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Solar - Geophysical Data

NO. 407 JULY 1978

Part I (Prompt Reports)

DATA FOR
JUNE 1978
MAY 1978

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
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. 407

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Chief
Solar-Terrestrial Physics Division

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"398A 36" listed under 1977 Aug means that data for August 1977 were contained in *Solar-Geophysical Data* Number 398 - Part I, beginning on page 36.

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----- = no data available.
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PRESTO MESSAGES (THE RAPID REPORT OF MAJOR EVENTS).

02 June 1978, BOULDER 02/1455Z POLCAP ABSORPTION BEGAN 31/1800Z MAXIMUM 1.1 DB ABSORPTION 01/1200Z. PROTON EVENT BEGAN 02/0730Z 11 PROTONS/CM2/SEC/STER 02/0730Z MAXIMUM 19 PROTONS/CM2/SEC/STER 02/0915Z.
22 JUNE 1978, BOULDER 22/1945Z SOFLARE 2B/M2 N17E17 22/1645Z DURATION 96 MINUTES.
24 JUNE 1978, BOULDER 24/1430Z PROTON EVENT BEGAN 24/0900Z 25 PROTONS/CM2/SEC/STER AT GREATER THAN 10 MEV 24/1345Z.
26 JUNE 1978, BOULDER 26/1638Z SOFLARE 2B/M3 N14W14 26/1529Z DURATION 73 MINUTES. TENFLARE 1024 FLUX UNITS 26/1530Z IN PROGRESS 26/1638Z.

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
152	1	31	232	148	16	N18W53	2	1	0	SOFLARE 2B/M5	31	N18W53	A	SOLALERT PIANO 01
						N25W34	0	0	0	N23W50 31/1009Z		N25W34	Q	MAGNIL
						N23W63	2	0	0	DURATION 140		N23W63	Q	
						N21W08	1	0	0	MINUTES. THREE		N21W08	Q	
						S15W53	0	0	0	PARALLEL RIBBONS		S15W53	Q	
						S24E03	0	0	0	WITH UMBRAL COVER-		S24E03	Q	
						S22W84	0	0	0	AGE.		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	
153	2	1	220	145	09	N17W67	1	0	0		1	N17W67	C,A	SOLALERT
						N24W47	4	1	0			N24W47	Q	MAGQUIET
						N21W75	2	0	0			N21W75	D,A	
						N21W21	6	0	0			N21W21	D,A	
						S17W66	7	0	0			S17W66	D,A	
						S17W45	0	0	0			S17W45	Q	
						S19W33	0	0	0			S19W33	Q	
						S24E06	0	0	0			S24E06	Q	
154	3	2	164	145	43	N17W80	0	0	0	POLCAP ABSORPTION	2	N17W80	Q	SOLALERT
						N26W60	3	0	0	BEGAN 31/1800Z		N26W60	A	MAGALERT
						N22W35	1	0	0	MAXIMUM 1.1 DB		N22W35	A	
						S17W79	2	0	0	ABSORPTION 01/1200Z		S17W79	C,A	
						S17W58	0	0	0	PROTON EVENT BEGAN		S17W58	Q	
						S17W46	0	0	0	02/0730Z 11 PRO-		S17W46	Q	
						S24W05	0	0	0	TONS/CM2/SEC/STER		S24W05	Q	
						N15E08	0	0	0	02/0730Z MAXIMUM		N15E08	Q	
						S21E22	0	0	0	19 PROTONS/CM2/		S21E22	Q	
						N19E75	0	0	0	SEC/STER 02/0915Z.		N19E75	Q	
155	4	3	143	127	25	N26W72	2	0	0		3	N26W72	C,A	SOLALERT
						N22W48	0	0	0			N22W48	C,A	MAGNIL
						S16W72	0	0	0			S16W72	Q	
						S17W59	0	0	0			S17W59	Q	
						N14W05	0	0	0			N14W05	Q	
						S22E09	0	0	0			S22E09	Q	
						N17E63	0	0	0			N17E63	Q	
						S26W19	0	0	0			S26W19	Q	
156	5	4	74	115	11	N24W84	0	0	0		4	N24W84	Q	SOLNIL
						N22W63	0	0	0			N22W63	Q	MAGALERT 05/05
						S27W30	1	0	0			S27W30	E	
						S22W02	0	0	0			S22W02	Q	
						N18E51	0	0	0			N18E51	Q	
157	6	5	91	114	35	N21W75	4	1	0		5	N21W75	E	SOLQUIET
						S27W44	0	0	0			S27W44	Q	MAGALERT MINOR 06
						S22W15	0	0	0			S22W15	Q	
						N20E37	0	0	0			N20E37	Q	
						N14W03	0	0	0			N14W03	Q	
158	7	6	63	107	07	N22W88	0	0	0		6	N22W88	Q	SOLQUIET
						S27W59	0	0	0			S27W59	Q	MAGNIL
						S21W28	0	0	0			S21W28	Q	
						N19E23	0	0	0			N19E23	Q	
159	8	7	80	107	09	S26W72	5	0	0		7	S26W72	Q	SOLQUIET
						S20W41	0	0	0			S20W41	Q	MAGQUIET
						N17E11	0	0	0			N17E11	Q	
						S15W38	0	0	0			S15W38	Q	
						S12E56	0	0	0			S12E56	Q	
160	9	8	64	106	11	S26W85	3	0	0		8	S26W85	Q	SOLQUIET
						N17W03	0	0	0			N17W03	Q	MAGQUIET
						S15W54	0	0	0			S15W54	Q	
						S11E42	0	0	0			S11E42	Q	
						N18E69	1	0	0			N18E69	Q	
161	10	9	67	103	06	N13W59	0	0	0		9	N13W59	Q	SOLQUIET
						S14W68	0	0	0			S14W68	Q	MAGQUIET
						S12E30	0	0	0			S12E30	Q	
						N18E57	0	0	0			N18E57	Q	
						N18E07	0	0	0			N18E07	Q	
162	11	10	60	105	12	N14W72	0	0	0		10	N14W72	Q	SOLQUIET
						S12E16	0	0	0			S12E16	Q	MAGQUIET
						N17E43	0	0	0			N17E43	Q	
						N15E15	0	0	0			N15E15	Q	
163	12	11	100	110	12	N19W38	0	0	0		11	N19W38	Q	SOLQUIET
						N18E31	0	0	0			N18E31	Q	MAGQUIET
						N18W21	0	0	0			N18W21	Q	
						N17W00	0	0	0			N17W00	Q	
						S32E47	1	0	0			S32E47	Q	
						N17E75	0	0	0			N17E75	Q	
						N24E34	0	0	0			N24E34	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

JUNE 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
164	13	12	120	116	08	N18E14	0	0	0		12	N18E14	Q	SOLQUIET
						N17W34	0	0	0			N17W34	Q	MAGQUIET
						N17W13	14	0	0			N17W13	E	
						S32E33	2	0	0			S32E33	Q	
						N16E65	1	0	0			N16E65	Q	
						N24E20	0	0	0			N24E20	Q	
						N19E76	2	0	0			N19E76	Q	
165	14	13	127	117	06	N17E01	0	0	0		13	N17E01	Q	SOLQUIET
						N17W25	19	0	0			N17W25	E	MAGQUIET
						S33E18	0	0	0			S33E18	Q	
						N15E52	1	0	0			N15E52	Q	
						N18E62	0	0	0			N18E62	Q	
						N24E28	0	0	0			N24E28	Q	
						N18W07	0	0	0			N18W07	Q	
						N16E10	0	0	0			N16E10	Q	
166	15	14	94	125	06	N17W62	2	0	0		14	N17W62	Q	SOLQUIET
						N17W41	5	0	0			N17W41	Q	MAGQUIET
						N16E38	1	0	0			N16E38	Q	
						N18E48	2	0	0			N18E48	Q	
						N24E14	0	0	0			N24E14	Q	
167	16	15	158	128	07	N17W75	0	0	0		15	N17W75	Q	SOLQUIET
						N17W53	2	0	0			N17W53	E	MAGQUIET
						N18W35	0	0	0			N18W35	Q	
						N19W24	0	0	0			N19W24	Q	
						N17W16	1	0	0			N17W16	Q	
						N24E02	2	0	0			N24E02	Q	
						N17E28	0	0	0			N17E28	Q	
						N18E37	0	0	0			N18E37	Q	
						S23E72	0	0	0			S23E72	Q	
168	17	16	102	137	06	N16W68	3	0	0		16	N16W68	E	SOLQUIET
						N16W30	0	0	0			N16W30	Q	MAGALERT MINOR RECURRENCE 17/19
						N25W12	1	0	0			N25W12	E	
						N20W11	0	0	0			N20W11	Q	
						N16E15	1	0	0			N16E15	E	
						N18E22	0	0	0			N18E22	Q	
						S25E60	2	0	0			S25E60	E	
												S15E85	C,E	
169	18	17	198	144	12	N17W78	1	0	0		17	N17W78	E	SOLALERT 18/XX
						N15W42	2	0	0			N15W42	C,A	MAGALERT 18/19
						N18W24	1	0	0			N18W24	Q	
						N23W22	1	0	0			N23W22	Q	
						N18E03	0	0	0			N18E03	Q	
						N18E09	2	0	0			N18E09	C,A	
						N11E23	0	0	0			N11E23	Q	
						N11E29	0	0	0			N11E29	Q	
						S23E47	0	0	0			S23E47	C,A	
						S15E65	0	0	0			S15E65	Q	
						S32E74	0	0	0			S32E74	Q	
						N19E76	1	0	0			N19E76	E	
170	19	18	265	151	09	N17W11	0	0	0		18	N17W11	E	SOLALERT 19/XX
						N19W02	1	0	0			N19W02	Q	MAGALERT MINOR 19/20
						N24W38	1	0	0			N24W38	E	
						N15W56	3	0	0			N15W56	E	
						S25E34	0	0	0			S25E34	C,A	
						N18W38	1	0	0			N18W38	Q	
						S17W45	0	0	0			S17W45	Q	
						N19E63	0	0	0			N19E63	C,E	
						N10E16	0	0	0			N10E16	Q	
						N33E64	0	0	0			N33E64	Q	
						N11E10	0	0	0			N11E10	Q	
						S20W26	0	0	0			S20W26	Q	
						S32W06	0	0	0			S32W06	Q	
												N17E86	C,A	
171	20	19	208	160	16	N17W24	2	0	0		19	N17W24	Q	SOLNIL
						N18W13	1	0	0			N18W13	Q	MAGALERT MINOR 20
						N24W51	1	0	0			N24W51	Q	
						N16W70	0	0	0			N16W70	Q	
						S25E20	0	0	0			S25E20	Q	
						N16W44	0	0	0			N16W44	Q	
						N17E51	0	0	0			N17E51	Q	
						N09E02	0	0	0			N09E02	Q	
						N29E49	0	0	0			N29E49	Q	
						N16E69	0	0	0			N16E69	Q	
						N26E82	0	0	0			N26E82	Q	

ALERT PERIODS

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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	Active Regions No of Flares M	Active Regions No of Flares X	Outstanding events	Forecasts Date	Forecasts Location Lat-Long	Forecasts Desc*	Alert Situations
172	21	20	214	169	11	N18W38	1	0	0		20	N18W38	Q	SOLALERT 21/23
						N20W24	0	0	0			N20W24	Q	MAGNIL
						N26W64	1	0	0			N26W64	Q	
						N17W82	0	0	0			N17W82	Q	
						S25E07	1	0	0			S25E07	Q	
						S17E30	0	0	0			S17E30	Q	
						N17W37	1	0	0			N17W37	Q	
						N12W12	0	0	0			N12W12	Q	
						N30E38	0	0	0			N30E38	Q	
						N16E60	1	0	0			N16E60	E	
						N25E64	1	0	0			N25E64	E	
						S22E74	5	1	0			S22E74	A	
						S17E42	1	0	0			S17E42	Q	
173	22	21	232	184	20	N17W52	0	0	0		21	N17W52	Q	SOLALERT MINOR 22
						N19W38	0	0	0			N19W38	Q	MAGQUIET
						S24W00	0	0	0			S24W00	Q	
						S13E15	0	0	0			S13E15	Q	
						N19E26	0	0	0			N19E26	Q	
						N12W75	4	0	0			N12W75	Q	
						N31E25	0	0	0			N31E25	Q	
						N17E46	1	0	0			N17E46	E	
						N25E50	0	0	0			N25E50	Q	
						S20E61	6	0	0			S20E61	E	
						S17E28	0	0	0			S17E28	Q	
						S21W55	0	0	0			S21W55	Q	
						N18E14	0	0	0			N18E14	Q	
						N20E72	0	0	0			N20E72	Q	
174	23	22	255	183	10	N17W65	0	0	0	SOFLARE 2B/M2	22	N17W65	Q	PROTON FLARE ALERT 23/25
						S24W16	1	0	0	N17E17 22/1645Z		S24W16	D,E	MAGQUIET
						S13E03	0	0	0	DURATION 96		S13E03	Q	
						N17E13	2	1	0	MINUTES.		N17E13	D,A	
						N12W37	2	0	0			N12W37	D,E	
						N13E14	0	0	0			N13E14	Q	
						N12E33	1	0	0			N12E33	C,A	
						N24E39	2	0	0			N24E39	D,E	
						S18E49	3	2	0			S18E49	C,A	
						S16E15	0	0	0			S16E15	Q	
						N21E61	3	0	0			N21E61	C,E	
						N13E03	0	0	0			N13E03	Q	
175	24	23	254	190	13	N17W77	0	0	0		23	N17W77	Q	SOLALERT 24/XX
						S25W28	1	0	0			S25W28	Q	MAGQUIET
						S14W11	0	0	0			S14W11	Q	
						N17E02	0	0	0			N17E02	Q	
						N12W52	0	0	0			N12W52	Q	
						N31E02	0	0	0			N31E02	Q	
						N16E11	0	0	0			N16E11	Q	
						N24E25	6	1	0			N24E25	C,A	
						S20E36	3	0	0			S20E36	C,A	
						N21E48	7	0	0			N21E48	C,A	
						N13W10	0	0	0			N13W10	Q	
						S32W19	0	0	0			S32W19	Q	
176	25	24	376	189	20	N18W90	1	0	0	PROTON EVENT BEGAN	24	N18W90	Q	SOLALERT 25/XX
						S25W41	0	0	0	24/0900 25 PROTONS		S25W41	Q	MAGALERT 25/26
						S16W26	0	0	0	CM2/SEC/STER AT		S16W26	Q	
						N18W11	1	0	0	GREATER THAN 10		N18W11	Q	
						N12W66	0	0	0	MEV 24/1345Z.		N12W66	Q	
						N17E08	1	0	0			N17E08	E	
						N25E12	1	0	0			N25E12	E	
						S20E24	8	0	0			S20E24	C,P	
						N22E36	1	0	0			N22E36	E	
						N13W23	0	0	0			N13W23	Q	
						S31W31	0	0	0			S31W31	Q	
						S19E02	0	0	0			S19E02	Q	
						N17E41	0	0	0			N17E41	Q	
177	26	25	334	178	14	S27W56	0	0	0		25	S27W56	Q	SOLALERT 26/XX
						S16W38	1	0	0			S16W38	Q	MAGNIL
						N18W25	1	0	0			N18W25	E	
						N12W79	0	0	0			N12W79	Q	
						N17W04	2	0	0			N17W04	C,A	
						N26W01	2	0	0			N26W01	E	
						S20E11	2	0	0			S20E11	C,A	
						S15W25	1	0	0			S15W25	Q	
						N23E23	2	0	0			N23E23	C,A	
						N13W36	0	0	0			N13W36	E	
						S18W11	0	0	0			S18W11	E	
						N22E13	0	0	0			N22E13	E	

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	Active Regions: No. of Flares M	Active Regions: No. of Flares X	Outstanding events	Forecasts: Date	Forecasts: Location Lat-Long	Forecasts: Desc*	Alert Situations
178	27	26	263	193	30	N18W37	4	0	0	SOFLARE 2B/M3	26	N18W37	Q	SOLALERT 27/29
						N17W18	3	1	0	N14W14 26/1529Z		N17W18	A	MAGALERT 28/XX
						N25W13	3	0	0	DURATION 73		N25W13	Q	
						S20W02	10	0	0	MINUTES. TENFLARE		S20W02	A	
						S14W38	0	0	0	1024 FLUX UNITS		S14W38	Q	
						N22E09	4	0	0	26/1530Z IN PROG-		N22E09	E	
						N12W49	1	0	0	RESS 26/1638Z.		N12W49	Q	
						S17W23	0	0	0			S17W23	Q	
						N22W00	0	0	0			N22W00	Q	
						N14E73	2	0	0			N14E73	E	
179	28	27	255	174	16	N17W32	2	0	0		27	N17W32	Q	SOLALERT MINOR 28
						N26W24	0	0	0			N26W24	Q	MAGALERT MINOR 28/29
						S20W15	7	0	0			S20W15	E	
						N22W01	3	0	0			N22W01	E	
						N15W62	2	0	0			N15W62	Q	
						N20W12	0	0	0			N20W12	Q	
						N15E51	3	0	0			N15E51	E	
						N19E56	0	0	0			N19E56	Q	
180	29	28	241	168	12	N17W46	6	0	0		28	N17W46	E	SOLNIL
						N26W37	0	0	0			N26W37	Q	MAGNIL
						S20W29	4	1	0			S20W29	E	
						N22W15	3	0	0			N22W15	E	
						N20W26	0	0	0			N20W26	Q	
						N15E38	4	0	0			N15E38	Q	
						N19E45	0	0	0			N19E45	Q	
						S17E60	1	0	0			S17E60	Q	
						N22E61	0	0	0			N22E61	Q	
181	30	29	207	162	15	N17W59	3	0	0		29	N17W59	C,A	SOLALERT 30/02
						N25W50	0	0	0			N25W50	Q	MAGALERT 30/01
						S19W42	3	0	0			S19W42	A	
						N22W28	8	0	0			N22W28	A	
						N17E21	4	0	0			N17E21	Q	
						N19E31	1	0	0			N19E31	Q	
						S16E47	1	0	0			S16E47	Q	
						N23E46	1	0	0			N23E46	Q	
						N19E79	0	0	0			N19E79	Q	
182	1	30	121	151	30	N19W74	4	0	0		30	N19W74	C,A	
						N26W62	0	0	0			N26W62	Q	
						S18W57	0	0	0			S18W57	Q	
						N24W40	10	0	0			N24W40	A	
						N16E06	4	0	0			N16E06	Q	
						N18E18	4	0	0			N18E18	Q	
						S17E35	1	0	0			S17E35	Q	
						N20E66	3	0	0			N20E66	C,E	

* 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	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	42	17	22	43	44	20	84	128	93	70	77	119
2	45	15	29	37	40	20	88	120	83	68	85	93
3	42	24	29	47	25	31	102	131	95	71	91	74
4	39	19	25	47	22	47	102	138	103	75	76	60
5	40	23	20	48	25	58	73	137	76	94	74	51
6	40	26	26	55	27	58	69	129	67	92	73	29
7	25	28	25	57	34	55	42	121	90	88	70	39
8	20	25	18	52	27	45	36	89	99	105	56	45
9	17	30	30	47	31	58	36	94	85	126	59	36
10	23	25	40	38	25	75	15	96	92	111	57	29
11	9	23	45	28	26	71	18	95	85	109	63	57
12	8	29	51	33	27	62	26	92	78	107	65	62
13	10	40	48	53	28	44	26	93	65	93	72	56
14	7	40	47	48	31	37	36	82	62	75	72	62
15	0	42	53	54	39	41	30	59	72	61	78	89
16	0	38	56	53	49	39	23	64	70	85	91	97
17	0	36	53	51	51	29	24	56	66	99	79	103
18	0	40	60	50	54	33	14	55	72	100	85	115
19	7	35	59	54	52	40	8	53	64	107	84	109
20	8	33	60	54	38	23	7	52	51	115	74	109
21	8	33	58	42	32	23	20	63	77	112	73	154
22	23	38	42	35	28	17	30	74	82	109	73	158
23	30	15	41	30	24	23	43	69	85	105	72	158
24	38	19	48	29	18	31	37	78	82	102	82	154
25	42	25	46	28	10	35	32	94	70	139	86	135
26	42	34	49	30	9	41	47	86	53	115	84	152
27	37	38	54	38	14	50	69	79	50	90	97	134
28	26	36	61	37	9	45	79	88	49	75	90	130
29	16	40	64	42	10	58	90		48	72	103	115
30	10	36	60	45	23	64	104		44	70	107	99
31	8	31		52		67	118		70		109	
MEAN	21.4	30.1	44.0	43.8	29.1	43.2	49.3	89.8	73.5	94.7	79.3	94.1

1977 yearly mean =27.5

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

	1977						1978					
DAY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	102.0	83.0*	83.1	93.8*	94.4	88.4	126.9*	139.1	136.3	130.0	181.4	149.1
2	100.7	82.8	84.2	93.2	93.6	91.2	133.9	152.6	141.1	129.8	183.0	147.0*
3	97.4	82.3	87.2	97.4	90.4	93.7	130.2	156.6*	146.6	134.5	182.2A	130.8
4	94.0	82.9*	84.2	98.8	89.4	95.9	124.8	154.0	148.4	143.3*	178.4	118.6
5	88.0*	86.4	85.6	104.0*	90.6	96.9	119.2	159.0	154.5	146.7*	173.9*	116.9
6	90.2	88.2	84.9	103.5	91.1	102.0*	118.7*	156.1	162.8	145.3*	173.1	109.8
7	85.2	86.9	89.3	105.5	90.2	105.5	111.6	157.3	165.2	146.9	162.6*	110.6
8	82.1	85.1	91.6	103.8	90.3	106.7	102.8	157.0*	168.7	148.6	143.4	109.3
9	79.0	85.9	95.9	100.7	91.1	112.6*	97.0	155.2	183.7	156.1	135.1	106.5
10	76.9	87.2	99.8	96.4	93.1	114.7	93.5	148.7	179.1	155.4	129.5	108.4
11	76.2	87.6	104.6	95.3	94.9	107.4	93.1	154.2	175.2	162.8*	133.8	113.2
12	75.8	86.5	107.8	100.8	91.4	111.0	92.1	159.0	169.8	156.2	138.2	116.4*
13	77.8	89.0	112.9	98.5	94.0	100.6	90.3	151.2	160.9	145.6	140.2	120.3*
14	76.8	87.5	118.2	98.9	97.9	93.7*	88.6	148.4	160.5	139.1	143.7	126.4*
15	76.0	86.9	120.7	98.2	97.9	92.5	89.6	136.8	154.2	141.4	146.1	132.5
16	76.9	87.3	120.4	96.8	95.9	92.5	86.4	130.2	143.3	137.6	147.8*	139.5*
17	76.5	87.1	120.6	94.9	100.4	91.1	83.8	125.9	135.4	133.4	143.8	149.0
18	76.9	88.6	120.5	95.4	102.0*	93.6	84.7	124.9	132.3	134.1	135.6	153.5*
19	76.9	87.0	104.5	105.0	99.2	91.0	85.4	119.1	128.1	139.5*	133.6	162.0*
20	80.1	88.7	108.8	99.6*	95.7*	88.7	87.0	122.2	125.3	138.1	132.3*	174.2
21	81.7	90.8	104.9*	98.6*	92.8	87.8	91.4	122.2	118.2	138.4*	132.7	185.4*
22	83.1	89.6	102.4	93.9	89.3	89.9	96.9	127.7	117.0	146.4	135.7*	190.3
23	85.0	86.0	99.3	87.3	88.0	91.2	99.6	131.8	116.4	162.9	142.9*	196.7
24	84.0	86.0	100.6	88.3	86.7	93.9	100.4	135.6	117.5	159.8	146.5*	194.8
25	86.0	87.7	98.8	88.1	84.7	96.3	103.3	139.3	118.2	159.1*	147.6	183.5
26	86.0	86.4	99.4	88.6	84.1	99.3	112.7	134.8	112.5	166.7	152.8	182.4*
27	85.4	85.4	100.0	88.5	83.8	98.3	116.4	137.5	114.1	172.8	150.6*	179.5
28	87.5	82.4	100.0	90.3*	85.6	98.9	127.7*	135.4	112.7	176.6*	147.1*	174.1
29	86.7	86.1	99.4	90.3	85.6	105.6*	132.2*		111.1	185.2	148.6	167.4
30	84.1	85.5	97.7	94.9	85.3	114.7	134.9		115.4*	182.1*	147.2*	154.6*
31	80.4	84.7		95.9		120.2	133.3*		124.5		152.6	
MEAN	83.7	86.4	100.9	96.3	91.6	98.9	106.1	141.8	140.3	150.5	149.7	146.8

* adjusted for burst

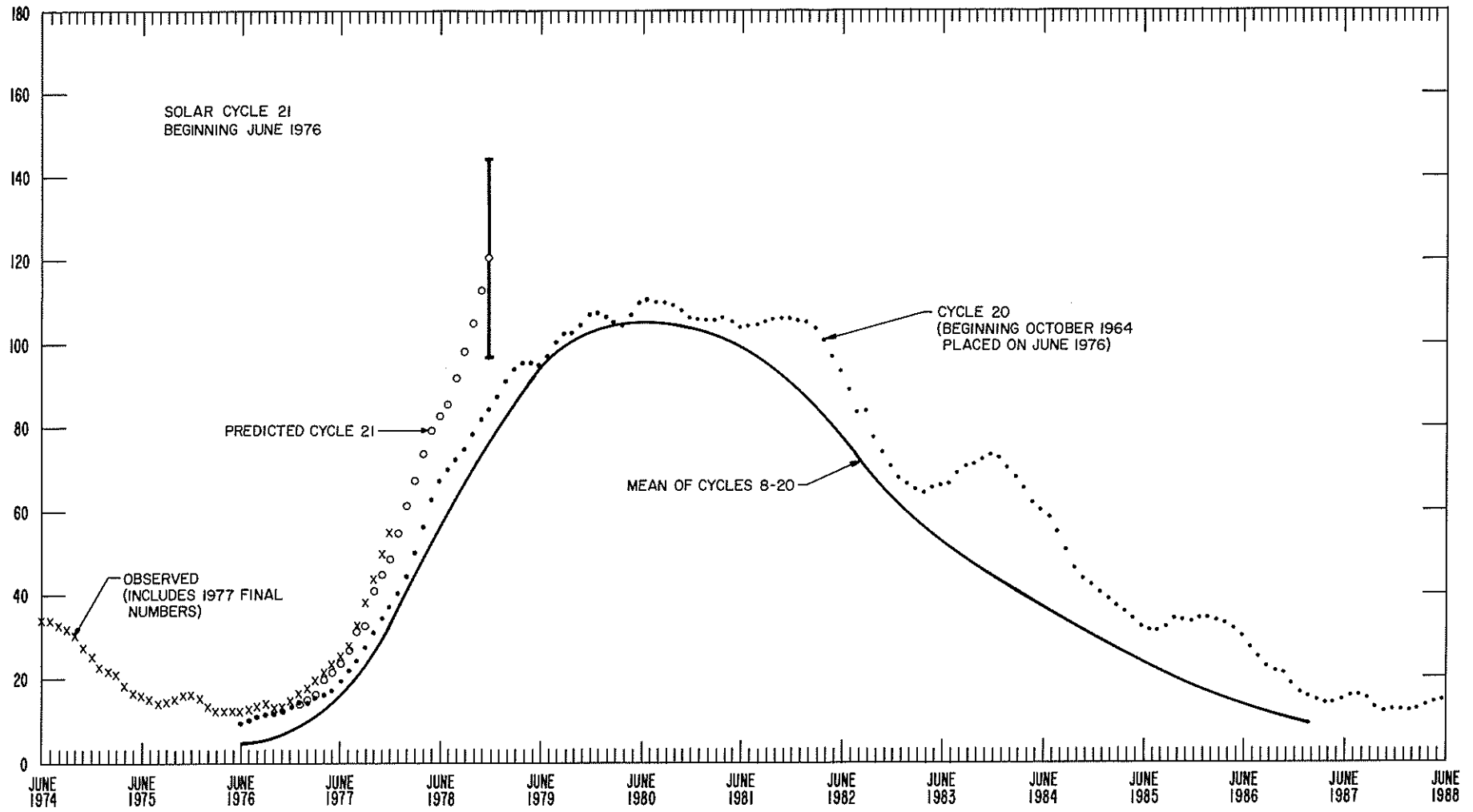
DAILY SOLAR INDICES

JUNE 1978

JUN 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	152	7	119	126	144.9	582	328	179	149.1	147.0	105.7	64.5	33.0	12.5
2	153	8	93	111	142.9*	580	326	179	147.0*	147.1	107.5	65.8	34.6	15.1
3	154	9	74	76	127.1	571	313	162	130.8	128.8	94.2	63.3	40.5	14.4
4	155	10	60	55	115.3	567	315	153	118.6	120.0	86.4	58.4	30.4	10.9
5	156	11	51	49	113.5	556	306	148	116.9	116.0	91.7	62.7	32.0	11.7
6	157	12	29	29	106.6	565	297	143	109.8	107.9	82.2	57.2	24.0	10.5
7	158	13	39	37	107.4	567			110.6		82.7	58.4	26.7	10.9
8	159	14	45	33	106.1	555	300	143	109.3	106.9	85.6	57.9	25.9	9.3
9	160	15	36	21	103.3	564	303	142	106.5	108.0	80.8	55.5	23.3	9.2
10	161	16	29	21	105.1	574	305	142	108.4	108.3	80.9	56.4	30.0	11.2
11	162	17	57	46	109.8	573	304	150	113.2	111.7	86.6	59.3	27.9	10.7
12	163	18	62	39	112.9*	568	303	147	116.4*	114.8	88.4	60.2	29.9	11.7
13	164	19	56	59	116.6*	565	310	154	120.3*	122.2	93.5	62.7	28.8	11.0
14	165	20	62	54	122.5*	587	320	158	126.4*	137.9	98.6	64.7	30.1	11.9
15	166	21	89	83	128.4	587	330	166	132.5	133.4	98.9	60.5	28.3	11.1
16	167	22	97	73	135.2*	592	330	174	139.5*	141.8	98.1	67.7	29.4	11.5
17	168	23	103	104	144.4	594	325		149.0	148.6	109.3	67.0	31.5	11.9
18	169	24	115	106	148.6*	586	334		153.5*	159.5	111.7	68.0	29.5	11.4
19	170	25	109	101	156.8*	593	354	188	162.0*	166.0	119.4	69.7	26.8	13.4
20	171	26	109	117	168.6	584	350	203	174.2	181.0	125.6	71.2	31.4	12.0
21	172	27	154	149	179.5*	606	354	222	185.4*	198.8	137.6	76.3	32.8	14.1
22	173	1	158	157	184.2	595	358	222	190.3	201.0	144.0	76.4	28.9	14.4
23	174	2	158	153	190.4	588	361	222	196.7	203.3	140.7	74.9	34.9	15.4
24	175	3	154	138	188.6	601	360	220	194.8	206.1	142.8	69.3	33.0	24.0
25	176	4	135	114	177.6	589	347	205	183.5	182.0	132.2	74.1	31.0	13.0
26	177	5	152	133	176.4*	584	345	209	182.4*	192.1	142.2	84.2	42.4	35.9
27	178	6	134	130	173.6	584	330	201	179.5	183.5	129.8	84.7	38.9	24.1
28	179	7	130	128	168.4	581	335	194	174.1	177.8	120.8	70.8	32.3	15.0
29	180	8	115	110	161.9	581	335	191	167.4	171.0	114.0	66.9	30.5	12.6
30	181	9	99	87	149.5*	590	337	184	154.6*	161.8	106.5	63.7	29.1	12.2
MEAN			94.1	88.0	142.2	580	328	178	146.8	151.2	107.9	66.4	30.9	13.8

* 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
1977	16.7	18.1	20.0	22.2	24.2	26.3	28.8	33.0	38.5	44.0	49.9	54.8
1978	60.6	66.6	72.6	78.9	85.9	92.1	97.0	101.4	105.6	109.4	113.9	120.3
	(3)	(5)	(8)	(10)	(13)	(15)	(18)	(21)	(24)	(25)	(25)	(24)
1979	125.7	130.3	134.6	137.4	140.0	144.5	149.0	151.8	153.3	153.9*	153.7	152.7
	(24)	(25)	(27)	(30)	(33)	(35)	(37)	(40)	(42)	(45)	(47)	(49)
1980	151.0	149.3	148.6	149.0	148.2	144.8	141.0	137.9	136.3	135.5	134.0	132.5
	(49)	(48)	(46)	(46)	(47)	(48)	(49)	(50)	(49)	(50)	(51)	(53)
1981	132.3	131.7	129.1	126.0	123.6	121.5	120.8	121.0	120.3	118.9	116.7	113.4
	(56)	(56)	(54)	(52)	(52)	(50)	(49)	(47)	(47)	(46)	(44)	(43)
1982	110.0	106.6	104.2	102.4	100.1	97.3	93.2	88.8	84.7	80.2	77.1	73.6
	(41)	(39)	(39)	(37)	(35)	(34)	(32)	(30)	(28)	(24)	(23)	(22)
1983	69.7	66.9	64.9	62.6	60.3	58.0	56.0	54.1	52.3	51.0	50.2	49.5
	(21)	(21)	(22)	(23)	(23)	(23)	(24)	(26)	(28)	(30)	(31)	(31)
1984	48.3	46.5	43.8	40.5	38.0	36.7	35.6	34.0	32.6	31.7	30.5	29.0
	(31)	(30)	(29)	(29)	(30)	(31)	(32)	(32)	(31)	(29)	(28)	(27)
1985	28.1	27.3	26.5	26.1	25.4	24.5	23.7	23.0	22.2	21.4	20.5	20.0
	(27)	(27)	(26)	(26)	(26)	(25)	(23)	(23)	(22)	(23)	(24)	(24)
1986	19.7	19.2	18.6	17.6	16.4	15.3	14.5	14.0	13.7	13.3	13.0	12.8
	(24)	(24)	(24)	(23)	(22)	(21)	(20)	(19)	(17)	(16)	(15)	(13)
1987	13.0	13.4	14.2	15.0	16.0							
	(12)	(11)	(11)	(11)	(12)							

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 154 ± 37.

Hα SOLAR FLARES

JUNE 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUN	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.	
MITK	01	0006	0012	0108	N19	W08	.442	15319	31.4	62	1B		C	0012	420	4.7	E
BUCA	01	0649	0650	0700	N21	W10	.481		31.5	11	SF		C	0650	86	1.0	E
BUCA	01	0735E		0800D	N22	W09	.490		31.6	25D	SF		C	0745	53	.6	E
MONT	01	0940	1009	1016	S17	W59	.854		28.0	36	SF		C	1009	50		E
HTPR	01	1002	1003	1011	S18	W26	.470		30.5	9	SF		C	1003	10	.1	
HTPR	01	1027	1030	1034	N20	W17	.514		31.2	7	SF		C	1030	20	.2	E
RAMY	01	1142	1152	1159	S16	W59	.853		28.1	17	SB	3	C		22		F
HTPR	01	1151	1153	1153	S17	W56	.827		28.3	2	SF		C	1153	30	.5	
RAMY	01	1214	1215	1223	N25	W40	.763		29.5	9	SB	3	C		21		
RAMY	01	1326	1326	1354	N21	W17	.526		31.3	28	SB	3	C		25		F
RAMY	01	1328	1329	1333	N22	W70	.961		27.3	5	SB	3	C		16		F
HTPR	01	1329	1329	1332	N20	W66	.939		27.6	3	SN		C	1329	20	.4	E
HTPR	01	1350	1356	1406	S24	W90	.999		25.8	16	SN		C	1356	50		
RAMY	01	1448	1449	1540	N21	W18	.534		31.3	52	SN	3	C		259		F
RAMY	01	1448	1510	1540	N21	W18	.534		31.3	52	SB	3	C		116		F
HTPR	01	1448		1511D	N21	W07	.467		1.1	23D	SN		C	1501	130	1.3	E
MCMA	01	1457E		1541D	N21	W15	.511	15319	31.5	44D	SN		P	1457	80	.9	E
RAMY	01	1521	1526	1542	S16	W62	.879		28.0	21	SN	3	C		16		F
RAMY	01	1600	1602	1627	N21	W19	.542		31.2	27	SN	3	C		42		F
PALE	01	1658	1700	1702	S17	W64	.894		27.9	4	SN	3	C		16		DE
RAMY	01	1700	1701	1704	N21	W19	.542		31.3	4	SN	3	C		20		F
MCMA	01	1730	1738	1750	N20	W60	.902	15314	28.2	20	SN		C	1738	30	.6	E
RAMY	01	1732	1739	1747	N22	W72	.969		27.3	15	SN	3	C		25		F
PALE	01	1743	1744	1748	N21	W74	.976		27.2	5	SN	3	C		14		DE
PALE	01	1743	1743	1750	S17	W64	.894		27.9	7	SN	3	C		12		DE
PALE	01	1917	1917	1923	S17	W65	.902		27.9	6	SN	3	C		12		DE
PALE	01	1928	1928	1937	N20	W20	.539		31.3	9	SN	3	C		21		DE
PALE	01	1939	1939	1943	N16	W67	.939		27.8	4	SN	3	C		16		DE
MCMA	01	1939	1941	1946	N18	W66	.936	15314	27.9	7	SN		C	1941	30	.9	D
MCMA	01	1945	1952	1959D	N16	E37	.678	15333	4.6	14D	SN		C	1952	30	.4	EK
PALE	01	1947	1947	1952	S17	W66	.909		27.9	5	SN	3	C		15		DE
PALE	01	2113E	2113U	2115D	N23	W45	.795	15314	29.5	2D	1B	3	C		254		FDE
TEHR	02	0258	0303	0319	N25	W46	.814		29.7	21	SB	2	C		127		
HTPR	02	0652	0730	0845	N26	W32	.703		30.9	113	SF		C	0730	40	.4	
HTPR	02	0815	0822	0835	N22	W31	.661		31.0	20	SF		C	0822	10	.1	
MONT	02	0750	0754	0759	S18	W78	.973	15321	27.5	9	1N		C	0754	240		
HTPR	02	0843	0844	0849	S14	W78	.974		27.5	6	SF		C	0844	20		
HTPR	02	0952	0955	0957	S14	W78	.974		27.6	5	SF		C	0955	20		
HTPR	02	1103	1110	1118	S17	W80	.981		27.5	15	SN		C	1110	150		
PALE	02	1646	1647	1658	N23	W56	.882		29.5	12	SN	3	C		19		DE
RAMY	02	1647	1648	1655	N25	W56	.888		29.5	8	SB	2	C		26		F
RAMY	02	1648	1648	1652	N21	W32	.662		31.3	4	SN	2	C		48		F
PALE	02	1800	1809	1824	N23	W57	.889		29.5	24	SN	3	C		17		
PALE	02	1803	1803	1902	N23	W43	.778		30.5	59	SN	3	C		19		DE
PALE	02	1935	1937	1953	S17	W79	.977		27.9	18	SN	3	C		36		FDE
PALE	02	2121	2122	2138D	S17	W80	.981		27.9	17D	SB	3	C		15		DE
PALE	02	2307E	2313U	2330D	N25	W60	.914		29.5	23D	SN	3	C		72		FDE
TEHR	03	0535	0542	0551	N26	W65	.944		29.4	16	SB	1	C		95		
HTPR	03	0738	0743	0750	N28	W63	.937		29.6	12	SN		C	0743	20	.4	
HTPR	03	1408	1408	1412	N22	W42	.764		31.4	4	SF		C	1408	20	.3	
MONT	05	0729E	0736	0812	N23	W68	.954	15319	31.2	43D	1B		C	0736	300		
TEHR	05	0730E	0738	0803	N21	W63	.924	15319	31.6	33D	1B	2	C		286		FDE
RAMY	05	1250	1318	1354	N21	W72	.969	15319	31.1	64	1B	3	C		113		DE
MCMA	05	1250E	1318	1345	N22	W70	.962	15319	31.3	55D	1N		C	1318	50	2.0	EK
MCMA	05	1250E	1331	1345	N22	W70	.962	15319	31.3	55D	1N		C	1331	60	2.4	EK
TEHR	05	1308	1312	1340	N21	W65	.936	15319	31.7	32	1B	3	C		222		
HTPR	06	1107		1141D	N18	E37	.693		9.2	34D	SF		C	1113	10	.1	
MCMA	06	1111	1117	1150	N18	E39	.714	15342	9.4	39	SF		C	1117	25	.4	D
HTPR	06	1217	1218	1220	N22	W80	.993		31.5	3	SF		C	1218	20		
PALE	07	1735	1736	1737	S27	W69	.930		2.6	2	SN	3	C		12		DE
RAMY	08	1110	1112	1126	N18	E77	.984		14.2	16	SN	3	C		15		
RAMY	10	1221	1222	1254	N15	W79	.988		4.6	33	SN	3	C		8		
RAMY	10	1253	1254	1300	S12	E23	.396		12.3	7	SN	3	C		32		
MCMA	10	1548	1559	1608	N16	E19	.491	15352	12.1	20	SN		C	1559	25	.3	DL

Hα SOLAR FLARES

JUNE 1978

OBSERVATORY	OBSERVED UT DATE - JUN	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
MANI	11	0204	0206	0214	N14	W50	.806		7.3	10	SF		P		40	.6	
MCMA	11	1052E		1115D	N17	E90	1.001	15360	18.2	23D	SN		C				
RAMY	11	1338	1339	1422	S32	E52	.815		15.5	44	SF	3	C		17		
PALE	12	0311	0315	0323	N16	W 2	.387		12.0	12	SN	3	C		134		FDE
RAMY	12	1136	1136	1224	N17	W 7	.417		12.0	48	SN	3	C		28		
RAMY	12	1254	1258	1316	N17	W 7	.417		12.0	22	SB	3	C		53		
RAMY	12	1637	1637	1720	N17	W 9	.427		12.0	43	SB	3	C		156		F
PALE	12	1818	1821	1834	N16	W10	.419		12.0	16	SB	3	C		88		FDE
PALE	12	1845	1846	1859	S33	E38	.694		15.6	14	SN	3	C		19		DE
PALE	12	1855	1859	1903	N16	W11	.425		12.0	8	SN	3	C		66		DE
PALE	12	2012	2012	2017	N16	W11	.425		12.0	5	SN	3	C		28		DE
PALE	12	2035	2042	2045	N16	W11	.425		12.0	10	SN	3	C		90		DE
PALE	12	2116	2121	2138	N16	W12	.432		12.0	22	SB	3	C		109		FDE
PALE	12	2239	2242	2250	N16	W13	.440		12.0	11	SB	3	C		109		FDE
PALE	12	2352	2357	0000	N16	W13	.440		12.0	8	SN	3	C		62		FDE
MANI	13	0136E	0137	0146D	N16	W16	.465		11.9	10D	SN		V		90	1.0	
PALE	13	0155	0156	0210D	N16	W15	.456		12.0	15D	SB	3	C		153		DE S
TEHR	13	0444	0452	0525	N17	W15	.469		12.1	41	SN	2	C		159		
BUCA	13	0706E		0717	N17	W19	.504		11.9	11D	SF		C	0706	43	.5	D
TEHR	13	0836E	0837	0853	N18	W20	.525		11.9	17D	SN	3	C		96		
TEHR	13	1112	1114	1125	N17	W22	.533		11.8	13	SB	2	C		64		
RAMY	13	1407E	1408	1410D	N16	W22	.522		11.9	3D	SB	3	C		21		F
RAMY	13	1505	1507	1517	N15	E58	.878		18.0	12	SN	3	C		28		F
MCMA	13	1515E		1522D	N17	E60	.898	15360	18.1	7D	SN		P	1515	60	1.3	E
RAMY	13	1510	1511	1518	N16	W23	.532		11.9	8	SB	3	C		38		F
MCMA	13	1515E		1522D	N17	W25	.563	15352	11.8	7D	SN		P	1517	60	.7	E
PALE	13	1716	1717	1720	N16	W24	.543		11.9	4	SB	3	C		47		DE
RAMY	13	1717	1718	1722	N16	W24	.543		11.9	5	SB	3	C		38		
MCMA	13	1720E	1720	1724	N17	W25	.563	15352	11.8	4D	SN		C	1720	25	.3	D
PALE	13	1737	1739	1750	N16	W24	.543		11.9	13	SB	3	C		50		DE
MCMA	13	1739	1740	1742D	N17	W25	.563	15352	11.9	3D	SB		C	1740	35	.4	D
PALE	13	1820	1821	1823	N15	W25	.544		11.9	3	SB	3	C		35		DE
RAMY	13	1858	1858	1909D	N16	W26	.564		11.8	11D	SB	3	C		38		F
MCMA	13	1900E		1902D	N17	W27	.584	15352	11.8	2D	SN		C	1900	25	.3	D
PALE	13	1919	1920	1930	N15	W26	.555		11.9	11	SB	3	C		140		HDE
PALE	13	2002	2004	2008	N15	W26	.555		11.9	6	SN	3	C		36		DE
RAMY	13	2016	2019	2053	N16	W26	.564		11.9	37	SB	3	C		72		
PALE	13	2018	2018	2053	N15	W26	.555		11.9	35	SB	3	C		114		HDE
RAMY	13	2121	2124	2145	N16	W26	.564		11.9	24	SB	3	C		190		
PALE	13	2121	2124	2141	N15	W27	.566	15352	11.9	20	1B	3	C		206		HDE
PALE	13	2218	2218	2223	N15	W27	.566		11.9	5	SN	3	C		36		HDE
PALE	13	2320	2320	2325	N15	W28	.577		11.9	5	SN	3	C		20		DE H
HTPR	14	0555	0559	0605	N17	W33	.648		11.8	10	SN		C	0559	60	.7	
TEHR	14	0731	0733	0740	N16	W35	.662		11.7	9	SB	2	C		32		
RAMY	14	1135	1136	1156	N16	W57	.873		10.2	21	SN	3	C		14		F
RAMY	14	1153	1200	1244	N14	E46	.768		17.9	51	SB	3	C		50		F
MCMA	14	1153	1202	1235	N16	E47	.786	15360	18.0	42	SN		C	1202	35	.5	E
RAMY	14	1209	1210	1236	N16	W57	.873		10.2	27	SN	3	C		25		
MCMA	14	1414	1415	1430	N17	W35	.669	15352	12.0	16	SN		C	1415	30	.4	D
RAMY	14	1615	1615	1627	N18	E55	.863		18.8	12	SN	3	C		56		
MCMA	14	1616	1618	1630	N17	E52	.835	15360	18.6	14	SF		C	1618	20	.4	D
MCMA	14	1721		1737D	N17	W37	.690	15352	11.9	16D	SN		C	1725	25	.4	DK
PALE	14	2003	2005	2027D	N19	E55	.866		19.0	24D	SN	3	C		60		FDE
MCMA	14	2008E		2022	N18	E51	.830	15360	18.7	14D	SB		C	2008	40	.7	E
MCMA	14	2008E		2018	N17	W38	.700	15352	12.0	10D	SF		C	2008	40	.6	E
PALE	15	0141	0143	0154	N15	W42	.731		11.9	13	SB	3	C		42		FDE
TEHR	15	0342E	0344	0351	N18	W43	.757		11.9	9D	SB	2	C		127		F
RAMY	15	1415	1423	1445	N16	W19	.494		14.2	30	SB	3	C		59		
RAMY	15	1628	1628	1637	N25	E 7	.538		16.2	9	SB	3	C		33		
MCMA	15	1759E		1930D	N17	W13	.455	15354	14.8	91D	SN		C	1820	50	.6	EK
MCMA	15	1906	1907	1915	N16	W52	.832	15352	11.9	9	SF		C	1907	25	.4	D
MCMA	15	2029	2033	2055	N26	E08	.555	15363	16.5	26	SN		C	2033	35	.4	E
RAMY	15	2031	2034	2041D	N25	E 4	.531		16.2	10D	SN	3	C		51		
PALE	16	0054	0055	0057	N18	W58	.886		11.7	3	SN	3	C		32		FDE
PALE	16	0057	0100	0104	N25	E 2	.529		16.2	7	SN	3	C		32		FDE
RAMY	16	1125	1126	1131	N16	W61	.903		11.9	6	SB	3	C		45		
RAMY	16	1143	1153	1202	N16	W62	.910		11.8	19	SB	3	C		40		

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OBSERVATORY	OBSERVED UT DATE JUN	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	16	1401	1405	1435D	N16	E20	.504		18.1	34D	SB	3	C		54		
RAMY	16	1525	1532	1545	S24	E64	.895		21.4	20	SB	3	C		32		
RAMY	16	1650	1651	1658	S24	E63	.888		21.4	8	SB	3	C		21		
MITK	16	2259E		2321	N13	W68	.942	15352	11.9	22D	1N		C	2259	170		E
MITK	17	0215	0225	0301	N17	E07	.421	15360	17.6	46	1N		C	0225	240	2.6	F
HTPR	17	1313	1317	1325	N30	E90	1.002		24.3	12	SF		C	1317	50		
RAMY	17	1548	1549	1553	N19	W21	.547		16.1	5	SN	3	C		26		F
RAMY	17	1826E	1836	1839D	N15	W41	.721		14.7	13D	SB	3	C		132		F
RAMY	17	1826E	1827	1830D	N15	W41	.721		14.7	4D	SB	3	C		68		F
MCMA	17	1835E		1858D	N15	W40	.711	15354	14.8	23D	1B		C	1840	130	2.0	E
PALE	17	2150	2152	2228D	N14	W44	.748	15354	14.6	38D	1B	3	C		181		DE F
MITK	18	0010	0027	0106	N18	E10	.451	15360	18.8	56	1N		C	0027	310	3.4	F
MANI	18	0011	0013	0032	N19	E10	.466		18.8	21	SN		P		100	1.1	F
PALE	18	0022	0022	0038	N18	E10	.451		18.8	16	SN	3	C		38		DE
PALE	18	0030	0033	0100	N14	W45	.758	15357	14.6	30	1B	3	C		133		DE
MANI	18	0033	0036	0040D	N15	W44	.753	15357	14.7	7D	1N		P		150	2.2	
PALE	18	0123	0123	0132	N14	W46	.768		14.6	9	SN	3	C		45		DE
MITK	18	0718	0742	0806	N26	W30	.694		16.1	48	SN		C	0742			E
BUCA	18	0720E		0800D	N25	W30	.686		16.1	40D	SN		C	0740	107	1.4	E
MCMA	18	1208	1210	1212D	N20	E06	.463	15360	19.0	4D	SB		C	1210	30	.3	D
RAMY	18	1637	1638	1656	N15	W53	.838		14.7	19	SB	2	C		49		F
MCMA	18	1650E		1700D	N17	W52	.836	15354	14.8	10D	SF		C	1650	50	.9	E
MITK	19	0354	0359	0422	N18	W05	.430		18.8	28	SN		C	0359			E
PALE	19	0355	0357	0404	N19	W 6	.448		18.7	9	SB	3	C		123		DE
TEHR	19	0400	0407	0414	N19	W 3	.441		18.9	14	SN	2	C		127		
TEHR	19	0400E	0407	0414	N19	W 3	.441		18.9	14D	SN	2	C		127		
MCMA	19	1550E	1551	1605D	N17	W21	.526	15360	18.1	15D	SN		C	1551	50	.6	E
MCMA	19	1816E		1830	N25	W50	.850	15354	16.0	14D	SF		P	1819	50	.9	E
PALE	19	1816	1816	1821	N25	W46	.819		16.3	5	SN	3	C		17		F
MITK	19	2336	2339	2356	N26	W53	.875		16.0	20	SB		C	2339			E
PALE	19	2337	2338	2343D	N25	W49	.842	15363	16.3	6D	1B	3	V		150		FDE
PALE	20	0045	0045	0052	N17	E69	.953		25.2	7	SN	3	C		24		FDE
HTPR	20	0807	0812	0814	N17	E66	.937		25.3	7	SN		C	0812	70	1.6	
HTPR	20	0813	0817	0819	S19	E90	.999		27.1	6	SF		C	0817	20		
HTPR	20	0839	0843	0845	N16	E66	.935		25.3	6	SF		C	0843	10	.2	
HTPR	20	0908	0912	0917	S19	E90	.999		27.1	9	SF		C	0912	10		
HTPR	20	0922	0924	0934	S19	E90	.999		27.1	12	SN		C	0924	50		
HTPR	20	1015	1020	1035	N12	W05	.336		20.1	20	SF		C	1020	30	.3	E
MCMA	20	1143	1152	1201	S20	E88	.997	15375	27.1	18	SN		C	1152			E
HTPR	20	1152	1153	1156	S19	E87	.996		27.0	4	SN		C	1153	30		
MCMA	20	1252	1258	1303	N16	E63	.917	15368	25.3	11	SN		C	1258	30	.7	EH
RAMY	20	1325	1327	1347	N26	E70	.968		25.8	22	SN	4	C		13		
MCMA	20	1330	1336	1400D	N16	E65	.929	15368	25.4	30D	SN		C	1336	50	1.2	E
MCMA	20	1355	1357	1420	S20	E15	.334	15365	21.7	25	SN		C	1357	35	.4	E
HTPR	20	1355	1356	1405	S29	E15	.441		21.7	10	SF		C	1356	40	.4	E
RAMY	20	1356	1358	1404	S30	E15	.453		21.7	8	SN	4	C		30		F
MCMA	20	1431	1435	1437	S20	E87	.996	15375	27.1	6	SN		C	1435			D
HTPR	20	1632	1634	1641	S19	E85	.993		27.1	9	SF		C	1634	20		
MCMA	20	1701	1709	1730	N25	E69	.963	15373	25.9	29	SN		C	1709	20	.6	D
HTPR	20	1703		1711D	N25	E74	.981		26.3	8D	SF		C	1708	10		
RAMY	20	1721	1726	1744	N18	E42	.748		23.9	23	SB	3	C		92		
MCMA	20	1722		1808D	N20	E51	.838	15368	24.5	46D	1B		C	1734	125	2.2	E
RAMY	20	1734	1735	1741	S17	E47	.730		24.3	7	SN	3	C		19		
MCMA	20	1734	1735	1743D	S18	E48	.743	15366	24.3	9D	SF		C	1735	30	.5	E
RAMY	20	1755	1758	1810	S19	E79	.976		26.7	15	SF	3	C		11		
MCMA	20	1908	1910	1917	S18	E47	.732	15366	24.3	9	SN		C	1910	15	.2	D
RAMY	20	1918	1928	1954	S19	E79	.976	15375	26.7	36	1B	2	C		99		
MCMA	20	1919	1928	1945	S19	E83	.988	15375	27.0	26	1N		C	1928			EU
PALE	20	1919	1928	1931D	S18	E78	.972	15374	26.7	12D	1N	3	V		88		DE
RAMY	20	2012	2015	2034	S19	E78	.972		26.7	22	SF	2	C		23		
MCMA	20	2150	2153	2201D	S18	E46	.721	15366	24.4	11D	SF		C	2153	15	.2	D
MCMA	20	2209	2212	2220D	S18	E82	.986	15375	27.1	11D	SN		C	2212			D
PALE	20	2210	2211	2218	S18	E76	.964		26.6	8	SN	3	C		13		F
PALE	20	2255	2255	2309	N18	W40	.728		18.0	14	SN	3	C		23		F
PALE	20	2337	2338	0008	N25	W49	.843	15358	17.3	31	1B	3	C		175		U F
MITK	21	0034E		0038	S17	E44	.695		24.3	4D	SF		C	0034			D
TEHR	21	0514E	0516	0526	S18	E71	.939		26.5	12D	SB	2	C		64		

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUN	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.	
HTPR	21	0804	0808	0815	N16	E56	.866		25.5	11	SF		C	0808	30	.5	
HTPR	21	0925	0927	0931	N18	E52	.840		25.3	6	SF		C	0927	30	.5	
HTPR	21	1001	1005	1015	S17	E73	.950		26.9	14	SF		C	1005	20		
RAMY	21	1120	1442	1452	N11	W20	.452		20.0	212	SB	3	C		150		
RAMY	21	1200	1209	1332	S19	E66	.907		26.5	92	SB	3	C		47		
RAMY	21	1242	1242	1301	N16	E51	.824		25.4	19	SN	3	C		20		
HTPR	21	1306	1309	1319	S18	E37	.611		24.3	13	SN		C	1309	60	.7	EG
RAMY	21	1400	1541	1543D	S19	E66	.907	15366	26.5	103D	1B	3	V		200		
RAMY	21	1420	1442	1452	N11	W20	.452		20.1	32	SB	3	C		150		
MCMA	21	1442E		1453D	N12	W22	.485	15370	20.0	11D	SN		C	1442	75	.8	EK
MCMA	21	1534E	1538	1550D	S22	E73	.949	15375	27.1	16D	1B		C	1538	100	4.0	E
HTPR	21	1534	1539	1546	S22	E72	.944		27.0	12	SN		C	1539	130		
RAMY	21	1541E	1541	1612	S19	E66	.907	15366	26.6	31D	1B	3	C		200		
MCMA	21	1618	1622	1635	N20	E35	.692	15368	24.3	17	SF		C	1622	40	.6	E
MCMA	21	1715	1724	1731D	S16	E69	.927	15375	26.9	16D	SN		C	1724	25	.8	E
PALE	21	2155E	2155U	2234D	N11	W24	.499		20.1	39D	SB	3	C		162		FDE
MANI	22	0236E	0236U	0240D	S20	E67	.914		27.1	4D	SF		V		40	.9	F
PALE	22	0237E	0237U	0250D	S19	E63	.885		26.8	13D	SB	3	C		120		FDE
MANI	22	0243E	0245	0258	S20	E66	.907		27.1	15D	SN		V		90	1.9	F
HTPR	22	0519E	0532	0552	S26	W08	.349		21.6	33D	SF		C	0532	70		E
HTPR	22	0601	0604	0650	S26	W08	.349	15370	21.7	49	1N		C	0604	260	2.9	E
TEHR	22	0605E	0610	0629	S28	W 5	.366		21.9	24D	SB	1	C		190		FDE
HTPR	22	0843	0849	0900	N09	W27	.520		20.3	17	SF		C	0849	40	.4	
HTPR	22	1027	1030	1030	S23	E59	.855		26.9	3	SF		C	1030	40	.8	E
HTPR	22	1356		1404D	N32	E20	.688		24.1	8D	SF		C	1401	20	.2	E
RAMY	22	1600	1600	1612	N11	W35	.633		20.0	12	SB	3	C		19		
HTPR	22	1601		1609D	N12	W30	.579		20.4	8D	SF		C	1608	20	.2	
RAMY	22	1645	1745	2002D	N17	E16	.482	15368	23.9	197D	2N	3	C		992		FDE
RAMY	22	1645	1654	2002D	N17	E16	.482	15368	23.9	197D	1B	3	C		320		FDE
PALE	22	1734E	1805U	2240	N19	E17	.515	15368	24.0	306D	2B	3	C		550		U F
PALE	22	1940	1955	2101	S20	E54	.807	15375	26.9	81	1B	3	C		265		Z F
RAMY	22	1949	1953	1956D	S19	E53	.796	15375	26.8	7D	1B	3	C		188		
MCMA	22	2103E		2341D	N17	E16	.482	15368	24.1	158D	1F		C	2104	200	2.1	BFL
MCMA	22	2117	2130	2201D	N24	E37	.739	15373	25.7	44D	SB		C	2130	75	1.1	EL
PALE	22	2118	2130	2155	N27	E44	.814		26.2	37	SB	3	C		84		FDE
MCMA	22	2246	2251	2300	N18	E63	.921	15376	27.7	14	SB		C	2251	25	.6	D
PALE	22	2248	2251	2259	N21	E58	.895		27.3	11	SN	3	C		31		FDE
PALE	23	0104	0120	0125	N21	E57	.888		27.3	21	SN	3	C		34		FDE
BUCA	23	0744E	0749	0830D	N25	E30	.687	15373	25.6	46D	1B		C	0749	322	4.1	CE
ISTA	23	0745		0800	N26	E31	.704		25.6	15	SN						E
TEHR	23	0749E	0801	0808	S24	E38	.644	15315	26.2	19D	1B	2	C		222		FDE
MCMA	23	1043	1050	1102	N13	W46	.765	15370	20.0	19	SN		C	1050	70	1.0	E
MCMA	23	1132	1135	1154	S28	W24	.513	15365	21.7	22	SN		C	1135	30	.4	E
MCMA	23	1143	1146	1154	N24	E29	.670	15373	25.7	11	SN		C	1146	30	.4	E
RAMY	23	1206	1207	1215	N23	E56	.887		27.7	9	SN	3	C		21		
MCMA	23	1210	1214	1220	N23	E57	.893	15376	27.8	10	SN		C	1214	40	.8	EK
RAMY	23	1234	1234	1239	N23	E56	.887		27.7	5	SN	3	C		16		
MCMA	23	1318	1323	1348	N23	E53	.865	15376	27.5	30	SB		C	1323	60	1.1	E
RAMY	23	1328	1328	1340	N23	E55	.880		27.7	12	SN	3	C		18		
MCMA	23	1328	1340	1404D	N23	E27	.643	15373	25.6	36D	SB		C	1340	90	1.1	E
RAMY	23	1331	1337	1401	N25	E31	.695		25.9	30	SB	3	C		56		
HTPR	23	1346E		1401	N24	E27	.653		25.6	15D	SF		C	1348	50	.5	E
HTPR	23	1416		1422D	S28	W26	.534		21.6	6D	SN		C	1419	120	1.4	E
RAMY	23	1417	1418	1426	S27	W24	.504		21.8	9	SB	3	C		62		
RAMY	23	1619	1620	1625	N25	E28	.671		25.8	6	SN	3	C		22		
RAMY	23	1624	1627	1636	N27	E57	.905		28.0	12	SN	3	C		18		
RAMY	23	1731	1735	1748	N25	E27	.662		25.8	17	SB	3	C		111		F
MCMA	23	1732	1736	1757	N25	E26	.654	15373	25.7	25	SB		C	1736	130	1.7	E
PALE	23	1733	1735	1740D	N27	E27	.682		25.8	7D	SB	3	C		120		FDE
PALE	23	2215	2216	2218	S21	E39	.645		26.9	3	SN	3	C		23		F
PALE	23	2305	2309	2322	S20	E38	.629		26.8	17	SN	3	C		51		F
PALE	24	0008	0009	0021	S20	E38	.629		26.9	13	SN	3	C		56		F
HTPR	24	0950		0953D	N25	E48	.836		28.0	3D	SF		C	0952	20	.3	E
HTPR	24	1015	1019	1028	N20	W05	.463		24.1	13	SF		C	1019	20	.2	
MCMA	24	1036	1039	1105	N25	E49	.843	15376	28.1	29	SB		C	1039	20	.3	D
HTPR	24	1038	1042	1100	N25	E47	.828		28.0	22	SF		C	1042	20	.3	
RAMY	24	1205	1208	1223	S20	E30	.527		26.8	18	SB	4	C		43		H
MCMA	24	1207	1208	1211	S24	E34	.597	15375	27.1	4	SB		C	1208	20	.3	D
HTPR	24	1208	1208	1209	S23	E35	.604		27.1	1	SN		C	1208	30	.4	

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OBSERVATORY	OBSERVED UT DATE JUN	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	24	1249	1259	1314	N17	W 8	.429		23.9	25	SB	4	C		60		
RAMY	24	1253	1324	1404	S20	E29	.514		26.7	71	SB	4	C		88		FDE
HTPR	24	1320	1329	1350	S22	E33	.575		27.0	30	SN		C	1329	70	.8	E
TEHR	24	1321E	1325	1357	S21	E34	.583		27.1	36D	SB	2	C		95		F
MCMA	24	1321	1332	1410D	S23	E33	.580	15375	27.0	49D	SN		C	1332	70	.9	E
RAMY	24	1413	1414	1522	N16	W87	1.000		18.1	69	SB	4	C		0		
RAMY	24	1413	1437	1522	N16	W87	1.000		18.1	69	SN	4	C		0		
TEHR	24	1414E	1416	1417D	N20	W88	1.000		18.0	3D	SN	2	V		64		
HTPR	24	1528	1531	1539	N28	E21	.650		26.2	11	SF		C	1531	20	.2	
MCMA	24	1529	1531	1538D	N28	E21	.650	15373	26.2	9D	SN		C	1531	40	.5	E
RAMY	24	1530	1531	1536	N25	E15	.578		25.8	6	SB	4	C		27		
RAMY	24	1542	1547	1608	N17	W10	.440		23.9	26	SN	3	C		31		
RAMY	24	1733	1734	1756	S20	E27	.487		26.8	23	SN	3	C		22		
PALE	24	2042	2043	2050	S20	E25	.461		26.7	8	SN	3	C		26		F
BUCA	25	0805E		0825	N28	E12	.602		26.2	20D	SF		C	0808	31	.4	
MCMA	25	1337	1342	1405D	N22	E28	.643	15376	27.7	28D	SN		C	1342	60	.7	E
BUCA	26	0820E		0840D	S16	E07	.194		26.9	20D	SF		C	0830	63	.7	E
MCMA	26	1453E		1456D	S17	W04	.184	15375	26.3	3D	SN		P	1453	40	.5	EH
MCMA	26	2036E		2040D	S17	W07	.207	15375	26.3	4D	SN		P	2036	40	.5	EH
HTPR	27	0658	0705	0720	N26	E10	.568		28.0	22	SF		C	0705	20	.2	
HTPR	27	0807	0809	0823	S17	W05	.190		27.0	16	SF		C	0809	20	.2	E
BUCA	27	0810E		0827	S17	W04	.183		27.0	17D	SF		C	0817	23	.3	E
BUCA	27	0822		0847	N22	E07	.500		27.9	25	SN		C	0825	19	.2	
HTPR	27	0838	0840	0852	N18	W40	.729		24.4	14	SN		C	0840	70	.9	E
BUCA	27	0840		0856D	N20	W41	.751		24.3	16D	SN		C	0845	31	.4	
ISTA	27	0843		0853	N15	W42	.733		24.2	10	SF						E
HTPR	27	1001	1003	1017	N15	E69	.950	15381	4.6	16	1N		C	1003	100	2.4	E
MCMA	27	1101	1107	1125D	N14	E70	.954	15381	4.7	24D	SF		C	1107	40	1.2	E
MCMA	27	1105	1107	1115	N25	E07	.543	15376	28.0	10	SN		C	1107	35	.4	E
HTPR	27	1110	1140	1200	S17	W16	.316		26.3	50	SN		C	1140	80	.8	EK
MCMA	27	1112	1145	1240	S18	W14	.299	15375	26.4	88	SB		C	1145	120	1.3	EK
MCMA	27	1130	1132	1145D	N25	E07	.543	15376	28.0	15D	SF		C	1132	30	.3	D
HTPR	27	1147	1151	1200	N22	E04	.492		27.8	13	SN		C	1151	60	.6	E
MCMA	27	1148	1152	1205	N23	E04	.507	15376	27.8	17	SB		C	1152	50	.6	E
MCMA	27	1159	1201	1205	N20	E90	1.001	15382	6.2	6	SN		C	1201			
HTPR	27	1242	1243	1254	N14	E67	.938		4.6	12	SF		C	1243	30	.7	E
MCMA	27	1244	1245	1254	N14	E70	.954	15381	4.8	10	SN		C	1245	40	1.2	E
MCMA	27	1340E		1410D	N20	E79	.991	15381	5.5	30D	SN		C	1350			EKLY
HTPR	27	1358	1400	1408	N17	W30	.619		25.3	10	SF		C	1400	30	.3	E
MCMA	27	1916	1921	1930D	N14	E66	.932	15381	4.8	14D	SN		C	1921	50	1.3	D
MCMA	27	1921	1924	1930	S17	W13	.276	15375	26.8	9	SB		C	1924	80	.9	EH
MCMA	27	1922	1927	1933	N27	E04	.565	15376	28.1	11	SN		C	1927	25	.3	D
PALE	28	0248E	0248	0252D	S20	W16	.344	15375	26.9	4D	2B	3	V		570		FDE
TEHR	28	0252E	0256	0314	S20	W15	.332		27.0	22D	SB	2	C		127		F
HTPR	28	0748	0751	0800	S23	W24	.469		26.5	12	SF		C	0751	50	.5	E
HTPR	28	0840	0842	0850	N14	E58	.877		4.7	10	SF		C	0842	40	.8	E
HTPR	28	1046	1053	1115	S18	W43	.685		25.2	29	SF		C	1053	60	.8	
MCMA	28	1049	1053	1130D	S18	W45	.708	15374	25.1	41D	SN		C	1053	40	.6	EL
MCMA	28	1125	1136	1215	N23	W08	.518	15376	27.9	50	SN		C	1136	45	.5	E
MCMA	28	1305	1312	1324	S23	W27	.506	15375	26.5	19	SN		C	1312	50	.6	E
TEHR	28	1306E	1312	1318	S19	W28	.495		26.4	12D	SB	2	C		64		F
HTPR	28	1308	1311	1322	S23	W27	.506		26.5	14	SF		C	1311	40	.4	E
RAMY	28	1309	1311	1324	S19	W22	.413		26.9	15	SB	4	C		36		F
HTPR	28	1533	1533	1538	N27	W07	.572		28.1	5	SF		C	1533	60	.7	E
MCMA	28	1535	1540	1600D	N19	W11	.475	15368	27.8	25D	SN		C	1540	50	.7	D
RAMY	28	1535	1538	1601	N17	W41	.734		25.6	26	SB	3	C		25		
RAMY	28	1546	1552	1557	S15	E67	.913		5.7	11	SF	3	C		13		
RAMY	28	1551	1552	1606	N17	E48	.801		4.3	15	SN	3	C		63		
MCMA	28	1551	1552	1601	N15	E52	.830	15381	4.6	10	SN		C	1552	50	.9	EL
RAMY	28	1614	1614	1627	N17	W42	.744		25.5	13	SN	3	C		18		
RAMY	28	1615	1615	1621	N17	E48	.801		4.3	6	SN	3	C		16		
RAMY	28	1636	1656	1710	N17	W42	.744		25.5	34	SB	3	C		76		
MCMA	28	1643	1655	1714	N15	W48	.793	15368	25.1	31	SB		C	1655	80	1.3	E
HTPR	28	1645	1652	1708	N14	W45	.760		25.3	23	SN		C	1652	80	1.1	E
HTPR	28	1720	1722	1735	S20	W25	.460		26.8	15	SF		C	1722	60	.7	EK
RAMY	28	1720	1723	1747	S19	W25	.454		26.8	27	SB	3	C		57		F
HTPR	28	1800	1808	1818	N27	W08	.575		28.2	18	SF		C	1808	20	.2	E
MCMA	28	1850E	1852	1905	N15	W49	.803	15368	25.1	15D	SB		C	1852	50	.8	D

Hα SOLAR FLARES

JUNE 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE ~JUN	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.	
PALE	28	1853E	1854U	1902D	N16	W46	.778		25.3	9D	SN	3	C		55		U F
MCMA	28	1912	1914	1928	N26	W10	.568	15376	28.1	16	SN		C	1914	60	.7	E
MCMA	28	1955	2010	2030D	S31	E23	.531	15377	2.6	35D	SF		C	2010	40	.5	E
MCMA	28	2018	2026	2033	N27	W09	.578	15376	28.2	15	SN		C	2026	70	.8	E
MCMA	28	2020	2027	2038D	N15	E49	.803	15381	4.5	18D	SN		C	2027	90	1.4	E
MCMA	28	2108		2125D	N15	E48	.793	15381	4.5	17D	SB		C	2122	100	1.5	EU
TEHR	29	0240E	0244	0258	S20	W29	.513		26.9	18D	SB	2	C		159		F
MANI	29	0335E	0335U	0350	S16	W31	.523		26.8	15D	SN		P		80	1.0	U
TEHR	29	0340E	0344	0358	S20	W29	.513		27.0	18D	SB	2	C		159		F
MANI	29	0432E	0434	0449	N26	W14	.586		28.1	17D	SF		P		40	.4	
TEHR	29	0434E	0442	0448	N22	W17	.554		27.9	14D	SB	2	C		95		DE
MANI	29	0501	0501	0508	N26	W14	.586		28.2	7	SF		P		20	.2	F
HTPR	29	0522	0537	0553	N17	W51	.828		25.4	31	SF		C	0537	30	.5	EK
HTPR	29	0546	0549	0552	S17	W37	.607		26.5	6	SF		C	0549	10	.1	
HTPR	29	0826	0828	0835	S18	W40	.648		26.4	9	SF		C	0828	20	.3	
HTPR	29	0835	0836	0847	N16	E34	.655		3.9	12	SF		C	0836	30	.3	E
HTPR	29	0953	0955	1005	N20	E90	1.001		8.2	12	SN		C	0955	60		
MONT	29	0953E	1005	1021	N18	E90	1.001		8.2	28D	SN		C	1005	70		
HTPR	29	1030	1031	1045	N17	W60	.899		24.9	15	SF		C	1031	20	.4	
RAMY	29	1134	1141	1154	N16	E36	.676		4.2	20	SN	3	C		26		
RAMY	29	1152	1210	1301	S19	W35	.587		26.9	69	SB	3	C		82		
HTPR	29	1209	1211	1220	S21	W41	.668		26.4	11	SF		C	1211	20	.3	
HTPR	29	1215	1217	1222	N26	W19	.616		28.1	7	SF		C	1217	10	.1	
MCMA	29	1216	1218	1223	N27	W20	.634	15376	28.0	7	SN		C	1218	25	.3	E
RAMY	29	1216	1216	1224	N23	W22	.603		27.9	8	SB	3	C		22		
HTPR	29	1218	1221	1225	S18	W38	.623		26.7	7	SF		C	1221	10	.1	
RAMY	29	1230	1232	1235	N15	W55	.856		25.4	5	SN	3	C		16		F
RAMY	29	1414	1417	1432	N25	W20	.611		28.1	18	SB	3	C		157		
HTPR	29	1414	1417	1430	N27	W20	.634		28.1	16	SB		C	1417	180	2.0	E
MCMA	29	1414	1416	1435	N26	W21	.629	15376	28.0	21	SB		C	1416	100	1.3	EH
TEHR	29	1415E	1420	1431	N24	W22	.614		27.9	16D	SB	2	C		127		
MCMA	29	1542	1543	1550	S22	W43	.694	15375	26.4	8	SN		C	1543	40	.6	E
MCMA	29	1600	1610	1640D	S16	E55	.813	15384	5.8	40D	SF		C	1610	70	1.3	E
RAMY	29	1607	1608	1622	S15	E54	.803		5.7	15	SN	3	C		22		F
RAMY	29	1636	1637	1647	N16	E33	.644		4.2	11	SN	3	C		25		F
MCMA	29	1816E		1841D	N15	E38	.691	15381	4.6	25D	SB		C	1830	80	1.1	E
PALE	29	1817	1820	1844	N16	E32	.633		4.2	27	SB	3	C		103		U F
PALE	29	1831	1835	1838	N22	W27	.635		27.7	7	SN	3	C		25		DE
PALE	29	1901	1901	1912	N16	E32	.633		4.2	11	SN	3	C		26		DE
MCMA	29	1901E		2005D	N15	E35	.659	15381	4.4	64D	SN		C	1914	125	1.7	E
PALE	29	1913E	1915	1940	N19	W67	.945		24.8	27D	SF	3	C		95		FDE
PALE	29	1920	1923	1945	N16	E26	.569		3.8	25	SN	3	C		36		DE
PALE	29	2134	2146	2153	N22	W29	.653		27.7	19	SN	3	C		27		DE
PALE	29	2134	2155	2155	N16	W61	.904		25.3	21	SN	3	C		27		FDE
PALE	29	2206	2214	2232	N25	W25	.648	15376	28.0	26	1B	3	C		206		UDE
PALE	29	2217	2217	2221	N22	E51	.847		5.8	4	SN	3	C		26		FDE
PALE	29	2226	2233	2236D	N16	W61	.904	15368	25.4	10D	1B	3	V		131		FDE
PALE	30	0123	0123	0125	N16	W63	.917		25.3	2	SN	3	C		16		F
MITK	30	0153E	0202	0230	N18	W61	.908	15368	25.5	37D	1F		C	0202	110	2.4	E
PALE	30	0215	0237	0301	N16	W64	.924		25.3	46	SB	3	C		105		F
TEHR	30	0215E	0219	0255	N17	W58	.865		25.7	40D	SN	2	C		127		
PALE	30	0236	0236	0250	N22	W31	.671		27.8	14	SN	3	C		27		F
MONT	30	0745	0751	0805	N21	W29	.644		28.1	20	SN		C	0751	80		EH
TEHR	30	1052	1054	1112	N18	E18	.513		3.8	20	SB	2	C		190		F
MCMA	30	1052	1053	1113	N17	E18	.501	15381	3.8	21	SB		C	1053	80	.9	E
MCMA	30	1146	1149	1159D	N19	E31	.646	15381	4.8	13D	SB		C	1149	60	.8	E
RAMY	30	1152	1153	1156D	N16	E22	.527		4.1	4D	SN	2	C		29		
MCMA	30	1254	1258	1304	N25	W35	.730	15376	27.9	10	SN		C	1258	50	.7	E
RAMY	30	1254	1257	1303	N23	W36	.724		27.8	9	SB	3	C		62		
MCMA	30	1331	1338	1355	N19	E32	.656	15381	5.0	24	SB		C	1338	60	.8	E
TEHR	30	1334E	1336	1342	N20	E25	.597		4.4	8D	SN	2	C		64		F
RAMY	30	1336	1337	1350	N19	E30	.636		4.8	14	SB	3	C		95		
RAMY	30	1411	1411	1427	N19	E31	.646		4.9	16	SN	3	C		20		
RAMY	30	1445	1450	1525	N17	W68	.948	15368	25.5	40	1B	3	C		206		FDE
MCMA	30	1448	1450	1516D	N18	W68	.949	15368	25.5	28D	1B		C	1450	125	3.7	E
RAMY	30	1527	1544	1603	S15	E41	.655		5.7	36	SB	3	C		148		
MCMA	30	1631E		1635D	N27	W35	.745	15376	28.1	4D	SN		P	1631	20	.3	D
MCMA	30	1704E		1718D	N27	W36	.753	15376	28.0	14D	SB		P	1704	50	.7	E
PALE	30	1706E	1710	1711D	N25	W36	.738	15376	28.0	5D	1B	3	C		182		U F
PALE	30	1709E	1713	1719	N18	E28	.608		4.8	10D	SN	3	C		34		DE

Hα SOLAR FLARES

JUNE 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUN	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.	
PALE	30	1815E	1846U	1846D	N22	W41	.762		27.7	31D	SN	3	C		58		DE
RAMY	30	1838	1845	1903	N20	E78	.989		8.6	25	SB	3	C		76		F
PALE	30	1848	1849	1857D	N19	E72	.969		8.2	9D	SB	3	C		41		FDE
RAMY	30	1919	1921	1930	N23	W39	.751		27.9	11	SB	3	C		60		
PALE	30	2107E	2107U	2117	N22	W42	.771		27.7	10D	SN	3	C		40		DE
PALE	30	2118E	2118U	2127D	N15	E15	.450		4.0	9D	SN	3	C		32		DE
PALE	30	2146E	2148U	2150D	N15	E15	.450		4.0	4D	SN	3	C		20		DE
PALE	30	2345	2353	0010	N22	W30	.662		28.7	25	SN	3	C		64		FDE

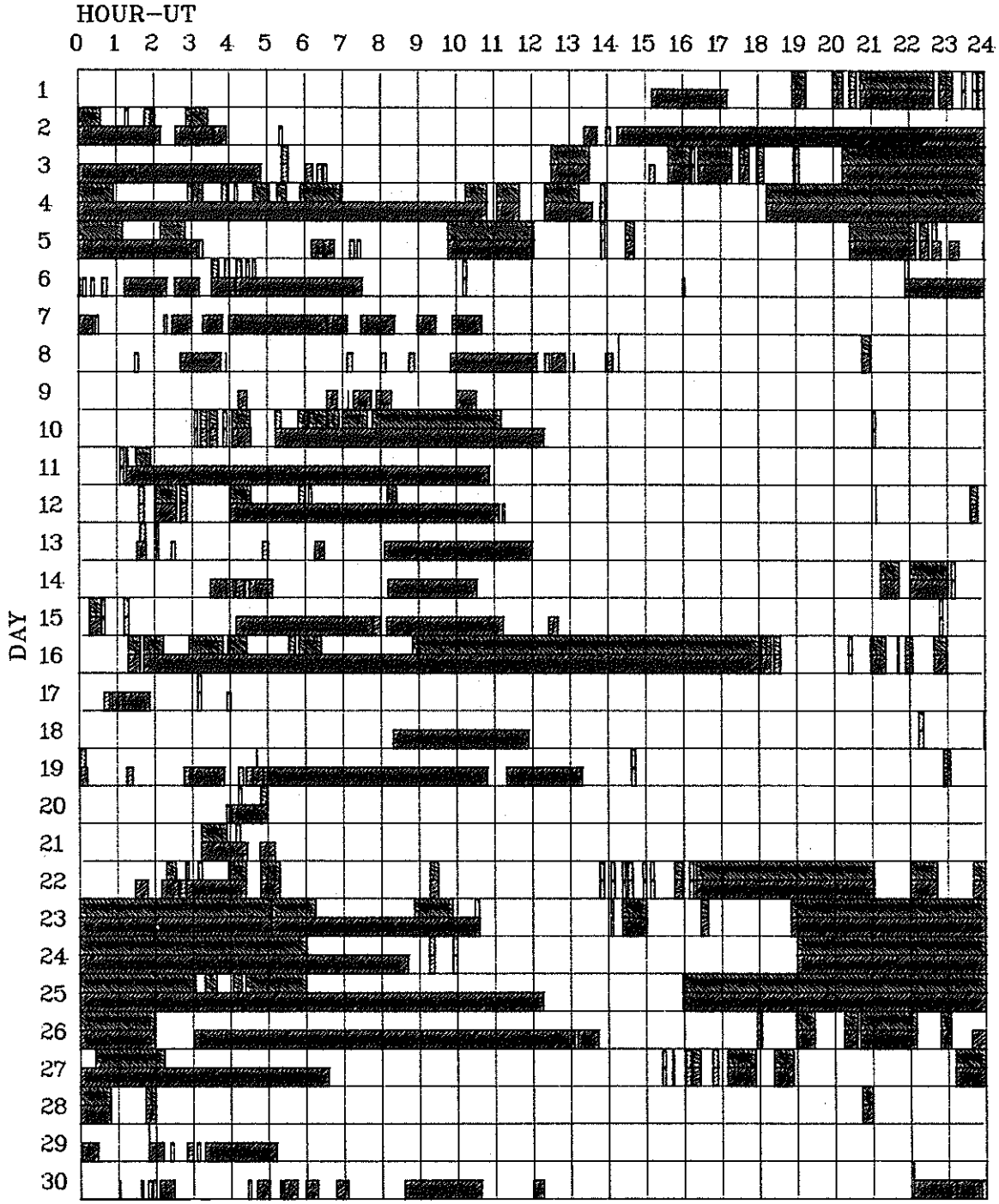
"Remarks":

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

JUNE 1978



Observatories included in total patrol:

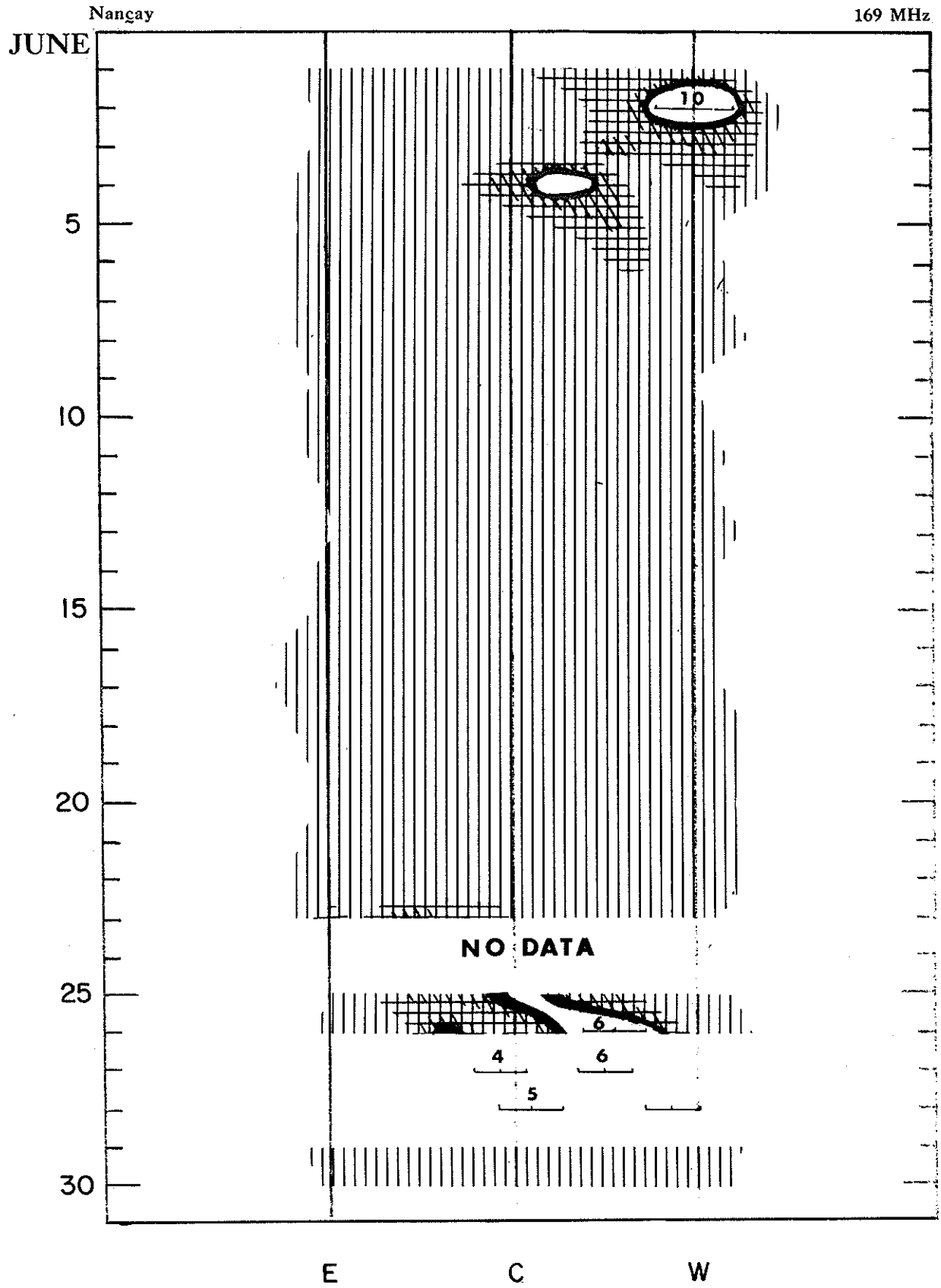
Bucharest	Holloman	Manila	Monte Mario	Tehran
Haute Provence	Istanboul	McMath-Hulbert	Palehua	Upice
Herstmonceux	Kodaikanal	Mitaka	Ramey	Wendelstein

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).

