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Solar - Geophysical Data

NO. 406 JUNE 1978

Part I (Prompt Reports)

DATA FOR
MAY 1978
APRIL 1978

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BOULDER, COLORADO

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To standardize referencing these reports in the open literature, the following format is recommended:

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SOLAR-GEOPHYSICAL DATA

No. 406

Issued in two parts

Helen E. Coffey, Editor

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

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A = Part I, B = Part II.

----- = no data available.
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BOULDER 01/1937Z SOFLARE M7/3B N22W10 01/1914Z DURATION 79 MINUTES. TENFLARE 2086 FLUX UNITS 01/1917Z IN PROGRESS AT 01/2100Z.
BOULDER 02/0100Z STRONG MAGSTORM IN PROGRESS BEGAN 01/1940Z.
BOULDER 07/0130Z TENFLARE 170 FLUX UNITS 06/2013Z DURATION 21 MINUTES.
BOULDER 07/0430Z SOFLARE X2/BSL N20W90 07/0320Z DURATION 24 MINUTES. TENFLARE 900 FLUX UNITS 07/0321Z IN PROGRESS.
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BOULDER 28/1630Z SOFLARE X1 N16W10 28/1457Z DURATION 12 MINUTES.
BOULDER 29/1843Z TENFLARE 250 FLUX UNITS 29/1757Z DURATION 6 MINUTES.
BOULDER 30/1532Z SOFLARE M5/2B N17W29 30/0716Z DURATION 10 MINUTES.
BOULDER 31/1328Z SOFLARE M5/2B N23W50 31/1009Z DURATION 140 MINUTES. THREE PARALLEL RIBBONS WITH UMBRAL COVERAGE.

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
121	1	30	162	185	30	N30W61 N28W51 N21E06 N23E25	0 0 9 1	0 0 3 0	0 0 1 0	SOFLARE X2/2B N20 E11 30/1439Z DURATION 41 MIN. TENFLARE 2900 F.U. 30/1437Z DURATION 143 MIN. PCA BEGAN 29/1030Z MAX 9.8 dB AT 30/1745Z IN PROGRESS SSC 30/0952Z.	30	N30W61 N28W51 N21E06 N23E25	Q Q P Q	PROTON FLARE ALERT 01/XX MAGALERT 01/XX
122	2	1	215	179	50	N22W10 N27W70 N23E12 S27W73 S26E73 N31W26 S22E41	2 0 1 4 0 0 0	1 0 0 0 0 0 0	0 0 0 0 0 0 0	SOFLARE M7/3B 01/1914Z DURATION 79 MIN. TENFLARE 2086 F.U. 01/1917Z DURATION 128 MIN. STRONG MAGSTORM BEGAN 01/1840Z IN PROGRESS. PCA IN PROGRESS 2.2 dB ABSORPTION.	1	N22W10 N27W70 N23E12 S27W73 S26E73 N31W26 S22E41	P Q Q E Q Q Q	PROTON FLARE ALERT 02/XX MAGALERT 02/XX
123	3	2	247	180	55	N21W23 N23W05 S29W87 S26E62 N31W43 S23E23 N17E65 N22E18	5 3 3 1 0 0 1 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0		2	N21W23 N23W05 S29W87 S26E62 N31W43 S23E23 N17E65 N22E18	E E E Q Q Q Q Q	SOLALERT 03/XX MAGALERT 03/06
124	4	3	142	179	33	N20W36 N23W15 S26E51 N14E48	8 3 0 3	0 0 0 0	0 0 0 0		3	N20W36 N23W15 S26E51 N14E48	E E Q E	SOLALERT 04/06 MAGALERT 04/05
125	5	4	106	175	50	N21W51 N22W29 S27E39 N18E37 N16W43	9 5 0 2 0	2 1 0 0 0	0 0 0 0 0		4	N21W51 N22W29 S27E39 N18E37 N16W43	P E Q Q Q	MAJOR FLARE ALERT 05/07 MAGALERT 05/06
126	6	5	179	172	08	N21W63 N22W45 S27E27 N18E23 N23W30 N15W57 N18E72	10 2 0 1 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0		5	N21W63 N22W45 S27E27 N18E23 N23W30 N15W57 N18E72	P E Q Q Q Q Q	PROTON FLARE ALERT 06/08 MAGNIL
127	7	6	167	170	03	N20W76 N21W59 S27E14 N18E10 N19E66 S19W24 N17E33	8 7 1 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	TENFLARE 07/0130Z 170 F.U. 06/2013Z DURATION 21 MIN.	6	N20W76 N21W59 S27E14 N18E10 N19E66 S19W24 N17E33	P A E Q A Q Q	PROTON FLARE ALERT 07/08 MAGQUIET
128	8	7	114	165	07	N23W87 N21W70 S25W01 N17W01 N17E48 N17E59	5 9 0 0 1 1	0 1 0 0 0 0	0 1 0 0 0 0	TENFLARE X1 N22W64 07/0320Z DURATION 24 MIN. PCA BEGAN 07/0515Z MAX 2.2 dB AT 07/0649Z ENDED 07/0830Z. PROTON EVENT BEGAN AT 07/0430Z MAX OF ABOUT 100 PROTONS/cm²/second/ster GREATER THAN 10 MEV AT 07/0530Z. ENDED AT 07/1660Z.	7	N23W87 N21W70 S25W01 N17W01 N17E48 N17E59	A C.P. Q Q Q Q	SOLALERT 08/10 MAGALERT 09/10
129	9	8	120	141	12	N21W83 S27W12 N18W15 N18E35 N18E51 N19E68 S17E69	4 1 1 1 3 0 0	2 0 0 0 0 0 0	0 0 0 0 0 0 0	SUDDEN COMMENCEMENT 08/2345Z	8	N21W83 S27W12 N18W15 N18E35 N18E51 N19E68 S17E69	C.P. Q Q Q Q Q Q	SOLALERT 09/10 MAGALERT 09/10
130	10	9	106	133	49	S26W25 N17W30 N18E25 N18E33 N19E55 S18E62	0 0 0 1 0 1	0 0 0 0 0 0	0 0 0 0 0 0		9	S26W25 N17W30 N18E25 N18E33 N19E55 S18E62	Q Q Q Q Q Q	SOLALERT 10/10 MAGALERT 10/12

ALERT PERIODS

INTERNATIONAL URSIGRAM
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MAY 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions Location Lat-Long	No. of Flares Total	M	X	Outstanding events	Forecasts Date	Location Lat-Long	Desc*	Alert Situations
131	11	10	092	127	05	S26W37	0	0	0		10	S26W37	Q	SOLNIL MAGALERT MINOR 11/11
						N17W43	0	0	0			N17W43	Q	
						N17E10	0	0	0			N17E10	Q	
						N17E20	0	0	0			N17E20	Q	
						N19E41	0	0	0			N19E41	Q	
						S18E50	0	0	0			S18E50	Q	
						S32E40	0	0	0			S32E40	Q	
132	12	11	103	131	20	S27W49	0	0	0		11	S27W49	Q	SOLQUIET MAGNIL
						N18W57	0	0	0			N18W57	Q	
						N17W03	1	0	0			N17W03	Q	
						N17E09	1	0	0			N17E09	Q	
						S19E37	0	0	0			S19E37	Q	
						S32E27	0	0	0			S32E27	Q	
133	13	12	131	135	17	S28W62	0	0	0		12	S28W62	Q	SOLQUIET MAGQUIET
						N17W70	0	0	0			N17W70	Q	
						N15W17	0	0	0			N15W17	Q	
						N17W06	0	0	0			N17W06	Q	
						S20E24	0	0	0			S20E24	Q	
						S32E14	0	0	0			S32E14	Q	
						N22E64	0	0	0			N22E64	Q	
						S26W82	0	0	0			S26W82	Q	
						S26E82	0	0	0			S26E82	Q	
134	14	13	156	137	08	N17W82	0	0	0		13	N17W82	Q	SOLQUIET MAGQUIET
						N17W29	0	0	0			N17W29	Q	
						N17W18	1	0	0			N17W18	Q	
						S20E10	1	0	0			S20E10	E	
						S37E02	0	0	0			S37E02	Q	
						N23E51	4	0	0			N23E51	E	
						S25W68	0	0	0			S25W68	Q	
						N15E73	0	0	0			N15E73	Q	
						S15W44	0	0	0			S15W44	Q	
						S26W30	1	0	0			S26W30	Q	
135	15	14	150	141	11	N18W31	0	0	0		14	N18W31	Q	SOLQUIET MAGQUIET
						S20W02	2	0	0			S20W02	E	
						N21E38	4	0	0			N21E38	Q	
						S28E56	1	0	0			S28E56	Q	
						N14E61	1	0	0			N14E61	Q	
						S14W63	0	0	0			S14W63	Q	
						S26W46	1	0	0			S26W46	Q	
136	16	15	146	143	05	N18W45	0	0	0		15	N18W45	Q	SOLQUIET MAGQUIET
						S21W16	0	0	0			S21W16	Q	
						N21E24	2	0	0			N21E24	Q	
						S26E45	1	0	0			S26E45	Q	
						N13E48	0	0	0			N13E48	Q	
						S14W76	0	0	0			S14W76	Q	
						S26W61	0	0	0			S26W61	Q	
						N20E48	0	0	0			N20E48	Q	
137	17	16	195	149	05	N17W58	2	0	0		16	N17W58	E	SOLQUIET MAGQUIET
						S21W28	5	0	0			S21W28	E	
						N21E09	3	0	0			N21E09	E	
						S26E31	0	0	0			S26E31	Q	
						N13E34	0	0	0			N13E34	Q	
						S14W87	0	0	0			S14W87	Q	
						S26W74	0	0	0			S26W74	Q	
						N20E39	0	0	0			N20E39	Q	
						N15W04	0	0	0			N15W04	Q	
						S18E56	0	0	0			S18E56	Q	
						N21E46	0	0	0			N21E46	Q	
						N18E35	0	0	0			N18E35	Q	
138	18	17	156	141	08	N18W72	1	0	0		17	N18W72	Q	SOLQUIET MAGQUIET
						S21W41	1	0	0			S21W41	E	
						N21W01	1	0	0			N21W01	E	
						S27E15	2	0	0			S27E15	E	
						N12E23	0	0	0			N12E23	Q	
						S29W91	3	0	0			S29W91	Q	
						S28E24	1	0	0			S28E24	Q	
						S31E74	0	0	0			S31E74	Q	
139	19	18	121	132	05	N18W86	0	0	0		18	N18W86	Q	SOLQUIET MAGALERT 20/21
						S22W53	0	0	0			S22W53	Q	
						N21W14	0	0	0			N21W14	E	
						S26E00	0	0	0			S26E00	E	
						N12E08	0	0	0			N12E08	Q	
						S27E16	0	0	0			S27E16	Q	
						S29E62	0	0	0			S29E62	Q	
						N18W66	0	0	0			N18W66	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

MAY 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	Active Regions: No. of Flares Total	Active Regions: No. of Flares M	Active Regions: No. of Flares X	Outstanding events	Forecasts: Date	Forecasts: Location Lat-Long	Forecasts: Desc*	Alert Situations
140	20	19	155	131	04	S21W66	6	1	0	SOFLARE M1/2B	19	S21W66	C.A.	SOLQUIET MAGALERT 20/22
						N21W25	0	0	0	S20W67 19/2258Z		N21W25	E	
						S26W10	0	0	0	DURATION 37 MIN.		S26W10	E	
						N12W03	0	0	0			N12W03	Q	
						N23E09	1	0	0			N23E09	E	
						N17E15	0	0	0			N17E15	Q	
						S27W00	0	0	0			S27W00	E	
						S29E48	0	0	0			S29E48	Q	
						N17W80	0	0	0			N17W80	Q	
						N17W17	0	0	0			N17W17	Q	
141	21	20	148	130	04	S21W79	7	0	0		20	S21W79	C.A.	SOLQUIET MAGALERT 21/23
						N20W39	0	0	0			N20W39	E	
						S27W24	0	0	0			S27W24	Q	
						N12W17	0	0	0			N12W17	Q	
						N23W04	0	0	0			N23W04	Q	
						S28W13	0	0	0			S28W13	Q	
						S30E34	0	0	0			S30E34	Q	
						S17E61	0	0	0			S17E61	Q	
						S32E24	0	0	0			S32E24	Q	
142	22	21	140	130	12	N21W92	3	0	0	TENFLARE 100 F.U.	21	N21W92	Q	SOLQUIET MAGALERT 22/23
						N20W53	0	0	0	21/0537Z DURATION		N20W53	C.A.	
						S27W37	0	0	0	8 MIN. TOYOKAWA.		S27W37	C.A.	
						N12W31	0	0	0			N12W31	Q	
						N22W18	0	0	0			N22W18	Q	
						S30W22	0	0	0			S30W22	Q	
						S29E22	0	0	0			S29E22	Q	
						S17E49	0	0	0			S17E49	Q	
						N32W11	0	0	0			N32W11	Q	
						N18E71	6	0	0			N18E71	C.A.	
143	23	22	105	135	22	S27W52	4	0	0		22	S27W52	E	SOLQUIET MAGALERT MINOR 23/23
						N12W43	0	0	0			N12W43	Q	
						S29E10	0	0	0			S29E10	Q	
						S17E36	0	0	0			S17E36	Q	
						N18E61	2	0	0			N18E61	E	
						N18E81	1	0	0			N18E81	Q	
						N26E85	0	0	0			N26E85	Q	
144	24	23	111	141	14	S26W66	0	0	0		23	S26W66	Q	SOLQUIET MAGNIL
						N12W55	0	0	0			N12W55	Q	
						S29W02	0	0	0			S29W02	Q	
						N17W68	0	0	0			N17W68	Q	
						S17E17	0	0	0			S17E17	Q	
						N17E59	2	1	0			N17E59	E	
						N26E70	1	1	0			N26E70	E	
145	25	24	115	145	23	S26W80	1	0	0		24	S26W80	Q	SOLQUIET MAGQUIET
						N17W70	0	0	0			N17W70	Q	
						S30W15	1	0	0			S30W15	E	
						S17E07	0	0	0			S17E07	Q	
						N17E39	4	1	0			N17E39	E	
						N25E56	0	0	0			N25E56	Q	
						S16E20	0	0	0			S16E20	Q	
146	26	25	178	144	14	N11W82	0	0	0		25	N11W82	Q	SOLQUIET MAGQUIET
						S29W25	0	0	0			S29W25	Q	
						N18E27	5	0	0			N18E27	E	
						N26E43	1	0	0			N26E43	Q	
						S16W31	0	0	0			S16W31	Q	
						N24E16	0	0	0			N24E16	Q	
						N18E67	0	0	0			N18E67	Q	
						N22E72	0	0	0			N22E72	Q	
147	27	26	169	146	10	S29W40	1	0	0		26	S29W40	E	SOLALERT MAGQUIET
						N18E14	2	1	0			N18E14	A	
						N26E30	0	0	0			N26E30	Q	
						N22E02	1	0	0			N22E02	E	
						N18E54	3	1	0			N18E54	A	
						N21E60	0	0	0			N21E60	Q	
						S16E15	0	0	0			S16E15	Q	
						S23E68	0	0	0			S23E68	Q	
148	28	27	170	148	05	S30W52	0	0	0		27	S30W52	Q	SOLALERT MAGALERT 28/30
						N18E01	2	0	0			N18E01	A	
						N26E16	0	0	0			N26E16	E	
						N23W10	1	0	0			N23W10	E	
						N20E42	2	0	0			N20E42	A	
						N23E46	1	0	0			N23E46	Q	
						S17E02	0	0	0			S17E02	Q	
						S25E58	0	0	0			S25E58	Q	
149	29	28	141	145	05	N17W12	5	0	1	SOFLARE X1 N16W10	28	N17W12	D.P.	SOLALERT 29/XX MAGALERT 29/30
						N27E04	0	0	0	28/1457Z. DURATION		N27E04	Q	
						N23W23	1	1	0	12 MIN.		N23W23	C.A.	
						N20E29	0	0	0			N20E29	E	
						N25E34	0	0	0			N25E34	Q	
						S16W09	0	0	0			S16W09	Q	
						S24E46	0	0	0			S24E46	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
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SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	Active Regions: No. of Flares Total	M	X	Outstanding events	Forecasts: Date	Forecasts: Location Lat-Long	Forecasts: Desc*	Alert Situations
150	30	29	167	145	09	N17W25	2	1	0	TENFLARE 250 F.U.	29	N17W25	E	SOLALERT 30/31 MAGALERT 30/30
						N26W10	0	0	0	29/1757Z DURATION		N26W10	Q	
						N22W36	1	0	0	6 MIN.		N22W36	Q	
						N19E14	2	0	0			N19E14	Q	
						N23E19	1	0	0			N23E19	Q	
						S17W23	1	0	0			S17W23	Q	
						S22E32	0	0	0			S22E32	Q	
						S23W60	0	0	0			S23W60	Q	
151	31	30	258	146	17	N18W35	6	2	0	SOFLARE M5/2B	30	N18W35	A	SOLALERT PIANO 31/01
						N26W21	0	0	0	N17W29 30/0716Z		N26W21	Q	MAGALERT MINOR 30
						N23W50	2	0	0	DURATION 10 MIN.		N23W50	Q	
						N21E05	4	0	0			N21E05	E	
						S15W37	2	0	0			S15W37	Q	
						S23E18	0	0	0			S23E18	Q	
						S22W72	1	0	0			S22W72	Q	
						S15W16	0	0	0			S15W16	Q	
						S18W08	0	0	0			S18W08	Q	
						N35W44	1	0	0			N35W44	Q	
						N19W19	0	0	0			N19W19	Q	
152	01	31	232	148	16	N18W53	2	1	0	SOFLARE M5/2B	31	N18W53	A	SOLALERT PIANO 01 MAGNIL
						N25W34	0	0	0	N23W50 31/1009Z		N25W34	Q	
						N23W63	2	0	0	DURATION 140 MIN.		N23W63	Q	
						N21W08	1	0	0	THREE PARALLEL		N21W08	Q	
						S15W53	0	0	0	RIBBONS WITH		S15W53	Q	
						S24E03	0	0	0	UMBRAL COVERAGE.		S24E03	Q	
						S22W84	0	0	0			S22W84	Q	
						S17W33	2	0	0			S17W33	Q	
						S19W19	0	0	0			S19W19	Q	
						N35W58	0	0	0			N35W58	Q	
						S27E18	0	0	0			S27E18	Q	

* 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

	1977 FINAL							1978 PROVISIONAL				
DAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	44	42	17	22	43	44	20	84	128	93	70	77
2	43	45	15	29	37	40	20	88	120	83	68	85
3	43	42	24	29	47	25	31	102	131	95	71	91
4	49	39	19	25	47	22	47	102	138	103	75	76
5	40	40	23	20	48	25	56	73	137	76	94	74
6	39	40	26	26	55	27	58	69	129	57	92	73
7	41	25	28	25	57	34	55	42	121	90	88	70
8	38	20	25	18	52	27	45	36	89	99	105	56
9	33	17	30	30	47	31	58	36	94	85	126	59
10	29	23	25	40	38	25	75	15	96	92	111	57
11	27	9	23	45	28	26	71	18	95	85	109	63
12	22	8	29	51	33	27	62	26	92	78	107	65
13	20	10	40	48	53	28	44	26	93	65	93	72
14	25	7	40	47	48	31	37	36	82	62	75	72
15	8	0	42	53	54	39	41	30	59	72	61	78
16	8	0	38	56	53	49	39	23	64	70	85	91
17	8	0	36	53	51	51	29	24	56	66	99	79
18	21	0	40	60	50	54	33	14	55	72	100	85
19	33	7	35	59	54	52	40	8	53	64	107	84
20	21	8	33	60	54	38	23	7	52	51	115	74
21	28	8	33	58	42	32	23	20	63	77	112	73
22	40	23	38	42	35	28	17	30	74	82	109	73
23	57	30	15	41	30	24	23	43	69	85	105	72
24	60	38	19	48	29	18	31	37	78	82	102	82
25	74	42	25	46	28	10	35	32	94	70	139	86
26	71	42	34	49	30	9	41	47	86	53	115	84
27	74	37	38	54	38	14	50	69	79	50	90	97
28	65	26	36	61	37	9	45	79	88	49	75	90
29	50	16	40	64	42	10	58	90		48	72	103
30	45	10	36	60	45	23	64	104		44	70	107
31		8	31		52		67	118		70		109
MEAN	38.5	21.4	30.1	44.0	43.8	29.1	43.2	49.3	89.8	73.5	94.7	79.3

1977 yearly mean = 27.5

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

	1977							1978				
DAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	88.9	102.0	83.0*	83.1	93.8*	94.4	88.4	126.9*	139.1	136.3	130.0	181.4
2	90.9*	100.7	82.8	84.2	93.2	93.6	91.2	133.9	152.6	141.1	129.8	183.0
3	93.0*	97.4	82.3	87.2	97.4	90.4	93.7	130.2	156.6*	146.6	134.5	182.2A
4	94.2	94.0	82.9*	84.2	98.8	89.4	95.9	124.8	154.0	148.4	143.3*	178.4
5	90.2*	88.0*	86.4	85.6	104.0*	90.6	96.9	119.2	159.0	154.5	146.7*	173.9*
6	90.6	90.2	88.2	84.9	103.5	91.1	102.0*	118.7*	156.1	162.8	145.3*	173.1
7	92.0	85.2	86.9	89.3	105.5	90.2	105.5	111.6	157.3	165.2	146.9	162.6*
8	91.9*	82.1	85.1	91.6	103.8	90.3	106.7	102.8	157.0*	168.7	148.6	143.4
9	90.9	79.0	85.9	95.9	100.7	91.1	112.6*	97.0	155.2	183.7	156.1	135.1
10	89.2*	76.9	87.2	99.8	96.4	93.1	114.7	93.5	148.7	179.1	155.4	129.5
11	87.2	76.2	87.6	104.6	95.3	94.9	107.4	93.1	154.2	175.2	162.8*	133.8
12	83.3	75.8	86.5	107.8	100.8	91.4	111.0	92.1	159.0	169.8	156.2	138.2
13	84.2	77.8	89.0	112.9	98.5	94.0	100.6	90.3	151.2	160.9	145.6	140.2
14	82.3	76.8	87.5	118.2	98.9	97.9	93.7*	88.6	148.4	160.5	139.1	143.7
15	82.3	76.0	86.9	120.7	98.2	97.9	92.5	89.6	136.8	154.2	141.4	146.1
16	81.4	76.9	87.3	120.4	96.8	95.9	92.5	86.4	130.2	143.3	137.6	147.8*
17	82.4	76.5	87.1	120.6	94.9	100.4	91.1	83.8	125.9	135.4	133.4	143.8
18	84.3	76.9	88.6	120.5	95.4	102.0*	93.6	84.7	124.9	132.3	134.1	135.6
19	85.2	76.9	87.0	104.5	105.0	99.2	91.0	85.4	119.1	128.1	139.5*	133.6
20	88.9	80.1	88.7	108.8	99.6*	95.7*	88.7	87.0	122.2	125.3	138.1	132.3*
21	92.4	81.7	90.8	104.9*	98.6*	92.8	87.8	91.4	122.2	118.2	138.4*	132.7
22	98.8*	83.1	89.6	102.4	93.9	89.3	89.9	96.9	127.7	117.0	146.4	135.7*
23	99.4	85.0	86.0	99.3	87.3	88.0	91.2	99.6	131.8	116.4	162.9	142.9*
24	107.4	84.0	86.0	100.6	88.3	86.7	93.9	100.4	135.6	117.5	159.8	146.5*
25	113.8	86.0	87.7	98.8	88.1	84.7	96.3	103.3	139.3	118.2	159.1*	147.6
26	120.7	86.0	86.4	99.4	88.6	84.1	99.3	112.7	134.8	112.5	166.7	152.8
27	115.9*	85.4	85.4	100.0	88.5	83.8	98.3	116.4	137.5	114.1	172.8	150.6*
28	113.4	87.5	82.4	100.0	90.3*	85.6	98.9	127.7*	135.4	112.7	176.6*	147.1*
29	111.9	86.7	86.1	99.4	90.3	85.6	105.6*	132.2*		111.1	185.2	148.6
30	106.9	84.1	85.5	97.7	94.9	85.3	114.7	134.9		115.4*	182.1*	147.2*
31		80.4	84.7		95.9		120.2	133.3*		124.5		152.6
MEAN	94.5	83.7	86.4	100.9	96.3	91.6	98.9	106.1	141.8	140.3	150.5	149.7

* adjusted for burst

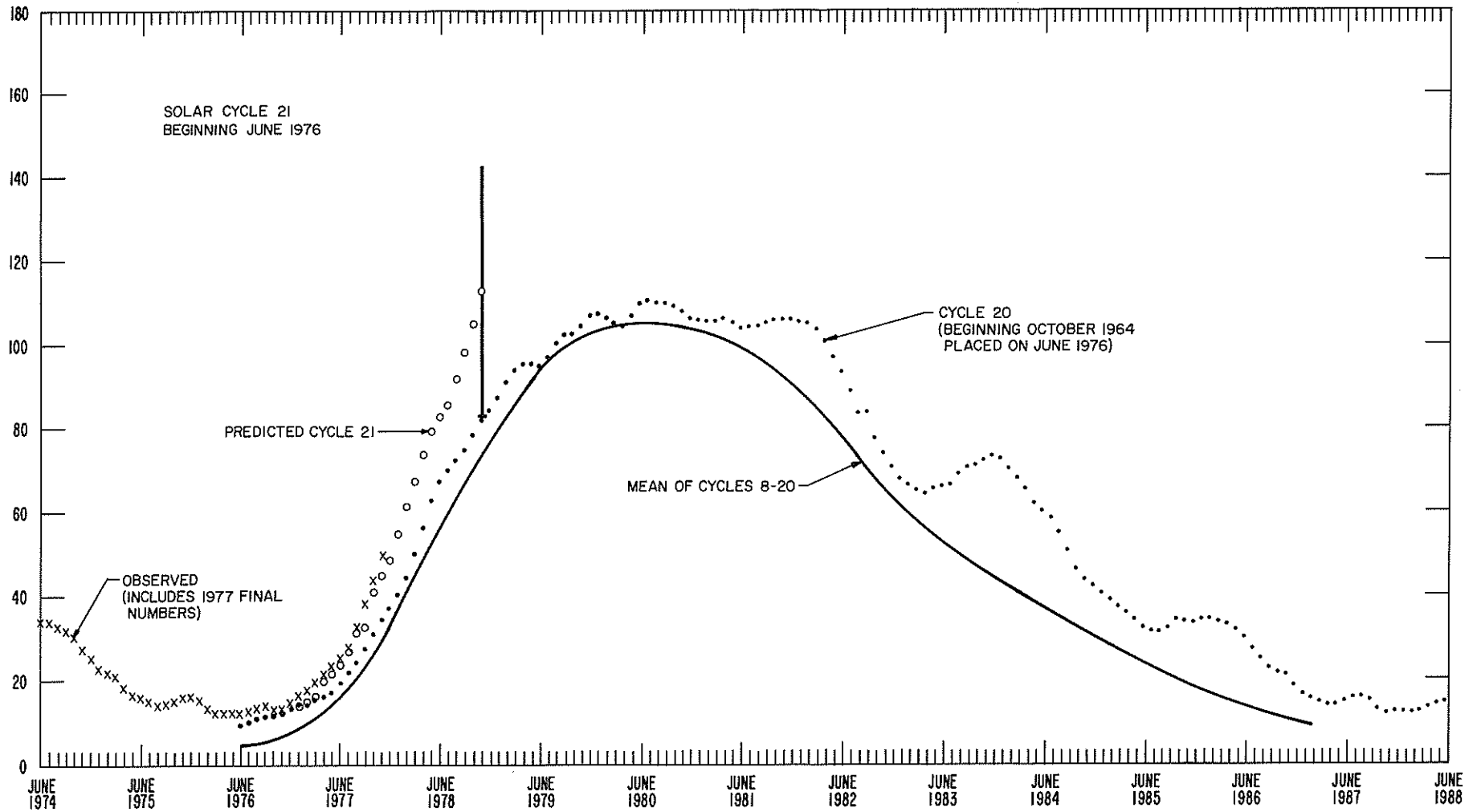
DAILY SOLAR INDICES

MAY 1978

MAY 1978	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX OTTAWA 2800	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$		AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	121	03	77	85	178.5	593	371	231	181.4	195.2	117.1	60.0	34.2	17.7
2	122	04	85	80	180.1	606	378	240	183.0	198.6	122.8	70.0	34.7	11.7
3	123	05	91	90	179.2A	592	375	233	182.2A	186.5	120.3	69.3	35.6	27.9
4	124	06	76	84	175.4	603	376	227	178.4	178.4	113.2	66.6	37.3	15.7
5	125	07	74	79	170.8*	588	369	211	173.9*	190.7	118.0	68.8	35.1	15.6
6	126	08	73	81	170.0	602	363	212	173.1	184.3	114.2	68.5	23.0	11.2
7	127	09	70	71	159.6*	607	377	210	162.6*	175.1	105.9	67.8	35.7	14.3
8	128	10	56	64	140.7	589	335	173	143.4	150.0	100.8	64.8	34.3	15.5
9	129	11	59	70	132.6	587	327	165	135.1	145.1	102.3	65.5	31.8	13.1
10	130	12	57	56	127.0	585	319	159	129.5	140.1	97.8	62.4	31.1	10.9
11	131	13	63	58	131.2	582	325	164	133.8	141.6	97.6	63.1	34.3	10.7
12	132	14	65	66	135.4	581	323	172	138.2	146.1	98.0	61.7	31.3	11.9
13	133	15	72	77	137.3	580	322	170	140.2	146.7	100.4	63.4	33.9	12.4
14	134	16	72	79	140.6	585	327	175	143.7	154.7	104.0	64.1	41.3	13.0
15	135	17	78	76	143.0	580	324	172	146.1	153.0	111.1	66.7	30.2	12.0
16	136	18	91	87	144.5*	574	321	169	147.8*	152.0	115.5	67.0		19.4
17	137	19	79	88	140.6	583	318	166	143.8	151.8	109.2	66.3	32.5	11.9
18	138	20	85	90	132.4	577	310	160	135.6	144.8	110.8	66.0	30.9	13.7
19	139	21	84	77	130.5	582	298	155	133.6	135.5	102.2	67.6	35.4	12.8
20	140	22	74	70	129.2*	577	316	161	132.3*	137.4	96.3	70.0	42.5	17.8
21	141	23	73	73	129.5	577	314	162	132.7	137.8	103.4	68.1	47.1	22.0
22	142	24	73	67	132.4*	582	333	174	135.7*	143.5	99.1	64.9	36.3	13.7
23	143	25	72	76	139.3*	592	336	182	142.9*	151.5		64.9	35.4	13.2
24	144	26	82	72	142.8*	596			146.5*		105.2	66.7	33.4	11.0
25	145	27	86	79	143.9	597	335	180	147.6	150.0	109.6	65.8	31.6	10.3
26	146	01	84	87	148.8	586	337	183	152.8	151.9	112.4	69.7	36.3	20.4
27	147	02	97	89	146.6*	579	327	183	150.6*	153.1	112.3	66.6	31.9	13.4
28	148	03	90	87	143.2*	598	347	193	147.1*	155.9	111.5	67.9	32.8	12.3
29	149	04	103	95	144.6	583	323	179	148.6	147.6	107.7	63.6	31.4	10.0
30	150	05	107	102	143.2*	584	329	178	147.2*	150.5	108.4	64.5	31.6	10.9
31	151	06	109	112	148.4	590	324	180	152.6	147.7	116.1	68.0	37.8	17.4
MEAN			79.3	79.6	146.5	588	336	184	149.7	156.6	108.1	66.1	34.3	14.3

* Adjusted for burst.

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



OBSERVED AND PREDICTED 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	14.0	14.3	13.4	13.5	14.8
1977	16.7	18.1	20.0	22.2	24.2	26.3	28.8	33.0	38.5	44.0	49.9	] 54.9 (3)
1978	60.6 (6)	66.6 (8)	72.5 (10)	78.7 (13)	85.6 (16)	91.6 (19)	96.3 (22)	100.5 (26)	104.5 (29)	108.2 (30)	112.9 (30)	119.4 (29)
1979	125.0 (29)	129.6 (30)	133.8 (32)	136.7 (35)	139.3 (37)	143.7 (39)	148.2 (41)	151.0 (43)	152.6 (46)	153.0 (49)	152.8 (51)	151.7 (52)
1980	149.9 (52)	148.2 (52)	147.4 (50)	147.8 (50)	147.0 (51)	143.5 (51)	139.8 (52)	136.7 (52)	135.1 (52)	134.4 (52)	132.7 (53)	131.2 (55)
1981	130.9 (58)	130.2 (58)	127.7 (56)	124.6 (54)	122.3 (53)	120.4 (52)	119.8 (50)	120.1 (49)	119.5 (48)	118.2 (48)	116.1 (46)	113.0 (43)
1982	109.6 (41)	106.2 (40)	103.7 (40)	101.9 (38)	99.7 (36)	96.7 (35)	92.5 (33)	88.0 (31)	84.0 (29)	79.5 (25)	76.4 (23)	72.9 (23)
1983	69.0 (22)	66.4 (22)	64.4 (23)	62.3 (23)	60.1 (23)	57.8 (23)	55.9 (24)	54.0 (26)	52.3 (28)	51.0 (30)	50.1 (31)	49.5 (31)
1984	48.4 (31)	46.5 (30)	43.8 (29)	40.6 (29)	38.0 (30)	36.8 (31)	35.6 (32)	33.9 (32)	32.5 (31)	31.6 (29)	30.5 (28)	29.0 (27)
1985	28.0 (27)	27.2 (27)	26.3 (26)	25.9 (26)	25.2 (26)	24.3 (25)	23.6 (23)	22.8 (23)	22.1 (22)	21.3 (23)	20.4 (24)	19.9 (24)
1986	19.7 (24)	19.3 (24)	18.8 (24)	17.9 (23)	16.8 (22)	15.7 (21)	14.9 (19)	14.4 (18)	14.0 (17)	13.5 (16)	13.3 (15)	13.1 (13)
1987	13.2 (11)	13.6 (11)	14.3 (11)	15.1 (11)	16.1 (13)							

The table gives observed Zürich smoothed sunspot numbers for Cycle 21 up to the one calculated from the latest observed data, marked by a vertical bar. They are based on final Zürich numbers through 1977 and provisional Zürich numbers thereafter. Some of these data after the June 1976 value will change slightly when final data for 1978 are received. The numbers after the vertical bar are predictions by the McNish-Lincoln method (see *Explanation of Data Reports*, February 1978). Shown in parentheses are the corresponding absolute values of the 90% confidence interval, an indication of the uncertainty above and below the predicted number.

The McNish-Lincoln method is very sensitive to the identification of a minimum epoch. In SGD 390-401 issues, the Cycle 21 predictions were based on March 1976 as the minimum epoch. Latest studies, including one published by Waldmeier, show that June 1976 is the more appropriate epoch of minimum. Thus, we have adopted a June 1976 mimimum.

*Prediction of Sunspot Maximum -- The McNish-Lincoln prediction method is recommended for predictions up to only one year ahead. From that point, the predictions regress rapidly towards the mean value. Combining this McNish-Lincoln prediction of sunspot maximum with the Ohl method (as done by Sargent, see *Explanation of Data Reports*, February 1978) indicates that the most probable value for sunspot maximum is 153 ± 38.

Hα SOLAR FLARES

MAY 1978

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 Milt of Disk	CORR. AREA Sq. Deg.	
MCMA	01	1109	1120	1150	N29	E12	.600	15266	2.4	41	SN		C	1120	100	1.3	E
MCMA	01	1307	1311	1322	N24	W02	.501	15266	1.4	15	SF		C	1311	35	.4	D
MCMA	01	1323	1324	1330	N21	E14	.505	15266	2.6	7	SF		C	1324	30	.4	D
MCMA	01	1332	1340	1400D	N18	W05	.415	15266	1.2	28D	SF		C	1340	30	.3	E
MCMA	01	1404	1406	1430	N32	E12	.639	15266	2.5	26	SB		C	1406	40	.5	D
MCMA	01	1455		1520	N26	W06	.538	15266	1.2	25	SN		C	1501	50	.6	E
MCMA	01	1541	1543	1551	S28	W74	.957	15252	27.1	10	SF		C	1543			D
MCMA	01	1646		1710D	S29	W74	.957	15252	27.1	24D	SF		C	1705			E
MCMA	01	1714	1715	1737D	N34	E23	.714	15266	3.4	23D	SB		C	1715	35	.4	E
MCMA	01	1727E		1747	N22	W08	.486	15266	1.1	20D	SB		C	1733	100	1.1	
PALE	01	1739	1743	1826	N16	W72	.964	15265	27.3	47	1B	3	C		167		
MCMA	01	1759E		1804D	S29	W74	.957	15252	27.2	50	SF		P	1759			D
MCMA	01	1910E		2230	N21	W12	.492	15266	31.9	200D	2B		C	1953	450	5.2	UXYZ
MCMA	01	1955	1958	2030	S29	W77	.969	15252	27.1	35	SN		C	1958			E
MCMA	01	2045E	2046	2050D	S29	W77	.969	15252	27.1	5D	SN		C	2046			E
MCMA	01	2134	2138	2146	S29	W78	.973	15252	27.0	12	SN		C	2138			D
MCMA	01	2148	2155	2201	S29	W78	.973	15252	27.1	13	SF		C	2155			E
MANI	02	0048	0050	0100	N26	E03	.533		2.3	12	SN	3	V		100	1.1	F
MANI	02	0118E	0120	0209D	N26	E03	.533		2.3	51D	SN	3	V		150	1.7	F
MANI	02	0347E	0349	0409D	N30	W05	.594		1.8	22D	1N	3	V		210	2.6	FU
MANI	02	0616E	0616U	0623	S27	E76	.965		8.0	7D	SN	3	V		30	.7	
MANI	02	0639E	0640	0709	N30	W10	.607		1.5	30D	SB	3	V		150	1.8	F
MCMA	02	1050E		1155D	N25	W04	.520	15266	2.2	65D	SN		C	1055	50	.6	E
MCMA	02	1130	1146	1203	S29	W85	.992	15252	27.1	33	SN		C	1146			E
MCMA	02	1200	1221	1305	N25	W03	.518	15266	2.3	65	SB		C	1221	90	1.1	E
MCMA	02	1307	1308	1313	S29	W85	.992	15252	27.2	6	SB		C	1308			E
MCMA	02	1330	1340	1355D	N25	W05	.522	15266	2.2	25D	SN		C	1340	40	.5	E
MCMA	02	1420	1424	1429	N16	E72	.964	15282	8.0	9	SF		C	1424	20	.6	D
MCMA	02	1432	1439	1445	S29	W86	.994	15252	27.2	13	SN		C	1439			D
MCMA	02	1610	1612	1615	S27	E72	.947	15280	8.1	5	SB		C	1612	40	1.4	EV1611
MCMA	02	1815	1830	1930	N28	E24	.659	15266	4.6	75	SF		C	1830	60	.8	E
MCMA	02	2003	2012	2045	N15	E68	.943	15282	7.9	42	SN		C	2012	20	.6	D
MCMA	02	2205	2208	2215	N22	E03	.473	15266	3.1	10	SF		C	2208	25	.3	D
MANI	02	2314E	2314U	2326	N26	W07	.542		2.4	12D	SN	3	P		80	.9	F
MANI	03	0122	0128	0148	S32	W90	.998		27.3	26	1B	3	P				LIMBFL
MONT	03	0748E	0822	0931D	S31	W86	.993		27.9	103D	SN		C	0822	110		
MONT	03	0957	1001	1009	S31	W86	.993		28.0	12	SN		C	1001	50		D
MCMA	03	1126	1128	1135	S29	W90	.999	15252	27.7	9	SN		C	1128			CAPSUR
MCMA	03	1211E		1245D	N29	W28	.698	15266	1.4	34D	SN		C	1220	45	.6	E
MCMA	03	1228	1230	1242	N22	W27	.624	15266	1.5	14	SN		C	1230	100	1.4	E
MCMA	03	1346	1348	1410	S33	W90	.998	15266	27.8	24	SF		C	1348			SURGES
MCMA	03	1355	1420	1455D	N23	W23	.599	15266	1.9	60D	1N		C	1420	160	2.1	EK
MCMA	03	1411	1413	1418	N15	E57	.869	15282	7.9	7	SN		C	1413	30	.6	D
MCMA	03	1435	1442	1447	S32	W90	.998	15252	27.9	12	SF		C	1442			SURGES
MCMA	03	1500	1505	1655D	N20	W33	.665	15266	1.2	115D	SN		C	1505	80	1.1	EK
MCMA	03	1628	1628	1639	N24	W18	.572	15266	2.3	11	SN		C	1628	20	.3	D
MCMA	03	1655	1700	1735	N29	W31	.721	15266	1.4	40	1B		C	1700	250	3.6	F
MCMA	03	1815	1820	1842	N25	W25	.636	15266	1.9	27	SN		C	1820	60	.8	D
MCMA	03	1847	1855	2015D	N23	W27	.634	15266	1.8	88D	SN		C	1855	110	1.4	FK
MCMA	03	2020	2023	2056	N26	W20	.610	15266	2.3	36	SB		C	2023	120	1.5	E
MANI	03	2243E	2243	2252	N20	W40	.734		31.9	9D	SF	3	V		20	.3	
MANI	03	2243E	2244	2302	N24	W20	.587		2.4	19D	SN	3	V		80	1.0	F
MANI	04	0150	0152	0158	N25	W23	.621		2.4	8	1N	3	V		250	3.2	F
MANI	04	0259	0302	0309D	N20	W40	.735		1.1	10D	1N	3	V		150	2.2	F
MANI	04	0638E	0642	0705D	N20	W27	.606		2.3	27D	SN	3	V		150	1.9	F
BUCA	04	0639E		0655D	N21	W24	.588	15266	2.5	16D	1N		C	640	429	5.1	C
MONT	04	0952E	1003	1027	N20	W43	.763		1.2	35D	SN		C	1003	110		E
MANI	05	0338	0344	0401D	N18	W60	.899		31.7	23D	SF	3	P		40	.8	
RAMY	06	1140E	1146	1208D	N15	W80	.990		31.5	28D	SN	3	C		35		
RAMY	06	1214	1215	1225	S28	E26	.542		8.5	11	SN	3	C		36		H
RAMY	06	1225	1310	1407	N18	W49	.810		2.8	102	SB	3	C		44		
RAMY	06	1225	1256	1407	N18	W49	.810		2.8	102	SF	3	C		39		
RAMY	06	1255	1300	1441	N15	W80	.990		31.5	106	SF	3	C		53		
RAMY	06	1255	1306	1441	N15	W80	.990		31.5	106	SB	3	C		39		
RAMY	06	1501	1514	1520	N16	W78	.986		31.8	19	SB	3	C		49		
RAMY	06	1535	1543	1551	N19	W71	.963		1.3	16	SB	3	C		27		
PALE	06	1638E	1644	1656	N16	W71	.960		1.4	18D	SN	3	C		26		DE

Hα SOLAR FLARES

MAY 1978

OBSERVATORY	OBSERVED UT DATE MAY	START	MAX. PHASE	END	LOCATION APPROX. LAT.	MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	DURATION MIN.	IMPORTANCE	OBS. CORD.	TYPE	MEASUREMENTS TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	REMARKS
RAMY	06	1643	1645	1658	N20	W51	.835		2.9	15	SN	3	C		38		F
PALE	06	1645	1647	1702	N19	W56	.872		2.5	17	SB	3	C		43		DE
RAMY	06	1702	1705	1713	N16	W78	.986		31.9	11	SB	3	C		23		
PALE	06	1738	1800	1826	N20	W57	.882		2.5	48	SB	3	C		88		DE
RAMY	06	1739	1742U	1752	N17	W78	.986	15292	31.9	13	1B	3	C		0		
MANI	07	0336E	0336U	0355	N24	W68	.956		2.1	19D	2N	3	P		250	5.6	FZ
RAMY	07	1237	1241	1307	N18	W81	.994		1.5	30	SB	3	C		0		
RAMY	07	1318	1326	1346	N19	W67	.944		2.5	28	SB	4	C		27		
RAMY	07	1405	1413	1418	N19	W68	.949		2.5	13	SB	4	C		21		
RAMY	07	1425	1429	1433	N19	W68	.949		2.5	8	SB	4	C		22		
RAMY	07	1435	1439	1441	N18	W84	.998		1.3	6	SB	4	C		0		
MCMA	07	1436	1436	1445	N20	W90	1.001	15266	31.9	9	SF		C	1436			
MCMA	07	1455	1501	1504	N24	W90	1.001	15266	31.9	9	SF		C	1501			
MCMA	07	1512	1514	1522D	N22	W70	.962	15266	2.4	10D	SN		C	1514			D
RAMY	07	1531	1532	1539	N25	W80	.994		1.6	8	SB	4	C		0		
RAMY	07	1544	1612	1627	N18	W66	.937	15266	2.7	43	1B	4	C		247		FDE
RAMY	07	1544	1552	1627	N18	W66	.937		2.7	43	SB	4	C		102		FDE
MCMA	07	1552		1625	N22	W70	.962	15266	2.4	33	1N		P	1611	60	2.2	EK
PALE	07	2124E	2126U	2128D	N17	W87	1.000		1.4	4D	SB	3	C		0		DE
PALE	07	2228	2229	2240	N21	W72	.969		2.5	12	SN	3	C		39		F
MONT	08	0752	0812	0829	N16	W06	.395		7.9	37	SN		C	0812	80		E
TEHR	08	0808E	0810	0822	N17	W 7	.414		7.8	14D	SB	2	C		127		F
RAMY	08	1212	1248U	1312	N22	W76	.984	15266	2.8	60	2B	4	C		115		F
RAMY	08	1212	1216U	1312	N22	W76	.984		2.8	60	SB	4	C		45		F
RAMY	08	1441	1447	1502	N16	E46	.775		12.1	21	SB	4	C		32		F
RAMY	08	1441	1448	1502	N16	E43	.745		11.8	21	SB	3	C		32		
RAMY	08	1441	1454	1502	N16	E43	.745		11.8	21	SF	3	C		10		
RAMY	08	1739	1741	1752	N18	E57	.877		13.0	13	SB	3	C		63		
PALE	08	1744E	1744U	1748	N16	E55	.856		12.9	4D	SB	3	C		58		DE
PALE	08	2044E	2044U	2101D	N16	E53	.839		12.8	17D	SB	3	C		30		DE
RAMY	09	1442	1443	1508	N22	W90	1.001	15266	2.9	26	1B	4	C		0		
HERS	09	1442E	1442	1510	N21	W90	1.001		2.9	28D	1B		P				
PALE	10	2157E	2215U	2245D	N20	E40	.737	15294	13.9	48D	1N	3	C		221		U F
PALE	10	2157E	2204U	2245D	N20	E40	.737	15294	13.9	48D	1B	3	C		216		U F
MANI	10	2210E	2210U	2235	N17	E38	.699		13.8	25D	1F	3	V		150	2.1	U
PALE	11	0249	0251	0338	N20	E38	.718		14.0	49	SB	3	3		120		UF
PALE	11	0249	0309	0338	N20	E38	.718	15294	14.0	49	1F	3	C		314		U
TEHR	11	0254E	0300	0318	N20	E38	.718	15294	14.0	24D	1B	1	C		509		U F
RAMY	11	1532	1533	1538	N17	E13	.452		12.6	6	SN	3	C		40		F
PALE	11	2114	2116	2142	N19	E30	.631		14.1	28	SB	3	C		51		DE
PALE	11	2145	2153	2204	N19	E29	.621		14.1	19	SN	3	C		57		DE
PALE	11	2330	2334	2341D	N20	W 1	.449	15291	11.9	11D	1B	3	C		413		FDE
MANI	11	2330E	2335	2350	N18	W04	.422		11.7	20D	1N	3	P		200	2.2	FE
MITK	11	2339		2415	N20	E00	.448	15290	12.0	36	1B		P	2339	310	3.5	E
RAMY	12	1851	1852	1852D	N23	E18	.567		14.1	1D	SB	2	C		44		F
MANI	13	0742	0744	0747D	S26	W73	.950		7.8	5D	SN	3	P		80	1.8	
TEHR	13	0743	0751	0841	S28	W70	.935	15280	8.1	58	1B	1	C		350		F
TEHR	13	0743	0751	0806D	S28	W70	.935	15280	8.1	23D	1B	1	C		350		F
TEHR	13	0743	0751	0806D	N22	E60	.909		17.8	23D	1B	1	V		350		F
RAMY	13	1118	1137	1212D	N22	E57	.889		17.7	54D	SN	3	C		26		
RAMY	13	1307	1308	1317	S19	E16	.339		14.7	10	SB	3	C		21		
RAMY	13	1836	1838	1840	N13	W21	.480		12.2	4	SN	3	C		61		
PALE	13	2057	2138	2231D	N22	E55	.875		18.0	94D	SN	3	C		31		DE
PALE	14	0001	0038	0055	N22	E52	.853		17.9	54	SB	3	C		40		DE
RAMY	14	1116	1138	1152	N19	E70	.959		19.7	36	SF	3	C		30		F
RAMY	14	1116	1117	1152	N19	E70	.959	15300	19.7	36	1N	3	C		110		F
TEHR	14	1117E	1118	1135	N18	E67	.943		19.5	18D	SB	2	C		96		F

Hα SOLAR FLARES

MAY 1978

OBSERVATORY	OBSERVED UT DATE MAY	START	MAX. PHASE	END	LOCATION APPROX. LAT.	MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	DURATION MIN.	IMPORTANCE	OBS. COND.	TYPE	MEASUREMENTS TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	REMARKS
RAMY	14	1129	1131	1150	S20	E 4	.238		14.8	21	SB	3	C		53		F
TEHR	14	1131	1133	1149	S18	E 9	.246		15.2	18	SB	2	C		127		F
TEHR	14	1131	1133	1137D	S18	E 9	.246		15.2	6D	SB	2	V		127		F
RAMY	14	1251	1253	1303	N20	E45	.785		17.9	12	SB	3	C		80		F
TEHR	14	1254	1256	1304	N21	E41	.754		17.6	10	SN	2	C		159		F
RAMY	14	1354E	1355	1402	S28	W82	.984		8.4	8D	SB	3	C		0		F
RAMY	14	1454E	1455	1502	S28	W82	.984		8.5	8D	SB	3	C		0		F
RAMY	14	1611	1612	1623	S20	E 1	.229		14.7	12	SB	3	C		82		F
PALE	14	2139	2141	2155D	S27	E60	.868		19.4	16D	SB	3	C		35		U F
RAMY	14	2140	2141	2152	S26	E58	.851		19.3	12	SB	3	C		56		F
RAMY	15	1606	1610	1618	N21	E33	.678		18.1	12	SB	4	C		62		F
PALE	15	2220	2227	2234	S27	E46	.744		19.4	14	SB	3	C		50		FDE
TEHR	16	0454	0457	0502	S18	W20	.382	15296	14.7	8	1B	2	C		222		
RAMY	16	1234	1240	1254	S20	W23	.437		14.8	20	SB	4	C		94		
RAMY	16	1626E	1630U	1656D	N15	W56	.863	15291	12.5	30D	1B	3	C		301		
RAMY	16	1626E	1640U	1656D	N15	W56	.863		12.5	30D	1N	3	C		150		
PALE	16	1634E	1635U	1642D	N16	W56	.866	15291	12.5	8D	1B	3	V		159		FDE
PALE	16	1634E	1635U	1710	N16	W56	.866	15291	12.5	36D	1B	3	C		159		FDE
PALE	16	1706	1708	1722	N19	E19	.529		18.1	16	SN	3	C		61		U F
PALE	16	1758	1801	1836	N20	E15	.510		17.9	38	SB	3	C		124		FDE
MCMA	16	1852	1908	1915D	S19	W28	.497	15296	14.7	23D	SF		C	1908	60	.7	E
PALE	16	1856	1858	1910	S21	W27	.495		14.8	14	SN	3	C		36		DE
RAMY	16	1858	1901	1909	S20	W26	.476		14.8	11	SB	3	C		67		
MCMA	16	2025E		2026D	N26	E17	.599	15298	18.1	1D	SF		P	2026	40	.5	E
MANI	16	2300E	2302	2309D	S21	W27	.495		14.9	9D	SN	3	V		150	1.8	
RAMY	17	1233	1237	1342	S26	W84	.989		11.2	69	SB	4	C		24		
RAMY	17	1233	1327	1342	S26	W84	.989		11.2	69	SF	4	C		7		
MCMA	17	1434		1439D	S18	W38	.624	15296	14.8	5D	SF		C	1438	15	.2	DL
MCMA	17	1453E		1523D	S18	W38	.624	15296	14.8	30D	SN		P	1454	50	.7	EL
RAMY	17	1504	1505	1514	S26	E20	.454		19.1	10	SB	4	C		36		
MCMA	17	1507E		1523D	S24	E20	.434	15301	19.1	16D	SN		P	1508	50	.6	E
RAMY	17	1505	1507	1513	S26	W85	.991		11.3	8	SN	4	C		9		
RAMY	17	1521	1522	1527	S26	W85	.991		11.3	6	SB	4	C		9		
RAMY	17	2056	2057	2101D	N16	W70	.956		12.6	5D	SN	3	C		0		
RAMY	17	2118	2126	2135D	N19	W 1	.437		17.8	17D	SB	3	C		81		F
MCMA	18	1159E		1213D	N18	E33	.656	15303	21.0	14D	SF		P	1159	60	.8	
MCMA	18	1754E		1840D	N20	W01	.453	15298	18.7	46D	SN		C	1755	110	1.2	E
MONT	19	1002	1011	1021	S29	E03	.378		19.6	19	SN		C	1011	110		
MONT	19	1028	1034	1043	S24	W64	.895		14.6	15	SN		C	1034	50		D
MCMA	19	1037E		1054	S24	W62	.880	15296	14.8	17D	SN		P	1037	60	1.5	D
MCMA	19	1120E		1145D	N20	E20	.550	15303	21.0	25D	SF		C	1125	55	.6	E
RAMY	19	1220	1221	1227	S25	W62	.881		14.9	7	SB	3	C		21		
TEHR	19	1222E	1223	1229	S23	W60	.864		15.0	7D	SB	2	C		32		
MCMA	19	1328	1334	1343D	S24	W64	.895	15296	14.8	15D	SN		C	1334	45	1.2	E
MCMA	19	1517E		1600D	N21	E04	.473	15300	19.9	43D	1F		C	1518	220	2.4	E
MCMA	19	1532	1542	1555	S24	W67	.915	15296	14.6	23	SF		C	1542	30	1.0	D
MCMA	19	1720	1726	1740	S28	E03	.362	15301	19.9	20	SF		C	1726	50	.6	E
MCMA	19	1842	1856	1918	S24	W67	.915	15296	14.8	36	SN		C	1856	60	1.8	E
MANI	19	2343E	2343U	2355	S21	W76	.963		14.3	12D	2N	2	P		400	9.7	Z
MANI	20	0226	0236	0240	S25	W70	.933		14.9	14	1N	3	P		150	3.3	
MONT	20	0953	1007	1012	S24	W78	.971		14.6	19	SN		C	1007	50		D
RAMY	20	1128	1130	1135	S24	W78	.971		14.6	7	SB	3	C		13		
RAMY	20	1148	1151	1210	S24	W78	.971		14.6	22	SB	3	C		16		F
TEHR	20	1153E	1154	1157D	S23	W75	.959		14.9	4D	SB	2	V		64		
RAMY	20	1456	1457	1459	S24	W78	.971		14.8	3	SN	3	C		22		
RAMY	20	1602	1604	1607	S24	W79	.975		14.7	5	SN	3	C		17		
RAMY	20	1610	1612	1617	S24	W79	.975		14.7	7	SN	3	C		23		
RAMY	20	1807	1809	1812	S25	W79	.975		14.8	5	SB	3	C		21		

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RAMY	21	1235	1238	1245	N25	W90	1.001		14.8	10	SB	4	C		0		
RAMY	21	1250	1251	1254	N17	E81	.994		27.6	4	SN	4	C		0		
RAMY	21	1316	1317	1319	N17	E81	.994		27.6	3	SN	4	C		0		
MCMA	21	1507E		1527D	N17	W10	.438	15303	20.9	20D	SN		C	1515	30	.3	EH
MCMA	21	1614		1640	S29	W22	.503	15301	20.0	26	SN		C	1625	50	.6	E
RAMY	21	1636E	1636	1653	N18	E76	.982		27.4	17D	SN	3	C		9		
RAMY	21	1716	1721	1724	N18	E76	.982		27.4	8	SB	3	C		10		
MITK	22	0207		0224	S28	W44	.726		18.8	17	SN		C	0208			E
PALE	22	0210E	0211U	0215	S26	W43	.708		18.9	5D	SB	3	C		47		DE
RAMY	22	1433	1436	1443	S26	W44	.718		19.[illegible]	10	SB	3	C		102		
MCMA	22	1434	1436	1443	S28	W50	.784	15301	18.9	9	SN		C	1436	60	1.1	E
RAMY	22	1459	1509	1522	N19	E66	.940		27.6	23	SB	3	C		28		
MCMA	22	1501	1502	1547	N18	E72	.967	15314	28.0	46	SN		C	1502	40	1.6	E
RAMY	22	1522	1531	1531	N19	E66	.940		27.6	9	SB	3	C		33		
MCMA	22	1625	1628	1638	S26	W53	.807	15301	18.7	13	SB		C	1628	50	.9	E
RAMY	22	1626	1626	1633D	S26	W46	.739	15301	19.2	7D	1B	3	C		132		FDE
RAMY	22	1626	1626	1627D	S26	W45	.729	15301	19.3	1D	1B	3	V		132		
MCMA	22	1650	1651	1656	N21	E89	1.000	15314	1.4	6	SF		C	1651			
MCMA	22	1816	1844	1909	N18	W24	.566	15300	21.0	53	SB		C	1844	50	.6	E
MCMA	22	1835	1842	1910	N16	E72	.965	15314	28.2	35	SF		C	1842	25	1.0	D
MITK	23	0015	0027	0130	N18	E66	.938	15314	28.0	75	1N		C	0027	140		E
PALE	23	0024E	0024U	0107D	N18	E69	.954		28.2	43D	SB	3	C		40		DE
MANI	23	0031E	0032	0050	N17	E70	.958		28.3	19D	SN	3	V		80	1.8	
MONT	23	0801	0812	0839	S33	W07	.449		22.8	38	SF		C	0812	40		D
MONT	23	0845	0851	0911	N17	E65	.931	15314	28.2	26	1N		C	0857	250		
RAMY	23	1140	1141	1200D	N19	E53	.851		27.5	20D	SB	3	C		20		
MCMA	23	1613	1613	1615D	N22	E67	.950	15314	28.7	2D	SN		P	1613	20	.6	D
MITK	24	0439	0534	0640	S30	W03	.391	15314	24.0	121	1F		C	0534	220	2.5	EH
MCMA	24	1239E		1304D	S33	W14	.484	15305	23.5	25D	SN		C	1239	25	.3	DH
MCMA	24	1525	1530	1606	N20	E52	.847	15314	28.5	41	SN		C	1530	45	.8	EL
MCMA	24	1800E		1805D	S28	W83	.986	15301	18.5	5D	1N		C	1802			E
PALE	24	1901	1914	2023D	N17	E42	.743	15314	27.9	82D	1B	3	C		200		FDE
MCMA	24	1913E	1919	2108	N18	E42	.749	15314	28.0	115D	1B		C	1919	175	2.8	EL
PALE	24	2054E	2054U	2142D	N17	E41	.733		27.9	48D	SN	3	C		49		DE
TEHR	25	0941	0944	0952	N15	E29	.592		27.6	11	SB	2	C		95		
MCMA	25	1327	1332	1337	N22	W67	.950	15300	20.5	10	SF		C	1332	30	.9	E
MCMA	25	1401	1403	1405	N20	E75	.980	15319	3.2	4	SN		C	1403	15	.6	D
MCMA	25	1657	1708	1719	N21	E74	.978	15319	3.3	22	SN		C	1708	30	1.2	E
MCMA	25	1707	1733	1810	N21	E35	.700	15314	28.3	63	1N		C	1733	150	2.0	EL
PALE	25	1715E	1740	1755D	N18	E31	.638		28.0	40D	SB	3	C		87		FDE
PALE	25	1754E	1754U	1757D	N21	W64	.932		20.9	3D	SN	3	C		30		DE
MCMA	25	1807	1808	1816	N21	E75	.981	15319	3.4	9	SN		C	1808	15	.6	D
E	25	1837	1842	1853D	N16	E25	.558	15314	27.7	16D	SN		C	1842	40	.5	
MITK	26	0041	0047	0127	N25	E35	.730		28.7	46	SF		C	0047			E
MCMA	26	1103	1109	1118	N20	E65	.936	15319	3.3	15	SN		C	1109	25	.6	D
MCMA	26	1157	1205	1215D	N20	E19	.544	15314	27.9	18D	SN		C	1205	70	.8	E
MCMA	26	1241	1245	1315	N20	E64	.931	15319	3.3	34	SN		C	1245	20	.6	D
MCMA	26	1323	1332	1347	N20	E63	.925	15319	3.3	24	SN		C	1332	20	.6	D
MCMA	26	1443	1450	1458	N23	E10	.526	15314	27.4	15	SF		C	1450	40	.5	E
MCMA	26	1604	1607	1720D	N20	E61	.912	15319	3.2	76D	SN		C	1607	20	.6	DK
MCMA	26	1604	1645	1720D	N20	E61	.912	15319	3.2	76D	SN		C	1645	20	.6	DK
MCMA	26	1732	1751	1812	N20	E61	.912	15319	3.3	40	1B		C	1751	100	2.2	E
PALE	26	1744E	1800U	1813	N20	E61	.912	15319	3.3	29D	1B	3	C		148		DE
PALE	26	1807	1810	1813	N18	E16	.496		28.0	6	SN	3	C		50		DE
MCMA	27	1208	1211	1245D	N22	W04	.492	15314	27.2	37D	SN		C	1211	60	.7	E
MCMA	27	1230	1232	1242	N19	E07	.455	15314	28.0	12	SN		C	1232	30	.3	DL
MCMA	27	1256	1258	1304	N27	E23	.654	15316	1.3	8	SN		C	1258	30	.4	E
MCMA	27	1256	1259	1303	N22	E48	.823	15319	3.1	7	SN		C	1259	40	.7	E
MCMA	27	1620	1625	1700	N20	E48	.814	15319	3.3	40	SN		C	1625	80	1.4	EH
MCMA	27	2040	2041	2054D	N19	E03	.444	15314	28.1	14D	SN		C	2041	25	.3	D
MITK	28	0145	0154	0219	N26	E20	.622	15316	1.6	34	1N		C	0154	200	2.4	FH

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TEHR	28	0716E	0734	0748	N17	W 4	.415		28.0	32D	SB	3	C		127		F
TEHR	28	0716E	0719	0748	N17	W 4	.415		28.0	32D	SF	3	C		64		F
TEHR	28	1044E	1047	1101	N18	W 5	.433		28.1	17D	SB	2	C		95		F
MCMA	28	1057E		1120D	N18	W04	.431	15314	28.2	23D	SN		P	1057	100	1.1	BE
MCMA	28	1310	1317	1450D	N20	W13	.501	15314	27.6	100D	1B		C	1317	180	2.0	EFK
MCMA	28	1310	1333	1450D	N20	W13	.501	15314	27.6	100D	1B		C	1333	180	2.0	EFK
MCMA	28	1451	1504	1629	N18	W10	.455	15314	27.9	98	1B		C	1504	280	3.1	EFLX
MONT	29	1040	1105	1130D	N22	W08	.504		28.8	50D	SN		C	1105	220		
MCMA	29	1113E		1133	N21	W08	.489	15314	28.9	20D	SN		C	1113	80	.9	E
MCMA	29	1220	1223	1229	N22	E26	.626	15319	3.5	9	SF		C	1223	30	.4	E
MCMA	29	1512	1516	1526	N18	W23	.558	15314	27.9	14	SF		C	1516	20	.3	E
MCMA	29	1512	1515	1530D	N22	E23	.600	15319	3.4	18D	SN		C	1515	50	.6	E
RAMY	29	1720	1759	1836	N16	W25	.558	15314	27.8	76	1B	3	C		355		
RAMY	29	1720	1759	1802D	N16	W25	.558	15314	27.8	42D	1B	3	V		355		DE
PALE	29	1740E	1800U	1900D	N19	W21	.550	15314	28.2	80D	1B	3	C		475		DE F
PALE	29	2310E	2310U	2425D	N21	E17	.541		3.2	75D	SN	3	C		45		DE
PALE	29	2310E	2316U	2403D	S24	W58	.847		25.6	53D	SB	3	C		58		FDE
PALE	30	0411E	0412U	0413D	N21	W39	.738	15314	27.2	20	1B	3	C		199		FDE
TEHR	30	0619	0623	0641	N20	E16	.522		3.5	22	SB	1	C		190		F
TEHR	30	0620	0631	0647	N18	W 6	.437		1.8	27	SN	1	C		95		F
TEHR	30	0620	0639	0647	N18	W 6	.437		1.8	27	SB	1	C		190		F
MONT	30	0655E	0725	0811	N16	W30	.612	15314	28.0	76D	1N		C	0725	440		
MONT	30	0655E	0712	0746	N22	E15	.540		3.4	51D	SN		C	0712	150		
TEHR	30	0716	0721	0813	N17	W26	.578	15314	28.4	57	2B	2	C		541		F
MONT	30	1001	1008	1014	N18	W30	.628		28.2	13	SF		C	1008	50		D
MONT	30	1109	1131	1149D	S30	E54	.823		6.5	40D	SN		C	1131	180		G
TEHR	30	1119	1123	1130D	N20	E16	.522		3.7	11D	SB	1	V		190		F
TEHR	30	1120	1123	1130D	N18	W16	.496		1.3	10D	SB	1	C		95		
MCMA	30	1152E		1250	S30	E53	.815	15300	6.5	58D	1F		C	1152	100	2.1	BE
MCMA	30	1233	1241	1310	N21	E12	.509	15319	3.4	37	SN		C	1241	80	.9	E
MCMA	30	1238	1241	1251	N21	W39	.738	15314	27.6	13	SF		C	1241	20	.3	DL
MCMA	30	1307	1309	1326	N22	W44	.789	15314	27.2	19	SN		C	1309	45	.7	E
MCMA	30	1336	1338	1354	N22	W23	.600	15314	28.8	18	SN		C	1338	40	.5	E
MCMA	30	1459E	1459	1518	N22	W23	.600	15314	28.9	19D	SN		C	1459	30	.4	DK
MCMA	30	1459E	1510	1518	N22	W23	.600	15314	28.9	19D	SN		C	1510	30	.4	DK
MCMA	30	1516	1523	1528D	N22	W45	.797	15314	27.3	12D	SF		C	1523	70	1.1	E
MCMA	30	1523		1551D	N18	W33	.659	15314	28.2	28D	SB		C	1532	90	1.2	E
WEND	30	1538E		1606D	N18	W33	.659	15314	28.2	28D	1N		V		500	6.8	
MCMA	30	1532		1551	N21	E11	.503	15319	3.5	19	SN		C	1539	40	.5	E
MCMA	30	1706E		1718D	N19	W37	.706	15314	27.9	12D	SF		C	1712	30	.4	EL
MCMA	30	1737	1739	1742	N27	E12	.590	15319	3.6	5	SN		C	1739	20	.3	E
RAMY	30	1756E	1800	1838	N21	E 6	.482		3.2	42D	SB	3	C		60		FDE
MCMA	30	1801E	1803	1809D	N20	E08	.475	15319	3.4	8D	SF		C	1803	50	.6	E
PALE	30	1927E	1927U	2027	N18	W36	.689	15314	28.1	60D	1B	3	C		278		UDE
PALE	30	2310E	2316U	2403D	S24	W58	.847		26.6	53D	SB	3	V		58		FDE
PALE	30	2310E	2316U	2403D	S24	W58	.847		26.6	53D	SB	3	C		58		FDE
MONT	31	0733E	0733	0802	N17	W43	.754		28.1	29D	SN		C	0733	180		
TEHR	31	0738E	0740	0753	N17	W42	.744		28.2	15D	SB	1	C		127		
MONT	31	0821	0832	0846	N16	W43	.749		28.1	25	SF		C	0832	60		E
MONT	31	1014	1053	1200D	N21	W41	.757	15314	28.4	106D	3B		C	1053	1700		FS
MCMA	31	1031E	1048	1450D	N20	W42	.760	15314	28.3	259D	2B		C	1048	360	5.4	BFU
WEND	31	1035E	1048	1308	N20	W40	.741	15314	28.4	153D	2N		P		1200		TW
RAMY	31	1044E	1106	1109D	N16	W48	.797	15314	27.8	25D	2B	3	C		804		U F
HERS	31	1103E	1130	1305	N20	W48	.814	15314	27.9	122D	3N		P				F
RAMY	31	1130	1132	1206	S16	W26	.452		1.5	36	SB	3	C		23		
RAMY	31	1427	1430	1447	N21	W 4	.477		3.3	20	SB	3	C		53		
RAMY	31	1621	1632	1651	N21	W57	.888		27.4	30	SB	3	C		52		
MCMA	31	1628	1632	1639	N22	W55	.877	15314	27.6	11	SF		C	1632	40	.8	E
RAMY	31	1646	1651	1703	S16	W28	.481		1.6	17	SN	3	C		23		
MCMA	31	1755	1758	1808	S17	W30	.513	15335	1.5	13	SF		C	1758	80	1.0	EL
MCMA	31	1812	1815	1821	N20	W07	.471	15319	3.2	9	SN		C	1815	50	.6	E
MCMA	31	1904	1905	1915	N22	W05	.495	15319	3.4	11	SN		C	1905	20	.2	D

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MAY 1978

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 Mill of Disk	CORR. AREA Sq. Deg.	
MCMA	31	2044E	2056	2110	N17	E52	.837	15333	7.8	26D	SB		C	2056	25	.5	D

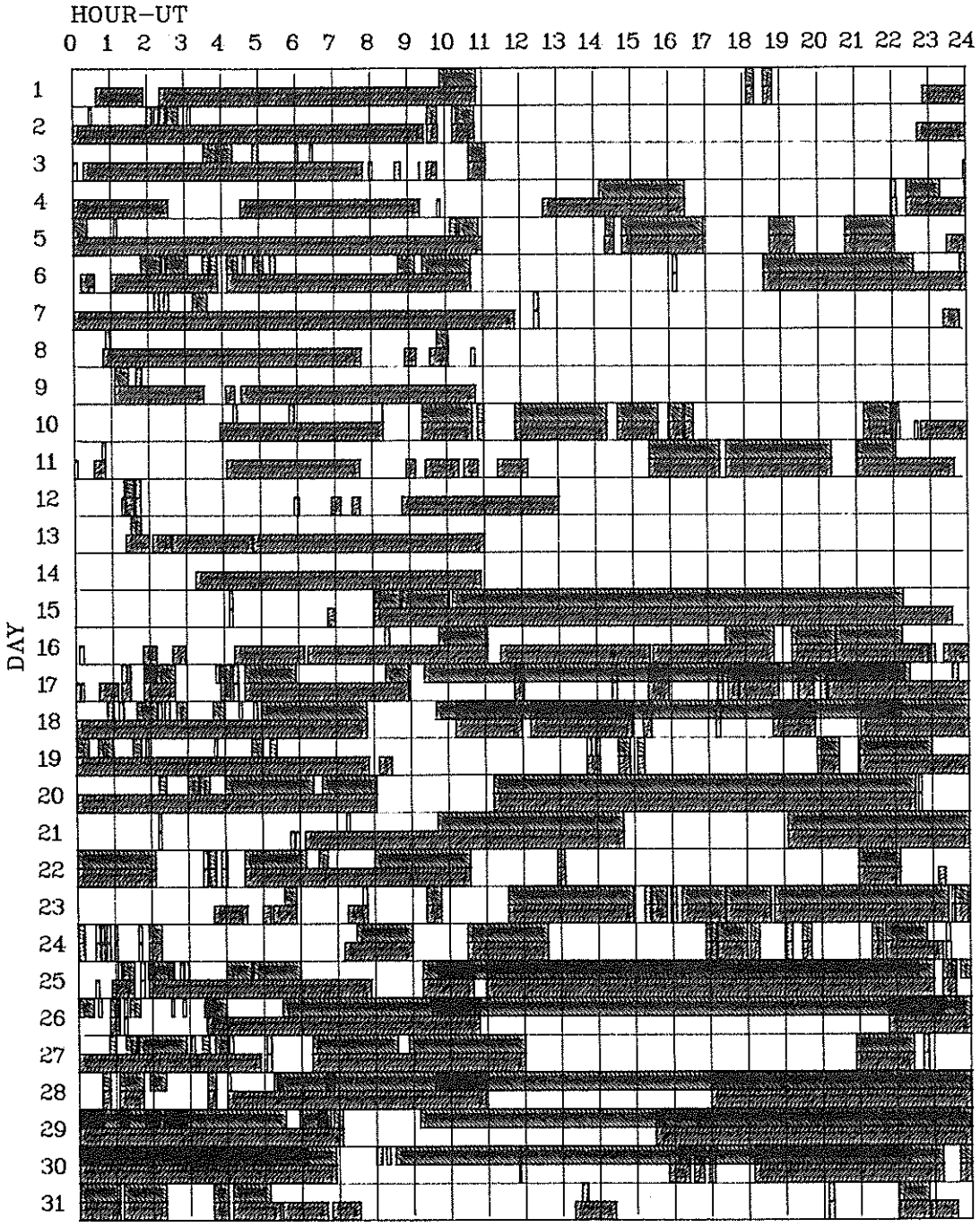
"Remarks":

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

MAY 1978



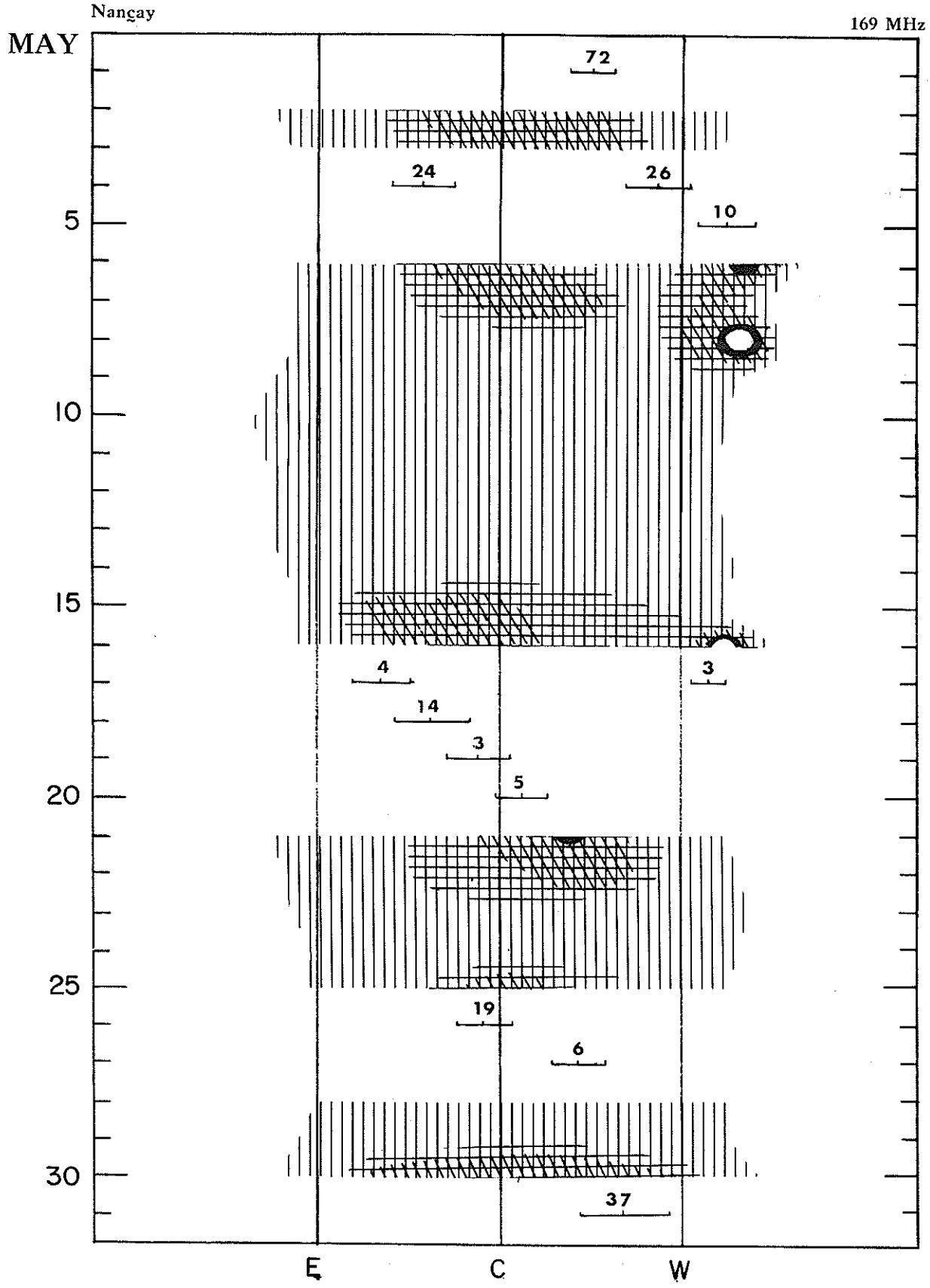
Observatories included in total patrol:

Bucharest	Istanbul	McMath-Hulbert	Monte Mario
Herstmonceux	Manila	Mitaka	Wendelstein

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).

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

MAY 1978

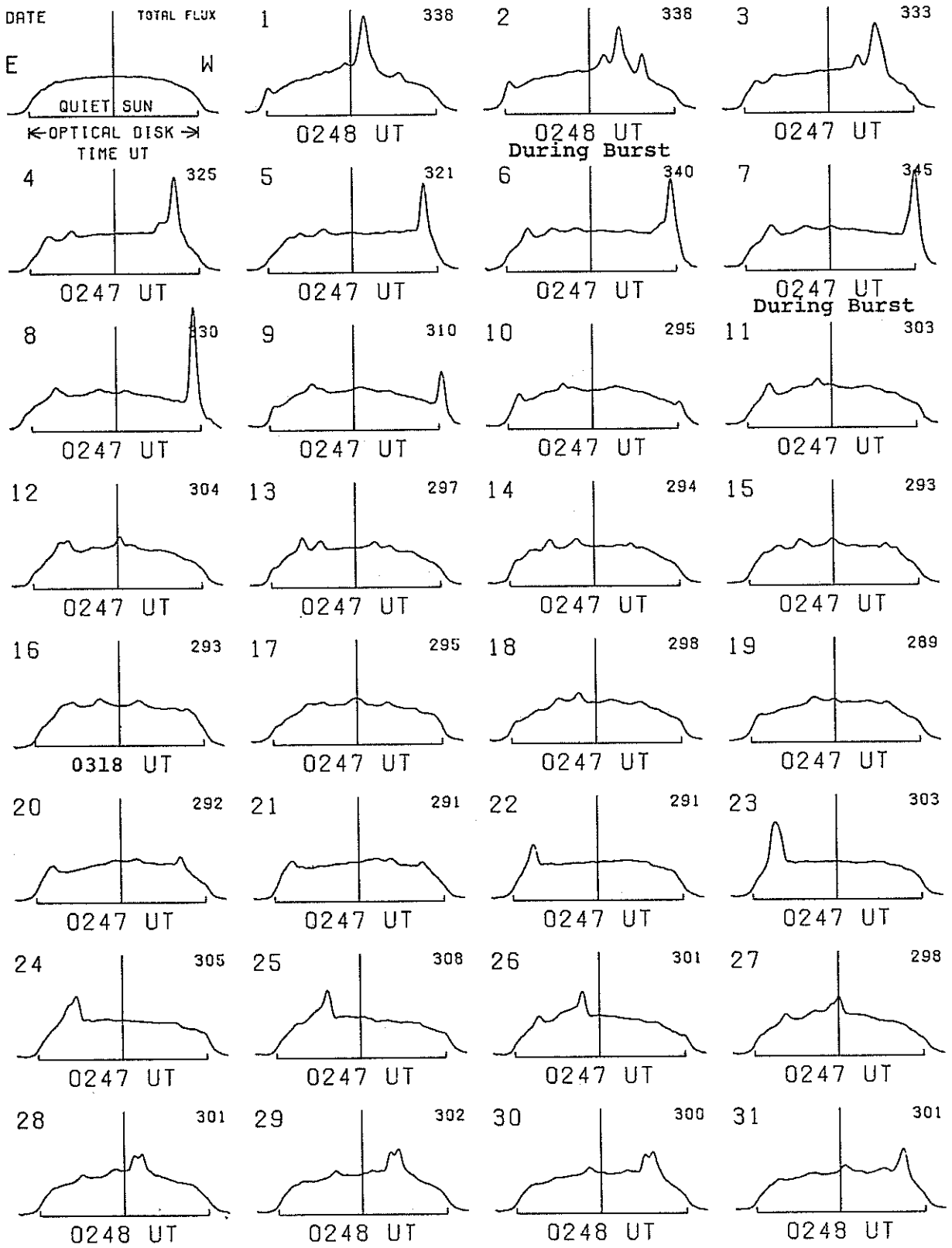


EAST-WEST SOLAR SCANS

MAY 1978

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC

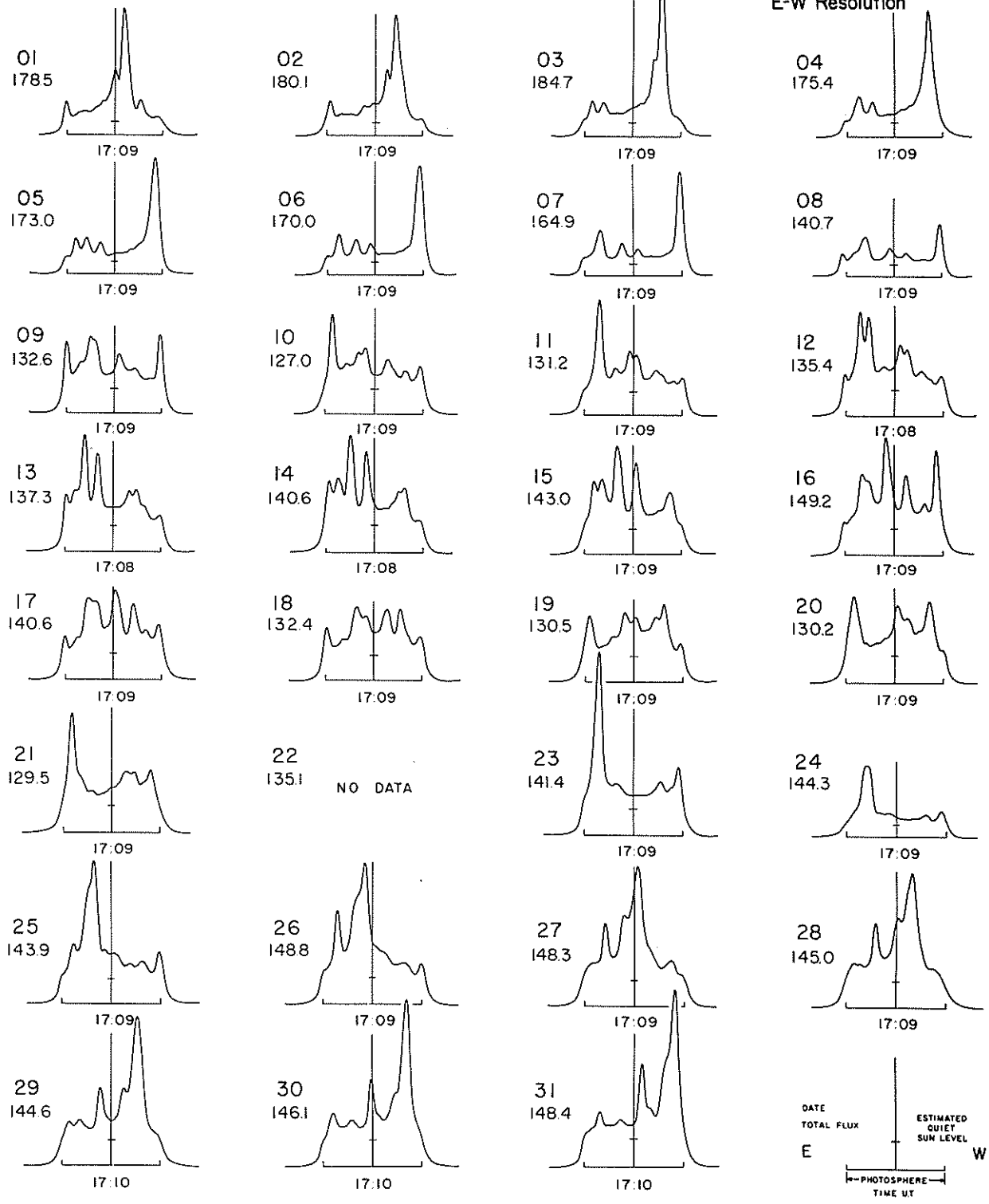


EAST-WEST SOLAR SCANS

MAY 1978

ALGONQUIN RADIO OBSERVATORY
CANADA

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



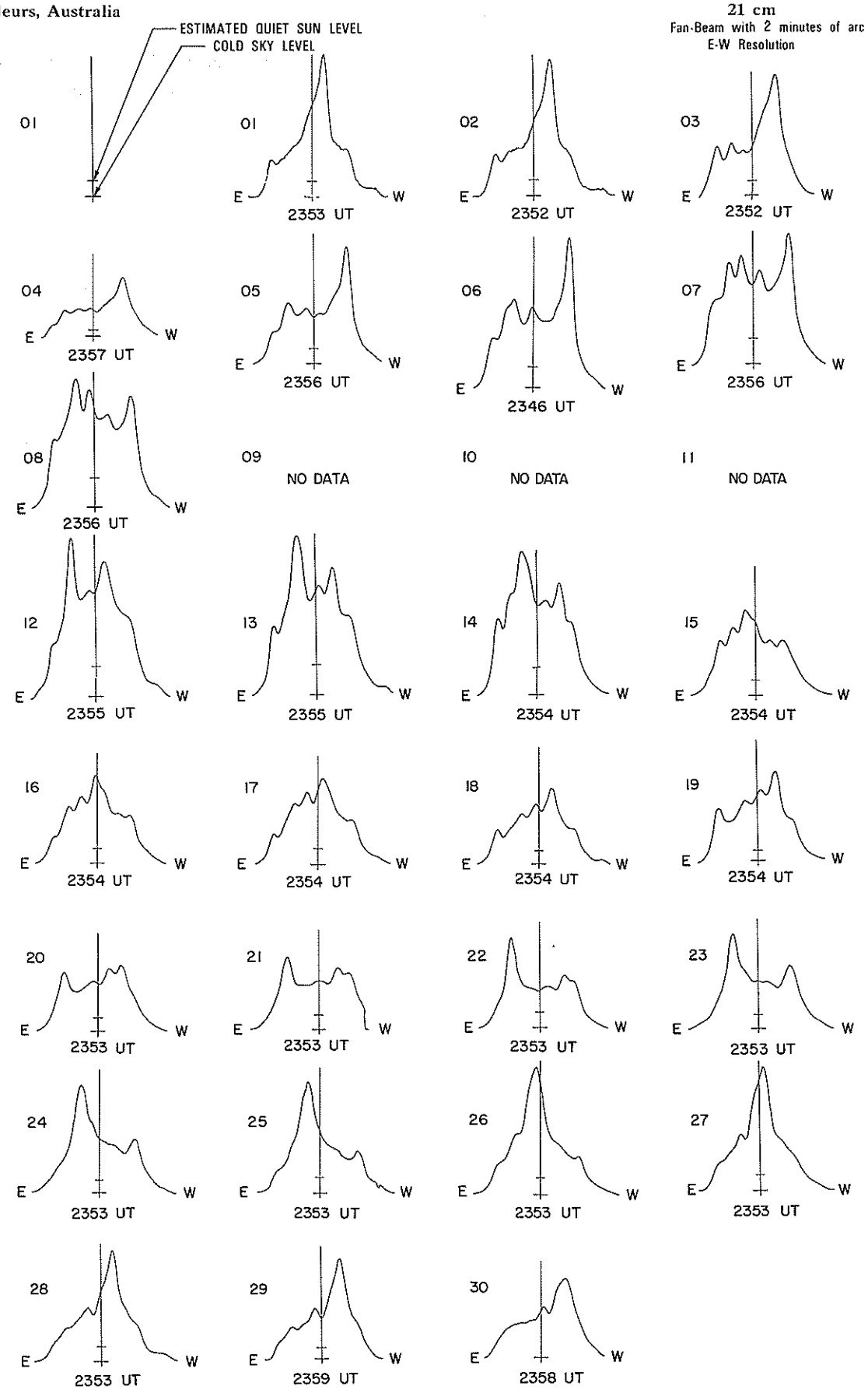
22
May 78

EAST-WEST SOLAR SCANS

MAY 1978

Fleurs, Australia

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

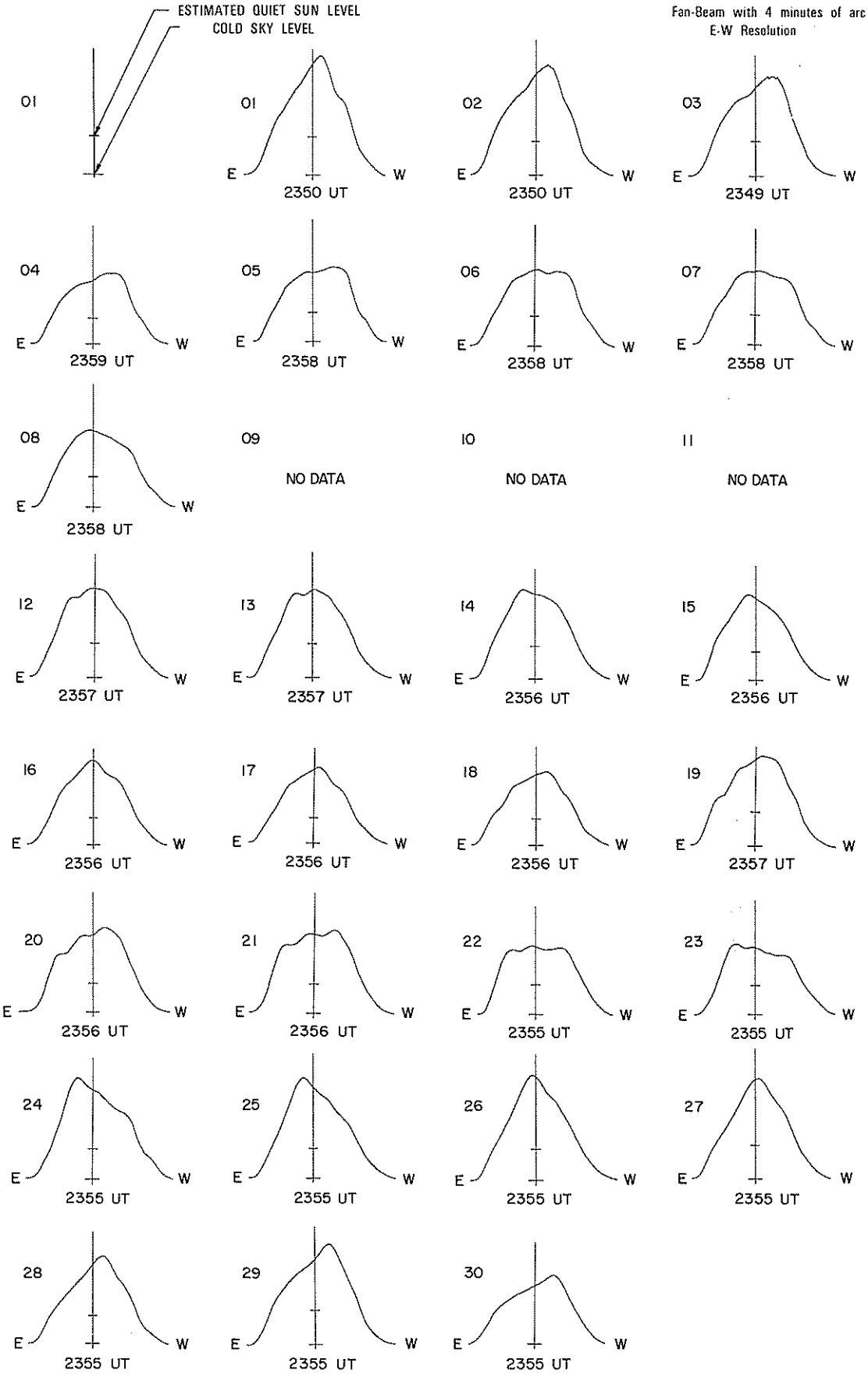


EAST-WEST SOLAR SCANS

MAY 1978

Fleurs, Australia

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



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1978

MAY 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22} Wm^{-2} Hz^{-1}$ PEAK	MEAN	INT	REMARKS
1	2695	PENT	21	GRF	0045	0100	50	7.2	3.6		
	2695	PENT	45	C	0048	0052.5	10	9	4.4		
	2800	OTTA	240	R	1102	1110	8	5.8	2.9		
	2800	OTTA	1	S	1111	1111.5	5	6	3		
	2800	OTTA	20	GRF	1140	1147	30	2.2	1.1		
	2800	OTTA	1	S	1316	1317.5	3	2.8	1.2		
	8800	SGHR	3	S	1724.7	1725.4	6.3	108	43.2		
	2800	OTTA	1	S	1724.9	1725.5	1.5	8.2	2		
	2695	SGHR	3	S	1725.1	1725.5	2.9	11.2	4.5		
	2800	OTTA	28	PRE	1800		101	6.4			
	2695	BOUL	49	GB	1917 E	1923.5	113 D	1930	643		
	2695	SGHR	47	GB	1917	2015.1	128	2200	880		CONT
	8800	SGHR	47	GB	1917.1	1954	127.9	870	348		CONT
	2800	OTTA	47	GB	1941	2015	84	1665	584		
	2800	OTTA	29	PBI	2105	2105	200	23	7.2		
2	2695	PENT	1	S	0057.2	0057.5	2	8.4	4.2		
	2695	PENT	21	GRF	0107		40 D	20			
	2800	OTTA	45	C	0115.5	0118.5	20	77	22		
	2695	PENT			0116.5	0118.5	9.5	77			
	2695	MANI	3	S	0116.6	0118.7	8.5	89.4	59.6		
	2695	PENT			0126	0130	10.5	30			
	2695	MANI	3	S	0344	0345.9	5.3	23.3	15.5		
	8800	MANI	3	S	0345.8	0346.5	1.5	34.5	23		
	2695	MANI	4	S/F	0613.4	0614.4	6.7	60.3	40.1		
	8800	MANI	4	S/F	0613.6	0616.2	4.3	163.3	108.9		
	8800	MANI	3	S	0638.7	0640.6	14.9	502.4	334.9		
	2695	MANI	4	S/F	0638.7	0640.6	12.2	243.9	162.6		
	2695	BOUL	45	C	0106	0108.5	6.5D	31	10		
	2695	BOUL	28	PRE	0113.5E	0116	2.5D	5	2		
	2695	SGHR	3	S	1218.8	1219.9	5.2	13.5	4.1		SWF
	8800	SGHR	3	S	1219.7	1219.9	4.3	68.2	20.5		SWF
	2800	OTTA	3	S	1219.7	1220	2	14.6	4		
	2800	OTTA	4	S/F	1610.2	1611.1	3	98	25		
	2695	SGHR	3	S	1610.5	1611.2	3	117	34.9		SWF
	8800	SGHR	3	S	1610.6	1611.2	3.4	80.8	24.3		SWF
	2695	BOUL	45	C	1611.5E	1612	5.5D	95	32		
	2800	OTTA	29	PBI	1613.2	1613.2	7	4.4	2		
	2800	OTTA	20	GRF	1820	1840	70	3.6	1.8		
	2800	OTTA	20	GRF	2000	2025	60	3	1.5		
	2800	OTTA	21	GRF	2200	2201	30	3.8	1.9		
	2800	OTTA	8	S	2202.7	2202.8	0.5	1.8	0.9		
	2695	BOUL	3	S	2307.5E	2308	1 D	16	5		
	2695	PENT	3	S	2307.7	2308	1	16.6	8.3		
	8800	MANI	3	S	2308.1	2308.3	1.2	24.3	16.2		
	2695	MANI	3	S	2308.1	2308.3	1	15	10		
	2695	PENT	29	PBI	2308.8	2308.8	22	4.8	2.4		
3	2800	OTTA	27A	RF	1115		255	4.4	3.6		
	2800	OTTA	24	R	1115	1155	40	4.4	2.2		
	2800	OTTA	24P	R	1155		165	4.4			
	2800	OTTA	1	S	1158.5	1159.2	2	3.6	1.8		
	8800	SGHR	3	S	1227.7	1228.5	4.5	49.5	14.9		5,CONT
	8800	SGHR	3	S	1313.8	1314.7	3	28.5	8.6		4,CONT
	2800	OTTA	3	S	1314	1314.9	4	15.6	5.2		
	2695	SGHR	3	S	1314	1315	4	14	4.2		4,CONT
	2800	OTTA	20	GRF	1415	1419	17	7.6	2.6		
	2800	OTTA	26	FAL	1440	1530	50	-4.4	-1.5		
	2695	SGHR	3	S	1654.9	1657.7	23.7	179	71.6		SWF
	2800	OTTA	4	S/F	1655	1657.5	9	169	53.5		
	8800	SGHR	3	S	1656.2	1700.4	22.6	273	109.2		SWF
	2695	BOUL	46	C	1656.5E	1658.5	6.5D	165	55		
	2695	BOUL	29	PBI	1703	1703	20.5D	16	5		
	2800	OTTA	29	PBI	1704	1704	45	9.6	3.2		
	2800	OTTA	20	GRF	1814	1816.5	25	9.6	2.6		
	2695	SGHR	20	GRF	1814	1816.5	16	9.2	4.6		CONT
	2800	OTTA	40	F	1930.5	1931.9	3	5.8			
	2800	OTTA	3	S	2019.5	2020.5	2.5	67	23		
	8800	SGHR	3	S	2019.5	2020.6	5.5	98	39.2		CONT
	2695	SGHR	3	S	2020	2020.8	5	66.6	26.7		CONT
	2800	OTTA	29	PBI	2022	2022	14	8	2.2		
	2695	PENT	22	GRF	2355	2427	100 D	7.2			
4	8800	MANI	4	S/F	0255.9	0257	6.8	165.4	110.3		
	2800	OTTA	20	GRF	1125	1152	55	3.4	1.7		
	8800	SGHR	20	GRF	1242.2	1243	17.3	11	5.5		CONT
	2800	OTTA	21	GRF	1250	1310	70	9.4	4.7		
	2800	OTTA	1	S	1332	1333	2.5	3.6	1.6		
	2800	OTTA	21	GRF	1735	1820	100	3	1.5		
	2800	OTTA	1	S	1839	1840	2	3	1.5		
	2800	OTTA	20	GRF	1915	1923	30	3	1.5		
	2800	OTTA	20	GRF	2105		17	2	1.6		
5	8800	SGHR	3	S	1028	1028.5	7	450	180		5

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1978

MAY 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22}Wm^{-2}Hz^{-1}$ PEAK	MEAN	INT	REMARKS
	2695	SGHR	3	S	1028	1028.5	7	200	80		S
	2800	OTTA	22	GRF	1210		130	3	1.5		
	2800	OTTA	24D	R	1420	1435	15	3	1.5		
	2800	OTTA	21	GRF	1440	1448	110	4.8	2.6		
	2800	OTTA	1	S	1458		9	1.8	1.1		
	2800	OTTA	1	S	1527.5	1529.4	6.5	2	1		
	2800	OTTA	27A	RF	1637		145	2.8	2.5		
	2800	OTTA	24	R	1637	1650	13	2.8	1.4		
	2800	OTTA	24P	R	1650		115	2.8			
	2800	OTTA	20	GRF	1732	1737	15	2.6	1.3		
	2800	OTTA	1	S	1800.6	1801	1.5	2.8	0.9		
	2800	OTTA	26	FAL	1845	1902	17	-2.8	-1.4		
	2800	OTTA	20	GRF	2000	2023	52	2	1		
	2800	OTTA	22	GRF	2130	2207	95	5.8	2.7		
	2695	PENT	20	GRF	2320	2345	45	3.4	2.2		
6	2800	OTTA	27A	RF	1217		225	3.8	3.3		
	2800	OTTA	24	R	1217	1245	28	3.8	1.9		
	2800	OTTA	24P	R	1245		165	3.8			
	2800	OTTA	20	GRF	1300 1	3130	22	2.4	1.6		
	2800	OTTA	26	FAL	1530	1602	32	-3.8	-2.2		
	8800	SGHR	3	S	2013	2016.8	81	95	38		S,CONT,SWF
	2695	SGHR	3	S	2013.7	2016.8	80.3	172	68.8		S,CONT,SWF
	2695	PENT	4	S/F	2013.5	2016.8	11.5	150	46.6		
	2800	OTTA	30	PBI	2025	2025	75	11	5.5		
	2800	OTTA	3	S	2058	2102	11	14.4	5.8		
	2800	OTTA	3	S	2120	2121	3	26	8.6		
	2800	OTTA	23	GRF	2201	2227	55	9.4	2.4		
	2800	OTTA	1	S	2201.8	2202.5	2.5	4	1.5		
	2800	OTTA	1	S	2222	2223	3	3.6	2		
	2695	PENT	1	S	2300	2301	2.5	6.6	3.3		
	2695	BOUL	1	S	2300	2301.5	4	5	2		
	2695	PENT	26	FAL	2318	2350	32	-6.8	-3.4		
7	2695	MANI	47	GB	0321.7	0332.7	48.2	765	250		
	2695	MANI	47	GB		0335.4		740			
	2695	MANI	45	C		0353.1		196			
	2695	MANI	45	C		0358.8		176.4			
	8800	MANI	47	GB	0322.2	0328.5	39.4	3450	1175		NT
	8800	MANI	47	GB		0329.4		3450			
	8800	MANI	46	C		0352.8		171.5			
	8800	MANI	46	C		0358.5		169.7			
	2695	MANI	3	S	0418	0418.1	1	19.6	13.1		
	8800	MANI	3	S	0455.3	0455.8	2.7	78.8	52.5		
	2695	MANI	3	S	0455.3	0455.9	5.7	68.6	45.7		
	2800	OTTA	2	S/F	1227	1231	6	3.8	1.6		
	2800	OTTA	21	GRF	1500	1705	260	8.6	4.3		
	2800	OTTA	1	S	1533.5	1534	3	4.4	1.5		
	2800	OTTA	2	S/F	1543	1543.6	1.5	7.6	1.5		
	2695	SGHR	3	S	1543.5	1555.4	22.5	149	59.6		SWF
	8800	SGHR	3	S	1548.8	1553.8	16.2	155	62		SWF
	2800	OTTA	45	C	1549	1555.3	17	110	44.6		
	2695	BOUL	46	C	1550.5E	1556.5	30.5D	87	29		
	2800	OTTA	30	PBI	1606	1606	35	7.6	3.8		
	2800	OTTA	1	S	1609	1610	3	3	1.5		
	8800	SGHR	3	S	1700.6	1705.4	26.6	132.8	53.1		CONT,SWF
	2695	SGHR	20	GRF	1701.3	1707	13.9	6.8	2.7		CONT,SWF
	2695	PENT	1	S	1710	1710.5	2	2.8	1.4		
	2695	BOUL	4	SF	1735	1737	2.5	23	8		
	2695	SGHR	1	S	1758	1759.3	2.3	7.2	2.9		CONT
	8800	SGHR	3	S	1758.2	1759.2	1.8	10.3	4.1		CONT
	2800	OTTA	2	S/F	1758.3	1759.1	3.5	5.8	1.6		
	2695	BOUL	2	SF	1758.5	1759.5	2	6	2		
	2800	OTTA	26	FAL	2035	2100	25	-3.8	-1.9		
8	2695	PENT	1	S	0040	0042	5	6	2.6		
	2695	BOUL	1	S	0040.5	0042.5	6.5	7	2		
	2695	MANI	4	S/F	0159.6	0211.7	17.4	87	58		
	8800	MANI	4	S/F	0327.2	0328	2.5	47.7	31.8		I
	2695	MANI	4	S/F	0327.3	0327.9	4.2	64.7	43.1		
	2800	OTTA	21	GRF	1107	1315	230	8	4		
	2800	OTTA	2	S/F	1122.2	1122.6	3	4	1		
	8800	SGHR	3	S	1122.3	1122.6	4.7	20.8	8.3		
	2695	SGHR	1	S	1122.3	1122.6	4.8	5.7	2.3		
	8800	SGHR	47	GB	1204	1231.7	56	759	304		2,4,CONT,
	8800	SGHR	47	GB		1245.5		452			SWF
	2800	OTTA	45	C	1204.5	1246.8	62	114	33		
	2695	SGHR	45	C	1204.7	1231.7	55.3	86	55.2		2,4,CONT,
	2695	SGHR	45	C		1246.7		138			SWF
	2695	BOUL	45	C	1244.5E	1248	5 D	88	29		
	2695	BOUL	29	PBI	1249.5	1249.5	13.5D	42	14		
	2800	OTTA	1	S	1544	1544.5	2	5.6	2.6		
	2695	BOUL	1	S	1544.5	1545	2	5	2		
	2800	OTTA	26	FAL	1602	1645	43	-3.2	-1.5		
	2695	BOUL	40	F	1737	1740.5	4	5	2		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS
MAY 1978

