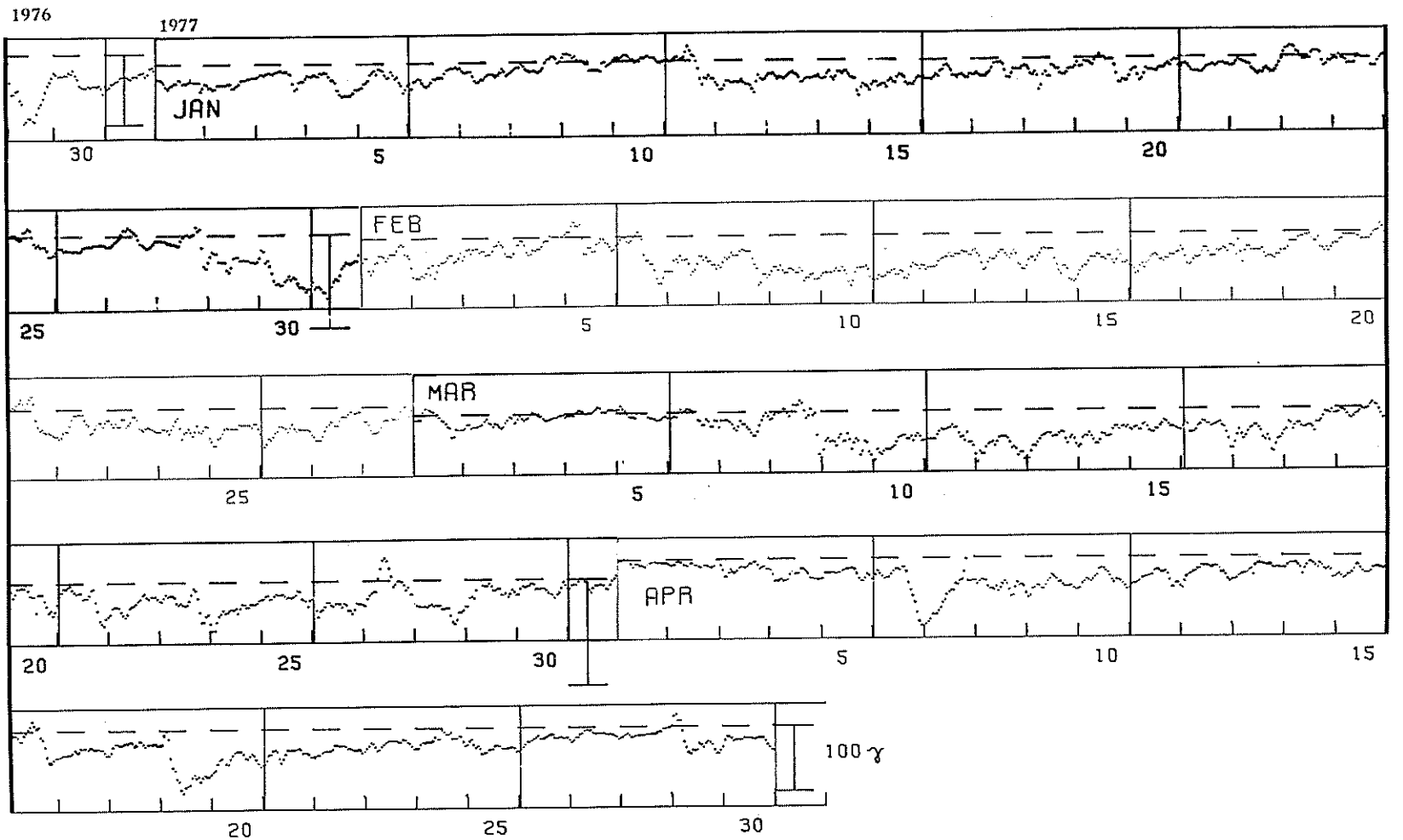
	1976								1977			
DAY	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
1	10	6	18	8	10	14	10	7	17	7	11	4
2	58	6	9	8	24	21	7	3	5	21	5	5
3	94	12	12	10	10	9	6	4	6	11	4	12
4	20	20	14	5	14	6	4	15	10	4	3	24
5	14	20	6	6	9	13	3	6	15	9	4	12
6	8	7	6	5	7	11	2	3	10	14	6	49
7	10	13	9	5	10	6	3	10	7	18	5	48
8	10	8	13	4	7	6	6	23	6	18	12	27
9	4	4	10	12	6	6	8	16	6	25	38	22
10	6	6	6	9	5	6	18	13	3	12	19	13
11	11	26	4	5	4	8	23	13	14	13	18	14
12	7	7	5	3	8	14	24	15	12	7	22	8
13	6	4	4	3	5	8	31	8	7	12	13	5
14	4	3	6	4	10	7	16	4	18	11	12	12
15	5	4	19	2	10	33	9	2	13	8	5	10
16	5	5	16	6	6	29	5	8	7	6	6	17
17	4	14	5	5	10	30	7	10	6	9	9	9
18	3	21	6	4	33	19	5	28	10	17	11	8
19	12	4	6	6	20	7	9	7	8	6	5	48
20	19	5	4	5	51	7	7	5	12	5	13	28
21	11	3	3	8	24	7	4	4	5	7	10	12
22	11	3	4	5	17	5	5	8	7	8	7	6
23	14	4	5	30	12	6	4	5	6	18	14	5
24	6	16	4	25	7	6	3	6	8	14	12	11
25	9	18	9	24	24	5	11	9	9	11	12	22
26	6	7	4	18	13	4	9	6	4	8	16	4
27	5	6	8	13	12	7	8	6	4	3	8	4
28	14	5	16	10	5	5	2	6	13	7	15	4
29	22	5	18	6	10	3	6	45	15		14	18
30	17	29	19	6	9	16	11	13	30		5	8
31	9		7	5		34		12	19		4	
MEAN	14	10	9	9	13	12	9	10	10	11	11	16

GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst



Note the sensitivity indicator for each month on the last day of the month and also note that the zero reference level is different for each month.

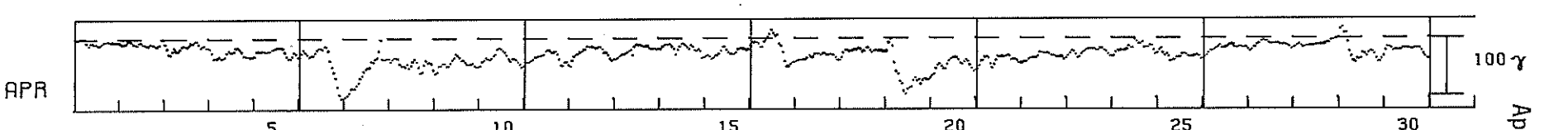
HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

APRIL 1977

NASA/GODDARD SPACE FLIGHT CENTER

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-2	-2	0	-1	-1	-1	-8	-12	-8	-7	-10	-10	-12	-13	-9	-6	-5	-4	-6	-7	-6	-7	-8	-7
2	-9	-11	-10	-9	-5	-4	-6	-10	-11	-12	-7	-7	-10	-11	-13	-14	-10	-11	-12	-14	-14	-11	-1	-2
3	-10	-18	-28	-29	-22	-17	-22	-23	-19	-14	-12	-14	-15	-12	-9	-8	-5	-5	-11	-16	-13	-12	-16	-16
4	-18	-25	-35	-34	-35	-32	-35	-34	-32	-25	-21	-24	-24	-23	-17	-16	-20	-24	-30	-31	-32	-31	-33	-33
5	-31	-23	-24	-23	-22	-22	-24	-22	-22	-19	-18	-17	-16	-16	-16	-18	-25	-32	-35	-35	-31	-25	-27	-33
6	-32	-26	-20	-25	-28	-32	-30	-30	-25	-20	-17	-17	-19	-14	-15	-22	-39	-50	-59	-69	-84	-98	-104	-11[illegible]
7	-101	-98	-94	-87	-86	-86	-81	-76	-69	-65	-57	-53	-51	-50	-40	-42	-35	-33	-22	-3	-37	-36	-35	-36
8	-41	-37	-34	-35	-36	-45	-48	-48	-50	-45	-52	-47	-41	-37	-41	-50	-60	-58	-46	-39	-43	-42	-45	-56
9	-62	-59	-48	-47	-44	-44	-49	-48	-43	-37	-34	-28	-31	-34	-39	-39	-42	-46	-45	-45	-44	-48	-50	-5[illegible]
10	-48	-41	-38	-34	-36	-38	-35	-31	-28	-19	-17	-19	-22	-25	-30	-36	-40	-35	-36	-38	-41	-45	-5[illegible]	-48
11	-43	-41	-42	-39	-37	-33	-33	-31	-30	-29	-28	-22	-20	-22	-25	-25	-23	-28	-36	-48	-48	-42	-41	-47
12	-49	-39	-32	-28	-27	-25	-23	-20	-19	-15	-15	-16	-16	-18	-18	-15	-15	-19	-26	-26	-29	-36	-39	-36
13	-36	-34	-31	-29	-28	-27	-25	-22	-20	-30	-15	-12	-13	-13	-14	-15	-15	-15	-18	-21	-18	-19	-20	-19