20
Jun 78

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

JUNE 1978

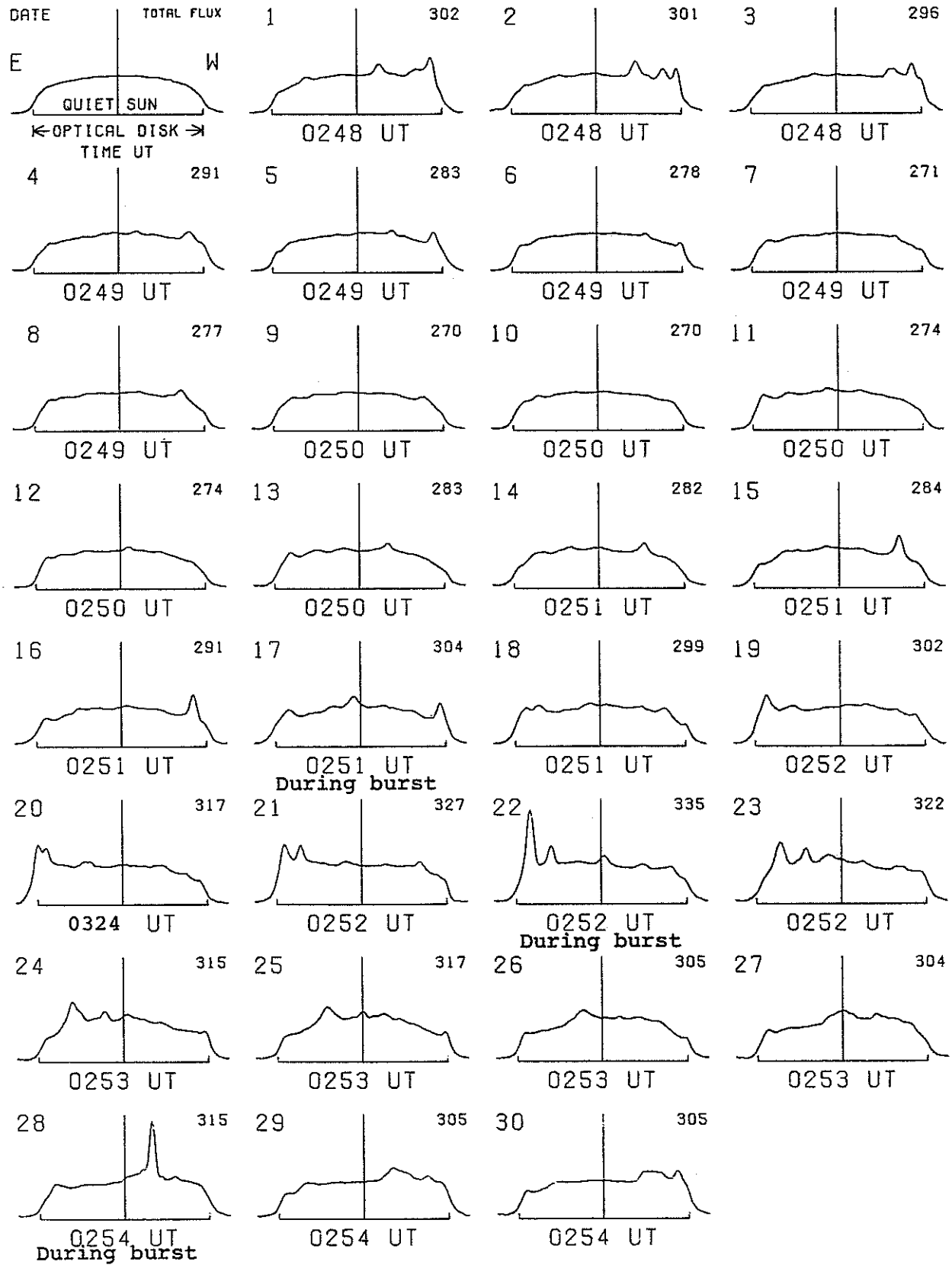


EAST-WEST SOLAR SCANS

JUNE 1978

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC



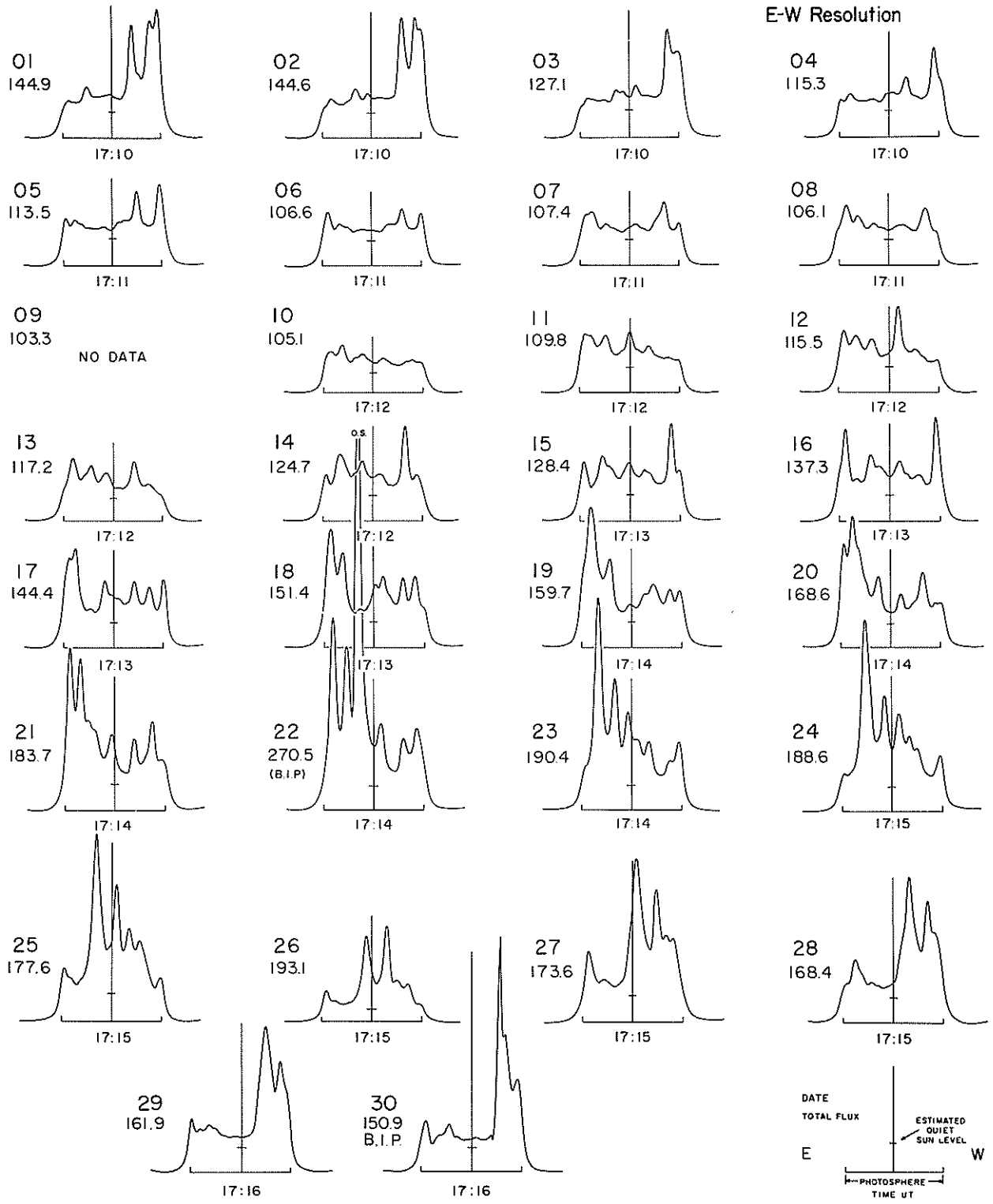
22
Jun 78

EAST-WEST SOLAR SCANS

JUNE 1978

ALGONQUIN RADIO OBSERVATORY
CANADA

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

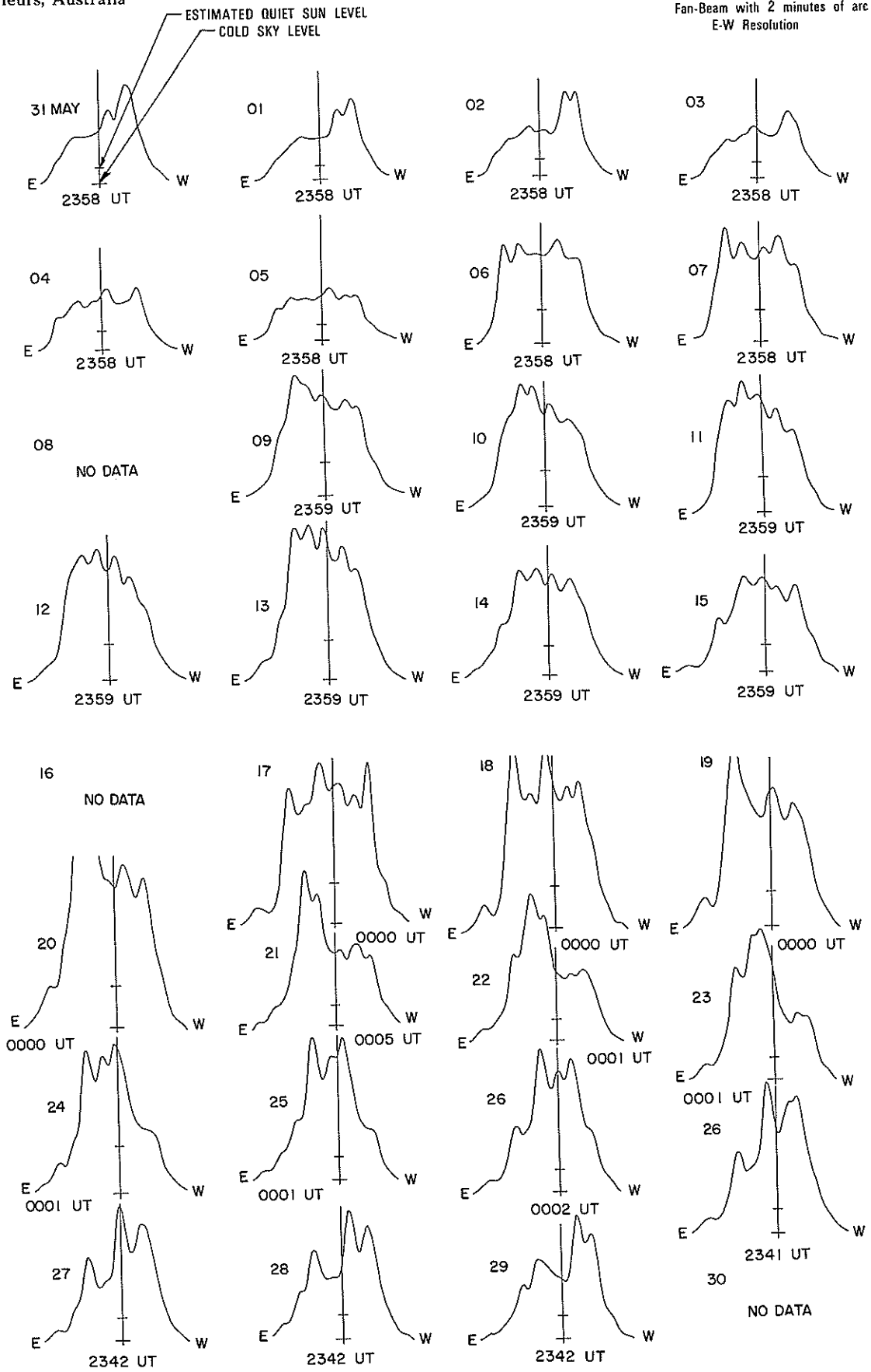


EAST-WEST SOLAR SCANS

JUNE 1978

Fleurs, Australia

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

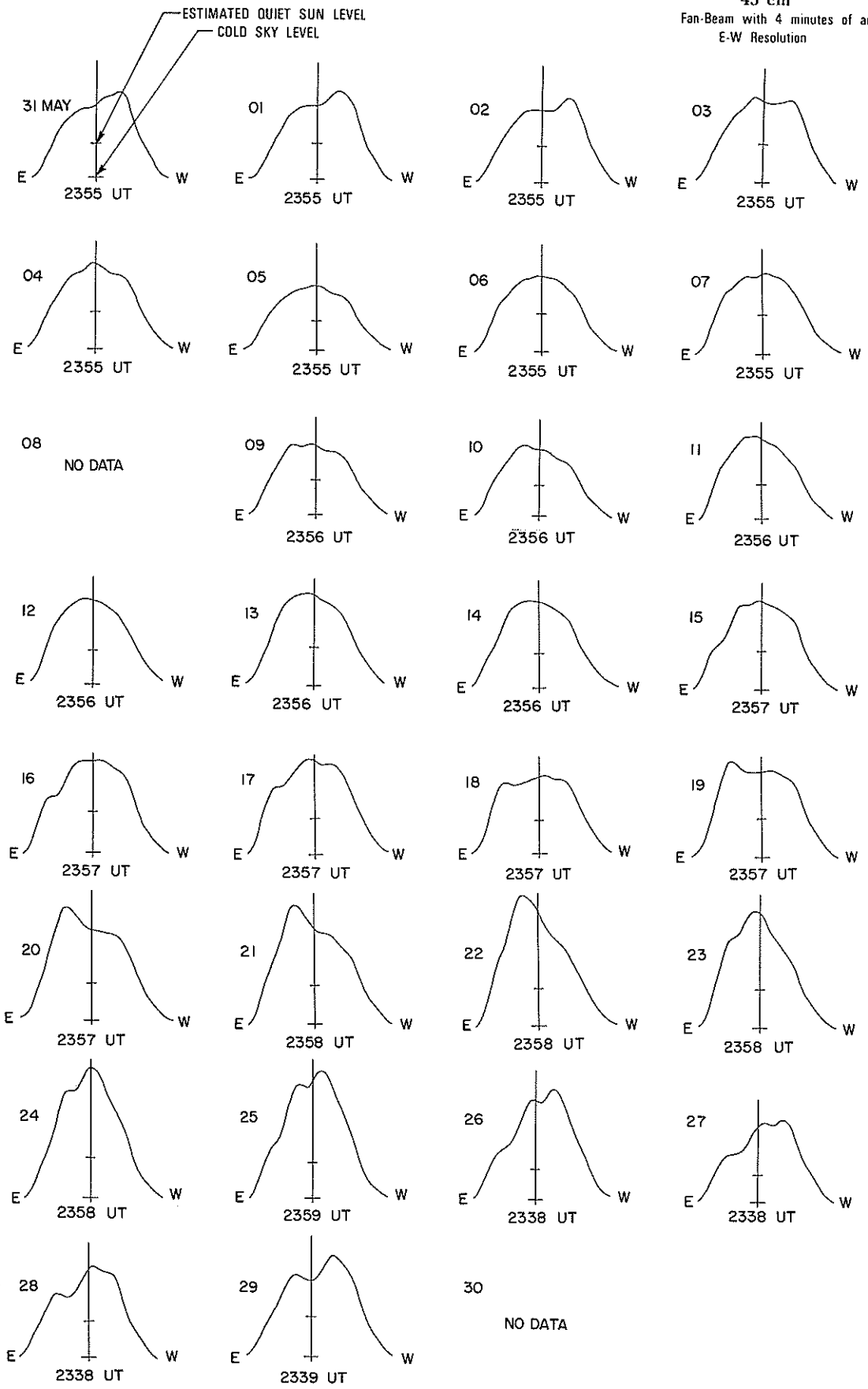


EAST-WEST SOLAR SCANS

JUNE 1978

Fleurs, Australia

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



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1978

JUN 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	2800	OTTA	21	GRF	1324		34	2.8	1.4		
	2800	OTTA	1	S	1325.3	1326	1.5	3	1.5		
	8800	SGMR	3	S	1325.9	1329	5.1	25.3	10.1		
	2695	SGMR	3	S	1326	1328.5	4.5	19.5	7.8		
	2695	BOUL	4	SF	1328	1329	2.5	13	4		
	2800	OTTA	3	S	1328	1328.7	2.5	15	5		
	2800	OTTA	22	GRF	1415	1514	115	4.2	2.1		
	2800	OTTA	21	GRF	2100	2118	78	3.6	1.4		
	8800	SGMR	3	S	2101.5	2104	3.5	12.6	5		2,5,SWF
	2695	SGMR	3	S	2102	2103.5	7	37.8	15.1		2,5,SWF
	2695	BOUL	46	G	2102	2104	13.5	27	9		
	2695	BOUL	29	PBI	2116	2119.5	5	3	1		
	2800	OTTA	4	S/F	2102	2102.4	7	32	10.5		
	2800	OTTA	1	S	2111	2113.2	4.5	5.8	2.9		
	2800	OTTA	20	GRF	2210	2225	60	2.8	1.4		
	2695	PENT	20	GRF	2336	2340	24	3.4	1.7		
2	2800	OTTA	20	GRF	1425	1500	60	2.2	1.7		
	2800	OTTA	20	GRF	1620	1915	280	5.6	2.8		
3	2800	OTTA	1	S	2212.5	2214	2.5	2.4	1.4		
5	2800	OTTA	22	GRF	1240	1325	110	3.4	1.7		
7	2800	OTTA	1	S	1851	1852	2	1	.5		
8	2800	OTTA	20	GRF	1820	2005	170	2	1		
12	2800	OTTA	20	GRF	1240	1317	85	3.2	1.6		
	2800	OTTA	2	S/F	1636	1637.7	6	8	2.7		
	2800	OTTA	29	PBI	1642	1642	60	2.8	1.4		
	2695	SGMR	1	S	1636.5	2637.7	5.8	7.5	3		SWF
	2800	OTTA	21	GRF	2030	2125	110	2.6	1.4		
	2800	OTTA	1	S	2120	2120.8	2	2	.6		
	2695	PENT	240	R	2350	2500	70	3.6	2		
13	2800	OTTA	27	RF	1218		152	1.2	1.1		
	2800	OTTA	24	R	1218	1230	12	1.2	.6		
	2800	OTTA	24P	R	1230		128	1.2			
	2800	OTTA	26	FAL	1438	1450	12	-1.2	-.6		
	2800	OTTA	20	GRF	1454	1605	95	1.6	.8		
	2800	OTTA	20	GRF	1640	1645	25	1	.5		
	2800	OTTA	8	S	1717.8	1718	.4	1.6			
	2800	OTTA	23	GRF	1900	2035	170	3.8	1.9		
	2800	OTTA	1	S	1908.5	1909.1	1.5	.8	.4		
	2800	OTTA	40	F	1918.8	1919.5	3	1.4			
	2695	BOUL	4	SF	1919	1920.5	3	12	4		
	8800	SGMR	3	S	2122.5	2122.7	1	18.6	7.4		SWF
	2695	SGMR	3	S	2122.7	2123.1	1.3	25.5	10.2		SWF
	2800	OTTA	4	S/F	2122.8	2123	1.2	22	6		
	2695	BOUL	8	S	2123.5	2124	1.5	18	6		
14	2695	PENT	1	S	0046.2	0046.9	1	2.6	1.3		
	2695	PENT	2	S/F	0129	0129.8	1.2	4			
	2695	BOUL	1	S	0130	0131	1	4	1		
	2800	OTTA	21	GRF	1100	1220	150	3.4	1.6		
	2800	OTTA	8	S	1235.5	1235.6	.5	1.8	.6		
	2800	OTTA	20	GRF	1405	1415	25	1.8	.9		
	2800	OTTA	27A	RF	1500		180	2.2	1.8		
	2800	OTTA	24	R	1500	1550	50	2.2	1.1		
	2695	BOUL	1	S	1543.5	1544	.5	2	1		
	2800	OTTA	24P	R	1550		110	2.2			
	2800	OTTA	40	F	1601.2	1602.1	2	8			
	2695	BOUL	2	SF	1602.5	1603	1.5	9	3		
	8800	SGMR	3	S	1620.2	1620.6	1.7	21.8	6.6		
	2695	SGMR	3	S	1620.2	1620.5	.8	37.7	11.3		
	2800	OTTA	3	S	1620	1620.3	2	15	3.4		
	2695	BOUL	8	S	1621	1621.5	1.5	14	5		
	2800	OTTA	8	S	1639	1639.1	.5	4.4	2.6		
	2800	OTTA	40	F	1720.8	1723	3.5	3.8			
	2695	BOUL	40	F	1721.5	1722	2.5	3	1		
	2695	BOUL	4	SF	1734.5	1735	2	13	4		
	2800	OTTA	3	S	1734	1734	2.2	16.6	4.2		
	2800	OTTA	26	FAL	1740	1800	20	-2.2	-1.1		
	2800	OTTA	240	R	1920	2010	50	3.2	1.6		
	2800	OTTA	1	S	2132.5	2132.9	1	2.2			
	2800	OTTA	1	S	2220.2	2220.5	1	4	2		
	2695	PENT	21	GRF	2235	2315	115	3.4	2		
	2695	PENT	1	S	2403	2403.2	1	3.2	1.4		
	2695	PENT	1	S	2407.9	2408	2	7	2.4		
15	2800	OTTA	240	R	1955	2020	25	2.2	1.1		
	2800	OTTA	1	S	2049.9	2050	1.5	6.6	2.2		
	2695	BOUL	2	SF	2050.5	2051	1	7	2		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1978

JUN 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
16	2800	OTTA	240 R	1230	1255	25	1.8	.9		
	2800	OTTA	22 GRF	1630	1740	215	2.4	1.6		
	2800	OTTA	240 R	1955	2020	25	1.8	.9		
	2800	OTTA	240AR	2210	2250	40	5.8	3.2		
	2800	OTTA	1 S	2235.2	2235.8	3	2.2	1.1		
	2695	BOUL	2 SF	2236	2237	1	4	1		
	2695	PENT	20 GRF	2320	2355	100	3.4	1.7		
17	2800	OTTA	240 R	1415	1550	35	4.6	2.3		
	2800	OTTA	240 R	1820	1840	20	3.4	1.7		
	2800	OTTA	20 GRF	1900	1910	18	1.8	.9		
	2800	OTTA	20 GRF	2015	2025	25	1.8	.9		
	2800	OTTA	1 S	2054	2054.5	2	1.2	.5		
	2800	OTTA	1 S	2108	2108.5	3	1.8	.9		
	2800	OTTA	20 GRF	2120	2140	90	2.2	1.4		
18	2695	PENT	21 GRF	0008	0045	100 D	7.8			
	2695	PENT	1 S	0009	0010.6	5	6.2	3		
	2695	PENT	1 S	0118	0119	3	3.2	1.6		
	2800	OTTA	20 GRF	1300		90	2.2			
	2800	OTTA	23 GRF	1515	1700	170	2.8	1.8		
	2695	PENT	1 S	1706	1707	2	2	1		
	2800	OTTA	240 R	2020	2035	15	1.8	.9		
	2800	OTTA	1 S	2147	2148	4	2.6	1.3		
	2695	BOUL	2 SF	2148 E	2148.5	1.50	4	1		
	2695	BOUL	2 SF	2410.5	2411.5	2 D	6	2		
19	2800	OTTA	21 GRF	1300	1410	130	2.8	1.4		
	2800	OTTA	1 S	1324	1325.5	4	2.2	1.4		
	2800	OTTA	27A RF	1540		230	2.2	2		
	2800	OTTA	24 R	1540	1550	10	2.2	1.1		
	2800	OTTA	24P R	1550		200	2.2			
	2800	OTTA	1 S	1815	1816	3	2.6	1		
	2800	OTTA	26 FAL	1910	1930	20	-2.2	-1.1		
	2695	PENT	21 GRF	2215	2350	165	4	2		
	2695	PENT	3 S	2336	2337.6	2.5	13	6		
20	2800	OTTA	20 GRF	1310	1333	120	1.4	.7		
	2800	OTTA	21 GRF	1705	1723	315	8.4	3.2		
	2800	OTTA	2 S/F	1724.5	1725	2.5	7.6	3.8		
21	2695	PENT	3 S	0041	0041.8	2	13.4	3.6		
	2800	OTTA	20 GRF	1120		100	3.2	2		
	2800	OTTA	20 GRF	1340	1425	75	2.2	1.8		
	2800	OTTA	21 GRF	1515	1623	190	6.2	3.1		
	8800	SGMR	3 S	1534.2	1536.6	3.3	20.5	8.2		
	2695	SGMR	1 S	1534.4	1535.5	3.2	3.7	1.5		
	2800	OTTA	2 S/F	1535	1536.5	3	3.2	1.8		
	2800	OTTA	20 GRF	1630	1904	90	3	1.4		
	2800	OTTA	240 R	2110	2140	30	4.6	2.6		
22	2800	OTTA	1 S	1431.5	1432	2	7.4	2.4		
	2695	SGMR	3 S	1641	1706.3	95	129	51.6		4,SWF
	2800	OTTA	45 C	1644	1706	90	113	66		
	2800	OTTA	30 PBI	1814	1814	265	39	18.2		
	8800	SGMR	20 GRF	1652	1709	83	38.4	15.4		4,SWF
	2695	BOUL	20 GRF	1652.5E	1703.5	60 D	117	39		
	2695	SGMR	3 S	1947	1950.6	14	11.1	4.4		SWF
	8800	SGMR	3 S	1948.8	1952.8	12.2	18.3	7.3		SWF
	2800	OTTA	1 S	1949	1951	8	6.4	3.1		
	2800	OTTA	1 S	2010	2014	10	3.6	1.8		
23	2800	OTTA	240 R	1150	1210	20	2.6	1.3		
	2800	OTTA	21 GRF	1320	1350	40	2.2	1.1		
	8800	SGMR	3 S	1320.8	1322.1	3.2	14.5	4.3		
	2695	SGMR	3 S	1321.4	1322	1.5	11.2	3.4		
	2800	OTTA	1 S	1321	1322	3	5.2	1.8		
	2800	OTTA	20 GRF	1730	1735	20	1.8	.9		
	2800	OTTA	1 S	1944	1945	2.5	2.2	1		
	2800	OTTA	1 S	2024	2024.5	1	2.2	1.1		
	2800	OTTA	20 GRF	2105	2113	20	2	1		
24	2800	OTTA	22 GRF	1525	1615	120	3.8	1.9		
	2800	OTTA	20 GRF	1730	1740	30	1.2	.8		
	2800	OTTA	240 R	2227	2240	13	3.6	2		
26	2800	OTTA	22 GRF	1200	1230	75	5.6	2.8		
	8800	SGMR	3 S	1436.5	1438.8	3.4	14.1	4.2		5,SWF
	2695	SGMR	3 S	1437.1	1438.3	4.1	21.3	6.4		5,SWF
	2800	OTTA	3 S	1437.9	1438.1	1.8	17.2	8		
	2800	OTTA	47 GB	1528	1539.5	32	1160	262		
	2800	OTTA	30 PBI	1600	1600	230	38	14		
	2695	BOUL	47 GB	1529 E	1541	73.50	1730	576		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1978

JUN 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	SGMR	47	GB	1531.1	1539.5	37.7	1787	536		2,4,5,SWF
	8800	SGMR	3	S	1534.5	1543	27.7	218	65.5		2,4,5,SWF
	2800	OTTA	3	S	1615	1619.5	17	22.6	10.2		
	2800	OTTA	1	S	1633	1635	6	3.8	1.9		
	2800	OTTA	1	S	1718.5	1719.2	2	2.6	1.3		
	2800	OTTA	3	S	1735	1735.7	2	43	14.4		
	8800	SGMR	3	S	1735.4	1735.5	2.6	18.1	7.2		
	2695	SGMR	3	S	1735.2	1735.7	1.8	64.2	25.7		
	2800	OTTA	4	S/F	1802.3	1803	1.5	19	10		
	2800	OTTA	4	S/F	2205	2205.5	4	55	18.2		
	8800	SGMR	3	S	2205.5	2205.7	9.5	19.2	7.7		
	2695	SGMR	3	S	2205.1	2205.9	9.9	55.1	22		
	2800	OTTA	4	S/F	2239	2241	3	12.4	4.2		
	2695	PENT	21	GRF	2247	2325	75	3.6	1.8		
	2695	PENT	2	S/F	2315	2315.1	1	1.8			
	2695	PENT	1	S	2340	2340.5	1	4.4	1.4		
27	2695	PENT	21	GRF	0055	0110	30	2.8	1.4		
	2695	PENT	3	S	0100.3	0101.2	6	47	12		
	2695	PENT	1	S	0111	0111.9	4	3.6	1.8		
28	2800	OTTA	1	S	1649	1651.5	5	9.8	4.6		
	2800	OTTA	20	GRF	2016	2023.5	16	4.5	2.2		
	2800	OTTA	20	GRF	2105	2155	110	4.8	2.4		
29	2800	OTTA	3	S	1120	1121.7	2.5	10.4	4		
	8800	SGMR	3	S	1120	1121	2	14.7	5.9		
	2695	SGMR	3	S	1120.5	1122.5	2.4	10.2	4.1		
	2695	SGMR	3	S	1415.3	1415.5	14.6	66.3	27		5,SWF
	2695	BOUL	4	SF	1415 E	1417	11 D	63	21		
	2800	OTTA	20	GRF	1500	1530	30	3	1.5		
	2800	OTTA	20	GRF	1850	1930	140	5.8	2.9		
	2800	OTTA			2210	2233	40 D	6.4			
30	2695	SGMR	1	S	1052	1052.5	1.9	7.2	3.6		3
	2800	OTTA	20	GRF	1055	1155	105	3.4	1.7		
	2800	OTTA	3	S	1446.5	1449	10	44	13		
	2695	BOUL	1	S	1447 E	1450.5	9.5D	30	10		
	8800	SGMR	3	S	1447.3	1449.1	4	24.5	7.4		
	2695	SGMR	3	S	1447.3	1449.1	4.1	54.5	16.4		
	2695	SGMR	3	S	1624.5	1627.3	7.5	46.5	14		
	2800	OTTA	3	S	1625.2	1627	4.8	42	10.6		
	2800	OTTA	29	PBI	1630	1630	15	4.8	2.4		
	2695	BOUL	1	S	1626.5	1628.5	6	30	10		
	2800	OTTA			1650	1705.2	40	30			
	2695	SGMR	3	S	1702.6	1715.2	16.6	51.6	15.5		SWF
	2695	BOUL	41	F	1703.5	1716	13.5	30	10		
	8800	SGMR	3	S	1719.4	1719.6	1.6	164	32.8		SWF
	2800	OTTA	32A	ABS	1735	1750	35	4	2		
	2800	OTTA	1	S	1800.5	1802	3	5.2	2.6		
	2695	BOUL	4	SF	1801.5	1803	3	7	2		
	2800	OTTA	20	GRF	1815	2000	235	4.8	2.6		

Observatories:

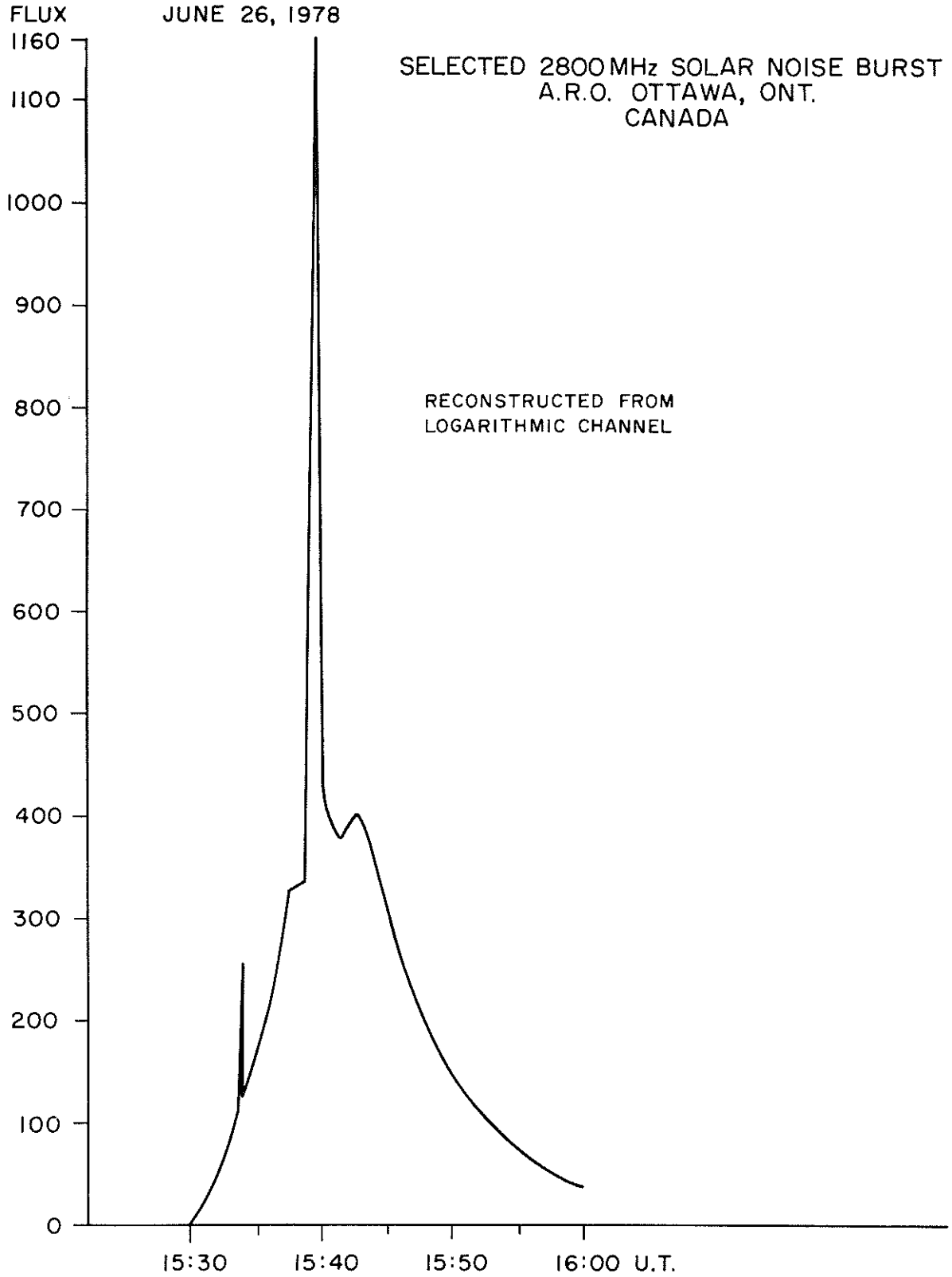
BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

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 +

SELECTED SOLAR NOISE BURST

JUNE 26, 1978



SOLAR X-RAYS BY SATELLITE
SMS GOES
JUNE 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
6/ 1	.017	.002	.003	.002	.002	.001	.002	.002	.002	.002	.001	.002	B	.002	.001	.002	.001	.001	.001	.002	.003	.019	.002	.002	.003
6/ 2	.001	.001	.002	.007	.002	.002	.006	.003	.002	.001	.001	.002	B	.001	.001	.001	.002	.003	.004	.004	.001	B	.001	.002	.002
6/ 3	.002	.002	.005	B	B	.003	.001	.002	.004	B	B	B	B	B	B	B	B	B	B	B	B	B	.001	B	.001
6/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	.013	B	B	B	.001	B	B	B	B	B
6/ 5	B	B	.004	B	.002	.005	.002	.038	.003	.001	.001	B	.001	.012	B	B	B	M	B	.001	B	B	B	B	.003
6/ 6	.001	B	.015	B	B	B	B	B	B	B	B	B	B	B	.003	B	B	B	M	B	B	B	B	B	.001
6/ 7	B	B	B	B	B	B	B	B	.001	B	B	B	B	B	B	B	B	B	.002	B	B	B	B	B	B
6/ 8	.001	B	B	.001	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	.001	.001	B	B	B	B
6/ 9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	M	.001	B	.001	M	M	B
6/11	.001	B	.008	B	.002	B	.002	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/12	B	B	B	B	.001	B	B	B	B	B	B	B	B	B	B	.004	.006	B	.001	B	.001	.003	.001	B	.001
6/13	.001	.006	B	B	.003	B	B	.001	.002	B	B	.013	.001	B	.001	.001	B	.001	B	.002	.002	.002	B	B	.002
6/14	.002	.002	B	B	B	B	B	.001	.001	.002	B	B	.001	B	B	B	B	.002	B	B	.002	B	.002	.003	.001
6/15	.002	.002	B	.002	B	.002	B	B	B	.001	B	B	B	B	B	B	B	B	B	B	.004	B	B	B	B
6/16	B	B	B	B	B	B	B	B	.001	B	B	B	B	B	.001	.001	.001	.029	B	B	.001	M	.015	.029	.004
6/17	.013	.003	.006	.003	.001	.003	.003	B	B	B	B	B	B	B	B	.001	.001	.002	.010	.002	.002	.003	.002	B	.002
6/18	.014	.008	B	B	B	B	B	.002	B	B	B	B	B	B	B	B	.002	B	B	.002	.006	.004	.001	.001	.002
6/19	.001	.001	.002	.002	.005	.003	.002	.006	.003	.002	.002	.004	.005	.002	.006	.005	M	.002	.004	.002	.004	.006	.002	.005	.003
6/20	.002	.002	.002	.004	.002	.002	.002	.002	.005	.006	.002	.006	.003	.002	.018	.002	.001	.006	.002	.044	.001	.001	.002	.002	.005
6/21	.002	.002	.002	.002	.001	.008	.001	.002	.002	.003	.002	.002	.003	.002	.002	.017	.002	.002	.002	.002	.001	.003	.001	.003	.003
6/22	.001	.002	.034	.003	.002	.002	.023	B	.001	.002	.005	B	B	.002	.001	B	.006	.165	.065	.036	.050	.008	.002	.001	.017
6/23	.002	.001	.001	.001	B	.001	B	.022	.006	.001	.001	B	.001	.002	.001	B	.003	.001	B	B	.001	.003	B	.002	.002
6/24	B	.001	.001	.001	B	.001	B	.002	.001	B	.001	.006	.001	.005	B	.001	.001	.001	.014	.002	.003	.001	.002	.001	.002
6/25	.005	.001	.001	.006	.007	.001	.002	.001	.020	.002	.001	.002	.001	.001	B	B	B	.002	.001	.002	B	B	B	M	.003
6/26	.001	.001	B	B	B	B	B	B	B	B	B	B	.005	.001	.004	.132	.147	.027	.008	.002	.004	.002	.014	.002	.014
6/27	B	.010	B	B	B	.001	B	.002	.002	B	.001	.003	.001	B	.032	.010	B	.002	.001	.001	B	.001	B	.001	.003
6/28	.001	.003	.055	B	B	B	B	B	.002	.002	.001	M	B	B	B	B	.003	.002	.002	.002	.002	.007	.006	.001	.004
6/29	.002	.002	.002	.007	.009	.006	.001	.003	.001	.001	.006	.013	.002	.001	.007	.001	.001	.001	.001	.003	.002	.001	.022	.011	.005
6/30	.001	.006	.019	.001	B	B	.001	.004	.001	.003	.001	.001	B	.002	.010	.007	.004	.013	.008	.002	.001	.002	B	.001	.004

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

SOLAR X-RAYS BY SATELLITE
SMS GOES
JUNE 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
6/ 1	.038	.013	.014	.013	.011	.009	.010	.012	.011	.011	.011	.013	.010	.012	.010	.013	.012	.011	.010	.011	.013	.036	.011	.011	.009
6/ 2	.010	.009	.012	.023	.014	.014	.019	.019	.018	.013	.010	.012	.009	.008	.010	.011	.011	.015	.020	.021	.012	.009	.009	.012	.008
6/ 3	.011	.011	.020	.009	.008	.013	.016	.011	.010	.007	.007	.007	.006	.006	.007	.006	.006	.007	.007	.006	.006	.006	.008	.006	.005
6/ 4	.006	.006	.006	.006	.005	.080	.006	.005	.005	.004	.005	.015	.025	.004	.006	.007	.005	.004	.004	.004	.004	.004	.004	.006	.005
6/ 5	.007	.006	.012	.008	.010	.013	.010	.043	.015	.007	.008	.006	.006	.024	.005	.004	.004	M	.005	.006	.004	.003	.004	.003	.006
6/ 6	.006	.037	.017	.003	.003	.003	.003	.003	.015	.004	.003	.004	.004	.003	.004	.003	.003	.003	M	.003	.003	.003	.003	.003	.004
6/ 7	.003	.004	.004	.004	.003	.003	.004	.004	.006	.004	.004	.004	.004	.004	.004	.003	.004	.005	.005	.005	.007	.003	.003	.003	.002
6/ 8	.005	.004	.004	.004	.003	.003	.003	.003	.003	.003	.002	.003	.003	.002	.003	.003	.004	.003	.003	.005	.006	.003	.002	.002	.002
6/ 9	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	B
6/10	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.003	.004	M	.006	.005	.006	M	M	.002
6/11	.007	.003	.015	.004	.006	.004	.008	.004	.002	.003	.003	.005	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002
6/12	.002	.002	.002	.003	.006	.003	.003	.003	.003	.003	.005	.006	.019	.005	.003	.004	.011	.006	.005	.005	.006	.008	.005	.004	.003
6/13	.007	.015	.007	.006	.030	.006	.005	.006	.007	.006	.006	.006	.007	.005	.006	.006	.004	.006	.004	.006	.007	.005	.003	.026	.005
6/14	.007	.027	.006	.005	.005	.005	.005	.007	.006	.009	.005	.006	.008	.004	.005	.005	.028	.007	.005	.005	.009	.007	.010	.013	.005
6/15	.010	.009	.008	.009	.007	.009	.007	.006	.060	.008	.007	.021	.005	.006	.006	.005	.005	.005	.005	.005	.012	.007	.007	.007	.005
6/16	.007	.008	.007	.007	.008	.008	.008	.007	.008	.008	.007	.007	.008	.008	.009	.009	.010	.028	.008	.007	.009	M	.032	.050	.008
6/17	.037	.018	.025	.016	.011	.013	.015	.009	.008	.008	.007	.008	.008	.007	.007	.011	.011	.011	.024	.015	.012	.016	.013	.011	.008
6/18	.032	.025	.010	.009	.009	.009	.009	.011	.009	.008	.008	.009	.010	.009	.009	.010	.012	.010	.009	.010	.017	.018	.011	.012	.007
6/19	.011	.011	.013	.012	.018	.014	.012	.020	.017	.016	.016	.019	.018	.016	.021	.019	M	.017	.019	.015	.018	.019	.014	.020	.010
6/20	.015	.015	.013	.018	.016	.015	.016	.017	.019	.021	.013	.017	.016	.014	.012	.014	.012	.022	.016	.055	.014	.011	.013	.014	.011
6/21	.013	.016	.014	.015	.018	.026	.014	.014	.014	.027	.015	.013	.016	.012	.013	.039	.016	.015	.013	.015	.012	.017	.012	.038	.010
6/22	.024	.036	.041	.019	.013	.014	.039	.010	.010	.013	.019	.011	.010	.021	.022	.023	.019	.219	.155	.091	.096	.033	.020	.016	.029
6/23	.014	.013	.014	.013	.011	.012	.011	.050	.028	.012	.014	.011	.036	.015	.012	.011	.054	.014	.011	.010	.011	.013	.023	.024	.010
6/24	.010	.036	.012	.013	.012	.024	.011	.013	.011	.011	.013	.020	.015	.019	.012	.014	.014	.016	.036	.019	.021	.016	.026	.018	.010
6/25	.023	.016	.015	.023	.025	.013	.015	.012	.033	.018	.012	.012	.011	.011	.010	.010	.011	.016	.013	.012	.010	.032	.009	M	.009
6/26	.053	.010	.010	.009	.021	.010	.010	.010	.010	.009	.009	.010	.017	.012	.015	.100	.192	.127	.030	.019	.019	.017	.031	.016	.023
6/27	.011	.021	.011	.010	.010	.011	.010	.012	.014	.011	.012	.013	.011	.010	.030	.035	.032	.133	.011	.010	.010	.034	.010	.067	.013
6/28	.011	.017	.049	.011	.010	.011	.010	.010	.012	.016	.013	M	.011	.010	.010	.010	.051	.061	.013	.023	.015	.023	.025	.017	.011
6/29	.015	.014	.014	.024	.021	.022	.012	.014	.011	.011	.025	.026	.017	.024	.017	.011	.012	.010	.011	.018	.012	.010	.049	.031	.011
6/30	.013	.017	.034	.013	.010	.009	.010	.015	.010	.014	.010	.010	.009	.012	.018	.026	.016	.031	.024	.015	.013	.012	.011	.010	.010

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

SOLAR X-RAYS BY SATELLITE

GOES

JUNE 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}
1	0158	2.2E-08	1.2E-06	0207	7.6E-08	2.1E-06	0217	1.7E-08	1.6E-06
1	0643	1.2E-08	9.1E-07	0648	6.5E-08	2.0E-06	0652	3.2E-08	1.4E-06
1	0731	2.6E-08	1.3E-06	0734	3.3E-08	2.0E-06	0736	3.3E-08	1.4E-06
1	0756	1.8E-08	1.2E-06	0759	8.3E-08	2.0E-06	0806	3.2E-08	1.5E-06
1	1026	1.0E-08	1.0E-06	1029	4.6E-08	1.5E-06	1034	1.9E-08	1.2E-06
1	1324	1.9E-08	1.2E-06	1331	9.2E-08	2.3E-06	1335	2.1E-08	1.7E-06
1	1452	2.0E-08	1.2E-06	1455	2.7E-08	1.8E-06	1457	2.9E-08	1.4E-06
1	2100	2.1E-08	1.1E-06	2111	7.8E-07	1.0E-05	2118	2.0E-07	5.6E-06
1	2340	2.8E-08	1.3E-06	2343	3.6E-08	2.0E-06	2350	2.8E-08	1.5E-06
2	0251	2.0E-08	1.3E-06	0304	2.6E-07	5.2E-06	0314	9.8E-08	3.2E-06
2	0612	2.2E-08	1.4E-06	0616	1.2E-07	2.6E-06	0620	2.7E-08	1.8E-06
2	0750	1.5E-08	1.9E-06	0754	1.9E-07	3.6E-06	0756	6.8E-08	2.6E-06
2	0953	4.9E-09	1.1E-06	0956	2.9E-08	2.2E-06	0958	2.2E-08	1.3E-06
2	1105	1.9E-08	1.2E-06	1112	1.6E-07	3.1E-06	1115	3.1E-08	1.7E-06
2	1933	6.9E-09	1.6E-06	1939	1.5E-07	3.2E-06	1947	5.5E-08	2.3E-06
2	2303	2.3E-08	1.1E-06	2306	5.2E-08	1.7E-06	2308	1.6E-08	1.1E-06
2	2309	1.8E-08	1.1E-06	2312	1.3E-07	2.5E-06	2318	3.1E-08	1.8E-06
3	0024	2.0E-08	1.0E-06	0027	4.9E-08	2.0E-06	0037	3.7E-08	1.5E-06
3	0230	5.2E-08	2.2E-06	0234	1.5E-07	3.3E-06	0239	6.9E-08	2.6E-06
3	2211	4.6E-09	5.8E-07	2218	5.3E-08	1.5E-06	2226	1.4E-08	1.0E-06
5	0046	4.0E-09	5.4E-07	0052	3.8E-08	1.1E-06	0059	1.0E-08	7.7E-07
5	0220	3.1E-09	6.0E-07	0231	1.6E-07	2.7E-06	0240	5.4E-08	1.6E-06
5	0411	4.2E-09	6.5E-07	0417	7.5E-08	1.4E-06	0432	2.3E-08	1.0E-06
5	0524	1.5E-08	7.7E-07	0537	1.3E-07	2.3E-06	0557	4.3E-08	1.5E-06
5	0728	2.6E-07	2.6E-06	0744	9.9E-07	9.5E-06	0756	2.7E-07	5.8E-06
5	1056	8.0E-09	6.9E-07	1100	3.2E-08	1.0E-06	1104	1.3E-08	8.5E-07
5	1245	1.4E-08	6.3E-07	1318	4.0E-07	5.4E-06	1325	9.9E-08	2.9E-06
7	1849	3.9E-09	4.2E-07	1854	9.7E-08	1.5E-06	1903	2.5E-08	9.3E-07
8	0015	2.0E-09	2.9E-07	0024	1.0E-07	1.4E-06	0029	2.0E-08	7.6E-07
10	2346	1.3E-07	1.7E-06	2351	1.6E-07	2.7E-06	2355	9.3E-08	2.2E-06
11	0413	1.6E-09	3.4E-07	0420	1.0E-07	1.8E-06	0426	3.6E-08	1.0E-06
11	0553	3.7E-09	3.2E-07	0601	1.3E-07	2.2E-06	0609	4.4E-08	1.2E-06
12	0403	8.2E-10	2.7E-07	0423	1.0E-07	2.2E-06	0426	4.7E-08	1.1E-06
12	2233	8.4E-09	5.0E-07	2045	4.1E-08	1.1E-06	2049	1.9E-08	8.2E-07
12	2118	1.5E-08	5.1E-07	2121	2.7E-07	3.0E-06	2127	6.1E-08	1.6E-06
12	2237	1.2E-08	4.1E-07	2244	4.8E-08	1.1E-06	2247	1.9E-08	7.5E-07
12	2349	5.5E-09	3.3E-07	0006	3.5E-08	1.2E-06	0013	1.2E-08	5.8E-07
13	0133	2.9E-08	1.0E-06	0140	2.9E-07	3.9E-06	0144	1.0E-07	2.4E-06
13	0437	3.4E-09	4.9E-07	0442	1.3E-07	2.1E-06	0451	4.8E-08	1.2E-06
13	0703	1.0E-08	5.4E-07	0708	5.9E-08	1.2E-06	0714	2.8E-08	8.4E-07
13	0829	1.7E-08	6.2E-07	0834	7.0E-08	1.4E-06	0840	3.2E-08	1.0E-06
13	1219	6.2E-09	5.7E-07	1224	3.6E-08	1.0E-06	1229	1.8E-08	7.9E-07
13	1405	3.1E-09	4.3E-07	1410	5.2E-08	1.1E-06	1422	1.1E-08	7.7E-07
13	1508	6.2E-09	5.9E-07	1511	9.3E-08	2.0E-06	1514	2.7E-08	1.0E-06
13	1714	1.8E-09	3.0E-07	1718	1.2E-07	1.7E-06	1720	3.3E-08	8.1E-07
13	1737	1.3E-08	6.4E-07	1740	8.3E-08	2.0E-06	1742	1.1E-08	7.4E-07
13	1916	7.3E-09	4.4E-07	1920	1.2E-07	2.0E-06	1923	5.1E-08	1.0E-06
13	2011	6.8E-09	4.5E-07	2019	9.2E-08	2.1E-06	2021	4.8E-08	1.2E-06
14	0125	5.1E-09	4.3E-07	0130	1.1E-07	2.2E-06	0133	3.9E-08	9.9E-07
14	0555	8.7E-09	5.2E-07	0600	1.0E-07	2.1E-06	0602	1.3E-08	6.9E-07
14	0841	4.1E-09	4.3E-07	0845	1.1E-07	1.4E-06	0847	1.9E-08	7.9E-07
14	0906	2.9E-08	8.9E-07	0910	2.5E-07	2.8E-06	0912	5.5E-08	1.6E-06

SOLAR X-RAYS BY SATELLITE

GOES

JUNE 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}
14	1616	8.3E-09	6.2E-07	1621	3.4E-08	1.0E-06	1623	9.2E-09	7.2E-07
14	1957	1.2E-08	7.3E-07	2005	3.5E-08	1.2E-06	2013	1.5E-08	9.5E-07
15	0333	9.0E-09	7.3E-07	0337	1.3E-07	2.3E-06	0342	4.9E-08	1.4E-06
16	2002	6.9E-09	8.1E-07	2006	6.0E-08	1.5E-06	2012	2.1E-08	1.1E-06
17	0153	2.0E-08	1.5E-06	0156	1.2E-07	2.4E-06	0211	2.9E-08	1.9E-06
18	0007	6.2E-09	1.0E-06	0034	4.6E-07	6.7E-06	0047	1.3E-07	3.8E-06
18	0116	1.6E-08	1.9E-06	0120	7.1E-07	7.1E-06	0124	2.0E-07	4.2E-06
18	1635	7.0E-09	9.4E-07	1643	6.3E-08	2.0E-06	1655	2.4E-08	1.4E-06
19	0649	4.3E-08	1.3E-06	0652	9.6E-08	1.8E-06	0702	4.4E-08	1.5E-06
19	1222	2.7E-08	1.5E-06	1228	3.1E-07	4.2E-06	1234	6.0E-08	2.6E-06
19	1324	1.9E-08	1.4E-06	1328	5.3E-08	2.1E-06	1351	6.2E-09	1.7E-06
19	1515	3.7E-08	1.5E-06	1521	1.7E-07	3.0E-06	1529	5.1E-08	2.3E-06
19	2129	2.4E-08	1.3E-06	2138	1.6E-07	3.1E-06	2156	4.9E-08	2.2E-06
19	2335	2.1E-08	1.5E-06	2345	1.5E-07	3.6E-06	2352	4.6E-08	2.4E-06
20	0920	1.7E-08	1.7E-06	0926	2.7E-07	3.7E-06	0931	9.6E-08	2.6E-06
20	1054	1.5E-08	1.3E-06	1057	6.1E-08	1.9E-06	1100	1.4E-08	1.6E-06
20	1150	6.5E-08	2.0E-06	1157	2.7E-07	3.8E-06	1204	1.0E-07	2.8E-06
20	1915	8.6E-08	2.3E-06	1925	2.0E-06	1.5E-05	1935	4.8E-07	8.1E-06
20	2207	1.2E-08	1.1E-06	2212	1.5E-07	2.6E-06	2214	4.4E-08	1.9E-06
21	1532	2.8E-08	1.5E-06	1538	6.7E-07	6.5E-06	1552	2.0E-07	3.9E-06
21	2147	2.2E-08	1.5E-06	2152	1.4E-07	3.0E-06	2157	4.2E-08	2.1E-06
21	2347	8.5E-08	1.1E-06	2350	1.3E-07	2.4E-06	2354	2.3E-08	1.6E-06
22	0232	1.4E-08	1.3E-06	0247	1.8E-06	1.4E-05	0254	4.9E-07	7.2E-06
22	0522	1.8E-08	1.4E-06	0525	3.0E-08	1.9E-06	0528	2.8E-08	1.5E-06
22	0558	1.9E-08	1.4E-06	0609	9.6E-07	9.7E-06	0621	1.7E-07	5.3E-06
22	1023	1.6E-08	1.4E-06	1029	3.1E-07	3.9E-06	1035	8.0E-08	2.6E-06
22	2016	1.3E-06	1.0E-05	2019	2.1E-06	2.0E-05	2024	1.3E-06	1.4E-05
23	1316	1.2E-08	1.3E-06	1324	6.2E-08	2.2E-06	1328	8.5E-09	1.7E-06
23	1620	2.1E-08	1.5E-06	1623	2.5E-08	2.3E-06	1627	2.3E-08	1.5E-06
24	0756	1.1E-08	1.2E-06	0759	3.1E-08	1.9E-06	0801	2.3E-08	1.4E-06
24	1318	2.2E-08	1.5E-06	1332	1.8E-07	3.4E-06	1339	4.2E-08	2.3E-06
24	1524	1.0E-08	1.3E-06	1527	2.3E-08	2.1E-06	1533	1.4E-08	1.7E-06
25	0032	3.8E-08	2.2E-06	0036	1.5E-07	3.3E-06	0044	6.5E-08	2.6E-06
25	0609	2.1E-08	1.3E-06	0612	3.3E-08	2.0E-06	0617	3.0E-08	1.6E-06
25	0822	3.7E-08	1.3E-06	0837	5.3E-07	6.0E-06	0858	1.2E-07	3.6E-06
25	1338	1.9E-08	1.2E-06	1341	4.1E-08	2.0E-06	1343	3.7E-08	1.4E-06
25	1723	9.6E-09	1.1E-06	1734	7.3E-08	2.4E-06	1752	1.2E-08	1.7E-06
25	1943	1.1E-08	1.1E-06	1949	5.8E-08	1.8E-06	1952	2.5E-08	1.4E-06
26	1207	2.1E-08	1.1E-06	1216	8.8E-08	2.1E-06	1221	3.3E-08	1.6E-06
26	1533	5.2E-08	1.6E-06	1558	3.8E-06	3.3E-05	1631	1.2E-06	1.7E-05
26	2008	2.8E-08	1.9E-06	2015	1.6E-07	3.4E-06	2020	7.6E-08	2.5E-06
26	2202	1.7E-08	1.5E-06	2207	8.0E-07	7.9E-06	2213	1.8E-07	4.6E-06
26	2236	1.9E-08	1.5E-06	2243	2.8E-07	5.3E-06	2253	9.6E-08	3.2E-06
27	0057	1.1E-08	1.2E-06	0106	7.9E-07	7.3E-06	0111	1.3E-07	3.6E-06
27	0150	1.2E-08	1.2E-06	0155	9.3E-08	2.4E-06	0201	1.7E-08	1.8E-06
27	0657	1.1E-08	1.1E-06	0702	1.2E-07	2.4E-06	0705	2.2E-08	1.6E-06
27	0959	5.7E-09	1.0E-06	1005	1.1E-07	2.6E-06	1009	1.0E-08	1.6E-06
27	1141	3.3E-08	1.3E-06	1152	1.0E-07	2.4E-06	1155	4.3E-08	1.9E-06
28	0111	1.1E-08	1.1E-06	0119	1.3E-07	3.1E-06	0124	3.2E-08	1.9E-06
28	0242	6.6E-09	1.1E-06	0247	5.4E-06	2.8E-05	0254	8.5E-07	1.2E-05
28	1651	5.7E-08	1.9E-06	1656	1.5E-07	3.1E-06	1701	6.0E-08	2.4E-06
28	1801	1.3E-08	1.2E-06	1804	3.8E-08	1.8E-06	1806	2.6E-08	1.4E-06

SOLAR X-RAYS BY SATELLITE

GOES

JUNE 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}
28	1847	1.0E-08	1.1E-06	1852	1.5E-07	2.7E-06	1855	2.0E-08	1.8E-06
28	1913	1.5E-08	1.2E-06	1916	1.7E-07	2.3E-06	1918	1.7E-08	1.2E-06
28	2017	1.5E-08	1.2E-06	2020	3.4E-08	2.2E-06	2045	1.1E-08	1.7E-06
29	0323	3.7E-08	2.2E-06	0327	2.0E-07	4.1E-06	0331	1.1E-07	3.1E-06
29	0455	2.1E-08	1.5E-06	0500	3.3E-07	4.0E-06	0505	7.0E-08	2.6E-06
29	1117	3.0E-08	1.5E-06	1123	6.5E-07	6.4E-06	1128	2.0E-07	3.7E-06
29	1413	8.7E-09	1.0E-06	1418	6.4E-07	5.7E-06	1423	1.4E-07	3.4E-06
29	1539	7.6E-09	1.0E-06	1542	4.6E-08	2.1E-06	1544	2.4E-08	1.3E-06
29	2207	2.8E-08	1.4E-06	2216	9.7E-07	8.4E-06	2221	2.3E-07	4.8E-06
29	2231	1.1E-07	3.0E-06	2239	4.4E-07	6.5E-06	2247	1.5E-07	4.6E-06
29	2303	1.5E-07	3.3E-06	2309	5.4E-07	6.7E-06	2315	1.5E-07	4.6E-06
30	0121	1.3E-08	1.1E-06	0125	5.8E-08	1.8E-06	0128	2.0E-08	1.4E-06
30	0146	1.8E-08	1.2E-06	0155	4.4E-07	5.2E-06	0202	1.2E-07	3.0E-06
30	0228	7.1E-08	2.4E-06	0235	6.0E-07	6.9E-06	0239	1.6E-07	4.3E-06
30	0712	1.9E-08	1.0E-06	0719	9.8E-08	2.2E-06	0726	2.5E-08	1.6E-06
30	0745	2.1E-08	1.2E-06	0753	1.3E-07	2.5E-06	0758	3.3E-08	1.8E-06
30	0912	2.0E-08	1.1E-06	0923	7.9E-08	2.3E-06	0932	1.7E-08	1.7E-06
30	1050	4.2E-09	8.1E-07	1053	4.4E-08	1.9E-06	1056	1.8E-08	1.2E-06
30	1145	6.5E-09	8.9E-07	1149	3.8E-08	1.5E-06	1156	1.3E-08	1.2E-06
30	1443	1.0E-08	9.0E-07	1453	6.3E-07	6.5E-06	1513	1.0E-07	3.6E-06
30	1623	1.1E-08	1.0E-06	1630	1.6E-07	2.9E-06	1642	4.3E-08	1.9E-06
30	1701	2.2E-08	1.4E-06	1713	8.7E-07	7.9E-06	1724	1.7E-07	4.0E-06
30	1759	1.7E-08	1.6E-06	1805	3.7E-07	4.4E-06	1815	9.5E-08	2.9E-06
30	2351	6.1E-09	9.0E-07	2354	3.3E-08	1.3E-06	2357	1.2E-08	1.0E-06

SOLAR WIND

Interplanetary Scintillations

JUNE 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	528	8					592	11	252	55	377	8	339	5	365	69
2	590	62					498	28	557	64	482	15	509	29	764	37
3	339	54			484	*	460	34	361	50	511	7	478	44		
4	569	23			546	*	507	10					469	25	665	8
5	467	10			437	77	394	49	411	26	561	68	374	77	565	27
6	471	46					422	6	401	49	483	8	503	61		
7	423	14					415	12	353	11	406	4	386	4	260	51
8	406	13			502	90	524	74			419	14	374	9	393	51
11	409	*													475	32
13	469	72														
14	418	18														
16	286	20					414	43								
17	389	20					361	6	336	8	383	31	379	47		
18	401	7			403	55	461	40	434	16	328	7	330	16		
19	377	5					563	34	583	42	421	5	423	6		
20	342	7							488	63			364	119		
21	334	9			513	130	516	46	429	54	501	7	470	6		
22	408	7					650	36							495	155
23	456	8					533	61	384	16	517	37	485	40	600	114
24	312	16					506	43	321	65	479	9	402	6		
25	460	19			473	32	510	21	656	125						
26	426	124									562	10	540	59		
27	467	75			453	66	486	56	381	47	437	11				
28	353	14			356	7	380	11	342	7	437	30	349	23		
29	432	18			390	14	425	17	353	7	417	60	370	7	366	91
30	368	17			426	102	394	5	303	20	463	4	506	8	456	18

JUNE	5 UT	5 LAT	5 DIST	5 DLON	15 UT	15 LAT	15 DIST	15 DLON	25 UT	25 LAT	25 DIST	25 DLON
3C48	17.	26.	0.70	38.	16.	20.	0.80	32.	16.	16.	0.88	25.
3C144	21.	-15.	0.15	-81.	20.	-47.	0.03	86.	19.	0.	0.18	79.
3C147	20.	50.	0.48	-42.	19.	62.	0.45	-22.	19.	63.	0.46	17.
3C161	22.	-46.	0.59	-32.	22.	-54.	0.52	-21.	21.	-58.	0.49	2.
3C237	2.	-3.	0.97	-17.	1.	-3.	0.92	-23.	0.	-4.	0.84	-33.
3C273	4.	0.	1.14	-14.	3.	0.	1.10	-16.	2.	1.	1.05	-17.
3C298	6.	3.	1.22	-10.	5.	4.	1.19	-12.	4.	5.	1.16	-13.
3C459	14.	4.	1.01	17.	14.	5.	1.06	16.	13.	6.	1.11	15.

* indicates data for which no error estimates are available since only two antennas were operating.

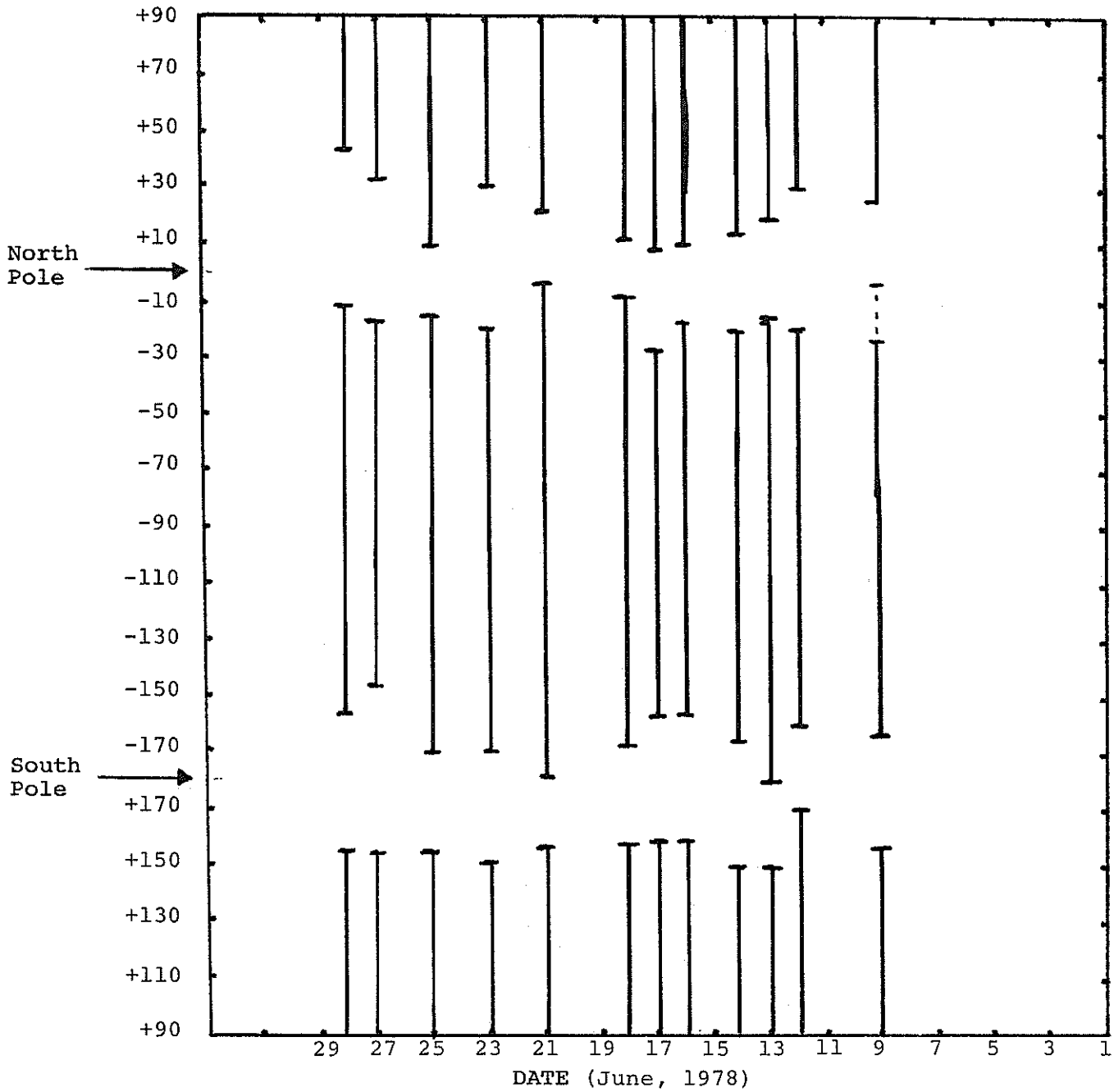
CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

JUNE 1978

Big Bear Solar Observatory

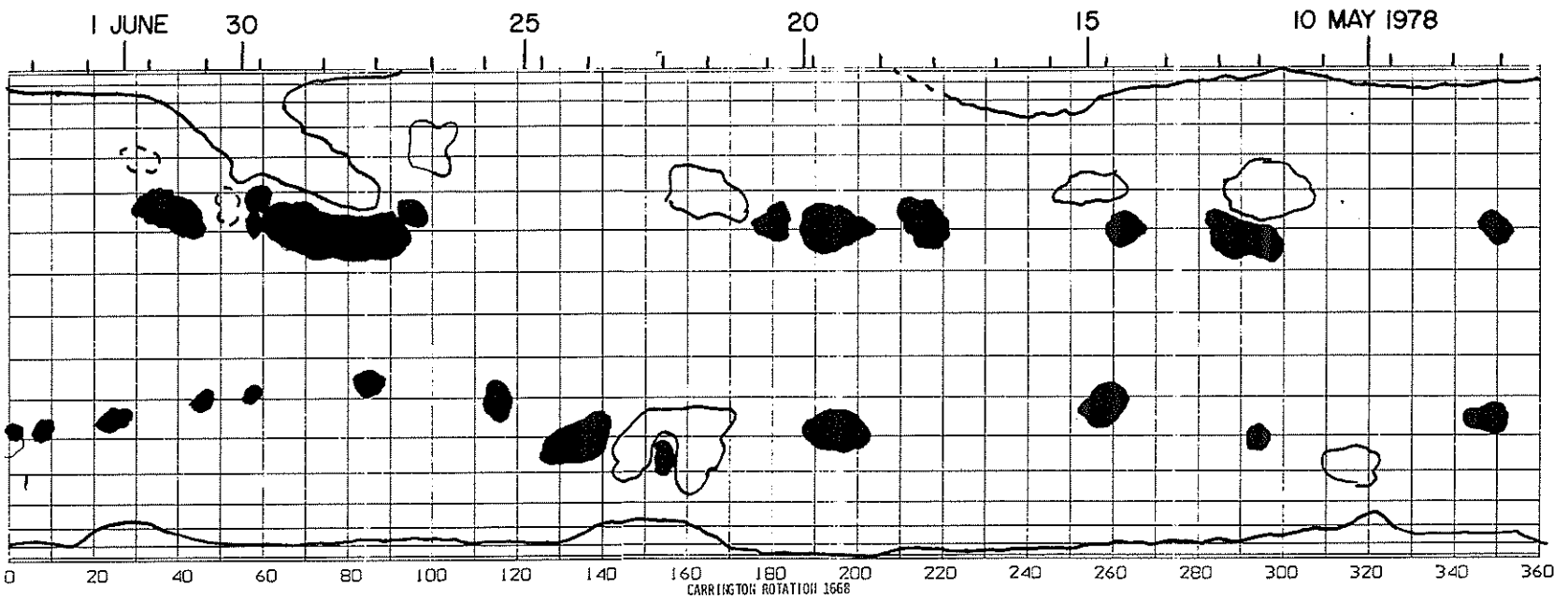
OBSERVATIONS OF D3 CHROMOSPHERE AT SOLAR LIMB



HELIUM 10830Å SYNOPTIC MAPS

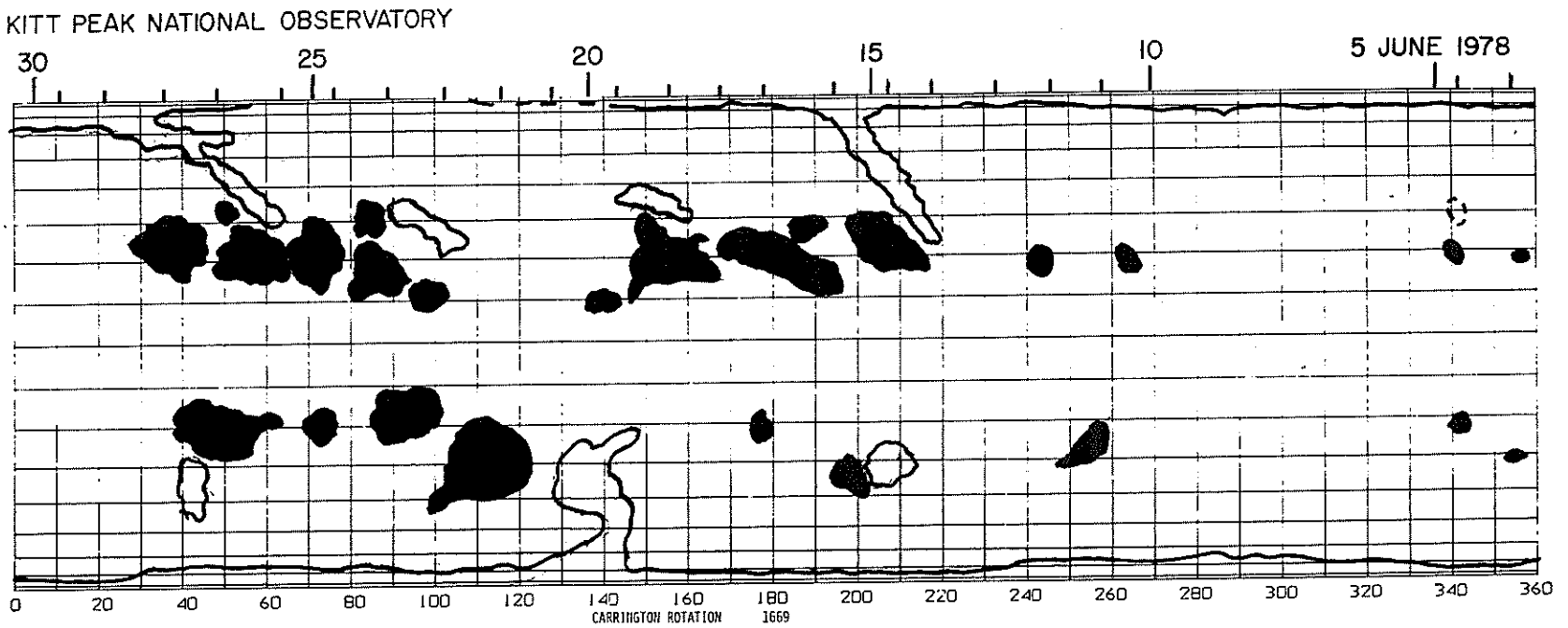
CARRINGTON ROTATION 1668

KITT PEAK NATIONAL OBSERVATORY



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1669



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
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	AT			-				AT	TA				-					-	-	-
1981	JUN 22	TA						A*																				

= definitely towards the sun = definitely away from the sun

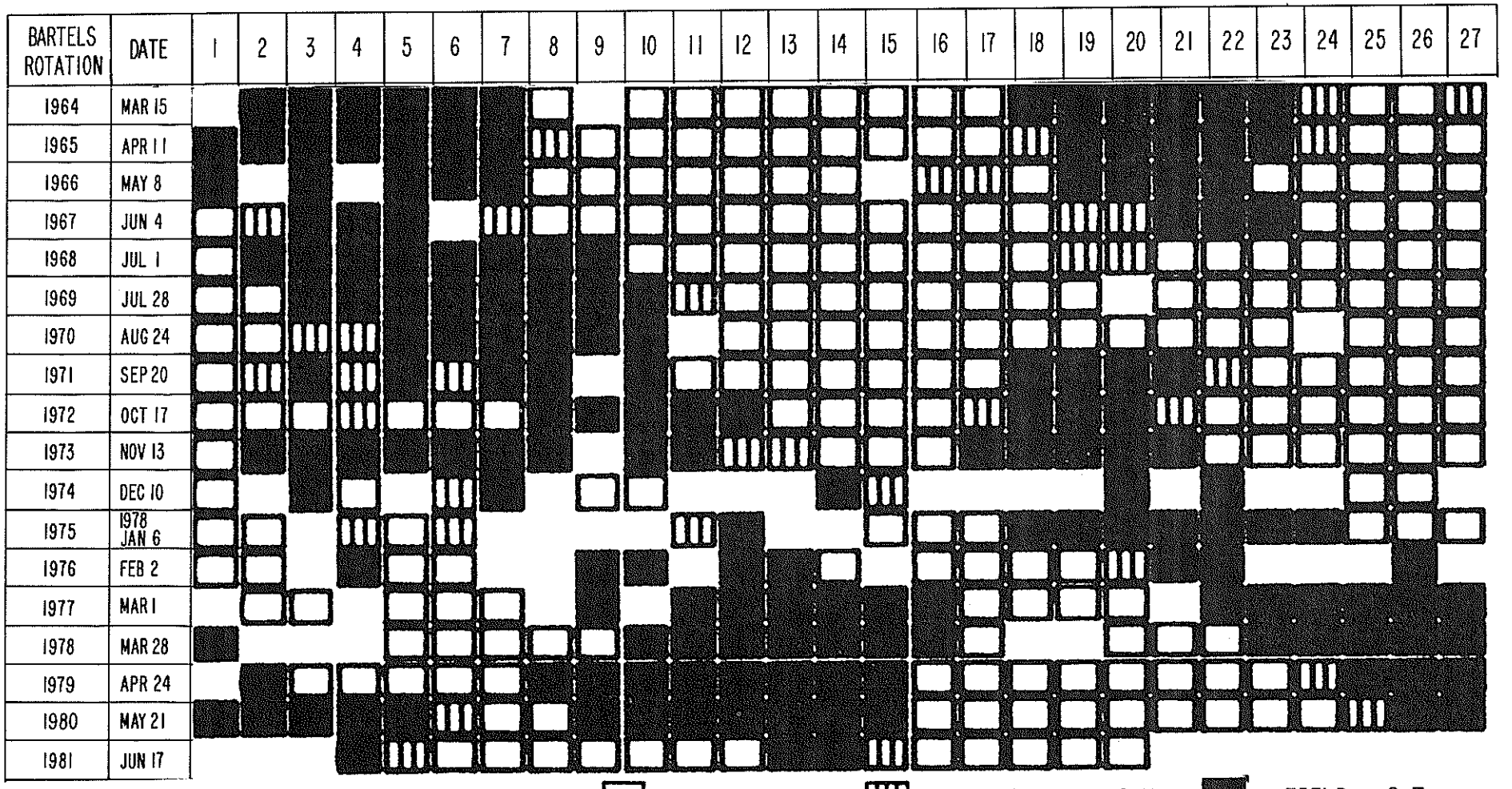
T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

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

Dot symbol entry indicates no data available for the day.

BOULDER GEOMAGNETIC SUBSTORM LOG

JUNE 1978

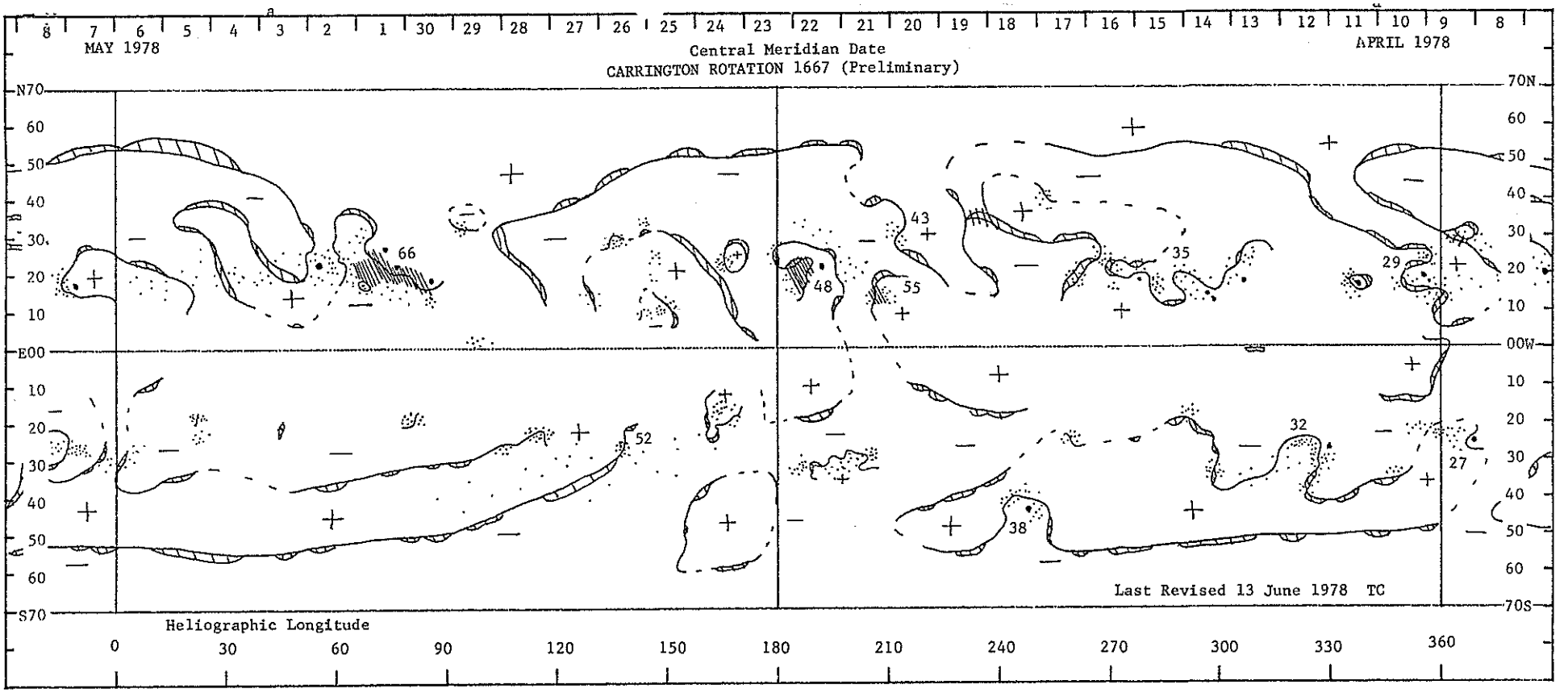
DATE	ONSET TIME	DIR.	COMMENTS
1	0230		Very weak.
	0305		Weak, slow onset.
	0600	≈center	Weak.
	0815	West	
	2140		Sharp onset on H component at mid- and low-latitude stations.
	2225		Network in daylight.
2	0545	West	
	0630	West	
	0730	West	
	0910		Onset of major global magnetic storm. Rapid positive excursions on H component at Midway (45γ), Tahiti (34γ) and Boulder (90γ). Storm continued through 03/0400 UT.
3	0450	East	SS evident at Island Lake, Lynn Lake and mid-latitude stations only.
	0540	East	SS evident at Island Lake, Lynn Lake and mid-latitude stations only.
	0735	≈center	1st of double onset; SS evident at Island Lake, Lynn Lake and mid-latitude stations only.
	0800	≈center	2nd of double onset; SS centered at Lynn Lake; extended from Island Lake to Norman Wells where it was weak.
	0945	West	1st of double onset; SS evident at College, Talkeetna and mid-latitude stations only.
	1030	West	2nd of double onset; SS evident southward of Fort Simpson - Inuvik and mid-latitude stations.
4	1215	West	Response stronger at stations north of auroral oval.
	1340	West	
	≈2000		Gradual onset of disturbed conditions throughout network.
	2340	East	
5	0105	East	1st of multiple onset.
	0135	East	2nd of multiple onset.
	0210	East	3rd of multiple onset.
	0230	East	4th of multiple onset.
	0310	East	5th of multiple onset.
	0455	Centered	Very intense SS.
	0805	West	Strong SS.
6	1045	West	
7	0510	East	1st of double onset and weak.
	0545	East	2nd of double onset and centered near Island Lake.
	1630		Gradual onset of unsettled condition.
8	0400	East	1st of multiple onset.
	0440	East	2nd of multiple onset.
	0500	Centered	3rd of multiple onset.
9	0400	East	Minor SS observed on Fort Churchill chain only.
10	0820		Onset of magnetic storm. Marked increase in H component at mid- and low-latitude stations. Storm continued through 11/1200 UT.
12	1030	West	
	1205	West	
	1525		Network in daylight.
13	0900	West	
14			No SS activity.
15	0445	East	Weak SS; eastward of Lynn Lake to Boulder.
	0645	West	Weak SS.
	0755	West	Centered near Fort Simpson - Norman Wells.
16	0500		Weak SS from Lynn Lake eastward.
	1125		Oval stations only - Norman Wells eastward.
17	0510	East	Weak SS.
	1040	West	
18	0615	≈center	Localized SS; moderate intensity at Back, Island Lake and Lynn Lake.
	0710	≈center	
	1055	West	1st of double onset.
	1145	West	2nd of double onset; moderate intensity along auroral oval stations.
19	0530	East	Weak.
	0620	≈center	SS centered near Lynn Lake.
	1010	West	SS centered near Fort Simpson.
	2200		Network in daylight; SS east of network.
20	0440	East	1st of double onset; SS centered near Lynn Lake.
	0510	East	2nd of double onset; SS centered near Lynn Lake.
21	0315	East	1st of double onset; strong SS centered near Island Lake.
	0340	East	2nd of double onset; strong SS centered near Island Lake.
	0510	≈center	1st of multiple onset.
	0555	≈center	2nd of multiple onset.
	0650	≈center	3rd of multiple onset.
	1130	West	SS centered near College.
	1435	West	1st of double onset and weak.
	1500	West	2nd of double onset and moderate.
22			Field unsettled 21/1600 UT to 22/0600 UT; no distinct onsets.
	0615	East	SS centered near Lynn Lake.
	1050	West	SS centered near Fort Simpson.
23	0825	East	1st of multiple onset.
	0920	≈center	2nd of multiple onset.
	1015	West	3rd of multiple onset.
24			Field generally disturbed 23/1600 UT to 24/1600 UT.
	0530	Centered	Moderate.
	1330	West	Strong; SS centered west of College near Midway.
25	0810	West	Strong; SS centered near Fort Simpson. Field unsettled after 1600 UT.
26	0015	East	
	0435	East	1st of multiple onset.
	0455	East	2nd of multiple onset.
	0515	East	3rd of multiple onset.
	0555	East	
	0725	≈center	1st of multiple onset.
	0740	≈center	2nd of multiple onset.
	0820	≈center	3rd of multiple onset.
	0945	West	Network in daylight; SS from Lynn Lake westward.
	1500		Network in daylight; SS from Lynn Lake westward.
	1550		Network in daylight; SS from Lynn Lake westward.
	1640		Network in daylight; SS from Fort Simpson westward.
	1655		Network in daylight; SS from Fort Simpson westward.
	1810		Network in daylight; SS in Alaska only between College and Arctic Village.
	1820		Network in daylight; SS in Alaska only between College and Arctic Village.
27	0245	East	
	0605	≈center	1st of double onset.
	0645	≈center	2nd of double onset.
	1215		Effect localized between Eskimo Point, Island Lake and Fort Simpson. Strongest response between Back and Lynn Lake. Sachs Harbour and Pelly Bay magnetometers strongly disturbed after 1600 UT.
28	0425	East	
	0850	West	
	1200	West	
	1435		Network in daylight.
29	0950		Sudden positive impulse on H component at low- and mid-latitude stations with 33γ at Boulder.
	2050		Magnetic storm began with SC; strong ring current established. Initial positive H-component deflections were 85γ at Boulder, 28γ at Tahiti and 33γ at Wake.
30			Magnetic storm continued; entire network disturbed between 0500 and 1500 UT; high-latitude activity continued until 2000 UT; lower latitude disturbance subsided at 2000 UT also.

MAY 1978 DATA

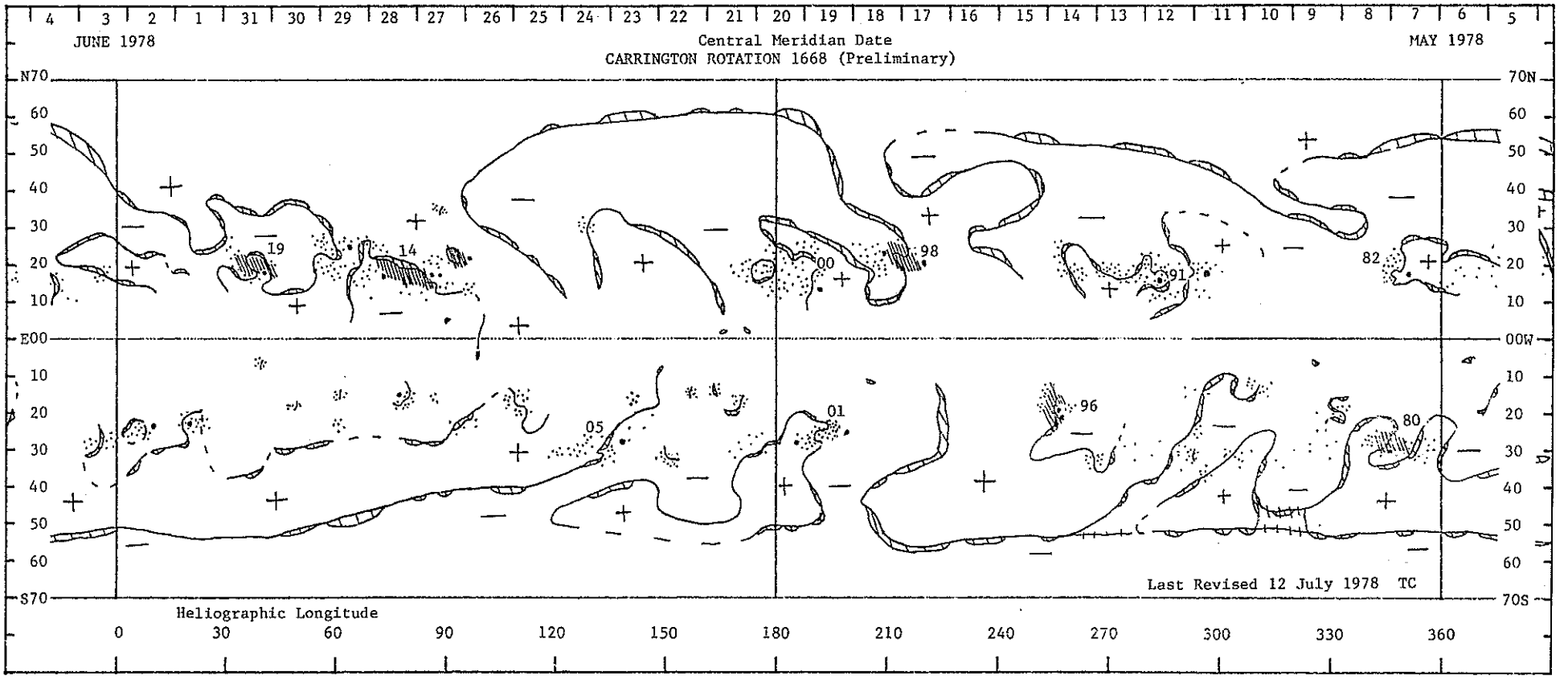
Contents

Hα SYNOPTIC CHART

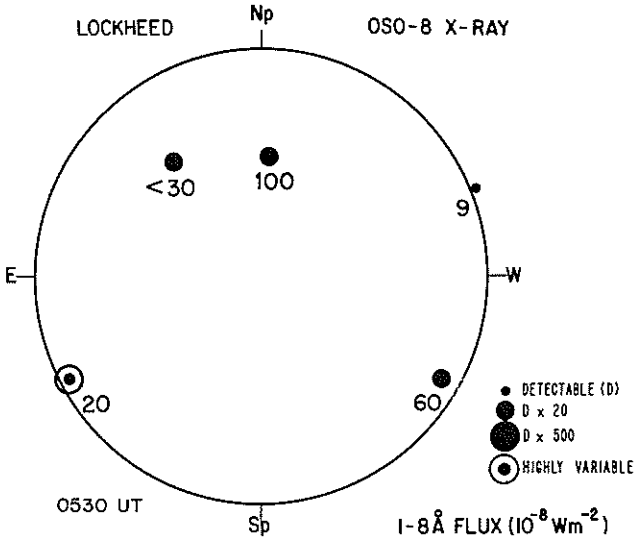
CARRINGTON ROTATION 1667 (PRELIMINARY)

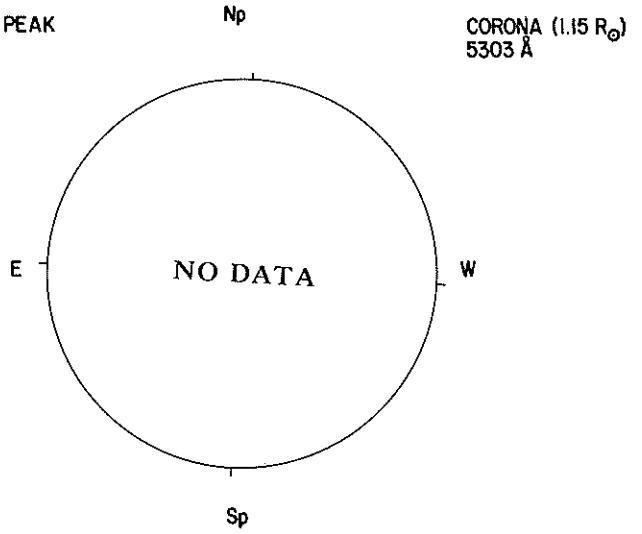


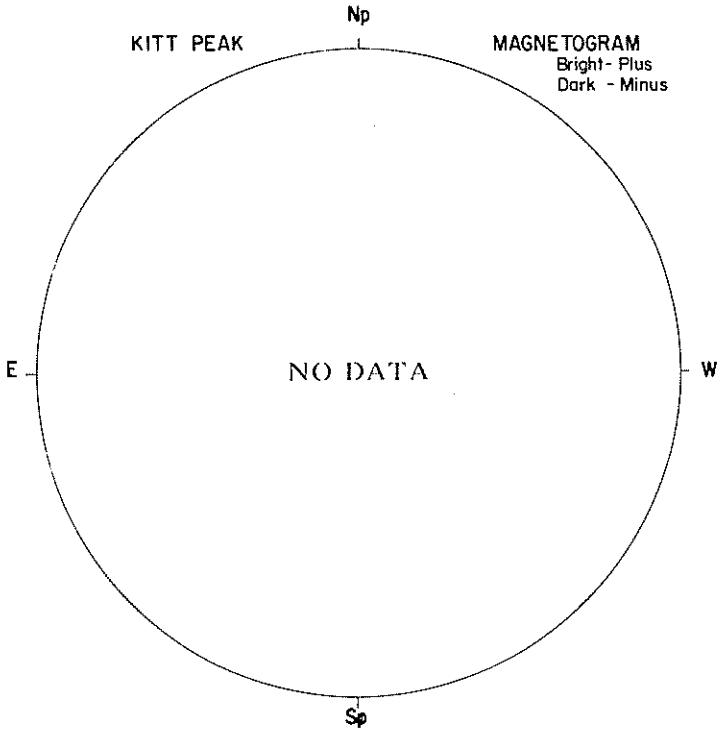
Hα SYNOPTIC CHART
MAY - JUNE 1978

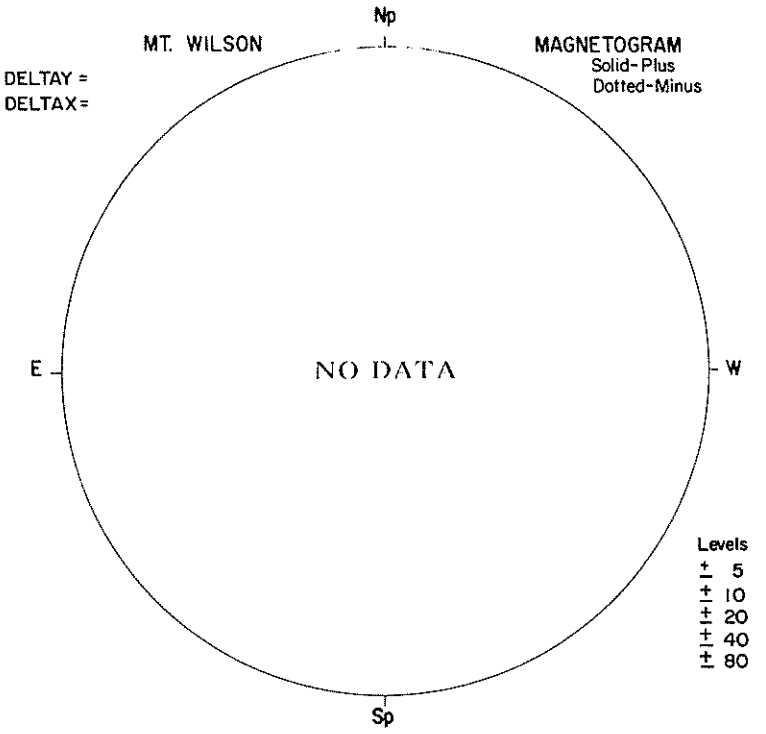


MAY 1, 1978 (P = -24.24, B_o = -4.17, L_o = 78.63)









OI
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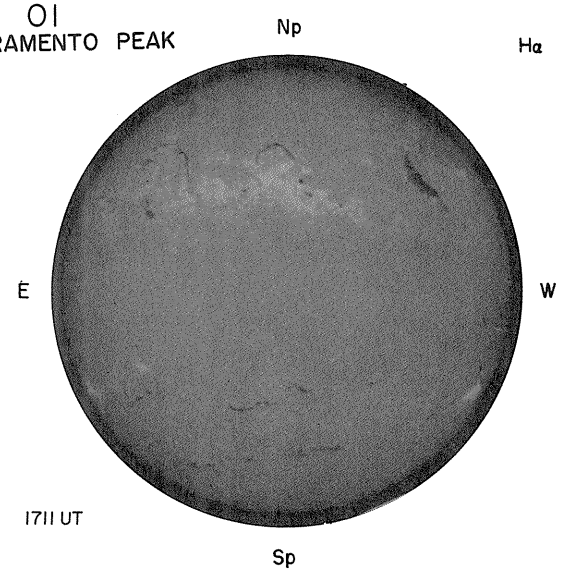
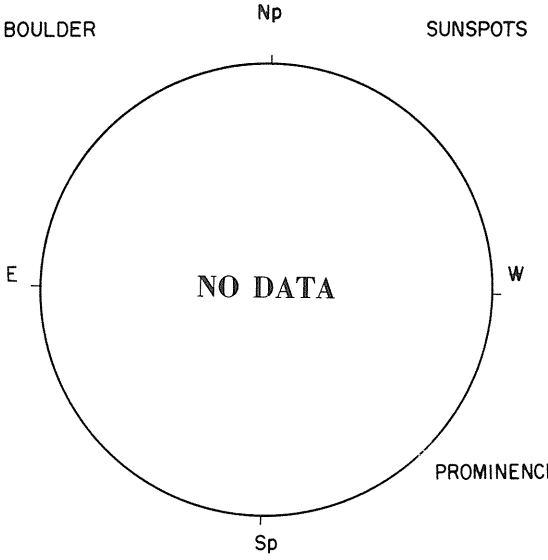


1711 UT

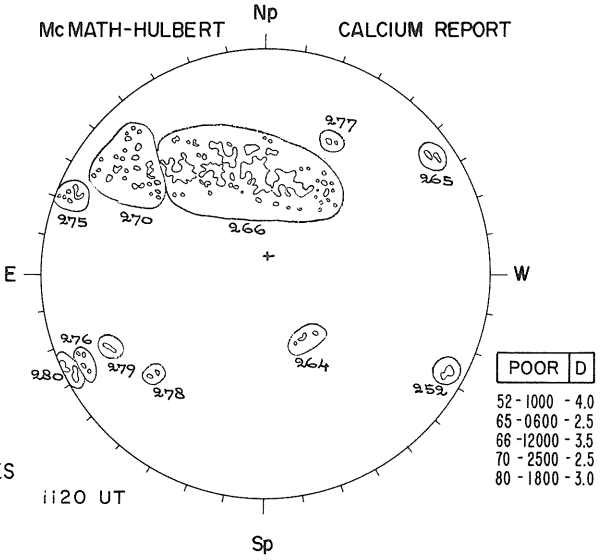
Hα

BOULDER



SUNSPOTS

McMATH-HULBERT

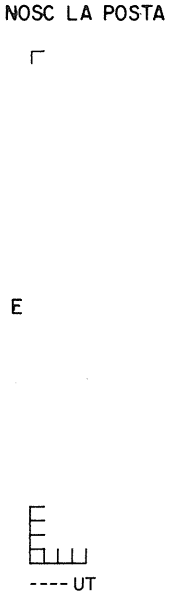


CALCIUM REPORT

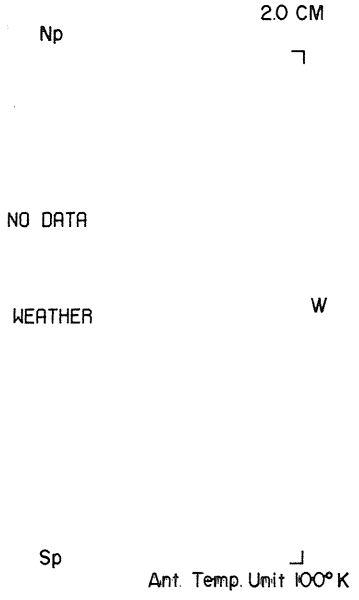
PROMINENCES

1120 UT

NOSC LA POSTA

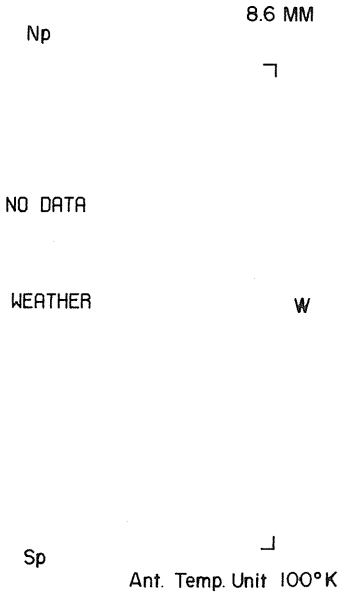


2.0 CM

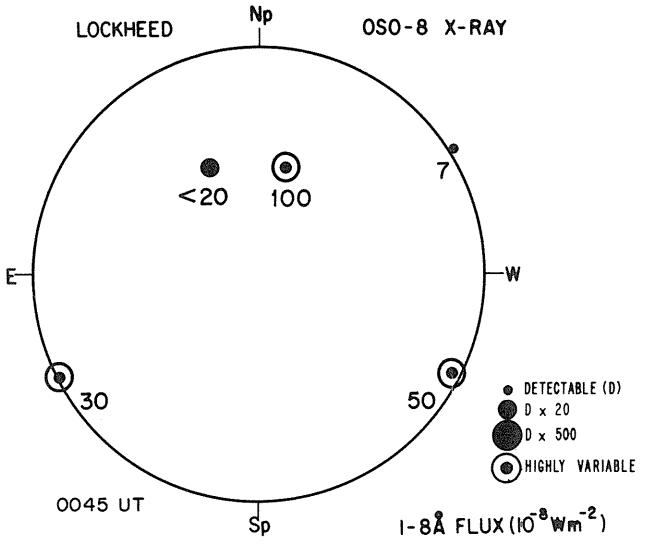


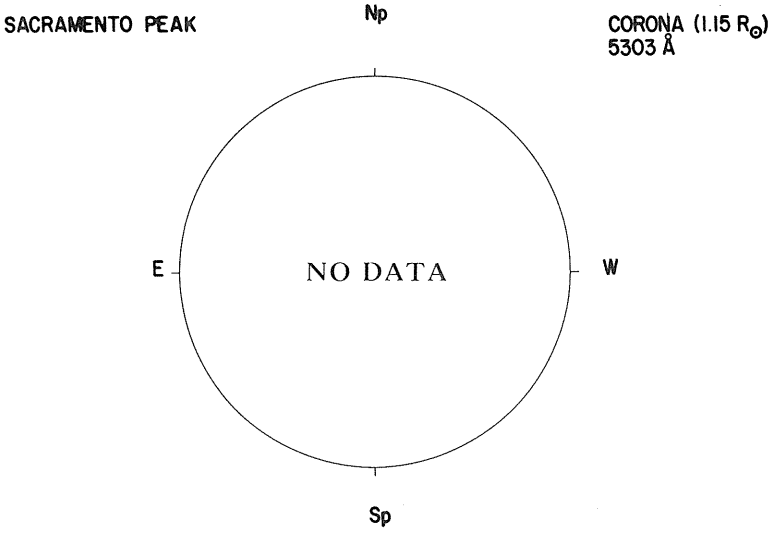
NOSC LA POSTA

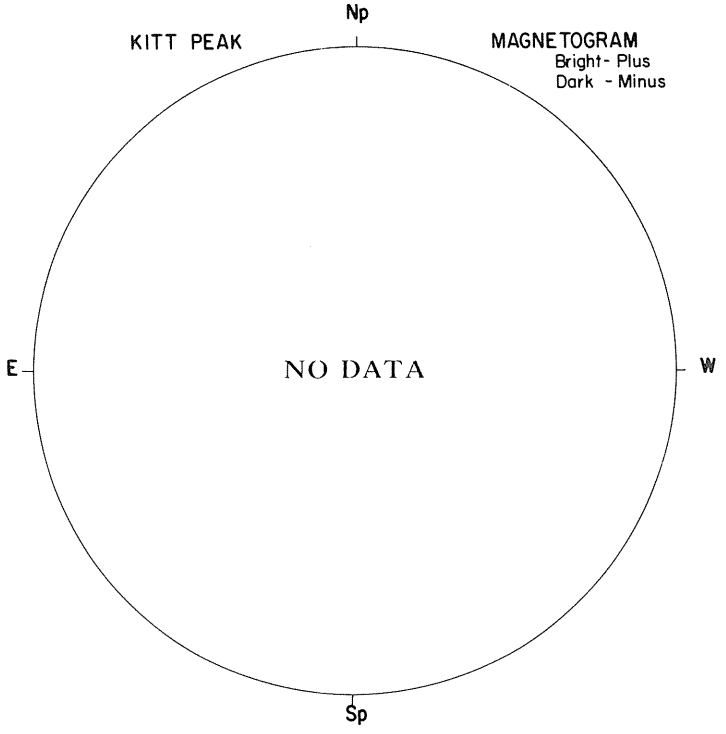
8.6 MM

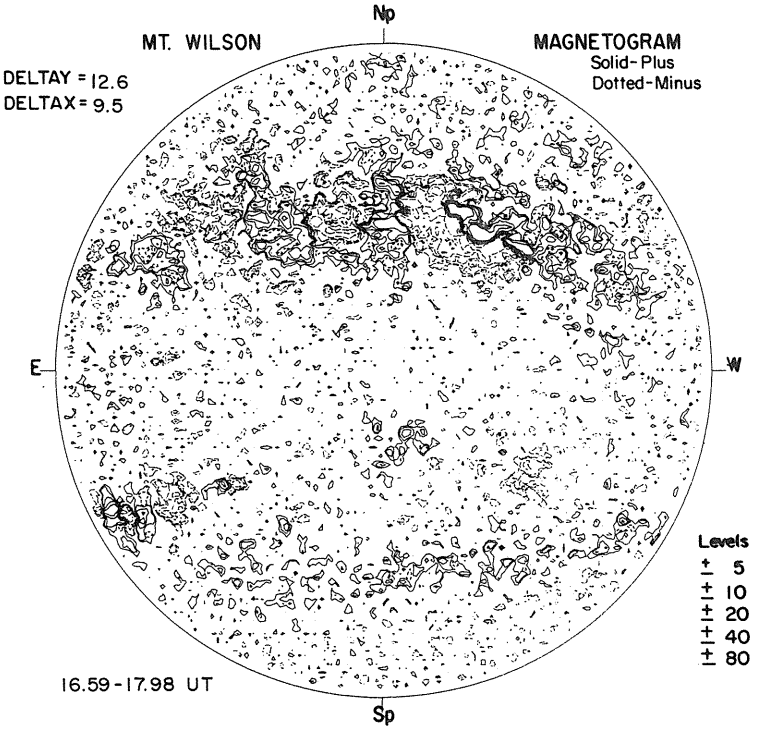


MAY 2, 1978 (P = -24.06, B_o = -4.07, L_o = 65.42)

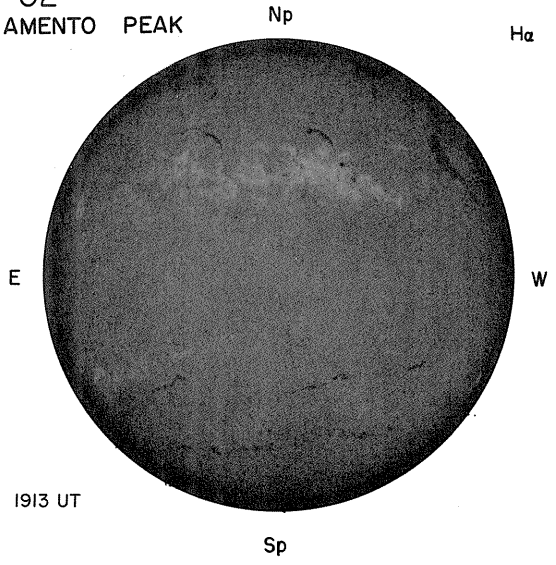




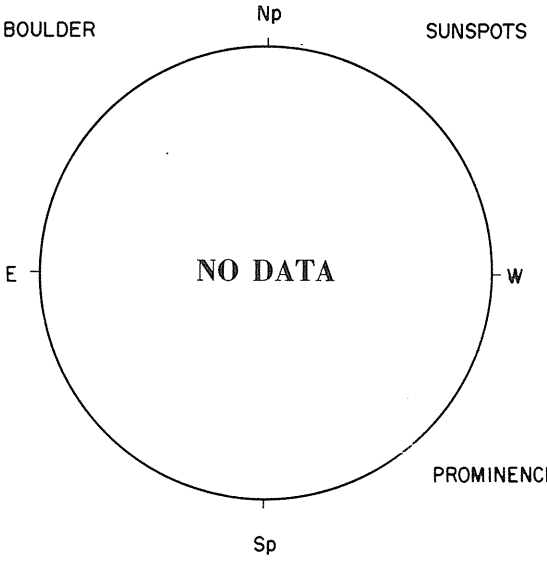




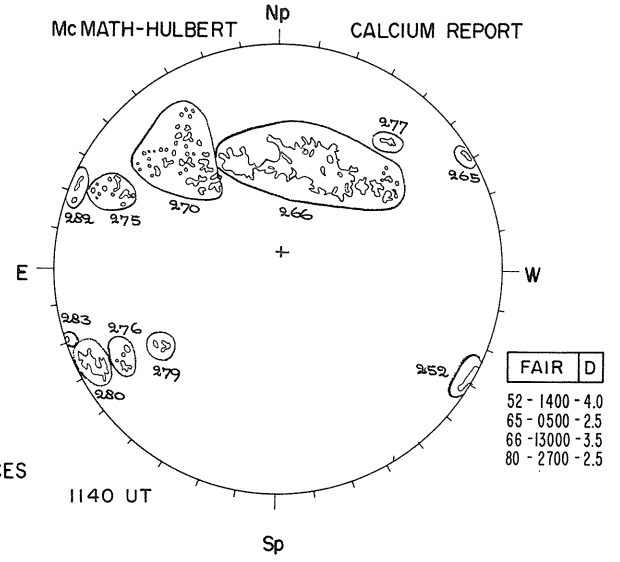
02
SACRAMENTO PEAK



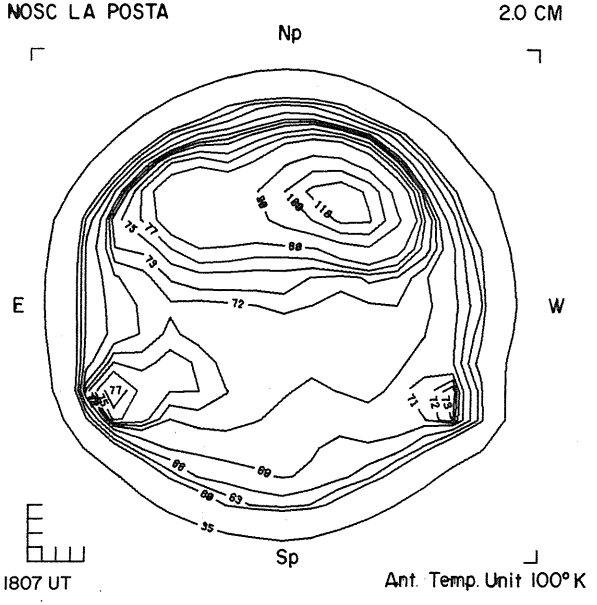
BOULDER



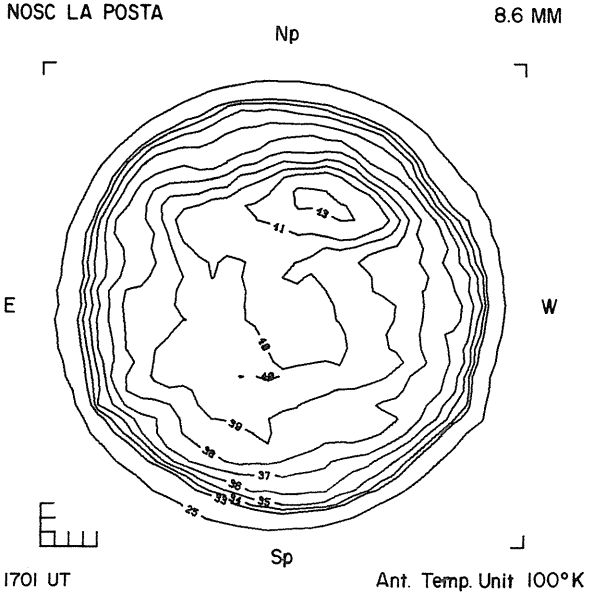
McMATH-HULBERT



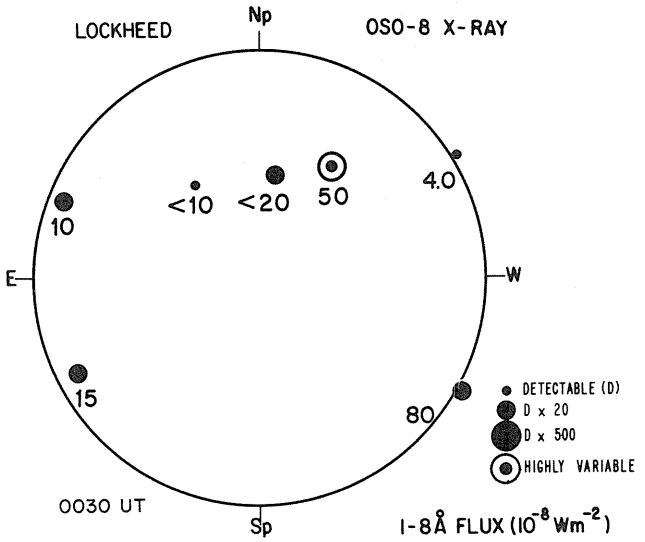
NOSC LA POSTA

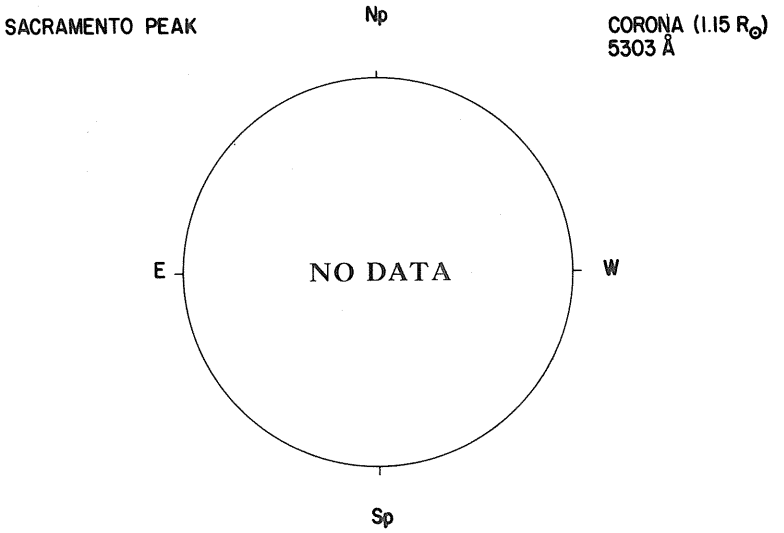


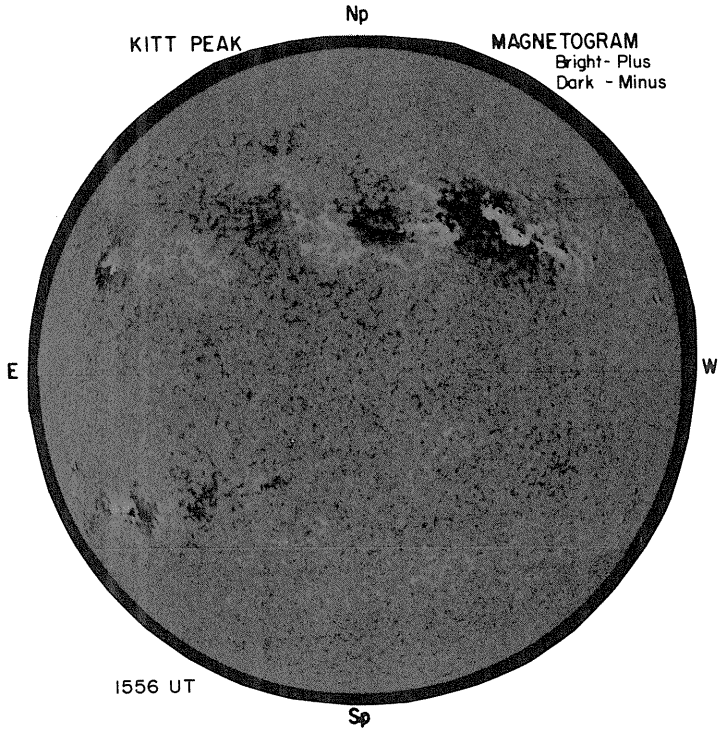
NOSC LA POSTA

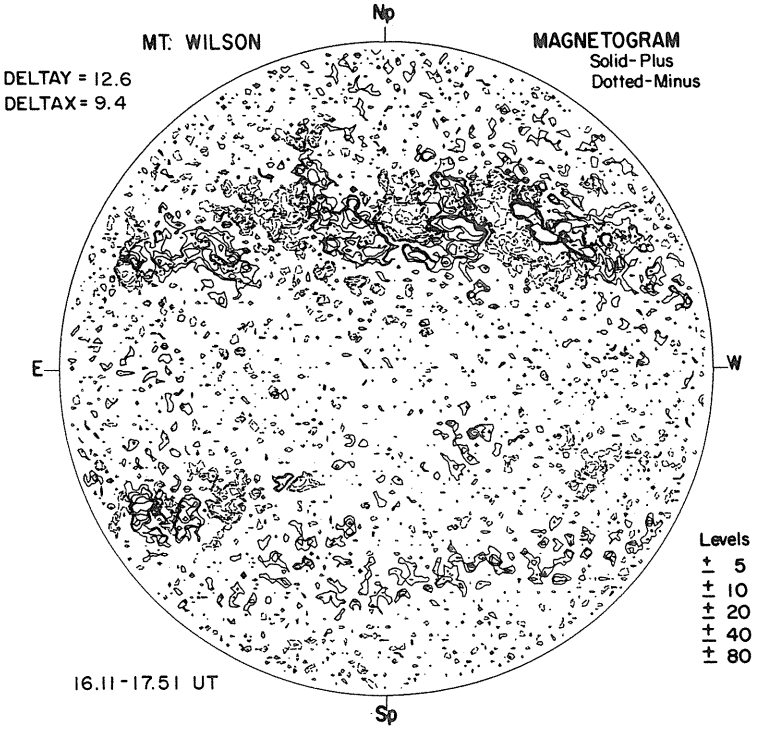


MAY 3, 1978 (P = -23.88, B_o = -3.97, L_o = 52.20)