MAY 1978	FREQUENCY STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22} Wm^{-2} Hz^{-1}$ PEAK	MEAN	INT	REMARKS
	2800 OTTA	1 S	1739	1739.8	2	3.4	1.2		
	2800 OTTA	20 GRF	1815	1855	125	2.6			
	2800 OTTA	20 GRF	2035	2100	65	1.6	0.8		
9	2800 OTTA	21 GRF	1430	1444	18	2.6	1.3		
	2800 OTTA	3 S	1432	1435.2	10	44.4	15.2		
	2695 SGMR	4 S/F	1432	1435.5	29	50	20		2,CONT,SWF
	2695 BOUL	20 GRF	1432.5	1436	16	44	15		
	8800 SGMR	4 S/F	1433	1436.9	20	176	70.4		2,CONT,SWF
	2800 OTTA	45 C	1450	1451.8	8	7.4	3.7		
	2695 BOUL	46 C	1450	1452.5	11.5	8	3		
	2800 OTTA	31 ABS	1458		250	-2.8	-1.4		
	2800 OTTA	26 FAL	2042	2112	30	-2.6	-1.3		
10	2800 OTTA	22 GRF	1610	1618	60	2.2	1.1		
	2800 OTTA	8 S	2155	2155	0.1	5			
	2800 OTTA	21 GRF	2200	2235	140	5	3.2		
	2800 OTTA	1 S	2204.5	2205.5	4	3.2	1.6		
	2695 BOUL	1 S	2205	2206.5	3.5	4	1		
11	2800 OTTA	20 GRF	1215	1235	50	2.2	1.4		
	2800 OTTA	240 R	1335	1400	25	2.2	1.1		
	2800 OTTA	20 GRF	1402	1530	165	2.8	1.4		
	2695 PENT	21 GRF	2325	2345	135	5	2.5		
	2695 PENT	3 S	2329.5	2331	4	11.8	5		
	2695 BOUL	4 SF	2330	2332	4.5	13	4		
12	2800 OTTA	8 S	1754.4	1754.4	0.2	23.6			
13	2695 MANI	3 S	0739.1	0742	10.8	105.1	70		
	2695 BOUL	2 SF	1658.5	1659	1.5	50	2		
	2695 BOUL	2 SF	1734.5	1735.5	2	3	1		
	2695 PENT	240 R	2215	2245	30	2	1.2		
	2695 PENT	27 RF	2345		65	1.2	0.9		
	2695 PENT	24 R	2345	2355	10	1.2	0.6		
	2695 PENT	24P R	2355		45	1.2			
	2695 PENT	26 FAL	2440	2450	10	-1.2	-0.6		
14	2800 OTTA	14 GRF	1055	1130	160	7	3.5		
	2800 OTTA	1 S	1250	1253.3	7	4	1.6		
	2800 OTTA	21 GRF	1346	1445	194	5	2.2		
	2695 SGMR	20 GRF	1358.6	1407.5	25	31.4	9.4		3G,SWF
	2800 OTTA	3 S	1400	1407	20	27.6	8.2		
	8800 SGMR	20 GRF	1401	1405.6	28	12.7	3.8		3G,SWF
	2695 BOUL	20 GRF	1401.5E	1408 U	12.5D	28	9		
	2800 OTTA	1 S	1611	1612	2	2.2	1		
	2695 BOUL	1 S	1611	1612.5	3	2	1		
	2695 BOUL	1 S	1658.5	1659	1.5	4	1		
	2695 BOUL	2 SF	1734.5	1735.5	2	3	1		
	2800 OTTA	1 S	2139	2140	4	1.6	0.8		
15	2800 OTTA	22 GRF	1555	1610	95	1.8	0.9		
	2695 BOUL	1 S	1916	1917	2	4	1		
	2800 OTTA	1 S	1916.1	1916.5	1.5	3.4	1.1		
	2800 OTTA	20 GRF	2217	2225	20	2	1		
	2695 PENT	24A R	2315	2325	10	2.6	1.3		
	2695 PENT	1 S	2317	2318.5	2	1.6	0.8		
16	2800 OTTA	1 S	1519	1519.5	1	1.4	0.7		
	2800 OTTA	21 GRF	1600	1635	170	8.2	4.1		
	2695 BOUL	4 SF	1610 E	1613.5	4.5D	26	9		
	2800 OTTA	45 C	1611.5	1612.4	8	20	64		
	2800 OTTA	1 S	1730	1731	6	1.2	0.6		
	2800 OTTA	20 GRF	1757	1801	25	5.6	1.9		
	2800 OTTA	1 S	1855.2	1856.5	5	1.6	0.8		
	2800 OTTA	8 S	1928.5	1928.8	0.5	1.6	0.8		
	2800 OTTA	27A RF	2110		230	2.6	2.2		
	2800 OTTA	24 R	2110	2145	35	2.6	1.3		
	2800 OTTA	24P R	2145		170	2.6			
	2800 OTTA	8 S	2156.9	2157.2	0.4	7.8	3.9		
	2800 OTTA	26 FAL	2435	2500	25	-2.6	-1.3		
17	2800 OTTA	22 GRF	1438	1510	80	5.8	2.9		
	2800 OTTA	20 GRF	2025	2125	230	3.6	1.6		
18	2800 OTTA	21 GRF	1100	1130	150	5	2.5		
	2800 OTTA	1 S	1158.5	1158.8	1.2	2.6	1.3		
	2800 OTTA	21 GRF	1750	1803	240	3	2.6		
	2695 SGMR	S	1751	1753.3	7	3 33.3	13.3		
	2695 BOUL	16 C	1751	1754	5	24	8		
	2800 OTTA	40 F	1751.5	1753.2	3	25			
19	2800 OTTA	20 GRF	1510	1550	80	1.8	1.4		
	2800 OTTA	20 GRF	1845	1940	70	1.8	1.4		
	2800 OTTA	20 GRF	2107	2125	85	3	2		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1978

MAY 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22} Wm^{-2} Hz^{-1}$ PEAK	MEAN	INT	REMARKS
	2695	PENT	20	GRF	2300	2330	100	5.2	2.6		
20	2800	OTTA	1	S	1328	1330	8	1	0.5		
	2695	BOUL	1	S	1406	1407.5	3	3	1		
	2800	OTTA	21	GRF	1610	1655	100	2.6	1.3		
	2800	OTTA	1	S	1628.5	1630	2	1	0.5		
	2695	BOUL	45	C	1629	1630.5	5.5	2	1		
	2800	OTTA	45	C	1818.5	1820	2	2.6	1.3		
	2695	BOUL	40	F	1819.5	1821	3	1	0.3		
	2800	OTTA	20	GRF	1830	1845	150	2.6	1.3		
	2800	OTTA	240	R	2118	2125	7	2.6			
21	2695	BOUL	46	C	0048.5	0050.5	5.5	5	2		
	2695	MANI	4	S/F	0547.6	0548.5	6.2	82.9	55.3		
	8800	MANI	4	S/F	0548	0548.3	4	58.2	38.8		
	2800	OTTA	1	S	1701	1703.5	5	1.4	0.7		
	2800	OTTA	22	GRF	2045	2103	100	3.2	2		
	2695	PENT	22	GRF	2223	2255	70	1.4	0.7		
	2695	PENT	2	S/F	2349.2	2349.9	7	4.2	2.1		
22	2695	BOUL	21	GRF	0105.5E	0107.5	16.50	30	10		
	2695	BOUL	28	PRE	0026	0037 U	39.5	19	6		
	2695	MANI	3	S	0204.3	0205	2.7	11.6	7.7		
	2695	BOUL	4	SF	1431.5	1434.5	5	13	4		
	2800	OTTA	2	S/F	1433	1434	3	7.4	2.6		
	2800	OTTA	23	GRF	1500	1727	235	5.2	2.3		
	2695	BOUL	1	S	1500.5	1502	2.5	4	1		
	2800	OTTA	4	S/F	1624	1624.5	3	25	8		
	2695	BOUL	4	SF	1624.5	1625	2	28	9		
	2800	OTTA	45	C	1837	1838	4.5	11	3.8		
	2695	BOUL	46	C	1837	1838	4.5	11	4		
	2695	PENT	21	GRF	2240	2517	180 D	17.4			
	2695	PENT	20	GRF	2414	2425	40	14.8	6.3		
	2695	PENT	4	S/F	2504.5	2507	10	34	11		
23	2695	MANI	3	S	0018.4	0022.5	13.6	15.8	10.2		
	2695	MANI	3	S	0104.6	0106.8	4.7	39.5	26.3		
	2800	OTTA	21	GRF	1445	1710	230	3.2	1.6		
	2800	OTTA	1	S	1610	1613	8	7.8	1.9		
	2695	BOUL	1	S	1612	1613.5	3	7	2		
	2800	OTTA	240	R	1948	1952	4	2	1		
	2800	OTTA	1	S	1953	1954.5	7	3	1.4		
	2695	BOUL	20	GRF	1953.5	1955.5	11.5	5	2		
	2800	OTTA	8	S	2038	2038.3	0.5	5.2	2.6		
	2800	OTTA	20	GRF	2100		120	2	1.4		
24	2800	OTTA	1	S	1250	1251.5	3	2.4	1.2		
	2800	OTTA	23	GRF	1350	1450	200	6.8	3.5		
	2800	OTTA	1	S	1602	1603.5	6	2.6	1.7		
	2800	OTTA	21	GRF	1750	1950	275	18	9		
	2695	BOUL	4	SF	1750.5	1755.5	11.5	21	7		
	2800	OTTA	4	S/F	1752	1754.1	6	12.2	4		
	2800	OTTA	3	S	1906	1911	14	52.8	26.4		
	2695	BOUL	20	GRF	1906	1912.5	19	50	17		
	2695	SGMR	3	S	1906.6	1910.5	19.4	59.2	23.7		
	8800	SGMR	3	S	1907	1911	18	41	16.4		
	2800	OTTA	29	PBI	1920	1920	30	16.4	8.2		
	2800	OTTA	1	S	2243	2243.5	2	3	1.8		
	2695	BOUL	2	SF	2243.5	2244.5	3	3	1		
25	2800	OTTA	21	GRF	1705	1729	180	10.4	3.2		
	2695	BOUL	28	PRE	1719	1741.5U	335	16	5		
	2800	OTTA	20	GRF	1736	1740	12	4.4	2.2		
	2800	OTTA	3	S	1752	1752.5	3	39.6	9		
	2695	SGMR	3	S	1752.2	1752.7	2.8	41.8	16.7		3,5
	2695	BOUL	3	S	1752.5E	1753.5	17 D	31	10		
	2800	OTTA	3	S	2251.8	2252.7	4	10	3.3		
	2695	MANI	3	S	2252	2252.6	1.7	11.8	7.9		
	2695	BOUL	1	S	2252	2253.5	3	8	3		
26	2695	PENT	20	GRF	0030	0048	70 D	15.6			
	2695	MANI	3	S	0045.1	0048	5.4	11.8	7.9		
	2800	OTTA	26A	FAL	1105	1535	270	-12			
	2800	OTTA	21	GRF	1150	1205	125	6	3.6		
	2800	OTTA	2	S/F	1334	1336.2	5.2	5.8	2		
	2800	OTTA	22	GRF	1744	1748	25	3	1.5		
	2800	OTTA	21	GRF	1745	1822	185	5.6			
	2800	OTTA	45	C	1746.5	1750.2	13	80	14.6		
	2695	BOUL	41	F	1746.5	1754	26.5	47	16		
	2695	SGMR	45	C	1746.7	1750.2	23.8	91.5	36.6		3G,CONT,SWF
	2695	SGMR	45	C		1754.5		77.8			3G,CONT,SWF
	8800	SGMR	45	C	1747.2	1749.9	24	140.4	56.2		3G,CONT,SWF
	8800	SGMR	45	C		1754.5		85.4			3G,CONT,SWF
	2695	BOUL	28	PRE	2337.5	2342.5	5	3	1		
	2695	BOUL	1	S	2342.5	2344.5	4.5	9	3		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

MAY 1978

MAY 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22} Wm^{-2} Hz^{-1}$ PEAK	MEAN	INT	REMARKS
	2800	OTTA	1	S	2344	2345.3	4	4.4	2		
	2695	MANI	2	S/F	2344.6	2345.3	1.4	6.5	4.3		
27	2800	OTTA	1	S	1209	1210	4	2.4	1.2		
	2800	OTTA	1	S	1229.9	1230	2.5	7.6	1.9		
	2800	OTTA	22	GRF	1550	1625	90	3	1.5		
	2800	OTTA	22	GRF	2038	2045	12	1.2	0.6		
	2695	PENT	240	R	2125	2305	100	3.8	2.2		
	2695	PENT	1	S	2314	2317	10	1.6	1		
28	2695	PENT	20	GRF	0056	0105	35	7	3.5		
	2695	MANI	4	S/F	0714.3	0717.4	4.7	70.4	46.9		
	2695	SGMR	3	S	1039	1039.9	3.9	35	14		
	8800	SGMR	3	S	1040.2	1041.2	2.8	16.2	6.5		
	2800	OTTA	26	FAL	1105	1300	115	-5.8	-3		
	2695	SGMR	3	S	1306.5	1315.3	15	96.4	38.6		SWF
	2800	OTTA	23	GRF	1307	1604	233	16.2	11.6		
	2695	BOUL	4	SF	1312	1314	5	14	5		
	2800	OTTA	3	S	1313	1315	8	85.2	23		
	8800	SGMR	3	S	1313	1315.2	7	61.2	24.5		SWF
	2800	OTTA	46F	C	1457	1501.3	7	34.2	18.5		
	8800	SGMR	3	S	1457.6	1501.5	8.9	378	113		SWF
	2695	SGMR	3	S	1458	1458.9	6.3	42.1	12.6		SWF
	2800	OTTA	29	PBI	1604	1604	40	14.8	7.4		
	2800	OTTA	32	ABS	1715	1735	53	-3.8	-2.2		
	2800	OTTA	21	GRF	1810	1820	240	8.8	4		
	2800	OTTA	21	GRF	1959.8	2004	25	2	1		
	2800	OTTA	1	S	2000.2	2001.2	1.5	3	1.5		
	2800	OTTA	21	GRF	2030	2036.5	50	3.6	1.8		
	2800	OTTA	8	S	2036.3	2036.3	0.2	53			
	2800	OTTA	20	GRF	2230	2235	30	2.4	1.2		
	2695	PENT	240	R	2305	2345	40	4.4	2		
29	2695	PENT	1	S	0016	0016.7	2	2	1		
	2695	PENT	3	S	0126	0127.8	6	12	4		
	2800	OTTA	20	GRF	1040		70	4.4	2.2		
	2800	OTTA	20	GRF	1505	1515	90	4.4	2.2		
	2800	OTTA	21	GRF	1650		195	4.6	2.3		
	8800	SGMR	3	S	1719.4	1720	2.6	58	23.2		
	2800	OTTA	1	S	1746	1747.5	4	3.6	1.8		
	2800	OTTA	3	S	1756.5	1757.8	5.5	205	46		
	2695	BOUL	4	SF	1756.5	1758	8	140	47		
	8800	SGMR	3	S	1756.8	1758.2	6.7	230	92		SWF
	2695	SGMR	3	S	1757	1758.1	6	253	101		SWF
	2800	OTTA	29	PBI	1802	1802	38	11.6	3.8		
	2695	BOUL	29	PBI	1804.5	1804.5	30.5	5	2		
	2800	OTTA	23	GRF	2105	2200	105	4.4	2.2		
	2800	OTTA	1	S	2242	2242.5	1.5	4.4	2.2		
	2695	PENT	20	GRF	2310	2410	110	2.8	1.4		
30	8800	MANI	3	S	0713.2	0714.3	3.4	77.6	49.8		
	2695	MANI	3	S	0713.5	0721	13.5	31.5	20.9		
	2800	OTTA	240	R	1120	1130	10	2.8	1.4		
	2800	OTTA	21	GRF	1135	1142	150	5.6	2.8		
	2800	OTTA	1	S	1306.8	1308	3	3	1.5		
	2800	OTTA	23	GRF	1450	1530	80	12	4		
	2695	BOUL	45	C	1520.5	1522	9	5	2		
	2800	OTTA	1	S	1521.5	1522.3	3	2.8	1.4		
	2800	OTTA	3	S	1526	1528	4	17.6	6.6		
	2800	OTTA	20	GRF	1615	1635	65	3.4	2		
	2800	OTTA	21	GRF	1750	2120	300	5.6	2.8		
	8800	SGMR	47	GB	1924.8	1926.4	16.2	612	245		SWF
	2695	BOUL	1	S	1925.5	1926.5	3	8	3		
	2800	OTTA	3	S	1925.5	1926.7	6	77.8	33.6		
	2695	SGMR	3	S	1926.6	1926.7	14.4	78.2	31.3		SWF
	2695	BOUL	29	PBI	1929.5	1933	26	4	1		
	2800	OTTA	29	PBI	1931.5	1931.5	40	18.8	5.8		
	2695	PENT	20	GRF	2335	2350	50	2.8	1.6		
	2695	BOUL	46	C	2336.5	2337.5	3	26	9		
31	2695	MANI	4	S/F	0733.5	0734.6	4.3	14.3	4.7		
	8800	MANI	3	S	0733.7	0734.8	3.5	104.9	34.9		
	8800	SGMR	3	S	1016	1052	59	84.2	33.7		SWF
	2695	SGMR	3	S	1020	1043	55	123	49.2		SWF
	2800	OTTA			1047	1053.9	373 D	135			
	2800	OTTA	26	FAL	1900	1925	25	-4.2	-2.1		
	2695	PENT	21	GRF	2330	2417	125	3.4	1.7		
	2695	PENT	1	S	2406	2408	6	7.4	3.7		

Observatories:

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

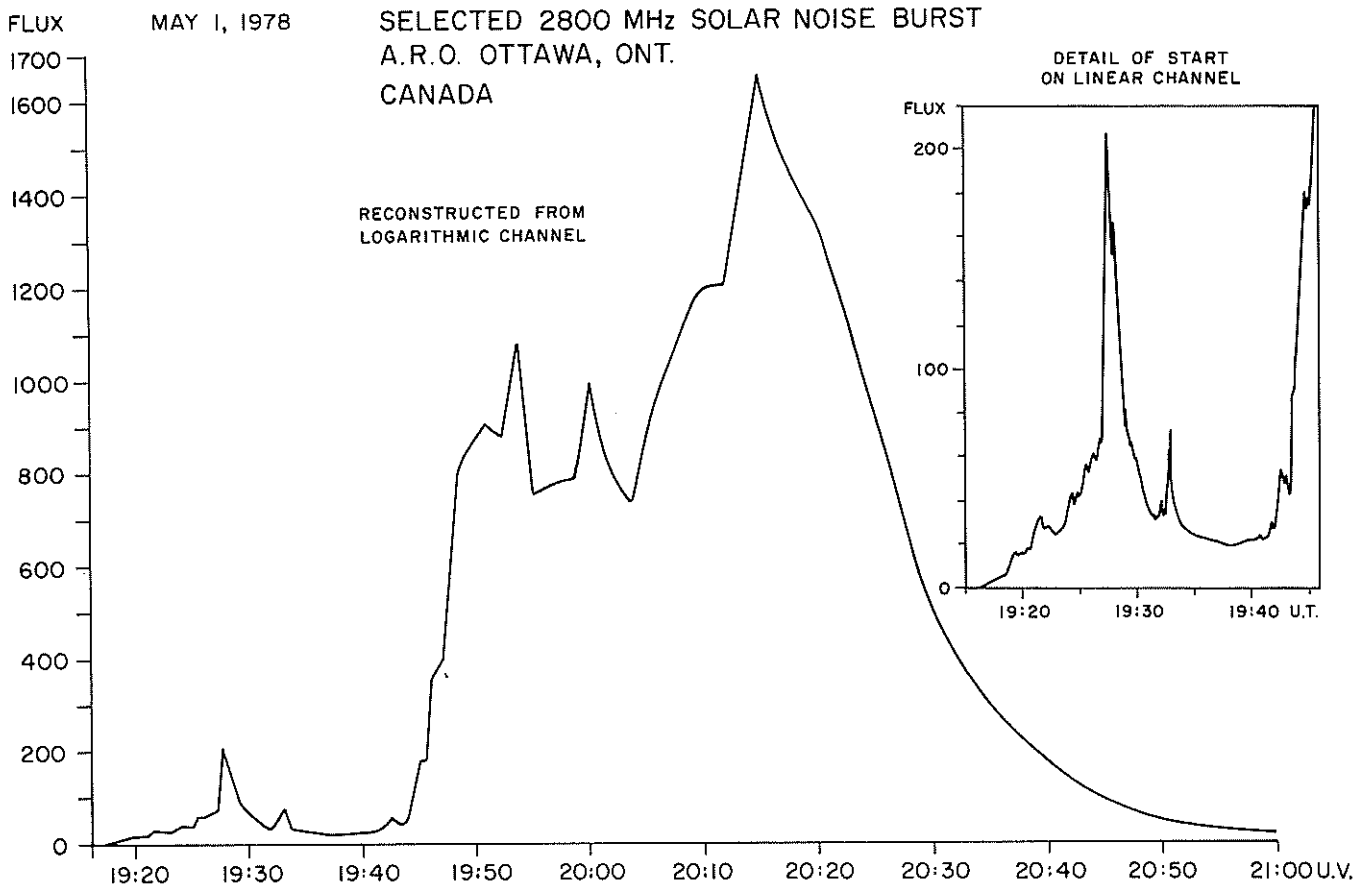
Explanation of Type Code:

1 Simple 1	6 Minor	22 Simple 3F	27 Rise and Fall	32 Absorption	44 Noise Storm in Progress
2 Simple 1F	7 Minor +	23 Simple 3AF	28 Precursor	40 Fluctuation	45 Complex
3 Simple 2	8 Spike	24 Rise	29 Post Burst Increase	41 Group of Bursts	46 Complex F
4 Simple 2F	20 Simple 3	25 Rise A	30 Post Burst Increase A	42 Series of Bursts	47 Great Burst
5 Simple	21 Simple 3A	26 Fall	31 Post Burst Decrease	43 Onset of Noise Storm	48 Major
					49 Major +

Errata: An error appears on page 26 of SGD, 405 Part I, May 1978 issue. April 28, 1978 Ottawa peak flux density of the great burst beginning at 1308 UT should read "24,000" instead of "2000".

SELECTED SOLAR NOISE BURST

MAY 1, 1978



SOLAR X-RAYS BY SATELLITE
SMS GOES
MAY 1978

.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	.003	.003	.002	.001	.001	.002	.003	.001	.002	B	.001	.003	-.005	.001	.001	.002	.001	.004	.002	.520	.576	.068	.012	.004	.050
5/ 2	.003	.086	.031	.011	.002	.005	.016	.003	.016	.003	.002	.003	- .007	.002	.002	.002	.003	.002	.002	.003	.003	.002	.003	.006	.009
5/ 3	.002	.006	.005	.011	.008	.003	.003	.005	.003	.004	.002	.023	- .006	.002	.003	.002	.006	.027	.006	.006	.012	.003	.012	.002	.007
5/ 4	.014	.028	.010	.010	.007	.002	.011	.005	.002	.004	.004	.001	- .002	.013	.007	.003	.004	.004	.006	.003	.003	.003	.002	.002	.006
5/ 5	.004	.001	.001	.002	.001	.001	.003	.002	.002	.002	.019	.002	- .003	.002	.002	.005	.006	.009	.010	.012	.004	.006	.015	.009	.005
5/ 6	.002	.006	.007	.001	.011	.009	.017	.011	.002	.003	.002	.002	- .003	.004	.006	.004	M	M	M	M	M	.031	.012	.015	.008
5/ 7	.008	.012	.010	.390	.171	.052	.040	.015	.027	.027	.026	.098	- .017	.015	.031	.095	.208	.174	.011	.012	.011	.004	B	.005	.081
5/ 8	.394	.112	.219	.038	.024	.008	.015	.008	.003	.003	.006	.018	- .553	.063	.013	.004	.003	.002	.002	.002	.001	.005	.003	.018	.063
5/ 9	.005	.010	.017	.010	.015	.001	.002	.001	B	.002	.002	B	- .027	.003	.429	.105	.006	.002	.002	.002	.001	B	B	B	.026
5/10	B	B	B	.003	.001	B	B	.003	.005	.003	.002	.002	- .002	.001	B	B	.004	B	B	B	B	B	.005	.001	.002
5/11	B	B	.001	.005	B	B	B	B	.002	.003	.002	.001	- B	B	B	B	.001	.002	.003	B	.001	.001	B	.003	.001
5/12	.001	B	B	B	.002	.001	.001	B	B	B	B	B	- B	B	B	B	B	.001	.064	.001	.003	B	B	B	.003
5/13	.002	B	.001	B	B	B	B	.011	.008	.001	B	B	- B	B	B	B	B	B	B	B	B	B	B	B	.001
5/14	B	B	B	B	B	B	B	B	B	B	B	.006	- .002	.003	.010	.001	B	B	B	B	B	B	B	B	.001
5/15	B	B	B	B	B	B	B	B	B	B	B	B	- B	B	B	B	.002	B	B	B	B	B	B	.001	B
5/16	B	B	.001	B	.002	B	B	B	B	B	B	B	- B	B	B	B	.012	.003	.002	B	B	.001	.006	.001	.002
5/17	B	B	.001	B	.001	B	B	B	B	.001	B	B	-.010	B	B	.030	B	B	B	B	B	.001	B	B	.002
5/18	B	B	.003	B	B	B	.003	.001	B	B	.001	.004	- .007	B	B	B	B	B	.002	.001	.001	B	B	B	.001
5/19	B	B	B	B	B	B	.001	B	.003	B	.002	.001	- .002	.001	B	.001	B	B	.002	.004	M	M	M	M	.001
5/20	M	.004	.003	B	.001	.001	.001	.002	.001	.003	.005	.003	- .003	.003	.002	.002	.002	.001	.012	.003	B	.001	.003	.002	.003
5/21	.002	.002	B	B	.002	.012	.007	.001	.002	.003	.002	B	- B	B	.002	.001	.002	.012	.002	.002	.005	.004	.003	.002	.003
5/22	.001	B	.007	B	.002	.003	.001	.005	.002	.001	.002	B	- .001	B	B	.012	.005	.003	.002	B	B	.001	B	.002	.002
5/23	.098	.061	.004	B	B	B	.001	.001	.001	.002	B	B	- B	B	B	.001	.001	B	B	.003	.005	.002	B	B	.008
5/24	B	B	.002	B	B	.002	.002	.002	.001	B	B	B	- B	B	.002	.002	.002	.008	.010	.108	.015	.001	.002	.001	.007
5/25	.001	.001	B	.004	.001	.003	.005	.001	.002	.002	.001	B	- B	B	B	B	B	.005	.001	B	.001	.001	B	B	.001
5/26	.004	.002	.001	.001	.001	.003	.035	.050	.020	.015	.009	.003	-.016	.007	N001	B	.002	.066	.008	.003	.001	B	B	B	.018
5/27	B	.002	.001	.003	B	.003	.006	B	.006	.003	.016	.001	-.002	.001	B	B	.009	.002	B	B	.005	.001	.002	.003	.003
5/28	.001	.003	.002	.002	.002	.001	.001	.018	.004	.002	.019	.003	-.001	.062	.080	.403	.008	.002	.002	.002	.006	B	B	.001	.026
5/29	.003	.003	.001	.001	.001	B	.002	.00	.001	P	.005	.006	-.001	B	B	.003	B	.017	.091	.001	.001	.003	.001	.002	.006
5/30	.001	B	B	B	.004	.002	.036	.250	.013	.002	.005	.002	-.003	.001	.002	.020	.001	.002	.002	.099	.003	.003	.002	.001	.019
5/31	.002	.002	.002	B	.001	.002	.001	.007	.002	B	.248	.496	-.187	.070	.033	.020	.014	.013	.010	.005	.004	.002	.002	.003	.047

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 1978

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	.018	.018	.014	.012	.012	.013	.017	.013	.012	.011	.012	.019	-.014	.012	.0 3	.014	.013	.027	.013	.296	.462	.122	.047	.027	.051
5/ 2	.020	.112	.079	.033	.016	.019	.031	.015	.037	.018	.015	.014	-.018	.013	.014	.015	.014	.013	.015	.014	.017	.015	.017	.022	.017
5/ 3	.014	.020	.022	.033	.030	.021	.020	.022	.019	.019	.016	.033	-.025	.014	.018	.013	.027	.042	.020	.022	.028	.016	.028	.013	.014
5/ 4	.033	.049	.029	.026	.019	.016	.026	.027	.014	.014	.016	.012	-.014	.032	.022	.019	.018	.016	.024	.014	.014	.015	.012	.013	.013
5/ 5	.020	.012	.012	.012	.013	.012	.015	.012	.013	.012	.035	.014	-.014	.018	.019	.023	.022	.029	.031	.032	.021	.022	.038	.030	.012
5/ 6	.020	.025	.029	.018	.035	.030	.040	.040	.019	.019	.016	.015	-.021	.025	.026	.023	M	M	M	M	M	.073	.042	.043	.018
5/ 7	.031	.042	.038	.499	.172	.084	.073	.045	.059	.066	.058	.112	-.046	.038	.054	.096	.202	.191	.044	.035	.033	.024	.018	.022	.084
5/ 8	.174	.161	.197	.084	.055	.036	.033	.031	.022	.020	.027	.042	-.344	.104	.040	.023	.020	.018	.018	.019	.018	.023	.021	.041	.064
5/ 9	.023	.027	.037	.030	.031	.019	.033	.011	.010	.011	.011	.010	-.044	.017	.224	.119	.023	.017	.015	.012	.010	.009	.008	.007	.029
5/10	.008	.007	.007	.012	.011	.009	.007	.009	.015	.013	.010	.009	-.008	.008	.008	.009	.014	.009	.007	.007	.007	.006	.021	.009	.006
5/11	.006	.005	.008	.021	.007	.006	.006	.006	.008	.011	.012	.010	-.009	.009	.008	.009	.008	.010	.011	.008	.008	.008	.007	.013	.005
5/12	.010	.006	.006	.007	.010	.009	.008	.007	.007	.006	.006	.007	-.007	.008	.007	.007	.007	.008	.011	.008	.062	.006	.006	.007	.006
5/13	.010	.006	.009	.006	.006	.006	.006	.023	.027	.010	.007	.007	-.005	.006	.005	.005	.005	.005	.006	.006	.005	.005	.005	.006	.005
5/14	.006	.005	.005	.005	.006	.005	.005	.005	.006	.006	.005	.023	-.012	.010	.027	.010	.008	.007	.006	.007	.006	.006	.006	.005	.005
5/15	.006	.005	.005	.006	.007	.007	.008	.007	.007	.006	.006	.005	-.006	.005	.005	.005	.010	.006	.006	.005	.005	.005	.006	.008	.003
5/16	.006	.005	.008	.006	.008	.006	.006	.008	.007	.007	.008	.006	-.007	.006	.006	.006	.031	.015	.012	.007	.007	.010	.011	.010	.005
5/17	.009	.007	.008	.007	.009	.008	.008	.006	.007	.010	.008	.006	-.017	.008	.007	.030	.007	.006	.006	.006	.007	.008	.006	.005	.006
5/18	.005	.005	.013	.006	.005	.008	.013	.009	.007	.005	.008	.016	-.018	.007	.005	.004	.005	.005	.010	.009	.008	.006	.006	.005	.005
5/19	.005	.006	.006	.007	.007	.007	.010	.008	.010	.007	.010	.009	- .010	.009	.008	.009	.006	.007	.009	.013	M	M	M	M	.005
5/20	M	.014	.011	.007	.009	.009	.009	.010	.010	.012	.016	.013	-.036	.013	.011	.010	.012	.010	.023	.016	.008	.010	.014	.011	.008
5/21	.010	.011	.008	.008	.009	.017	.023	.010	.008	.012	.012	.008	-.008	.008	.010	.010	.012	.031	.014	.014	.020	.023	.016	.013	.008
5/22	.010	.010	.016	.010	.012	.014	.010	.024	.013	.010	.012	.010	-.011	.009	.009	.028	.020	.026	.015	.009	.008	.009	.008	.011	.008
5/23	.086	.103	.025	.011	.008	.007	.008	.009	.009	.011	.009	.007	-.007	.008	.008	.010	.011	.010	.008	.010	.017	.012	.009	.009	.012
5/24	.009	.008	.011	.008	.008	.013	.011	.011	.010	.009	.008	.007	-.007	.007	.014	.012	.011	.015	.027	.102	.048	.019	.011	.010	.011
5/25	.010	.010	.009	.014	.010	.012	.019	.011	.010	.021	.010	.007	- .007	.007	.007	.007	.007	.016	.009	.007	.008	.009	.008	.008	.006
5/26	.014	.016	.009	.008	.007	.012	.051	.035	.069	.047	.031	.022	- .035	.028	.013	.010	.011	.056	.025	.013	.010	.008	.008	.008	.018
5/27	.007	.010	.007	.010	.007	.010	.020	.008	.012	.011	.029	.008	-.010	.007	.006	.007	.019	.010	.007	.007	.008	.008	.008	.010	.007
5/28	.008	.022	.009	.009	.008	.007	.006	.024	.011	.009	.027	.015	-.014	.058	.053	.265	.029	.011	.011	.010	.015	.008	.008	.008	.026
5/29	.012	.012	.009	.010	.009	.008	.010	.009	.009	.009	.014	.020	-.010	.007	.008	.014	.008	.018	.099	.010	.009	.013	.010	.010	.010
5/30	.008	.007	.007	.007	.014	.011	.060	.217	.046	.014	.014	.012	-.015	.011	.010	.030	.010	.011	.013	.088	.019	.015	.012	.010	.023
5/31	.010	.010	.010	.007	.008	.009	.008	.015	.010	.008	.172	.537	-.303	.137	.077	.052	.038	.034	.029	.022	.019	.017	.016	.013	.056

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

SOLAR X-RAYS BY SATELLITE

GOES

MAY 1978

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}
6	2119	2.5E-07	7.1E-06	2123	8.2E-07	1.2E-05	2127	3.7E-07	9.2E-06
7	0321	1.4E-07	4.3E-06	0331	3.6E-05	1.7E-04	0344	1.2E-05	8.5E-05
7	0521	5.9E-07	8.7E-06	0527	1.3E-06	1.3E-05	0530	7.3E-07	1.1E-05
7	0625	2.3E-07	6.0E-06	0633	1.6E-06	1.5E-05	0638	6.0E-07	1.0E-05
7	0854	2.0E-07	5.9E-06	0858	9.0E-07	9.9E-06	0901	2.2E-07	6.8E-06
7	1111	2.1E-07	5.6E-06	1117	2.3E-06	1.9E-05	1139	8.5E-07	1.2E-05
7	1236	1.3E-07	4.1E-06	1239	6.7E-07	7.6E-06	1241	2.2E-07	5.4E-06
7	1432	1.4E-07	4.1E-06	1443	7.5E-07	8.7E-06	1505	3.0E-07	6.3E-06
7	1548	1.9E-07	5.1E-06	1600	7.2E-06	4.4E-05	1613	2.1E-06	2.3E-05
7	1702	1.4E-06	1.6E-05	1712	4.5E-06	3.5E-05	1724	1.8E-06	2.5E-05
7	1902	9.1E-08	3.4E-06	1908	2.8E-07	6.4E-06	1913	1.3E-07	4.7E-06
8	0645	1.3E-07	3.3E-06	0653	5.4E-07	5.7E-06	0706	1.5E-07	4.5E-06
8	1202	1.3E-07	4.0E-06	1239	1.0E-05	6.0E-05	1254	3.4E-06	3.2E-05
8	1701	1.1E-08	1.6E-06	1706	1.0E-07	2.7E-06	1711	2.5E-08	2.1E-06
8	1914	6.7E-09	1.7E-06	1918	9.3E-08	2.5E-06	1921	2.8E-08	2.1E-06
9	0409	4.5E-08	2.1E-06	0415	9.7E-07	7.9E-06	0420	2.6E-07	4.9E-06
9	0953	4.2E-08	1.4E-06	0956	5.1E-08	2.1E-06	0958	4.8E-08	1.5E-06
9	1201	2.9E-08	1.3E-06	1222	7.4E-07	8.0E-06	1238	2.0E-07	4.5E-06
10	0344	7.0E-08	1.6E-06	0347	1.0E-07	1.2E-05	0350	6.5E-08	1.7E-06
10	0448	2.2E-08	1.0E-06	0451	2.3E-08	7.6E-06	0453	1.9E-08	1.0E-06
10	0630	6.3E-09	7.7E-07	0634	2.1E-08	1.5E-06	0636	6.1E-09	7.6E-07
10	0734	1.2E-08	8.8E-07	0748	7.5E-08	2.1E-06	0752	7.8E-08	1.4E-06
10	0809	9.8E-08	1.7E-06	0812	9.9E-08	1.2E-05	0817	9.4E-08	1.8E-06
10	0818	9.2E-08	1.8E-06	0822	1.6E-07	1.8E-05	0825	8.7E-08	1.8E-06
10	1337	6.0E-09	8.4E-07	1340	1.4E-08	1.3E-06	1342	2.4E-08	8.6E-07
10	1441	2.7E-09	7.6E-07	1446	1.3E-08	1.1E-06	1448	2.9E-09	7.7E-07
10	1451	1.0E-08	7.5E-07	1456	2.2E-08	1.3E-06	1515	1.1E-08	1.0E-06
10	1612	3.5E-08	1.0E-06	1616	1.3E-07	1.1E-05	1623	1.0E-07	2.0E-06
10	2200	6.2E-09	6.5E-07	2213	1.3E-07	3.4E-06	2235	2.8E-08	1.9E-06
11	0247	4.7E-09	6.8E-07	0304	1.1E-07	3.1E-06	0331	1.9E-08	1.9E-06
11	1509	6.2E-09	7.9E-07	1513	3.7E-08	1.3E-06	1519	1.5E-08	1.0E-06
11	1651	9.5E-09	8.1E-07	1700	1.0E-07	2.1E-06	1709	3.3E-08	1.4E-06
11	1733	6.4E-09	7.0E-07	1737	2.1E-08	1.0E-06	1742	9.8E-09	8.4E-07
11	2328	9.5E-09	8.6E-07	2348	7.9E-08	2.3E-06	2356	2.3E-08	1.5E-06
12	0507	1.0E-08	8.2E-07	0512	5.6E-08	1.3E-06	0520	1.8E-08	1.0E-06
12	2350	8.0E-09	6.5E-07	2357	5.3E-08	2.1E-06	0000	3.3E-08	1.3E-06
13	0735	1.1E-08	8.4E-07	0748	4.1E-07	6.5E-06	0816	1.3E-07	3.6E-06
14	1111	3.3E-08	1.6E-06	1119	1.6E-07	3.9E-06	1136	6.4E-08	2.7E-06
14	1251	8.9E-09	7.9E-07	1256	4.1E-08	1.3E-06	1302	1.4E-08	1.0E-06
14	1345	1.6E-09	5.2E-07	1403	3.9E-07	5.9E-06	1418	9.9E-08	3.0E-06
14	1609	6.1E-09	7.7E-07	1613	5.8E-08	2.0E-06	1616	2.8E-08	1.3E-06
14	2137	3.2E-09	5.8E-07	2142	3.3E-08	1.0E-06	2147	1.0E-08	8.1E-07
15	2315	3.3E-09	5.4E-07	2323	6.5E-08	1.4E-06	2326	2.0E-08	9.4E-07
16	0444	3.1E-09	5.4E-07	0447	1.9E-07	2.4E-06	0450	4.3E-08	1.3E-06
16	2146	2.4E-08	1.2E-06	2149	4.3E-08	1.9E-06	2151	3.1E-08	1.4E-06
16	2253	1.5E-08	1.1E-06	2256	4.1E-08	1.8E-06	2300	2.1E-08	1.3E-06
17	0355	1.4E-08	8.1E-07	0400	5.3E-08	1.2E-06	0410	1.9E-08	1.0E-06
17	1230	7.0E-09	6.8E-07	1239	5.8E-07	5.4E-06	1247	1.4E-07	2.8E-06
18	0215	1.7E-08	8.3E-07	0226	9.3E-08	2.3E-06	0237	2.8E-08	1.5E-06
18	0622	3.1E-08	1.2E-06	0630	6.7E-08	2.0E-06	0639	3.1E-08	1.6E-06
18	1027	7.4E-09	7.4E-07	1036	2.4E-08	1.1E-06	1051	9.7E-09	9.2E-07

SOLAR X-RAYS BY SATELLITE

GOES

MAY 1978

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}
18	1750	3.9E-09	5.0E-07	1848	2.8E-08	1.4E-06	1922	1.2E-08	9.5E-07
19	0812	3.2E-09	5.7E-07	0822	1.2E-07	2.5E-06	0827	3.4E-08	1.4E-06
19	1016	5.9E-09	7.6E-07	1019	2.6E-08	1.1E-06	1026	1.2E-08	9.0E-07
19	1027	1.4E-08	9.3E-07	1033	8.8E-08	2.0E-06	1038	2.2E-08	1.2E-06
19	1227	3.4E-08	1.1E-06	1230	4.9E-08	1.7E-06	1233	4.7E-08	1.4E-06
19	1851	2.8E-08	1.1E-06	1857	1.0E-07	2.2E-06	1903	3.8E-08	1.6E-06
20	0132	2.9E-08	1.1E-06	0139	1.5E-07	3.0E-06	0145	4.4E-08	1.9E-06
20	0228	8.0E-09	7.1E-07	0234	3.0E-07	3.4E-06	0239	6.3E-08	2.0E-06
20	1135	2.7E-08	1.3E-06	1138	5.0E-08	1.9E-06	1141	4.4E-08	1.5E-06
20	1454	8.3E-09	9.0E-07	1458	4.8E-08	1.4E-06	1500	1.6E-08	1.0E-06
20	1600	3.2E-08	1.2E-06	1603	5.1E-08	1.8E-06	1607	4.1E-08	1.5E-06
20	1804	2.1E-08	1.2E-06	1807	3.3E-08	1.9E-06	1809	3.1E-08	1.3E-06
20	1832	9.4E-08	1.6E-06	1848	2.8E-07	4.4E-06	1904	9.6E-08	2.9E-06
20	2238	3.3E-08	1.3E-06	2243	1.1E-07	2.2E-06	2249	4.1E-08	1.7E-06
21	0036	1.0E-08	8.8E-07	0040	5.1E-08	1.4E-06	0045	1.8E-08	1.1E-06
21	0430	5.1E-09	7.3E-07	0435	9.1E-08	2.0E-06	0443	3.3E-08	1.3E-06
21	0850	1.2E-08	8.8E-07	0853	4.2E-07	1.4E-06	0947	1.6E-08	1.1E-06
21	1003	3.0E-08	1.4E-06	1006	3.8E-08	2.0E-06	1008	3.4E-08	1.4E-06
21	1630	1.2E-08	1.0E-06	1633	4.1E-08	1.9E-06	1635	3.6E-08	1.3E-06
21	2044	1.7E-08	1.6E-06	2057	1.5E-07	3.9E-06	2115	5.7E-08	2.8E-06
21	2349	1.2E-08	1.1E-06	2352	5.0E-08	2.0E-06	0000	2.6E-08	1.5E-06
22	0201	7.5E-09	9.6E-07	0207	7.2E-07	7.7E-06	0211	1.1E-07	3.4E-06
22	0707	1.2E-08	1.0E-06	0716	1.5E-07	2.3E-06	0803	5.1E-08	1.7E-06
22	1431	2.3E-09	7.9E-07	1435	5.6E-08	2.0E-06	1439	2.4E-08	1.2E-06
22	1458	4.2E-09	8.5E-07	1542	1.4E-07	3.3E-06	1612	4.2E-08	2.0E-06
22	1622	1.4E-08	1.6E-06	1627	2.7E-07	4.5E-06	1630	8.3E-08	2.8E-06
22	1837	2.9E-08	1.4E-06	1843	9.9E-08	2.3E-06	1849	5.1E-08	1.8E-06
23	0105	4.9E-07	9.6E-06	0109	1.3E-06	1.9E-05	0122	9.5E-07	1.4E-05
23	0950	3.1E-08	1.3E-06	0953	4.2E-08	2.0E-06	1002	2.1E-08	1.6E-06
23	1518	2.5E-08	1.1E-06	1521	3.9E-08	1.7E-06	1523	3.8E-08	1.4E-06
23	1949	1.5E-08	9.3E-07	2004	1.2E-07	2.5E-06	2026	2.4E-08	1.7E-06
24	0523	2.8E-08	1.3E-06	0526	4.2E-08	2.0E-06	0538	2.1E-08	1.6E-06
24	1750	6.2E-09	7.4E-07	1802	4.9E-07	8.4E-06	1809	1.6E-07	4.3E-06
24	1906	5.0E-08	1.5E-06	1930	1.8E-06	1.5E-05	2004	3.7E-07	8.2E-06
24	2241	1.4E-08	1.0E-06	2248	9.4E-08	2.3E-06	2257	1.5E-08	1.6E-06
25	0332	1.2E-08	9.3E-07	0342	1.5E-07	3.0E-06	0351	4.1E-08	1.9E-06
25	0537	9.5E-09	8.2E-07	0554	1.7E-07	3.3E-06	0650	2.3E-08	1.5E-06
25	0933	6.0E-08	8.3E-07	0941	4.4E-08	1.4E-06	0951	1.5E-08	1.1E-06
25	2251	7.8E-09	7.7E-07	2254	3.5E-08	1.2E-06	2257	1.3E-08	9.8E-07
26	0040	2.8E-08	1.2E-06	0053	1.2E-07	2.8E-06	0115	3.0E-08	2.0E-06
26	1649	2.0E-08	1.3E-06	1657	5.5E-08	2.0E-06	1702	3.1E-08	1.6E-06
26	1744	3.6E-09	1.1E-06	1751	6.3E-06	3.8E-05	1756	2.2E-06	1.9E-05
27	0059	5.9E-09	7.0E-07	0105	4.4E-08	1.4E-06	0136	1.8E-08	1.0E-06
27	0318	6.0E-08	7.6E-07	0323	9.1E-08	1.7E-06	0330	3.5E-08	1.2E-06
27	0808	1.1E-08	7.5E-07	0814	6.1E-07	5.5E-06	0818	1.2E-07	2.9E-06
27	0922	1.1E-08	8.2E-07	0925	7.3E-08	1.8E-06	0929	4.1E-08	1.3E-06
27	0937	1.5E-08	9.6E-07	0940	6.1E-08	1.8E-06	0944	4.5E-08	1.3E-06
**	****	3.3E+20	1.9E-78	0000	1.1E+00	2.7E-41	0000	0.0E+00	1.4E+51
27	1146	7.3E-09	7.3E-07	1149	4.3E-08	1.1E-06	1151	2.0E-08	9.2E-07
27	1206	1.3E-08	7.8E-07	1212	5.4E-08	1.5E-06	1224	2.8E-08	1.1E-06
27	1617	2.3E-08	9.0E-07	1627	3.6E-07	4.4E-06	1637	6.4E-08	2.6E-06

SOLAR X-RAYS BY SATELLITE

GOES

MAY 1978

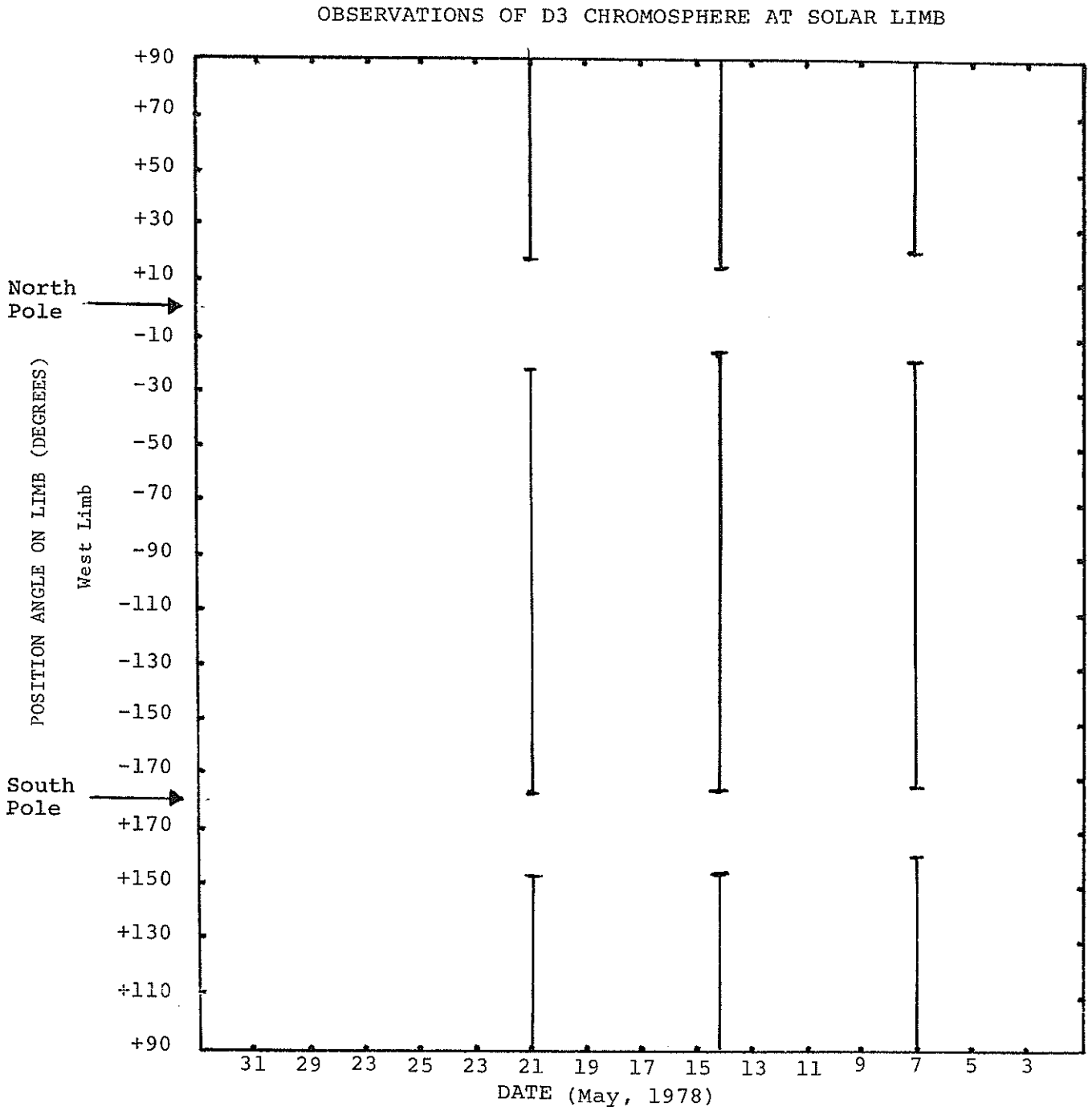
DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
27	1729	2.0E-08	9.2E-07	1735	5.8E-08	1.8E-06	1738	3.8E-08	1.2E-06
27	2029	1.2E-08	7.3E-07	2032	2.5E-06	1.3E-06	2034	9.5E-09	7.3E-07
27	2247	7.4E-09	7.2E-07	2320	4.2E-08	1.4E-06	2334	1.7E-08	1.0E-06
28	0333	3.0E-08	8.5E-07	0337	6.8E-08	1.3E-06	0342	1.9E-08	1.0E-06
28	0714	3.9E-08	7.6E-07	0732	7.5E-07	6.8E-06	0740	1.8E-07	3.5E-06
28	0821	2.8E-08	1.1E-06	0824	9.1E-08	2.3E-06	0826	3.3E-08	1.5E-06
28	1023	3.4E-08	1.4E-06	1026	5.0E-08	2.0E-06	1031	6.0E-08	1.7E-06
28	1038	7.8E-08	1.8E-06	1046	9.4E-07	7.6E-06	1054	2.5E-07	4.6E-06
28	1311	3.0E-08	9.8E-07	1340	1.5E-06	1.2E-05	1401	4.8E-07	6.3E-06
28	1456	2.2E-07	3.6E-06	1502	3.0E-05	1.2E-04	1507	9.3E-06	5.9E-05
28	1710	2.9E-08	1.2E-06	1713	3.7E-08	2.0E-06	1717	4.8E-08	1.6E-06
28	1958	1.7E-08	9.9E-07	2006	2.1E-07	3.2E-06	2011	4.4E-08	1.9E-06
28	2033	4.0E-08	1.2E-06	2038	2.0E-07	2.7E-06	2043	4.1E-08	1.7E-06
29	0014	2.3E-08	1.0E-06	0017	6.2E-08	2.2E-06	0022	4.0E-08	1.6E-06
29	0124	3.5E-08	1.2E-06	0127	7.1E-08	2.0E-06	0136	4.2E-08	1.6E-06
29	0655	1.1E-08	8.9E-07	0658	6.9E-08	1.8E-06	0705	3.8E-08	1.3E-06
29	1018	7.9E-09	8.4E-07	1023	5.2E-08	1.7E-06	1029	1.8E-08	1.2E-06
29	1510	2.0E-08	1.0E-06	1519	1.1E-07	2.5E-06	1530	2.0E-08	1.7E-06
29	1717	9.3E-09	8.4E-07	1720	6.1E-08	1.3E-06	1723	1.8E-08	1.0E-06
29	1957	1.1E-08	8.8E-07	2001	6.5E-08	1.9E-06	2003	3.3E-08	1.2E-06
29	2140	3.8E-08	1.3E-06	2147	1.8E-07	2.6E-06	2157	7.5E-08	1.9E-06
29	2313	1.5E-08	1.0E-06	2316	6.7E-08	1.8E-06	2319	2.2E-08	1.2E-06
30	0350	1.2E-08	7.3E-07	0354	3.4E-08	1.1E-06	0400	8.0E-09	9.0E-07
30	0405	1.1E-08	8.9E-07	0416	1.1E-07	2.4E-06	0430	2.8E-08	1.6E-06
30	0547	2.6E-08	1.1E-06	0618	9.2E-07	8.7E-06	0706	1.6E-07	4.9E-06
30	0712	1.5E-07	4.2E-06	0725	8.7E-06	5.4E-05	0737	2.5E-06	2.7E-05
30	0957	1.7E-08	1.2E-06	1006	2.2E-07	3.8E-06	1011	5.6E-08	2.2E-06
30	1128	3.5E-08	1.2E-06	1146	8.0E-08	2.0E-06	1205	5.3E-08	1.6E-06
30	1306	1.3E-08	1.2E-06	1310	4.5E-08	1.9E-06	1314	2.4E-08	1.5E-06
30	1516	1.4E-08	1.0E-06	1531	1.2E-06	1.0E-05	1538	2.2E-07	5.4E-06
31	0024	6.5E-09	9.1E-07	0027	5.0E-08	1.4E-06	0029	1.3E-08	1.0E-06
31	0156	6.4E-09	9.2E-07	0206	6.0E-08	1.9E-06	0212	3.5E-08	1.3E-06
31	0732	1.2E-08	7.7E-07	0736	6.7E-07	5.6E-06	0740	1.3E-07	2.9E-06
31	1009	3.6E-08	1.3E-06	1104	6.4E-06	5.7E-05	1229	1.7E-06	2.9E-05

CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

MAY 1978

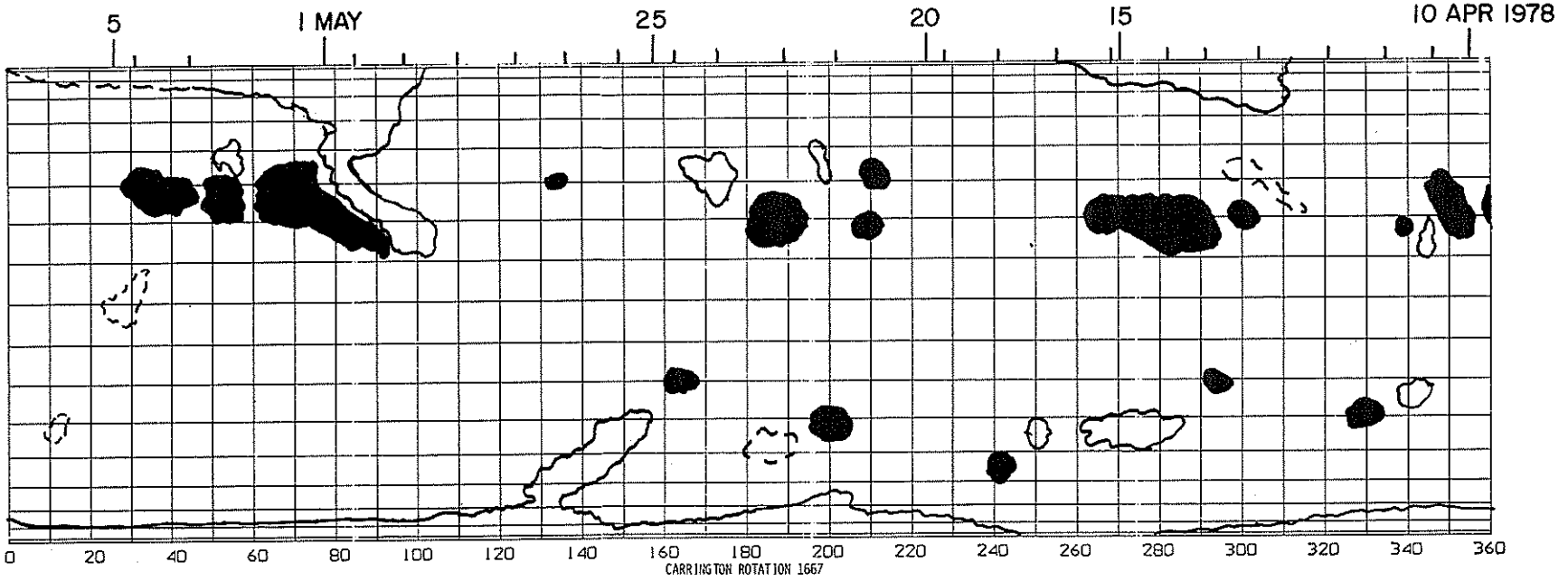
Big Bear Solar Observatory



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1667

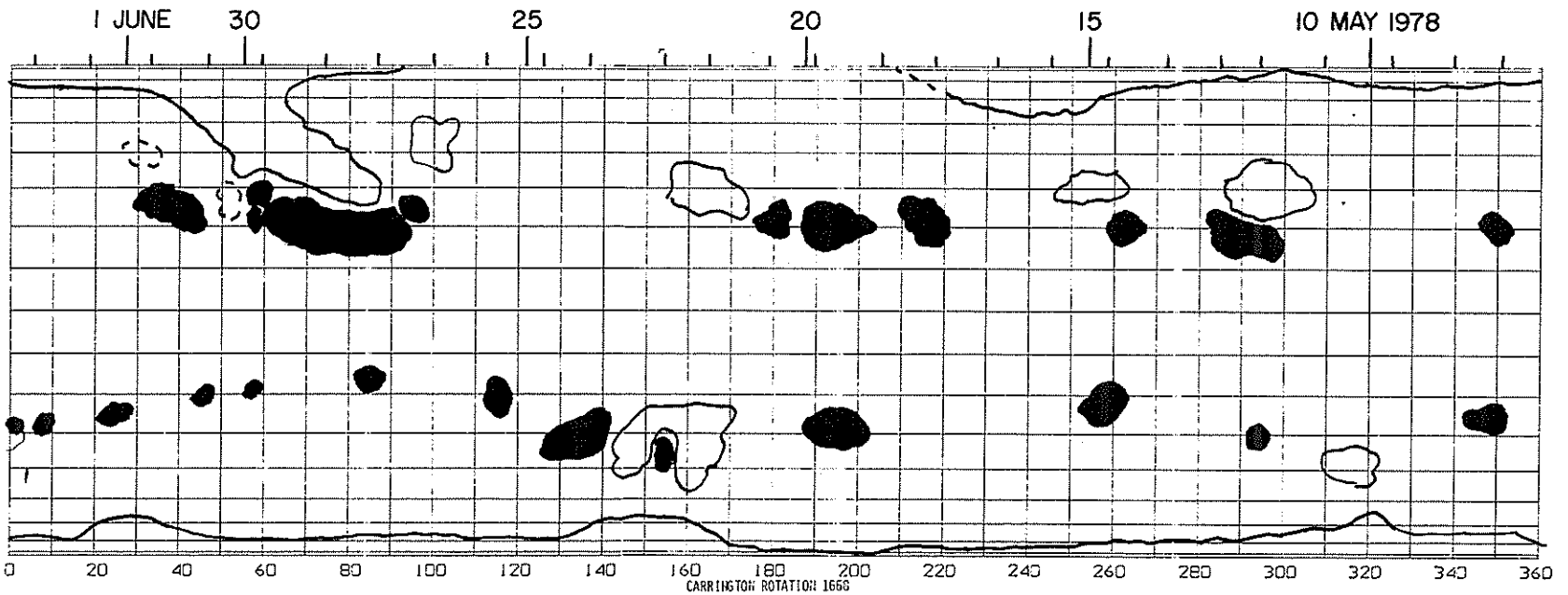
KITT PEAK NATIONAL OBSERVATORY



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1668

KITT PEAK NATIONAL OBSERVATORY



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
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	-	-	AT	T* -	T*		AT	AT -
1967	JUN 9								TA		-			TA						AT	A*				AT *	A*		TA TA
1968	JUL 6										A*			T*	TA	TA		T*			AT			-	AT		-	
1969	AUG 2		TA						TA	-			TA	*								AT	TA					
1970	AUG 29			-	-	-		TA										AT	AT			AT	TA	TA -	AT	AT		
1971	SEP 25						-	-	-	-	-	-					TA				TA							
1972	OCT 22					-	AT														AT AT					*		
1973	NOV 18			TA	AT						-		AT							*			*		*			
1974	DEC 15					-	-	-	AT	-	AT				AT	AT		AT		TA		TA		TA			*	
1975	1978 JAN 11		*	*					*		*	*						*			TA		- AT			-		-
1976	FEB 7						*	TA				-			-						-		*			TA	A*	TA
1977	MAR 6	TA		-					AT			T*	*					TA			AT AT		AT	AT	*	TA		
1978	APR 2							*	-		AT											AT AT						
1979	APR 29		TA			*	TA	AT AT	TA		-	-	T*							TA TA			AT					
1980	MAY 26				TA		AT																					

= definitely towards the sun = definitely away from the sun

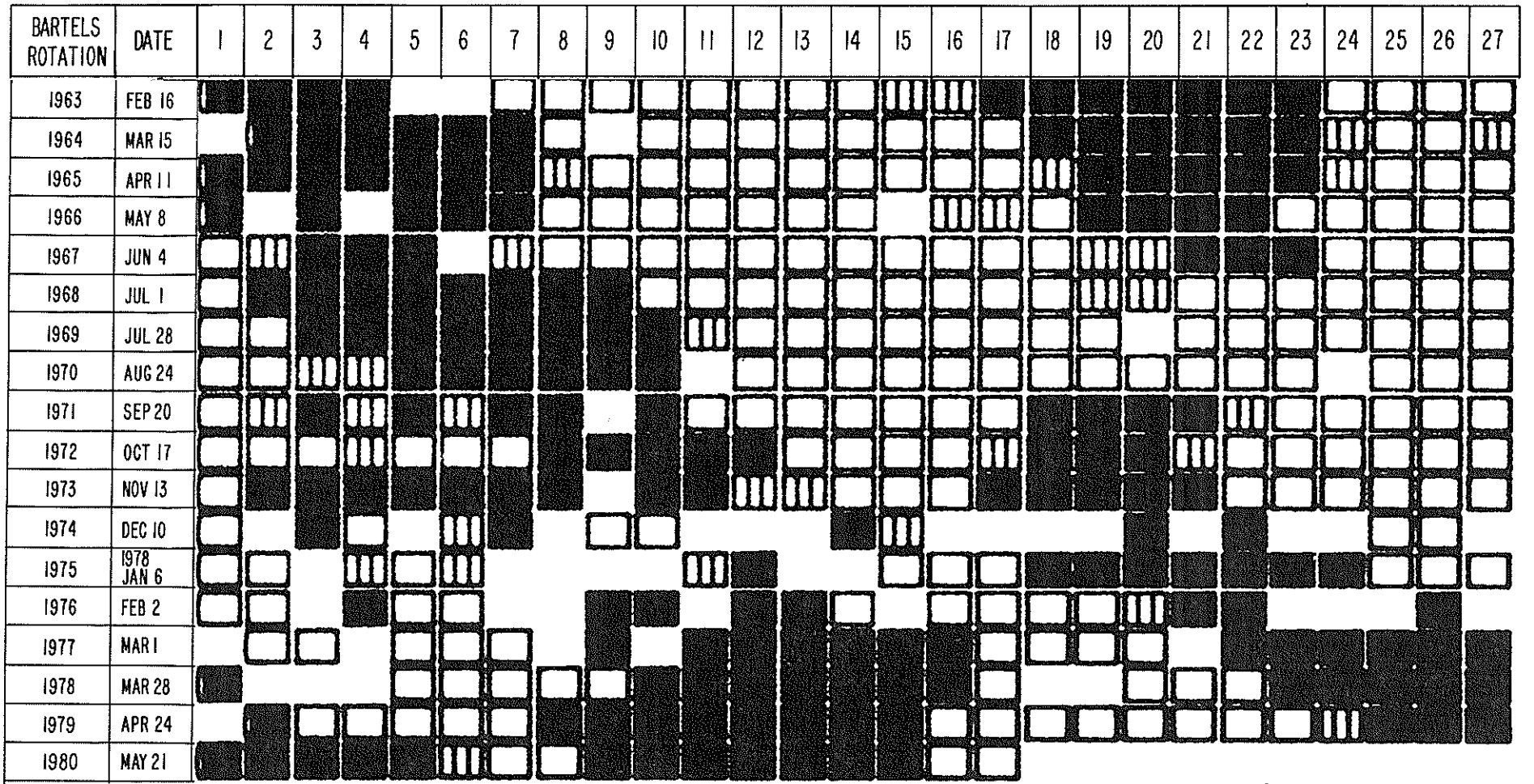
T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

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.

Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD



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. Dates given are not Bartels Rotation dates. These earlier dates correspond to the occurrence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

	1977							1978				
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY
DAY												
01	13	2	-16	-9	9	6	-14	.	16	.	52	-12
02	15	-12	-23	-13	6	1	-10	.	31	22	46	-34
03	15	-18	-25	.	3	-14	-7	14	26	12	43	-27
04	13	-26	-23	3	13	-16	8	31	.	.	13	-27
05	0	-31	-16	12	13	-11	26	.	-5	8	4	-29
06	-19	-33	-5	18	11	-1	46	27	4	11	-15	-27
07	-32	-26	-1	22	-6	11	55	15	9	4	-32	-23
08	-31	-14	11	17	-13	31	53	.	.	.	-53	-12
09	.	-7	25	8	-13	46	46	-1	.	-31	-52	3
10	0	3	20	4	-4	48	26	11	-28	.	-41	24
11	7	20	17	6	2	51	.	0	-43	-70	-32	41
12	17	29	12	13	12	32	-2	.	.	-78	-4	50
13	28	30	11	19	28	14	10	.	-41	-56	22	47
14	38	24	5	23	35	-4	.	.	-23	-49	.	30
15	40	26	7	40	46	-10	1	.	3	-28	.	16
16	31	18	.	.	39	-18	-6	0	.	-3	58	5
17	24	13	5	38	20	-24	.	-3	31	18	37	1
18	18	4	13	41	6	-5	6	.	22	54	11	-29
19	19	1	19	31	6	-11	8	.	37	48	-9	-49
20	16	-1	23	17	1	-12	.	18	22	24	-30	-75
21	10	6	24	2	3	.	.	39	-1	.	-49	-79
22	2	9	22	-3	7	-7	.	10	-18	-23	-50	-59
23	-2	22	18	-2	3	-4	-5	-4	-49	-49	-62	-37
24	-7	25	8	-6	-3	0	-1	-15	.	-69	.	-21
25	-15	31	4	-1	-9	2	.	-17	.	-79	-13	-9
26	-10	30	0	-3	-5	4	.	-36	.	-73	10	1
27	4	24	2	-8	-5	7	.	-48	-34	-53	13	27
28	15	6	-2	.	-6	5	.	-33	.	-28	6	14
29	19	4	-6	-8	5	-2	-9	-15		.	13	-10
30	14	-4	-6	3	6	-11	.	14		.	18	-20
31		-10	-11		8		-20	10		.		-27

Dot symbol entry indicates no data available for the day.

SOLAR WIND

Interplanetary Scintillations

MAY 1978

DAY	3C48 VEL	3C48 ERR	3C144 VEL	3C144 ERR	3C147 VEL	3C147 ERR	3C161 VEL	3C161 ERR	3C237 VEL	3C237 ERR	3C273 VEL	3C273 ERR	3C298 VEL	3C298 ERR	3C459 VEL	3C459 ERR
1			690	54			771	17	529	37						
2			778	15	467	57	515	38								
3							640	9								
4			624	25			382	6							461	63
5	499	9	426	9			476	17								
6	590	6	389	9	379	58	422	8								
7	621	25	396	62			431	67	494	18	504	11				
8	397	4	310	12	337	45	430	5			540	20				
9	516	12	323	8	214	4	446	15			519	3			572	48
10	408	5	441	7	342	67	516	11			786	32			525	9
11	536	34	357	8			398	38			490	13			459	9
12	450	4	450	11	407	23	408	6	351	70	448	80			461	6
13	352	5	383	16	371	24	361	6			455	48			516	60
14	483	6	345	8			356	6			380	92			371	4
15	515	18	398	61	441	69	273	45	327	42	417	3			356	5
16	508	26	416	19	355	23	352	24	307	64	379	4			360	40
17	415	6	405	10			234	7			381	39				
18	488	18	353	10	405	10	394	14								
19	368	4	375	11	464	11	376	11			335	6			437	45
20	386	7	337	6			395	18							402	52
21	442	6	299	12	300	47	413	28	275	3	349	20			416	12
22	515	15							355	30	390	3			311	5
23			384	16			598	14								
24	523	10			354	29	486	21			509	11				
25	503	9	487	24	386	71	472	9			538	121				
26	402	6	552	91			387	14								
27	281	6					491	33								
28	336	6					361	7	223	16					384	85
29	336	6	554	113	338	40	384	5	275	18	312	19			267	16
30	317	5					455	8			397	4	385	16	334	4
31	354	11					516	18			411	9	426	5	340	16

MAY	5 UT	LAT	DIST	DLON	15 UT	LAT	DIST	DLON	25 UT	LAT	DIST	DLON
3C48	19.	57.	0.40	33.	18.	44.	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.	0.65	-43.	21.	35.	0.56	-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.	1.03	-17.
3C273	6.	-3.	1.25	-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.	0.81	34.	16.	4.	0.90	25.	15.	3.	0.96	17.

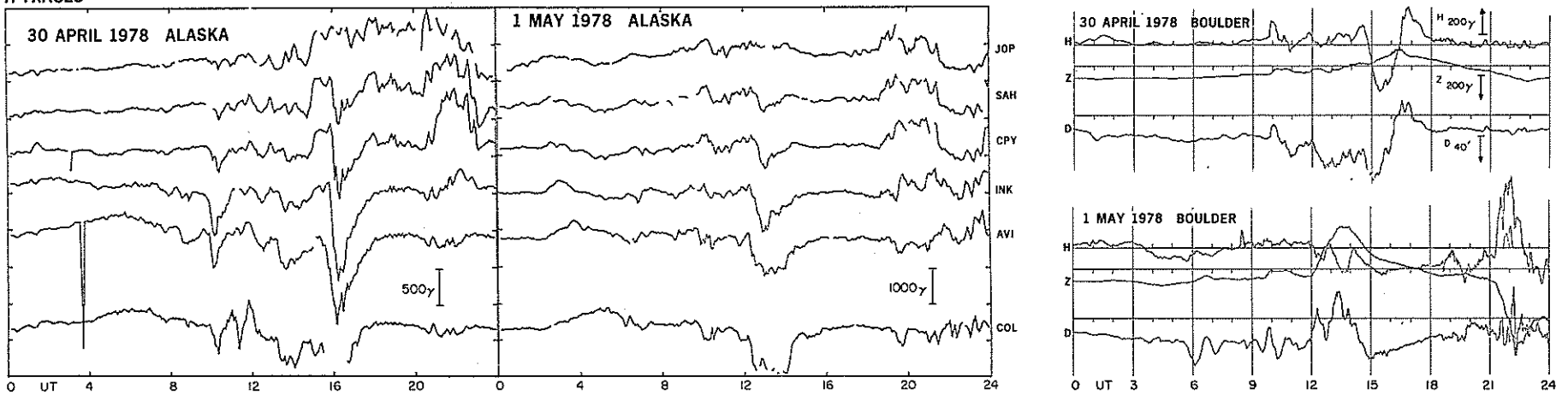
BOULDER GEOMAGNETIC SUBSTORM LOG

MAY 1978

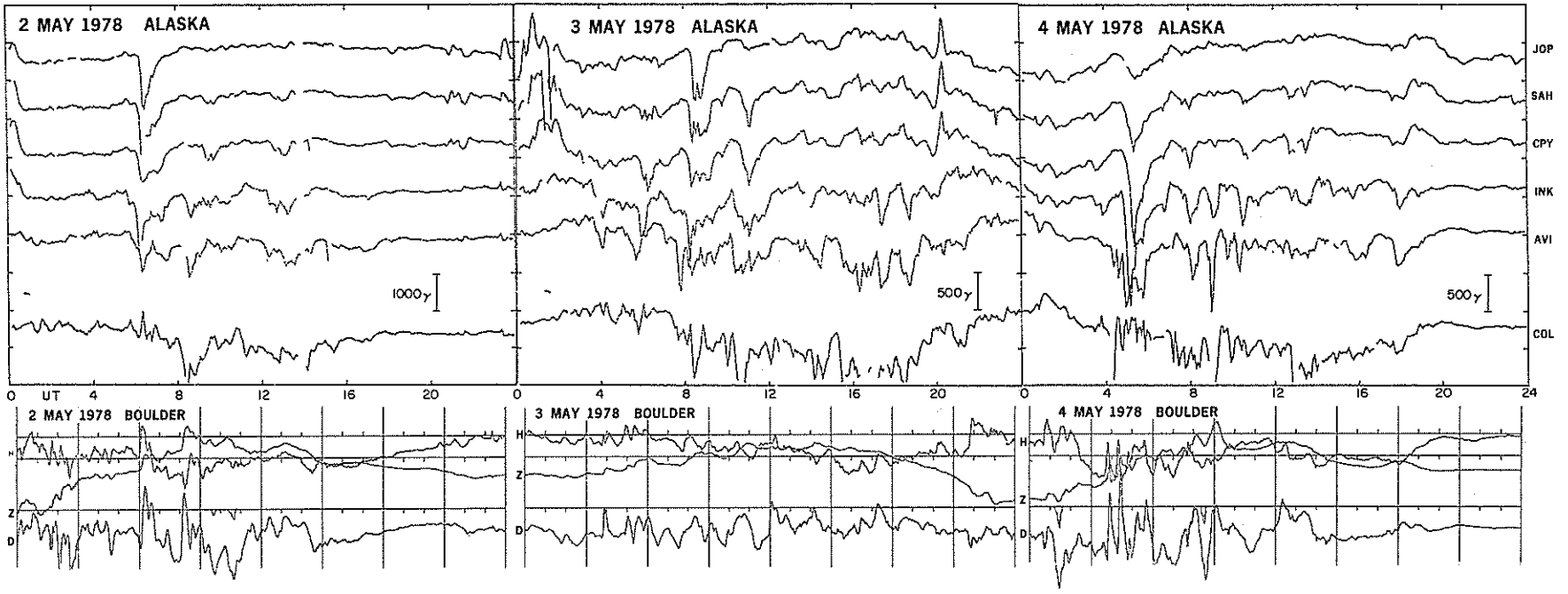
DATE	TIME OF ONSET	DIRECTION	COMMENTS
1	0230		Gradual onset of mag storm
	1205		Very intense; 140 gamma minus Z component at Boulder
	2110		Very intense; 235 gamma plus H component at Boulder 210 gamma plus Z component at Boulder
2			Mag storm continues through 1600 UT
	2310		Ssc
3			Mag storm
4			Mag storm continues through 2000 UT
5	2010		Boulder daylight; H component only at midlatitudes
	2100		Boulder daylight: H component only at midlatitudes
6			Unsettled; no distinct onsets
7	0440	East	Weak
	0540	East	
	0850	West	Weak
	1545		Boulder daylight
	1830		" "
8	1100	West	
			Midlatitude and stations north of auroral oval strongly unsettled in daylight, oval stations quiet 08/1640 UT to 09/0050 UT.
9	0050		Gradual onset of magstorm lasting through 09/1800 UT. Intense global SS detected over entire network; propagation time between Hudson Bay and Alaska of 15 minutes.
	0955		" " "
10	2005		Network in daylight; excursions most notable midlatitude and north of oval.
	2140		" " "
	2250		" " "
	2320		" " "
11	0150	East	
	0255	East	
	0345	East	
	0515	West	
	0545	West	
	0820	West	
	0940	West	
12	0045	East	1st of double onset SS-weak
	0110	East	2nd of double onset SS
	0245	East	
	0440	East	
	0540	East	
	0730	West	
	0820	West	
	1205		Boulder daylight
	1245		Boulder daylight - SS propagated slowly northward through network stations north of oval.
13	0035	East	
14	0155	East	Weak
	0940	West	Weak
			Midlatitude and stations north of auroral oval unsettled in daylight, oval stations quiet 1800-2300 UT.
15	2035		Weak - network in daylight Unsettled conditions for network, 1010-2220 UT
16	1250		Weak - onset of unsettled conditions lasting through 2300 UT
	1745		Boulder daylight
17	0405		Slow increase in H-component only at Boulder and oval stations west of Boulder
	0550	East	
	1010	West	Weak
18	0335	East	Most evident on Ft. Churchill chain
	0940	West	Weak
	1550		Network in daylight, response evident from Norman Wells through Alaska Chain
19			Network unsettled 0800-1600 UT No distinct onsets.
20	1710		Network in daylight, response evident at Pelly Bay and Arctic Village northward
	1955		Network in daylight, response evident at Eskimo Pt. northward and Cape Parry northward. Midlatitude and oval stations show only minor pertubations.
21	0245		H-component response only, mid and low latitude
	0545		" " "
	1830		Network in daylight, 1st of multiple onset
	1915		" " 2nd " "
	1935		" " 3rd " "
	1950		" " 4th " "
	2100		" " 5th " "
	2250		" "
22	0350	East	SS evident at Lynn Lake, Back, Island Lake, Tucson and Boulder only
	0940	West	1st onset, College and Talkeetna only
	1020	West	2nd onset, College, Arctic Village and Talkeetna only
	1145	West	1st onset, College, Arctic Village and Talkeetna only
	1230	West	2nd onset, Lynn Lake westward through Alaska as far north as Inuvik
	1350		Onset of multiple onset ss period lasting through 2100 UT. Activity from Back-Lynn Lake Westward through Alaska along oval
23	0600	Near center	
	1105	West	
	1610		Network in daylight
	2005		Sharp impulse observed throughout network including low latitude stations. Marks onset of unsettled field conditions
24			Generally unsettled throughout the day
	0730	West	1st of multiple onset
	0815	West	2nd of multiple onset, H-component response moderate at Honolulu, Midway and Tahiti
	0910	West	3rd of multiple onset
	0950	West	4th of multiple onset
	1140	West	1st of multiple onset, moderately strong along oval
	1215	West	2nd of multiple onset, moderately strong along oval
	1250	West	3rd of multiple onset, moderately strong along oval
	1340	West	4th of multiple onset, moderately strong along oval
	2340	East	
25	0035	East	Weak activity
	0225	East	" "
	0730	West	" "
	1255	West	" "
	2030		Beginning of unsettled conditions in network except oval stations quiet
26	0100	East	1st of double onset
	0145	East	2nd of double onset
	0535	Near center	
	0945	West	1st of multiple onset
	1020	West	2nd of multiple onset
	1110	West	3rd of multiple onset
27	0400	East	Weak ss
	0615	Near center	
	0920	West	SS seen at oval stations only
28	0910	West	1st of double onset
	0945	West	2nd of double onset
29	1825		Marked increase in H-component only at mid and low latitude stations. Pelly Bay, Sachs Harbour and Cape Parry stations become moderately disturbed
	2215		Network in daylight
30	0020	East	1st of double onset
	0050	East	2nd of double onset
	0635	West	1st of multiple onset
	0700	West	2nd of multiple onset
	0730	West	3rd of multiple onset
31	0140	East	Most distinct at mid and low latitude stations. Oval center between Inuvik and Cape Parry and between Norman Wells and Fort Simpson
	0345	East	1st of double onset - weak
	0430	East	2nd of double onset
	0720	West	Weak ss
	1150	West	Weak ss

GEOMAGNETIC ACTIVITY FOR STORMS 30 APRIL TO 4 MAY 1978

H-TRACES



5-MINUTE AVERAGES



GMS/SEM Proton, Alpha and Electron Data

The Space Environment Monitor (SEM) aboard the Japanese Geostationary Meteorological Satellite (GMS) -- "HIMAWARI" or "Sunflower" -- has 7 proton channels, 5 alpha particle channels and one electron channel. Table 1 lists the channel names and characteristics. Scanning of all channels is repeated in every 16.4 seconds.

The instrument consists of five single-detector units. Particle type/energy can be observed by a combination of moderator and detector and by appropriate pulse height discriminations. Figure 1 shows a cross-sectional view of the detector system. Geometric factors for each detector (D1-D5) can be separated into two values: 0.0421 $cm^2 \cdot$sterad for D1 and D2 with relatively narrow acceptance angle; and 0.389 $cm^2 \cdot$sterad for D3-D5 with wide acceptance angle. The characteristics of each detector and their moderators are summarized in Table 2. Each channel's detection efficiency has been calculated.

The direction of all fields of view are perpendicular to the satellite spin axis, which is parallel to the Earth's axis. The satellite spin rate is 100 rpm, and the particle accumulation time of all channels is 0.992 second. Thus, the counting rates represent an average over 1.68 satellite revolutions.

GMS was launched on July 14, 1977, and after a test operation period, continuous (24 hour a day) data acquisition began February 5, 1978. Because a special data recovery effort was made for the observations during September 18 - 26, 1977, nearly all data of that period were obtained. Some interesting September data appear in the Comprehensive Report of this SGD issue. Data quality at present is good except for some noisy channels during quiet times. The counting rate of channel P2, for example, during an undisturbed period is about 80 counts/$cm^2 \cdot$sec$\cdot$sterad -- a value that should be considered as a noise level.

On page 46, are GMS (Himawari) 2-minute average particle flux values for all channels (T. Kohno), GOES-1 x-ray plots for the May 7 proton event (via SELDADS), and stack plots for May 9. Although the flare which caused this event was not large in comparison with the April 28 flare, GMS high-energy proton channels show very clearly that the higher energy channels display a greater relative increase. Kohno noted that the noise level of the P2 channel is reduced and that this channel shows an interesting variation during the April - May events. On pages 47-50 hourly average fluxes of all 13 particle energy windows monitored by the GMS/SEM detectors are tabulated for the period April 28 - May 7, 1978.

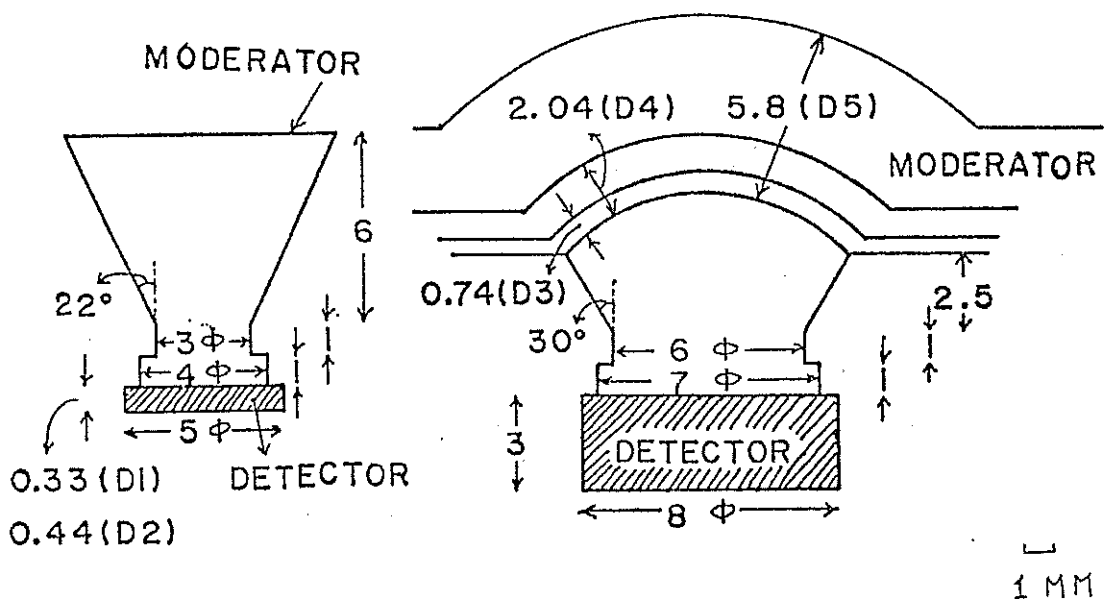


Fig. 1. Cross-sectional view of the five single-detector units of the GMS/SEM particle telescope.

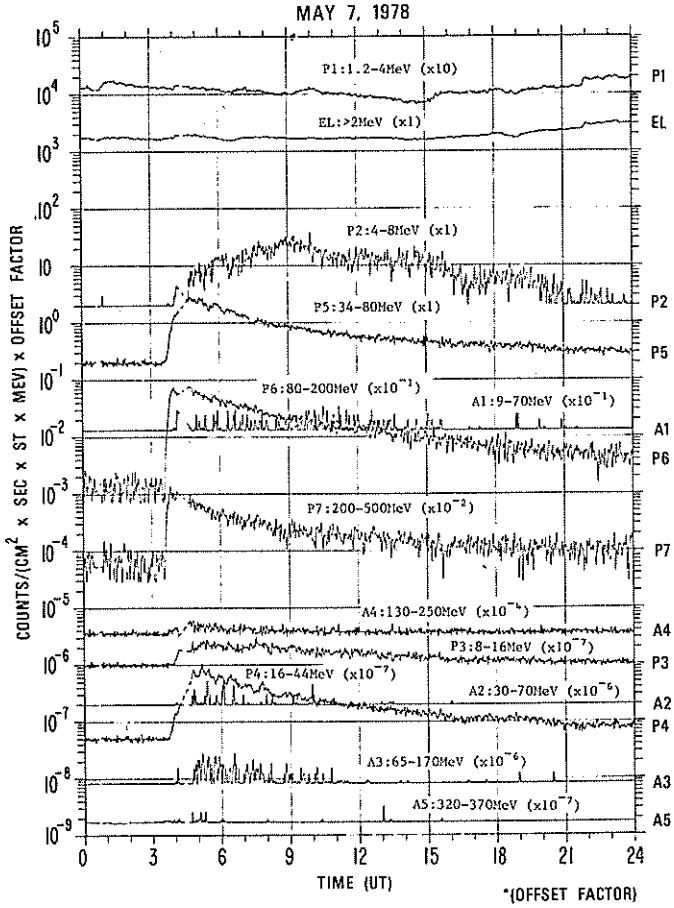
Table 1

Channel Name	Detector	Particle Type	Energy Range MeV	G-factor $cm^2 \cdot st$
P1	D1	proton	1.2 - 4	0.0421
P2	D1	proton	4 - 8	0.0421
P3	D2	proton	8 - 16	0.0421
P4	D3	proton	16 - 34	0.389
P5	D4	proton	34 - 80	0.389
P6	D5	proton	80 - 200	0.389
P7	D5	proton	200 - 500	0.389
A1	D1	alpha	9 - 70	0.0421
A2	D2	alpha	30 - 70	0.0421
A3	D3	alpha	65 - 170	0.389
A4	D4	alpha	130 - 250	0.389
A5	D5	alpha	320 - 370	0.389
EL	D3	electron	> 2	0.389

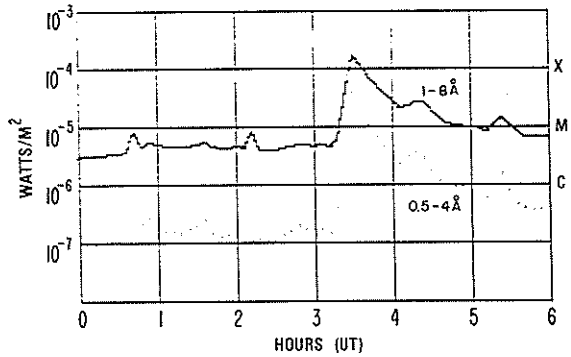
Table 2

	D1	D2	D3	D4	D5
Detector Type	surface bar.	surface bar.	Si(Li)	Si(Li)	Si(Li)
Diameter	5 mm	5 mm	8 mm	8 mm	8 mm
Thickness	0.33 mm	0.4 mm	3 mm	3 mm	3 mm
Moderator Thickness	1.1 mg/cm^2 1.25 μ	106 mg/cm^2 120 μ	200 mg/cm^2 0.74 mm	1.71 g/cm^2 2.04 mm	9.9 g/cm^2 5.8 mm
Material	Ni	Ni	Al	Cu	W
Channel Used	P1,P2,A1	P3,A2	P4,A3,EL	P5,A4	P6,P7,A5

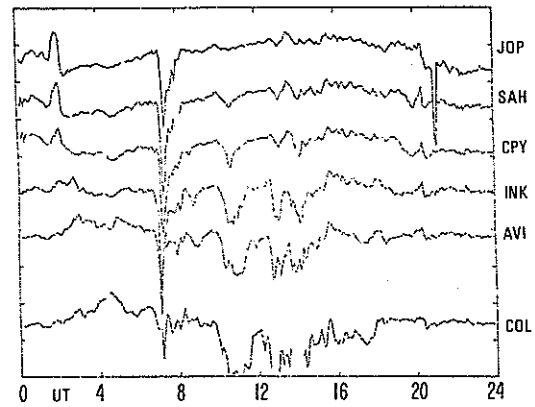
GMS/SEM TWO-MIN. AVERAGES
MAY 7, 1978



GOES-1 X-RAYS
MAY 7, 1978



ALASKA MERIDIAN MAGNETOMETER CHAIN
MAY 9, 1978 H-TRACE



5-MINUTE AVERAGES -- TICS AT 500 GAMMA INTERVALS

Errata: Several errors appeared in the information about the *IMS North American Magnetometer Network* given in the May 1978 issue of SGD, No. 405 Part I, page 39.

a.) Some satellite telemetry relay data from the network exist for the period July 1977 - January 1978. February 1978 data are not the first received at the Space Environment Laboratory.

b.) "Van Sabben 3-letter code" should read "International 3-letter code."

c.) Because the International 3-letter codes were not used in the first data set we received, NGSDC wrongly deciphered 3 station names. Please make the following changes in the station list:

"Cape Prince Alfred	CPA"	should read	"Cape Parry	CPY"
"Baker Lake	BLC"	should read	"Back	BKC"
"Norway House	NHO"	should read	"Norman Wells	NOW".

c.) Eusebio is in Brazil and San Juan is in Puerto Rico. Data from all the stations are not currently received at Boulder because either all the equipment is not yet installed or some portion of the installed equipment has failed. Although substorm activity can be variable throughout the network, the full array is being used for analysis of activity. The description of the activity (and its variability) will become more specific in the comment portion of the Substorm Log.

********** SEM HOURLY AVERAGE DATA **********

1978. 4.28. (118)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	3877.9	19.03	94.85	11.01	11.01	4.28	2.48	5.49	1.78	0.35	4.85	0.46	3445.3	168
1 - 2	3070.2	9.53	81.48	9.83	9.43	2.05	1.43	0.55	0.22	0.16	4.27	0.06	2673.1	216
2 - 3	2690.8	12.72	82.84	9.98	9.64	1.98	1.55	1.50	0.21	0.16	4.35	0.09	2641.6	224
3 - 4	1473.9	11.31	82.14	9.91	9.38	2.18	1.62	0.78	0.44	0.08	4.36	0.04	1420.[illegible]	216
4 - 5	1085.0	7.87	81.59	9.95	9.51	2.20	1.43	0.78	0.11	0.05	4.38	0.05	1031.2	216
5 - 6	946.5	6.84	81.67	9.68	9.27	1.92	1.28	1.07	0.32	0.03	4.35	0.06	896.[illegible]	224
6 - 7	906.3	5.65	80.70	9.57	9.35	1.85	1.73	0.22	0.11	0.05	4.32	0.10	858.7	216
7 - 8	789.0	4.81	82.31	9.54	9.37	1.82	1.42	0.75	0.11	0.05	4.40	0.01	793.9	224
8 - 9	716.9	7.32	80.70	9.47	9.96	1.88	1.57	0.78	0.11	0.07	4.31	0.05	615.[illegible]	216
9 - 10	918.8	5.02	81.03	9.44	9.21	1.94	1.45	0.43	0.0	0.05	4.33	0.07	693.4	224
10 - 11	818.3	4.99	80.92	9.45	9.36	2.09	1.42	0.33	0.0	0.02	4.38	0.10	650.2	216
11 - 12	654.1	6.09	80.81	9.53	9.31	1.90	1.43	0.75	0.21	0.02	4.38	0.05	562.[illegible]	224
12 - 13	702.7	8.98	80.59	9.57	9.19	1.98	1.55	0.33	0.22	0.05	4.32	0.05	531.6	216
13 - 14	961.4	2.03	81.13	9.36	9.31	1.90	1.39	0.53	0.11	0.08	4.32	0.10	550.[illegible]	224
14 - 15	997.0	3.55	80.04	9.48	9.48	2.03	1.36	0.22	0.11	0.04	4.33	0.02	587.[illegible]	
15 - 16	1049.7	3.10	81.13	10.10	9.85	2.82	1.63	0.53	0.0	0.03	4.30	0.10	615.5	224
16 - 17	1055.6	2.99	85.36	12.21	10.78	3.29	2.22	0.55	0.0	0.05	4.42	0.08	643.3	216
17 - 18	975.0	6.02	86.37	14.09	11.83	4.47	2.48	0.21	0.11	0.08	4.42	0.06	651.7	224
18 - 19	966.6	10.53	93.23	16.32	12.90	5.43	3.07	0.78	0.22	0.11	4.43	0.12	635.8	216
19 - 20	989.9	33.92	108.25	20.83	14.10	7.11	3.50	1.55	0.67	0.22	4.39	0.13	689.4	216
20 - 21	1350.3	44.04	114.70	23.65	15.29	7.84	3.82	1.82	1.07	0.23	4.47	0.15	715.2	224
21 - 22	1765.7	26.27	107.20	24.31	16.39	9.19	4.43	1.33	1.22	0.31	4.43	0.10	935.6	216
22 - 23	1794.8	34.31	119.30	27.26	17.66	10.31	4.64	2.57	0.64	0.30	4.48	0.12	1105.2	224
23 - 24	1901.2	82.03	141.62	30.35	18.72	11.10	4.31	4.32	1.44	0.47	4.43	0.19	1271.[illegible]	216

********** SEM HOURLY AVERAGE DATA **********

1978. 4.29. (119)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	2082.0	82.81	136.18	32.49	19.65	11.78	4.72	3.42	1.00	0.37	4.43	0.11	1349.5	168
1 - 2	2311.1	60.69	127.48	30.10	20.22	11.59	4.91	3.21	1.33	0.59	4.49	0.17	1248.9	216
2 - 3	2316.8	63.87	136.38	34.33	20.95	12.16	4.84	3.63	2.24	0.52	4.48	0.15	1302.2	224
3 - 4	2172.3	62.41	145.50	40.46	22.75	12.23	4.95	5.10	2.77	0.64	4.50	0.16	1234.7	216
4 - 5	2145.3	75.40	156.21	49.70	24.83	12.93	4.44	5.42	3.42	0.71	4.47	0.15	1225.8	84
5 - 6	1912.1	74.76	159.85	53.45	28.24	12.71	5.05	8.54	4.95	0.96	4.47	0.09	1014.1	213
6 - 7	1941.4	52.10	135.38	46.80	26.75	13.21	4.70	6.41	4.28	0.86	4.59	0.13	908.5	224
7 - 8	1933.7	68.84	168.00	60.32	28.59	12.83	4.55	6.98	4.66	1.04	4.62	0.14	943.7	216
8 - 9	1744.7	96.74	160.18	58.46	27.92	11.56	4.80	9.41	3.85	0.98	4.58	0.10	1001.2	224
9 - 10	1536.9	180.80	207.13	74.49	30.28	12.26	4.73	11.31	3.99	1.32	4.70	0.20	1023.6	216
10 - 11	1424.9	148.38	194.11	71.59	31.42	12.39	4.27	10.97	4.32	1.27	4.65	0.08	1015.5	216
11 - 12	1511.9	188.40	215.13	79.55	32.05	11.82	4.40	13.47	4.60	1.47	4.60	0.17	1141.0	224
12 - 13	1458.8	192.22	228.03	84.97	33.05	11.83	4.82	11.75	5.99	1.44	4.53	0.11	1119.0	216
13 - 14	1526.5	180.17	235.92	97.59	35.53	11.67	4.73	15.07	3.31	1.28	4.56	0.08	1118.6	224
14 - 15	1715.[illegible]	136.24	211.79	94.71	35.58	12.50	4.45	12.97	2.88	1.40	4.46	0.12	1124.9	216
15 - 16	1908.7	117.48	220.90	96.04	35.74	11.05	3.79	13.15	5.56	1.39	4.60	0.13	1193.0	224
16 - 17	1863.9	136.96	235.29	103.48	36.62	11.24	3.98	12.42	5.43	1.63	4.62	0.14	1189.6	[illegible]
17 - 18	1696.6	188.56	256.87	114.49	37.48	11.33	3.97	16.46	4.28	1.78	4.67	0.09	1184.3	224
18 - 19	1858.4	243.44	282.51	116.90	38.09	10.66	3.73	19.07	5.21	1.72	4.61	0.11	1156.6	216
19 - 20	1926.7	311.97	313.31	124.00	37.95	10.60	3.89	18.17	7.27	2.02	4.62	0.09	1301.6	224
20 - 21	2230.4	321.70	302.30	111.34	35.09	9.71	3.37	19.95	7.54	1.84	4.55	0.08	1375.5	216
21 - 22	2536.1	389.18	324.08	112.66	35.58	10.37	3.26	20.63	8.50	1.66	4.63	0.13	1602.0	217
22 - 23	2753.2	368.98	304.63	107.90	35.11	9.28	3.44	22.95	6.87	1.73	4.55	0.11	1611.6	216
23 - 24	3268.4	333.84	305.85	105.02	34.17	9.66	3.18	21.39	7.32	1.79	4.64	0.13	1898.7	216

********** SEM HOURLY AVERAGE DATA **********

1978. 4.30. (120)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	3967.5	344.64	303.05	107.37	34.90	8.93	3.56	23.16	7.25	1.92	4.48	0.12	2176.6	304
1 - 2	5789.7	407.72	293.65	100.30	33.66	9.18	3.54	26.27	8.42	1.56	4.55	0.13	2194.7	216
2 - 3	4994.1	346.13	302.30	108.08	33.58	9.04	3.22	22.02	7.16	1.90	4.48	0.13	2511.3	224
3 - 4	4714.9	527.22	339.82	112.20	33.02	8.99	3.84	25.72	8.20	1.76	4.67	0.14	2469.6	216
4 - 5	4095.0	527.42	324.37	105.33	32.50	7.64	3.46	22.51	8.46	1.76	4.54	0.10	2229.1	150
5 - 6	4224.0	1095.79	469.58	125.92	31.89	7.97	3.24	50.55	9.64	1.78	4.62	0.08	1142.5	216
6 - 7	5064.3	1202.78	423.20	115.13	31.66	7.76	2.48	41.53	7.38	1.79	4.58	0.06	552.3	224
7 - 8	6156.8	1252.65	434.66	113.90	31.51	8.22	3.04	42.12	8.20	1.44	4.53	0.08	436.8	216
8 - 9	6083.0	1208.34	413.58	114.16	31.02	8.29	2.86	39.55	9.19	1.75	4.49	0.10	356.9	224
9 - 10	12417.0	1325.48	423.02	115.25	29.95	7.50	2.80	49.88	8.87	1.69	4.59	0.07	383.4	216
10 - 11	14401.8	2135.34	668.20	182.90	37.89	7.62	2.86	68.57	13.47	2.22	4.49	0.12	277.3	224
11 - 12	13055.5	2212.21	672.77	181.26	37.48	6.74	2.59	65.13	12.86	2.58	4.49	0.07	258.8	216
12 - 13	11531.0	2265.75	699.74	172.24	34.94	6.80	2.46	70.66	11.54	2.22	4.45	0.09	271.4	224
13 - 14	11772.3	2233.05	760.00	214.82	39.05	5.68	2.45	73.94	13.86	2.34	4.48	0.04	422.5	216
14 - 15	10917.4	2378.93	926.52	289.66	44.78	5.51	2.32	91.84	16.41	3.05	4.59	0.08	490.5	216
15 - 16	13617.6	2680.93	924.11	276.73	42.19	5.61	2.24	94.76	17.42	2.92	4.56	0.15	417.3	224
16 - 17	12229.9	2660.95	1165.08	392.50	55.61	5.92	2.33	113.74	24.83	3.43	4.48	0.08	515.8	216
17 - 18	9365.7	2764.74	1338.97	478.86	66.84	6.27	2.46	127.15	29.50	4.11	4.57	0.07	567.3	224
18 - 19	8744.6	2524.82	1207.65	441.36	64.80	5.75	2.51	122.99	26.38	3.95	4.55	0.16	550.8	216
19 - 20	8059.0	2219.14	1119.41	455.95	68.51	6.00	2.44	114.61	25.87	4.11	4.51	0.07	565.7	224
20 - 21	9447.0	2805.50	1418.93	553.85	79.18	6.84	2.45	143.78	30.04	5.11	4.69	0.11	654.0	216
21 - 22	8958.7	2903.27	1662.96	639.53	86.85	6.66	3.10	167.77	37.84	5.47	4.60	0.08	726.5	224
22 - 23	13543.3	3032.09	1585.86	616.04	88.60	6.53	3.00	166.78	35.58	5.64	4.61	0.18	717.6	216
23 - 24	10970.9	2537.69	1105.72	461.09	80.20	7.14	2.86	130.36	28.22	4.96	4.59	0.06	628.6	224

* SPL = Number of data points (Sampling number) per hour
Blank = no data

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 1. (121)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	9990.0	2078.04	999.40	454.30	84.14	6.74	3.13	114.09	30.22	5.26	4.60	0.12	669.5	168
1 - 2	8093.2	1741.75	949.02	463.68	79.98	7.09	2.52	105.99	30.04	5.07	4.52	0.20	618.4	224
2 - 3	6997.6	1773.23	1064.64	495.30	76.45	7.55	2.77	112.91	28.71	4.92	4.59	0.10	606.4	216
3 - 4	6251.2	2315.78	1350.87	538.65	81.05	7.57	2.73	138.11	32.07	4.75	4.64	0.09	607.3	224
4 - 5	7023.1	2431.64	1331.89	514.24	80.30	7.35	2.68	133.39	35.39	4.79	4.61	0.21	548.9	113
5 - 6	7627.2	2449.44	1272.39	477.25	70.48	8.03	2.90	127.15	32.48	4.39	4.56	0.12	477.8	216
6 - 7	8036.8	2330.74	1185.04	443.69	69.89	7.65	2.58	125.66	28.86	4.43	4.62	0.19	455.7	224
7 - 8	8610.3	2336.36	1142.46	445.82	75.37	7.71	2.99	144.06	27.38	5.21	4.80	0.11	453.8	216
8 - 9	9350.9	2253.76	1118.95	438.29	77.42	8.60	2.93	150.22	29.25	5.27	4.81	0.07	447.7	221
9 - 10	9510.9	2302.67	1166.41	441.93	71.30	7.93	2.65	131.86	29.15	4.07	4.63	0.08	440.4	216
10 - 11	10896.5	2370.51	1215.40	468.12	76.91	7.25	2.57	135.65	32.60	4.79	4.75	0.10	476.3	224
11 - 12	7075.6	1890.95	1020.52	383.53	62.42	7.75	2.41	122.49	24.06	4.44	4.75	0.13	397.3	216
12 - 13	7753.8	2176.39	937.26	302.69	52.13	9.93	2.82	216.89	30.47	5.01	4.74	0.14	351.7	224
13 - 14	6029.1	1316.51	624.11	202.30	42.18	10.17	2.70	129.09	20.40	3.32	4.76	0.06	240.2	216
14 - 15	4450.3	949.44	482.58	155.28	37.61	9.11	1.96	90.33	18.49	2.71	4.51	0.14	182.3	224
15 - 16	4443.8	944.69	492.86	161.99	36.47	8.32	2.22	97.27	15.74	2.59	4.63	0.08	189.4	216
16 - 17	4371.6	968.36	492.15	159.23	34.64	7.61	2.20	107.38	15.61	2.83	4.52	0.03	197.1	[illegible]
17 - 18	4578.3	1056.77	511.81	158.48	35.17	7.94	2.20	106.31	16.52	2.94	4.70	0.12	211.5	216
18 - 19	6152.3	1360.23	567.19	177.12	38.56	7.99	2.17	150.72	17.53	3.75	4.67	0.06	249.2	224
19 - 20	9969.3	1971.54	684.41	172.04	30.55	5.41	1.76	225.75	22.73	3.11	4.56	0.05	248.7	216
20 - 21	8006.6	2312.20	805.02	189.46	32.04	4.88	1.74	275.20	30.04	3.89	4.56	0.05	256.5	216
21 - 22	6718.2	1879.00	636.13	152.43	27.64	5.18	1.50	212.29	22.66	3.16	4.53	0.08	213.4	224
22 - 23	5436.7	1349.32	441.26	96.69	20.10	3.85	1.28	172.88	14.97	2.15	4.40	0.05	128.9	216
23 - 24	6574.5	1463.82	404.49	81.75	17.63	3.40	1.47	221.65	16.68	1.92	4.44	0.01	112.9	224

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 2. (122)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	4019.3	769.36	277.86	55.88	15.40	2.67	1.26	122.93	9.12	1.34	4.46	0.05	84.2	168
1 - 2	3075.2	725.39	270.02	56.38	15.66	3.15	1.12	102.83	9.19	1.02	4.52	0.10	84.5	224
2 - 3	3367.1	721.24	264.96	52.49	15.29	2.74	1.19	95.27	7.83	1.25	4.40	0.05	85.9	216
3 - 4	3508.3	573.56	224.37	48.30	15.27	2.53	1.08	80.48	7.65	1.04	4.34	0.04	94.2	216
4 - 5	2664.2	461.99	228.53	45.88	14.86	2.52	0.99	70.78	7.04	0.91	4.42	0.08	88.0	[illegible]
5 - 6	2543.4	431.18	199.09	40.93	14.18	2.46	1.17	57.37	5.23	0.86	4.39	0.07	72.0	[illegible]
6 - 7	3218.8	569.46	225.87	42.90	14.37	1.91	1.02	70.06	6.76	0.84	4.40	0.13	64.5	216
7 - 8	2608.2	538.64	220.10	43.07	13.89	2.43	1.01	68.09	7.38	0.91	4.43	0.03	59.0	224
8 - 9	2854.7	501.95	204.25	39.14	13.56	2.10	0.97	58.53	6.43	0.82	4.32	0.04	87.6	216
9 - 10	2562.1	484.43	201.15	39.57	13.22	2.36	0.96	60.47	5.32	0.73	4.45	0.06	88.5	216
10 - 11	7193.2	468.79	200.70	39.36	13.05	1.85	1.04	51.31	4.81	0.65	4.41	0.09	238.4	224
11 - 12	4032.0	410.66	186.90	37.18	12.89	1.94	1.00	50.88	5.76	0.83	4.38	0.04	296.9	216
12 - 13	2683.9	411.07	179.37	34.27	12.85	2.12	1.04	49.17	4.38	0.51	4.35	0.06	217.8	224
13 - 14	2281.4	423.24	185.90	34.59	12.81	2.21	0.92	47.89	5.43	0.78	4.37	0.07	67.0	216
14 - 15	6264.5	397.81	178.78	33.69	12.42	1.79	1.23	45.43	3.63	0.54	4.35	0.01	359.2	[illegible]
15 - 16	3669.3	301.80	170.49	32.05	11.97	1.88	1.34	40.91	3.66	0.36	4.38	0.04	513.5	216
16 - 17	2923.4	305.77	165.95	31.34	11.70	1.78	1.02	40.35	3.10	0.53	4.40	0.07	452.4	224
17 - 18	4227.5	251.53	155.92	27.11	11.43	2.00	1.08	36.14	2.22	0.40	4.30	0.07	439.8	216
18 - 19	6215.3	171.41	130.52	24.87	11.43	1.57	1.30	34.31	1.82	0.31	4.43	0.02	468.5	224
19 - 20	4959.6	85.19	117.78	23.23	10.99	2.05	1.15	22.06	2.00	0.52	4.38	0.07	579.6	216
20 - 21	4234.8	76.25	123.04	22.45	10.90	1.72	1.31	19.24	2.46	0.35	4.30	0.08	657.7	224
21 - 22	4573.0	107.75	122.99	22.18	10.81	1.80	1.18	24.50	2.77	0.40	4.33	0.06	651.7	216
22 - 23	8332.7	102.51	113.74	19.70	10.72	1.82	1.09	21.27	1.60	0.27	4.33	0.06	690.4	224
23 - 24	30253.9	170.83	109.97	17.11	10.15	1.55	1.18	20.06	1.66	0.31	4.37	0.10	2379.6	216