14	-19	-15	-12	-11	-12	-11	-15	-19	-29	-20	-15	-10	-10	-13	-16	-19	-13	-16	-21	-23	-20	-23	-35	-33
15	-31	-29	-32	-36	-34	-30	-30	-27	-22	-15	-15	-21	-25	-28	-28	-28	-25	-20	-18	-18	-20	-21	-22	-2[illegible]
16	-13	-8	-7	-7	-10	-16	-15	-7	-3	2	7	14	7	3	5	-11	-14	-25	-41	-50	-50	-45	-42	-42
17	-40	-38	-37	-38	-37	-38	-35	-30	-34	-33	-28	-27	-27	-30	-27	-27	-30	-29	-28	-30	-30	-34	-39	-38
18	-34	-26	-21	-21	-24	-23	-22	-20	-21	-18	-20	-25	-23	-17	-18	-22	-25	-22	-22	-23	-22	-23	-25	-24
19	-23	-8	-2	-15	-44	-59	-62	-76	-79	-93	-97	-88	-86	-84	-73	-69	-75	-72	-80	-74	-70	-73	-72	-69
20	-65	-62	-53	-47	-45	-49	-53	-54	-45	-39	-36	-34	-34	-35	-38	-45	-46	-42	-38	-41	-48	-53	-58	-55
21	-54	-48	-40	-39	-34	-32	-35	-46	-53	-47	-39	-33	-33	-35	-33	-32	-30	-32	-38	-37	-38	-40	-43	-44
22	-44	-41	-41	-37	-35	-34	-34	-35	-32	-26	-25	-27	-27	-26	-28	-31	-31	-32	-34	-34	-33	-34	-38	-35
23	-31	-27	-22	-24	-29	-35	-33	-28	-25	-22	-20	-19	-19	-20	-20	-22	-21	-18	-19	-22	-24	-28	-32	-32
24	-32	-25	-22	-24	-22	-22	-22	-20	-15	-18	-17	-3	-6	-10	-11	-8	-17	-16	-17	-13	-14	-22	-28	-26
25	-21	-18	-27	-31	-28	-32	-41	-39	-38	-34	-34	-33	-29	-27	-29	-32	-33	-33	-33	-31	-30	-32	-37	-36
26	-33	-30	-26	-22	-23	-20	-18	-16	-13	-18	-18	-18	-16	-13	-12	-13	-17	-17	-16	-15	-17	-16	-17	-20
27	-23	-20	-16	-16	-12	-10	-6	-4	-6	-5	-9	-11	-10	-10	-10	-10	-12	-13	-12	-13	-14	-16	-19	-17
28	-16	-13	-11	-14	-17	-16	-14	-14	-14	-14	-14	-12	-12	-12	-13	-13	-11	-9	-8	-4	-3	-2	-2	1
29	15	18	8	8	-8	-25	-33	-41	-43	-37	-38	-36	-27	-29	-32	-26	-23	-25	-28	-36	-42	-42	-37	-32
30	-22	-16	-17	-19	-23	-21	-22	-22	-21	-18	-19	-18	-19	-20	-21	-19	-18	-18	-19	-23	-29	-33	-36	-38