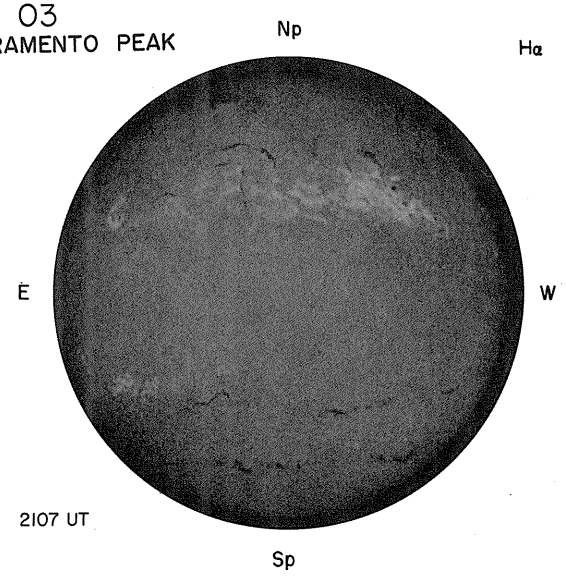






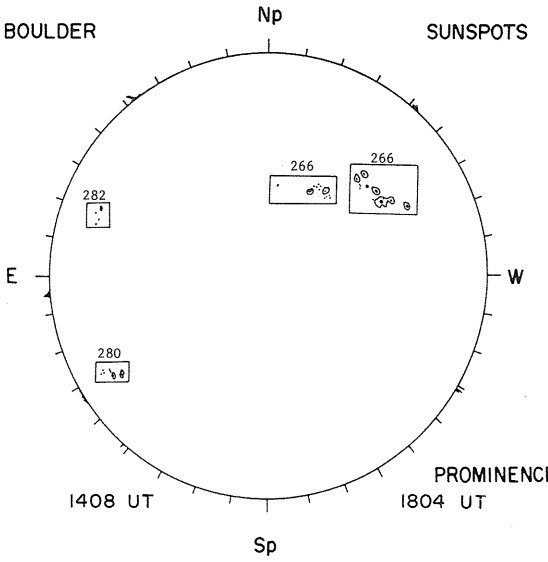


03
SACRAMENTO PEAK



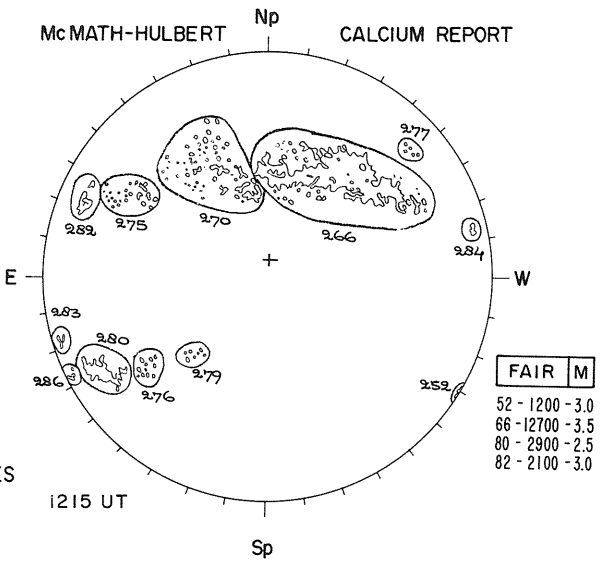
2107 UT

BOULDER



1408 UT

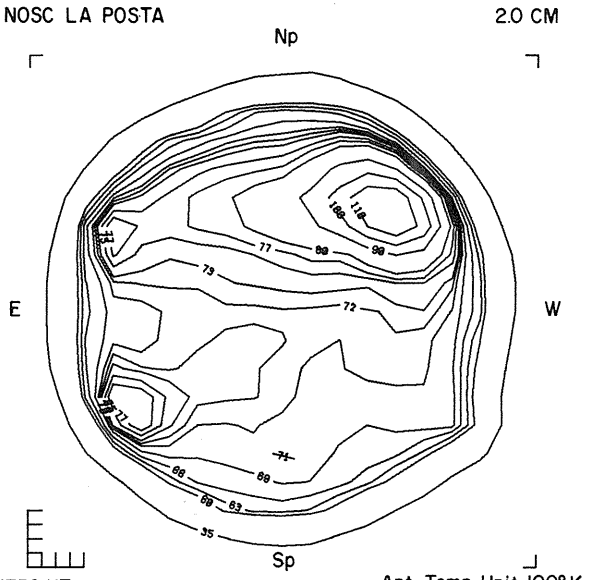
McMATH-HULBERT



PROMINENCES
1804 UT

1215 UT

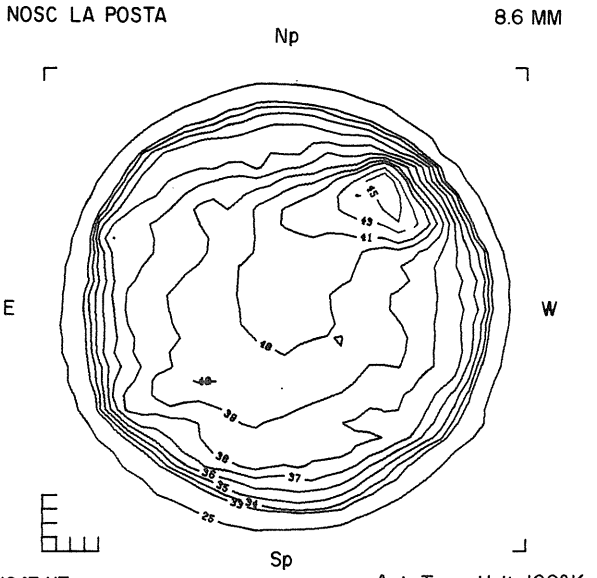
NOSC LA POSTA



1750 UT

Ant. Temp. Unit 100° K

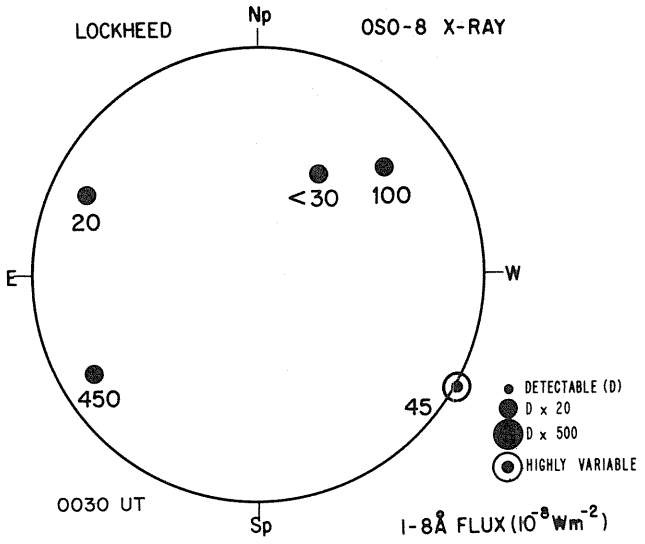
NOSC LA POSTA

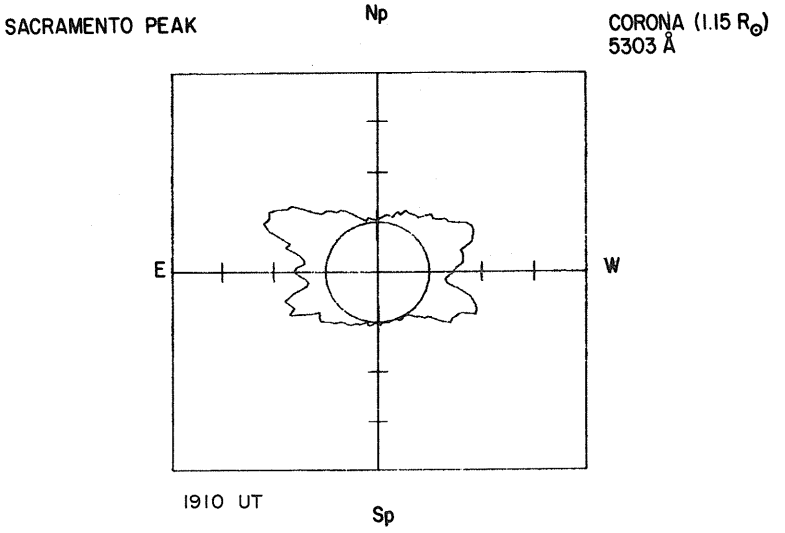


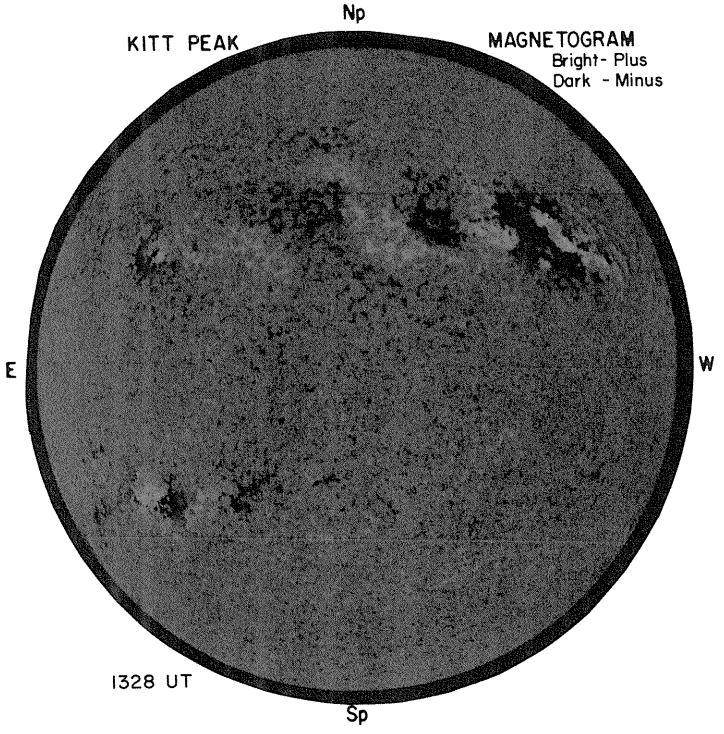
1647 UT

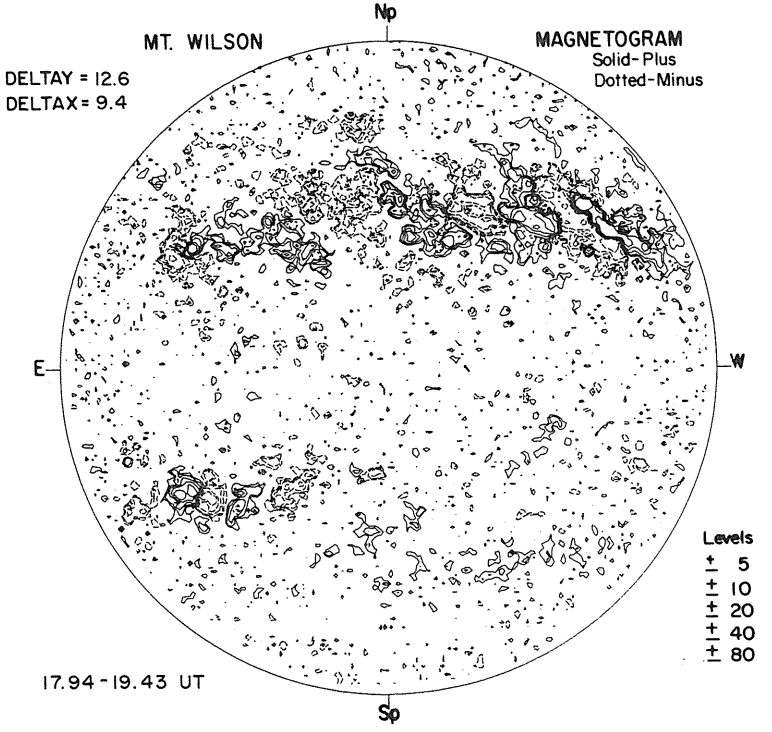
Ant. Temp. Unit 100° K

MAY 4, 1978 (P = -23.68, B_o = -3.86, L_o = 38.98)

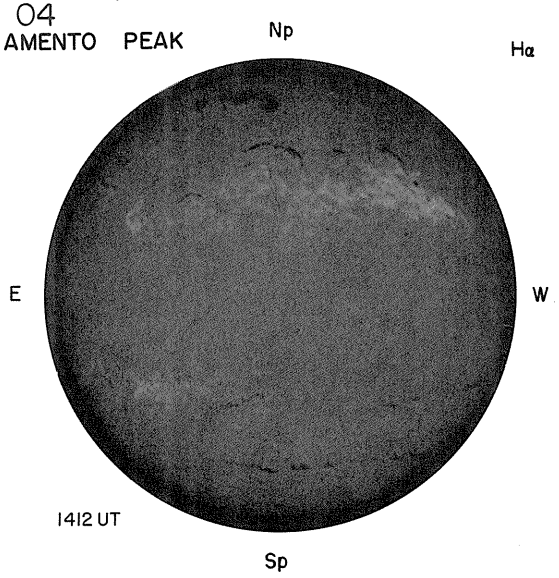






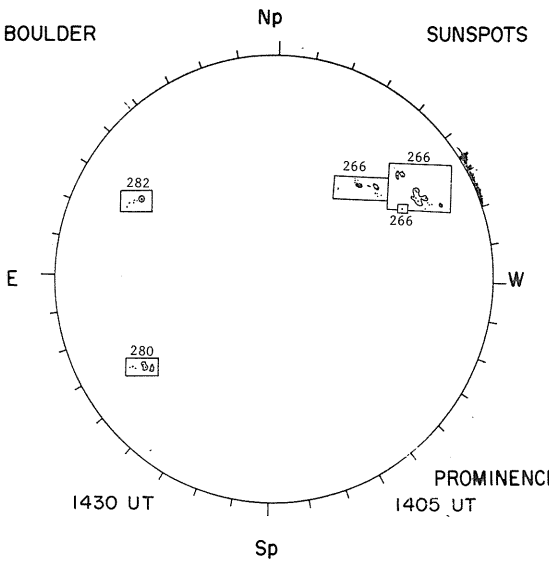


04
SACRAMENTO PEAK



1412 UT

BOULDER

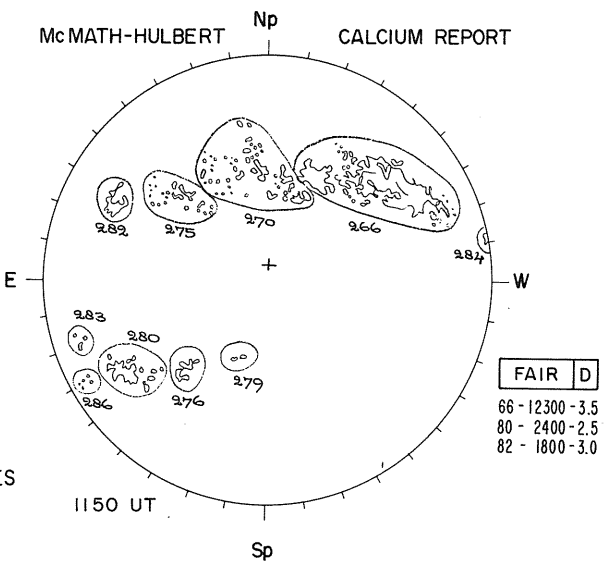


1430 UT

PROMINENCES

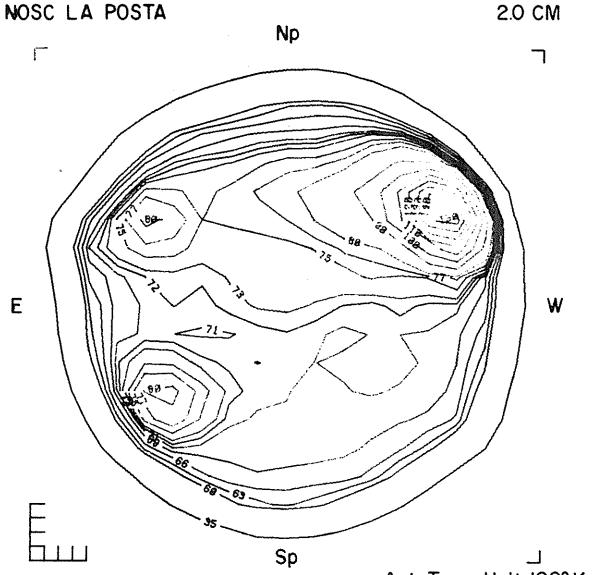
1405 UT

McMATH-HULBERT



1150 UT

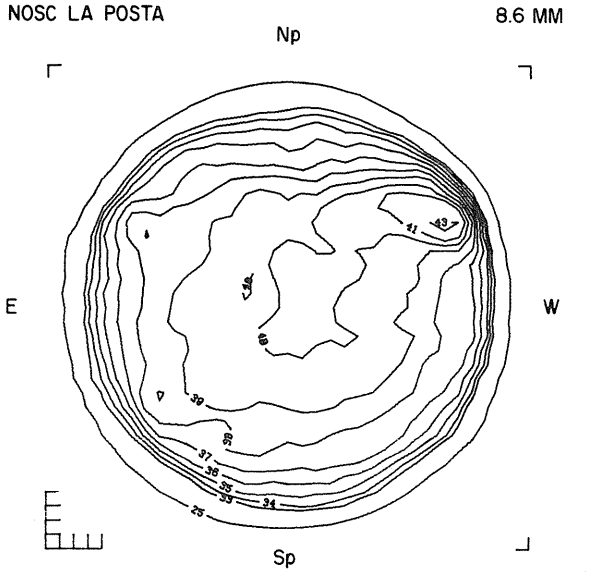
NOSC LA POSTA



1804 UT

Ant. Temp. Unit 100° K

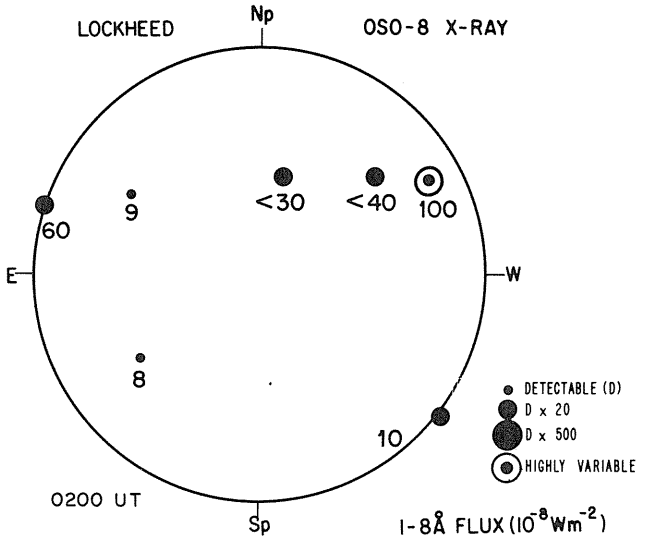
NOSC LA POSTA

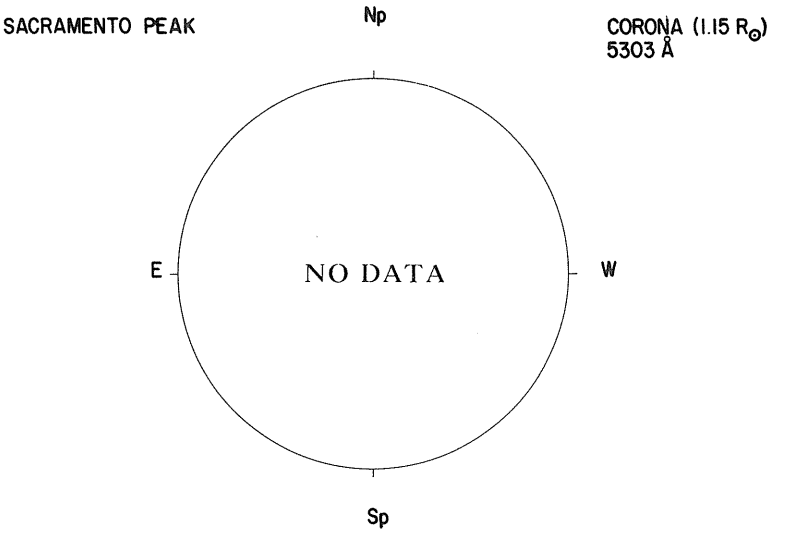


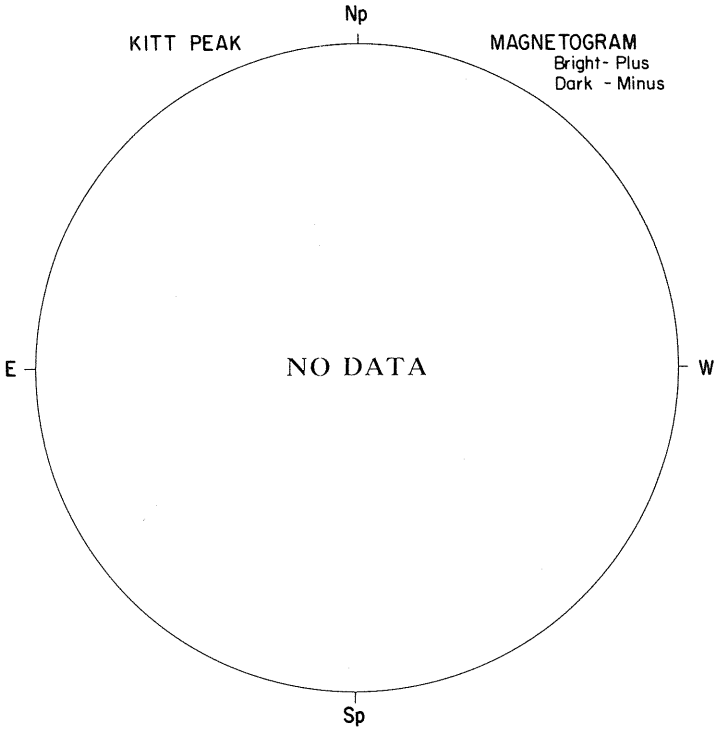
1701 UT

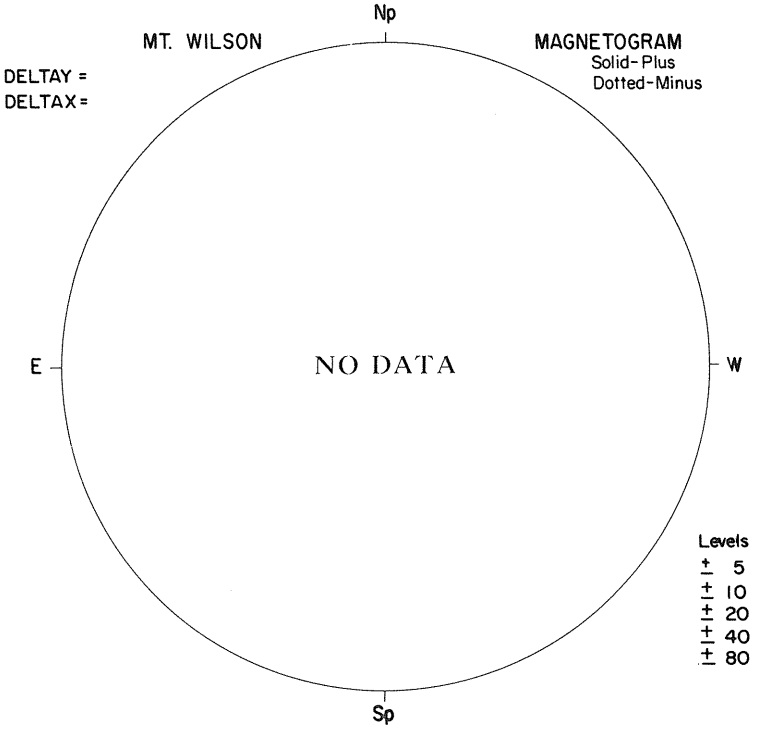
Ant. Temp. Unit 100° K

MAY 5, 1978 (P =-23.48, B_o =-3.76, L_o =25.76)

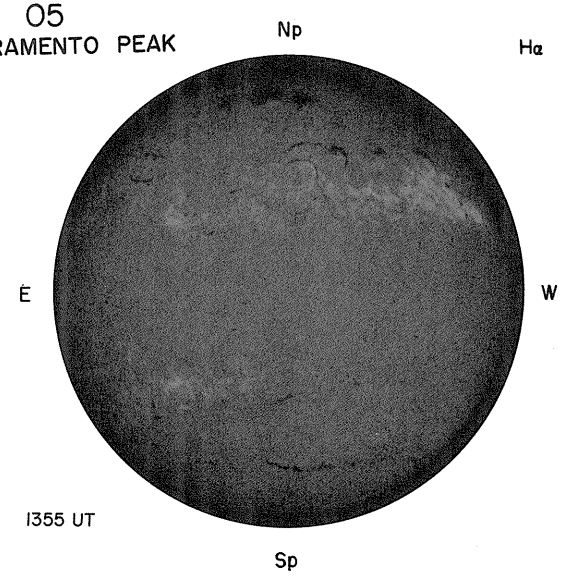




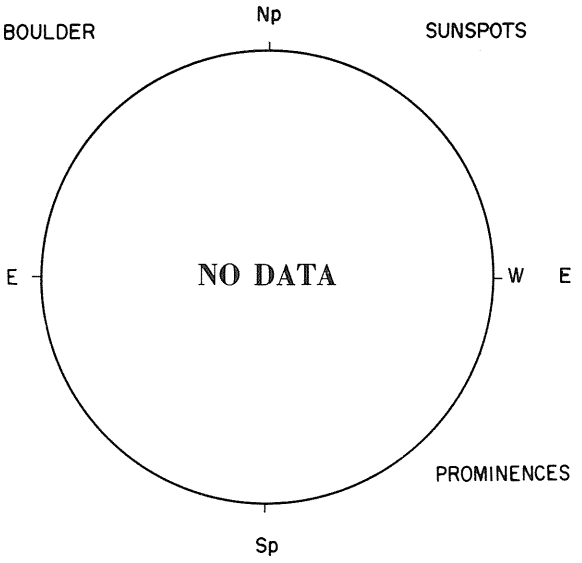




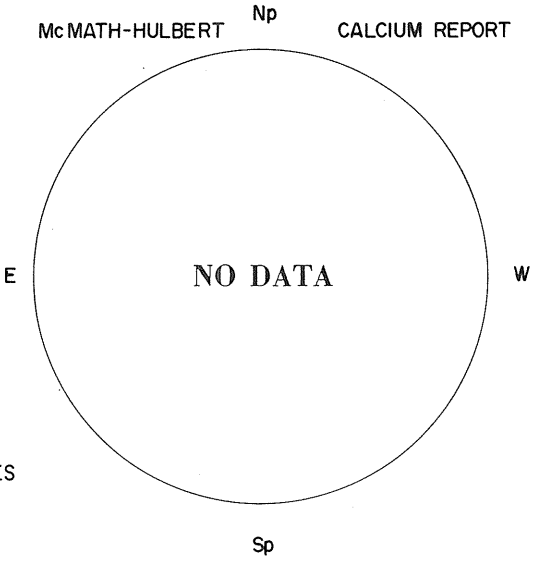
05
SACRAMENTO PEAK



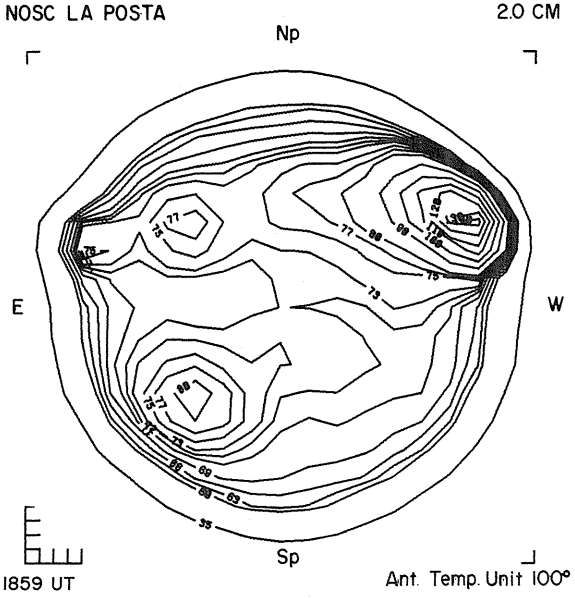
BOULDER



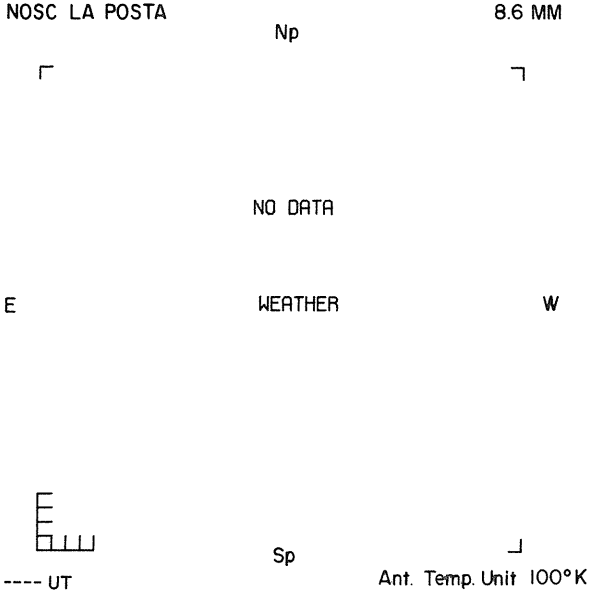
McMATH-HULBERT



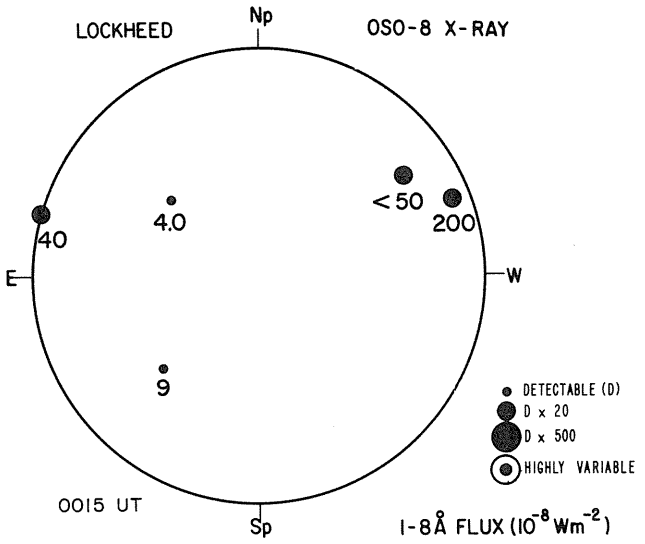
NOSC LA POSTA

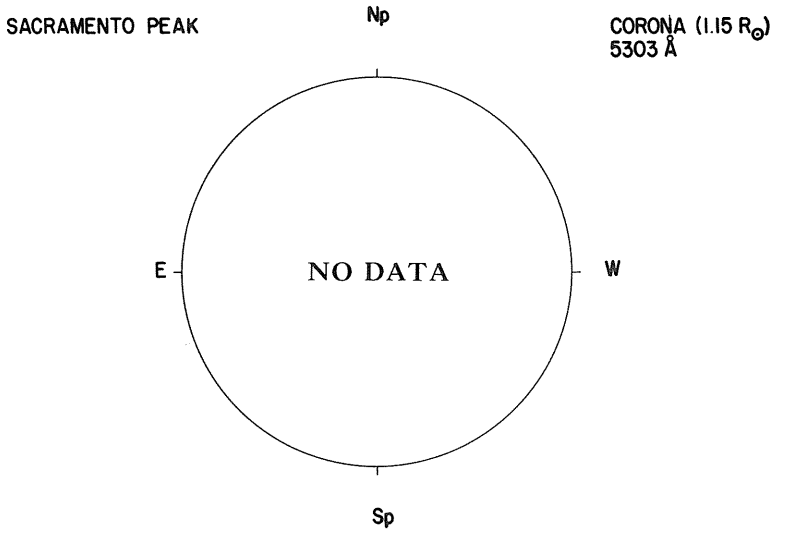


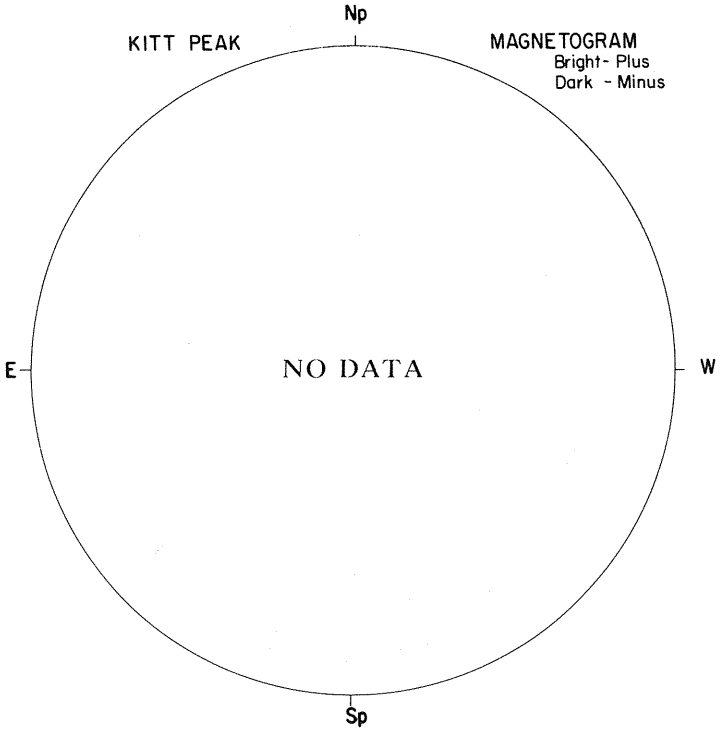
NOSC LA POSTA

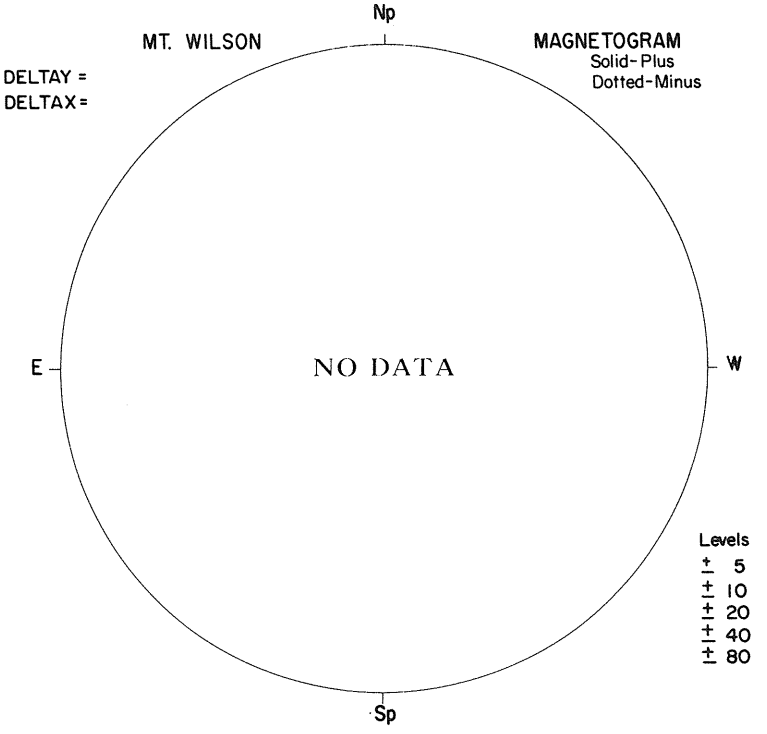


MAY 6, 1978 (P = -23.28, B_o = -3.66, L_o = 12.54)



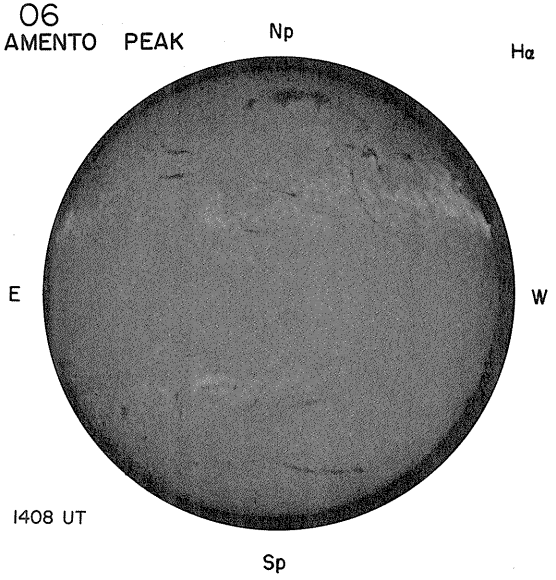






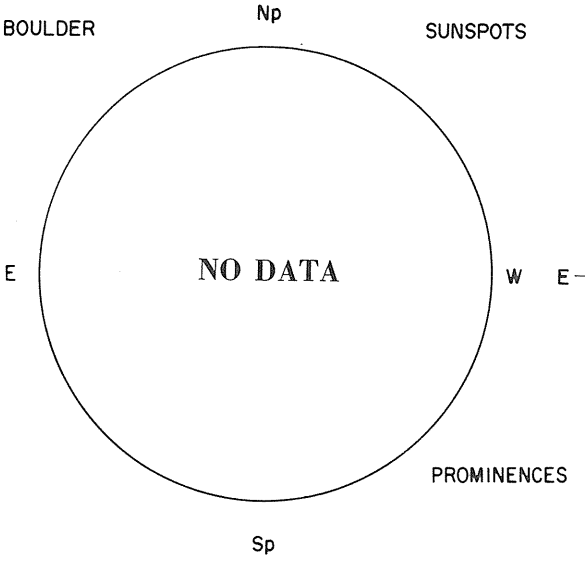
06

SACRAMENTO PEAK



1408 UT

Hα BOULDER

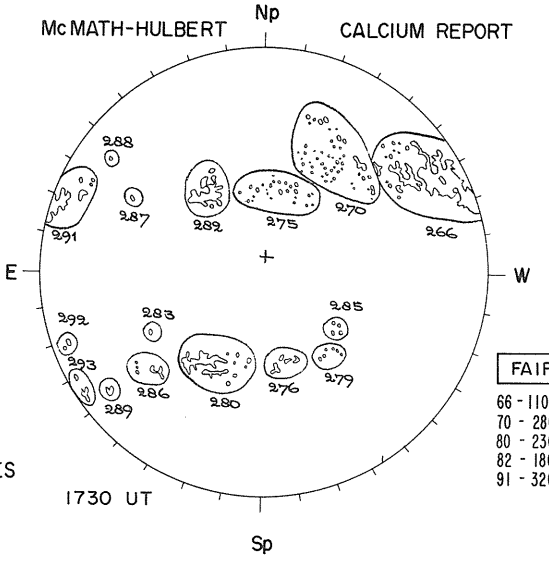


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT



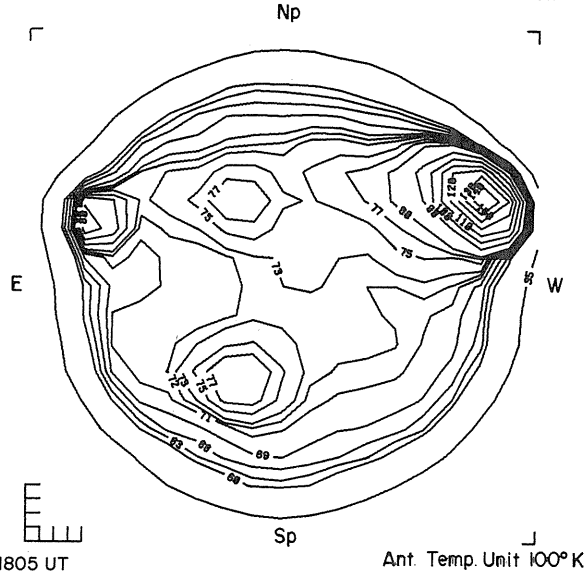
1730 UT

FAIR	M

66 - 11000 - 3.5
70 - 2800 - 2.5
80 - 2300 - 3.0
82 - 1800 - 2.5
91 - 3200 - 3.0

NOSC LA POSTA

2.0 CM

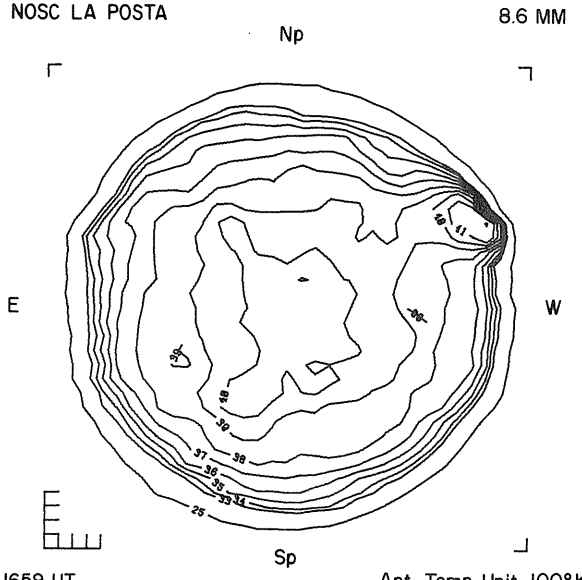


1805 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

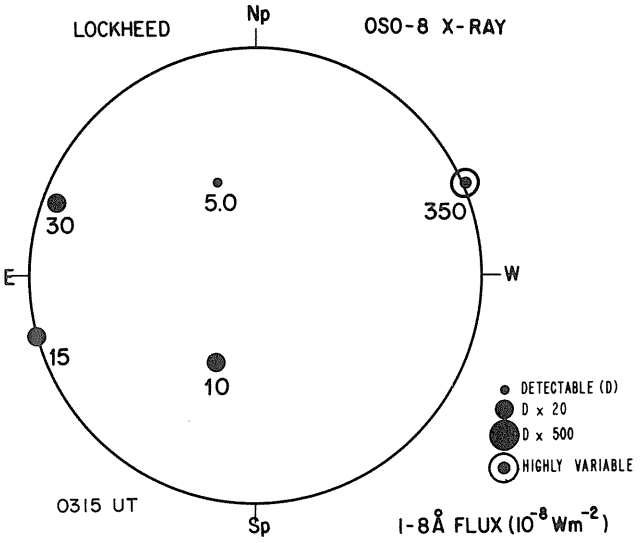
8.6 MM

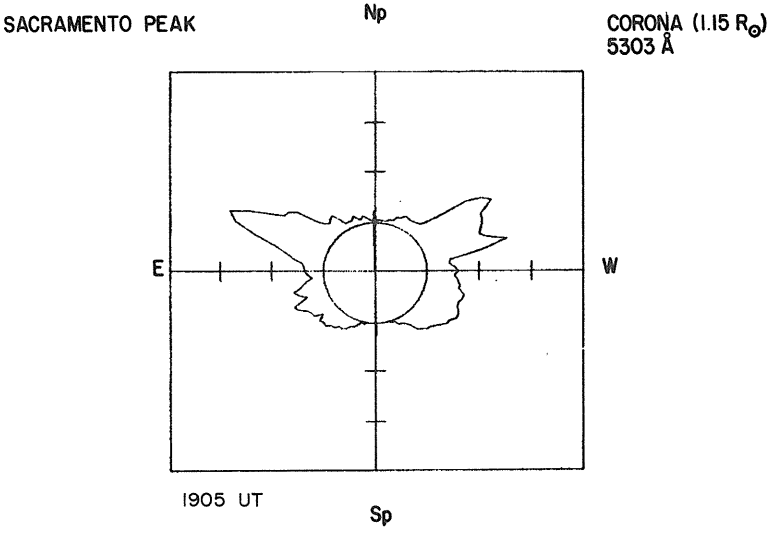


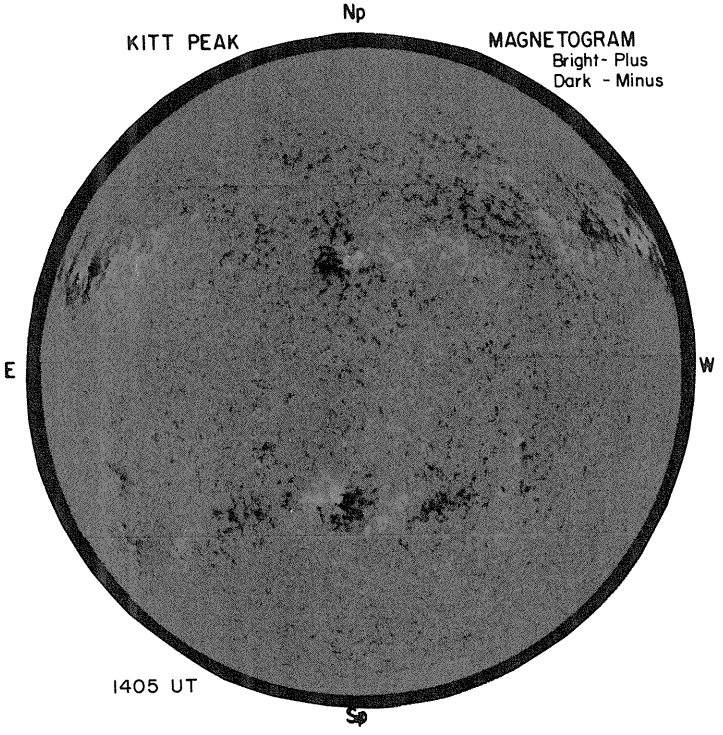
1659 UT

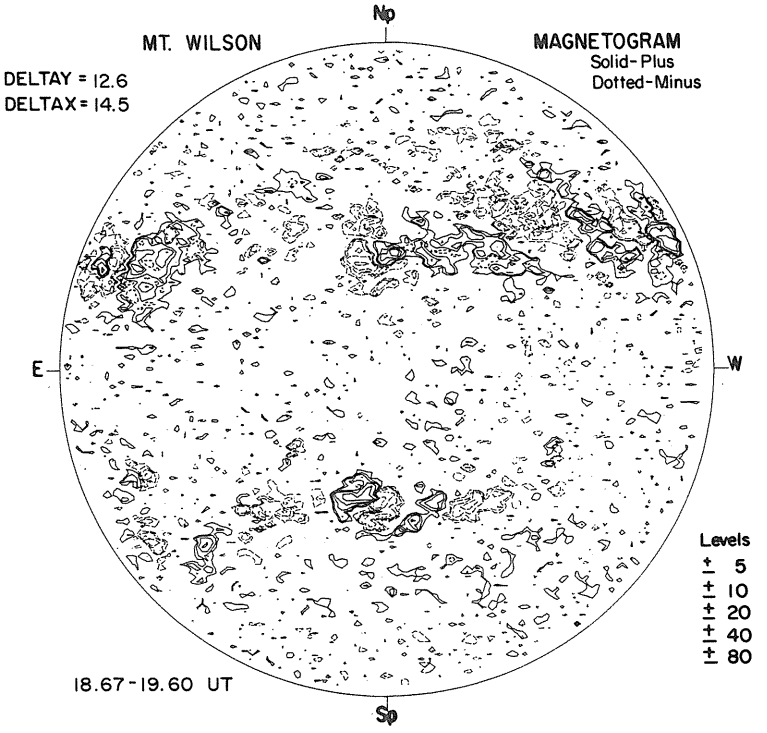
Ant. Temp. Unit 100° K

MAY 7, 1978 (P = -23.06, B_o = -3.55, L_o = 359.32)



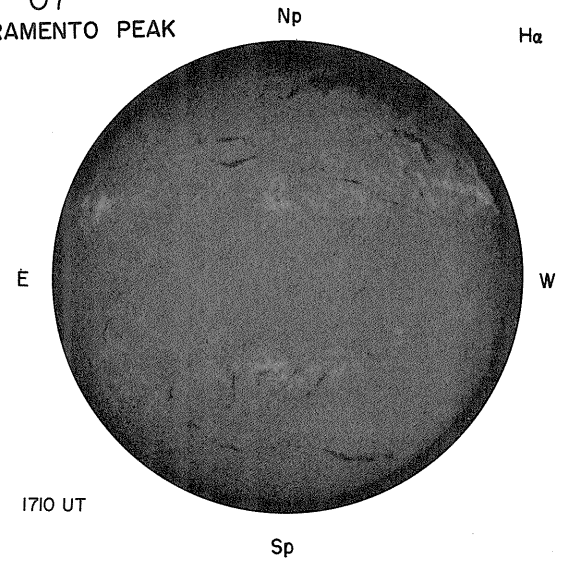




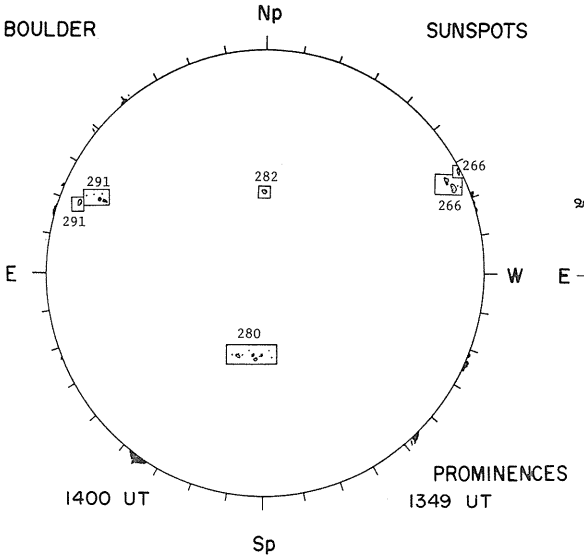


07

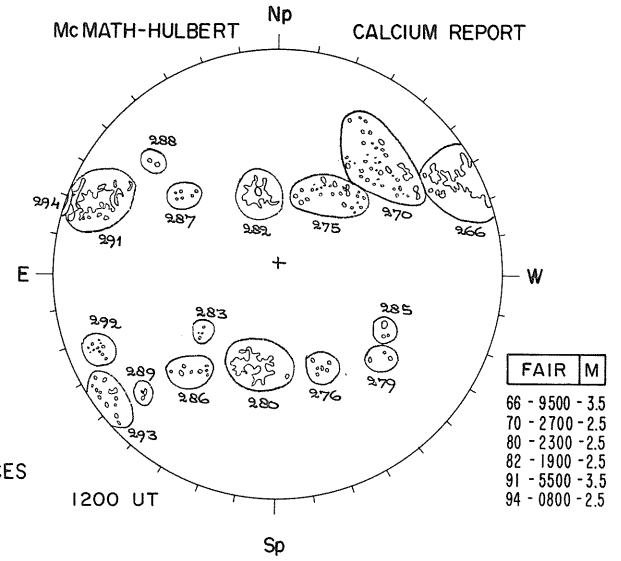
SACRAMENTO PEAK



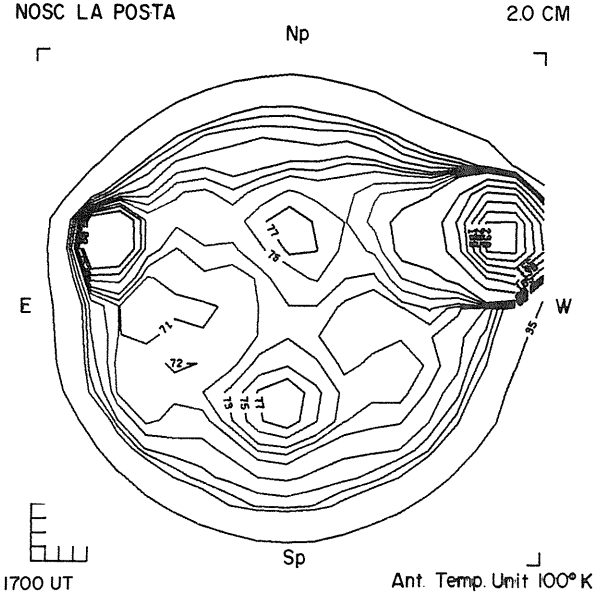
BOULDER



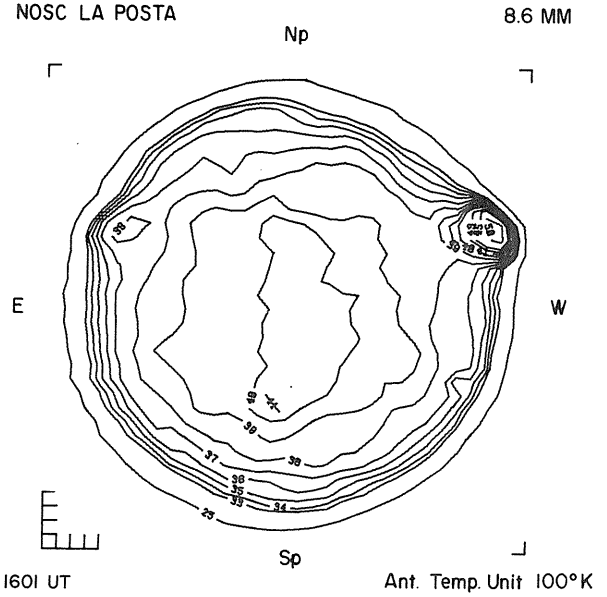
McMATH-HULBERT



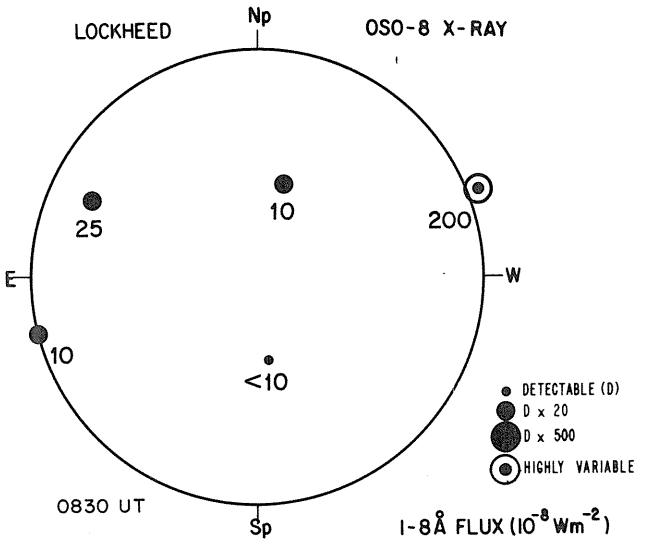
NOSC LA POSTA

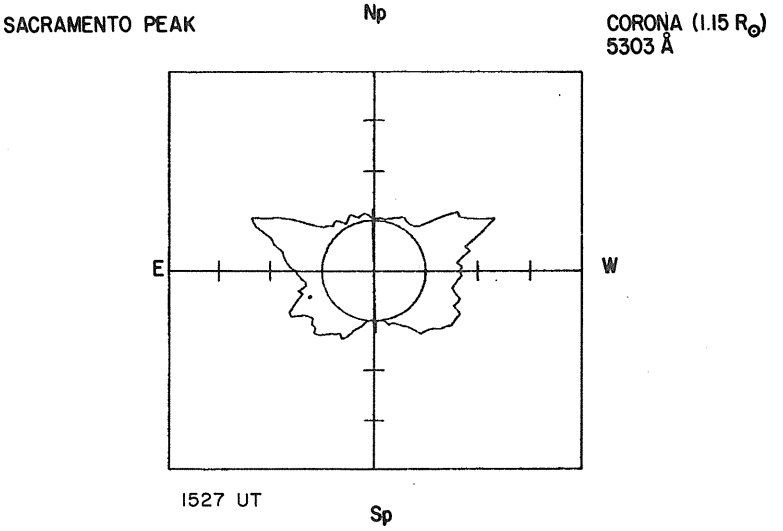


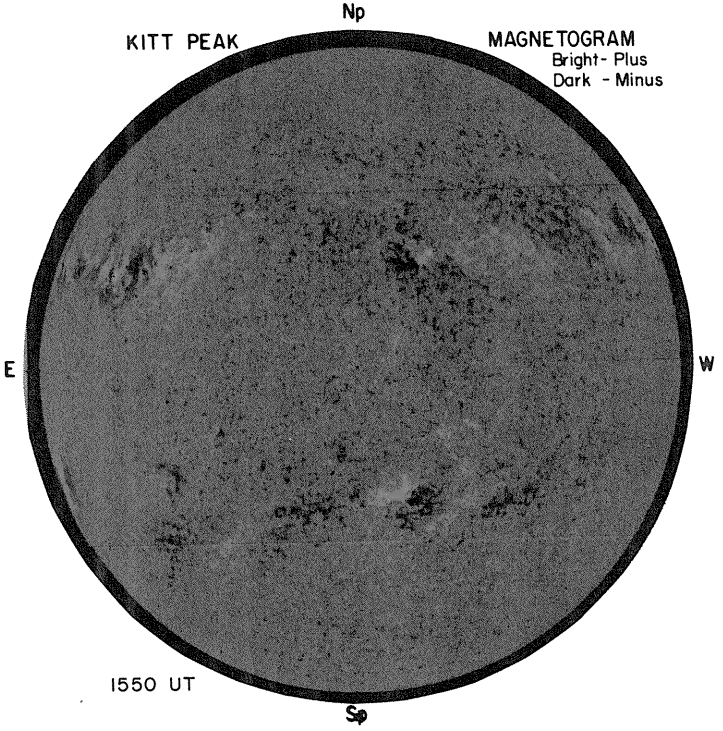
NOSC LA POSTA

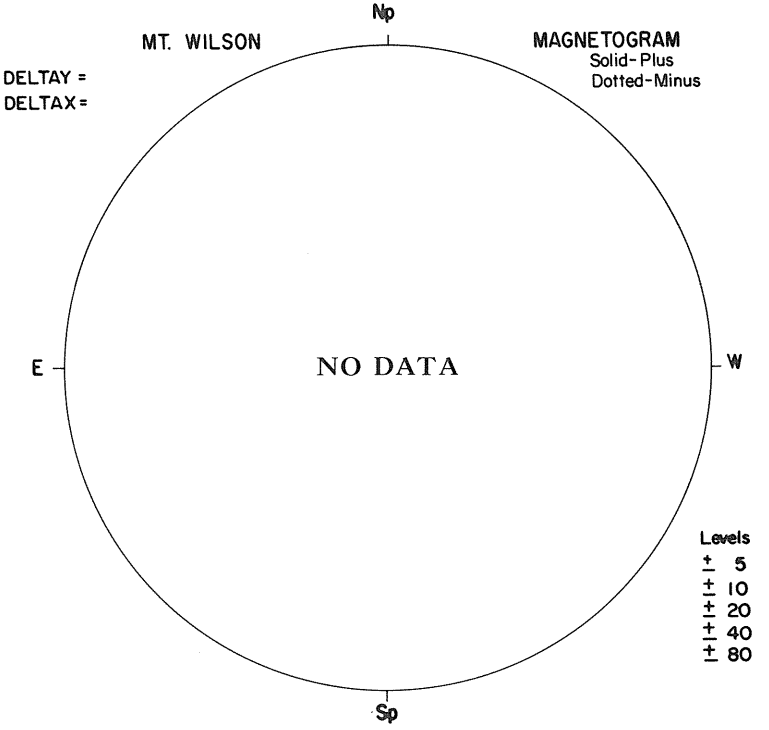


MAY 8, 1978 (P =-22.84, B_o =-3.44, L_o =346.10)



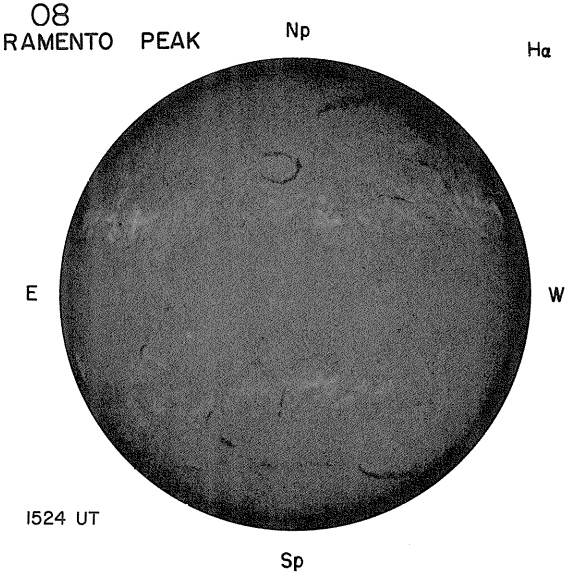




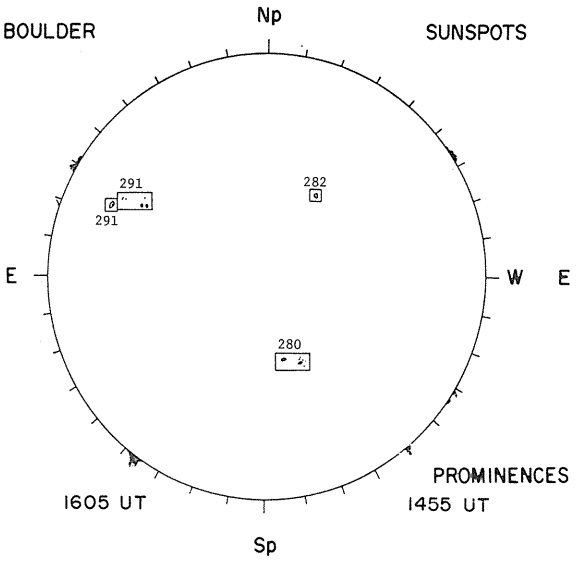


08

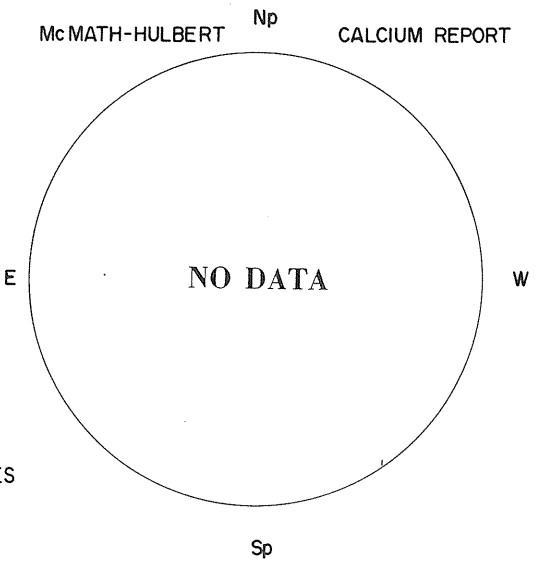
SACRAMENTO PEAK



BOULDER



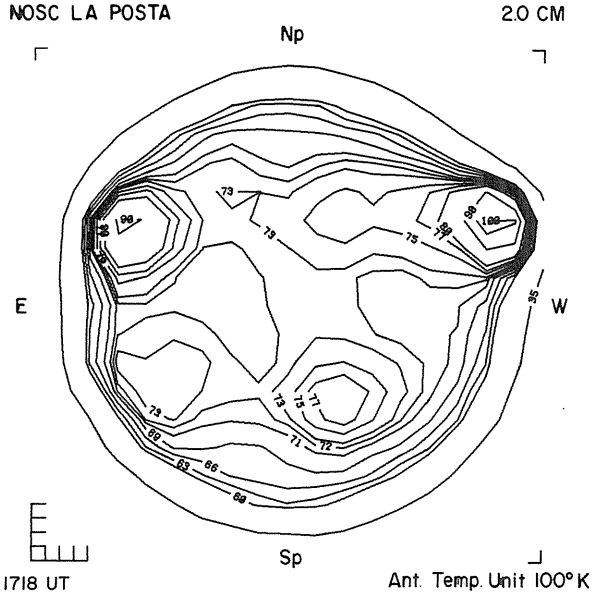
McMATH-HULBERT



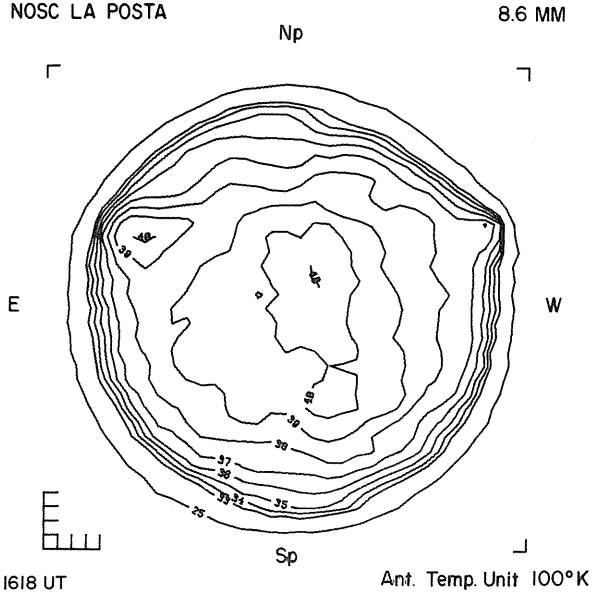
PROMINENCES

1455 UT

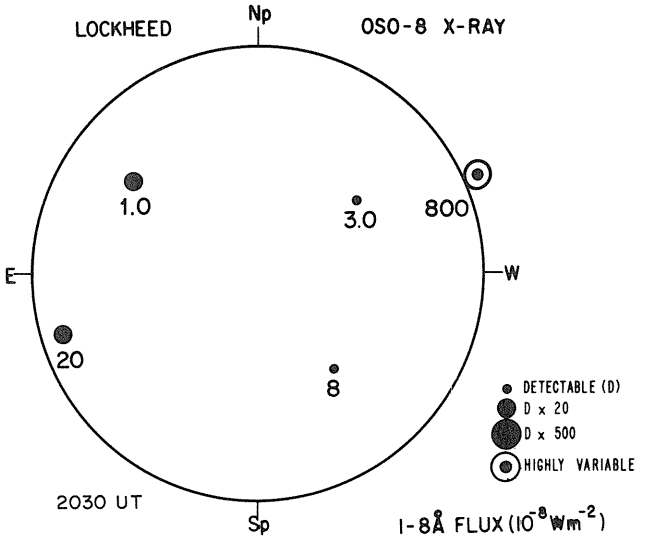
NOSC LA POSTA

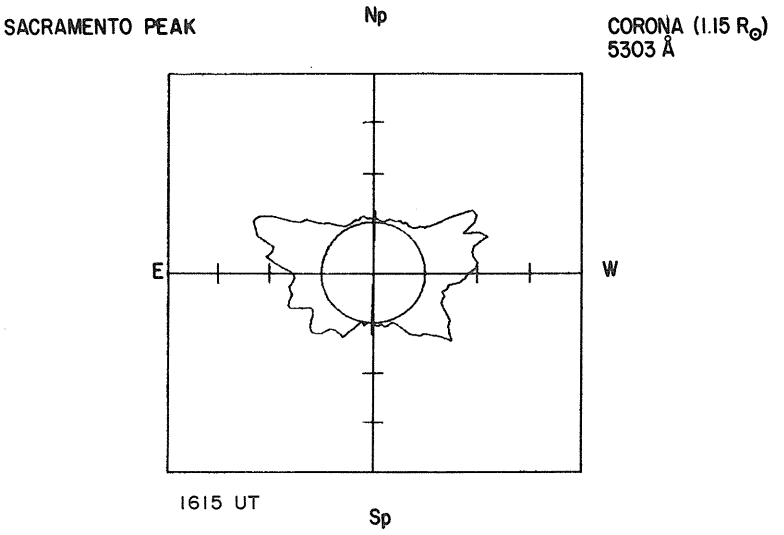


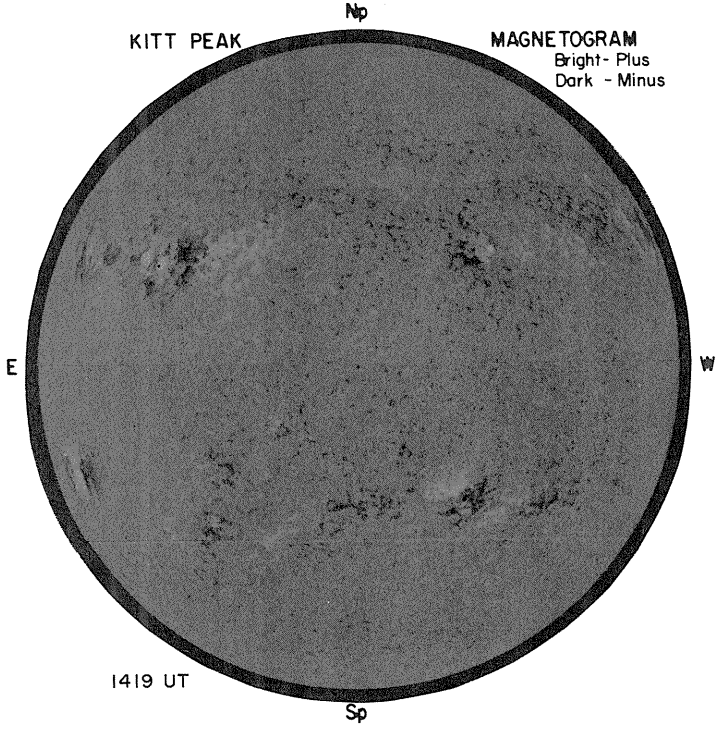
NOSC LA POSTA

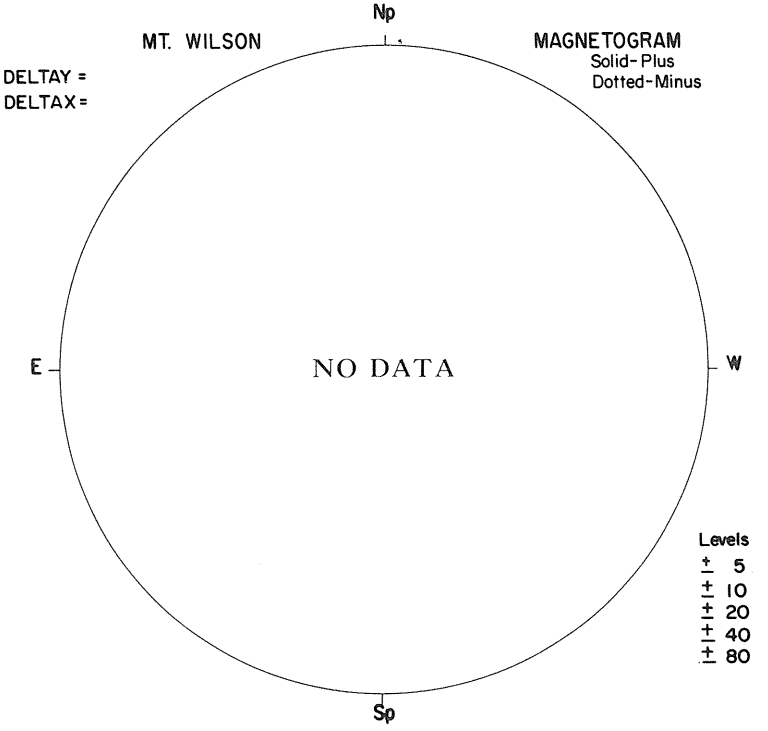


MAY 9, 1978 (P = -22.61; B_o = -3.33, L_o = 332.88)

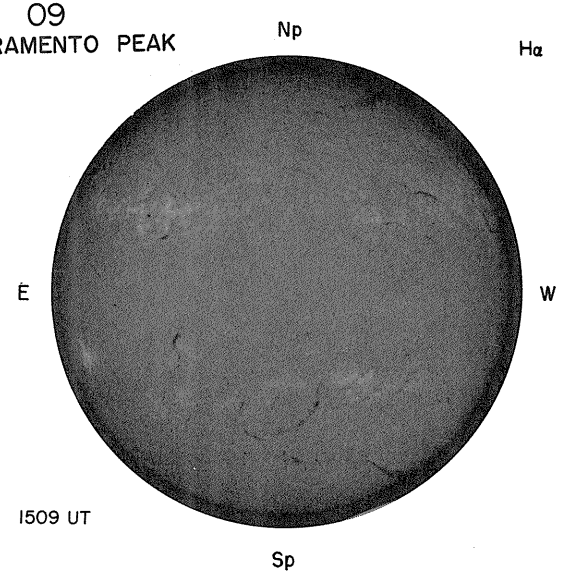






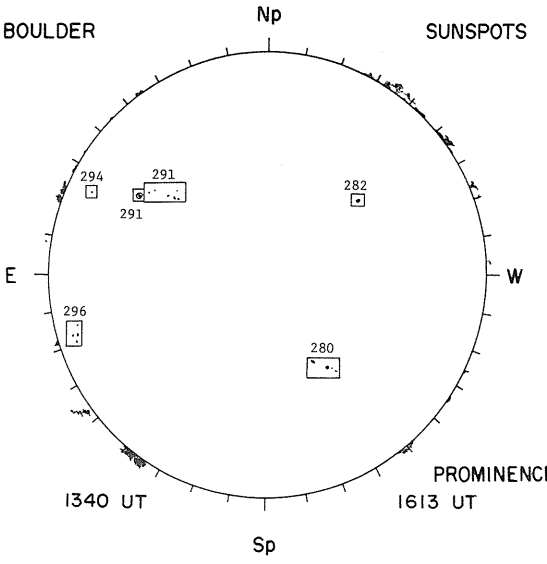


09
SACRAMENTO PEAK



1509 UT

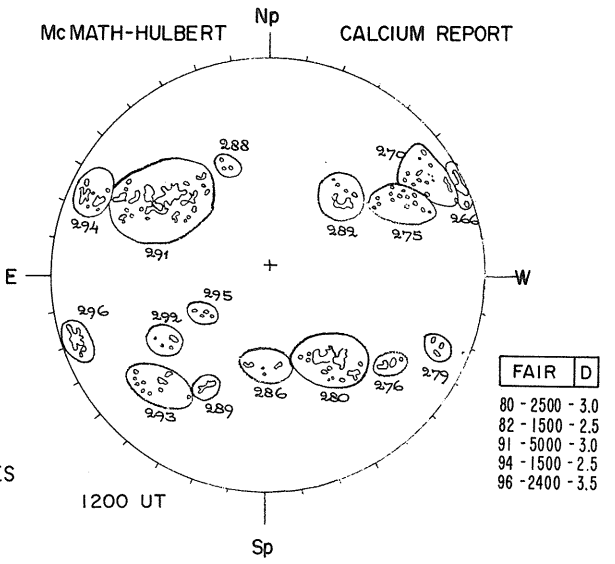
BOULDER



1340 UT

SUNSPOTS

McMATH-HULBERT



CALCIUM REPORT

FAIR	D

80 - 2500 - 3.0
82 - 1500 - 2.5
91 - 5000 - 3.0
94 - 1500 - 2.5
96 - 2400 - 3.5

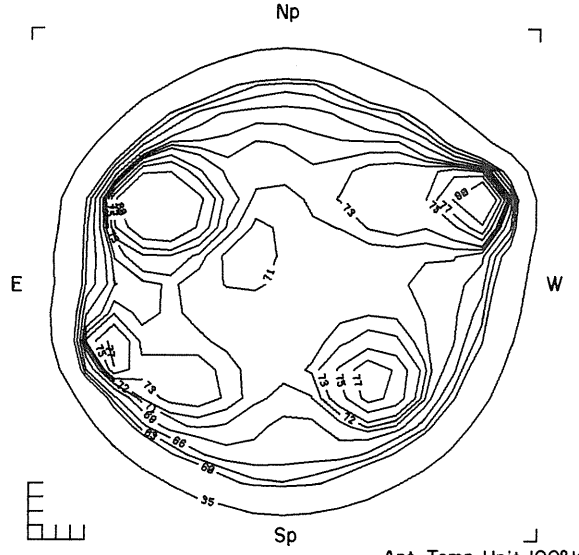
PROMINENCES

1613 UT

1200 UT

NOSC LA POSTA

2.0 CM

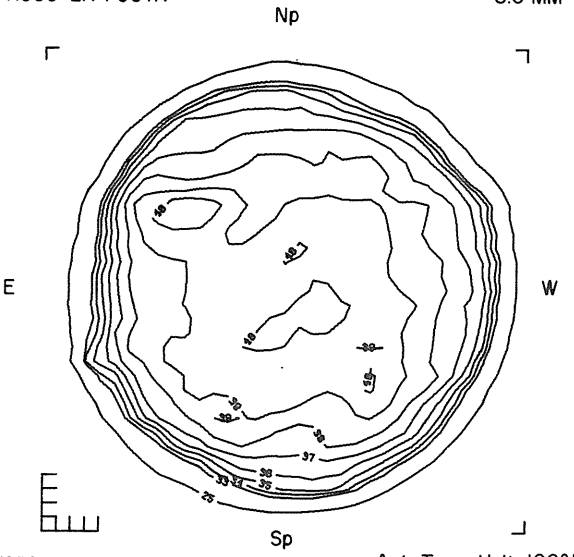


1802 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

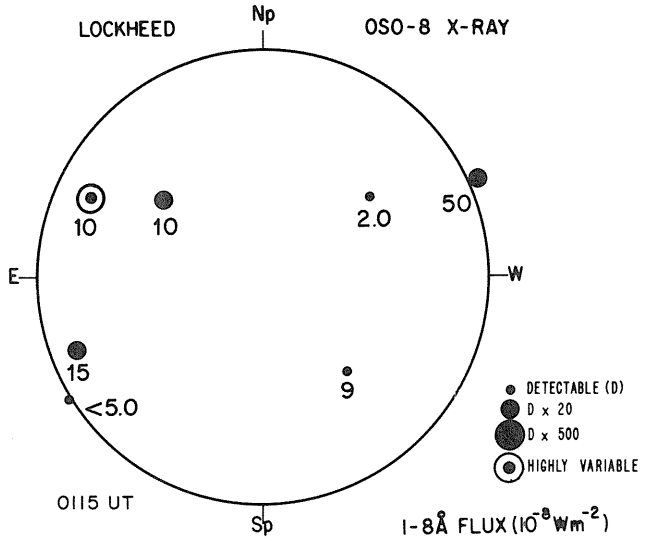
8.6 MM

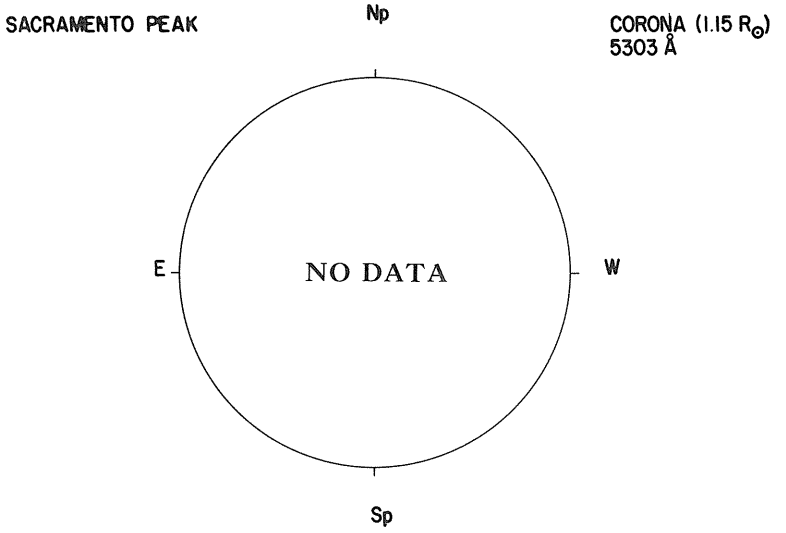


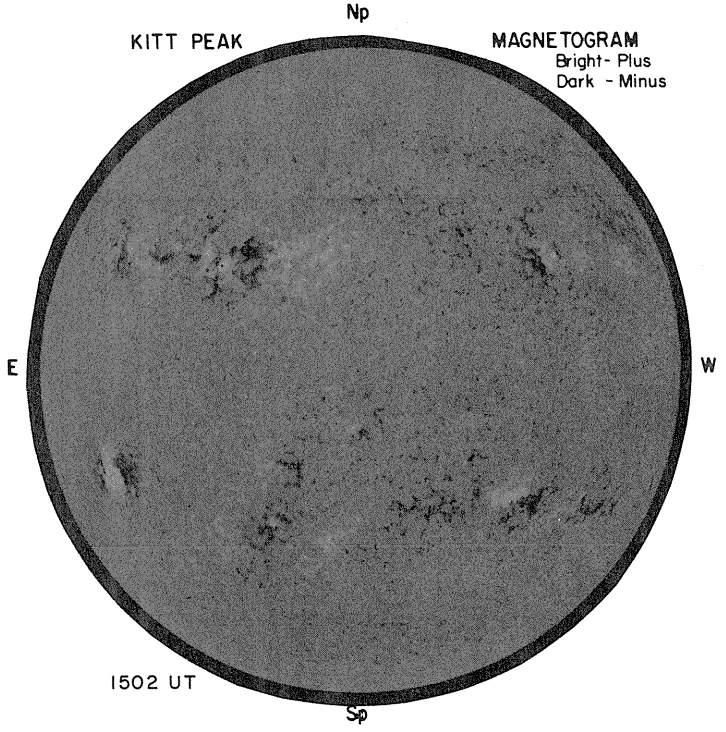
1658 UT

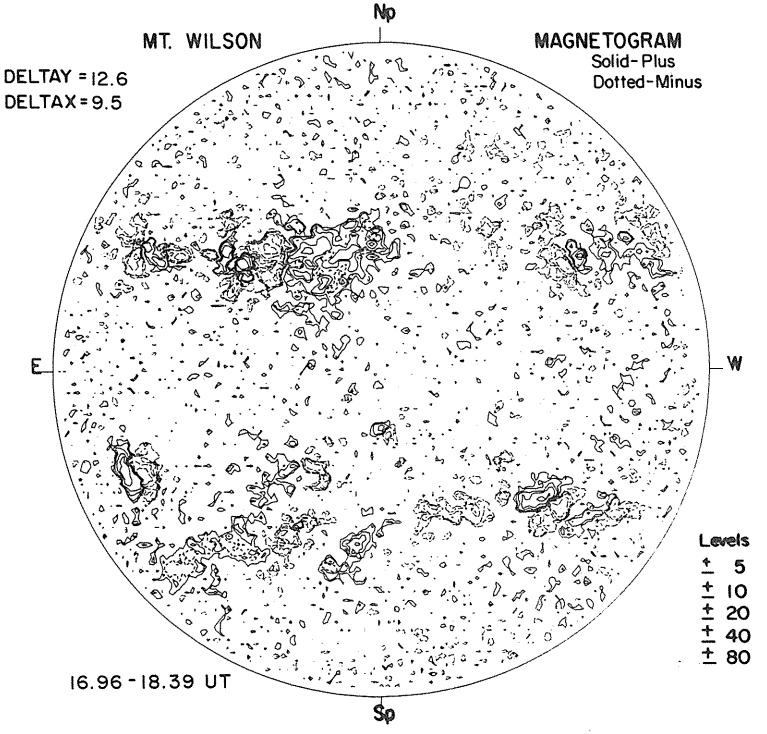
Ant. Temp. Unit 100° K

MAY 10, 1978 (P = -22.38, B_o = -3.22, L_o = 319.66)



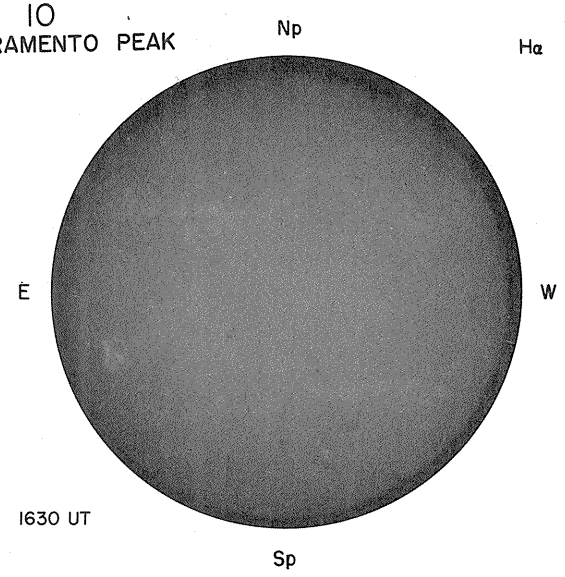




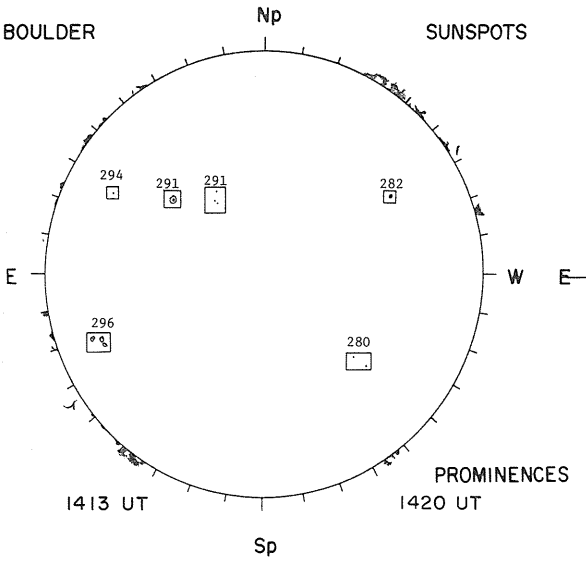


10

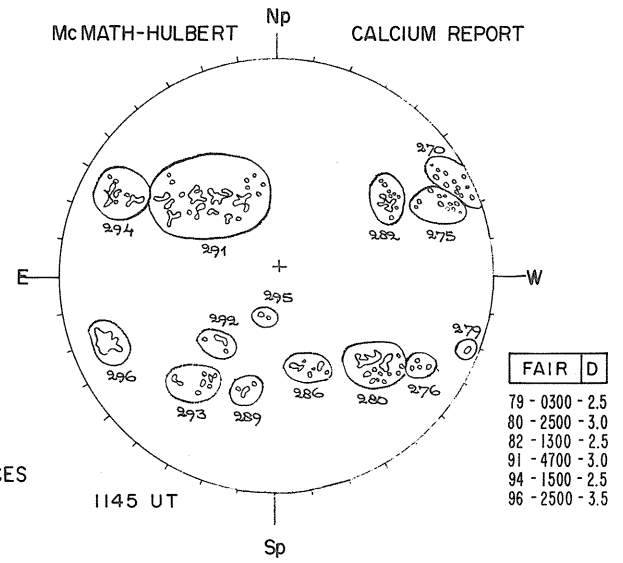
SACRAMENTO PEAK



BOULDER



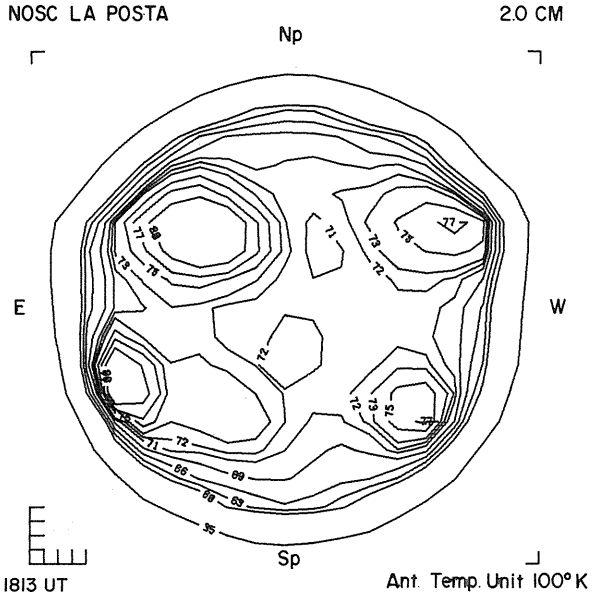
McMATH-HULBERT



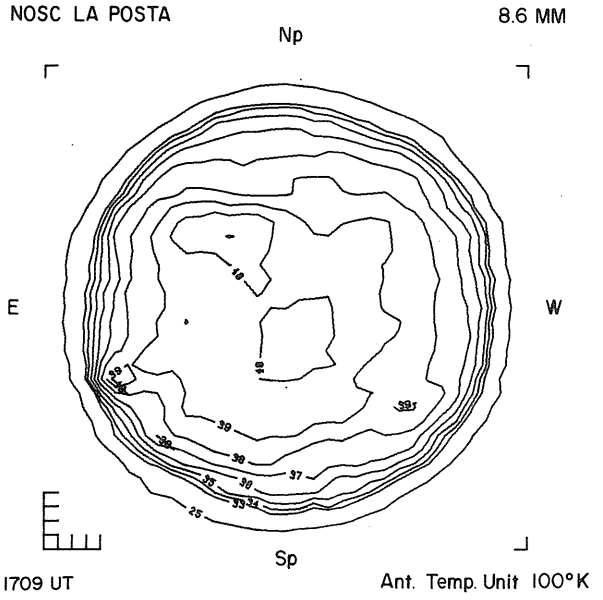
PROMINENCES

1420 UT

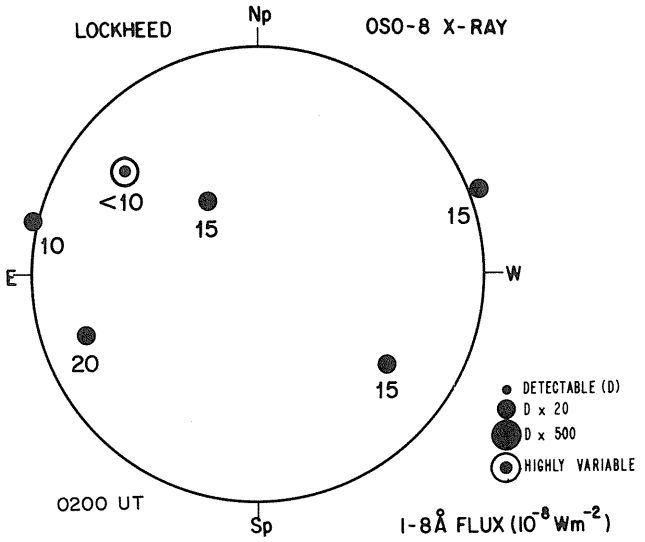
NOSC LA POSTA

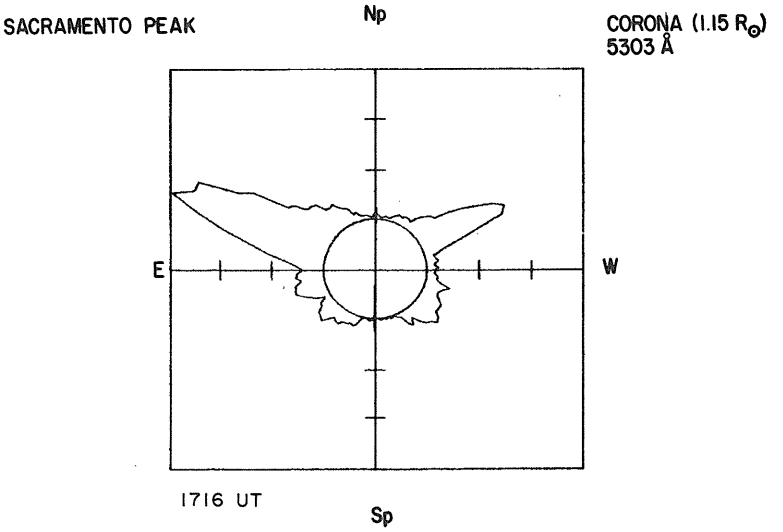


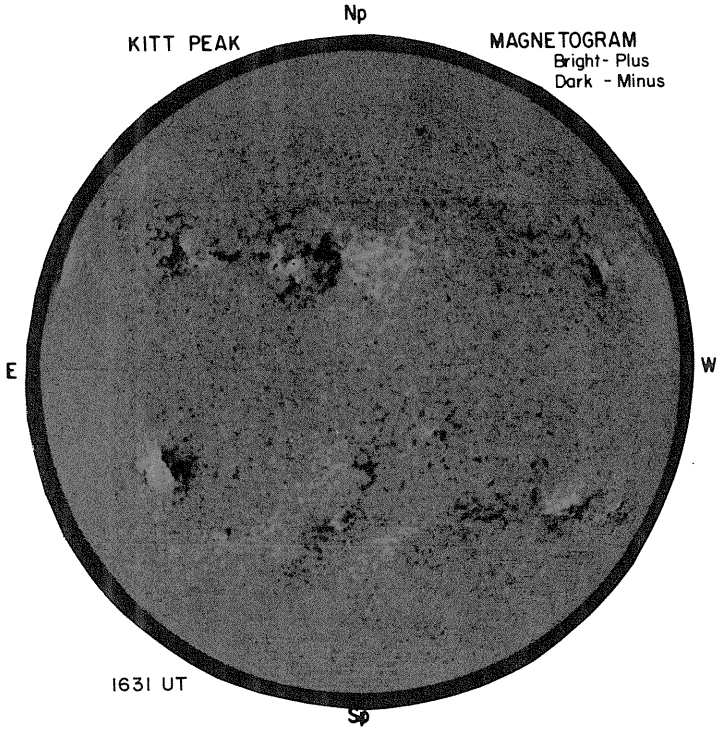
NOSC LA POSTA

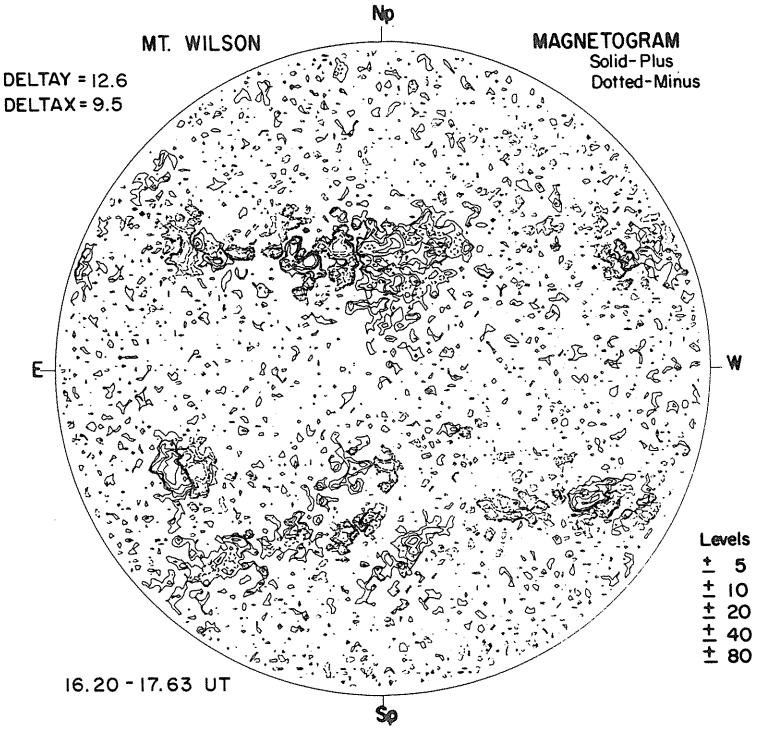


MAY 11, 1978 (P = -22.14, B_o = -3.11, L_o = 306.44)