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 3. (123)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	31015.6	88.37	90.08	13.86	9.89	1.42	1.26	11.69	1.00	0.19	4.30	0.11	3175.5	168
1 - 2	13822.8	58.58	105.51	16.46	10.01	1.41	1.30	12.40	2.78	0.21	4.36	0.06	2075.3	224
2 - 3	9776.9	75.05	103.82	15.19	9.95	1.48	1.10	12.86	1.44	0.18	4.36	0.11	1539.6	216
3 - 4	9594.9	86.42	106.73	15.97	9.86	1.67	1.24	15.18	1.50	0.19	4.34	0.02	1706.9	224
4 - 5	23709.3	131.28	106.50	16.10	9.89	1.46	1.26	17.07	1.04	0.27	4.37	0.09	2141.5	115
5 - 6	11410.4	82.47	98.93	13.67	9.51	1.45	1.19	11.22	0.86	0.12	4.30	0.05	1739.6	224
6 - 7	11582.5	79.21	96.78	14.07	9.90	1.62	1.19	12.30	2.00	0.23	4.31	0.05	2582.3	216
7 - 8	4612.4	113.48	106.68	15.02	9.68	1.48	1.12	15.85	1.57	0.21	4.29	0.04	1273.8	213
8 - 9	3408.1	117.06	101.76	14.77	9.59	1.56	1.20	15.52	1.33	0.16	4.30	0.02	1285.9	216
9 - 10	5529.0	104.12	101.39	13.78	9.56	1.38	1.16	11.54	0.86	0.10	4.36	0.08	2753.3	224
10 - 11	4224.0	64.46	94.95	11.85	9.25	1.36	1.39	6.87	0.78	0.08	4.33	0.08	3263.3	216
11 - 12	896.3	69.27	93.11	12.20	9.32	1.28	1.03	6.41	0.53	0.08	4.32	0.03	345.1	224
12 - 13	1182.5	56.04	92.45	11.51	9.26	1.36	1.09	5.21	0.33	0.07	4.32	0.08	1073.1	216
13 - 14	1381.1	35.38	88.83	11.14	9.28	1.32	1.31	3.96	0.43	0.03	4.29	0.03	1244.4	224
14 - 15	260.7	16.52	84.25	10.26	9.25	1.26	0.86	1.55	0.44	0.02	4.33	0.08	226.5	216
15 - 16	8304.0	10.20	83.14	9.68	9.06	1.38	1.27	1.00	0.44	0.08	4.28	0.06	1940.5	216
16 - 17	3526.3	18.39	85.73	9.94	9.19	1.39	1.52	2.46	0.21	0.02	4.30	0.03	2233.4	224
17 - 18	3050.0	19.62	85.47	10.23	9.15	1.28	1.37	1.66	0.22	0.02	4.28	0.08	1444.7	216
18 - 19	2504.3	20.74	83.38	10.42	9.32	1.39	1.56	1.92	0.53	0.06	4.29	0.03	2289.9	224
19 - 20	3071.1	27.49	86.58	11.03	9.33	1.54	1.73	3.33	0.33	0.11	4.30	0.02	2572.4	216
20 - 21	26120.9	13.58	84.55	10.02	9.15	1.31	1.96	1.50	0.53	0.06	4.32	0.01	2243.9	224
21 - 22	18381.0	10.86	82.36	9.80	9.25	1.38	1.98	1.00	0.11	0.01	4.27	0.05	4442.5	216
22 - 23	26309.7	11.76	81.45	9.89	9.10	1.23	2.05	1.39	0.43	0.03	4.28	0.07	4757.1	224
23 - 24	22922.4	6.21	83.69	9.38	9.15	1.34	2.29	0.55	0.55	0.02	4.32	0.02	6995.7	216

* SPL = Number of data points (Sampling number) per hour
Blank = no data

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 4. (124)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	9745.4	8.27	81.67	9.26	9.29	1.26	1.79	0.57	0.86	0.05	4.26	0.03	5946.5	168
1 - 2	2781.0	5.88	81.37	9.38	8.99	1.27	1.31	1.00	0.0	0.05	4.32	0.08	1386.3	216
2 - 3	2881.3	6.31	81.67	9.47	9.08	1.40	1.13	0.53	0.0	0.02	4.32	0.02	1043.1	224
3 - 4	287.3	4.55	80.92	9.38	9.01	1.34	1.19	0.67	0.0	0.0	4.28	0.05	367.2	216
4 - 5	227.9	6.29	80.51	9.23	9.10	1.49	0.97	0.60	0.0	0.03	4.34	0.0	283.2	80
5 - 6	510.1	5.65	80.70	9.32	8.99	1.42	0.97	0.55	0.11	0.06	4.31	0.02	452.5	216
6 - 7	229.9	6.98	81.46	9.26	9.07	1.32	1.00	0.44	0.22	0.01	4.38	0.05	162.8	216
7 - 8	265.8	9.73	81.45	9.39	9.16	1.47	1.09	0.32	0.21	0.03	4.33	0.03	273.8	224
8 - 9	229.7	11.42	81.15	9.49	9.03	1.44	1.27	1.11	0.0	0.04	4.30	0.08	119.9	216
9 - 10	327.2	9.19	80.92	9.34	9.13	1.48	1.16	0.86	0.21	0.05	4.33	0.05	152.8	224
10 - 11	147.6	13.41	81.81	9.38	9.17	1.28	0.76	0.89	0.11	0.04	4.32	0.06	23.1	216
11 - 12	151.2	17.32	82.95	9.57	9.21	1.57	1.17	1.28	0.43	0.05	4.35	0.02	16.0	224
12 - 13	148.2	12.08	82.70	9.59	8.89	1.61	1.08	0.55	0.11	0.0	4.28	0.06	17.2	216
13 - 14	476.3	11.61	82.52	9.35	9.09	1.57	1.02	1.07	0.21	0.01	4.32	0.02	103.9	224
14 - 15	1251.9	9.53	81.48	9.43	9.20	1.49	1.19	0.89	0.0	0.04	4.31	0.05	270.8	216
15 - 16	736.2	8.34	81.67	9.32	9.16	1.41	0.93	0.96	0.0	0.06	4.35	0.05	205.4	224
16 - 17	836.4	8.20	82.25	9.41	9.02	1.27	1.19	0.67	0.0	0.04	4.32	0.10	188.3	216
17 - 18	2564.6	5.34	80.81	9.21	9.01	1.33	1.20	1.07	0.0	0.02	4.32	0.02	352.2	224
18 - 19	4085.6	8.09	81.48	9.41	9.06	1.31	1.39	0.89	0.78	0.02	4.33	0.04	460.2	216
19 - 20	5360.2	6.20	80.49	9.22	9.08	1.30	1.34	0.75	0.32	0.05	4.32	0.03	486.8	224
20 - 21	5266.5	4.88	81.03	9.30	9.07	1.81	1.19	1.11	0.44	0.01	4.37	0.05	520.4	216
21 - 22	6472.6	4.10	79.93	9.20	9.13	1.33	1.45	0.78	0.44	0.05	4.33	0.05	646.4	216
22 - 23	7193.6	2.78	80.28	9.30	9.07	1.31	1.46	0.53	0.21	0.09	4.33	0.02	730.8	224
23 - 24	8661.3	3.33	81.03	9.20	9.21	1.36	1.14	0.55	0.33	0.02	4.33	0.06	879.6	216

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 5. (125)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	6764.8	1.36	81.36	9.04	8.94	1.35	1.33	0.82	0.0	0.01	4.34	0.09	912.3	176
1 - 2	10135.2	2.44	79.93	9.25	9.08	1.70	1.31	0.67	0.55	0.07	4.32	0.01	993.2	216
2 - 3	11769.6	3.85	80.49	9.24	9.10	1.37	1.31	0.53	1.07	0.03	4.30	0.05	1129.8	224
3 - 4	12631.6	3.66	80.92	9.12	9.11	1.57	1.37	0.44	0.55	0.06	4.34	0.05	1126.4	216
4 - 5	11337.7	4.92	78.89	9.12	8.91	1.55	1.11	0.43	0.43	0.0	4.37	0.07	974.6	112
5 - 6	9769.8	4.21	80.37	9.19	9.25	1.46	1.21	0.55	0.22	0.04	4.37	0.05	773.4	216
6 - 7	8543.1	2.03	80.39	9.16	9.04	1.58	1.10	0.75	0.75	0.05	4.36	0.02	621.9	224
7 - 8	6873.4	1.33	79.15	9.00	9.23	1.49	1.16	0.44	0.67	0.05	4.31	0.05	609.7	216
8 - 9	6199.9	1.28	79.53	9.08	8.99	1.64	1.18	0.53	0.21	0.09	4.32	0.05	576.8	224
9 - 10	6213.6	0.55	79.48	8.93	8.97	1.39	1.14	0.11	0.11	0.04	4.33	0.06	555.8	216
10 - 11	5598.1	1.55	79.82	8.88	9.03	1.56	1.15	0.44	0.11	0.04	4.33	0.06	512.2	216
11 - 12	5271.2	0.75	79.53	8.88	9.04	1.68	1.15	0.32	0.32	0.0	4.32	0.05	485.7	224
12 - 13	5438.5	1.11	79.48	8.88	9.06	1.28	1.33	0.0	0.33	0.0	4.30	0.04	514.5	216
13 - 14	5426.9	0.96	79.53	8.90	8.94	1.75	1.38	0.11	0.21	0.03	4.35	0.08	541.8	224
14 - 15	5284.2	0.22	79.59	8.93	9.02	1.62	1.55	0.33	0.67	0.04	4.34	0.07	550.8	[illegible]
15 - 16	5613.3	0.43	79.10	8.84	9.24	1.54	1.26	0.21	0.21	0.02	4.32	0.06	588.1	224
16 - 17	5773.7	0.22	79.26	8.90	9.00	1.32	1.27	0.0	0.0	0.02	4.30	0.02	606.4	216
17 - 18	6189.7	0.43	79.32	8.80	9.04	1.77	1.19	0.11	0.21	0.03	4.32	0.03	653.8	224
18 - 19	5956.4	0.33	79.59	8.95	9.09	1.62	1.32	0.22	0.22	0.04	4.31	0.10	659.8	216
19 - 20	6227.3	0.11	79.21	8.86	8.99	1.47	1.31	0.11	0.21	0.06	4.26	0.07	693.4	224
20 - 21	6149.8	0.33	79.37	8.93	9.14	1.24	1.57	0.22	0.22	0.06	4.30	0.06	675.2	216
21 - 22	5014.7	4.49	80.17	9.14	9.09	1.67	1.28	0.11	0.32	0.03	4.30	0.03	704.3	224
22 - 23	5972.4	2.22	79.26	9.03	9.08	1.76	1.55	0.22	0.67	0.06	4.31	0.01	1088.6	216
23 - 24	5729.6	0.86	79.21	9.00	9.12	1.62	1.20	0.32	0.43	0.03	4.32	0.08	1226.1	224

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 6. (126)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	5401.9	0.45	79.62	8.94	9.07	1.44	1.55	0.15	0.15	0.05	4.32	0.02	1264.9	160
1 - 2	5881.9	0.78	79.26	8.94	9.09	1.51	1.64	0.55	0.33	0.04	4.39	0.06	1357.2	216
2 - 3	6465.0	0.43	78.89	8.84	9.14	1.74	1.65	0.43	0.53	0.03	4.28	0.09	1460.0	224
3 - 4	7419.7	0.67	79.15	8.91	8.99	1.57	1.33	0.33	0.44	0.02	4.34	0.05	1702.9	216
4 - 5	6708.0	0.65	78.63	9.07	9.07	1.33	1.79	0.65	0.0	0.07	4.27	0.11	1665.6	74
5 - 6	5426.1	0.43	78.88	8.83	9.02	1.57	1.65	0.43	0.76	0.02	4.33	0.07	1455.5	221
6 - 7	4676.0	0.21	79.64	8.85	8.94	1.61	1.83	0.11	0.21	0.05	4.32	0.05	1352.5	224
7 - 8	4170.3	0.22	79.26	8.95	9.15	1.61	1.72	0.11	0.22	0.01	4.30	0.06	1276.5	216
8 - 9	4593.9	0.75	79.64	8.78	9.02	1.64	1.46	0.43	0.21	0.05	4.28	0.06	1310.8	224
9 - 10	3871.0	1.00	78.93	9.01	8.99	1.67	1.66	0.22	1.00	0.04	4.31	0.05	1176.9	216
10 - 11	3754.6	1.07	79.21	8.95	9.15	1.68	1.43	0.21	0.96	0.03	4.30	0.03	1133.6	224
11 - 12	3358.0	0.55	79.15	8.88	9.15	1.64	1.76	0.44	0.44	0.01	4.31	0.07	1130.9	216
12 - 13	3055.9	0.53	79.96	9.02	9.07	1.62	1.87	0.53	0.32	0.03	4.36	0.08	1323.7	224
13 - 14	2897.1	0.44	79.59	9.11	9.20	1.24	2.00	0.11	0.44	0.06	4.32	0.04	1423.5	[illegible]
14 - 15	2937.1	1.28	79.53	9.10	8.99	1.67	1.96	0.43	0.21	0.02	4.33	0.09	1440.5	224
15 - 16	2982.0	0.33	79.70	9.01	9.15	1.98	2.04	0.0	0.0	0.01	4.32	0.06	1491.4	216
16 - 17	3088.0	0.33	79.26	8.95	8.99	1.56	1.96	0.0	0.33	0.04	4.31	0.01	1493.2	216
17 - 18	3217.1	0.96	79.21	8.92	9.10	1.69	1.90	0.21	0.32	0.02	4.36	0.07	1513.6	224
18 - 19	3226.3	0.89	79.70	8.87	9.01	1.25	1.90	0.44	0.0	0.0	4.28	0.02	1544.7	216
19 - 20	3421.1	0.96	79.74	8.93	9.08	1.60	1.93	0.32	0.64	0.09	4.32	0.09	1582.5	224
20 - 21	3792.5	0.22	79.48	9.00	9.07	1.70	2.09	0.11	0.67	0.01	4.31	0.05	1635.9	216
21 - 22	3740.9	1.18	79.85	9.10	9.27	1.60	2.06	0.86	0.86	0.03	4.33	0.07	1639.7	224
22 - 23	4220.0	1.77	79.93	8.96	8.99	1.56	2.22	0.55	0.55	0.04	4.37	0.04	1765.3	216
23 - 24	3916.6	0.64	79.53	8.98	9.20	1.72	2.09	0.11	1.07	0.03	4.34	0.05	1880.4	224

* SPL = Number of data points (Sampling number) per hour
Blank = no data

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 7. (127)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	3730.8	1.85	80.39	9.04	9.21	1.73	2.13	0.43	1.28	0.05	4.33	0.12	1754.5	[illegible]
1 - 2	4585.4	1.39	79.96	9.12	9.23	1.65	2.13	0.86	0.96	0.09	4.32	0.03	1800.7	[illegible]
2 - 3	4000.1	1.33	79.59	9.12	9.23	1.49	1.62	0.44	0.55	0.04	4.36	0.0	1717.0	[illegible]
3 - 4	3692.6	1.28	82.10	11.57	15.66	19.85	11.07	0.96	0.75	0.12	4.45	0.19	1695.3	[illegible]
4 - 5	3666.8	21.66	148.46	95.52	104.24	79.51	23.04	7.30	6.64	1.09	5.82	0.69	1917.1	105
5 - 6	3541.7	37.09	162.84	124.25	99.63	61.00	15.67	7.27	6.73	1.61	5.54	0.44	1838.6	224
6 - 7	3219.2	45.78	161.63	91.79	72.55	45.69	11.72	6.98	6.98	1.06	5.03	0.34	1632.1	216
7 - 8	3310.6	65.65	175.76	72.49	52.49	37.10	10.04	8.09	4.55	1.28	4.99	0.32	1766.7	216
8 - 9	2891.3	87.23	155.16	54.80	42.13	27.44	7.04	5.88	3.21	0.76	4.85	0.22	1765.9	224
9 - 10	3091.1	92.95	148.71	48.81	37.41	24.43	6.89	8.09	4.77	0.74	4.74	0.17	1688.5	216
10 - 11	3138.9	68.04	132.50	40.92	31.19	19.00	5.88	9.19	2.35	0.65	4.69	0.22	1682.8	224
11 - 12	2759.7	52.60	132.03	34.98	26.50	16.51	5.75	8.54	1.66	0.38	4.59	0.12	1698.1	216
12 - 13	2530.4	56.12	123.89	31.65	25.36	15.84	5.31	8.12	2.57	0.29	4.53	0.17	1705.3	[illegible]
13 - 14	2311.1	48.22	112.74	28.73	23.35	13.86	4.67	6.54	2.44	0.29	4.49	0.26	1683.1	216
14 - 15	1992.5	49.92	107.80	25.38	21.87	12.17	4.45	4.92	1.07	0.32	4.50	0.12	1595.1	224
15 - 16	2485.4	41.68	104.37	23.62	20.57	10.85	3.47	5.88	1.44	0.12	4.50	0.18	1644.5	216
16 - 17	2908.4	22.98	94.50	19.30	18.86	9.87	3.90	2.57	0.86	0.17	4.60	0.13	1750.1	224
17 - 18	2986.0	22.61	94.45	20.67	18.10	8.15	3.65	2.66	1.11	0.22	4.33	0.08	1846.4	216
18 - 19	3005.0	24.16	94.87	19.91	17.76	7.75	3.49	2.99	1.39	0.12	4.44	0.08	1873.5	224
19 - 20	3145.2	22.61	91.45	19.01	17.26	7.05	3.08	2.66	1.55	0.23	4.38	0.08	1982.4	216
20 - 21	3475.9	13.52	86.58	16.14	15.23	6.25	3.36	2.44	1.55	0.23	4.49	0.14	2208.5	216
21 - 22	3744.3	7.38	86.75	14.57	14.44	6.46	2.89	2.14	2.46	0.21	4.47	0.14	2380.2	224
22 - 23	4966.7	7.54	84.25	14.77	14.46	5.31	3.13	1.11	1.77	0.18	4.36	0.10	2926.1	216
23 - 24	5267.8	5.56	84.87	14.61	14.01	5.57	3.29	1.18	2.14	0.12	4.36	0.15	3096.8	224

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 8. (128)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	5509.0	5.27	87.80	14.30	13.86	5.14	3.22	0.86	3.28	0.19	4.41	0.12	3220.5	168
1 - 2	6167.4	5.34	87.01	13.99	13.72	4.44	2.70	1.50	2.46	0.10	4.38	0.05	3501.9	224
2 - 3	7763.8	4.99	84.91	15.20	13.08	4.31	2.96	1.44	3.88	0.06	4.31	0.10	4209.3	216
3 - 4	5799.7	10.48	88.30	15.46	13.33	4.07	3.22	1.18	2.67	0.15	4.37	0.06	3862.0	224
4 - 5	4623.9	9.39	88.22	13.73	12.55	4.14	3.06	1.26	2.75	0.14	4.31	0.05	3496.0	209
5 - 6	4308.3	5.77	84.39	12.96	12.50	4.19	3.45	0.96	2.24	0.10	4.35	0.03	3458.6	224
6 - 7	4212.9	7.21	85.47	12.89	12.03	3.91	3.43	1.44	2.00	0.14	4.28	0.06	3479.7	216
7 - 8	3401.4	8.34	85.30	13.02	11.72	3.78	3.25	0.75	2.03	0.20	4.40	0.07	3166.2	224
8 - 9	3082.6	6.87	81.92	12.83	11.48	3.85	3.58	1.44	2.00	0.11	4.37	0.10	3090.4	216
9 - 10	2776.3	6.20	83.70	11.89	11.37	3.71	3.24	0.64	1.71	0.07	4.29	0.05	3071.0	224
10 - 11	2157.9	12.30	84.91	12.48	11.63	3.17	3.28	0.89	1.44	0.08	4.36	0.05	2881.1	216
11 - 12	1126.1	19.40	85.03	12.24	11.16	3.06	2.09	1.66	0.67	0.07	4.39	0.13	1620.5	216
12 - 13	1051.4	14.97	85.84	12.25	11.14	3.16	1.77	1.60	0.11	0.08	4.33	0.09	1210.6	224
13 - 14	764.8	21.95	86.24	12.66	10.88	3.29	1.48	0.78	1.00	0.07	4.32	0.06	812.6	216
14 - 15	573.8	15.39	84.45	12.03	10.89	2.79	1.55	0.96	0.21	0.09	4.35	0.07	749.5	[illegible]
15 - 16	435.5	15.74	85.19	11.57	10.94	3.14	1.63	0.78	0.0	0.08	4.36	0.08	647.3	216
16 - 17	367.6	14.75	85.30	11.80	10.34	2.87	1.38	0.64	0.0	0.07	4.35	0.02	476.4	224
17 - 18	338.9	11.31	84.80	11.60	10.44	2.59	1.62	0.89	0.67	0.04	4.31	0.06	430.3	216
18 - 19	499.1	13.90	82.52	11.45	10.56	2.45	1.49	1.18	0.11	0.07	4.34	0.05	473.1	224
19 - 20	630.9	8.20	84.47	11.13	10.45	2.38	1.36	0.67	0.22	0.07	4.40	0.05	481.9	216
20 - 21	1305.9	6.20	81.88	10.69	10.53	2.67	1.50	0.32	0.32	0.06	4.32	0.10	709.1	224
21 - 22	1464.6	4.43	80.70	10.53	10.28	2.52	1.87	0.33	0.89	0.06	4.28	0.07	1020.7	216
22 - 23	4641.8	6.84	83.16	10.61	10.31	2.28	1.70	0.53	1.07	0.05	4.30	0.02	1322.0	224
23 - 24	7067.2	6.54	82.03	10.69	10.07	2.42	1.70	0.11	0.78	0.10	4.43	0.07	2042.8	216

********** SEM HOURLY AVERAGE DATA **********

1978. 5. 9. (129)

COUNTS/(CM2*SEC*STERAD)

U.T.	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5	EL	SPL*
0 - 1	4526.6	11.09	92.99	11.08	10.31	2.34	1.81	0.41	1.77	0.04	4.34	0.06	2352.7	176
1 - 2	4526.4	14.85	81.92	10.37	10.19	2.20	2.30	1.88	1.55	0.06	4.37	0.07	2387.1	216
2 - 3	5337.9	7.54	80.48	9.96	9.69	2.33	2.21	0.55	1.33	0.02	4.38	0.05	2710.3	216
3 - 4	3751.6	6.20	80.92	9.86	9.87	2.15	1.83	0.86	0.64	0.06	4.29	0.05	2059.4	224
4 - 5	2391.6	5.70	80.96	9.63	9.26	1.11	2.10	0.0	1.14	0.0	4.20	0.12	1682.9	21
5 - 6														0
6 - 7														0
7 - 8														0
8 - 9														0
9 - 10														0
10 - 11														0
11 - 12														0
12 - 13														0
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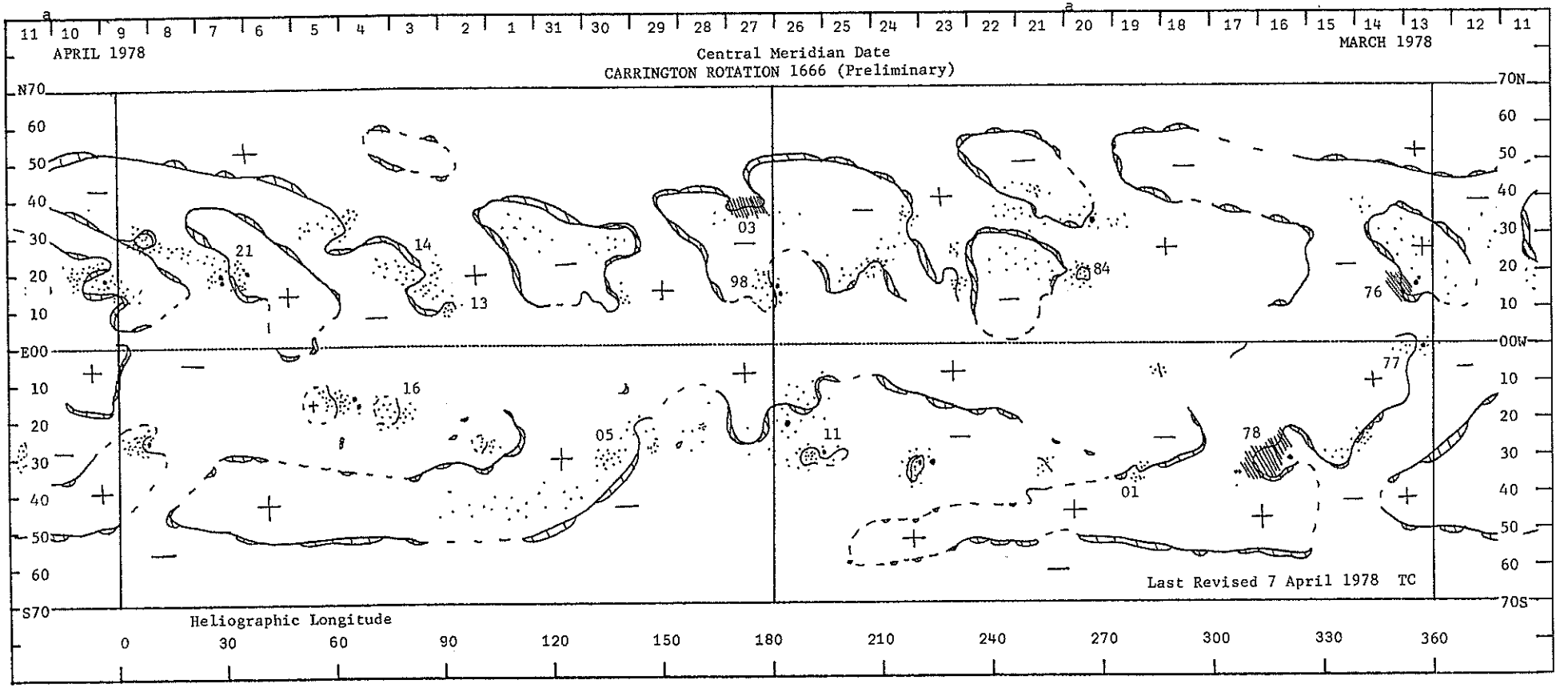
16 - 17														0
17 - 18														0
18 - 19														0
19 - 20														0
20 - 21														0
21 - 22														0
22 - 23														0
23 - 24														0

* SPL = Number of data points (Sampling number) per hour
Blank = no data

APRIL 1978 DATA

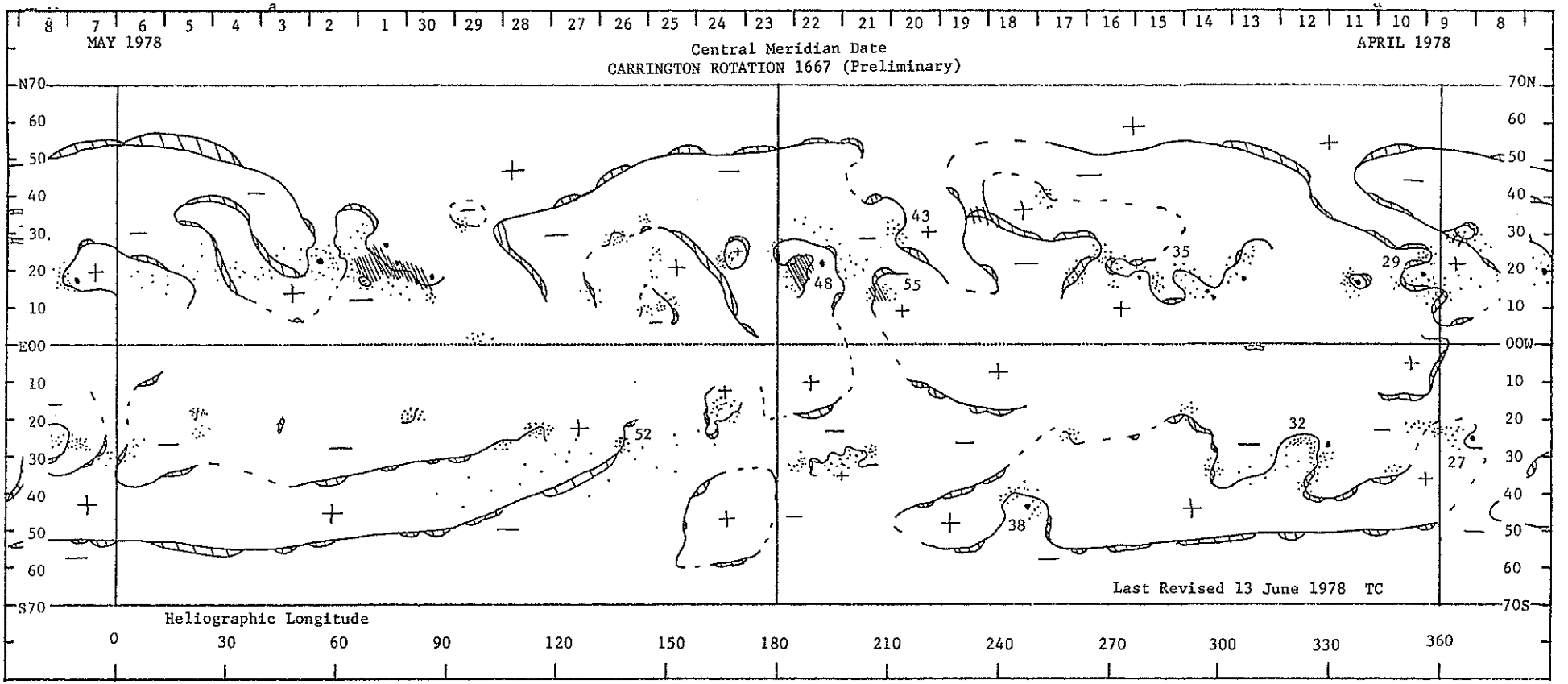
Contents

Hα SYNOPTIC CHART
MARCH - APRIL 1978



Hα SYNOPTIC CHART

CARRINGTON ROTATION 1667 (PRELIMINARY)



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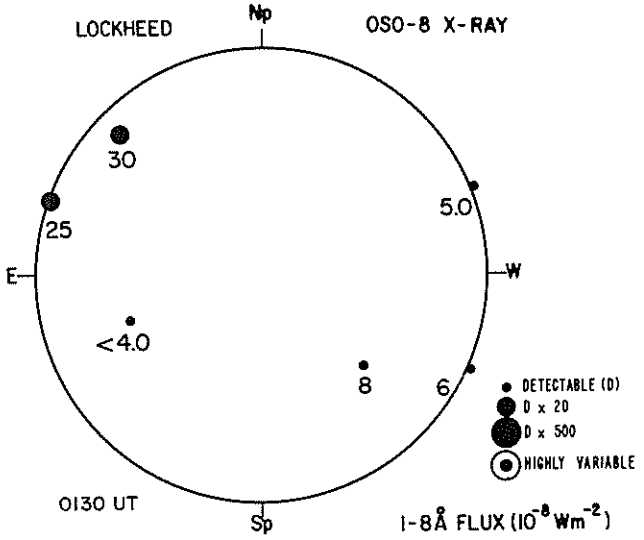
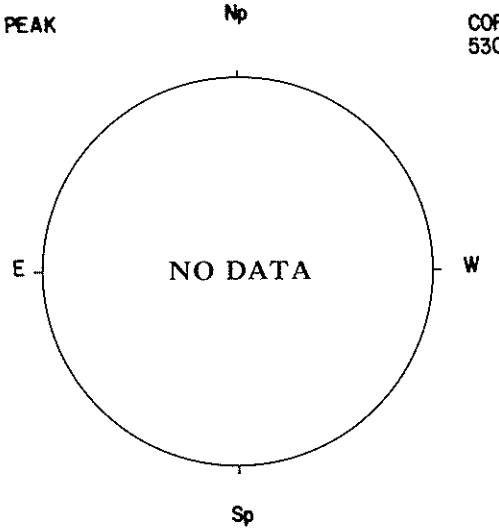
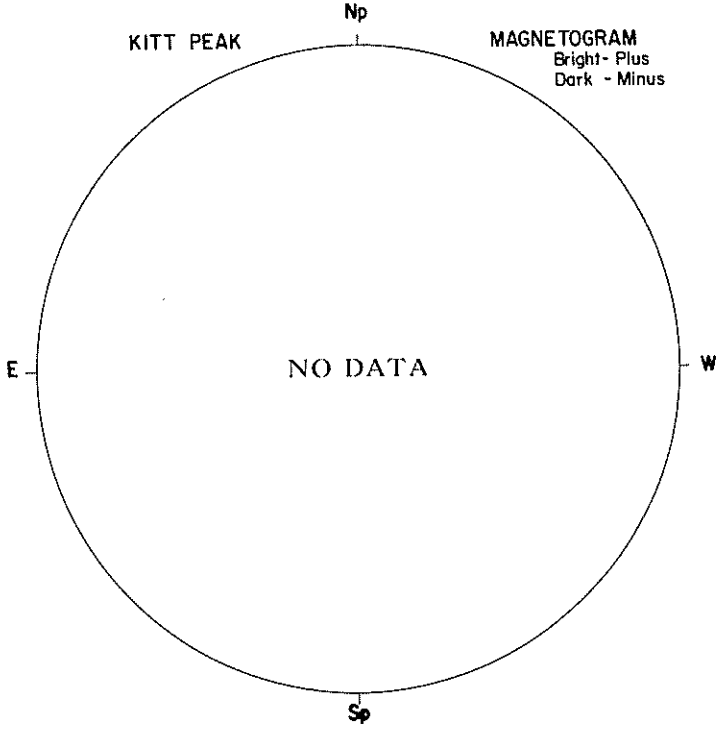
LOCKHEED OSO-8 X-RAY



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



KITT PEAK MAGNETOGRAM Bright- Plus Dark - Minus



MT. WILSON MAGNETOGRAM Solid-Plus Dotted-Minus

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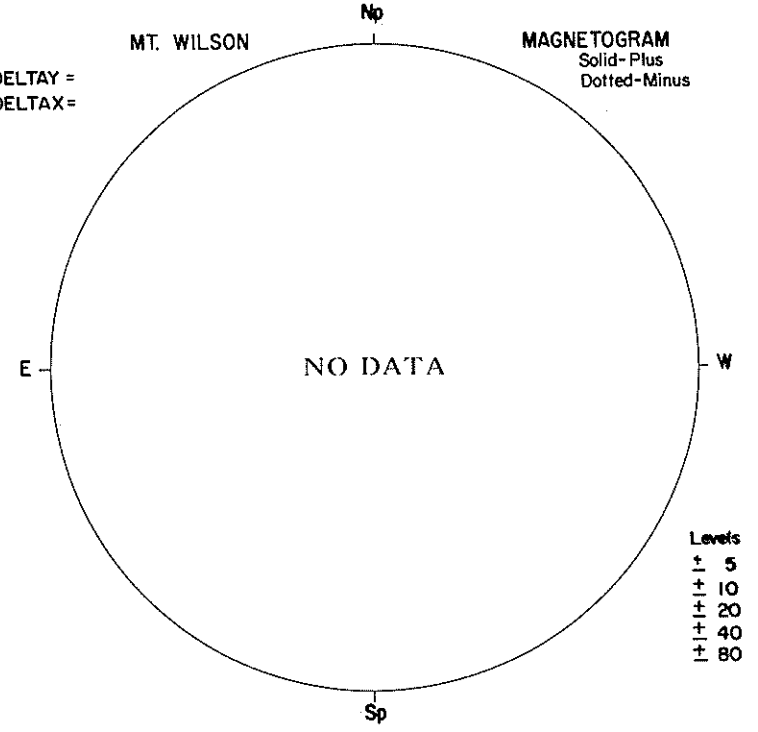
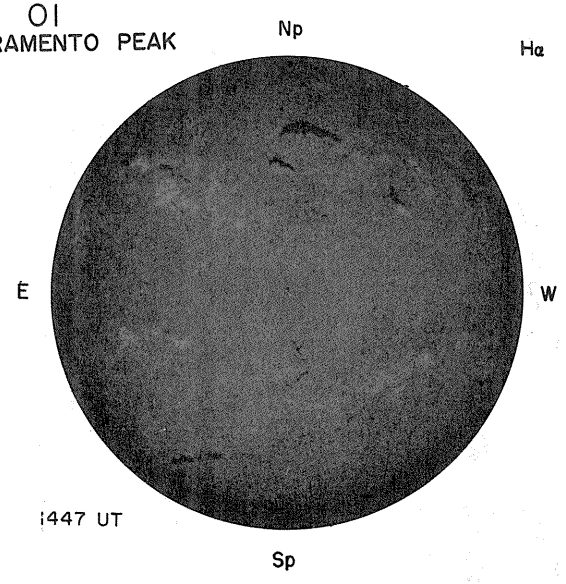
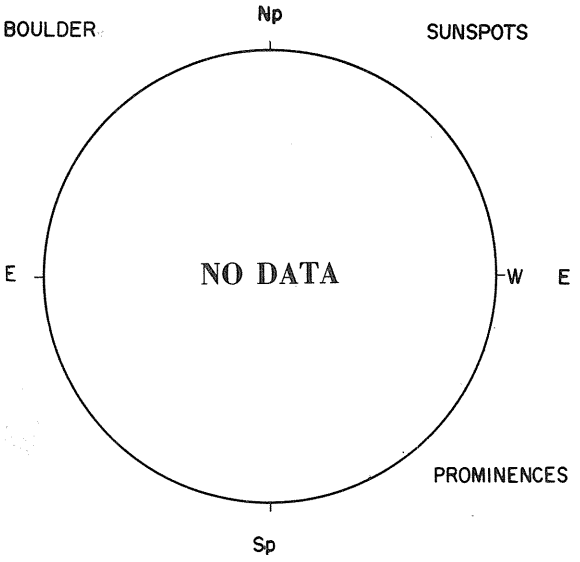


OI
SACRAMENTO PEAK



1447 UT

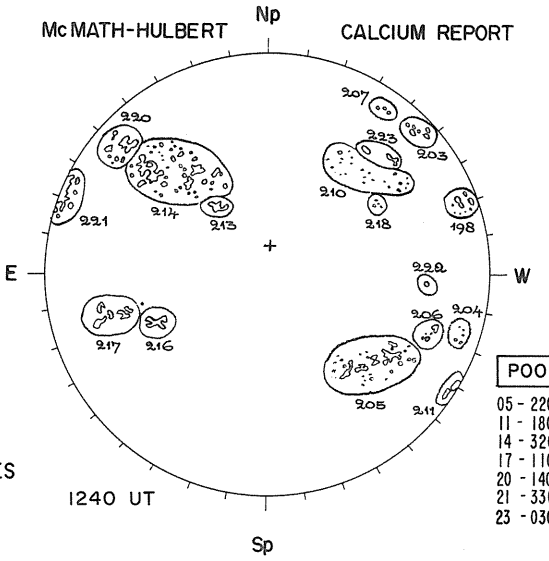
Hα BOULDER



NO DATA

SUNSPOTS

McMATH-HULBERT



1240 UT

CALCIUM REPORT

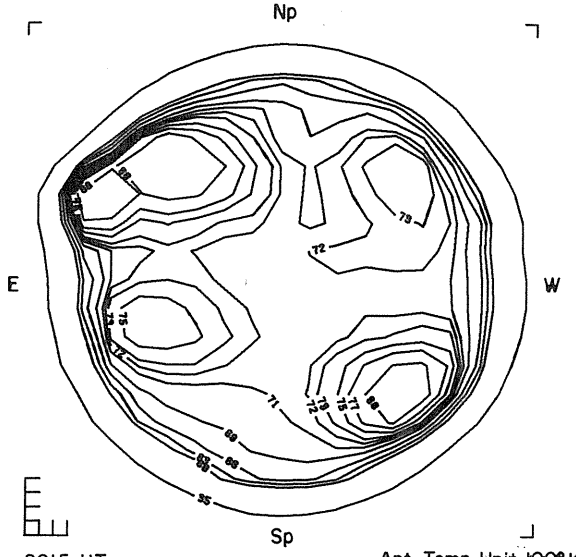
POOR	M

05 - 2200 - 2.5
11 - 1800 - 3.0
14 - 3200 - 2.5
17 - 1100 - 2.5
20 - 1400 - 2.5
21 - 3300 - 3.5
23 - 0300 - 2.5

PROMINENCES

NOSC LA POSTA

2.0 CM

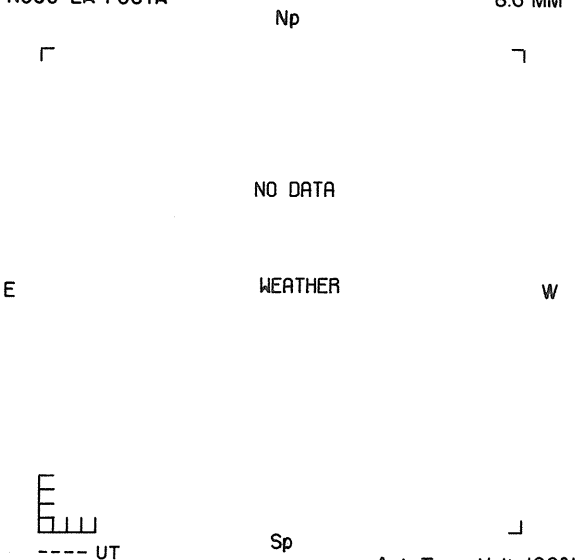


2015 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



NO DATA

WEATHER

---- UT

Ant. Temp. Unit 100° K

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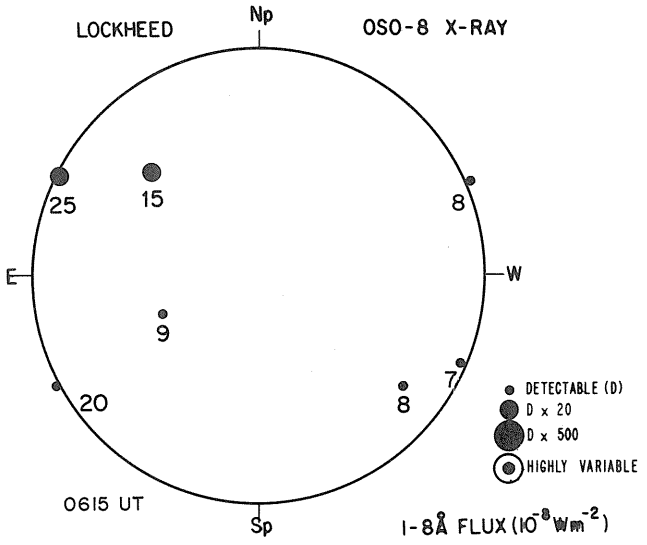
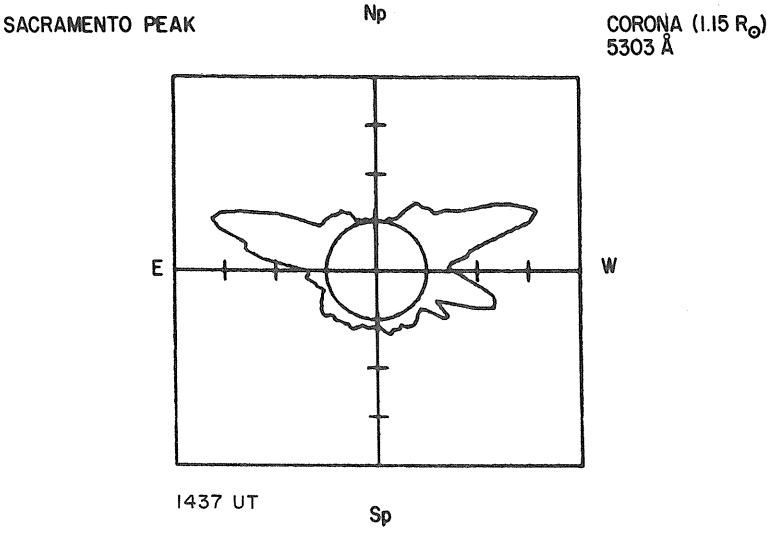
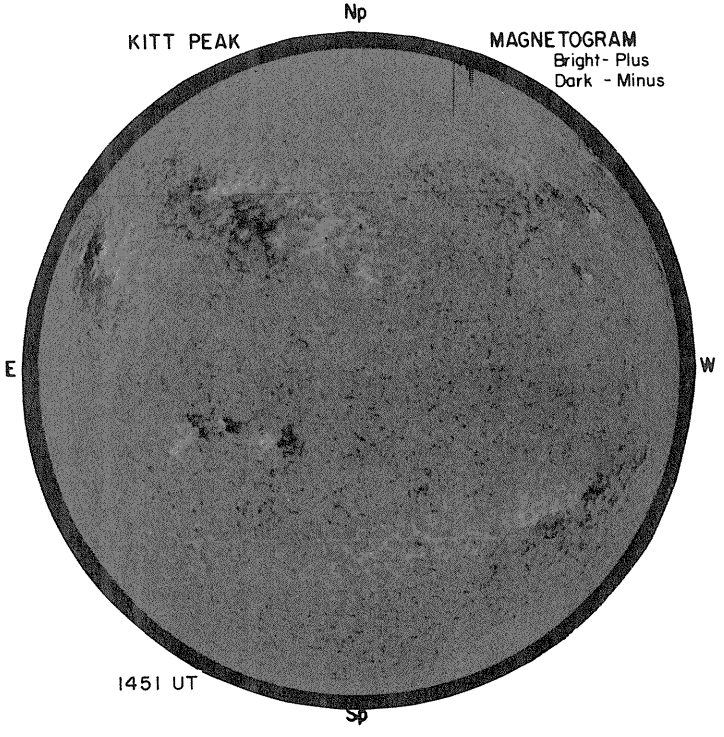
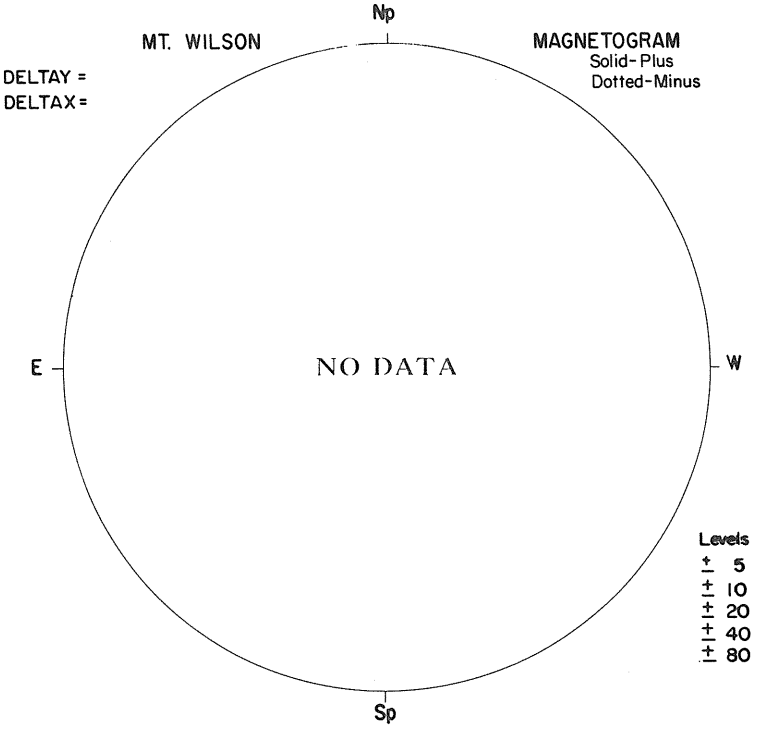
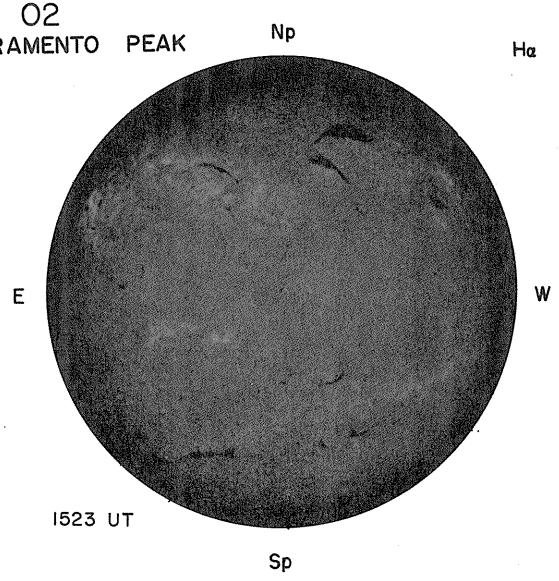






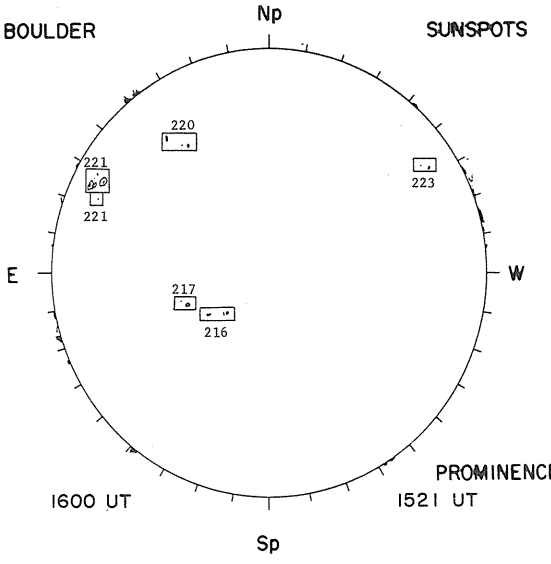


02
SACRAMENTO PEAK



1523 UT

BOULDER SUNSPOTS

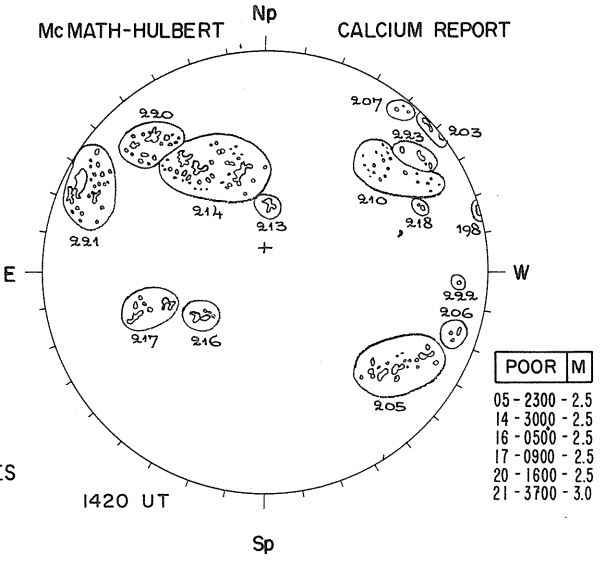


1600 UT

PROMINENCES

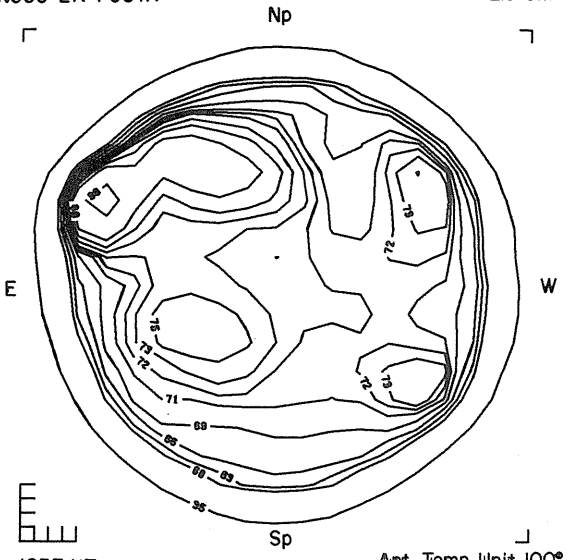
1521 UT

McMATH-HULBERT CALCIUM REPORT



1420 UT

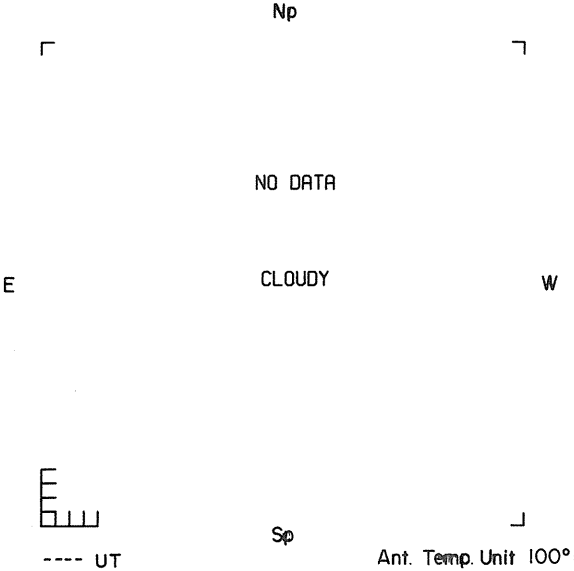
NOSC LA POSTA 2.0 CM



1837 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA 8.6 MM



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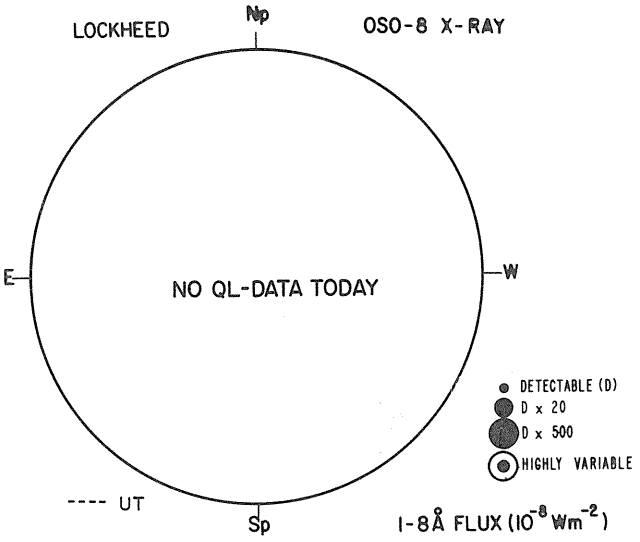
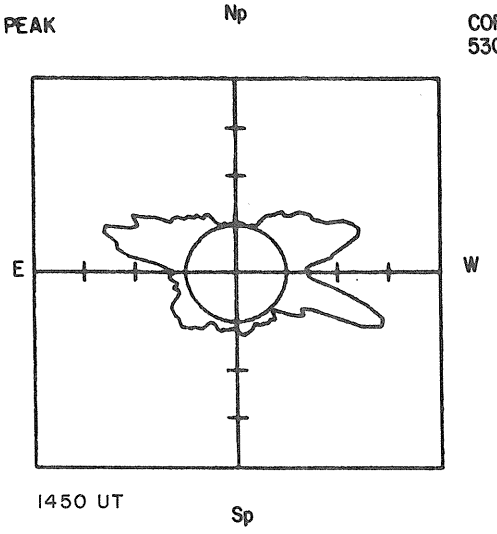
Ant. Temp. Unit 100° K

APRIL 3, 1978 (P =-26.26, B_o =-6.43, L_o = 88.38)

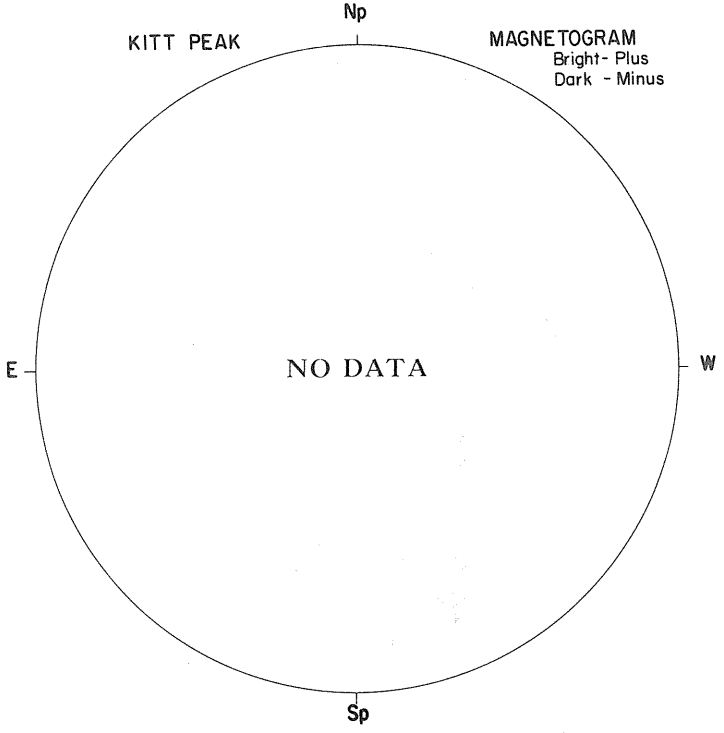
LOCKHEED OSO-8 X-RAY



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



KITT PEAK MAGNETOGRAM Bright- Plus Dark - Minus



MT. WILSON MAGNETOGRAM Solid- Plus Dotted-Minus

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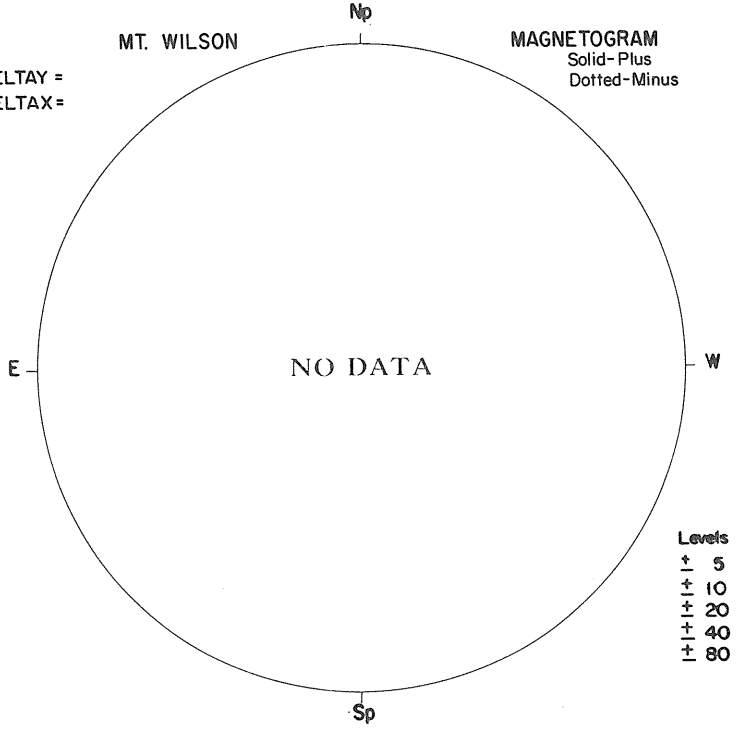
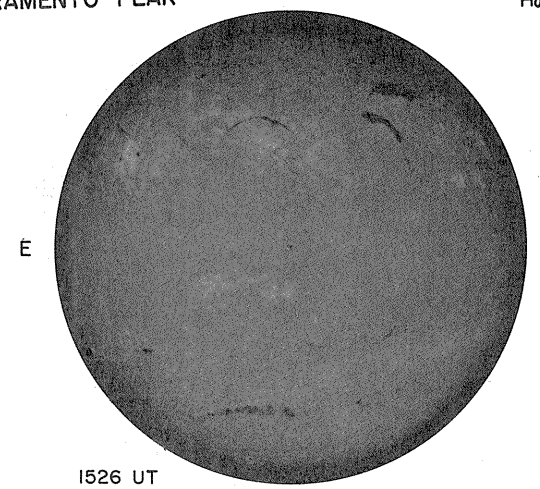


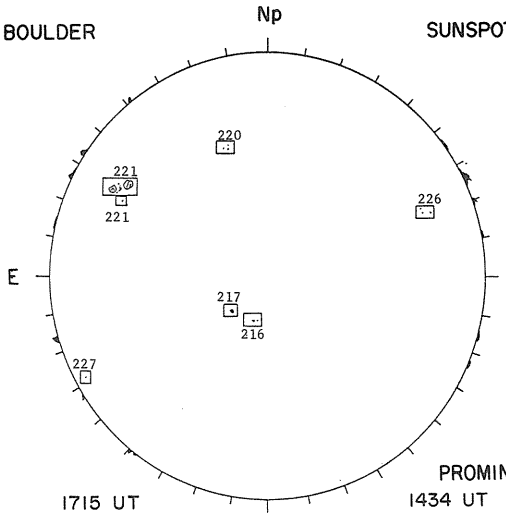
03
SACRAMENTO PEAK



1526 UT

Hα

BOULDER



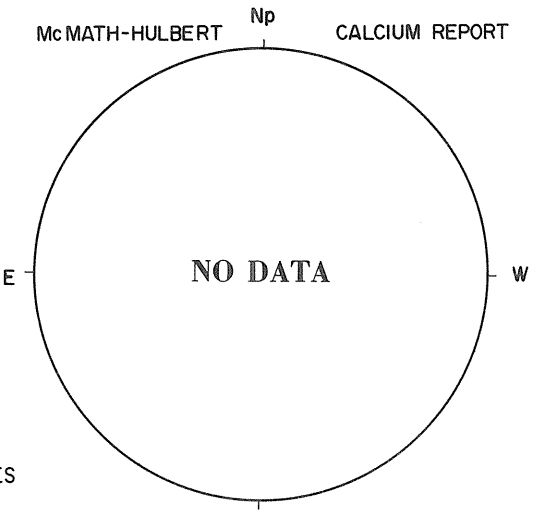
1715 UT

SUNSPOTS

PROMINENCES

1434 UT

McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

Np

NO DATA

E

EQUIPMENT

W

Sp

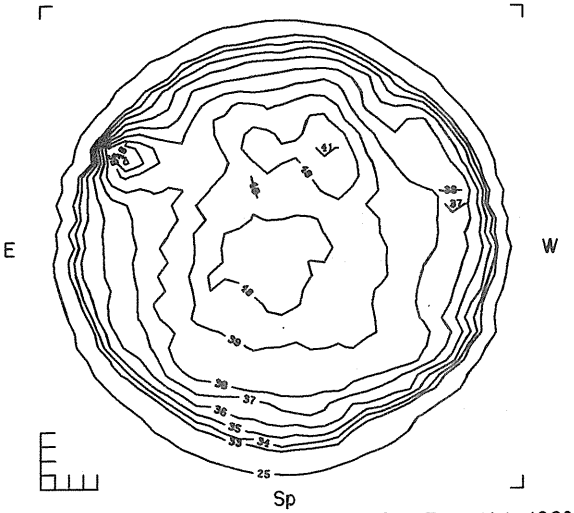
---- UT

2.0 CM

Ant. Temp. Unit 100°K

NOSC LA POSTA

Np

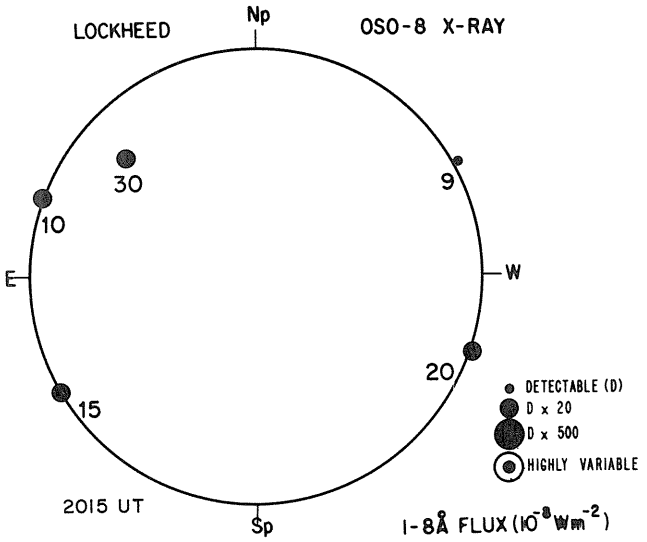


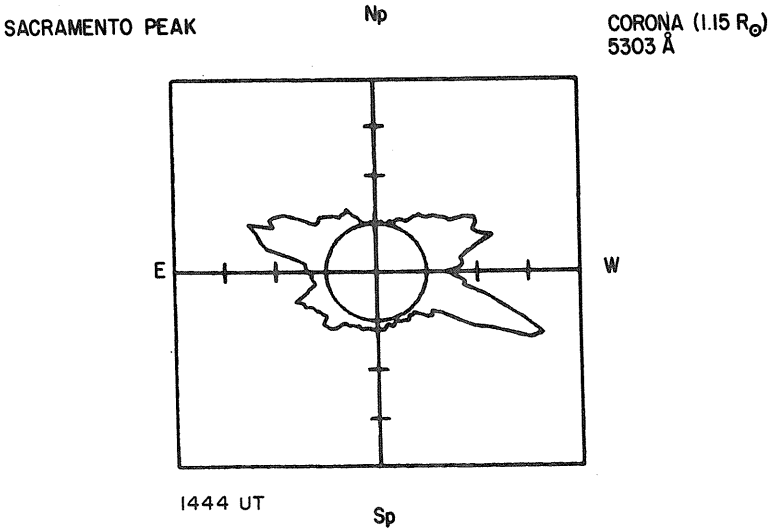
1940 UT

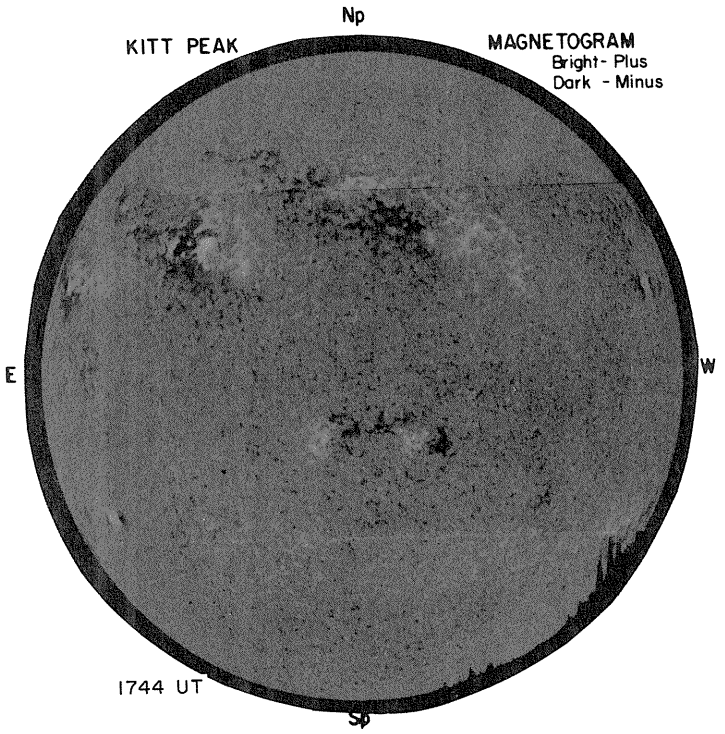
8.6 MM

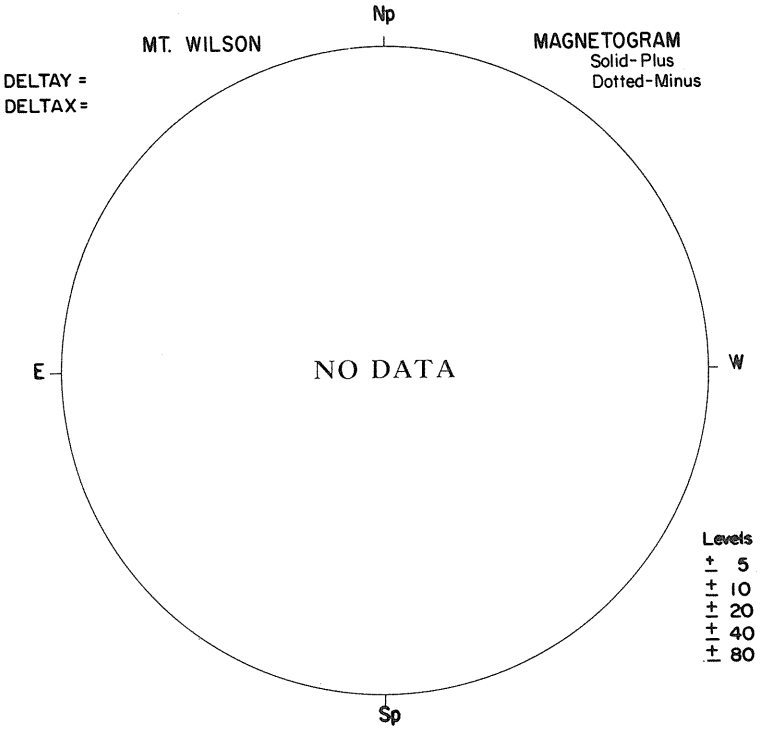
Ant. Temp. Unit 100°K

APRIL 4, 1978 (P = -26.29, B_o = -6.37, L_o = 75.19)





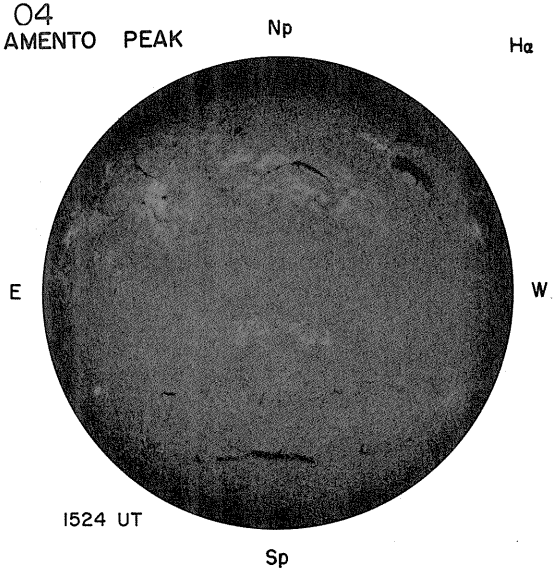




04

SACRAMENTO PEAK

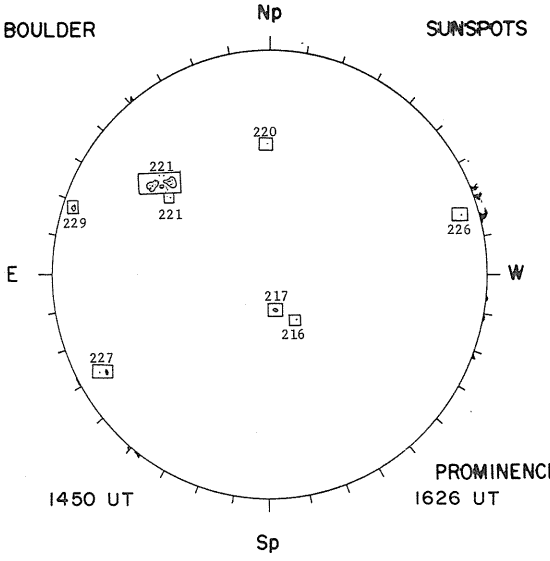
Hα



1524 UT

BOULDER

SUNSPOTS



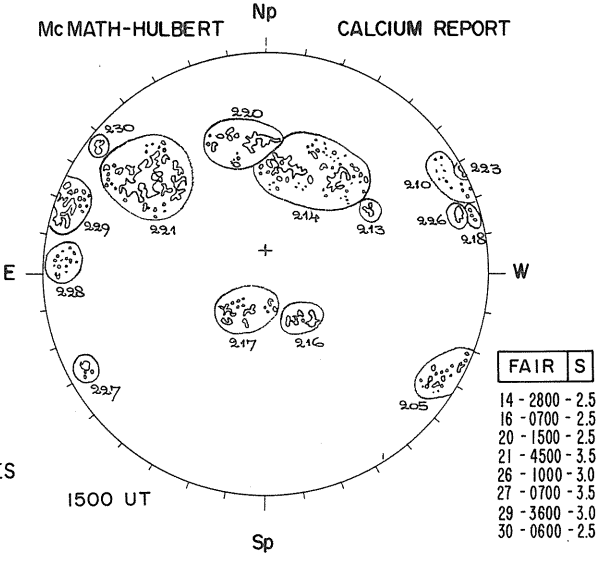
1450 UT

PROMINENCES

1626 UT

McMATH-HULBERT

CALCIUM REPORT



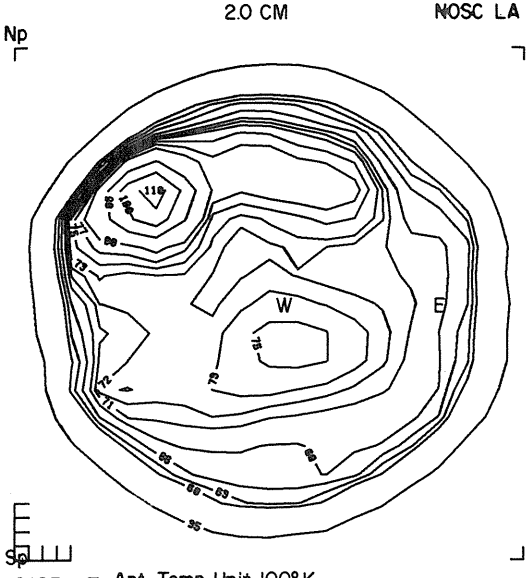
1500 UT

FAIR	S

14 - 2800 - 2.5
16 - 0700 - 2.5
20 - 1500 - 2.5
21 - 4500 - 3.5
26 - 1000 - 3.0
27 - 0700 - 3.5
29 - 3600 - 3.0
30 - 0600 - 2.5

NOSC LA POSTA

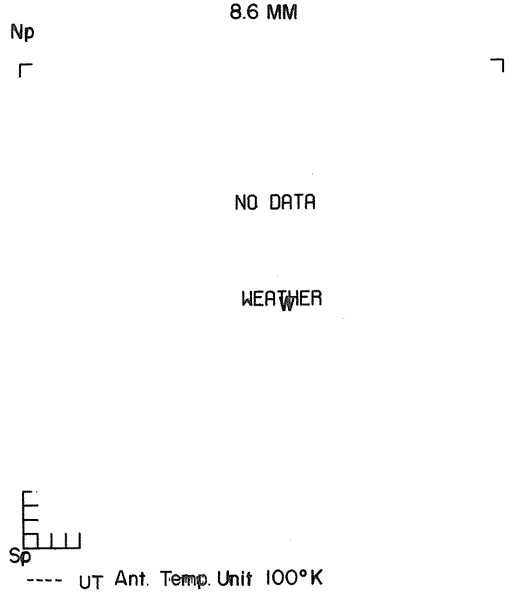
2.0 CM



2123 UT Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

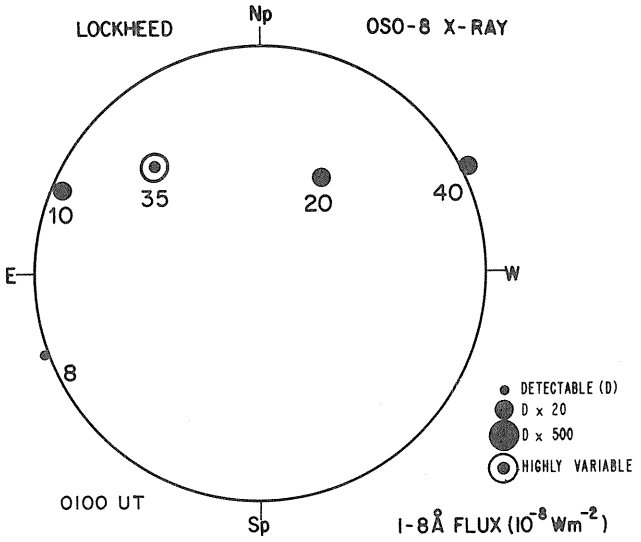


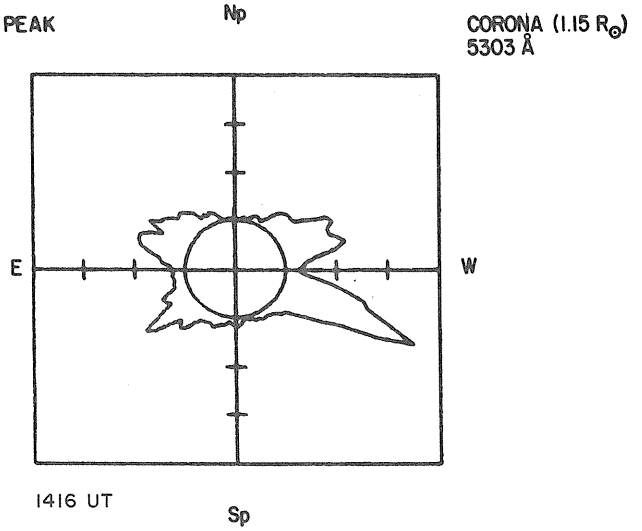
NO DATA

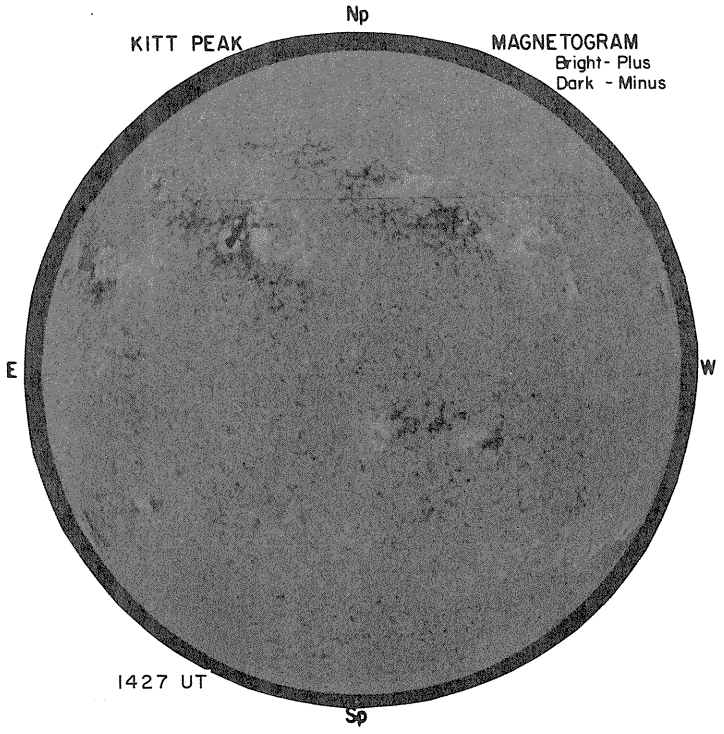
WEATHER

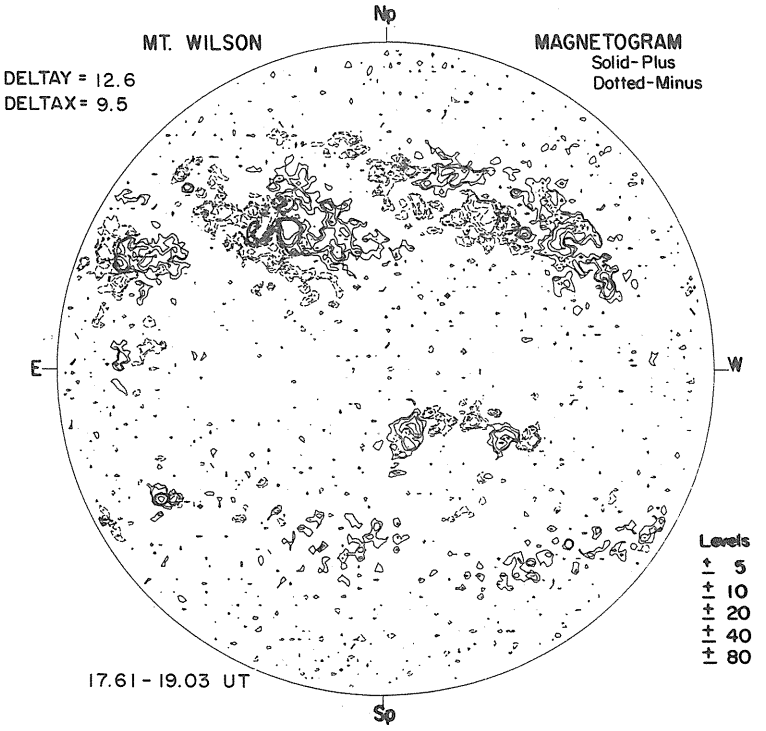
---- UT Ant. Temp. Unit 100°K

APRIL 5, 1978 (P = -26.31, B_o = -6.31, L_o = 61.99)

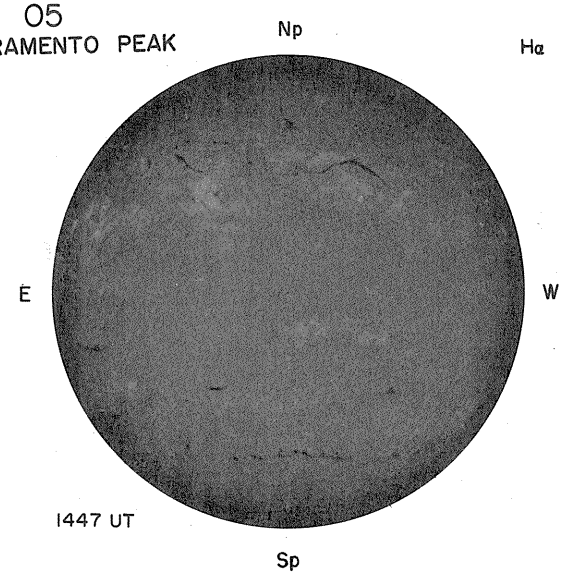




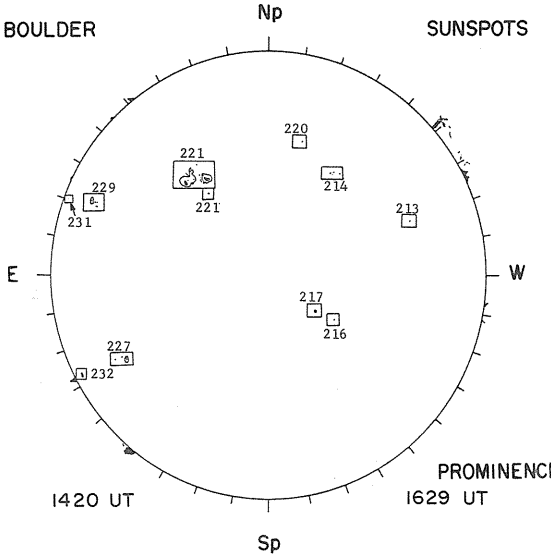




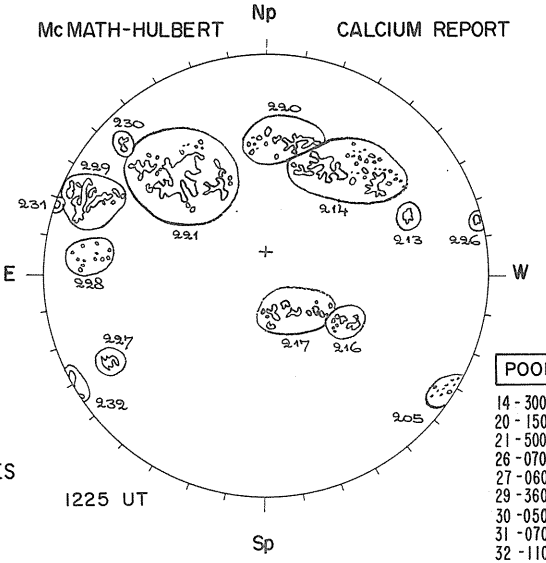
05
SACRAMENTO PEAK



BOULDER SUNSPOTS



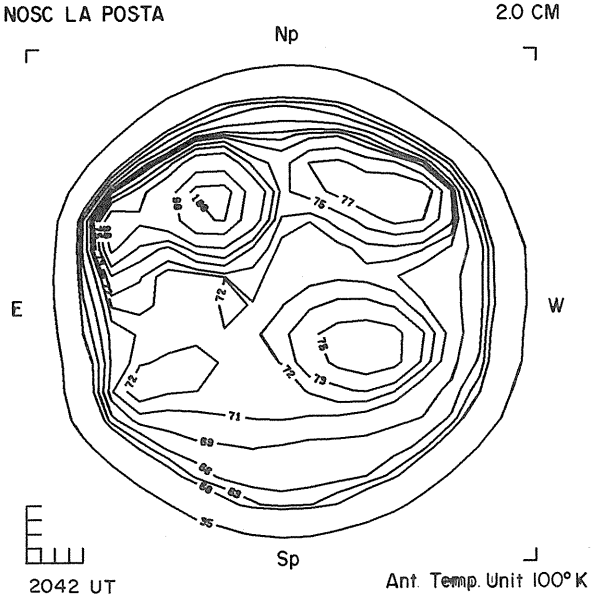
McMATH-HULBERT CALCIUM REPORT



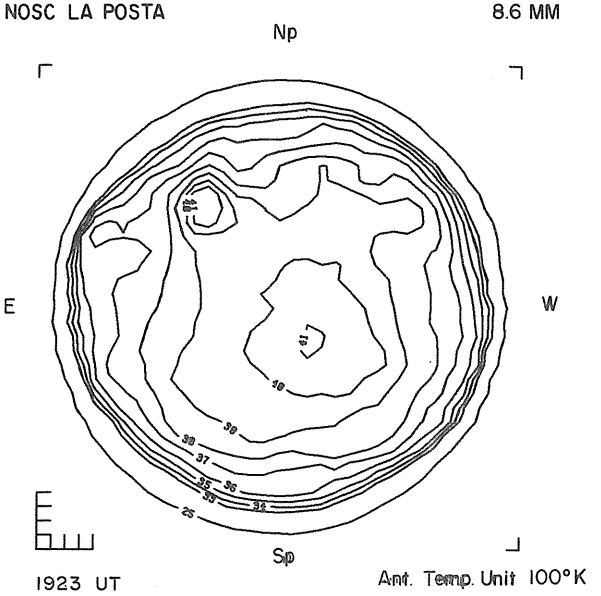
POOR	S
14 - 3000 - 2.5	
20 - 1500 - 2.5	
21 - 5000 - 3.5	
26 - 0700 - 3.0	
27 - 0600 - 3.5	
29 - 3600 - 3.0	
30 - 0500 - 2.5	
31 - 0700 - 3.0	
32 - 1100 - 2.5	

PROMINENCES
1629 UT

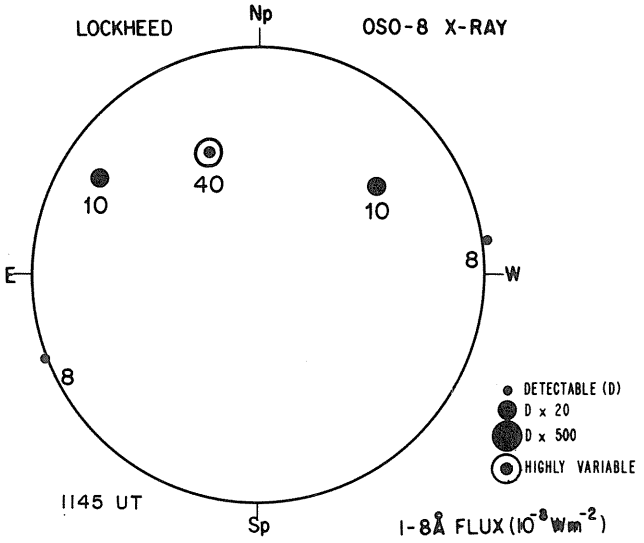
NOSC LA POSTA 2.0 CM

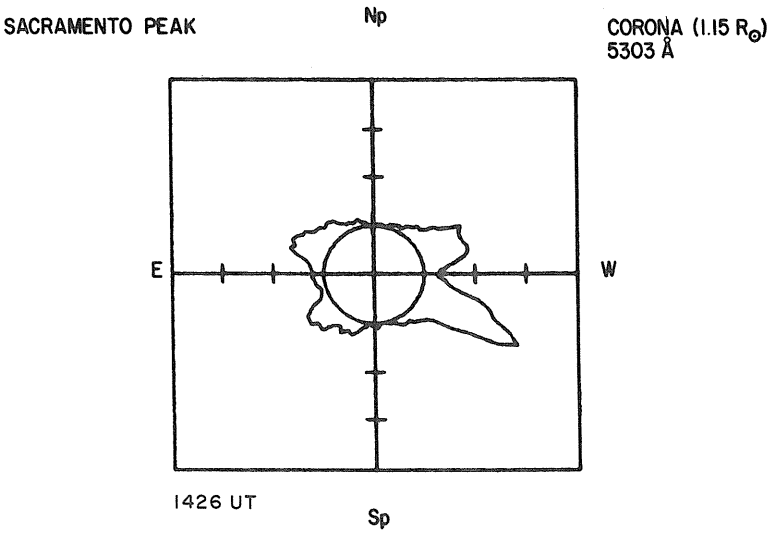


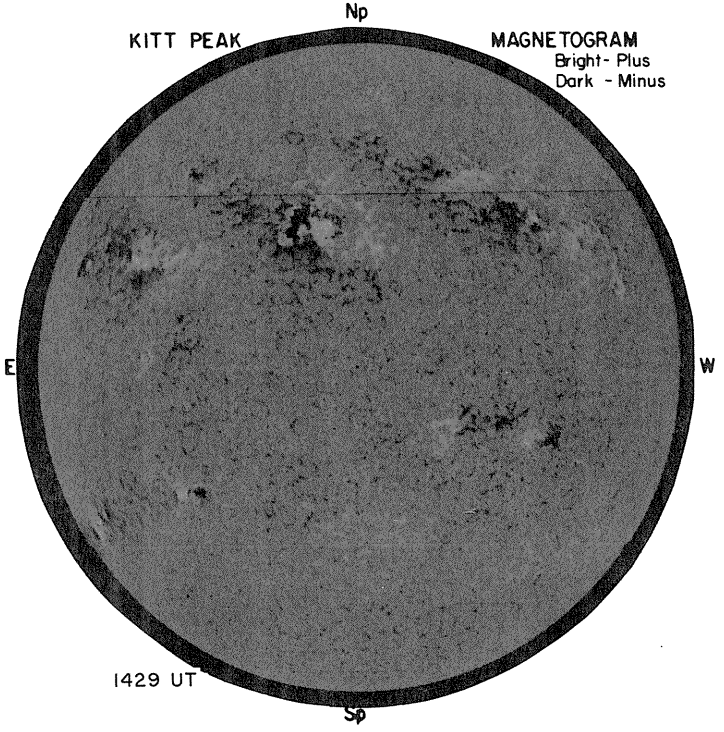
NOSC LA POSTA 8.6 MM

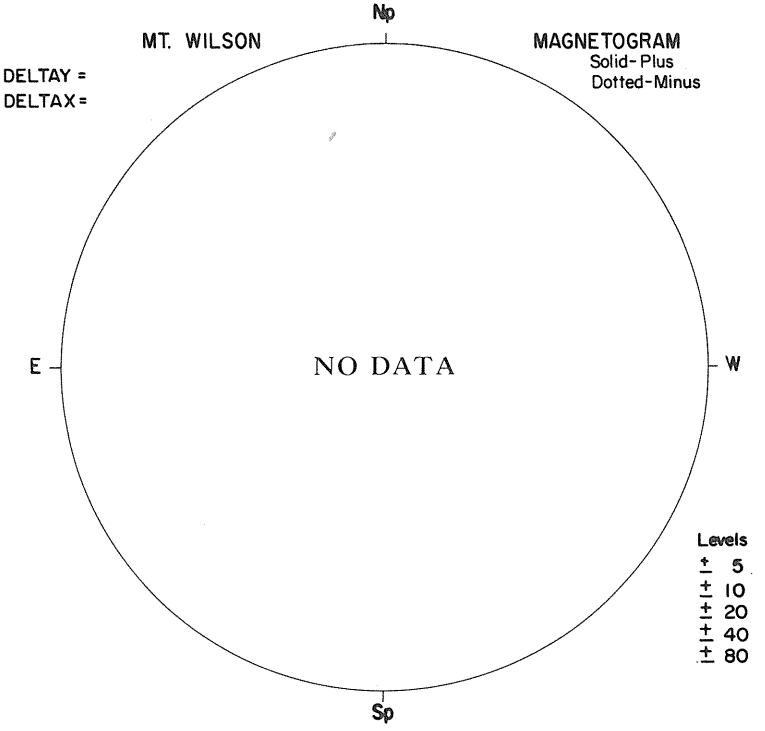


APRIL 6, 1978 (P = -26.32, B_0 = -6.25, L_0 = 48.80)



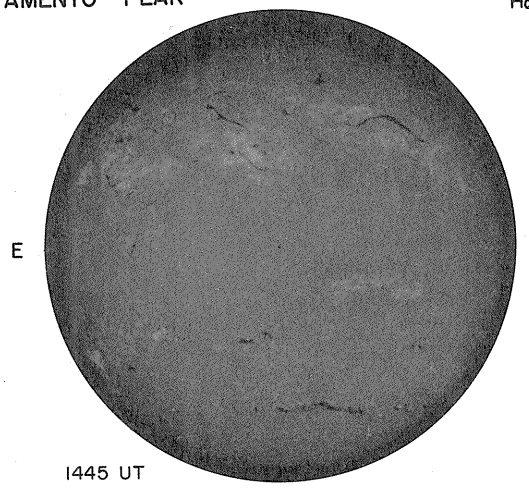






06

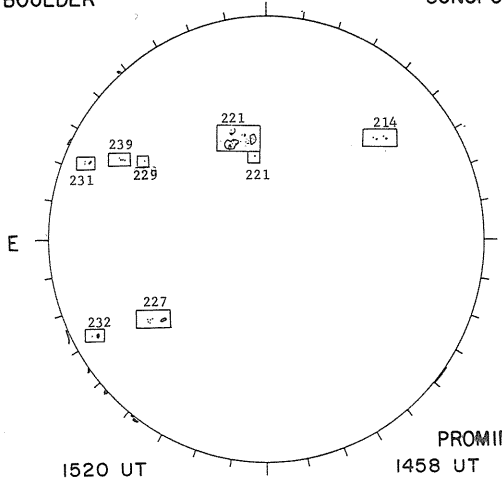
SACRAMENTO PEAK



1445 UT

Hα

BOULDER



1520 UT

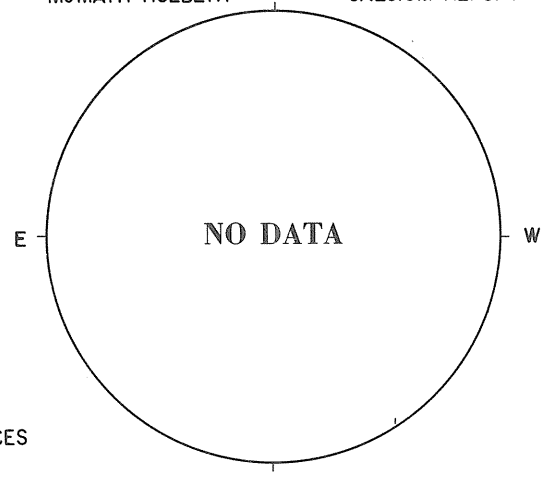
SUNSPOTS

PROMINENCES

1458 UT

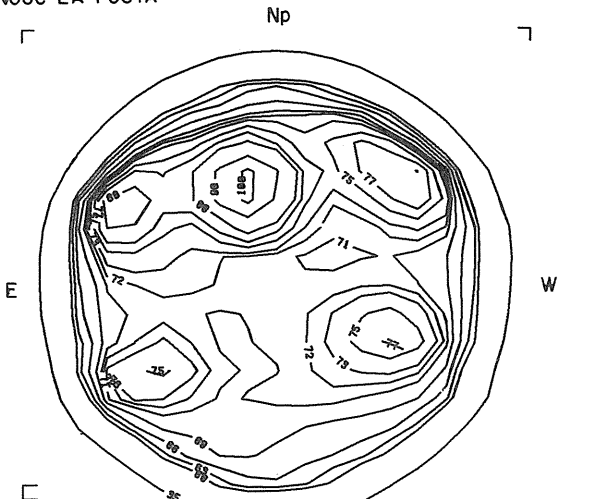
McMATH-HULBERT

CALCIUM REPORT



NOSC LA POSTA

2.0 CM

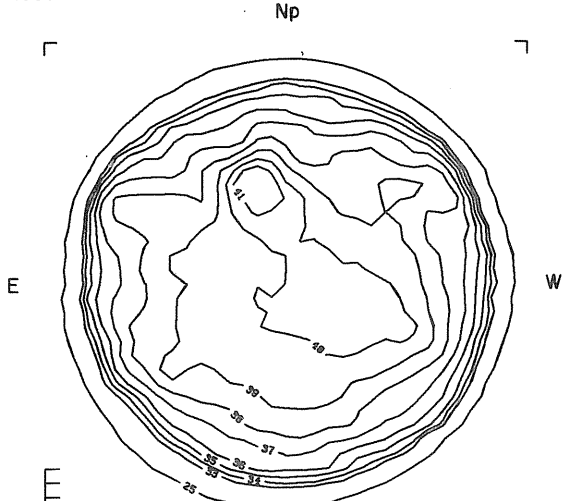


1922 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM



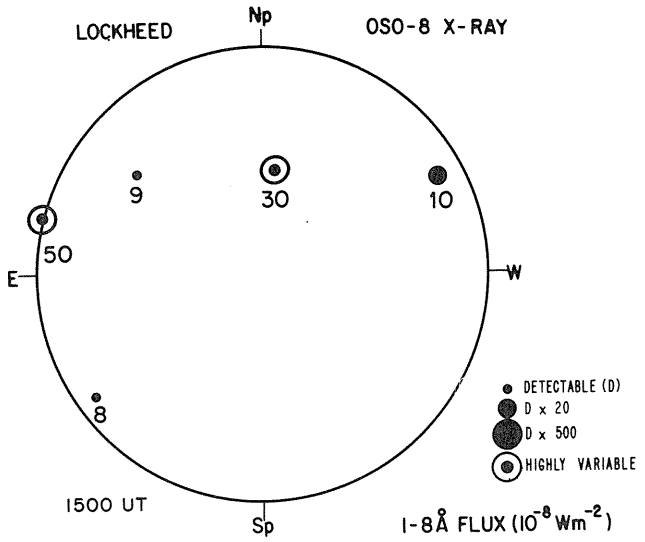
1823 UT

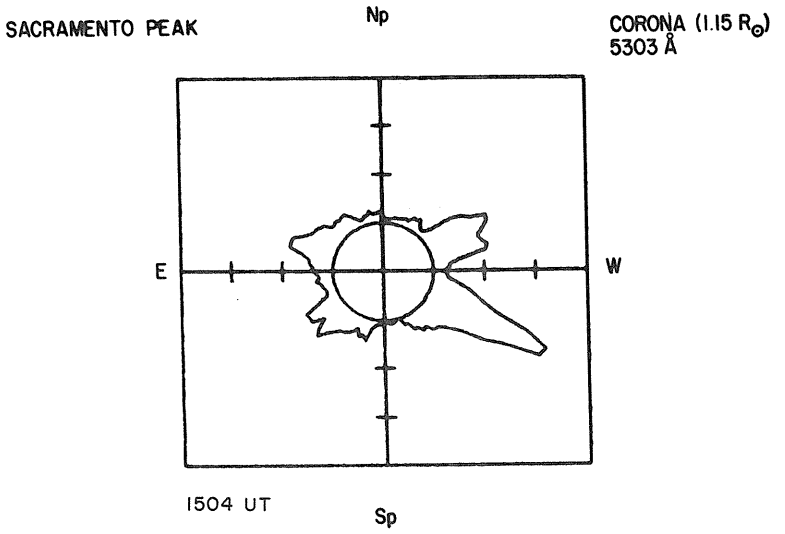
Ant. Temp. Unit 100° K

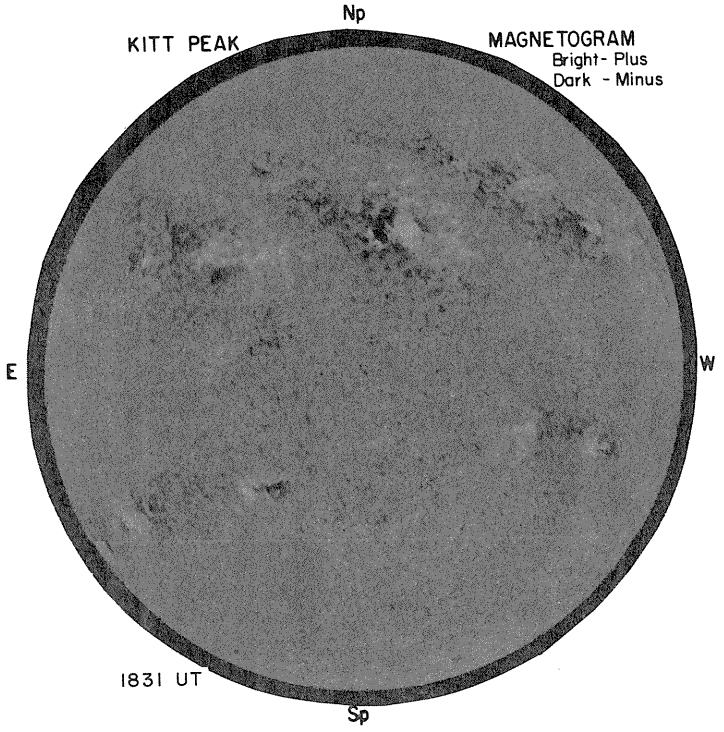
65

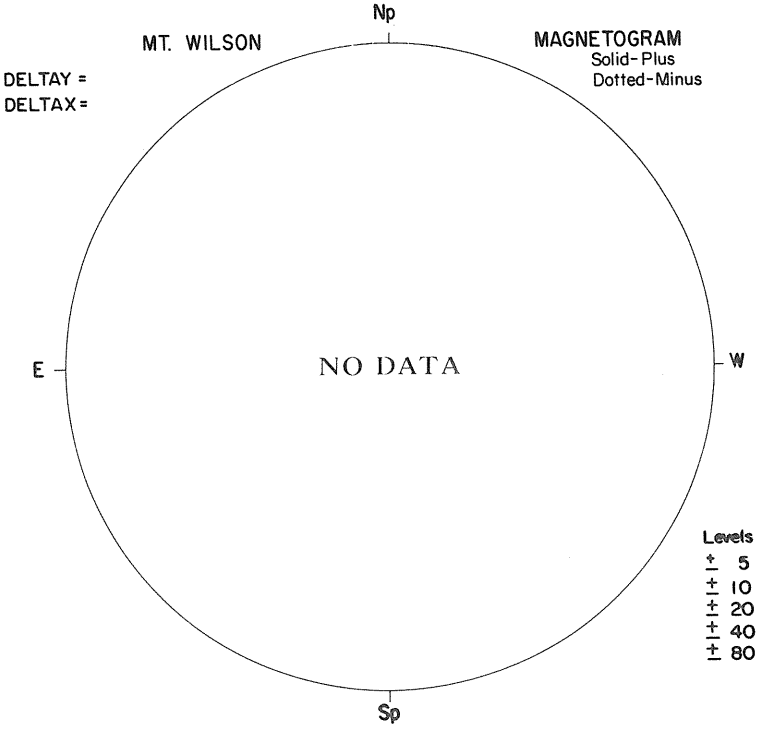
Apr 78

APRIL 7, 1978 (P = -26.33, B_o = -6.19, L_o = 35.60)



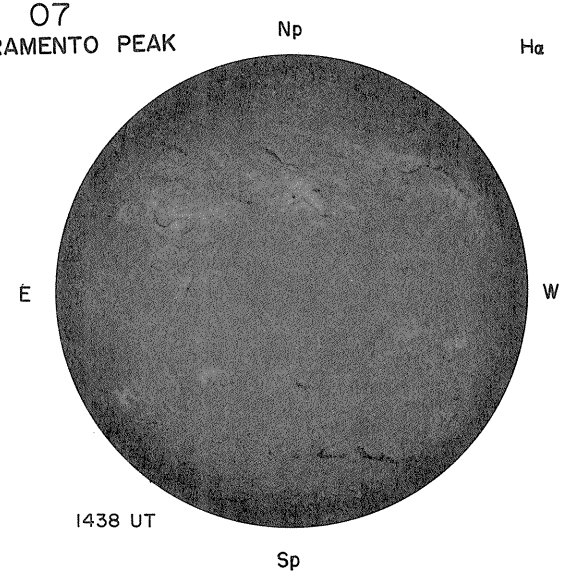




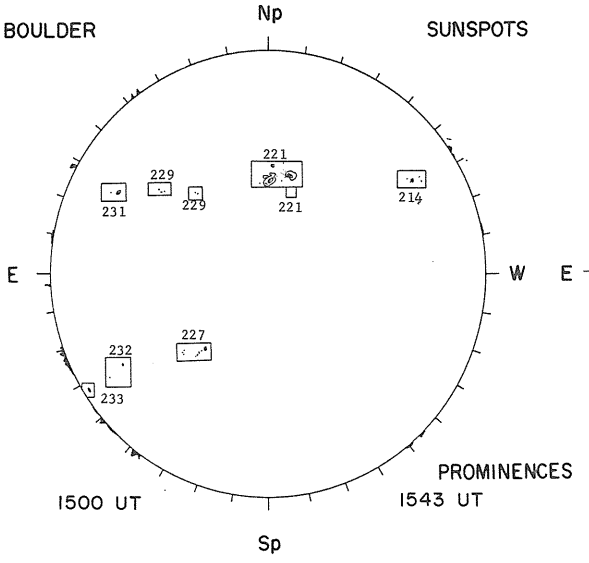


07

SACRAMENTO PEAK

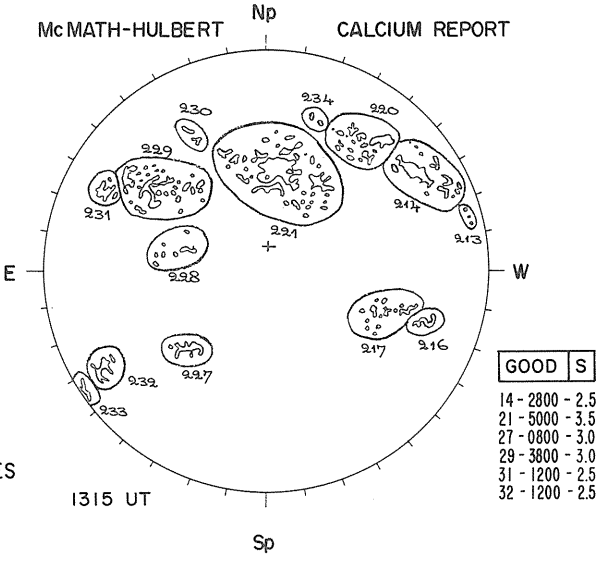


BOULDER



SUNSPOTS

McMATH-HULBERT



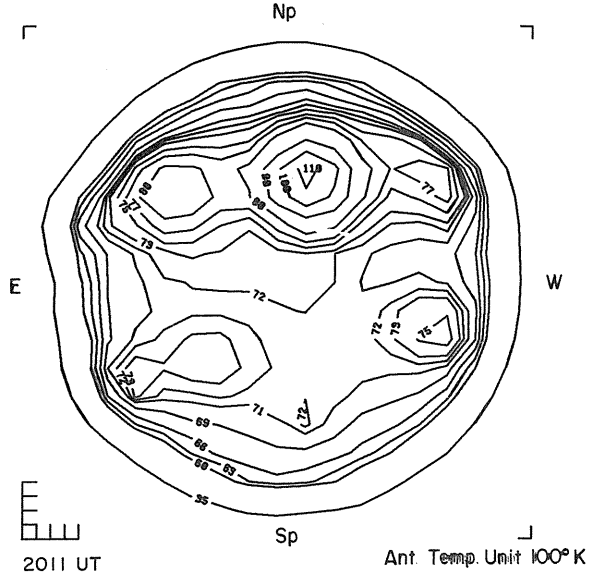
CALCIUM REPORT

PROMINENCES

1543 UT

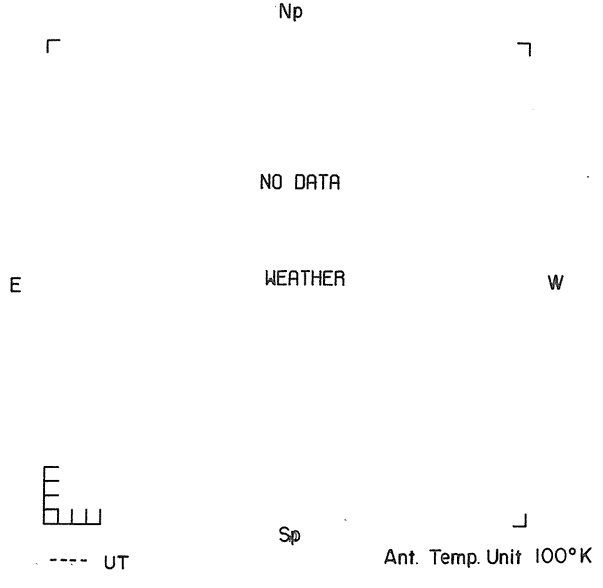
NOSC LA POSTA

2.0 CM



NOSC LA POSTA

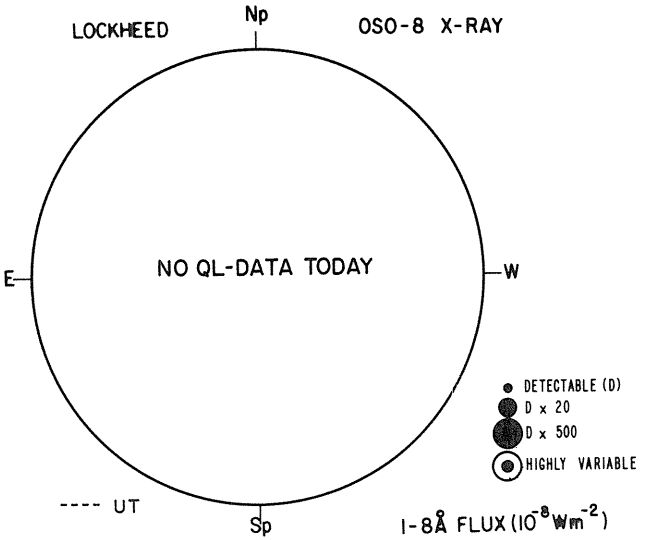
8.6 MM



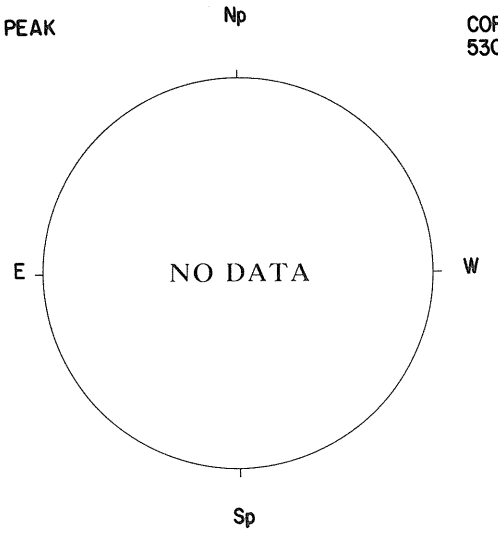
67
Apr 78

APRIL 8, 1978 (P = -26.32, B_o = -6.12, L_o = 22.40)