PRINCIPAL MAGNETIC STORMS

APRIL 1977

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
NE	55.1N	2	2156	SC*	2	18	..	04(1)	6	34	107	148	05	04
HD	07.6N	2	2157	SC	- 0.2	+14	- 1	04(1)	4	4	76	27	04	22
BD	48.9N	3	18--	..	..	..	..	04(1)	5	27	97	50	04	12
NE	55.1N	5	19--	..	..	..	..	07(1,3)	7	61	218	264	11	07
BD	48.9N	5	20--	..	..	..	..	07(1)	6	40	157	93	10	12
CO	64.6N	6	14--	..	..	..	..	07(5) 08(6)	7	185	1600	830	09	21
SI	60.0N	6	05--	..	..	..	..	07(1)	7	77	820	510	07	21
HI	54.2N	6	14--	..	..	..	..	06(6,7,8) 07(1,7)	6	35	255	120	08	01
FR	49.6N	6	15--	..	..	..	..	06(8) 07(1)	6	32	125	115	07	15
IR	41.0N	6	1200	..	..	..	..	06(7,8) 07(7)	6	28	160	62	09	22
SJ	29.9N	6	1400	..	..	..	..	06(6)	5	12	133	41	08	12
JP	17.3N	6	12--	..	..	..	..	--	-	7	83	38	09	22
SH	14.6N	6	12--	..	..	..	..	--	-	5	97	31	09	22
UJ	13.5N	6	12--	..	..	..	..	--	-	5	93	33	09	22
AL	09.5N	6	12--	..	..	..	..	06(6,7) 07(7) 08(6)	5	5	78	46	09	22
HD	07.6N	6	1130	..	..	..	..	06(6,7) 07(7)	5	4	102	37	09	21
GU	04.0N	6	1406	..	..	..	..	06(8)	5	8	120	40	09	19
AN	01.5N	6	12--	..	..	..	..	--	-	--	132	--	09	22
TV	01.1S	6	12--	..	..	..	..	--	-	3	196	77	09	22
HU	06.1S	6	0111	..	..	..	..	07(7)	6	6	298	42	08	23
PM	18.7S	6	15--	..	..	..	..	06(8) 07(5,7)	5	6	120	70	09	22
HR	33.7S	6	15--	..	..	..	..	06(6,8) 07(7)	5	28	90	101	07	21
GN	43.3S	6	15--	..	..	..	..	06(6,7,8) 07(5,7) 08(6)	5	21	130	140	09	18
TO	46.7S	6	14--	..	..	..	..	06(6,7,8) 07(3,5)	5	30	203	99	07	20
KG	56.5S	6	1626	..	..	..	..	06(7,8)	7	--	--	--	07	18
FR	49.6N	7	19--	..	..	..	..	07(7)	5	18	130	45	10	09
HD	07.6N	14	0530	..	..	..	..	14(3,6,7,8)	3	5	87	29	15	14
HD	07.6N	15	2334	SC	- 0.1	+ 8	0	16(6,7)	4	5	121	27	17	02
HU	06.1S	16	1140	..	..	..	..	16(6)	5	4	206	26	16	24
HR	33.7S	16	18--	..	..	..	..	16(6)	5	18	75	97	17	01
FR	49.6N	18	21--	..	..	..	..	19(3)	6	22	130	90	21	10
CO	64.6N	19	01--	..	..	..	..	19(3) 20(4)	7	288	1410	910	20	18
SI	60.0N	19	03--	..	..	..	..	19(3)	8	140	--	650	20	11
NE	55.1N	19	0107	SC	1	13	..	19(3)	8	86	324	438	21	12
BD	48.9N	19	03--	..	..	..	..	19(3)	6	35	97	109	21	11
IR	41.0N	19	0200	..	..	..	..	19(2,3,4,5) 20(3,4,6)	5	11	116	65	20	21
SJ	29.9N	19	0030	..	..	..	..	19(2)	5	10	72	19	20	04
JP	17.3N	19	01--	..	..	..	..	--	-	6	140	47	20	18
SH	14.6N	19	01--	..	..	..	..	--	-	5	154	34	20	18
UJ	13.5N	19	01--	..	..	..	..	--	-	5	129	43	20	18
AL	09.5N	19	01--	..	..	..	..	19(2,3) 20(6)	5	5	135	37	20	18
HD	07.6N	19	0045	..	..	..	..	19(3,4)	6	5	166	34	20	22
GU	04.0N	19	0106	SC	.0	-15	-06	19(02)	6	0	200	20	20	18
AN	01.5N	19	01--	..	..	..	..	--	-	4	179	92	20	18
TV	01.1S	19	01--	..	..	..	..	--	-	3	197	107	20	18
HU	06.1S	19	0106	SC	1	13	3	19(5,6)	5	7	176	44	19	23
PM	18.7S	19	0106	SC	0	+14	+13	19(2,3,4)	5	6	170	60	20	18
HR	33.7S	19	00--	..	..	..	..	19(2,3,5)	5	25	144	79	20	02
GN	43.3S	19	03--	..	..	..	..	19(3,4) 20(6)	6	22	100	120	20	00
TO	46.7S	19	03--	..	..	..	..	19(3)	6	31	164	68	20	18
HD	07.6N	24	1037	SC	- 0.2	+ 9	- 1	25(1)	4	4	60	27	25	13
BD	48.9N	25	01--	..	..	..	..	25(1)	6	24	86	41	25	14
NE	55.1N	28	19--	..	..	..	..	29(2,3)	5	24	98	97	30	09
BD	48.9N	28	22--	..	..	..	..	29(2)	5	16	77	26	29	16
JP	17.3N	28	18--	..	..	..	..	--	-	7	96	37	29	22
SH	14.6N	28	18--	..	..	..	..	--	-	7	106	36	29	22
UJ	13.5N	28	18--	..	..	..	..	--	-	6	77	31	29	22
AL	09.5N	28	18--	..	..	..	..	29(2)	5	5	91	34	29	22
HD	07.6N	28	1840	..	..	..	..	29(1,2)	4	5	113	20	29	22
AN	01.5N	28	18--	..	..	..	..	--	-	5	135	50	29	22
TV	01.1S	28	18--	..	..	..	..	--	-	4	167	69	29	22
PM	18.7S	28	18..	..	..	..	..	29(1)	5	4	140	40	29	18
CO	64.6N	29	03--	..	..	..	..	29(3)	7	136	1160	590	29	15