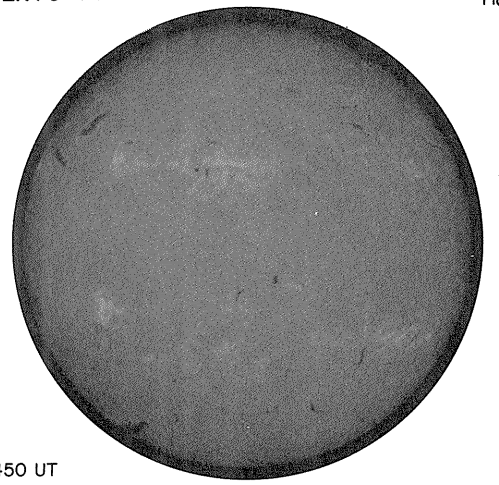






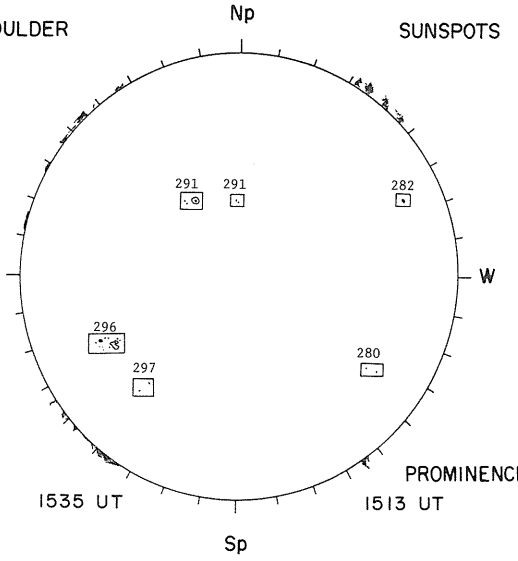


SACRAMENTO PEAK Hα



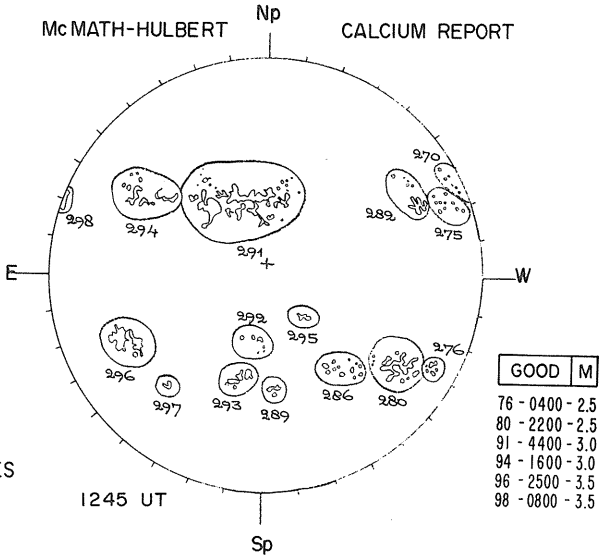
1450 UT

BOULDER SUNSPOTS



1535 UT

McMATH-HULBERT CALCIUM REPORT



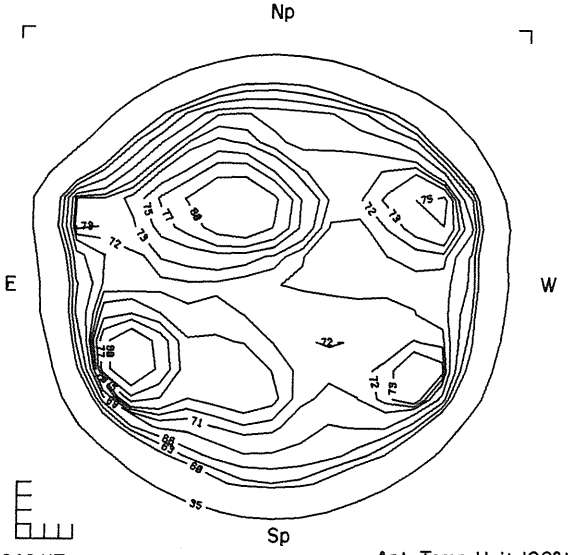
GOOD	M
76 - 0400 - 2.5	
80 - 2200 - 2.5	
91 - 4400 - 3.0	
94 - 1600 - 3.0	
96 - 2500 - 3.5	
98 - 0800 - 3.5	

1245 UT

PROMINENCES

1513 UT

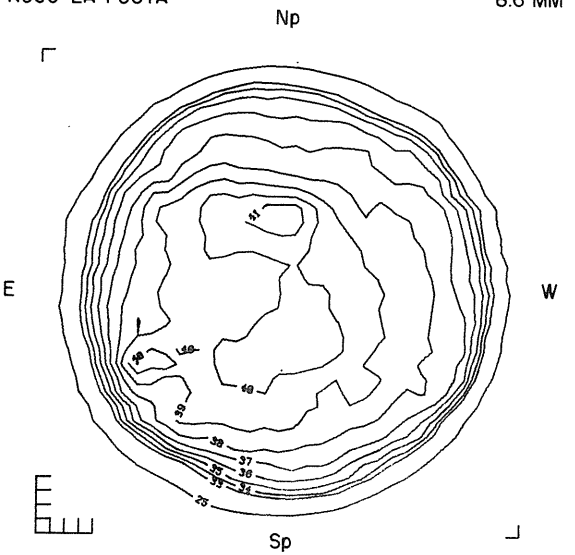
NOSC LA POSTA 2.0 CM



1646 UT

Ant. Temp. Unit 100° K

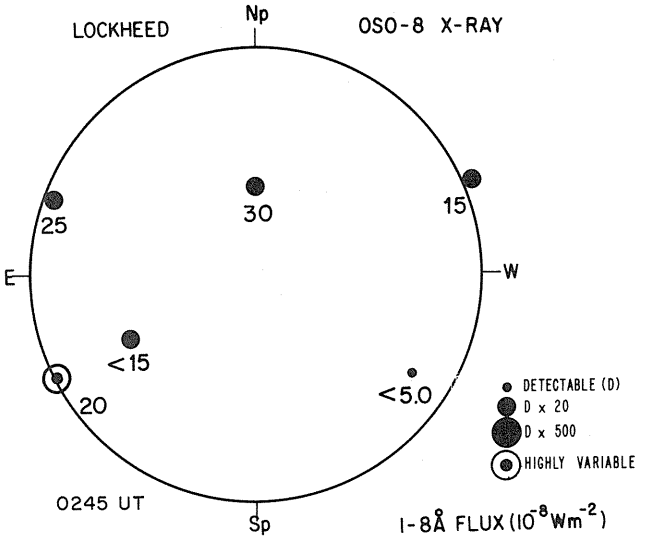
NOSC LA POSTA 8.6 MM

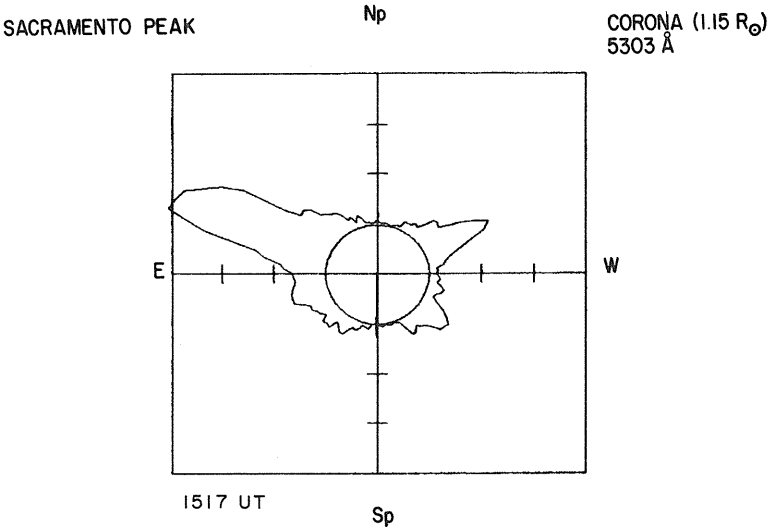


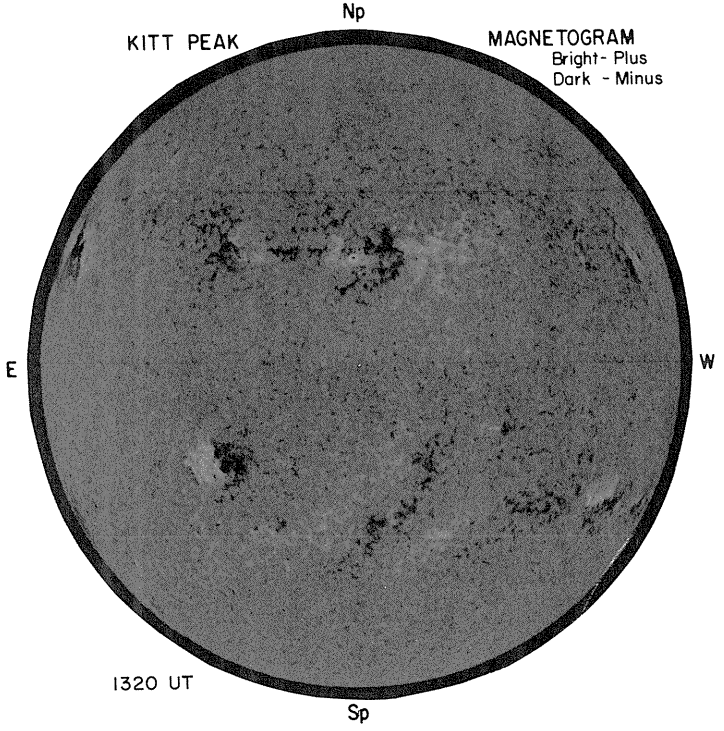
1539 UT

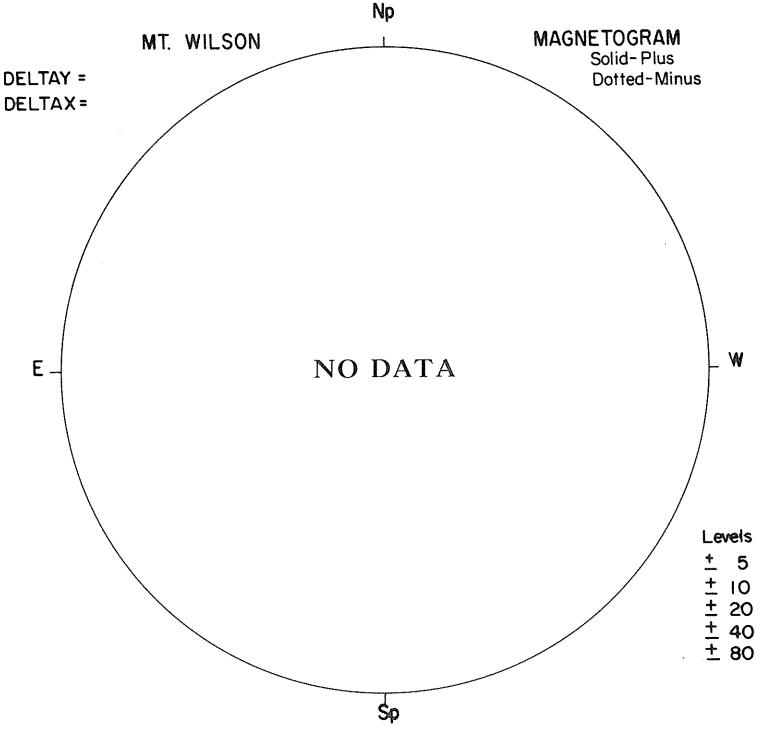
Ant. Temp. Unit 100° K

MAY 12, 1978 (P = -21.89, B_o = -3.00, L_o = 293.22)



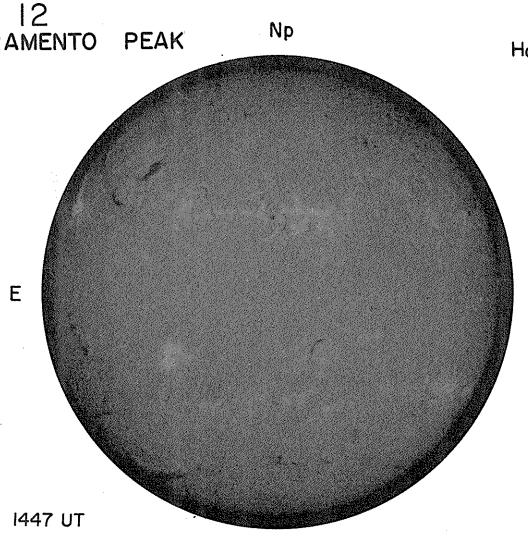




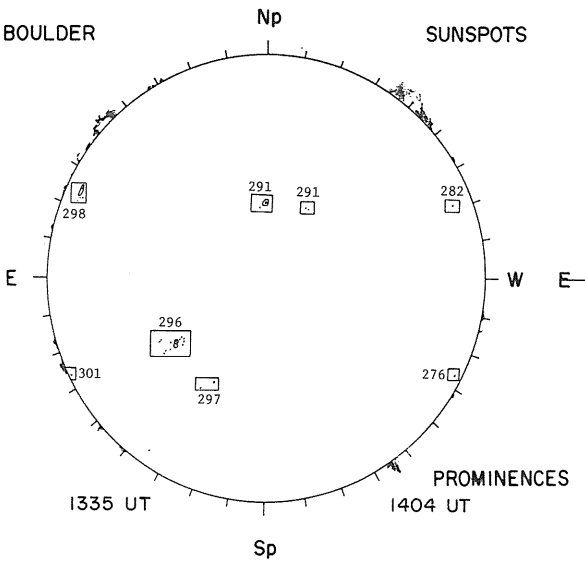


12

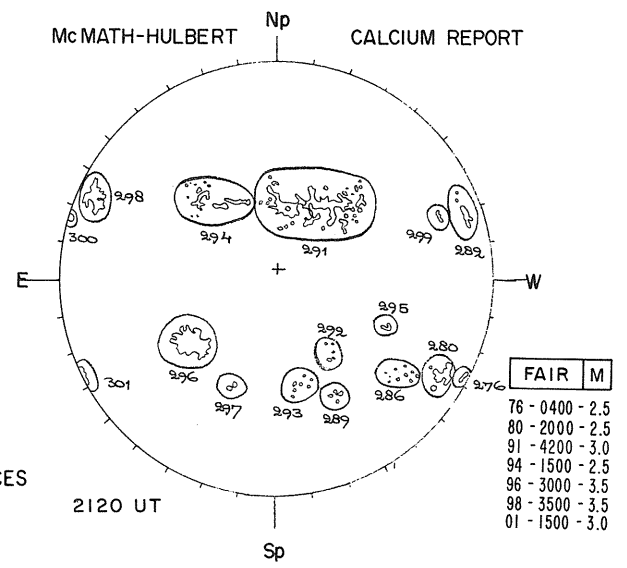
SACRAMENTO PEAK



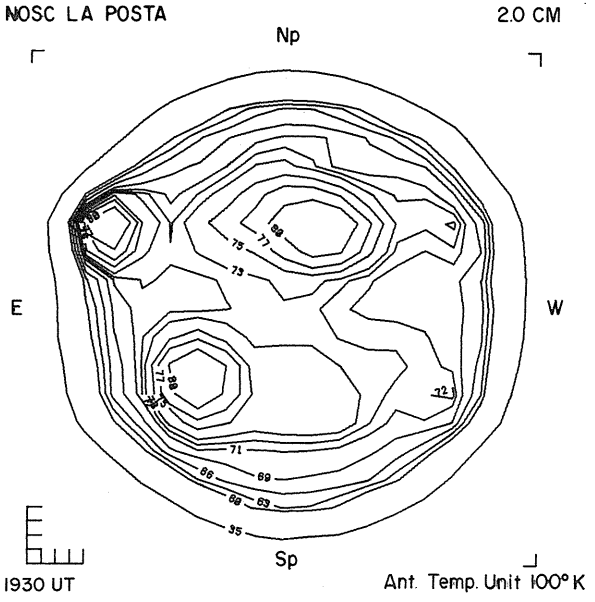
BOULDER



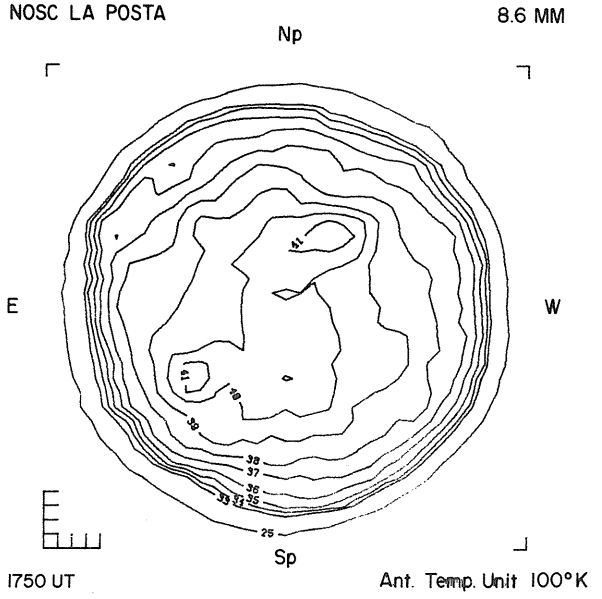
McMATH-HULBERT



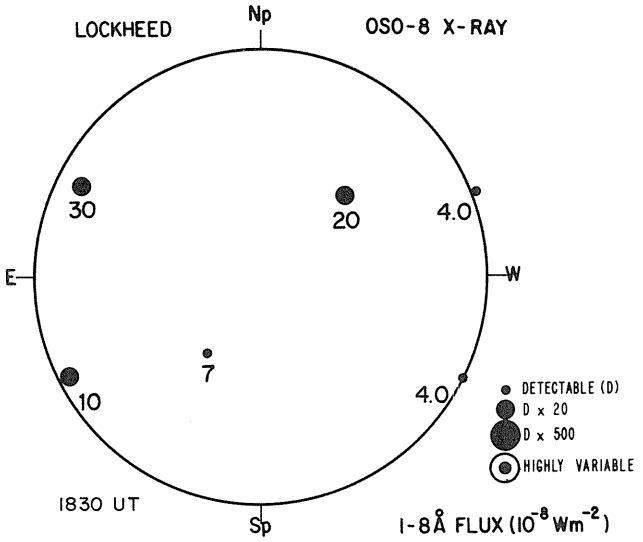
NOSC LA POSTA

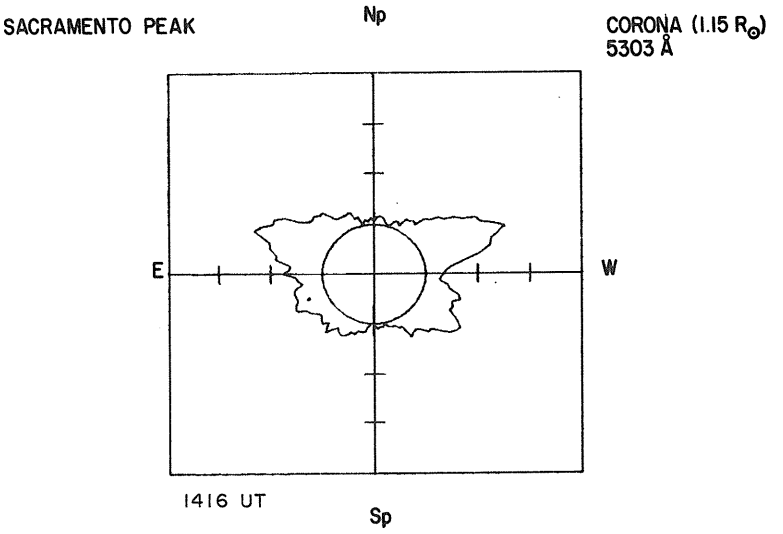


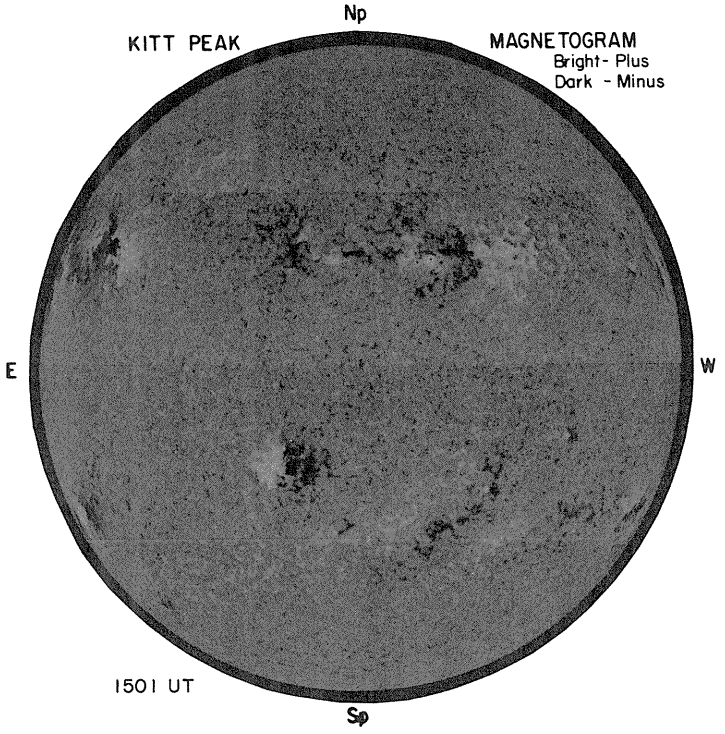
NOSC LA POSTA

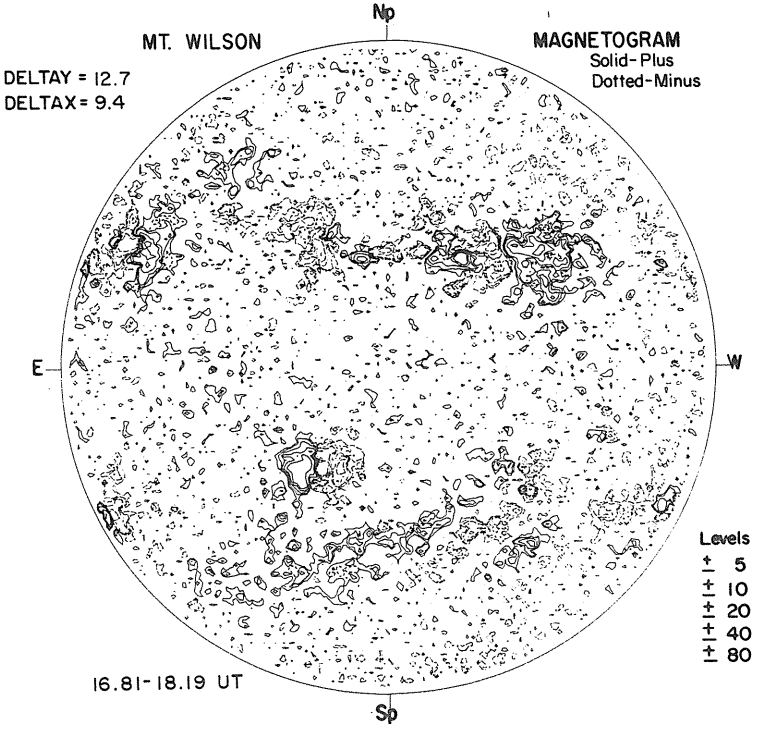


MAY 13, 1978 (P = -21.63, B_o = -2.89, L_o = 279.99)



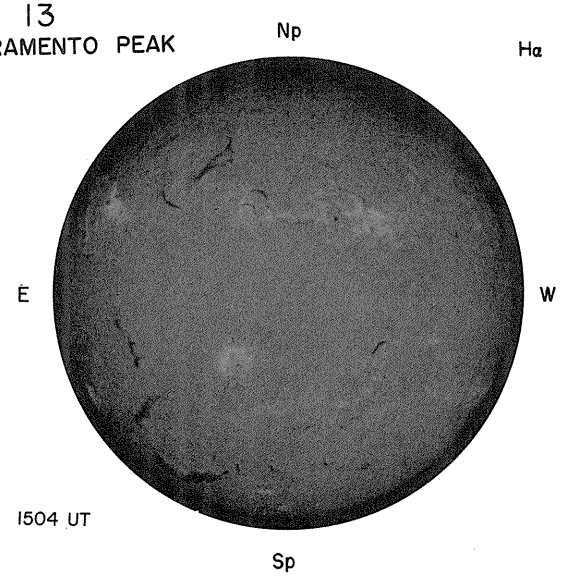




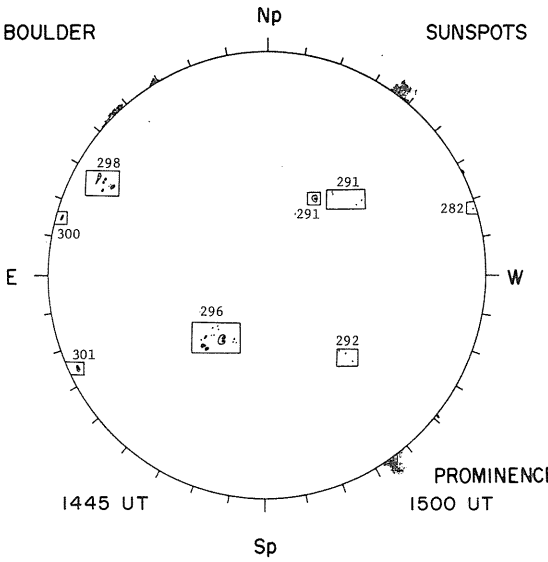


13

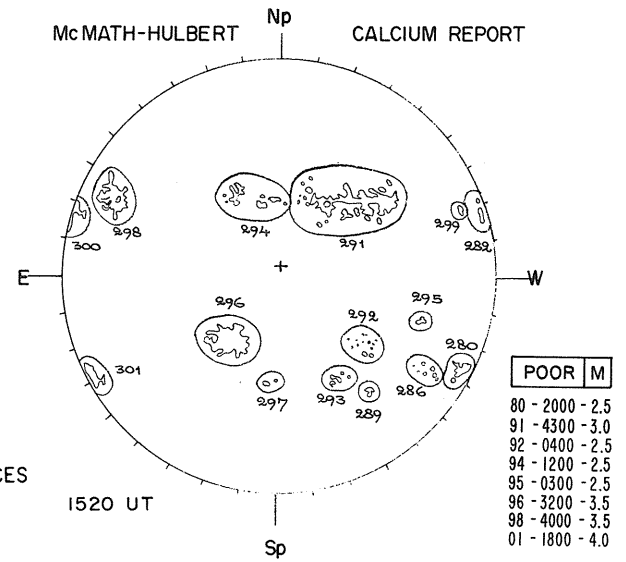
SACRAMENTO PEAK



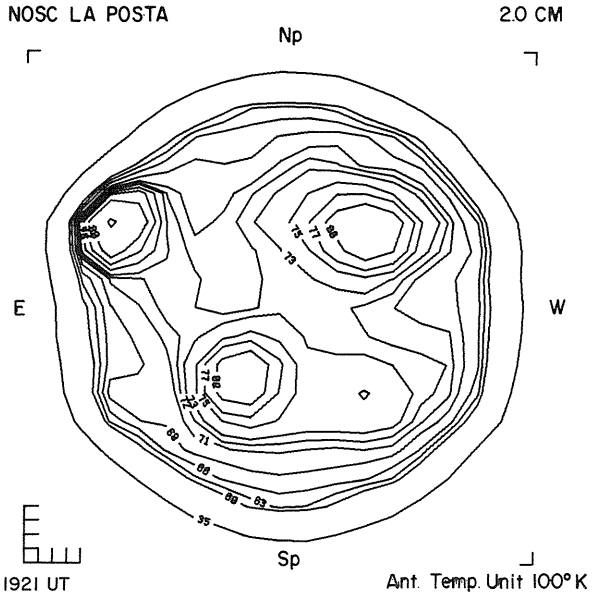
BOULDER



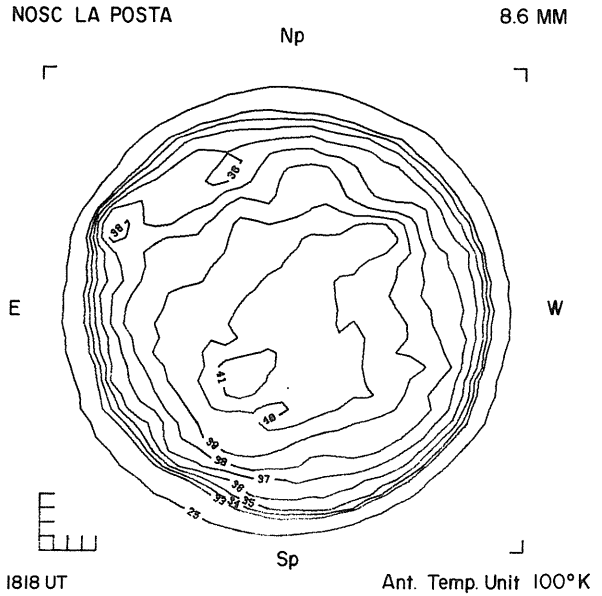
McMATH-HULBERT



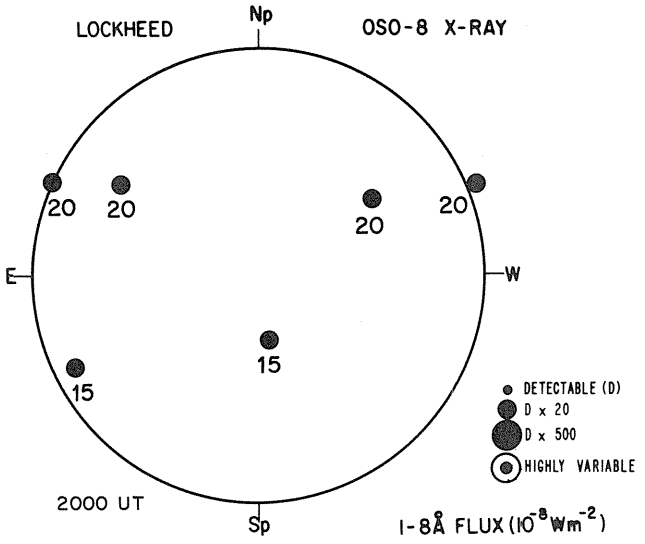
NOSC LA POSTA

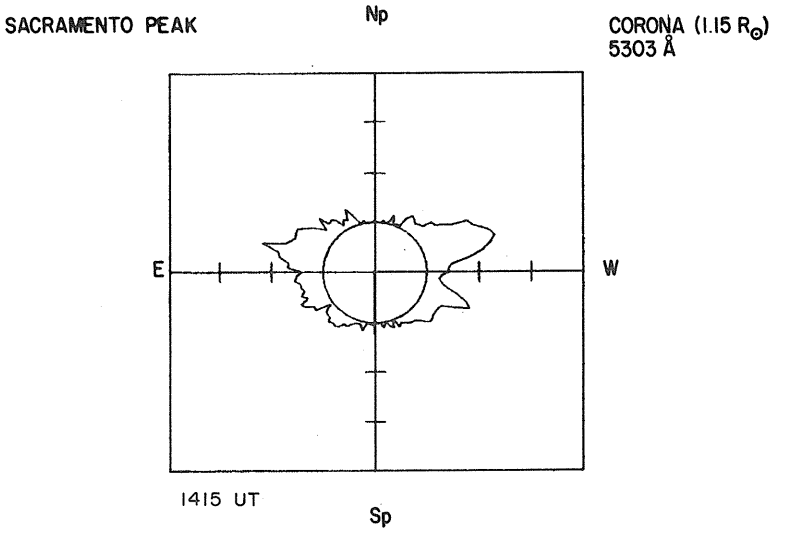


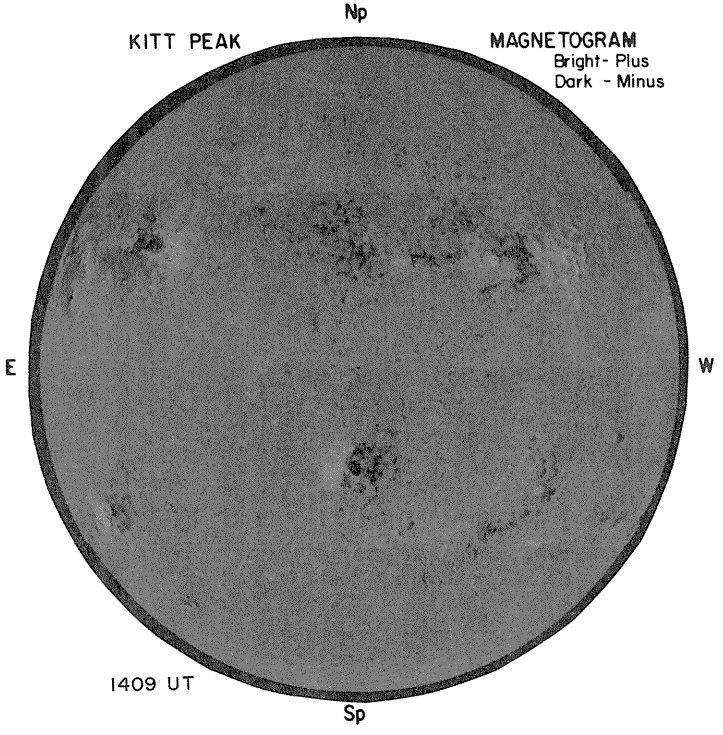
NOSC LA POSTA

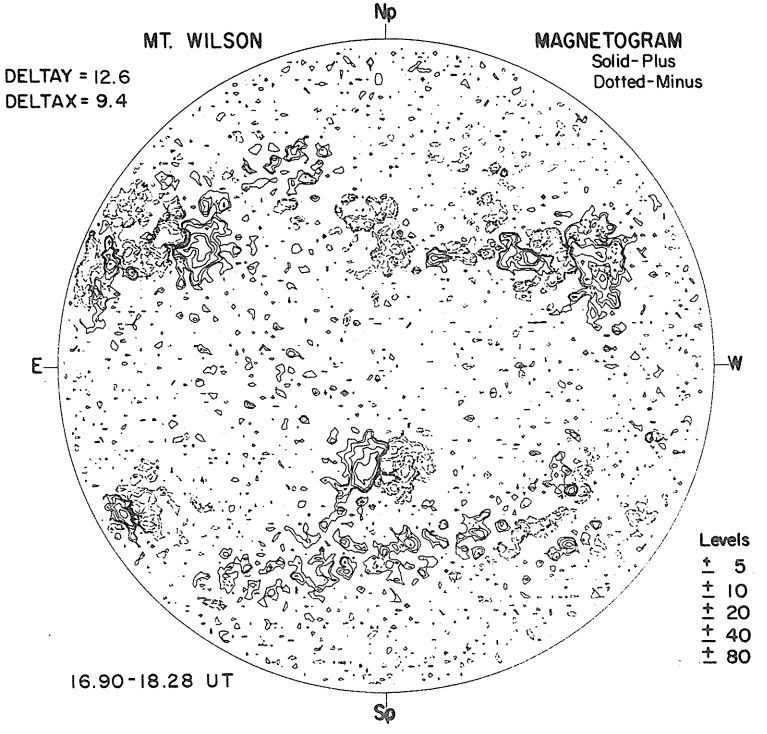


MAY 14, 1978 (P = -21.37, B_o = -2.78, L_o = 266.77)

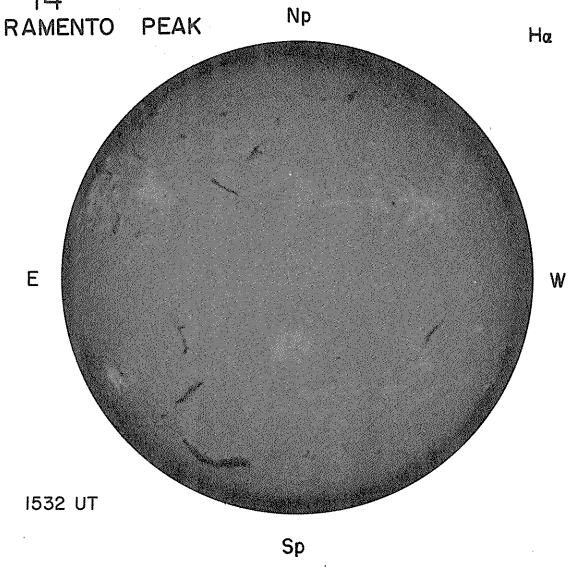






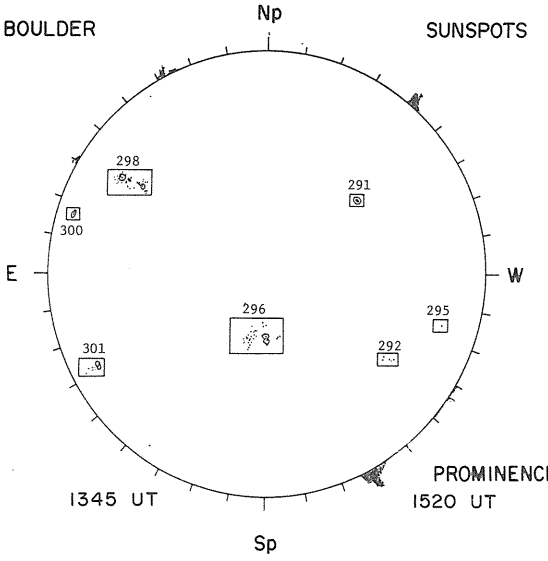


SACRAMENTO PEAK



1532 UT

BOULDER



1345 UT

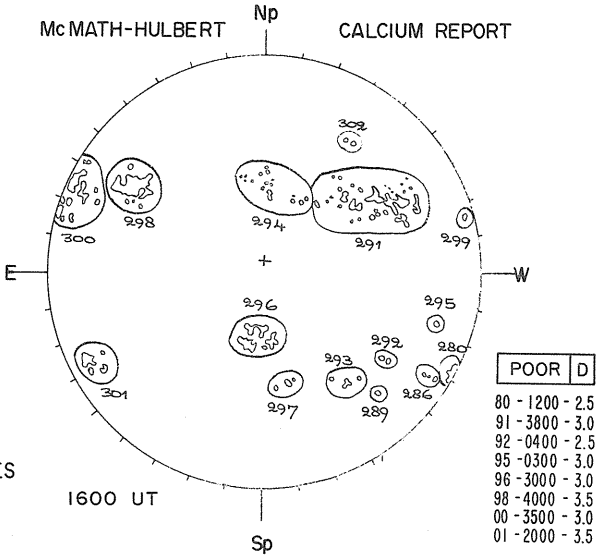
SUNSPOTS

PROMINENCES

1520 UT

McMATH-HULBERT

CALCIUM REPORT



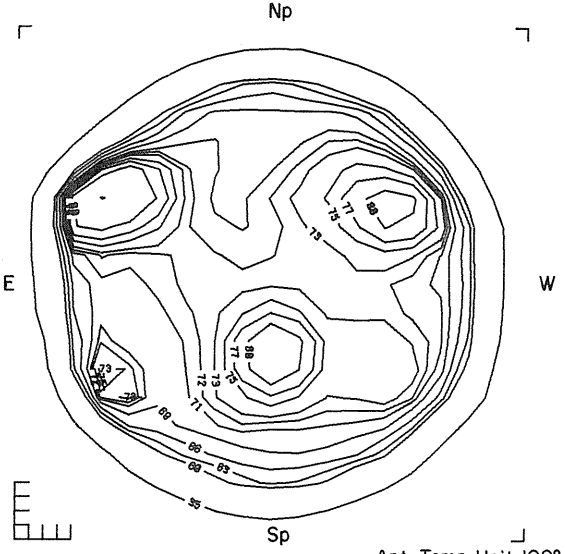
1600 UT

POOR	D

80 - 1200 - 2.5
91 - 3800 - 3.0
92 - 0400 - 2.5
95 - 0300 - 3.0
96 - 3000 - 3.0
98 - 4000 - 3.5
00 - 3500 - 3.0
01 - 2000 - 3.5

NOSC LA POSTA

2.0 CM

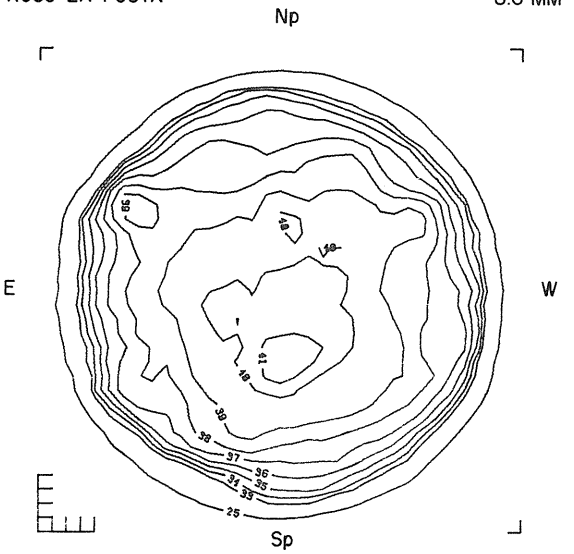


1819 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

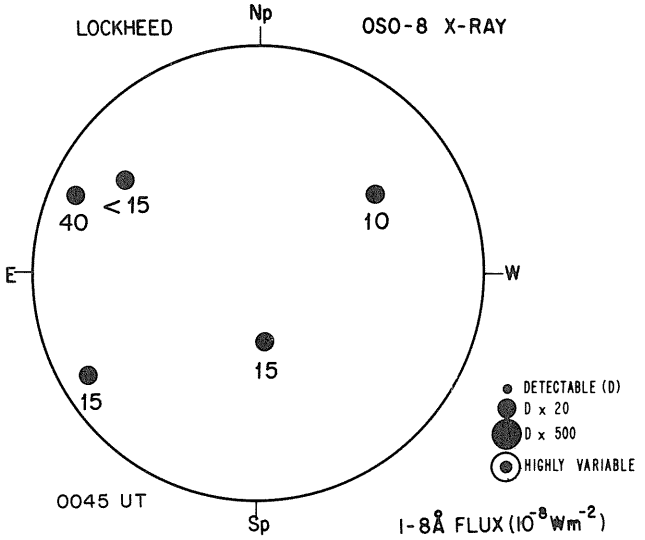
8.6 MM

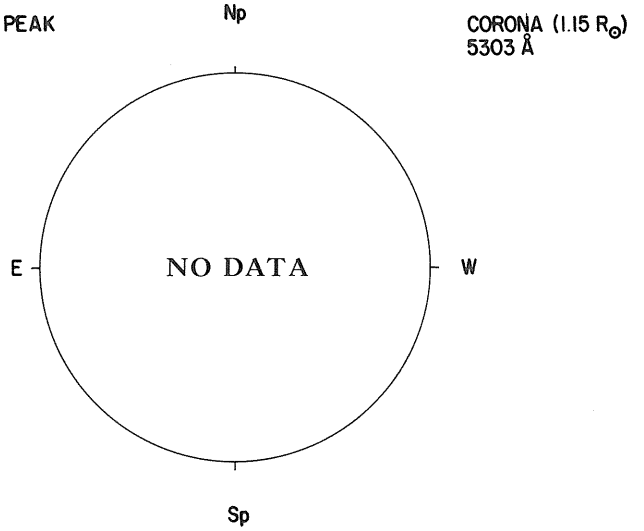


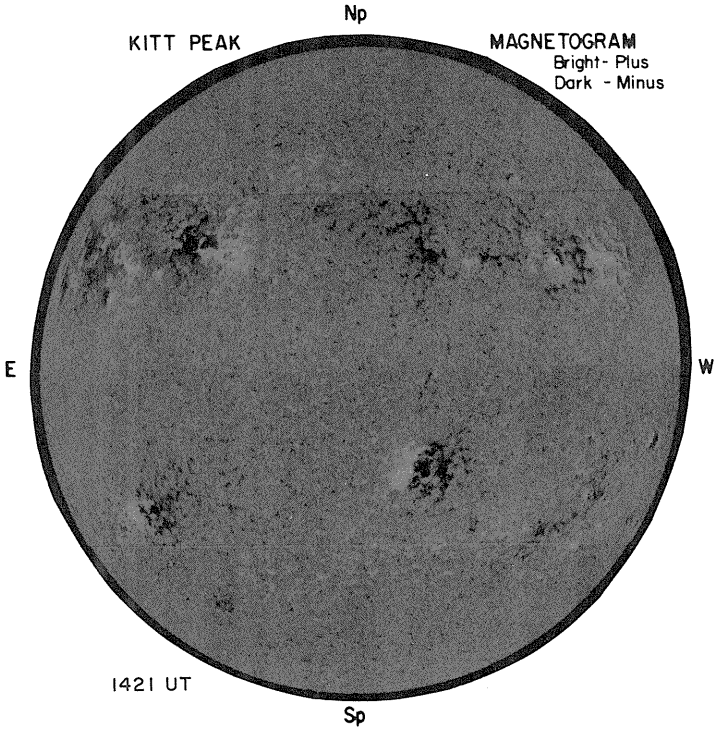
1656 UT

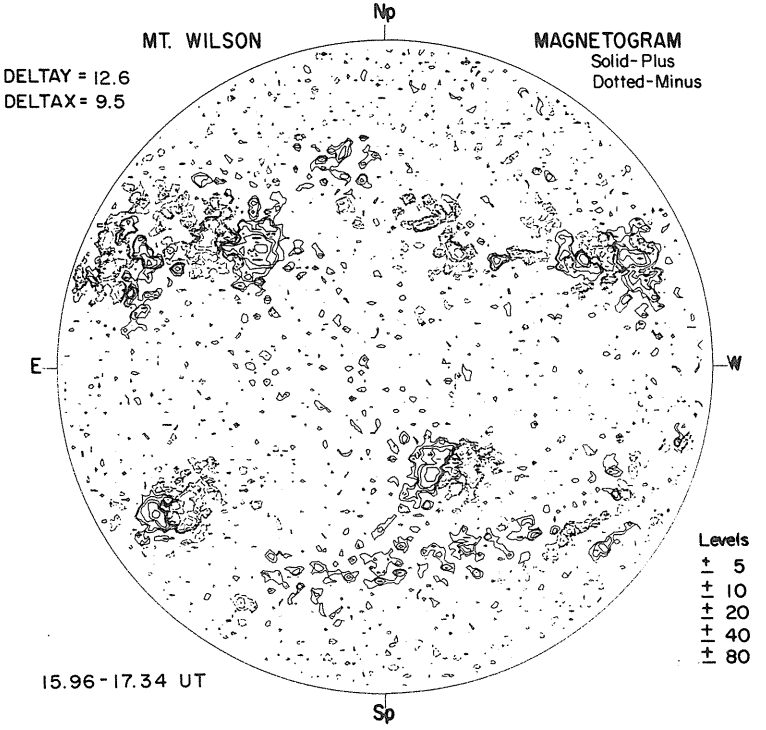
Ant. Temp. Unit 100°K

MAY 15, 1978 (P = -21.10, B_o = -2.67, L_o = 253.54)



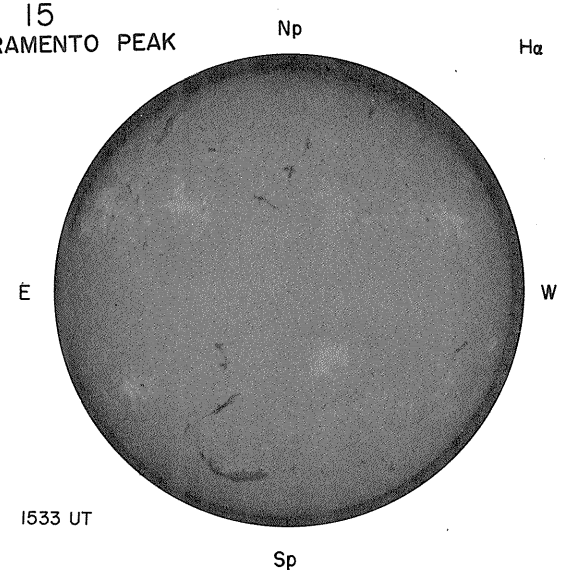






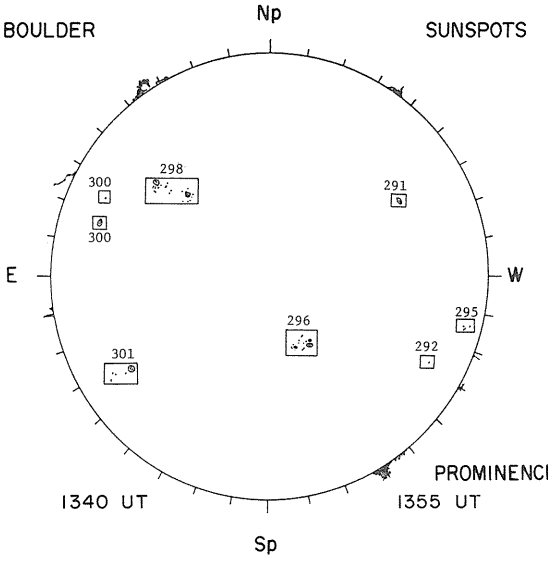
15

SACRAMENTO PEAK Hα



1533 UT

BOULDER SUNSPOTS

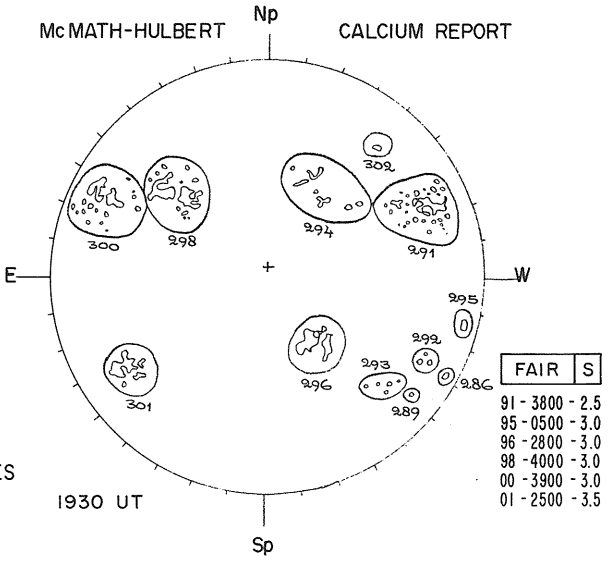


1340 UT

PROMINENCES

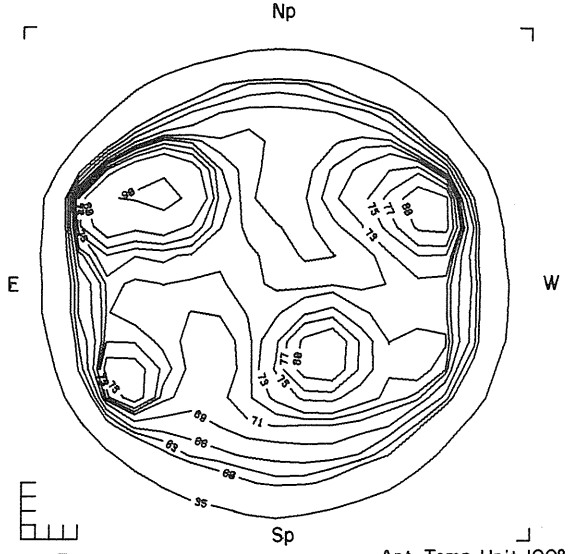
1355 UT

McMATH-HULBERT CALCIUM REPORT



1930 UT

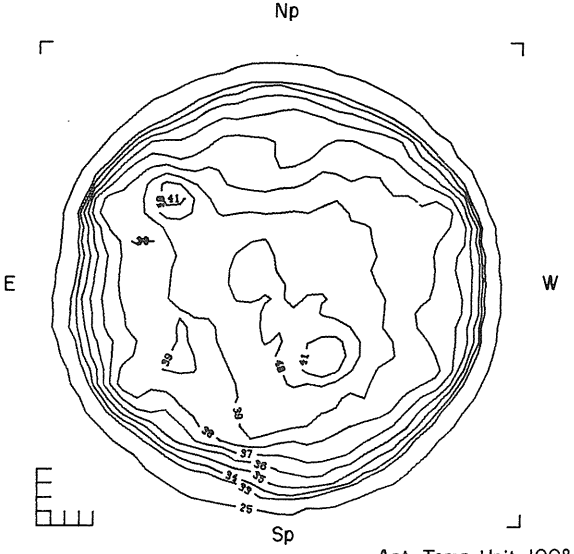
NOSC LA POSTA 2.0 CM



1645 UT

Ant. Temp. Unit 100° K

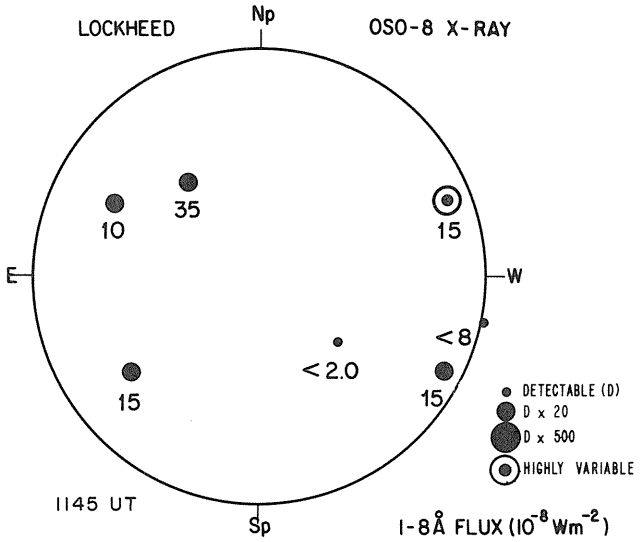
NOSC LA POSTA 8.6 MM

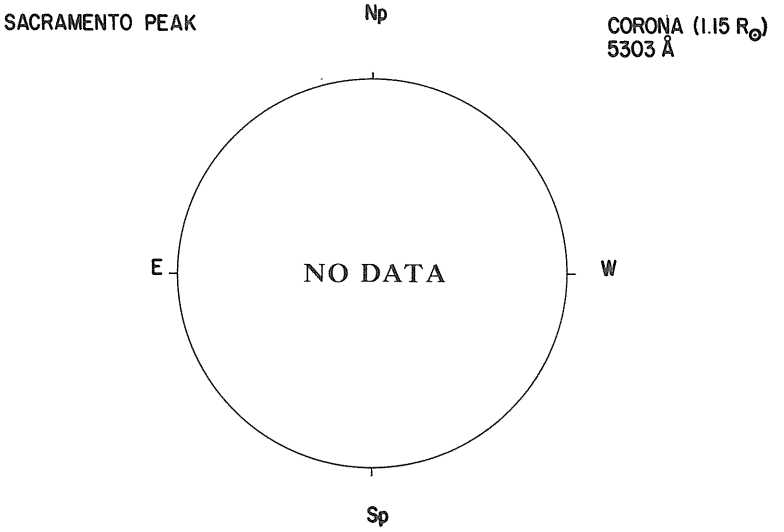


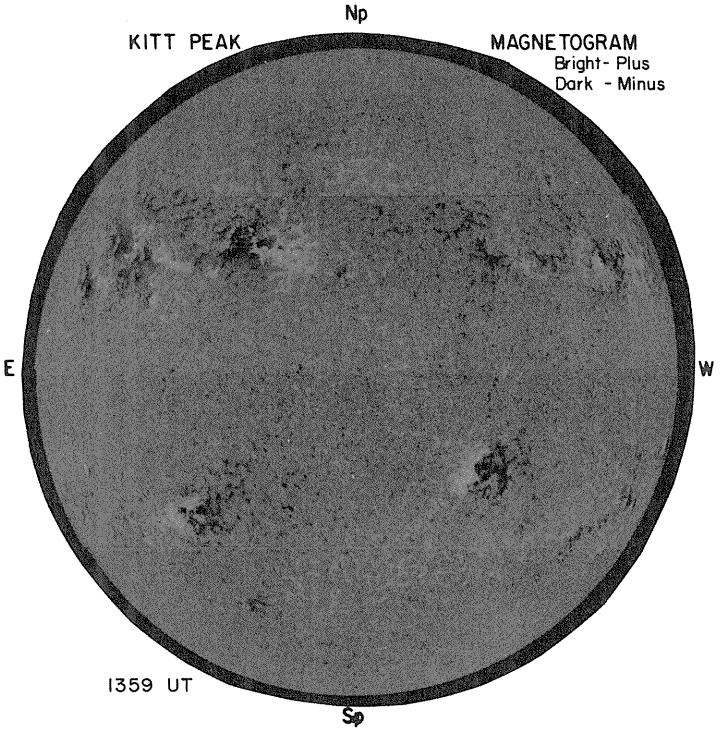
1729 UT

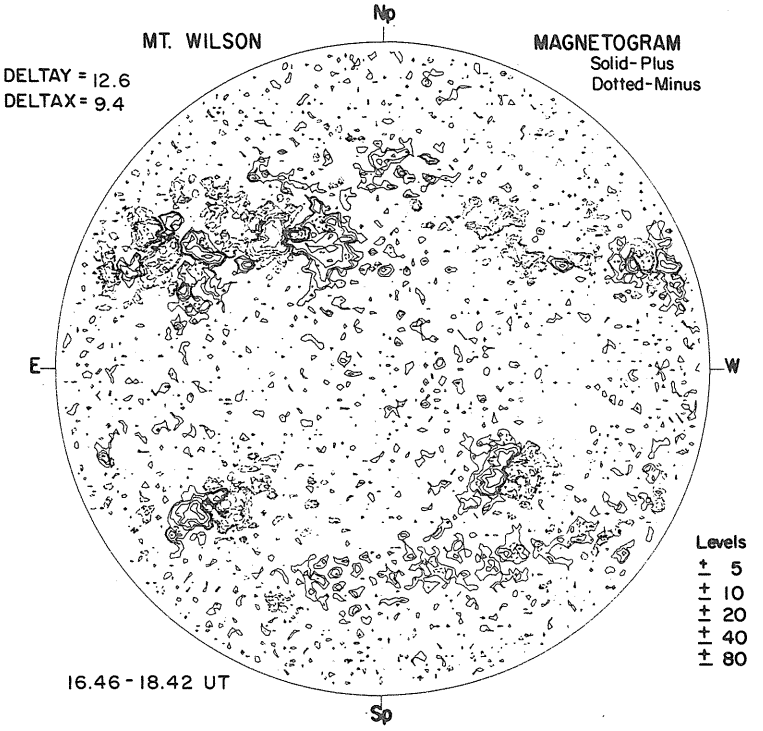
Ant. Temp. Unit 100° K

MAY 16, 1978 (P = -20.83, B_o = -2.55, L_o = 240.32)



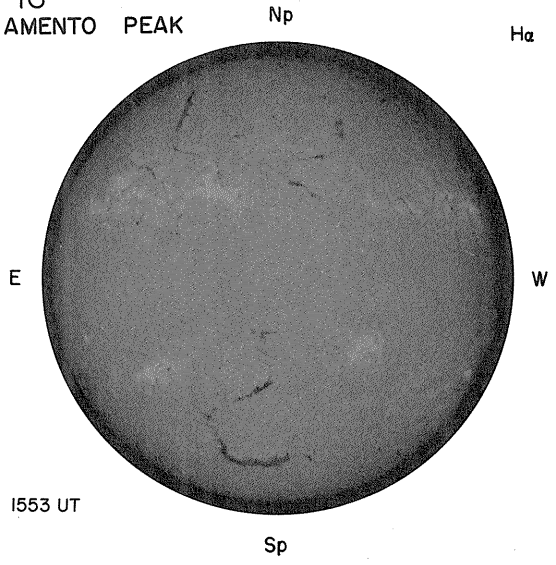




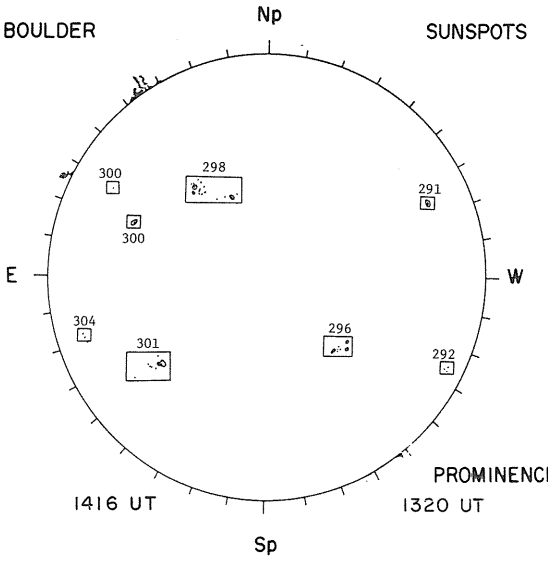


16

SACRAMENTO PEAK

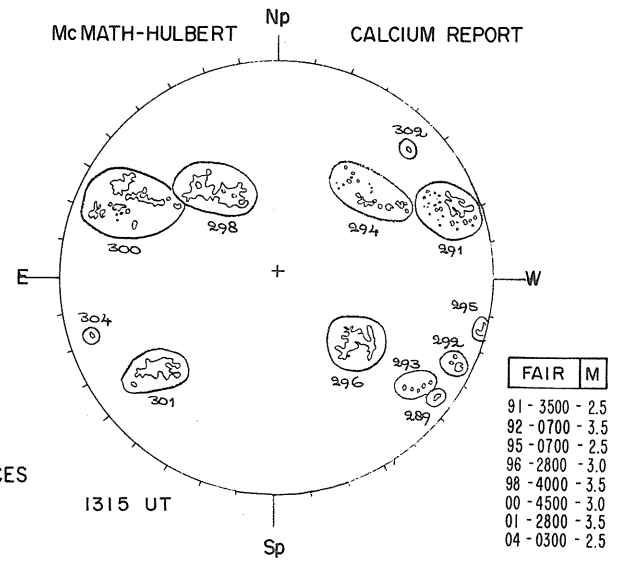


BOULDER



SUNSPOTS

McMATH-HULBERT



CALCIUM REPORT

FAIR	M

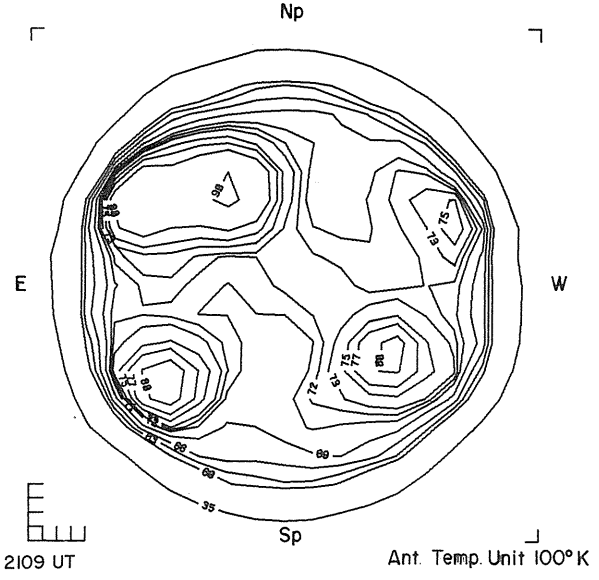
91 - 3500 - 2.5
92 - 0700 - 3.5
95 - 0700 - 2.5
96 - 2800 - 3.0
98 - 4000 - 3.5
00 - 4500 - 3.0
01 - 2800 - 3.5
04 - 0300 - 2.5

PROMINENCES

1320 UT

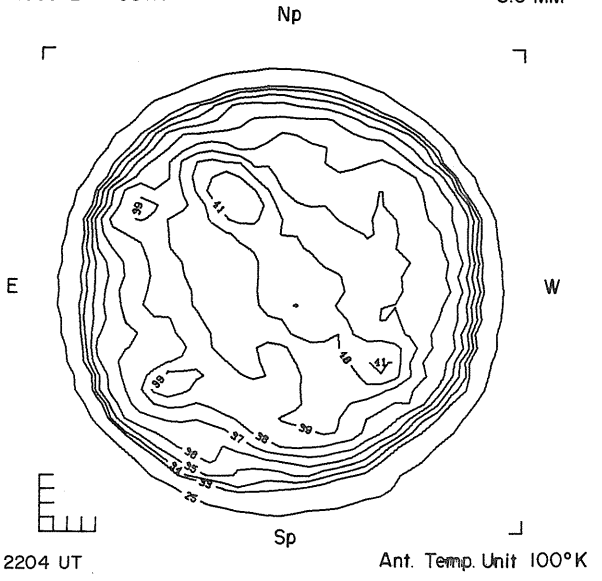
NOSC LA POSTA

2.0 CM



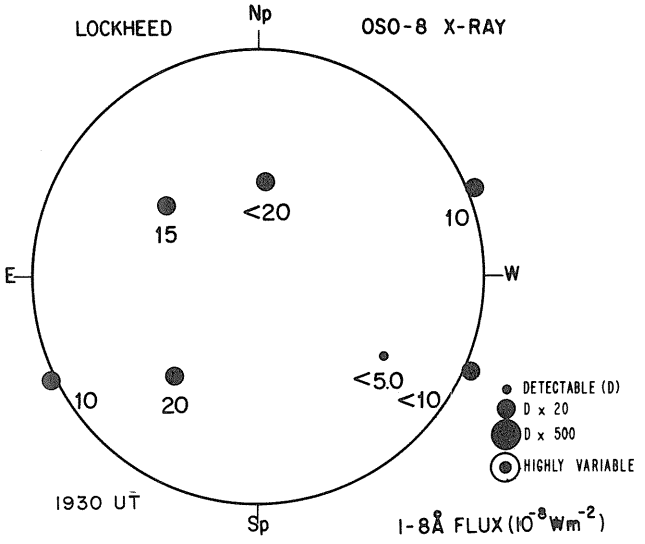
NOSC LA POSTA

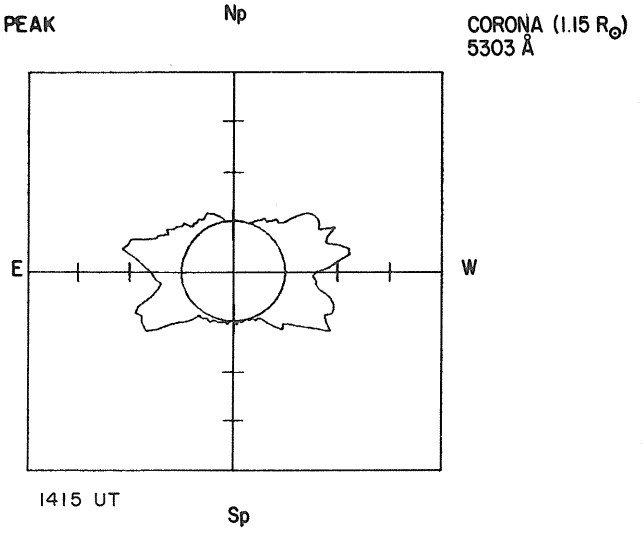
8.6 MM

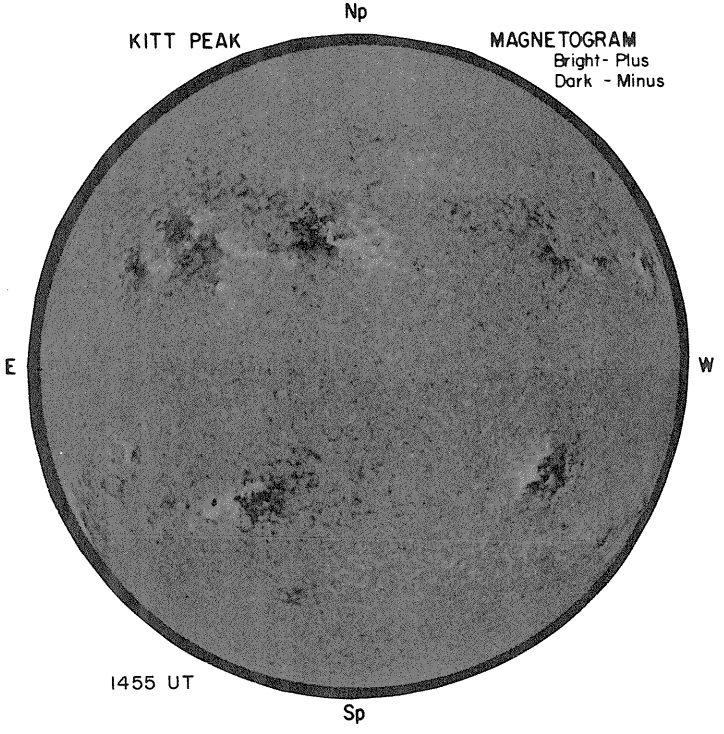


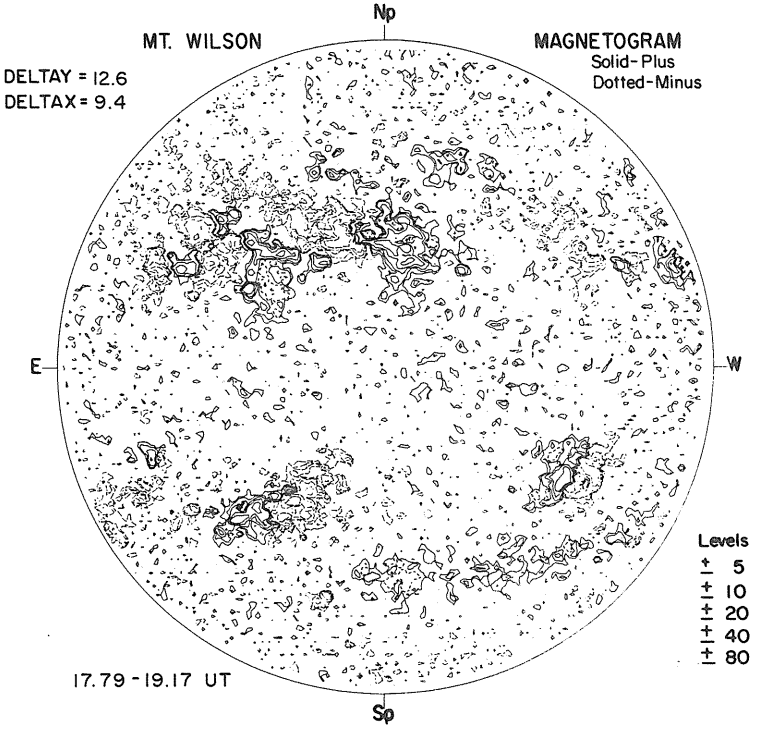
77
May 78

MAY 17, 1978 (P =-20.54, B_o =-2.44, L_o = 227.09)

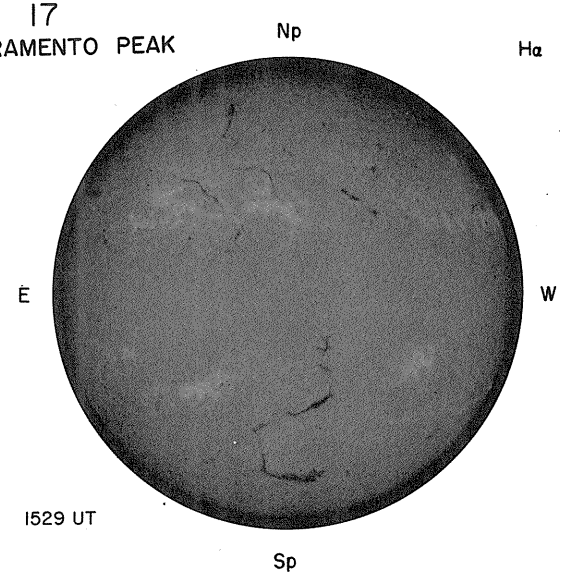






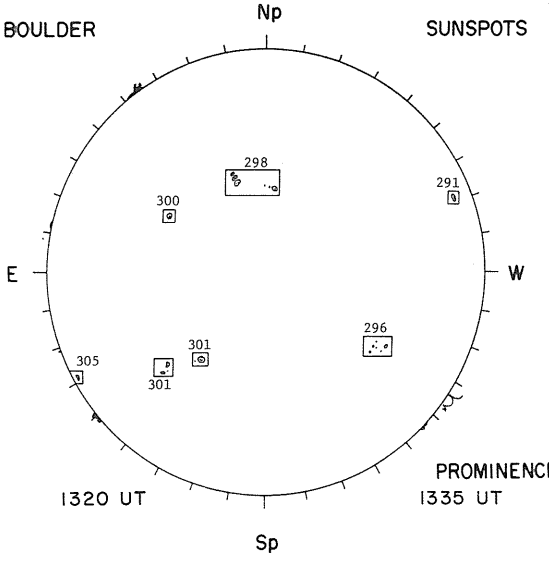


SACRAMENTO PEAK Hα



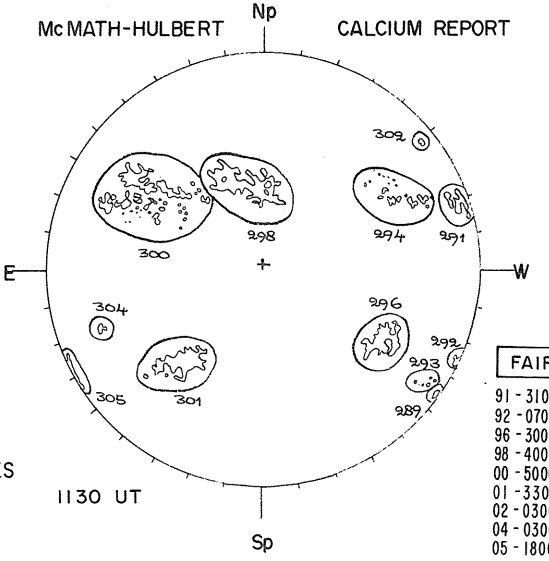
1529 UT

BOULDER SUNSPOTS



1320 UT

McMATH-HULBERT CALCIUM REPORT



PROMINENCES

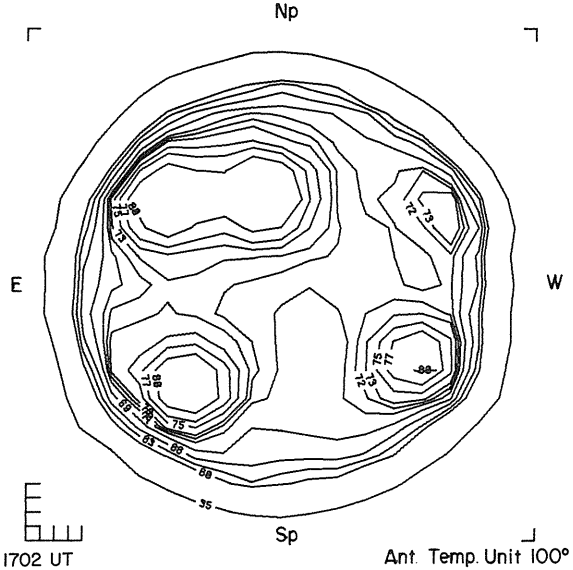
1335 UT

1130 UT

FAIR	D

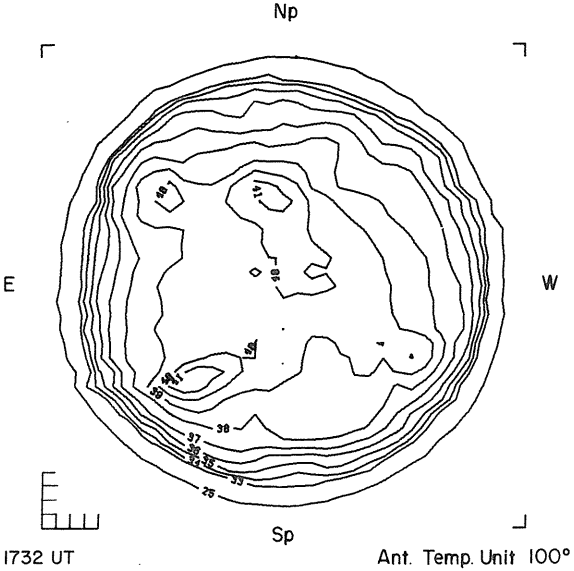
91 - 3100 - 2.5
92 - 0700 - 3.5
96 - 3000 - 3.0
98 - 4000 - 3.0
00 - 5000 - 3.0
01 - 3300 - 3.0
02 - 0300 - 3.0
04 - 0300 - 3.0
05 - 1800 - 2.5

NOSC LA POSTA 2.0 CM



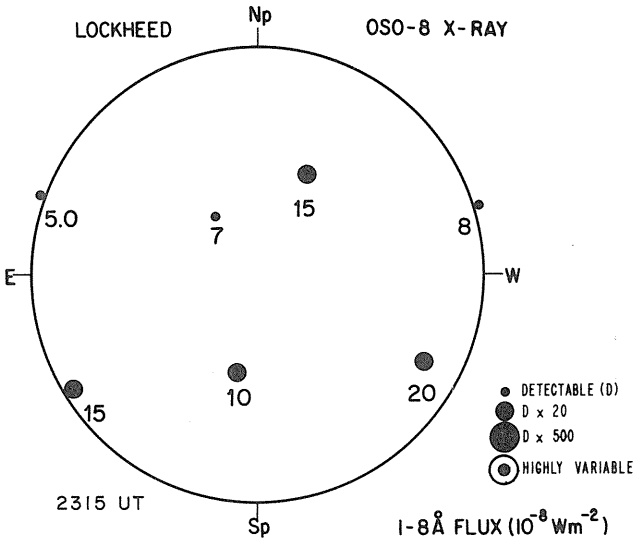
1702 UT Ant. Temp. Unit 100° K

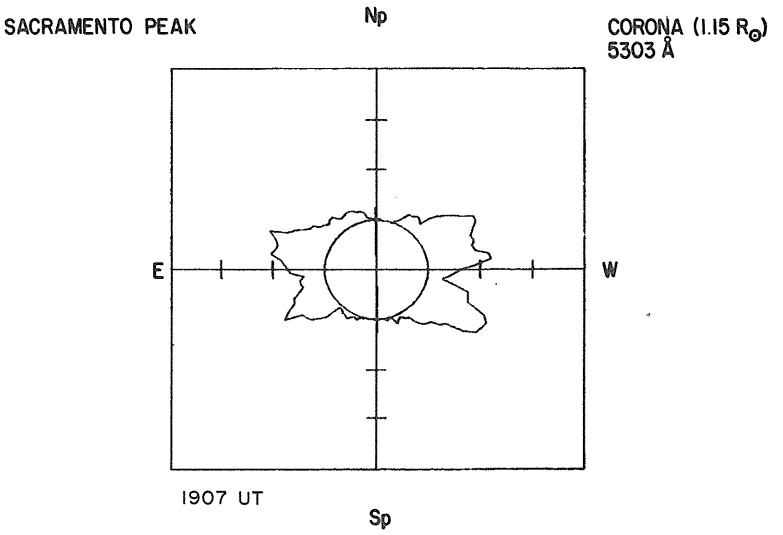
NOSC LA POSTA 8.6 MM

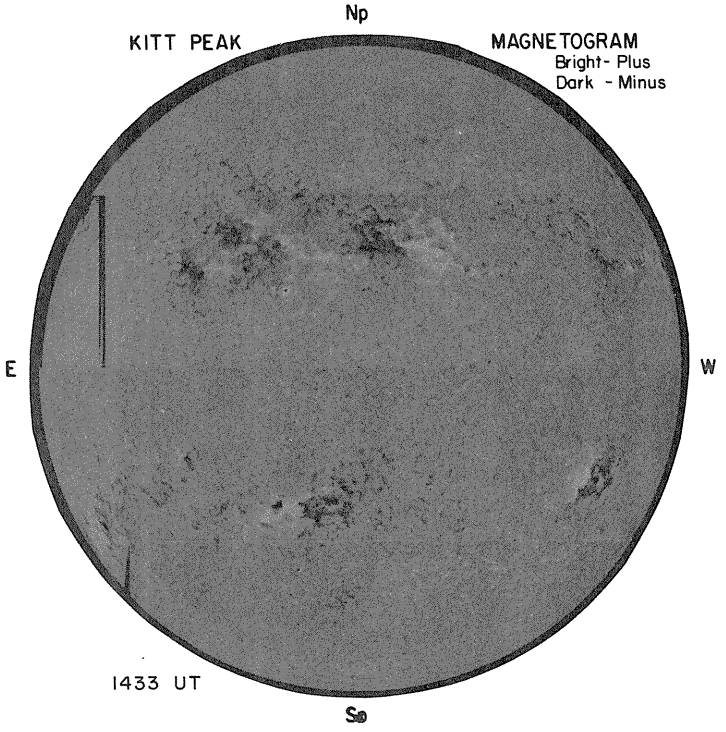


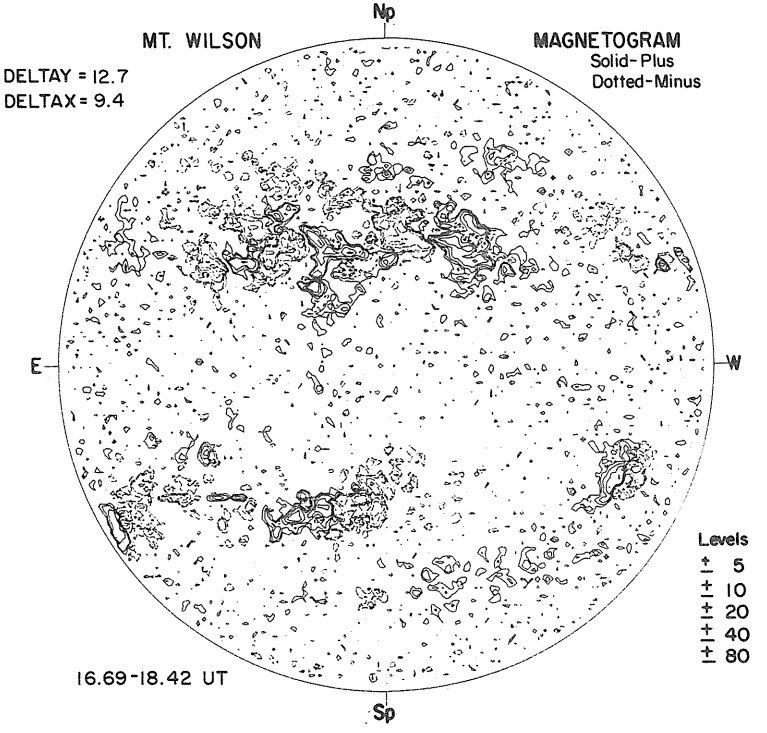
1732 UT Ant. Temp. Unit 100° K

MAY 18, 1978 (P =-20.26, B_o =-2.33, L_o = 213.86)



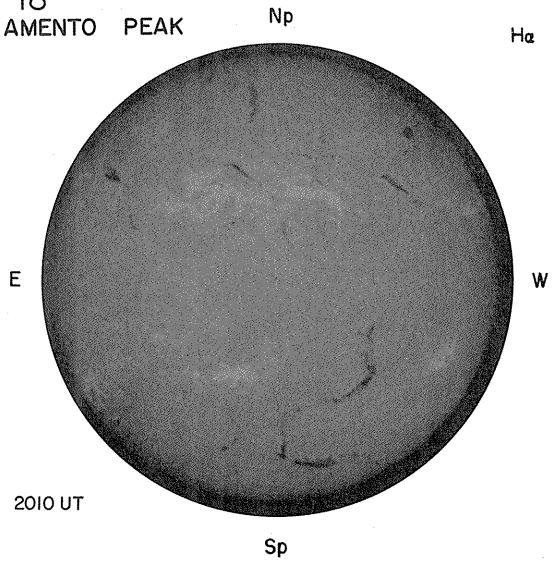






18

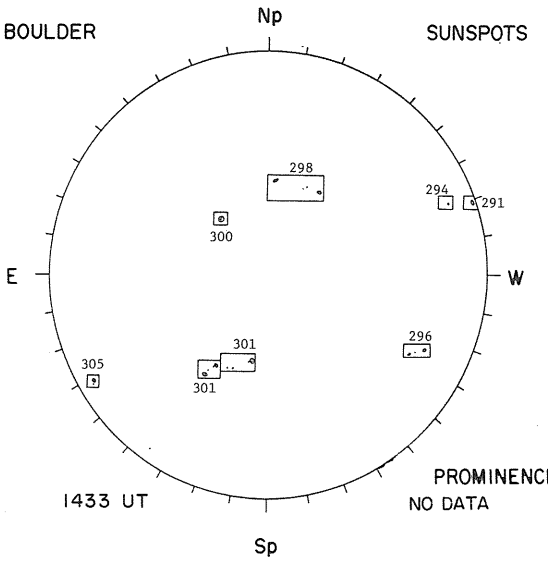
SACRAMENTO PEAK



2010 UT

Hα

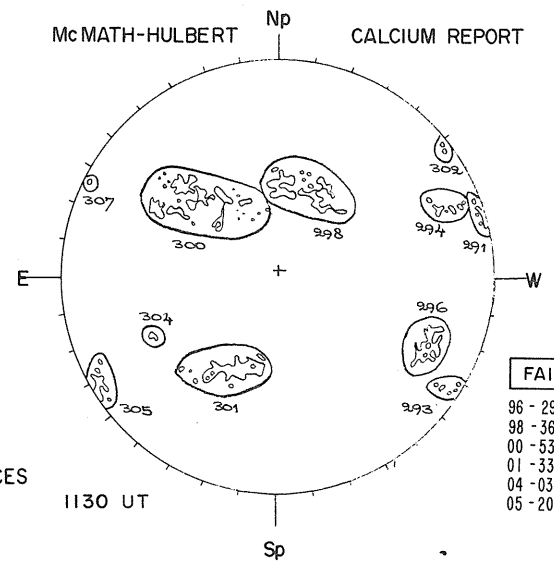
BOULDER



1433 UT

SUNSPOTS

McMATH-HULBERT



1130 UT

CALCIUM REPORT

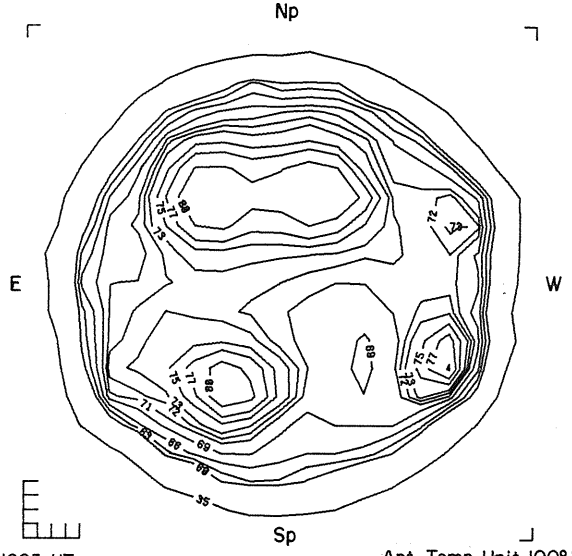
FAIR	S
96 - 2900	- 3.0
98 - 3600	- 3.0
00 - 5300	- 3.0
01 - 3300	- 3.5
04 - 0300	- 3.0
05 - 2000	- 2.5

PROMINENCES

NO DATA

NOSC LA POSTA

2.0 CM

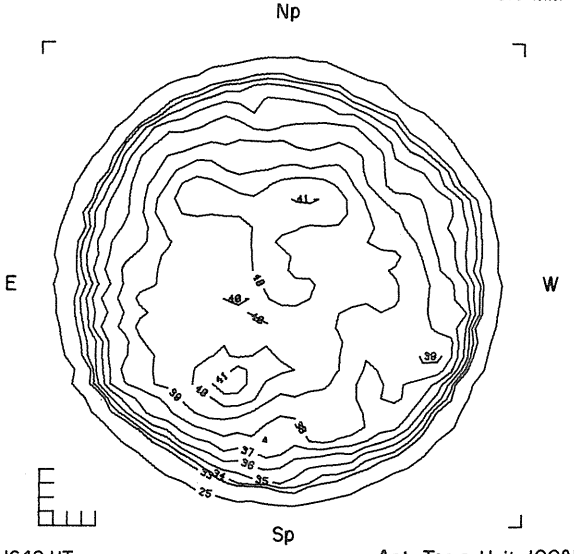


1605 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

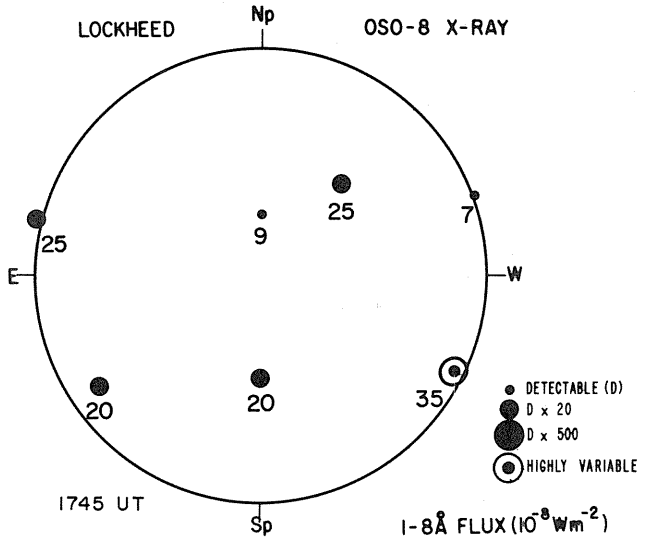
8.6 MM

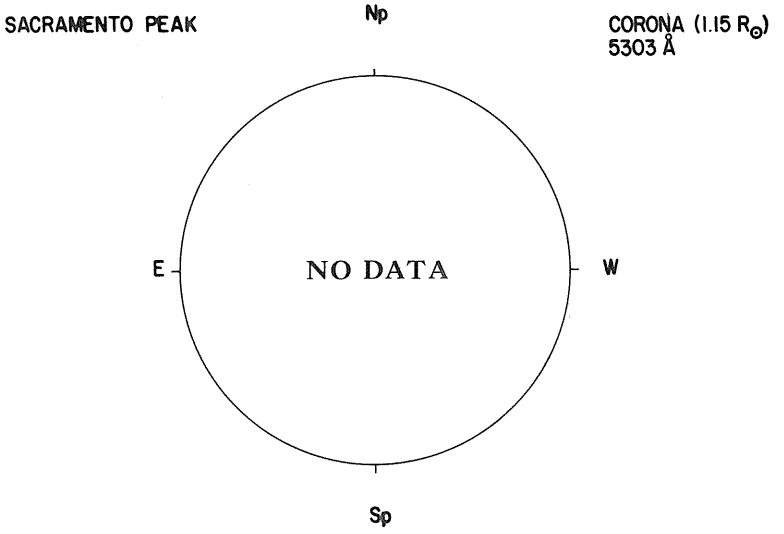


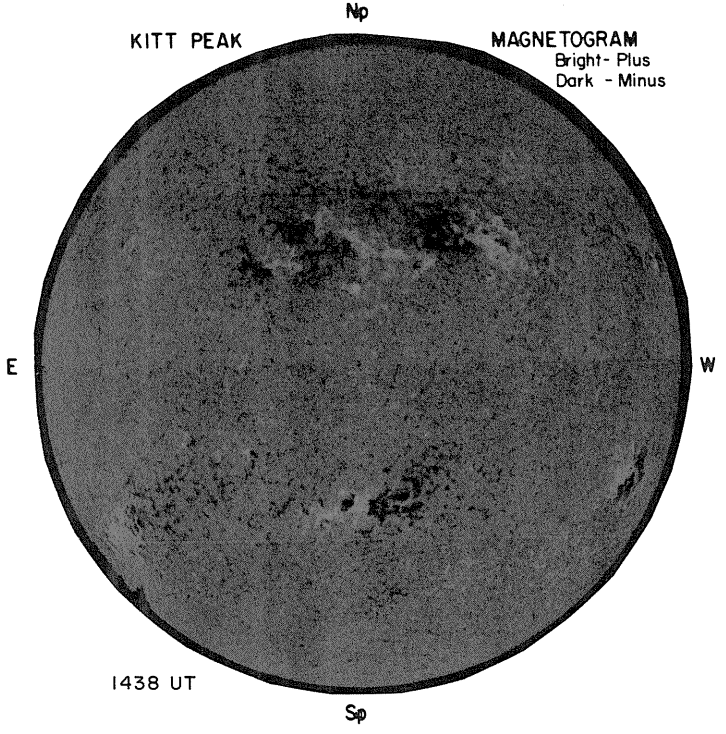
1640 UT

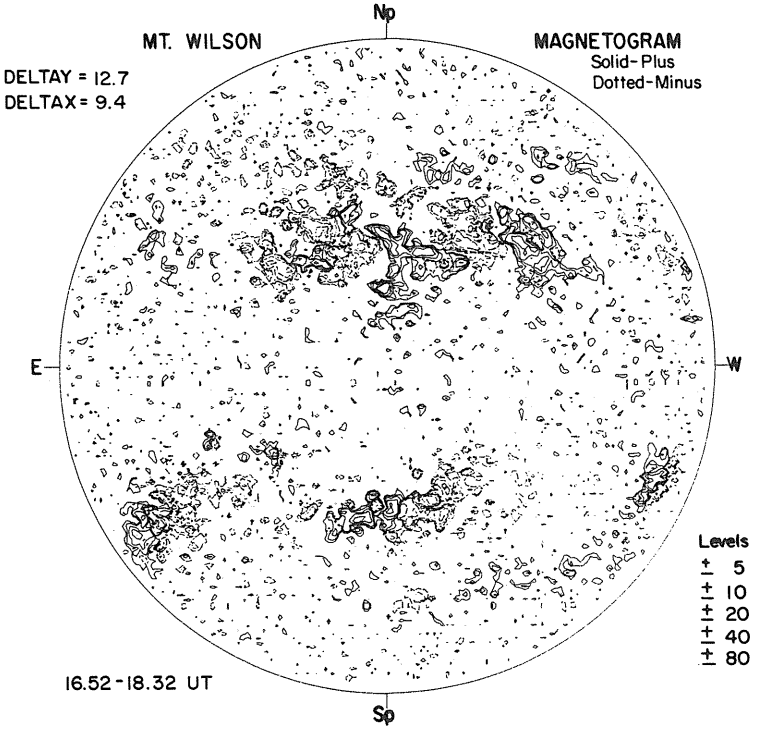
Ant. Temp. Unit 100° K

MAY 19, 1978 (P =-19.96, B_o =-2.21, L_o =200.63)