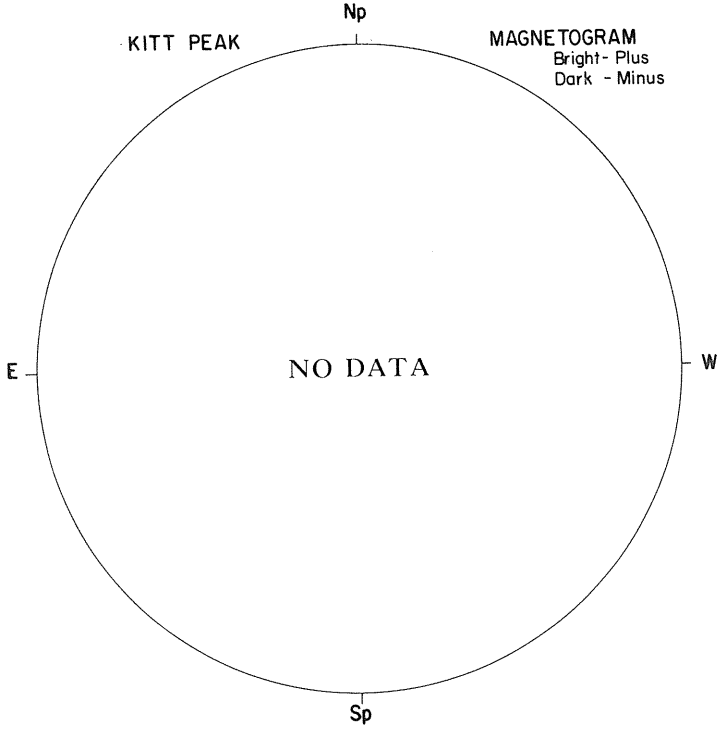
LOCKHEED OSO-8 X-RAY



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

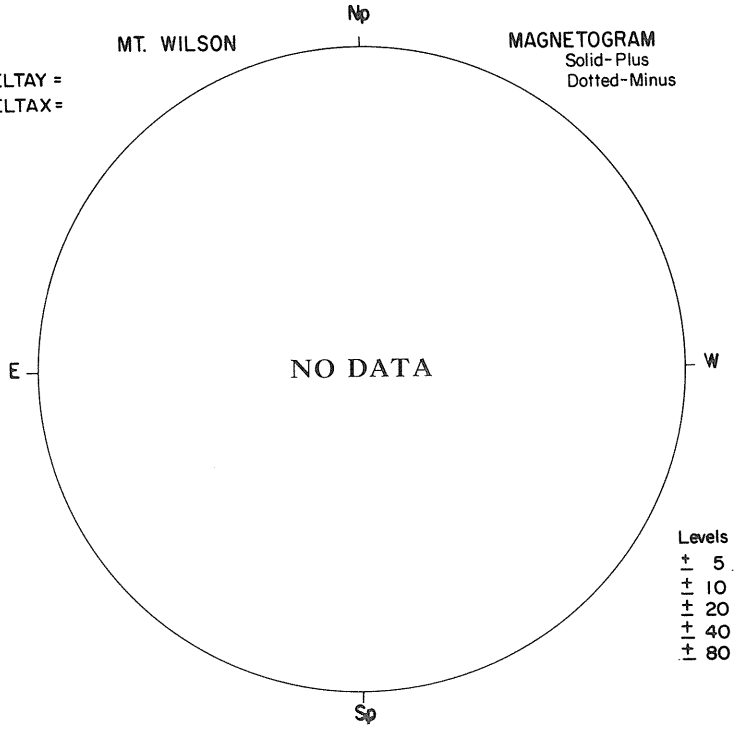


KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus



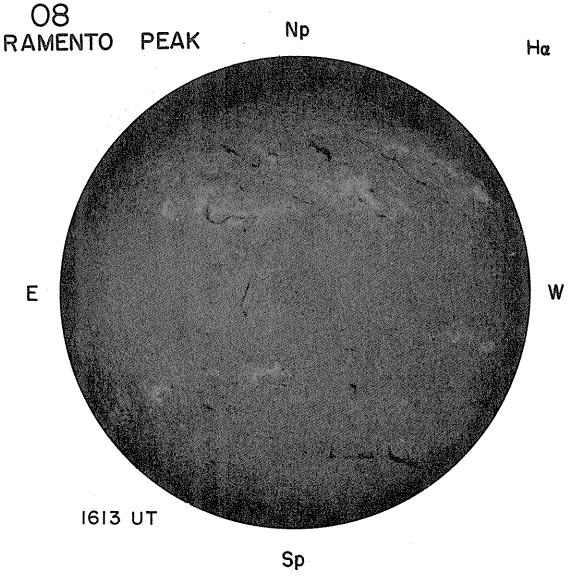
MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

DELTAY =
DELTAX =

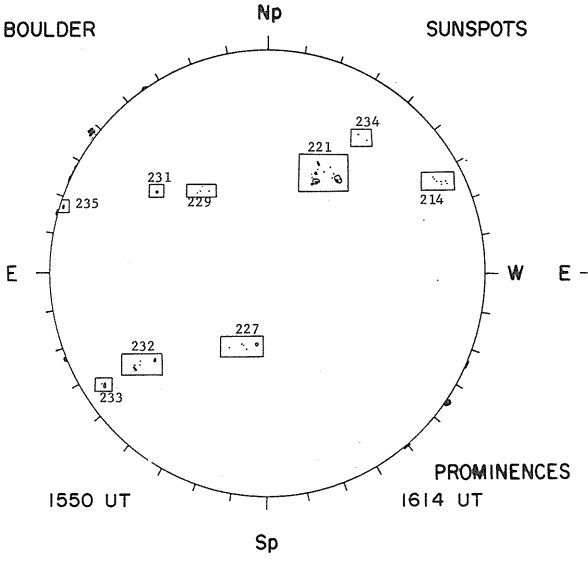


08

SACRAMENTO PEAK



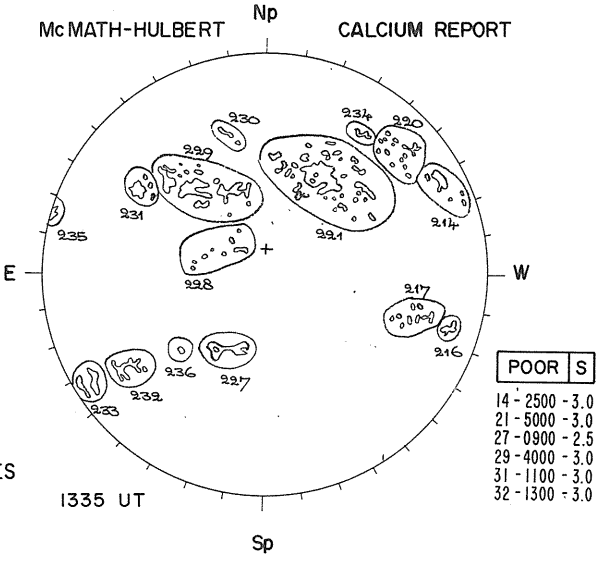
BOULDER



SUNSPOTS

McMATH-HULBERT

CALCIUM REPORT

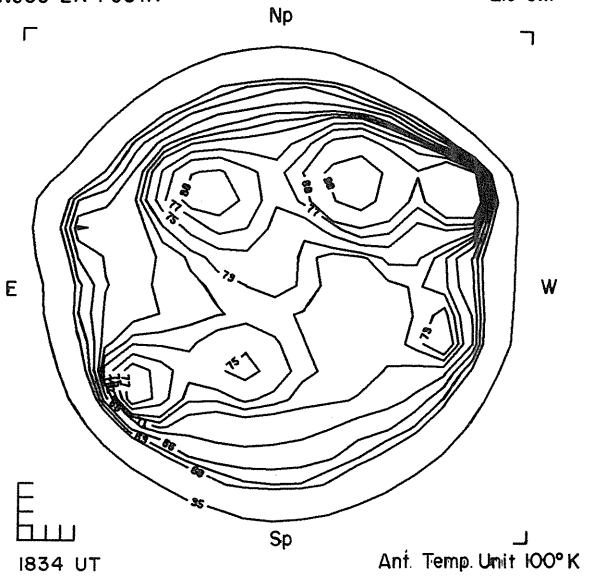


PROMINENCES

1614 UT

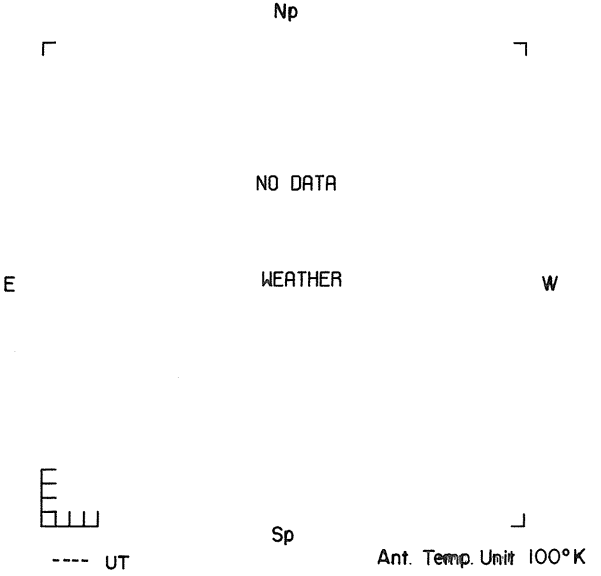
NOSC LA POSTA

2.0 CM

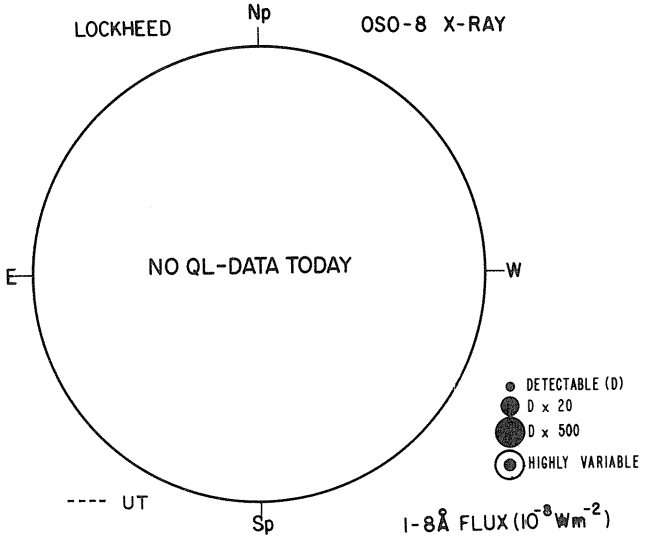


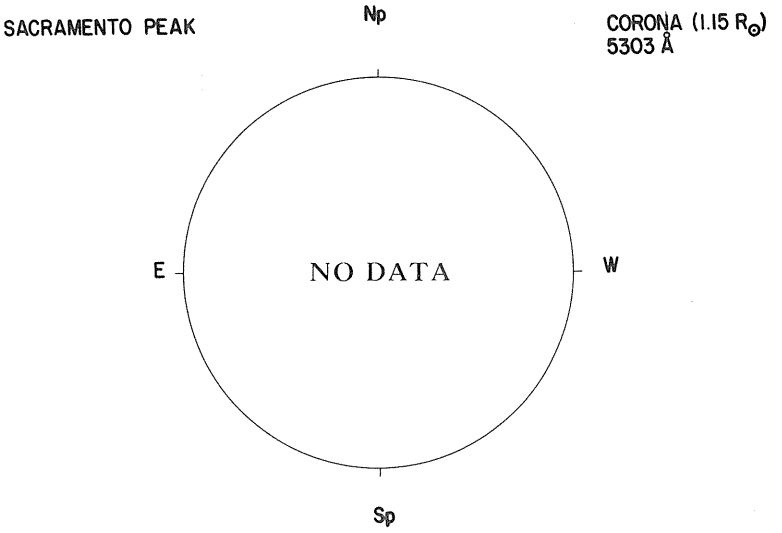
NOSC LA POSTA

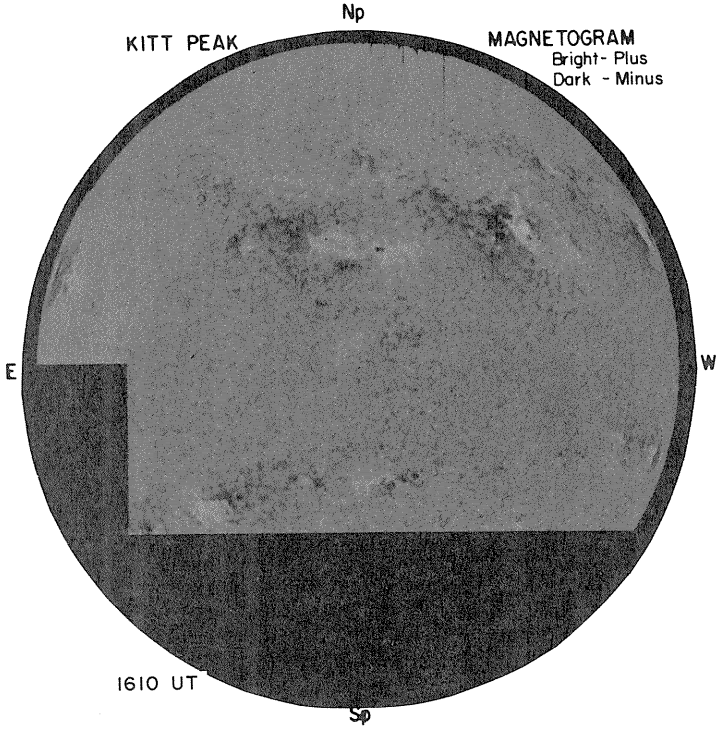
8.6 MM

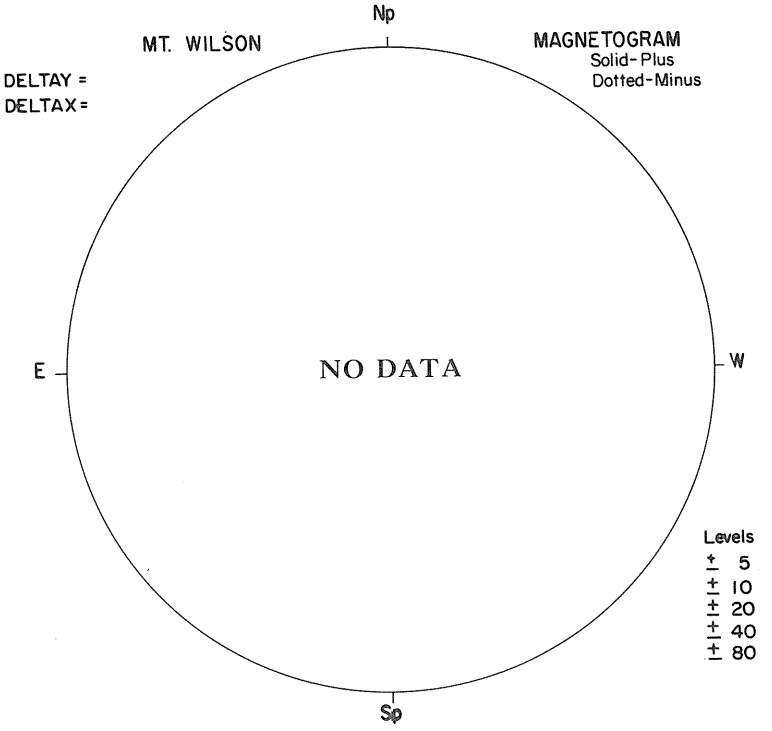


APRIL 9, 1978 (P =-26.31, B_o =-6.05, L_o =9.21)

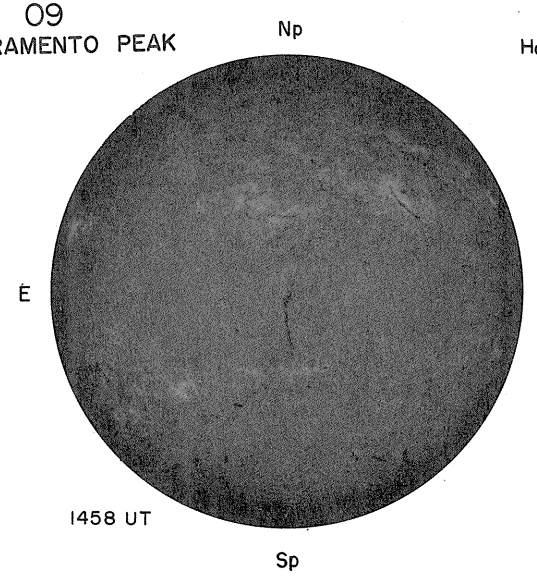




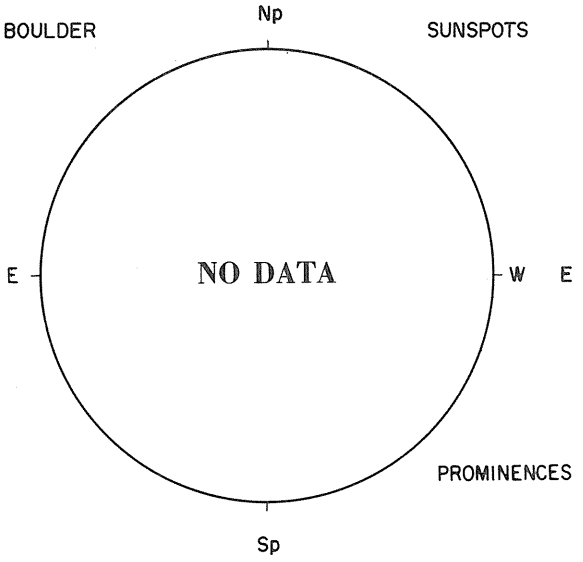




09
SACRAMENTO PEAK



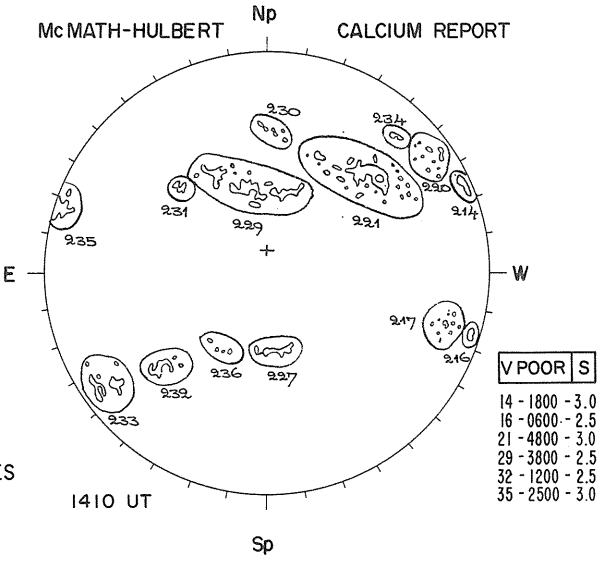
BOULDER



SUNSPOTS

McMATH-HULBERT

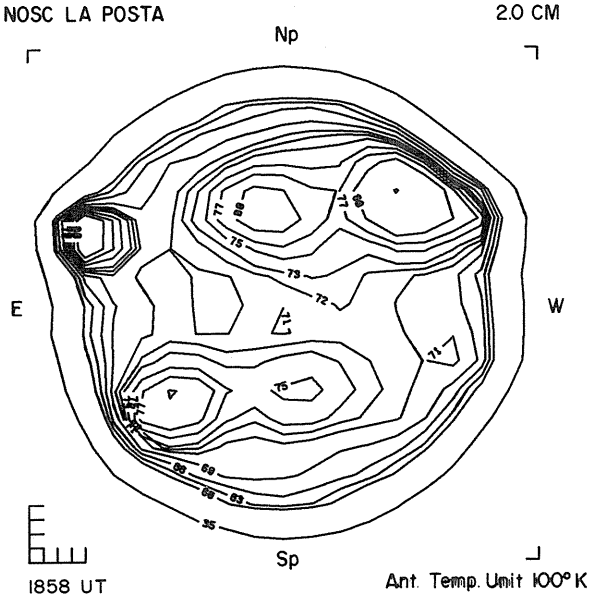
CALCIUM REPORT



PROMINENCES

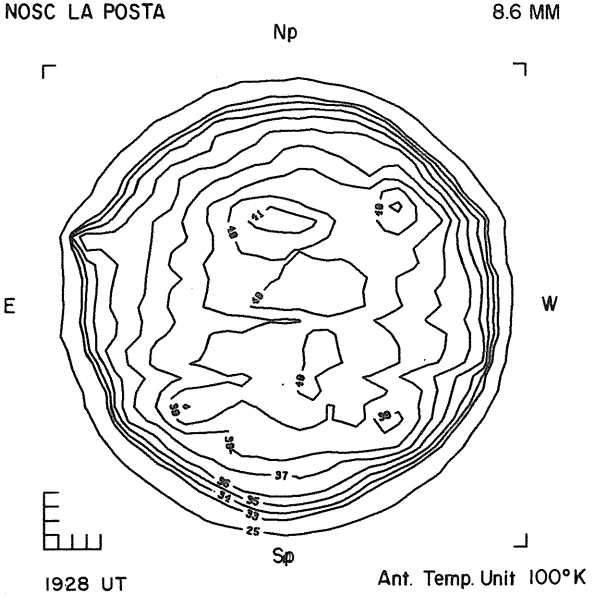
NOSC LA POSTA

2.0 CM

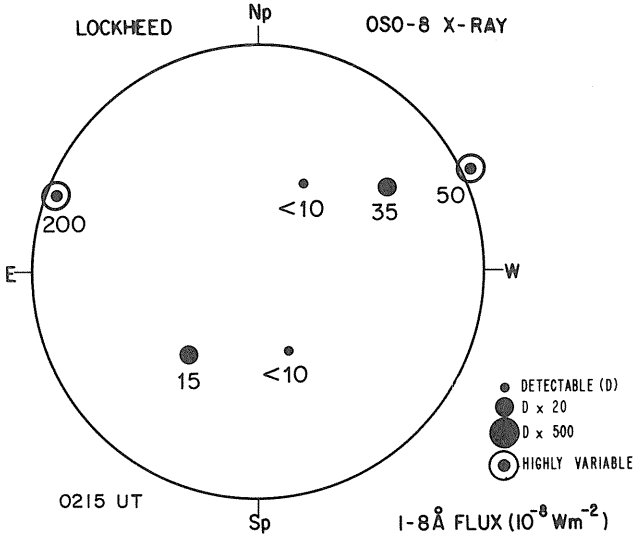


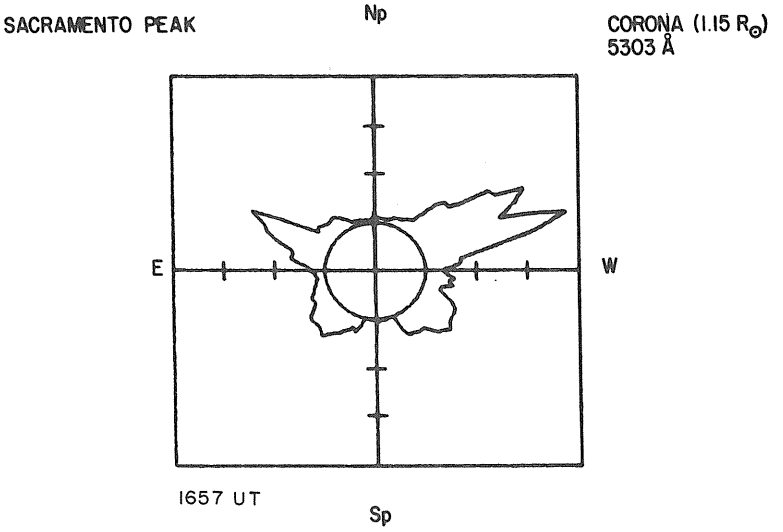
NOSC LA POSTA

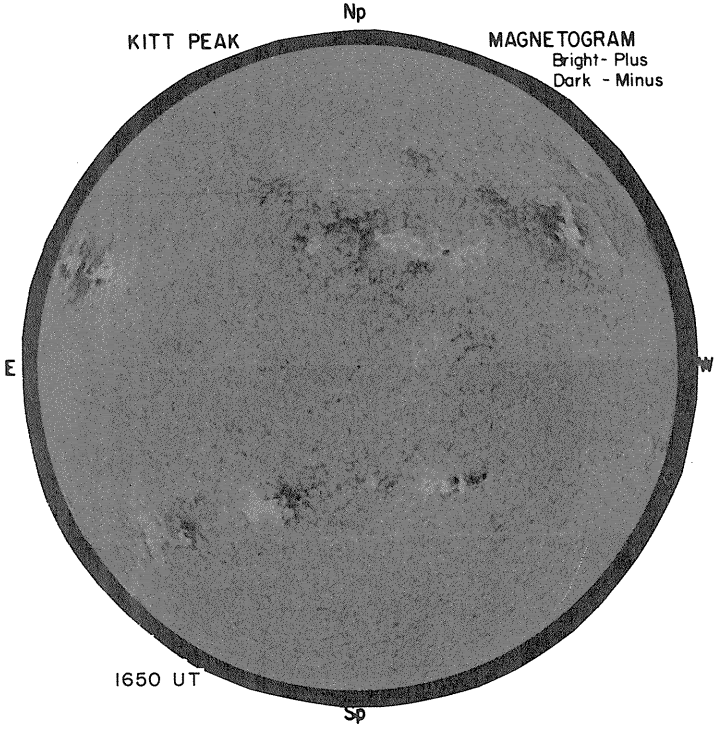
8.6 MM

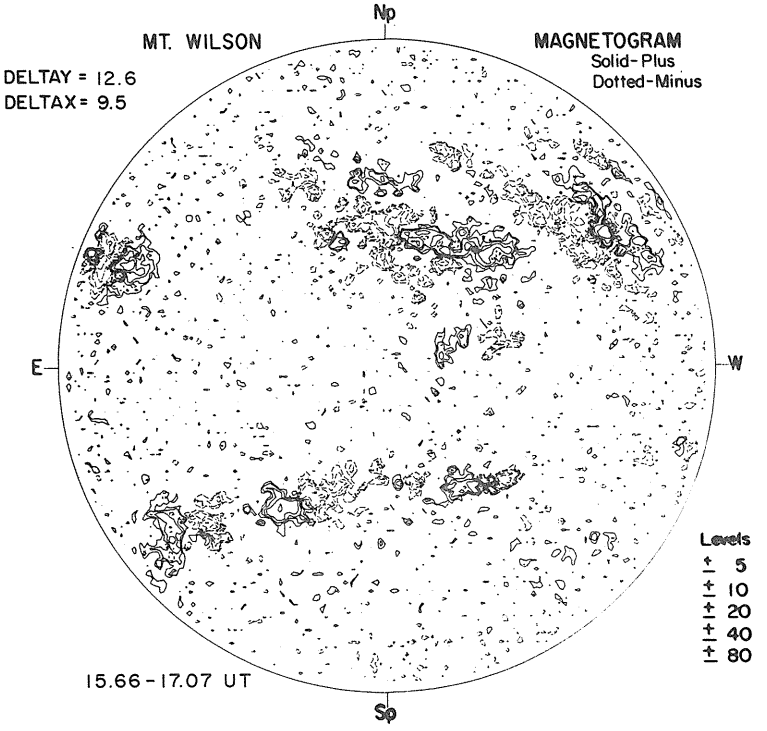


APRIL 10, 1978 (P = -26.30, B_o = - 5.98, L_o = 356.01)

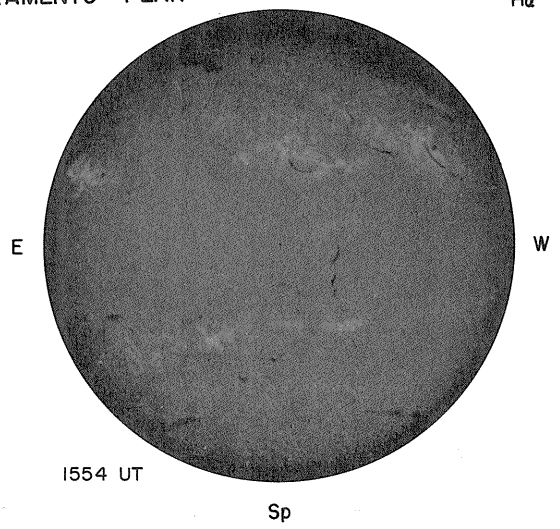






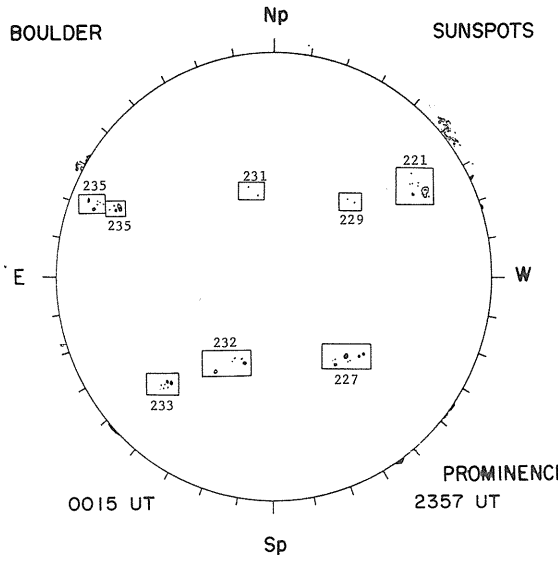


SACRAMENTO PEAK Hα



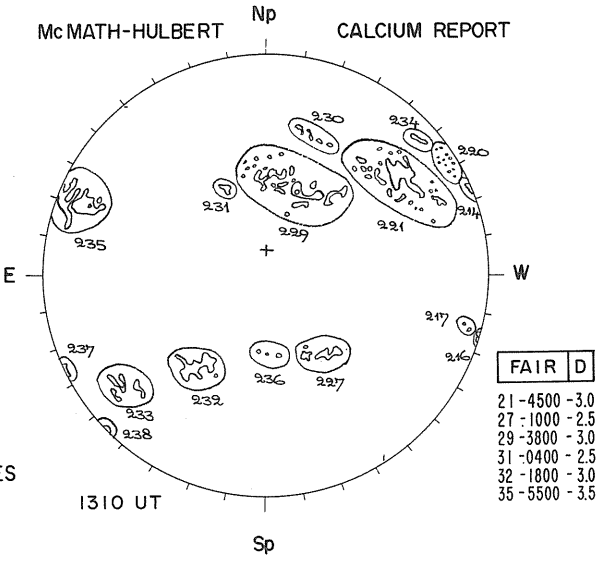
1554 UT

BOULDER SUNSPOTS



0015 UT

McMATH-HULBERT CALCIUM REPORT

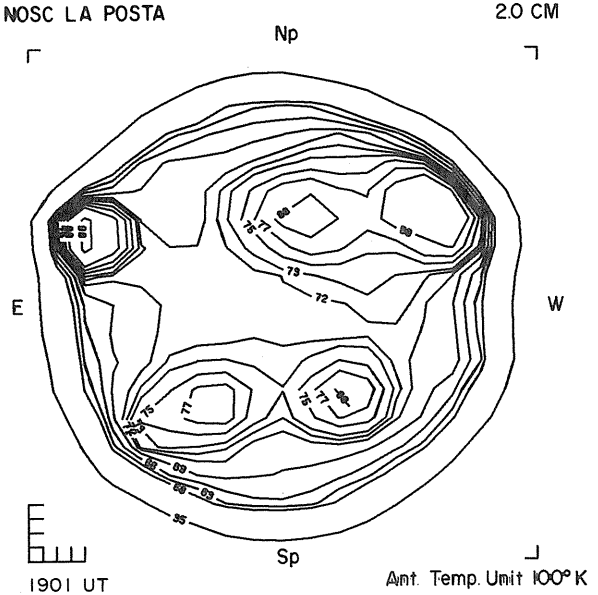


PROMINENCES

2357 UT

1310 UT

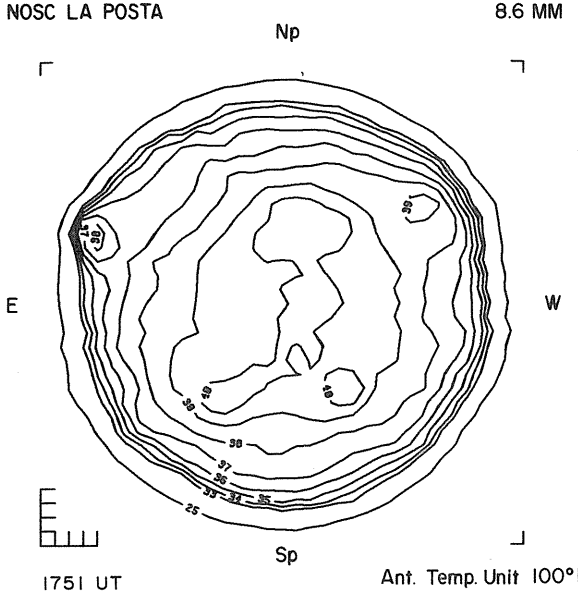
NOSC LA POSTA 2.0 CM



1901 UT

Ant. Temp. Unit 100° K

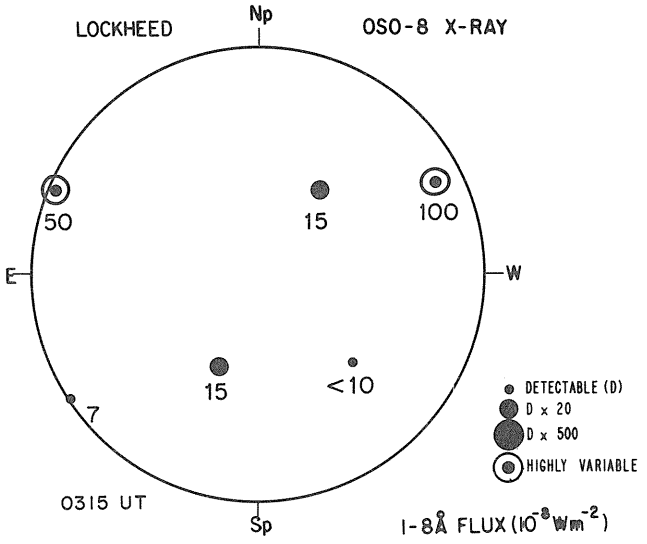
NOSC LA POSTA 8.6 MM

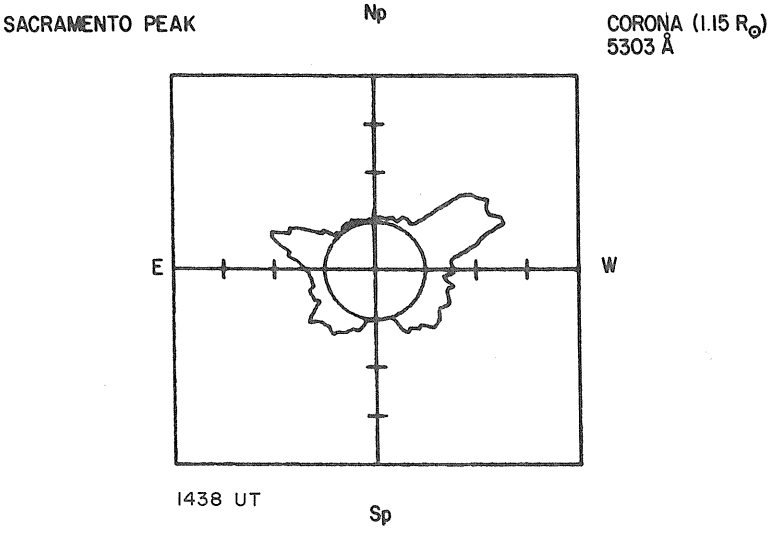


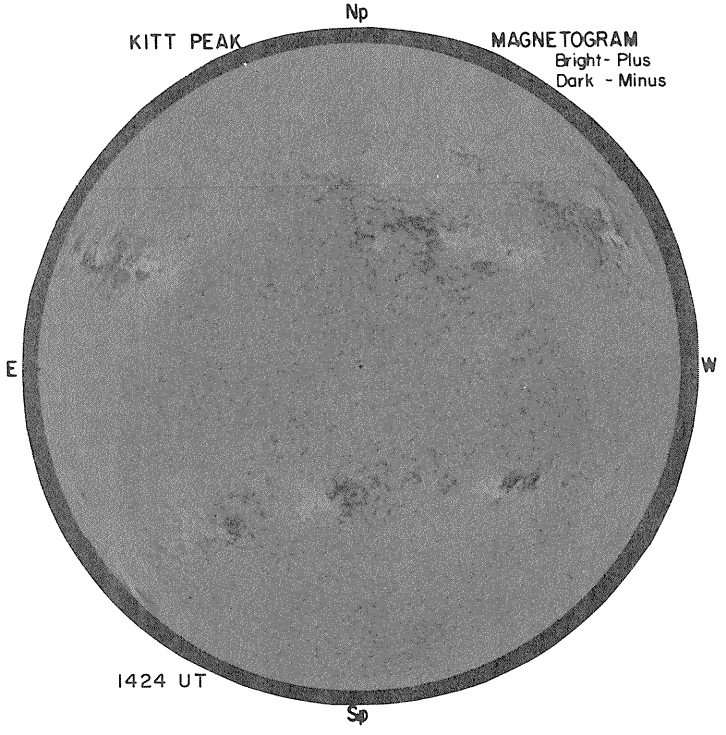
1751 UT

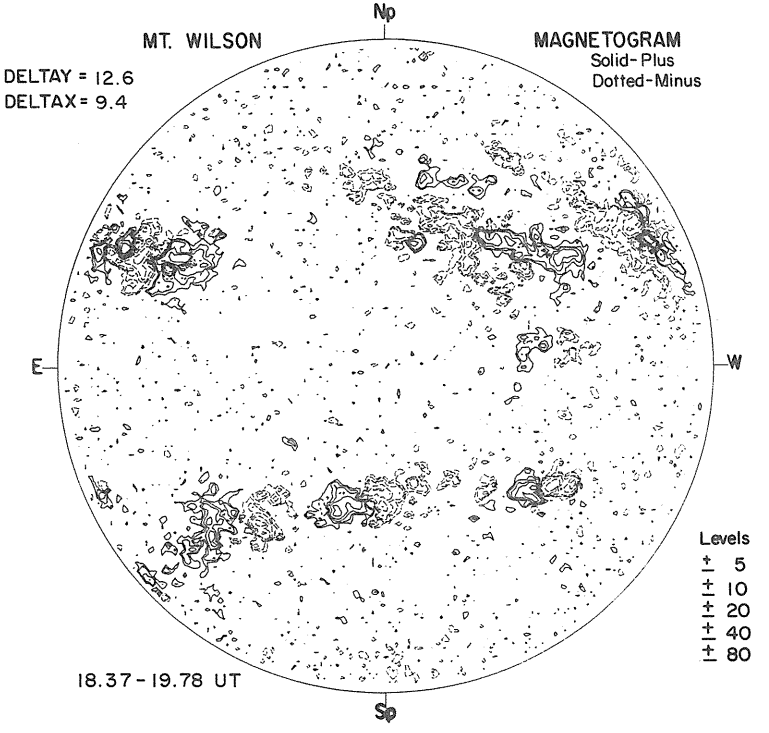
Ant. Temp. Unit 100° K

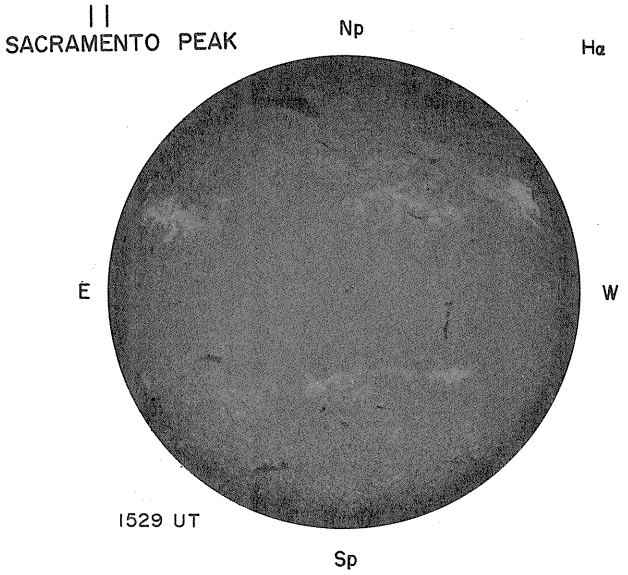
APRIL 11, 1978 (P = -26.27, B_o = -5.91, L_o = 342.81)

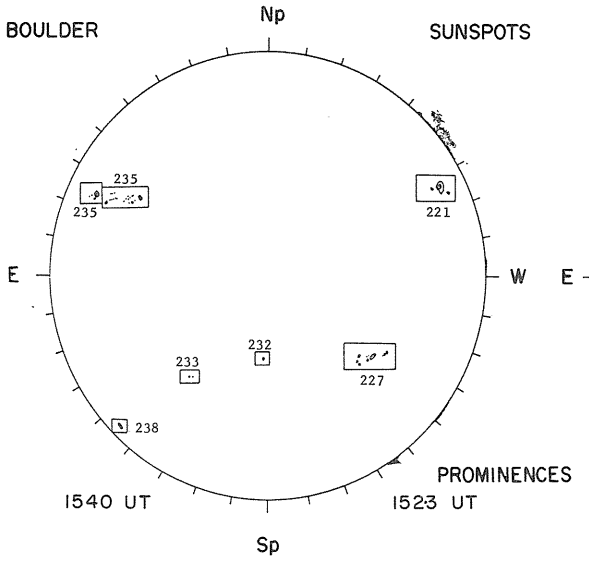


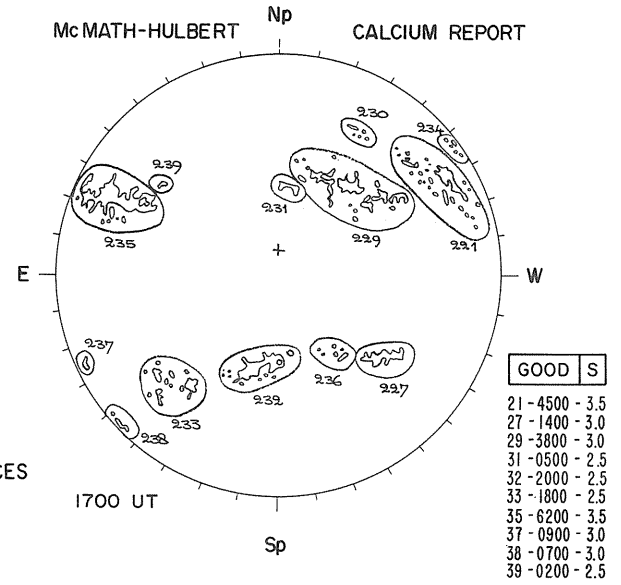


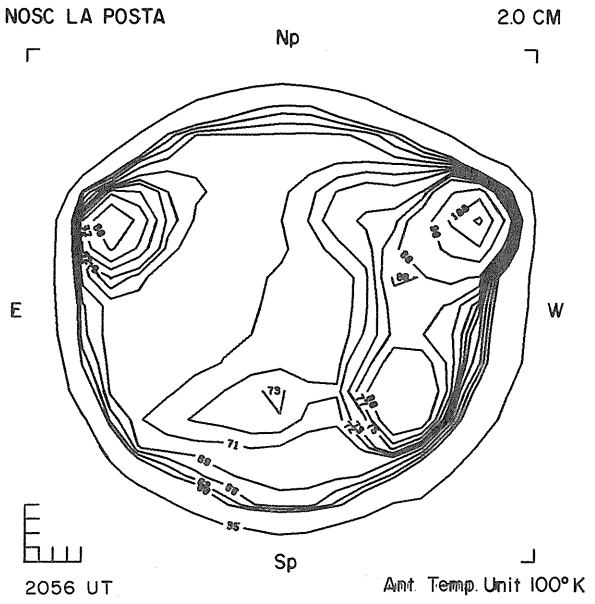


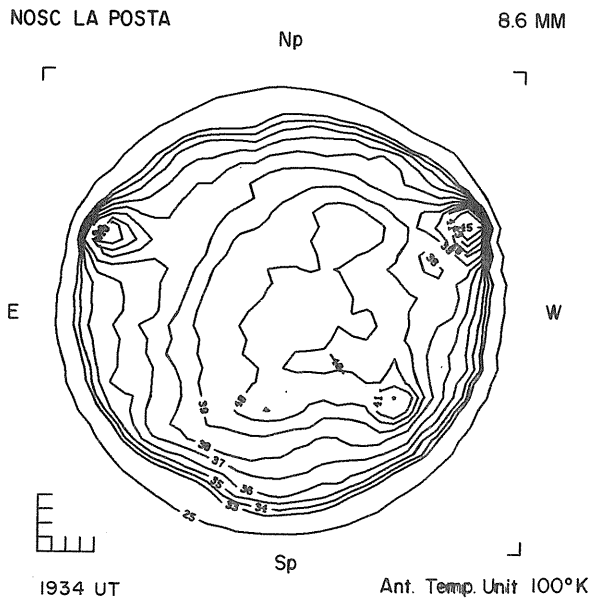



SACRAMENTO PEAK
Np
Hα
E
W
1529 UT
Sp

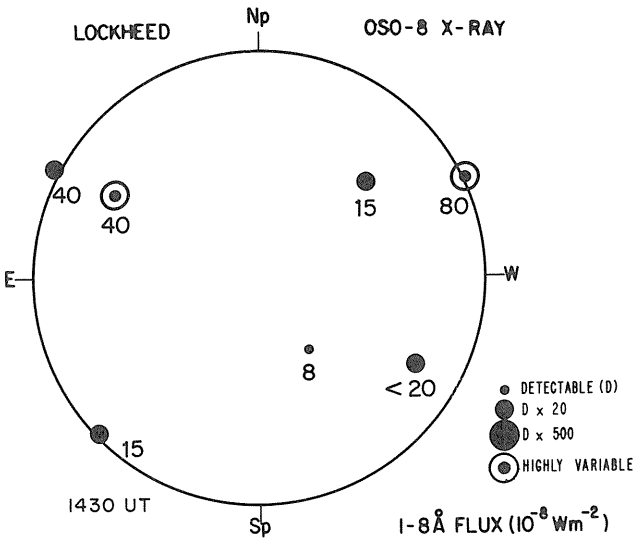

BOULDER
Np
SUNSPOTS
E
W
235
235
221
232
233
227
238
PROMINENCES
1540 UT
1523 UT
Sp

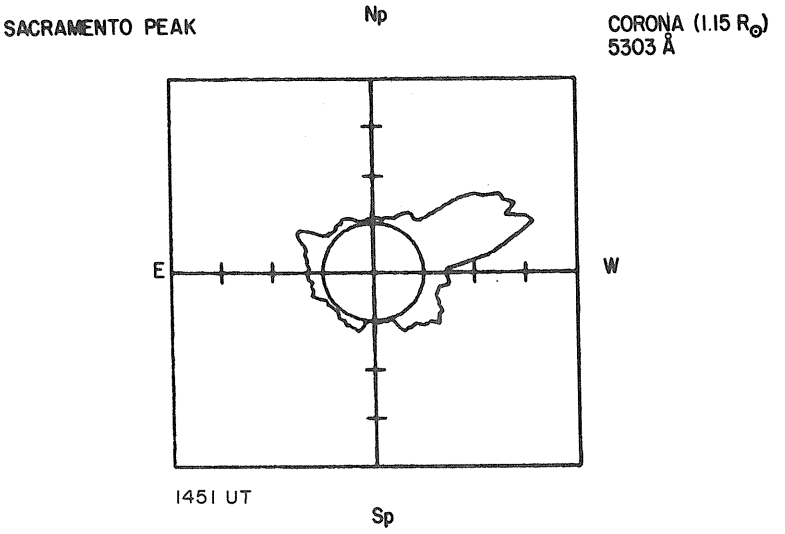

McMATH-HULBERT
Np
CALCIUM REPORT
E
W
230
234
239
231
235
229
221
237
232
236
227
233
238
1700 UT
Sp
GOOD S
21 - 4500 - 3.5
27 - 1400 - 3.0
29 - 3800 - 3.0
31 - 0500 - 2.5
32 - 2000 - 2.5
33 - 1800 - 2.5
35 - 6200 - 3.5
37 - 0900 - 3.0
38 - 0700 - 3.0
39 - 0200 - 2.5

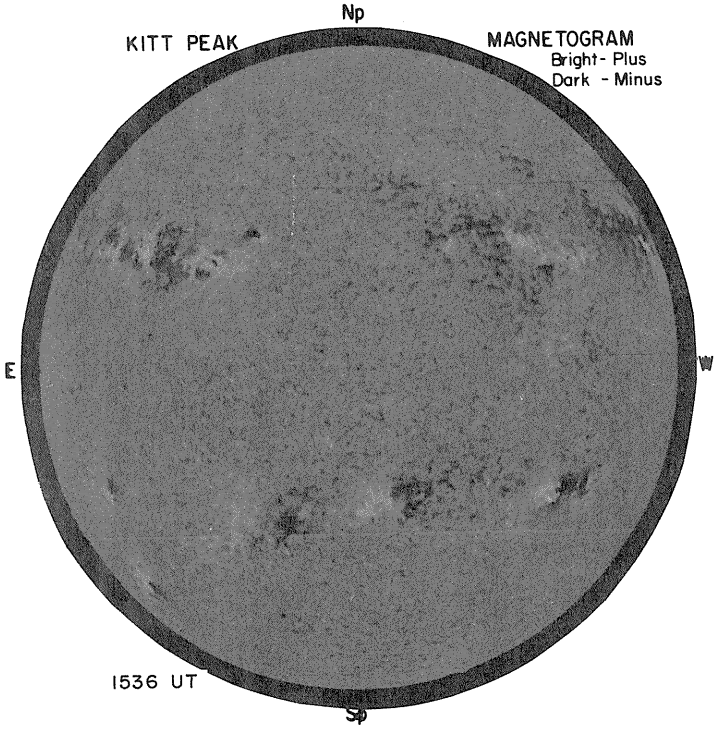

NOSC LA POSTA
Np
2.0 CM
E
W
Sp
2056 UT
Ant. Temp. Unit 100°K

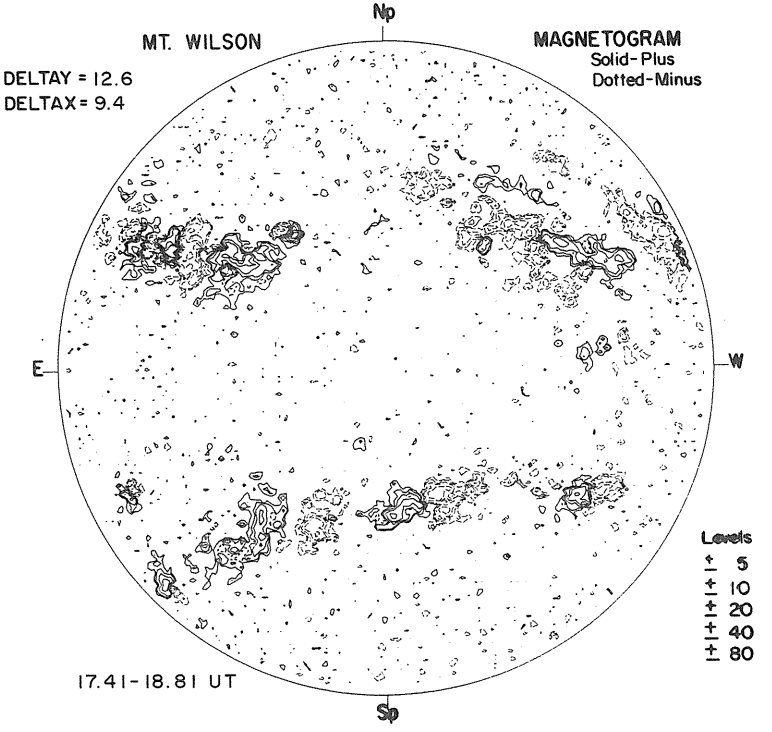

NOSC LA POSTA
Np
8.6 MM
E
W
Sp
1934 UT
Ant. Temp. Unit 100°K

APRIL 12, 1978 (P = -26.24, B_o = -5.84, L_o = 329.61)



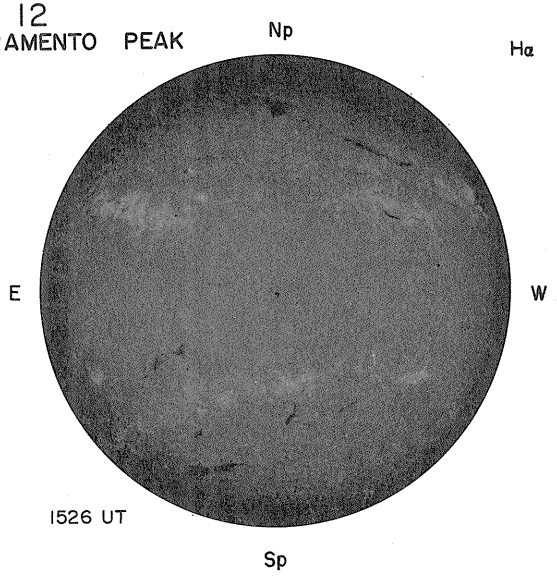




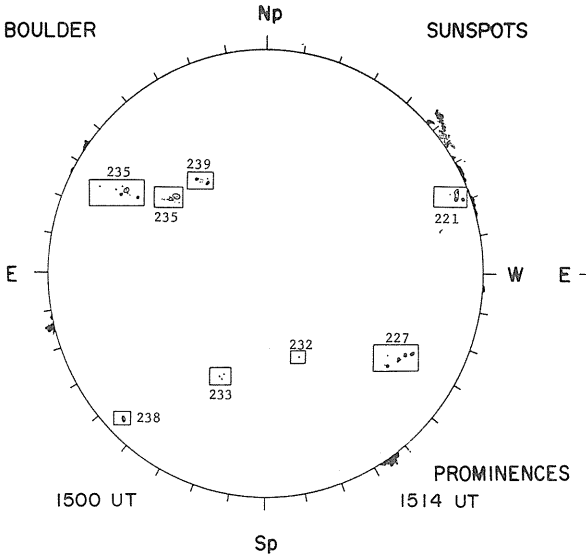


12

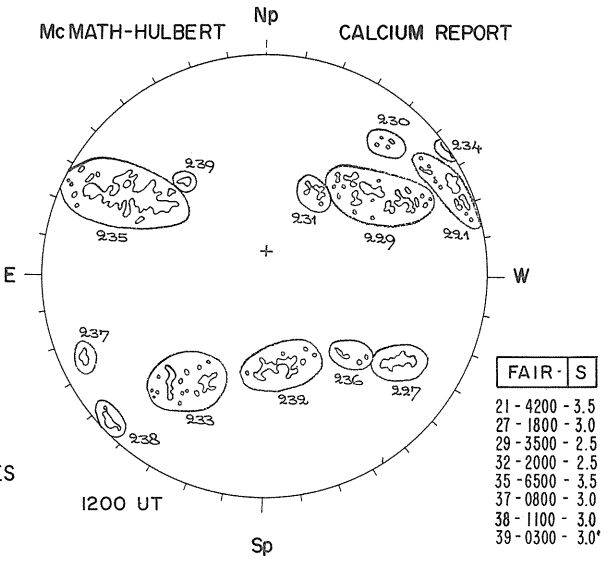
SACRAMENTO PEAK



BOULDER SUNSPOTS



McMATH-HULBERT CALCIUM REPORT

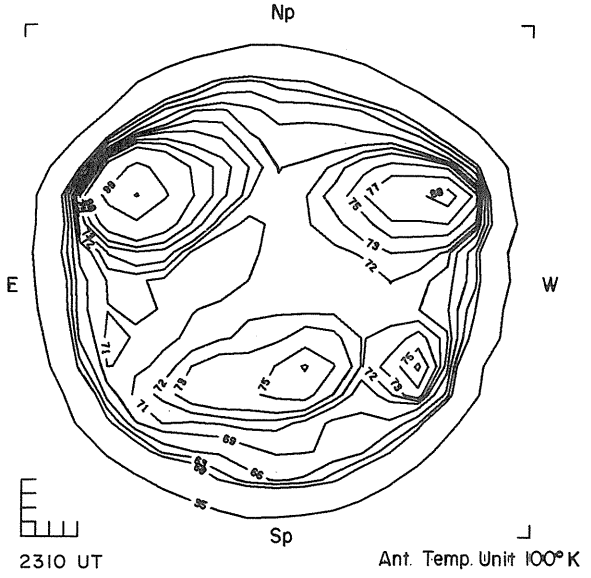


FAIR	S
21 - 4200 - 3.5	
27 - 1800 - 3.0	
29 - 3500 - 2.5	
32 - 2000 - 2.5	
35 - 6500 - 3.5	
37 - 0800 - 3.0	
38 - 1100 - 3.0	
39 - 0300 - 3.0*	

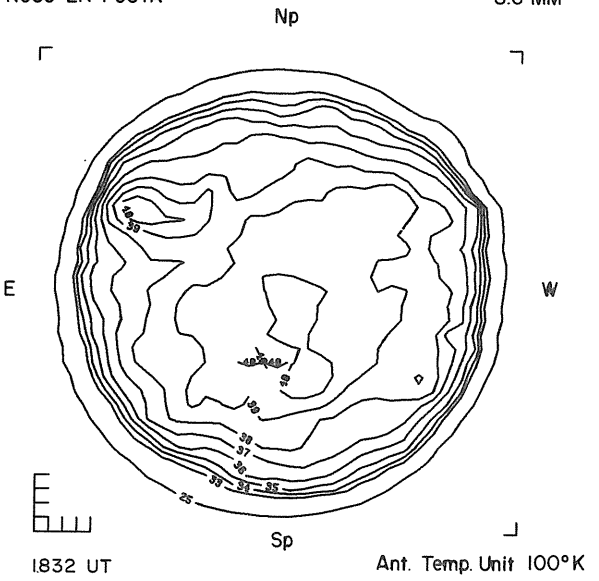
PROMINENCES

1514 UT

NOSC LA POSTA 2.0 CM

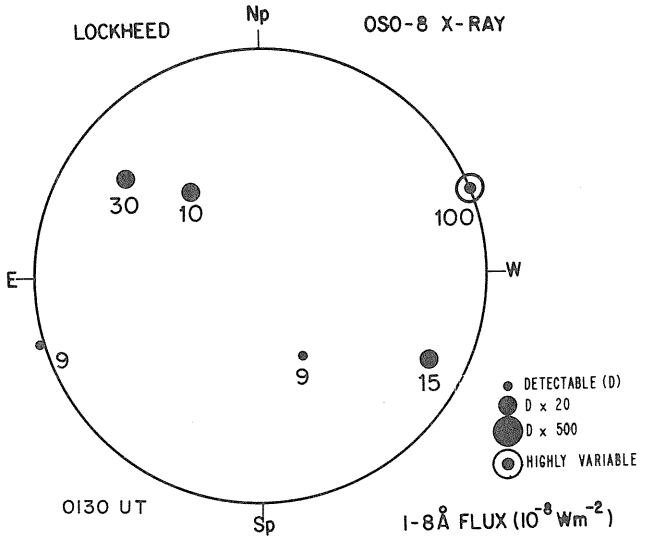


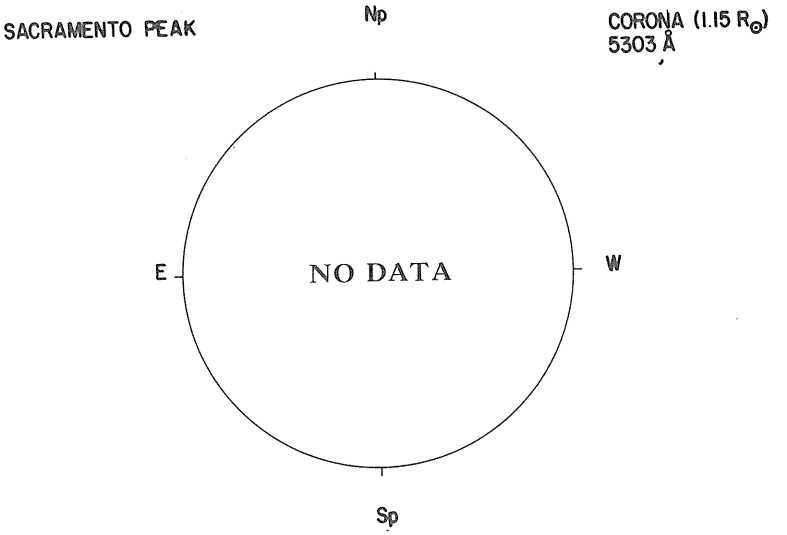
NOSC LA POSTA 8.6 MM

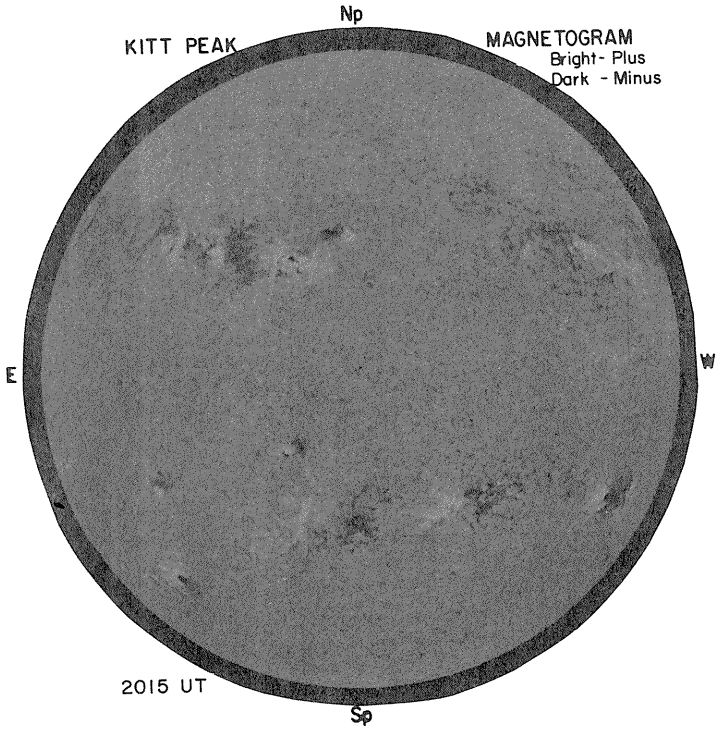


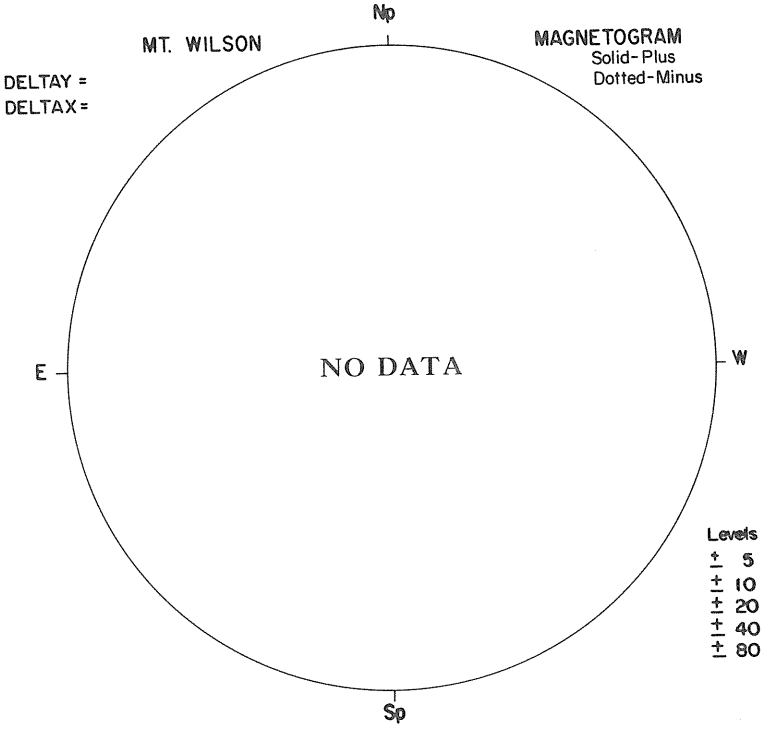
77
Apr 78

APRIL 13, 1978 (P = -26.20, B_o = -5.76, L_o = 316.40)



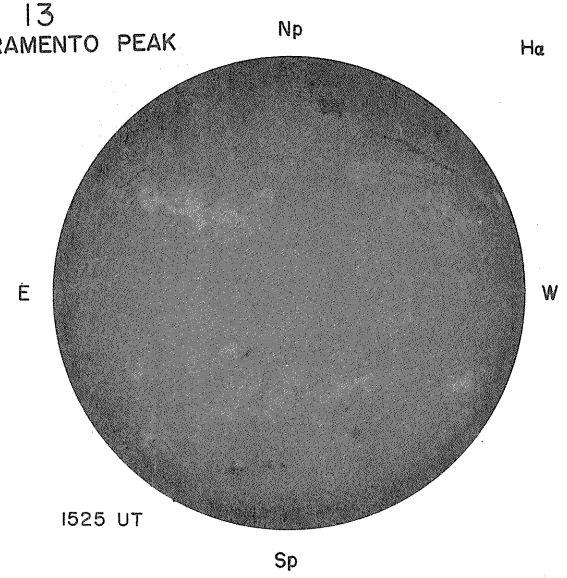




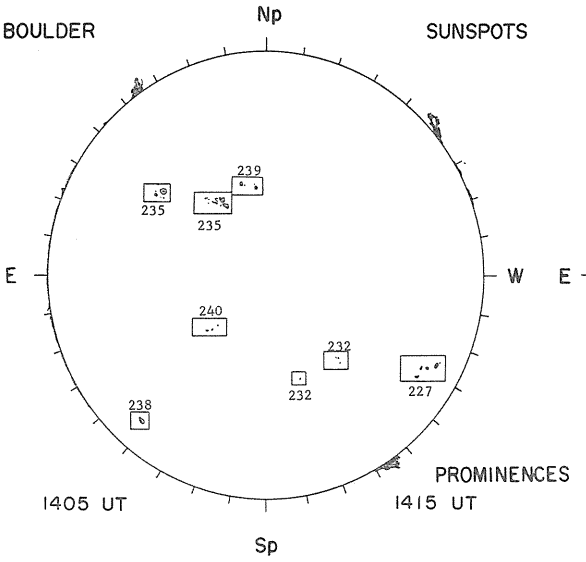


13

SACRAMENTO PEAK



BOULDER

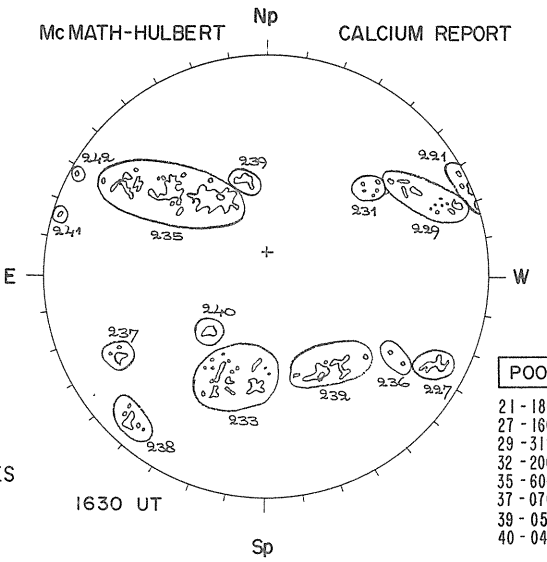


SUNSPOTS

PROMINENCES

1415 UT

McMATH-HULBERT



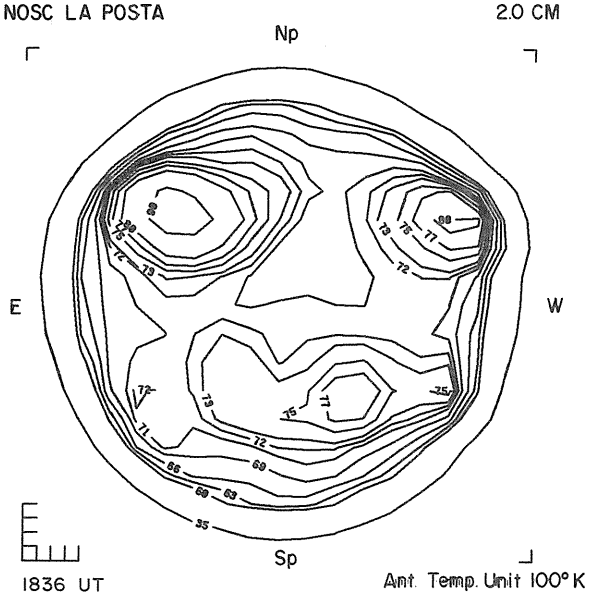
CALCIUM REPORT

POOR	S

21 - 1800 - 2.5
27 - 1600 - 3.0
29 - 3100 - 2.5
32 - 2000 - 3.0
35 - 6000 - 3.0
37 - 0700 - 3.0
39 - 0500 - 3.0
40 - 0400 - 3.0

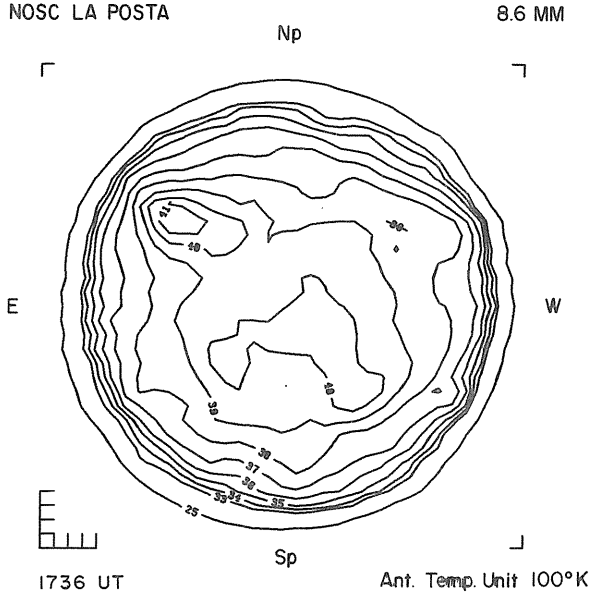
NOSC LA POSTA

2.0 CM

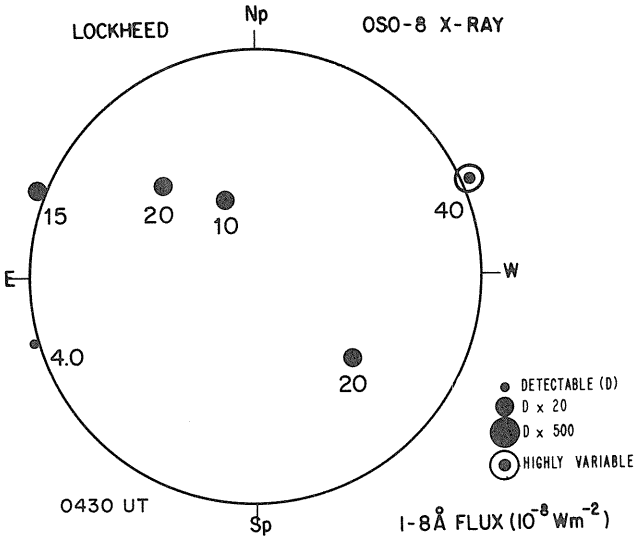


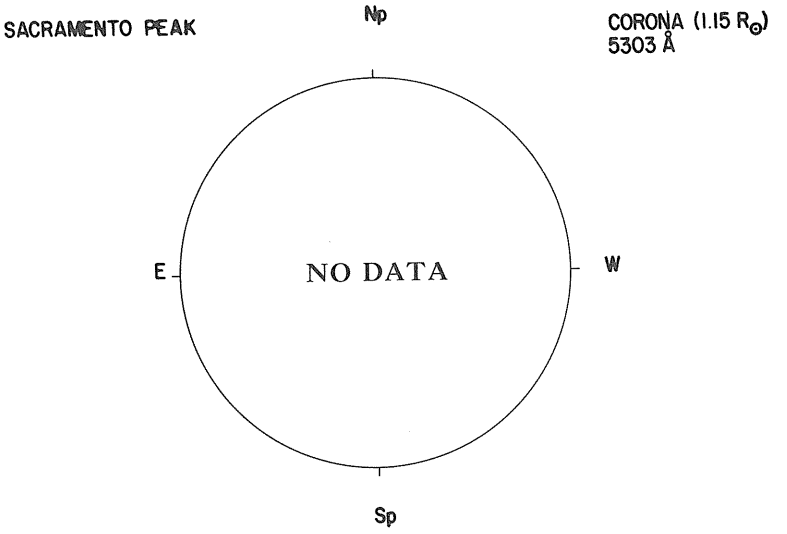
NOSC LA POSTA

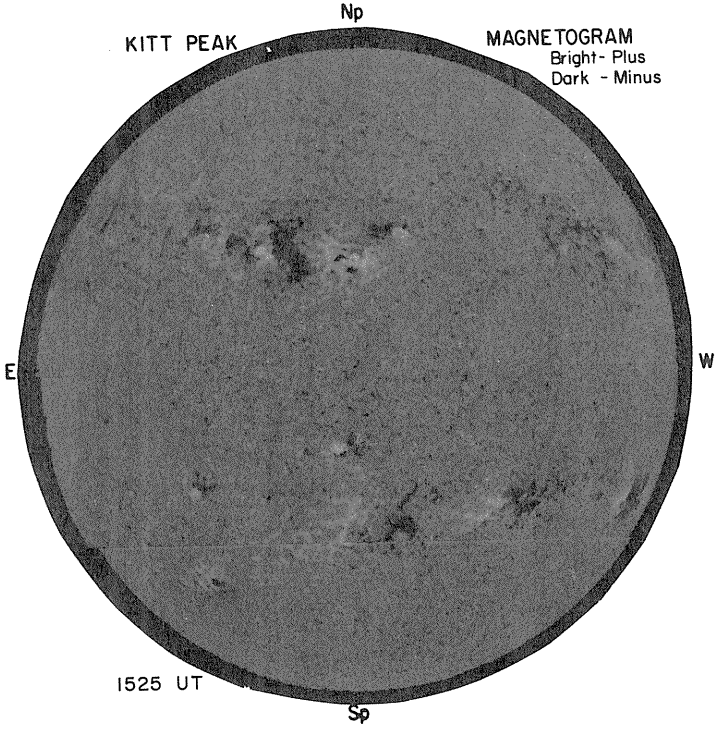
8.6 MM

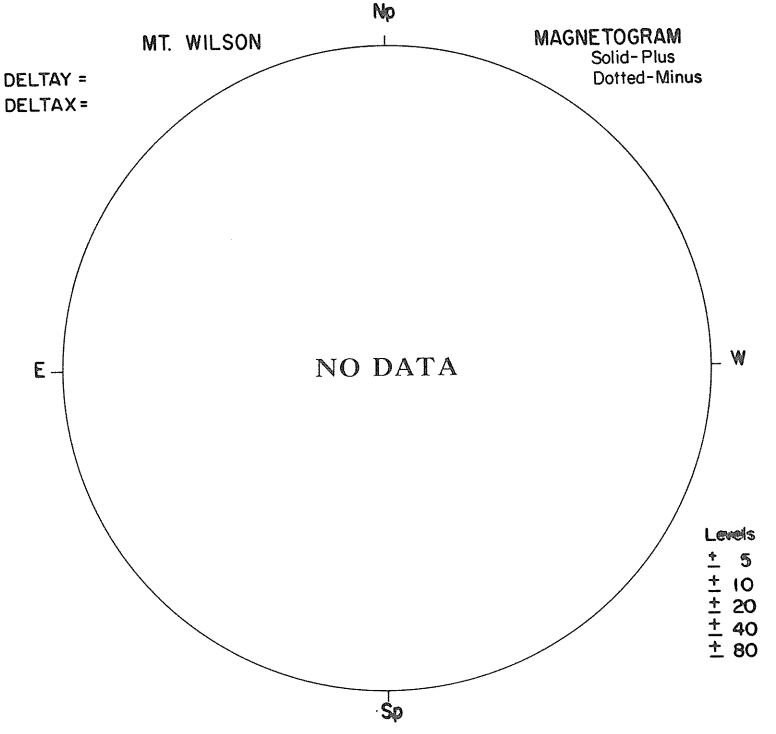


APRIL 14, 1978 (P = -26.16, B_o = -5.69, L_o = 303.20)



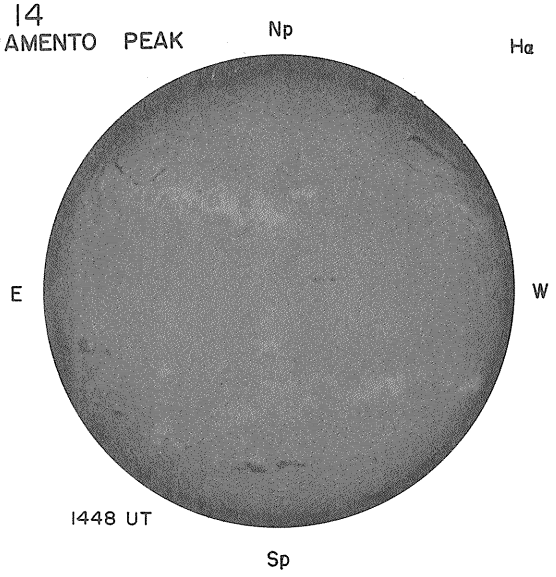




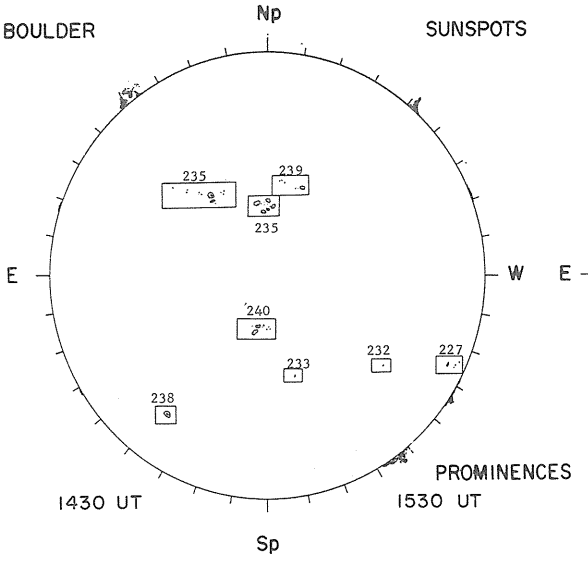


14

SACRAMENTO PEAK



BOULDER

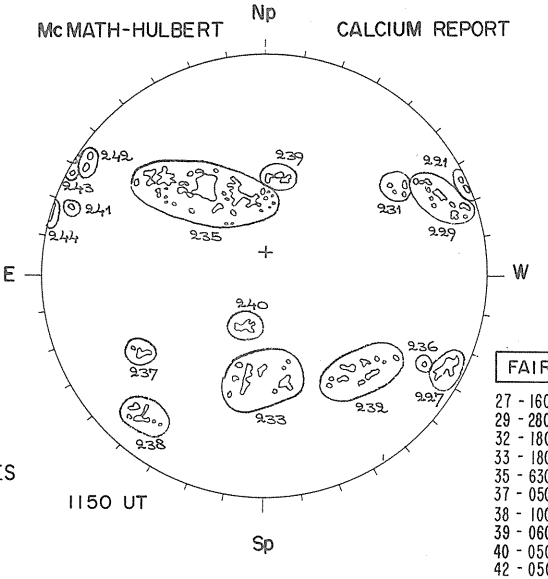


SUNSPOTS

PROMINENCES

1530 UT

McMATH-HULBERT



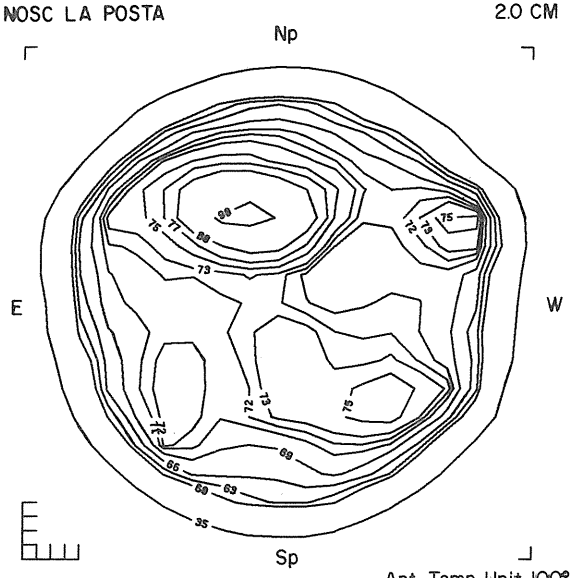
CALCIUM REPORT

FAIR	D

27 - 1600 - 3.5
29 - 2800 - 2.5
32 - 1800 - 3.0
33 - 1800 - 2.5
35 - 6300 - 3.5
37 - 0500 - 3.0
38 - 1000 - 2.5
39 - 0600 - 3.0
40 - 0500 - 3.0
42 - 0500 - 2.5

NOSC LA POSTA

2.0 CM

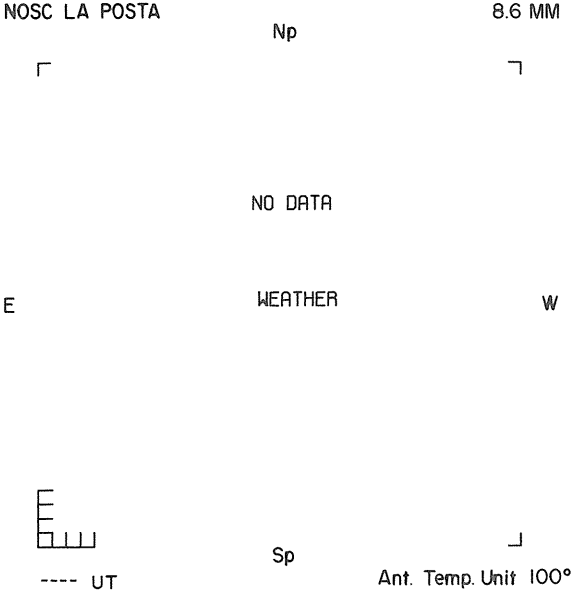


2051 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

8.6 MM

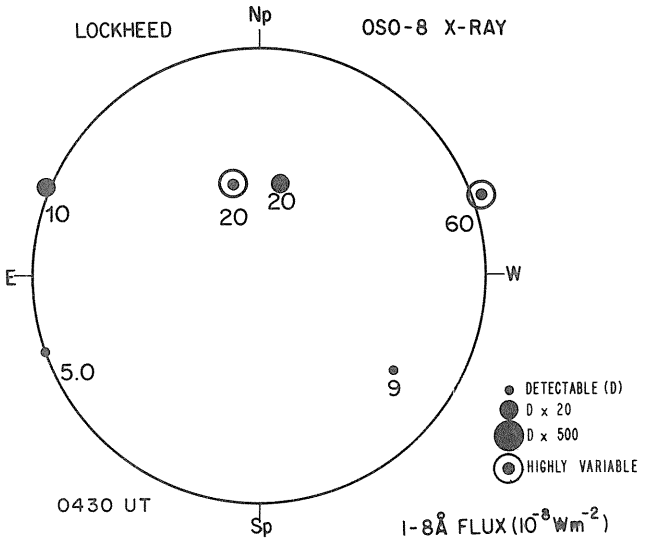


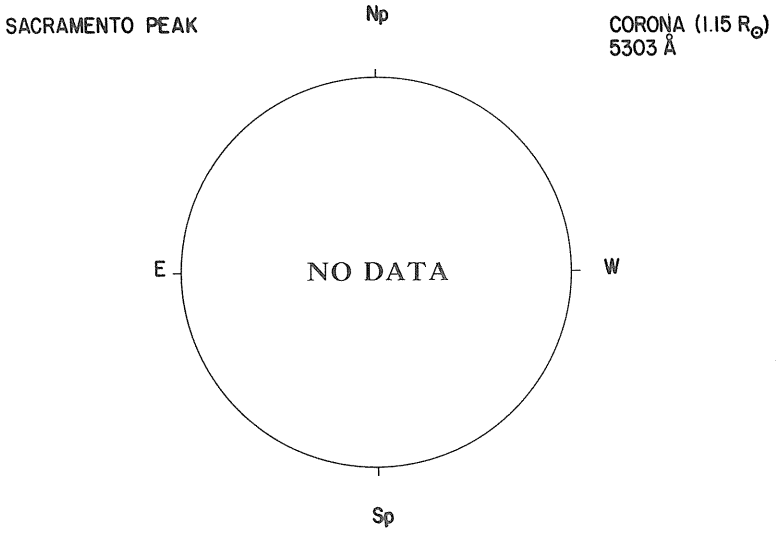
---- UT

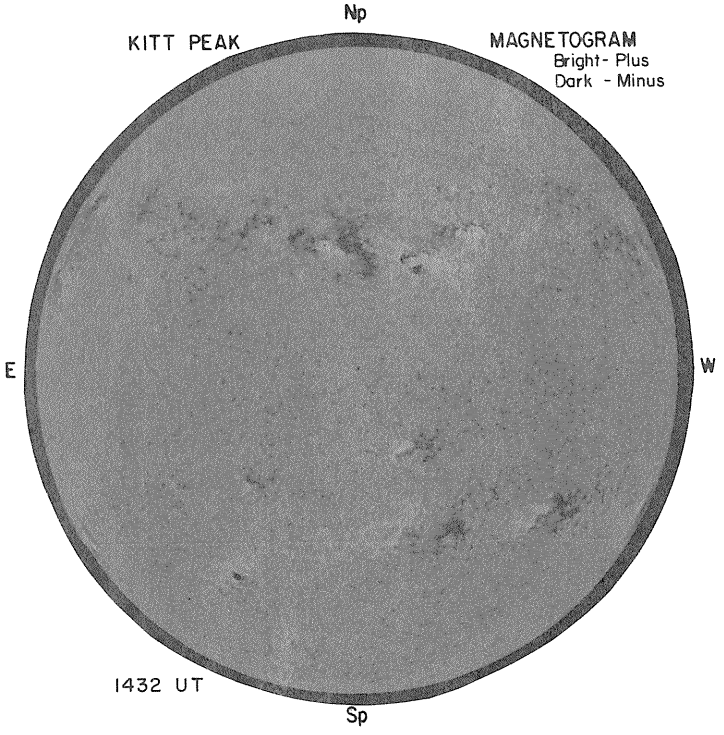
Ant. Temp. Unit 100° K

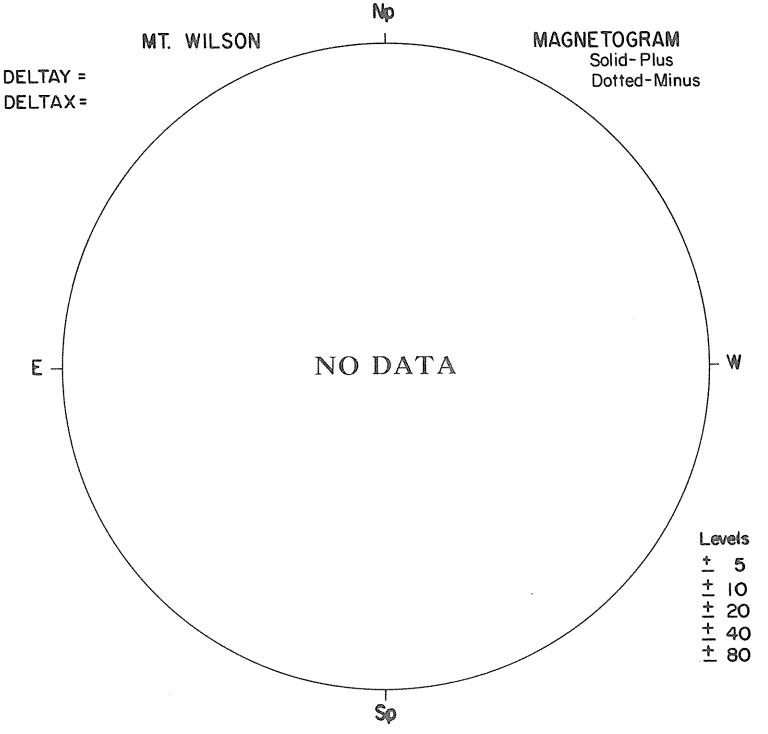
81
Apr 78

APRIL 15, 1978 (P = -26.10, B_o = -5.61, L_o = 290.00)



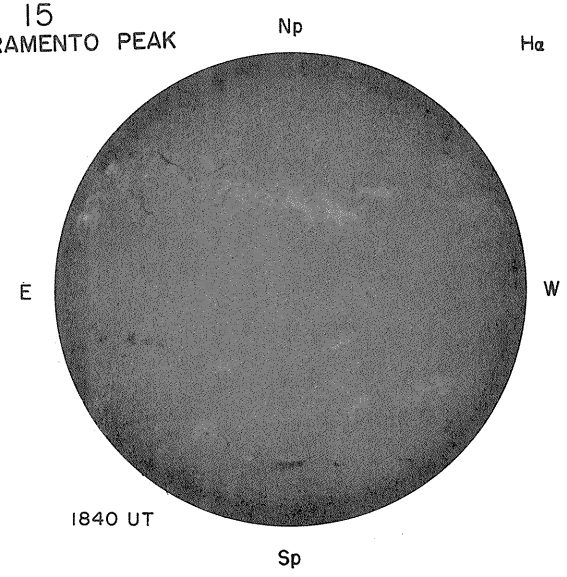




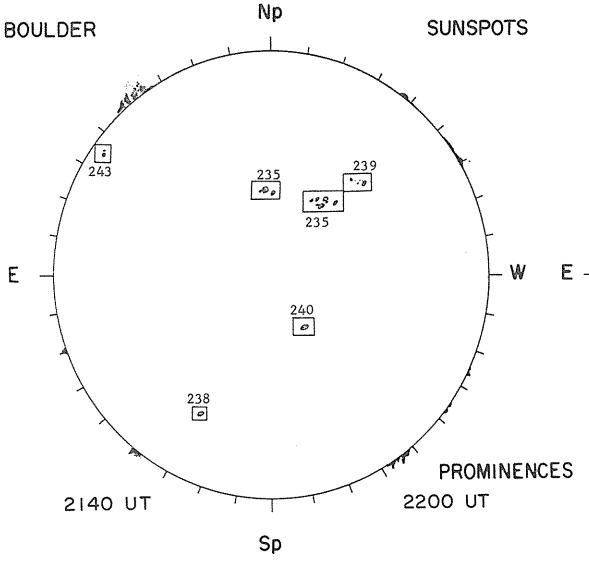


15

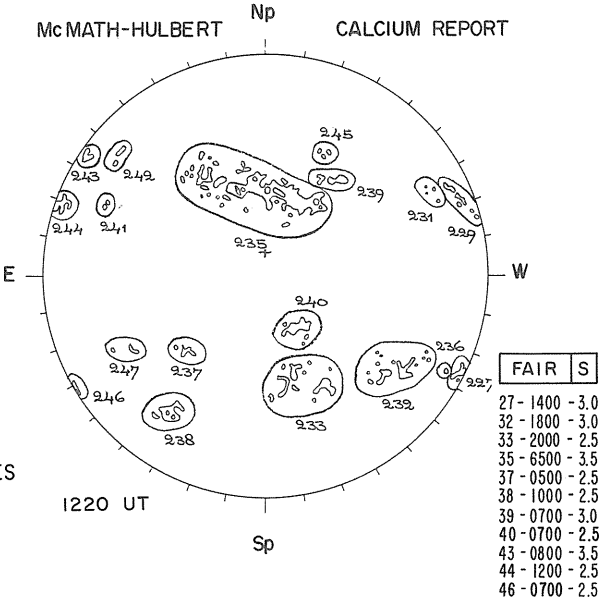
SACRAMENTO PEAK



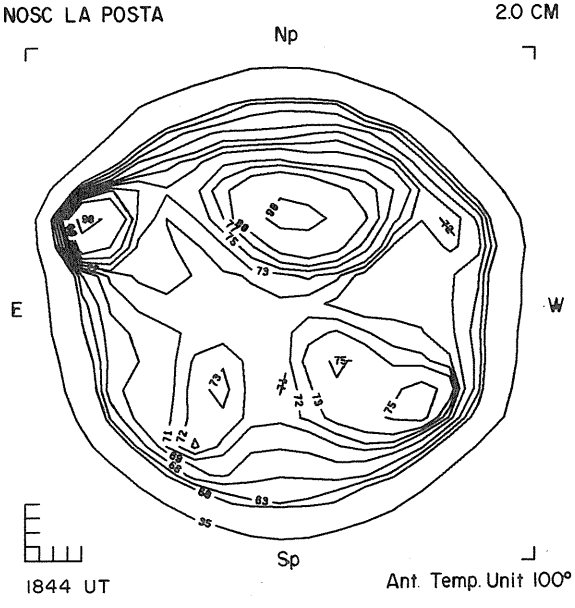
BOULDER



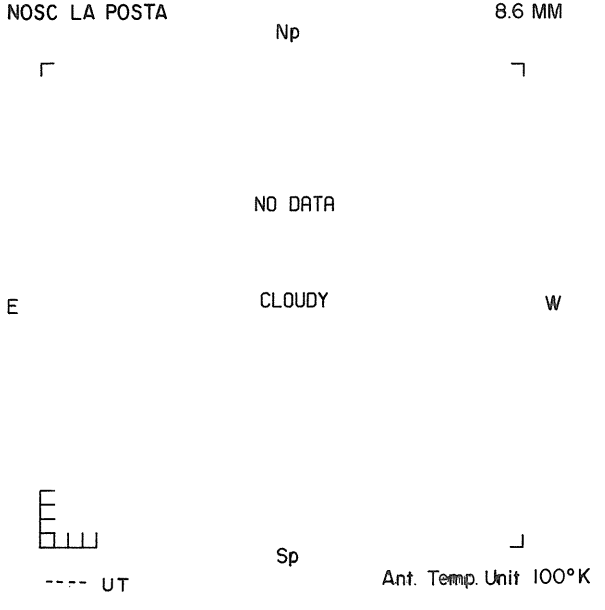
McMATH-HULBERT



NOSC LA POSTA

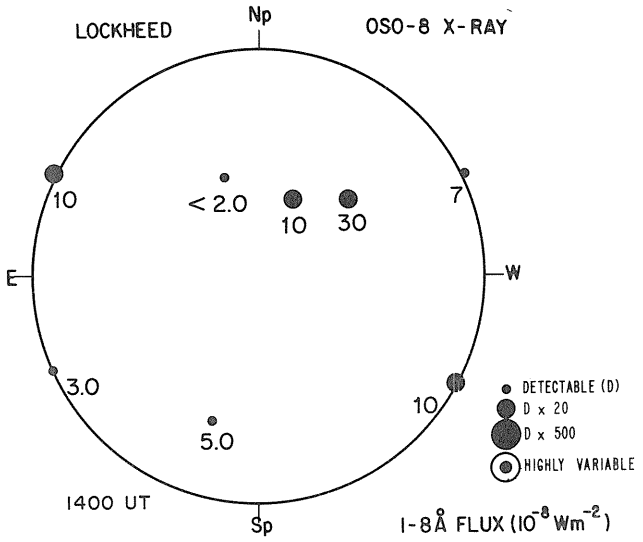


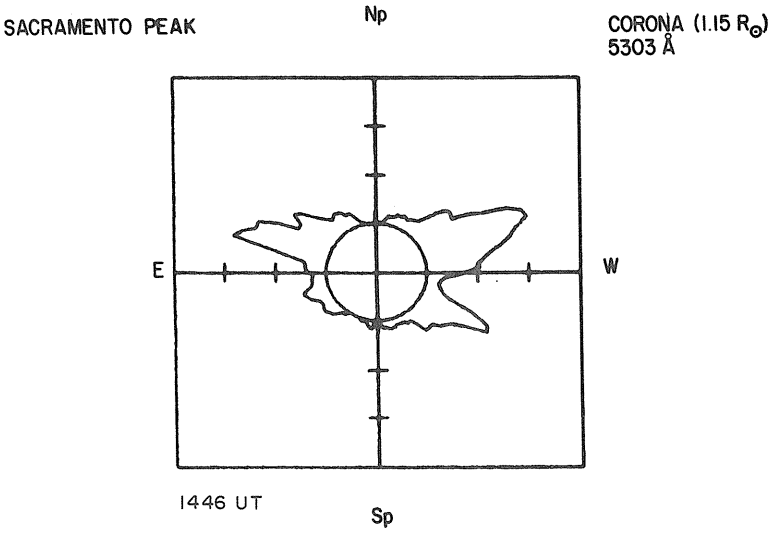
NOSC LA POSTA

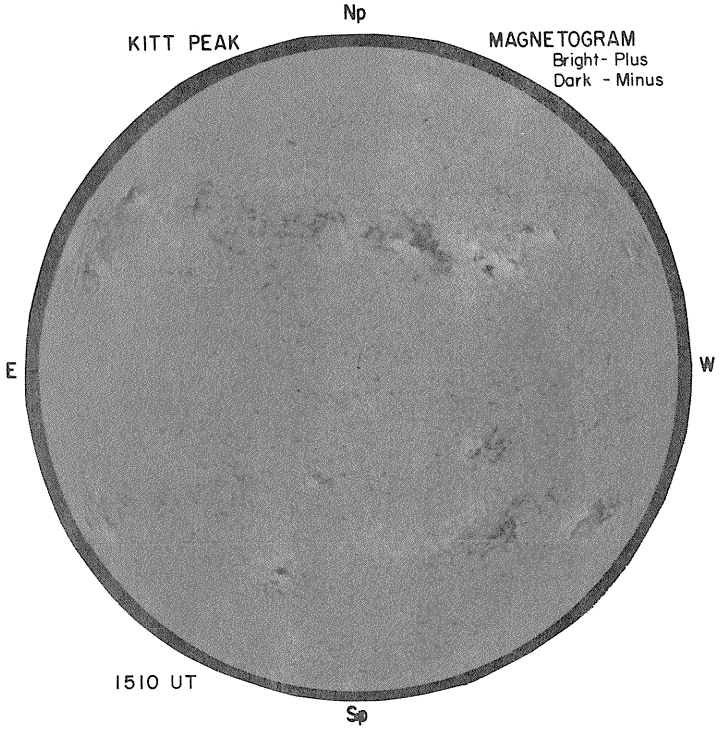


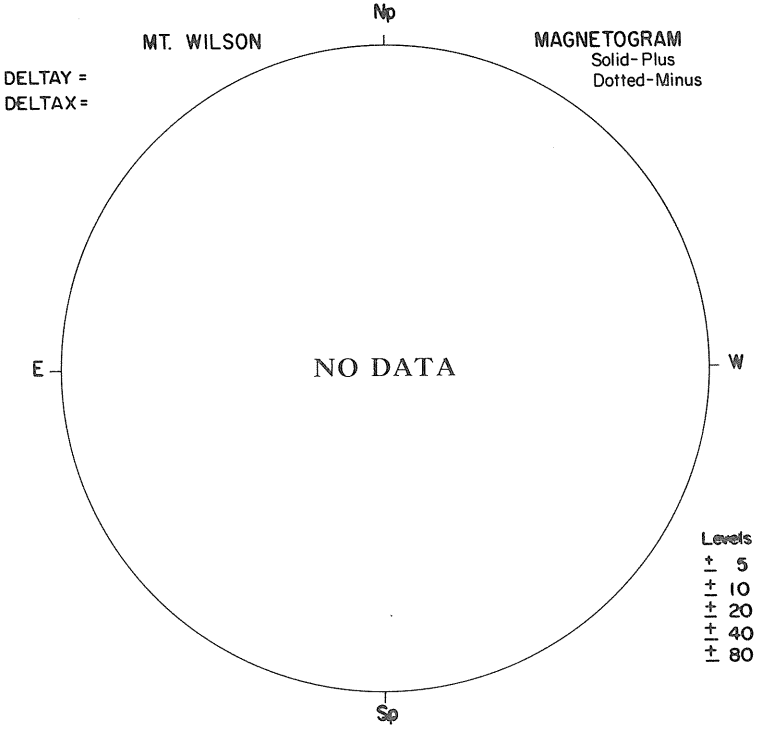
83
Apr 78

APRIL 16, 1978 (P = -26.04, B_o = -5.53, L_o = 276.79)



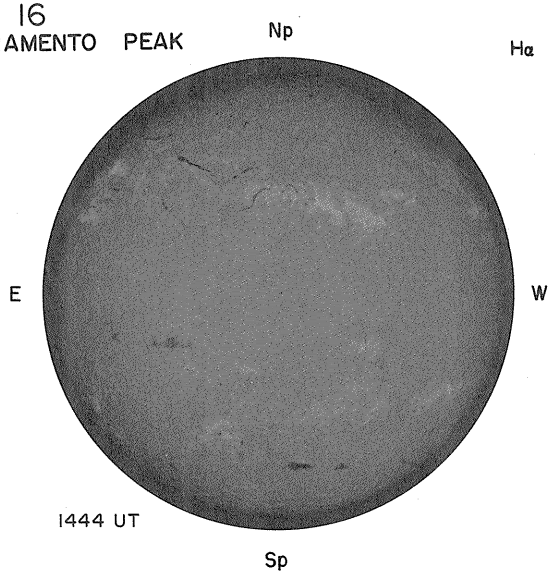




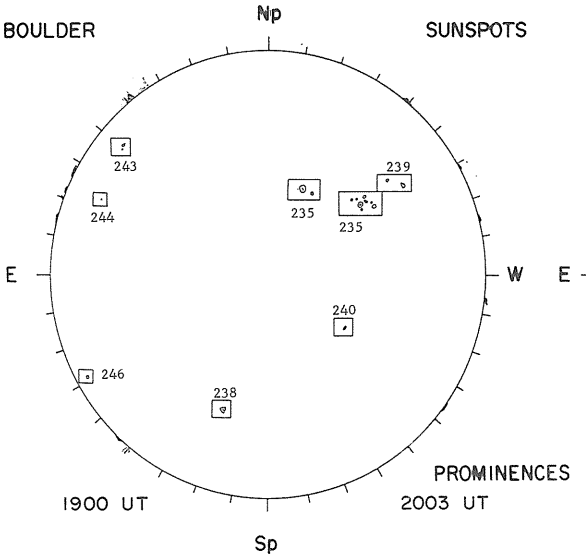


16

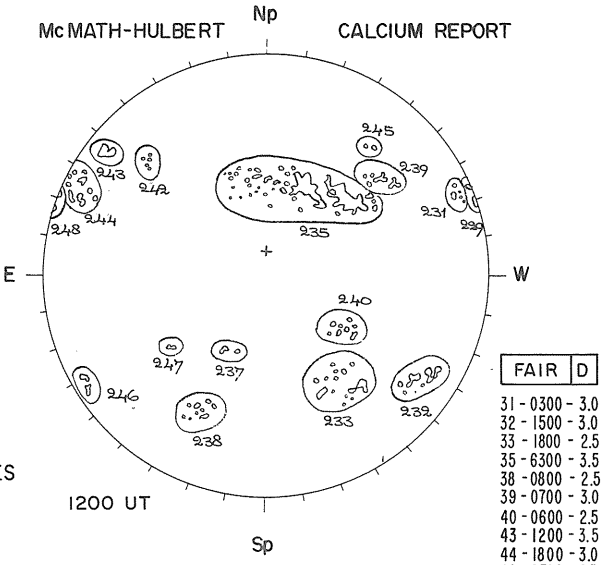
SACRAMENTO PEAK



BOULDER



McMATH-HULBERT



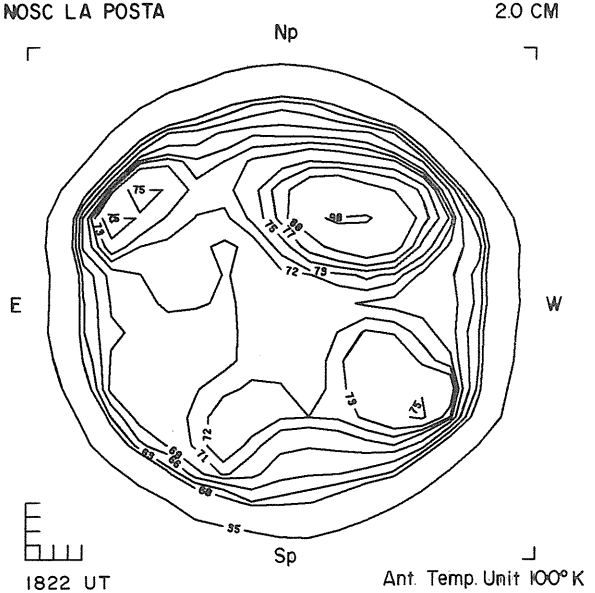
PROMINENCES

2003 UT

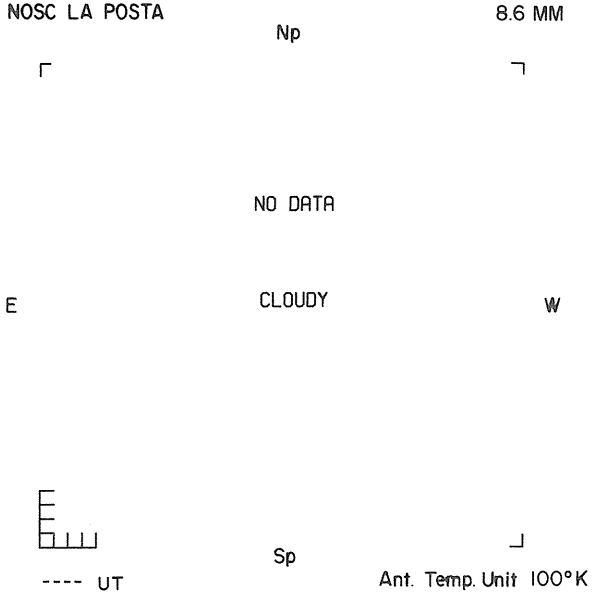
FAIR	D

31 - 0300 - 3.0
32 - 1500 - 3.0
33 - 1800 - 2.5
35 - 0300 - 3.5
38 - 0800 - 2.5
39 - 0700 - 3.0
40 - 0600 - 2.5
43 - 1200 - 3.5
44 - 1800 - 3.0
46 - 0700 - 2.5