Reports were received from the following observatories:

College	Witteveen	Tucson	Jaipur	Alibag	Annamalaingar	Port Moresby	Toolangi
Sitka	Fredericksburg	San Juan	Shillong	Hyderabad	Huancayo	Hermanus	Port-aux-Francais
Newport	Boulder	Honolulu	Ujjain	Guam	Trivandrum	Gnangara	

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

APRIL 1977

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romaňá)
The meaning of the station symbols is given in the IAGA-Bulletin nr. 32.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

02 2157 A: LM DU; B: WN FU VI CI AE PM HU GN; C: EB SZ (si: C: TL)

07 1845 A: LM; B: SO WN WI FU? AE SZ DU (si: A: EB SZ HU; B: NI TL)

19 0106 B: WN FU PM HU; C: WI MT KA KY SZ (bs: B: EB)

Solar-flare effects (sfe)
Effects confirmed by solar or ionospheric observations are underlined.

12 0946 - 1017 WN NI EB TL (bs: A: LM)

14 0540 - 0615 KA

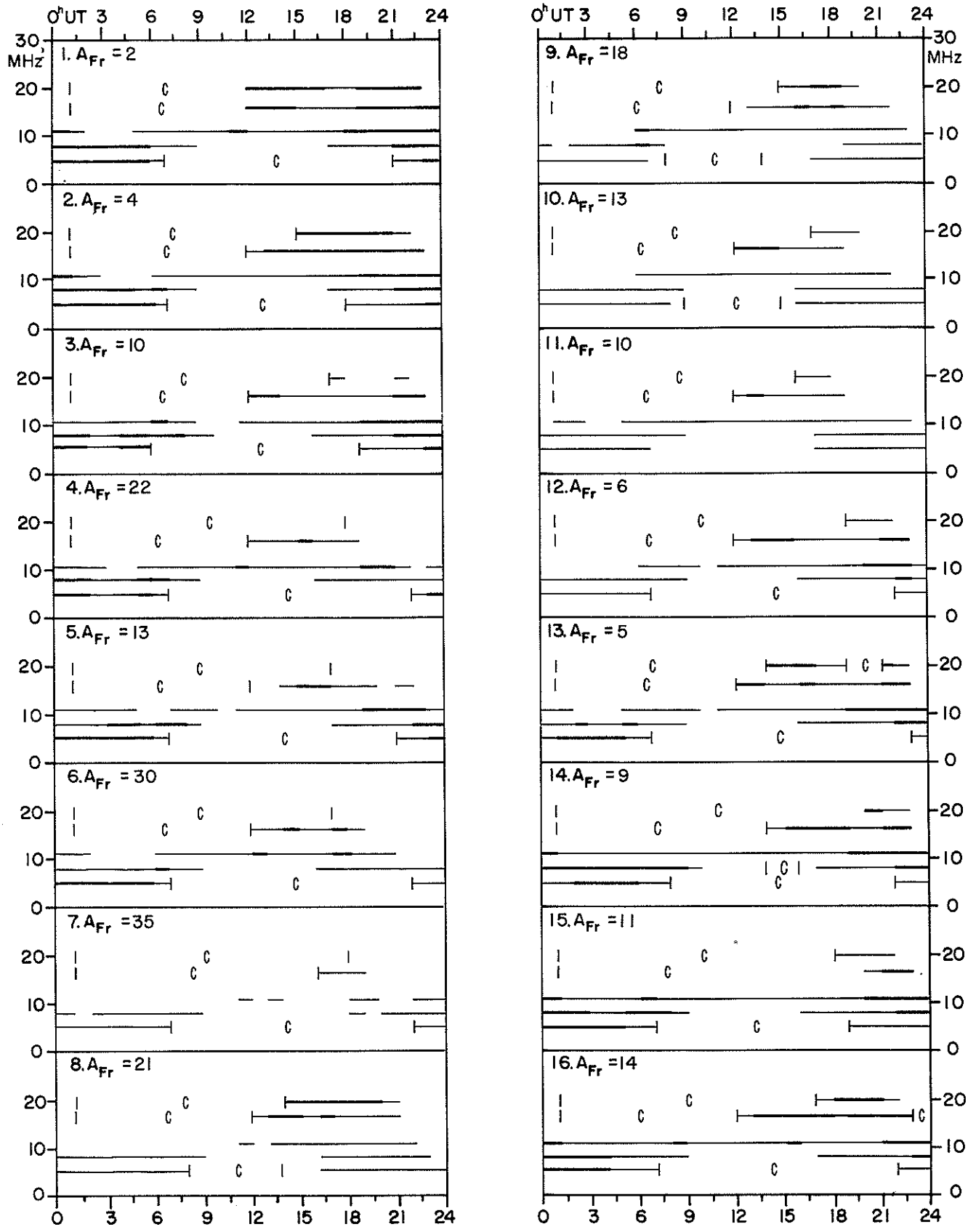
24 1227 - 1249 TL

Very unusual events

20 1641 bp: WN $\binom{+124\gamma}{+\ 83\gamma}$ WI $\binom{+}{+}$

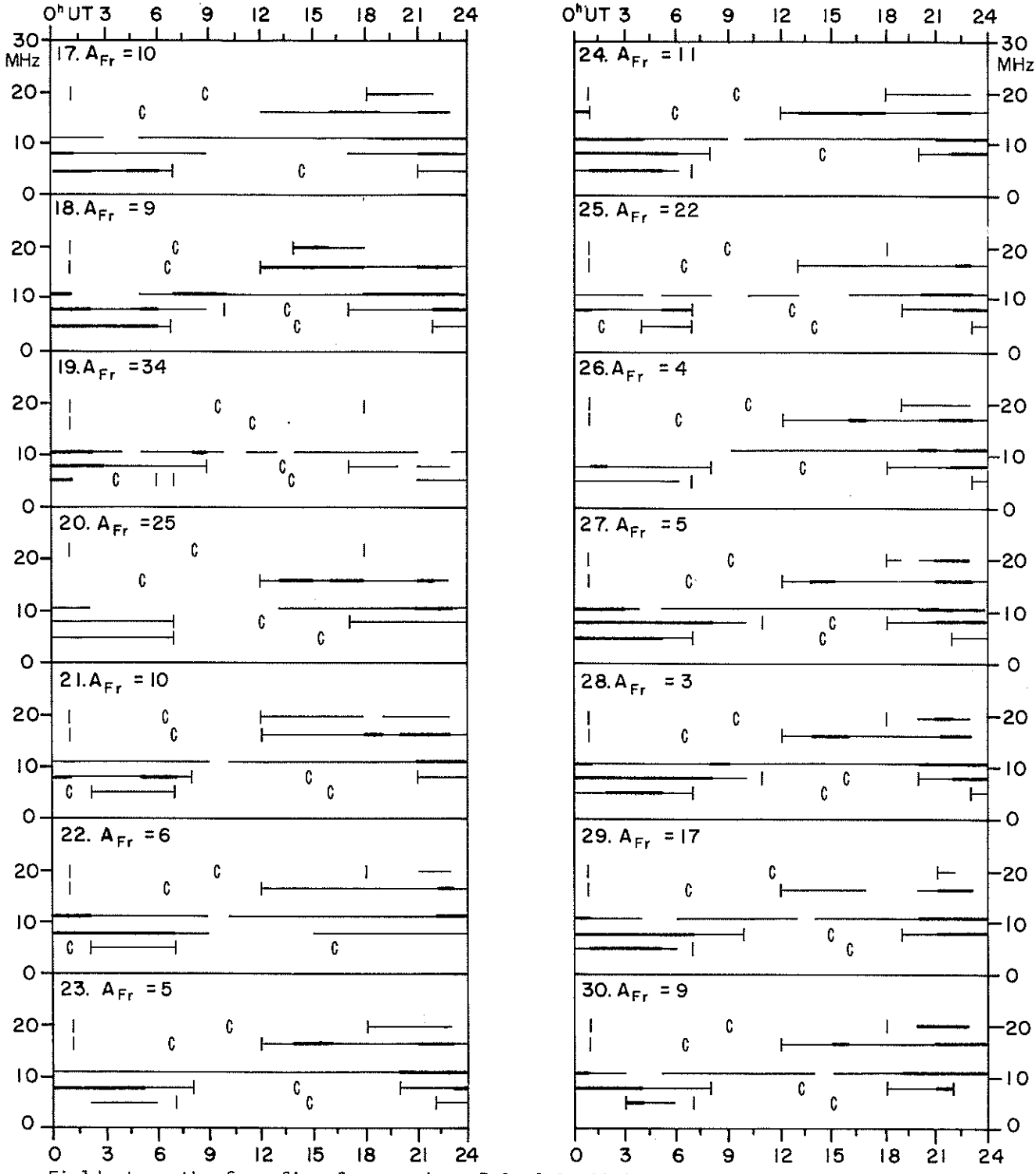
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

APRIL 1977



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

APRIL 1977



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow - Norfolk 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 above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line.

Adapted from Observations by Deutsche Bundespost

RADIO PROPAGATION QUALITY INDICES

APRIL 1977

Quality indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	5.8	6.9	12.2	4.5	13.1
2	5.2	6.8	12.0	4.7	13.2
3	5.0	5.6	11.8	4.3	12.4
4	4.3	4.8	10.9	3.4	12.1
5	5.5	4.7	11.9	4.0	12.4