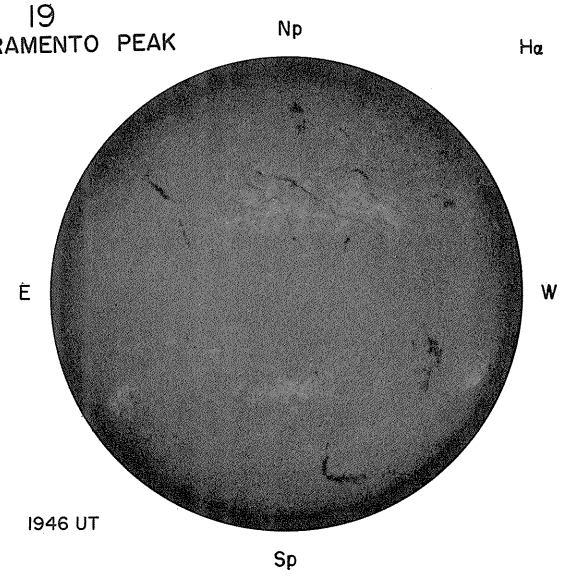






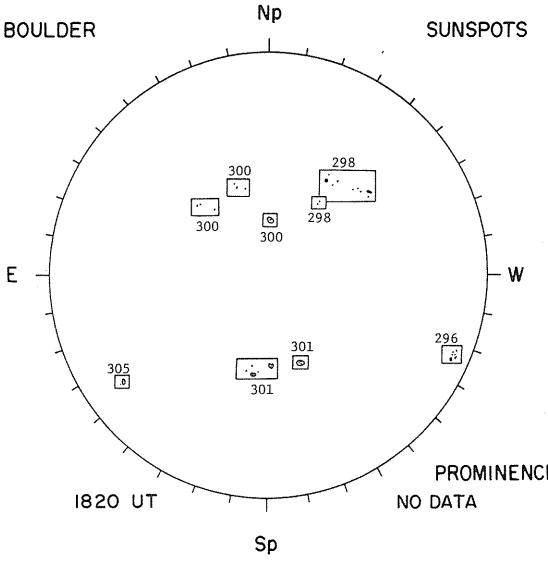
19

SACRAMENTO PEAK



1946 UT

BOULDER



1820 UT

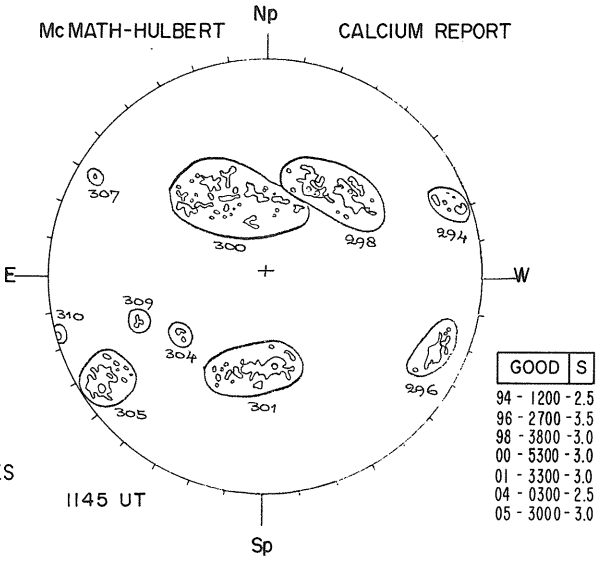
SUNSPOTS

PROMINENCES

NO DATA

McMATH-HULBERT

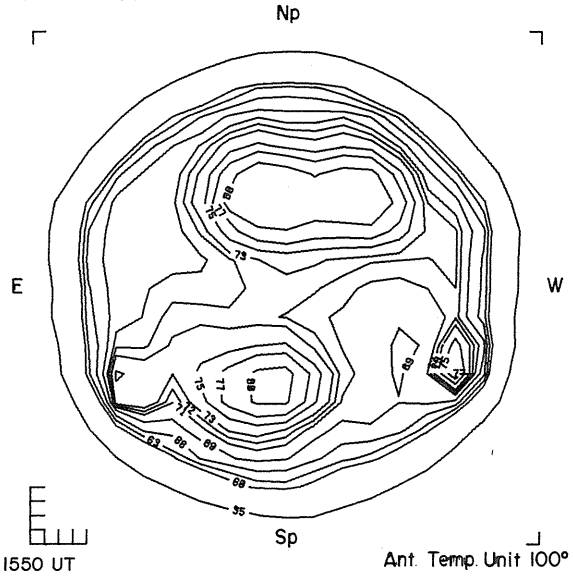
CALCIUM REPORT



1145 UT

NOSC LA POSTA

2.0 CM

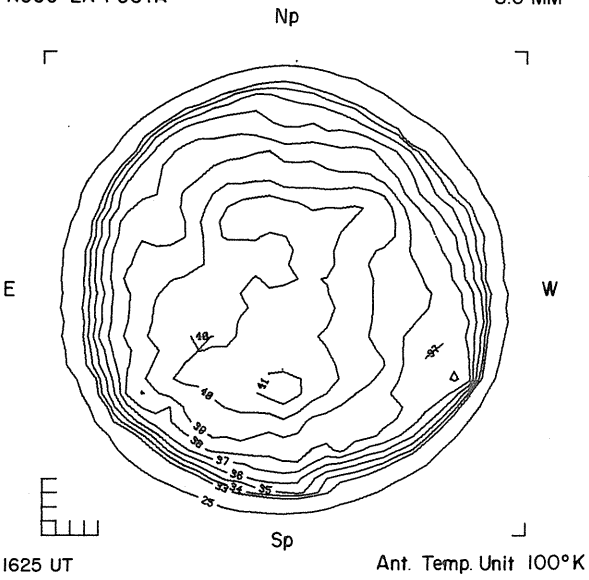


1550 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

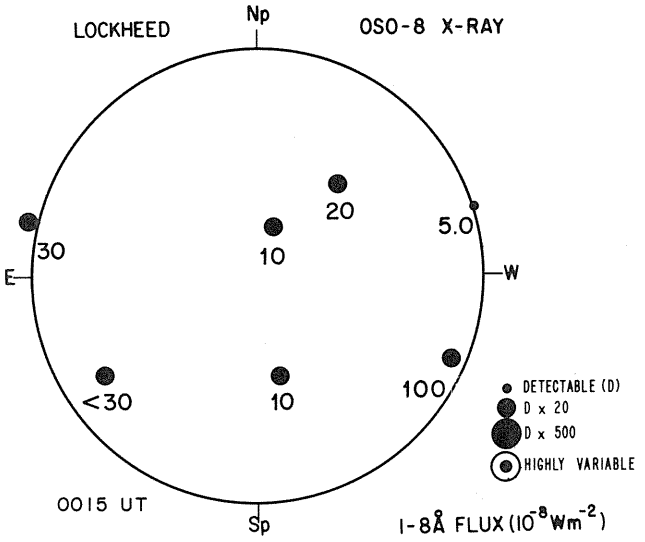
8.6 MM

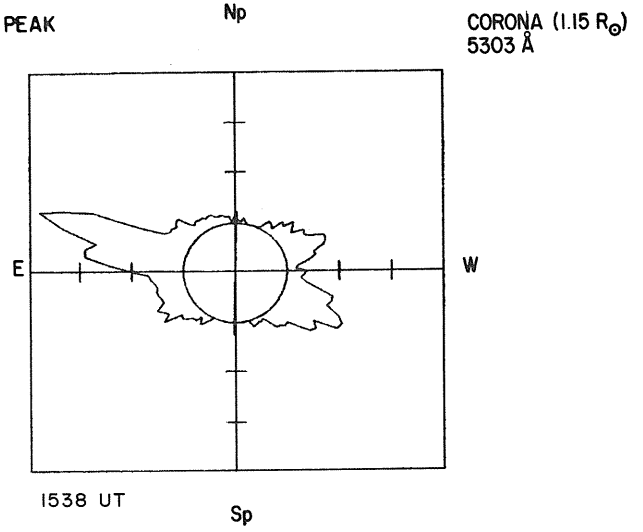


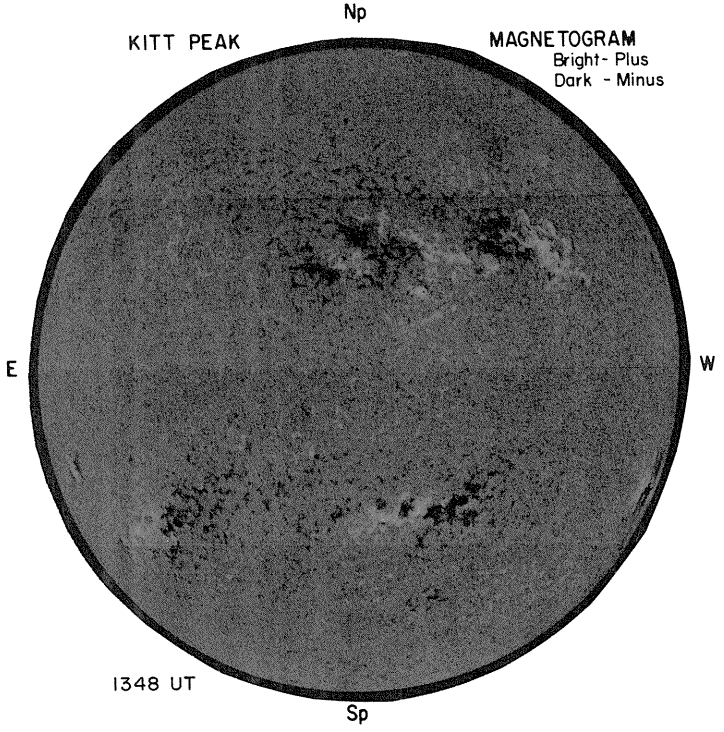
1625 UT

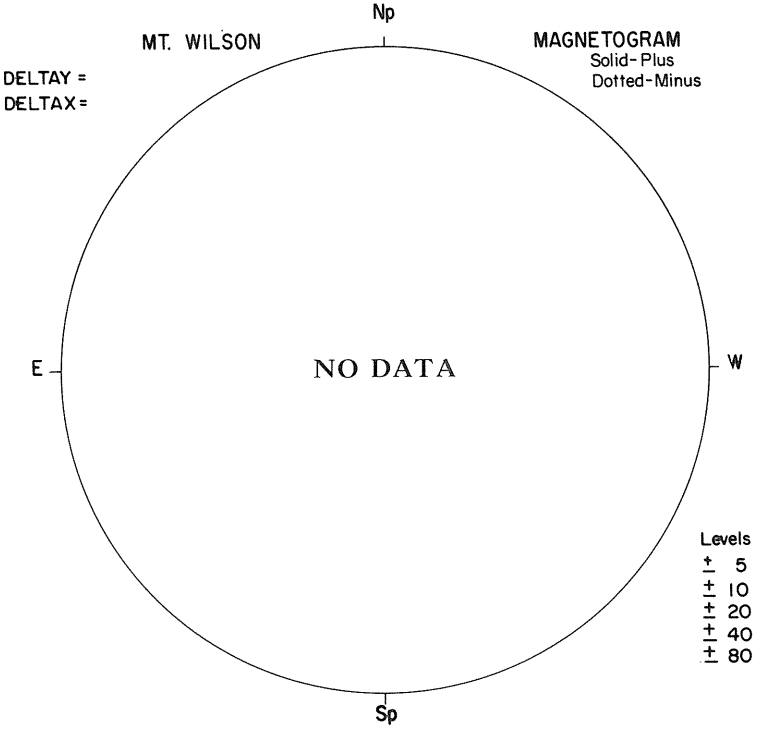
Ant. Temp. Unit 100° K

MAY 20, 1978 (P =-19.66, B_o =-2.09, L_o = 187.41)



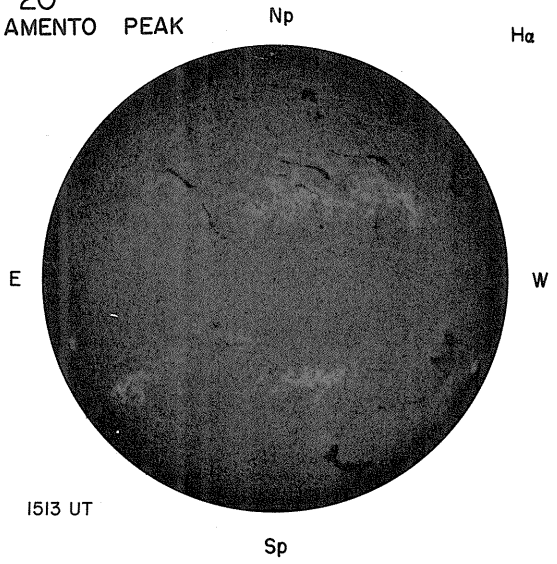




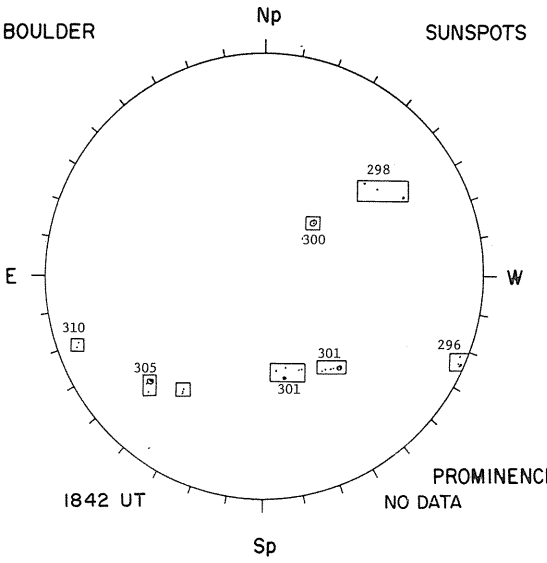


20

SACRAMENTO PEAK



BOULDER

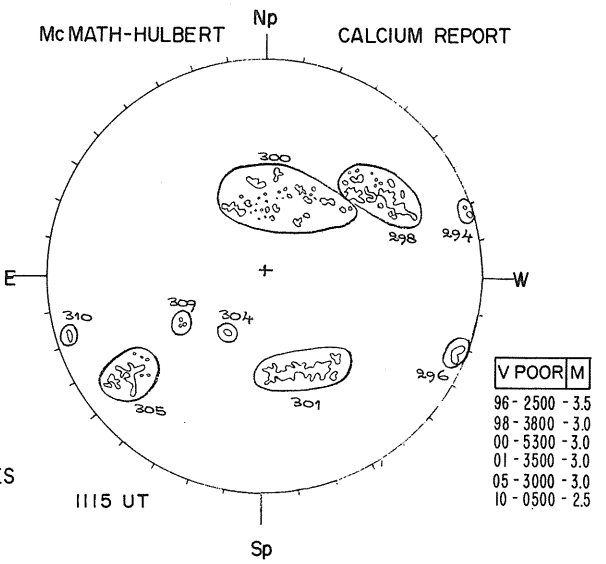


SUNSPOTS

PROMINENCES

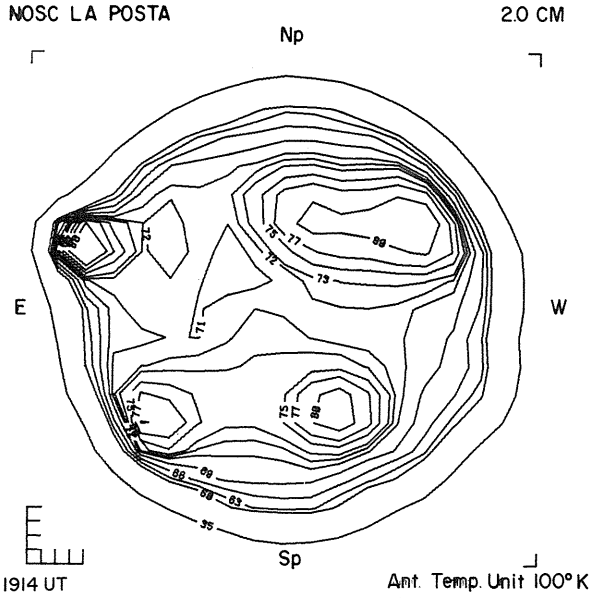
NO DATA

McMATH-HULBERT

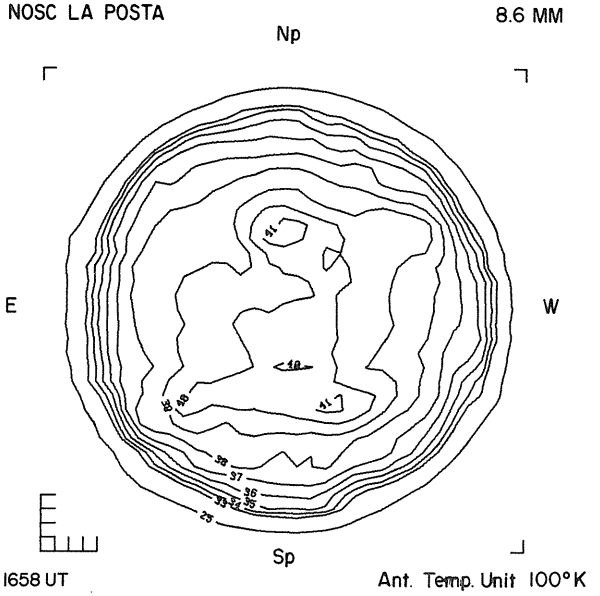


CALCIUM REPORT

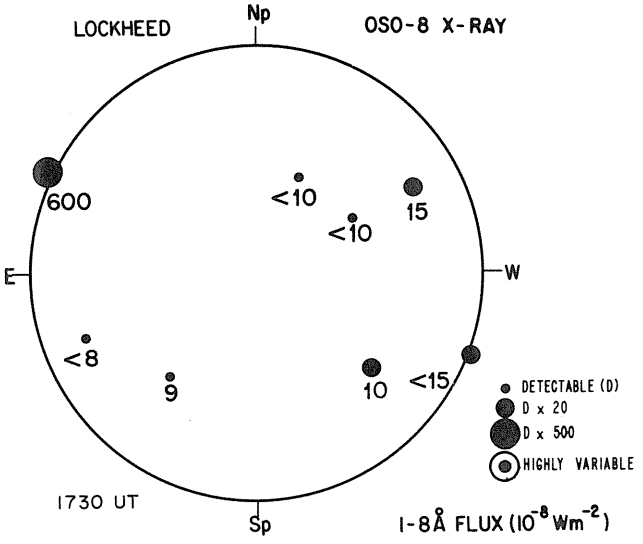
NOSC LA POSTA

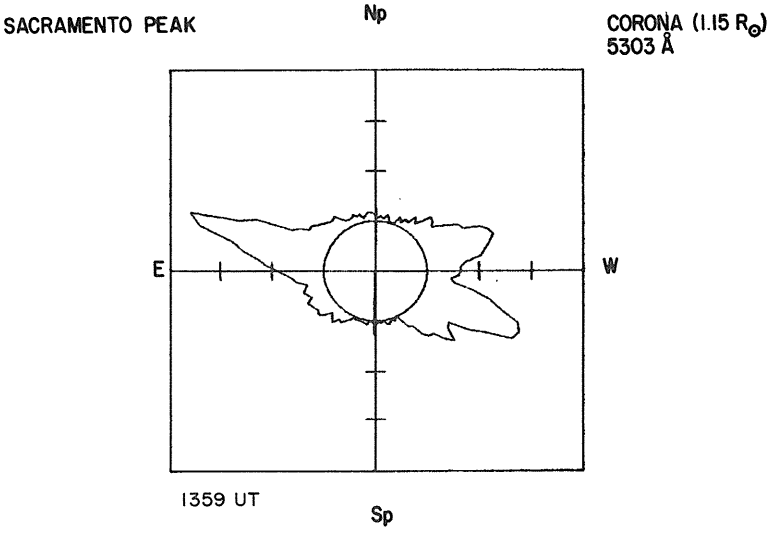


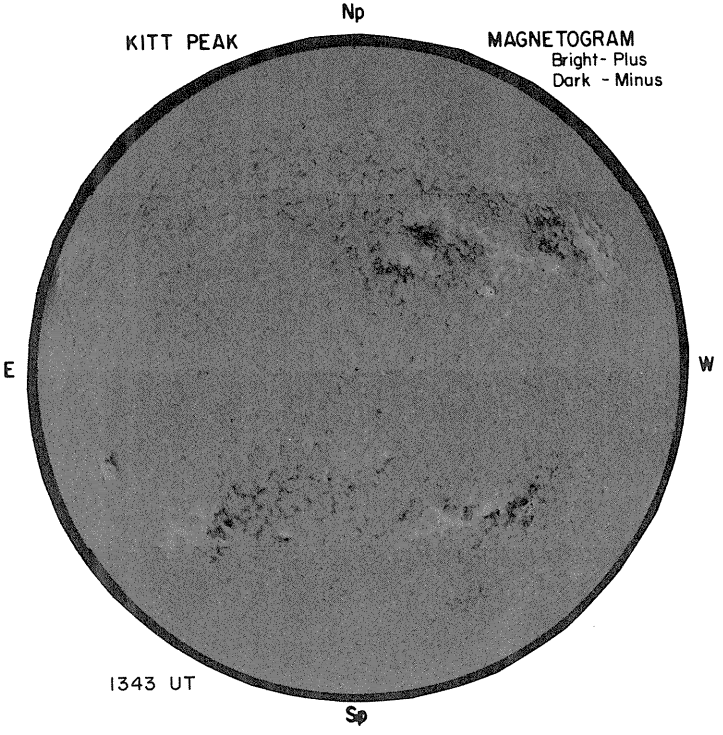
NOSC LA POSTA

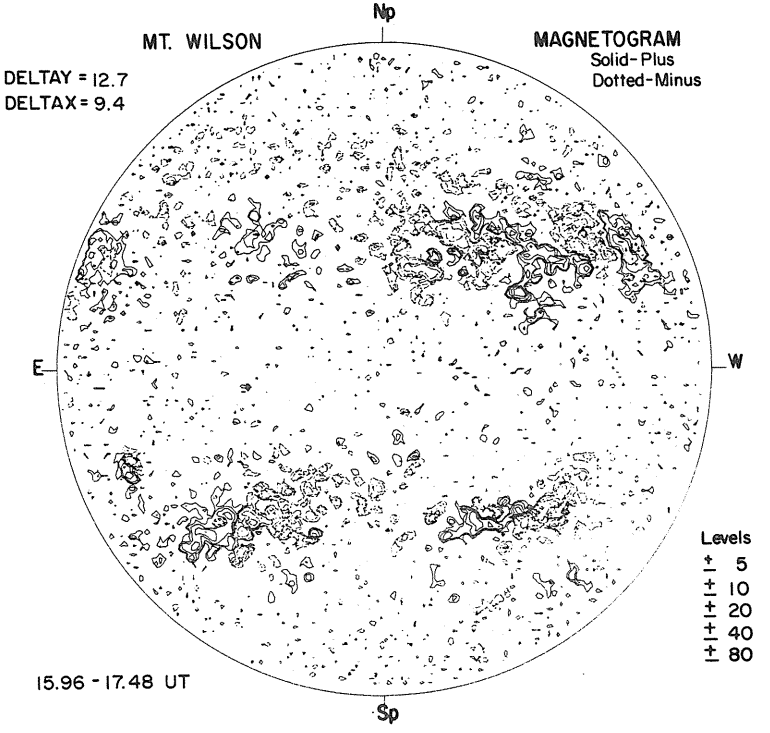


MAY 21, 1978 (P = -19.35, B_o = -1.98, L_o = 174.18)



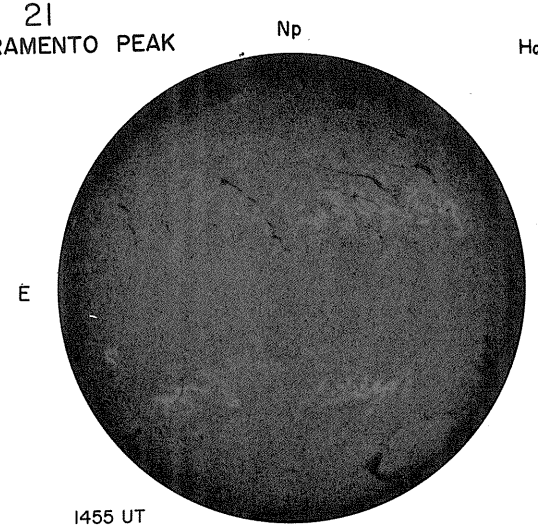




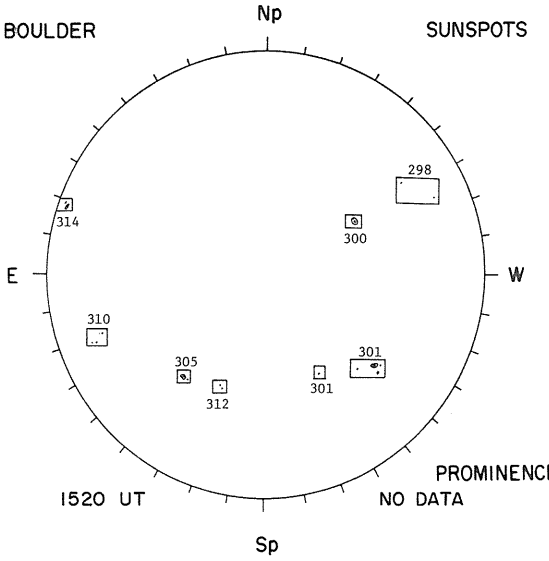


21

SACRAMENTO PEAK



BOULDER

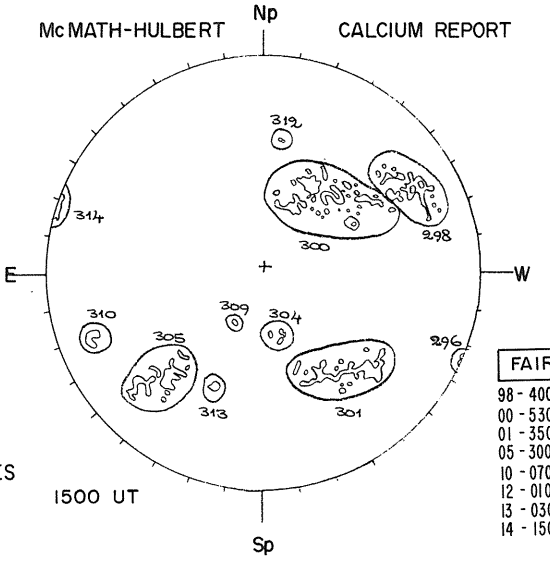


SUNSPOTS

PROMINENCES

NO DATA

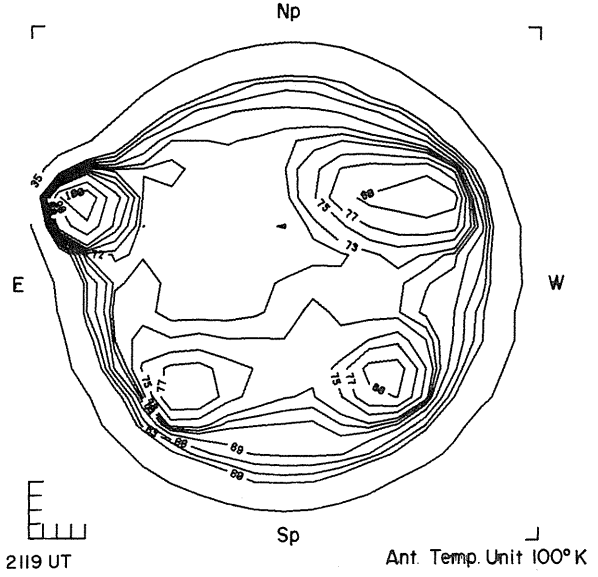
McMATH-HULBERT



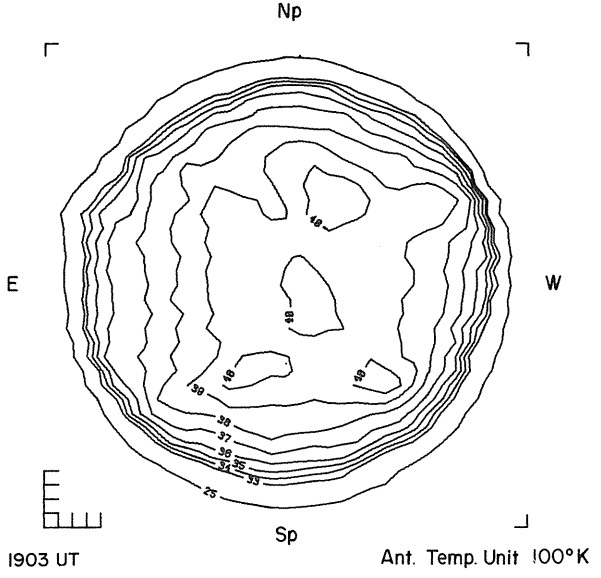
CALCIUM REPORT

FAIR	S
98 - 4000 - 3.0	
00 - 5300 - 3.5	
01 - 3500 - 3.5	
05 - 3000 - 3.0	
10 - 0700 - 3.0	
12 - 0100 - 2.5	
13 - 0300 - 3.0	
14 - 1500 - 3.5	

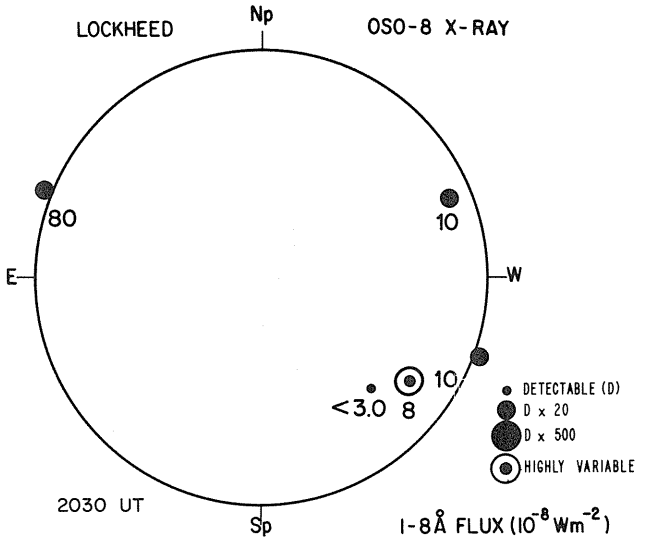
NOSC LA POSTA

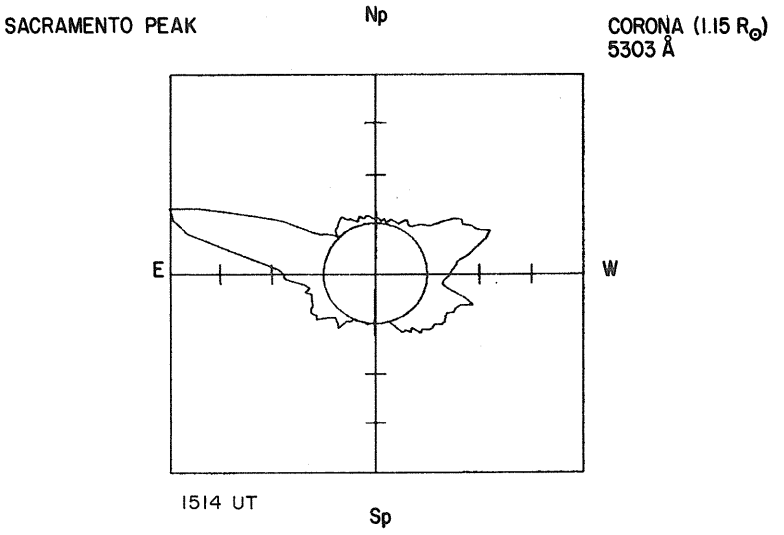


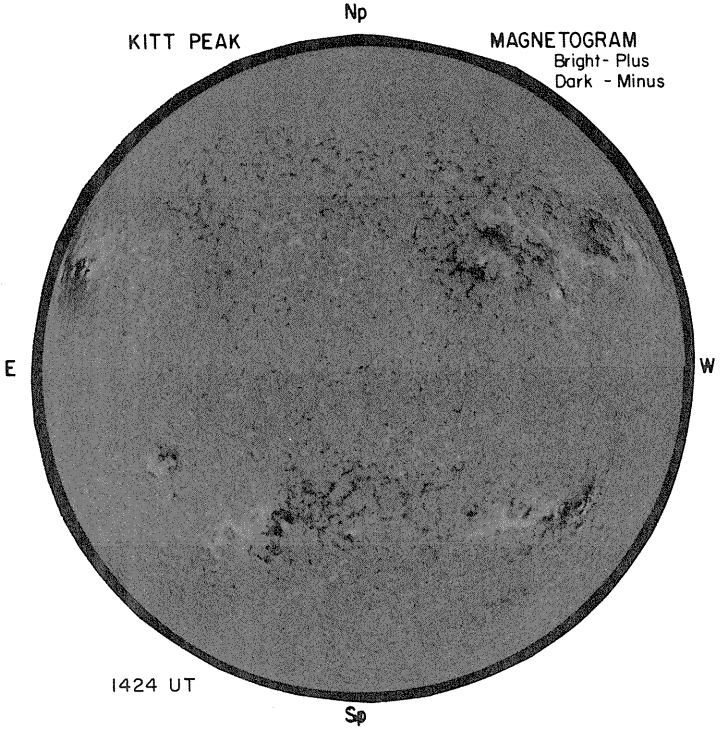
NOSC LA POSTA

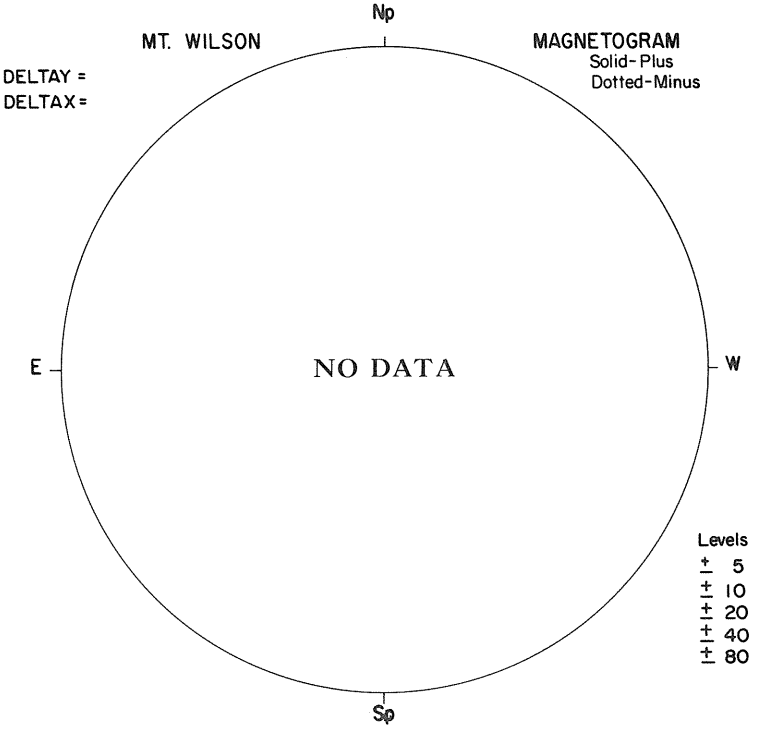


MAY 22, 1978 (P=-19.04, B_o=-1.86, L_o=160.95)

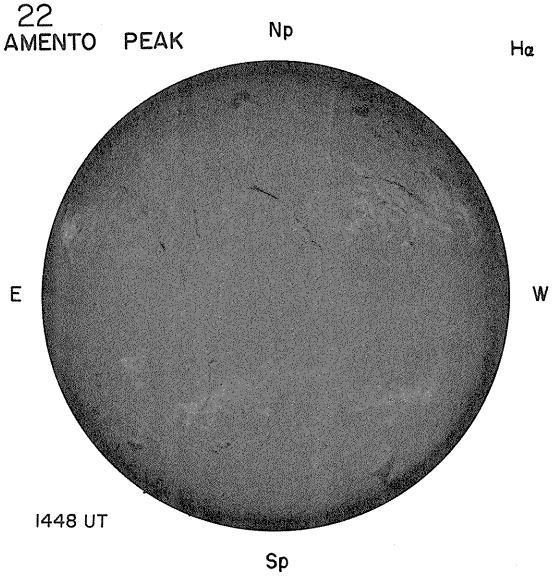




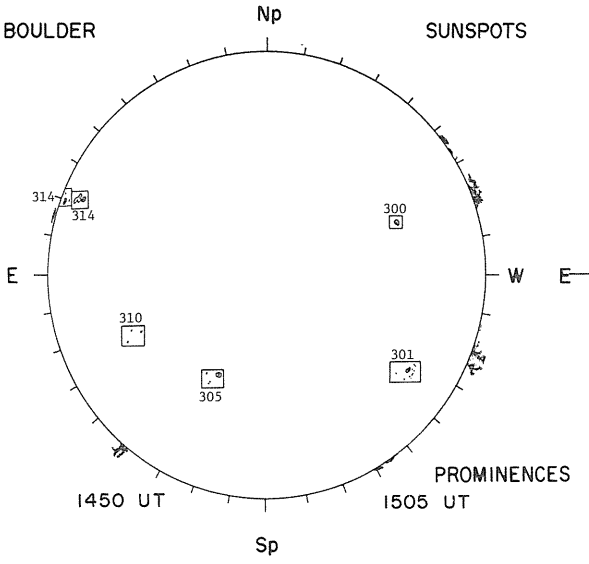




SACRAMENTO PEAK



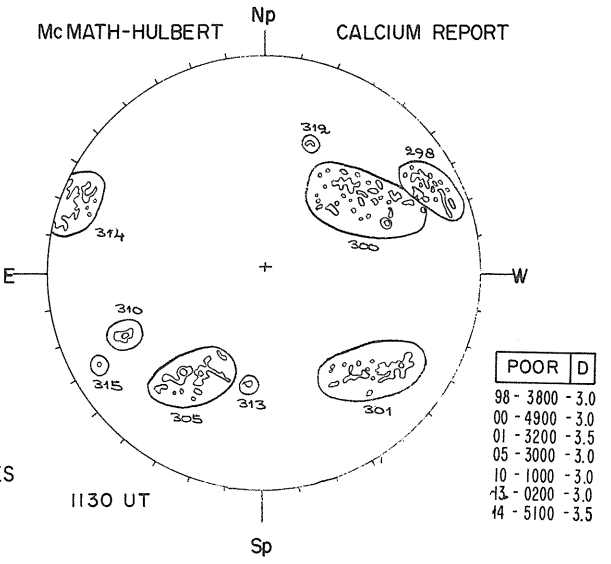
BOULDER SUNSPOTS



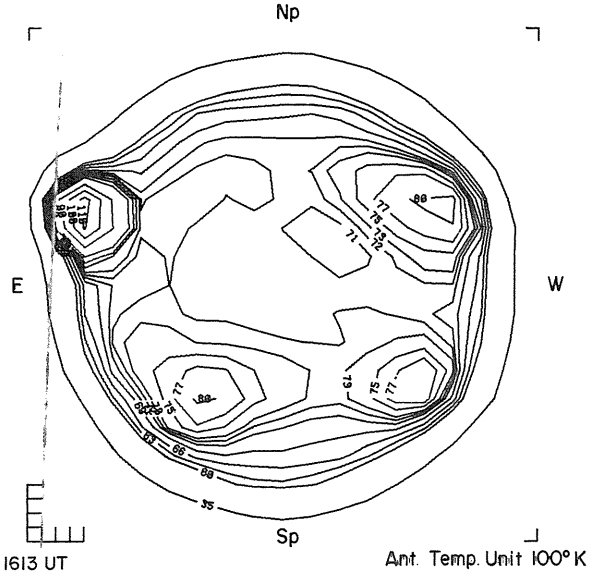
PROMINENCES

1505 UT

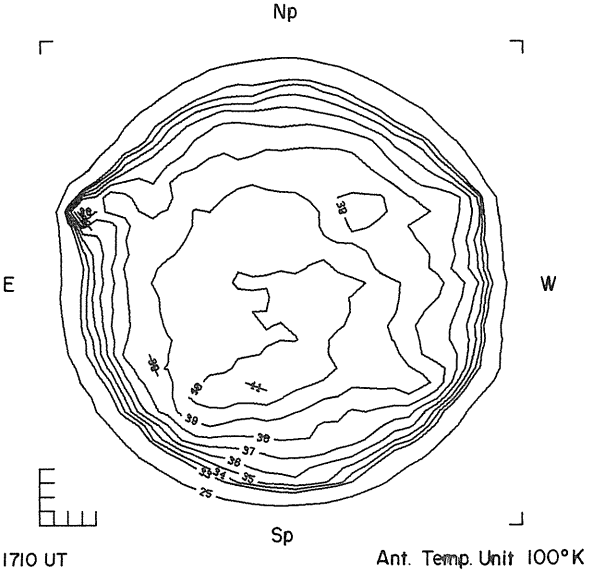
McMATH-HULBERT CALCIUM REPORT



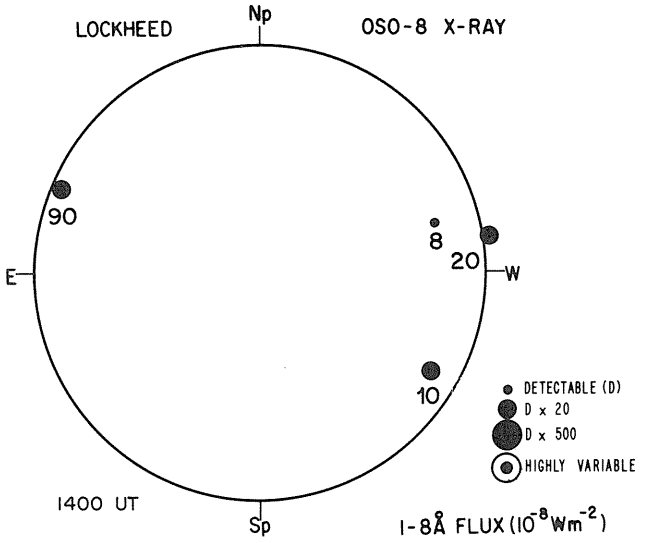
NOSC LA POSTA 2.0 CM

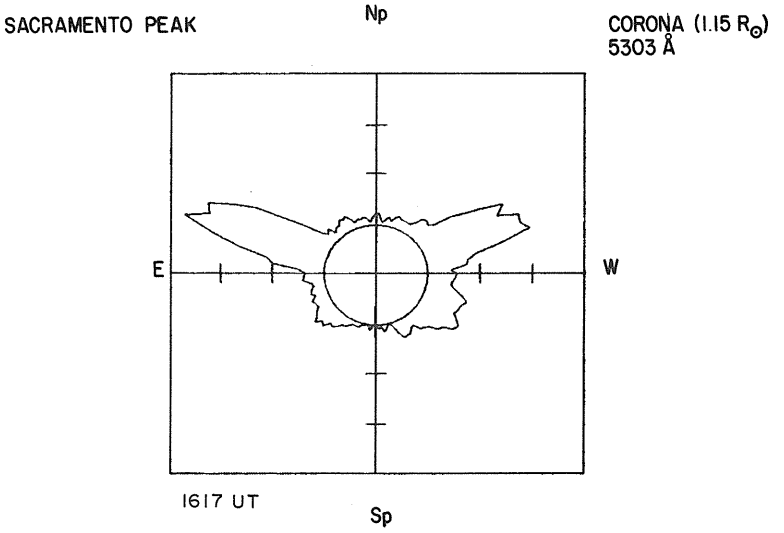


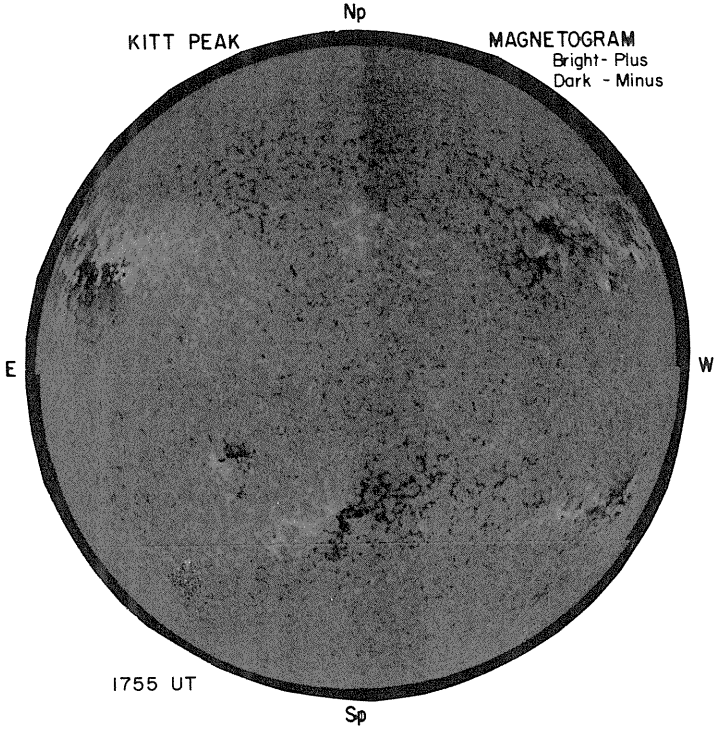
NOSC LA POSTA 8.6 MM

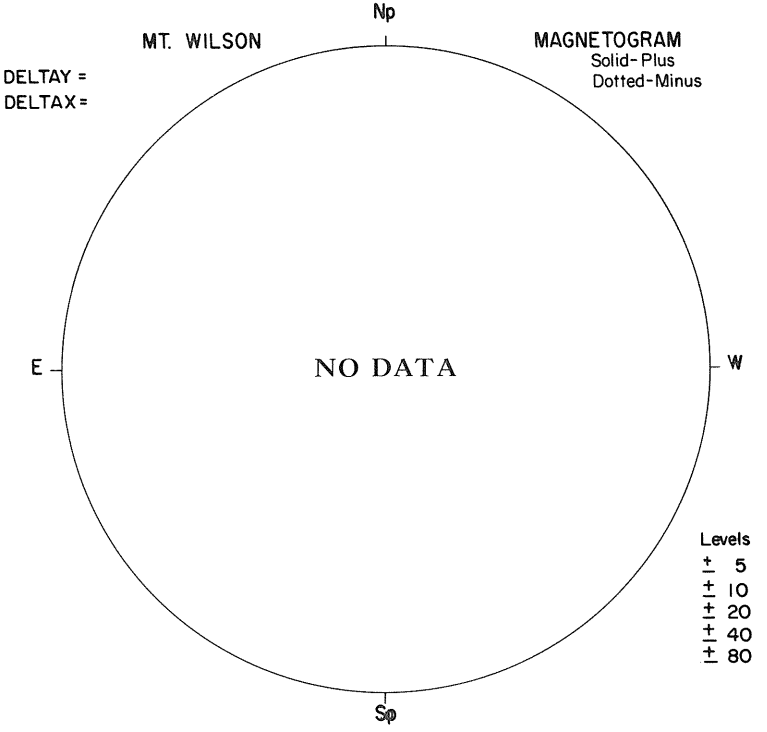


MAY 23, 1978 (P =-18.72, B_o =-1.74, L_o =147.72)



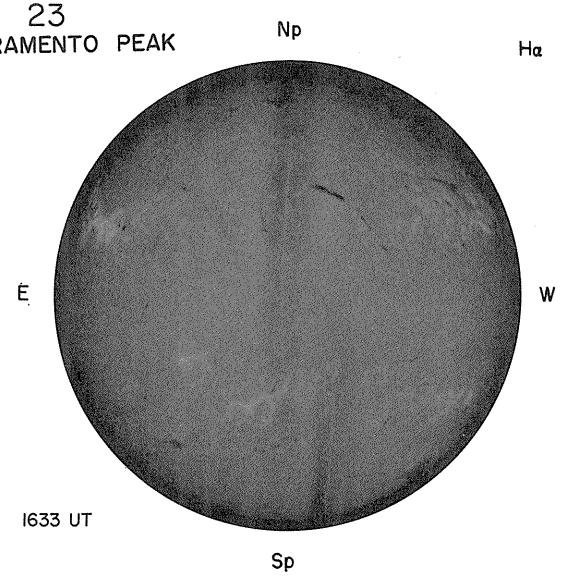




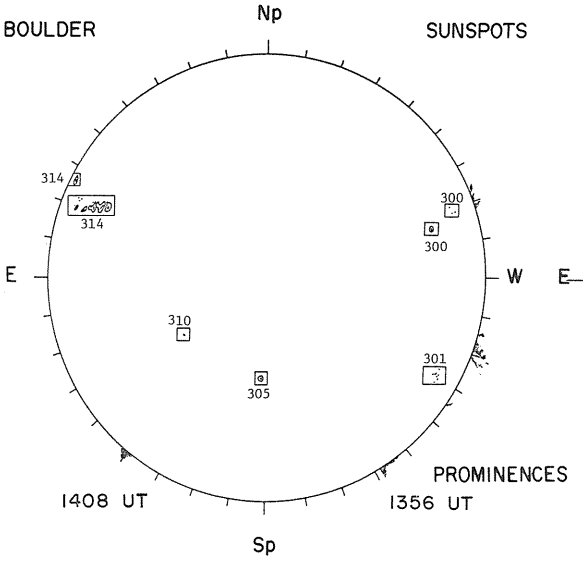


23

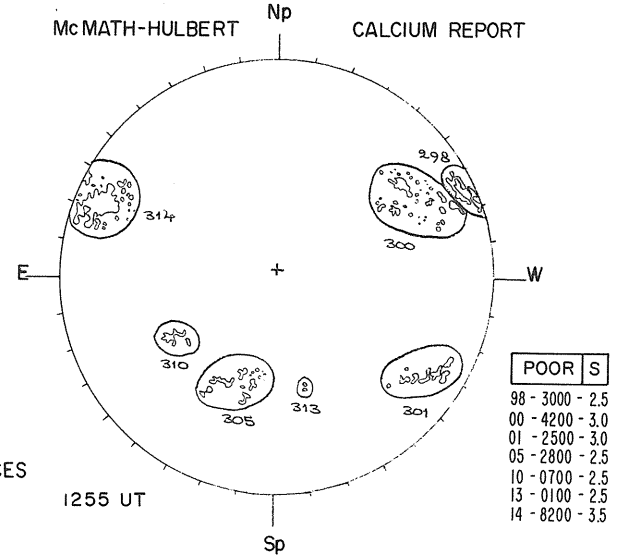
SACRAMENTO PEAK



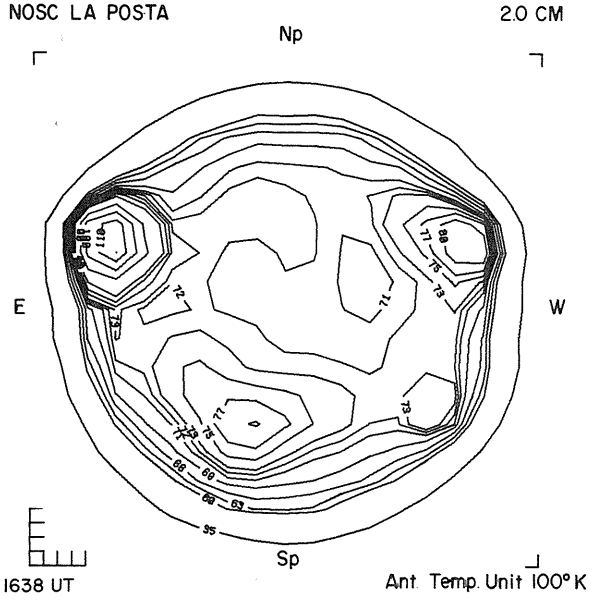
BOULDER



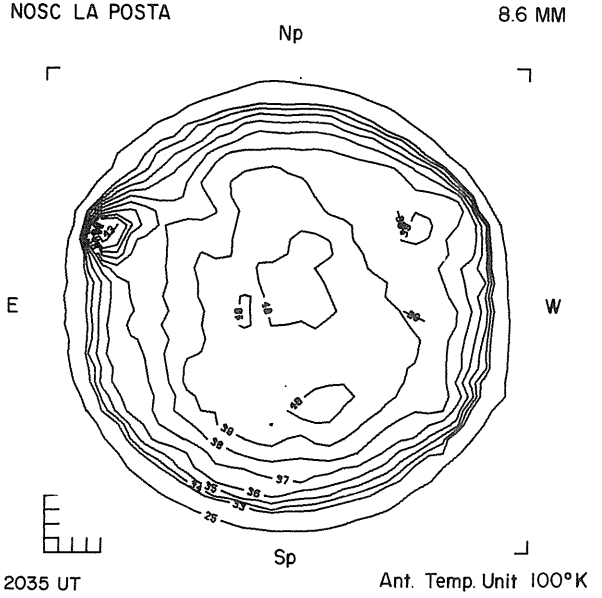
McMATH-HULBERT



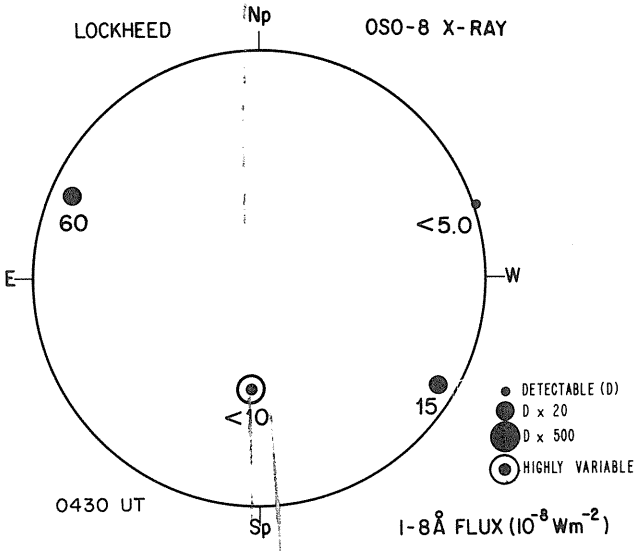
NOSC LA POSTA

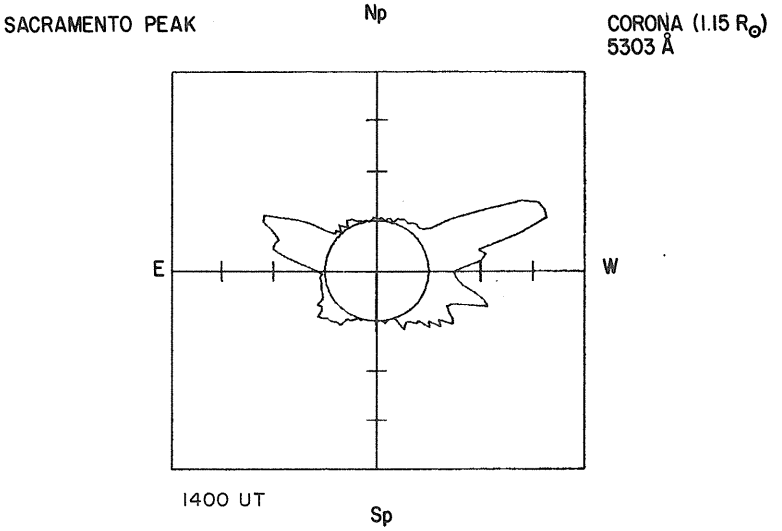


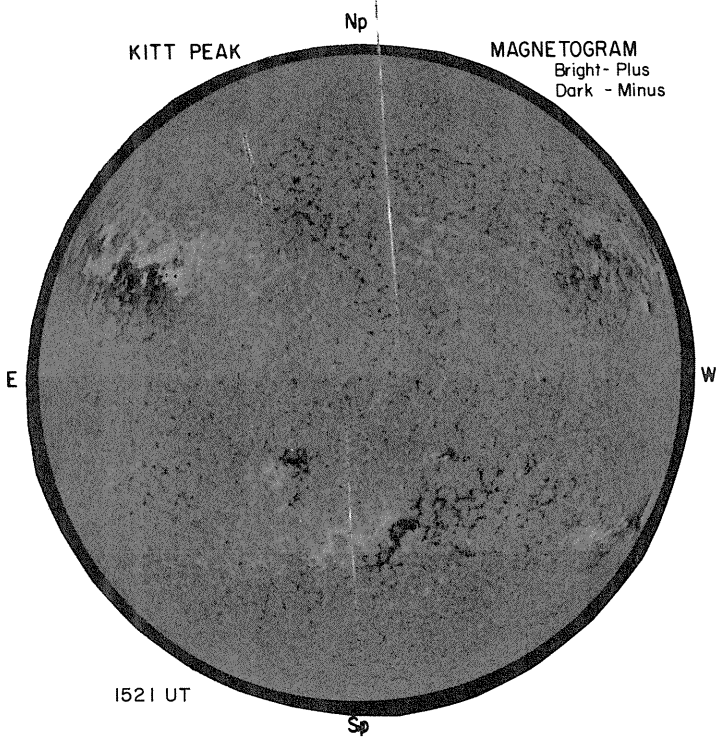
NOSC LA POSTA

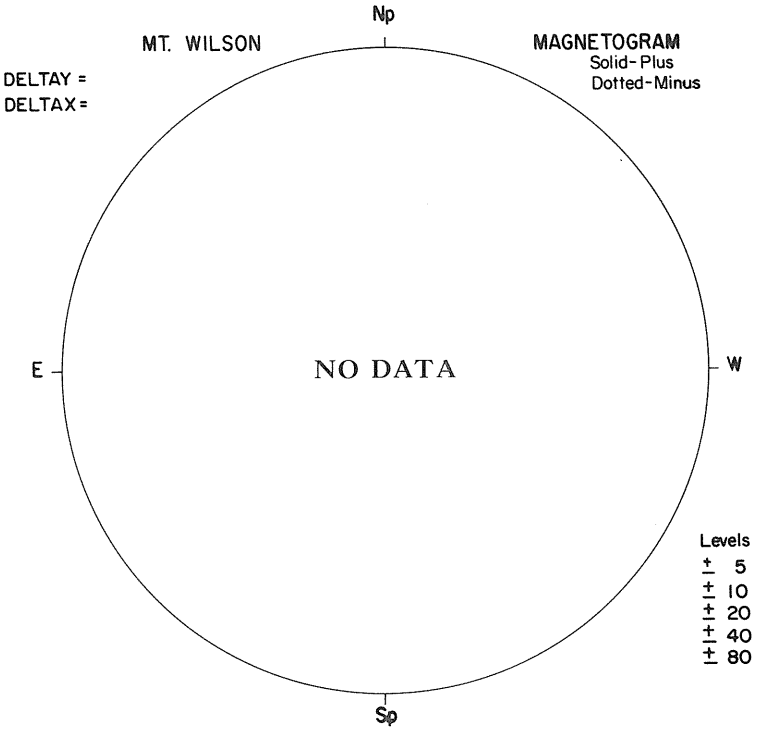


MAY 24, 1978 (P =-18.40, B_o =-1.62, L_o =134.49)

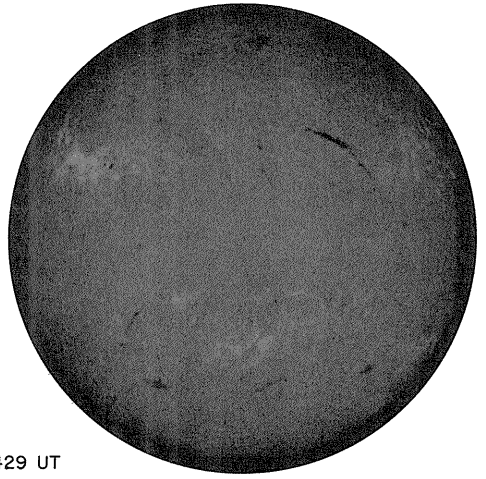






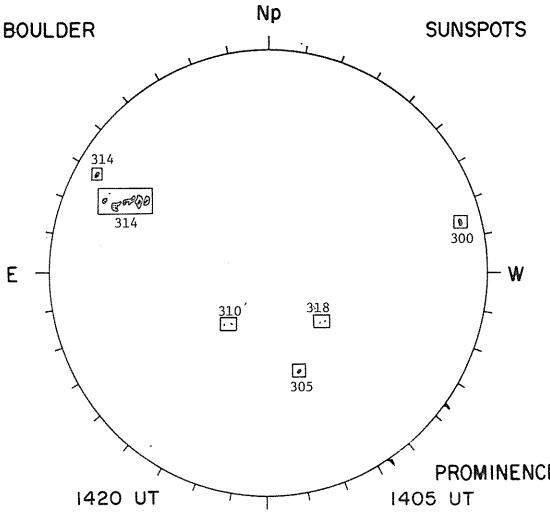


SACRAMENTO PEAK Hα



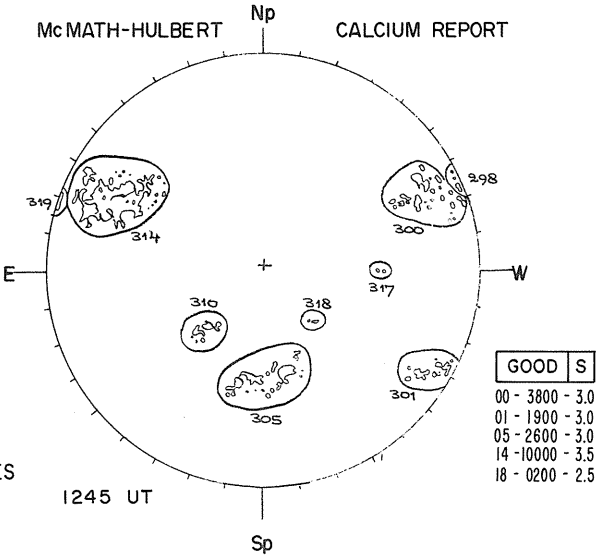
1429 UT

BOULDER SUNSPOTS



1420 UT

McMATH-HULBERT CALCIUM REPORT

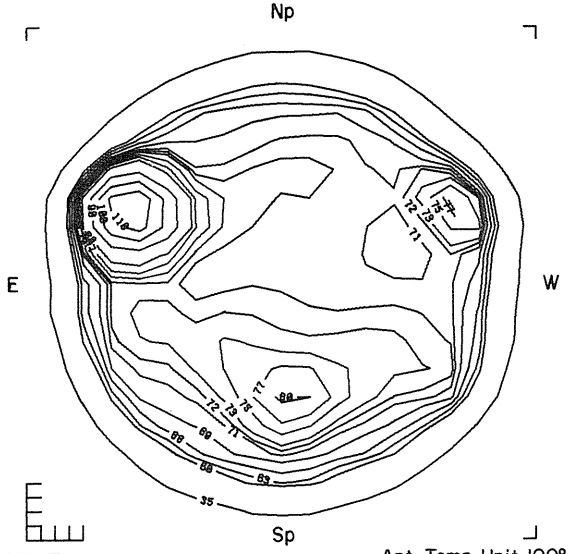


PROMINENCES

1405 UT

1245 UT

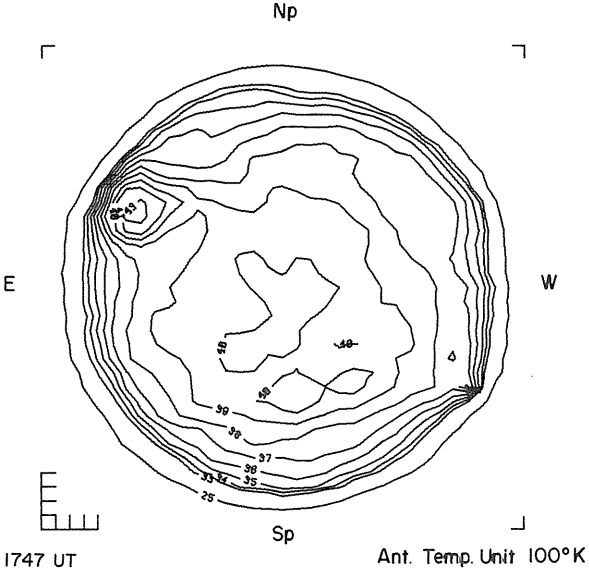
NOSC LA POSTA 2.0 CM



1711 UT

Ant. Temp. Unit 100° K

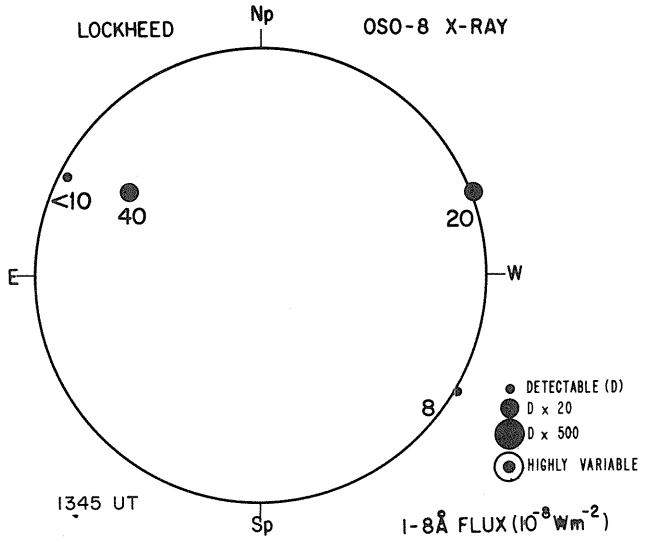
NOSC LA POSTA 8.6 MM

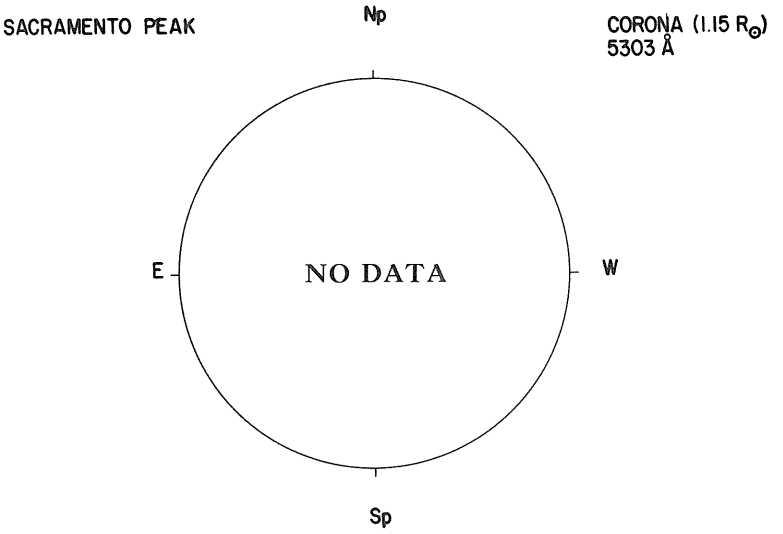


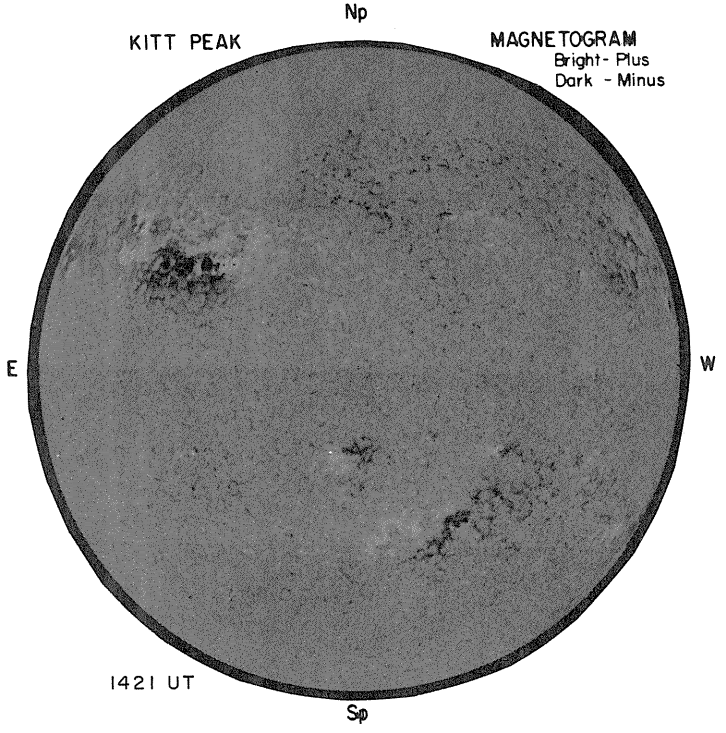
1747 UT

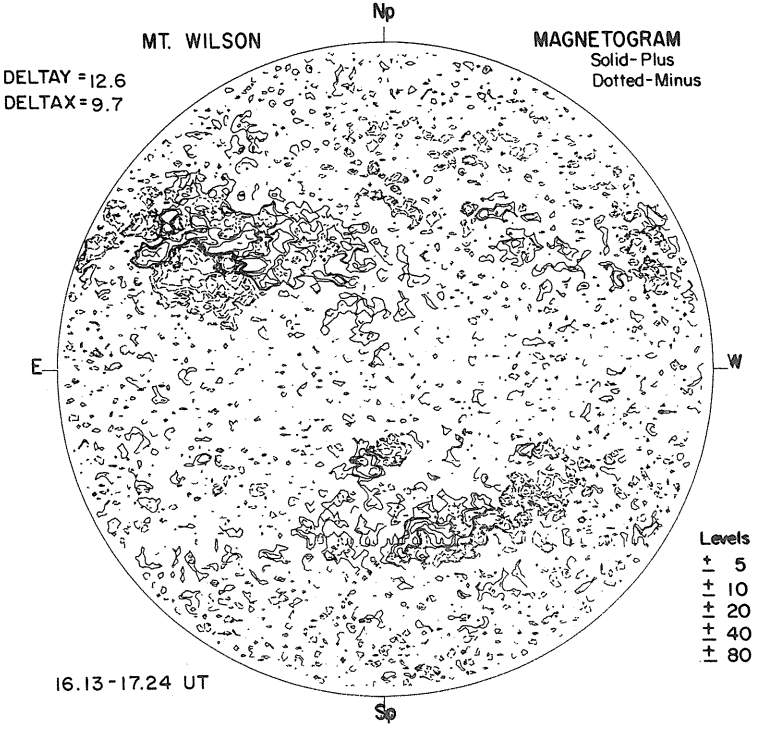
Ant. Temp. Unit 100° K

MAY 25, 1978 (P =-18.06, B_o =-1.51, L_o =121.26)



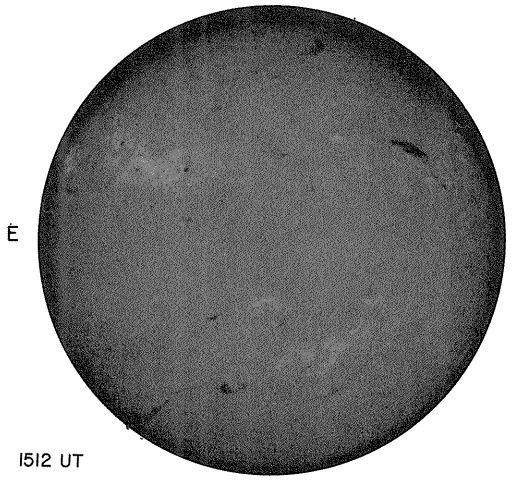






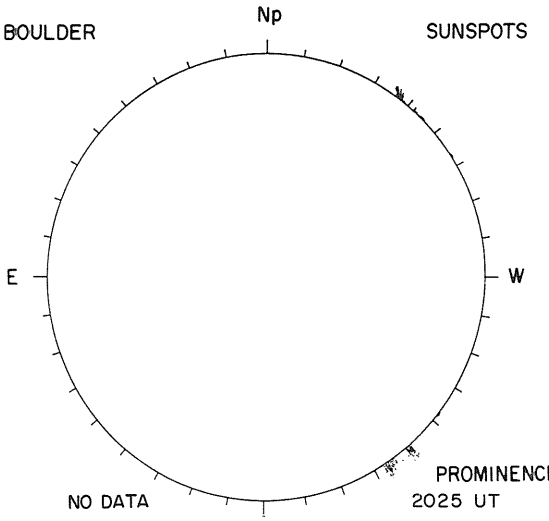
25

SACRAMENTO PEAK



1512 UT

BOULDER



SUNSPOTS

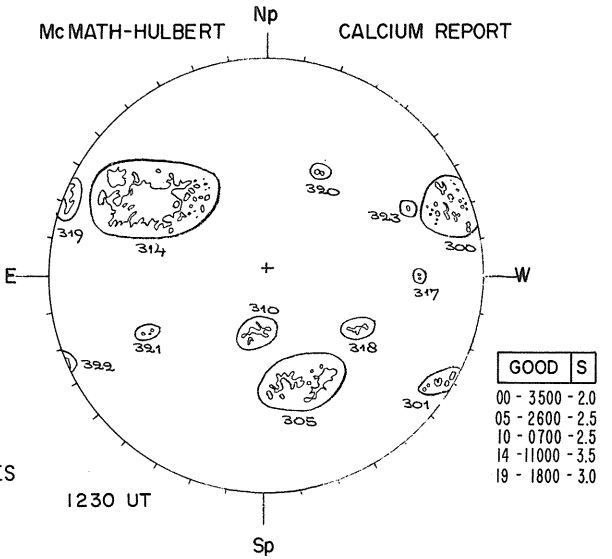
NO DATA

PROMINENCES

2025 UT

McMATH-HULBERT

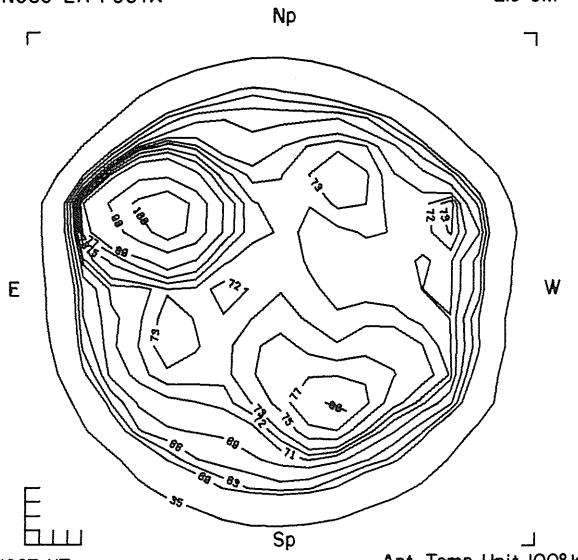
CALCIUM REPORT



1230 UT

NOSC LA POSTA

2.0 CM

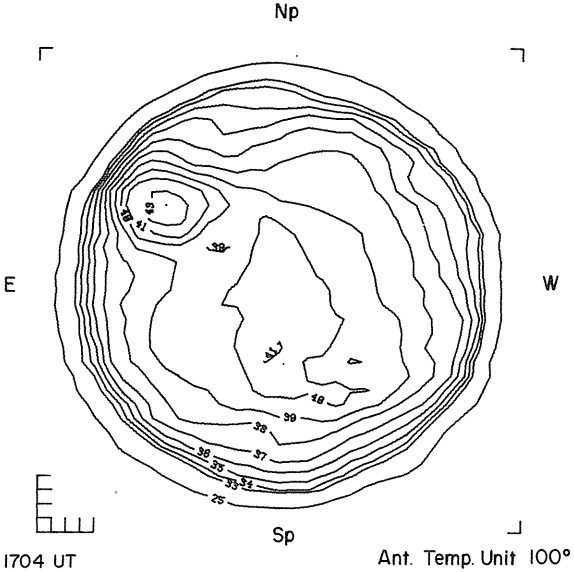


1627 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA

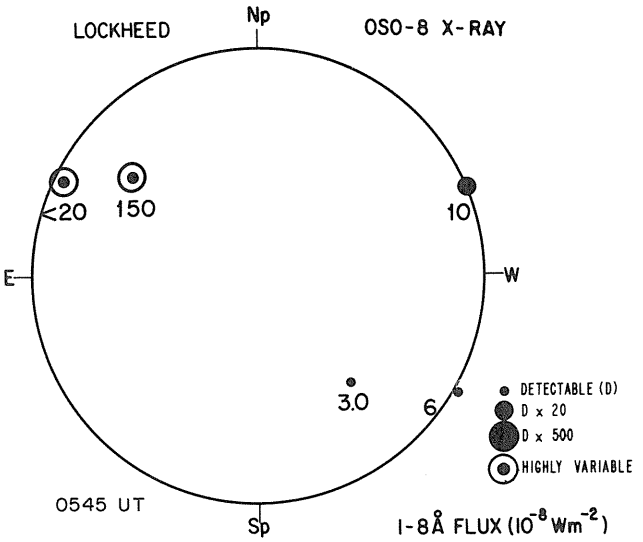
8.6 MM

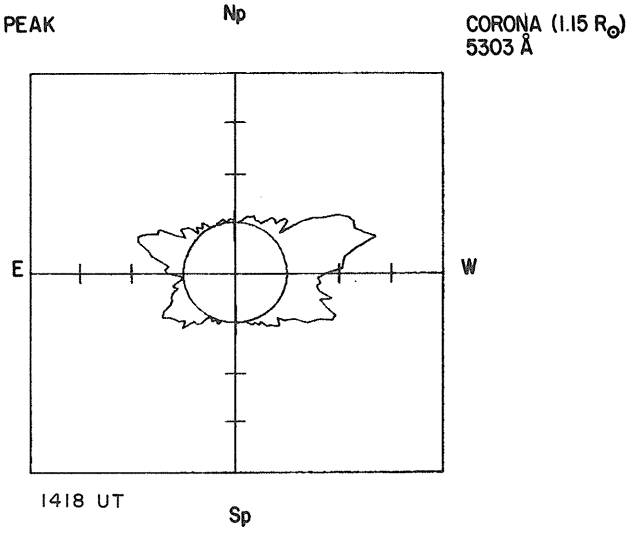


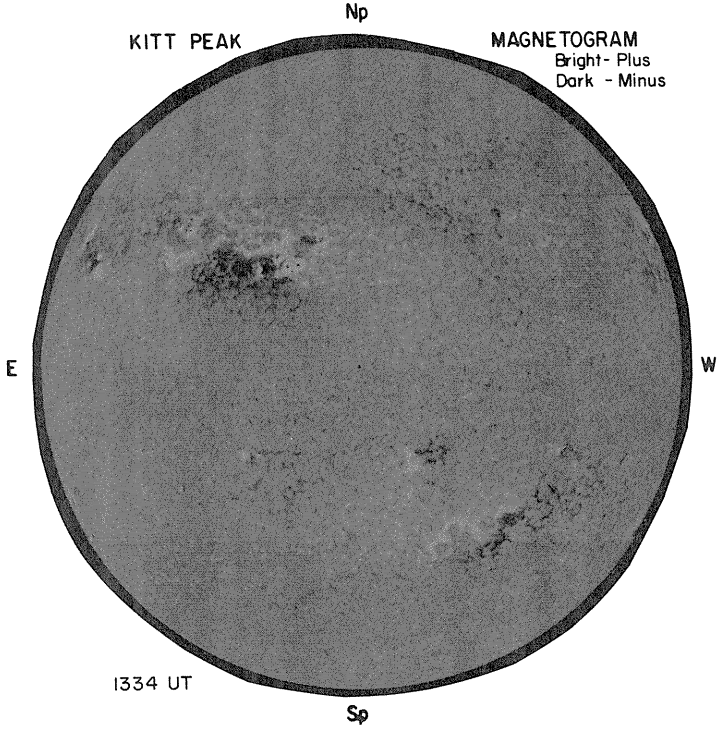
1704 UT

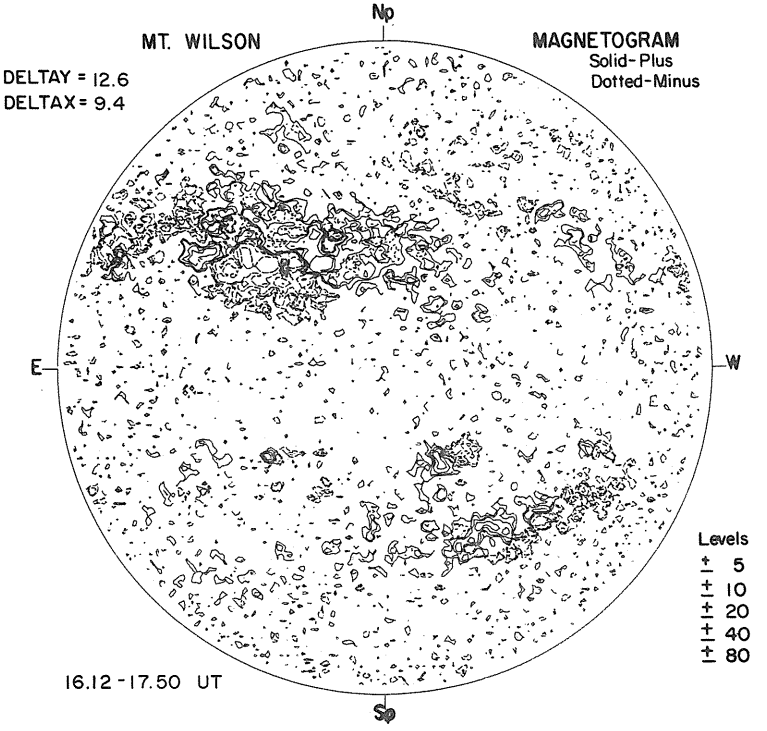
Ant. Temp. Unit 100° K

MAY 26, 1978 (P =-17.73, B_o =-1.39, L_o =108.02)

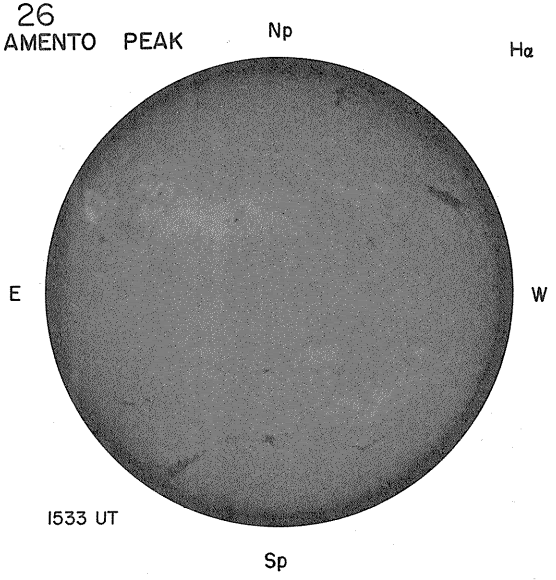






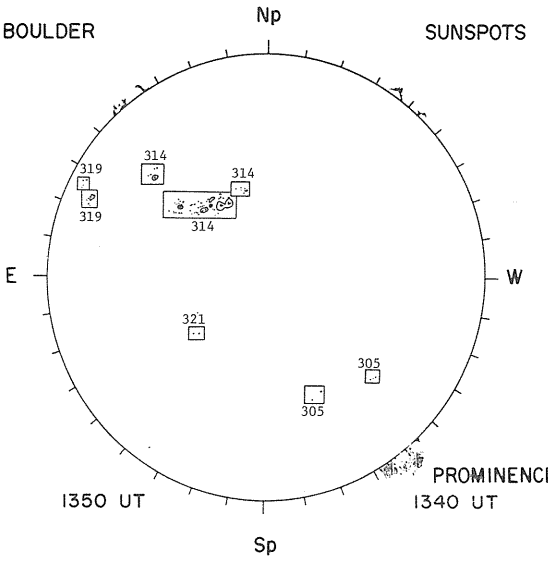


SACRAMENTO PEAK Hα



1533 UT

BOULDER SUNSPOTS

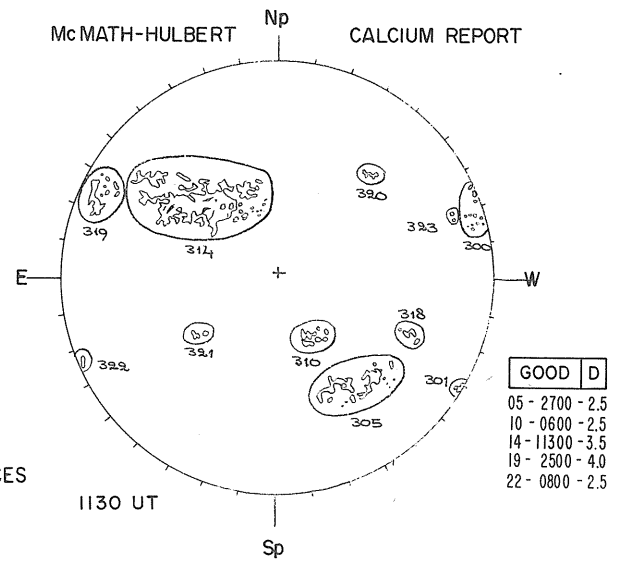


1350 UT

PROMINENCES

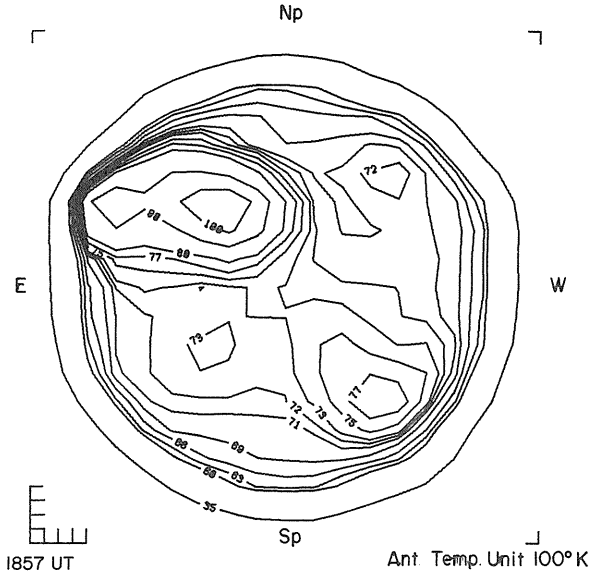
1340 UT

McMATH-HULBERT CALCIUM REPORT



1130 UT

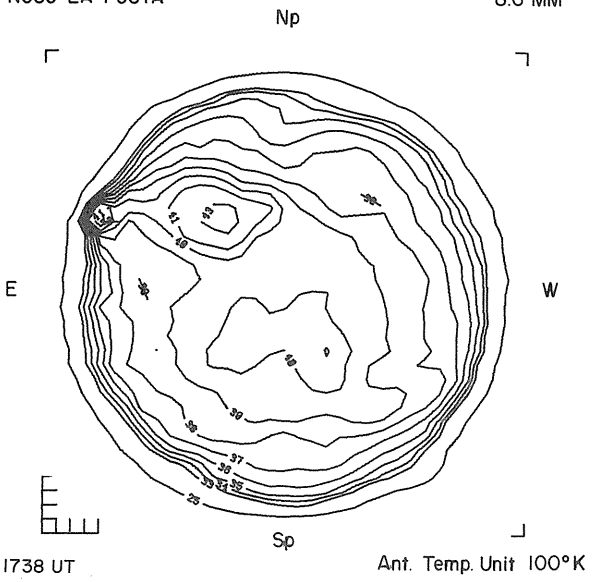
NOSC LA POSTA 2.0 CM



1857 UT

Ant. Temp. Unit 100°K

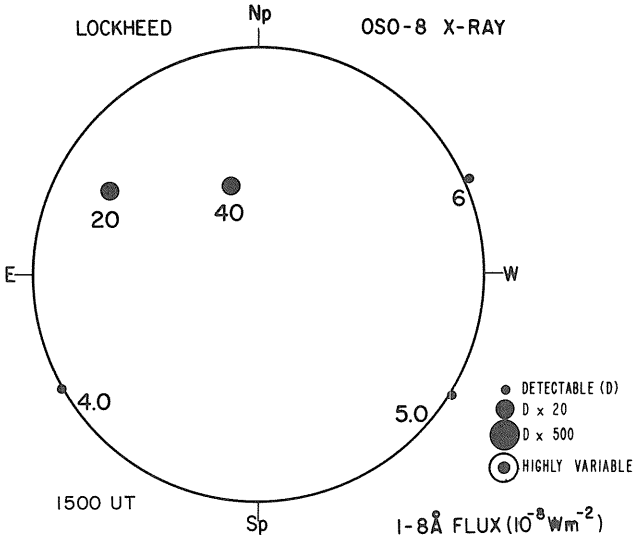
NOSC LA POSTA 8.6 MM

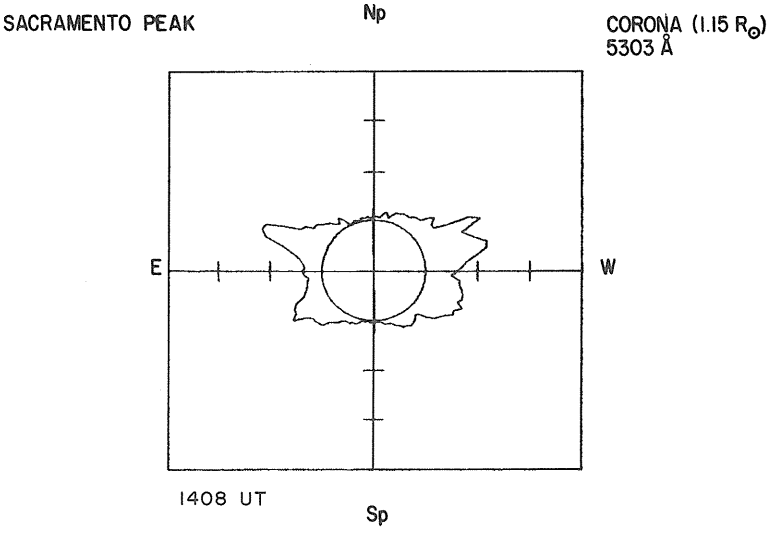


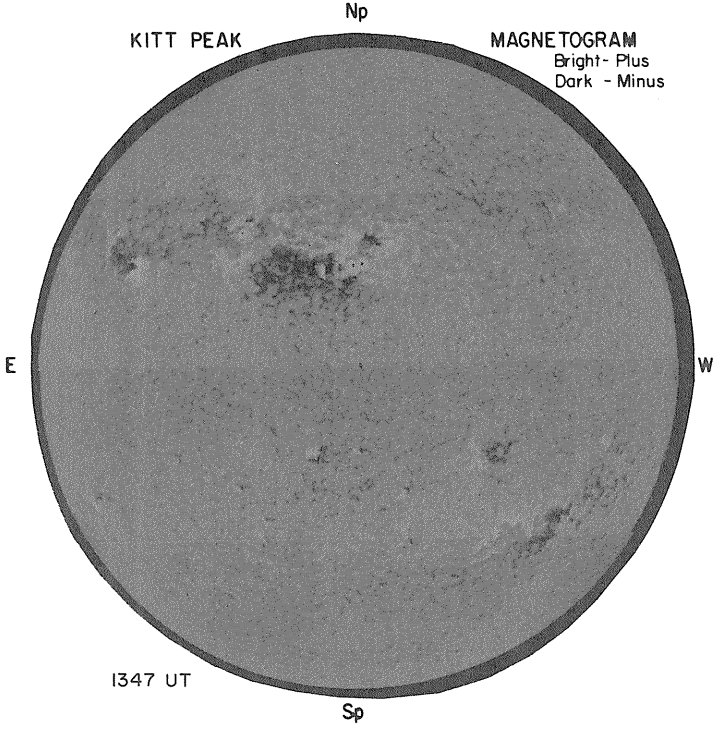
1738 UT

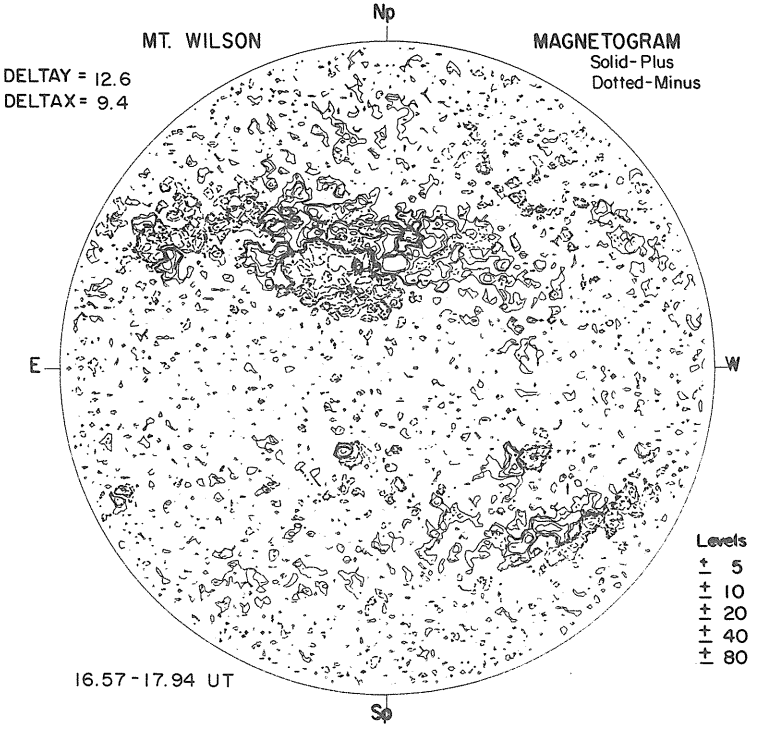
Ant. Temp. Unit 100°K

MAY 27, 1978 (P =-17.39, B_o =-1.27, L_o = 94.79)



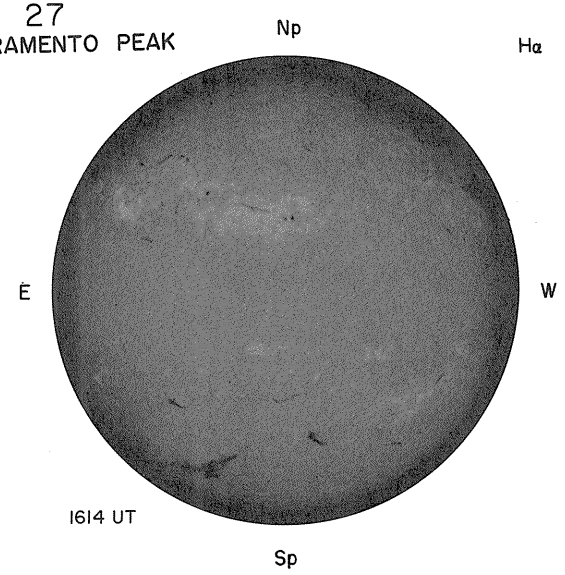




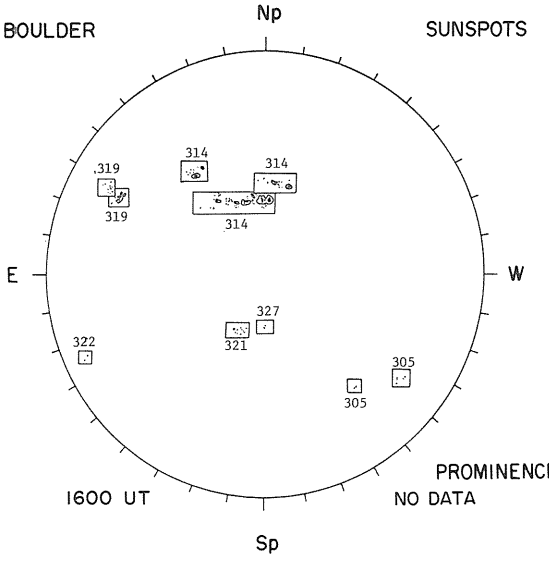


27

SACRAMENTO PEAK



BOULDER

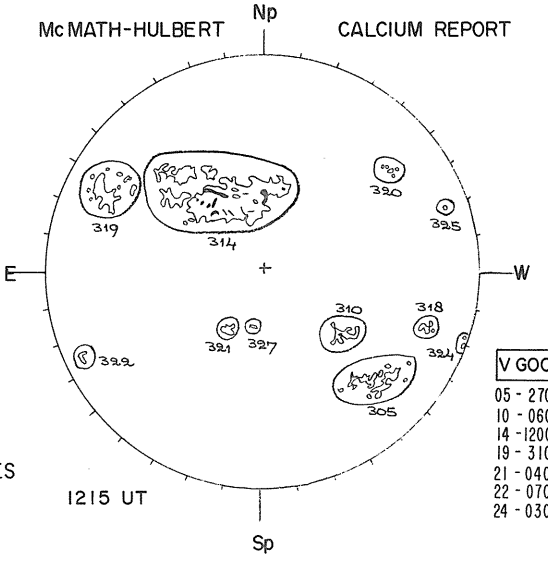


SUNSPOTS

PROMINENCES

NO DATA

McMATH-HULBERT

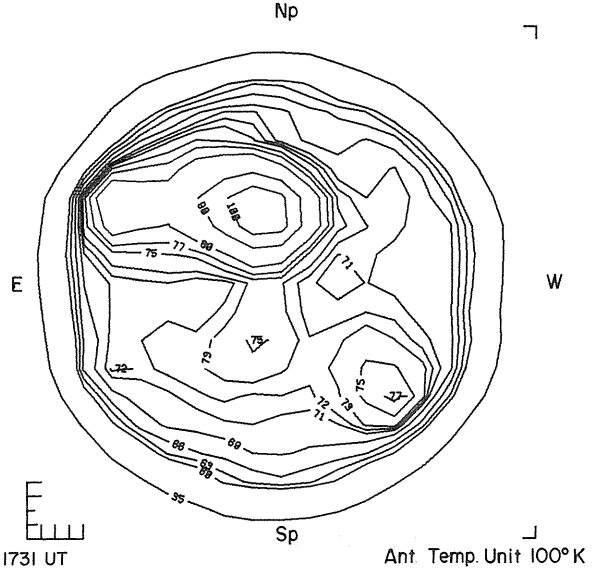


CALCIUM REPORT

V GOOD	M
05 - 2700 - 2.5	
10 - 0600 - 2.5	
14 - 12000 - 3.5	
19 - 3100 - 3.0	
21 - 0400 - 2.5	
22 - 0700 - 2.5	
24 - 0300 - 3.0	

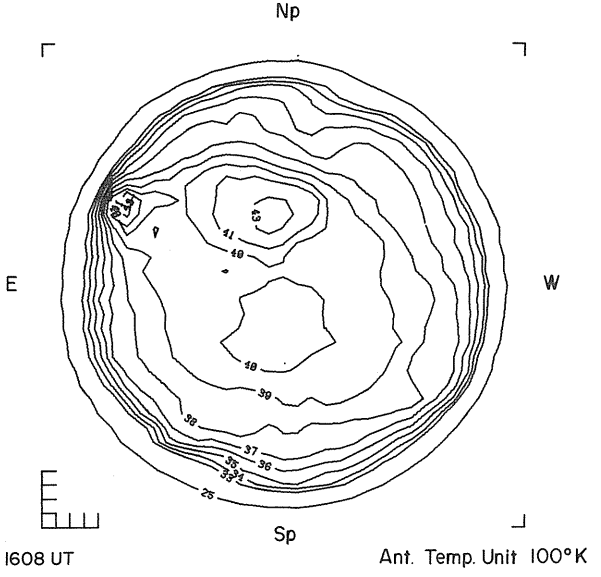
NOSC LA POSTA

2.0 CM

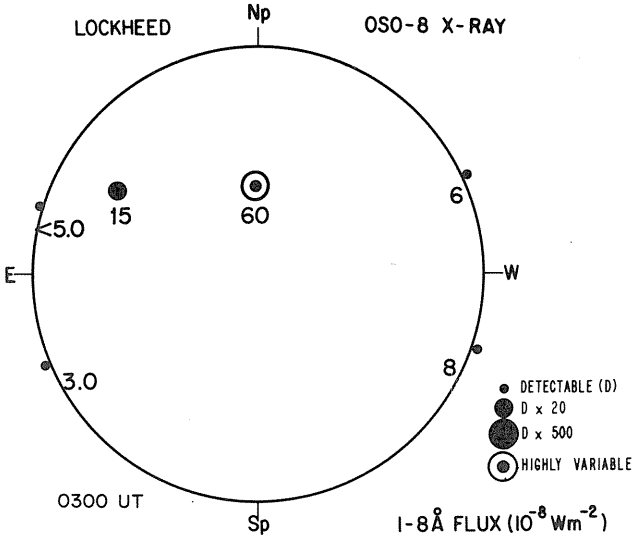


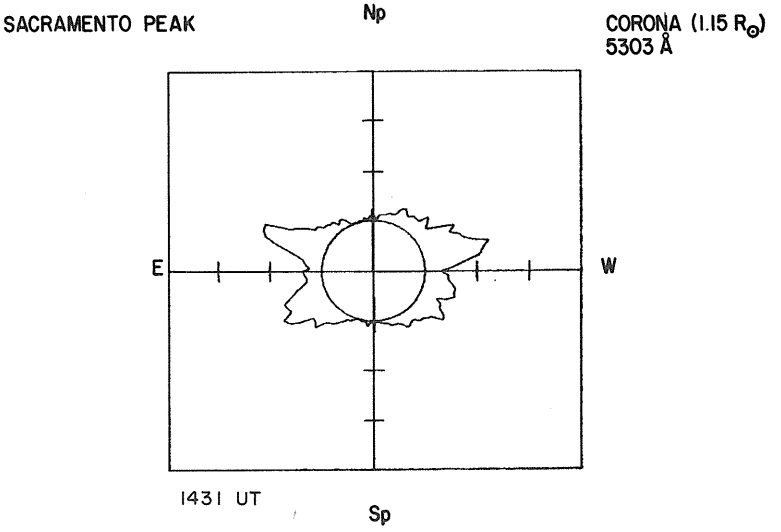
NOSC LA POSTA

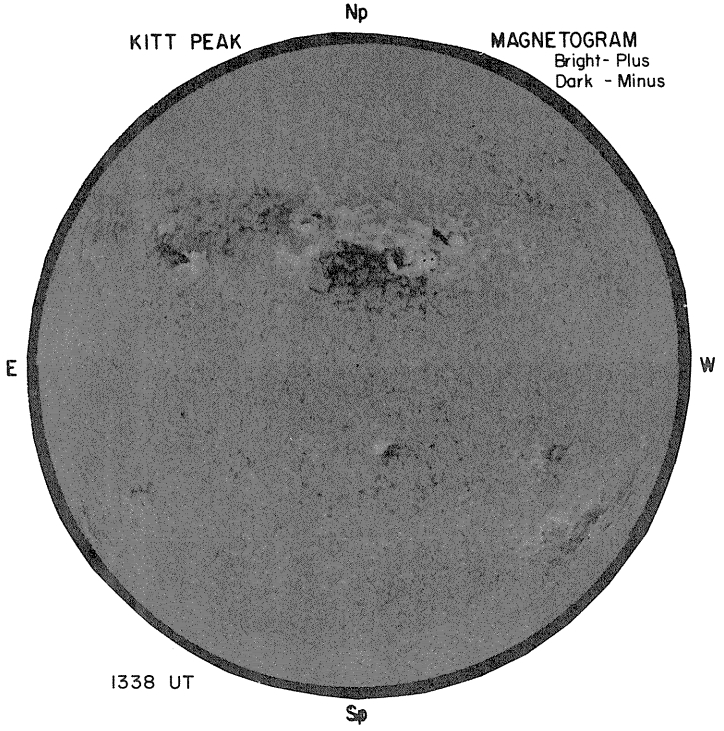
8.6 MM

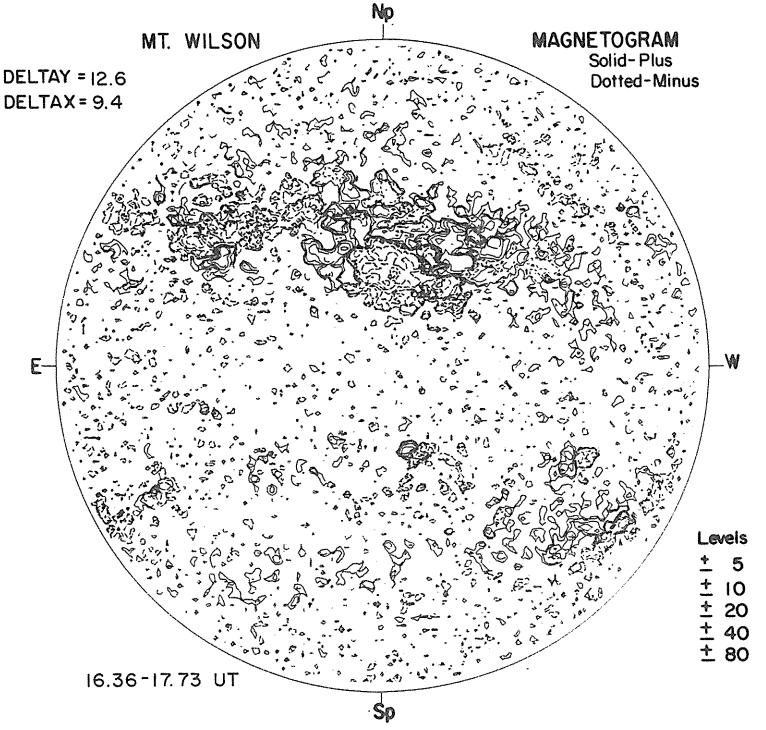


MAY 28, 1978 (P = -17.04, B_o = -1.15, L_o = 81.56)