NOSC LA POSTA

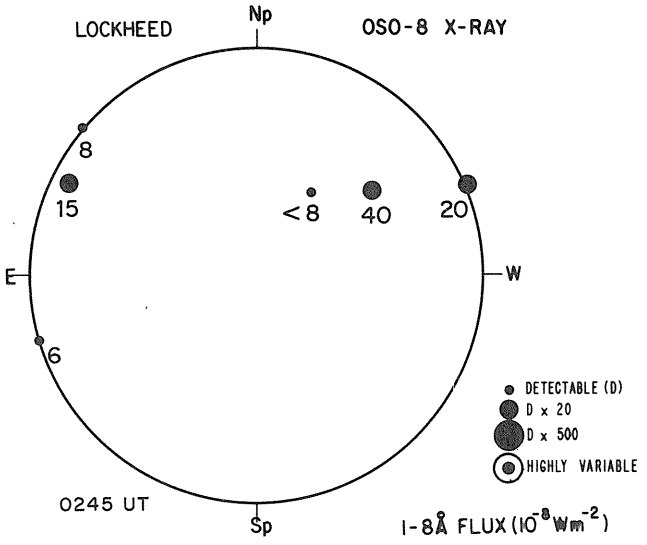


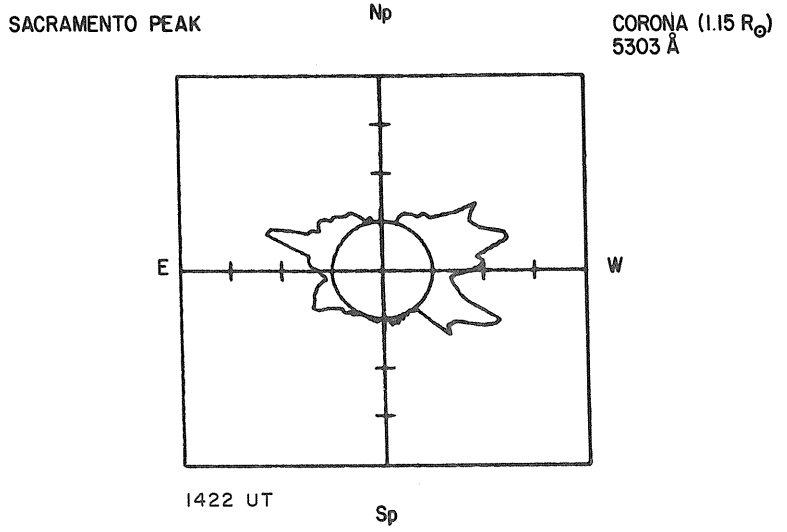
NOSC LA POSTA

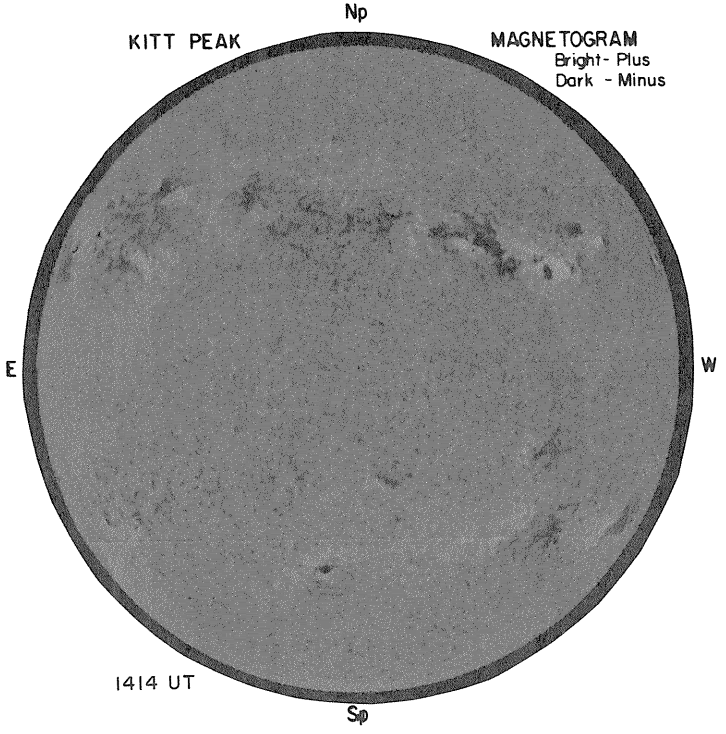


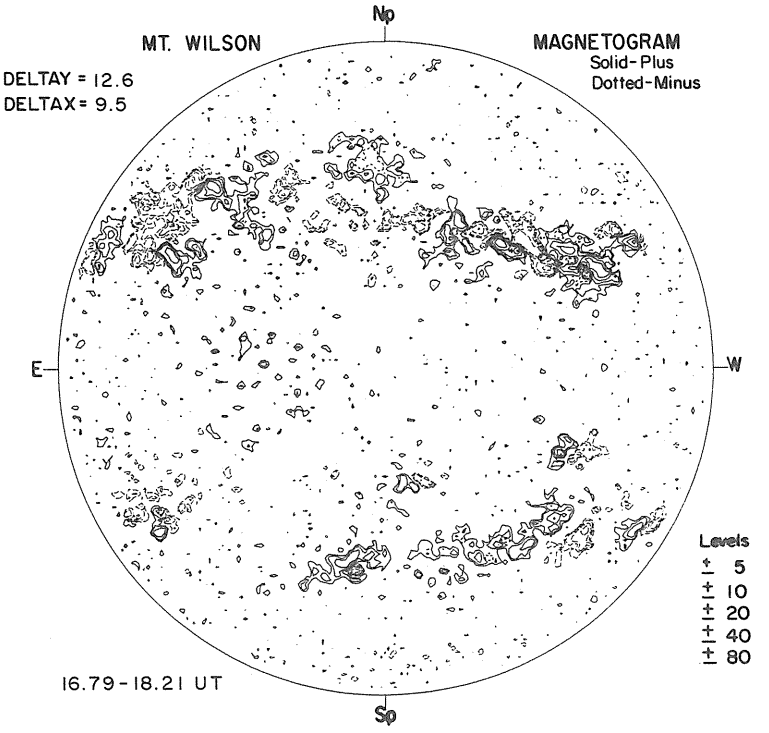
85
Apr 78

APRIL 17, 1978 (P = -25.97, B_o = -5.45, L_o = 263.59)



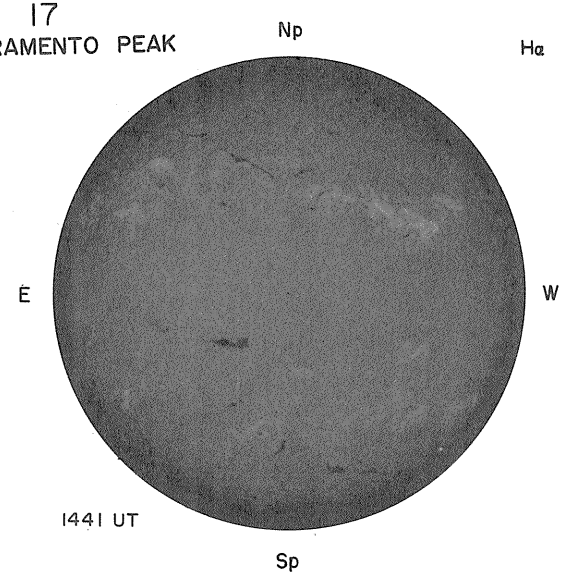




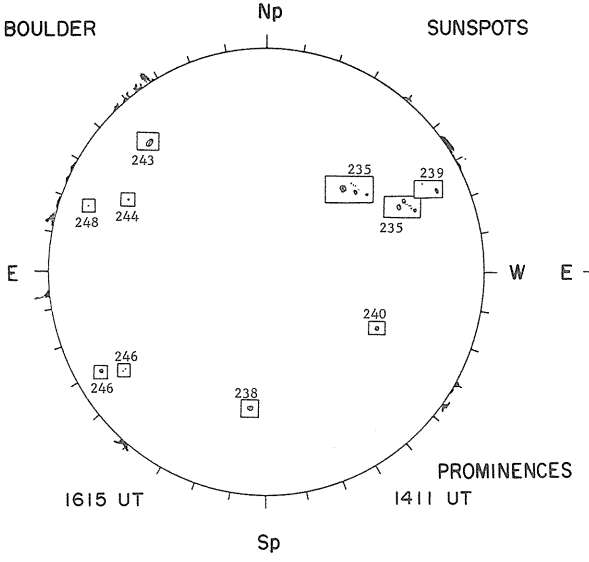


17

SACRAMENTO PEAK

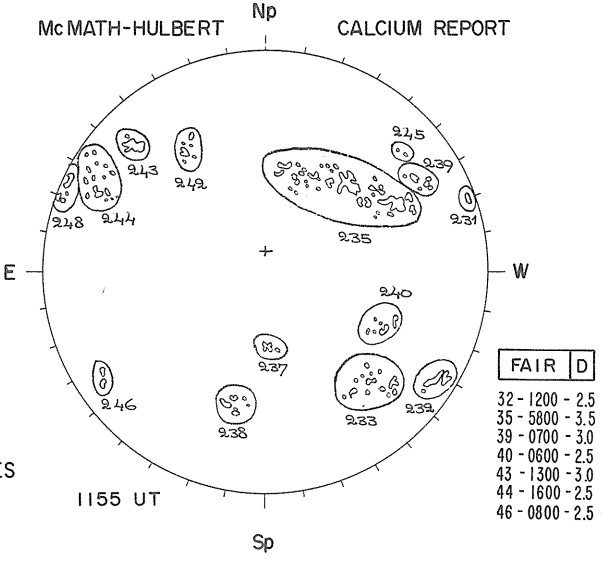


BOULDER



SUNSPOTS

McMATH-HULBERT

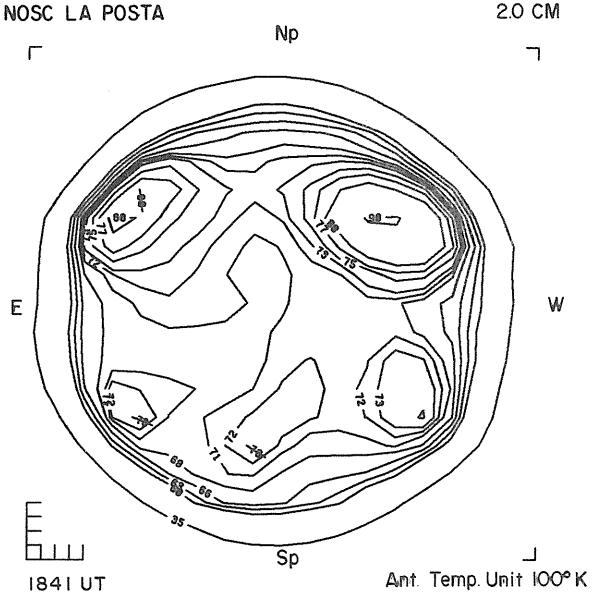


CALCIUM REPORT

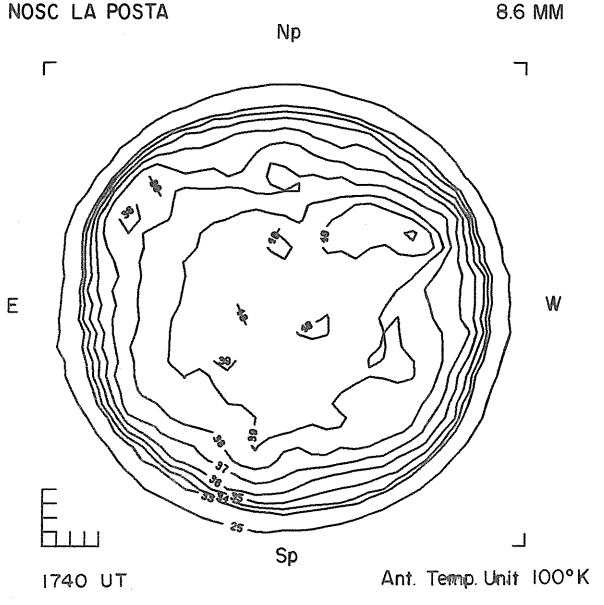
PROMINENCES

1411 UT

NOSC LA POSTA

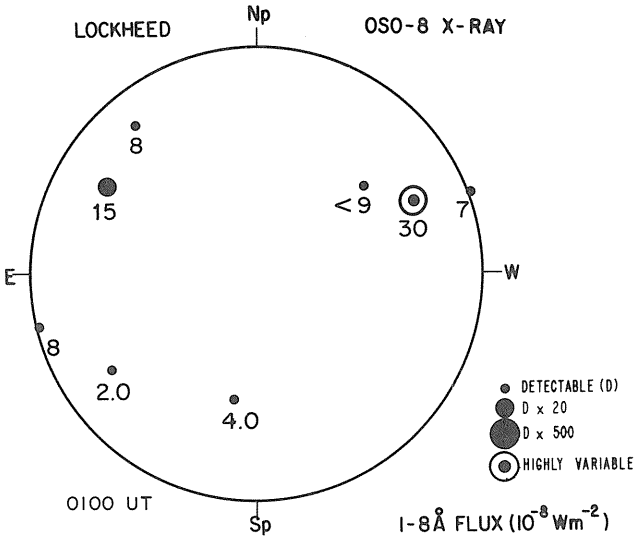


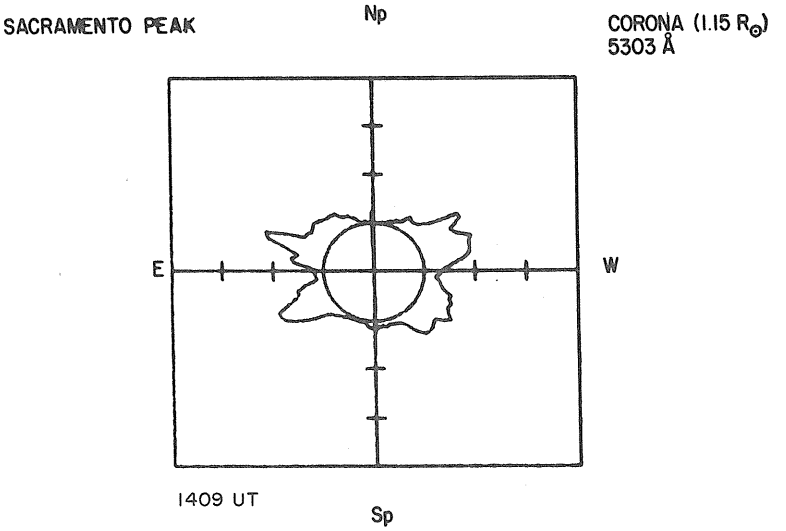
NOSC LA POSTA

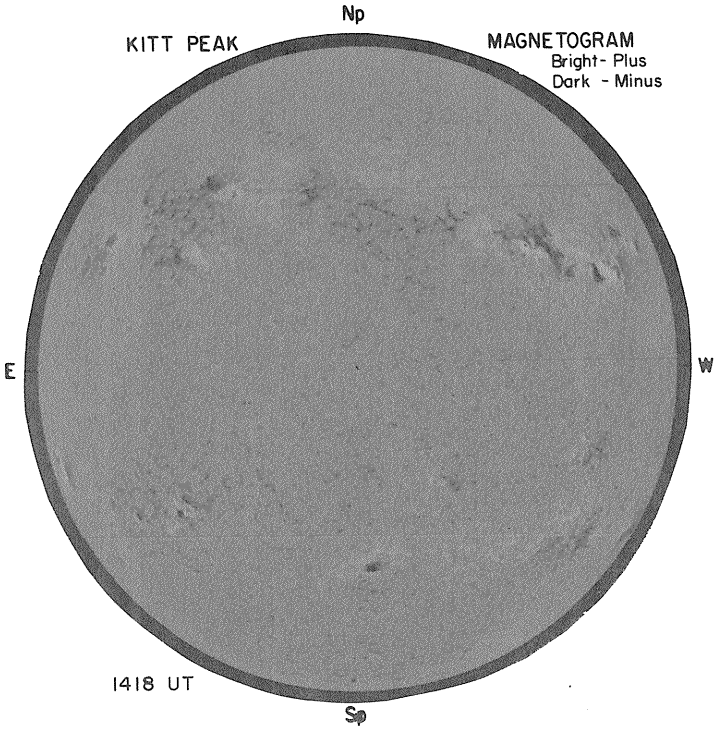


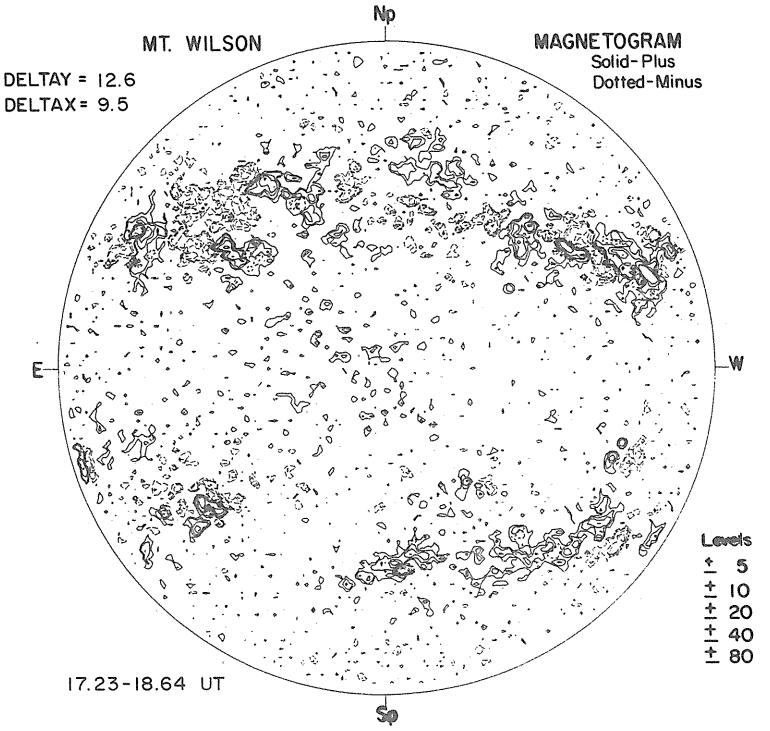
87
Apr 78

APRIL 18, 1978 (P =-25.90, B_o =-5.37, L_o =250.38)



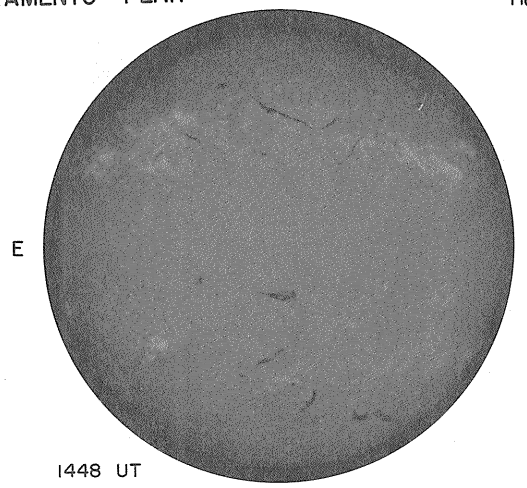






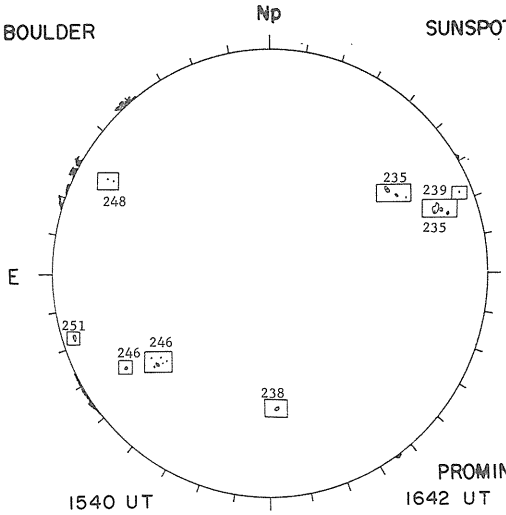
18

SACRAMENTO PEAK Hα



1448 UT

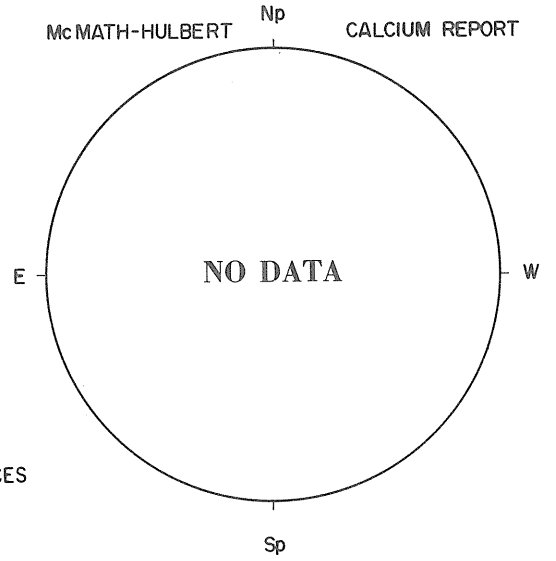
BOULDER SUNSPOTS



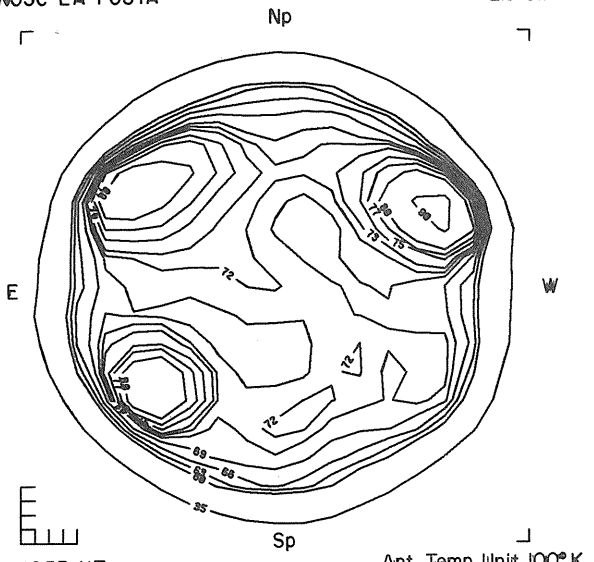
1540 UT

PROMINENCES 1642 UT

McMATH-HULBERT CALCIUM REPORT



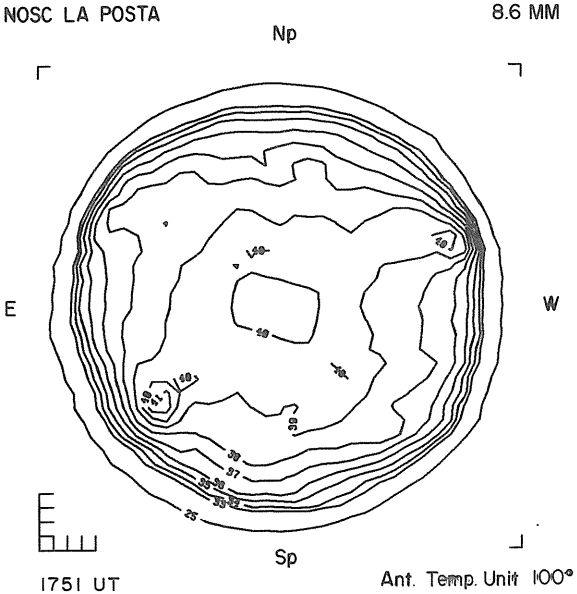
NOSC LA POSTA 2.0 CM



1853 UT

Ant. Temp. Unit 100°K

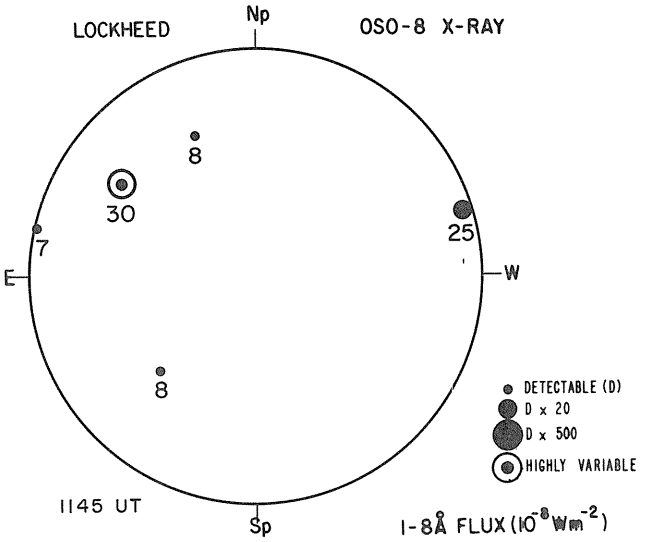
NOSC LA POSTA 8.6 MM

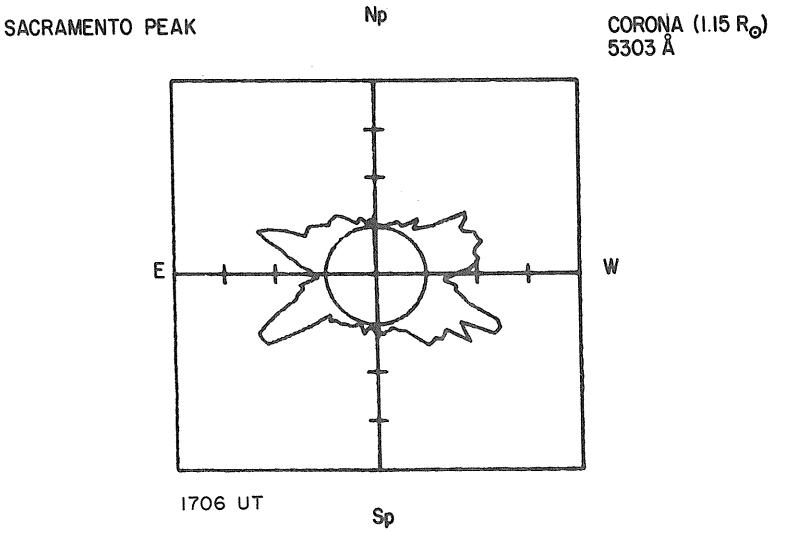


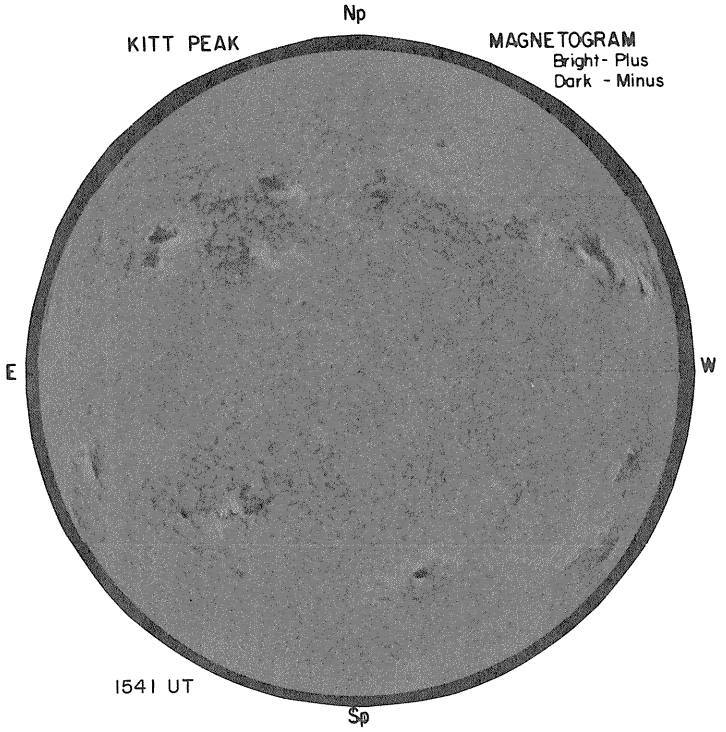
1751 UT

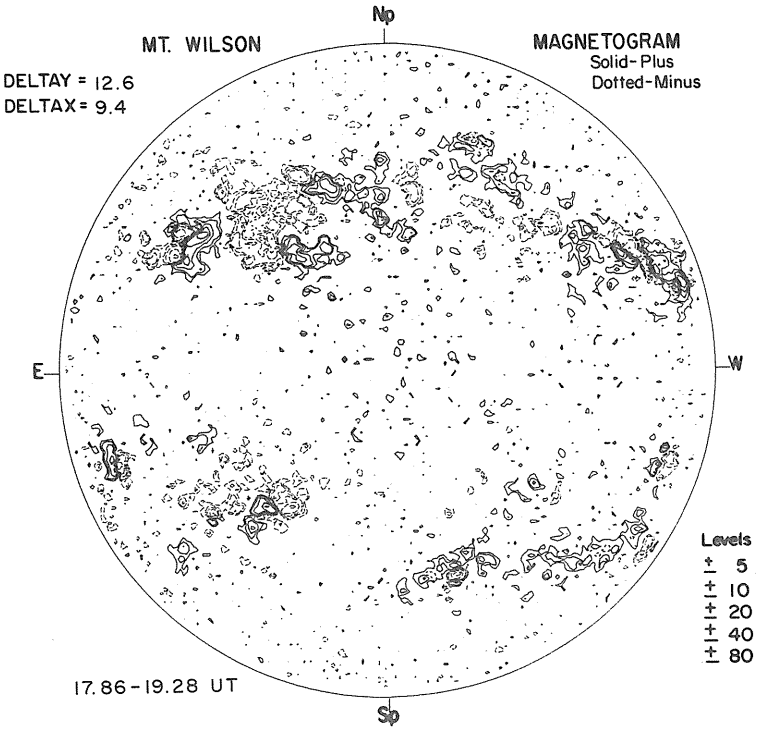
Ant. Temp. Unit 100°K

APRIL 19, 1978 (P =-25.81, B_o =-5.28, L_o =237.18)



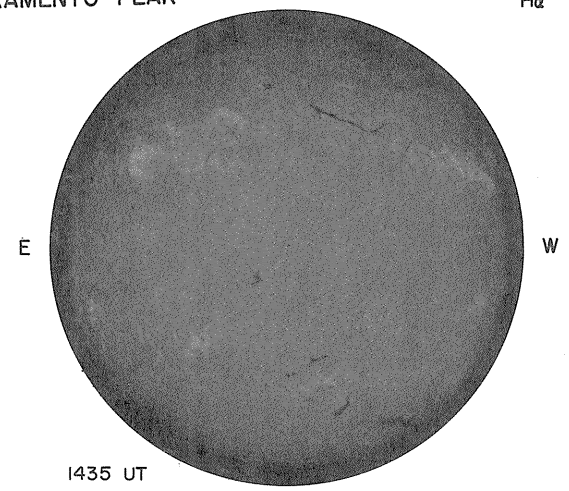






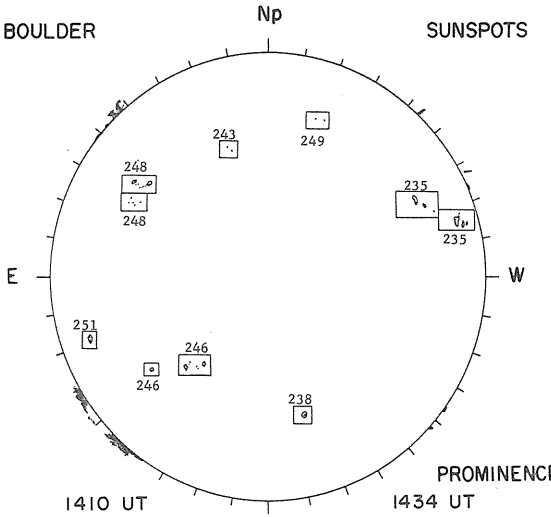
19

SACRAMENTO PEAK Hα



1435 UT

BOULDER SUNSPOTS

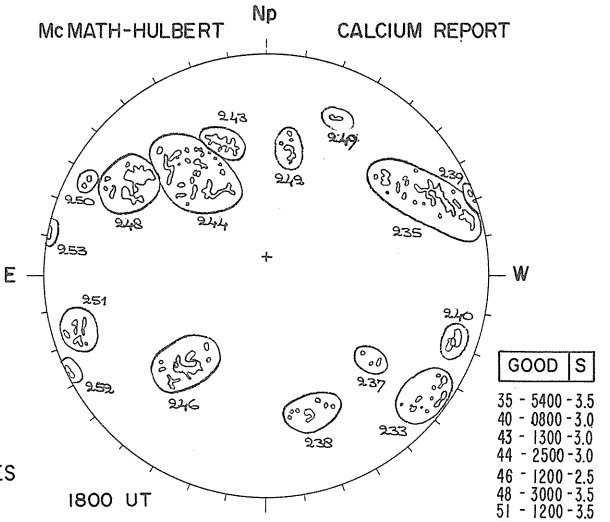


1410 UT

PROMINENCES

1434 UT

McMATH-HULBERT CALCIUM REPORT

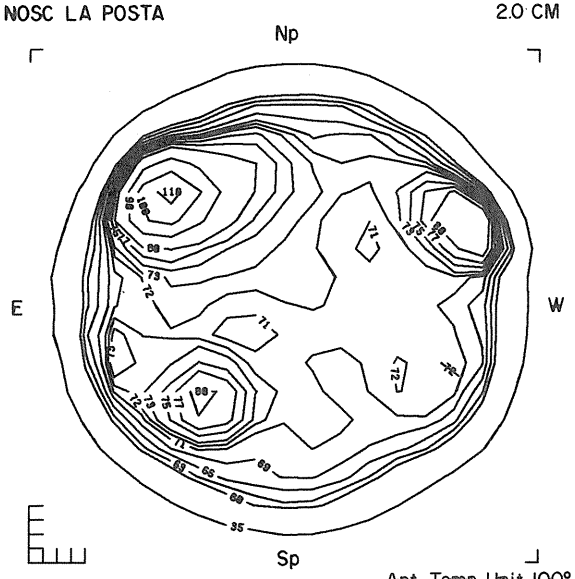


1800 UT

GOOD	S

35 - 5400 - 3.5
40 - 0800 - 3.0
43 - 1300 - 3.0
44 - 2500 - 3.0
46 - 1200 - 2.5
48 - 3000 - 3.5
51 - 1200 - 3.5
53 - 0800 - 2.5

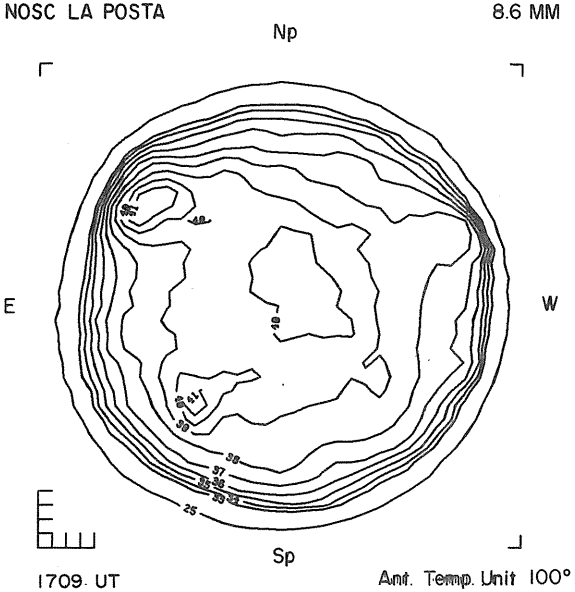
NOSC LA POSTA 2.0 CM



1909 UT

Ant. Temp. Unit 100°K

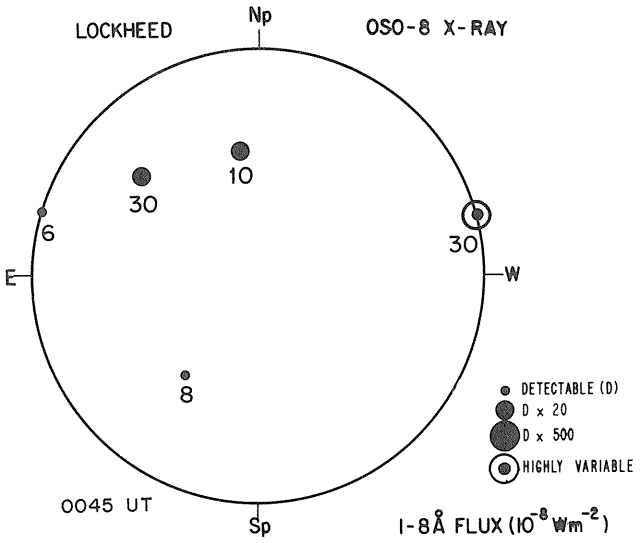
NOSC LA POSTA 8.6 MM

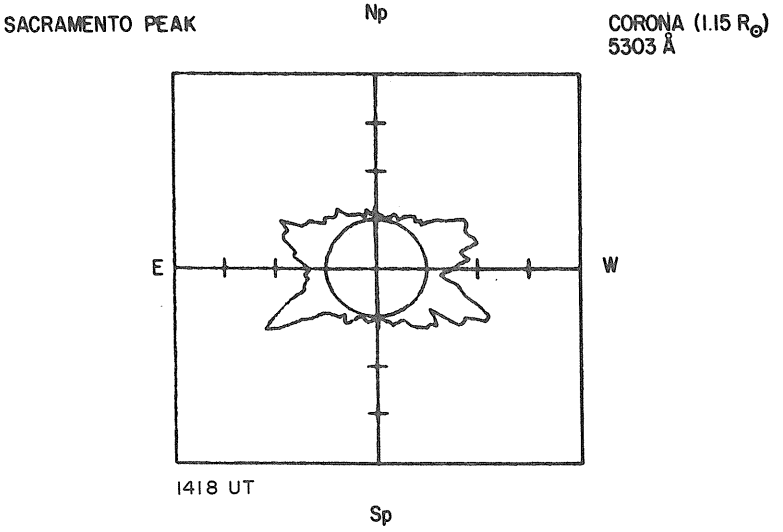


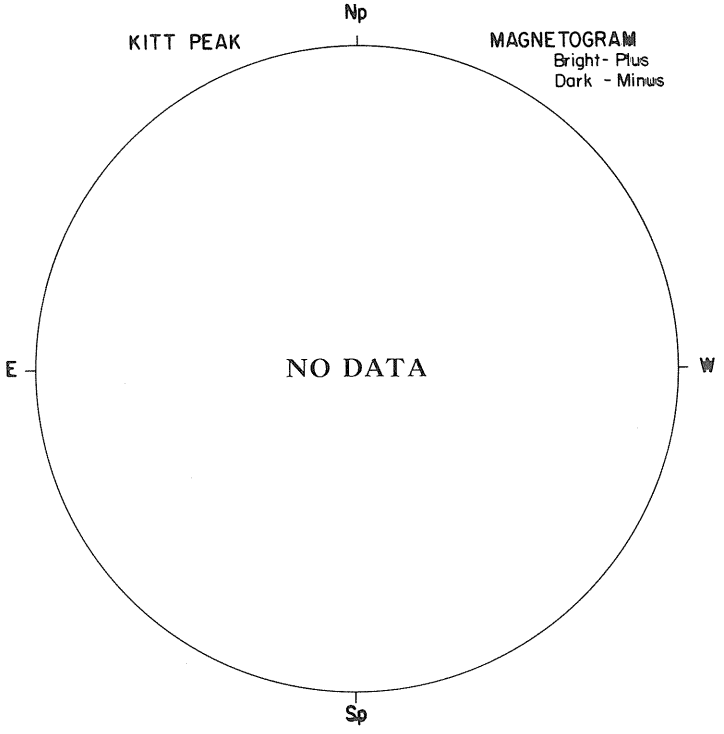
1709 UT

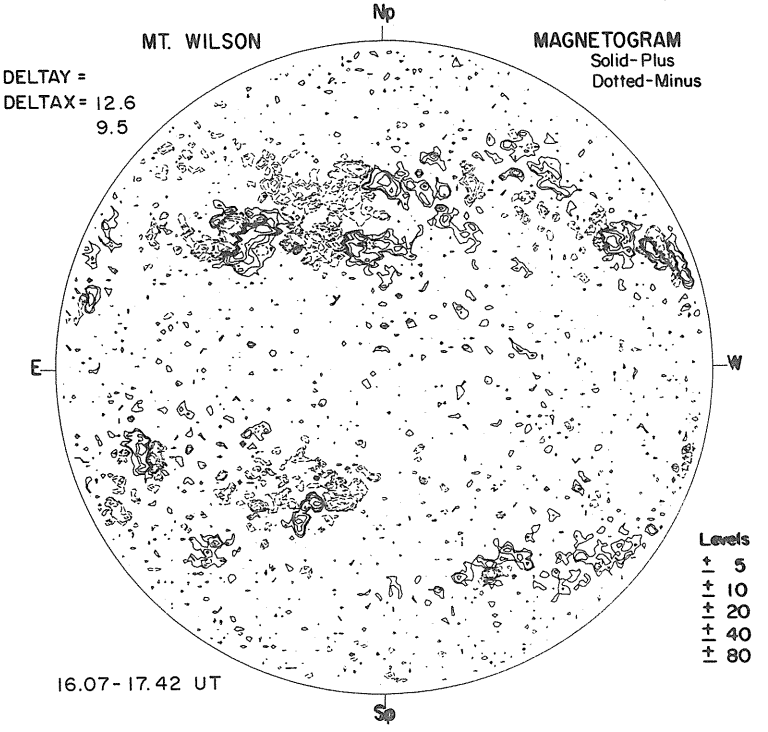
Ant. Temp. Unit 100°K

APRIL 20, 1978 (P =-25.72, B_o =-5.20, L_o =223.97)



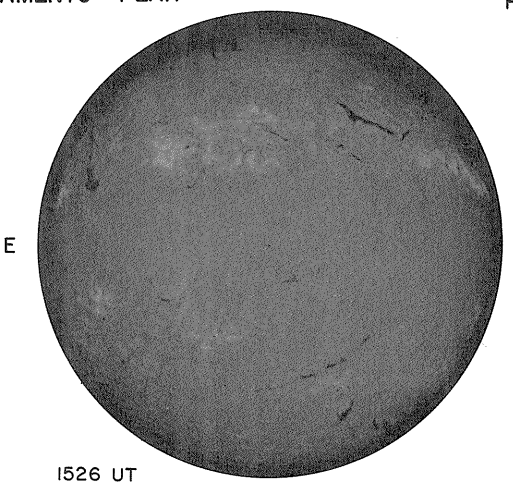






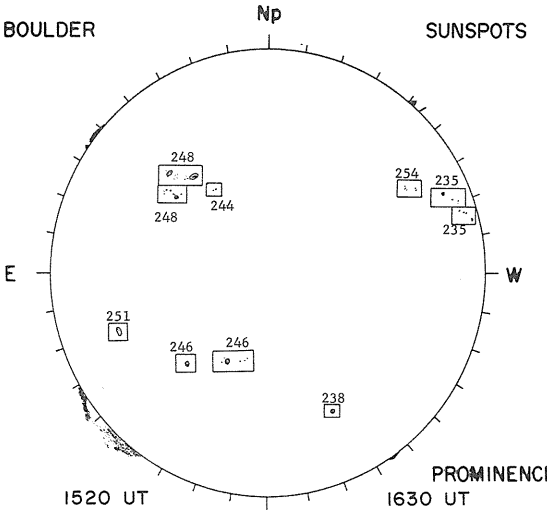
20

SACRAMENTO PEAK Hα



1526 UT

BOULDER SUNSPOTS

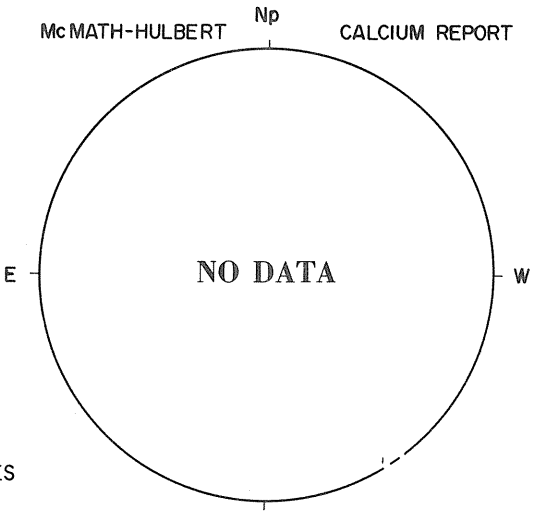


1520 UT

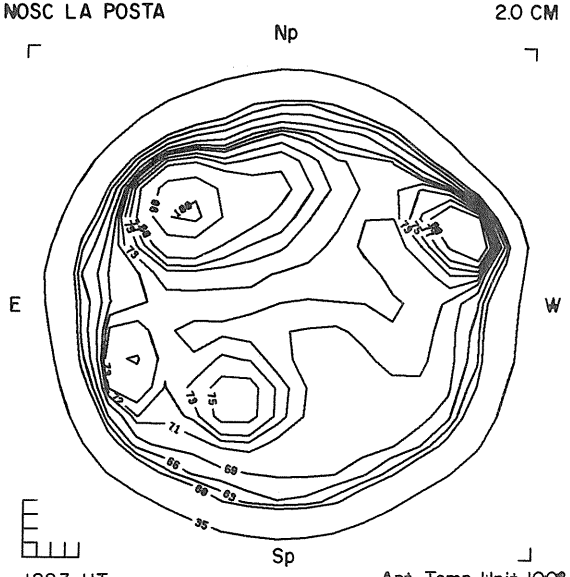
PROMINENCES

1630 UT

McMATH-HULBERT CALCIUM REPORT



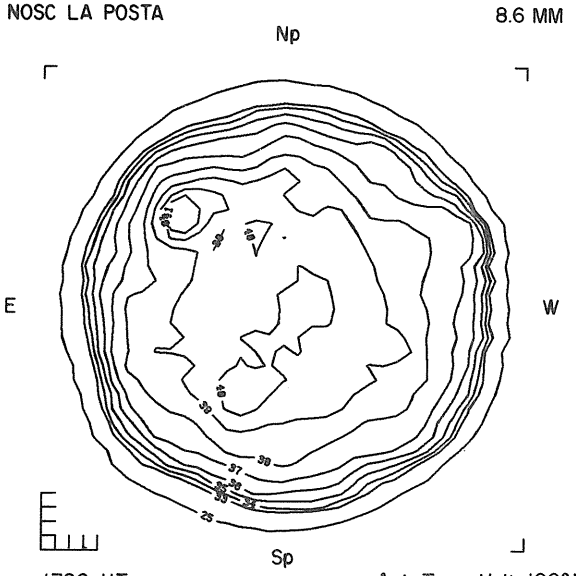
NOSC LA POSTA 2.0 CM



1823 UT

Ant. Temp. Unit 100° K

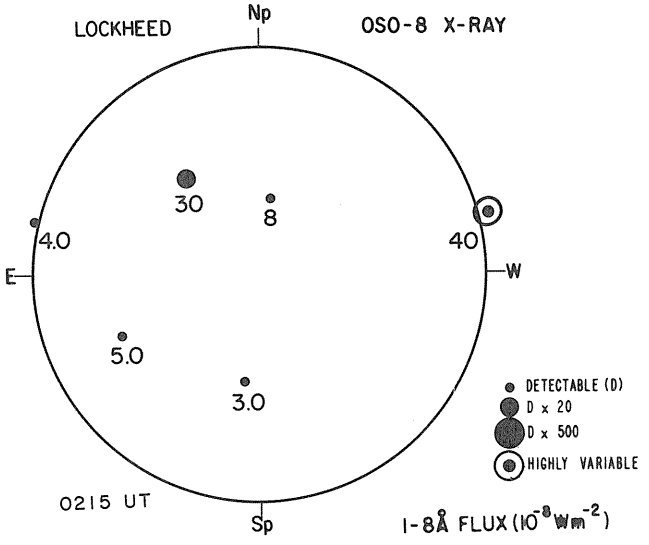
NOSC LA POSTA 8.6 MM

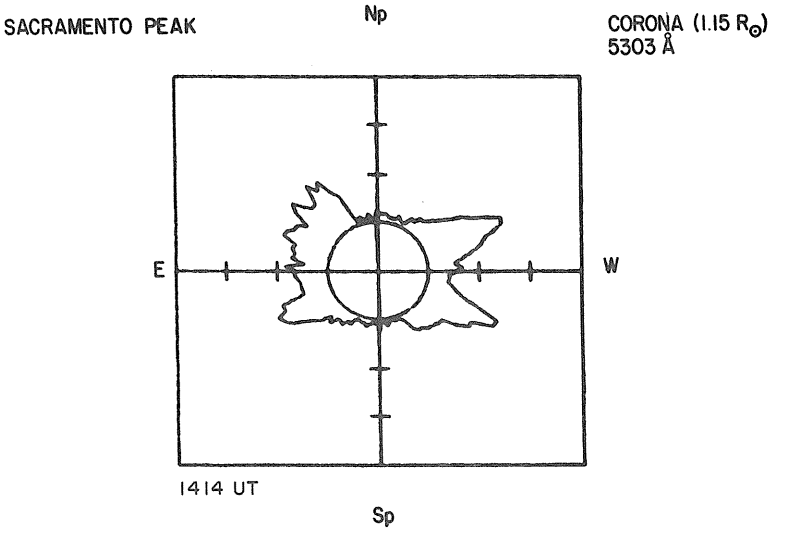


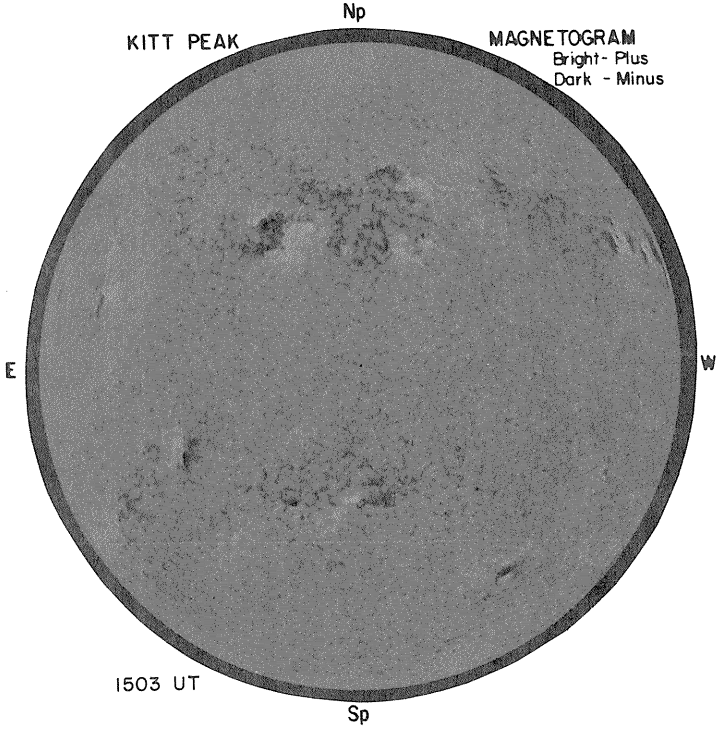
1720 UT

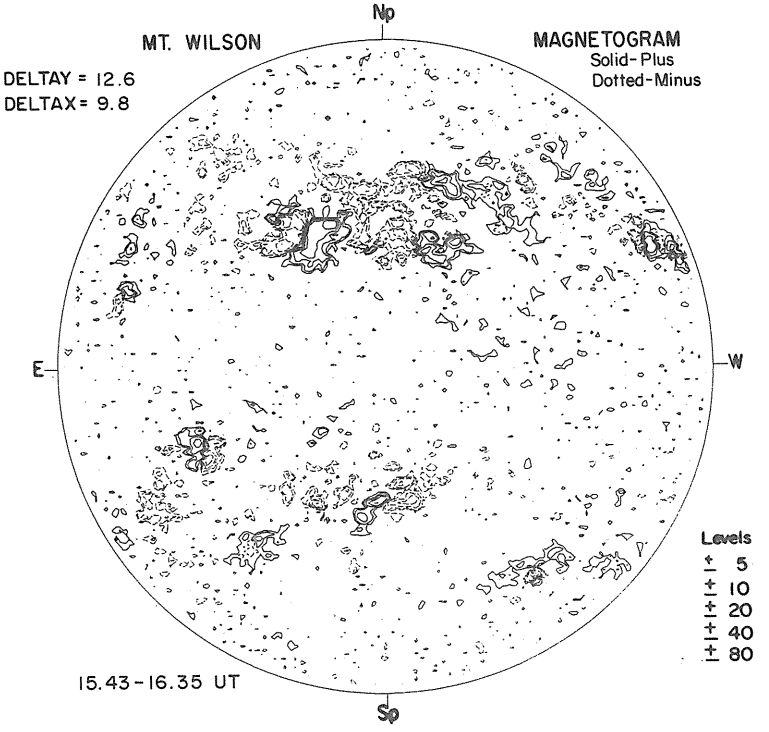
Ant. Temp. Unit 100° K

APRIL 21, 1978 (P =-25.62, B_o =-5.11, L_o = 210.76)



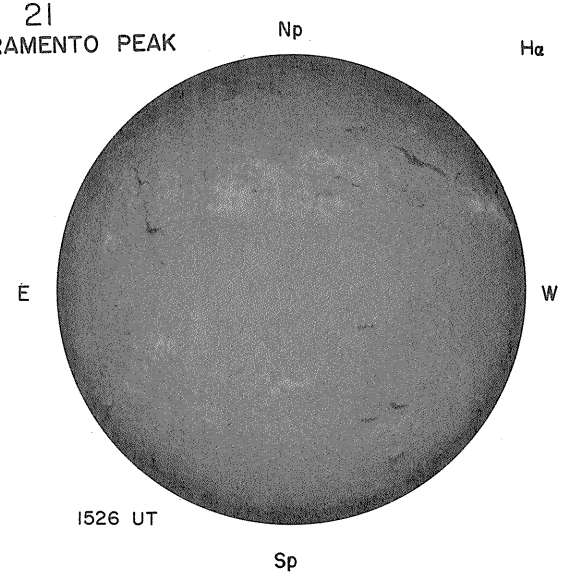




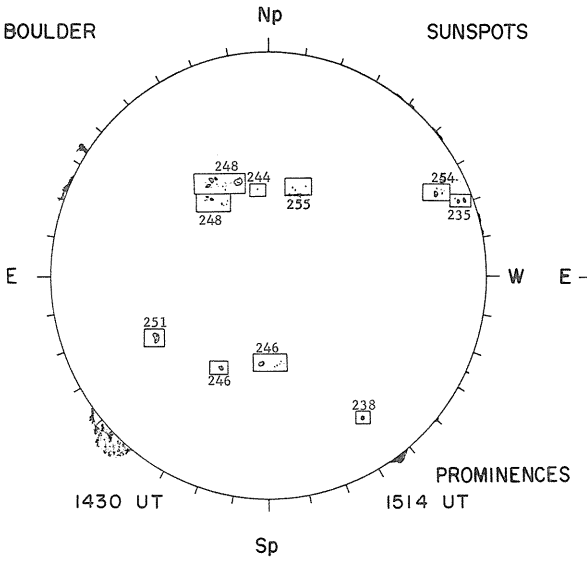


21

SACRAMENTO PEAK



BOULDER

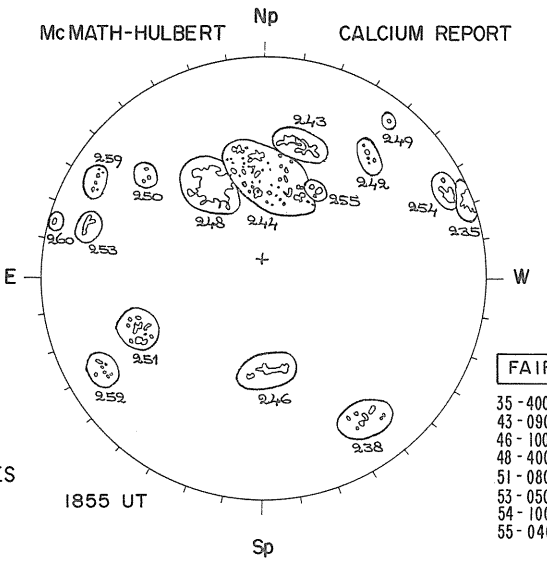


SUNSPOTS

PROMINENCES

1514 UT

McMATH-HULBERT

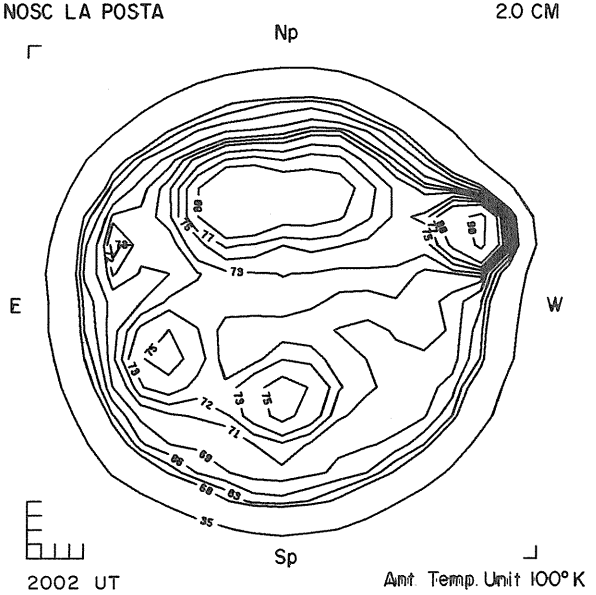


CALCIUM REPORT

FAIR	M
35 - 4000 - 3.0	
43 - 0900 - 2.5	
46 - 1000 - 2.5	
48 - 4000 - 3.0	
51 - 0800 - 3.0	
53 - 0500 - 2.5	
54 - 1000 - 3.5	
55 - 0400 - 2.5	

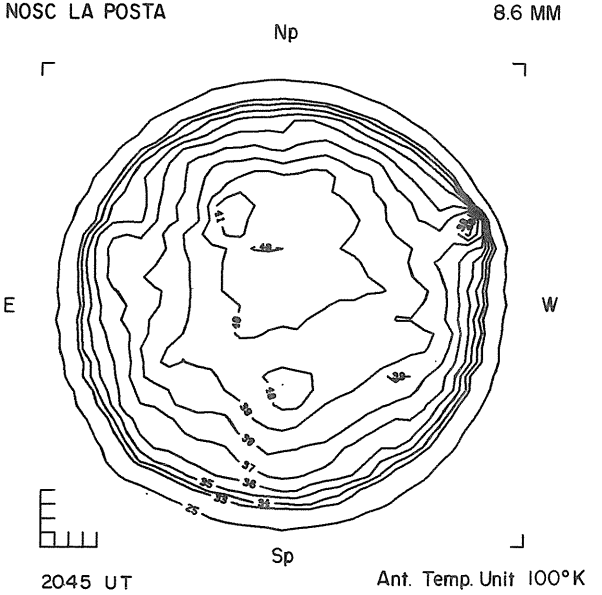
NOSC LA POSTA

2.0 CM

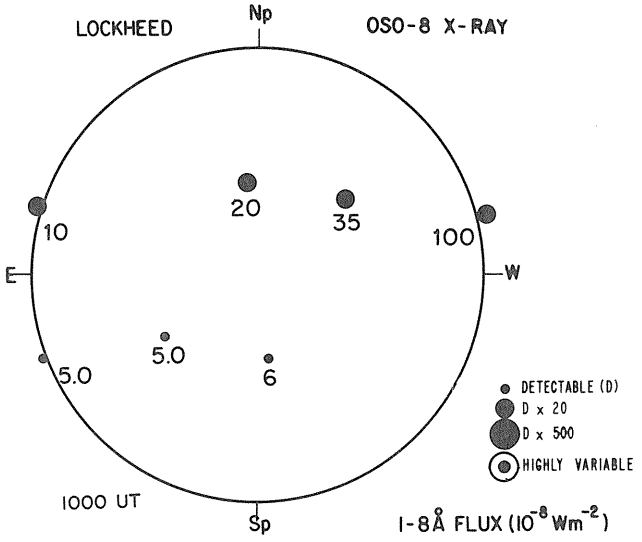


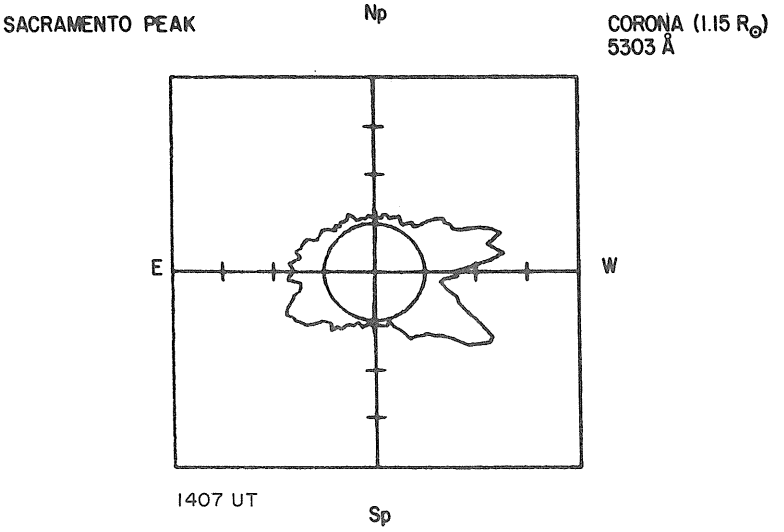
NOSC LA POSTA

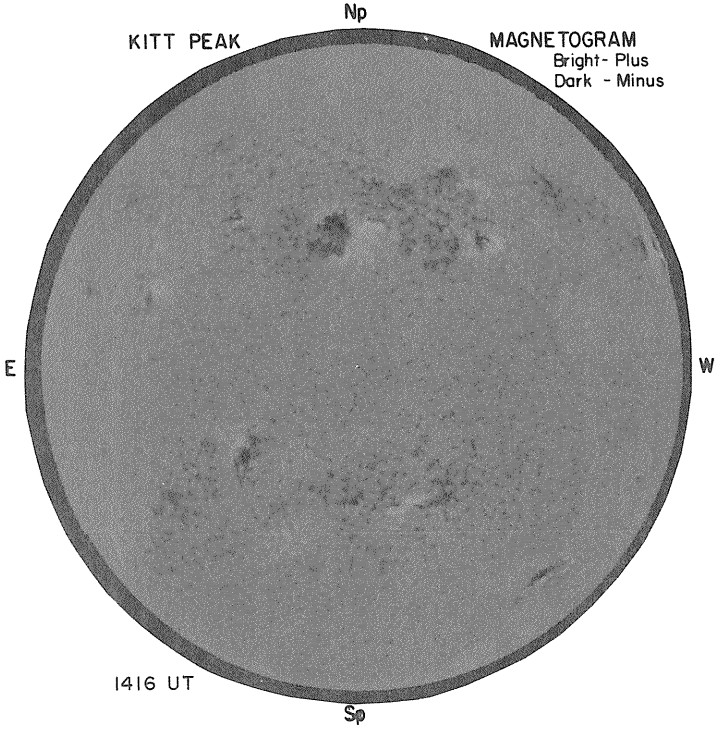
8.6 MM

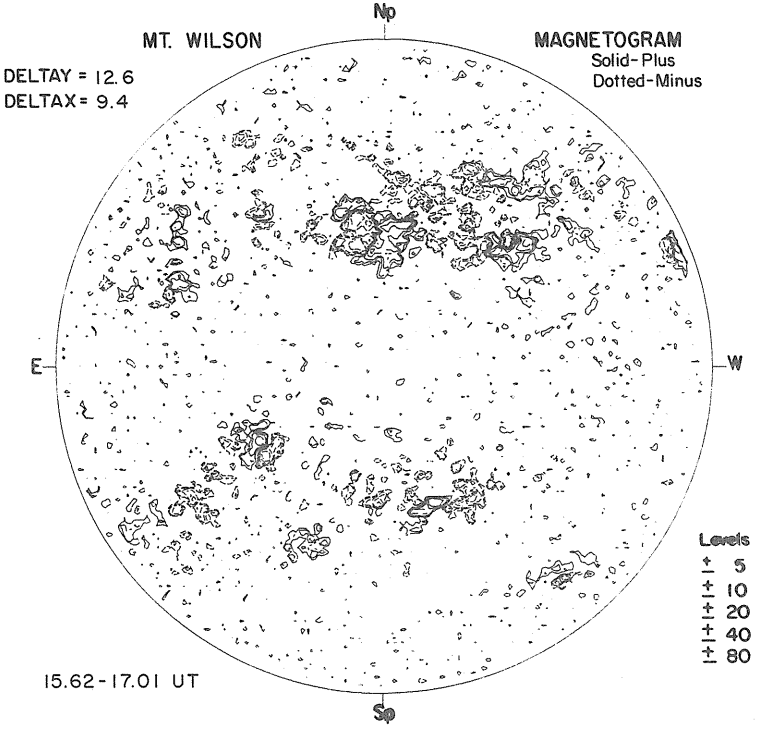


APRIL 22, 1978 (P = -25.52, B_o = -5.02, L_o = 197.55)



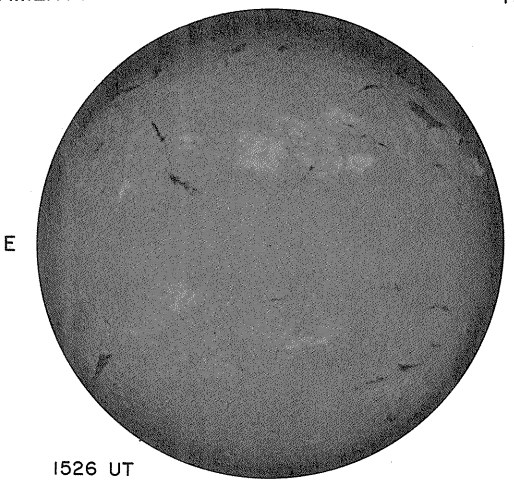






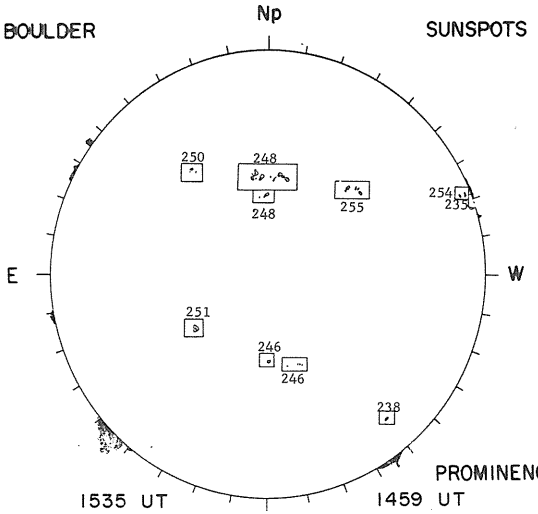
22

SACRAMENTO PEAK Hα



1526 UT

BOULDER SUNSPOTS

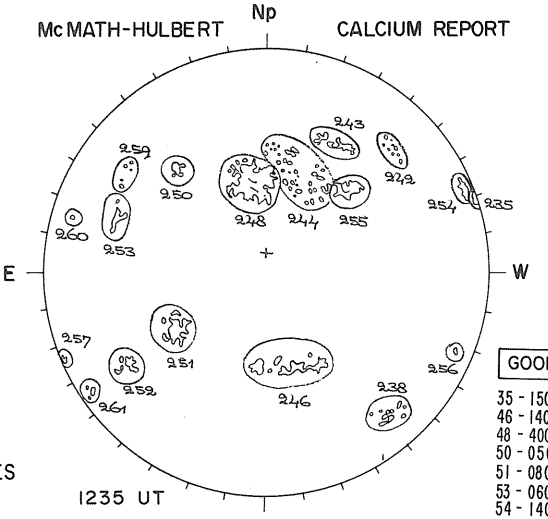


1535 UT

PROMINENCES

1459 UT

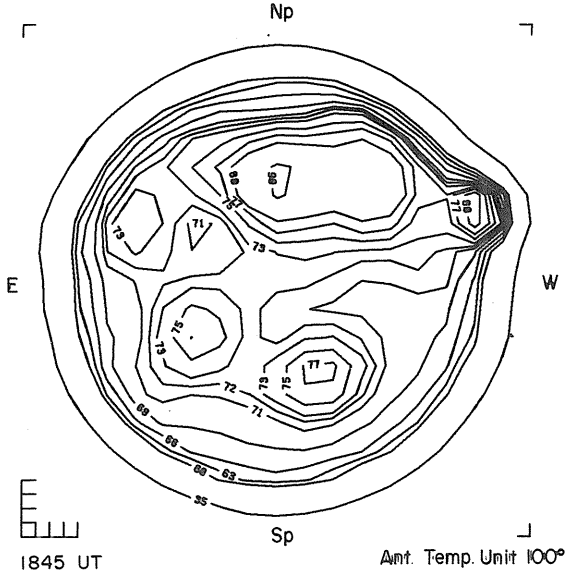
McMATH-HULBERT CALCIUM REPORT



1235 UT

GOOD	M
35 - 1500 - 3.0	
46 - 1400 - 2.5	
48 - 4000 - 3.0	
50 - 0500 - 2.5	
51 - 0800 - 2.5	
53 - 0600 - 2.5	
54 - 1400 - 3.5	
55 - 1300 - 3.0	

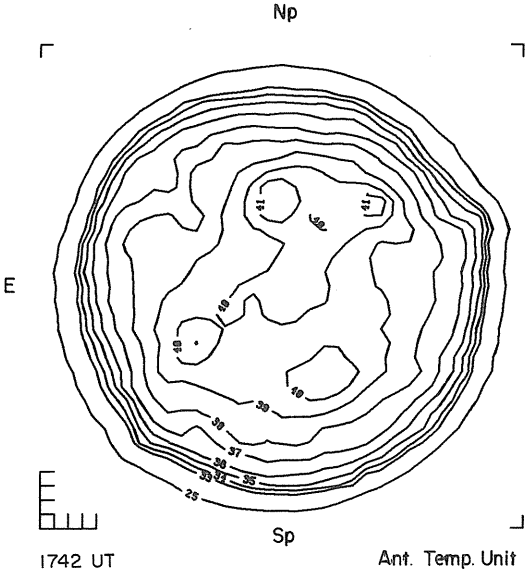
NOSC LA POSTA 2.0 CM



1845 UT

Ant. Temp. Unit 100° K

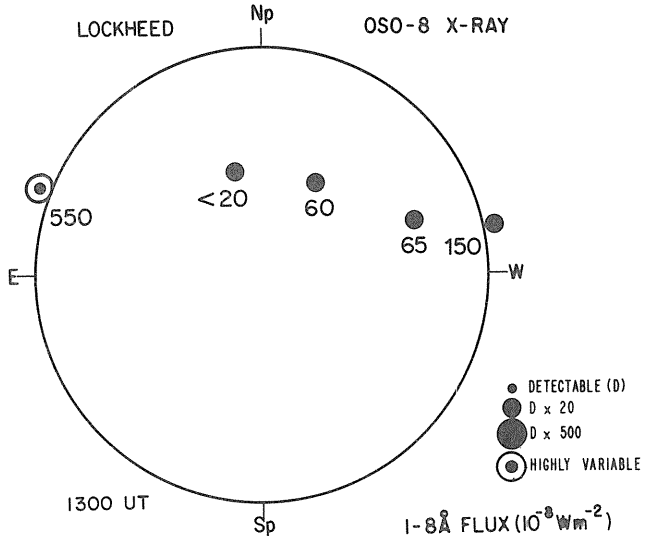
NOSC LA POSTA 8.6 MM

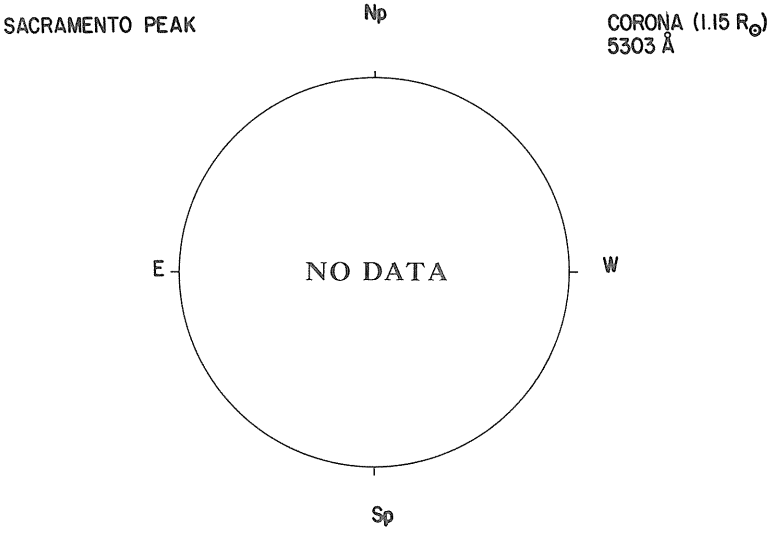


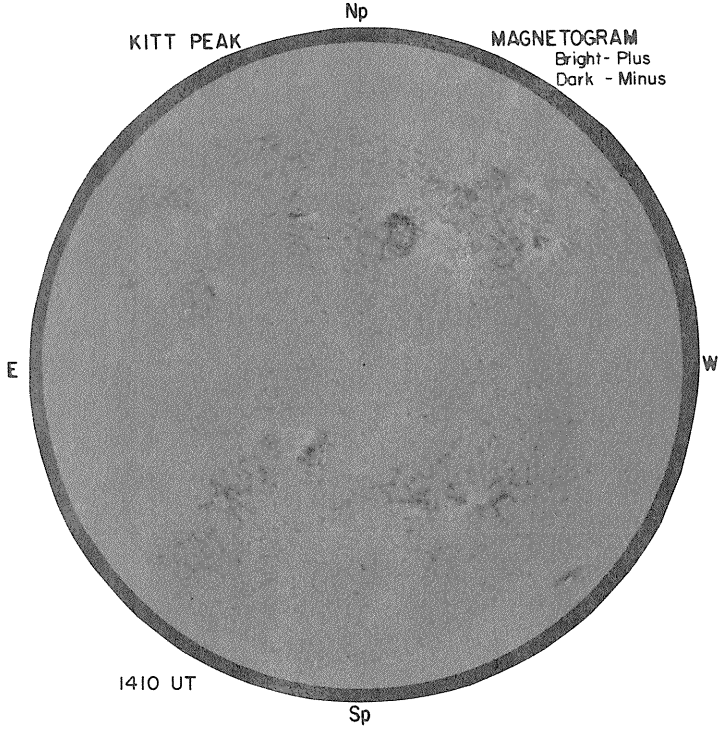
1742 UT

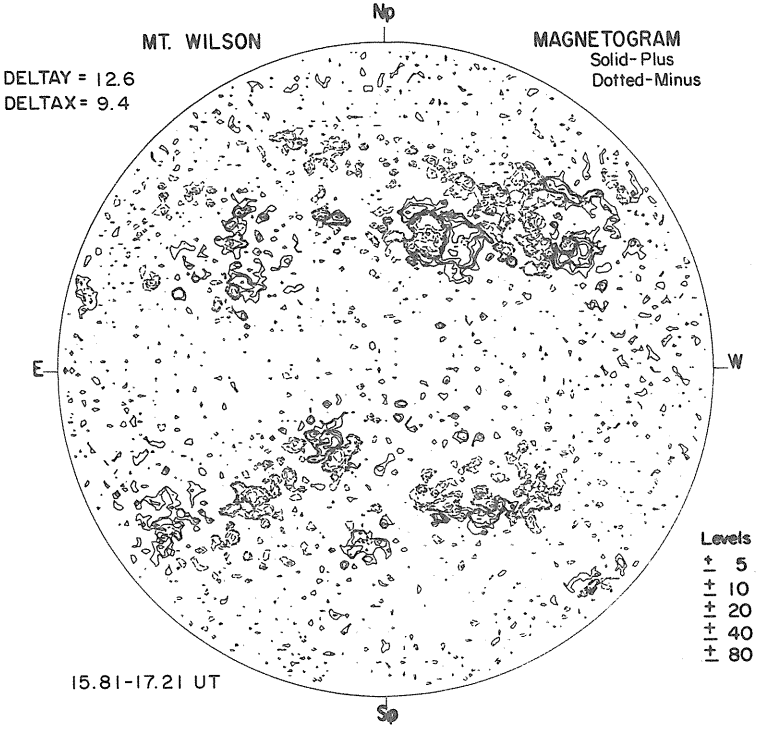
Ant. Temp. Unit 100° K

APRIL 23, 1978 (P =-25.41, B_o =-4.93, L_o =184.34)



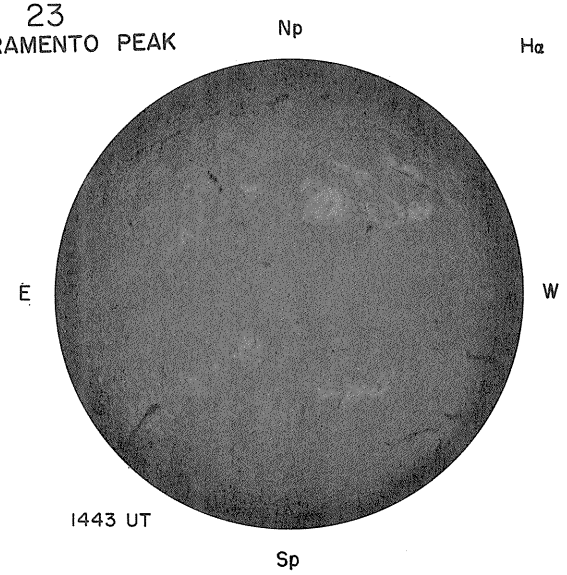




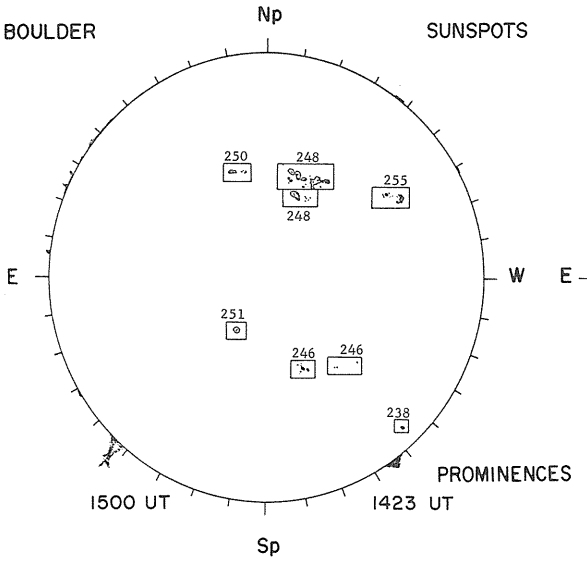


23

SACRAMENTO PEAK



BOULDER

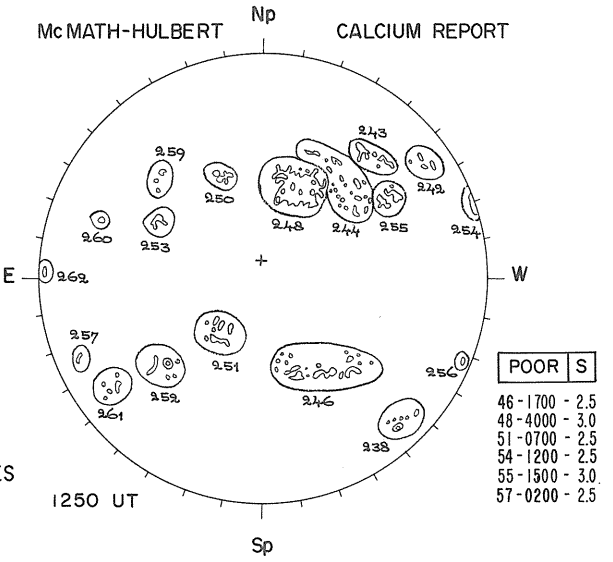


SUNSPOTS

PROMINENCES

1423 UT

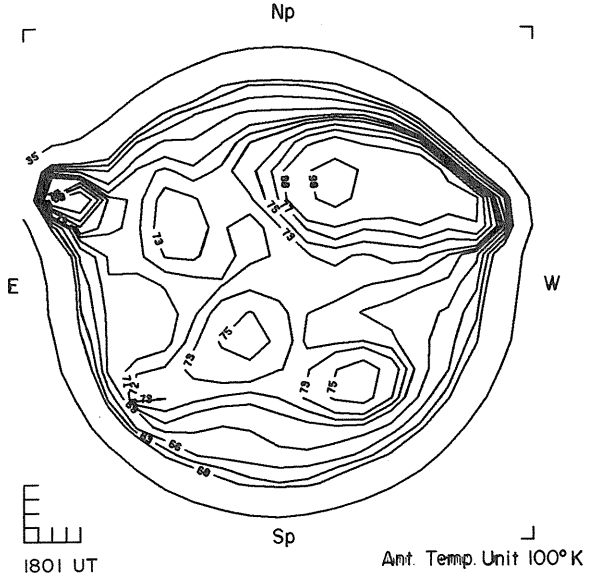
McMATH-HULBERT



CALCIUM REPORT

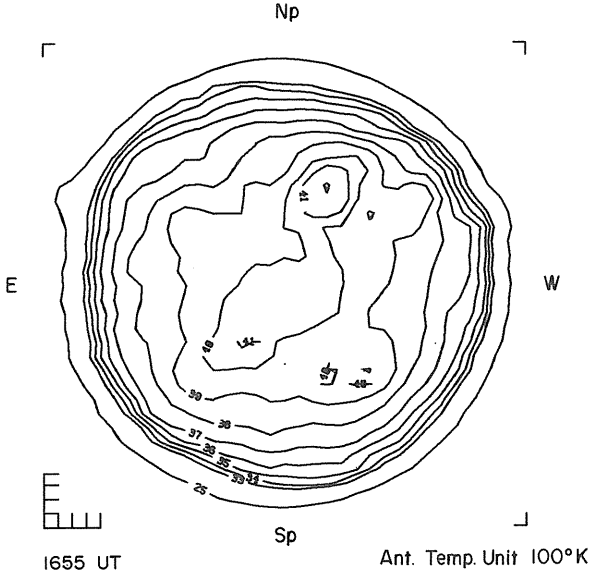
NOSC LA POSTA

2.0 CM

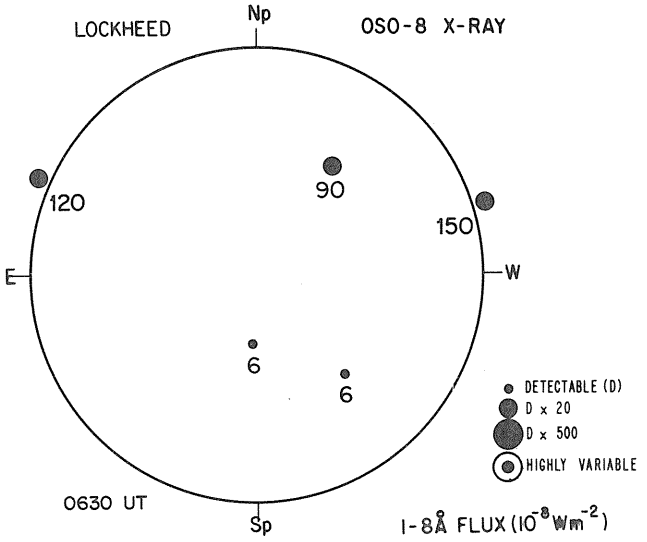


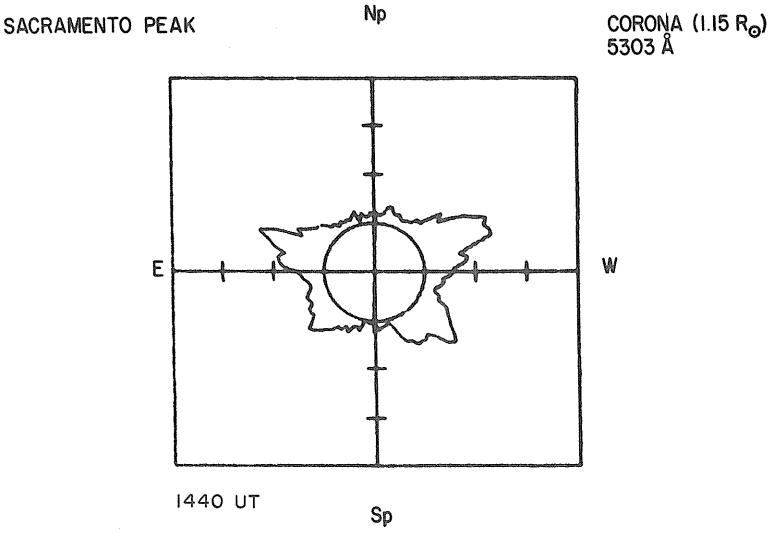
NOSC LA POSTA

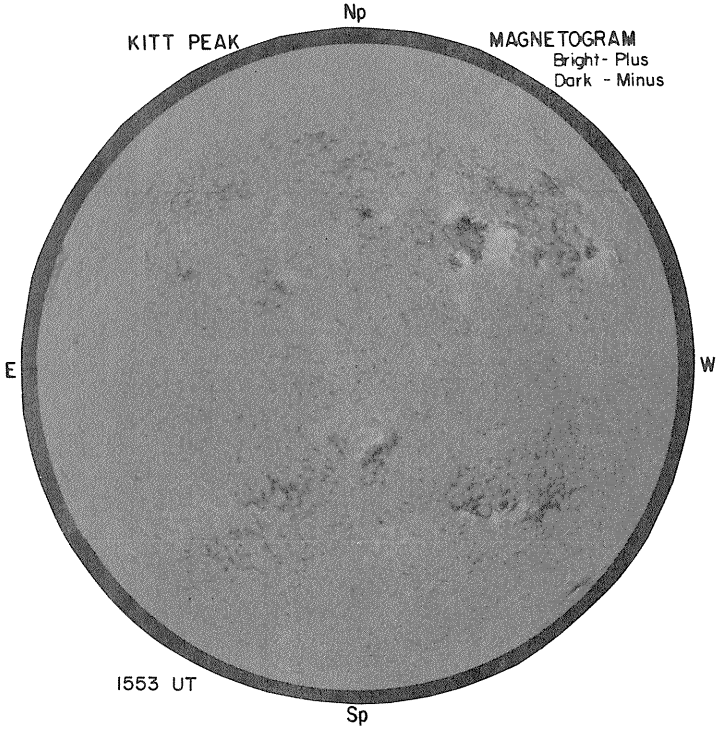
8.6 MM

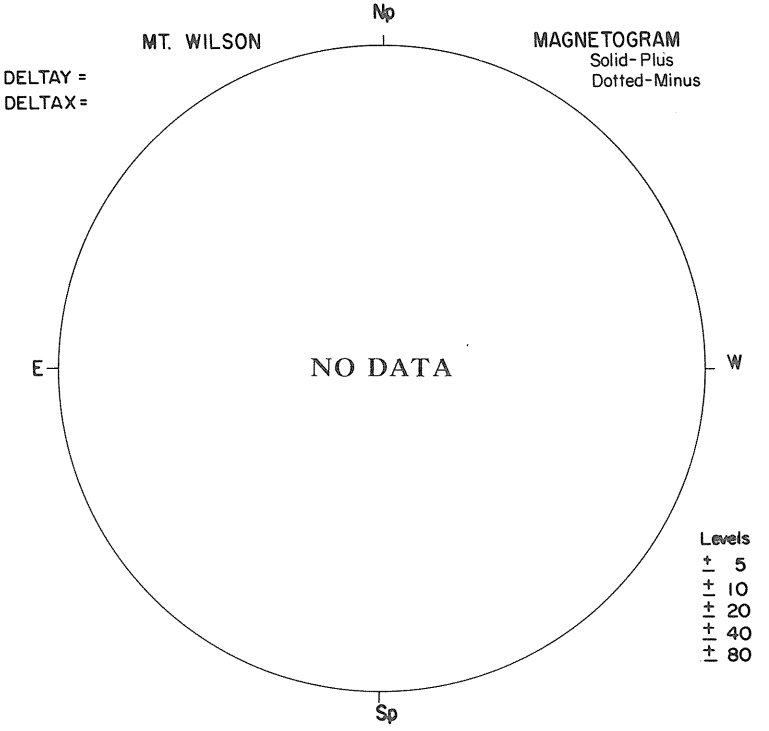


APRIL 24, 1978 (P = -25.29, B_o = -4.84, L_o = 171.13)



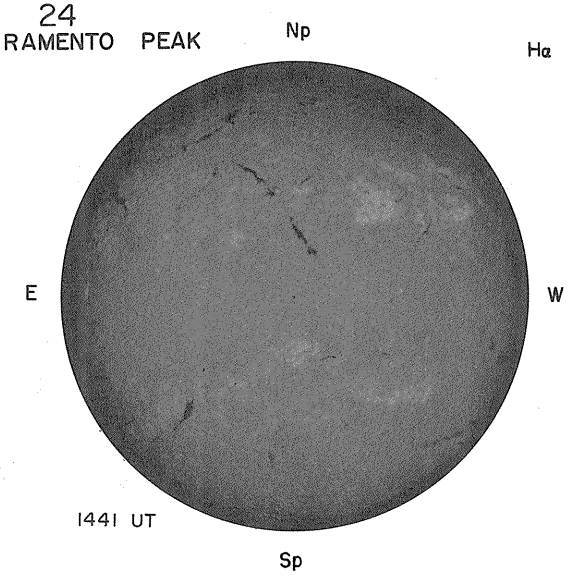






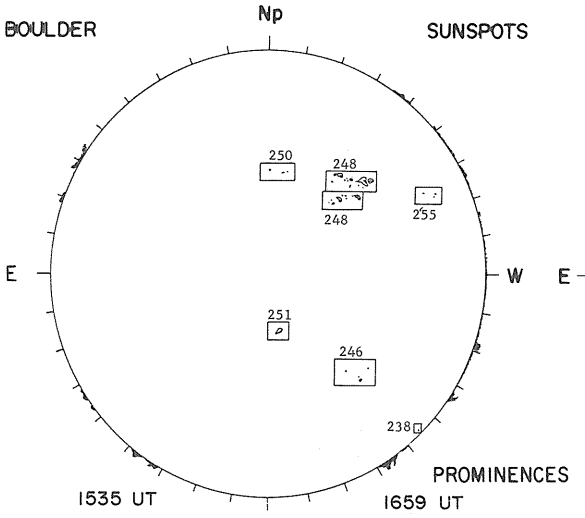
24

SACRAMENTO PEAK Hα



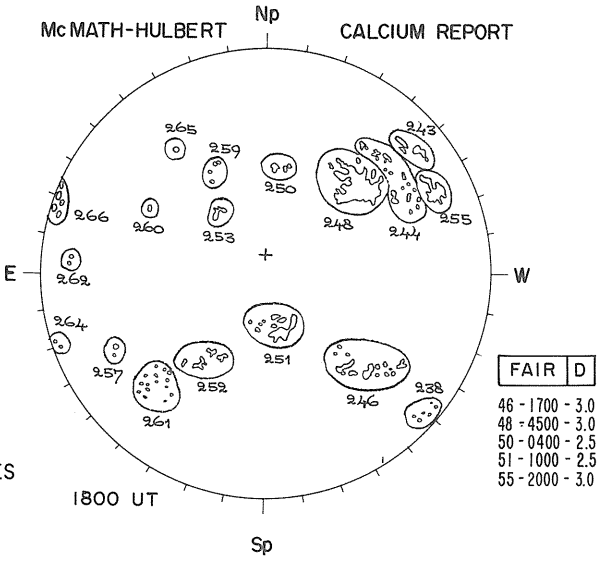
1441 UT

BOULDER SUNSPOTS



1535 UT

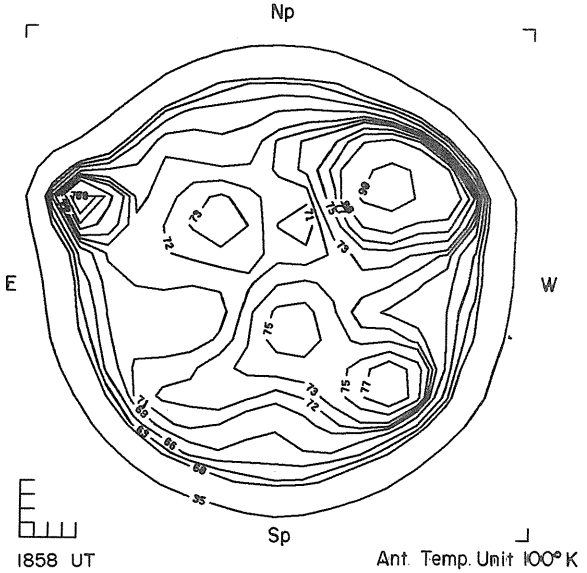
McMATH-HULBERT CALCIUM REPORT



1659 UT PROMINENCES

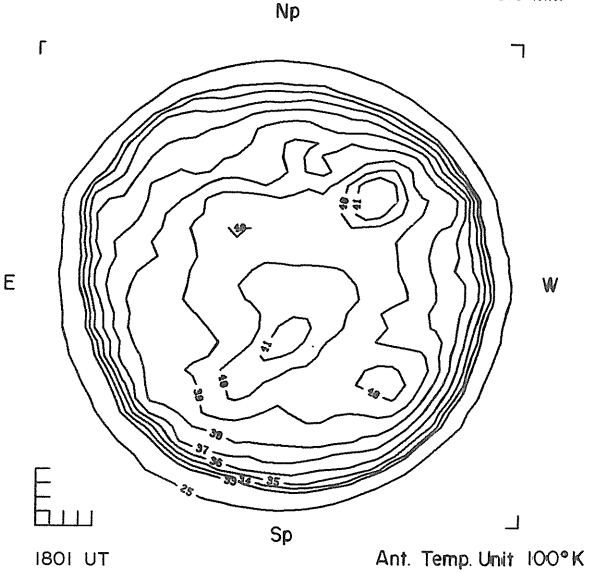
1800 UT

NOSC LA POSTA 2.0 CM



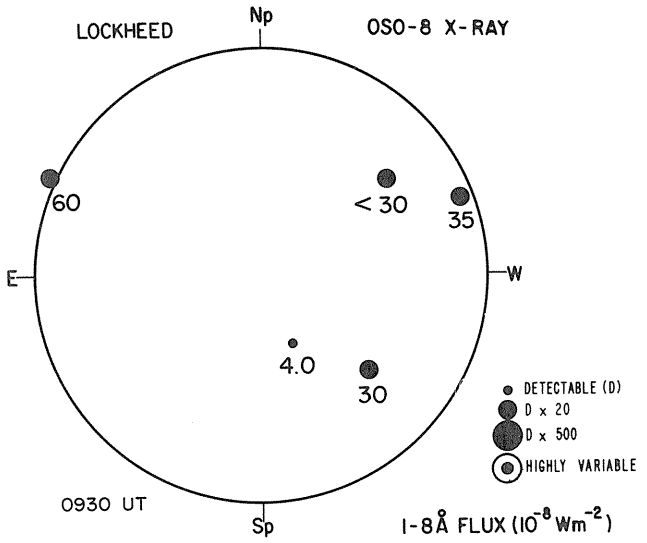
1858 UT Ant. Temp. Unit 100° K

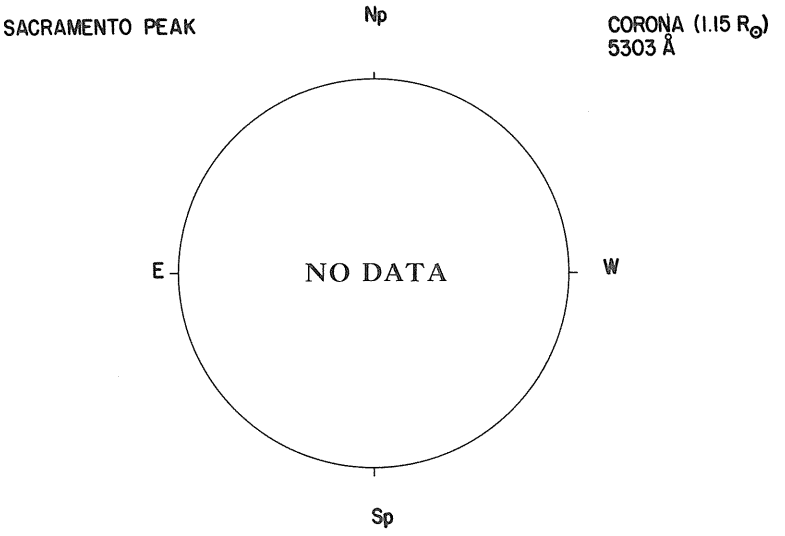
NOSC LA POSTA 8.6 MM

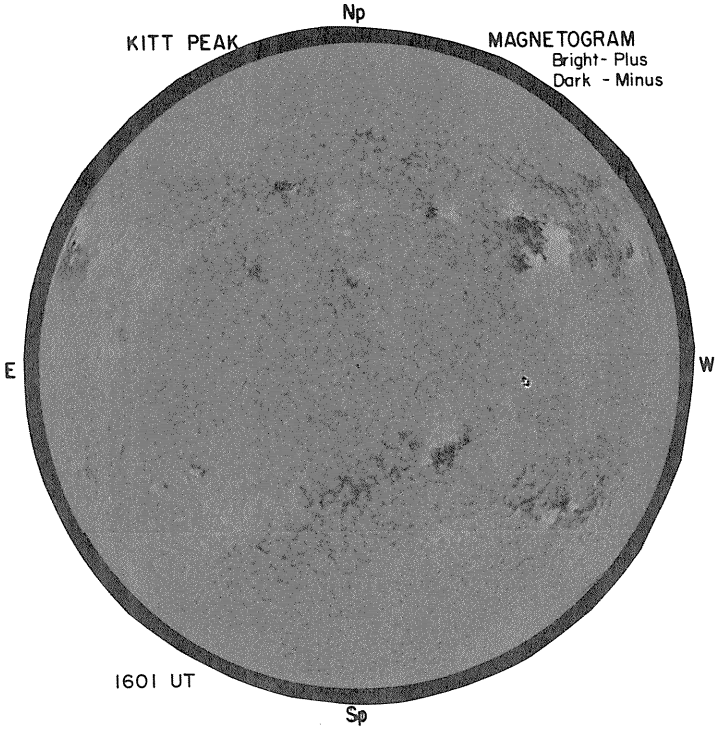


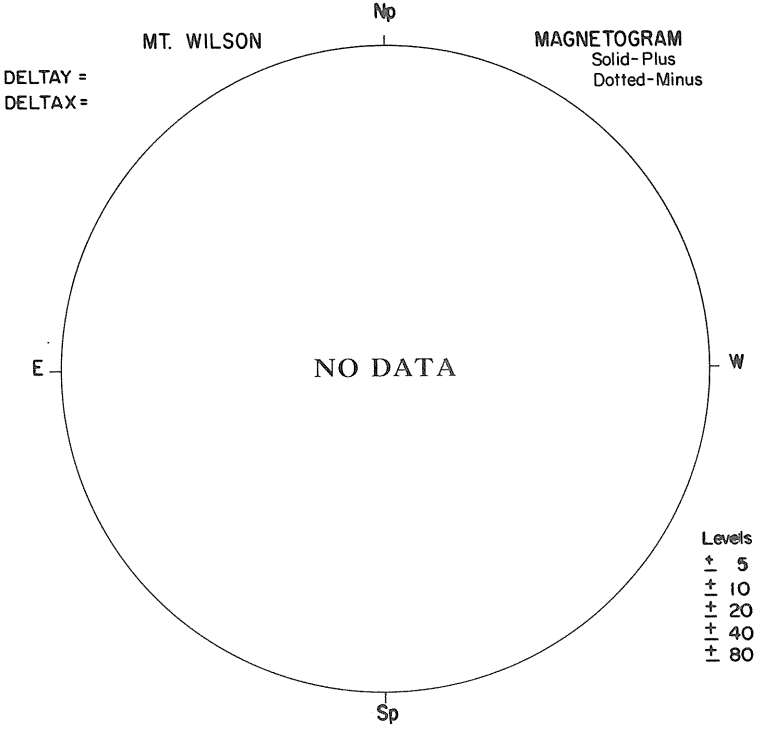
1801 UT Ant. Temp. Unit 100° K

APRIL 25, 1978 (P =-25.16, B_o =-4.75, L_o =157.92)

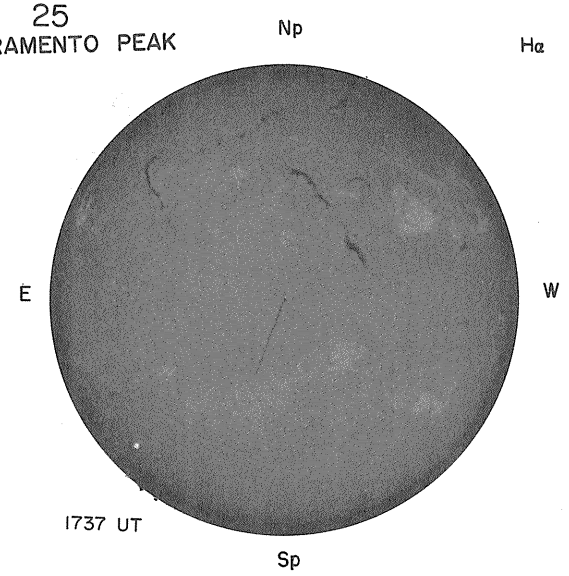




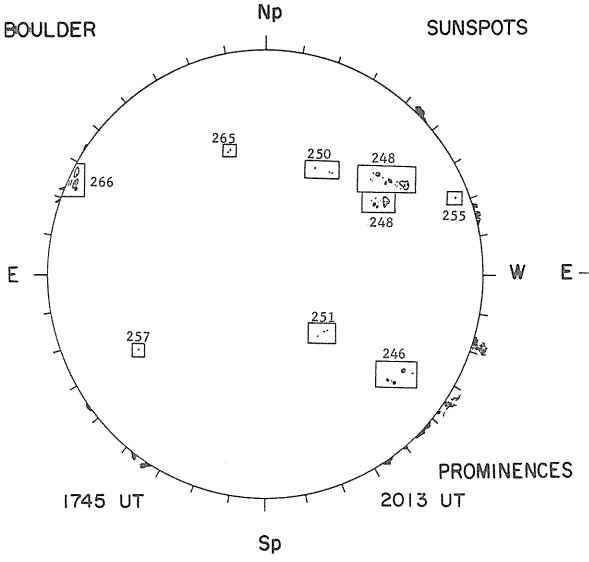




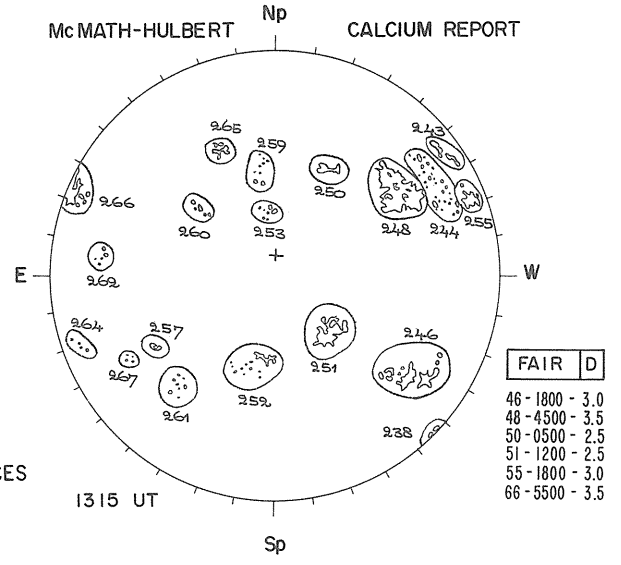
25
SACRAMENTO PEAK



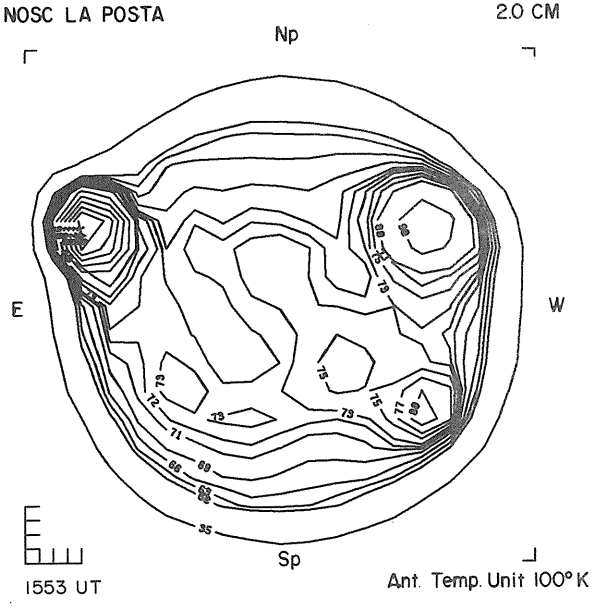
BOULDER



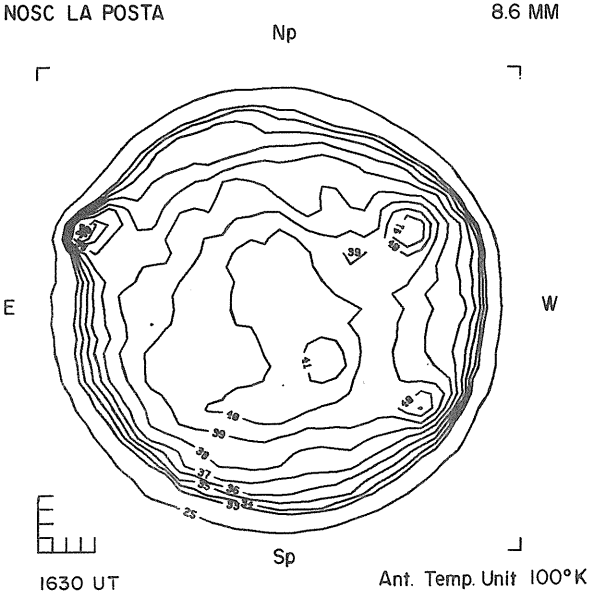
McMATH-HULBERT



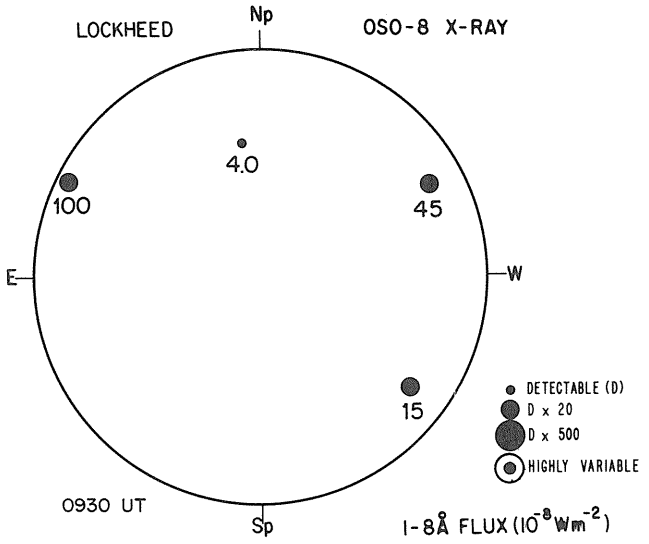
NOSC LA POSTA

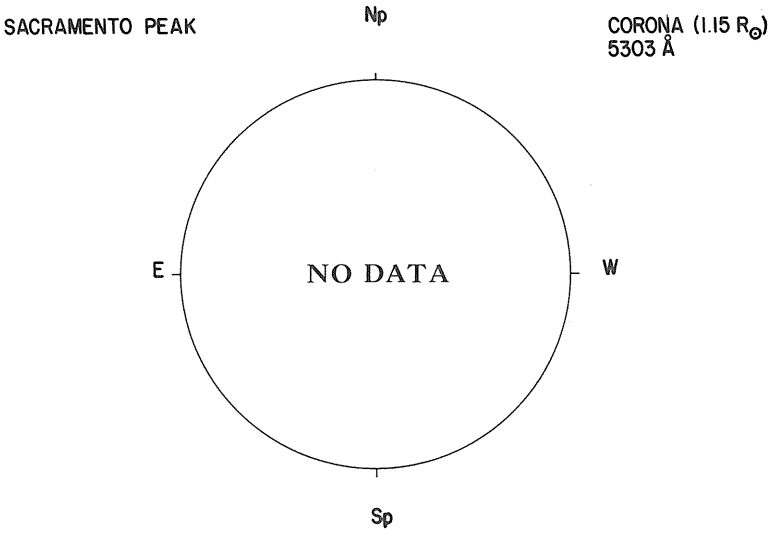


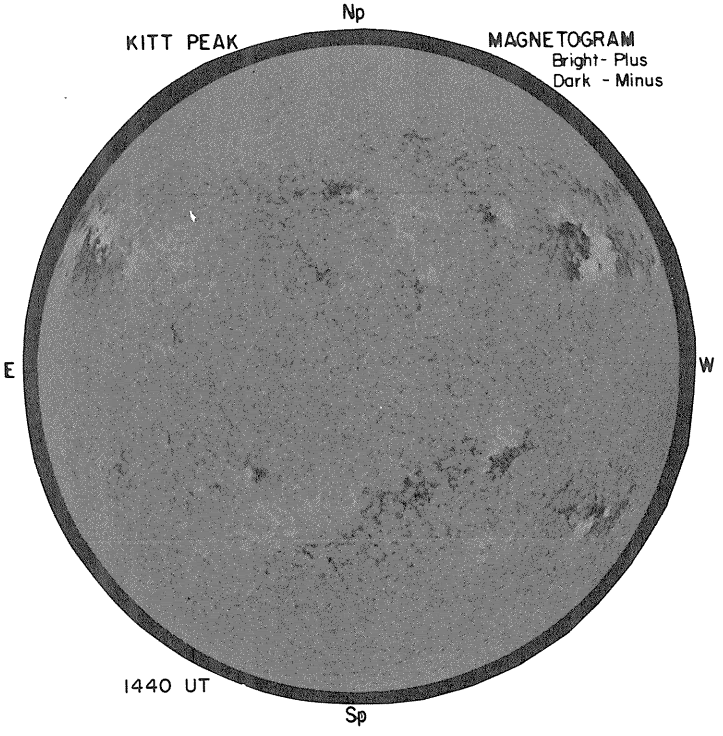
NOSC LA POSTA

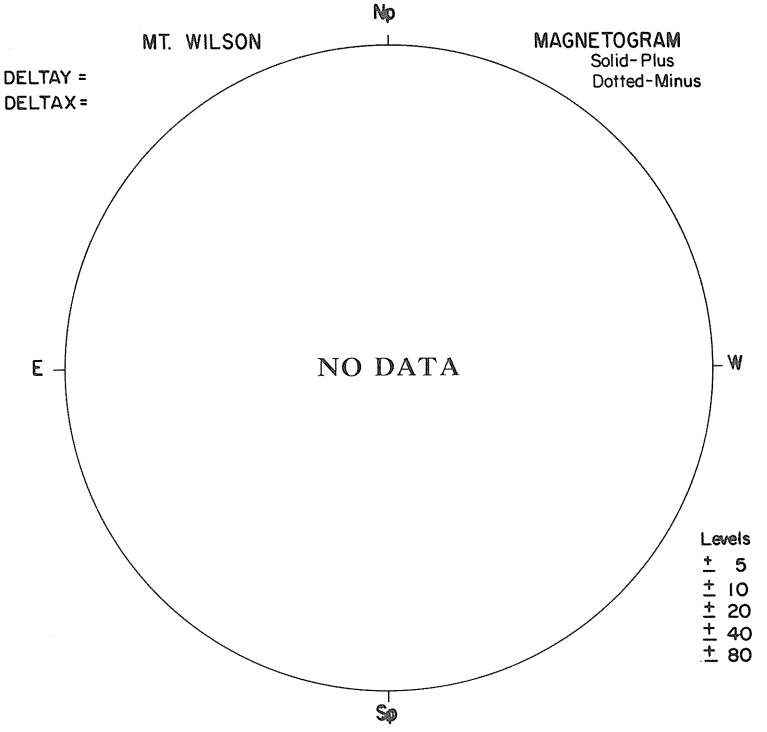


APRIL 26, 1978 (P = -25.02, B_o = -4.66, L_o = 144.71)