6	5.2	3.6	11.7	3.4	12.0
7	3.8	3.0	10.1	2.9	11.4
8	4.7	3.4	11.2	4.5	12.3
9	3.2	3.5	10.6	3.2	12.0
10	4.3	3.6	10.8	3.3	12.4
11	3.8	3.5	11.2	3.8	12.2
12	4.6	3.9	10.3	2.7	12.3
13	4.7	4.8	11.8	3.6	12.3
14	5.3	5.2	11.8	3.7	12.4
15	6.4	5.5	11.8	4.1	12.7
16	5.8	5.6	11.6	4.3	13.0
17	5.5	5.2	11.4	3.6	12.3
18	6.0	5.7	11.8	4.0	12.3
19	4.2	4.2	10.1	4.3	11.6
20	3.6	3.7	11.5	3.2	12.8
21	4.6	4.6	11.3	3.6	12.5
22	5.1	2.8	11.2	3.8	12.9
23	4.4	4.5	10.9	4.3	12.7
24	4.4	3.9	11.6	4.0	12.4
25	4.2	3.0	11.6	3.4	12.1
26	6.1	4.5	11.4	3.1	12.5
27	6.5	4.8	11.8	3.0	12.5
28	6.1	5.2	11.2	2.6	12.4
29	5.3	3.6	11.5	3.9	12.3
30	5.6	4.5	11.2	4.3	12.5
MEAN	5.0	4.5	11.3	3.7	12.4

USCOMM-NOAA-ASHEVILLE, NC--7-8-77--950

WORLD DATA CENTER A
FOR
SOLAR-TERRESTRIAL PHYSICS

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

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