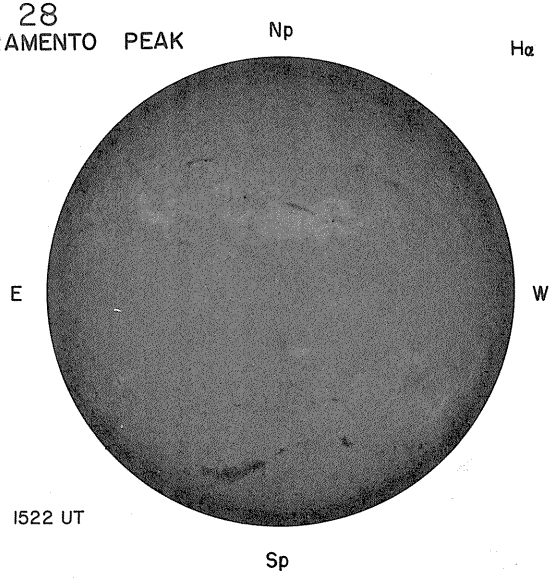






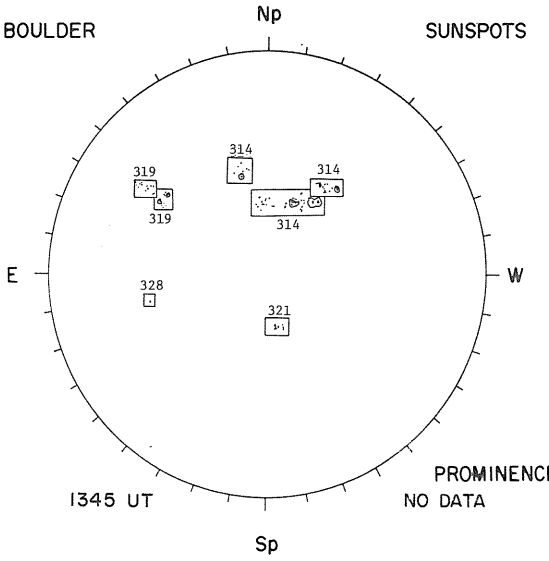
28

SACRAMENTO PEAK Hα



1522 UT

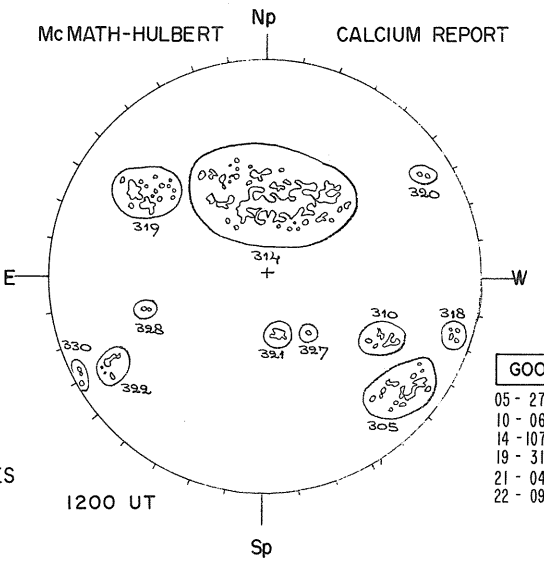
BOULDER SUNSPOTS



1345 UT

PROMINENCES
NO DATA

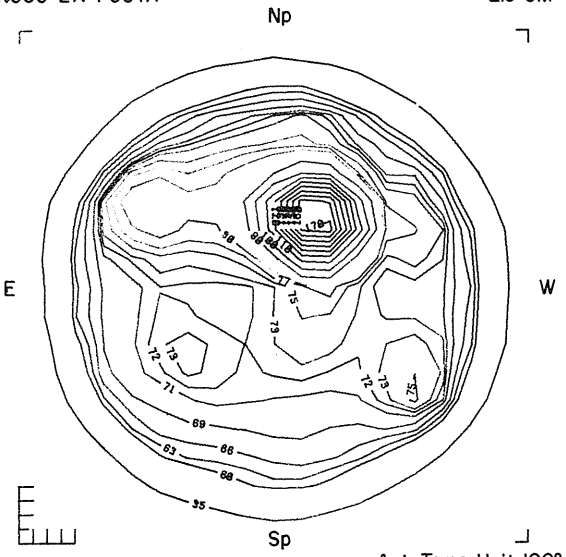
McMATH-HULBERT CALCIUM REPORT



1200 UT

GOOD	D
05 - 2700 - 2.5	
10 - 0600 - 2.5	
14 - 10700 - 3.5	
19 - 3100 - 3.0	
21 - 0400 - 3.0	
22 - 0900 - 2.5	

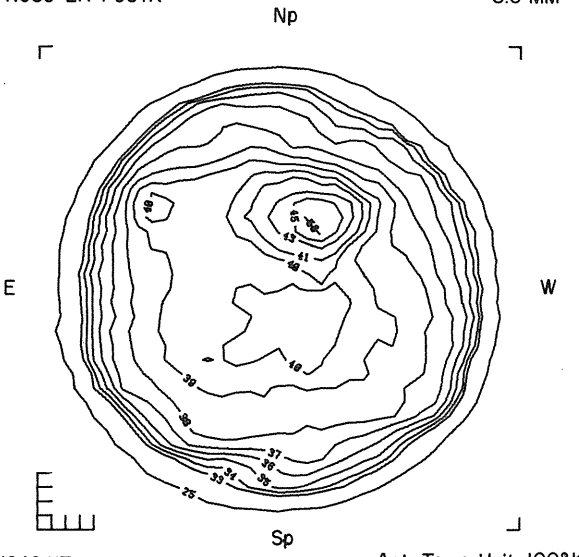
NOSC LA POSTA 2.0 CM



1534 UT

Ant. Temp. Unit 100° K

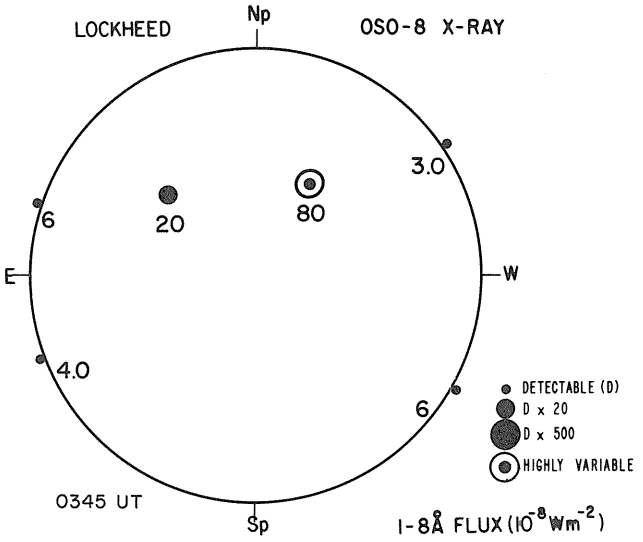
NOSC LA POSTA 8.6 MM

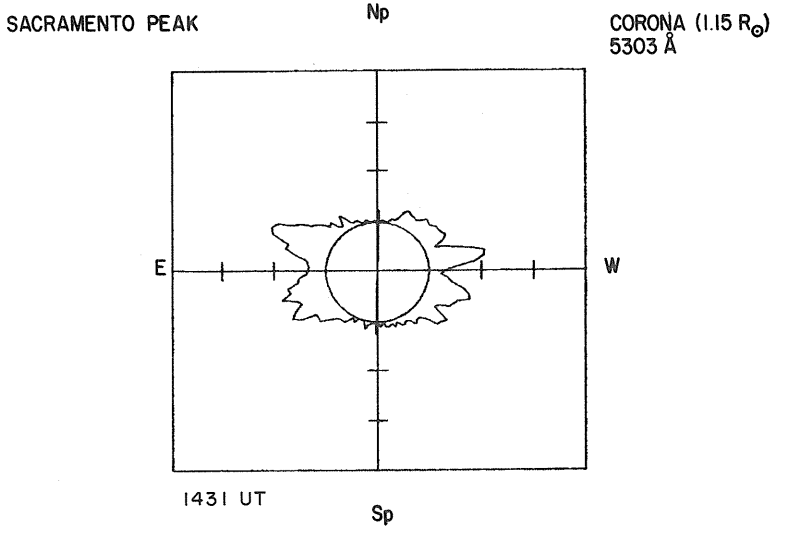


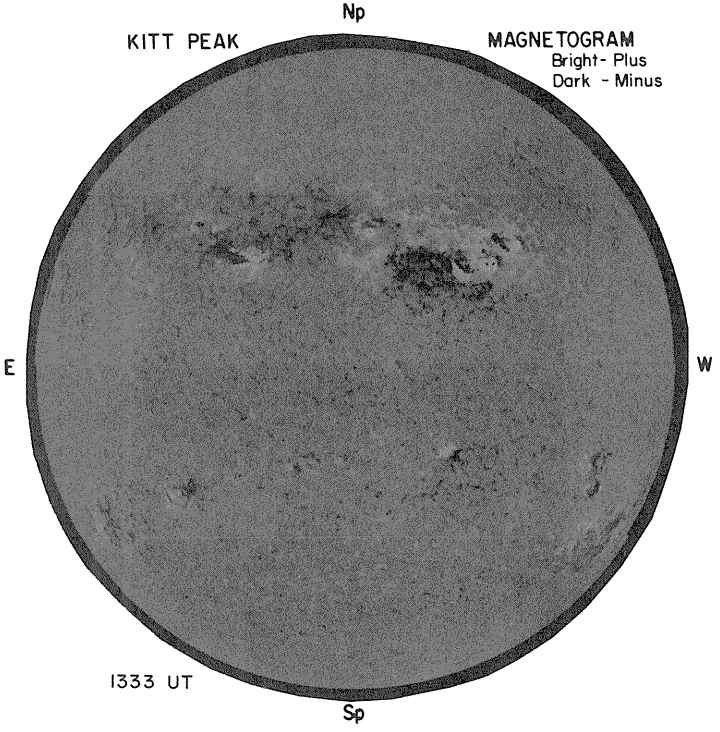
1646 UT

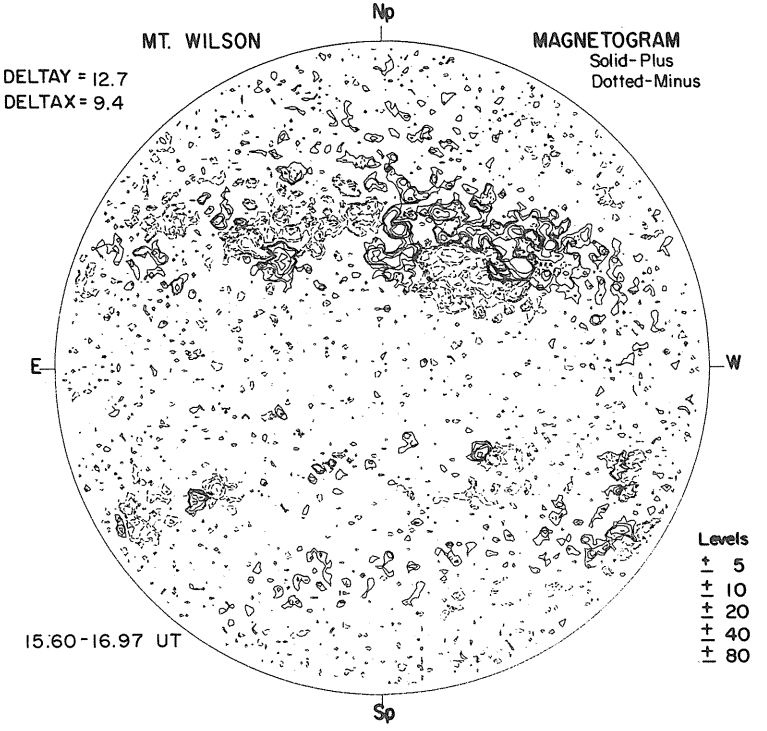
Ant. Temp. Unit 100° K

MAY 29, 1978 (P = -16.68, B_o = -1.03, L_o = 68.33)



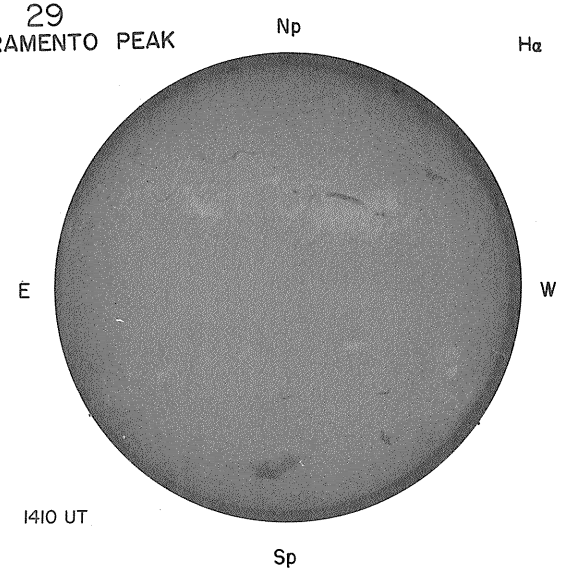




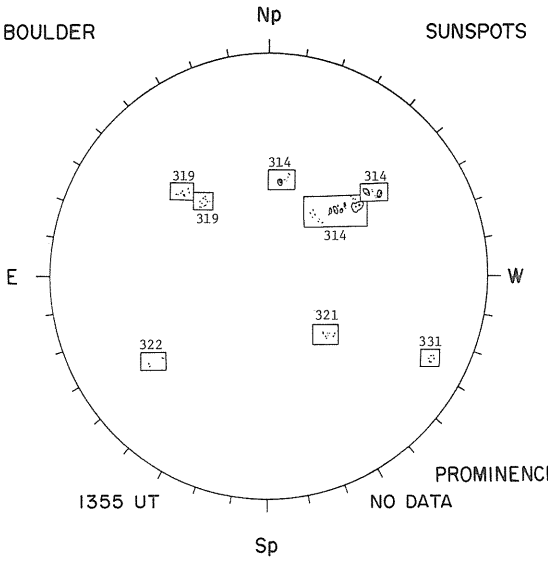


29

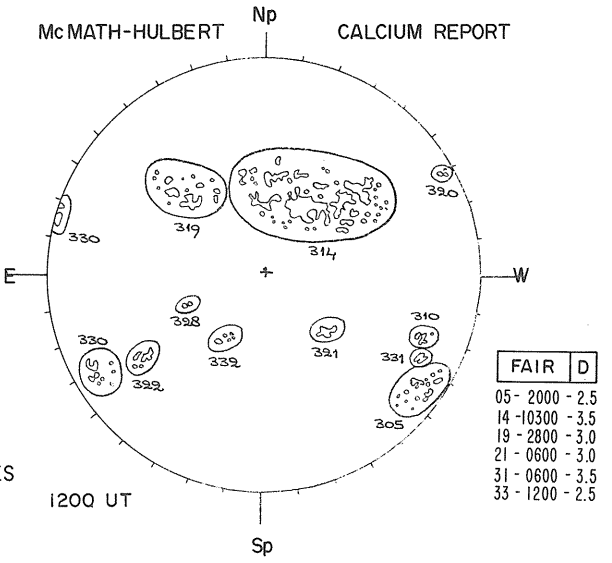
SACRAMENTO PEAK



BOULDER



McMATH-HULBERT



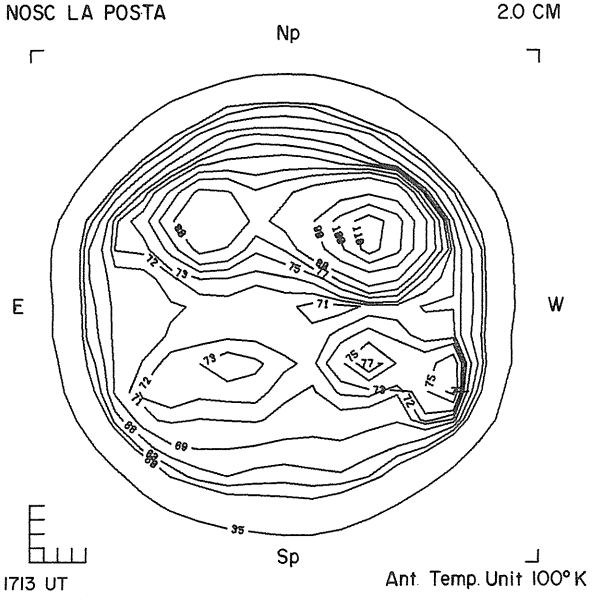
FAIR	D

05 - 2000 - 2.5
14 -10300 - 3.5
19 - 2800 - 3.0
21 - 0600 - 3.0
31 - 0600 - 3.5
33 - 1200 - 2.5

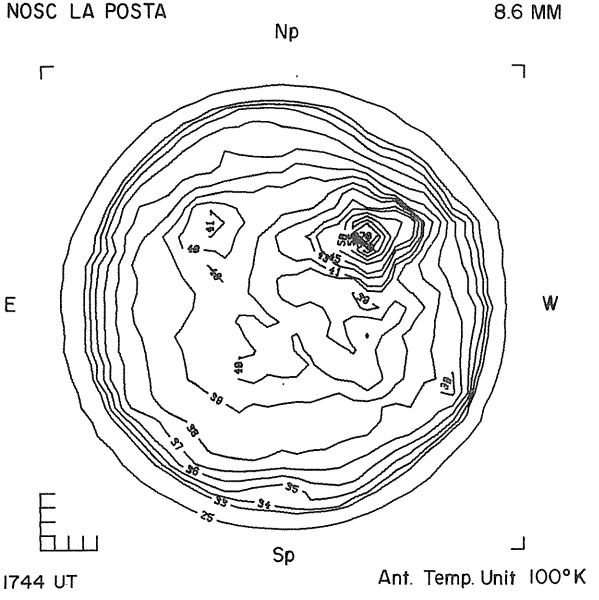
PROMINENCES

NO DATA

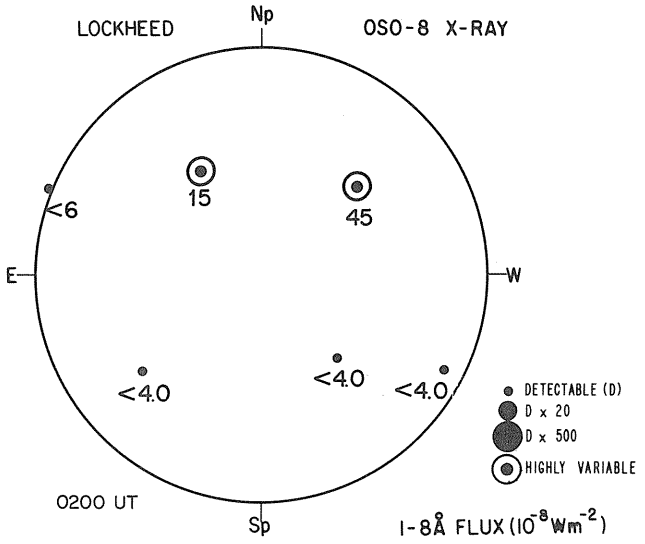
NOSC LA POSTA

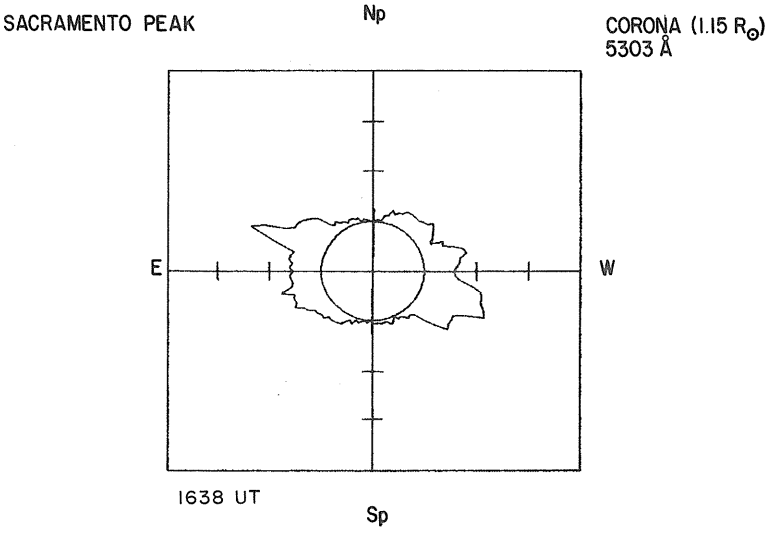


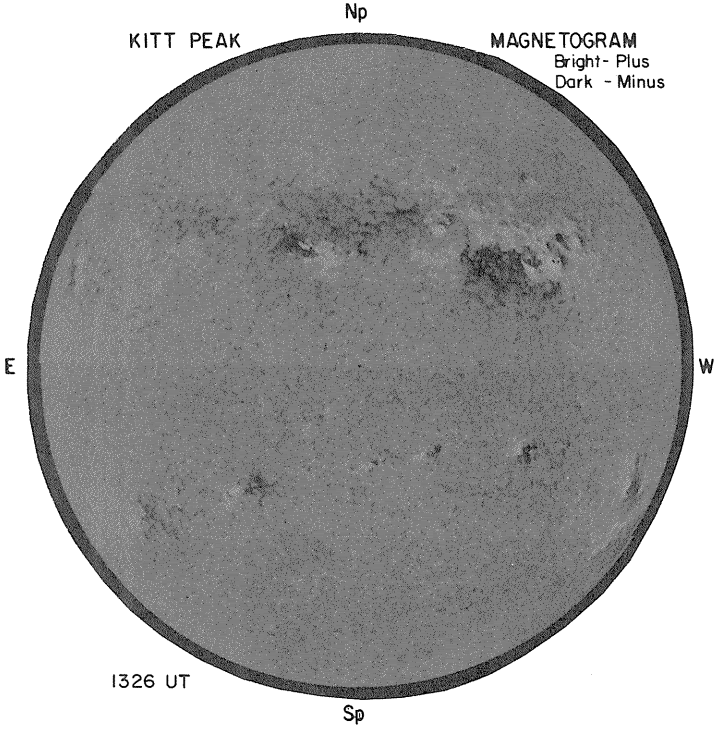
NOSC LA POSTA

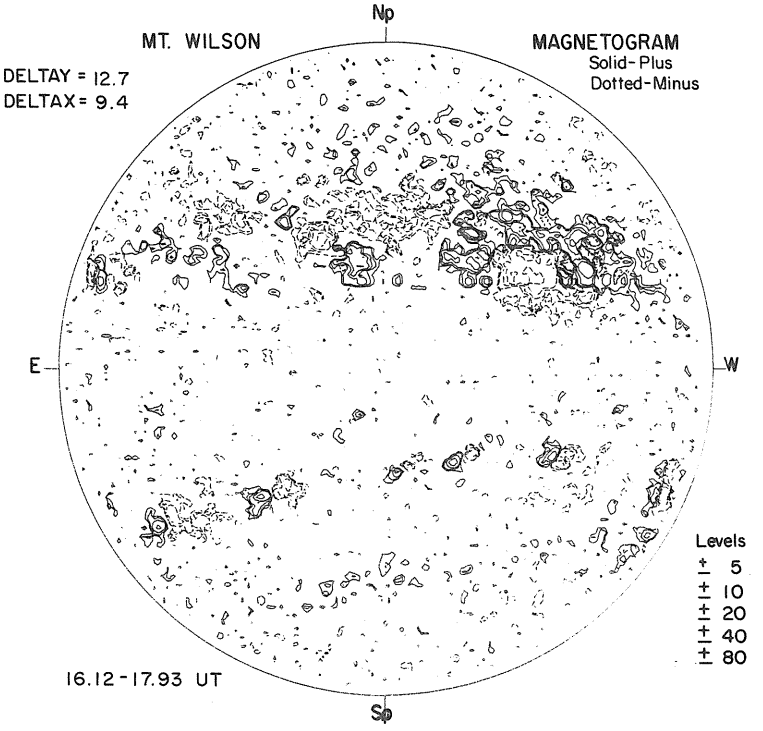


MAY 30, 1978 (P = -16.33, B_o = -0.91, L_o = 55.10)



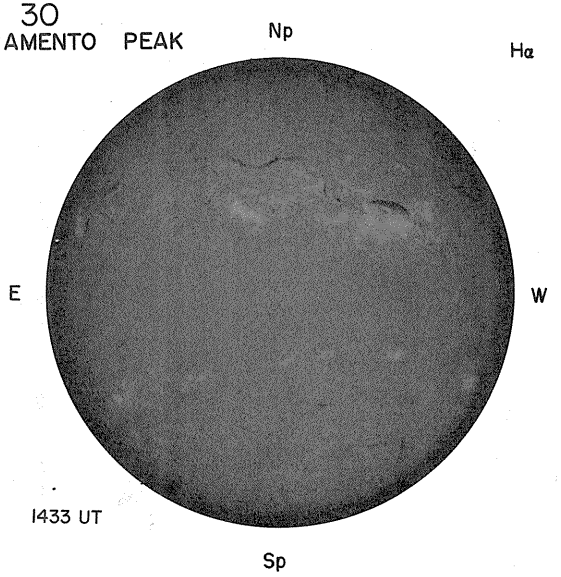






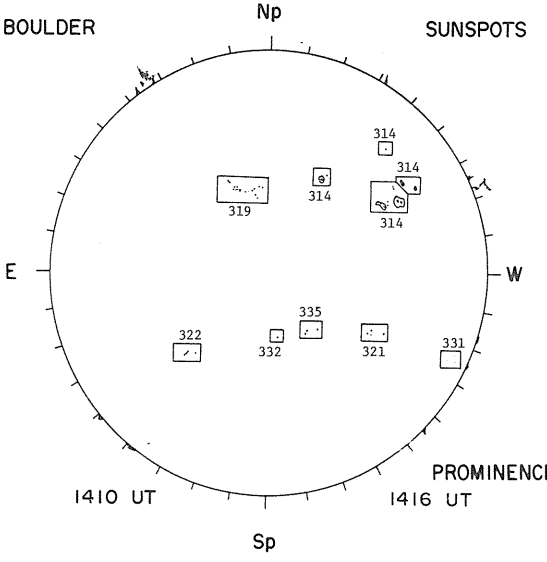
30

SACRAMENTO PEAK



1433 UT

BOULDER SUNSPOTS

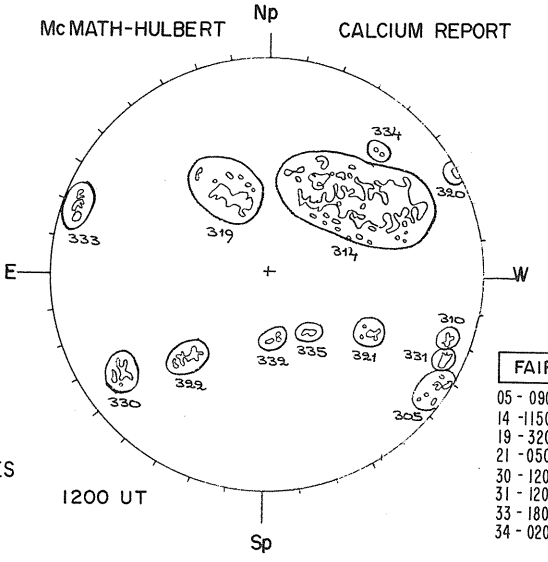


1410 UT

PROMINENCES

1416 UT

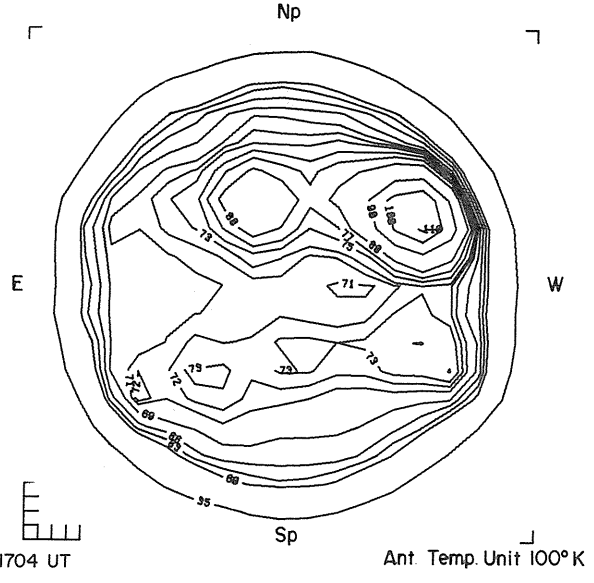
McMATH-HULBERT CALCIUM REPORT



1200 UT

FAIR	D
05 - 0900 - 2.5	
14 - 11500 - 3.5	
19 - 3200 - 3.0	
21 - 0500 - 2.5	
30 - 1200 - 3.5	
31 - 1200 - 3.5	
33 - 1800 - 3.5	
34 - 0200 - 3.0	

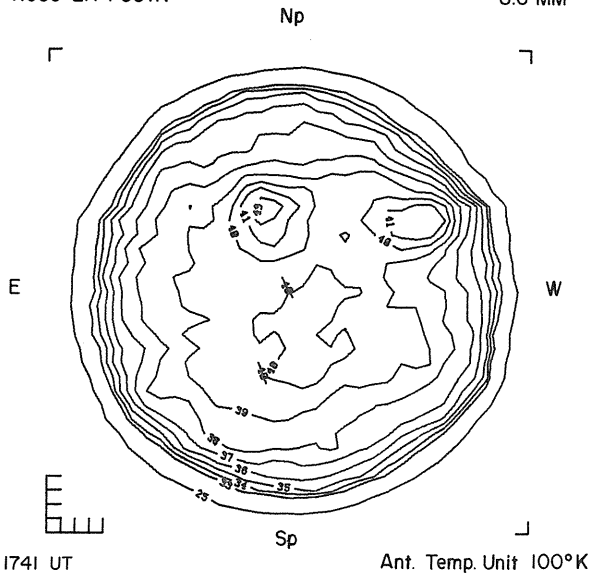
NOSC LA POSTA 2.0 CM



1704 UT

Ant. Temp. Unit 100° K

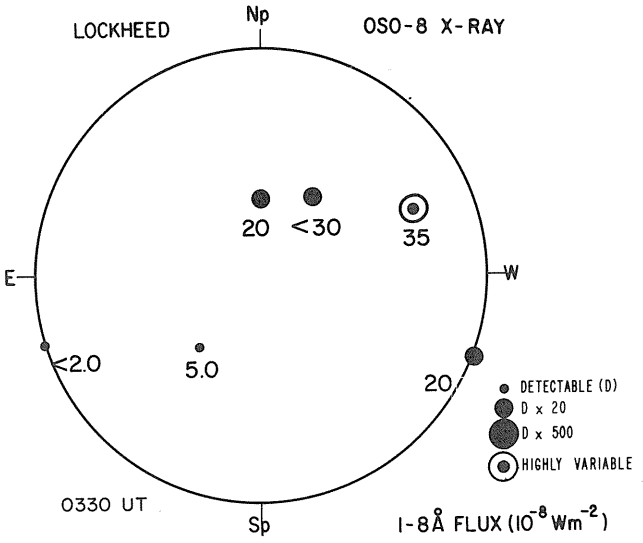
NOSC LA POSTA 8.6 MM

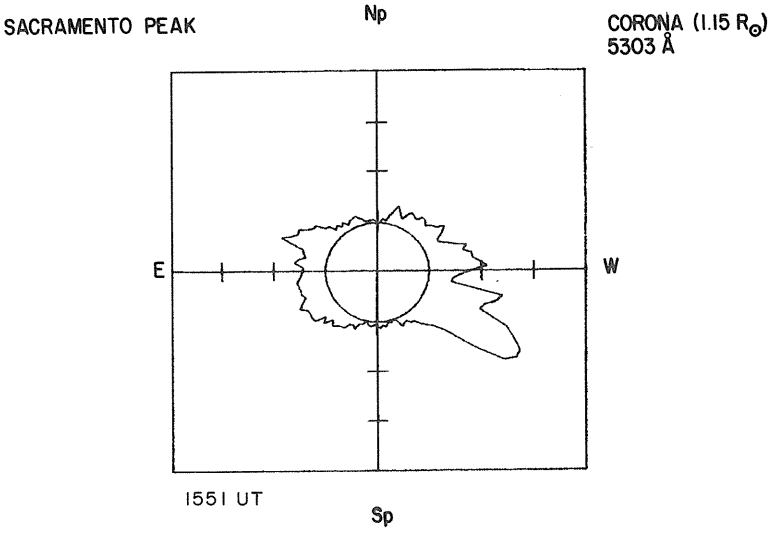


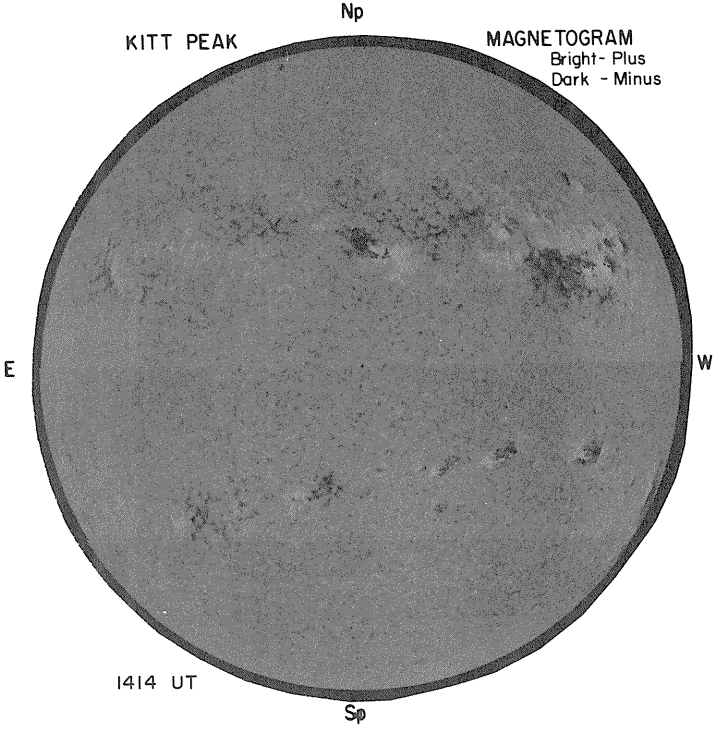
1741 UT

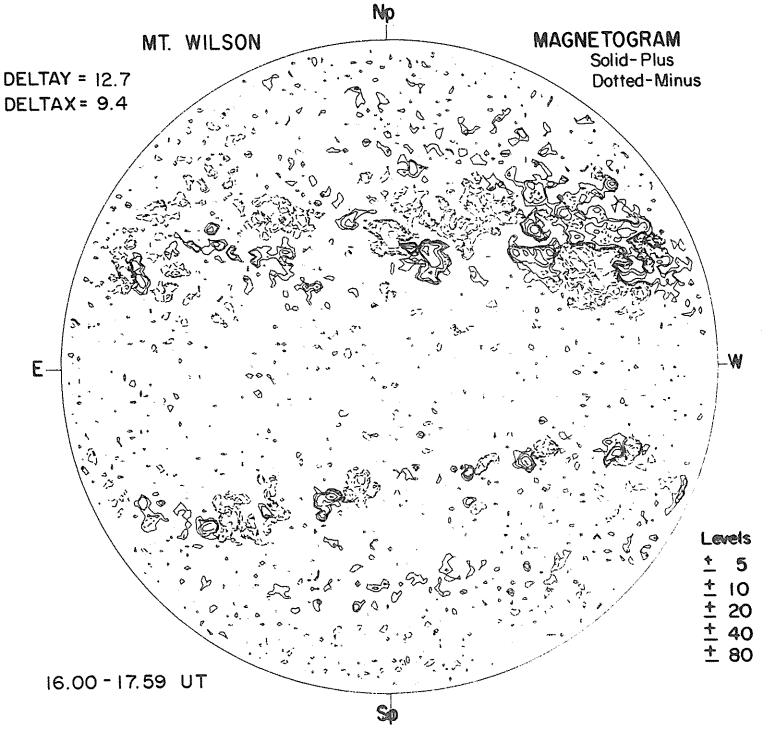
Ant. Temp. Unit 100° K

MAY 31, 1978 (P = -15.96, B_o = -0.79, L_o = 41.86)



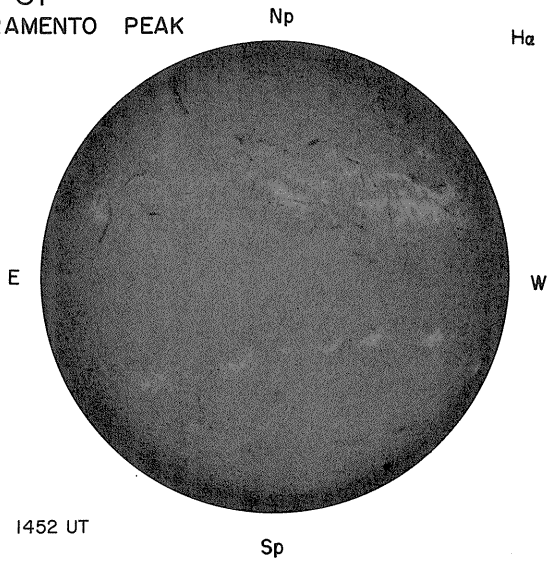






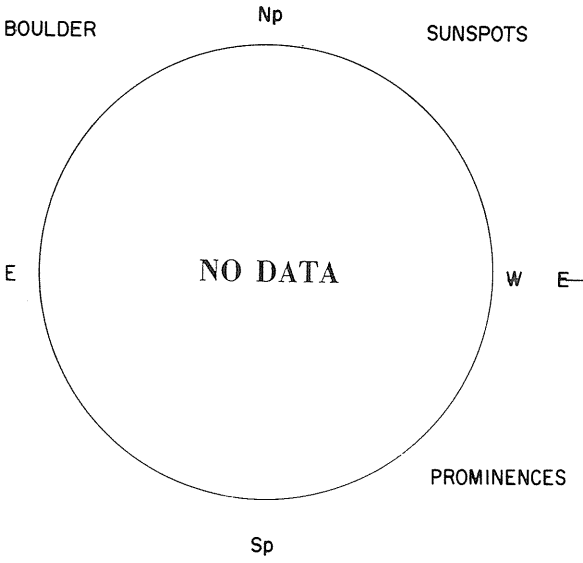
31

SACRAMENTO PEAK



1452 UT

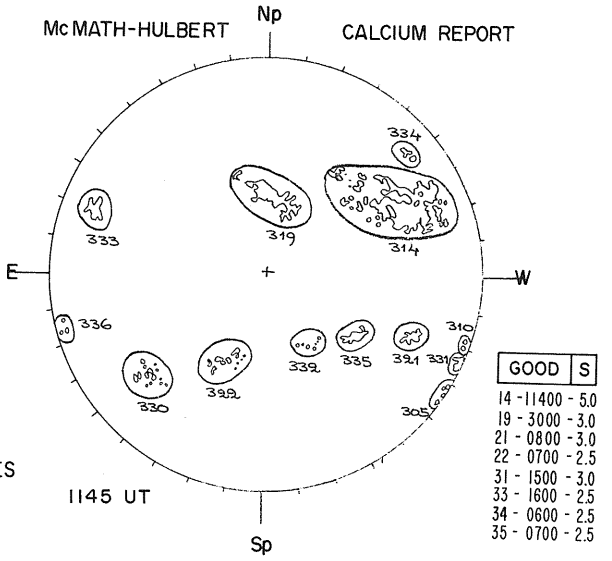
Hα BOULDER



SUNSPOTS

McMATH-HULBERT

CALCIUM REPORT

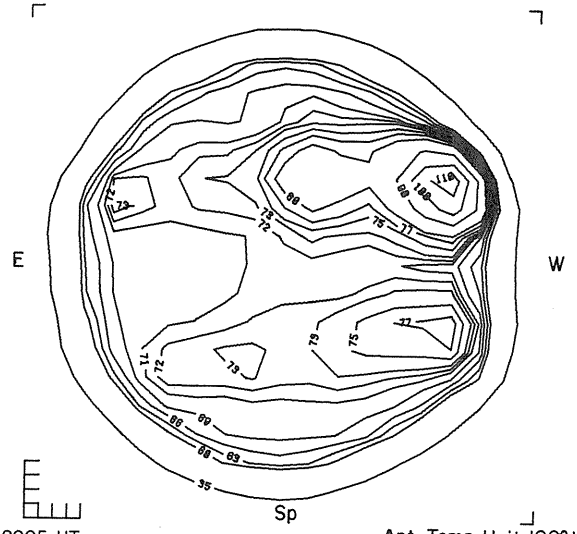


1145 UT

GOOD	S
14 - 11400 - 5.0	
19 - 3000 - 3.0	
21 - 0800 - 3.0	
22 - 0700 - 2.5	
31 - 1500 - 3.0	
33 - 1600 - 2.5	
34 - 0600 - 2.5	
35 - 0700 - 2.5	

PROMINENCES

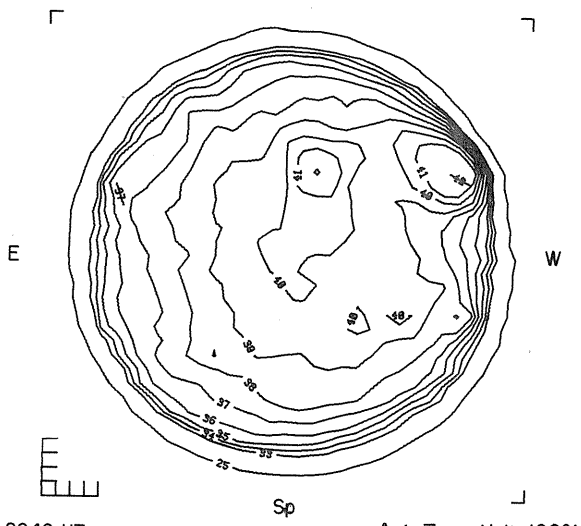
NOSC LA POSTA 2.0 CM



2005 UT

Ant. Temp. Unit 100° K

NOSC LA POSTA 8.6 MM



2040 UT

Ant. Temp. Unit 100° K

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15266 CMP DATE 1.8 RETURN OF REGION 15214 AND NEW ROTATION 4 AND 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	24	15266	N22 E85	77	1200	1.5									
78	4	25	15266	N22 E75	76	5500	3.5		N23 E75				B	600	5	ESO
78	4	26	15266	N22 E65	74	8500	3.5		N23 E59				B	950	19	EKI
78	4	27	15266	N23 E55	69	11000	3.5	20018	N19 E44	79	(D)	4				
78	4		15266					20019	N25 E52	71	(B)	5	B	820	23	EKI
78	4	28	15266	N24 E43	68	11500	3.5	20018	N20 E31	79	(D)	4				
78	4		15266					20019	N24 E38	72	(BP)	5	B	1000	24	EKC
78	4	29	15266	N23 E30	69	12000	3.5	20018	N20 E15	81	D	4				
78	4		15266					20019	N24 E23	73	BP	5	B	880	37	EKC
78	4	30	15266	N23 E16	70	12000	3.5									
78	5	1	15266	N24 E04	68	12000	3.5	20018	N20 W12	81	Y	5	M	10	2	BXO
78	5		15266					20019	N25 W04	73	B	5	M	990	39	EKC
78	5		15266					20020	N24 E15	54	BP	4	M	280	24	EKI
78	5	2	15266	N24 W10	68	13000	3.5	20018	N19 W24	80	(D)	4				
78	5		15266					20019	N24 W16	72	(BP)	5	R	1120	90	FKC
78	5		15266					20020	N23 E04	52	(D)	4	R	440	50	FKI
78	5	3	15266	N24 W23	68	12700	3.5	20018	N19 W36	80	(D)	4	B	1150	15	FKI
78	5		15266					20019	N24 W29	73	(Y)	5				
78	5		15266					20020	N23 W08	52	(D)	4	B	240	11	EKI
78	5	4	15266	N24 W33	65	12300	3.5	20018	N19 W50	81	(D)	5	B	740	20	FKI
78	5		15266					20019	N26 W46	77	(AP)	4				
78	5		15266					20020	N23 W24	55	(BP)	4	B	190	17	ESI
78	5	5	15266					20018	N21 W64	81	(D)	4	R	880	37	FKC
78	5		15266					20019	N27 W56	73	(AP)	4				
78	5		15266					20020	N24 W46	63	(AP)	4	R	170	25	DSI
78	5	6	15266	N24 W63	66	11000	3.5	20018	N20 W73	77	(D)	4	M	1080	15	FKI
78	5		15266					20019	N27 W69	73	(AP)	4				
78	5		15266					20020	N23 W55	59	(Y)	4	M	990	17	FKC
78	5	7	15266	N25 W73	66	9500	3.5	20019	N26 W85	76	AP	3	B	130	1	HSX
78	5		15266					20020	N22 W67	58	(D)	4	B	310	8	EKO
78	5	8	15266					20020	N22 W80	58	Y	3				
78	5	9	15266	N25 W80	47	2000	2.0									

MCMATH REGION 15278 CMP DATE 4.1

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	1	15278	S30 E35	37	100	1.0									

MCMATH REGION 15270 CMP DATE 4.7 RETURN OF REGION 15221 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	27	15270	N19 E80	44	600	1.5	20020	N23 E74	49	(B)	4				
78	4	28	15270	N23 E70	41	1300	2.0	20020	N23 E58	52	(BP)	4	B	240	4	EHO
78	4	29	15270	N23 E66	33	2400	2.0	20020	N23 E43	53	BP	4	B	390	14	EHI
78	4	30	15270	N23 E54	32	2500	2.5									
78	5	1	15270	N23 E40	32	2500	2.5									
78	5	2	15270	N24 E26	32	2600	2.0		N25 E13				R	30	5	CRO
78	5	3	15270	N25 E15	30	2800	2.0									
78	5	4	15270	N25 E03	29	2800	2.0									
78	5	6	15270	N25 W23	26	2800	2.5		N23 W24				R	10	1	AXX
78	5	7	15270	N25 W37	30	2700	2.5									
78	5	9	15270	N25 W65	32	2000	1.0									
78	5	10	15270	N25 W76	30	1000	1.0									
78	5	11	15270	N25 W88	29	500	1.0									

MCMATH REGION 15279 CMP DATE 5.1

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	29	15279	S23 E78	21	200	1.0									
78	4	30	15279	S23 E63	23	400	1.5									
78	5	1	15279	S23 E49	23	300	2.0		S23 E42				M	10	4	BXO
78	5	2	15279	S23 E35	23	300	1.5		S23 E35				R	30	3	CRO
78	5	3	15279	S23 E21	24	200	1.0									
78	5	4	15279	S23 E08	24	200	1.0									
78	5	6	15279	S23 W20	23	200	1.0									
78	5	7	15279	S23 W31	24	200	1.5									
78	5	9	15279	S23 W57	24	300	1.0									
78	5	10	15279	S23 W71	25	300	2.5									

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MCMATH REGION 15285 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	5	6	15285	S18 W20	23	200	1.0		S19 W23				M	10	1	AXX
78	5	7	15285	S17 W30	23	200	1.5									

MCMATH REGION 15276 CMP DATE 6.3 RETURN OF REGION 15227 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	29	15276	S26 E90	9	300	1.0									
78	4	30	15276	S26 E80	6	500	1.0									
78	5	1	15276	S26 E65	7	500	1.5									
78	5	2	15276	S26 E51	7	500	1.5									
78	5	3	15276	S26 E38	7	500	1.5									
78	5	4	15276	S27 E25	7	500	1.5									
78	5	6	15276	S27 W06	9	400	2.0									
78	5	7	15276	S27 W14	7	300	1.5									
78	5	9	15276	S27 W40	7	500	2.0									
78	5	10	15276	S27 W53	7	300	2.0									
78	5	11	15276	S27 W64	5	400	2.5									
78	5	12	15276	S27 W80	2	400	2.5	20030	S26 W77	2	X	1	B	10	1	AXX

MCMATH REGION 15275 CMP DATE 6.5 RETURN OF REGION 15229 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	4	30	15275	N18 E80	6	900	1.5									
78	5	1	15275	N18 E65	7	800	1.5									
78	5	2	15275	N18 E53	5	900	1.5									
78	5	3	15275	N18 E40	5	800	1.5									
78	5	4	15275	N18 E26	6	800	1.5									
78	5	6	15275	N18 W03	6	900	1.5									
78	5	7	15275	N18 W14	7	900	1.5									
78	5	9	15275	N18 W40	7	800	1.0									
78	5	10	15275	N18 W53	7	700	1.0		N19 W53				B	190	8	DSI
78	5	11	15275	N18 W65	6	600	1.0		N17 W58				M	30	2	HSX

MCMATH REGION 15280 CMP DATE 7.9

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	30	15280	S27 E90	357	300	2.0									
78	5	1	15280	S26 E80	353	1800	3.0	20023	S27 E70	0	B	3				
78	5	2	15280	S27 E68	351	2700	2.5	20023	S27 E68	349	(B)	3	R	360	18	EAI
78	5	3	15280	S27 E55	351	2900	2.5	20023	S28 E55	350	(B)	3	B	260	7	ESI
78	5	4	15280	S27 E44	349	2400	2.5	20023	S28 E42	350	(B)	4	B	240	11	DAI
78	5	5	15280					20023	S28 E31	347	(B)	3	R	150	36	DAI
78	5	6	15280	S28 E14	350	2300	3.0	20023	S28 E18	347	(B)	4	M	160	17	DSO
78	5	7	15280	S28 E05	348	2300	2.5	20023	S28 E04	347	(B)	4	B	80	11	ESI
78	5	8	15280					20023	S28 W07	345	(B)	3	B	60	7	DSO
78	5	9	15280	S28 W19	346	2500	3.0	20023	S28 W21	346	(B)	3	B	30	7	DSO
78	5	10	15280	S28 W32	346	2500	3.0	20023	S27 W35	347	(AP)	3	B	10	2	CRO
78	5	11	15280	S27 W46	347	2200	2.5	20023	S28 W48	347	(B)	4	M	10	2	BXO
78	5	12	15280	S27 W62	344	2000	2.5									
78	5	13	15280	S26 W82	354	2000	2.5									
78	5	14	15280	S26 W87	346	1200	2.5									

MCMATH REGION 15282 CMP DATE 7.9 RETURN OF REGION 15231 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	5	2	15282	N20 E78	341	900	2.0	20024	N16 E74	343	B	1	R	10	2	BXO
78	5	3	15282	N19 E61	345	2100	3.0	20024	N17 E58	347	(B)	3	B	100	4	CSO
78	5	4	15282	N18 E46	347	1800	3.0	20024	N17 E42	350	(B)	5	B	130	6	CSI
78	5	5	15282					20024	N17 E29	349	(B)	4	R	140	9	DSO
78	5	6	15282	N17 E16	348	1800	2.5	20024	N17 E15	350	(B)	4	M	100	6	DSO
78	5	7	15282	N17 E05	348	1900	2.5	20024	N17 W01	352	(AP)	5	B	40	1	HSX
78	5	8	15282					20024	N17 W13	351	(AP)	4	B	30	1	HSX
78	5	9	15282	N17 W21	348	1500	2.5	20024	N18 W27	352	(AP)	4	B	20	1	HSX
78	5	10	15282	N17 W34	348	1300	2.5	20024	N18 W40	352	(AP)	4				
78	5	11	15282	N17 W47	348	1000	2.0	20024	N18 W53	352	(AP)	4				
78	5	12	15282	N17 W65	347	1200	2.0	20024	N17 W67	352	(AP)	4	B	20	1	HRX

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MCMATH REGION 15282 (CONT) CMP DATE 7.9 RETURN OF REGION 15231 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	5	13	15282	N17 W76	348	1000	2.0	20024	N18 W80	353	AP	1				

MCMATH REGION 15299 CMP DATE 8.9

			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	5	12	15299	N16 W52	334	300	1.5									
78	5	13	15299	N17 W62	334	300	2.0									
78	5	14	15299	N17 W75	334	300	2.0									

MCMATH REGION 15283 CMP DATE 9.0

			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	2	15283	S19 E90	329	100	1.0									
78	5	3	15283	S18 E78	328	300	1.5									
78	5	4	15283	S18 E63	330	300	1.5									
78	5	6	15283	S19 E32	332	100	1.5									
78	5	7	15283	S19 E20	333	100	1.0									

MCMATH REGION 15286 CMP DATE 9.6 RETURN OF REGION 15232 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	5	3	15286	S28 E75	331	400	1.0									
78	5	4	15286	S29 E60	333	300	1.0									
78	5	7	15286	S29 E25	328	400	1.5		S27 E26				M	190	28	DSI
78	5	9	15286	S29 E01	326	400	1.5									
78	5	10	15286	S29 W12	326	600	1.5									
78	5	11	15286	S28 W25	326	600	1.5									
78	5	12	15286	S28 W42	324	400	1.0									
78	5	13	15286	S27 W51	323	400	1.5									
78	5	14	15286	S28 W64	323	400	1.5									
78	5	15	15286	S28 W75	319	200	1.0									

MCMATH REGION 15287 CMP DATE 9.6

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	6	15287	N17 E39	325	100	1.5		N16 E34				M	10	1	AXX
78	5	7	15287	N17 E28	325	200	1.0									

MCMATH REGION 15288 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	5	6	15288	N29 E50	314	100	1.5									
78	5	7	15288	N29 E40	313	200	1.5									
78	5	9	15288	N29 E13	314	200	1.5									

MCMATH REGION 15295 CMP DATE 10.9

			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	5	9	15295	S13 E18	309	200	1.5									
78	5	10	15295	S13 E05	309	200	1.5									
78	5	11	15295	S13 W11	312	200	2.0									
78	5	12	15295	S14 W31	313	200	1.5									
78	5	13	15295	S13 W42	314	300	2.5	20032	S14 W42	315	AP	1				
78	5	14	15295	S15 W56	315	300	3.0	20032	S15 W57	316	(AP)	2	B	10	1	AXX
78	5	15	15295	S15 W71	315	500	3.0		S15 W73				M	20	3	BXO
78	5	16	15295	S14 W82	316	700	2.5		S16 W81				R	10	2	BXO

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MCMATH REGION 15289 CMP DATE 11.1 RETURN OF PART OF REGION 15233 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	5	6	15289	S34 E56	308	300	1.5									
78	5	7	15289	S34 E46	307	300	1.5									
78	5	9	15289	S34 E20	307	500	2.0									
78	5	10	15289	S34 E08	306	400	2.0									
78	5	11	15289	S35 W04	305	400	2.0									
78	5	12	15289	S35 W20	302	300	1.5									
78	5	13	15289	S35 W30	302	300	1.5									
78	5	14	15289	S35 W42	301	200	1.5									
78	5	15	15289	S35 W56	300	100	1.5									
78	5	16	15289	S35 W65	299	100	1.5									
78	5	17	15289	S35 W78	299	200	1.0									

MCMATH REGION 15292 CMP DATE 11.8 RETURN OF REGION 15240 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	5	6	15292	S20 E70	294	300	1.5									
78	5	7	15292	S21 E60	293	400	1.5									
78	5	9	15292	S21 E32	295	400	1.5									
78	5	10	15292	S21 E18	296	400	1.0									
78	5	11	15292	S21 E04	297	300	1.0									
78	5	12	15292	S22 W14	296	200	1.0									
78	5	13	15292	S22 W24	296	400	2.5	20033	S25 W28	301	(AP)	1	M	10	5	BXO
78	5	14	15292	S25 W38	297	400	2.5	20033	S25 W40	299	(B)	3	B	10	4	BXO
78	5	15	15292	S25 W55	299	300	2.0		S25 W57				M	0	1	AXX
78	5	16	15292	S25 W66	300	700	3.5		S27 W68				R	10	3	BXO
78	5	17	15292	S25 W79	300	700	3.5									

MCMATH REGION 15293 CMP DATE 12.1 RETURN OF PART OF REGION 15233 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	5	6	15293	S34 E74	290	600	1.0									
78	5	7	15293	S34 E65	288	800	1.5									
78	5	9	15293	S34 E38	289	900	2.0									
78	5	10	15293	S34 E26	288	700	2.0									
78	5	11	15293	S33 E08	293	500	1.0									
78	5	12	15293	S33 W08	290	300	1.5									
78	5	13	15293	S33 W18	290	400	2.0									
78	5	14	15293	S33 W29	288	400	2.0									
78	5	15	15293	S33 W43	287	400	2.0									
78	5	16	15293	S33 W52	286	300	1.5									
78	5	17	15293	S33 W64	285	300	1.0									
78	5	18	15293	S33 W70	278	400	1.0									

MCMATH REGION 15291 CMP DATE 12.2 RETURN OF REGIONS 15235 AND 15239 ROTATIONS 3 AND 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	6	15291	N17 E75	289	3200	3.0	20025	N17 E83	282	(B	4	M	440	10	FSI
78	5	7	15291	N17 E65	288	5500	3.5	20025	N17 E60	291	(BP)	5	B	170	6	ESO
78	5		15291					20026	N17 E70	281	(BP)	4				
78	5	8	15291					20025	N16 E45	293	(B)	4	B	60	6	DRO
78	5		15291					20026	N16 E53	285	(AP)	4				
78	5	9	15291	N17 E35	292	5000	3.0	20025	N16 E30	295	(B)	4	B	20	6	CSO
78	5		15291					20026	N17 E39	286	(AP)	5	B	100	1	HSX
78	5	10	15291	N17 E22	292	4700	3.0	20025	N16 E13	299	(AP)	4	B	40	4	DRO
78	5		15291					20026	N17 E27	285	(AP)	5	B	130	1	HSX
78	5	11	15291	N17 E09	292	4400	3.0	20025	N16 E01	298	(AP)	3	M	40	4	CRO
78	5		15291					20026	N17 E14	285	(AP)	5	M	100	4	CSO
78	5	12	15291	N17 W10	292	4200	3.0	20025	N16 W13	298	(AP)	3	B	20	2	AXX
78	5		15291					20026	N17 E01	284	(AP)	6	B	90	2	HSX
78	5	13	15291	N17 W20	292	4300	3.0	20025	N17 W26	299	(AP)	2	M	0	1	AXX
78	5		15291					20026	N17 W12	285	(AP)	5	M	60	1	HSX
78	5	14	15291	N17 W33	292	3800	3.0	20026	N17 W26	285	(AP)	5	B	140	1	HSX
78	5	15	15291	N17 W47	291	3800	2.5		N16 W44				M	110	1	HSX
78	5	16	15291	N17 W59	293	3500	2.5	20026	N18 W58	287	(AP)	3	R	110	1	HSX
78	5	17	15291	N17 W72	293	3100	2.5	20026	N18 W68	287	(AP)	3	B	110	1	HSX
78	5	18	15291	N17 W85	293	1400	2.0	20026	N18 W82	288	(AP)	2	B	100	1	HSX

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MCMATH REGION 15302 CMP DATE 12.6

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	14	15302	N35	W27	286	100	1.5
78	5	15	15302	N36	W39	283	100	1.0
78	5	16	15302	N36	W49	283	200	1.0
78	5	17	15302	N36	W61	282	300	3.0
78	5	18	15302	N36	W72	280	300	2.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS

MCMATH REGION 15297 CMP DATE 13.9

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	11	15297	S33	E33	268	300	2.0
78	5	12	15297	S33	E15	267	200	1.5
78	5	13	15297	S33	E04	268	200	1.5
78	5	14	15297	S33	W07	266	300	1.5

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20029	S33	E34	265	(B)	3	M	20	2	BXO
	S31	E19				B	10	2	BXO

MCMATH REGION 15294 CMP DATE 14.3 RETURN OF REGION 15254 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	7	15294	N19	E90	263	800	2.5
78	5	9	15294	N20	E62	265	1500	2.5
78	5	10	15294	N20	E50	264	1500	2.5
78	5	11	15294	N19	E37	264	1600	3.0
78	5	12	15294	N19	E19	263	1500	2.5
78	5	13	15294	N19	E09	263	1200	2.5
78	5	14	15294	N19	W03	262	1000	2.0
78	5	15	15294	N19	W18	262	1000	2.0
78	5	16	15294	N19	W29	263	1000	2.0
78	5	17	15294	N19	W42	263	1000	2.0
78	5	18	15294	N19	W55	263	1000	2.0
78	5	19	15294	N19	W70	265	1200	2.5
78	5	20	15294	N19	W84	266	600	1.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20027	N19	E60	265	(AP)	3	B	10	1	AXX
	N18	E47				B	10	1	AXX
	N18	W60				B	10	1	AXX
20039	N18	W77	271	(AP)	2				

MCMATH REGION 15296 CMP DATE 14.8

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	9	15296	S19	E72	255	2400	3.5
78	5	10	15296	S20	E59	255	2500	3.5
78	5	11	15296	S20	E44	257	2500	3.5
78	5	12	15296	S20	E26	256	3000	3.5
78	5	13	15296	S20	E15	257	3200	3.5
78	5	14	15296	S20	E02	257	3000	3.0
78	5	15	15296	S20	W13	257	2800	3.0
78	5	16	15296	S20	W24	258	2800	3.0
78	5	17	15296	S20	W36	257	3000	3.0
78	5	18	15296	S20	W49	257	2900	3.0
78	5	19	15296	S20	W61	256	2700	3.5
78	5	20	15296	S20	W74	256	2500	3.5
78	5	21	15296	S23	W90	257	400	1.5

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20028	S20	E67	258	(BP)	4	B	50	5	DSI
20028	S20	E55	257	(BP)	4				
20028	S21	E42	257	(BP)	5	M	130	8	DAO
20028	S21	E29	256	(BP)	4	B	110	13	DAI
20028	S21	E15	258	(BP)	4	M	200	18	EAI
20028	S21	E00	259	(BP)	4	B	140	34	DSI
	S21	W15				M	190	12	DAI
20028	S22	W29	258	(B)	3	R	80	11	DAO
20028	S23	W38	257	(B)	4	B	50	6	DSI
20028	S23	W50	256	(BP)	3	B	40	3	DSO
20028	S23	W65	259	(B)	2	B	120	8	DRI
20028	S24	W80	260	(AP)	2	B	40	3	CRO

MCMATH REGION 15298 CMP DATE 17.9 RETURN OF REGION 15255 AND PART OF 15244 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	11	15298	N20	E85	216	800	3.5
78	5	12	15298	N22	E66	216	3500	3.5
78	5	13	15298	N21	E55	217	4000	3.5
78	5	14	15298	N21	E42	217	4000	3.5
78	5	15	15298	N21	E28	216	4000	3.0
78	5	16	15298	N22	E18	216	4000	3.5
78	5	17	15298	N21	E06	215	4000	3.0
78	5	18	15298	N21	W07	215	3600	3.0
78	5	19	15298	N21	W20	215	3800	3.0
78	5		15298					
78	5	20	15298	N20	W33	215	3800	3.0
78	5	21	15298	N22	W46	213	4000	3.0
78	5	22	15298	N22	W58	213	3800	3.0
78	5	23	15298	N23	W72	213	3000	2.5
78	5	24	15298	N23	W85	214	1100	2.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
	N22	E80				M	100	3	CSO
20031	N21	E70	215	(B)	4	B	230	5	CKO
20031	N21	E58	215	(B)	4	M	220	12	DAO
20031	N21	E44	215	(B)	4	B	230	35	EKI
	N22	E26				M	230	28	EAI
20031	N20	E12	217	(B)	4	R	190	30	EAI
20031	N20	E02	217	(B)	4	B	100	9	EAO
20031	N21	W10	216	(B)	4	B	50	4	ESO
20031	N21	W22	216	(B)	4	B	60	9	ESO
20040	N17	W15	209	(AP)	3	B	10	2	AXX
20031	N20	W36	216	(B)	4	B	30	3	DRO
20031	N20	W49	216	(B)	4	B	10	2	BXO
	N17	W63				B	10	3	BXO

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MCMATH REGION 15301 CMP DATE 19.6 RETURN OF REGION 15246 ROTATION 3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	12	15301	S26	E84	198	1500	3.0
78	5	13	15301	S27	E75	197	1800	4.0
78	5	14	15301	S27	E63	196	2000	3.5
78	5	15	15301	S27	E48	196	2500	3.5
78	5	16	15301	S27	E39	195	2800	3.5
78	5		15301					
78	5	17	15301	S27	E27	194	3300	3.0
78	5		15301					
78	5	18	15301	S27	E14	194	3300	3.5
78	5		15301					
78	5	19	15301	S27	E01	194	3300	3.0
78	5		15301					
78	5	20	15301	S27	W12	194	3500	3.0
78	5		15301					
78	5	21	15301	S28	W26	193	3500	3.5
78	5		15301					
78	5	22	15301	S28	W40	195	3200	3.5
78	5	23	15301	S28	W53	194	2500	3.0
78	5	24	15301	S28	W66	195	1900	3.0
78	5	25	15301	S28	W78	194	1200	2.0
78	5	26	15301	S28	W90	193	500	1.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
	S26	E87				B	30	1	HSX
20034	S27	E76	197	(AP)	4	M	130	3	CSO
20034	S28	E61	198	(BP)	4	B	130	8	CSO
	S26	E46				M	150	5	CSO
20034	S28	E29	200	(AP)	4				
20036	S29	E40	189	X	1	R	160	11	CKO
20034	S27	E19	200	(AP)	4	B	80	2	HSX
20036	S29	E30	189	(B)	4	B	50	4	DSO
20034	S26	E06	200	(AP)	4	B	60	5	CSO
20036	S28	E18	188	(Y)	4	B	80	4	DSO
20034	S26	W08	202	(AP)	3	B	100	3	HSX
20036	S28	E05	189	(B)	3	B	100	13	DAO
20034	S26	W23	203	(AP)	3	B	30	7	CSI
20036	S30	W06	186	(AF)	4	B	20	6	CRI
20034	S27	W35	202	(Y)	3	B	70	10	CAI
20036	S30	W18	185	(AF)	3	B	0	1	AXX
20034	S27	W50	203	(BP)	3	B	120	13	DAI
	S26	W61				B	30	9	CRI
	S29	W73				M	40	4	CAO

MCMATH REGION 15300 CMP DATE 20.0 RETURN OF REGION 15248 AND PART OF 15244 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	12	15300	N17	E80	202	300	2.0
78	5	13	15300	N16	E77	195	1500	2.0
78	5	14	15300	N20	E68	191	3500	3.0
78	5	15	15300	N20	E55	189	3900	3.0
78	5	16	15300	N19	E45	189	4500	3.0
78	5		15300					
78	5	17	15300	N20	E33	188	5000	3.0
78	5	18	15300	N20	E20	188	5300	3.0
78	5	19	15300	N20	E07	188	5300	3.0
78	5		15300					
78	5	20	15300	N20	W07	189	5300	3.0
78	5	21	15300	N20	W20	187	5300	3.5
78	5	22	15300	N20	W30	185	4900	3.0
78	5	23	15300	N20	W42	183	4200	3.0
78	5	24	15300	N20	W55	184	3800	3.0
78	5	25	15300	N20	W70	186	3500	2.0
78	5	26	15300	N20	W82	185	2000	2.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20035	N12	E80	193	AP	3	M	90	1	HSX
20035	N12	E67	192	(AP)	3	B	120	1	HSX
	N19	E52				M	10	2	BXO
20035	N12	E36	193	(AP)	5	R	120	1	HSX
	N13	E41				R	120	1	HSX
20035	N12	E26	193	(AP)	4	B	70	1	HSX
20035	N12	E14	192	(AP)	5	B	80	1	HSX
20035	N12	E01	193	(AP)	5	B	80	1	HSX
20041	N18	E21	173	(AF)	2	B	20	3	BXI
20035	N12	W13	193	(AP)	5	B	80	1	HSX
20035	N12	W26	193	(AP)	5	B	50	1	HSX
20035	N12	W39	192	(AP)	3	B	70	1	HSX
	N11	W50				B	70	1	HSX
	N12	W66				M	30	1	HSX
20035	N12	W81	196	(AF)	3	R	40	1	HSX

MCMATH REGION 15324 CMP DATE 21.1

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	27	15324	S19	W85	174	300	3.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS

MCMATH REGION 15304 CMP DATE 21.2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	16	15304	S17	E65	169	300	2.5
78	5	17	15304	S17	E53	168	300	3.0
78	5	18	15304	S17	E37	171	300	3.0
78	5	19	15304	S17	E23	172	300	2.5
78	5	20	15304	S17	E10	172	300	2.0
78	5	21	15304	S18	W04	171	400	1.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20037	S17	E58	171	X	1	R	10	2	BXO

MCMATH REGION 15312 CMP DATE 21.2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT
78	5	21	15312	N37	W05	172	100	2.5
78	5	22	15312	N37	W15	170	200	1.0

SUNSPOT DATA

MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS

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MCMATH REGION 15317 CMP DATE 22.0

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	24	15317	S01 W33	162	200	2.0									
78	5	25	15317	S01 W45	161	100	1.0									

MCMATH REGION 15309 CMP DATE 22.2

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	19	15309	S14 E37	158	300	1.5									
78	5	20	15309	S14 E24	158	200	1.0									
78	5	21	15309	S15 E08	159	200	1.5									

MCMATH REGION 15323 CMP DATE 22.2

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	25	15323	N18 W44	160	100	1.5									
78	5	26	15323	N18 W59	162	200	1.5									

MCMATH REGION 15325 CMP DATE 22.7

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	5	27	15325	N18 W63	152	100	1.0									

MCMATH REGION 15313 CMP DATE 22.8

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	21	15313	S33 E16	151	300	3.0	20043	S32 E15	152	(8)	2	B	10	2	BXO
78	5	22	15313	S32 E04	151	200	3.0									
78	5	23	15313	S32 W10	151	100	2.5									

MCMATH REGION 15318 CMP DATE 23.5

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	5	24	15318	S15 W14	143	200	2.5		S16 W20				M	10	3	BXO
78	5	25	15318	S15 W26	142	400	2.0		S16 W26				R	10	5	BXO
78	5	26	15318	S15 W40	143	300	2.0									
78	5	27	15318	S15 W52	141	400	2.0									
78	5	28	15318	S15 W66	142	300	1.0									

MCMATH REGION 15307 CMP DATE 24.3 RETURN OF REGION 15265 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	5	18	15307	N26 E78	130	200	1.5									
78	5	19	15307	N27 E64	131	100	1.0									

MCMATH REGION 15320 CMP DATE 24.3

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	25	15320	N28 W16	132	200	2.0	20045	N28 W19	134	(AP)	1	R	10	5	BXO
78	5		15320					20046	N28 W05	120	X	1				
78	5	26	15320	N28 W29	132	300	2.0									
78	5	27	15320	N28 W42	131	200	1.5									
78	5	28	15320	N28 W56	132	200	1.0									
78	5	29	15320	N28 W70	133	200	1.0									
78	5	30	15320	N29 W87	137	300	1.0									

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MCMATH REGION 15305 CMP DATE 24.4 RETURN OF REGION 15252 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	5	17	15305	S30	E90	131	1800	2.5	20038	S30	E80	139	(AP)	2	B	60	1	HSX
78	5	18	15305	S31	E80	128	2000	2.5	20038	S30	E67	139	(AP)	4	B	70	3	HSX
78	5	19	15305	S30	E65	130	3000	3.0	20038	S29	E54	140	(AP)	4	B	60	2	HSX
78	5	20	15305	S30	E51	131	3000	3.0	20038	S30	E40	140	(Y)	3	B	50	4	CSO
78	5	21	15305	S31	E35	132	3000	3.0	20038	S30	E28	139	(AP)	3	B	50	3	HSX
78	5	22	15305	S30	E23	132	3000	3.0	20038	S29	E15	138	(AP)	3	B	80	4	CSO
78	5	23	15305	S30	E11	130	2800	2.5		S28	E03				B	70	1	HSX
78	5	24	15305	S30	W03	132	2600	3.0										
78	5	25	15305	S30	W12	128	2600	2.5	20038	S29	W22	137	(AP)	3	R	20	8	BXO
78	5		15305						20047	S33	W06	121	(AF)	2				
78	5	26	15305	S30	W25	128	2700	2.5	20038	S29	W36	138	(AP)	3	B	10	2	AXX
78	5	27	15305	S30	W39	128	2700	2.5		S31	W30				B	10	2	AXX
78	5	28	15305	S30	W52	128	2700	2.5										
78	5	29	15305	S30	W65	128	2000	2.5										
78	5	30	15305	S31	W78	128	900	2.5										
78	5	31	15305	S32	W90	127	500	1.0										

MCMATH REGION 15331 CMP DATE 25.6

CALCIUM PLAGE DATA									SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	29	15331	S22	W52	115	600	3.5	20055	S23	W55	117	(BP)	3	B	50	6	BXI
78	5	30	15331	S23	W66	116	1200	3.5	20055	S23	W69	117	(B)	3	R	50	9	BXO
78	5	31	15331	S24	W80	117	1500	3.0	20055	S23	W80	115	B	1	R	50	11	DRI
78	6	01	15331	S24	W90		100	1.0										

MCMATH REGION 15310 CMP DATE 25.8

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	5	19	15310	S17	E88	107	300	1.0										
78	5	20	15310	S17	E73	109	500	2.5	10042	S19	E70	110	(AF)	1	B	0	2	AXX
78	5	21	15310	S18	E58	109	700	3.0	20042	S18	E55	112	(B)	2	B	0	4	BXO
78	5	22	15310	S18	E43	112	1000	3.0	20042	S18	E39	114	(B)	3	B	20	3	BXO
78	5	23	15310	S18	E30	111	700	2.5		S17	E23				B	10	2	AXX
78	5	24	15310	S18	E17	112	700	2.0		S19	E11				M	20	4	BXO
78	5	25	15310	S18	E04	112	700	2.5		S23	W04				R	10	1	AXX
78	5	26	15310	S18	W10	113	600	2.5										
78	5	27	15310	S18	W23	112	600	2.5										
78	5	28	15310	S18	W35	111	600	2.5										
78	5	29	15310	S18	W48	111	600	2.0										
78	5	30	15310	S18	W63	113	600	2.0										
78	5	31	15310	S18	W77	114	600	1.0										

MCMATH REGION 15315 CMP DATE 26.9

CALCIUM PLAGE DATA									SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	22	15315	S25	E59	96	100	1.5										

MCMATH REGION 15334 CMP DATE 27.5

CALCIUM PLAGE DATA									SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	30	15334	N35	W39	89	200	3.0										
78	5	31	15334	N35	W53	90	600	2.5	20059	N33	W40	75	(B)	3	R	30	3	BXO
78	6	01	15334	N35	W65		600	2.0										
78	6	02	15334	N34	W80		400	2.0										

MCMATH REGION 15327 CMP DATE 27.7

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	5	27	15327	S16	E02	87	100	1.5	20053	S17	W01	89	(AP)	2	B	10	3	AXX
78	5	28	15327	S16	W11	87	100	1.5										

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MCMATH REGION 15321 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	25	15321	S17 E35	81	100	1.0									
78	5	26	15321	S17 E23	80	200	2.0	20052	S16 E22	80	(B)	2	B	10	2	BXO
78	5	27	15321	S16 E10	79	400	2.5	20052	S17 E08	80	(BF)	3	B	20	12	CRI
78	5	28	15321	S17 W03	79	400	3.0	20052	S17 W05	80	(B)	3	B	20	9	CRO
78	5	29	15321	S17 W16	79	600	3.0	20052	S17 W18	80	(BP)	2	B	60	12	BXI
78	5	30	15321	S17 W30	80	500	2.5	20052	S17 W34	82	(BF)	3	R	30	10	BXO
78	5	31	15321	S17 W44	81	800	3.0	20052	S15 W47	82	(BP)	4	R	60	16	CRI
78	6	01	15321	S16 W58		1000	3.5	20052	S16 W62		(B)	4	B	160	21	C
78	6	02	15321	S16 W72		1000	3.0	20052	S17 W75		(BP)	3	B	130	4	C
78	6	03	15321	S16 W85		600	3.5	20052	S17 W86		(AF)	2				

MCMATH REGION 15340 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	6	03	15340	S26 W67		100	1.5									
78	6	04	15340	S26 W78		100	1.0									

MCMATH REGION 15314 CMP DATE 28.4 RETURN OF REGION 15266 ROTATION 2 AND 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	5	21	15314	N18 E88	79	1500	3.5	20044	N18 E80	87	(BP)	3	B	70	2	CSO
78	5	22	15314	N18 E75	80	5100	3.5	20044	N18 E67	86	(BP)	4	B	480	5	DKC
78	5	23	15314	N18 E60	81	8200	3.5		N18 E67				B	70	7	CSO
78	5	24	15314	N18 E50	79	10000	3.5		N17 E40				M	640	37	FKC
78	5		15314						N25 E56				M	120	1	HSX
78	5	25	15314	N18 E37	79	11000	3.5	20044	N18 E32	83	(D)	5	R	760	57	FKC
78	5		15314					20048	N24 E21	94	(AP)	2				
78	5		15314					20049	N26 E49	66	(AP)	5	R	100	3	CSO
78	5	26	15314	N18 E24	79	11300	3.5	20044	N18 E18	84	(D)	5	B	650	52	FKI
78	5		15314					20048	N23 E08	94	(B)	3	B	20	7	BXI
78	5		15314					20049	N27 E36	66	(AP)	5	B	100	5	CSO
78	5	27	15314	N18 E12	77	12000	3.5	20044	N18 E06	82	(D)	5	B	580	50	FKI
78	5		15314					20048	N23 W05	93	(BY)	4	B	70	21	DAI
78	5		15314					20049	N27 E23	65	(Y)	5	B	10	9	CSO
78	5	28	15314	N18 W02	78	10700	3.5	20044	N18 W07	82	(D)	5	B	480	40	FKI
78	5		15314					20048	N23 W18	93	(BY)	4	B	100	19	DAI
78	5		15314					20049	N27 E09	66	(BF)	6	B	80	8	CSO
78	5	29	15314	N18 W15	78	10300	3.5	20044	N18 W24	86	(D)	5	B	500	35	FKI
78	5		15314					20048	N23 W32	94	(B)	4	B	220	16	DAI
78	5		15314					20049	N26 W04	66	(BF)	5	B	80	7	CSO
78	5	30	15314	N18 W30	80	11500	3.5	20044	N17 W36	84	(Y)	5	R	550	45	FKC
78	5		15314					20048	N23 W45	93	(B)	4	R	150	7	DAO
78	5		15314					20049	N25 W17	65	(BF)	5	R	130	2	CSO
78	5	31	15314	N18 W42	79	11400	5.0	20044	N17 W50	85	(Y)	5	R	360	24	FKI
78	5		15314					20048	N23 W59	94	(B)	4	R	110	7	DAO
78	5		15314					20049	N24 W29	64	(AP)	5	R	90	1	HSX
78	6	01	15314	N19 W55		10500	3.5	20044	N17 W65		(Y)	5	B	260	12	D
78	6	01	15314					20048	N22 W72		(B)	4				
78	6	01	15314					20049	N25 W42		(Y)	5				
78	6	02	15314	N18 W68		9500	3.0	20044	N17 W79		(BP)	3	B	260	6	B
78	6	02	15314					20049	N24 W55		(BP)	5				
78	6	03	15314	N18 W80		6500	3.0	20049	N25 W62		(AP)	4				
78	6	04	15314	N19 W85		4500	1.5	20049	N25 W83		(AP)	3	B	50	1	H

MCMATH REGION 15316 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	6	01	15316	N27 W39		1600	2.0						B	140	19	C
78	6	02	15316	N28 W53		1300	2.0						B	150	11	C
78	6	03	15316	N28 W66		1500	2.5						B	120	3	C
78	6	04	15316	N27 W79		1200	2.5									

REGIONS OF SOLAR ACTIVITY

MAY 1978

MCMATH REGION 15335 CMP DATE 29.6

				CALCIUM PLAGE DATA						SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	5	30	15335	S17 W12	62	300	2.0	20057	S17 W14	62	(B)	4	R	40	12	BXO
78	5	31	15335	S17 W26	63	700	2.5	20057	S17 W27	62	(BP)	3	R	70	12	DRO
78	6	01	15335	S17 W39		900	2.5	20057	S17 W41		(B)	3	B	40	20	B
78	6	02	15335	S17 W52		900	3.0	20057	S17 W55		(B)	3	B	20	9	B
78	6	03	15335	S17 W65		1500	2.5	20057	S16 W68		(AF)	3	B	60	8	B
78	6	04	15335	S17 W78		1500	3.0									
78	6	05	15343	S16 W66		200	1.5									

MCMATH REGION 15332 CMP DATE 30.4

				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	5	29	15332	S18 E12	51	300	1.5									
78	5	30	15332	S18 W03	53	300	1.5	20058	S19 W04	52	(AP)	3	R	20	10	BXO
78	5	31	15332	S19 W12	49	300	1.5	20060	S20 W14	49	(AF)	3	R	10	2	AXX

MCMATH REGION 15328 CMP DATE 31.0

				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	28	15328	S10 E33	43	200	1.0		S08 E33				B	10	1	AXX
78	5	29	15328	S10 E20	43	200	1.0									
78	6	01	15332	S19 W26		400	2.5	20060	S18 W20		(B)	3	B	30	11	B
78	6	02	15332	S23 W40		500	2.0	20060	S18 W43		(B)	3	B	10	5	B
78	6	03	15332	S18 W53		700	2.0						B	10	1	A
78	6	04	15332	S18 W65		500	2.0									
78	6	05	15332	S18 W78		500	1.5									

MCMATH REGION 15319 CMP DATE 31.3

				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	24	15319	N19 E87	42	600	1.0									
78	5	25	15319	N20 E76	40	1800	3.0	20050	N18 E75	40	(AP)	2				
78	5		15319					20051	N22 E79	36	(B)	2	R	10	4	BXO
78	5	26	15319	N21 E64	39	2500	4.0	20050	N20 E60	42	(AP)	3	B	130	9	CAI
78	5		15319					20051	N26 E69	33	(AP)	2	B	10	4	BXO
78	5	27	15319	N21 E52	37	3100	3.0	20050	N23 E49	39	(BF)	4	B	160	21	CKI
78	5	28	15319	N21 E38	38	3100	3.0	20050	N22 E37	38	(BP)	3	B	90	18	DRO
78	5	29	15319	N21 E25	38	2800	3.0	20050	N21 E22	40	(BY)	3	B	60	11	CRI
78	5	30	15319	N21 E10	40	3200	3.0	20050	N20 E09	39	(AP)	3	R	110	36	DRI
78	5	31	15319	N21 W02	39	3000	3.0	20050	N21 W04	39	(Y)	4	R	140	34	DRI
78	6	01	15319	N21 W15		3300	3.5	20050	N21 W16		(B)	4	B	100	55	D
78	6	02	15319	N21 W29		3000	3.5	20050	N21 W30		(B)	4	B	270	26	D
78	6	03	15319	N22 W42		3200	3.5	20050	N22 W43		(BP)	3	B	250	30	E
78	6	04	15319	N22 W55		3500	3.5	20050	N22 W58		(B)	4	B	100	6	D
78	6	05	15319	N23 W69		3500	3.5	20050	N23 W72		(B)	3	B	100	16	D
78	6	06	15319	N23 W82		2800	3.5	20050	N25 W80		(AF)	2	B	40	7	C

MCMATH REGION 15343 CMP DATE 31.3

				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	6	04	15343	S16 W55		200	2.0									

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on May 5 and 8, 1978.
No sunspot observations were made at Mt. Wilson on May 15, 23, and 24, 1978.

DAILY CALCIUM PLAGE INDEX

MAY 1978

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
78	5	1	46.8	78	5	11	30.1	78	5	21	42.5
78	5	2	50.2	78	5	12	33.6	78	5	22	38.5
78	5	3	50.7	78	5	13	37.8	78	5	23	35.1
78	5	4	47.2	78	5	14	37.9	78	5	24	37.5
78	5	5	*	78	5	15	37.9	78	5	25	40.8
78	5	6	36.6	78	5	16	42.5	78	5	26	46.9
78	5	7	33.6	78	5	17	42.4	78	5	27	52.5
78	5	8	*	78	5	18	42.0	78	5	28	50.0
78	5	9	31.1	78	5	19	42.7	78	5	29	48.5
78	5	10	31.0	78	5	20	40.8	78	5	30	52.2
								78	5	31	58.1

* NO OBSERVATIONS

SUDDEN IONOSPHERIC DISTURBANCES

MAY 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	1115	1143	1126	1	3			2					1109	15266
01	1725	1815	1733	1	5	1			1		13		1727E	15266
01	1916	2258	2008	2+	5	3	1	1	2		13		1910E	15266
01	1951	2103	1958	1-	3			1			4		1955	15252
02	0057	0345D	0144	2	5	1		1	1		1		0048	15266
02	0346	0407	0352	1-	5	1		1	1		1		0347E	15266
02	0612	0806D	0618	1+	5			2	3		1		0616E	15280
02	0642	0644D	0644	1-	3			2	2				0639E	15266
02	0811	0900	0825	1	3	1		1			3		NF	
02	1148	1200	1151	1	5			3	2		1		1130	15252
02	1218	1305	1228	1-	5	2		3	2		2		1200	15266
02	1304	1316	1307	1-	1			1					1307	15252
02	1332	1359	1334	1-	3	1					1		1330	15266
02	1437	1515	1442	1-	1				1		1		1432	15252
02	2200	2243	2206	1-	1				1				2205	15266
02	2306	2342	2320	1-	1				1				2314E	15266
03	0123	0208	0130	1-	1				1				0122	15280
03	0403	0454	0410	1-	1				1				*	
03	1137	1345	1150	1-	5	1		5	4		2		1126	15252
03	1406	1523	1424	1-	1				1		1		1355	15266
03	1657	1815	1710	1	5	3		5	3		13		1655	15266
03	1815	1915	1819	1-	1	1							1815	15266
03	2020	2105	2027	1-	5	1			1		5		2020	15266
04	0142E	0205D	0155	1-	5	1		1	1		1		0150	15266
04	0255E	0422D	0302	1	5	1		1	1		1		0259	15266
04	0638	0806	0700	1	3			1	1				0638	15266
04	0955	1040	1007	1	5	1		3	4		1		0952	15266
04	1239	1246D	1246	1-	1				1		1		*	
04	1308	1350	1320	1+	5	3		5	3		2		*	
04	1400	1525	1425	1-	3	1			1		1		*	
04	1543	1615	1547	1-	1				1		1		*	
04	1620	1715	1626	1-	1				1		1		*	
05	0008	0108	0014	1-	1				1				*	
05	1027	1154	1034	1+	5	3		3	3		2		1028	15266
05	1538	1555	1543	1-	5			4	2		3		1537	15266
05	1647	1725	1654	1-	3			2	1		1		*	
05	1759	1857	1805	1-	5				1		4		*	
05	1915	1938	1921	1-	1	1							*	
05	2113	0019	2128	1	1				1				*	
05	2156	2301	2216	1-	3			1	1		1		*	
06	0133	0307	0216	1-	1				1				NF	
06	0409	0558	0437	1-	1				1				*	
06	0930	0945	0934	1-	5	1			3		2		*	
06	1142	1230	1158	1-	3			1			7		1140E	15266
06	1255	1330	1303	1-	5						8		1255	15266
06	1543	1610	1555	1	3			1			3		1535	15266
06	1726	1840	1734	1	5						5		NF	
06	1900	1936	1907	1-	1	1							*	
06	2004	2151D	2032	2+	5	3	1	2	1		8		*	
06	2142	2300D	2158	1	1				1				*	
06	2220E	2252	2234	1-	1				1				*	
07	0323	0625D	0422	3-	3	2			1		1		0336E	15266
07	0625E	0753	0633	1+	5	1		2	2				0625	X-RAY
07	0834	0842D	0842	1	5	2		3	2				0835	15266
07	0856	0900D	0900	1	3	1		2	1				0854	X-RAY
07	1113	1220	1130	1+	5	2	1	4	3		2		1111	X-RAY
07	1236	1240D	1240	1-	5			2	2		1		1237	15266
07	1316	1410	1325	1-	3			1	1		1		1318	15266
07	1435	1520	1436	1-	5	1		3	2		9		1425	15266
07	1513	1517D	1517	1-	1				1		1		1512	15266
07	1553	1655	1606	2	5	5	1	7	3		13		1544	15266
07	1640	1650	1651	1-	5	3					3		NF	
07	1703	1900	1711	1-	5	1	2		2		9		1702	X-RAY
07	1904	1930U	1910	1-	3		1				1		1902	X-RAY

SUDDEN IONOSPHERIC DISTURBANCES

MAY 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
08	0643	0700	0650	1+	5	2		6	3		1		0645	X-RAY
08	1110	1127D	1127	1	5	2		1	2		5		NF	
08	1205	1530	1242	2	5	4	1	4	3		2		1212	15266
08	1511	1524	1518	1-	1			1	1				*	
08	1648	1740	1651	1-	3	1					5		*	
09	0115	0211D	0144	1-	1				1				*	
09	0408E	0536	0414	2	5	1		1	1		1		0409	X-RAY
09	0708	0755	0727	2	3	2	1		2				NF	
09	1208	1348	1231	1+	5	2	1	4	3		2		1201	X-RAY
09	1425	1650	1445	3	5	6	2	5	2		12		1442E	15266
10	0739	0932	0806	1-	1				1				0734	X-RAY
10	1240	1302	1251	1-	1			1					*	
10	2210	2235	2212	1-	1	1							2200	X-RAY
11	0251	0353	0315	1-	1				1				0247	X-RAY
12	0508	0535	0516	1-	1				1				0507	X-RAY
12	1232U	1315	1233	1-	1			1					*	
12	1529	1557	1536	1-	1			2					*	
13	0740	0810	0753	1	5	2		2	3		1		0805	15294
14	1352	1420	1406	1	5	1	1	2	2		9		1345	X-RAY
16	0447	0542	0450	1-	1				1				0444	X-RAY
16	1610	1721	1637	1-	5	1		2	1		9		1626E	15291
16	1750	1819	1801	1-	1			1					1758	15298
17	0355	0456	0400	1-	1				1				0355	X-RAY
17	1235	1415	1245	1-	5	3	1	4	3		4		1233	15292
17	1510	1700	1517	2+	5	5	1	5	3		13		1504	15301
18	0218	0320	0230	1-	1				1				0215	X-RAY
18	0622	0712	0636	1-	1				1				0622	X-RAY
18	1158	1330	1208	1-	5	2	1	1	3		2		1159E	15303
18	1434	1452	1439	1-	1				1				*	
19	1850	1920	1900	1-	1	1							1842	15296
19	2107	2211	2116	1-	5	2	1	1	1		10		*	
19	2310	2349	2322	1-	5	2			1		10		NF	
20	0023	0135D	0052	1-	3	2			1				*	
20	0132	0231D	0139	1-	3	1			1				0132	X-RAY
20	0231E	0332	0237	1-	1				1				0226	15296
20	1237	1320	1254	1-	1				1		1		*	
20	1833	1925	1843	1	5	1		1			10		1832	X-RAY
20	2238	2322D	2245	1-	1				1				2238	X-RAY
21	0037	0102D	0046	1-	1				1				0036	X-RAY
21	0432	0530D	0441	1-	1				1				0430	X-RAY
21	0538E	0807	0551	1+	3	1		1	2		1		NF	
21	1700	1820	1720	1	3						6		NF	
21	1717	1743	1720	1	1	1							1716	15314
21	2000	2128	2013	1	1					1			*	
21	2044	2136	2100	1-	1					1			2044	X-RAY
21	2230	2250D	2250	1	5						8		*	
21	2302	0042	2331	1-	5			1		1	3		*	
21	2345	0032	2350	1-	5	1		1			5		2349	X-RAY
22	0201	0313	0209	1	3	1			1		1		0201	X-RAY
22	0601E	0706D	0607	1-	1				1				*	
22	0706E	0908	0716	1-	1				1				0707	X-RAY
22	1502	1625	1522	1-	5		1	1	1		12		1459	15314
22	1532	1606	1541	1-	3						3		1522	15314
22	1625	1700	1631	1-	5		1	1	1		9		1625	15301
22	2123	2140	2130	1-	1	1							*	
23	0016	0330	0034	2	5	1		1	1		3		0015	15314
23	1952	2045	2006	1-	3						4		1949	X-RAY

SUDDEN IONOSPHERIC DISTURBANCES

MAY 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
24	0202	0247	0216	1-	1				1				*	
24	1721	1728D	1728	1-	1	1							*	
24	1755	1910	1804	1-	5	2		1	1		12		1750	X-RAY
24	1907	2052	1928	1	5	2	1	1	2		11		1901	15314
24	2243	2317	2251	1-	1				1				2241	X-RAY
25	0334	0436	0346	1-	1				1				0332	X-RAY
25	0538	0738	0621	1-	1				1				0537	X-RAY
25	0846	1002	0858	1-	1				1				*	
25	1250	1329	1310	1	1			1					*	
26	0043	0200	0055	1-	1				1				0041	15314
26	0548	1014	0651	2	1				1				*	
26	0605	0858	0650	1-	3			1	1				*	
26	1236	1255D	1255	1-	1				1		1		1241	15319
26	1330	1455	1343	1-	1				1		1		1323	15319
26	1604	1625	1609	1-	3	1		2					1604	15319
26	1748	1945	1757	2	5	5	2	6	3		12		1744E	15319
27	0320	0346	0325	1-	1			1					0318	X-RAY
27	0551	0724	0556	1-	5			2	2				NF	
27	0810	1004D	0816	1-	5	3		2	3		1		0808	X-RAY
27	1005	1150	1020	1	5	3	1	3	4		2		1013E	15319
27	1116	1125	1119	1-	1			1	1				*	
27	1620	1743	1632	1-	5	4		3	2		10		1620	15319
28	0718	0900	0732	1	5	3		2	3		1		0716E	15314
28	1036	1205	1117	1-	5	2	1	3	3		3		1044E	15314
28	1316	1455	1346	1+	5	6	1	3	3		12		1310	15314
28	1458	1715	1505	3	5	7	2	6	3		13		1451	15314
28	2034	2138	2042	1-	1				1				2033	X-RAY
29	0016	0054	0023	1-	1				1				0014	X-RAY
29	0125	0202	0134	1-	1				1				0124	X-RAY
29	0659	0739	0704	1-	1				1				0655	X-RAY
29	1045	1250	1115	1-	5	1		1	3		1		1040	15314
29	1515	1617	1520	1-	1				1				1512	15314
29	1759	1915	1802	1	5	4	2	3	3		12		1740E	15314
29	2112	2240	2147	1-	1				1				*	
29	2144	2237	2151	1-	1				1				*	
30	0407	0530	0420	1-	1				1				0411E	15314
30	0551E	1056	0724	1-	1				1				*	
30	0615	0929	0728	1	5			2	2				0620	15314
30	0650	0812	0724	1-	1				1				0655E	15314
30	0712	0925	0724	2	5	4	1	7	2		2		0716	15314
30	1000	1040	1009	1-	3			1	1				1001	15314
30	1525	1630	1530	1-	5	6	1	4	2		12		1523	15314
30	1730	1805	1737	1	1	1							1737	15319
30	1925	2118	1933	2	5	3	1	1	1		11		1727E	15314
30	2237	2241D	2241	1	1		1						*	
30	2254	2335	2307	1	1	1							*	
31	0156	0230	0209	1-	1				1				0156	X-RAY
31	0732	1019D	0739	1	5	2		5	2		1		0733E	15314
31	1016	1430	1058	2+	5	5	1	4	3		1		1014	15314
31	1135E	1230	1154	1	1				1				1130	15335

SUDDEN IONOSPHERIC DISTURBANCES

MAY 1978

PERIODS OF NO OBSERVATIONS:

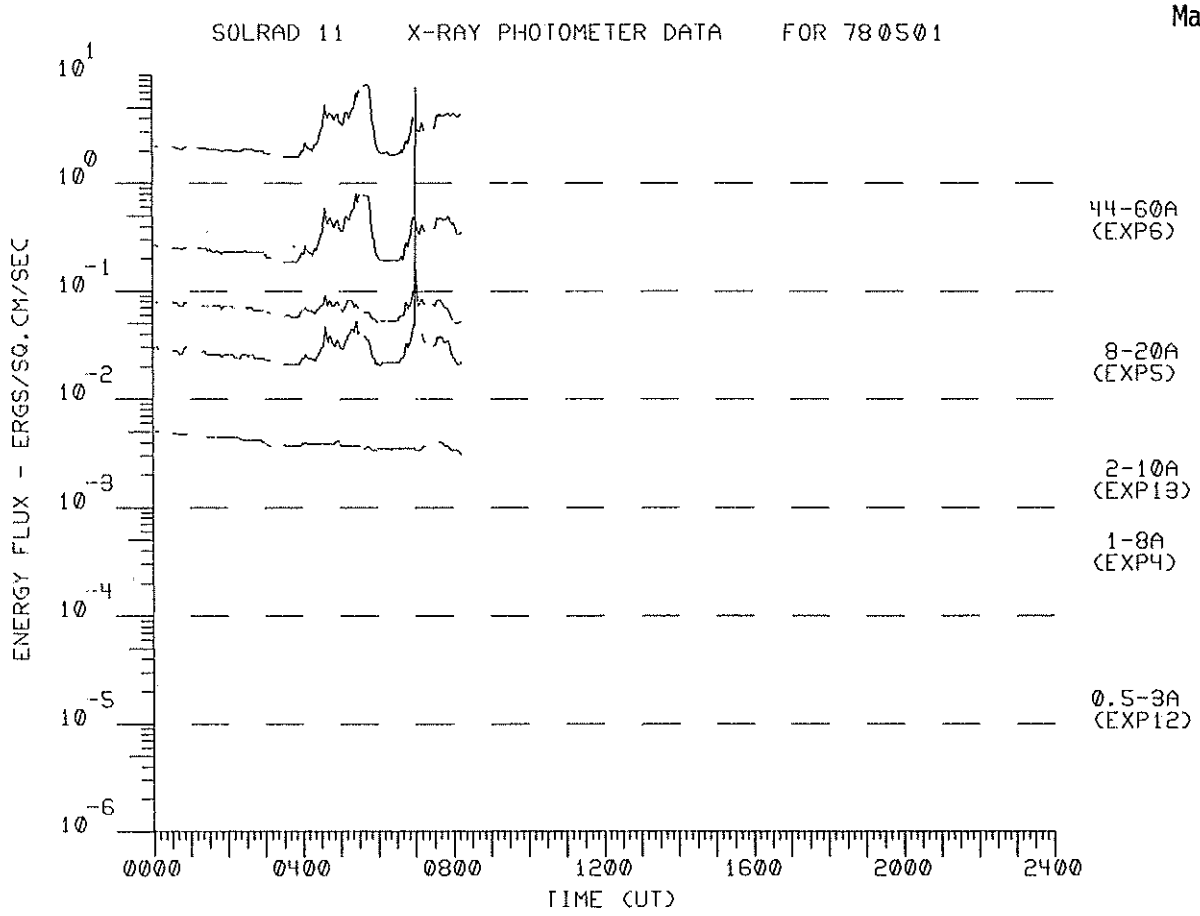
DATE	TIME (UT) and STATION
01-31	0000-2400 A30, 0000-2400 A40
01-20	0000-2400 A46
01	1828-1837 TM
02	1040-1355 UM (16 kHz), 2028-2102 UM (13 kHz)
04-13	0000-2400 A34
06	0737-2122 TM
09	1011-1340 UM (16 kHz), 1704-1900 UM (16 kHz), 1704-1900 UM (13 kHz)
10	0715-0750 UM (13 kHz)
16	1001-1330 UM (16 kHz)
17	0714-0758 UM (13 kHz)
19	0000-2400 TN
20-31	1600-2400 A5
21	0000-2400 TN
22	1544-1557 TM
29	1605-1940 UM (13 kHz)
30	2054-2112 TM