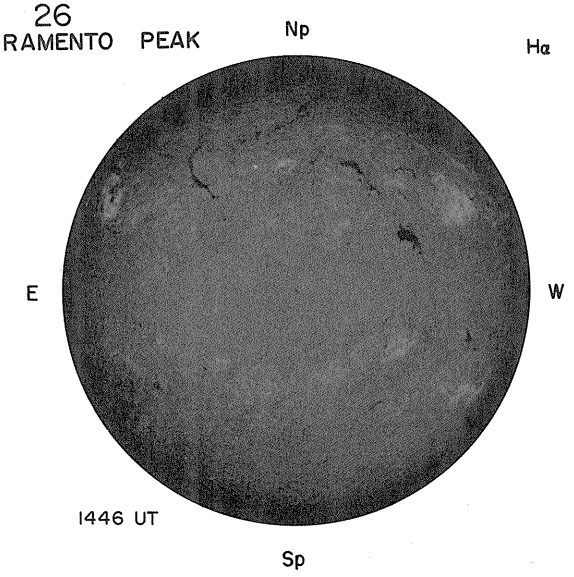




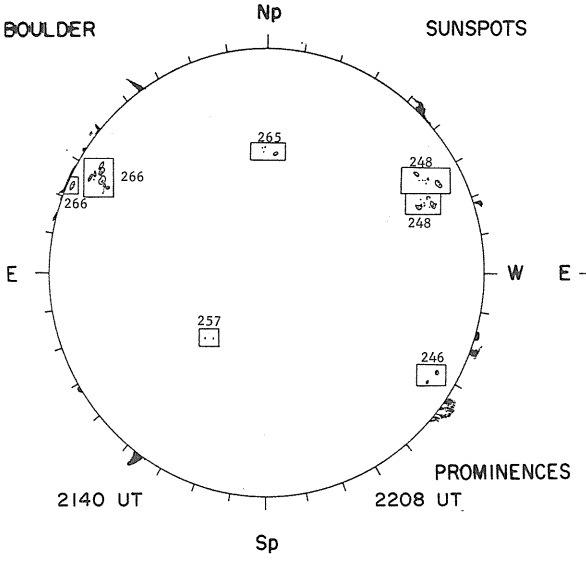


26

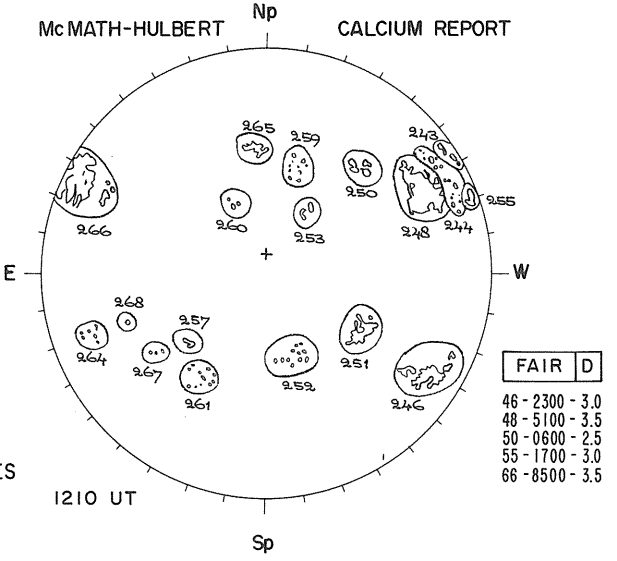
SACRAMENTO PEAK



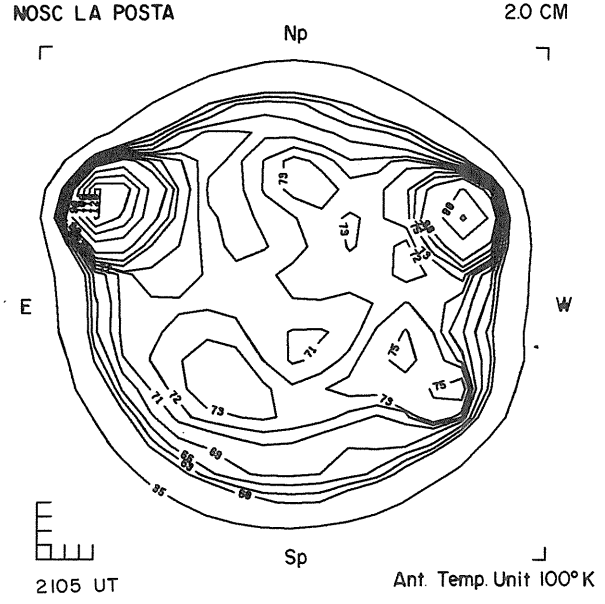
BOULDER



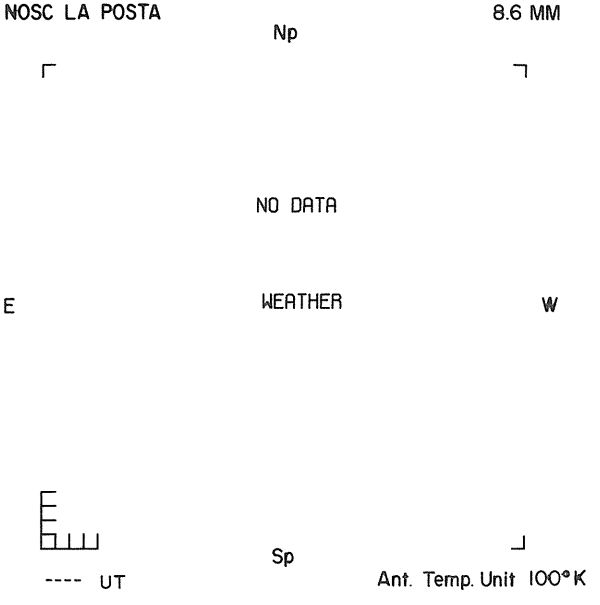
McMATH-HULBERT



NOSC LA POSTA

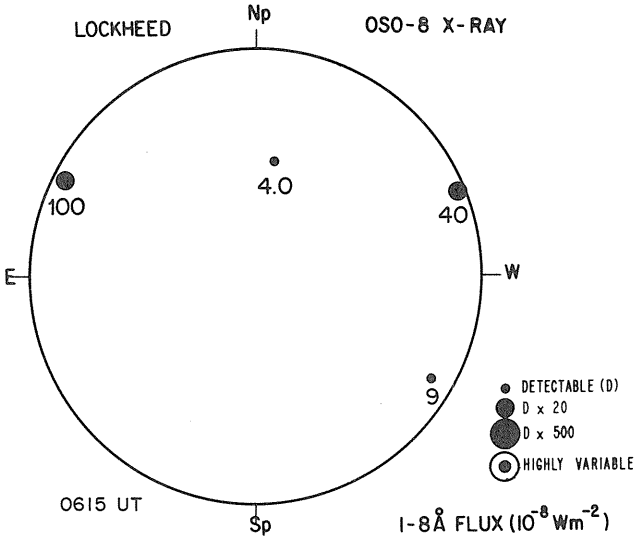


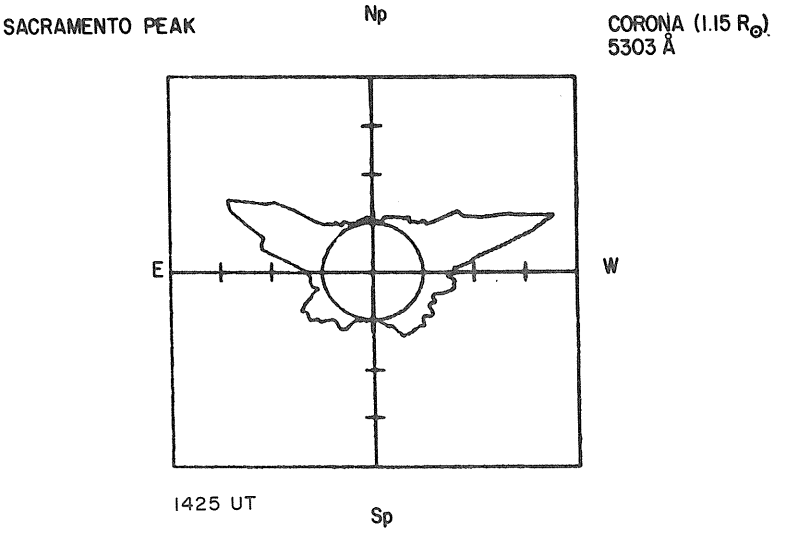
NOSC LA POSTA

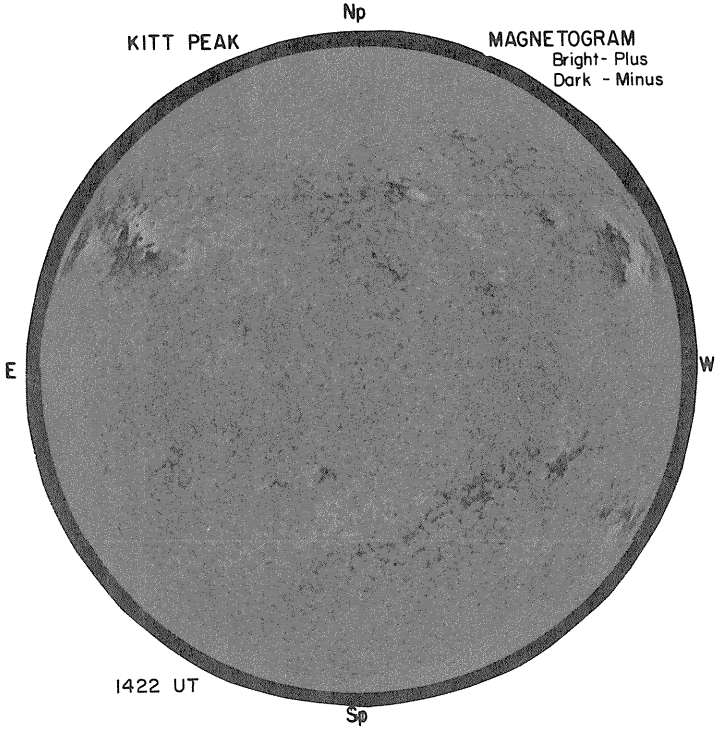


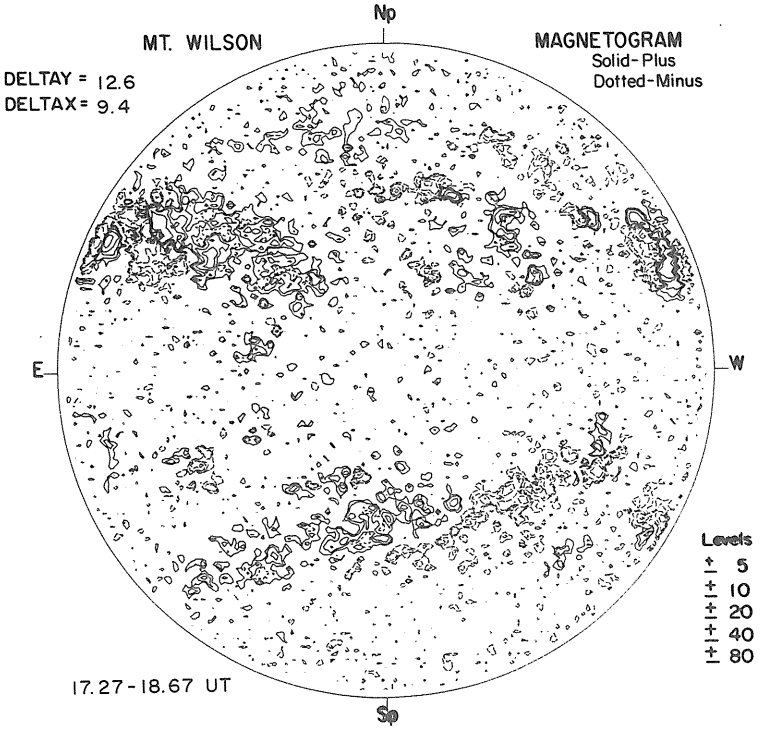
105
Apr 78

APRIL 27, 1978 (P = -24.88, B_o = -4.56, L_o = 131.49)



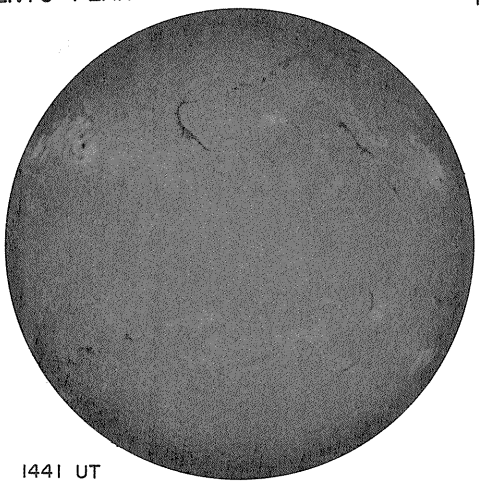






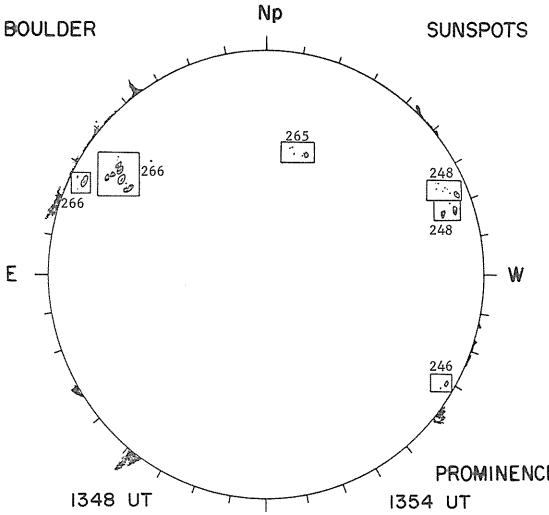
27

SACRAMENTO PEAK Hα



1441 UT

BOULDER SUNSPOTS

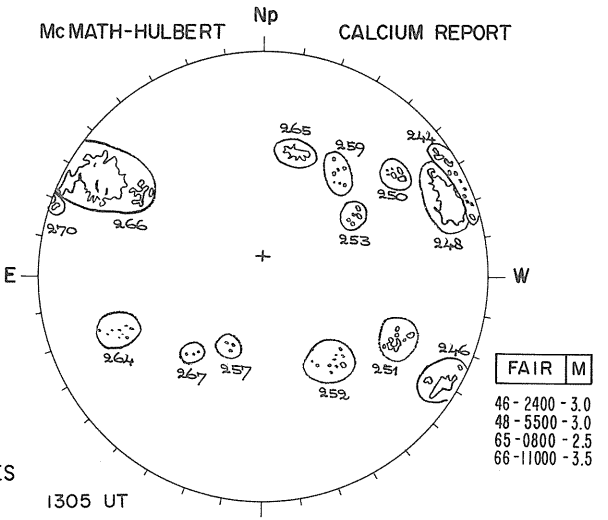


1348 UT

PROMINENCES

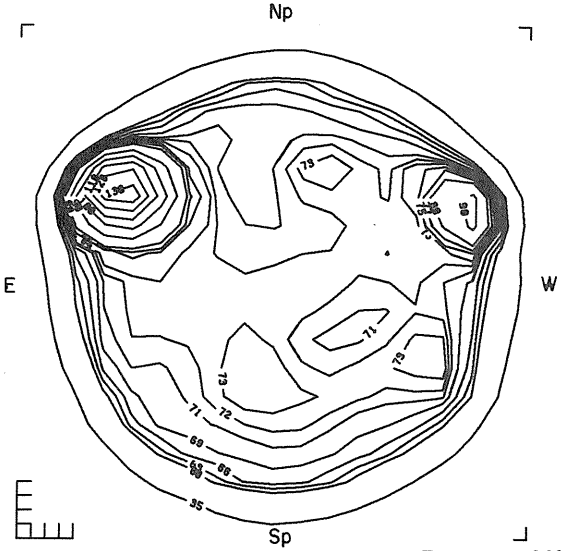
1354 UT

McMATH-HULBERT CALCIUM REPORT



1305 UT

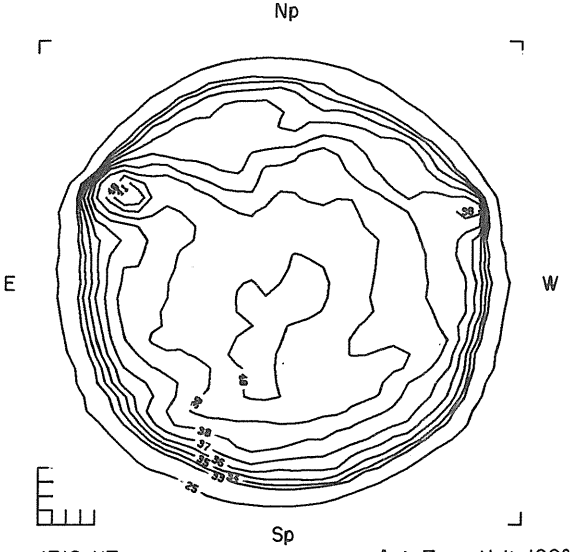
NOSC LA POSTA 2.0 CM



1811 UT

Ant. Temp. Unit 100° K

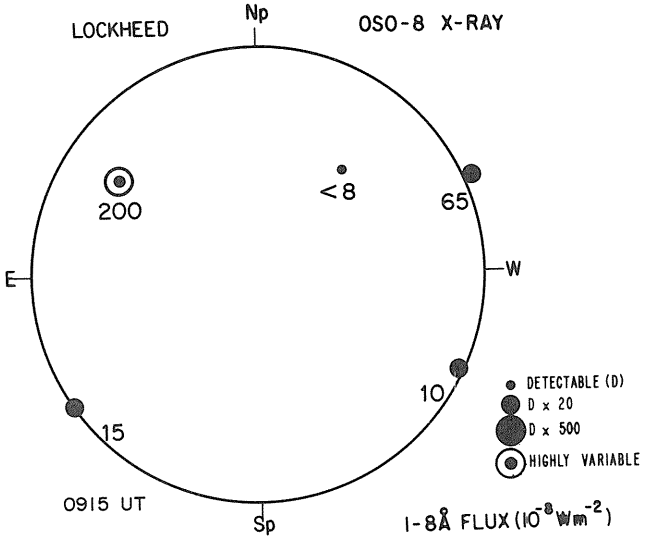
NOSC LA POSTA 8.6 MM

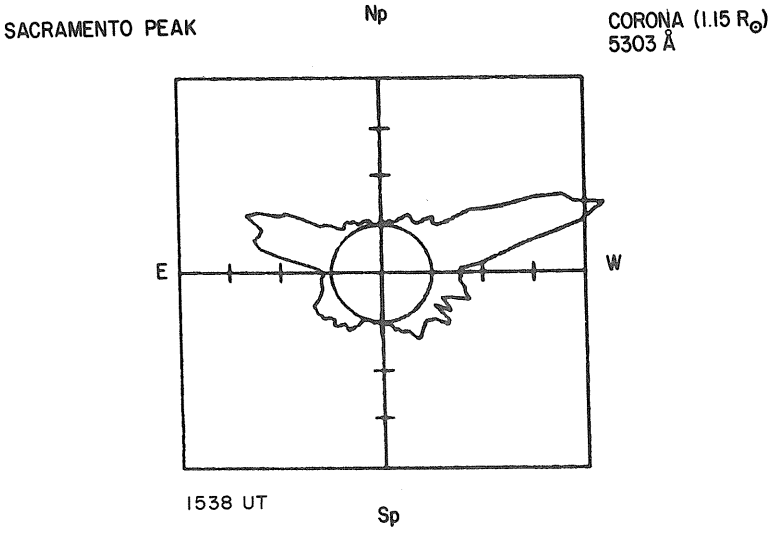


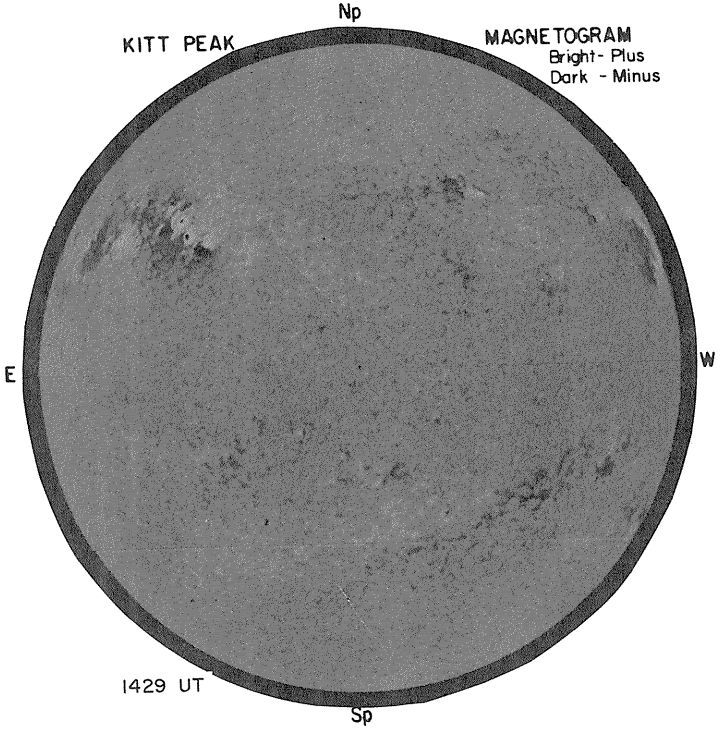
1712 UT

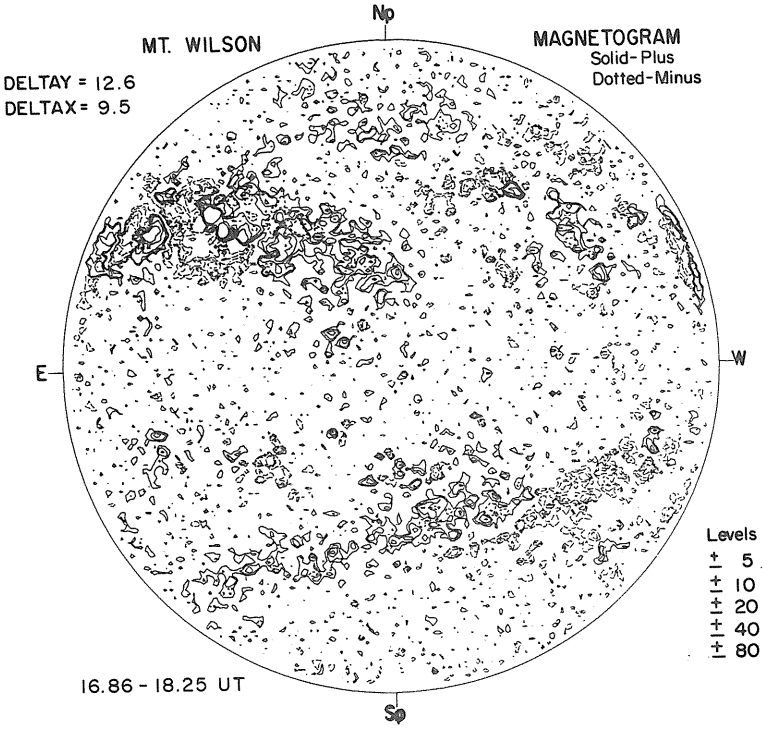
Ant. Temp. Unit 100° K

APRIL 28, 1978 (P = -24.73, B_o = -4.47, L_o = 118.28)



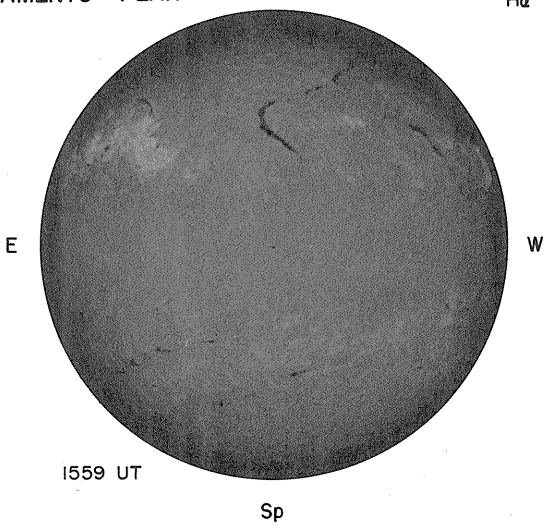






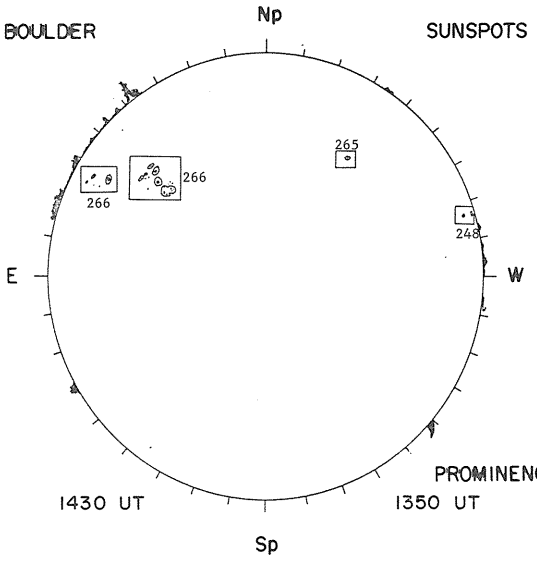
28

SACRAMENTO PEAK Hα



1559 UT

BOULDER SUNSPOTS

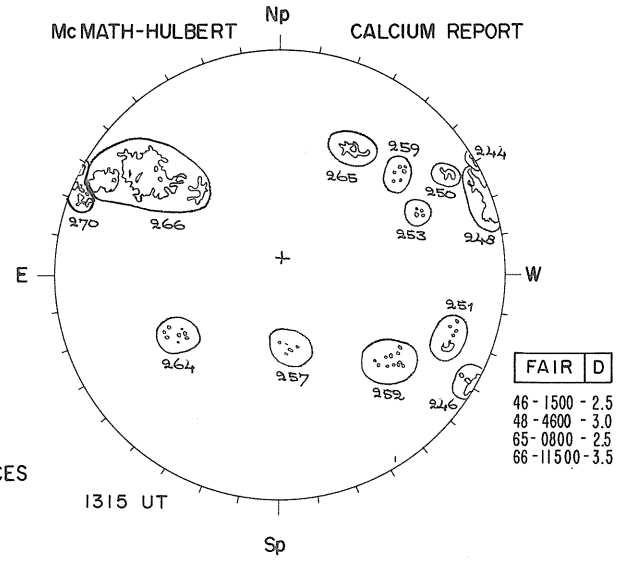


1430 UT

PROMINENCES

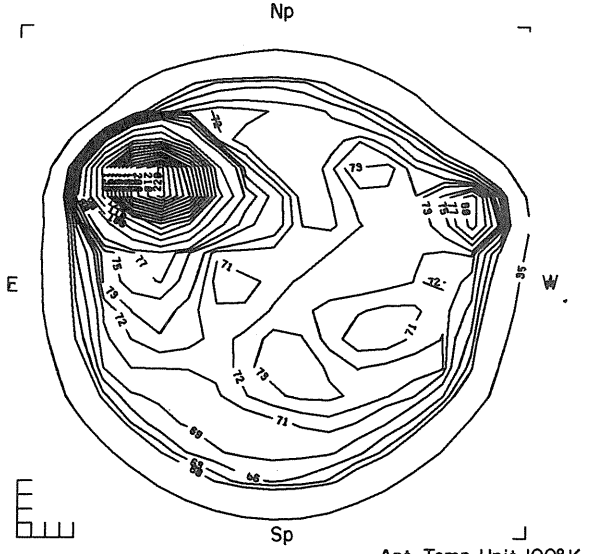
1350 UT

McMATH-HULBERT CALCIUM REPORT



1315 UT

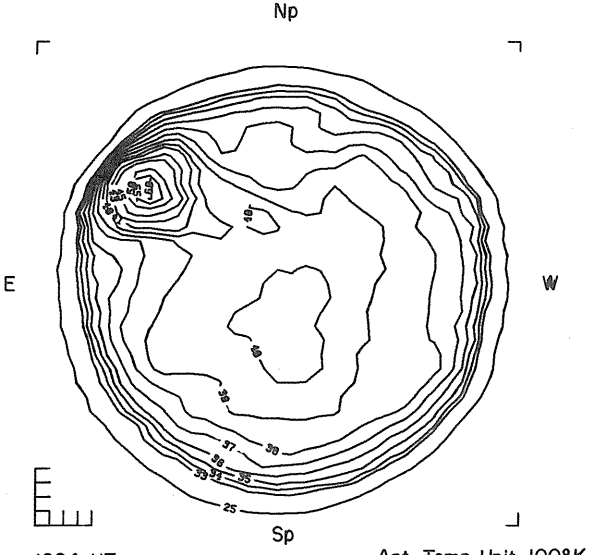
NOSC LA POSTA 2.0 CM



1936 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA 8.6 MM

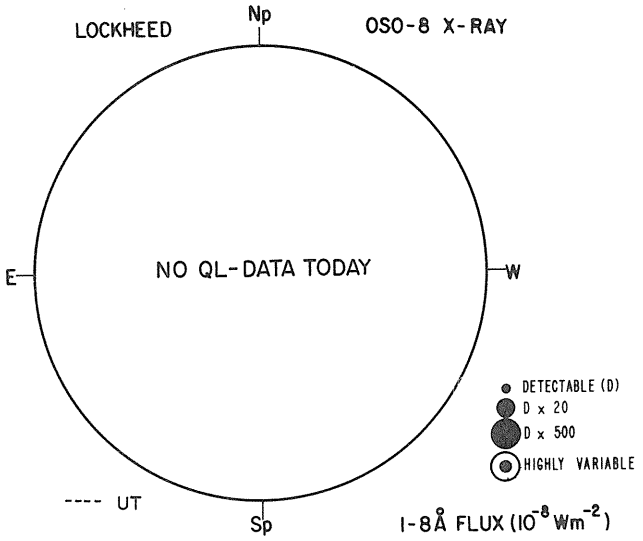


1824 UT

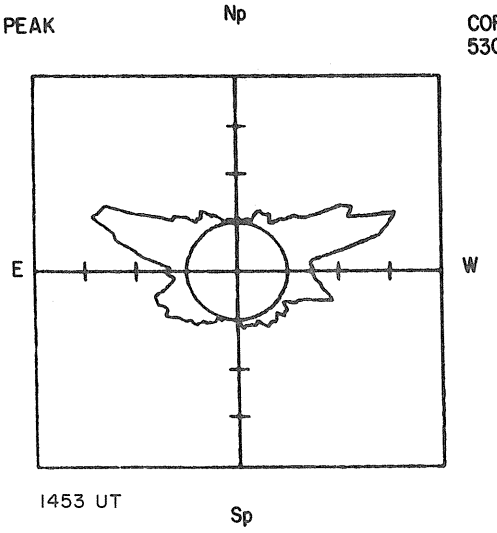
Ant. Temp. Unit 100° K

APRIL 29, 1978 (P =-24.58, B_o =-4.37, L_o = 105.06)

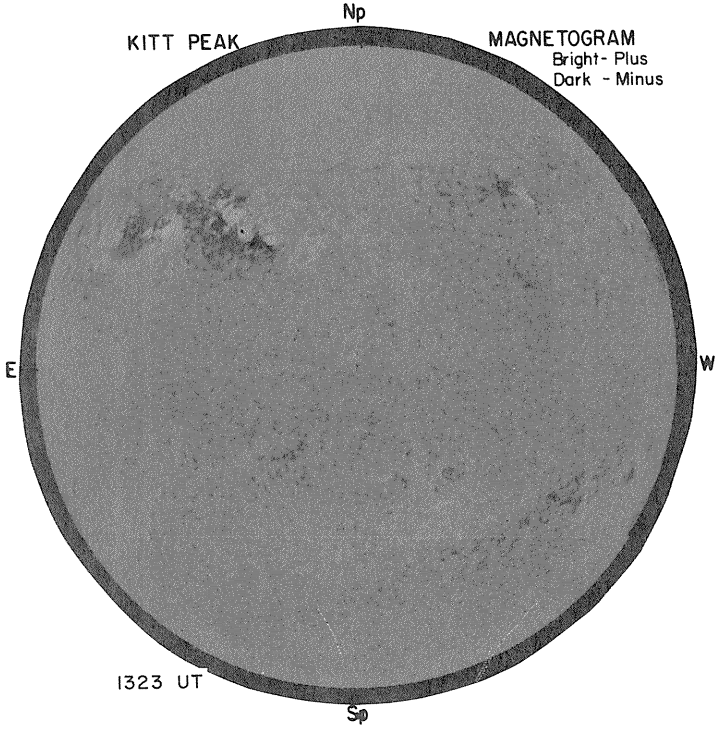
LOCKHEED OSO-8 X-RAY



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

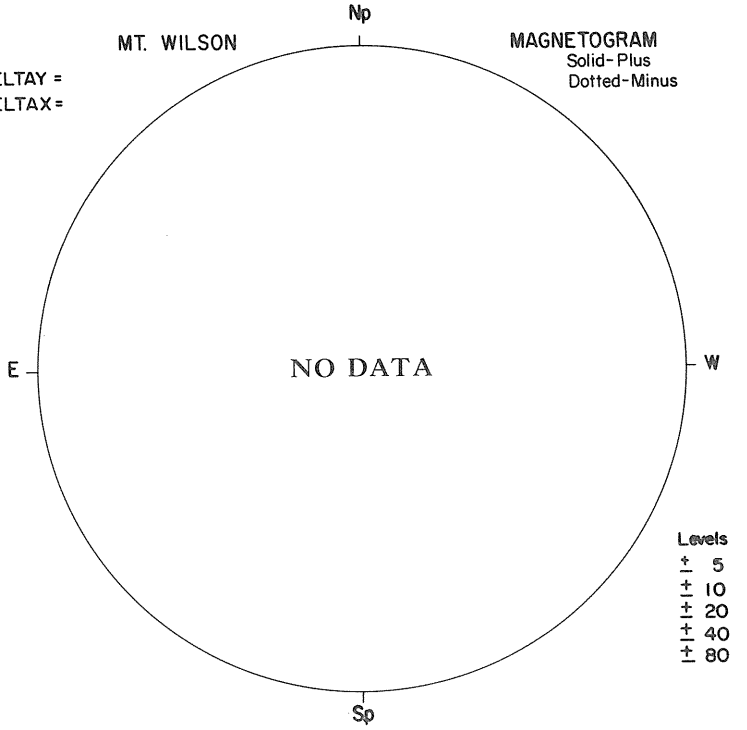


KITT PEAK MAGNETOGRAM Bright- Plus Dark - Minus



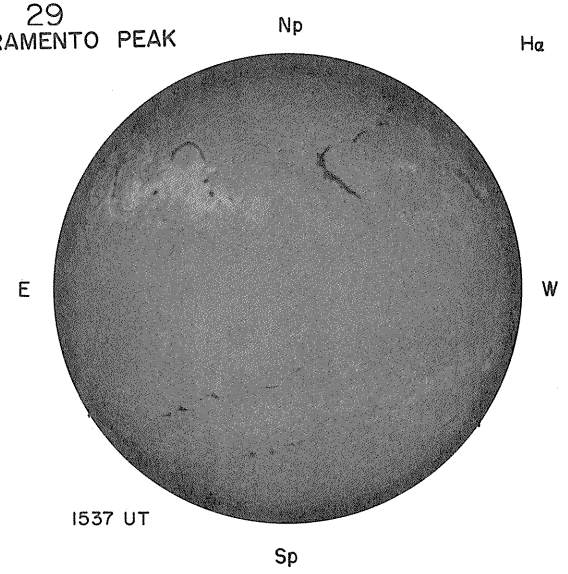
MT. WILSON MAGNETOGRAM Solid- Plus Dotted-Minus

DELTAY =
DELTAX =

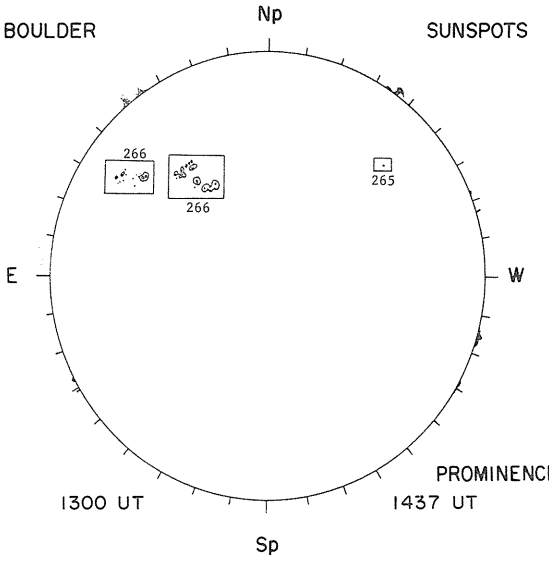


29

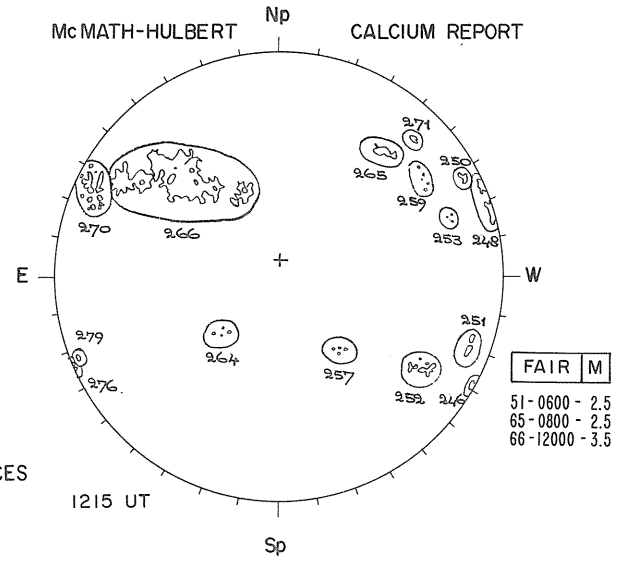
SACRAMENTO PEAK



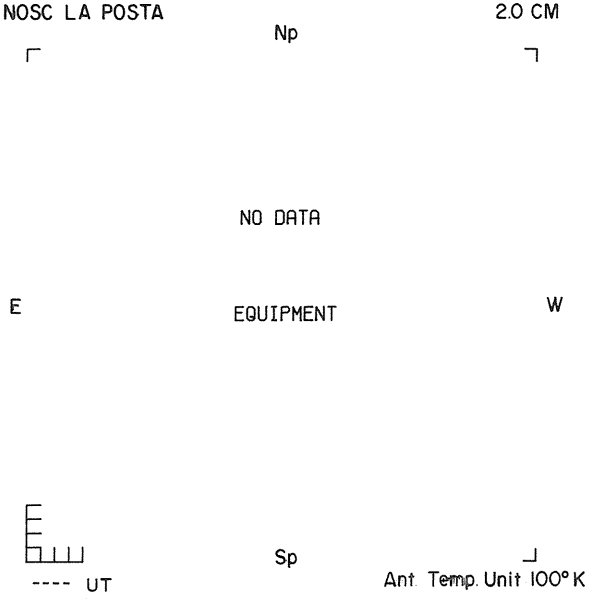
BOULDER



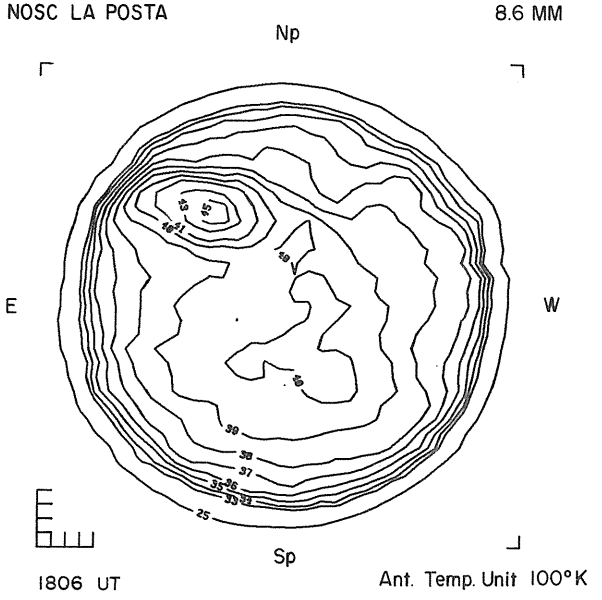
McMATH-HULBERT



NOSC LA POSTA

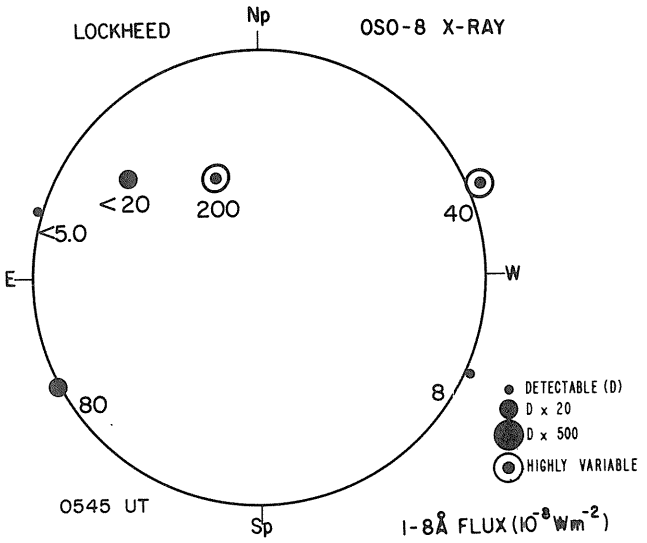


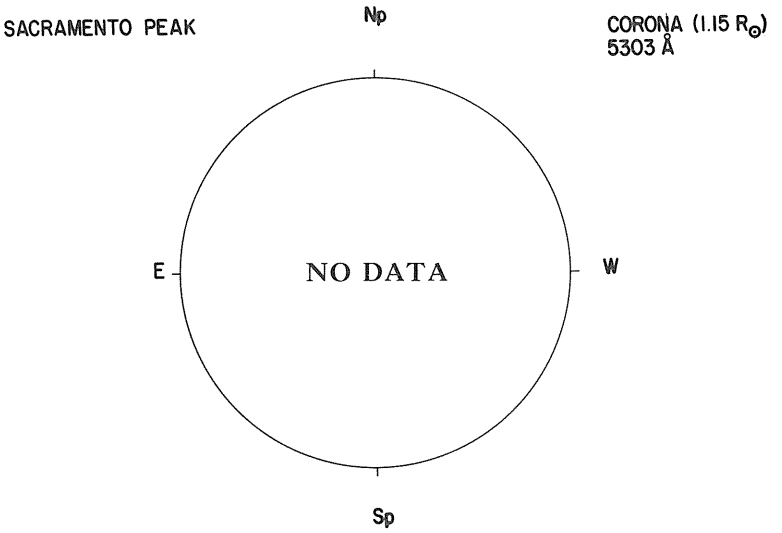
NOSC LA POSTA

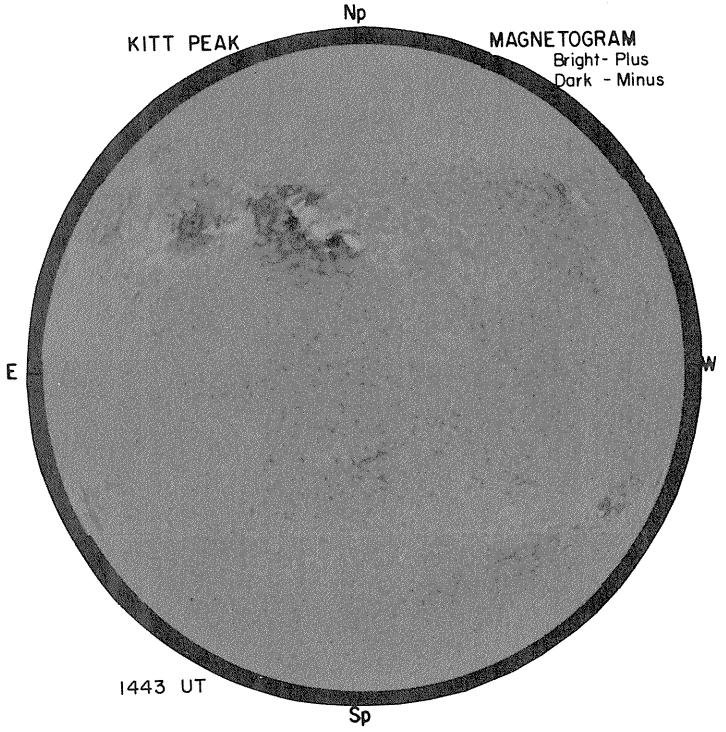


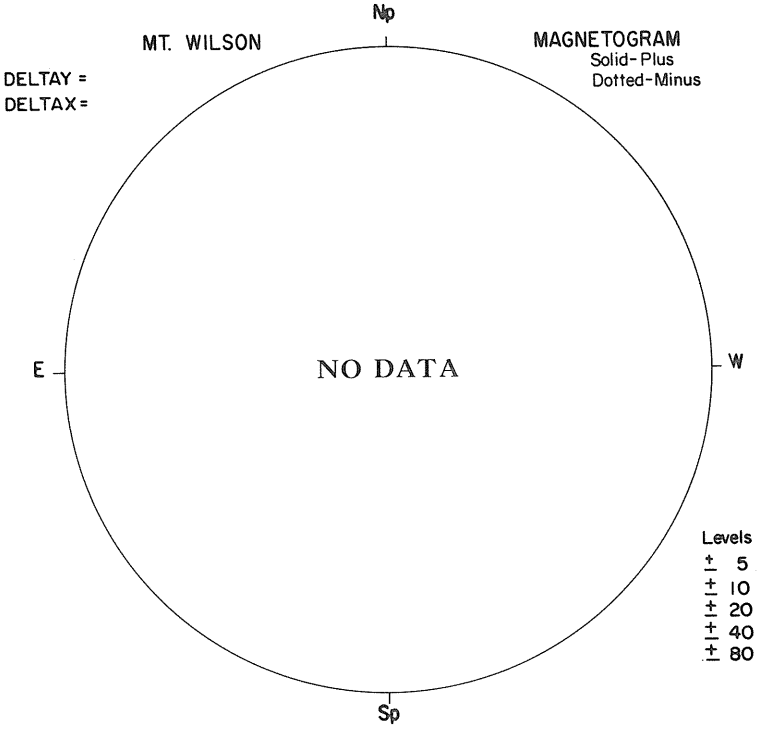
111
Apr 78

APRIL 30, 1978 (P =-24.41, B_o =-4.27, L_o =91.85)



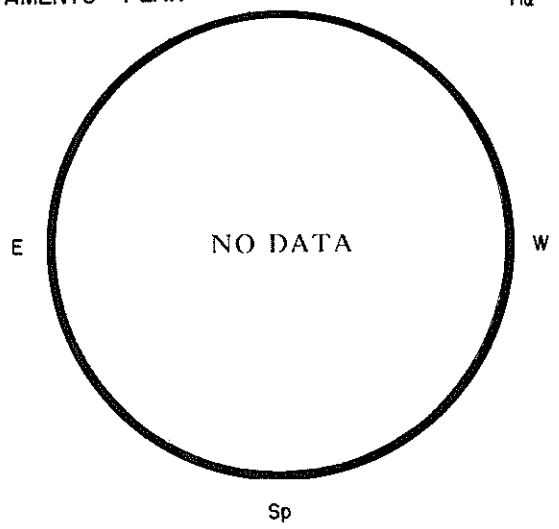




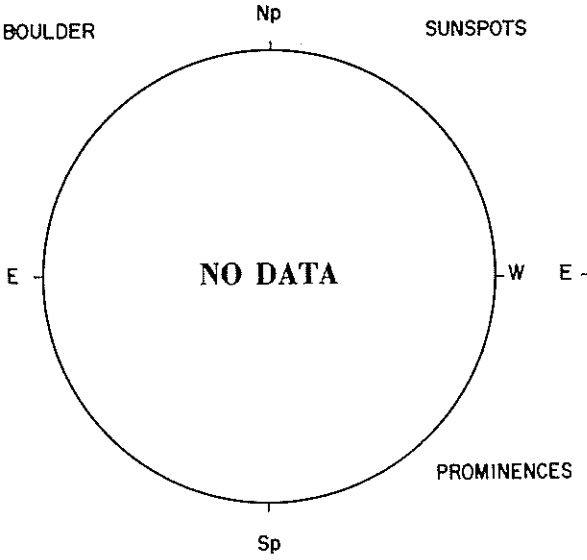


30

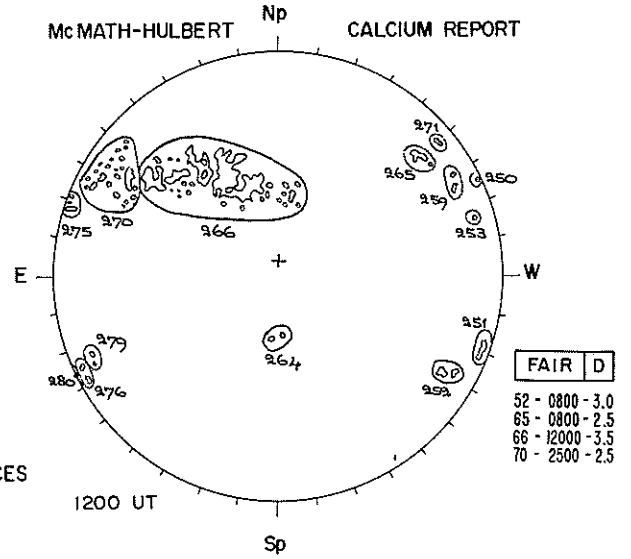
SACRAMENTO PEAK Hα



BOULDER SUNSPOTS



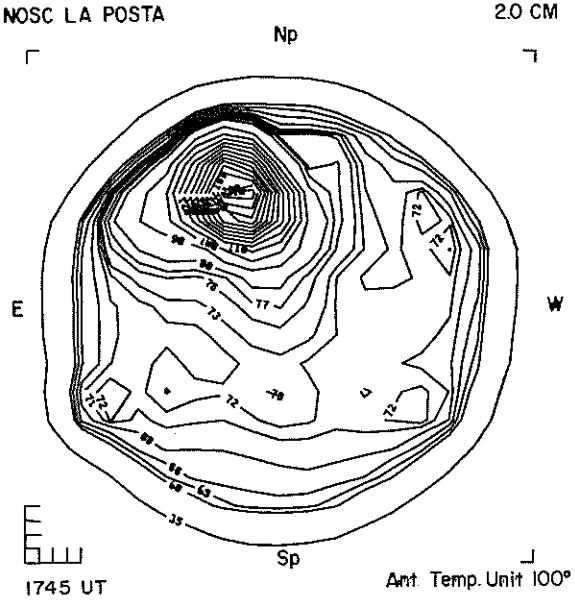
McMATH-HULBERT CALCIUM REPORT



PROMINENCES

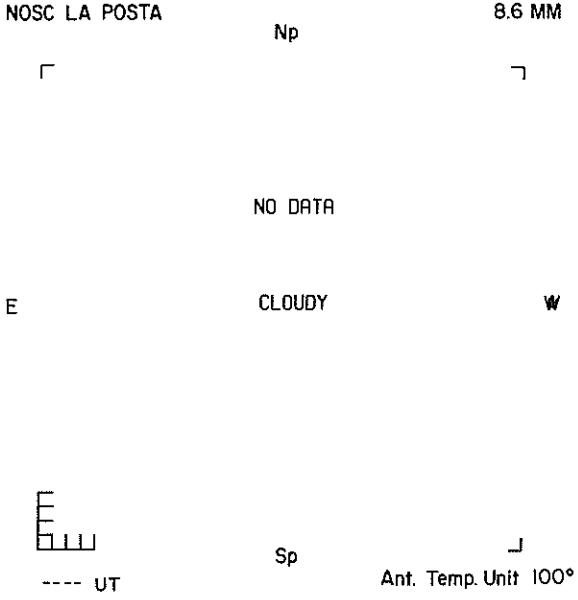
1200 UT

NOSC LA POSTA 2.0 CM



1745 UT Ant. Temp. Unit 100° K

NOSC LA POSTA 8.6 MM



---- UT Ant. Temp. Unit 100° K

REGIONS OF SOLAR ACTIVITY

APRIL 1978

MCMATH REGION 15219 CMP DATE 2.0

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
78	3	29	15219	S29 E43	104	200	1.0									
78	3	30	15219	S29 E31	101	200	1.5									
78	3	31	15219	S29 E18	101	100	1.5									

MCMATH REGION 15215 CMP DATE 2.5

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
78	3	29	15215	S14 E52	95	100	2.0									

MCMATH REGION 15213 CMP DATE 2.5

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
78	3	28	15213	N14 E67	89	800	3.0									
78	3	29	15213	N14 E56	91	700	3.0									
78	3	30	15213	N13 E41	91	700	2.0									
78	3	31	15213	N13 E26	93	700	2.0									
78	4	1	15213	N12 E14	94	700	2.0									
78	4	2	15213	N12 W01	94	400	2.0									
78	4	4	15213	N12 W28	94	400	2.0									
78	4	5	15213	N12 W41	96	500	2.0	19993	N10 W47	97	X	1				
78	4	7	15213	N13 W68	95	400	1.5									

MCMATH REGION 15214 CMP DATE 3.6 RETURN OF REGION 15172 ROTATION 3 AND 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
78	3	28	15214	N24 E78	78	1000	2.5	19985	N21 E58	87	(B)	3	B	10	2	BXO
78	3	29	15214	N23 E68	79	2400	2.5									
78	3	30	15214	N23 E54	78	3400	2.5									
78	3	31	15214	N23 E41	78	3500	2.5									
78	4	1	15214	N23 E28	80	3200	2.5									
78	4	2	15214	N23 E15	78	3000	2.5									
78	4	4	15214	N23 W13	79	2800	2.5									
78	4	5	15214	N23 W25	80	3000	2.5	19994	N21 W25	75	(B)	1				
78	4	7	15214	N23 W51	78	2800	2.5									
78	4	8	15214	N23 W64	78	2500	3.0									
78	4	9	15214	N23 W75	76	1800	3.0	19994	N22 W77	75	(B)	3				
78	4	10	15214	N23 W87	76	1300	1.5									

MCMATH REGION 15216 CMP DATE 3.9

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
78	3	29	15216	S16 E71	76	100	2.5	19986	S17 E67	78	(AP)	3				
78	3		15216					19987	S16 E78	67	(AP)	3	B	60	1	HSX
78	3	30	15216	S18 E57	75	300	3.5									
78	3	31	15216	S18 E43	76	300	3.0		S17 E42				B	30	6	CSO
78	4	1	15216	S18 E31	77	400	2.0	19986	S18 E28	77	B	2				
78	4		15216					19987	S15 E37	68	AP	2				
78	4	2	15216	S18 E17	76	500	2.5									
78	4	4	15216	S18 W10	76	700	2.5									
78	4	5	15216	S18 W22	77	500	2.0	19987	S15 W18	68	(AP)	2				
78	4	7	15216	S18 W48	75	600	2.0									
78	4	8	15216	S18 W60	74	600	2.0									
78	4	9	15216	S17 W73	74	600	2.5									
78	4	10	15216	S17 W85	74	600	1.5									

MCMATH REGION 15217 CMP DATE 5.2

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
78	3	29	15217	S14 E88	59	400	1.5									
78	3	30	15217	S14 E74	58	1100	2.0									
78	3	31	15217	S15 E59	60	1100	3.0		S15 E51				B	30	1	HSX
78	4	1	15217	S15 E48	60	1100	2.5									

(Con't)

REGIONS OF SOLAR ACTIVITY

APRIL 1978

MCMATH REGION 15217 (CONT) CMP DATE 5.2

				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
78	4	2	15217	S15 E34	59	900	2.5									
78	4	4	15217	S15 E07	59	800	2.0									
78	4	5	15217	S15 W06	61	900	2.0									
78	4	7	15217	S15 W35	62	1000	2.0									
78	4	8	15217	S15 W47	61	1200	2.0									
78	4	9	15217	S16 W58	59	900	1.5									
78	4	10	15217	S15 W71	60	500	1.5									

MCMATH REGION 15220 CMP DATE 5.2 RETURN OF PART OF 15172 ROTATION 3 AND 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
78	3	30	15220	N33 E76	56	700	2.5									
78	3	31	15220	N32 E61	58	800	3.0		N31 E60				B	30	3	BXO
78	4	1	15220	N30 E49	59	1400	2.5	19990	N30 E44	61	X	1				
78	4	2	15220	N30 E35	58	1600	2.5									
78	4	4	15220	N30 E07	59	1500	2.5									
78	4	5	15220	N30 W06	61	1500	2.5									
78	4	7	15220	N31 W33	60	1600	2.0									
78	4	8	15220	N30 W45	59	1400	1.5									
78	4	9	15220	N30 W60	61	1100	1.0									
78	4	10	15220	N30 W72	61	1000	1.0									

MCMATH REGION 15234 CMP DATE 6.3

				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
78	4	7	15234	N34 W17	44	300	2.0									
78	4	8	15234	N35 W32	46	400	2.0									
78	4	9	15234	N34 W45	46	400	2.0									
78	4	10	15234	N34 W57	46	500	2.0									
78	4	11	15234	N34 W72	46	400	1.5									
78	4	12	15234	N34 W85	48	300	1.0									

MCMATH REGION 15221 CMP DATE 7.3 RETURN OF REGION 15175 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
78	3	31	15221	N20 E87	32	600	3.5		N21 E78				B	30	1	HSX
78	4	1	15221	N20 E75	33	3300	3.5	19991	N15 E69	36	AP	1				
78	4		15221					19992	N20 E70	35	B	3				
78	4	2	15221	N20 E61	32	3700	3.0									
78	4	4	15221	N21 E35	31	4500	3.5									
78	4	5	15221	N21 E24	31	5000	3.5	19991	N15 E14	36	(AP)	3				
78	4		15221					19992	N20 E19	31	(B)	4				
78	4	7	15221	N21 W03	30	5000	3.5									
78	4	8	15221	N21 W16	30	5000	3.0									
78	4	9	15221	N21 W29	30	4800	3.0	19992	N20 W33	31	(B)	4				
78	4	10	15221	N21 W42	31	4500	3.0	19992	N20 W45	31	(B)	4				
78	4	11	15221	N22 W55	29	4500	3.5	19992	N20 W58	33	(D)	4				
78	4	12	15221	N22 W66	29	4200	3.5	19992	N20 W70	31	(D)	4				
78	4	13	15221	N22 W80	27	1800	2.5									
78	4	14	15221	N23 W88	25	800	1.0									

MCMATH REGION 15227 CMP DATE 9.3

				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
78	4	4	15227	S26 E65	1	700	3.5									
78	4	5	15227	S26 E53	2	600	3.5	19995	S28 E46	4	(BP)	3				
78	4	7	15227	S26 E23	4	800	3.0									
78	4	8	15227	S26 E10	4	900	2.5									
78	4	9	15227	S26 W03	4	900	2.0	19995	S26 W12	10	(AP)	3				
78	4	10	15227	S27 W17	6	1000	2.5	19995	S26 W23	9	(BP)	3				
78	4	11	15227	S27 W32	6	1400	3.0	19995	S26 W34	9	(BP)	4				
78	4	12	15227	S27 W44	7	1800	3.0	19995	S26 W46	7	(BP)	3				
78	4	13	15227	S27 W59	6	1600	3.0		S27 W58				B	150	7	DAI
78	4	14	15227	S27 W68	5	1600	3.5		S26 W70				B	20	4	CSO
78	4	15	15227	S27 W78	2	1400	3.0									

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APRIL 1978

MCMATH REGION 15228 CMP DATE 9.3 RETURN OF REGION 15177 (REMNANTS) 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
78	4	4	15228	N03 E66	0	500	1.0								
78	4	5	15228	N02 E53	2	500	1.0								
78	4	7	15228	N02 E23	4	600	1.5								
78	4	8	15228	N02 E10	4	500	1.0								

MCMATH REGION 15230 CMP DATE 9.5

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
78	4	4	15230	N33 E64	2	600	2.5								
78	4	5	15230	N33 E51	4	500	2.5								
78	4	7	15230	N33 E24	3	500	2.0								
78	4	8	15230	N33 E12	2	400	2.0								
78	4	9	15230	N33 E00	1	400	1.5								
78	4	10	15230	N33 W14	3	400	1.5								
78	4	11	15230	N34 W26	0	400	1.5								
78	4	12	15230	N34 W36	359	300	1.5								

MCMATH REGION 15229 CMP DATE 9.9 RETURN OF REGION 15176 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
78	4	4	15229	N17 E72	355	3600	3.0								
78	4	5	15229	N17 E60	356	3600	3.0	19996	N15 E55	356	(AP)	3			
78	4	7	15229	N17 E31	357	3800	3.0								
78	4	8	15229	N17 E18	357	4000	3.0								
78	4	9	15229	N17 E04	358	3800	2.5	19999	N15 W06	4	(B)	2			
78	4	10	15229	N17 W09	358	3800	3.0	19999	N15 W18	4	(AP)	1			
78	4	11	15229	N18 W24	358	3800	3.0	19999	N15 W29	4	AP	1			
78	4		15229					20004	N17 W15	350	(B)	2			
78	4	12	15229	N18 W35	358	3500	2.5								
78	4	13	15229	N18 W51	358	3100	2.5								
78	4	14	15229	N18 W60	357	2800	2.5								
78	4	15	15229	N18 W70	354	1400	2.0								
78	4	16	15229	N18 W84	355	600	1.0								

MCMATH REGION 15236 CMP DATE 10.5

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
78	4	8	15236	S25 E24	351	200	1.0								
78	4	9	15236	S26 E12	350	300	1.5	20000	S26 E10	349	(AF)	1			
78	4	10	15236	S27 W01	350	300	1.5								
78	4	11	15236	S27 W16	350	400	1.5								
78	4	12	15236	S26 W25	348	300	1.0								
78	4	13	15236	S26 W42	349	200	1.0								
78	4	14	15236	S26 W55	352	100	1.5								
78	4	15	15236	S27 W68	352	100	1.5								

MCMATH REGION 15231 CMP DATE 11.4

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
78	4	5	15231	N19 E82	334	700	3.0	19997	N17 E70	341	X	1			
78	4	7	15231	N18 E52	336	1200	2.5								
78	4	8	15231	N18 E38	337	1100	3.0								
78	4	9	15231	N17 E24	338	800	2.0	19997	N16 E19	340	(AP)	3			
78	4	10	15231	N17 E11	338	400	2.5	19997	N17 E08	338	(B)	2			
78	4	11	15231	N17 W04	338	500	2.5	19997	N16 W04	339	B	1			
78	4	12	15231	N17 W15	338	500	1.5								
78	4	13	15231	N17 W30	337	300	1.0								
78	4	14	15231	N17 W39	336	400	1.5								
78	4	15	15231	N18 W53	337	300	1.0								
78	4	16	15231	N18 W67	338	300	3.0								
78	4	17	15231	N18 W79	336	300	2.0								

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MCMATH REGION 15232 CMP DATE 12.1

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
78	4	5	15232	S29 E83	333	1100	2.5	19998	S29 E75	336	(AP)	3				
78	4	7	15232	S29 E57	331	1200	2.5									
78	4	8	15232	S29 E45	330	1300	3.0									
78	4	9	15232	S30 E33	329	1200	2.5	19998	S30 E29	330	(B)	3				
78	4	10	15232	S30 E20	329	1800	3.0	19998	S29 E15	331	(B)	3				
78	4	11	15232	S30 E05	329	2000	2.5	19998	S29 E03	332	(BP)	3				
78	4	12	15232	S30 W05	328	2000	2.5	19998	S30 W10	331	(BP)	3				
78	4	13	15232	S31 W20	327	2000	3.0		S27 W23				B	10	3	BXO
78	4	14	15232	S31 W30	327	1800	3.0		S28 W38				B	10	1	AXX
78	4	15	15232	S30 W42	326	1800	3.0		S29 W43				R	10	3	BXO
78	4	16	15232	S30 W55	326	1500	3.0									
78	4	17	15232	S30 W67	324	1200	2.5									

MCMATH REGION 15245 CMP DATE 14.1

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
78	4	15	15245	N28 W18	302	200	1.5		N28 W17				R	10	1	AXX
78	4	16	15245	N28 W31	302	200	1.0									
78	4	17	15245	N28 W43	300	200	1.0									

MCMATH REGION 15239 CMP DATE 14.2

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
78	4	11	15239	N19 E33	301	200	2.5	20005	N19 E33	302	(AP)	1				
78	4	12	15239	N19 E22	301	300	3.0	20005	N19 E20	301	(B)	4				
78	4	13	15239	N19 E07	300	500	3.0		N17 E06				B	50	4	DSO
78	4	14	15239	N20 W04	301	600	3.0		N18 W08				B	40	6	CRO
78	4	15	15239	N20 W19	303	700	3.0		N19 W22				R	30	15	CRO
78	4	16	15239	N20 W33	304	700	3.0									
78	4	17	15239	N20 W46	303	700	3.0	20005	N20 W60	311	(AP)	3	B	40	2	CSO
78	4	18	15239					20005	N20 W74	312	(AP)	2				
78	4	19	15239	N20 W81	309	500	2.0	20005	N20 W85	314	AP	2				

MCMATH REGION 15233 CMP DATE 14.4 RETURN OF REGION 15178 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
78	4	7	15233	S35 E82	306	900	2.0									
78	4	8	15233	S32 E70	305	1500	2.0									
78	4	9	15233	S33 E60	302	1800	1.5	20001	S33 E51	308	(AP)	3				
78	4	10	15233	S33 E49	300	1800	2.0	20001	S34 E39	307	(AP)	2				
78	4	11	15233	S34 E35	299	1800	2.5	20001	S34 E28	307	(AP)	3				
78	4	12	15233	S33 E25	298	1800	2.0	20001	S35 E15	306	(AP)	2				
78	4	13	15233	S33 E10	297	2000	2.0									
78	4	14	15233	S33 E00	297	1800	2.5		S33 W10				B	10	1	AXX
78	4	15	15233	S33 W12	296	2000	2.5		S35 W18				R	10	2	BXO
78	4	16	15233	S33 W23	294	1800	2.5									
78	4	17	15233	S33 W35	292	1800	2.0									
78	4	19	15233	S33 W65	293	1500	1.5									

MCMATH REGION 15240 CMP DATE 14.8

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
78	4	13	15240	S20 E15	292	400	3.0		S20 E17				B	20	3	BXO
78	4	14	15240	S19 E04	293	500	3.0		S20 E04				B	80	11	DAI
78	4	15	15240	S19 W09	293	700	2.5		S20 W09				R	40	9	CRO
78	4	16	15240	S19 W22	293	600	2.5									
78	4	17	15240	S19 W35	292	600	2.5	20007	S20 W38	289	(AF)	2	B	20	2	HSX
78	4	18	15240					20007	S20 W50	288	(AF)	2	M	20	2	HRX
78	4	19	15240	S19 W64	292	800	3.0	20007	S17 W62	291	AF	1				

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MCMATH REGION 15235 CMP DATE 15.6 RETURN OF REGION 15194 AND 15184 ROTATION 2 AND 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
78	4	8	15235	N16 E85	290	600	1.5									
78	4	9	15235	N16 E76	286	2500	3.0	20002	N15 E71	288	(BP)	2				
78	4	10	15235	N17 E68	281	5500	3.5	20002	N16 E58	288	(BP)	4				
78	4		15235					20003	N18 E72	274	(BP)	3				
78	4	11	15235	N17 E53	281	6200	3.5	20002	N15 E44	291	(BP)	4				
78	4		15235					20003	N17 E59	276	(B)	3				
78	4	12	15235	N17 E41	282	6500	3.5	20002	N14 E28	293	(D)	4				
78	4		15235					20003	N17 E44	277	(BY)	4				
78	4	13	15235	N17 E25	282	6000	3.0		N17 E31				B	130	5	DSO
78	4		15235						N14 E15				B	130	19	EAI
78	4	14	15235	N17 E16	281	6300	3.5		N15 E18				B	140	12	CSI
78	4	15	15235	N17 E01	283	6500	3.5		N18 E12				R	10	7	BXO
78	4		15235						N17 E06				R	200	24	ESI
78	4	16	15235	N17 W11	282	6300	3.5									
78	4	17	15235	N17 W23	280	5800	3.5	20002	N14 W45	296	(B)	3	B	140	15	DSI
78	4		15235					20003	N17 W28	279	(BF)	4	B	140	7	DSI
78	4	18	15235					20002	N14 W59	297	(D)	3	H	20	1	HSX
78	4		15235					20003	N18 W39	277	(AP)	4	H	170	13	DSI
78	4		15235						N17 W28				M	110	5	DSO
78	4	19	15235	N18 W54	282	5400	3.5	20002	N14 W68	297	(B)	3	B	270	9	DKO
78	4		15235					20003	N18 W49	278	(AP)	4	B	110	6	DAO
78	4	20	15235					20002	N14 W82	297	(AP)	2				
78	4		15235					20003	N18 W64	279	(AP)	3				
78	4		15235					20014	N19 W48	263	(B)	3				
78	4	21	15235	N18 W80	281	4000	3.0									
78	4	22	15235	N19 W90	281	1500	3.0	20003	N18 W85	272	(AP)	2				

MCMATH REGION 15254 CMP DATE 16.9

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
78	4	21	15254	N20 W64	265	1000	3.5									
78	4	22	15254	N20 W75	266	1400	3.5	20014	N19 W79	266	(B)	3				
78	4	23	15254	N20 W88	265	1200	2.5									

MCMATH REGION 15237 CMP DATE 17.3

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
78	4	10	15237	S25 E88	261	900	2.0									
78	4	11	15237	S25 E72	262	900	3.0									
78	4	12	15237	S25 E62	261	800	3.0									
78	4	13	15237	S26 E47	260	700	3.0									
78	4	14	15237	S26 E36	261	500	3.0									
78	4	15	15237	S26 E23	261	500	2.5									
78	4	16	15237	S26 E10	261	300	2.0									
78	4	17	15237	S26 W02	259	300	1.5									
78	4	19	15237	S26 W32	260	300	1.0									

MCMATH REGION 15256 CMP DATE 17.4

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
78	4	22	15256	S22 W68	259	100	1.0									
78	4	23	15256	S23 W79	256	200	1.0									

MCMATH REGION 15249 CMP DATE 18.0

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
78	4	19	15249	N41 W23	251	200	2.0		N40 W19				B	10	2	BXO
78	4	21	15249	N41 W49	250	100	1.0									

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MCMATH REGION 15238 CMP DATE 18.3 RETURN OF REGION 15201 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
78	4	10	15238	S44	E89	260	500	1.0										
78	4	11	15238	S44	E78	256	700	3.0	20006	S44	E79	256	(AP)	2				
78	4	12	15238	S43	E69	254	1100	3.0	20006	S44	E67	254	(AP)	3				
78	4	13	15238	S43	E58	249	900	2.0		S45	E54				B	100	1	HSX
78	4	14	15238	S43	E49	248	1000	2.5		S43	E40				B	80	1	HSX
78	4	15	15238	S43	E36	248	1000	2.5		S43	E34				R	70	1	HSX
78	4	16	15238	S43	E23	248	800	2.5										
78	4	17	15238	S43	E10	247	700	2.0	20006	S44	E05	246	(AP)	4	B	60	1	HSX
78	4	18	15238						20006	S44	W05	243	(AP)	3	M	80	1	HSX
78	4	19	15238	S43	W15	243	800	2.0	20006	S44	W15	244	(AP)	4	B	70	1	HAX
78	4	20	15238						20006	S44	W28	243	(AP)	4				
78	4	21	15238	S43	W40	241	600	1.5										
78	4	22	15238	S43	W50	241	600	1.5	20006	S45	W53	240	(AP)	3				
78	4	23	15238	S43	W60	237	600	1.5	20006	S45	W67	239	(AP)	2	B	30	1	HRX
78	4	24	15238	S43	W72	234	300	1.0		S44	W82				B	20	1	HRX
78	4	25	15238	S43	W82	233	300	1.0										

MCMATH REGION 15247 CMP DATE 18.5

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
78	4	15	15247	S24	E43	241	300	1.0										
78	4	16	15247	S24	E27	244	200	1.0										

MCMATH REGION 15241 CMP DATE 19.1

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
78	4	13	15241	N14	E72	235	100	1.0										
78	4	14	15241	N15	E65	232	200	1.5										
78	4	15	15241	N15	E48	236	100	1.0										

MCMATH REGION 15242 CMP DATE 19.2 RETURN OF REGION 15185 (REMNANTS) 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
78	4	13	15242	N26	E71	236	200	2.0										
78	4	14	15242	N27	E65	232	500	2.5										
78	4	15	15242	N28	E49	235	400	2.0										
78	4	16	15242	N28	E36	235	400	2.0										
78	4	17	15242	N28	E23	234	400	2.0										
78	4	19	15242	N28	W07	235	500	1.0										
78	4	21	15242	N29	W33	234	300	1.0										
78	4	22	15242	N29	W42	233	400	1.0										
78	4	23	15242	N28	W55	232	400	1.5										

MCMATH REGION 15255 CMP DATE 20.7

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
78	4	21	15255	N18	W14	215	400	2.5										
78	4	22	15255	N18	W24	215	1300	3.0	20015	N18	W27	214	(B)	4				
78	4	23	15255	N17	W37	214	1500	3.0	20015	N18	W42	214	(B)	3	B	80	17	DSO
78	4	24	15255	N17	W54	216	2000	3.0		N19	W55				B	10	3	BXO
78	4	25	15255	N18	W65	216	1800	3.0		N18	W69				B	10	1	AXX
78	4	26	15255	N18	W77	216	1700	3.0										

MCMATH REGION 15243 CMP DATE 20.9

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
78	4	14	15243	N28	E85	212	600	1.5										
78	4	15	15243	N30	E70	214	800	3.5		N32	E67				R	60	4	CRO
78	4	16	15243	N30	E57	214	1200	3.5										
78	4	17	15243	N30	E44	213	1300	3.0	20008	N33	E41	210	(AF)	1	B	40	3	HRX
78	4	18	15243						20008	N33	E29	209	(AF)	2	M	20	4	CSO
78	4	19	15243	N31	E14	214	1300	3.0	20008	N30	E13	216	(AP)	2	B	10	1	BXO

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MCMATH REGION 15243 (CONT) CMP DATE 20.9

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
78	4	21	15243	N31	W12	213	900	2.5										
78	4	22	15243	N31	W21	212	900	2.0										
78	4	23	15243	N30	W34	211	800	2.0										
78	4	24	15243	N30	W50	212	800	2.0										
78	4	25	15243	N32	W62	213	600	2.0										
78	4	26	15243	N32	W74	213	500	1.5										

MCMATH REGION 15244 CMP DATE 21.7

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
78	4	14	15244	N17	E89	208	700	1.0										
78	4	15	15244	N20	E76	208	1200	2.5		N17	E71				R	10	1	AXX
78	4	16	15244	N22	E65	206	1800	3.0										
78	4	17	15244	N21	E52	205	1600	2.5		N16	E56				B	10	1	AXX
78	4	18	15244							N17	E38				M	0	1	AXX
78	4	19	15244	N21	E22	206	2500	3.0										
78	4	21	15244	N22	W01	202	2800	2.0										
78	4	22	15244	N22	W10	201	2500	2.0										
78	4	23	15244	N21	W22	199	2200	2.0										
78	4	24	15244	N21	W37	199	1800	2.0										
78	4	25	15244	N22	W48	199	1700	2.0										
78	4	26	15244	N22	W61	200	1500	1.5		N22	W55				B	230	17	EKI
78	4	27	15244	N22	W75	199	1400	1.0										
78	4	28	15244	N28	W88	199	400	1.0										

MCMATH REGION 15246 CMP DATE 21.9 RETURN OF REGION 15211 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
78	4	15	15246	S31	E80	204	700	2.5		S29	E79				R	20	3	BXO
78	4	16	15246	S31	E68	203	700	2.5										
78	4	17	15246	S31	E56	201	800	2.5	20009	S29	E52	199	(AP)	2	B	10	2	AXX
78	4		15246						20010	S29	E58	193	(AP)	2	B	20	1	HSX
78	4	18	15246						20009	S29	E34	204	(AP)	2				
78	4		15246						20010	S29	E49	189	(AP)	3	M	30	1	HSX
78	4	19	15246	S30	E26	202	1200	2.5	20009	S29	E24	205	(B)	3	B	60	12	DAI
78	4		15246						20010	S30	E40	189	(AP)	3	B	50	1	HSX
78	4	20	15246						20009	S30	E10	205	(B)	3				
78	4		15246						20010	S30	E25	190	(AP)	3				
78	4	21	15246	S30	E01	200	1000	2.5										
78	4	22	15246	S30	W09	200	1400	2.5	20009	S30	W11	198	B	1				
78	4		15246						20010	S30	W01	188	(AP)	3				
78	4	23	15246	S30	W19	196	1700	2.5	20010	S30	W15	187	(AP)	3	B	20	7	CRO
78	4		15246							S28	W26				B	10	3	BXO
78	4	24	15246	S30	W33	195	1700	3.0		S30	W30				B	40	4	DRO
78	4	25	15246	S30	W44	195	1800	3.0		S30	W46				B	90	7	DSO
78	4	26	15246	S30	W57	196	2300	3.0		S29	W62				B	80	2	DSO
78	4	27	15246	S30	W70	194	2400	3.0	20010	S30	W75	198	(B)	2				
78	4	28	15246	S30	W83	194	1500	2.5										
78	4	29	15246	S29	W90	189	300	1.0										

MCMATH REGION 15248 CMP DATE 22.9

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
78	4	16	15248	N21	E85	186	800	1.0										
78	4	17	15248	N20	E71	186	900	2.0										
78	4	18	15248						20012	N22	E51	187	(B)	3	M	10	1	AXX
78	4	19	15248	N20	E41	187	3000	3.5	20012	N22	E41	188	(B)	4	B	100	16	DAI
78	4		15248						20013	N17	E43	186	(BY)	2	B	20	5	BXI
78	4	20	15248						20012	N22	E26	189	(B)	4				
78	4		15248						20013	N17	E27	188	(B)	3				
78	4	21	15248	N21	E15	186	4000	3.0										
78	4	22	15248	N20	E05	186	4000	3.0	20012	N21	W01	188	( )	4				
78	4		15248						20013	N16	E02	185	(BP)	3				
78	4	23	15248	N19	W09	186	4000	3.0	20012	N21	W15	187	(B)	4				
78	4		15248						20013	N15	W09	181	(B)	3	B	440	27	EAI
78	4		15248							N17	W10				B	160	14	CRO
78	4	24	15248	N19	W26	188	4500	3.0		N17	W22				B	80	13	DAX
78	4		15248							N21	W27				B	300	22	EKI
78	4	25	15248	N19	W37	188	4500	3.5		N14	W34				B	250	12	DAI
78	4		15248							N21	W39				B	350	13	EAI
78	4	26	15248	N19	W49	188	5100	3.5		N15	W50				B	220	17	DAO

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MCMATH REGION 15248 (CONT) CMP DATE 22.9

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
78	4	27	15248	N19	W62	186	5500	3.0	20012	N22	W63	186	(B)	3	B	120	8	CSO
78	4		15248						20013	N16	W62	185	(B)	3	B	220	5	DSO
78	4	28	15248	N19	W76	187	4600	3.0	20012	N23	W80	190	(B)	2				
78	4		15248						20013	N16	W78	188	(B)	2	B	120	2	ESO
78	4	29	15248	N19	W88	187	2300	2.0										

MCMATH REGION 15250 CMP DATE 24.4

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
78	4	19	15250	N22	E61	167	300	2.0										
78	4	21	15250	N23	E35	166	200	1.0										
78	4	22	15250	N23	E25	166	500	2.5	20016	N24	E22	165	(Y)	3				
78	4	23	15250	N22	E12	165	500	2.0	20016	N24	E06	166	(B)	3	B	80	7	DRO
78	4	24	15250	N22	W05	167	400	2.5		N23	W04				B	20	4	CRO
78	4	25	15250	N23	W15	166	500	2.5		N23	W18				B	10	3	BXO
78	4	26	15250	N24	W27	166	600	2.5										
78	4	27	15250	N24	W41	165	500	2.0										
78	4	28	15250	N24	W55	166	500	2.0										
78	4	29	15250	N24	W67	166	500	2.0										
78	4	30	15250	N24	W82	168	200	1.0										

MCMATH REGION 15251 CMP DATE 24.4 RETURN OF REGION 15206 ROTATION 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
78	4	17	15251						20011	S18	E85	166	AP	2				
78	4	18	15251						20011	S19	E73	165	(AP)	3	M	90	1	HSX
78	4	19	15251	S17	E62	166	1200	3.5	20011	S19	E62	167	(AP)	4	B	130	2	HAX
78	4	20	15251						20011	S20	E47	168	(AP)	4				
78	4	21	15251	S17	E35	166	800	3.0										
78	4	22	15251	S18	E24	167	800	2.5	20011	S20	E21	166	(AP)	4				
78	4	23	15251	S18	E12	165	700	2.5	20011	S20	E06	166	(AP)	3	B	80	1	HSX
78	4	24	15251	S18	W03	165	1000	2.5		S20	W04				B	70	2	HKX
78	4	25	15251	S19	W15	166	1200	2.5		S20	W17				B	10	3	BXO
78	4	26	15251	S20	W27	166	1200	2.0										
78	4	27	15251	S20	W40	164	800	2.0										
78	4	28	15251	S20	W53	164	500	2.0										
78	4	29	15251	S20	W66	165	600	2.5										
78	4	30	15251	S20	W78	164	600	1.5										

MCMATH REGION 15253 CMP DATE 25.6 RETURN OF REGION 15218 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
78	4	19	15253	N11	E85	143	800	2.5										
78	4	21	15253	N11	E55	146	500	2.5										
78	4	22	15253	N11	E44	147	600	2.5										
78	4	23	15253	N11	E30	147	500	2.0										
78	4	24	15253	N11	E11	151	400	2.0										
78	4	25	15253	N11	E01	150	200	1.5										
78	4	26	15253	N11	W11	150	200	1.5										
78	4	27	15253	N11	W24	148	200	1.0										
78	4	28	15253	N12	W38	149	200	1.0										
78	4	29	15253	N12	W51	150	100	1.0										
78	4	30	15253	N12	W65	151	100	1.0										

MCMATH REGION 15259 CMP DATE 25.9 RETURN OF PART OF REGION 1521Ø ROTATION 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
78	4	21	15259	N23	E52	149	200	1.0										
78	4	22	15259	N23	E42	149	200	1.0										
78	4	23	15259	N23	E30	147	200	1.0										
78	4	24	15259	N23	E15	147	200	1.5										
78	4	25	15259	N24	E04	147	200	1.0										
78	4	26	15259	N24	W08	147	300	1.0		N27	W03				B	20	4	CSO
78	4	27	15259	N24	W22	146	300	1.0										
78	4	28	15259	N24	W35	146	300	1.0										
78	4	29	15259	N24	W47	146	200	1.0										
78	4	30	15259	N24	W59	145	200	1.0										

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MCMATH REGION 15271 CMP DATE 25.9

			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
78	4	29	15271	N36 W48	147	200	1.5									
78	4	30	15271	N36 W60	146	200	1.5									

MCMATH REGION 15252 CMP DATE 26.2 RETURN OF REGION 152Ø5 AND NEW ROTATION 1 AND 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
78	4	19	15252	S27 E80	148	700	1.0									
78	4	21	15252	S27 E55	146	400	1.0									
78	4	22	15252	S27 E45	146	500	2.0									
78	4	23	15252	S27 E32	145	500	1.5									
78	4	24	15252	S27 E19	143	700	2.0									
78	4	25	15252	S27 E08	143	700	2.0									
78	4	26	15252	S27 W06	145	400	1.5									
78	4	27	15252	S27 W20	144	400	1.5									
78	4	28	15252	S27 W33	144	400	1.0	20021	S32 W18	128	X	1				
78	4	29	15252	S27 W45	144	700	2.0									
78	4	30	15252	S27 W58	144	800	3.0									
78	5	01	15252	S27 W70		1000	4.0	20022	S27 W71		(B)	3	B	80	7	F
78	5	02	15252	S28 W83		1400	4.0	20022	S29 W76		(B)	2	B	140	7	D
78	5	03	15252	S30 W90		1200	4.0									

MCMATH REGION 15265 CMP DATE 26.8

			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
78	4	24	15265	N29 E28	134	200	1.0									
78	4	25	15265	N29 E17	134	500	2.0		N27 E12				B	10	2	AXX
78	4	26	15265	N29 E04	135	600	2.0									
78	4	27	15265	N29 W10	134	800	2.5	20017	N29 W11	134	(BP)	4	B	20	6	CSO
78	4	28	15265	N30 W22	133	800	2.5	20017	N28 W27	137	(AP)	3	B	20	1	HSX
78	4	29	15265	N30 W34	133	800	2.5	20017	N28 W41	137	AP	3	B	20	1	HRX
78	4	30	15265	N30 W47	133	800	2.5		N32 W12				R	10	1	AXX
78	5	01	15265	N30 W59		500	2.5						B	10	1	A
78	5	02	15265	N30 W73		500	2.5									

MCMATH REGION 15260 CMP DATE 27.1 RETURN OF REGION 15226 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
78	4	21	15260	N12 E78	123	200	1.0									
78	4	22	15260	N12 E63	128	100	1.0									
78	4	23	15260	N12 E49	128	200	1.0									
78	4	24	15260	N12 E32	130	200	1.5									
78	4	25	15260	N12 E20	131	300	1.5									
78	4	26	15260	N12 E08	131	100	1.0									

MCMATH REGION 15261 CMP DATE 27.9 RETURN OF PART OF 152Ø5 ROTATION 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
78	4	22	15261	S34 E68	123	300	1.0									
78	4	23	15261	S34 E54	123	400	1.0									
78	4	24	15261	S34 E38	124	500	1.0									
78	4	25	15261	S34 E30	121	300	1.0									
78	4	26	15261	S33 E19	120	300	1.0									

MCMATH REGION 15257 CMP DATE 28.2

			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
78	4	22	15257	S23 E79	112	200	1.5									
78	4	23	15257	S23 E65	112	200	2.5									
78	4	24	15257	S23 E48	114	200	1.5									
78	4	25	15257	S23 E36	115	200	2.0		S24 E40				B	10	1	AXX
78	4	26	15257	S23 E22	117	300	1.5		S22 E16				B	10	2	BXO
78	4	27	15257	S23 E09	115	100	1.5									

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MCMATH REGION 15257 (CONT) CMP DATE 28.2

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
78	4	28	15257	S23 W02	113	100	1.0									
78	4	29	15257	S23 W16	115	100	1.0									

MCMATH REGION 15284 CMP DATE 28.2

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
78	5	03	15284	N11 W69		500	1.5									
78	5	04	15284	N11 W83		500	1.5									

MCMATH REGION 15273 CMP DATE 28.3

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
78	5	01	15273	S30 W41		200	1.0									

MCMATH REGION 15267 CMP DATE 29.1

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
78	4	25	15267	S25 E46	105	200	1.5									
78	4	26	15267	S25 E33	106	100	1.0									
78	4	27	15267	S25 E20	104	100	1.0									

MCMATH REGION 15262 CMP DATE 29.3

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
78	4	23	15262	N01 E80	97	200	1.0									
78	4	24	15262	N01 E62	100	200	1.5									
78	4	25	15262	N01 E50	101	200	1.5									

MCMATH REGION 15268 CMP DATE 29.5

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
78	4	26	15268	S17 E40	99	100	1.5									

MCMATH REGION 15277 CMP DATE 30.0

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
78	5	01	15277	N31 W20		200	1.5									
78	5	02	15277	N31 W34		300	2.0						B	20	3	C
78	5	03	15277	N32 W47		200	1.0						B	10	2	B

MCMATH REGION 15263 CMP DATE 30.3

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
78	5	01	15263	N17 W16		600	2.0									

MCMATH REGION 15264 CMP DATE 30.6 RETURN OF REGION 15216 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
78	4	24	15264	S20 E85	77	200	1.0									
78	4	25	15264	S20 E72	79	200	1.5									
78	4	26	15264	S20 E55	84	300	1.5									

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MCMATH REGION 15264 (CONT) CMP DATE 30.6 RETURN OF REGION 15216 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
78	4	27	15264	S19 E43	81	200	1.0								
78	4	28	15264	S19 E30	81	300	1.0								
78	4	29	15264	S19 E16	83	200	1.0								
78	4	30	15264	S19 E01	85	200	1.0								
78	5	01	15264	S20 W11		300	1.0								

DAILY CALCIUM PLAGE INDEX

APRIL 1978

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
78	4	1	22.3	78	4	11	44.2	78	4	21	27.7
78	4	2	23.4	78	4	12	42.3	78	4	22	30.2
78	4	3	*	78	4	13	35.8	78	4	23	28.3
78	4	4	32.3	78	4	14	39.4	78	4	24	28.6
78	4	5	35.4	78	4	15	39.5	78	4	25	31.4
78	4	6	*	78	4	16	36.8	78	4	26	33.4
78	4	7	41.6	78	4	17	32.0	78	4	27	33.8
78	4	8	40.0	78	4	18	*	78	4	28	33.9
78	4	9	32.5	78	4	19	35.7	78	4	29	38.8
78	4	10	37.6	78	4	20	*	78	4	30	43.7

* NO OBSERVATIONS

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on April 3, 6, 18 and 20, 1978. No sunspot observations were made at Mt. Wilson on April 2, 3, 4, 6, 7, 8, 13, 14, 15, 16, 21, 24, 25, 26 and 30, 1978.

SUDDEN IONOSPHERIC DISTURBANCES

APRIL 1978

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
01	0822	0832	0825	1-	1				1				NF	
02	0106	0202	0114	1-	1				1				0107	15221
02	0313	0438	0320	1-	1				1				0307E	15214
02	1209	1245	1215	2	5	2	1	7	3		3		NF	
02	1720	1745	1725	1-	3				1		14		1718	15221
04	0256	0412	0313	1-	1				1				----	X-RAY
04	0914	0925	0918	1-	1			1	1				0915E	15221
04	2114	2340	2206	1+	1				1				----	X-RAY
04	2143	2330	2206	1+	5	1			2	1	7		2142	15221
05	0255	0423	0340	1-	1				1				0339	15221
05	0616	0708	0618	1-	5				2		1		0615	15221
05	0750	0832	0758	1-	5			1	3				0750	15221
05	0912	0944	0916	1	5	2		3	4		2		0915E	15221
05	1358	1408	1358	1-	1				1				1353	15221
05	1728	1740	1733	1-	3						11		1728	15221
06	0942	1040	1011	1+	5	1		1	4		2		----	X-RAY
06	1859	1930	1905	1-	3						2		1858	15221
06	2352	0015	2357	1-	1				1				2356	15221
07	0500	0611	0517	1-	1				1				0528	15221
07	0642	0806	0650	1-	1				1				0707	15221
07	1140	1205	1147	1	5	2		4	3		3		1140	15221
07	1255	1429	1323	1	3			2					NF	
07	1622	1645	1625	1-	3						10		1618	15221
07	1845	1930	1855	1	5				2		13		1840	15221
07	1921	1939	1923	1-	3				1		7		1917	15221
07	2001	2012	2004	1-	5	1			2		10		2016	15221
07	2015	2047	2020	1	5	3			2		12		2016	15221
07	2135	2204	2139	1-	3				1		4		----	X-RAY
08	0124	0604	0234	3	5	1			1		1		0120	15221
08	0805	0853	0811	2	5	3	1	5	3		2		*	
08	1105	1123	1111	1	5				3		2		*	
08	1122	1205	1127	1+	5	3		5	4		3		*	
08	1205	1245	1210	1-	3				1		2		1206	15214
08	1418	1423D	1423	1-	3						2		*	
08	1437	1504	1446	1-	5			1	2		10		----	X-RAY
08	1826	1838	1830	1-	3						3		1826	15221
08	1903	1918	1906	1-	3				1		7		1856	15214
08	2214	2302D	2220	1-	3				2				----	X-RAY
08	2302	2340	2314	1-	5				2		6		----	X-RAY
09	0040	0143	0048	1	5	1		1	1		1		----	X-RAY
09	0210	0312D	0220	1-	5	1		1	1		1		0215E	15214
09	0312E	0423D	0322	1	3			1	1		1		0316	15221
09	0423E	0606D	0457	1+	3	2			1				0422	15214
09	0606E	0747D	0620	1	1				1				NF	
09	0744	0854	0757	1-	3				1		1		0755E	15214
09	1200	1250	1208	1-	5	1			3		1		1159	15221
09	1317	1530	1335	1-	1				1		1		1321	15221
09	2147	2306	2158	1+	5	2	1		2	1	13		2149E	15235
10	0113	0148	0126	1-	1				1				----	X-RAY
10	0220	0317D	0229	1-	3	1			1		1		----	X-RAY
10	0523	0733	0538	1-	5	1			2				NF	
10	1053	1100	1215	3	5	4	1	6	4		3		NF	
10	1210	1230	1213	2	1			1					*	
10	1435	1451	1437	1-	3	2			1				1419	15239
10	1454	1610	1508	1	5			5	3		15		*	
10	1518	1542	1523	1-	5	1			1		8		1519	15239
10	1608	1640	1614	1+	5	3		6	3		17		1609	15239
10	1704	1745	1715	1+	5	2		2	2		15		1706	15239
10	1924	2000	1938	1	3						13		1919	15239
10	2236	2300	2239	1	1	1							2230	15227
10	2306	2345	2314	1-	1				1				2304	15227

SUDDEN IONOSPHERIC DISTURBANCES

APRIL 1978

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
11	0055	0145	0058	1-	1				1				0053	15239
11	0223	0248	0230	1-	1				1				0226	15221
11	0302	0409D	0306	1-	1				1				0300	15221
11	0408	0601D	0418	1	3	1			1		1		0410	15221
11	0601E	0700D	0612	1	1				1				----	X-RAY
11	0700E	0741D	0709	1-	5	1			3		1		----	X-RAY
11	0741E	0850	0748	1-	5				3		1		----	X-RAY
11	0930	0938D	0938	1-	3			1	1				*	
11	0951	0955D	0955	1	5			3	4		3		----	X-RAY
11	1022	1027D	1027	1	5			1	3		2		----	X-RAY
11	1043	1052D	1052	1-	5			2	3		1		----	X-RAY
11	1057	1125	1104	1+	5	2		3	1		1		----	X-RAY
11	1159	1300	1212	2	5			4	2		1		NF	
11	1344	1705	1418	3+	5	5	2	7	3		17		1340	15221
11	1401	1800D	1415	3	5	2		1	1		9		1438	15239
11	2119	2202	2123	1-	3				1		5		2106	15239
11	2307	2354	2311	1-	1				1				NF	
12	0116	0210	0134	1-	1				1				NF	
12	0222	0400	0228	1-	3	1			1				*	
12	0450	0612	0510	1-	3	1			1				NF	
12	0642	0720	0649	2	5	3		3	3		2		0644	15221
12	0740	0822	0743	2	5	2		2	2		2		0740	15235
12	0910	0937	0920	1-	5			1	2		1		0909	15235
12	1736	1810	1746	1-	5			1	1		14		1737	15235
12	2344	0200	0046	1-	1				1				NF	
13	0018	0145	0032	1-	3	1			1				NF	
13	0443	0656	0459	2	3	1			1		1		0450	15235
13	0707	0717	0712	1-	5				2		1		0706	15239
13	1030	1052	1038	1	3		1	1					NF	
13	1209	1227	1213	1	3			2					---	X-RAY
13	1437	1520	1451	2	5	4	1	6	2		16		1439	15221
13	1713	1807	1727	1	3	1					7		1706	15235
13	2050	2132	2101	1-	3						7		*	
13	2335	0018D	2342	1-	5				2		3		2340	15221
14	0756	0815	0759	1-	5				3				----	X-RAY
14	0841	0940	0847	1	5	2		1	3		2		*	
14	1015	1100	1025	1	5	2		1	3		2		*	
14	1104	1145	1111	1	5	2		2	3		2		1059	15239
14	1706	1750	1715	1-	3						12		----	X-RAY
14	1803	1842	1805	1	3	1		1			14		----	X-RAY
14	2241	0057D	2252	2	5	3		1	2	1	14		2230	15227
15	0057E	0155D	0118	1-	1				1				NF	
15	0538	0543	0541	1-	3			2	1				NF	
15	0631	0715	0647	2	5	3		2	2		1		0631	15239
15	0812	0915	0817	2	5	3		4	2		2		0814	15239
15	1146	1210	1152	1	5	3		2	1		2		1146	15239
15	1224	1243	1232	1-	3	1	1		1		1		1222	15235
16	0919	1010	0924	2+	5	3		5	3		3		0919	15239
16	1151	1230	1211	1-	3	1			1				1153	15239
17	0519	0700	0525	1+	1				1				NF	
18	0107	0330	0122	2+	3	1		1	1		1		0109	15239
18	1246	1313	1255	1	5	2		3	2		2		----	X-RAY
18	1350	1430	1354	1	5	1		4	1		6		----	X-RAY
18	1518	1533	1525	1	5				1		4		NF	
19	0657	0957	0720	1+	5	1		1	3				0654	15244
19	0921	0933	0926	1-	3				1		1		*	
21	0731	0818	0740	2	5	2		1	2				NF	
21	2015	2035	2025	1-	3	2					14	2021		15244
22	0606	0626	0614	1	1				1				0618	15235
22	0648	0702	0653	1-	1				1				0649	15254
22	1307	1320	1311	1-	1				1				1300	15255

SUDDEN IONOSPHERIC DISTURBANCES

APRIL 1978

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
23	0402	1148	0524	2+	5			2	1				----	X-RAY
23	1025	1115	1028	2	1			1					NF	
23	1745	2000D	1810	2+	1	1							NF	
23	2016	2323	2035	2+	5	3	1	2	2	1	15		2016	15248
24	0130	0158	0140	1-	1				1				----	X-RAY
24	0326	0411	0336	1-	1				1				----	X-RAY
24	0442	0538D	0505	1-	1				1				----	X-RAY
24	0538	0600	0543	2	3				2				----	X-RAY
24	1325	1405	1335	1	3		1		1		1		NF	
24	2206	2252	2212	1-	1				1				NF	
25	0108	0140	0120	1-	1				1				0111E	15266
25	0304	0346	0314	1-	1				1				0326	15266
25	0451	0630	0500	1-	1				1				----	X-RAY
25	1324	1410	1342	1	5	1		1	2		2		1320	15266
25	1420	1505	1432	1+	5	1		2	3		15		1420	15266
25	1534	1650	1553	2	5	5	2	5	4		17		1535	15266
25	1619	1630D	1630	1	5			1	1		8		1603	15266
25	2212	2249	2218	1-	5				2				2210	15266
26	0744	0758	0749	1-	1					1			0727	15246
26	0824	0855	0835	1	3			1	1		1		*	
26	1040	1105	1049	1	1				1				*	
26	1243	1400	1253	1	1				1		1		NF	
26	1342	1420	1352	1	5			2	2		11		1339	15266
26	1858	1920	1903	1-	5			1	1		13		1855	15266
26	1938	1945D	1945	1	3	1		1			2		1920	15266
26	1943	2112	2002	1+	5	4	1	1	2		18		1940	15266
26	2202	2301D	2216	1-	3				1		2		2203	15266
26	2301E	2350	2311	1-	3				1		2		NF	
27	0052	0124	0057	1-	1				1				*	
27	0311	0352	0312	1-	1				1				NF	
27	0418	0554	0432	1-	1				1				*	
27	0452E	0523	0455	1-	1				1				*	
27	1011	1125	1017	2	5	3		4	4		3		----	X-RAY
27	1926	2004	1932	1	5	2		1	1		10		1923	15266
27	2023	2027D	2027	1-	5			1			6		NF	
27	2045	2130	2050	1-	5	1			2		7		2046	15266
27	2144	2226	2200	1	5	1			2		7		*	
27	2315	2355	2322	1-	5				2		2		NF	
28	0010	0130	0017	1-	5	1			2		2		0010	15266
28	0643	0746	0649	1-	5				2		1		----	X-RAY
28	1306	1800	1332	3+	5	6	2	7	3		13		1304	15266
29	0442	0512	0447	1-	1				1				0442	15266
29	1145	1150D	1150	1-	1				1		1		*	
29	1634	1700	1644	1-	5	1		1	2		12		1629	15266
29	1818	1830D	1830	1+	5	2			2		14		1755	15266
29	1854	2126D	1922	3	5	2	1	1	3	1	16		----	X-RAY
29	2125	2220	2133	1	5			1	2		11		*	
30	0108	0146	0116	1-	1				1				0108	15266
30	0207	0314	0214	1-	1				1				*	
30	0419	0540	0438	1-	1				1				----	X-RAY
30	0844	0945D	0858	1	5	3		3	3		1		*	
30	0948	1035	0953	1	5	2	1	2	4		3		*	
30	1109	1135	1115	1	5	1		2	2		1		*	
30	1220	1250	1226	1-	1				1		1		1218	15266
30	1324	1339D	1339	1	5	1		2	3	1	10		1320	15266
30	1423	1436D	1436	1+	5	1		2	2		14		1420	15266
30	1443	1630	1457	3	5	5	2	7	4	1	12		1437	15266
30	2235	2320D	2246	1-	1				1				2234	15266

SUDDEN IONOSPHERIC DISTURBANCES

APRIL 1978

PERIODS OF NO OBSERVATIONS:

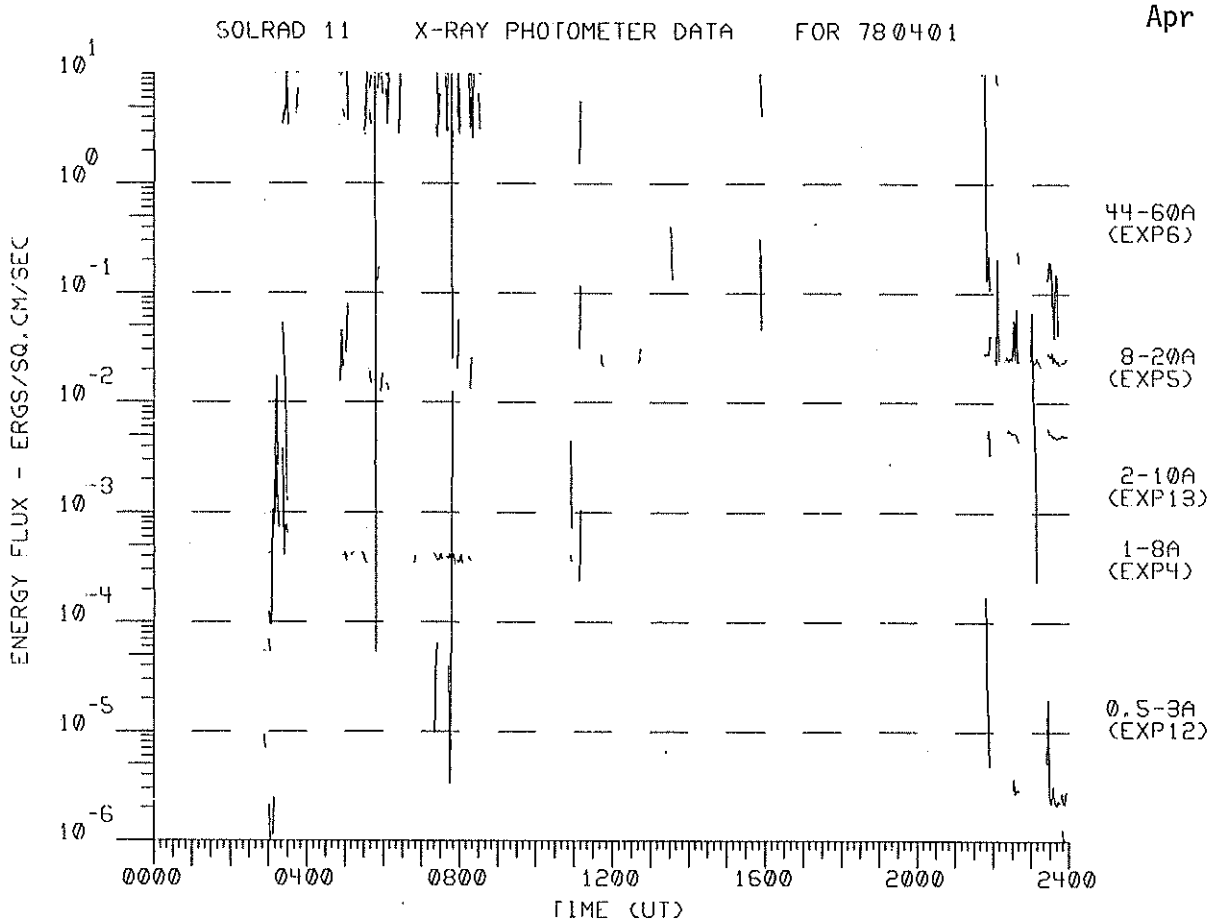
DATE	TIME (UT) and STATION
01-08	0000-2400 A46
03	1541-1600 TM
04	0000-2400 TN
07	0000-2400 A28
10	1216-1346 TM
15	0000-2400 TN
19-20	0000-2400 A37
21	1358-1428 TM
22	0000-2400 A37
24	1820-1850 TM
25	1520-1532 TM
26-27	0000-2400 A40
26-30	0000-2400 A30
30	0000-2400 A35

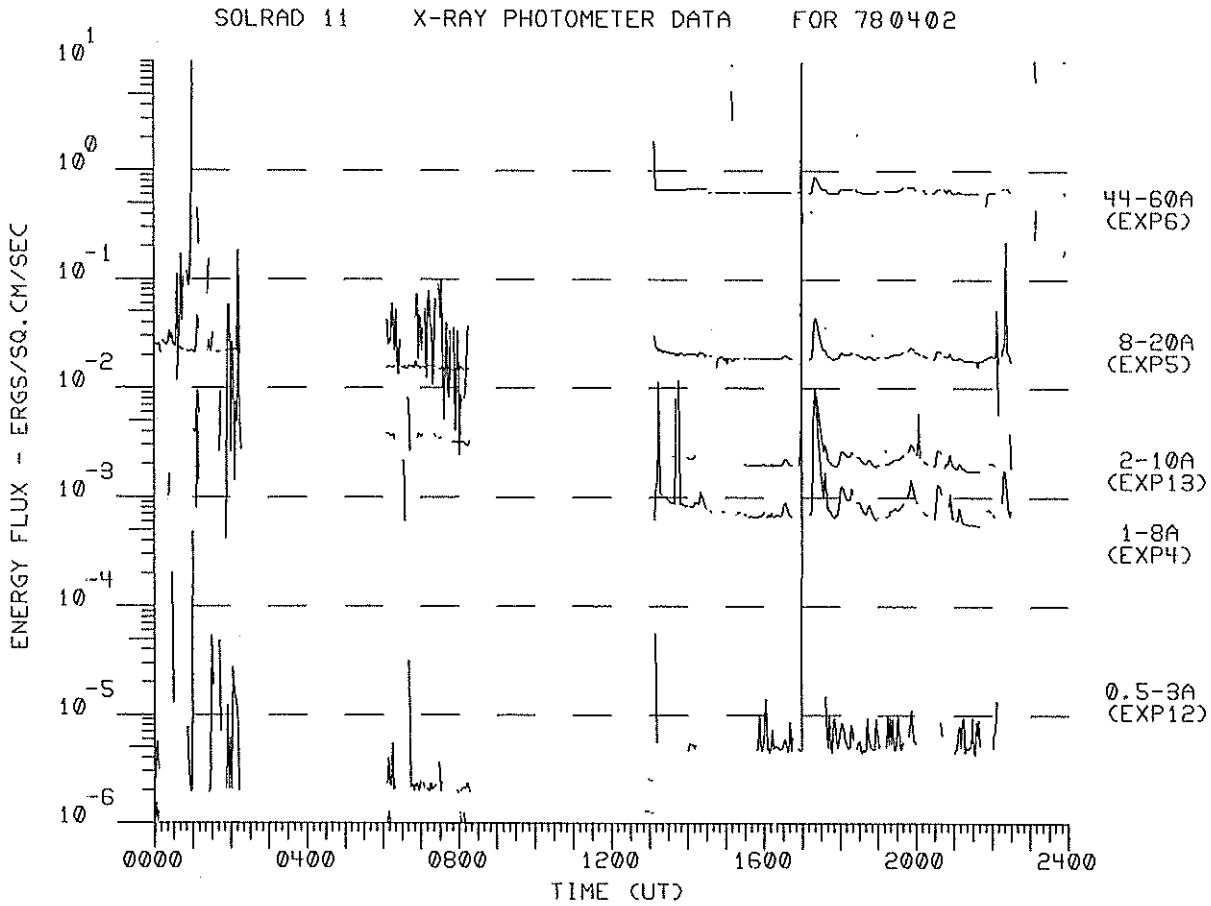
STATIONS REPORTING FOR APRIL 1978

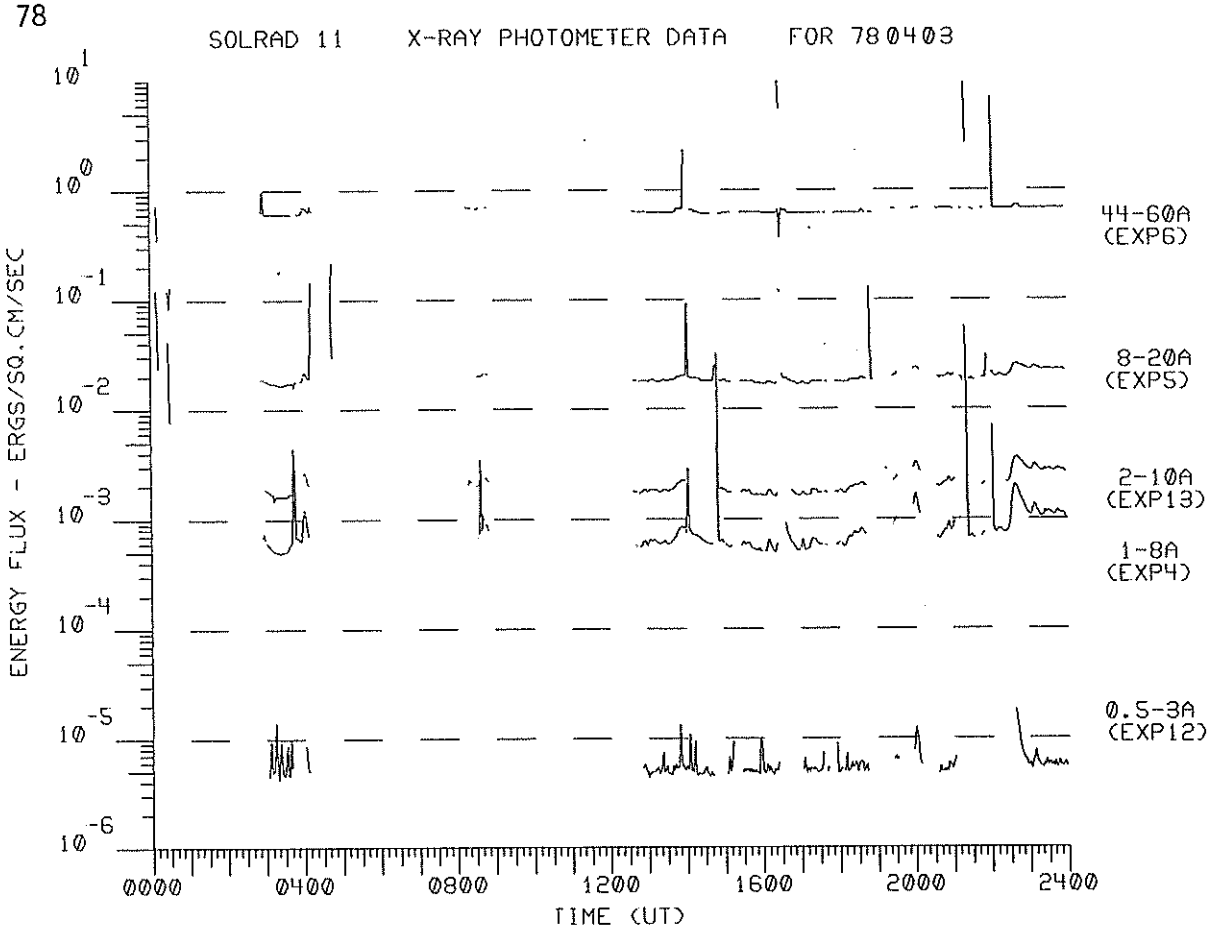
AAVSO (A1, A5, A19, A21, A26, A28, A30, A34, A35, A37, A40, A45, A46) (SES) (A1, A31) (SES) (A31) (SWF)
CHILWORTH (CL) (SCNA)
DARMSTADT (DA) (SWF)
HERSTMONCEUX (HC) (SFA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
KUHLUNGSBORN (KU) (SEA, SPA)
JULIUSRUH (JU) (SWF)
MC MATH (MC) (SWF, SCNA)
NEW JERSEY (NJ) (SES)
PANSKA VES (PU) (SWF, SES, SEA)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SEA)
SOMERTON (SO) (SWF)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
UPICE (UI) (SEA)
VSETIN (VA) (SEA)

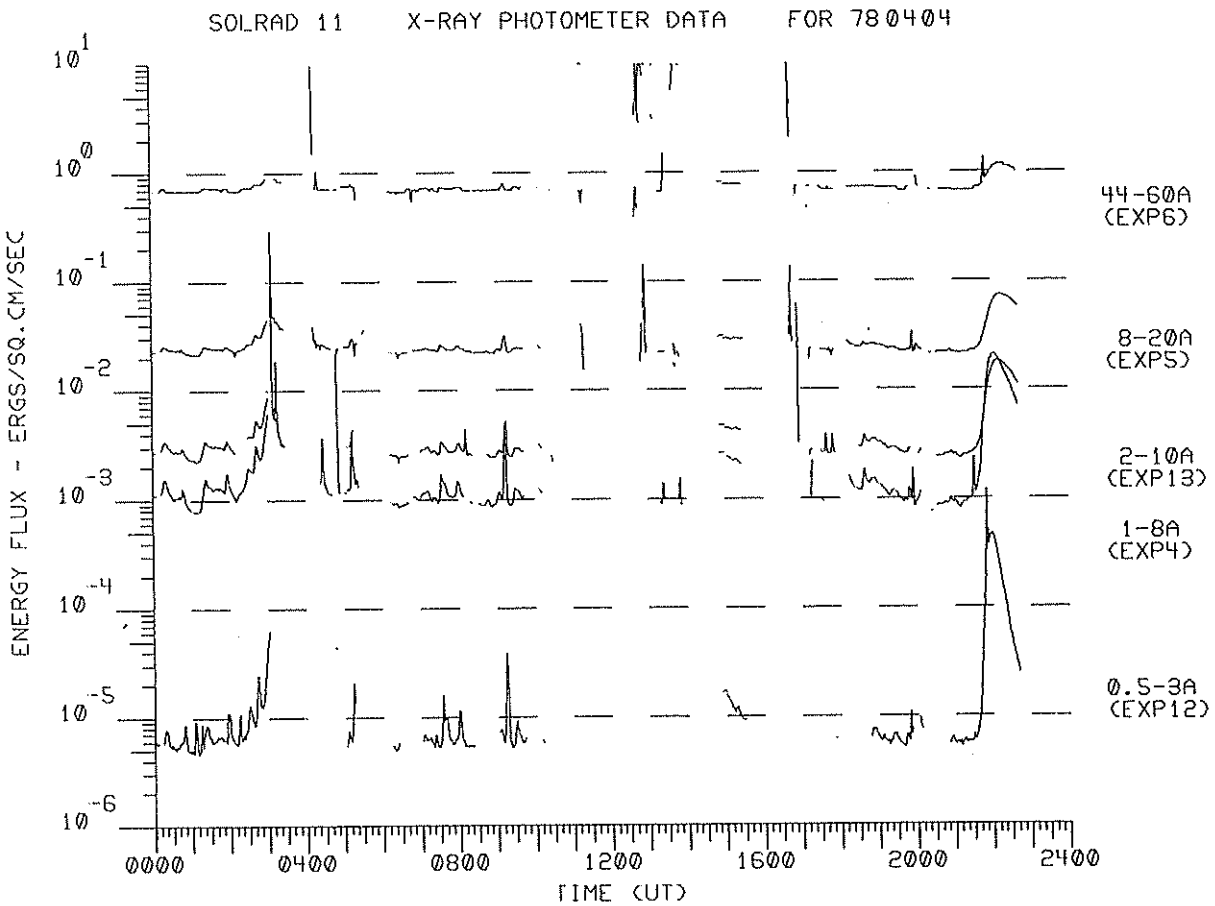
SIDs BY McMATH REGION

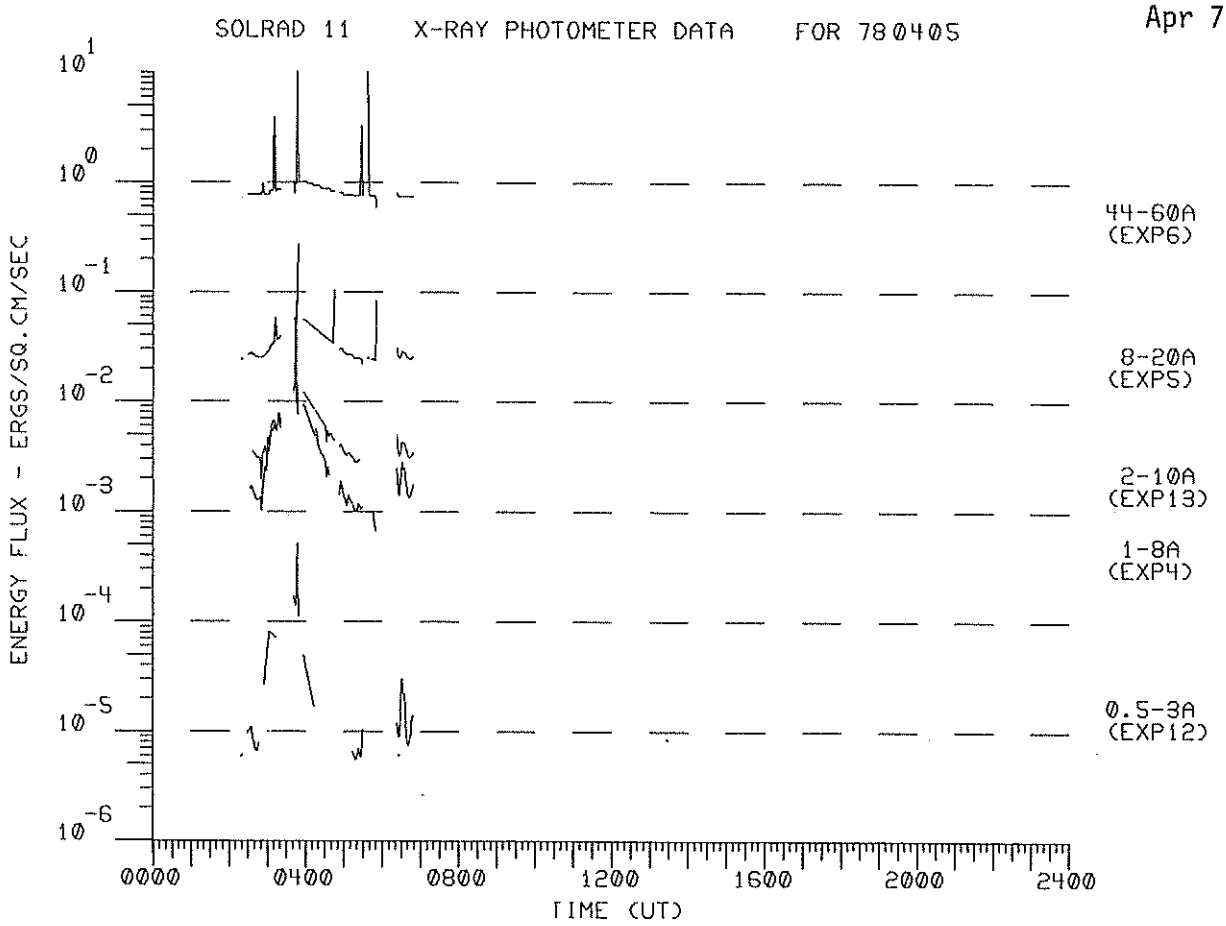
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
REGION																															
15214		1						2	3																						
15221		2		2	6	2	8	2	3		4	1	2																		
15227										2				1																	
15235									1			3	2		1							1									
15239										5	3		1	1	3	2		1													
15244																			1		1										
15246																										1					
15248																							1								
15254																						1									
15255																						1									
15266																									7	5	2	2	3	6	
X-RAY				2		1	1	3	1	2	7		1	3				2					1	4	1		1	1	1	1	
UNKNOWN	1	1					1		1	2	2	3	2		2		1	1			1		2	2		2	3				
NO FP								4		2	1	1	1	2					1							2	4		2	4	

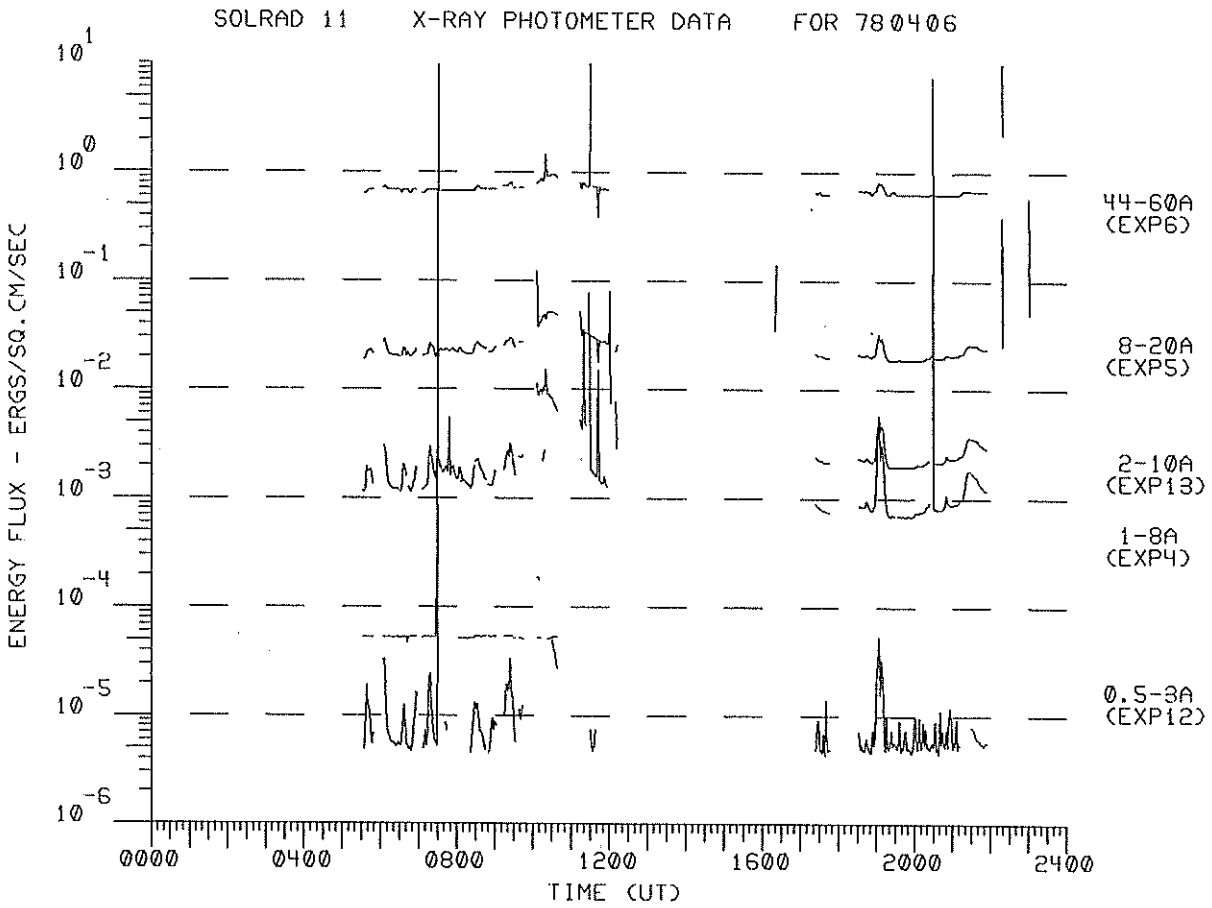

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780401
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

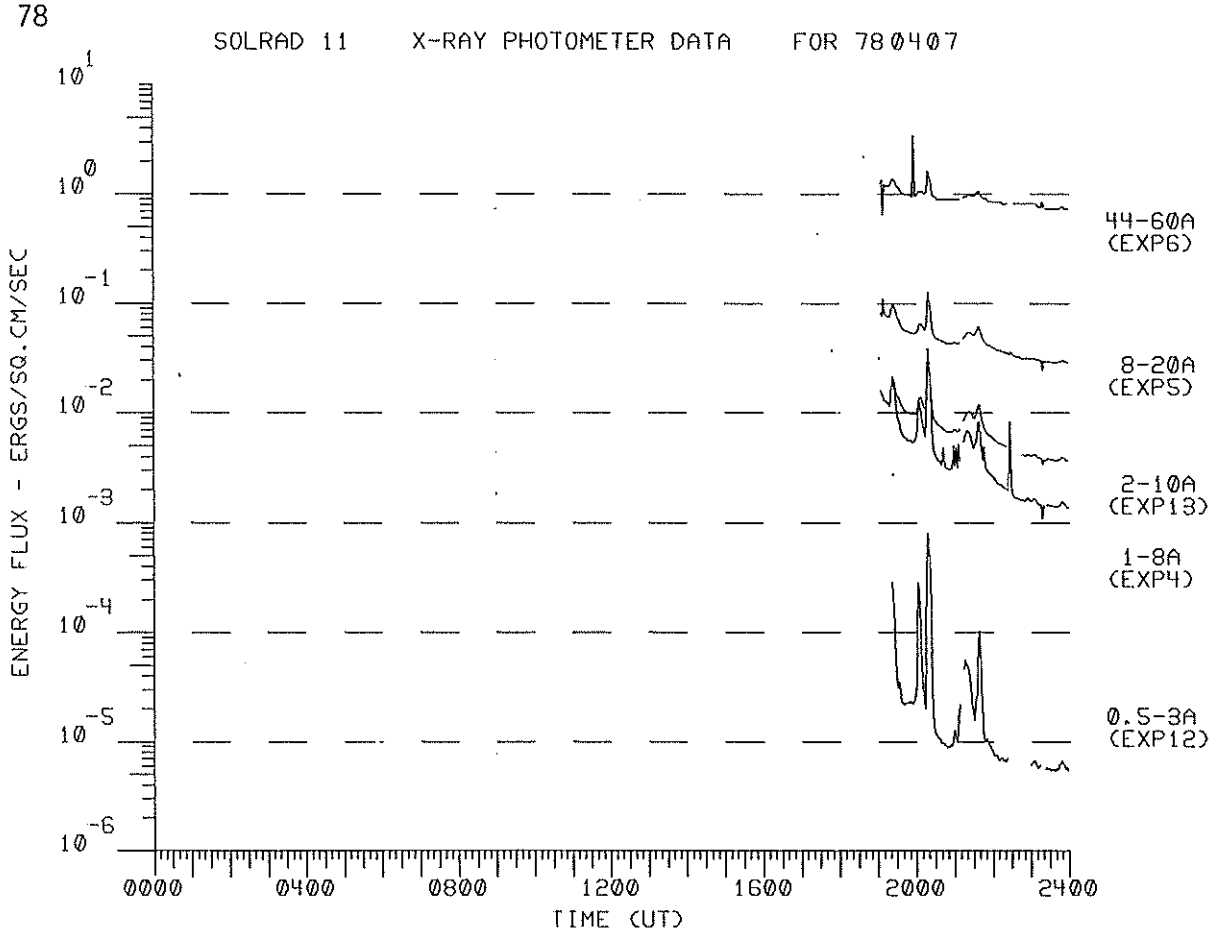

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780402
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

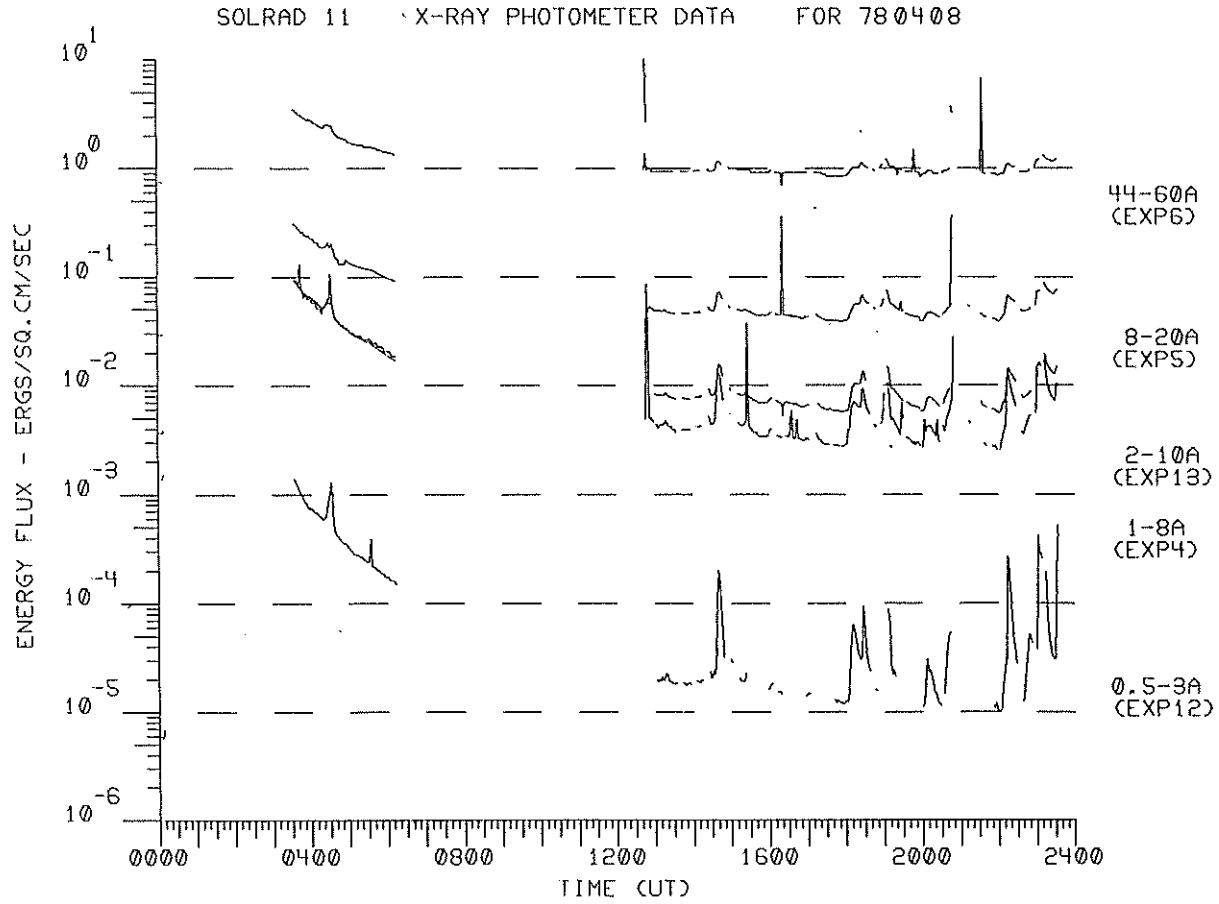

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780403
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

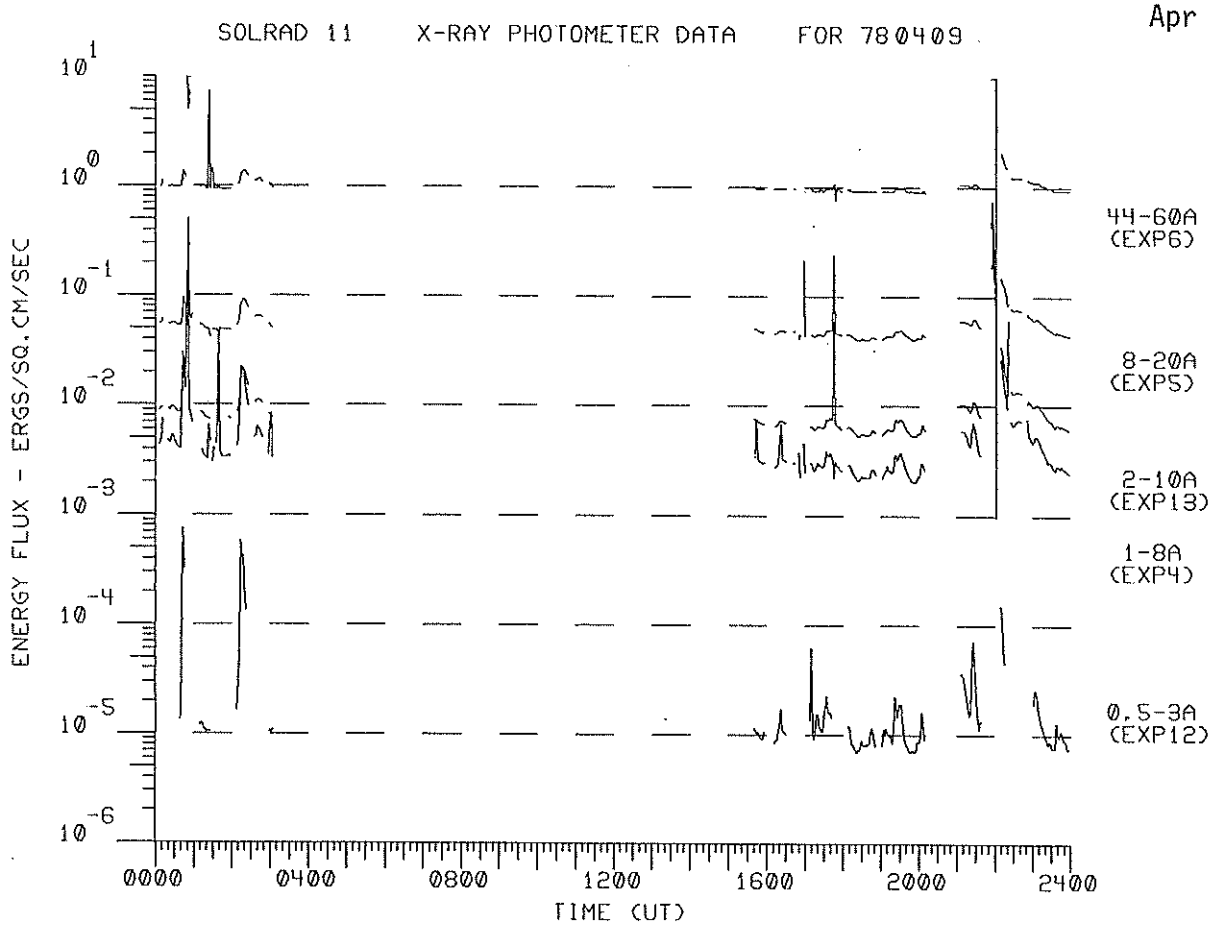

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780404
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

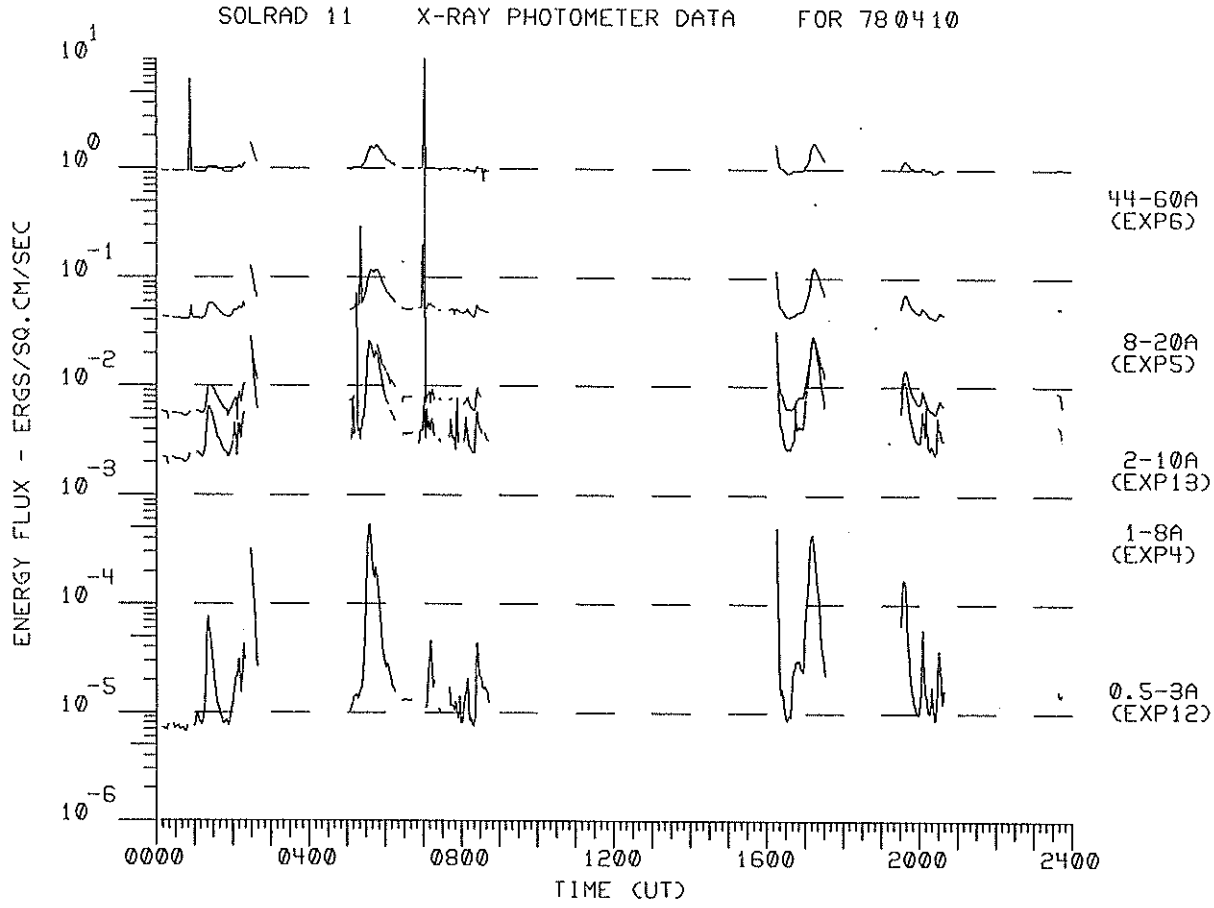

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780405
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

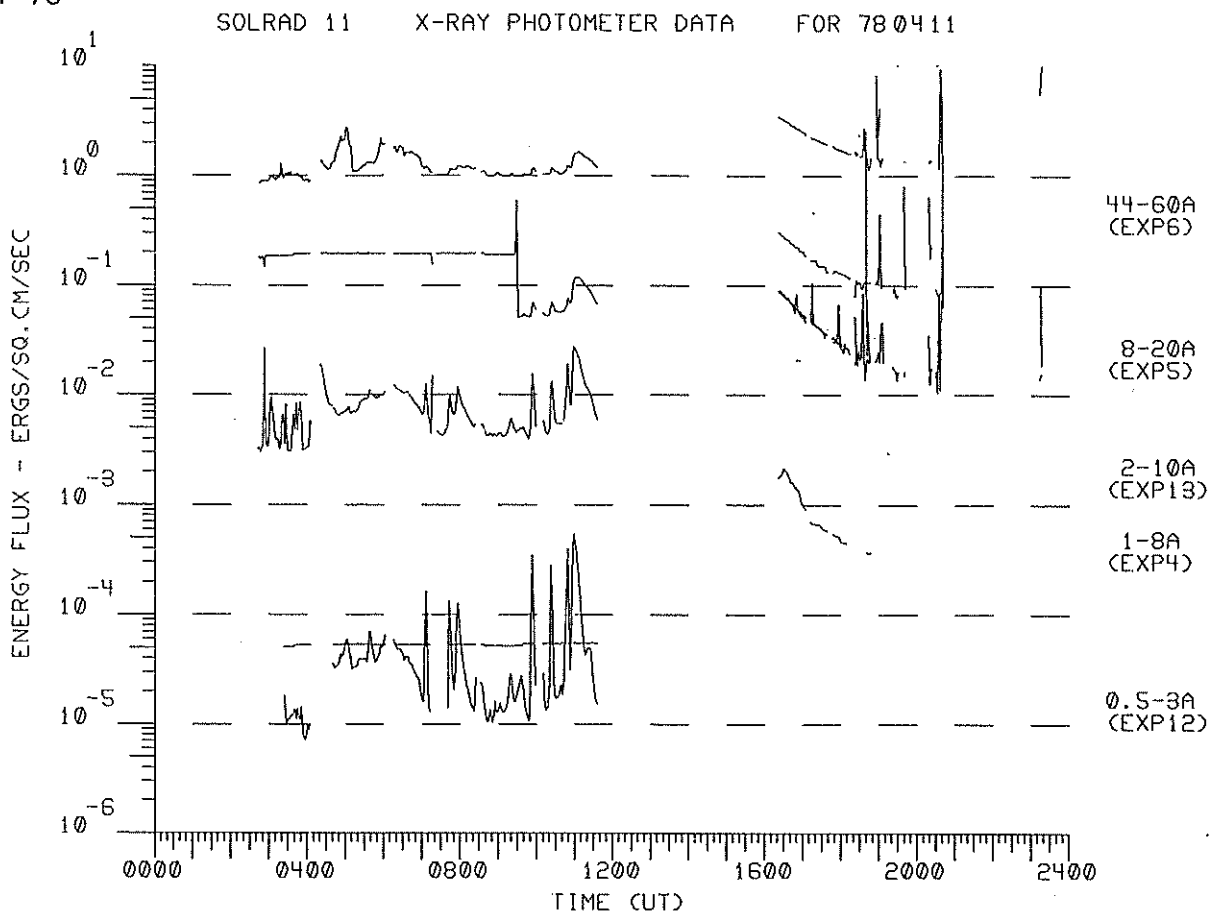

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780406
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

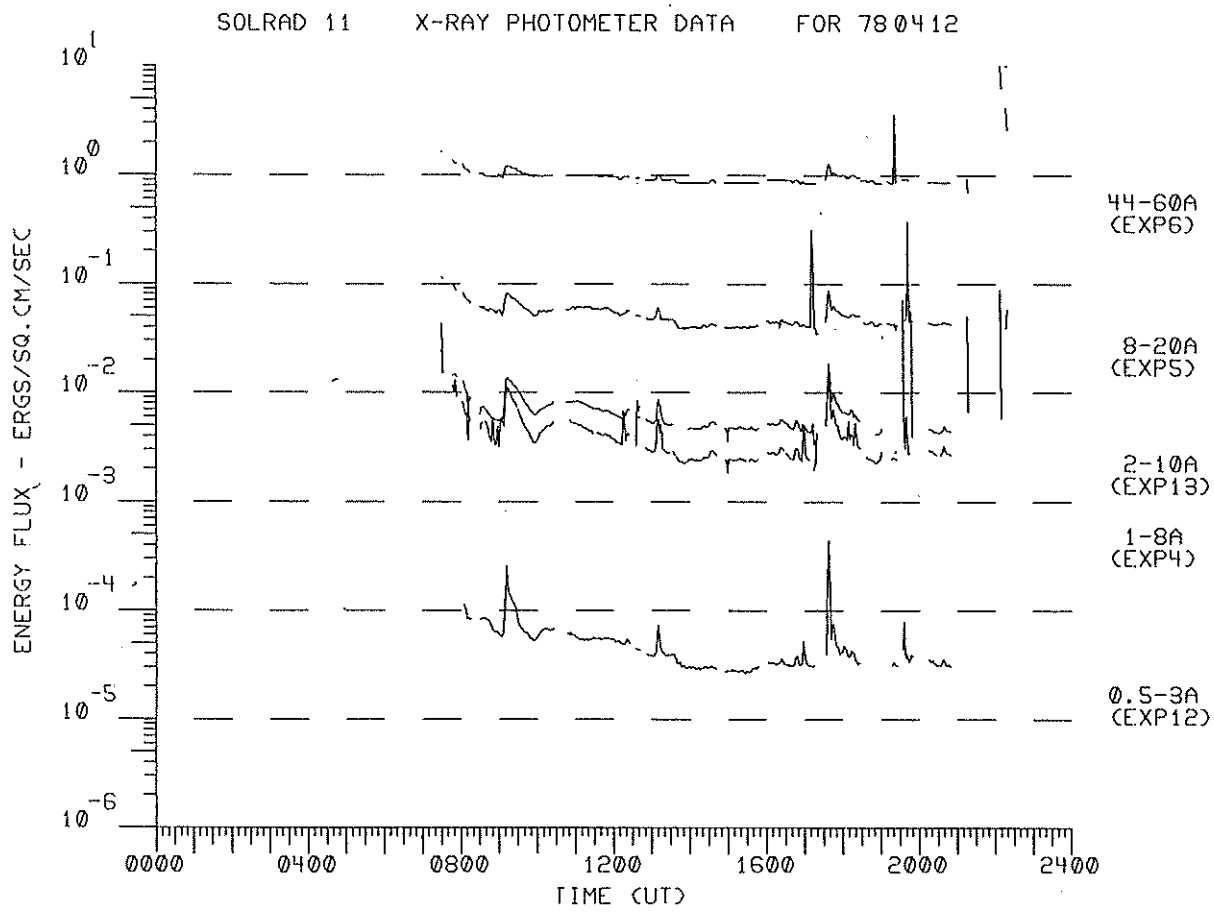

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780407
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

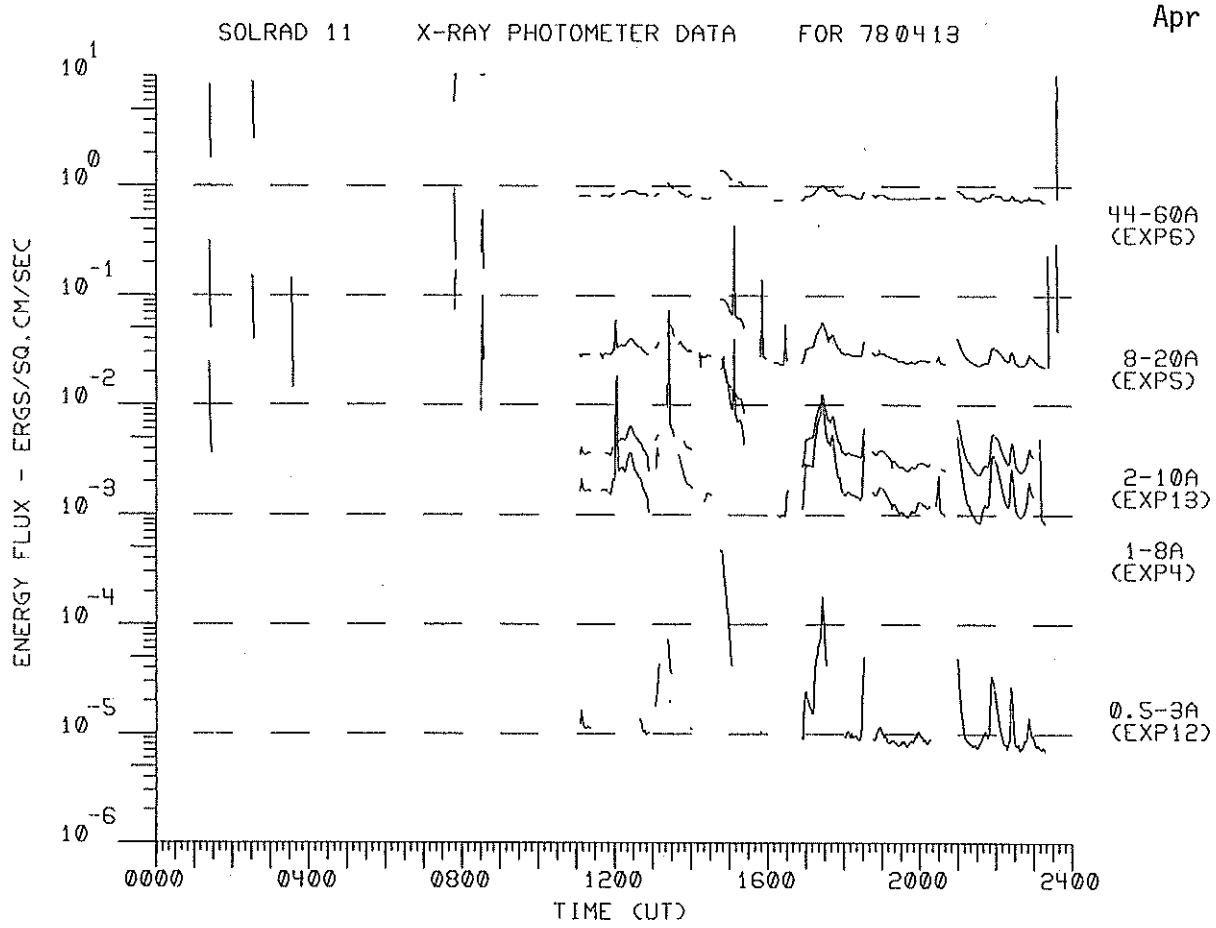

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780408
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

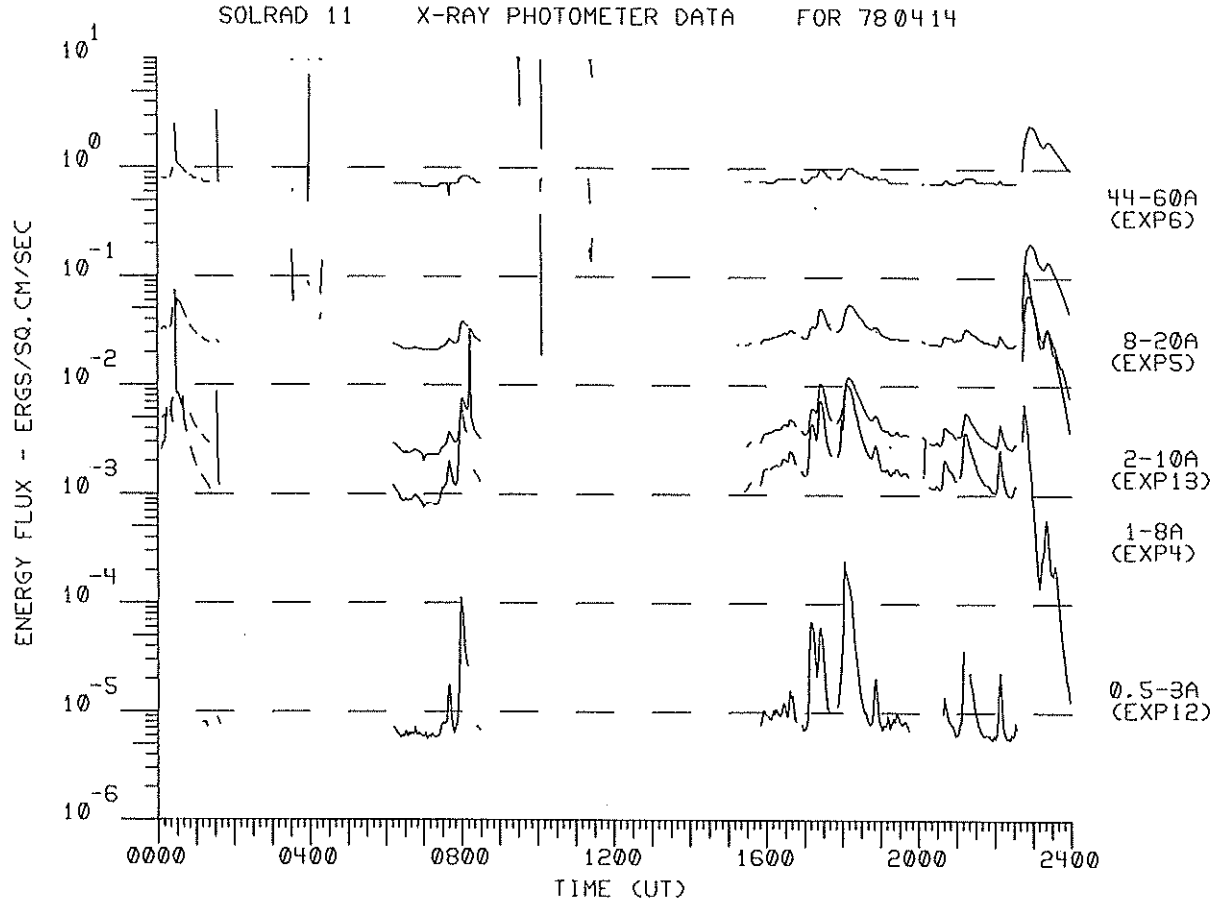

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780409
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

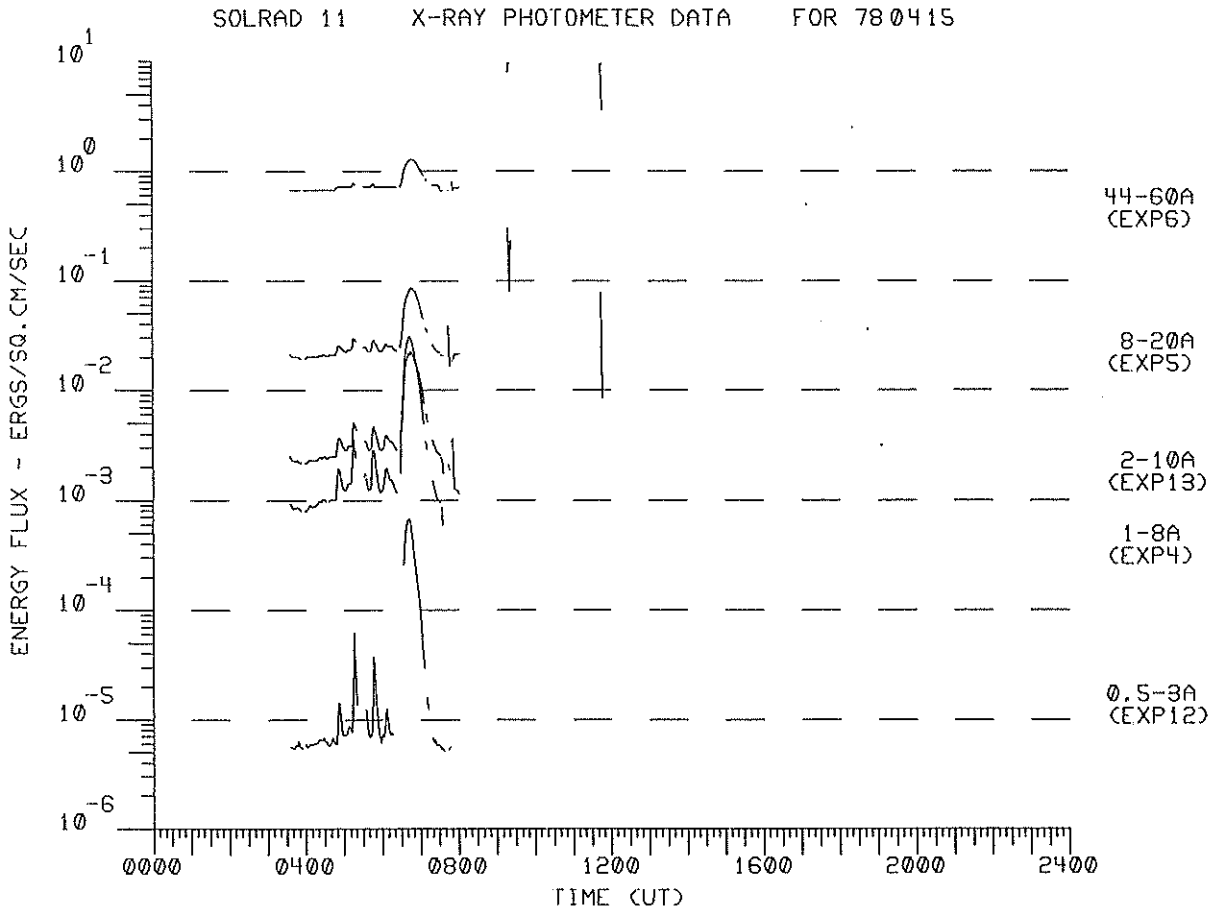

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780410
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

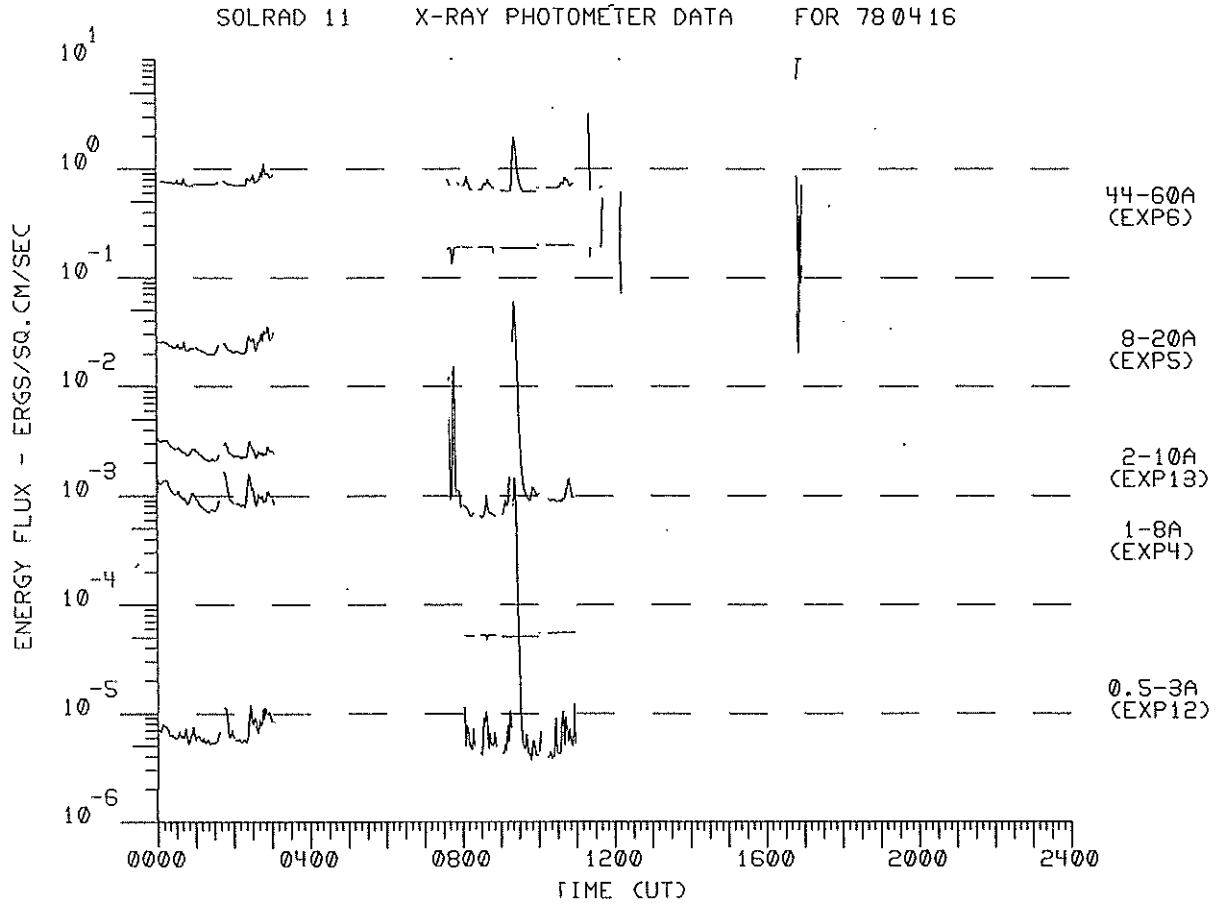

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780411
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

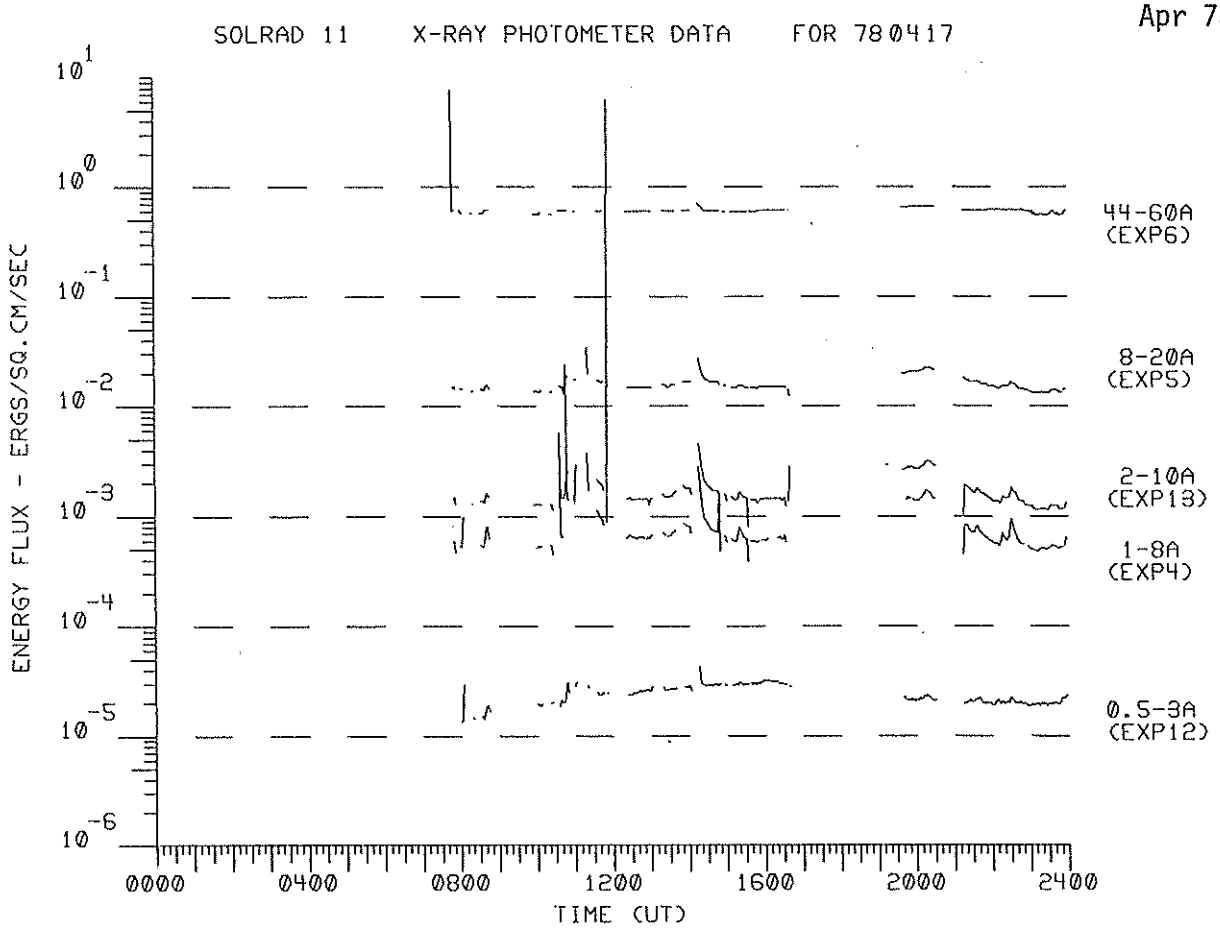

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780412
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

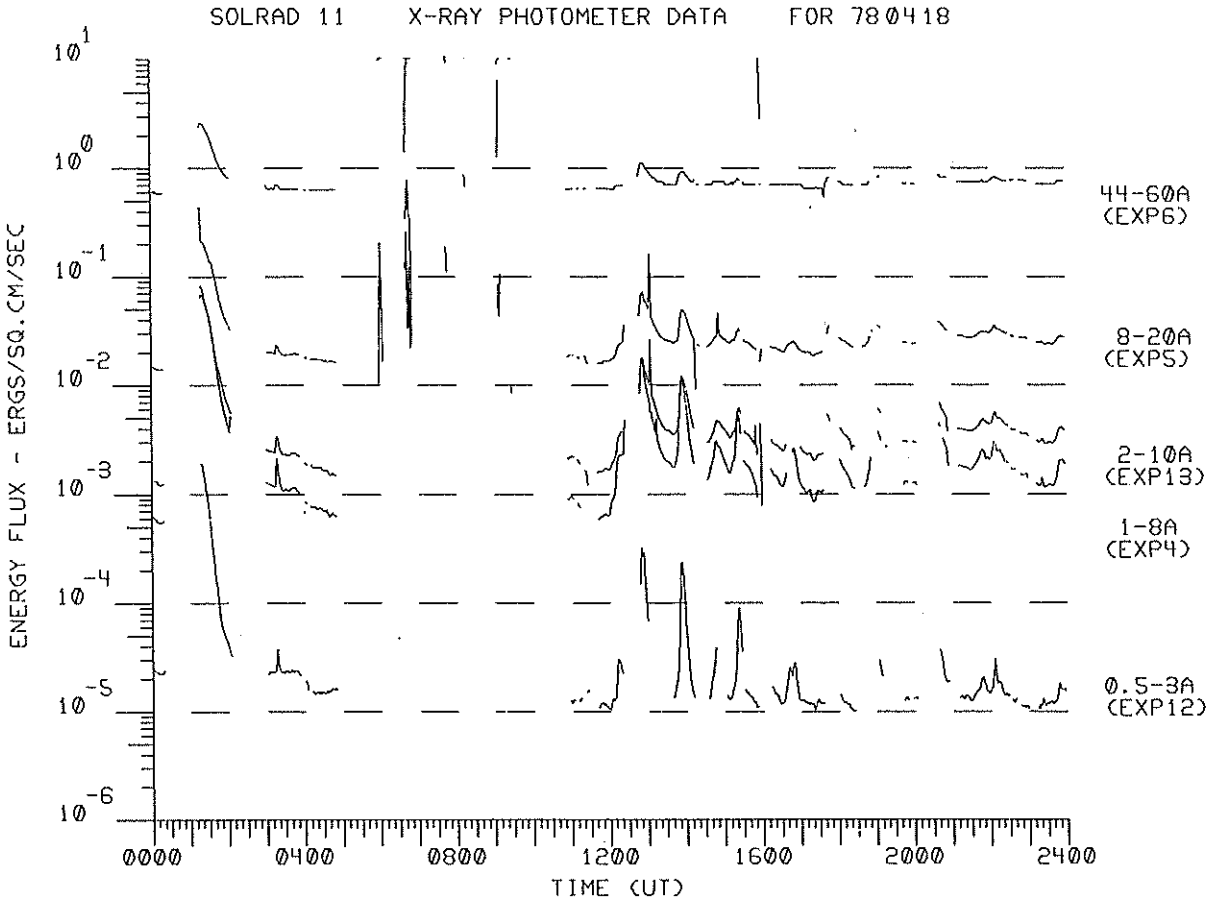

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780413
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

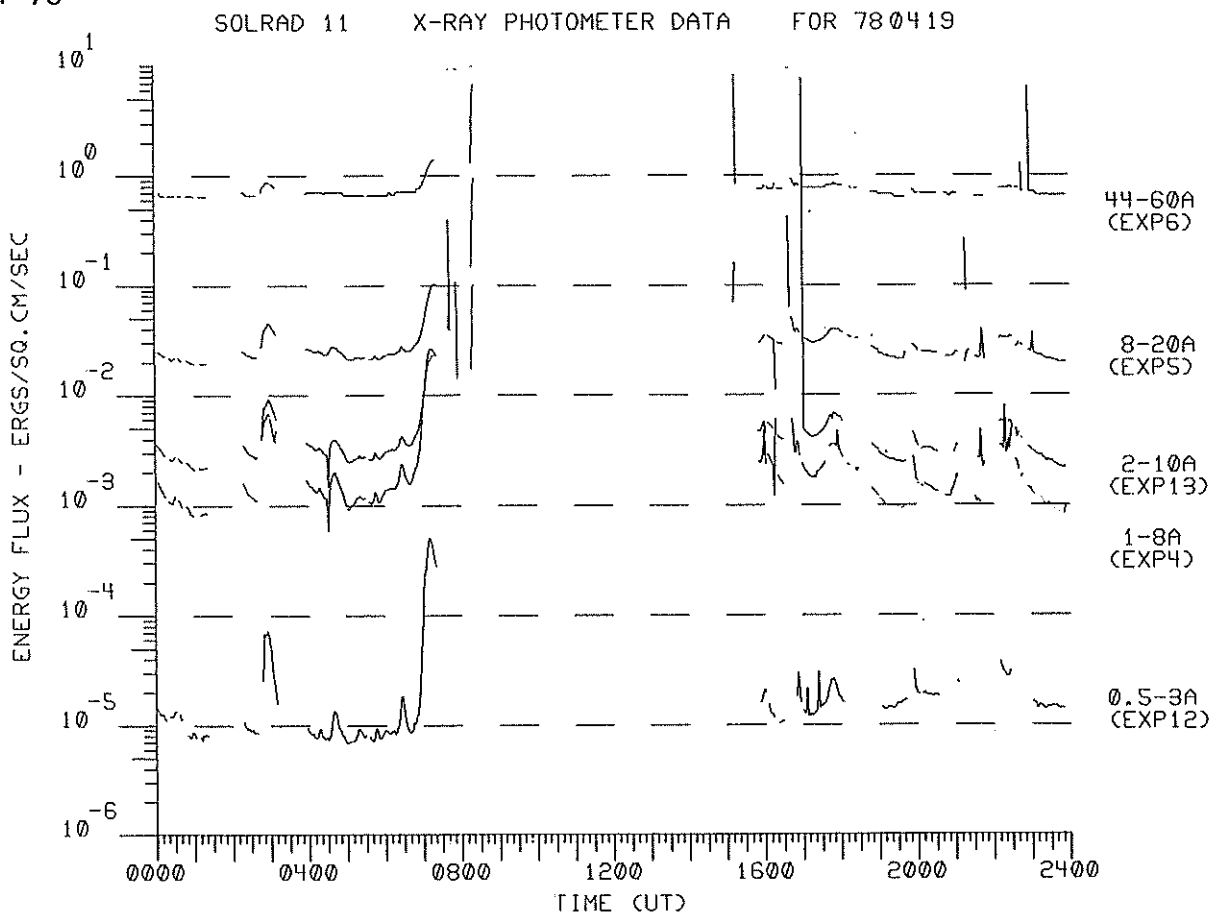

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780414
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

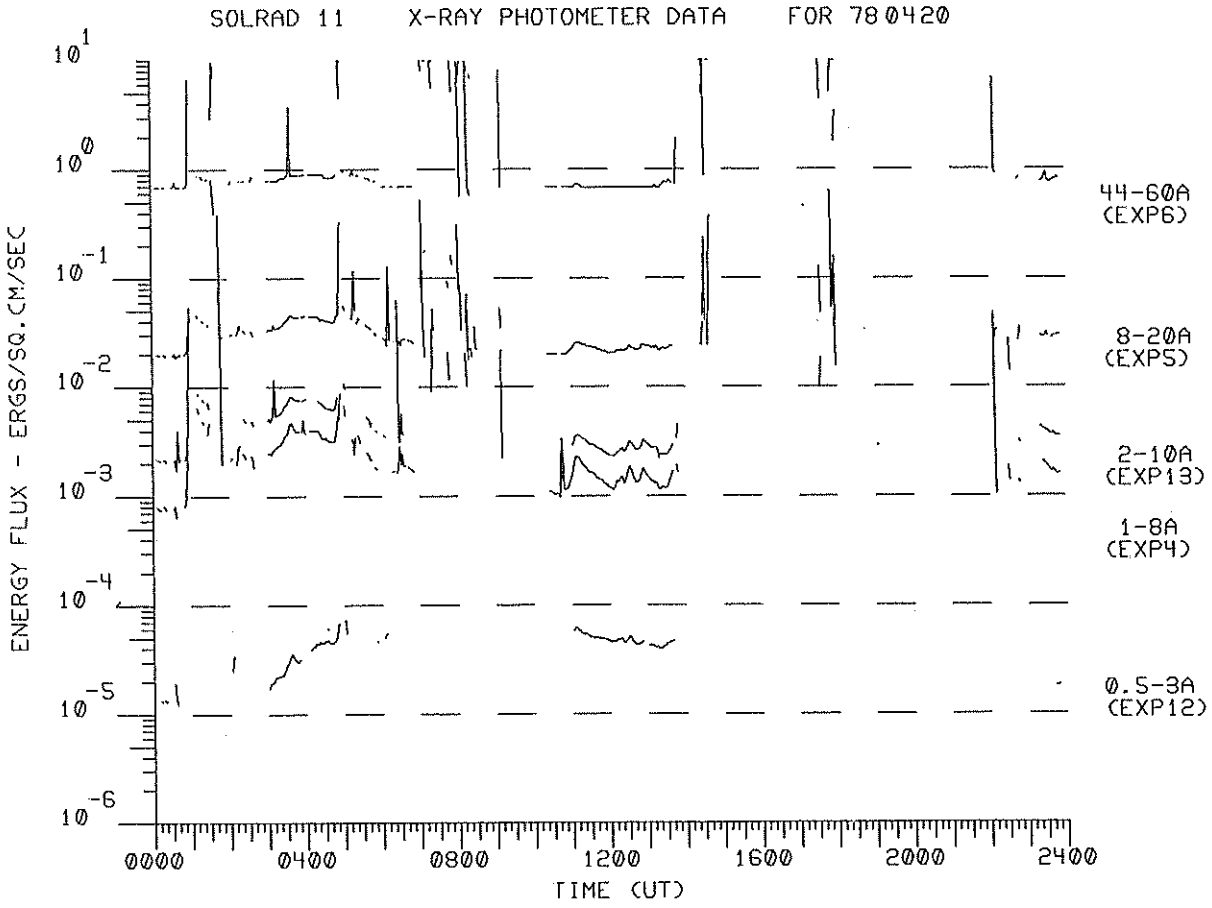

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780415
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

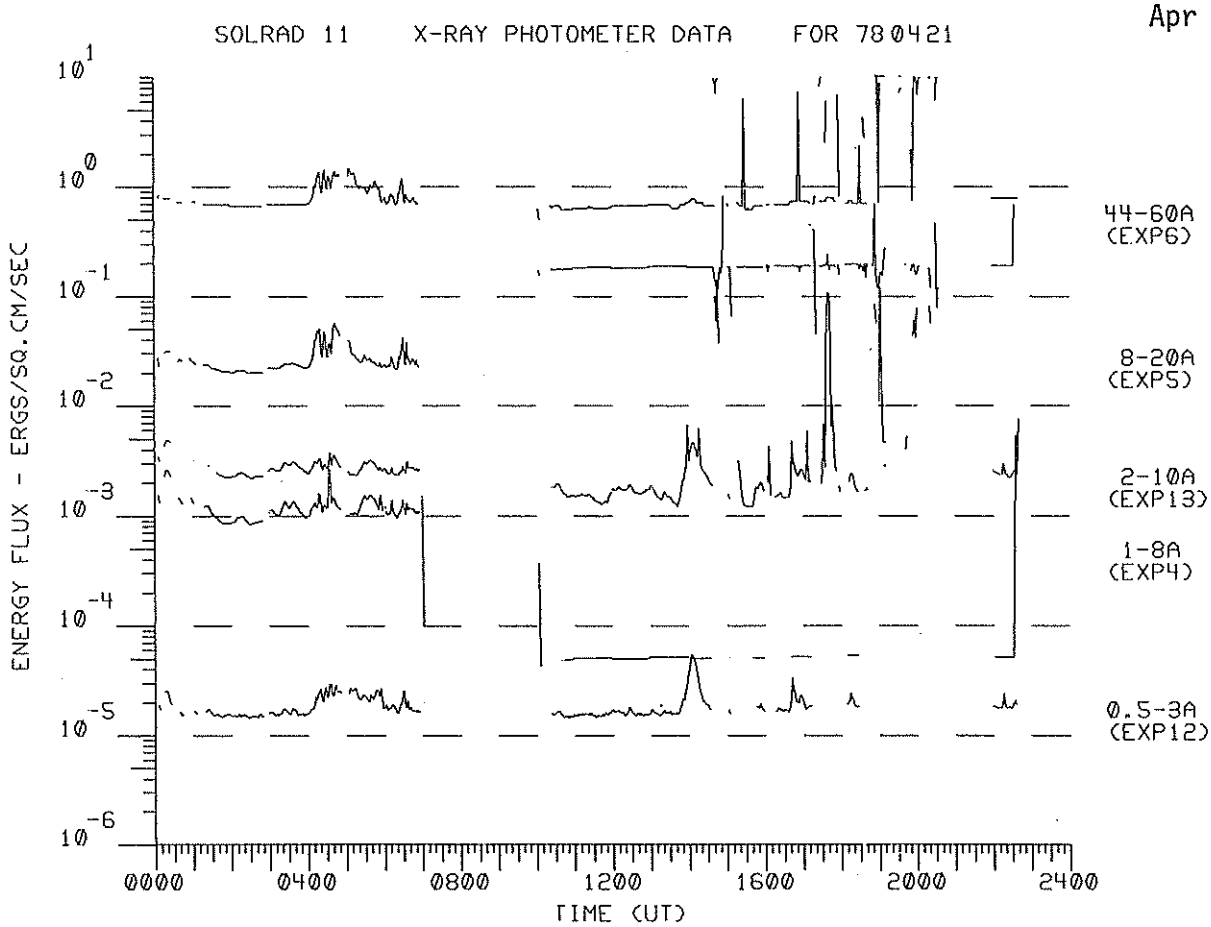

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780416
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

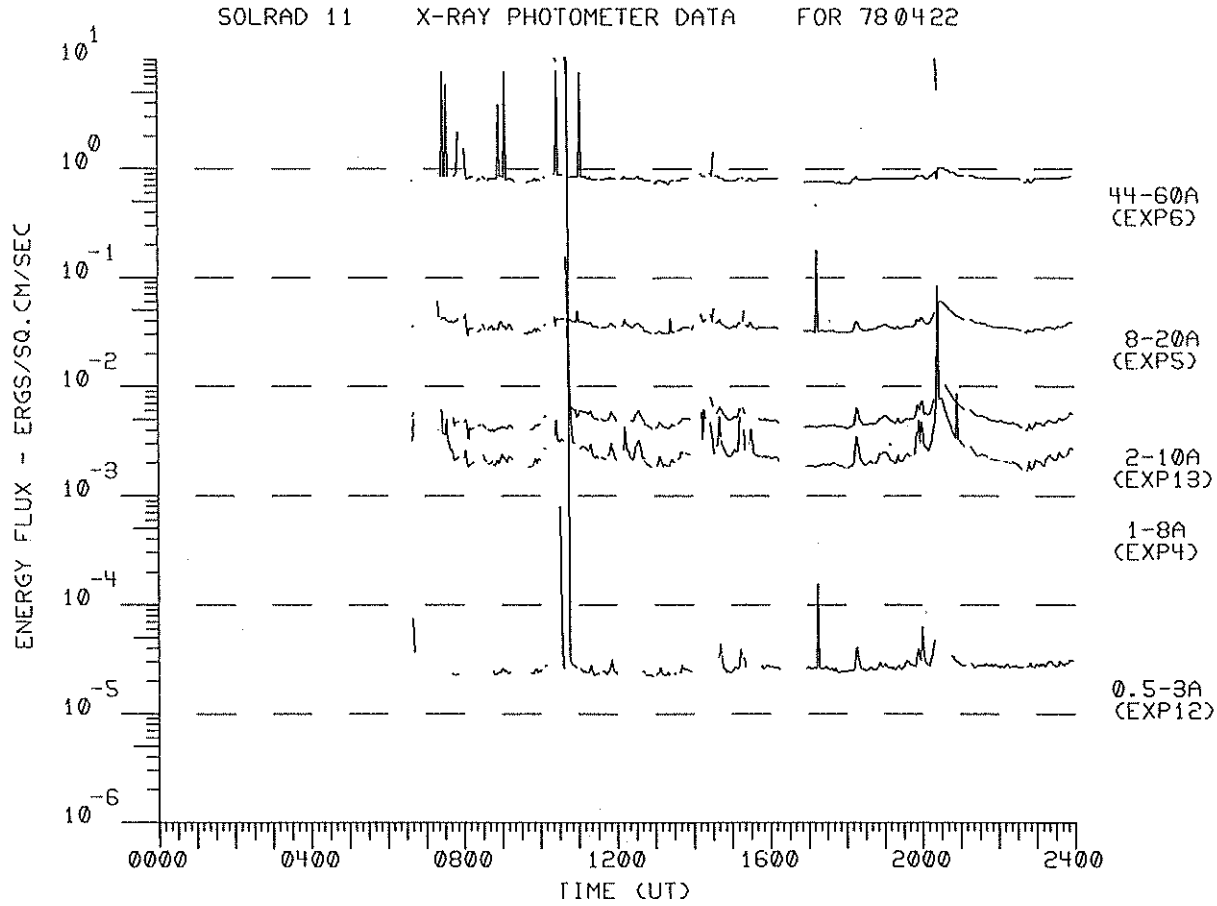

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780417
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

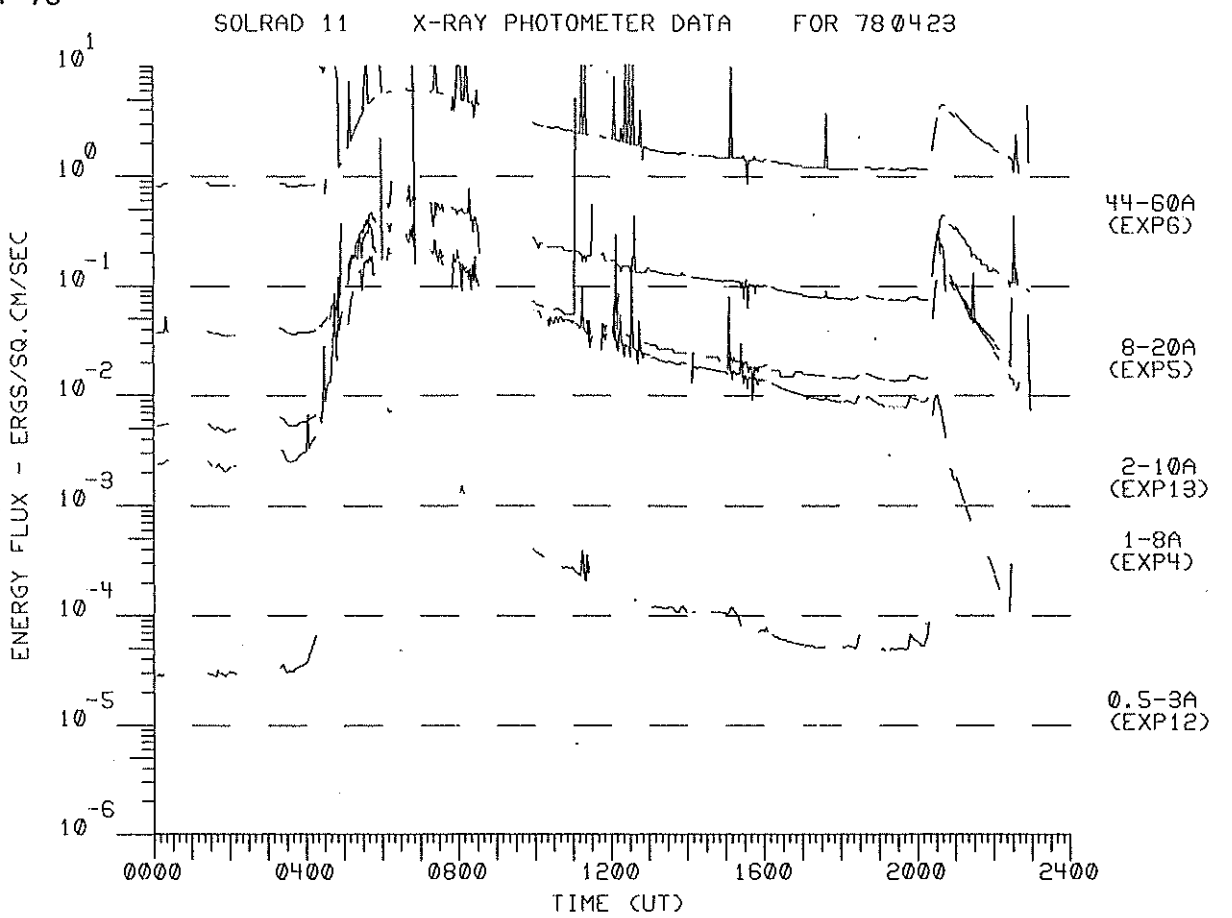

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780418
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

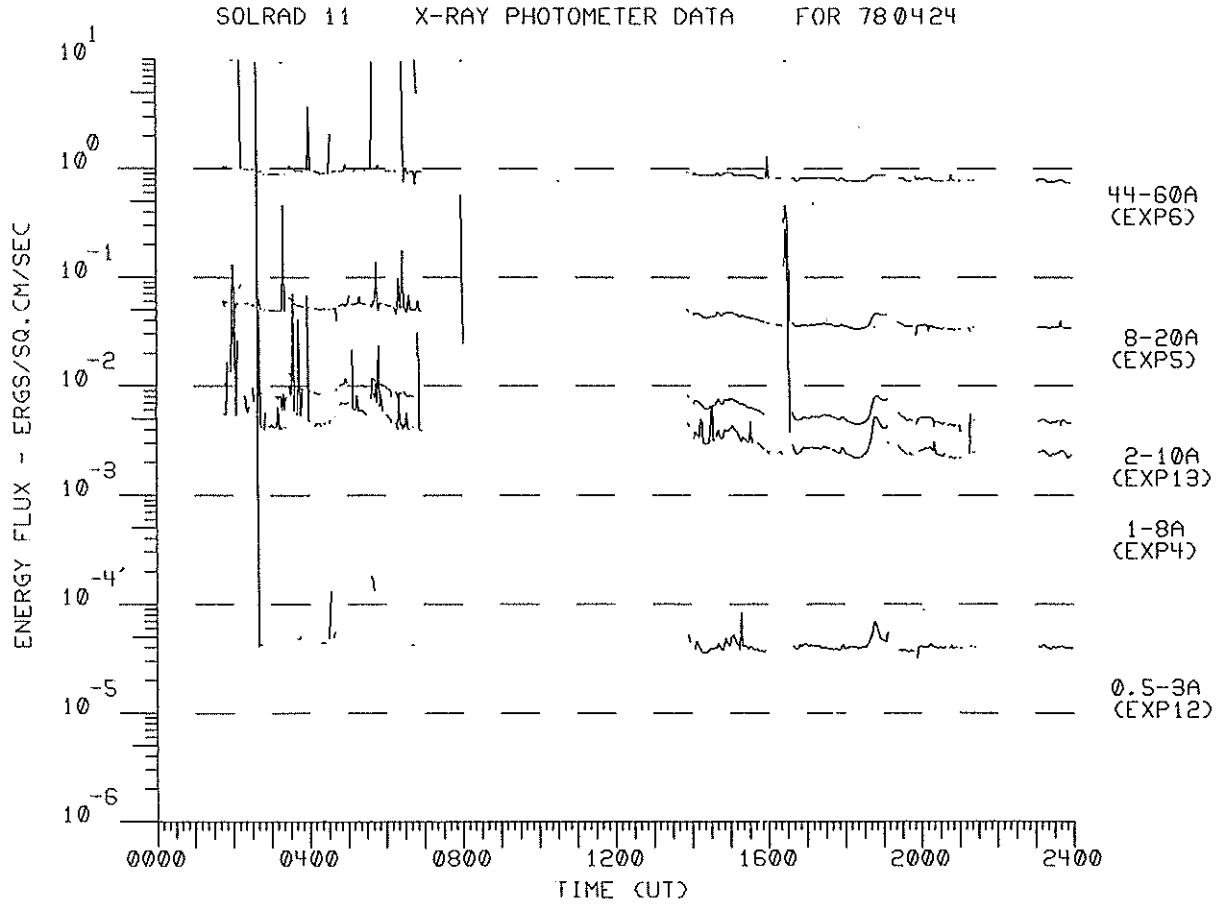

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780419
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)

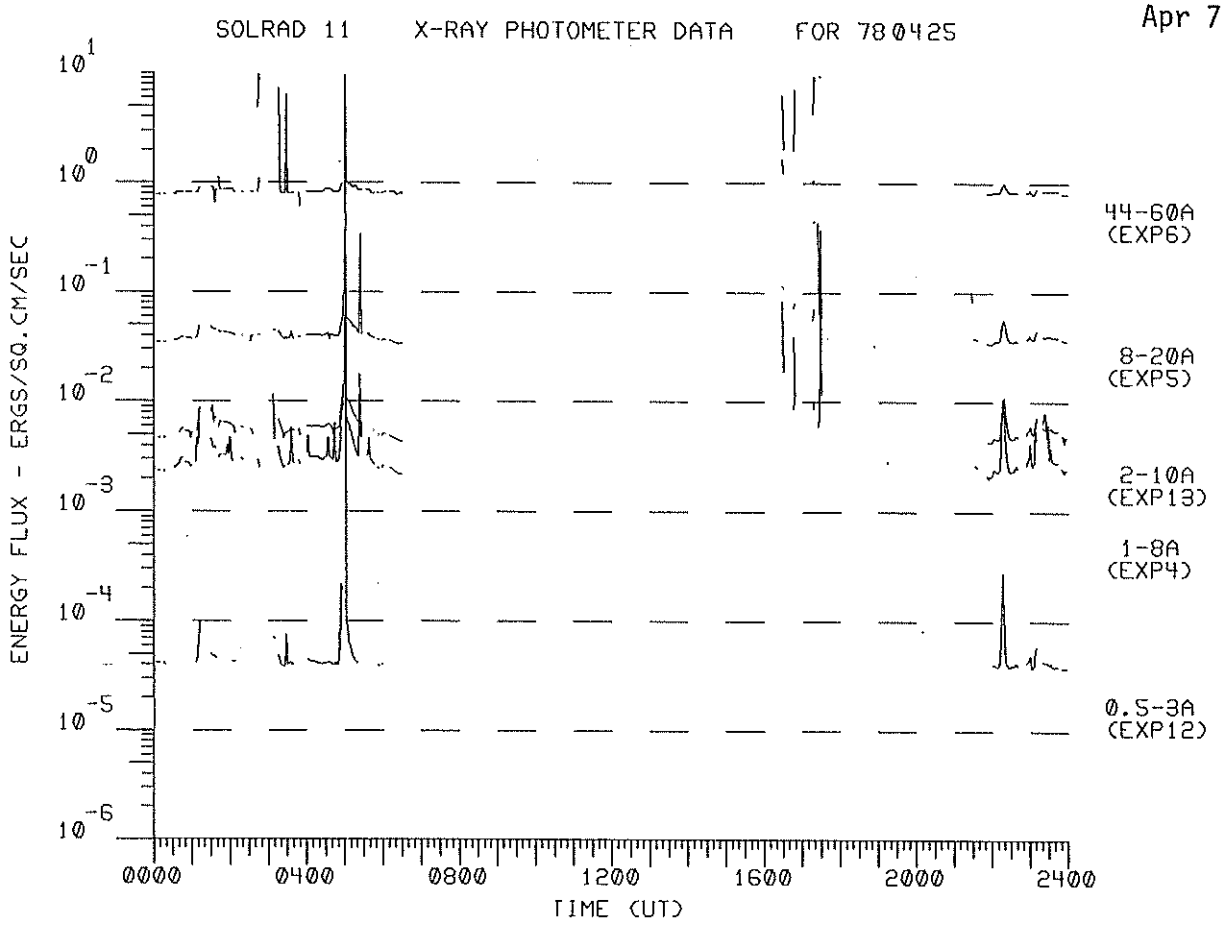

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780420
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)

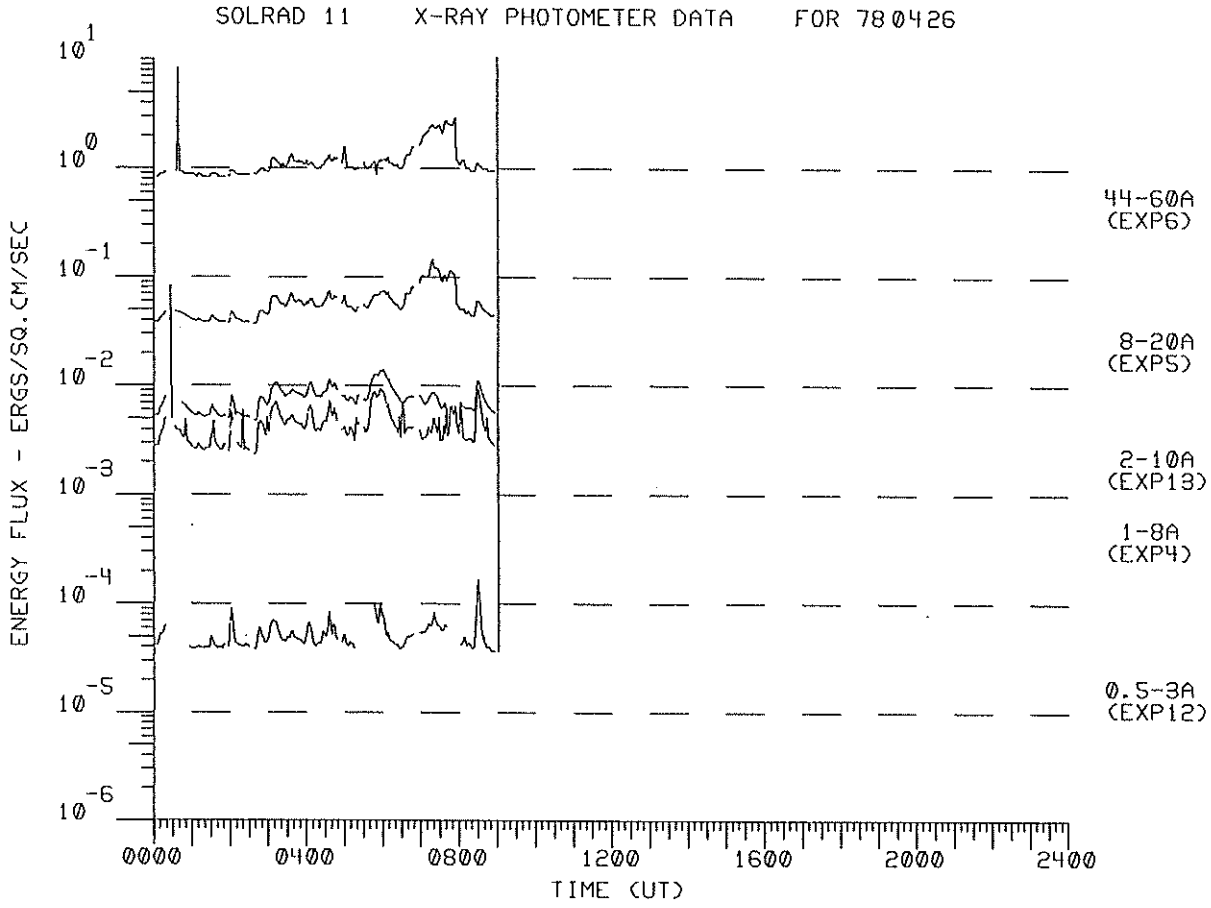

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780421
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

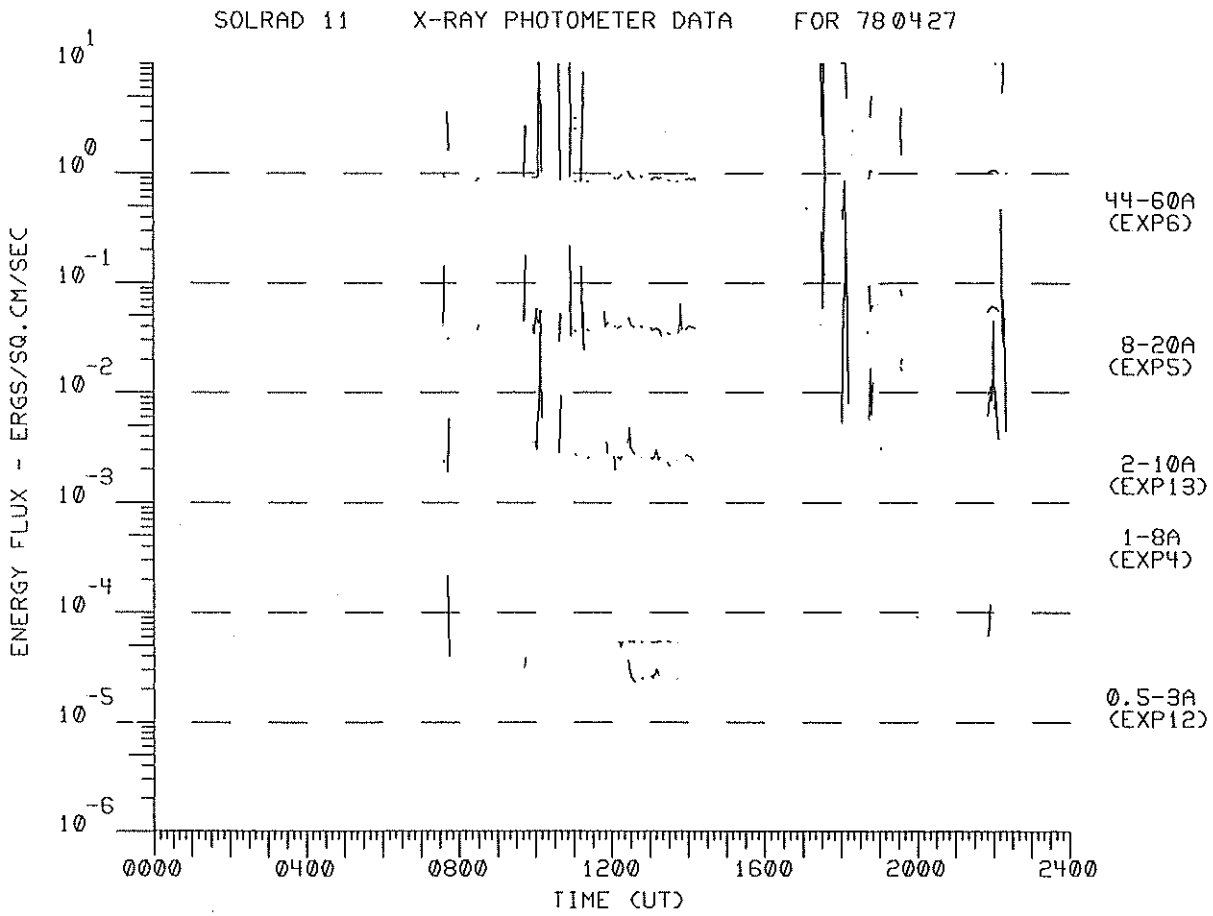

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780422
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

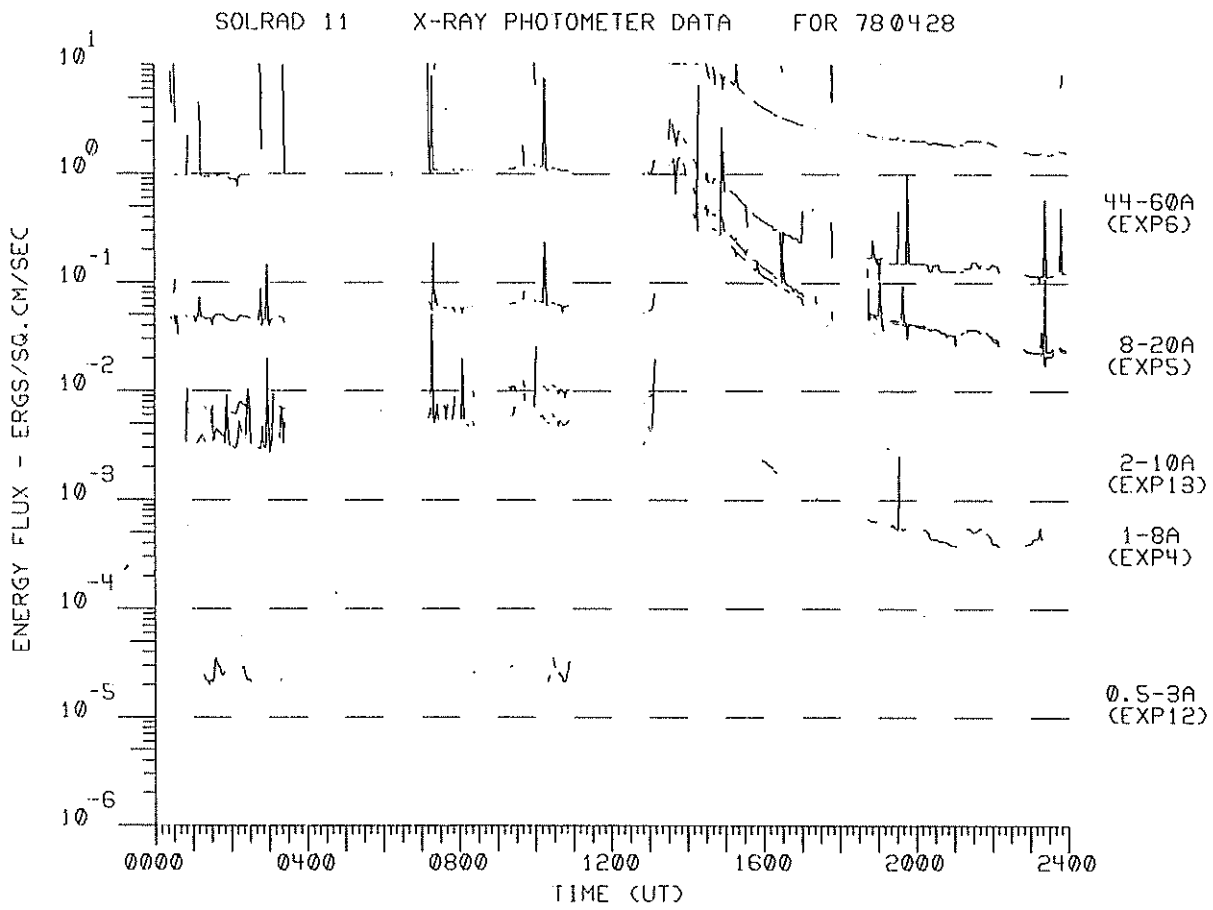

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780423
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

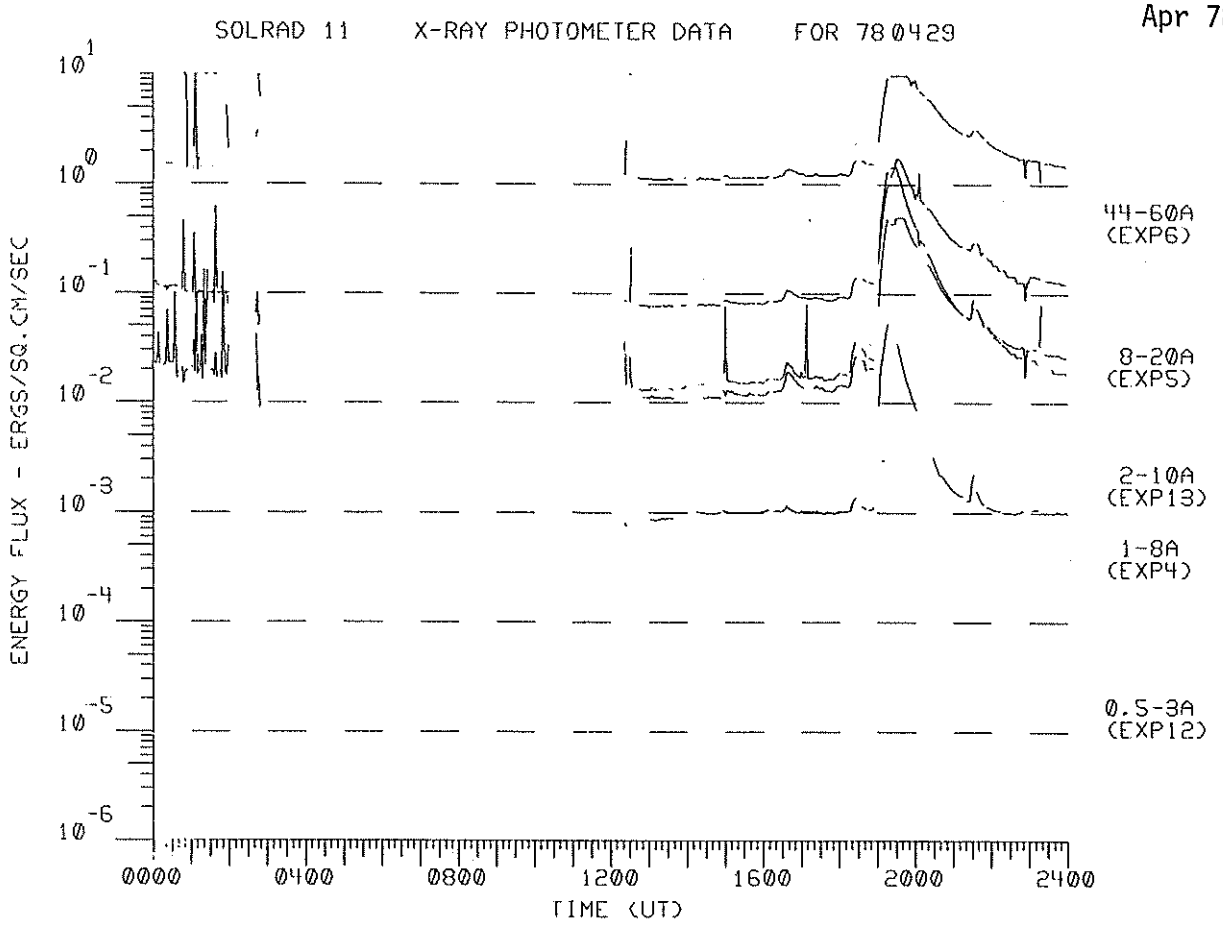

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780424
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