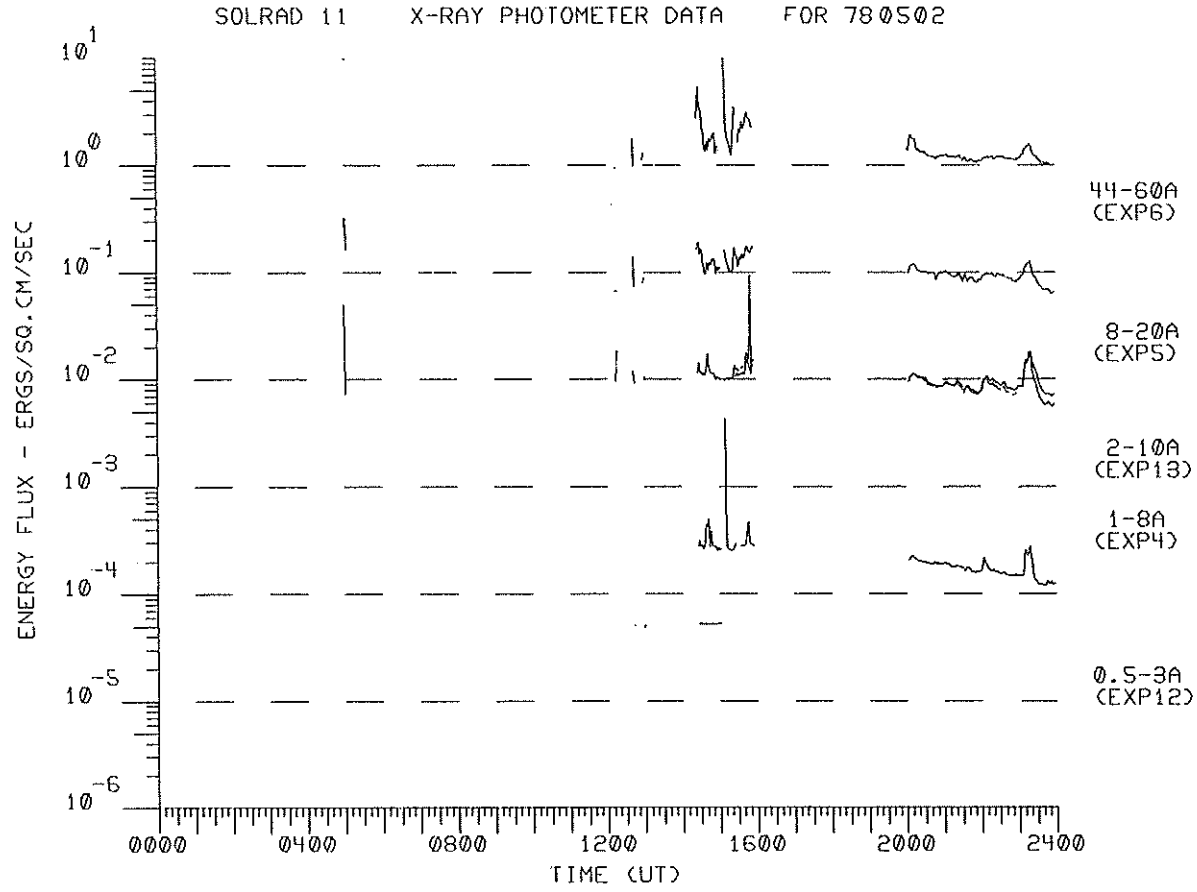
STATIONS REPORTING FOR MAY 1978

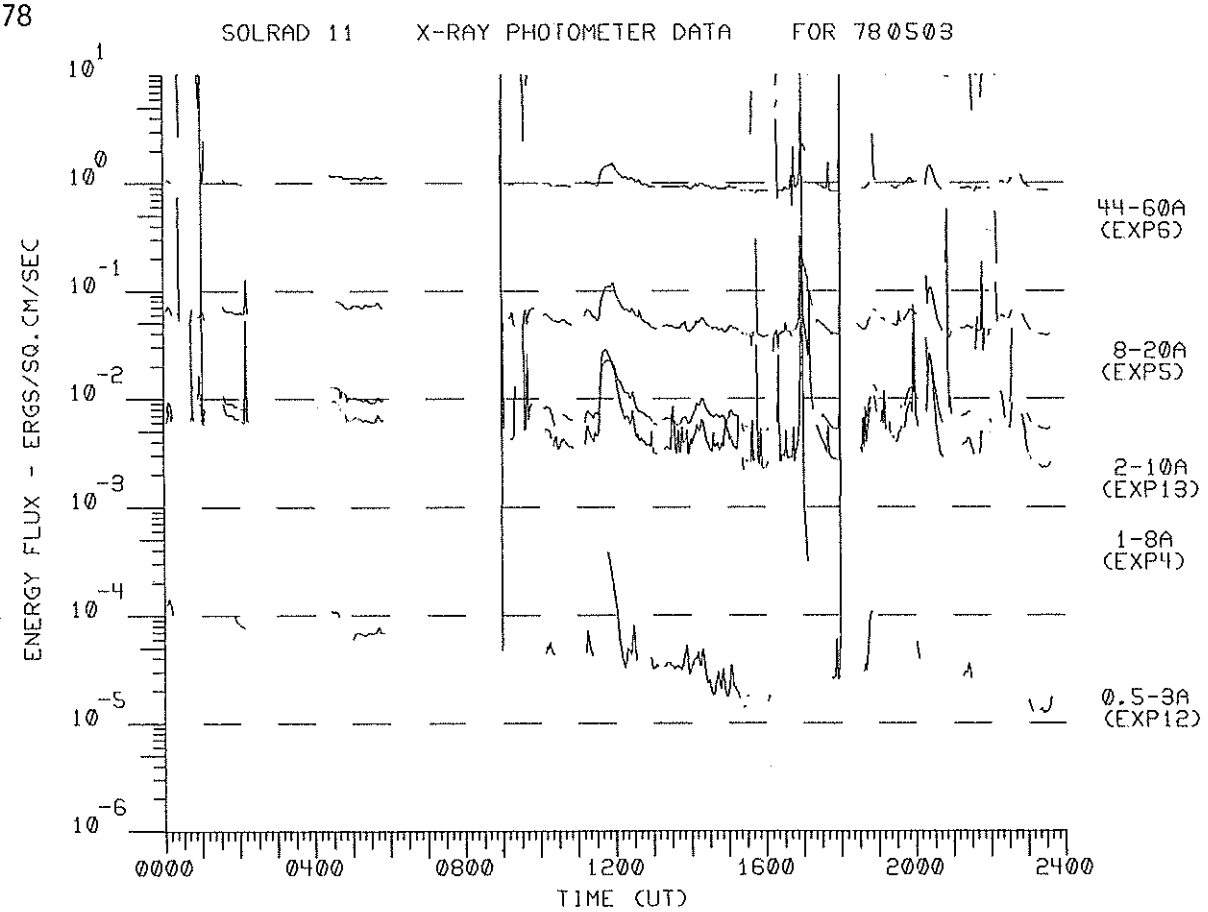
AAVSO (A1, A5, A19, A21, A26, A28, A30, A31, A34, A37, A40, A45, A46) (SES) (A1, A31) (SEA) (A31) (SWF)
BEARLY (BY) (SWF)
CHILWORTH (CL) (SCNA)
DARMSTADT (DA) (SWF)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
JULIUSRUH (JH) (SWF)
KUHLUNGSBORN (KU) (SES, SPA)
MC MATH (MC) (SWF, SCNA)
NEW JERSEY (NJ) (SES)
PANSKA VES (PU) (SEA,SES)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TORINO (TN) (SPA)
UPICE (UI) (SEA)
VSETIN (VS) (SEA)

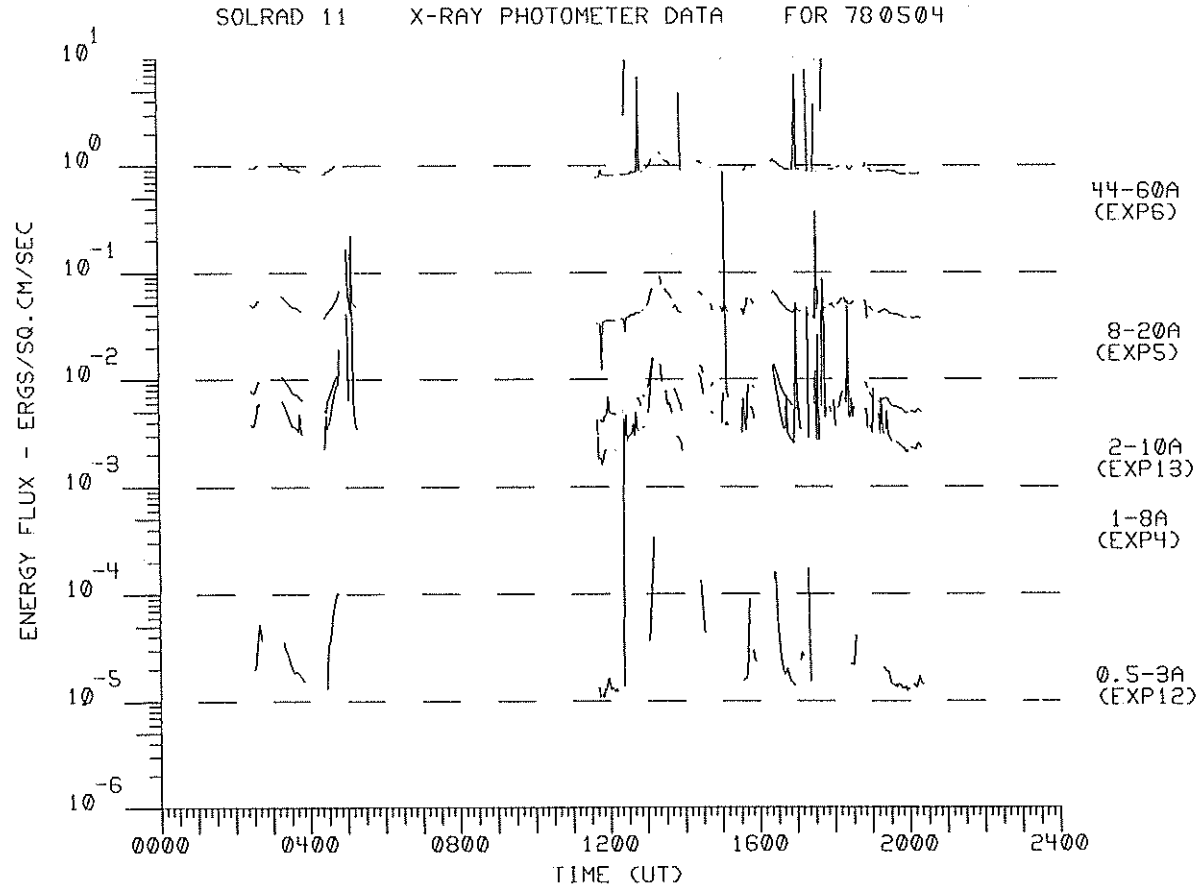
SIDs BY McMATH REGION

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
REGION																															
15252	1	3	1																												
15266	3	7	4	4	2	3	7	1																							
15280		1	1																												
15291																1															
15292																	1														
15294													1																		
15296																			1	1											
15298																1															
15301																	1					1									
15303																		1													
15314																					1	2	1	1		1		4	3	7	2
15319																										4	2			1	
15335																															1
X-RAY							5	1	2	2	1	2		1		1	1	2		3	4	2	1	2	2		2	1	3		1
UNKNOWN		1				2	1	1	1										1		2						1				
NO FP			1	5	6	6		2	1	1		4						1	1	2	3	2		2	2	2	1		2	3	

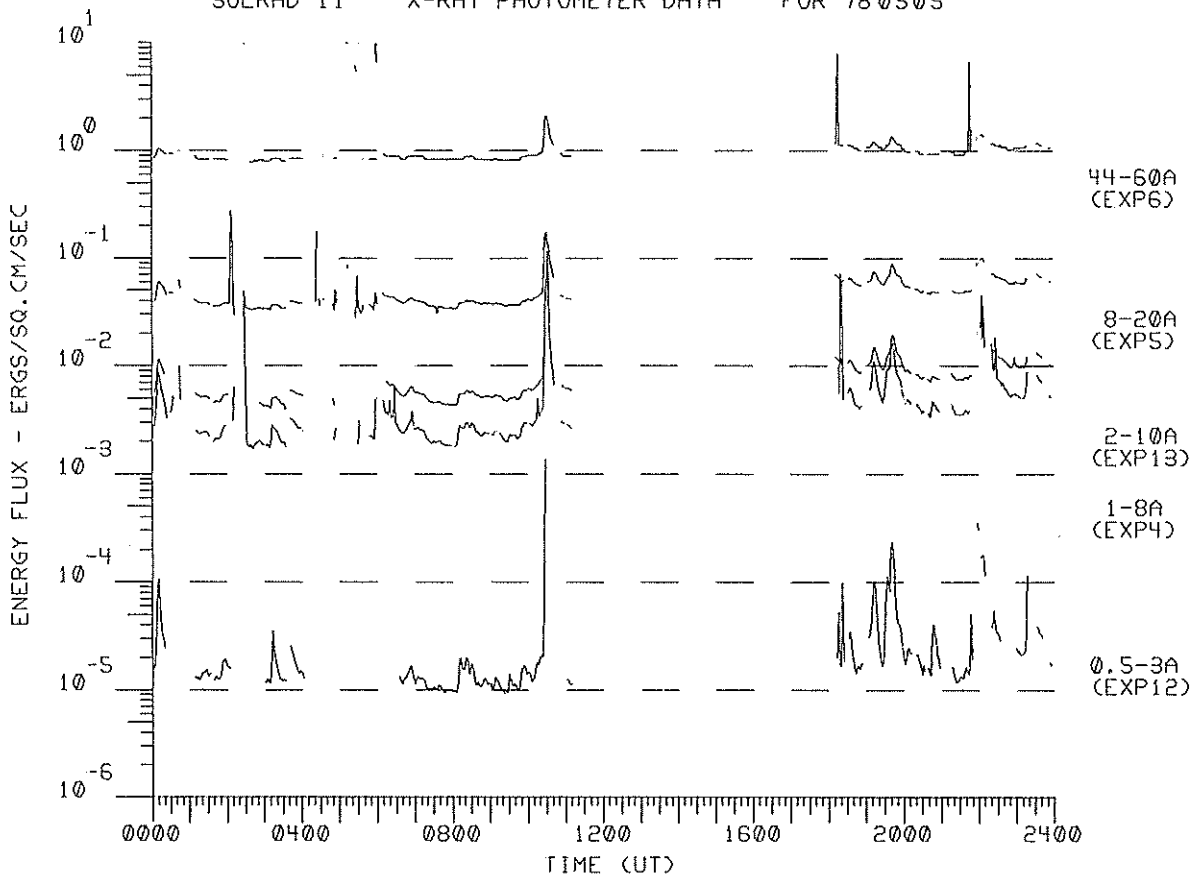

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780501
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780502
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)

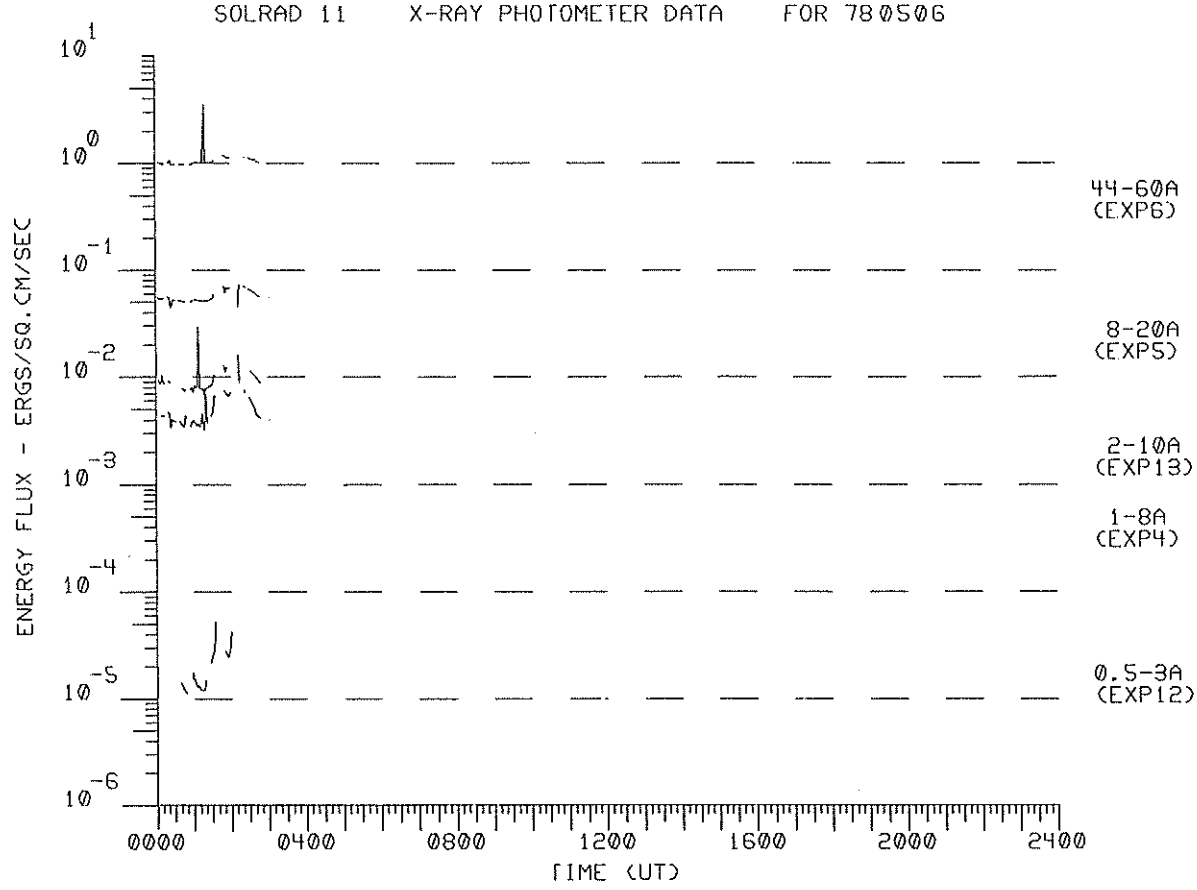

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780503
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

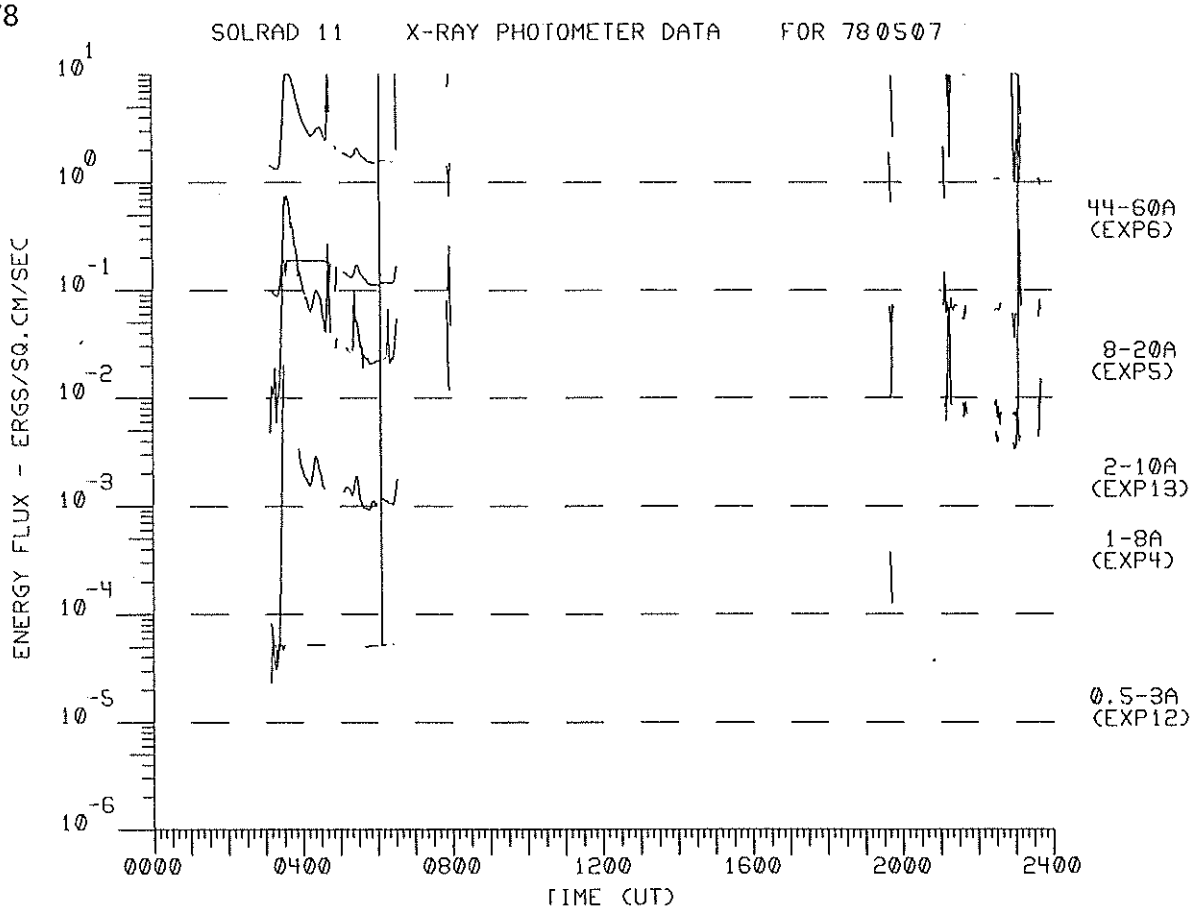

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780504
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

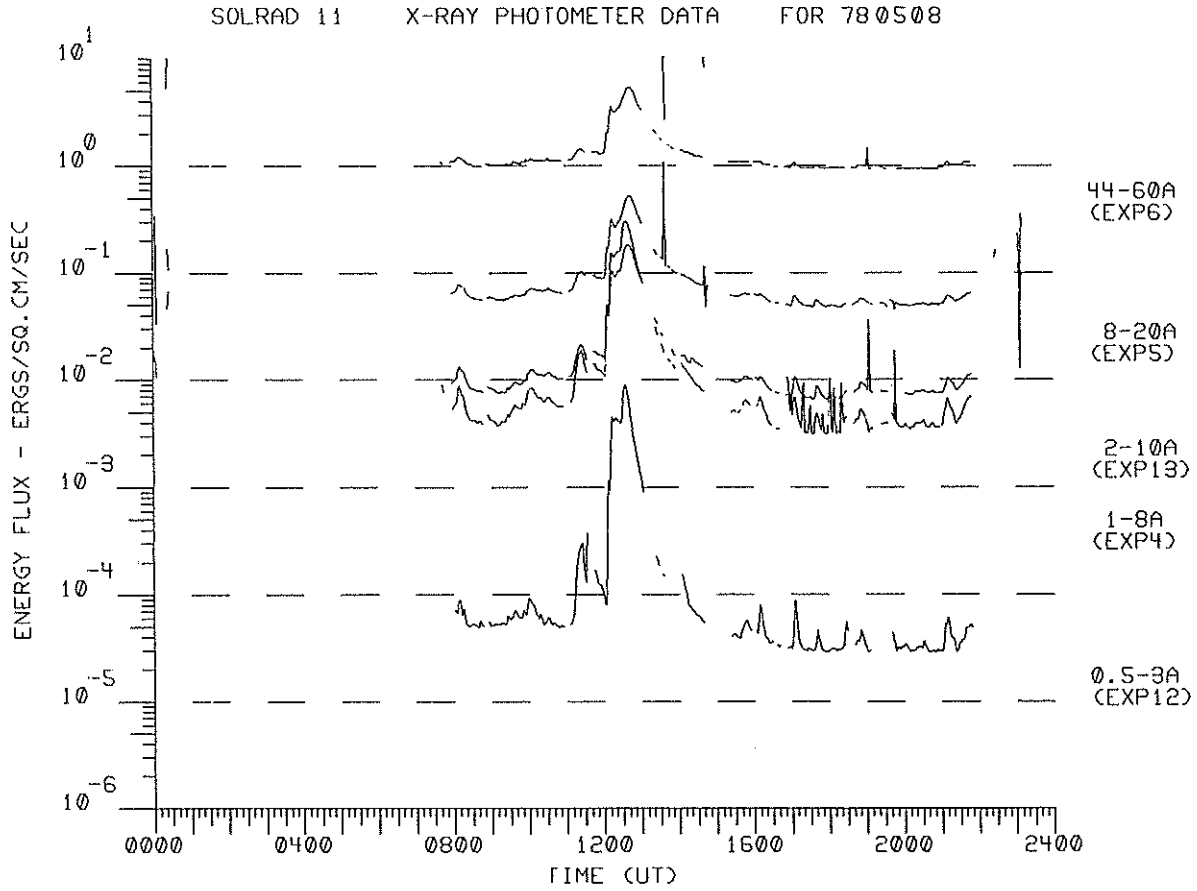
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780505

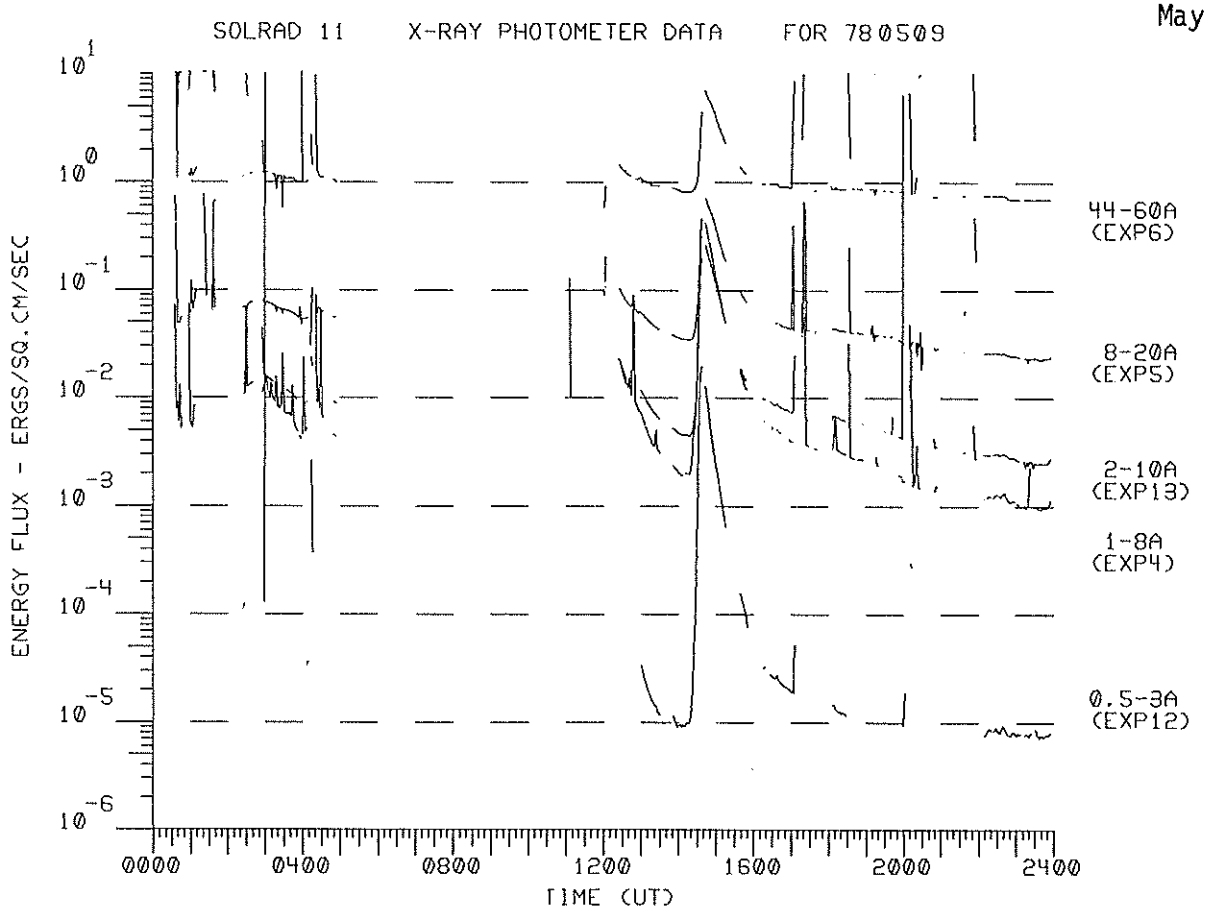


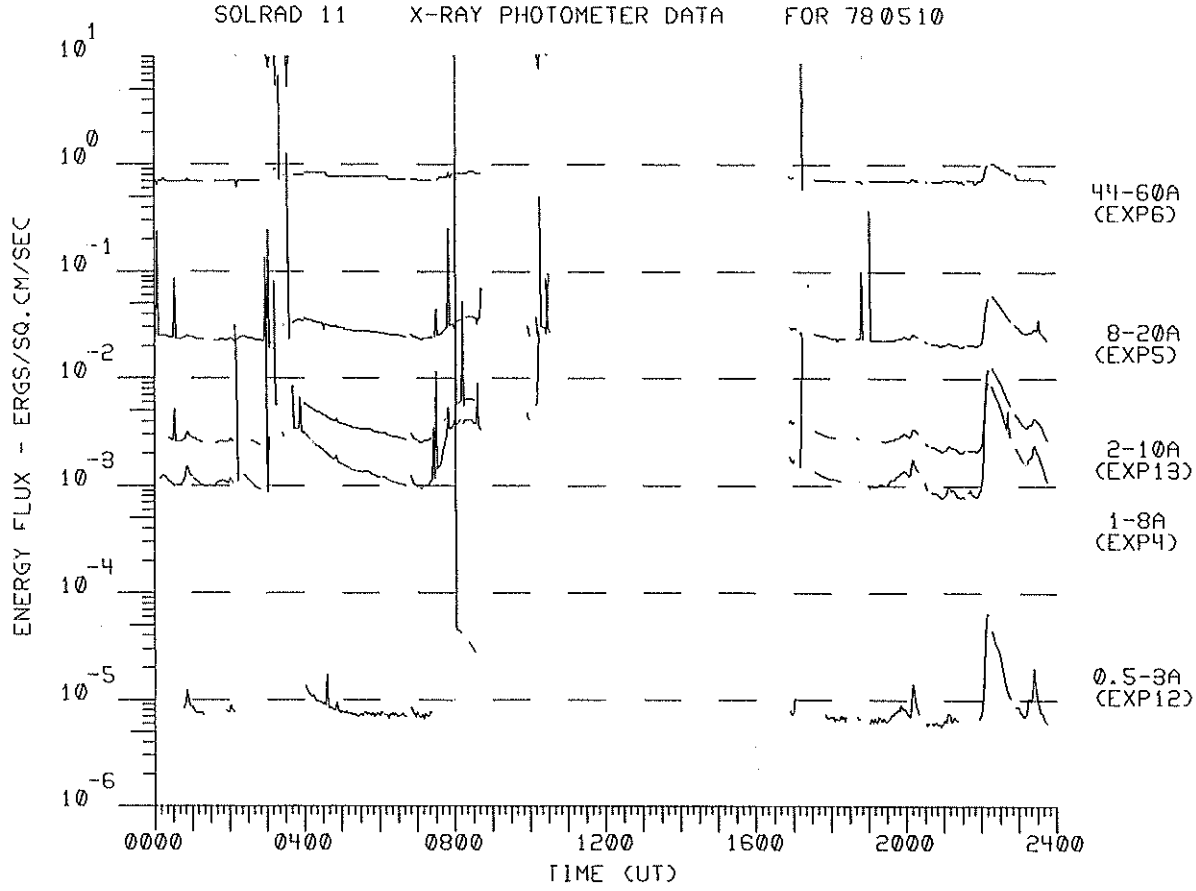
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780506

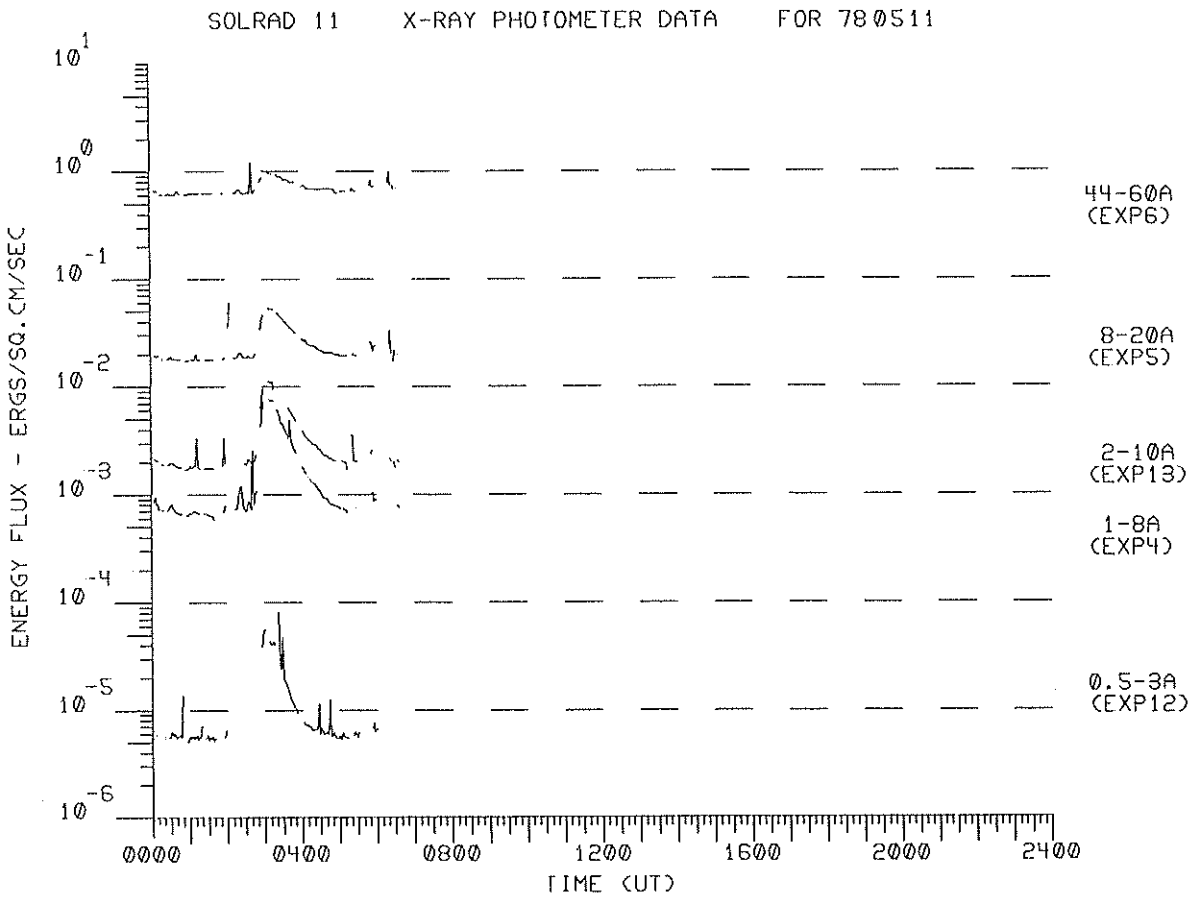


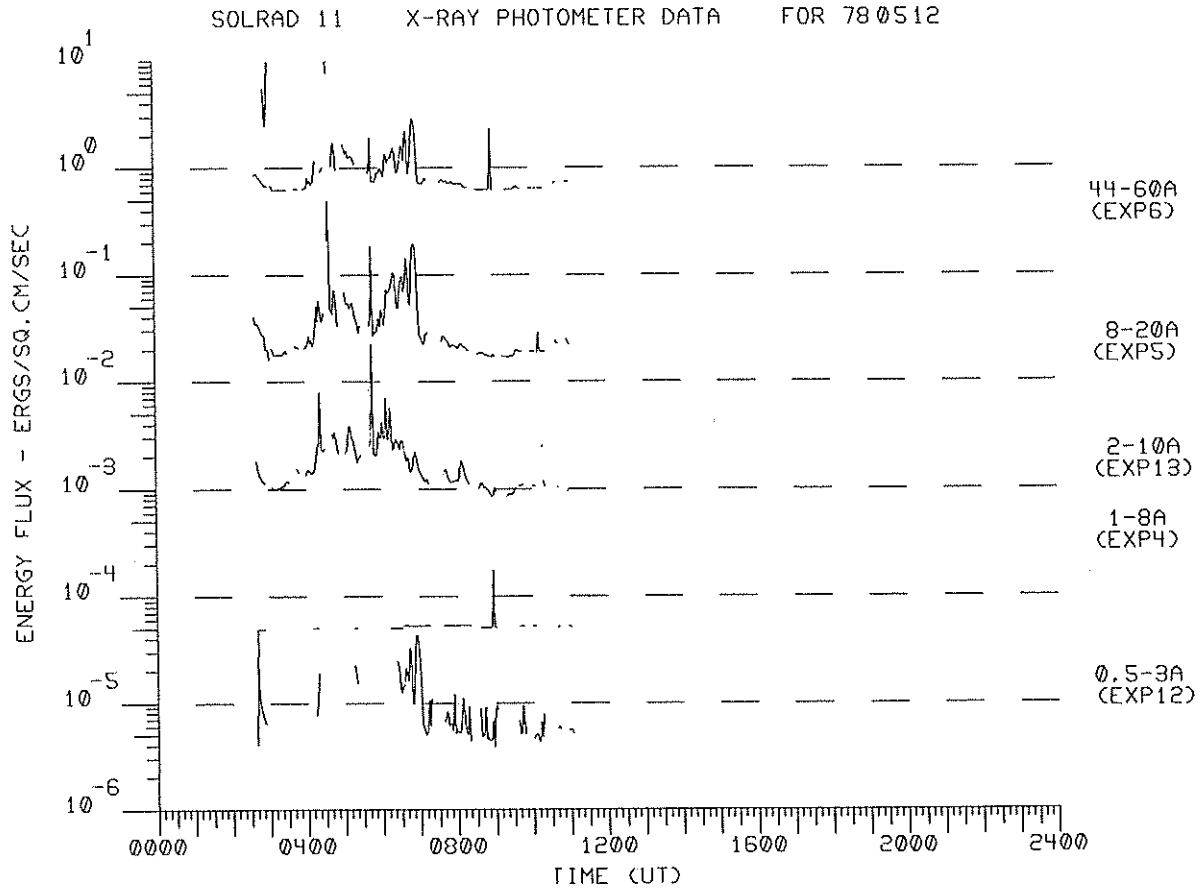

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780507
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

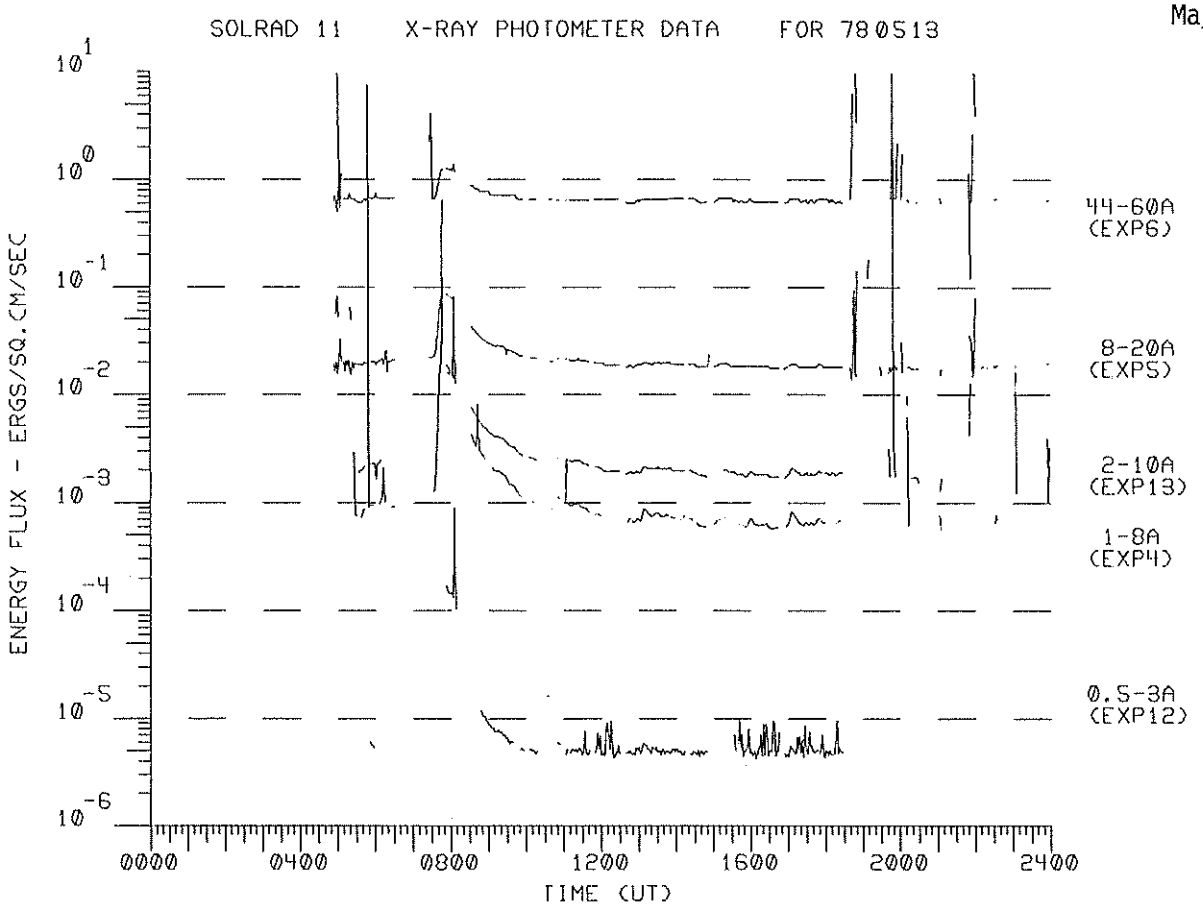

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780508
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

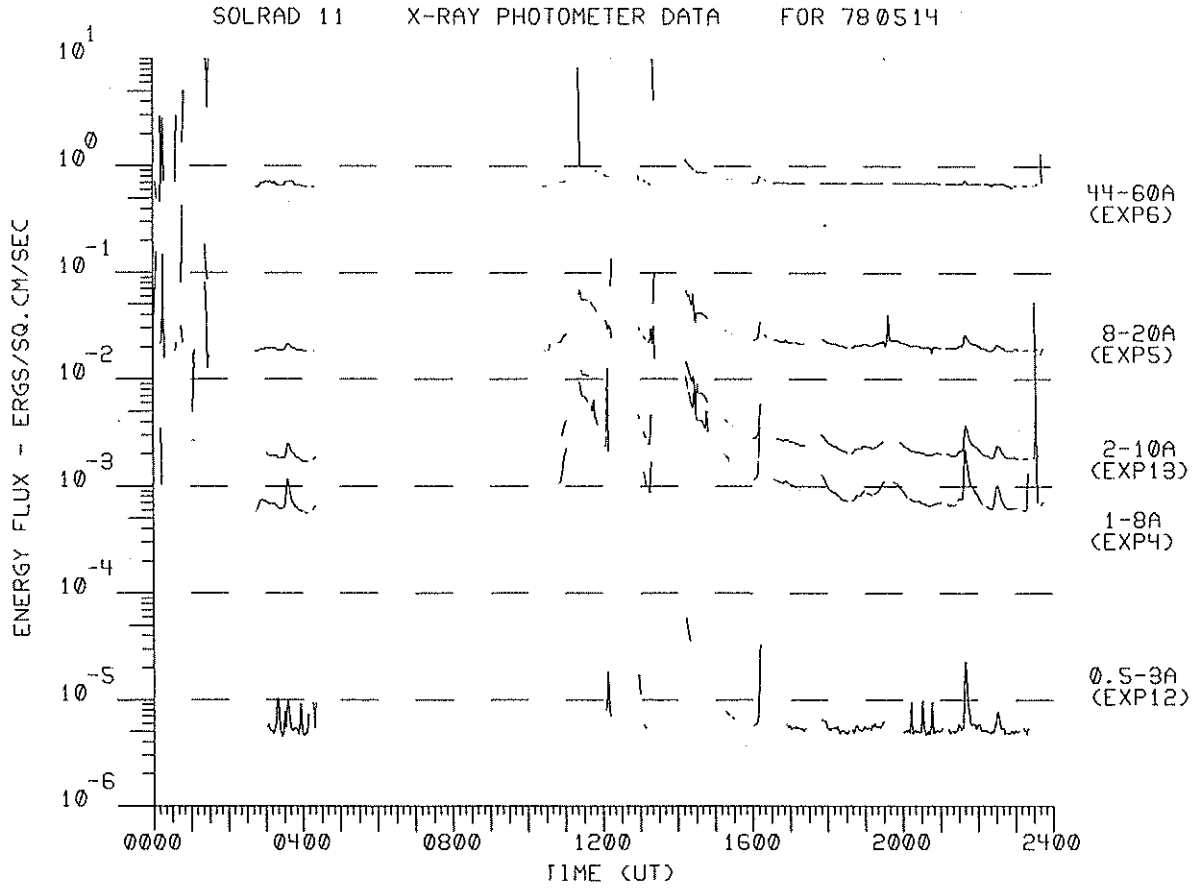

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780509
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
0000
0400
0800
1200
1600
2000
2400
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)

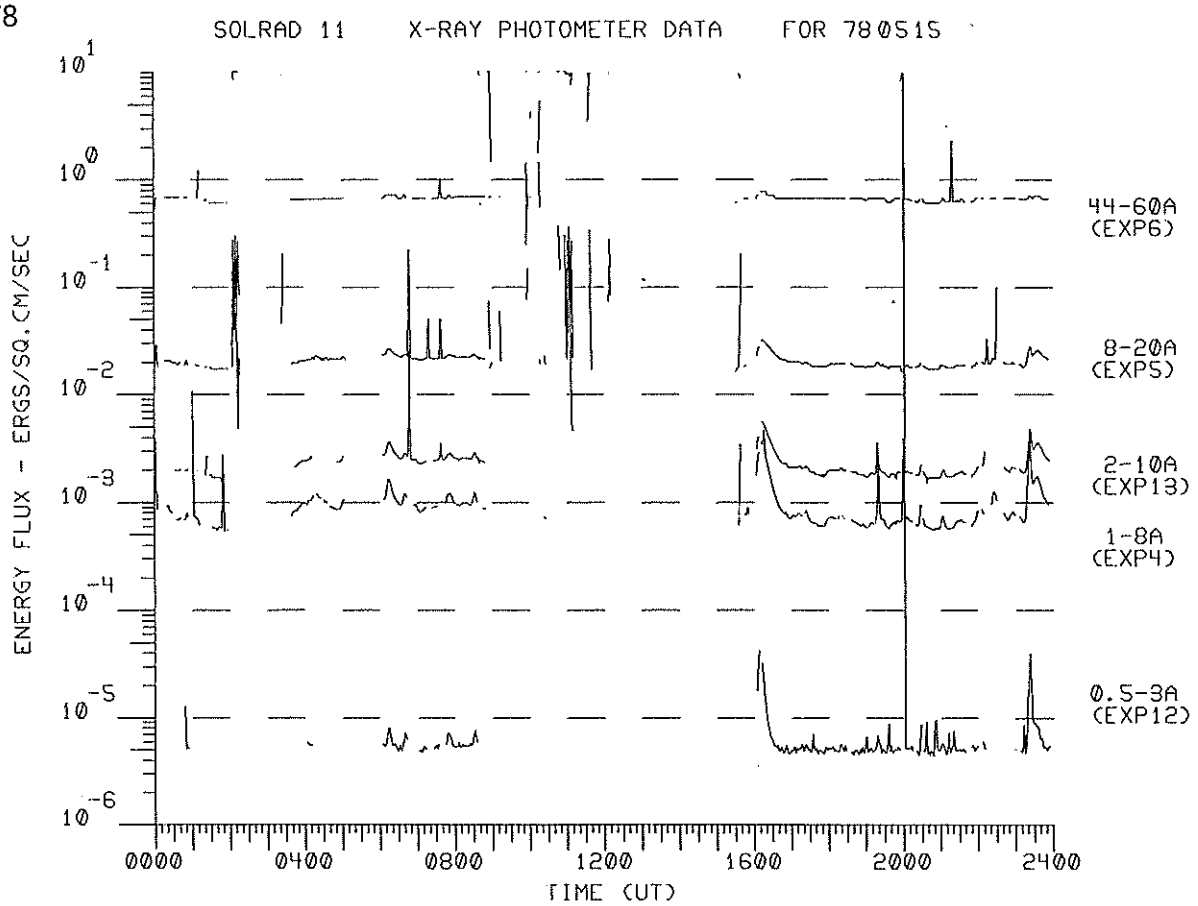

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780510
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
0000
0400
0800
1200
1600
2000
2400
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)

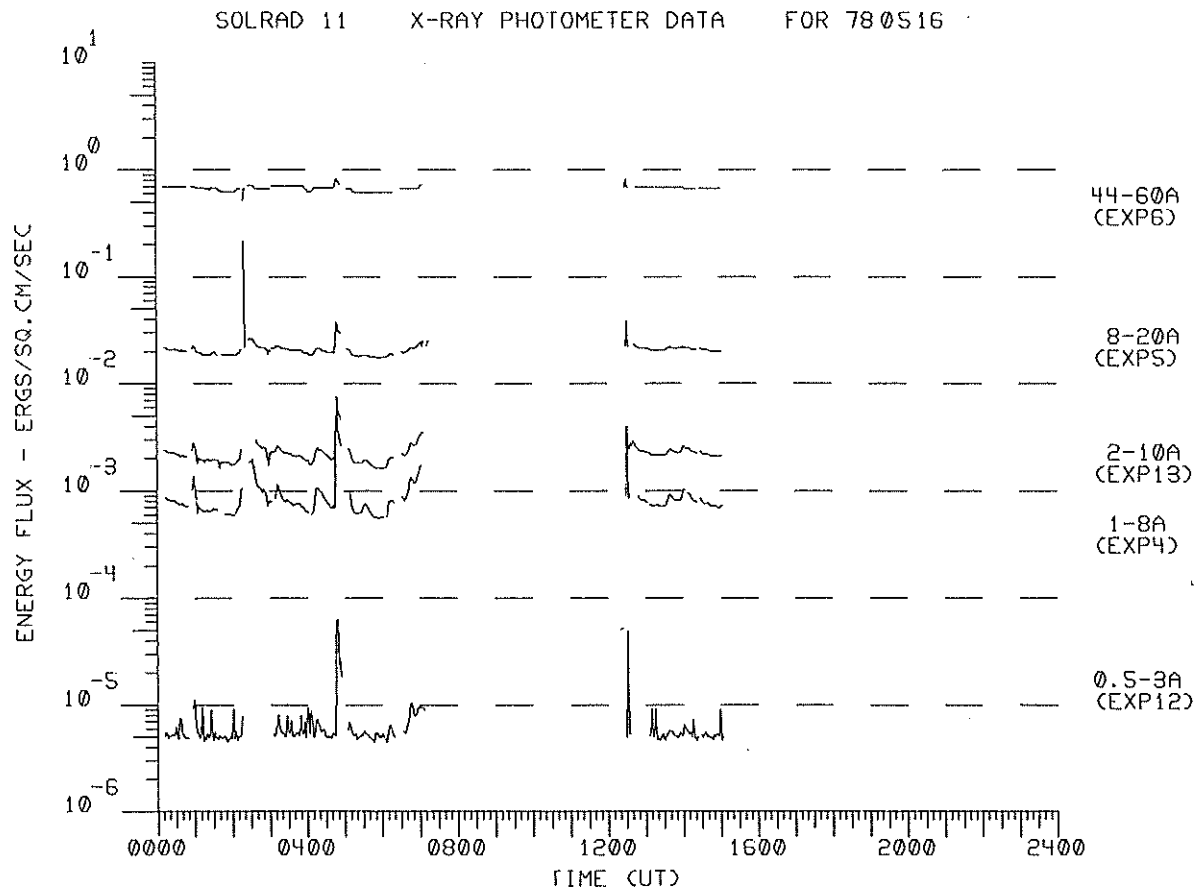

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780511
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

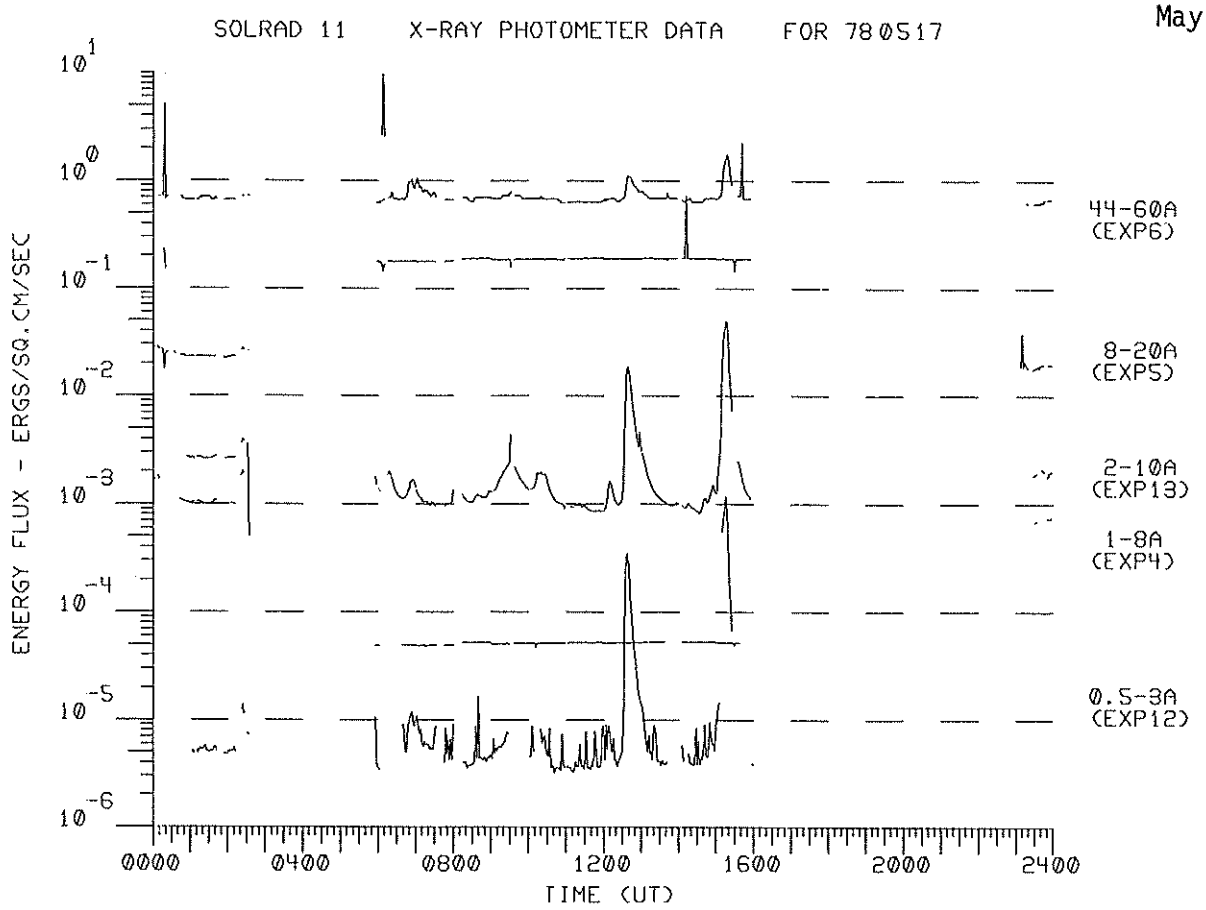

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780512
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

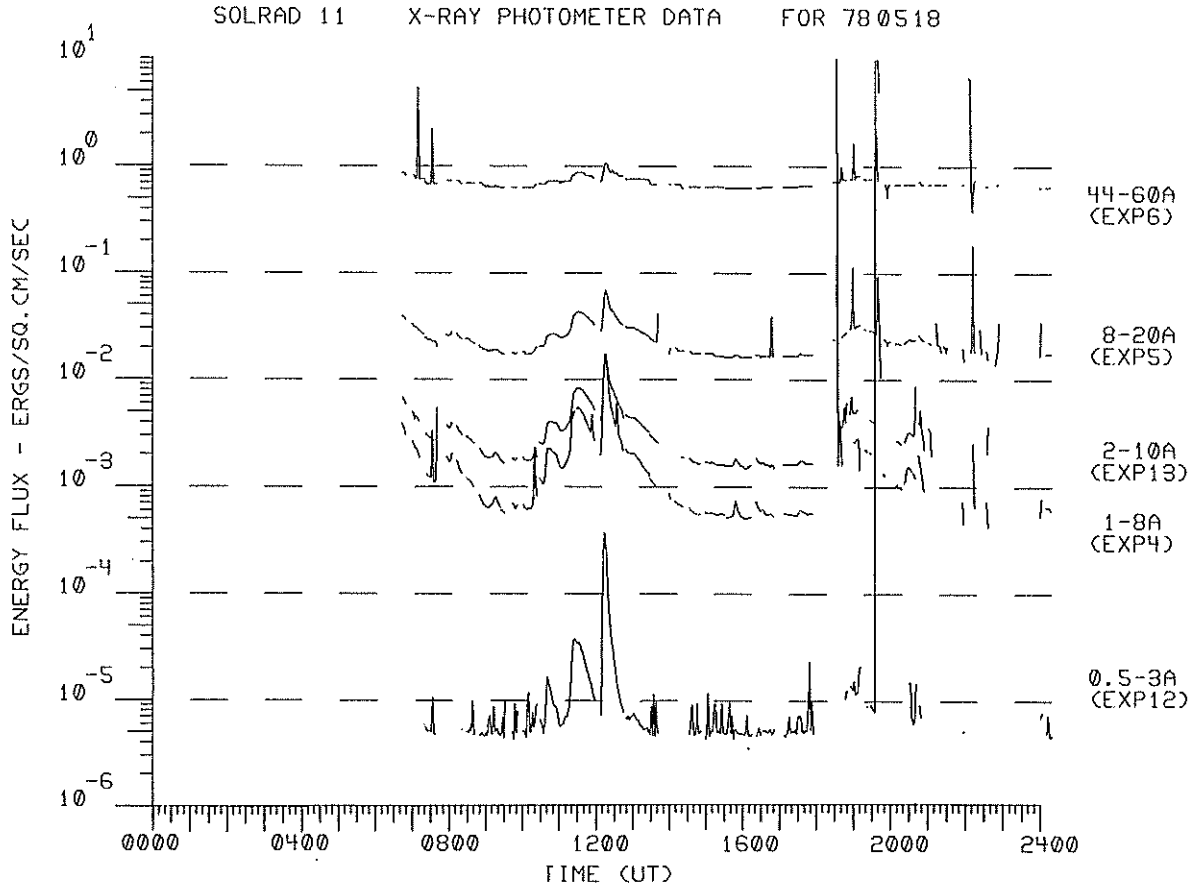

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780513
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
0000
0400
0800
1200
1600
2000
2400
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)

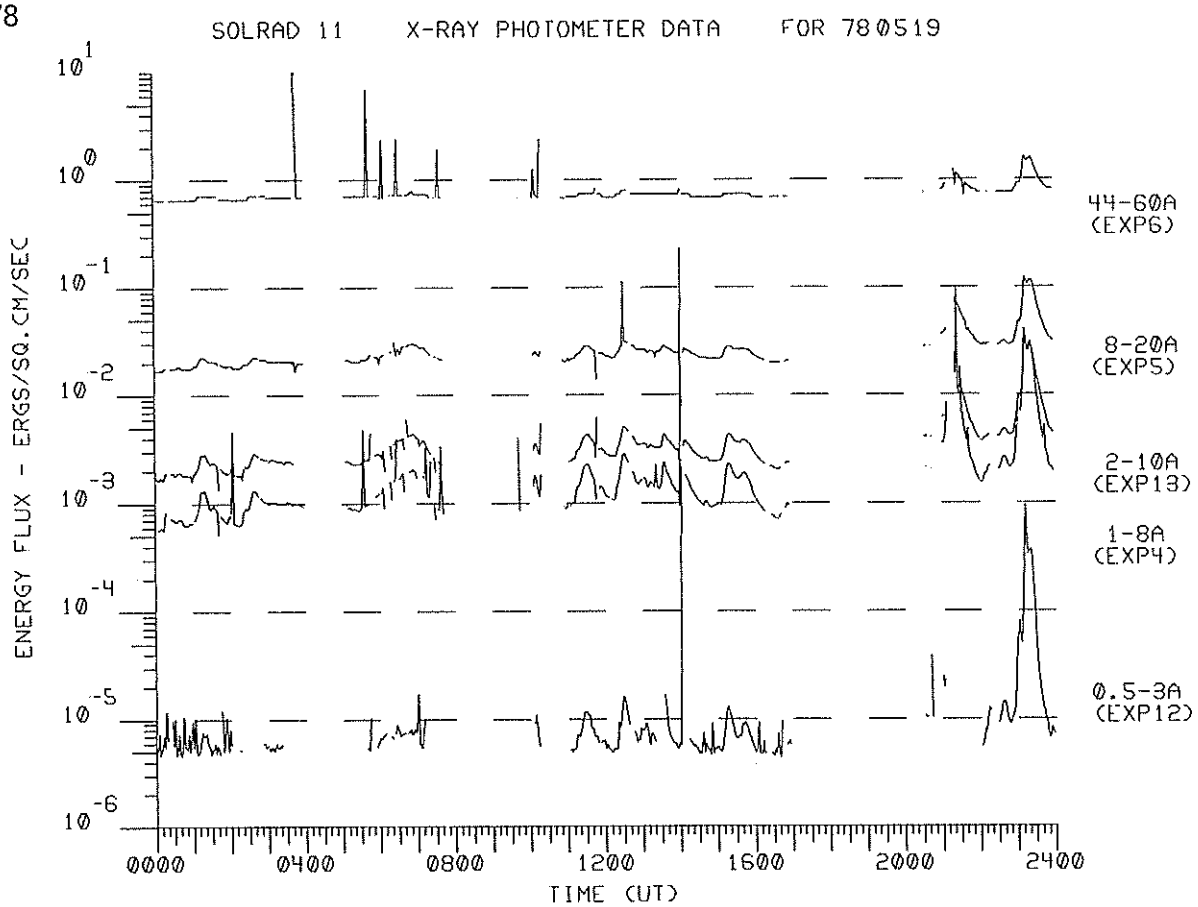

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780514
ENERGY FLUX - ERGS/SQ.CM/SEC
TIME (UT)
0000
0400
0800
1200
1600
2000
2400
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)

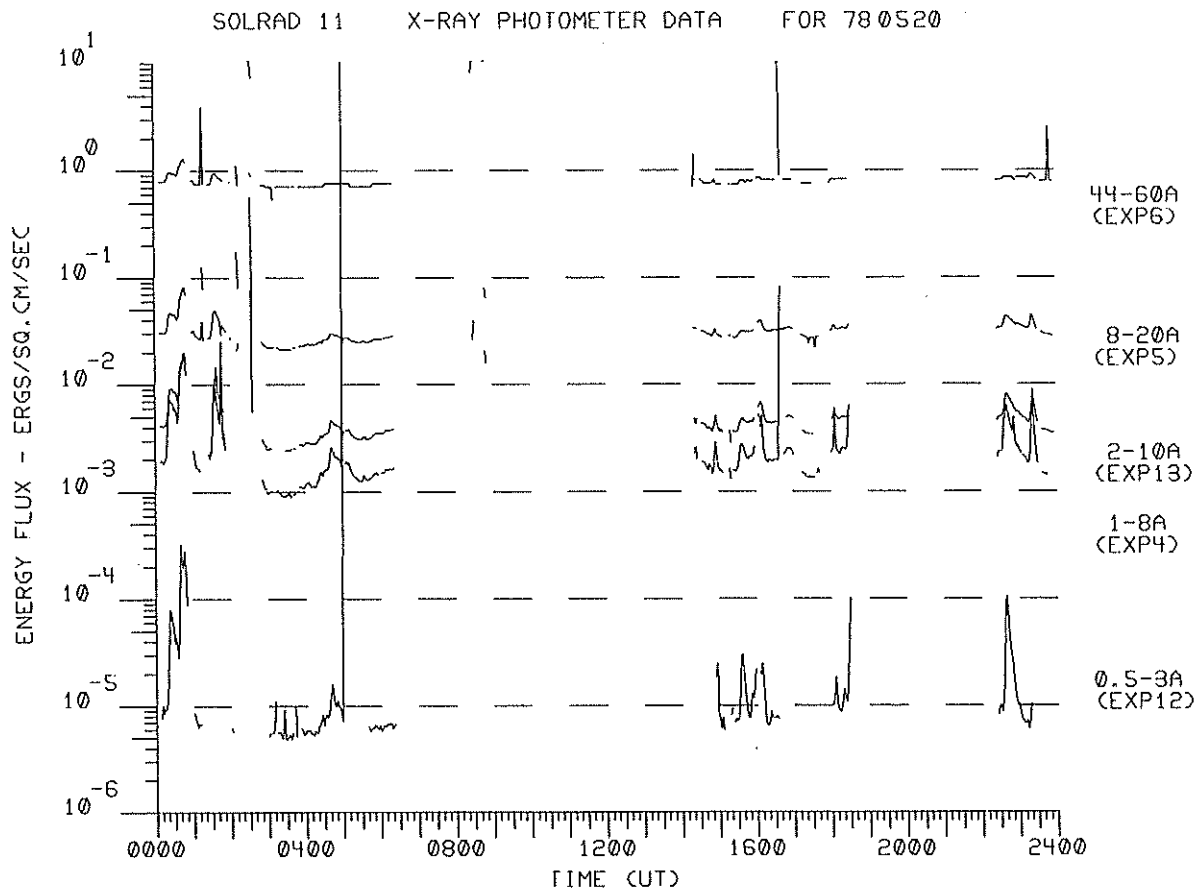

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780515
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

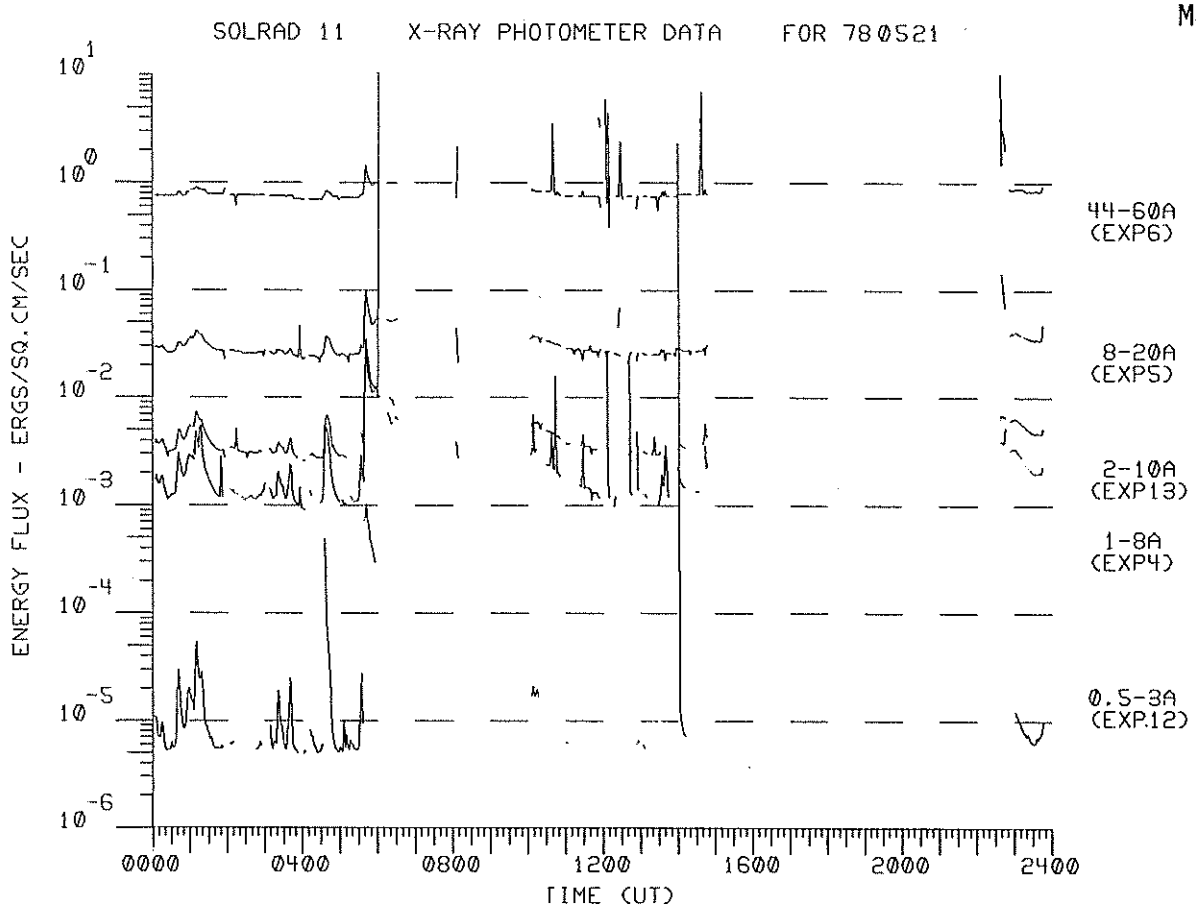

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780516
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

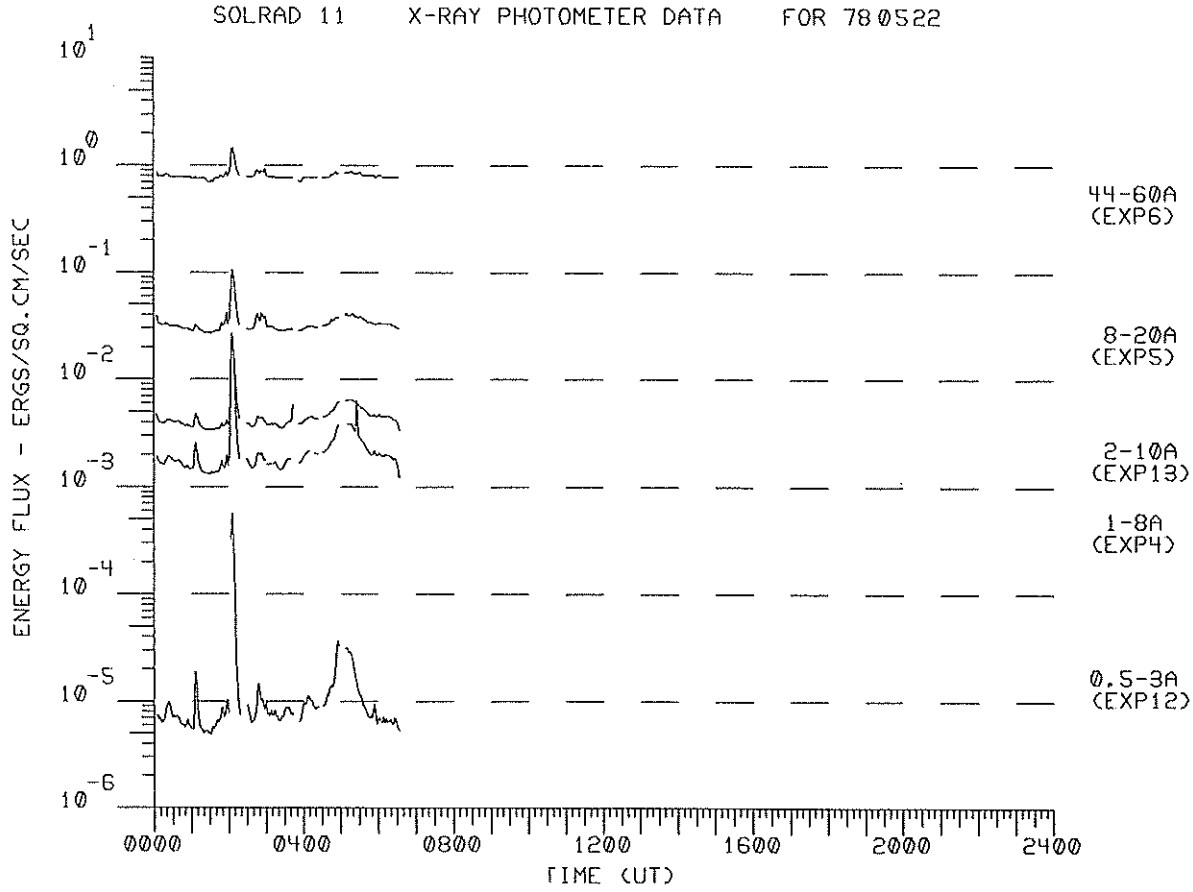

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780517
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

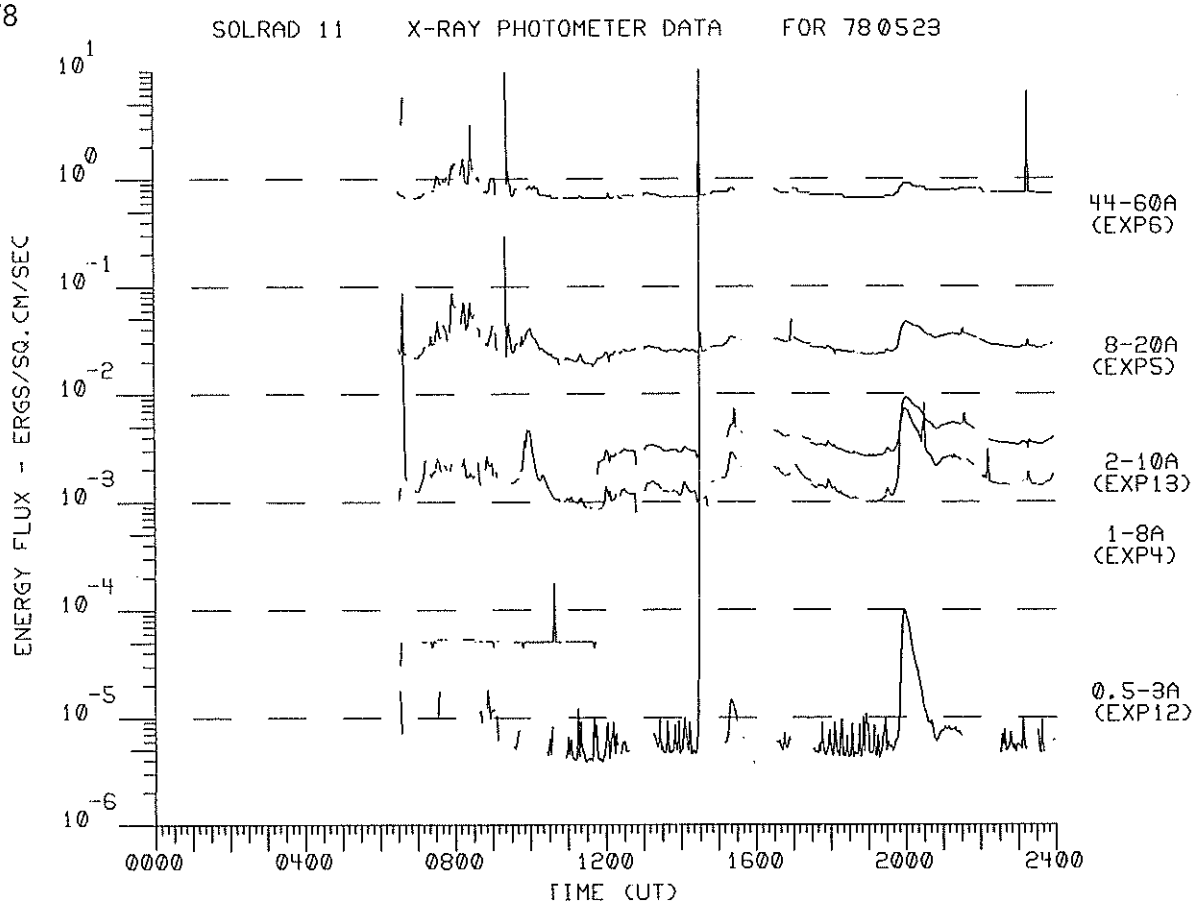

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780518
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

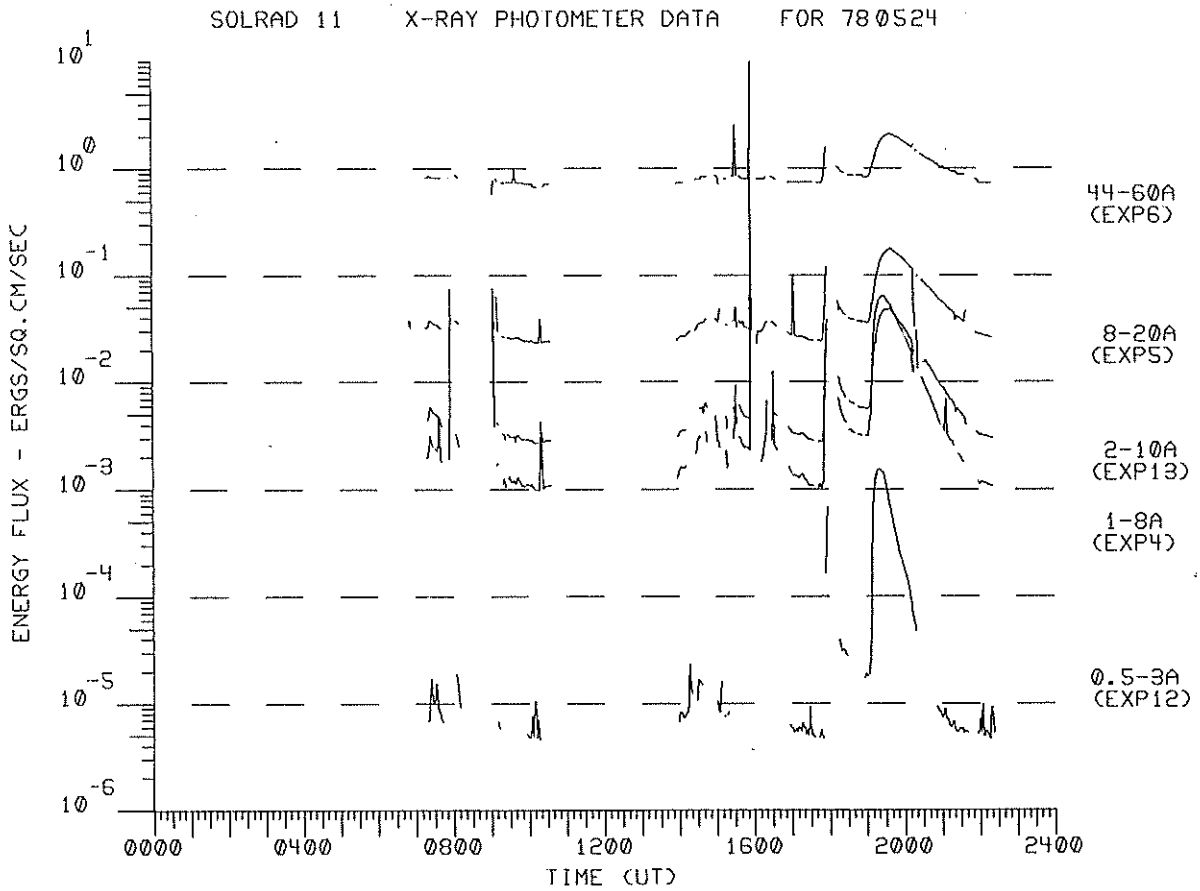

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780519
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

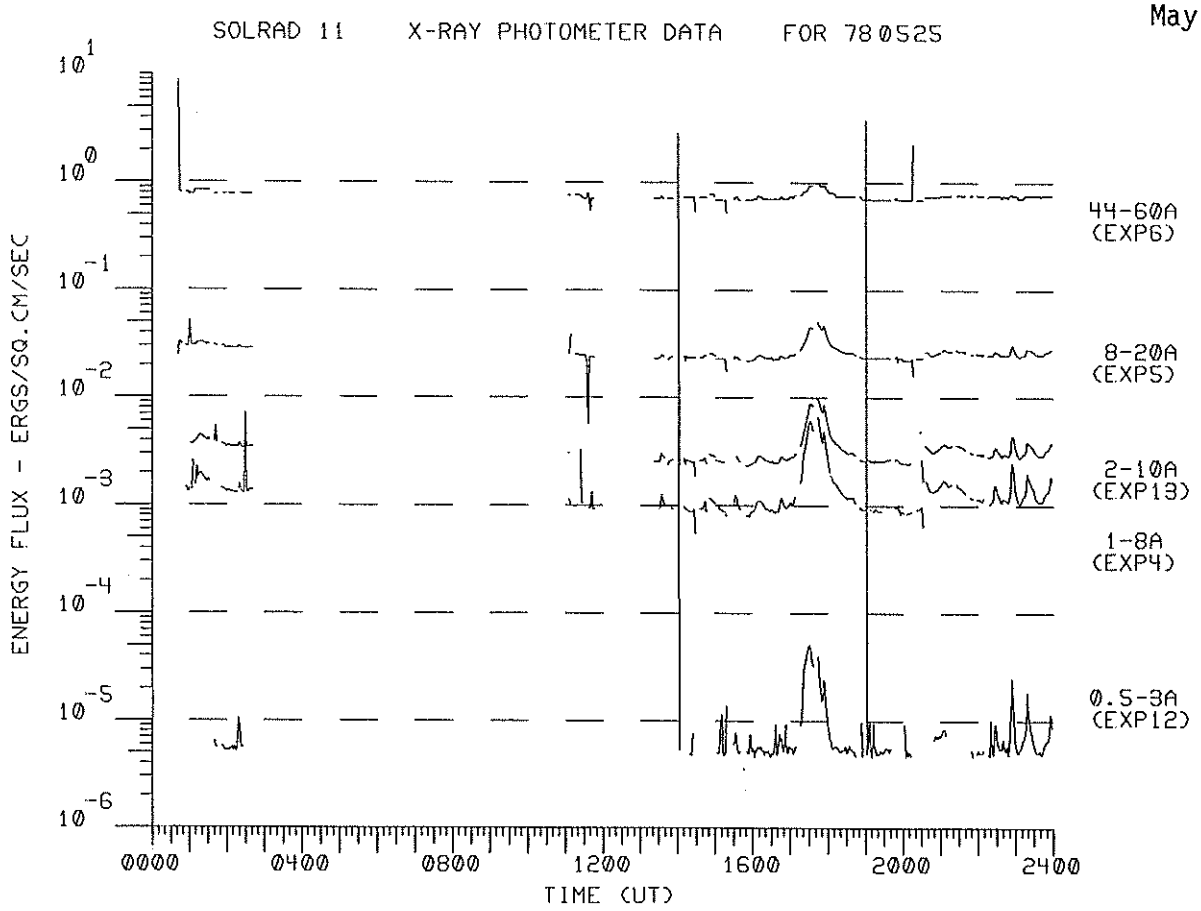

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780520
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

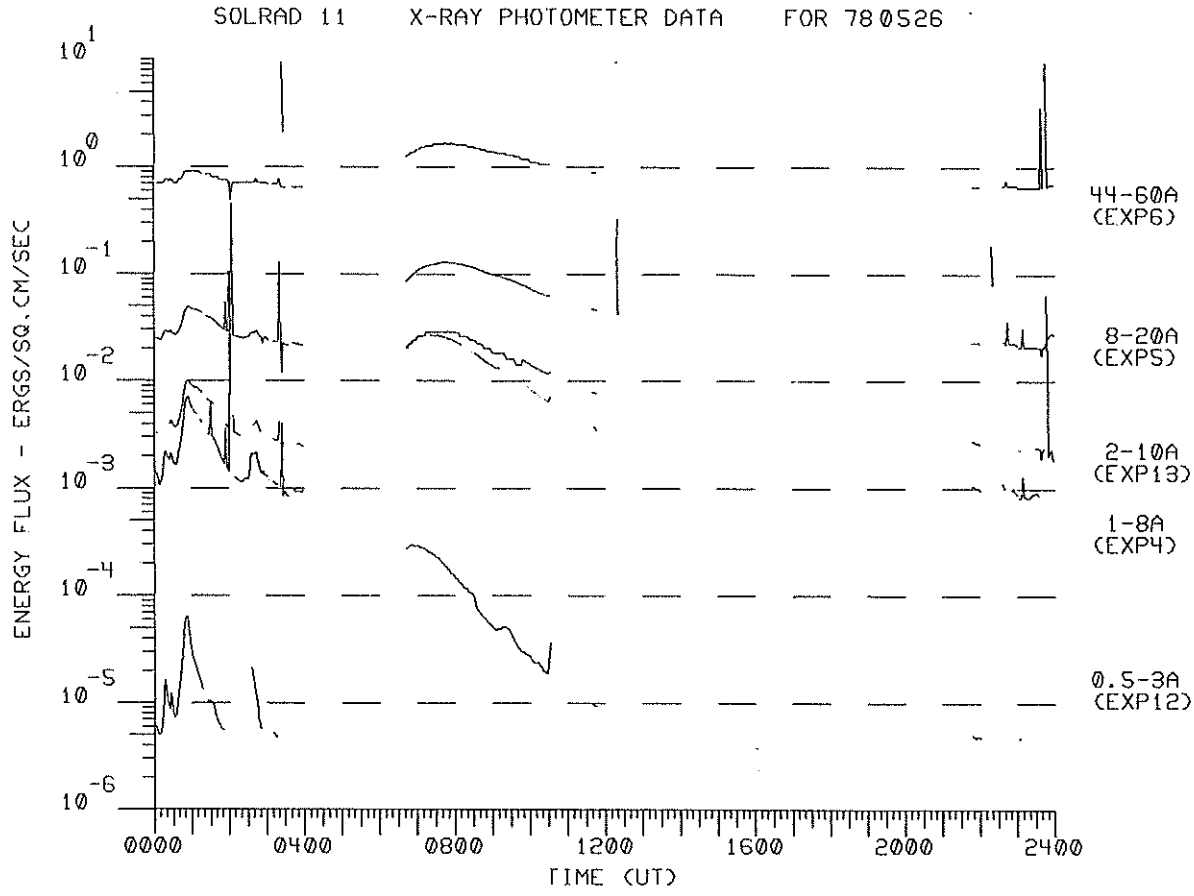

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780521
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

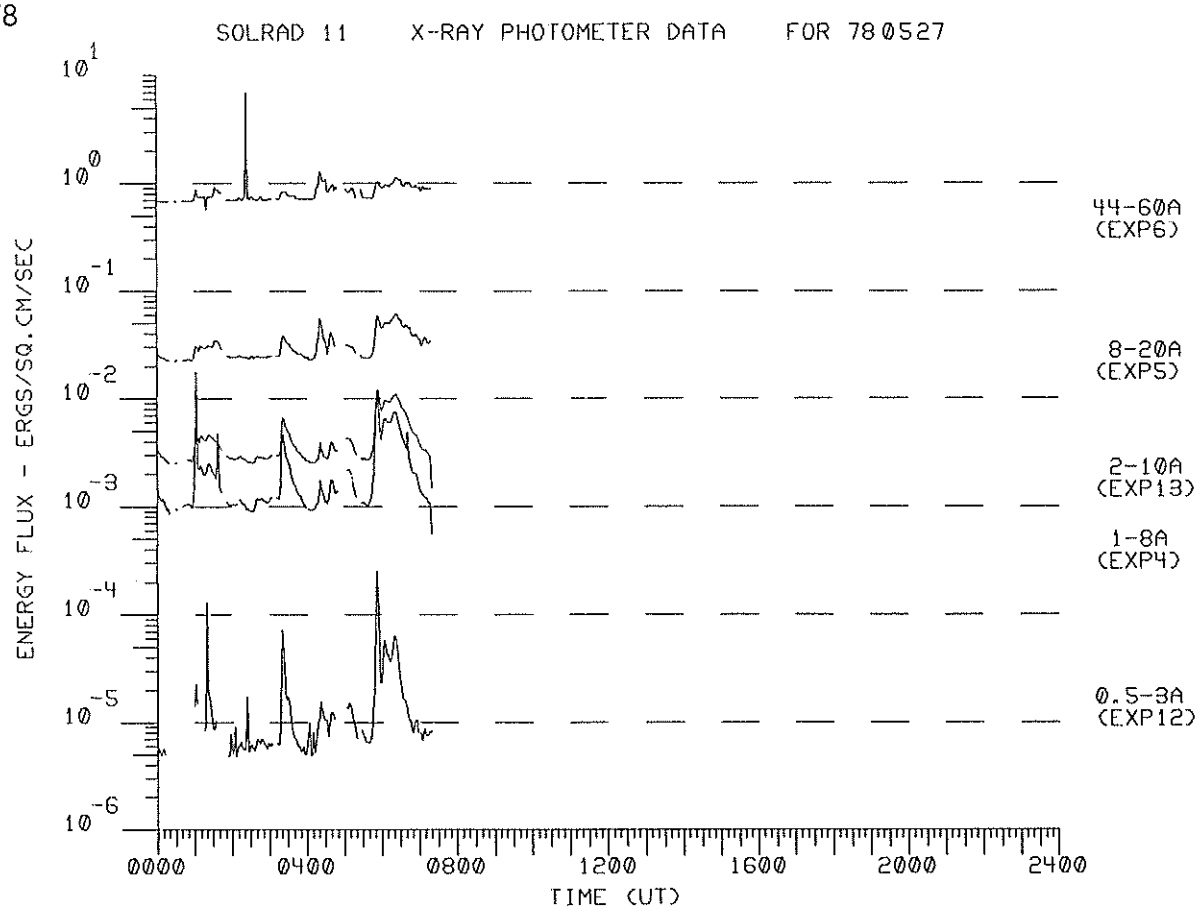

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780522
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

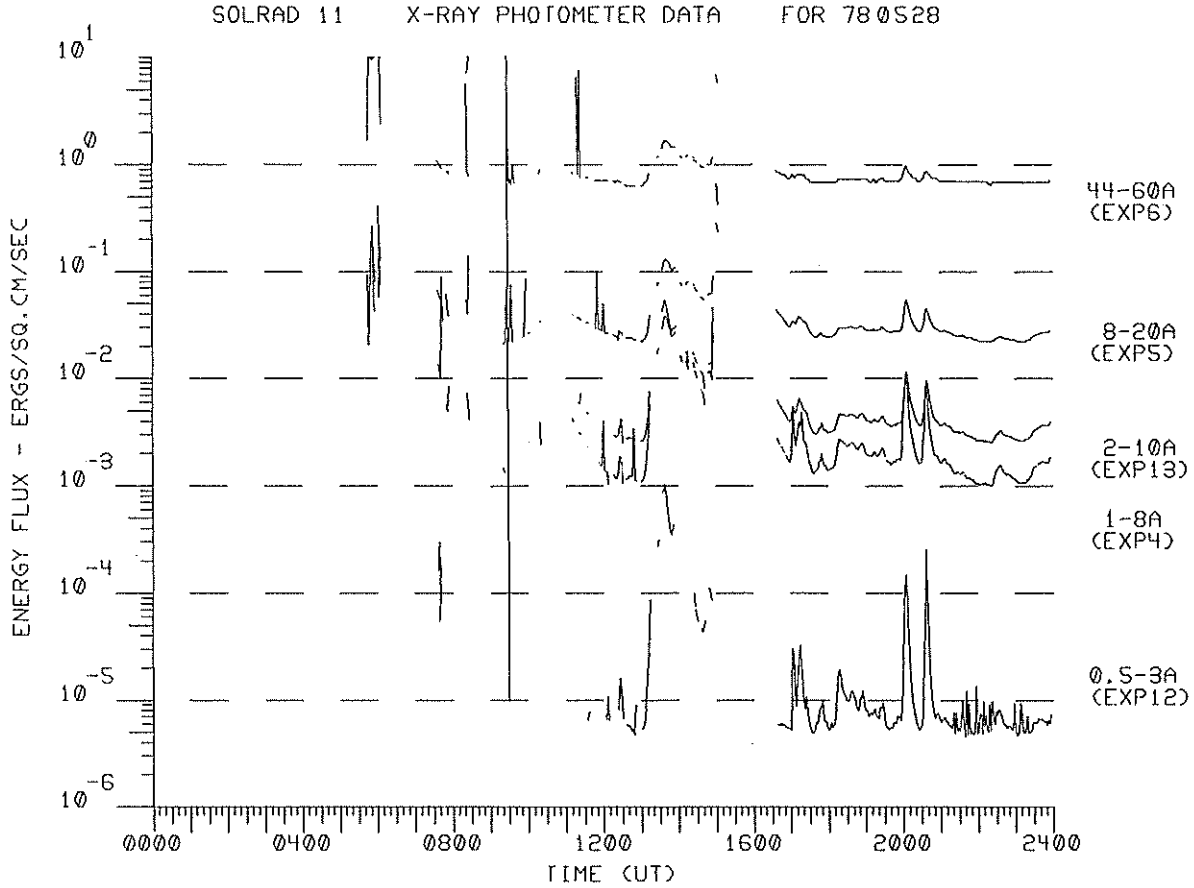

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780523
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

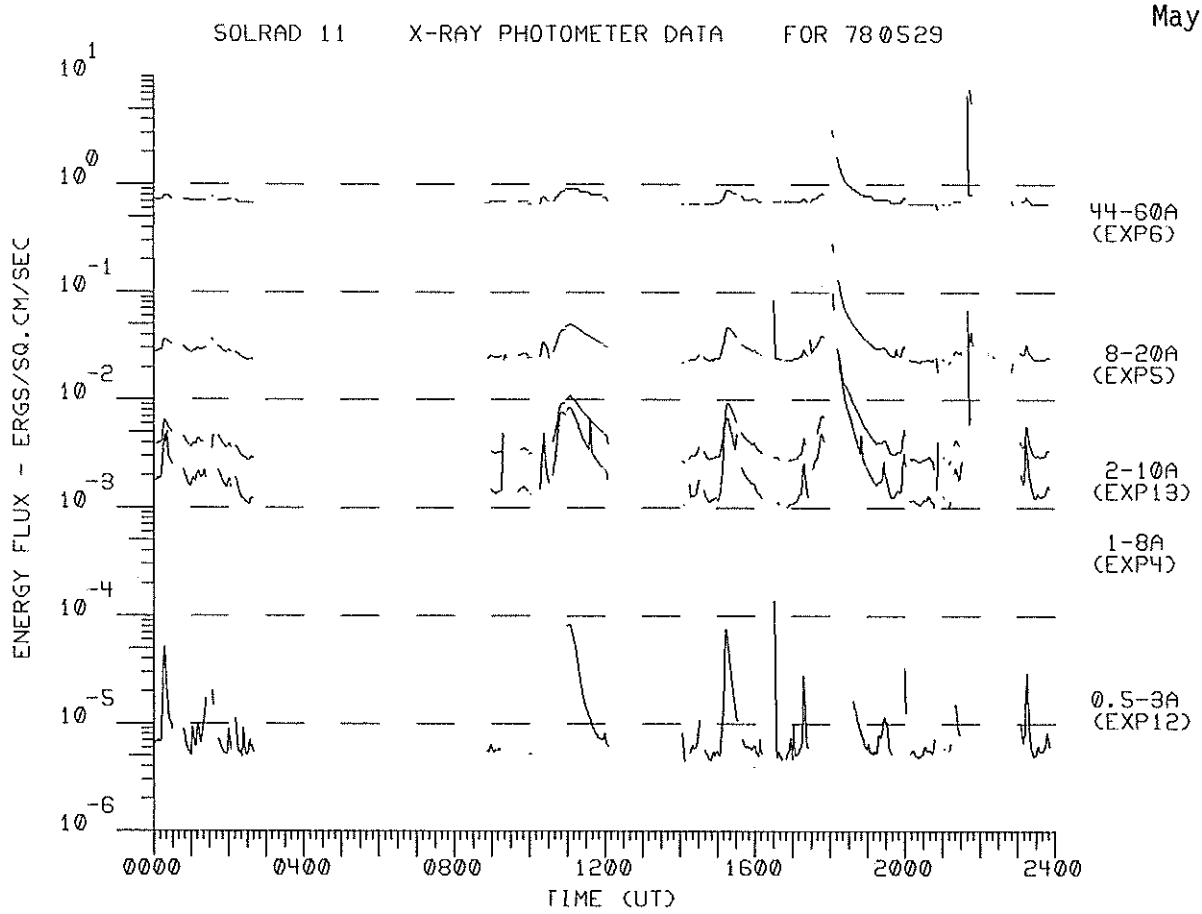

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780524
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

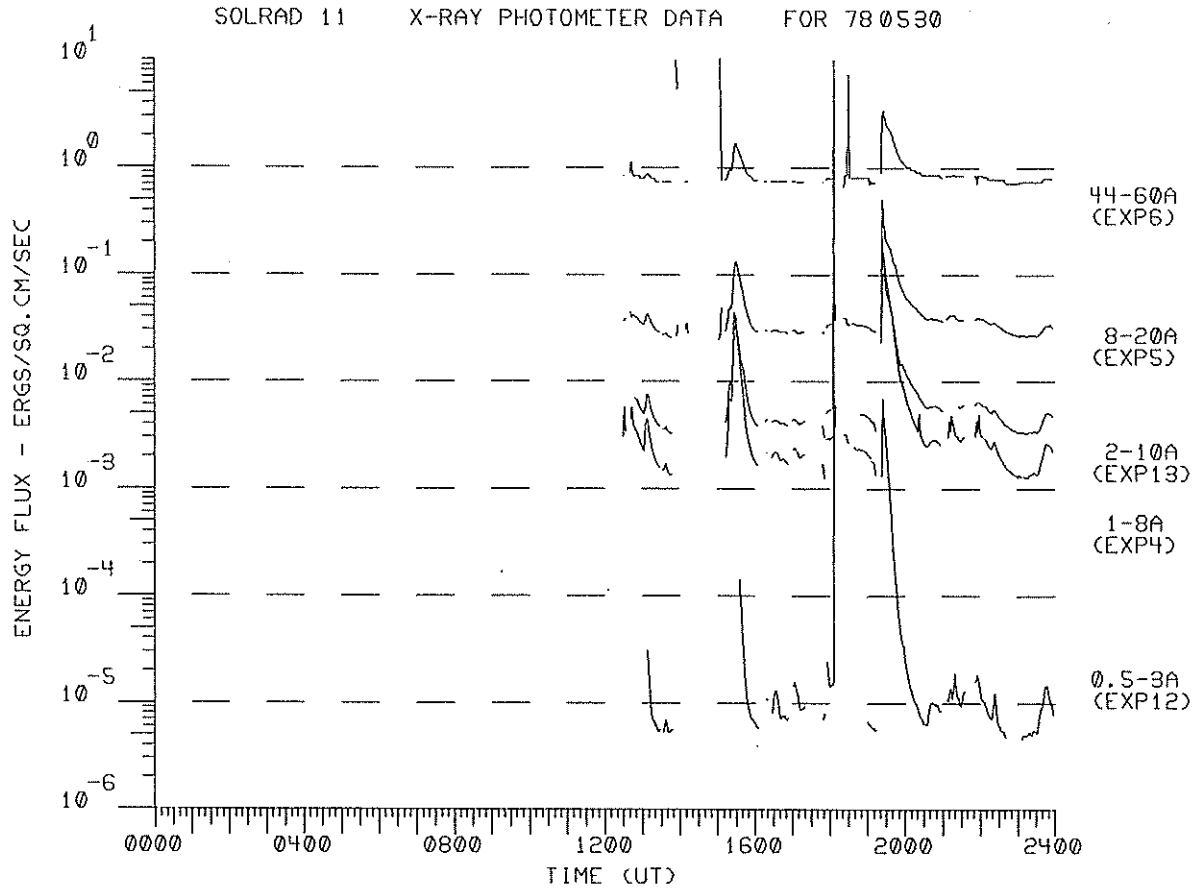

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780525
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780526
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)