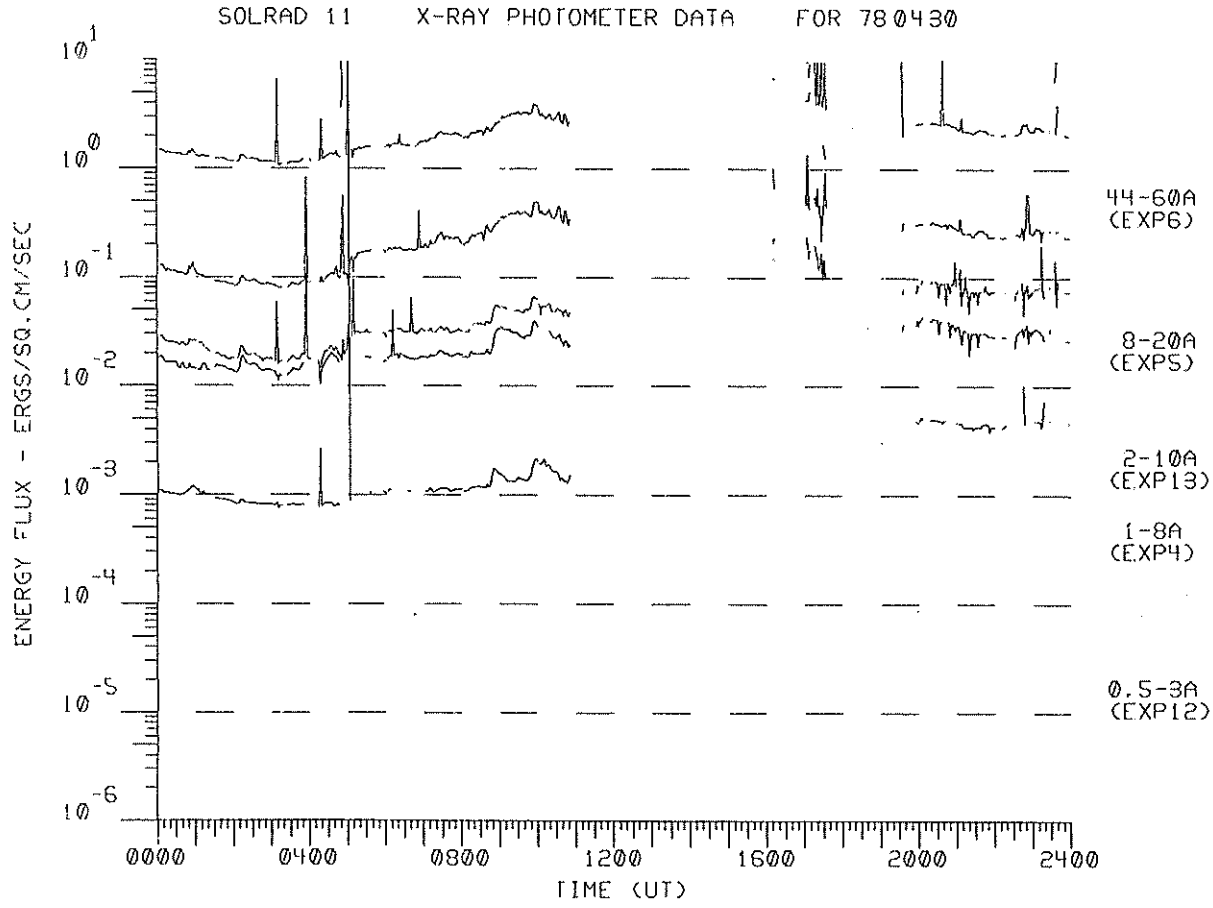

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780425
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780426
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780427
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780428
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780429
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780430
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	1006	MANI										
	0531	0859	DURN				0601.5	0601.5	1				IIIB
	0537	1143	WEIS				0808.2	0808.4	1				IIIB
	0934	1709	DURN										
	1030	2305	SGMR										
	1153	1715	WEIS										
	1315	2345	HARV				1701	1703	1				I
			HARV				1939	1940	1				IIIG
	2158	2400	MANI										
02	0000	1010	MANI							0305.0	0305.5	1	III
	0529	1741	DURN										
	0636	1716	WEIS				1108.2	1115.5	1				II
			WEIS				1137.2	1140.5	1				IIIG
			WEIS				1209.1	1210.3	2				IIIG
	1028	2306	SGMR				1209.6	1210.0	1				III
			WEIS				1214.4	1214.6	1				IIIB
	1315	2345	HARV										
	2127	2400	MANI										
03	0000	1003	MANI										
	0532	0841	WEIS				0702.0	0702.6	1				IIIG
			WEIS				0744.1	0744.2	1				IIIB
			WEIS				0750.0	0752.3	2				IIIGG
	0529	1743	DURN	0751.1	0752.0	1	0751.1	0752.0	2				IIIGG
			WEIS				0755.2	0755.3	1				IIIB
	0846	1718	WEIS				0955.5	0956.7	2				IIIG
			WEIS				0958.1	0958.2	1				IIIB
			WEIS				1122.3	1122.7	2				IIIG
			DURN	1122.3	1122.6	1	1122.3	1111.6	2				IIIG
			DURN				1132	1254	1				I
			WEIS				1133.0	1133.4	1				IIIG
			WEIS				1146.7	1147.1	1				IIIG
			WEIS				1231.0	1232.8	1				IIIG
			WEIS				1248.7	1251.1	1				IIIG
			WEIS				1252.8	1253.5	2				IIIG
	1315	2345	HARV				1447	1500	1				IIIG
			WEIS				1457.2	1458.0	2				IIIG
			WEIS				1459.8	1500.7	2				IIIG
			DURN				1459.9	1500.2	3				IIIG
	1027	2307	SGMR				2052.1	2052.5	2				V
			HARV	2052		1	2052		2	2052		1	IIIG
	2113	2400	MANI										
04	0000	1003	MANI							0144.7	0144.9	1	III
	0532	1639	WEIS				0624.0	1631.2	1				IIIN
			WEIS				0910.2	0914.8	3				IIIG,U
	0529	1744	DURN	0910.8	0914.8	2	0910.8	0911.7	3				IIIGG,RS
			WEIS				1025.0	1025.4	2				IIIG
			DURN				1025.1	1025.3	3				IIIG
	1025	2308	SGMR				1314.2	1314.7	1				IIIG
			SGMR				1630.8	1631.0	1				III
	1654	1719	WEIS										
			SGMR				1902.0	1902.2	1				III
	1315	2345	HARV				1902		1	1902		1	IIIG
			HARV				1944	2028	2				I,IIIN
	2122	2400	MANI										
05	0000	1000	MANI										
	0528	1636	DURN										
	0529	1721	WEIS				0744.7	1619.0	1				IIIN
			WEIS				0819.6	0820.2	3				IIIG
	1300	2345	HARV										
	1023	2310	SGMR				1421.8	1422.0	1				III
	2127	2400	MANI										
06	0000	1004	MANI										
	0540	1308	WEIS				0540.2	0642.4	2				IIIG
			WEIS				0544.8	0545.2	2				IIIG,U
			WEIS				0547.5	0547.9	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
06			WEIS				0551.8	0552.2	2				IIIG
	0627	1748	DURN				0627 E	1748 D	1				IS,DC
			DURN	0647.8	0648.2	1							IIIG
			DURN	0713.9	0715.2	3	0714.3	0714.4	3				IIIGG
			WEIS				0732.8	1717.0	3				IIIN
			DURN	0748.2	0748.3	2							IIIG
			DURN	0858.3	0858.9	2							IIIG
			DURN	0908.7	0908.7	1							IIIB
			DURN	0953.6	0953.6	3							III
			DURN	1022.6	1022.6	2							III
			WEIS				1047.5	1048.1	2				IIIG
			DURN	1047.6	1047.9	2	1047.6	1047.9					IIIG
			DURN	1104.4	1106.4	3	1104.4	1106.4	2				IIIGG
			WEIS				1114.5	1114.7	2				IIIG
	1022	2311	SGMR				1128.5	1149.6	2				IIIG
			WEIS				1144.5	1146.4	2				IIIG
			SGMR				1223.0	1224.4	2				IIIG
			DURN				1223.4	1223.5	1				IIIG
	1316	1722	WEIS										
			SGMR				1332.6	1428.6	2				IIIS
	1300	2345	HARV				1332	1338	2				IIIG
			HARV				1349	1354	1				IIIN
			DURN				1354.5	1354.7	3				IIIG
			HARV	1412		1							IIIG
			HARV				1419	1420	1				IIIG
			HARV				1426	1431	2				IIIGG
			DURN	1433.8	1434.0	1	1433.8	1434.0	2				IIIG
			HARV				1454	1456	1				IIIG
			DURN	1520.1	1520.2	2	1520.1	1520.2	2				III
			SGMR				1614.9	2311.0	2				IIIS
			HARV				1614	1619	2				IIIG
			DURN	1633.2	1633.3	2							IIIG
			HARV	1633		1	1633	1635	2				IIIG
			DURN	1639.0	1639.3	2							IIIG
			HARV	1639		1							IIIG
			HARV				1652	1656	3	1653		3	IIIGG
			HARV				1703		1				IIIG
			DURN	1713.6	1715.4	2	1713.6	1715.4	2				IIIG
			HARV	1714		1	1714	1717	2	1714	1717	1	IIIGG
			HARV				1727	1728	1				IIIG,W
			HARV	1802	1812	1							IIIN,W
			HARV				1827		1				IIIB
			HARV	1858	1910	2	1859	1903	2				IIIGG
			SGMR				1904.6	1908.9	2				II
			HARV				1904	1913	3				II
			HARV				1940	1947	3	1945	1946	3	IIIGG
			SGMR				1945.4	1947.0	3				V
			HARV				2003	2004	1				IIIG
			HARV				2018	2025	2				IIIG
	2116	2400	MANI										
			HARV				2120	2121	1				IIIG
			HARV	2200		1	2200		1				IIIG
			HARV	2210		3	2210		3				IIIG
			HARV				2221		1				IIIB
			HARV	2237		1	2236		2				IIIG
07	0000	1000	MANI							0001.9	0002.2	1	III
			MANI							0323.5	0323.9	1	III
			MANI							0419.7	0420.3	1	III
	0530	1748	DURN	0530 E	1748 D	1	0530 E	1748 D	1				I,DC
	0625	1723	WEIS				0541.5	1704.5	3				IIIN
			DURN				0541.9	0542.4	3				IIIGG
			DURN	0604.1	0604.1	3	0604.1	0604.1	3				III
			WEIS				0621.1	0622.4	3				IIIG
			DURN				0621.2	0621.8	3				IIIGG
			WEIS				0638.9	0639.8	3				IIIG
			DURN				0639.0	0639.6	3				IIIGG
			DURN	0646.7	0648.1	1	0647.7	0648.1	2				IIIGG
			DURN	0705.4	0710.5	1	0705.2	0719.7	3				IIIGG
			WEIS				0709.7	0711.2	3				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
07			DURN	0817.6	0818.0	3	0817.6	0818.1	3				IIIGG
			DURN	0826.3	0827.7	3							IIIGG
			DURN	0830.0	0830.2	1							IIIG
			DURN				0832.5	0833.1	1				IIIGG
			DURN	0858.7	0902.1	2	0858.7	0902.1	3				IIIGG
			DURN				0918.5	0918.5	2				III
			WEIS				0948.0	1706.3	2				IN
	1020	2312	SGMR				1118.8	2312.0	1				CONT
			DURN	1140.4	1142.8	3							IIIGG
			DURN	1217.7	1217.8	1	1217.7	1217.8	1				IIIG
			DURN	1249.7	1249.8	2	1249.7	1249.8	2				IIIG
	1301	2345	HARV	1309		1	1309	1310	2				IIIG
			DURN	1334.6	1335.0	3	1334.6	1334.9	3				IIIGG
			HARV	1335	1341	2	1335	1341	2				IIIGG
			DURN	1340.3	1340.9	3	1340.3	1340.9	3				IIIGG
			HARV				1417		2				IIIG
			DURN	1434.4	1458.5	3	1434.4	1458.5	3				IIIGG,N
			WEIS				1434.5	1438.0	3				IIIG
			SGMR				1435.8	1437.0	3				III
			HARV	1435	1458	3	1430	1458	3				IIIGG,V
			WEIS				1443.8	1445.1	3				IIIG
			WEIS				1452.2	1454.4	3				IIIG
			WEIS				1456.0	1458.5	3				IIIG
			HARV				1518	1539	1				IIIN
			DURN				1538.5	1538.5	3				III
			DURN	1547.4	1556.9	3	1547.1	1556.9	3				IIIG,N
			HARV	1547	1554	3	1547	1558	3				IIIGG
			WEIS				1550.0	1555.3	3				IIIG
			HARV	1637		1	1637	1643	1	1643		1	IIIG
			DURN				1659.5	1700.8	3				IIIGG
			HARV				1659	1705	2				IIIGG
			HARV				1712	1804	2				I
			DURN	1733.5	1733.5	1	1733.5	1733.5	1				III
			HARV	1733		1	1733		2				IIIB
			HARV				1745	1747	3	1745	1747	3	IIIGG
			HARV				1814	1815	1	1814	1815	1	IIIG
			HARV	1841	1842	3							IIIG
			HARV				1919	2200	2				I
			HARV				1924	1926	1				IIIG
			HARV	1930	1932	3							IIIGG
			HARV				1940		2				IIIB
			SGMR				2015.7	2023.0	3				III
			HARV	2015	2020	3	2015	2020	3	2015	2018	3	IIIGG,V
			HARV				2023	2027	1				II
			HARV				2028	2029	3				IIIG
			HARV				2056		1				IIIG
			HARV				2111	2124	2				IIIGG
			HARV	2130	2135	2	2130	2135	2				IIIGG
	2132	2400	MANI										
			HARV				2204		3				IIIG
			HARV				2206	2236	1				IN
			HARV	2225		3	2223	2225	3				IIIGG
			HARV				2335		1				IIIG,W
			HARV				2342	2343	1				IIIG,W
08	0000	1004	MANI							0219.1	0541.0	1	CONT
	0523	0845	WEIS				0525.0	0738.0	2				I
	0901	1725	WEIS				0526.0	1707.0	2				IN,DC
			DURN	0529 E	0806	3							IV, F
	0529	1749	DURN				0529 E	1749 D	1				I,DC
			WEIS				0553.0	1648.0	3				IIIN
			WEIS				0803.5	0819.5	3				IIIGG,V
			MANI							0804.3	0808.2	1	IV
			DURN	0804.5	0809.6	3	0804.2	0811.3	3				IIIGG
			DURN	1052.4	1053.6	3	1052.4	1053.6	3				IIIGG
	1018	2313	SGMR				1111.5	2313.0	2				CONT
			WEIS				1118.8	1130.5	3				IIIGG,V
			SGMR				1119.0	1130.6	3				IV
			DURN	1121.5	1125.8	3	1121.2	1125.0	3				IIIGG
			DURN	1140	1720								IV, F

SOLAR RADIO EMISSION
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APRIL 1978

APR 1978	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	
08			DURN				1202.5	1202.7	1				IIIG
			DURN				1204.6	1204.6	1				III
			DURN	1229.3	1229.5	1	1229.3	1229.5	2				IIIG
			DURN	1249.4	1250.5	1	1249.4	1250.5	2				IIIG
	1300	2345	HARV				1314	1318	1				IIIN
			HARV				1337	1339	1				IIIG
			HARV				1349	1400	2				IIIGG
			DURN	1400.1	1400.2	1	1400.1	1400.2	2				IIIG
			HARV				1441	2305	1				IIIN,I
			DURN				1457.8	1458.8	2				IIIG
			HARV				1459	1500	3				IIIG
			DURN	1623.4	1623.9	3	1623.4	1623.9	3				IIIGG
			WEIS				1623.4	1624.2	3				IIIG
			DURN	1624.9	1625.1	1	1624.9	1625.1	1				IIIG
			HARV	1624		2	1623	1624	3	1624		3	IIIG,V
			HARV				1649	1650	3	1650		3	IIIGG
			HARV	1826		2	1824	1826	2				IIIG
			HARV				1836		3	1836		3	IIIG
			HARV	1906		2	1905	1907	3				IIIGG
			HARV				1931	1932	2	1931		2	IIIG
			HARV				2037	2039	2				IIIG
			HARV				2044		3	2044		3	IIIG
			HARV	2052	2053	1	2052	2053	3	2053		3	IIIGG
			HARV				2123	2124	3	2124		3	IIIG
			HARV				2130	2133	2	2130	2132	1	IIIG
	2132	2400	MANI										
			HARV	2215		1	2215		2				IIIG
			HARV	2312		2	2310	2315	3				IIIGG
			HARV				2319	2320	2				IIIG
			HARV	2322	2323	1							IIIG
			HARV				2328		1				IIIB
09	0000	1008	MANI							0004.1	0004.4	1	III
			MANI							0106.1	0107.0	1	III
			MANI							0315.0	0327.8	1	IIIG
			MANI							0446.6	0447.5	1	III
			WEIS				0526	1232.0	1				IN
	0530	1751	DURN				0530 E	1445	1				I,DC
	0521	1711	WEIS				0544.0	1701.0	2				IIIN
			WEIS				0651.3	0652.5	2				IIIG
			DURN	0652.2	0652.2	3	0652.2	0652.2	3				III
			DURN	0655.3	0655.5	3	0655.3	0655.3	3				IIIG
			WEIS				0655.3	0655.5	3				IIIG
			WEIS				0703.5	0705.0	3				IIIG
			DURN	0703.7	0715.2	3	0703.7	0715.2	3				IIIGG,N
			WEIS				0709.6	0710.8	2				IIIG,RS
			WEIS				0714.5	0715.0	3				IIIG
			WEIS				0714.9	0717.4	3				IIIGG
			DURN	0731.3	0731.3	1	0731.3	0731.3	1				III
			WEIS				0735.4	0736.4	2				IIIG
			WEIS				0759.8	0802.4	3				IIIG
			DURN	0759.9	0802.5	1	0759.9	0802.5	3				IIIGG
			WEIS				0811.9	0812.4	3				IIIG
			DURN	0812.0	0813.9	1	0809.2	0813.9	3				IIIGG
			DURN				0945.8	0946.1	2				IIIG
			WEIS				1016.6	1016.9	2				IIIG
			DURN				1016.7	1016.9	2				IIIG
			WEIS				1039.5	1040.6	2				IIIG
			DURN				1039.6	1040.7	2				IIIG
			DURN	1134.5	1136.1	1	1134.5	1136.1	3				IIIG
			WEIS				1134.6	1135.6	3				IIIG
			DURN				1139.8	1139.8	2				IIIG
			DURN				1141.7	1141.7	3				III
	1016	2314	SGMR				1200.1	1206.4	3				IV
			WEIS				1200.2	1206.8	3				IIIGG,V
			DURN	1200.7	1205.2	3	1200.6	1205.9	3				IIIGG
			SGMR				1206.4	2314.0	2				CONT
			DURN	1219.4	1219.7	2	1219.4	1219.7	3				IIIG
			WEIS				1219.4	1220.7	2				IIIG
			DURN	1308.2	1309.0	3	1308.2	1309.0	3				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
09			WEIS				1308.3	1309.7	2				IIIG
	1301	2345	HARV				1308	1309	2				IIIG
			WEIS				1331.1	1333.5	3				IIIGG
			HARV				1331	1333	3	1333		3	IIIG
			WEIS				1352.5	1353.6	3				IIIG
			HARV				1353		2				IIIG
			DURN				1400.1	1400.2	2				IIIG
			HARV				1427	1437	2				IIIN
			WEIS				1444.5	1445.0	2				IIIG
			DURN				1444.6	1444.6	2				III
			HARV				1445	1450	3				IIIG
			HARV				1640	1650	1				IIIN
			HARV				1701	1703	2				IIIG
			HARV				1732	1734	3	1733		3	IIIG
			HARV				1743		1				IIIB
			HARV				1750	1758	3	1750	1756	3	IIIGG
			SGMR				1752.8	1754.3	3				V
			HARV				1831	1834	1				IIIG
			HARV				1847		1				IIIB
			SGMR				1912.3	1921.4	3				V
			HARV	1917	1921	1	1917	1929	3	1917	1927	3	IIIGG
			HARV				1954	1958	3	1954	1958	2	IIIGG
			HARV	2045	2053	2	2045	2059	3	2053		2	IIIG
			HARV				2110		1				IIIB
			HARV				2140	2141	1				IIIG
	2122	2400	MANI							2151.7-	2152.2	1	III
			HARV				2157		2				IIIB
			HARV				2213	2215	1				IIIG
			HARV				2239		2				IIIG
			HARV	2250	2256	1	2249	2257	3	2252	2257	1	IIIGG
10	0000	1004	MANI							0219.5	0222.0	1	IIIG
			MANI							0248.6	0249.2	1	III
			MANI							0313.5	0316.7	2	IIIG
			MANI							0447.3	0448.3	1	III
			MANI							0551.9	0552.3	1	III
	0529	1321	DURN	0610.0	0619.0	2	0610.0	0619.3	3				IIIG,N
			DURN				0706	1321 D	1				IS
	0748	1728	WEIS				0801.5	1606.5	1				IIIN
			DURN	0822.5	0826.2	3	0822.5	0826.2	3				IIIG
			WEIS				0828.3	0831.8	2				IIIG
			DURN	1047.0	1047.2	2	1047.0	1047.2	1				IIIG
			DURN	1054.0	1058.5	3	1054.0	1059.5	3				IIIGG
			WEIS				1054.2	1100.7	3				IIIG
			WEIS				1055.3	1124.0	3				IIH B
			DURN	1055.3	1058.5	3	1055.3	1059.5	3				II
	1015	2315	SGMR				1103.2	1104.3	2				V
			WEIS				1143.0	1208.0-	2				CONT
			DURN				1218.1	1218.4	3				IIIG
			WEIS				1218.2	1218.6	3				IIIG
			DURN	1225.5	1225.6	2	1225.5	1225.6	2				IIIG
			WEIS				1233.7	1235.3	2				IIIG
	1301	2352	HARV				1334	1335	1				IIIG
			HARV				1455		2				IIIB
			SGMR				1457.0	2315.0	1				CONT
			HARV				1510	1515	3	1510		2	IIIG
			HARV				1531		1				IIIB
			HARV				1549	1552	2				IIIG
			WEIS				1608.3	1609.3	2				IIIG
			HARV	1608		1	1608	1610	2	1610		2	IIIG
			WEIS				1610.3	1611.2	3				IIIG
			WEIS				1616.0	1617.5	3				IIIG
			WEIS				1628.4	1629.7	3				IIIG
			HARV				1629	1630	3	1629	1630	3	IIIG
			SGMR				1717.1	1718.0	3				V
			HARV				1717	1718	3	1717	1718	3	IIIG
			WEIS				1727.1	1727.7	3				IIIG
			HARV				1750		3	1750		3	IIIG
			HARV				1817		2				IIIB
			SGMR				1827.3	1827.9	3				V

SOLAR RADIO EMISSION
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APRIL 1978

APR 1978	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	
10			HARV	1827		2	1827		3	1827		3	IIIG
			SGMR				1850.7	1851.0	3				V
			HARV				1850	1851	3	1850	1851	3	IIIG
			HARV				1906		2	1906		2	IIIB
			HARV				1913	1924	3	1913	1924	3	IIIG
			HARV				1936	1939	3	1936	1939	3	IIIG
			HARV	1957		1	1954	1957	3	1954	1957	3	IIIGG,V
			HARV				2030	2031	2				IIIG
			SGMR				2101.4	2101.9	3				V
			HARV	2101		3	2101	2104	3				IIIG
			HARV				2202		2				IIIB
			HARV				2228		2				IIIG
			HARV				2325	2329	3				IIIG
			HARV	2348	2351	1	2350	2352	1				IIIG
	2129	2400	MANI							2351.7	2351.9	1	III
11	0000	1000	MANI							0300.7	0300.9	2	III
	0517	1559	WEIS				0520.0	1656.5	2				IIIN
	0543	1755	DURN				0543 E	1755 D	1				I
			WEIS				0604.8	0607.5	3				IIIG,V
			MANI							0605.0-	0606.3	1	III
			DURN	0605.4	0605.8	3	0604.9	0605.8	3				IIIGG
			DURN	0635.4	0635.5	2							IIIG
			DURN	1023.2	1023.2	1							III,RS
			DURN				1042.1	1042.3	1				IIIG
	1013	2316	SGMR				1229.6	2208.5	2				CONT
			WEIS				1331.7	1432.8	2				IIIG
			WEIS				1334.1	1335.7	3				IIIG
	1300	2345	HARV				1341	1342	1				I
			HARV				1344	1346	2				IIIG
			WEIS				1349.0	1521.0	3				IV, P
			DURN	1349.0	1402.0	3	1351.0	1402.0	3				II
			DURN	1349.0	1620.0	3	1349.0	1620.0	3				IIIG,N,RS
			HARV	1350	1417	3	1351	1417	3				IV
			HARV	1350	1407	3							IIIN
			DURN	1355.0	1620.0	3	1400.0	1620.0	3				IV
			WEIS				1358.7		3				II
			SGMR				1358.8	1432.0	3				II
			HARV				1359	1425	3				II
			HARV				1401	1438	1				IN
			WEIS				1404.3	1433.0	3				IV, P
			HARV				1406	1413	3	1406	1413	3	IIIGG,RS
			WEIS				1436.4	1450.4	3				IIIGG,V
			HARV	1436	1441	1	1436	1452	3	1436	1449	2	IIIGG
			SGMR				1437.9	1443.9	2				IV
			SGMR				1447.0	1448.8	2				IIIG
			WEIS				1533.2	1536.7	3				IIIG,RS
			HARV	1537		1	1533	1536	2	1533		1	IIIG
			HARV				1549		2				IIIB
			HARV				1555		1				IIIG
			HARV	1622	1623	1							IIIG
			HARV				1626		1				IIIB
			HARV				1632		1				IIIB
	1614	1729	WEIS				1633.8	1639.7	3				IIIG,VU
			SGMR				1633.9	1639.2	3				V
			DURN				1634.4	1634.6	3				IIIG
			HARV				1634	1640	3	1634	1639	3	IIIGG
			DURN	1637.1	1637.1	3							III
			HARV				1642	1648	1				IIIN
			DURN	1655.5	1656.0		1654.8	1656.0	2				IIIGG
			HARV	1656		1	1655	1656	1				IIIG
			HARV				1708	1709	1				IIIG
			HARV				1748	1750	3	1748	1750	3	IIIGG
			HARV				1756		1				IIIB
			HARV				1801	1802	1				IIIG
			HARV				1811	1812	2				IIIG
			HARV				1820	1821	2				IIIGG
			HARV				1835	1836	2				IIIG
			HARV	1854		1	1851	1858	2	1851	1858	2	IIIGG
			HARV				1903		1				IIIB

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
11			SGMR				1911.4	1912.5	2				IIIG
			HARV	1912		3	1911	1913	3	1911	1913	3	IIIGG
			HARV				1924	1941	2	1924	1941	2	IIIN
			HARV				1953	2005	3	1953	2005	3	IIIN
			HARV	2015		2							IIIG
			HARV				2018	2021	3	2018	2021	3	IIIG
			SGMR				2024.7	2026.3	3				V
			HARV				2025	2026	3	2025	2026	3	IIIG,V
			SGMR				2028.9	2102.1	3				IIIG
			HARV				2028	2030	3	2028	2030	3	IIIG,V
			HARV	2035		1	2032	2037	3	2032	2037	3	IIIGG
			HARV	2046	2121	2	2042	2121	2	2042	2121	2	IIIN
	2110	2400	MANI										
			HARV				2150		1				IIIG
			SGMR				2154.2	2154.8	3				V
			HARV	2154		3	2154		3	2154		3	IIIG,V
			HARV				2208	2314	2	2208	2217	2	IIIN
			HARV	2344		2	2344	2345	2				IIIG
12	0000	1004	MANI							0023.8	0024.0	1	III
			MANI							0202.7	0203.0	1	III
			MANI							0206.5	0206.8	1	III
			MANI							0222.8	0223.1	1	III
			MANI							0236.3	0236.5	1	III
			MANI							0303.2	0303.4	1	III
			MANI							0309.8	0310.0	1	III
			MANI							0327.8	0328.4	1	III
			MANI							0426.5	0426.8	1	III
			MANI							0435.7	0435.9	1	III
			MANI							0507.4	0507.6	1	III
	0616	1729	WEIS				0529.5	1721.0	2				IIIN
			WEIS				0544.8	0545.9	3				IIIG
	0530	1756	DURN				0546.0	0546.4	3				IIIG
			WEIS				0632.5	0632.7	3				IIIB
			WEIS				0636.2	0637.4	3				IIIG,U
			DURN				0637.3	0638.6	2				IIIG
			WEIS				0712.5	0712.6	3				IIIB
			DURN	0740.3	0742.9	3	0740.3	0741.5	3				IIIG
			WEIS				0740.4	0742.6	3				IIIG
			DURN	0740.5	0741.2	3	0740.5	0741.2	3				V
			WEIS				0757.0	0759.4	3				IIIG
			DURN	0758.7	0800.4	3	0758.7	0800.4	3				IIIGG
			WEIS				0907.5	0911.0	3				IIIG
			DURN	0908.7	0914.5	1	0908.7	0912.1	2				IIIGG,RS
	1011	2317	SGMR				1309.4	1323.0	1				IIIS
	1301	2345	HARV				1310	1323	1				IIIN
			SGMR				1501.4	1501.8	1				III
			HARV				1501		1				IIIG
			SGMR				1526.8	2317.0	2				IIIS
			HARV				1526	1549	2				IIIN
			WEIS				1547.9	1548.2	2				IIIG,U
			HARV				1618	1705	2				IIIN
			DURN	1719.5	1721.4	1	1719.5	1721.4	3				IIIGG
			HARV				1719	1721	2				IIIGG
			DURN				1721	1756 D	1				I,DC
			DURN	1735.6	1737.9	3	1736.1	1737.9	3				IIIG
			HARV	1736	1739	2	1737	1741	1				IIIG
			HARV				1741	1743	2				II
			HARV				1744	1834	2				IIIN
			DURN	1754.2	1754.3	1	1754.2	1754.3	1				IIIG
			HARV				1850	1952	2				IIIN
			HARV				1956		3				IIIG,V
			HARV				2009	2012	3				IIIG
			HARV				2017	2023	3				IIIGG
			HARV				2024	2041	1				IIIN
			SGMR				2026.9	2027.2	3				III
			HARV				2027		3				IIIB,V
			SGMR				2036.1	2036.5	3				III
			HARV				2036		3				IIIB,V
			HARV				2111	2344	2				IIIN

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
12	2131	2400	MANI							2242.9	2243.8	1	IIIG
			HARV				2242	2244	3				IIIGG
			MANI							2324.0	2327.4	1	IIIG
			HARV				2324	2327	3				IIIGG
			MANI							2354.0	2354.2	1	III
13	0000	0958	MANI							0002.0	0003.0	1	IIIG
			MANI							0033.2	0038.4	1	IIIG
			MANI							0122.2	0123.0	1	III
			MANI							0236.0	0236.4	1	III
			MANI							0241.8	0247.3	1	IIIG
			MANI							0404.2	0408.9	1	IIIG
			MANI							0441.1	0441.3	1	III
			MANI							0447.2	0449.0	1	IIIG
			MANI							0626.2	0627.0	1	III
			MANI							0705.8	0708.5	1	III
	0714	1421	WEIS				0800.5	1627.0	2				IIIN
			WEIS				0824.0	0825.3	3				IIIGG
			MANI							0824.8	0825.0	1	III
			WEIS				0911.0	0915.0	3				IIIGG,V
	0530	1756	DURN				0913.3	0914.0	2				IIIG
			MANI							0913.6	0913.8	1	III
			WEIS				0929.6	0933.8	2				IIIG,V
			WEIS				0943.8	0950.1	3				IIIG,V,RS
			DURN				0944.1	0944.7	3				IIIG,RS
			DURN	1005.4	1005.4	3	1005.4	1005.4	3				IIIG
			WEIS				1042.0	1044.7	3				IIIG,V
			WEIS				1106.0	1108.3	3				IIIG,V
			DURN				1107.1	1107.3	3				IIIG
			WEIS				1140.0	1142.6	3				IIIG
	1010	2319	SGMR				1141.4	2319.0	2				IIIS
			WEIS				1153.6	1158.0	3				IIIG
			WEIS				1201.7	1205.3	3				IIIG,V
			WEIS				1220.5	1233.0	2				IIIG
			WEIS				1231.5	1233.1	3				IIIG
			SGMR				1231.6	1233.1	3				III
			WEIS				1256.7	1257.9	3				IIIG
			WEIS				1310.3	1320.0	3				IIIG
			SGMR				1310.4	1313.0	3				V
	1300	2345	HARV				1310	1337	2				IIIN
			DURN	1311.3	1313.5	2	1311.3	1314.1	3				IIIGG
			WEIS				1404.3	1409.3	3				IIIGG
			DURN				1404.6	1406.0	3				IIIG
			HARV				1404	1409	2				IIIGG
			HARV				1416		2				IIIB
			DURN				1417.1	1417.1	3				IIIB
	1435	1732	WEIS				1550.3	1554.5	3				IIIG
			HARV				1551		2				IIIG
			HARV				1628		1				IIIG
			HARV				1639		3				IIIG
			DURN	1657.8	1658.0	1							IIIG
			HARV	1658		1							IIIG
			HARV				1722	1741	2				IIIN
			HARV				1839		1				IIIG
			HARV				1908	2117	2				IIIN
	2118	2400	MANI										
			HARV				2207	2326	2				IIIN
			HARV	2258		2							IIIG
14	0000	1000	MANI							0028.5	0028.9	1	III
			MANI							0158.4	0202.2	1	IIIG
			MANI							0325.0	0327.7	1	IIIG
			WEIS				0515.5	1703.0	2				IIIN
	0513	1733	WEIS				0523.0	1724.0	2				IN
	0526	1759	DURN				0526 E	1759 D	1				I,DC
			DURN	0555.9	0556.0	1	0555.9	0556.0	1				IIIG
			WEIS				0635.5	0637.1	3				IIIG
			WEIS				0839.3	0850.5	3				IIIGG,V
			MANI							0839.6	0844.3	1	IIIG
			DURN	0841.8	0842.6	3	0841.8	0842.6	3				IIIG

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APRIL 1978

APR 1978	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	
14			WEIS				0931.9	0932.7	3				IIIG
			WEIS				1032.4	1043.0	3				IIIGG,V,RS
	1008	2320	SGMR				1033.2	1037.7	3				V
			DURN				1033.3	1038.1	3				IIIGG,RS
			WEIS				1101.0	1118.0	3				IIIGG,V
			SGMR				1102.3	1112.3	3				V
			DURN	1103.4	1115.3	2	1103.5	1115.3	3				IIIGG,RS
			SGMR				1112.3	2320.0	3				CONT
			WEIS				1229.4	1243.5	3				IIIGG
	1301	2345	HARV				1301	2343	2				I
			HARV				1315	2326	2				IIIN
			WEIS				1358.7	1403.3	3				IIIGG
			DURN	1400.7	1401.1	3	1400.7	1401.0	3				IIIGG
			HARV	1401		2	1359	1404	2				IIIGG
			HARV				1633	1638	2				IIIGG
			DURN	1634.1	1634.3	1	1634.1	1634.3	3				IIIG
			WEIS				1642.9	1648.3	3				IIIGG
			WEIS				1705.1	1706.7	3				IIIG
			HARV				1705	1706	2				IIIG
			HARV				1847	1853	2				IIIGG
			HARV				2036	2037	3				IIIG
			HARV				2205	2208	3				IIIGG
	2134	2400	MANI							2206.8	2207.2	1	III
15	0000	1006	MANI							0342.0	0342.2	1	III
	0509	1200	DURN	0509 E			0509 E		2				I,DC
			WEIS				0512.0	1644.5	2				IN
			WEIS				0513.0	0935.0	2				CONT
	0511	0935	WEIS				0516	1653.5	2				IIIN
			WEIS				0529.5	0532.7	3				IIIGG,RS
			DURN	0529.5	0531.1	3	0529.5	0531.1	1				IIIGG,RS
			WEIS				0630.1	0646.0	3				IIIGG,V
			DURN	0630.7	1200 D	3							DCIM,N
			DURN	0630.7	0658.0	3	0630.7	0658.0	3				IIIGG,N
			MANI							0631.0	0639.2	1	IV
			WEIS				0650.0	0657.0	2				IIIGG
			DURN	0812.0	0818.0	3	0812.2	0818.0	3				IIIGG
			WEIS				0812.3	0817.5	3				IIIGG
			DURN				0858.4	0858.8	1				IIIG
	1007	2321	SGMR				1007.0	2321.0	1				CONT
			DURN				1009.2	1012.4	2				IIIGG
	1011	1734	WEIS				1051.8	1052.4	2				IIIG
			DURN	1052.0	1052.2	2	1052.0	1052.0	2				IIIG
			SGMR				1052.0	1052.4	3				V
			DURN	1114.5	1117.6	2							IIIGG
			DURN	1145.8	1150.7	3							IIIGG
			WEIS				1145.9	1150.8	3				IIIG,V
			SGMR				1146.0	1151.0	3				V
			WEIS				1225.8	1239.3	2				IIIGG
	1300	2345	HARV				1300	2330	2				I
			HARV				1430	2343	1				IIIN
	1438	1801	DURN				1438 E	1801 D	1				IG,DC
			SGMR				1447.0	1456.3	3				V
			WEIS				1454.2	1456.3	2				IIIG
			HARV				1454	1456	2	1455	1456	2	IIIG
			HARV				1602	1631	3	1602	1631	3	IIIGG
			WEIS				1606.5	1625.5	3				IIIGG
			DURN	1612.7	1615.4	2							DCIM
			WEIS				1612.8	1613.2	2				IIIG
			HARV				1653		3	1653		3	IIIB
			HARV				1852	1854	2	1852	1854	2	IIIGG
			HARV				1924		3	1924		3	IIIG,V
			HARV				1932	1935	3	1932	1935	3	IIIGG
			HARV				2121	2126	2	2122	2124	2	IIIGG
			HARV				2132	2139	2	2132	2138	2	IIIGG
			HARV	2157	2158	2	2158		3	2158		3	IIIG
			HARV				2341	2343	2	2342	2343	1	IIIGG
	2123	2400	MANI							2342.3	2342.7	1	III
16	0000	1003	MANI							0144.8	0145.2	1	III

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APRIL 1978

APR 1978	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	
16			MANI							0355.4	0355.7	1	III
	0508	1802	DURN				0508 E	1802 D	2				I,DC
	0505	1736	WEIS				0520.5	1453.0	2				IIIN
			MANI							0702.8	0703.0	1	III
			WEIS				0919.0	0926.5	3				IIIGG,V
			DURN	0919.4	0924.0	3	0919.4	0924.0	3				IIIGG,DCIM
			MANI							0919.5	0920.2	1	III
			DURN	0921.1	0922.5	3	0921.1	0923.0	3				II
			WEIS				0921.2	0022.3	2				II
			WEIS				1035.0	1706.0	2				IN
	1005	2322	SGMR				1234.0	1238.0	1				IIIG
			SGMR				1304.0	1500.0	1				IIIS
	1301	2351	HARV				1316	2351	1				IN,W
			SGMR				1500.0	2322.0	1				CONT
			HARV				1832	2349	1	1832	1917	1	IIIN
	2134	2400	MANI										
17	0000	1002	MANI										
	0506	0614	WEIS										
	0507	1803	DURN	0507 E	1803 D	1	0507 E	1803 D	2				I,DC
	0748	1737	WEIS				0755.0	1530.0	2				IN
			DURN	1031.5	1031.6	2	1031.5	1031.6	2				IIIG
			WEIS				1041.0	1313.2	2				IIIN
	1003	2323	SGMR				1058.8	1100.1	1				IIIG
			SGMR				1100.1	2323.0	1				CONT
			SGMR				1236.0	1236.6	2				III
			WEIS				1433.8	1434.3	3				IIIG
			SGMR				1434.1	1434.4	3				IIIG
	1301	2345	HARV				1434		2	1434		2	IIIG
			WEIS				1518.8	1519.2	2				IIIG
			HARV				1519		1	1519		1	IIIG
			HARV				1616		1	1616		1	IIIB
			DURN				1658.9	1659.4	2				IIIG
			HARV				1711	1736	1				IN,W
			HARV				1717	1730	1	1717	1730	1	IIIN
			HARV				1855	1903	1	1855	1903	1	IIIG
			HARV				1906	2250	2				I
			HARV	1906	1909	2	1906	1913	2	1906	1913	2	IIIGG
			HARV				1929	2023	2				IIIN
	2135	2400	MANI										
18	0000	1002	MANI							0109.1-	0121.7	2	IIIG
			DURN				0507 E	1805 D	1				IS
	0504	1423	WEIS				0600.0	1716.0	2				IIIN
			WEIS				0808.5	0811.7	3				IIIGG
	0508	1804	DURN				0809.3	0809.5	3				IIIG
			WEIS				1013.7	1014.7	3				IIIG
	1002	2324	SGMR				1013.9	1104.8	2				IIIS
			SGMR				1244.8	1249.0	2				IIIG
			WEIS				1247.0	1249.7	2				IIIGG
			SGMR				1340.6	1345.0	2				IIIG
			WEIS				1343.0	1344.0	3				IIIG
			DURN				1344.8	1344.9	3				IIIG
	1301	2345	HARV				1345		1				IIIB
			WEIS				1347.5	1353.7	3				IIIGG
			SGMR				1348.5	1356.0	3				IV
			HARV				1349	1351	1	1349	1351	1	IIIG
			DURN				1350.7	1350.8	3				IIIG
			SGMR				1430.2	2029.0	2				IIIS
	1444	1738	WEIS										
			HARV				1535	1935	2	1535	1935	2	IIIN
			DURN				1628.1	1628.1	2				III
			HARV				1740	1745	2	1740	1745	2	IIIG
			DURN				1750.7	1750.7	2				III
			HARV				1854	1911	3	1854	1911	3	IIIGG
			SGMR				1918.8	1923.1	3				IIIG
			HARV				1919	1928	3	1919	1928	3	IIIGG
			HARV				2029		2	2029		2	IIIB
	2152	2400	MANI										
19	0000	1002	MANI							0325.3	0325.7	1	III

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APR 1978	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
19	0504	1740	WEIS				0544.0	0549.7	3				IIIGG
			MANI							0544.1	0545.0	1	III
	0507	1805	DURN				0544.2	0544.9	2				IIIG
			WEIS				0555.3	0615.0	2				II
			WEIS				0810.7	0811.1	2				IIIGG
			WEIS				0853.0	0853.5	1				IIIG
			WEIS				0952.8	0953.0	1				IIIB
			WEIS				1421.3	1422.2	2				IIIG
	1301	2345	HARV				1422		1				IIIG,W
			WEIS				1453.2	1453.5	1				IIIB
			WEIS				1455.2	1456.3	1				IIIG
			WEIS				1459.6	1500.3	2				UNCL
			HARV				1500	1501	1				I
			WEIS				1526.8	1527.0	1				IIIB
			WEIS				1536.5	1536.7	1				IIIB
			WEIS				1650.5	1650.7	2				IIIG
	1000	2325	SGMR				1650.8	1650.9	1				III
			HARV				1651		2	1651		2	IIIB
			HARV				2001		2	2001		2	IIIB
	2126	2400	MANI										
20	0000	1009	MANI										
	0542	1806	DURN										
	0503	1011	WEIS				0628.0	0628.7	2				IIIG
			WEIS				0655.0	0657.0	2				IIIB
	0959	2326	SGMR										
	1018	1741	WEIS										
	1301	2345	HARV				1854		1				IIIB,W
			HARV				2103		1	2103		1	IIIB,W
	2134	2400	MANI										
			HARV				2305		1				IIIG
21	0000	1000	MANI										
	0500	1727	WEIS				0619.3	1423.0	1				IIIN
			WEIS				0724.3	0727.8	3				IIIGG
			WEIS				0729.5	0732.2	2				II
			WEIS				0735.1	0739.5	3				IIIGG,RS
			WEIS				0749.5	0755.5	2				III,RS
			WEIS				0934.7	0935.8	2				IIIG
	1301	2345	HARV				1832	1834	1	1832	1834	1	IIIG
	0957	2328	SGMR				1837.5	1840.0	3				IIIG
			HARV				1837	1840	3	1837	1840	3	IIIGG
			HARV				1845	1848	2	1845	1848	2	IIIG
	2151	2400	MANI										
22	0000	1001	MANI							0053.8	0100.0	1	IIIG
	0507	1808	DURN	0759.9	0800.0	1	0759.9	0800.0	3				IIIG
	0956	2329	SGMR				1301.4	1301.6	1				III
			DURN				1339.5	1339.5	2				III
	1301	2345	HARV				1543		1				IIIB
			DURN	1550.3	1550.5	3	1550.3	1550.5	3				IIIG
			HARV	1550		1							IIIG
			HARV				1645		1	1645		1	IIIG
			HARV				1724	1726	2	1726		2	IIIG
			SGMR				1725.9	1726.1	1				III
			HARV				1738	1739	2	1738	1739	2	IIIG
			HARV				1754		1	1754		1	IIIB,W
			SGMR				1807.2	1813.9	2				IIIG
			HARV				1807	1813	3	1807	1813	3	IIIG,V
			HARV	1816		2	1816		1				IIIG
			HARV				1852	1853	1	1852	1853	1	IIIG
			HARV				1909		1	1909		1	IIIB,W
			HARV	1930		1							IIIG
			HARV	1935	1937	2	1937		1				IIIG
			HARV				2000		1				IIIB,W
			HARV				2036		1				IIIG
			HARV				2045		1	2045		1	IIIB,W
			HARV				2105		1	2105		1	IIIB,W
			HARV				2135		1				U,W
	2136	2200	MANI										

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APRIL 1978

APR 1978	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	
22			HARV	2200	2202	2							IIIG
	2205	2400	MANI										
			HARV	2249	2252	1							IIIG,W
			HARV				2259		1				IIIB
23	0000	1008	MANI							0009.3	0010.2	1	III
			MANI							0120.2	0121.1	1	III
			MANI							0441.5	0442.3	1	III
	0457	1250	WEIS				0502.6	1741.0	2				IIIN
	0507	1602	DURN	0507 E	1802 D	1	0507 E	1802 D	2				I,DC
			WEIS				0538.2	0541.6	2				IIIG,U
			MANI							0539.5	0540.2	1	III
			DURN	0626.1	0633.9	3	0627.0	0627.2	2				IIIG,N
			WEIS				0632.5	1118.0	2				IN,DC
			WEIS				0713.3	0713.7	3				IIIG
			WEIS				0716.7	0717.0	2				IIIG,U
			WEIS				0754.3	0757.2	2				IIIG
			MANI							0754.4	0754.7	1	III
			DURN				0822.9	0823.4	2				IIIGG
			WEIS				0904.5	0907.2	3				IIIG,V
			MANI							0905.0	0905.6	1	III
			DURN	0910.5	0910.8	1							DCIM
			DURN	0927.4	0927.6	2	0927.4	0927.6	2				IIIG
			WEIS				0937.3	0940.6	2				IIIG
			DURN	0940.4	0940.4	3	0940.4	0940.4	3				III
			WEIS				1105.3	1105.6	3				IIIG
	0954	2330	SGMR				1105.4	1111.9	2				IIIS
			WEIS				1110.3	1112.5	3				IIIG
			DURN	1156.5	1156.6	3	1156.5	1156.6	3				IIIG
			SGMR				1207.0	2330.0	1				CONT
			DURN	1216.9	1216.9	1							III
			DURN	1219.2	1220.3	1	1219.2	1220.3	3				IIIG
			SGMR				1219.3	1310.0	2				IIIS
	1301	2345	HARV				1301	1312	1				I,W
			SGMR				1308.0	1310.1	3				IV
			HARV				1308	1309	2	1308	1309	2	IIIG
			HARV				1350	1351	1				IIIG,W
	1330	1744	WEIS				1507.2	1511.8	3				IIIG
			HARV	1507		1							IIIB
			DURN				1508.3	1508.3	2				III
			HARV				1508	1512	2	1508	1512	2	IIIG
			DURN				1511.4	1511.7	3				IIIG
			HARV				1531	1538	1				IIIN
			HARV				1618	1629	1				IIIN
			WEIS				1635.9	1637.5	3				IIIG
			HARV				1637	1639	2	1637	1639	2	IIIG,V
			HARV				1708	1721	1				IIIN
			HARV				1724		3	1724		3	IIIG
			HARV				1739	1746	2	1739	1742	2	IIIGG,V
			HARV				1818	1905	1	1818	1905	1	IIIN
			SGMR				1946.6	1949.3	3				V
			HARV				1946	1949	3	1946	1949	3	IIIGG,V
			HARV				2017	2029	2				IIIN
			HARV				2018	2045	3	2024	2045	2	II
			HARV				2018	2025	1				I
			SGMR				2019.2	2030.8	3				II
			HARV				2046	2047	1	2047		1	IIIG,W
			HARV				2131	2150	2	2131	2150	2	IIIN
	2132	2400	MANI										
			HARV				2243		1				IIIB,W
24	0000	1002	MANI							0200.0	0202.0	2	IIIG
	0458	1810	DURN				0458 E	1810 D	1				IS,W
	0455	0727	WEIS				0530.2	1740.0	2				IIIN
			WEIS				0723.3	0724.8	2				IIIG
			MANI							0724.3	0724.4	1	III
	0729	1746	WEIS										
	0953	2331	SGMR				1227.5	1227.9	1				III
			SGMR				1318.8	1600.0	1				IIIS
	1301	2345	HARV				1605		1				IIIB,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
24			HARV				1740		2	1740		2	IIIB
			HARV				2000	2002	1	2000	2002	1	IIIG
	2132	2400	MANI										
			HARV				2144	2146	1	2144	2146	1	IIIG
25	0000	0214	MANI										
	0239	1003	MANI										
	0451	0545	WEIS										
	0621	1748	WEIS				0900.9	0903.1	3				IIIG
			WEIS				0905.0	1707.3	2				IIIN
	0457	1812	DURN	1325.5	1326.8	1	1325.5	1326.8	1				IIIGG
			DURN	1334.5	1339.9	3	1334.5	1339.9	3				IIIGG,N
	1301	2345	HARV	1335	1340	1	1335	1338	1				IIIG
			WEIS				1430.1	1430.4	3				IIIG
	0951	2332	SGMR				1431.4	1431.6	2				III
			HARV				1431		2	1431		2	IIIB
			DURN	1544.6	1544.8	3							IIIGG
			HARV				1707		1	1707		1	IIIB
	2131	2147	MANI										
			HARV				2159		1				IIIB
	2202	2400	MANI										
			HARV	2208	2216	2	2209	2216	2				IIIN
			HARV				2247		1				IIIG
26	0451	1403	WEIS				0455.0	1726.0	2				IIIN
	0000	0932	MANI							0750.2	0750.4	1	III
	0456	1813	DURN				0750.3	0750.5	2				IIIG
			WEIS				0750.3	0751.3	3				IIIG
			DURN	0910.8	0911.3	2	0910.8	0911.3	2				IIIG
			WEIS	1111.5	1114.3	2							IIIG
			DURN	1111.6	1114.3	3	1111.6	1114.3	1				IIIGG
			DURN				1229.4	1229.5	3				IIIG
	0950	2333	SGMR				1338.0	2333.0	1				CONT
			DURN	1456.2	1456.3	2	1456.2	1456.3	1				IIIG
			SGMR				1521.2	1521.6	1				III
			DURN	1634.8	1635.5	2	1635.2	1635.5	2				IIIG
	1301	2345	HARV	1635		1							IIIG
			HARV				1707	1726	2	1707	1726	2	IIIN
			SGMR				1715.2	1755.0	2				IIIS
			DURN				1719.2	1719.5	2				IIIG
	1420	1749	WEIS				1719.2	1719.7	3				IIIG
			HARV	1955	1958	2	1955	1958	2	1958		1	IIIN
			HARV				2133	2136	2	2133	2136	2	IIIGG
	2231	2400	MANI										
27	0000	1001	MANI							0035.7	0036.3	1	III
	0455	1750	WEIS				0612.7	1649.0	2				IIIN
			WEIS				0812.9	0813.6	3				IIIG
	0740	1814	DURN	0813.1	0813.4	3	0813.1	0813.4	3				V
			WEIS				1010.7	1018.0	3				IIIGG,V,RS
			DURN	1012.5	1014.7	3	1012.5	1014.7	3				IIIGG
	0948	2334	SGMR				1012.9	1015.5	2				IIIG
			SGMR				1153.1	1153.4	1				III
			SGMR				1439.9	1446.5	2				IIIG
			SGMR				1604.9	1607.0	2				IIIG
			WEIS				1604.9	1607.8	3				IIIG
	1301	2345	HARV				1605	1608	2	1605	1608	2	IIIG
			HARV				1615		1	1615		1	IIIB
			HARV				1648		1	1648		1	IIIB
			HARV				1754	1757	2	1754	1757	2	IIIG
			HARV				1830	1839	1	1830	1839	1	IIIN
			HARV				1934		1	1934		1	IIIB
			HARV				1957	1958	1	1957	1958	1	IIIG
	2133	2400	MANI										
28	0000	1002	MANI										
	0453	0556	DURN										
	0448	0809	WEIS				0509.5	1000.7	1				IIIN
	0825	1752	WEIS				0516.8	1023.0	1				IN
	0634	0823	DURN	0822.1	0822.9	1	0822.1	0822.9	3				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
28			WEIS				1201.2	1203.7	3				IIIG
	0947	2335	SGMR				1205.6	1207.7	3				IIIG
			DURN	1315.5	1324	3	1318	1324	3				II
			WEIS	1315.5	1318.6	3							IV, P
			WEIS				1315.5	1322.5	3				IIIGG
			DURN	1317	1416	3	1317	1416	3				IV, F
	1103	1816	DURN				1317	1816 D	1				IS
			WEIS				1318.5	1323.0	3				IIIG
			SGMR				1318.6	1324.2	3				V
			WEIS				1319.0	1540.0	3				IV, P
			SGMR				1323.0	1337.9	3				II
			SGMR				1324.0	1338.3	3				IV
			SGMR				1338.3	1603.0	2				CONT
			DURN	1422	1800								DCIM,N
	1528	2346	HARV				1528	1554	1				IN
			HARV	1530	1717	3							IVN
			DURN				1806.0	1806.4	1				IIIG
			HARV				1806	1817	1	1815	1817	2	IIIN
			HARV				1951		1				IIIB
	2132	2400	MANI										
			HARV				2158		2	2158		2	IIIB
			HARV	2342	2346	1	2338	2346	2				IIIN
29	0000	1005	MANI										
	0452	1817	DURN				0452 E	1530	1				I,DC
	0447	1554	WEIS				0623.3	1352.5	2				IIIN
			DURN	0630.1	0630.3	1	0629.9	0630.3	3				IIIG
			DURN	0943.3	0945.7	3							IIIG,RS
			WEIS	1135.5	1149.6	3							IIIGG
			DURN	1135.5	1135.8	1	1135.5	1135.8	3				IIIG
	0945	2337	SGMR				1135.7	1144.7	2				IIIG
			SGMR				1326.4	1327.0	2				V
	1301	2345	HARV				1327		1				IIIB
			SGMR				1353.3	1353.5	1				III
	1610	1753	WEIS										
			HARV	1857	2031	3	1900	2031	3	1908	2050	3	IV
			HARV	1857	2031	3	1900	2031	3	1908	2050	3	IV
			HARV				1903	2056	3	1903	2056	3	IIIS,I
			SGMR				1906.0	1908.0	2				IIIG
			SGMR				1908.0	2015.0	3				IV
			HARV				1908	1913	2				II
			SGMR				1916.5	1925.0	3				II
			HARV				1916	1921	3	1916	1921	3	H
			SGMR				2015.0	2115.0	2				CONT
	2140	2400	MANI										
			HARV				2208	2210	2				IIIG
			SGMR				2209.3	2209.7	1				IIIG
30	0000	1005	MANI										
	0450	1818	DURN	0454.7	0455.2	3							DCIM
	0444	1754	WEIS				0501.8	1434.0	3				IIIN
			WEIS				0750.3	0750.4	2				IIIB
			WEIS				0808.8	0815.3	3				IIIGG
			DURN	0808.9	0816.8	3	0808.9	0816.8	3				IIIGG
			WEIS				0920.7	0921.2	2				IIIG
			WEIS				0948.2	0949.8	3				IIIG
			DURN	0948.9	0949.6	2	0948.8	0949.1	1				IIIG,RS
			WEIS				1003.6	1005.9	3				IIIG
	0944	2338	SGMR				1005.0	1120.0	1				IIIS
			DURN				1100	1818	1				I,DC
			DURN	1219.5	1220.5	3							IIIG
			WEIS				1256.9	1257.3	3				IIIG
			SGMR				1257.0	1257.4	1				III
			WEIS				1339.6	1340.5	3				IIIG
			SGMR				1340.3	1340.7	2				III
	1245	2245	HARV				1340		2				IIIB
			HARV	1438	1443	2							IV
			WEIS	1440.0	1631.0	3							IV, P
			DURN	1441	1632	3	1441	1632	3				IV
			WEIS				1442.5	1445.6	3				IIIGG

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	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	
30			HARV				1442	1550	2				IIIN
			HARV	1443	1606	3	1446	1620	3				IV
			WEIS				1445.5	1720.0	3				IV, P
			SGMR				1445.7	1457.8	3				IV
			HARV				1446	1502	3	1446	1502	3	II
			HARV				1446	1548	2				IIIGG,RS
			SGMR				1450.8	2338.0	2				CONT
			SGMR				1551.8	1552.5	3				IV
			HARV				1551	1552	3	1552		3	IIIGG
			HARV				1606	1735	1				I
			DURN	1633.6	1633.9	2	1633.6	1633.9	1				IIIG
			HARV				1640	1646	2	1640	1646	2	IIIN
			HARV				1736	2058	2	1736	2058	2	I
			HARV				1808	2058	2	1808	2058	2	IIIN
			SGMR				1958.1	1958.8	3				III
			HARV	1958	1959	1	1958	1959	3	1958	1959	3	IIIG
	2127	2400	MANI										
			HARV				2138	2245	2				IN
			HARV				2145	2220	2				IIIN

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

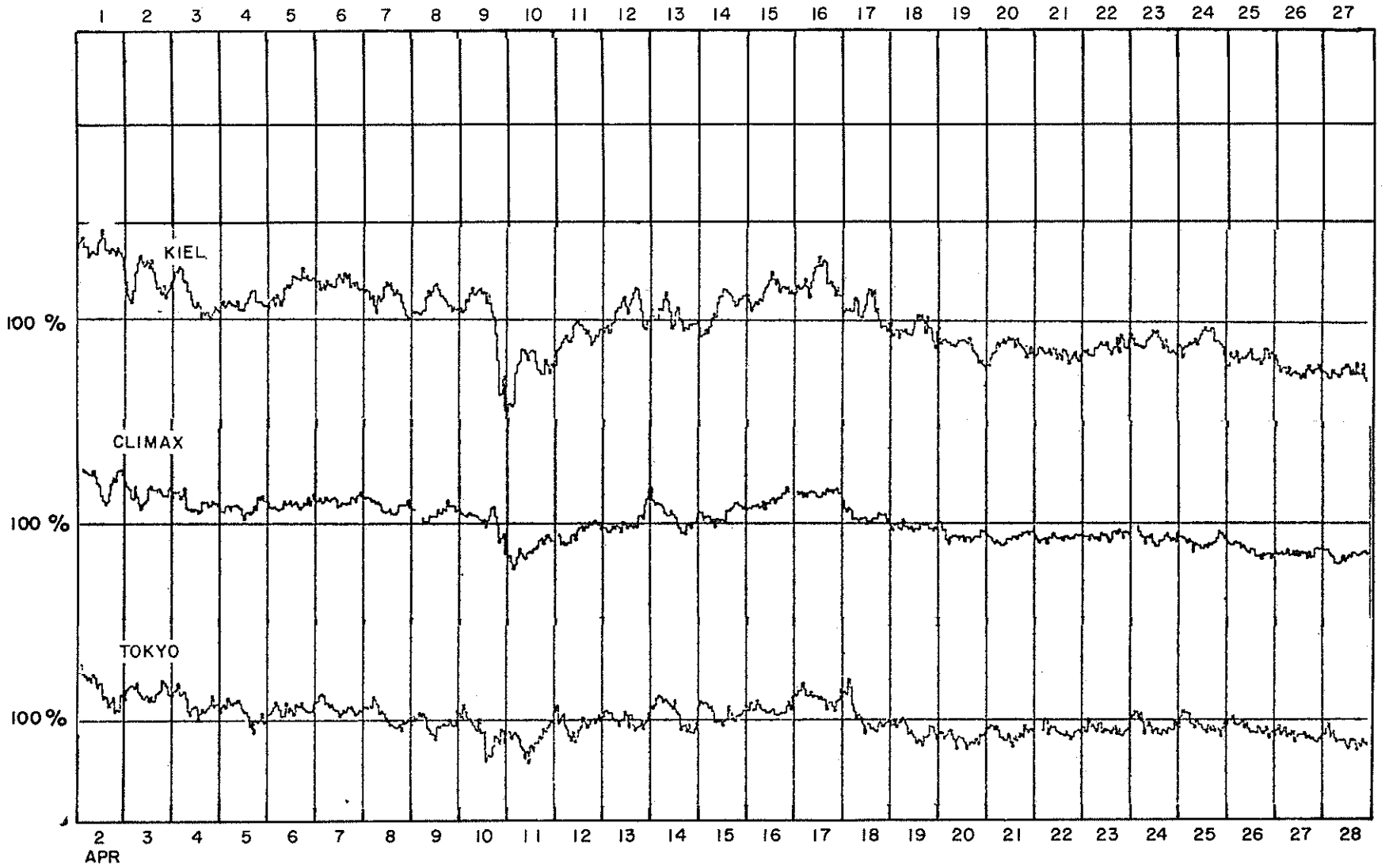
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

Note: No data from Dwingeloo Solar Radio Observatory were recorded because the radio spectrograph is being retuned.

Errata: Manila January 1978 spectral data are reprinted correctly in this SGD issue, 406 Part II, pages 70-71. Some of these data appeared incorrectly in the SGD, 403 Part I, page 136, March 1978 issue.

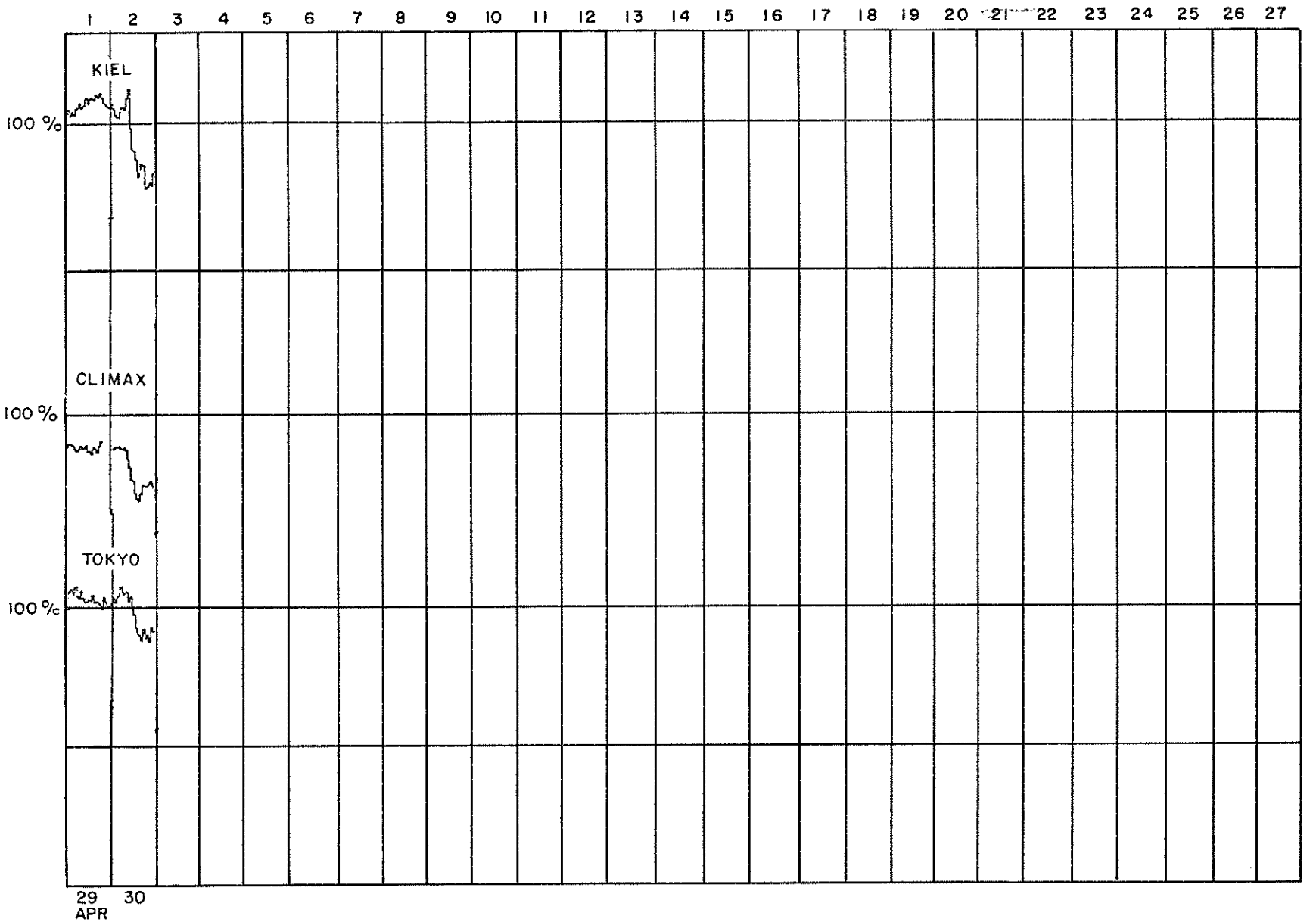
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1978 (April 1978)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1978 (April 1978)



COSMIC RAY INDICES

(Neutron Monitors)

APRIL 1978

April 1978	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	KULA Average cts/hr
1	Data not available at time of publication.	Data will be published next month -- NGSDC computer problems.	Data not available at time of publication.	Data not available at time of publication.	Data not available at time of publication.	6343.1	4303.6	3641.6	Data not processed at time of publication -- NGSDC paper tape problems.
2						6336.6	4287.2	3633.4	
3						6243.1	4233.9	3626.5	
4						6186.7	4194.0	3606.9	
5						6173.1	4173.5	3590.4	
6						6221.2	4187.0	3596.0	
7						6232.8	4203.6	3599.5	
8						6189.0	4181.9	3583.4	
9						6174.5	4152.7	3570.1	
10						6123.1	4119.0	3554.8	
11						5969.4	3996.2	3542.8	
12						6072.6	4073.3	3568.5	
13						6147.0	4111.1	3576.2	
14						6132.5	4135.8	3588.2	
15						6159.5	4146.2	3587.8	
16						6210.1	4196.5	3595.6	
17						6242.8	4232.3	3616.2	
18						6153.5	4136.2	3583.1	
19						6098.0	4090.4	3555.6	
20						6043.2	4057.6	3542.6	
21						6041.1	4046.9	3551.2	
22						6023.3	4047.1	3555.7	
23						6044.5	4054.8	3558.9	
24						6057.9	4045.1	3566.0	
25						6066.0	4030.7	3567.5	
26						6016.9	3994.9	3562.5	
27						5977.6	3983.6	3548.3	
28						5971.0	3972.3	3540.3	
29						5976.7	4500.2	3533.6	
30						5857.3	3865.3	3502.6	
MEAN						6116.1	4123.2	3502.6	

( ) 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.

Notes: Tokyo neutron monitor counting rate increased by 2.0/1.5 since the beginning of September 1977. The number of counters changed from 27 to 36. Since the scaling factor has been changed, the listed figures are nearly the same as those in and before May 1977. The level in June, July, and August, 1977 is slightly lower than before. The level in September 1977 has been adjusted, so that direct comparison with the data in and before May, 1977 is possible.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100. Deep River Scaling Factor = 300. Tokyo Scaling Factor = 256.

Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967-December 1970 and October 1975 to the present.

GEOMAGNETIC ACTIVITY INDICES

APRIL 1978

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	Q0A	4	4-	3	1+	1	2	2-	2+	19	3+	3-	3-	2-	1	3-	2+	2+	12	17	20	19	19		0.7
2		4-	4-	1	2	2+	2	3-	5-	22	3+	3-	1	2-	2+	2+	3-	4+	15	35	18	23	31		0.9
3		2	5+	5+	3+	3	4	6-	6	35-	2	4+	4	4-	3+	4-	5-	5	41	55	51	46	60		1.5
4	D4	5+	5	5-	2+	2-	5+	7	6+	38-	5-	5-	4	3-	2-	5-	5+	6-	55	73	57	50	81		1.6
5		5+	5	3-	1+	2	2-	3+	3	24+	5-	4+	3-	1+	2-	2-	3	3-	21	29	28	40	18		1.1
6	Q9A	3-	3	2	2	3	2-	2-	2-	18-	2+	3-	2-	2	2+	2-	2-	2-	9	14	13	14	13	CC	0.5
7	Q2	2-	0+	0+	1+	2-	1-	2	2+	10+	1+	0	1-	1	2-	0+	2-	2	5	10	5	8	9	CC	0.2
8	Q1	1-	2-	1	1	2-	2	2-	1+	11	1	1	1	1-	2-	2	2	2-	5	9	7	5	11	CC	0.2
9	Q3	1	3-	2	2	1+	1+	1	1+	13-	1	2+	2-	2-	1	1	1	1+	6	11	7	10	8	CC	0.3
10		1-	2-	1+	2-	4+	5-	5-	7+	26+	1-	1+	1	1	4-	4-	4	6+	36	52	26	6	73		1.4
11	D1	8-	6+	5	3	4-	6-	5+	4+	41	6	5+	5	3	3	4+	4+	4+	64	79	48	68	60		1.7
12		7-	3-	4	3+	3-	3+	4-	3-	29	5+	3-	3+	3	2	3-	3+	3-	29	32	29	41	21		1.3
13		3+	2+	2+	2+	4-	3	5-	6-	27+	3	2	2	2+	3+	3	4	5	24	36	33	16	53		1.1
14	D2	6-	4+	4+	6-	6+	4+	5+	4	40	5-	4-	4	5	6-	4-	5-	4-	51	73	56	63	65		1.6
15		5-	4-	4-	3+	3+	3	2+	2	26	4-	3	3+	3	3+	3	2+	2+	19	31	26	32	25		1.0
16	Q6A	3	2+	2	1+	1	1	2+	2	15	3-	2	2	2	1+	1-	2	2-	8	15	18	20	14		0.4
17	Q5A	2-	1+	2	1+	2-	1+	1	3	13+	1+	1+	2	1+	2	1+	1-	3-	7	14	10	11	14	C	0.3
18		4	5-	3	2-	1+	4	3+	3-	25-	4-	4	3	2	1+	3+	3	3-	19	33	20	30	24		1.0
19		2-	4-	5+	4	5	5	6-	4+	35-	1+	3+	4+	3	4+	4+	5	4-	38	51	55	32	73		1.4
20		6-	4+	3	3	2-	4-	2+	3+	27	5-	4-	3	3	2	3	2+	3-	23	38	27	43	23		1.1
21	Q8A	3-	2	2+	1+	3-	2	2+	2+	18-	2+	2-	2	1	3	2-	2+	2+	9	18	16	11	23		0.5
22	Q7A	1	2	1+	2-	3-	2	3-	3	16+	1	2-	1	2	2+	2-	2+	3-	8	16	7	8	16	C	0.5
23		3+	3-	3-	3-	4+	4+	4-	4+	28	3	3-	2+	3	3+	4+	3+	4	22	38	31	24	25		1.1
24	D5	6	6-	5	4+	5-	6-	3+	4+	39	5-	5-	5-	4	4-	4+	3-	4	48	62	61	67	57		1.6
25		5-	3	3+	3	3-	3	3-	2+	25-	4+	3-	3	3	2+	3-	3-	2+	17	23	32	32	23		0.9
26		4-	4	4	2+	3-	3	3	3	26-	4-	4-	4-	2+	3-	3-	3	3-	18	30	28	32	26		1.0
27		3+	2+	2+	3+	2+	4-	3	4	24+	3	2	2+	3-	2+	3+	3-	4	16	32	30	28	35		0.9
28		3+	3+	2+	3-	3	2	3-	1+	21-	3	3	3-	2	3-	2-	3-	2-	12	25	12	18	20		0.7
29	Q4	2+	1	1	1	2	1+	2+	2+	13+	2+	1	1	1	2-	1	2+	2+	6	13	10	7	16	C	0.3
30	D3	3+	3-	2	5	7-	8	4-	5-	36	3	2+	2-	5-	5-	6	3	4	58	85	40	33	93		1.7
																			23	35.0	27.4	31.4			0.95

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

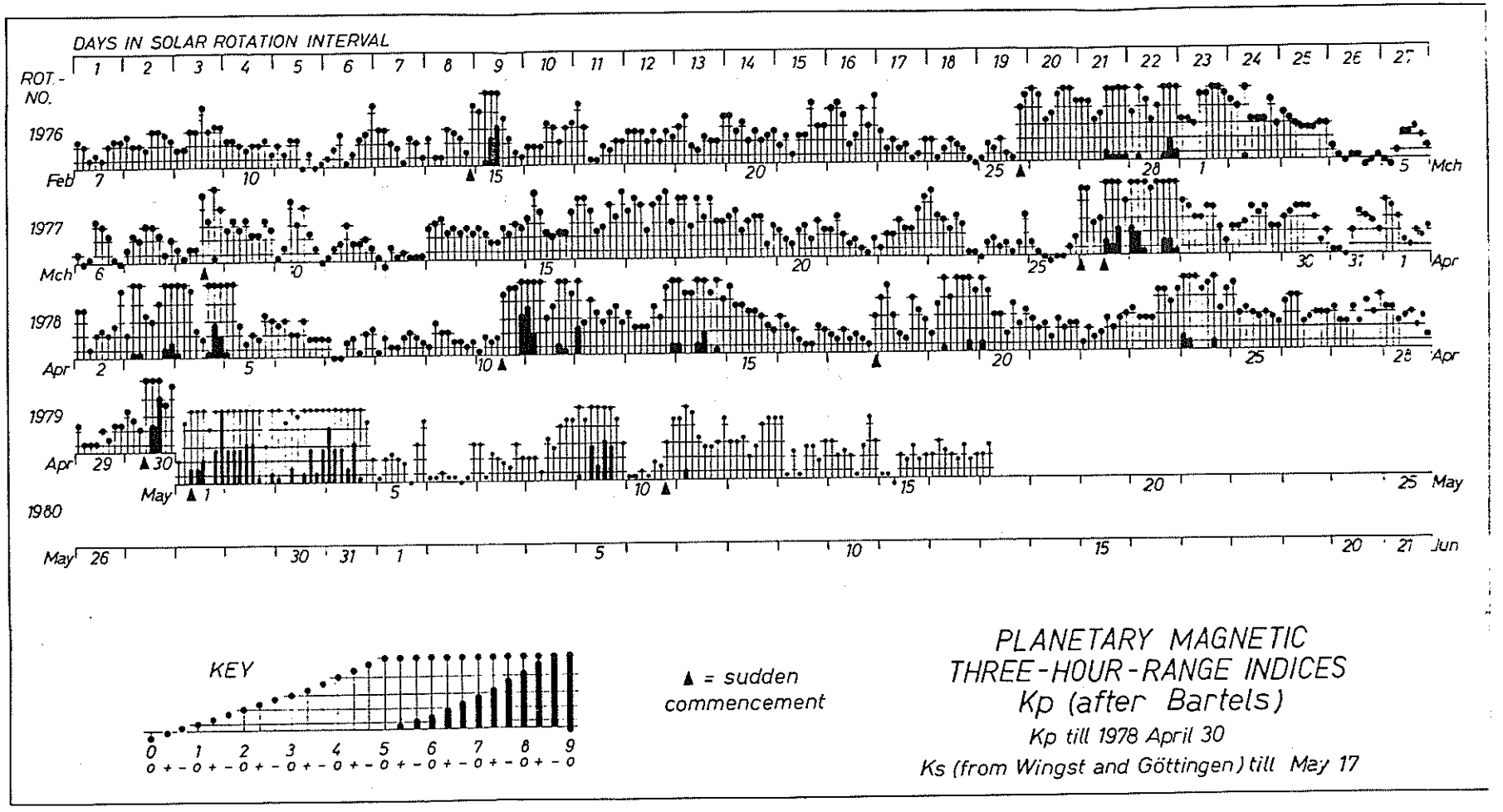
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, 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

	1977								1978			
DAY	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
1	13	9	15	6	4	4	5	6	7	15	33	12
2	66	14	11	4	6	5	6	69	8	14	27	15
3	15	6	9	7	8	10	4	9	13	14	15	41
4	19	5	8	9	6	7	8	14	89	11	3	55
5	11	7	5	40	3	8	10	18	31	17	6	21
6	10	5	28	21	4	8	7	5	34	14	7	9
7	6	6	15	17	6	3	5	3	13	7	9	5
8	3	6	14	12	8	6	3	2	19	10	20	5
9	7	6	16	20	11	2	3	3	23	16	14	6
10	9	8	14	12	13	4	9	4	21	7	12	36
11	24	4	10	28	19	12	6	38	7	5	7	64
12	19	4	4	11	6	28	18	21	4	10	3	29
13	6	6	9	11	28	14	26	16	8	8	12	24
14	8	9	18	12	10	13	42	8	3	11	10	51
15	14	3	12	11	9	19	25	5	2	48	17	19
16	22	10	27	9	7	8	14	9	14	11	24	8
17	18	8	14	29	10	12	8	12	9	10	25	7
18	11	10	7	13	6	22	6	3	12	10	24	19
19	5	10	23	24	42	28	6	3	6	12	15	38
20	10	11	29	8	44	7	4	4	3	12	9	23
21	4	6	10	5	64	5	5	6	1	12	7	9
22	7	10	11	5	63	22	3	6	3	22	13	8
23	7	10	6	6	21	6	2	4	2	6	15	22
24	8	7	7	10	12	6	2	5	6	5	6	48
25	5	5	5	27	10	4	15	5	12	12	3	17
26	2	6	3	13	18	6	19	11	12	37	49	18
27	4	7	3	14	24	62	12	6	5	42	70	16
28	7	12	4	7	9	47	5	10	9	46	17	12
29	2	7	61	6	3	9	6	8	36		14	6
30	5	9	17	5	4	9	12	5	36		16	58
31	7		8	4		6		6	23		8	
MEAN	11	8	14	13	16	13	10	10	15	16	16	23

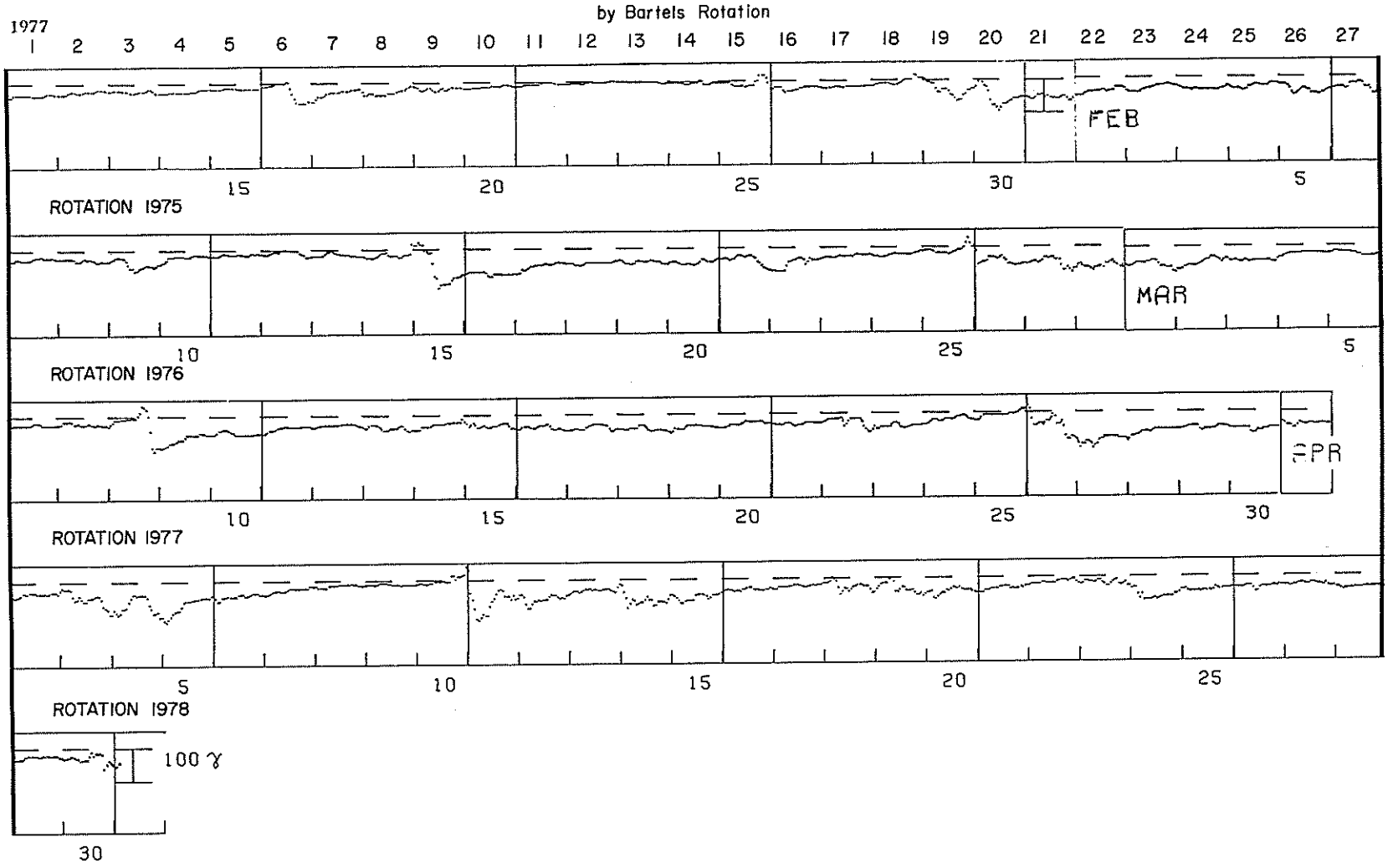
GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst

by Bartels Rotation



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.

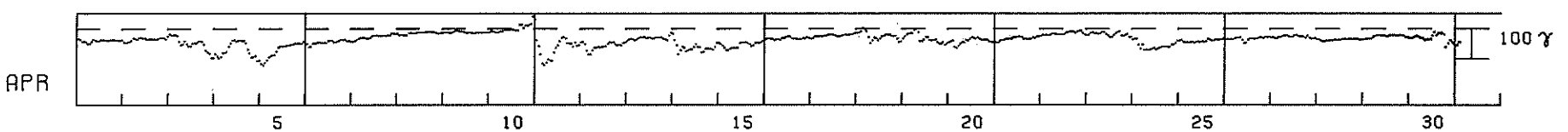
HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

APRIL 1978

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	-33	-36	-42	-41	-45	-50	-49	-42	-37	-38	-41	-40	-37	-36	-38	-39	-38	-37	-37	-36	-39	-39	-38	-37
2	-44	-48	-44	-42	-38	-33	-35	-36	-31	-29	-32	-32	-35	-34	-34	-35	-34	-37	-33	-30	-30	-29	-35	-25
3	-16	-21	-21	-19	-24	-42	-54	-51	-40	-56	-57	-58	-49	-47	-46	-41	-39	-42	-52	-71	-77	-82	-96	-95
4	-82	-93	-96	-91	-79	-79	-75	-59	-47	-38	-37	-41	-38	-38	-39	-39	-46	-68	-80	-95	-92	-89	-107	-104
5	-115	-120	-111	-104	-94	-89	-87	-85	-75	-62	-58	-58	-57	-55	-53	-54	-51	-50	-47	-48	-48	-50	-43	-39
6	-50	-60	-58	-49	-47	-46	-43	-47	-47	-46	-45	-40	-38	-39	-44	-45	-41	-38	-36	-36	-37	-40	-39	-42
7	-41	-40	-36	-32	-30	-29	-31	-33	-31	-30	-30	-32	-32	-31	-30	-31	-31	-29	-24	-24	-25	-25	-29	-28
8	-31	-32	-29	-23	-21	-21	-23	-20	-18	-19	-21	-19	-17	-18	-19	-19	-20	-22	-24	-24	-21	-20	-19	-19
9	-22	-22	-18	-14	-14	-16	-16	-18	-20	-22	-20	-20	-21	-23	-21	-22	-20	-20	-20	-20	-19	-18	-15	-17
10	-20	-21	-20	-16	-15	-12	-11	-12	-13	-11	-11	-13	-14	6	6	-5	2	3	6	9	31	22	-46	-66
11	-92	-124	-127	-119	-110	-113	-112	-87	-71	-63	-50	-39	-36	-40	-56	-58	-58	-65	-53	-64	-62	-53	-51	-58
12	-80	-92	-93	-73	-70	-70	-67	-69	-66	-67	-65	-59	-53	-53	-53	-59	-63	-60	-63	-55	-53	-48	-44	-40
13	-43	-46	-43	-38	-36	-37	-35	-39	-37	-37	-40	-39	-37	-36	-36	-37	-40	-44	-46	-31	-22	-26	-45	-63
14	-92	-79	-67	-71	-83	-79	-73	-74	-68	-59	-67	-69	-86	-84	-74	-73	-72	-74	-78	-66	-53	-54	-58	-63
15	-70	-78	-80	-73	-70	-71	-72	-69	-58	-53	-52	-52	-54	-59	-65	-62	-56	-54	-55	-51	-47	-43	-40	-38
16	-41	-42	-46	-42	-43	-45	-39	-38	-35	-33	-33	-39	-40	-41	-42	-43	-42	-39	-39	-35	-39	-40	-38	-33
17	-33	-34	-33	-32	-31	-30	-27	-26	-28	-29	-32	-34	-34	-31	-28	-26	-30	-26	-26	-24	-21	-20	-20	-16
18	-5	-16	-15	-36	-56	-48	-36	-39	-46	-46	-34	-31	-27	-27	-26	-32	-33	-31	-40	-51	-49	-39	-33	-27
19	-23	-22	-22	-12	-8	-19	-49	-51	-42	-36	-37	-44	-47	-44	-43	-51	-58	-59	-52	-61	-55	-52	-49	-47
20	-67	-71	-64	-53	-53	-53	-45	-47	-42	-37	-38	-40	-36	-41	-45	-45	-45	-44	-49	-52	-53	-53	-54	-53
21	-45	-45	-44	-40	-41	-41	-40	-36	-35	-34	-33	-36	-41	-40	-42	-42	-39	-36	-39	-34	-32	-31	-28	-28
22	-28	-29	-27	-24	-24	-26	-27	-27	-27	-25	-21	-18	-16	-16	-17	-21	-16	-13	-14	-21	-27	-30	-27	-20
23	-20	-23	-24	-23	-23	-17	-19	-24	-29	-35	-36	-29	-23	-16	-15	-31	-34	-28	-24	-35	-37	-42	-39	-40
24	-61	-73	-60	-73	-77	-77	-76	-73	-70	-76	-73	-69	-66	-66	-66	-68	-68	-60	-59	-55	-47	-47	-44	-50
25	-55	-52	-54	-51	-52	-54	-51	-50	-52	-49	-52	-48	-41	-44	-47	-46	-42	-44	-43	-41	-40	-41	-43	-43
26	-42	-42	-39	-37	-38	-36	-45	-56	-53	-43	-39	-40	-42	-39	-39	-36	-37	-39	-34	-37	-35	-37	-36	-39
27	-39	-35	-36	-31	-30	-29	-33	-36	-34	-29	-29	-33	-35	-33	-35	-38	-33	-38	-40	-39	-38	-43	-43	-47
28	-51	-47	-47	-46	-45	-47	-43	-45	-45	-44	-41	-41	-42	-42	-42	-40	-40	-41	-42	-44	-42	-42	-41	-40
29	-39	-40	-37	-32	-29	-29	-29	-31	-32	-33	-31	-29	-29	-26	-31	-30	-29	-30	-32	-35	-37	-39	-38	-36
30	-34	-30	-35	-38	-39	-45	-42	-43	-41	-30	-18	-29	-23	-22	-23	-27	-69	-56	-45	-51	-56	-63	-61	-52



PRINCIPAL MAGNETIC STORMS

APRIL 1978

OBS. 2 letter IAGA code	GEOMAGNETIC LATITUDE	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
CO	64.6N	2	21--	..	..	..	..	03(6) 04(6,7)	6	171	1330	800	05	11
NE	55.1N	2	2058	..	..	..	..	04(2,8) 05(2)	6	53	253	264	05	10
FR	49.6N	2	20--	..	..	..	..	03(8) 04(2,8) 05(1,2)	5	19	112	117	06	06
SJ	29.9N	2	2057	SC	--	+7	+2	03(7)	5	7	136	39	05	06
HD	07.6N	2	2055	SC		+ 9	- 1	03(2,4,7,8) 04(3)	4	6	130	28	04	11
GU	04.0N	2	2057	..	..	..	..	03(2)	5	10	150	30	05	09
HU	00.6S	2	1100	..	..	..	..	04(6)	6	6	353	23	05	06
PM	18.7S	2	20..	..	..	..	..	03(2,4),4(3,7)	5	6	150	70	05	09
HR	33.7S	2	2100	..	..	..	..	04(6,8)	6	36	143	131	05	09
SI	60.0N	3	05--	..	..	..	..	04(3)	6	60	530	400	05	06
WI	54.2N	3	16--	..	..	..	..	04(7)	7	45	230	125	05	06
IR	41.0N	3	0400	..	..	..	..	04(7)	6	26	151	59	05	12
GM	24.5N	3	0400	..	..	..	..	--	-	11	111	53	06	04
JP	17.3N	3	0400	..	..	..	..	--	-	9	104	38	06	04
SH	14.6N	3	0400	..	..	..	..	--	-	7	137	41	06	04
UJ	13.5N	3	0400	..	..	..	..	--	-	8	118	38	06	04
AL	09.5N	3	0400	..	..	..	..	04(6,7,8) 05(1)	5	7	124	37	06	04
AN	01.5N	3	0400	..	..	..	..	--	-	5	194	125	06	04
TV	01.1S	3	0400	..	..	..	..	--	-	5	220	..	06	04
KG	56.5S	3	0855	SC*	--	--	--	03(7,8),4(1)	6	--	--	--	04	09
HD	07.6N	4	1500	..	..	..	..	05(1)	6	6	87	19	05	23
CO	64.6N	10	1306	SC*	-14	+70	-14	11(3)	6	173	1110	500	12	13
SI	60.0N	10	1306	SC*	-10.7*	+32.9	+13.3	11(3)	7	80	780	610	12	20
NE	55.1N	10	1305	SC	4	22	3	10(8) 11(3)	7	59	361	522	13	05
WI	54.2N	10	1307	SC*	- 4 *	+86 *		10(8) 11(1)	7	56	310	135	12	04
FR	49.6N	10	1306	SC	- 4	+14	- 6	10(8)	7	31	261	112	13	03
IR	41.0N	10	1256	SC*	-02	66	11	10(8)	6	28	225	53	12	12
SJ	29.9N	10	1306	SC	+3	+14	+4	10(8)	7	16	215	60	12	04
GM	24.5N	10	1306	SC	- .8	40	- 4	--	-	9	143	53	12	04
HO	21.1N	10	1306	SC	4	23	8	14(2)	7	5	127	27	15	17
JP	17.3N	10	1306	SC	- 1.2	38	-- 9	--	-	8	141	43	12	04
SH	14.6N	10	1306	SC	- .4	33	7	--	-	6	145	32	12	04
UJ	13.5N	10	1306	SC	- .8	45	-10	--	-	7	182	43	12	04
AL	09.5N	10	1306	SC	- 1.0	33	- 8	10(8)	6	6	141	42	12	04
HD	07.6N	10	1305	SC	- .5	+37	- 2	11(1)	7	5	168	48	12	22
GU	04.0N	10	1307	SC	--	29	- 8	11(1)	7	10	170	50	12	16
AN	01.5N	10	1306	SC	- 1.7	42	23	--	-	5	233	53	12	04
HU	00.6S	10	1307	SC*	3	97	7	11(6)	7	12	589	75	12	22
TV	01.1S	10	1306	SC	- .3	33	45	--	-	3	..	..	12	04
PM	18.7S	10	1306	SC	+00.3	+29	+25	10(8)	6	9	140	70	12	12
HR	33.7S	10	1307	SC	+2	+28	+16	10(8)	6	33	122	161	12	12
GN	43.3S	10	1306	SC	+ 2.1	+27	+13	10(8) 11(1)	6	21	160	100	12	12
TO	46.7S	10	1305	SC	+ .7	+33	- 6	10(8) 11(1)	5	26	190	47	12	03
KG	56.5S	10	1308	SC*	--	--	--	10(8)	8	--	--	--	11	10
CO	64.6N	13	08--	..	..	..	..	14(4)	7	264	1540	1120	15	16
SI	60.0N	13	08--	..	..	..	..	14(5)	8	150		850	15	16
NE	55.1N	13	19--	..	..	..	..	14(5)	7	55	280	413	16	07
WI	54.2N	13	18--	..	..	..	..	13(8) 14(7)	6	40	250	85	15	05
FR	49.6N	13	12--	..	..	..	..	13(7,8) 14(1,5)	5	23	133	134	16	03
IR	41.0N	13	0400	..	..	..	..	14(5)	6	16	146	84	15	18
SJ	29.9N	13	1926	SC	+1	+14	+4	13(8)	6	06	126	59	15	05
GM	24.5N	13	1100	..	..	..	..	--	-	8	184	50	14	23
JP	17.3N	13	1100	..	..	..	..	--	-	6	169	38	14	23
SH	14.6N	13	1100	..	..	..	..	--	-	5	192	31	14	23
UJ	13.5N	13	1100	..	..	..	..	--	-	4	166	38	14	23
AL	09.5N	13	1100	..	..	..	..	14(4)	6	5	164	34	14	23
HD	07.6N	13	1924	SC	- .4	+24	- 1	14(5)	7	4	198	23	15	16
AN	01.5N	13	1100	..	..	..	..	--	-	4	210	61	14	23
HU	00.6S	13	1215	..	..	..	..	14(5)	6	8	340	69	15	20
TV	01.1S	13	1100	..	..	..	..	--	-	3	234	114	14	23
PM	18.7S	13	1925	SC	0	+14	+13	13(8)	6	5	170	60	15	09
HR	33.7S	13	1800	..	..	..	..	13(7),14(1,7)	5	22	117	73	15	12
KG	56.5S	14	09--	..	..	..	..	14(5,7)	7	--	--	--	15	03
GU	04.0N	17	2345	SC*	--	27	- 7	18(2)	5	--	110	20	18	09
SI	60.0N	17	2346	SC*	+ 2.6*	+17.1*	+ 5.2*	19(3)	7	70	660	510	20	11
NE	55.1N	17	2345	SC*	3	31	1	19(3,5,7) 20(1,2)	5	28	155	258	21	10
FR	49.6N	17	2345	SC*	+ 2	+25	- 5	19(5,6,7)	5	18	110	57	22	00
HO	21.1N	17	2345	SC	4	17	5	11(2)	8	6	241	49	18	20
HD	07.6N	17	2344	SC	- .1	+15	- 1	18(2,6)	4	4	72	15	18	22
HR	33.7S	17	2348	SC	+2	+13	+9	19(3,7),20(1)	5	19	103	93	20	12
KG	56.5S	17	2347	SC*	--	--	--	18(1,2)	4	--	--	--	18	09

PRINCIPAL MAGNETIC STORMS

APRIL 1978

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
GM	24.5N	18	1700	..	..	..	..	--	-	11	73	67	21	02
JP	17.3N	18	1700	..	..	..	..	--	-	9	96	56	21	02
SH	14.6N	18	1700	..	..	..	..	--	-	7	107	52	21	02
UJ	13.5N	18	1700	..	..	..	..	--	-	8	122	56	21	02
AL	09.5N	18	1700	..	..	..	..	19(3,7)	5	7	122	48	21	02
AN	01.5N	18	1700	..	..	..	..	--	-	6	202	78	21	02
TV	01.1S	18	1700	..	..	..	..	--	-	5	233	..	21	02
KG	56.5S	18	1712	..	..	..	..	19(6,7,8),20(1)	5	--	--	--	20	01
CO	64.6N	19	04--	..	..	..	..	19(3)	7	155	1210	620	20	18
WI	54.2N	19	04--	..	..	..	..	19(7)	6	34	155	95	20	11
IR	41.0N	19	0300	..	..	..	..	19(3,5,7),20(4)	5	18	121	38	20	20
SJ	29.9N	19	0300	..	..	..	..	19(7)	5	08	84	26	20	11
HD	07.6N	19	0300	..	..	..	..	19(7)	5	7	144	29	20	17
GU	04.0N	19	0254	..	..	..	..	19(3)	5	--	120	20	20	17
HU	00.6S	19	0047	..	..	..	..	19(6,7)	6	6	289	41	20	22
PM	18.7S	19	03..		..	..	..	19(3,5)	6	6	110	50	20	12
GN	43.3S	19	03--	..	..	..	..	19(7)	6	19	70	110	20	19
TO	46.7S	19	04--	..	..	..	..	19(4,7)	5	21	128	64	20	11
HO	21.1N	19	0656	SC	4	20	8	20(1)	6	6	59	24	21	00
CO	64.6N	23	08--	..	..	..	..	23(6) 24(2,6)	6	225	1270	1020	24	19
SI	60.0N	23	09--	..	..	..	..	24(1)	7	70	640	410	28	10
NE	55.1N	23	14--	..	..	..	..	24(2)	6	36	177	245	29	02
WI	54.2N	23	14--	..	..	..	..	24(6)	6	25	220	105	25	04
FR	49.6N	23	14--	..	..	..	..	22(6) 23(1,2)	5	27	133	65	28	13
IR	41.0N	23	0600	..	..	..	..	23(6),24(1)	6	16	170	48	25	21
GM	24.5N	23	1400	..	..	..	..	--	-	8	95	31	25	03
JP	17.3N	23	1400	..	..	..	..	--	-	7	79	41	25	03
SH	14.6N	23	1400	..	..	..	..	--	-	6	84	40	25	03
UJ	13.5N	23	1400	..	..	..	..	--	-	7	95	40	25	03
AL	09.5N	23	1400	..	..	..	..	24(6)	5	7	69	42	25	03
HD	07.6N	23	1100	..	..	..	..	24(1,6)	5	6	127	32	26	22
GU	04.0N	23	2350	..	..	..	..	24(1)	5	10	130	40	25	13
HU	00.6S	23	1113	..	..	..	..	23(5,6)	5	8	381	48	24	22
TV	01.1S	23	1400	..	..	..	..	--	-	4	139	90	25	03
PM	18.7S	23	08..	..	..	..	..	24(1,2,3,4)	5	5	120	70	25	16
HR	33.7S	23	1400	..	..	..	..	24(2)	5	22	76	65	25	09
KG	56.5S	23	14--	..	..	..	..	24(1,6)	6	--	--	--	25	04
HR	33.7S	29	2000	..	..	..	..	30(6)	6	15	136	135	30	24
CO	64.6N	30	00--	..	..	..	..	02(3)	8	447	2290	2330	04	21
SI	60.0N	30	04--	..	..	..	..	04(5)	8	--	--	--	04	20
NE	55.1N	30	0953	SC	5	44	--	02(3)	9	129	1049	968	04	23
WI	54.2N	30	0952	SC*	+ 2 *	-25 *		30(6)	8	31	365	135	30	24
FR	49.6N	30	0952	SC	- 5	+36	- 7	--	-	--	--	--		
SJ	29.9N	30	0951	SC	-1	+21	+4	30(6)	6	12	118	43	01	16
GM	24.5N	30	0951	SC	- .5	28	- 2	--	-	10	148	29	01	02
HO	21.1N	30	0941	SC	4	28	11	30(2)	5	117	71	24		
JP	17.3N	30	0951	SC	- .9	28	- 5	--	-	8	144	29	01	02
SH	14.6N	30	0951	SC	- .4	24	5	--	-	7	133	20	01	02
UJ	13.5N	30	0951	SC	- .5	34	- 7	--	-	7	169	31	01	02
AL	09.5N	30	0951	SC	- .8	25	- 7	30(6)	6	7	151	34	01	02
HD	07.6N	30	0951	SC	- .4	+27	- 3	30(6)	6	6	173	16	01	02
GU	04.0N	30	0951	SC	--	27	- 9	30(4)	5	--	90	30	01	08
HU	00.6S	30	0951	SC	1	34	7	30(6)	8	10	564	62	30	23
TV	01.1S	30	0951	SC	.1	44	53	--	-	4	202	136	01	02
PM	18.7S	30	0951	SC	+00.3	+33	+28	30(4)	6	4	100	60	30	18
GN	43.3S	30	0951	SC*	+ 9 *	- 3.2*	-10	01(8)	8	40	160	220		
TO	46.7S	30	0950	SC -	3- 3.5	+40	- 9	01(8)	7	56	300	122	03	15
KG	56.5S	30	0951	SC*	--	--	--	30(6)	7	--	--	--	01	07
IR	41.0N	30	0951	SC*	26	23	03	30(6),1(5,8),2(3,4)	7	33	296	176	02	20

Reports were received from the following observatories:

Alibag Annamalainagar College Fredericksburg Gnangara Guam Gulmarg Hermanus Honolulu Huancayo Hyderabad Irkutsk Jaipur Kerguelen Newport Port Moresby San Juan Shillong Sitka Toolangi Trivandrum Ujjain Witteveen

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

APRIL 1978

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romaná)

The meaning of the station symbols is given in the IAGA-News No. 16.
Times of ssc are mean values.

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

10 1306 A: SOD NUR WNG WIT ESK DOU VIC FUR CLF OTT MMB EBR COI TOL FRD KAK KNY SZT LMN LAS TRW CZT PAF
B: NGK HAD HUA GNA DRV

17 2345 A: SOD NUR ESK DOU VIC TOL FRD SZT LMN LAS TRW PAF
B: WNG WIT HAD CLF EBR KSA CZT
C: NGK DRV (si: A: FUR OTT HUA)

30 0951 A: SOD NUR ESK FUR COI TOL FRD SZT HUA LMN LAS TRW CZT PAF DRV
B: WNG WIT HAD VIC OTT MMB KAK KSA KNY GNA
C: NGK CLF EBR

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

08 1121 - 1128 WNG

09 0421 - 0440 MMB KAK KNY (bs: A: TRW - bps: A: HUA)

09 1225 - 1305 WNG

09 2054 - 2108 HUA

10 1054 - 1125 SOD WNG WIT NGK CLF EBR LAS

12 1733 - 1743 HUA

17 0646 - 1657 GNA

28 1314 - 1451 NGK EBR (bp: B: TOL LMN)

Very unusual events.

04 1958 b-bp CZT (+177 +196 +114) PAF (-430 -738 +392)

18 1721 si FUR (+20 -3) LAS (-29 -20 -12)

19-20 1850-0545 pc3 MMB (14s +2.20 -0.65 -0.19 nT/s)

20 0855-1100 pc3+4 DOU FUR (25-55s +0.5 +1) LAS

23 1459 bp GNA DRV (+172 -143 -208)

RADIO PROPAGATION QUALITY INDICES

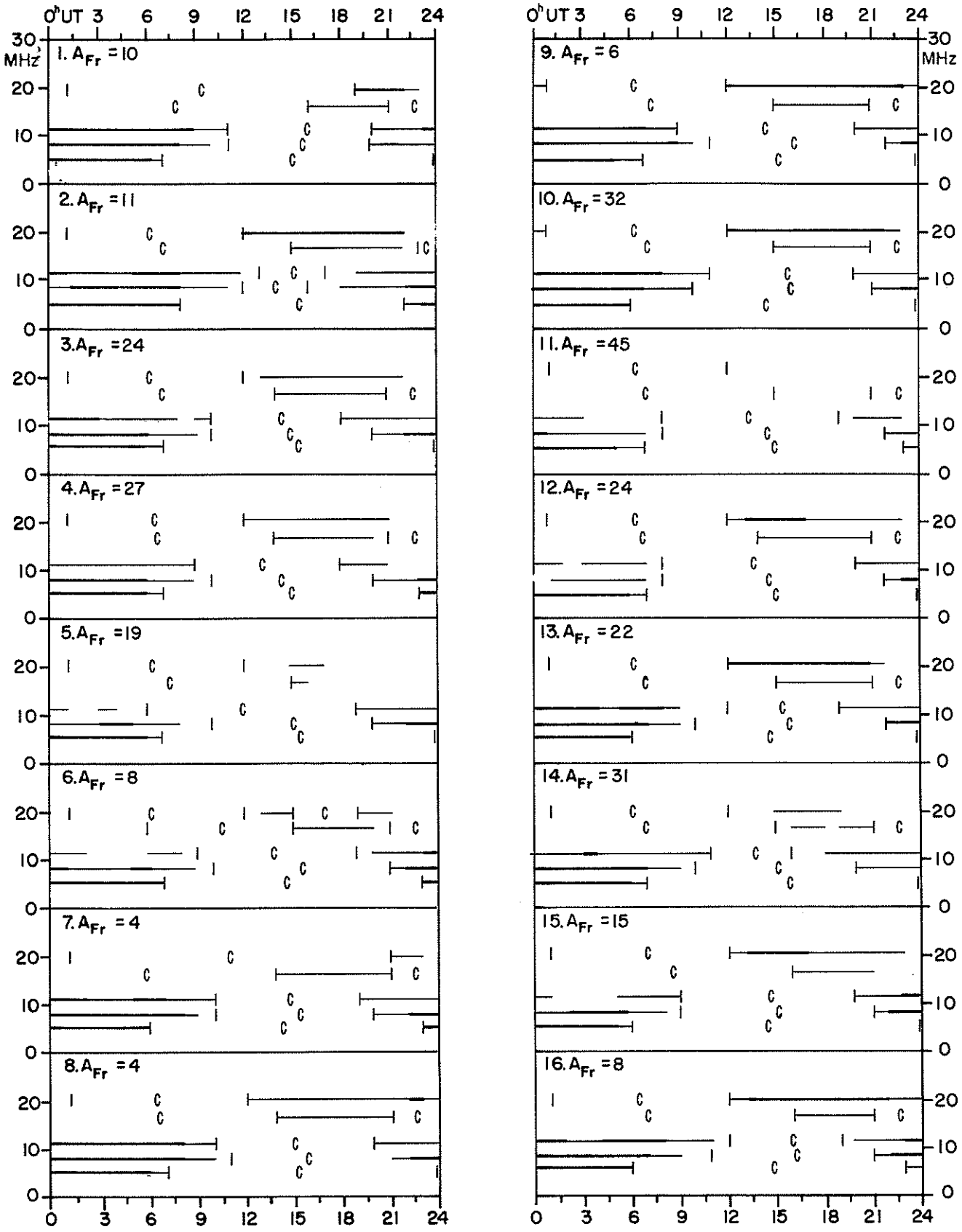
APRIL 1978

Quality indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	4.9	5.7	12.6	5.1	12.4
2	6.1	6.4	12.5	3.9	12.3
3	4.9	3.8	12.7	3.9	12.3
4	3.5	4.0	12.6	3.2	11.8
5	3.0	3.9	11.9	2.8	11.9
6	6.7	4.7	12.4	3.7	12.6
7	6.9	4.8	13.3	5.1	13.0
8	6.3	4.9	12.2	4.7	12.6
9	7.1	6.4	12.8	5.2	12.9
10	5.3	5.5	12.7	4.3	12.3
11	3.3	3.9	11.3	4.6	10.9
12	5.3	4.4	13.2	6.5	13.4
13	5.6	5.2	11.8	5.8	13.2
14	4.1	3.5	12.2	5.2	12.0
15	6.0	4.9	12.3	6.8	13.5
16	5.1	5.4	12.8	7.3	13.5
17	6.3	5.6	13.2	6.1	13.9
18	4.7	4.6	12.3	6.3	12.9
19	4.2	4.1	12.6	4.8	13.8
20	4.7	4.1	11.9	5.9	12.2
21	5.9	4.5	12.9	7.1	13.8
22	6.3	6.1	12.4	6.6	13.7
23	4.4	4.4	12.2	5.3	12.2
24	3.9	4.2	11.8	5.9	12.2
25	6.0	5.4	13.5	5.1	12.2
26	5.6	5.5	13.6	6.2	13.5
27	6.5	6.2	13.0	5.5	12.6
28	5.1	5.4	11.5	6.0	12.4
29	5.5	5.4	12.1	6.1	13.4
30	3.6	3.8	10.6	5.6	12.1
MEAN	5.2	4.9	12.4	5.4	12.7

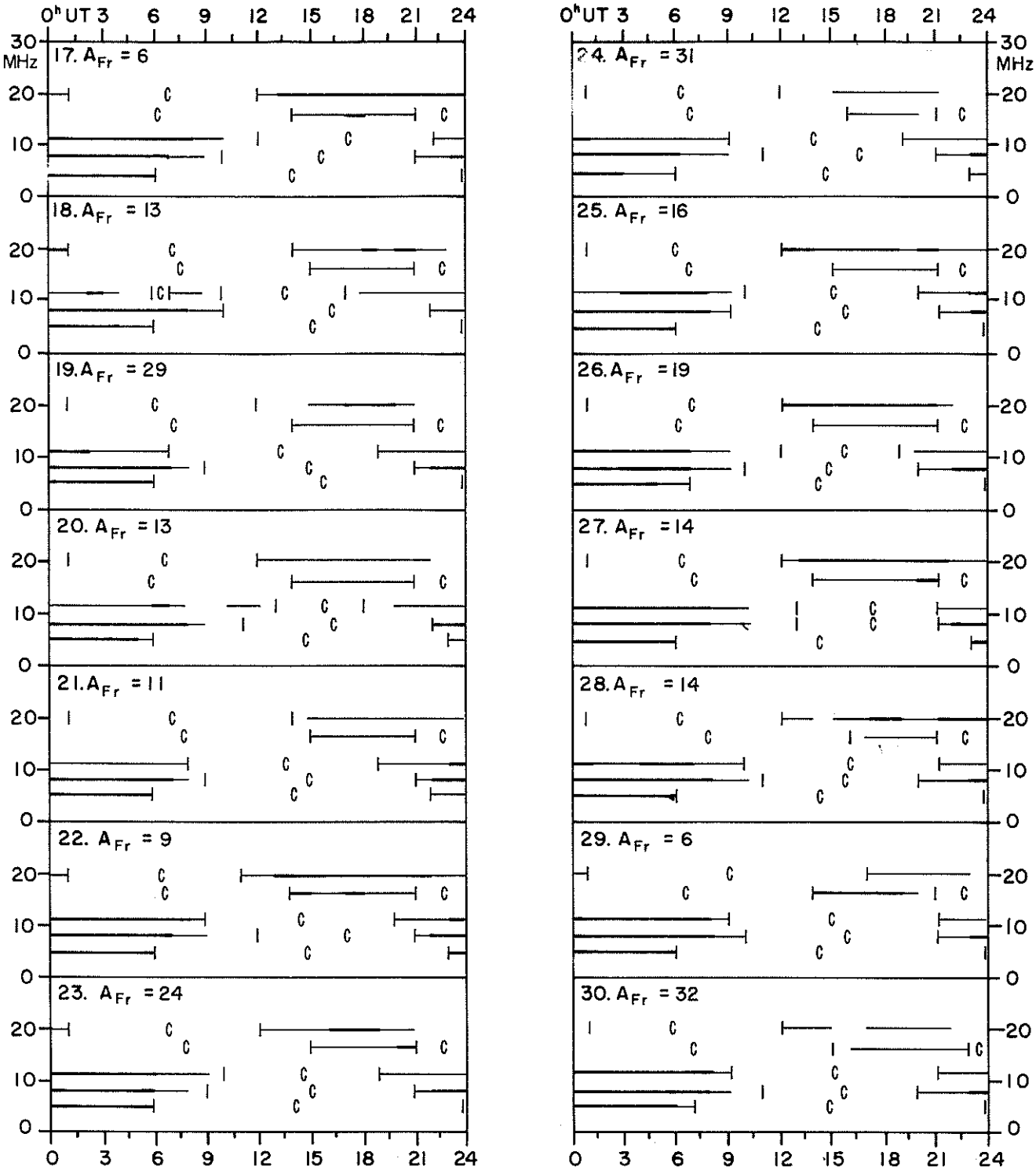
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

APRIL 1978



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

APRIL 1978



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

USCOMM-NOAA-ASHEVILLE, NC--7-78--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."