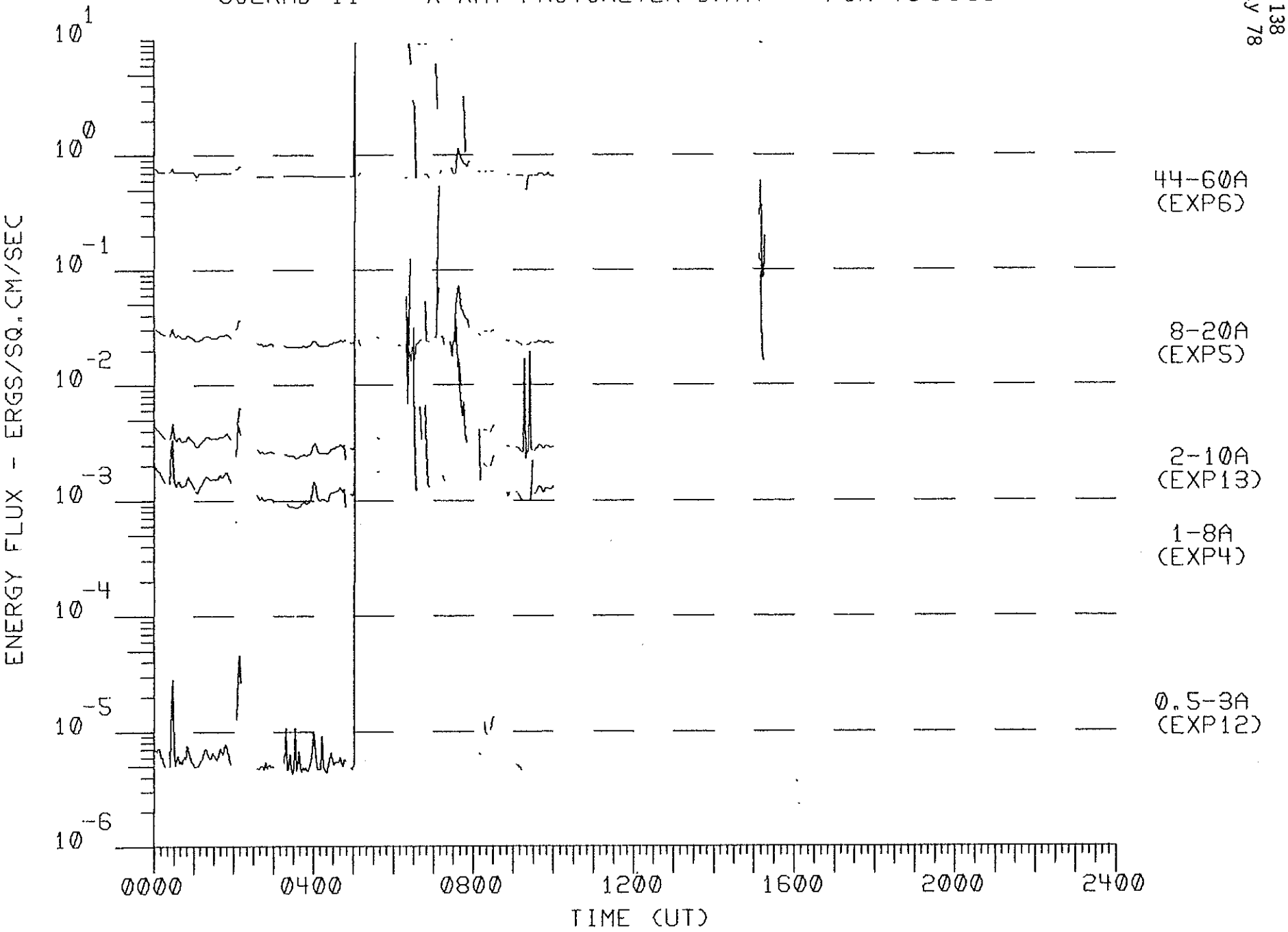

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780527
ENERGY FLUX - ERGS/SQ.CM/SEC
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780528
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 780529
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 780530
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 780531



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MAY 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			CULG				0000	0105	2				IIIS
			CULG				0000	0728	1				IS,C
	0000	0728	CULG	0000	0728								IS,W
			CULG				0105	0728	1				IIIS
			CULG	0145.5	0146.5	1	0145.5	0146.5	2	0146	0146.5	2	IIIG
			CULG	0148.5	0149.5	1	0148	0149.5	2	0148	0148.5	1	IIIG
			CULG				0258	0259.5	2				IIIG,V
			CULG				0301	0301.5	2				IIIG
			CULG				0302.5	0303.5	2				IIIG
			CULG	0423	0424.5	1	0423.5	0424.5	2	0423.5	0424.5	1	IIIG
	0943	1756	WEIS				0436.0	1745.0	2				CONT
	0450	0640	DURN				0450 E	0640 D	1				I
	0435	0928	WEIS				0503.0	1750.0	2				IIIS
			CULG	0503.5	0506	1	0503.5	0506	2				IIIG
			DURN				0535.8	0536.8	2				IIIG
			CULG	0535	0546	1	0530	0543	2				IIIS
			CULG				0539	0543	1				II
			CULG				0631	0635.5	2				IIIS
	2030	2400	CULG	2035	2225	2	2035	2225	2				CONT
			CULG				2215	2307	1				IIIS
			CULG	2225	2145	1	2225	2245	1				CONT
			CULG				2245	2400	1				IS,C
			CULG				2307	2400					IIIS,W
02	0000	0720	CULG				0000	0115					IIIS,W
			CULG				0100	0103	1				IIIGG
			CULG							0105	0215	1	S.W.F.
			CULG	0116	0121	2	0116	0121	2				IIIGG,V
			CULG	0118	0255	2	0118	0255	2				IV
			CULG				0122	0137	1				II
			CULG				0135	0137	2				HB
			CULG				0142.5	0143.5	2				IIIG
			CULG	0255	0650	1	0255	0455	1				IV
			CULG				0306	0310	2				UNCLF
			CULG				0341.5	0342	2				IIIG
			CULG				0346	0347	2				IIIG
			CULG				0403	0406					IIIG,W
			CULG				0412.5	0419	2				II? UNCLF,HB
			CULG				0419	0450	1				II?
			CULG	0421.5	0424	1							UNCLF
	0450	1133	DURN				0450 E	1133 D	2				I
			CULG	0507	0515	1							II?
	0441	1621	WEIS				0508.0	1747.5	2				IIIN
			CULG				0508	0510	1				IIIG
			CULG				0527	0527.5	1				IIIG
			WEIS	0613.2	0624.8	3							IIIGG,V
			DURN	0613.5	0616.7		0613.5	0617.7	3				IIIGG
			WEIS	0614.0	0617.0	2							CONT
			CULG	0614	0617	1	0614	0617	2				IIIG,V
			WEIS				0616.5	0622.0	3				II
			CULG				0616	0624	2				II
			WEIS				0634.0	0643.5	3				IIIGG,V
			CULG				0634	0639	1				IIIS
			DURN	0639.4	0651.4	3	0639.4	0651.4	3				DCIM
			CULG	0639	0642	2	0639	0642	2				IIIGG
			DURN	0641.3	0651.4	2	0641.3	0651.4	3				IIIGG,N
			WEIS				0644.5	0727.5	3				IIIGG
			CULG	0645	0655	1	0642	0655	2				IIIS
			CULG	0650	0720	2							IV
			WEIS				0959.5	1001.5	3				IIIG
			WEIS				1115.0	1116.7	3				IIIG
			WEIS	1610.6	1616.7	3							IIIG,V
			WEIS	1610.7	1611.8	2							CONT
			WEIS				1618.0	1619.6	1				II
	1714	1756	WEIS										
			CULG				2041.5	2354.5					IIIS,W
	2030	2400	CULG				2041.5	2147					IS,W
			CULG	2052	2052.5	1							IIIG
			CULG				2124.5	2127	1				IIIGG
			CULG	2134.5		1							IIIB

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02			CULG				2146.5	2149	2				IIIGG
			CULG				2147	2209.5	2				IS
			CULG				2150.5	2151.5	3				IIIG
			CULG				2154	2159	1				IIIGG
			CULG				2209.5	2356.5					IS,W
			CULG	2219.5	2221	1	2219.5	2221	1				IIIG
			CULG				2232	2232.5	1				IIIB,U
			CULG				2354.5	2400	1				IIIS
			CULG				2356.5	2400					IS,W
03			CULG				0000	0415					IS,W
	0000	0729	CULG				0000	0008	1				IIIS
			CULG				0008	0403.5					IIIS,W
			CULG				0121.5	0122	3	0121.5	0122	1	IIIB
			CULG				0123.5	0127	1				DC
			CULG				0133.5		1				IIIB
			CULG				0249.5	0306	2				IS,DC
			CULG				0253	0257	3	0254.5	0255	1	IIIGG
			CULG				0304.5	0305.5	2				IIIGG
			CULG	0306		1	0306		1				IIIB
			CULG				0403	0712	2				IIIGG,N
			CULG				0403	0714	1				IIIS
			CULG				0403	0635	2				IS,C,DC
	0441	1758	WEIS				0442.0	1750.0	2				I
			WEIS				0443.0	1737.0	2				III
			CULG	0459.5	0500	1	0458.5	0501	2	0459.5	0500	1	IIIGG
			CULG				0544.5	0546	1				DC
			CULG				0547	0547.5	2				IIIG
			CULG				0635	0719.5	2				IS,DC
			WEIS				0655.7	0712.6	3				IIIGG,V
			CULG				0655	0715	1				DC
			CULG				0658.5	0702.5	2				IIIGG
			CULG	0706	0711	1	0706	0712	2				IIIGG
			WEIS				0934.5	0947.3	3				IIIGG
			WEIS				1150.3	1308.0	3				IIIGG,V
	0529	1818	DURN				1322	1818 D	1				I,DC
			WEIS				1330.6	1330.9	3				IIIB
			WEIS				1642.5	1711.0	3				IIIGG,V
			DURN	1655.7	1702.5	3	1655.7	1702.5	3				IIIGG,N
	2030	2400	CULG				2034	2400	1				IS,C,DC
			CULG				2036	2201	1				SCINTLLTNS
			CULG				2049.5	2200					IIIS,W
			CULG				2200	2309	1				IIIS
			CULG				2309	2400					IIIS,W
04	0000	0730	CULG				0000	0725					IIIS,W
			CULG				0000	0430	1				IS,C,DC
			CULG	0116	0117								IN,W
			CULG				0430	0722.5	2				IS,DC
			WEIS				0440.0	1756.0	2				IS
			CULG	0440	0440.5	2							IIIG
	0439	1015	WEIS				0441.0	1750.0	2				IIIS
	0445	1817	DURN				0445 E	1817 D	2				I,DC
			CULG	0457	0457.5	1	0457	0504.5	2				II, HB
			WEIS				0745.0	1050.0	2				CONT
	1030	1759	WEIS				1154.0	1217.0	3				II
			WEIS				1234.8	1239.0	3				IIIGG
	2030	2400	CULG				2036	2400	2				IS,C
			CULG				2039.5	2400	1				IIIS
			CULG				2235	2237.5	2				IIIGG
			CULG	2257.5	2301	1	2257	2301.5	2	2257.5	2301.5	1	IIIGG
			CULG				2328.5	2330	2				IIIGG
			CULG	2331	2332.5	1	2331	2332.5	2	2331	2332	1	IIIGG
05	0000	0729	CULG				0000	0719	1				IS,C,DC
			CULG				0000	0716	1				IIIS
			CULG				0140.5	0218	1				RS,DP,N
			CULG	0153.5	0205.5								IS,W
			CULG				0242	0244	2				IIIGG
			CULG				0252.5	0253.5	2	0253	0253.5	1	IIIG

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05			CULG	0259	0259.5	1	0258.5	0300	1				IIIGG
			CULG				0305.5	0311	2	0305.5	0306.5	1	IIIGG
			CULG				0317	0320.5	2				IIIGG
			CULG				0324.5	0327	2				IIIGG
			CULG				0333	0334	2				IIIG
			CULG				0333	0334	2				SLOW DRIFT
			CULG				0342.5	0359	1				SCINTLLLTNS
			WEIS				0439.0	1701.0	2				IIIN
	0437	1754	WEIS				0439.0	1631.0	3				IN
	0445	1819	DURN				0445 E	1040	1				I,DC
			WEIS				0526.1	0528.8	3				IIIGG
			DURN				0526.2	0526.6	3				IIIGG
			CULG				0526	0528	2				IIIGG
			CULG				0610	0729	1				GRND REFL
			CULG				0614.5		2				IIIB
			WEIS				0614.5	0630.5	3				IIIGG
			CULG	0622	0623	1	0621	0628	2				IIIGG
			CULG	0628.5	0633	1							IIIGG
			DURN				0629.1	0631.7	3				IIIGG
			DURN	0655.2	0657.1	3	0655.2	0657.1	3				IIIGG
			WEIS				0655.2	0658.2	3				IIIGG,V
			CULG	0655	0658	1	0655	0657	2				IIIGG,V
			WEIS				0756.8	0801.0	3				IIIGG
			WEIS				1021.0	1039.0	3				IIIGG,V
			DURN	1027.1	1035.7	3	1027.1	1035.7	3				IIIGG,N
			DURN	1027.2	1029.7	3	1027.2	1029.7	3				V
			WEIS				1227.5	1228.1	2				IIIG
			WEIS				1237.0	1238.5	2				IIIG
			WEIS				1308.3	1309.6	3				IIIG
			WEIS				1316.2	1318.3	3				IIIG
			WEIS				1356.3	1357.3	3				IIIG
			WEIS				1403.0	1408.8	3				IIIG
			DURN	1403.4	1415.7	3	1403.4	1415.7	3				IIIGG,N
			WEIS				1410.8	1412.7	3				IIIG
			WEIS				1433.7	1437.6	3				IIIG
			WEIS				1445.5	1449.0	3				IIIG
			WEIS				1505.4	1512.5	3				IIIG
			WEIS				1524.2	1529.6	3				IIIG
			WEIS				1606.8	1607.7	3				IIIG
			WEIS				1633.3	1644.8	3				IIIGG
			DURN				1643.3	1643.5	3				IIIG
			WEIS				1713.0	1713.3	3				IIIG
			CULG				2038	2250	1				IS,C,DC
	2030	2400	CULG				2038	2233	1				IIIS
			CULG				2104	2111	2				DC
			CULG				2110	2110.5	2				IIIG,V
			CULG				2136	2156.5	2				IIIG,N
			CULG	2202	2208	2	2159.5	2209	3	2201.5	2202	1	IIIGG
			CULG				2233.5	2400					IIIN,W
			CULG	2243.5	2245.5	1	2243	2244.5	2				IIIGG,V
			CULG				2250	2400					IN,W
			CULG	2331.5	2332	1	2331	2332	2				IIIG
			CULG				2336	2357.5	1				N,RS,DP
			CULG	2354	2354.5	1	2354	2355	3	2354	2354.5	2	IIIG,V
06	0000	0728	CULG				0000	0033	1				IS
			CULG				0003.5	0029.5					IIIS,W
			CULG				0032	0704					IIIN,W
			CULG				0033	0656					IN,W
			CULG	0045	0045.5	1	0045	0045.5	1				IIIG
			CULG	0211	0213	1	0212	0213.5	3	0212	0212.5	2	IIIG,V
			CULG				0213	0216.5	1				IIIG
			CULG				0410	0411.5	2	0410.5		1	IIIGG
	0434	1803	WEIS				0436.3	0437.2	3				IIIG
			CULG	0436.5	0437	1	0436.5	0437.5	2	0436.5	0437.5	2	IIIG,V
			CULG				0445.5	0447	1				IIIG
			WEIS				0445.5	1412.0	2				IIIN
	0445	1818	DURN	0930	1110	1	0930	1110	1				I
			WEIS				1100.2	1110.5	3				IIIGG
			DURN	1215.1	1215.4	3	1215.1	1215.4	3				IIIG,RS

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06			WEIS				1216.4	1217.1	2				IIIG
			DURN	1300.5	1301.0	3	1300.5	1301.0	1				IIIG
			DURN	1535.0	1535.1	3							III
	2028	2400	CULG				2028	2314	1				IS,DC
			CULG				2042.5	2043.5	1				UNCLF
			CULG				2047	2047.5	1				IIIG
			CULG				2050	2240					IIIN,W
			CULG	2058.5	2114.5	2	2040	2152	2				CONT
			CULG	2120.5	2124.5	1	2117.5	2125	3				IIIGG
			CULG				2124	2150	1				N,UNCLF,
			CULG				2152	2152.5	1				IIIG
			CULG	2158	2159	1	2157.5	2158.5	1				IIIG
			CULG				2239.5	2259	1				SCINTLLTNS
			CULG				2240	2321	1				IIIN
			CULG				2240	2321.5					IIIS,W
			CULG	2307	2321	1							IIIG,N
			CULG				2314	2400					IS,W
			CULG				2333.5	2334	1				IIIG
			CULG	2351	2351.5	1	2350.5	2351.5	2				IIIG
07	0000	0715	CULG				0000	0058					IN,W
			CULG				0008.5	0010	2				IIIG
			CULG	0008	0014		0007	0014					IIIN,W
			CULG				0104.5	0107	1				IIIGG
			CULG	0115.5	0116		0114.5	0116					IIIG,W,RS
			CULG				0126	0130	1				IIIGG,U
			CULG	0136	0139	1	0136	0139.5	2				IIIGG
			CULG				0146	0146.5	1				IIIG
			CULG	0203	0204.5	2	0203.5	0205.5	2				IIIGG,V
			CULG	0208	0210	2	0208	0210	2				IIIG
			CULG				0237.5	0249					IIIS,W
			CULG				0242		2				IIIB
			CULG	0322.5	0323	1							FAST DRIFT
			CULG	0323.5	0326.5	1	0323.5	0329.5	1				IIIN
			CULG				0325	0710					IIIS,W
			CULG							0326	0405	1	S.W.F.
			CULG	0327.5	0500	2	0329	0348	3	0333	0348	3	IV
			CULG	0327	0328.5	3	0327.5	0355	3				II, HB
			CULG				0333	0348	2	0333	0348	2	IIIS
			CULG				0348	0352	2				IV
			CULG				0418	0456	1				IIIG,N
	0440	0712	DURN	0440 E	0517	2	0440 E	0517	3				IV
			CULG				0455.5	0456.5	1				FAST DRIFT
			CULG	0500	0710	1	0352	0516	1				IV
	0433	1124	WEIS				0515.0	1539.0	2				IIIN
			CULG				0516	0715					IV, W
			WEIS				0519.5	0520.7	2				IIIG
			CULG				0519	0520.5	1				IIIGG
			DURN				0522.1	0529.6	3				IIIG,N
			CULG	0522	0532	1							IIIG,N
			CULG	0523	0523.5	2							IIIG
			WEIS				0525.5	0527.5	3				IIIG
			CULG				0526	0527.5	2				IIIG,V
			WEIS				0735.3	0741.3	3				IIIGG
			WEIS				0812.2	0812.8	2				IIIG
			WEIS				0835.9	0838.1	3				IIIG
			WEIS				0852.9	0906.0	2				IIIGG
			WEIS				1000.8	1005.7	3				IIIGG
			WEIS				1119.9	1120.5	3				IIIG
	1138	1205	WEIS										
	1249	1816	DURN				1249 E	1816 D	1				I,DC
	1227	1805	WEIS				1529.8	1537.0	3				IIIGG,V
			DURN				1531.1	1531.7	3				IIIGG,U
			DURN	1533.2	1535.1	3	1533.2	1535.1	3				IIIGG
			WEIS				1550.0	1557.5	3				IIIGG,V
			DURN	1550.1	1551.8	3	1550.1	1551.8	3				IIIGG
			DURN	1550	1602	1	1553	1602	2				DCIM
			WEIS				1555.0		2				II
			WEIS				1555.0	1706.0	3				IV
			DURN	1709.9	1710.4	3							IIIG

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07			WEIS				1710.0	1711.5	3				IIIG
			DURN	1758.3	1758.7	2							IIIG
			WEIS				1758.8	1805.0	3				
	2029	2400	CULG	2041	2045								IS,W
			CULG				2046	2128	1				IS
			CULG				2053	2129	1				IIIS
			CULG	2123.5	2124.5	2	2123.5	2125	2				IIIGG,U
			CULG				2134	2400					IN,W
			CULG				2139	2348	1				IIIN
			CULG				2233.5	2236	1				IIIG
			CULG				2249.5	2250.5	2				IIIG,V
			CULG				2251.5	2254	1				IIIG
			CULG				2357.5	2358	1	2357.5	2358	1	IIIG
08	0000	0728	CULG				0000	0728					IS
			CULG				0012.5		1				IIIB
			CULG				0034.5	0042					IIIGG,W
			CULG				0036	0036.5	2	0036	0036.5	1	IIIG
			CULG							0040	0121	1	S.W.F.
			CULG				0139	0404	1				IIIG,N
			CULG	0155	0205	1							IV
			CULG	0203	0203.5	1							IIIG
			CULG	0205	0216	2	0212.5	0252	2				IV
			CULG				0207.5	0220	2	0216.5	0217	1	II, HB
			CULG							0211	0355		S.W.F.
			CULG	0216	0335	1	0252	0455	1				IV
			CULG				0223	0225	2				OC
			CULG	0323.5	0328	1	0325.5	0330	2	0327.5		1	IIIGG,V,U
			CULG	0355	0728		0455	0728					IV, W
			CULG				0357	0407.5	2	0403.5	0404	1	IIIN
	0431	1800	WEIS				0539.0	1726.1	2				IIIN
			CULG	0622.5	0623	1	0622.5	0623	1				IIIG
	0442	1820	DURN	0622.8	0623.0	1	0622.8	0623.0	1				IIIG
			DURN	0630.3	0630.4	1	0630.3	0630.4	2				IIIG
			CULG	0630	0630.5	1							IIIG
			CULG	0633.5	0635.5	1	0633.5	0635.5	1				IIIG
			DURN	0633.7	0635.3	1	0633.7	0635.3	3				IIIGG
			WEIS				0633.7	0635.5	2				IIIG
			CULG				0644.5	0647	1				IIIGG
			WEIS				0645.7	0647.0	2				IIIG
			DURN	0709.9	0712.3	1	0709.9	0712.3	3				IIIGG
			CULG	0710.5	0712.5		0710	0710.5					IIIGG,W
			WEIS				0743.1	0746.1	3				IIIGG
			WEIS				0806.0	0809.5	3				IIIGG
			WEIS				0932.1	0940.0	3				IIIGG,V
			WEIS				1002.6	1006.3	2				IIIGG
			DURN	1122.1	1122.2	2	1122.1	1122.2	3				IIIG
			DURN	1211.1	1214.5	3	1211.1	1214.5	3				II
			WEIS				1211.2	1320.0	3				IV
			DURN	1213	1324	3	1213	1324	3				IV
			WEIS				1313.0	1325.0	3				IV
			WEIS				1543.5	1547.5	3				IIIG,V
			DURN				1819.4	1819.4	1				III
	2029	2400	CULG				2051	2052.5					IIIG,W
			CULG				2100						IIIB,W
			CULG				2144						IIIB,W
			CULG				2159.5	2200					IIIG,W
			CULG				2257.5		2				IIIB
09	0000	0728	CULG	0012.5	0228		0121	0154					IN,W
			CULG				0159.5						IIIB,W
			CULG	0241	0242.5		0241	0242.5					IIIG,W
			CULG				0304	0304.5					IIIG,W
			CULG	0330	0335		0330	0335					IIIN,W
			CULG				0342.5	0343.5					IIIG,W
			CULG				0356	0357	1				IIIG
			CULG				0439.5						IIIB,W
			CULG				0559						IIIB,W
			CULG				0625.5	0716	2				II
	0441	1818	DURN	1436.7	1440.8	3	1436.7	1440.8	3				II

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09	0430	0508	WEIS				1439.3	1459.5	2				II
			DURN	1441.4	1600	2	1441.4	1600	2				IV
	0643	1807	WEIS				1444.0	1600.0	3				IV
	2029	2400	CULG				2102.5						IIIB,W
			CULG	2142		1	2141.5	2142.5	1				IIIG
			CULG				2208.5						IIIB,W
			CULG				2320.5	2321					UNCLF,W
10	0000	0728	CULG				0041.5	0043	2				IIIG
			CULG				0213.5						IIIB,W
			CULG	0242	0242.5		0243						IIIG,W
			CULG	0403.5		1	0403.5		1				IIIB
	0440	1816	DURN										
	0728	1610	WEIS										
	1651	1807	WEIS										
	2029	2400	CULG	2116.5	2119		2117	2119					IIIG,W
			CULG	2124	2124.5		2123.5	2124.5					IIIG,W
			CULG	2126.5	2127.5		2126.5	2127.5					IIIG,W
			CULG				2156.5	2157					IIIG,W
			CULG				2201.5	2206.5	2				IIIGG,V
			CULG				2206	2224	3	2213.5	2220.5	1	II, HB
11	0000	0728	CULG				0251	0256					IIIN,W
			CULG	0256.5	0258.8	1	0256.5	0258.5	2				IIIGG
			CULG				0259.5	0332.5	3	0303.5	0308.5	2	II, HB
			CULG				0315	0728					IS,W
			CULG				0315	0728	1				IIIN
			CULG				0315	0728	1				IV
	0429	1807	WEIS				0735.3	0751.0	2				II
	0439	1506	DURN	0735.3	0738.4	3	0735.3	0738.4	3				II
			DURN	0737.6	0737.7	3	0736.6	0737.7	3				IIIG
			WEIS				0737.6	0743.0	2				IIIGG
			DURN	0742	0806	1	0742	0806	2				IV
			WEIS				0751.0	0753.5	2				IIIG
			WEIS				1215.5	1216.0	2				IIIG
	2029	2400	CULG	2329.5	2331.5	1	2329.5	2333	2				IIIGG
12	0000	0726	CULG				0009	0013					IIIG,RS,W
			CULG				0123						IIIB,W
			CULG	0124			0124						IIIB,W
	0428	0820	WEIS										
	0637	1819	DURN										
	0926	1809	WEIS										
13	0000	0728	CULG										
	0438	1817	DURN										
	0426	1540	WEIS				0740.2	0741.6	1				IIIG
			WEIS				0743.1	0756.5	3				IV
			WEIS				0757.0	0812.0	3				II
			WEIS				1511.1	1511.4	2				IIIG
	1559	1810	WEIS				1624.3	1624.4	1				IIIB
			WEIS				1644.1	1644.2	1				IIIB
			WEIS				1722.0	1722.2	1				IIIB
	2028	2400	CULG										
14	0000	0728	CULG										
	0437	1819	DURN										
	0426	1812	WEIS				1353.3	1353.7	1				IIIB
			WEIS				1357.0	1403.3	3				IIIGG
			WEIS				1447.0	1505.0	1				II
			WEIS				1510.4	1511.4	2				IIIG
	2028	2400	CULG										
15	0000	0340	CULG				0119.5	0121.5	1				IIIG
			CULG				0158.5	0200	1				IIIG
			CULG				0242.5	0243	1				IIIG
	0435	1816	DURN										
	0500	0628	CULG										
	0424	0902	WEIS				0549.0	1811.0	2				IIIN
	0633	0728	CULG										

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15			WEIS				0810.3	0811.7	3				IIIG
	0952	1813	WEIS				1533.6	1534.4	2				IIIG
			WEIS				1626.8	1627.6	2				IIIG
	2028	2400	CULG				2119.5	2120.5	1				IIIG
			CULG				2219	2219.5	1				IIIG
			CULG				2339	2340.5	1				IIIG
16	0000	0728	CULG				0028.5	0029	1				IIIG
			CULG				0241.5	0243	1				IIIG
			CULG				0331.5	0332	1				IIIG
			CULG				0411	0412	1				IIIG
			CULG				0436.5	0707					IIIS,W
	0424	1613	WEIS				0443.0	1613.0	2				IIIN
			CULG				0454.5	0455	1				IIIG,U
			CULG				0521		1				IIIG
			CULG				0558		1				IIIB
			CULG				0606		1				IIIB
			WEIS				0617.2	0621.5	2				IIIGG
			CULG				0617	0621	1				IIIGG,V
	0434	1817	DURN				0642.3	0642.3	2				IIIG
			WEIS				0649.7	0700.2	3				IIIG
			CULG				0659.5	0700	2				IIIG
			WEIS				0703.0	0707.6	3				IIIG
			CULG				0703	0703.5	1				IIIG
			DURN	0705.2	0706.6	1	0705.2	0706.6	2				IIIG
			CULG				0705	0705.5	2				IIIG
			CULG				0706.5		1				IIIG
			CULG				0707.5		1				IIIB
			WEIS				0741.9	0742.3	3				IIIB
			WEIS				0839.1	0840.2	3				IIIG
			WEIS				0915.5	1613.0	2				IN
			WEIS				0925.0	0927.5	3				IIIG
			WEIS				0930.7	0931.5	3				IIIG
			WEIS				0954.7	0957.2	3				IIIG
			DURN				1330	1817 D	1				I
	1647	1814	WEIS										
	2028	2400	CULG				2101	2400					IS,W
			CULG				2112	2341					IIIN,W
			CULG				2154.5	2156	1				IIIGG
			CULG	2157	2157.5	2	2157	2159	3				IIIGG,V
			CULG				2225	2237					IIIS,W
17	0000	0726	CULG				0000	0316.5					IN,W
			CULG				0026	0138.5					IIIS,W
			CULG	0027.5	0028	1	0027.5	0029	1				IIIG,U
			CULG				0138.5	0657					IIIS,W
			CULG				0316	0442					IN,W
			CULG				0425	0432	1				II
	0421	1714	WEIS				0430.0	1349.6	1				IIIN
			CULG				0432	0706	1				IS,DC
			CULG				0527		1				IIIB
	0433	1820	DURN				0900	1040	1				I
			WEIS				1502.3	1505.8	3				IIIGG
			DURN				1502.5	1504.7	2				IIIGG
	2030	2400	CULG				2057	2300					IN,W
			CULG				2059	2400					IIIS,W
			CULG				2301	2400	1				IS,DC
			CULG	2336.5									IIIG,W
18			CULG				0000	0036					IS,W
	0000	0728	CULG				0000	0226					IIIS,W
			CULG				0036	0309	1				IS,DC
			CULG				0226	0553					IIIN,W
			CULG				0309	0411					IN,W
	0432	1818	DURN				0432 E	1818 D	1				IS
	0420	0949	WEIS				0441.0	1751.0	1				IIIN
			CULG				0506.5	0507.5	1				IIIG
			WEIS				0516.3	0520.5	3				II
			CULG				0516	0532	3				II, HB
			WEIS				0519.3	0520.5	2				IIIG

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18			WEIS				0520.0	0532.0	3				IVR S
			CULG	0530.5	0534.5	1							I
			CULG				0530	0545	1				IV
			WEIS				0533.0	0538.0	1				II
			CULG				0553	0653.5					IIIS,W
			CULG				0608	0608.5	1				IIIG
			CULG	0623.5	0626	1	0624.5	0628.5	1				IIIGG
			CULG	0630	0634	1	0631.5	0633.5	1				UNCLF
			CULG				0634	0651					IN,W
			WEIS				0721.0	1734.0	2				IN
			WEIS				0730.0	1440.0	2				CONT
	0947	1815	WEIS				1751.3	1753.3	2				IIIG
			DURN	1751.3	1755.0	3	1751.3	1753.2	3				IIIG
			DURN	1752	1755								DCIM
	2029	2400	CULG				2046	2400	1				IIIS
			CULG				2105	2242					IS,W
			CULG				2242	2400	1				IS,DC
19	0000	0728	CULG				0000	0649					IIIS,W
			CULG				0000	0129	1				IS,DC
			CULG				0129	0258					IN,W
			CULG	0138	0138.5								IIIG,W
	0420	1405	WEIS				0425.3	1730.5	1				IIIN
	0433	1819	DURN	0511.0	0511.2	1							IIIG
			DURN				1110	1210	1				I
	1504	1816	WEIS				1112.7	1126.0	3				IIIGG
	2029	2400	CULG	2100	2308		2107	2400					IN,W
			CULG				2109	2400					IIIS,W
			CULG				2143.5	2144	1				IIIG
20	0000	0728	CULG				0000	0704					IIIS,W
			CULG				0014.5		1				IIIB
			CULG	0034	0036.5		0037	0710					IS,W
	0432	0641	DURN				0432 E	0641 D	1				I
	0419	1819	WEIS				0439.2	1710.5	1				IIIN
			DURN	0556.8	0557.0	1							IIIG
			CULG				0600.5	0601.5	1				IIIB,V
			WEIS				0600.8	0602.5	2				IIIG
			CULG				0602	0602.5	1				IIIG
			WEIS				1318.2	1318.3	2				IIIG
	1504	1819	DURN				1504 E	1819 D	2				I,DC
			WEIS				1635.0	1641.8	2				IIIGG
	2028	2400	CULG	2048	2255								IS,W,C
			CULG				2109	2219					IIIN,W
			CULG				2126.5	2326	1				IS
			CULG	2255	2400								IS,W
21	0000	0728	CULG				0007.5						IIIB,U,W
			CULG				0102	0102.5	1	0102	0102.5	1	IIIG
			CULG				0105.5	0106.5					IIIG,W
			CULG	0109.5	0658								IN,W
			CULG				0216.5		1				IIIB
			CULG				0218.5	0219.5					IIIG,W
			CULG				0227	0708					IIIN,W
	0432	1816	DURN				0432 E	1816 D	1				I,DC
	0416	0740	WEIS				0503.5	1736.0	1				IIIN
			CULG				0546		2				IIIB
			WEIS				0720.8	0721.0	1				IIIG
			WEIS				0722.3	0722.6	1				IIIG
			DURN				1526.7	1526.8	3				IIIG
			WEIS				1607.7	1607.8	3				IIIG
	0935	1819	WEIS				1626.7	1527.8	3				IIIG
			WEIS				1650.0	1652.5	3				IIIG
			WEIS				1759.7	1800.4	3				IIIG
	2028	2400	CULG				2046.5	2049	1				IIIGG
			CULG	2049	2400	1							IS,C
			CULG				2104	2150.5					IN,W
			CULG				2129	2129.5					IIIG,W
			CULG	2138.5	2148.5	1	2136	2147.5	2				IIIGG,V
			CULG				2325	2328	1				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 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
21			CULG				2349	2353	2				IIIGG
22			CULG				0000	0717					IIIN,W
	0000	0728	CULG	0000	0236	1							IS,C
			CULG	0037		1	0034.5	0039	1				IIIG
			CULG				0147.5	0148	1				IIIG
			CULG	0204.5	0205	2	0203.5	0206.5	3	0204.5	0206	2	IIIGG,V,U
			CULG				0206.5	0210	1				IIIGG
			CULG				0210	0216.5					IIIGG,W
			CULG	0308	0309	1	0308	0309.5	2	0308.5	0309	1	IIIGG,V,U
			CULG	0310	0310.5	1	0310.5	0312	1				IIIG
			CULG				0310	0319	1				IIIN
			CULG				0315.5	0316	2				IIIG
			CULG				0325.5	0326	1				IIIB
			CULG				0345.5	0346	1				IIIG
	0432	1818	DURN				0432 E	1818	1				IS,W
	0417	1533	WEIS				0444.0	1814.3	2				IIIN
			CULG				0454.5	0455	1				IIIG
			CULG				0510	0510.5	1				IIIG
			CULG				0609	0610.5	1				IIIG
			CULG				0619	0621	2				IIIG
			WEIS				0714.3	0718.4	3				IIIGG
			DURN	0716.3	0717.3	1	0716.3	0717.3	2				IIIGG
			WEIS				0729.8	0730.4	2				IIIGRS,U
			DURN				0730.1	0730.3	2				IIIG
			WEIS				1039.1	1040.3	2				IIIG
			DURN				1046.2	1046.7	3				IIIG
			WEIS				1046.3	1049.1	3				IIIG
			DURN				1100	1400	1				I
			WEIS				1338.3	1340.0	3				IIIG
			WEIS				1430.7	1435.6	3				IIIG
			DURN				1431.8	1434.0	3				IIIGG
			WEIS				1438.8	1440.8	1				II
	1610	1821	WEIS				1623.9	1628.7	3				IIIGG,V
			DURN	1624.4	1625.1	3	1624.4	1625.1	3				IIIGG
	2030	2400	CULG				2143.5	2400					IIIN,W
			CULG	2313	2313.5	1	2312	2313.5	1				IIIGG
			CULG	2333	2334								IIIG,W
23	0000	0728	CULG				0000	0436					IIIN,W
			CULG	0010.5		1							IIIB
			CULG				0044.5	0046	1				IIIG
			CULG				0104.5	0108	1				II? UNCLF
			CULG				0116	0119					UNCLF,W
			CULG	0230.5	0231	1	0230.5	0231.5	1				IIIG
	0417	1822	WEIS				0523.1	0524.5	2				IIIG
			CULG				0523	0524.5	1				IIIG
			WEIS				1122.8	1123.0	2				IIIB
			WEIS				1129.5	1129.8	2				IIIG
	0432	1400	DURN	1129.5	1129.8	3	1129.5	1129.8	3				IIIG
	2029	2400	CULG										
24	0000	0728	CULG				0059						IIIB,W
			CULG				0124	0125					IIIG,W
			CULG				0316		1				IIIB
			CULG				0347	0348	2				IIIG,U
			CULG				0509.5	0511.5					IIIG,W
			CULG	0551.5	0554	1	0553	0554	1				IIIG
			CULG				0631		1				IIIB
			CULG				0633	0652	1				IS
	0416	0812	WEIS				0653.3	0655.0	2				IIIG
			CULG				0656.5	0657	1				IIIG
			CULG	0701.5	0702	1	0701	0702.5	1				IIIG
			CULG				0706.5	0707					IIIG,W
			WEIS				0756.7	0757.1	2				IIIG
			WEIS				0800.8	0802.7	2				IIIG
			WEIS				0830.5	0831.1	2				IIIG
	0833	1823	WEIS				0941.2	0945.3	2				IIIG
			WEIS				1227.9	1228.8	2				IIIG
			WEIS				1752.4	1755.8	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 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
24			WEIS				1758.2	1807.6	3				IIH
	2029	2400	CULG	2122	2123.5	1	2121.5	2124	1				IIIGG,U
			CULG				2137	2138					IIIG,W
			CULG				2332	2354					IIIN,W
			CULG				2336.5	2337.5	2	2336.5	2337	1	IIIG,V,U
			CULG				2341.5	2343					IIIGG,W
			CULG				2352.5	2353	2	2352.5	2353	1	IIIG
25	0000	0729	CULG				0021	0624					IIIN,W
			CULG				0042.5		1				IIIB
			CULG				0321.5	0322.5	1				IIIG
			CULG				0334.5	0336	1				IIIGG
			CULG				0335.5	0336	1				UNCLF
			CULG				0344.5	0345	1				SLOW DRIFT
			CULG				0454.5	0455.5	1				IIIG,U
	0416	1401	WEIS				0454.5	0455.5	2				IIIG,U
			CULG	0612.5	0613.5	1	0612.5	0613	1				IIIG
			WEIS				0612.8	0613.1	2				IIIG
			CULG	0615.5	0616.5	1							FAST DRIFT
			WEIS				0617.8	0617.9	1				IIIB
			WEIS				0723.1	0723.2	1				IIIG
			WEIS				0802.8	0803.3	1				IIIG
			WEIS				1213.3	1214.4	1				IIIG
			WEIS				1307.5	1307.7	1				IIIB
			WEIS				1327.0	1327.2	1				IIIB
			WEIS				1329.5	1329.9	2				IIIG
			WEIS				1331.9	1333.1	1				IIIG
	1420	1824	WEIS				1527.7	1528.5	2				IIIG
			WEIS				1531.1	1532.1	1				IIIG
			WEIS				1533.2	1533.2	2				IIIB
			WEIS				1535.8	1536.2	1				IIIG
			WEIS				1555.4	1555.7	2				IIIG
			WEIS				1656.8	1657.2	1				IIIB
			WEIS				1704.8	1707.4	2				IIIG
			WEIS				1753.2	1754.4	3				IIIG,V,U
	2029	2400	CULG				2117						IIIB,W
			CULG				2123	2124.5	1				IIIG
			CULG				2155.5	2157.5					IIIG,W
			CULG				2221	2222					IIIG,W
			CULG				2225.5	2228	1				IIIGG
			CULG	2252	2253	1	2252	2253	1				IIIG
26	0000	0729	CULG	0047	0049	1							I
			CULG				0108	0551					IIIN,W
			CULG				0521	0705					IS,W
			WEIS				0551.0	1726.0	1				IIIN
			CULG				0551	0656					IIIS,W
	0414	1825	WEIS				1616.5	1823.0	1				IN
			WEIS				1751.0	1757.0	3				IIIGG
	2029	2400	CULG				2054	2400	1				IS,DC
			CULG				2057	2400					IIIS,W
			CULG	2157	2400								IN,W
			CULG	2221.5	2223	1	2220.5	2225	2				IIIGG
			CULG				2228	2230	1				IIIGG
			CULG				2305	2306	1				IIIG
			CULG	2344.5	2350	1	2341	2351	2				IIIGG
27	0000	0726	CULG				0000	0726					IIIN,W
			CULG				0000	0136					IS,W
			CULG	0000	0726								IN,W
			CULG				0136	0726					IN,W
			CULG	0300	0300.5	1	0259	0310.5	2				IIIGG
			CULG				0341	0342	1				IIIG
	0414	0610	WEIS				0424.5	1736.0	1				IIIN
			CULG				0457.5	0502.5					IIIGG,W
			CULG	0630.5	0632	1	0630	0646	2				IIIS
	1005	1828	WEIS				1209.5	1214.5	2				IIIGG
			WEIS				1226.6	1232.0	2				IIIG
			WEIS				1344.0	1347.5	2				IIIG
	2030	2400	CULG	2052.5	2400								IN,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 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
27			CULG				2104	2400	1				IIIN
			CULG				2104	2400					IIIS,W
28	0000	0712	CULG				0000	0118.5					IIIS,W
			CULG	0001	0712								IN,W
			CULG				0015.5	0018	2	0017.5	0018.5	2	UNCLF
			CULG				0026.5	0027.5	1				IIIG
			CULG				0051		1				IIIB
			CULG				0118	0501					IIIN,W
			CULG	0138		1	0138		1				IIIB
			CULG				0332.5		1				IIIB
			CULG				0335.5		1				IIIB
	0414	1451	WEIS				0417.0	1435.0	1				IIIN
			CULG				0501	0645					IIIS,W
			WEIS				1312.5	1323.0	3				IIIGG
	1510	1635	WEIS				1607.2	1608.7	1				IIIG
			WEIS				1627.0	1629.5	2				IIIG
	2030	2400	CULG				2108	2400					IIIS,W
			CULG				2144	2148	1				IS
			CULG	2315.5	2318		2318	2319					IN,W
29	0000	0729	CULG				0000	0606					IIIN,W
			CULG				0525	0527.5	1				IIIGG
	0744	1829	WEIS				1016.2	1019.4	2				IIIG
			WEIS				1023.0	1023.8	1				IIIG
			WEIS				1507.8	1512.8	2				IIIG
	2030	2400	CULG	2056	2056.5								IIIG,W
			CULG				2114.5	2115.5					IIIG,W
			CULG				2135	2259					IIIN,W
			CULG				2239.5	2241					IIIG,W
			CULG	2242	2243.5	2	2242.5	2243	1				IIIGG
			CULG	2247.5	2249	1							IIIG
			CULG	2349.5	2350	1	2349.5	2350.5	2				IIIG
30	0000	0729	CULG				0124	0256					IIIN,W
			CULG	0251.5	0252	1	0251.5	0252.5	2				IIIG,V,U
			CULG				0259	0259.5	1				IIIG
			CULG	0407	0409.5		0407	0409.5					IIIG,W
			CULG	0418	0419.5	1	0419.5		1				IIIGG
	0410	0715	WEIS				0419.2	0419.3	1				IIIB
			WEIS				0551.3	1551.5	2				IIIG
			CULG	0551	0552	1	0551	0552	1				IIIG
			WEIS				0603.3	0605.0	1				IIIG
			CULG	0604	0605	1	0604	0605	1				IIIG
			WEIS				0700.4	0701.3	2				IIIG
			CULG				0701	0702.5	2				IIIG
	0722	1829	WEIS				0803.5	0807.5	2				IIIG
			WEIS				1238.9	1240.1	2				IIIG
			WEIS				1307.0	1310.2	2				IIIG
			WEIS				1344.9	1345.4	1				IIIG
			WEIS				1515.5	1518.7	2				IIIG
	2030	2400	CULG				2117	2319					IN,W,DC
			CULG				2119	2124.5					II? W
			CULG				2136.5	2147.5	1				IIIGG
			CULG				2216						IIIB,W
			CULG	2335.5			2335.5	2336					IIIG,W
31	0000	0730	CULG	0031		1							IIIB
			CULG				0141.5	0144					IIIG,W,DC
			CULG				0148.5	0149.5					IIIG,W
			CULG	0350.5	0351		0350	0351					IIIG,W
			CULG				0632	0643					IIIGG,W
			CULG				0648.5						IIIB,W
	0509	1830	WEIS				0648.5	0648.9	2				IIIG
			WEIS				0831.2	0832.2	1				IIIG
			WEIS				0923.1	0923.2	2				IIIB
			WEIS	1023.0	1215.0	3							IV
			WEIS				1038.5	1040.5	2				IIIG
			WEIS				1040.0	1535.0	3				IV
			WEIS				1040.0	1053.0	3				II

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 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	
31			WEIS				1507.0	1507.4	2				IIIG
			WEIS				1540.0	1800.1	2				I
			WEIS				1629.8	1632.8	2				IIIG
	2030	2400	CULG	2053.5	2212								IS,W
			CULG				2056.5	2102	1				IS
			CULG				2102	2255	1				IS,DC
			CULG				2217	2217.5	1				IIIB,U
			CULG				2220.5	2221.5	1				UNCLF
			CULG				2225	2226					IIIG,W
			CULG	2231.5	2232	1	2231.5	2232	1				IIIG
			CULG				2255	2310					IS,W
			CULG				2310	2400					IN,W
			CULG				2355.5	2357.5					IIIG,W

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: See page 52 of *Solar-Geophysical Data*, Comprehensive Reports, Number 407, for the May 1978 spectral observations from Harvard, Manila and Sagamore Hill. NGSDC must take the blame for failing to include the Manila and Sagamore Hill data with the observations listed here. Those from Harvard, on the other hand, simply arrived too late. The quality of the Culgoora spectrograph film was poor during the period 12/2028 UT to 16/0417 UT. No observations were taken at Durnten from May 24 to May 31, 1978. Retuning of the Dwingeloo radio spectrograph prevented observations from being made during May 1978.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
30/1	2300	0500	160	.4	0	-	3	IS	
	2300	0500	43.25)				2)		
			80)	.4	0	-	2)	IIIS	
			160)				3)		
2	0116	0121	43.25)						)
			80)	.3	0	-	3	IIIGG,V	) Complex
			160)						) Source
									) Structure
									)
	0118	0410	43.25)						)
			80)	.3	0	-	3	IV	)
			160)						)
									)
	0122	0137	43.25)						)
			80)	.3	0	-	3	II	)
			160)						
	0410	0450	43.25)				3)		Spectral type
			80)	1.1	45	-	3)	II	not easily
			160)				2)		distinguishable.

Days without Heliograph observations: Nil

UT Date 1978. May	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
	2354	2400	43.25)				2)		
			80)	.8	90	-	2)	IIIS	
			160)				1)		
3	0045		43.25)				2)		
			80)	1.1	215	-	3)	IIIG,W	
			160)				1)		
	0253	0257	43.25)				3)		
			80)	.5	0	-	3)	IIIGG	*
			160)				2)		
3/4	2300	0500	43.25	.6)	340	L	2)	IS	Type I persisted from this region until 7th. The 160MHz source double only on 4th.
			80	.7)			3)		
			160	.5)	330	L	2)		
				.7)					
	0025	0500	160)	1.1)	105	L	)	IS	
				1.1)	115	R	2)		
			80	1.2	90	1	)		
			43.25	1.3	75	-	)		

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
	0457	0504	43.25)	1.4)			3)		
			80)	1.2)	25	-	2)	II, HB	
			160)	1.0)			2)		
4	2257	2302	43.25)	)	335	)	3		
			)	)	270	)			
			80)	1.0)	310	-)	3	IIIGG	*
			)	)	280	)			
			160)		295	)	2		
5	2354	2355	43.25)	1.4					
			80)	1.2	280	-	3	IIIG,V	*
			160)	1.0					
7	0203	0210	43.25)	1.5					
			80)	1.3	270	-	3	IIIGG,V	*
			160)	1.1					
	0323	0442	43.25	1.4	260)			II,HB)	Complex source
			80	1.2	270)	-	3	IV)	
			160	1.0	270)			)	
8	0207	0208	43.25)	1.0)			3)		
			80)	1.0)	290		2)	IIIG	
			160)	.9)			2)		

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

UT Date 1978. May	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
	0210	0221	43.25)	1.0)					
			80)	1.0)	290		3	II	
			160)	.9)					
	0221	0310	43.25	1.3)	275	-	2)	IV	
			80	1.1)	270		3)		
9	0240	0243	80)	1.0	70	-	1	IIIG,W	*This region produced type III's also on the 10th.
			160)				2		
	0356	0357	43.25)	1.3)					*This region produced type III's also on the 10th.
			80)	1.1)	270	-	2	IIIG	
			160)	1.0)					
11	0256	0258	43.25)	.5	80)		3)		)Complex
			80)	.3	40)		2)	IIIGG	)Source
			160)	.4	20)		2)		)Structure.
									)The type IV
	0259	0332	43.25	.3	115)		3	II	)moved from
			80	.1	10)				)position A to B
									)at times
	0315	0328	43.25	A) .4	340)		2	IV	)indicated.
			43.25	B) .3	115)				)

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
	2329	2333	80)	.7)	0	-	2)	IIIGG	
			160)	.6)			3)		
15	0119	0122	43.25)				3)		*This region produced type III's also on 16th.
			80)	.9	70	-	2)	IIIG	
			160)				2)		
16/17	2300	0500	80)						Type I persisted from this region from 16th to 21st May.
			160)	1.0	45	R	1	I	
	2300	0500	80)	.9	290	L	1	I	
			160)						
17	0425	0432	80)	1.2	220		2)	II	
			160)	1.1			1)		
18	0506	0507	43.25)	3.0	160		2)	IIIG	
			80)	1.4			1)		
	0516	0518	43.25)	1.0	240		3	II,HB	
			80)						
22	0203	0208	43.25)	1.4					*Type III's from this region were observed also on the 23rd.
			80)	1.2	220		3	IIIGG,V,U	
			160)	.9					

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

UT Date 1978. May	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Positions Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
23	0106	0109	43.25)				2)		Spectral type
			80)	1.0	50		2)	II	not easily
			160)				1)		distinguishable.
24	0347	0348	80)	.8	40		2	IIIG,U	*Type III's
			160)				3		from this region were observed also on the 25th.
	2342	2343	80)				1)		
			160)	.8	120	-	2)	IIIGG,W	
25	0334	0336	43.25)	1.2	190	-	2	IIIGG	*
			80)	1.1					
			160)	.9					
	0342	0345	43.25	1.2	190	-	2	UNCLF,SLOW DRIFT.	
26/27	2245	0500	80)	1.0	330)	L	2)	I	
			160)	.6	345)		1)		
	2245	0500	80)	.7	295)	L	2)	I	
			160)	.2	335)		1)		

Days without Heliograph observations: Nil

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

MAY 1978

Culgoora

UT Date 1978. May	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions		Polar-ization	Inten-sity (1-3)		
				Central Dist. ($R_\odot$)	Position Angle (Deg.)				
26/27	2342	2354	43.25)	1.3)	340	-	3)	IIIGG	*
			80)	1.0)	330		3)		
			160)	.6)	345		2)		
28	0026	0027	80)	.2	300		2	IIIG	*
			160)						
30	0252	0253	43.25)	.9)			2)		
			80)	.8)	250		3)	IIIG,V,I	*
			160)	.7)			3)		
30/31	2300	0500	80)	.5	0	R	1	IS	
			160)						

Days without Heliograph observations: Nil.....

* Other type III's observed from same position during the day.

COSMIC RAY INDICES

(Neutron Monitors)

MAY 1978

May 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.	6425	6115	Data not available at time of publication.	Data not available at time of publication.	5554.8	Data not available at time of publication.	3400.9	Data not processed at time of publication because of NGSDC paper tape problems.
2		6026	5730			5170.1		3310.9	
3		6181	5830			5265.8		3366.5	
4		6333	5982			5457.2		3422.0	
5		6560	6196			5603.4		3457.3	
6		6692	6316			5720.7		3487.1	
7		6933	6489			5897.1		3512.0	
8		6917	6517			5882.5		3531.1	
9		6952	6542			5921.3		3552.8	
10		7056	6649			6004.5		3551.5	
11		7094	6677			6064.7		3569.4	
12		7177	6726			6137.7		3591.4	
13		7181	6775			6163.3		3595.3	
14		7230	6806			6162.9		3600.9	
15		7194	6797			6166.2		3584.1	
16		7216	6807(23)			6147.5		3590.2	
17		7261	6836			6188.2		3595.0	
18		7302	6883			6205.5		3595.5	
19		7280	6868			6216.0		3605.2	
20		7287	6857			6215.7		3600.4	
21		7262	6850			6178.3		3592.3	
22		7218	6823			6203.2		3598.0	
23		7276	6865			6223.7		3600.8	
24		7229	6820			6152.6		3583.6	
25		7251	6835			6157.6		3586.4	
26		7285	6850			6180.8		3594.5	
27		7290	6864			6194.8		3591.2	
28		7320	6902			6215.1		3596.9	
29		7246	6833			6171.2		3587.6	
30		7108	6730			6092.1		3560.9	
31		7074	6654			6031.9		3541.8	
MEAN		7028	6627			5998.3		3546.9	

( ) 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.

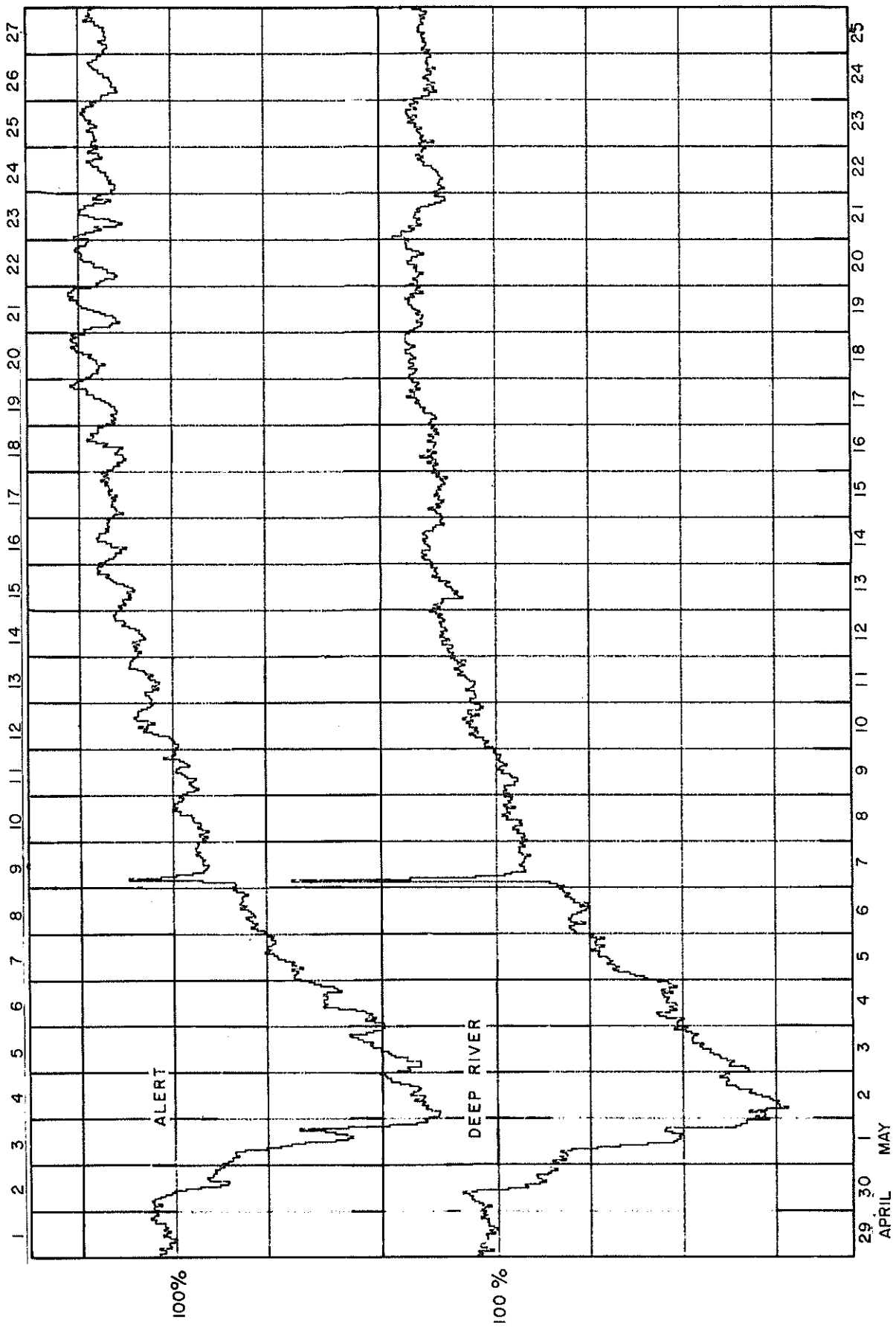
Notes: Tokyo neutron monitor counting rate increased by 2.0/1.5 since the beginning of September 1977. The number of counters changed from 27 to 36. Since the scaling factor has been changed, the listed figures are nearly the same as those in and before May 1977. The level in June, July, and August,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

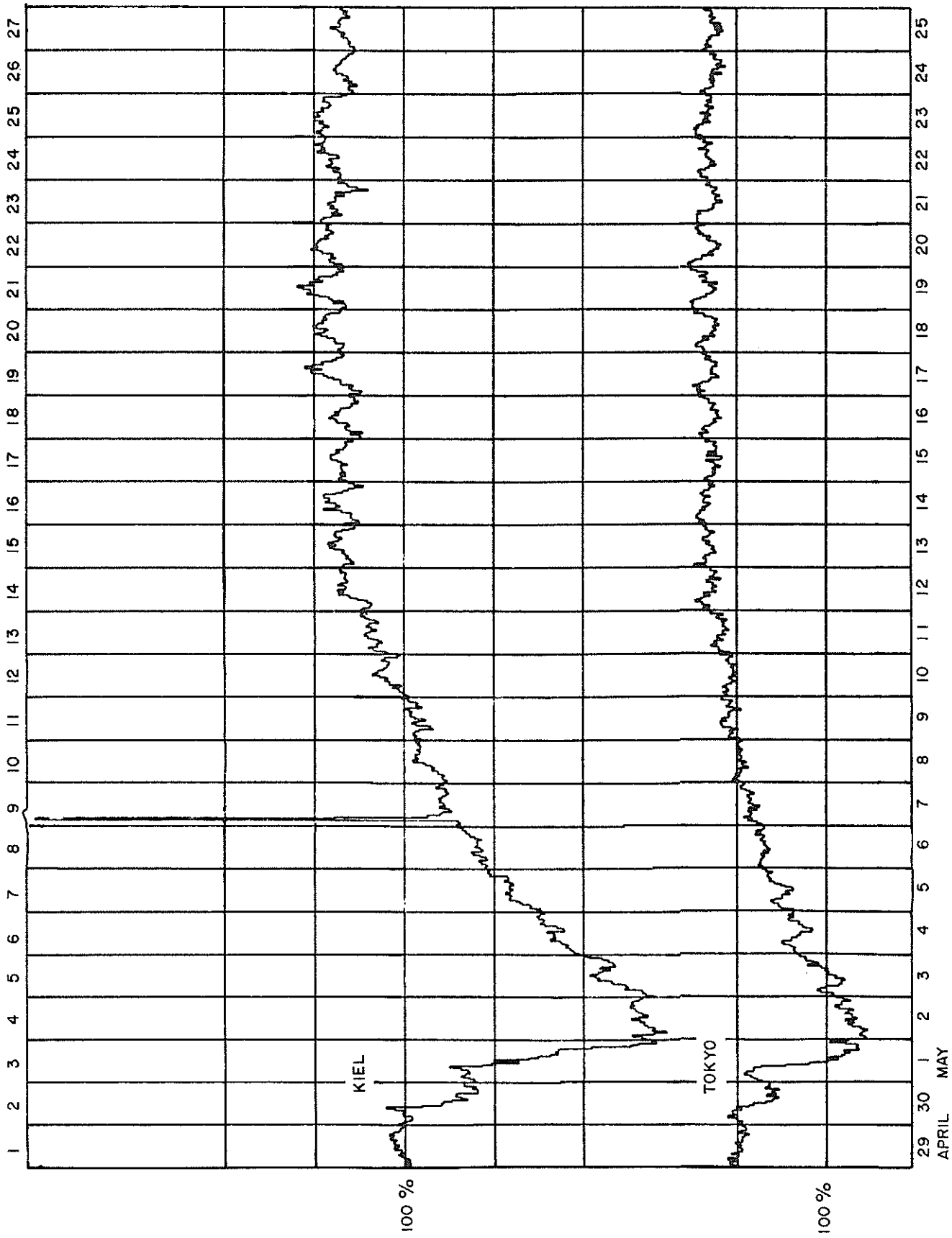
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1979 (April-May 1978)



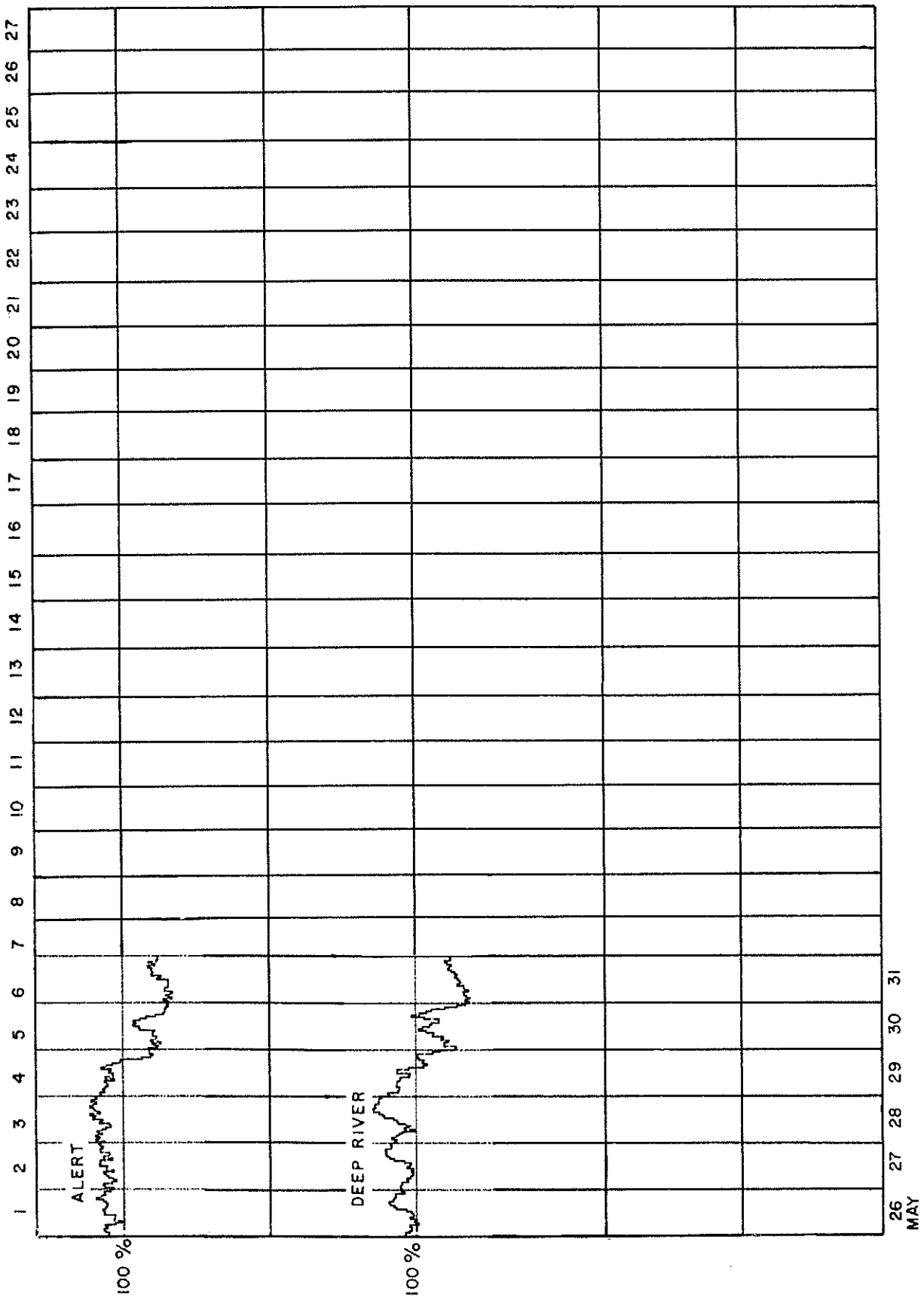
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1979 (April-May 1978)



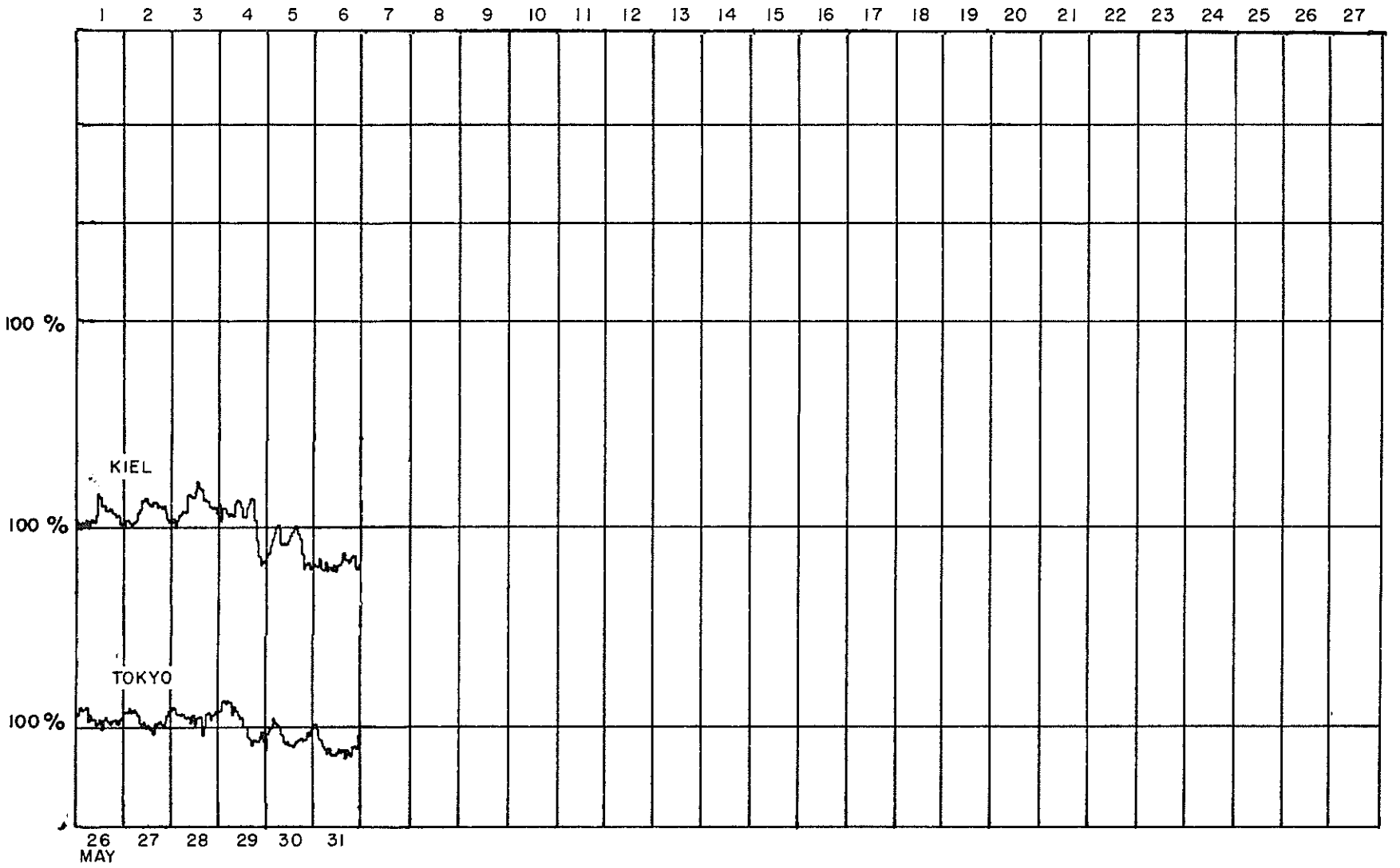
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1980 (May 1978)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1980 (May 1978)



GEOMAGNETIC ACTIVITY INDICES

MAY 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	D5	3-	5-	6-	5+	7+	4+	7-	8+	45	3-	4	4+	4+	7-	3+	5	7+	88	97	93	48	142		1.8
2	D1	7+	6-	7+	7	7	5+	4-	5-	48	6	5-	6+	6-	5+	4	3+	4	94	85	93	89	89		1.9
3	D4	5-	5+	6	5+	7-	7-	6	7	48-	4-	5-	5-	5	5	5	5	5+	83	85	83	95	72		1.8
4	D2	7+	8-	7+	6+	7-	4+	5-	2-	46	6	7-	6+	6-	5+	3+	4-	2-	96	100	117	164	54		1.9
5	Q0A	1+	2-	1	1	1+	1	2+	4-	13+	1+	1	1-	1-	1	1-	2-	3+	7	15	8	7	17	K	0.4
6	Q4	2-	1	1+	1	1	1	1	3-	11-	1+	1-	1+	1	1	1	1-	2+	5	9	7	8	8	CK	0.2
7	Q9A	3-	1+	2-	2-	1+	2-	3-	2	15	2+	2-	2-	2-	1	2	3-	2	7	15	10	10	15	CC	0.4
8		2-	1+	1	3	3	4	4+	4-	22	1+	1	2-	3-	3	3+	3+	3+	16	29	20	13	36		0.9
9	D3	5	5	8-	6+	7	7-	5	3+	46	4+	4+	7-	6-	6-	5	4+	3	85	85	96	104	77		1.8
10		1-	1+	1-	1-	1+	1-	3+	5-	13+	1-	1+	0+	1-	2-	1	3-	4	10	13	12	4	22	K	0.6
11		4	6	5	3+	3	3	3+	4-	31+	3+	5	4+	3	3-	3	3	3+	30	47	34	50	31		1.3
12		4-	3+	4-	3-	3+	3	4-	3+	27-	4-	3+	3	3-	3	2+	4-	2+	18	33	31	29	35		1.0
13		5-	2-	1	1	2+	2-	1+	3-	16+	4	2-	1	1	2+	1+	1	3-	11	19	11	17	14		0.6
14		3-	2	1+	2	1+	3-	3+	2+	18-	2+	2	2-	2	1+	2+	3	2+	9	20	10	12	19	K	0.5
15	Q5	1	0+	0+	2	1+	2+	2	2	11+	2-	0+	1-	2+	1+	2-	2-	2-	5	13	7	7	14	CC	0.2
16	Q7A	2-	2	1	1	2+	3-	2-	2-	14	2-	1+	1-	1	2-	2	2-	1+	7	15	8	9	15	CC	0.3
17		2-	2+	2+	1+	1+	1+	2+	3	16-	1+	2+	2+	1+	1+	1	2-	3-	8	15	8	9	15	CC	0.4
18	Q3	1+	2	1-	1+	1+	2	1+	0+	10+	1+	2+	0+	1+	1	2	1	0+	5	12	8	9	12	CC	0.2
19	Q1	1	1-	1-	2+	2-	1	0+	1	9-	0+	0+	1-	2	2-	1-	0+	1-	4	9	5	7	7	CC	0.2
20		1+	1+	1+	1+	1	2+	4	1+	14	1	1+	2-	1+	1	2	3	1+	8	19	7	9	18	KK	0.4
21		2	3	2+	1+	3-	2+	6-	6	25+	2+	3+	2+	2-	2+	2	5-	5+	26	43	36	19	61		1.2
22		5	3-	3-	3-	3	4	5-	4	29-	4-	3	3-	2+	3	3+	4-	4-	24	43	27	28	43		1.2
23		3	4-	3	2	2+	4+	4+	5+	28	3-	3	3-	3-	3-	3	4-	4+	24	43	23	22	45		1.1
24		5-	3	4+	4+	5-	3	3-	4-	30+	4+	3	4	4-	3+	3-	2+	4-	26	38	42	44	36		1.2
25		4-	2+	2+	1	2+	1+	2	3+	18+	4	3-	2+	1+	2+	2-	2-	3	10	20	17	18	20		0.6
26	Q8A	3	2-	2-	2-	2-	2-	2-	1	14	3	2-	2	2+	2	1+	2-	1	7	14	18	17	15		0.3
27	Q2	1+	1	2-	1+	1	1-	1-	2+	10	1+	1+	2	1	1-	1-	1-	2+	5	12	4	8	9	CC	0.2
28	Q6A	2-	1	1+	2-	2	2	3-	2-	14	2-	1+	1+	3-	2	2	2+	1+	7	17	16	11	22	K	0.3
29		1+	1-	0+	1	1+	1	4-	3+	13-	1+	1-	1-	1	1+	1	3	3	8	17	11	6	22		0.4
30		5	4	4-	2-	3-	2+	3-	2+	24+	5-	3+	4-	2	2+	2	2+	2	18	30	21	28	24		1.0
31		4	4	2+	1+	3-	1	1+	1	18-	3+	3+	2+	2	2+	1+	1+	1	12	20	13	24	9		0.7
																			25	33.4	29.0	31.3			0.81

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-	4	5-	5-	6+	4-	5+	7	2+	4	4	4	7-	3	5	8-
2	6+	5-	7-	6-	6-	4	3	4-	6	5-	6	6	5	4	3+	4+
3	4	5-	5	5-	5	5+	5-	6-	4-	4+	5-	5	5+	5-	5	5+
4	6-	7-	7-	6-	6-	4-	4-	2-	6	6+	6	6-	5-	3+	3+	1+
5	1	1+	1+	1	1+	1+	2+	3	1+	1	0+	0+	0+	0+	1+	4-
6	2-	1	2-	1+	2-	1+	1+	2+	1	1-	1+	1-	0+	0+	0	2
7	3-	2	2-	2+	1+	2+	3	3-	2+	1+	1+	1	1-	1+	2	1
8	2-	1	2-	3	3	4-	4-	3+	1+	1+	1+	2+	3	3+	3	3
9	5-	5-	7-	6-	6-	5+	4+	3	4	4	6+	6	6-	5	4+	3
10	1	1+	0+	1	2-	1-	3	4+	1-	1+	0+	0+	1+	1	2+	4
11	4-	5+	4+	3	3-	3	3	3	3+	5	4+	3	3-	3	3	3+
12	4-	3+	3	3-	3+	2+	3+	3-	4-	3+	3+	2+	3	2+	4-	2
13	4-	2-	1+	1+	3-	2-	2-	3-	4+	1+	1-	1	2-	1+	0+	2+
14	3-	2	2-	2+	1+	3-	3	3-	2+	2	1+	2-	1	2-	3	2+
15	2-	0+	1	3-	2-	2	2	2+	1+	0+	0+	2-	1+	1	1	1
16	2-	2-	1+	1+	2+	3-	2	2	1+	1+	0+	1-	1+	2-	1+	1-
17	2-	3-	2+	2-	2-	1+	2+	3-	1-	2	2+	1	1	1	1	3
18	1+	2+	1-	2-	1+	2+	1+	1-	1+	2+	0	1	1-	2-	1-	0
19	1-	0+	1-	2+	2	1	1-	1+	0+	0+	1-	2-	1+	0	0+	0
20	1	2-	2	2-	2-	3-	3+	1+	1-	1	1+	1-	0	1	3-	1
21	3-	3+	3-	2+	3-	3-	5	5-	2	4-	2	1+	2-	1	5-	6-
22	4	3	3-	3-	3	3+	3+	3	4-	3	3-	2+	3-	3+	4	4
23	3-	3	3-	3-	3-	4-	4	5-	3-	3	3	3-	3-	3-	3	4+
24	4	3	4	4	4-	3	3-	3+	5-	3+	4+	4-	3+	3-	2-	4+
25	3+	3-	3-	2-	2+	2-	2	3-	5-	3-	2	1+	2+	1+	1+	3
26	3	2-	2-	2	2	2-	2-	1+	3	2-	2	2+	2	1	2-	1-
27	1+	1+	2+	1+	1+	1-	1	2-	1+	1+	2	1	0	0+	0+	3-
28	2-	1+	2	2+	2+	2	2+	1+	2-	1+	1	3-	2-	2-	2+	1+
29	1	1	1	1	2-	1+	3+	3	2-	0+	0	1-	1+	0+	2+	3-
30	5-	3	3+	2+	2+	2+	3-	2+	5	4-	4-	2	2+	2-	2-	1+
31	4-	4-	2+	3-	3-	2-	2	1+	3	3+	2+	1+	2-	0+	1-	0+

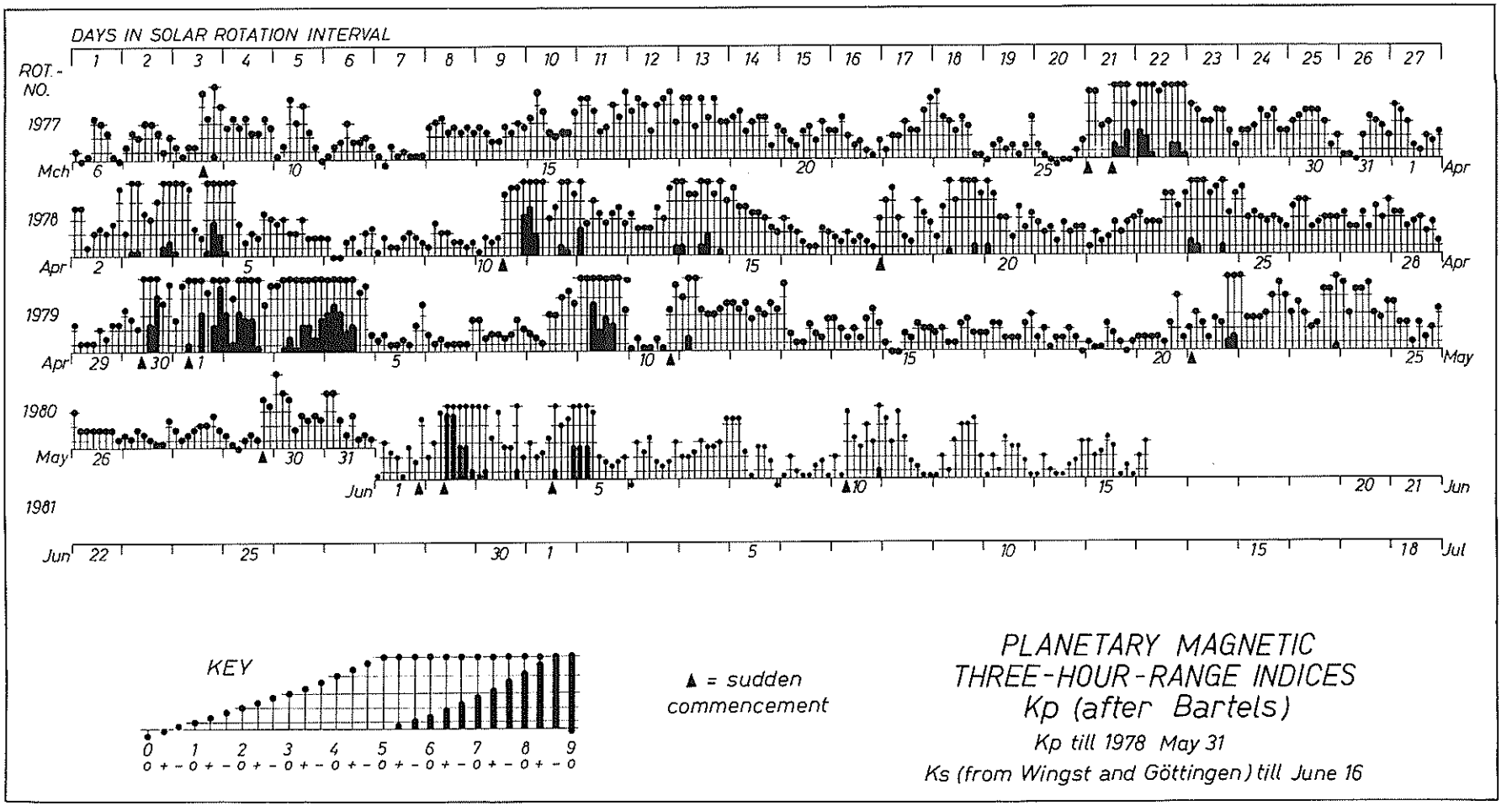
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen,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

Geoagnetic 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	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	9	15	6	4	4	5	6	7	15	33	12	88
2	14	11	4	6	5	6	69	8	14	27	15	94
3	6	9	7	8	10	4	9	13	14	15	41	83
4	5	8	9	6	7	8	14	89	11	3	55	96
5	7	5	40	3	8	10	18	31	17	6	21	7
6	5	28	21	4	8	7	5	34	14	7	9	5
7	6	15	17	6	3	5	3	13	7	9	5	7
8	6	14	12	8	6	3	2	19	10	20	5	16
9	6	16	20	11	2	3	3	23	16	14	6	85
10	8	14	12	13	4	9	4	21	7	12	36	10
11	4	10	28	19	12	6	38	7	5	7	64	30
12	4	4	11	6	28	18	21	4	10	3	29	18
13	6	9	11	28	14	26	16	8	8	12	24	11
14	9	18	12	10	13	42	8	3	11	10	51	9
15	3	12	11	9	19	25	5	2	48	17	19	5
16	10	27	9	7	8	14	9	14	11	24	8	7
17	8	14	29	10	12	8	12	9	10	25	7	8
18	10	7	13	6	22	6	3	12	10	24	19	5
19	10	23	24	42	28	6	3	6	12	15	38	4
20	11	29	8	44	7	4	4	3	12	9	23	8
21	6	10	5	64	5	5	6	1	12	7	9	26
22	10	11	5	63	22	3	6	3	22	13	8	24
23	10	6	6	21	6	2	4	2	6	15	22	24
24	7	7	10	12	6	2	5	6	5	6	48	26
25	5	5	27	10	4	15	5	12	12	3	17	10
26	6	3	13	18	6	19	11	12	37	49	18	7
27	7	3	14	24	62	12	6	5	42	70	16	5
28	12	4	7	9	47	5	10	9	46	17	12	7
29	7	61	6	3	9	6	8	36		14	6	8
30	9	17	5	4	9	12	5	36		16	58	18
31		8	4		6		6	23		8		12
MEAN	8	14	13	16	13	10	10	15	16	16	23	25

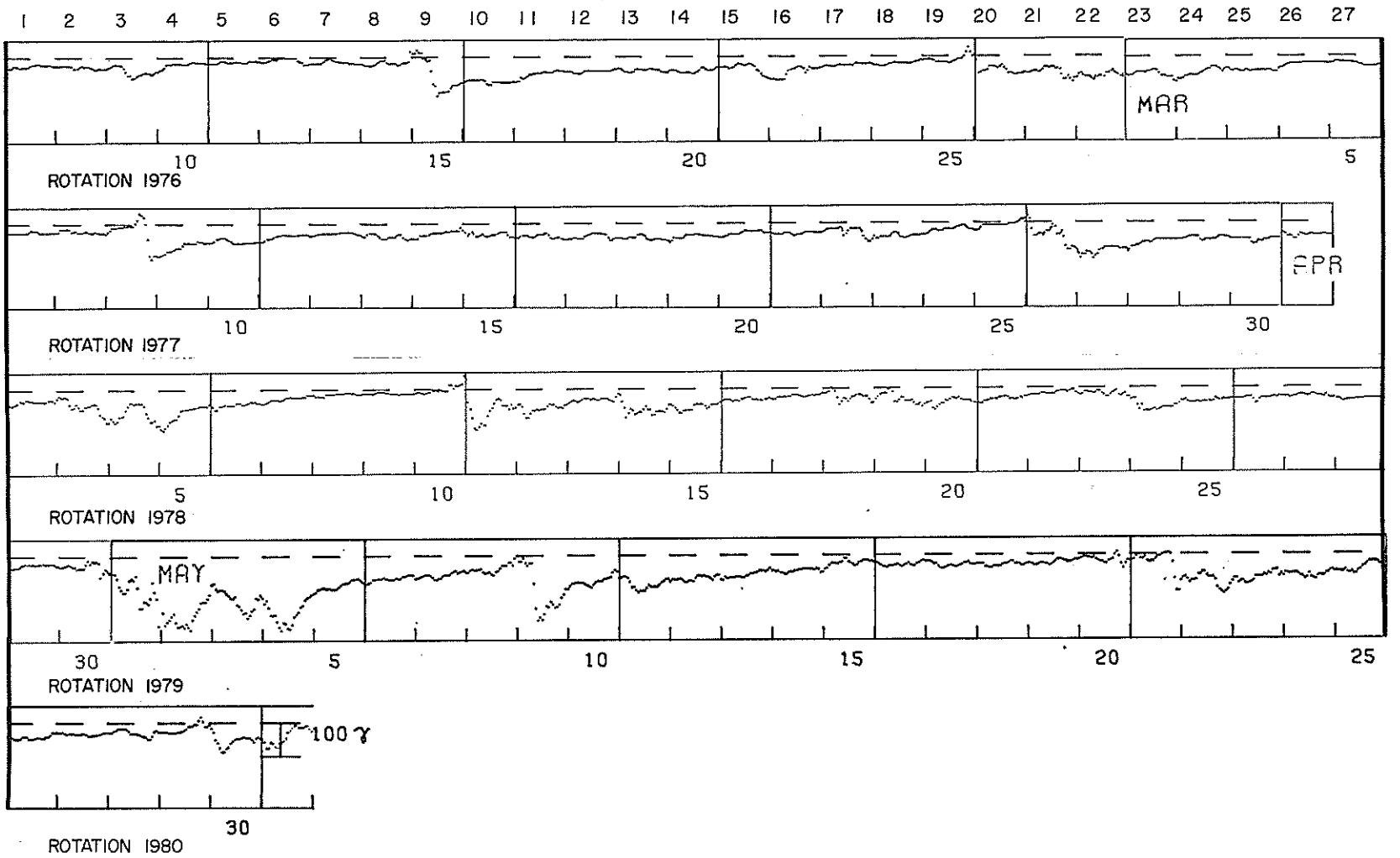
GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst

by Bartels Rotation



Note: Both the sensitivity indicator placed on the last day of the month and the zero reference level change from month to month.

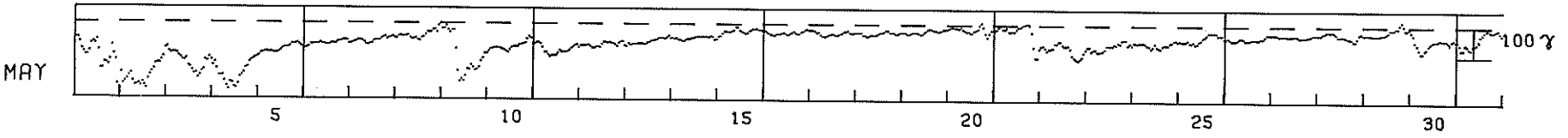
HOURLY EQUATORIAL Dst VALUES (PROVISIONAL

MAY 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	-52	-53	-66	-88	-98	-108	-107	-95	-70	-65	-70	-58	-92	-154	-151	-132	-135	-139	-122	-76	-105	-124	-205	-217
2	-163	-202	-193	-187	-175	-167	-194	-208	-205	-201	-209	-198	-207	-216	-186	-172	-162	-152	-135	-133	-133	-123	-112	-83
3	-80	-96	-101	-98	-100	-102	-110	-115	-123	-125	-118	-142	-146	-158	-168	-165	-182	-173	-160	-154	-122	-126	-114	-122
4	-139	-130	-151	-174	-175	-171	-192	-209	-218	-194	-198	-212	-214	-200	-177	-171	-163	-148	-144	-128	-122	-118	-113	-110
5	-107	-95	-97	-94	-93	-97	-95	-97	-99	-98	-96	-91	-86	-81	-80	-80	-76	-69	-68	-67	-65	-71	-77	-82
6	-84	-81	-78	-70	-70	-68	-68	-69	-64	-68	-70	-72	-71	-70	-66	-68	-68	-62	-61	-59	-56	-57	-59	-67
7	-67	-64	-62	-59	-56	-57	-60	-64	-70	-72	-68	-66	-60	-57	-58	-56	-51	-47	-44	-52	-49	-46	-44	-50
8	-50	-43	-40	-44	-42	-41	-39	-48	-53	-51	-49	-56	-59	-48	-45	-38	-30	-30	-29	-22	-20	-29	-8	-1
9	-18	-17	-9	-23	-30	-23	-23	-85	-157	-191	-182	-188	-171	-148	-152	-136	-144	-154	-151	-144	-123	-114	-98	-99
10	-91	-84	-82	-80	-80	-80	-82	-85	-88	-92	-95	-87	-80	-76	-76	-75	-70	-68	-66	-63	-50	-43	-48	-67
11	-65	-62	-63	-67	-79	-95	-93	-102	-110	-105	-105	-106	-97	-88	-93	-92	-92	-91	-87	-80	-75	-70	-71	-79
12	-72	-72	-72	-70	-69	-74	-80	-80	-76	-75	-78	-67	-61	-61	-63	-61	-64	-64	-68	-74	-63	-59	-58	-72
13	-75	-64	-69	-66	-66	-67	-64	-64	-65	-67	-65	-61	-60	-55	-56	-52	-50	-46	-45	-46	-49	-44	-38	-46
14	-46	-49	-46	-52	-51	-56	-57	-51	-49	-50	-46	-45	-42	-41	-40	-40	-42	-42	-42	-44	-39	-42	-51	-49
15	-41	-38	-31	-24	-23	-26	-25	-22	-19	-10	-11	-20	-24	-28	-32	-29	-22	-19	-15	-16	-16	-19	-19	-23
16	-23	-26	-31	-35	-37	-38	-33	-32	-31	-29	-28	-33	-36	-31	-28	-24	-30	-33	-33	-26	-23	-18	-16	-20
17	-19	-19	-23	-28	-26	-34	-39	-42	-39	-36	-33	-31	-34	-37	-35	-32	-29	-24	-23	-20	-28	-31	-29	-27
18	-28	-27	-29	-36	-37	-39	-38	-55	-36	-37	-34	-30	-27	-26	-24	-19	-21	-27	-26	-28	-33	-31	-28	-26
19	-26	-28	-32	-32	-29	-26	-25	-28	-29	-32	-31	-25	-20	-14	-13	-16	-19	-20	-23	-21	-19	-15	-15	-14
20	-12	-9	-9	-11	-11	-13	-9	-15	-19	-22	-22	-27	-27	-20	-17	-13	-1	6	-8	-28	-41	-28	-18	-18
21	-18	-14	-7	-1	-13	-15	-9	-21	-24	-20	-22	-14	-8	-6	-2	2	3	5	0	-25	-72	-108	-109	-77
22	-69	-66	-74	-84	-78	-79	-75	-60	-60	-52	-54	-63	-68	-68	-66	-76	-99	-106	-111	-115	-111	-105	-89	-80
23	-71	-70	-86	-80	-78	-86	-88	-85	-85	-77	-66	-67	-67	-65	-61	-63	-56	-60	-49	-46	-47	-65	-59	-64
24	-56	-58	-60	-56	-57	-56	-60	-64	-67	-73	-69	-58	-69	-72	-75	-66	-62	-64	-63	-56	-54	-48	-47	-52
25	-49	-52	-53	-53	-47	-55	-58	-53	-60	-58	-50	-46	-38	-35	-30	-23	-21	-22	-21	-24	-31	-33	-33	-42
26	-44	-38	-43	-48	-48	-50	-46	-40	-38	-42	-47	-48	-47	-44	-43	-43	-46	-46	-41	-40	-35	-28	-27	-28
27	-29	-29	-28	-32	-34	-32	-52	-32	-35	-35	-33	-32	-32	-35	-38	-38	-37	-37	-35	-34	-32	-28	-29	-29
28	-30	-28	-24	-21	-17	-16	-18	-16	-20	-25	-33	-34	-34	-33	-36	-38	-41	-42	-48	-48	-38	-26	-22	-27
29	-29	-26	-29	-29	-31	-31	-30	-31	-28	-26	-25	-22	-18	-11	-11	-9	-4	-6	7	16	3	-12	-12	-6
30	-16	-28	-50	-60	-75	-86	-86	-76	-71	-60	-54	-49	-46	-47	-44	-41	-44	-45	-43	-49	-57	-46	-41	-47
31	-49	-57	-75	-75	-57	-61	-70	-72	-60	-58	-54	-44	-28	-23	-14	-9	-9	-13	-15	-13	-10	-8	-17	-25



Note: Both the sensitivity indicator placed on the last day of the month and the zero reference level change from month to month. Hourly values of the provisional Dst index for May 1978 are based on data from Hermanus, Kakioka and San Juan; the magnetometer at Honolulu was not operating for about 1 month.

PRINCIPAL MAGNETIC STORMS

MAY 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
FR	49.6N	30	0952	SC	- 5	+36	- 7	01(8)	8	54	575	565	04	21
HI	54.2N	1	0828	SC*	- 2 *	-45 *	0	01(8)	8	65	360	295	04	20
SJ	29.9N	1	1836	SC	- .5	+19	+ 5	01(8)	7	12	184	36	02	15
GM	24.5N	1	0800	..	..	..	..	--	-	11	215	67	04	23
JP	17.3N	1	0800	..	..	..	..	--	-	9	190	45	04	23
SH	14.6N	1	0800	..	..	..	..	--	-	8	233	52	04	23
UJ	13.5N	1	0800	..	..	..	..	--	-	6	212	45	04	23
AL	09.5N	1	0800	..	..	..	..	01(5)	7	7	191	51	04	23
HD	07.6N	1	0826	SC	- .2	+17	- 1	01(5)	7	6	229	20	01	18
HD	07.6N	1	1835	SC	- .5	+44	- 2	01(7,8) 02(3,4,5)	6	6	177	39	02	19
GU	04.0N	1	0828	SC	..	+17	- 5	01(5)	6	--	120	20	01	18
GU	04.0N	1	1836	SC	..	+32	- 9	01(8)	7	10	200	50	04	19
AN	01.5N	1	0800	..	..	..	..	--	-	7	246	130	04	23
HU	00.6S	1	0828	SC	+ 1	+28	+ 6	01(5,8)	7	12	459	70	02	21
TV	01.1S	1	0800	..	..	..	..	--	-	4	262	182	04	23
GN	43.3S	1	1836	SC	+ 6.8	+30	+36	01(8)	8	52	200	210	02	20
GN	43.3S	1	0829	SC*	+ 1.3	+16 *	+ 6	01(5)	7	22	80	180	01	18
KG	56.5S	1	0828	SC*	--	--	--	01(5,8)	9	--	--	--	04	21
IR	41.0N	2	2320	SC	- 2.6	+19	+ 3	03(8) 04(3,5)	6	32	246	127	04	21
SJ	29.9N	2	2324	SC	+ 1	+15	+ 5	04(2)	6	12	99	29	04	19
HD	07.6N	2	2317	SC	+ .3	+23	- 1	03(4,5) 04(2,3)	6	5	181	29	04	21
HU	00.6S	2	2318	SC	+ 1	+22	+ 3	03(6)	6	10	287	42	04	20
GN	43.3S	2	2319	SC	+ 5.2	+13	+25	03(5) 04(1,4,5)	6	21	180	180	04	21
NE	55.1N	7	2154	SC*	+ 2	+22	..	09(3,4,5)	7	62	434	503	09	04
FR	49.6N	7	21--	..	..	..	..	09(3)	7	50	280	190	10	00
HU	00.6S	7	2156	SC	--	+16	+ 2	09(3,5,6)	6	11	395	50	09	23
CO	64.6N	8	10--	..	..	..	..	09(3)	8	274	1670	1160	10	04
SI	60.0N	8	11--	..	..	..	..	09(5)	8	160	--	770	09	23
HI	54.2N	8	13--	..	..	..	..	09(3)	7	30	260	130	09	23
IR	41.0N	8	0500	..	..	..	..	09(3)	8	36	198	114	09	23
SJ	29.9N	8	1200	..	..	..	..	09(3)	7	11	168	42	10	00
GM	24.5N	8	1300	..	..	..	..	--	-	9	229	82	10	03
JP	17.3N	8	1300	..	..	..	..	--	-	9	234	58	10	03
SH	14.6N	8	1300	..	..	..	..	--	-	8	294	45	10	03
UJ	13.5N	8	1300	..	..	..	..	--	-	7	259	49	10	03
AL	09.5N	8	1300	..	..	..	..	09(3)	7	8	237	55	10	03
HD	07.6N	8	1300	..	..	..	..	09(3)	8	7	282	36	10	01
GU	04.0N	8	1303	..	..	..	..	09(3)	7	10	320	30	09	23
AN	01.5N	8	1300	..	..	..	..	--	-	7	372	168	10	03
TV	01.1S	8	1300	..	..	..	..	--	-	4	--	--	10	03
GN	43.3S	8	11--	..	..	..	..	09(6)	7	34	200	210	10	00
TO	46.7S	8	11--	..	..	..	..	09(3,4,5)	6	47	234	119	09	23
KG	56.5S	8	1713	SC*	--	--	--	09(5,6)	7	--	--	--	09	21
CO	64.6N	10	2004	SC*	- 4	+14	- 6	12(3)	7	149	1010	650	13	04
SI	60.0N	10	20--	..	..	..	..	11(2)	7	--	440	400	12	15
NE	55.1N	10	2005	SC*	+ 1	+22	--	11(2,3)	6	41	190	200	13	05
FR	49.6N	10	2005	SC	- 1	+23	- 3	10(8) 11(2) 12(1)	5	18	100	76	12	06
HD	07.6N	10	2002	SC	- .2	+ 8	- 1	10(8)	4	5	66	28	11	22
KG	56.5S	10	20--	..	..	..	..	11(2)	5	--	--	--	11	10
FR	49.6N	20	17--	..	..	..	..	21(7,8) 23(7,8) 24(3,4)	5	24	180	98	25	03
GM	24.5N	20	1600	..	..	..	..	--	-	--	--	--	--	--
JP	17.3N	20	1600	..	..	..	..	--	-	9	127	53	23	03
SH	14.6N	20	1600	..	..	..	..	--	-	8	129	35	23	03
UJ	13.5N	20	1600	..	..	..	..	--	-	8	143	47	23	03
AL	09.5N	20	1600	..	..	..	..	21(7,8)	5	8	140	50	23	03
TV	01.1S	20	1600	..	..	..	..	--	-	5	190	78	23	03
CO	64.6N	21	18--	..	..	..	..	22(6,7) 24(3,4,5)	6	208	1140	660	24	15
NE	55.1N	21	0243	SC	+ 1	+18	--	21(8) 22(1) 23(8) 24(3)	5	30	177	168	25	09
HI	54.2N	21	0241	SC*	+ 1 *	+ 6	0	21(7,8) 24(1)	6	35	190	85	24	17
SJ	29.9N	21	0241	SC	..	+11	+ 2	21(7)	6	12	126	27	22	12
HD	07.6N	21	0240	SC	+ .1	+21	- 2	21(8)	6	7	162	26	22	23
GU	04.0N	21	0242	..	..	..	..	21(7)	5	10	100	30	22	03
HU	00.6S	21	0241	SC	--	+15	+ 3	21(7,8)	6	6	303	40	22	23
TO	46.7S	21	19--	..	..	..	..	21(7,8)	5	35	148	31	24	18
KG	56.5S	22	11--	..	..	..	..	22(7)	6	--	--	--	23	00
NE	55.1N	29	1831	SC*	+ 4	+18	--	30(1,3) 31(1)	5	27	173	174	31	12
FR	49.6N	29	1831	SC	- 1	+25	- 4	29(1) 31(2)	5	17	105	39	31	15
GM	24.5N	29	1830	SC	- .3	+31	+ 6	--	-	8	95	32	31	03
JP	17.3N	29	1830	SC	- .5	+27	- 4	--	-	7	81	37	31	03
SH	14.6N	29	1830	SC	+ .3	+25	+ 3	--	-	8	100	27	31	03
UJ	13.5N	29	1830	SC	- .3	+33	- 7	--	-	6	96	35	31	03
AL	09.5N	29	1830	SC	- .4	+23	- 3	29(7) 30(1)	4	5	63	32	31	03
HD	07.6N	29	1830	SC	- .2	+26	- 1	30(1)	5	6	79	26	31	16
GU	04.0N	29	1831	SC	..	+17	- 5	30(1)	6	10	110	40	30	08
HU	00.6S	29	1830	SC*	+ 1	+62	+ 7	30(1,2)	5	4	285	21	31	08
TV	01.1S	29	1830	SC	+ .1	+20	+28	--	-	3	127	73	31	03
KG	56.5S	29	1834	SC	--	--	--	30(1)	5	--	--	--	30	12

Reports were received from the following observatories:

Alibag Annamalainagar College Fredericksburg Gulmarg Gnangara Guam Huancayo Hyderabad Irkutsk Jaipur
Kerguelen Newport Shillong San Juan Sitka Toolangi Trivandrum Trjjain Witteveen

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

MAY 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).

01 0828 A: COI QUE LAS TRW CZT PAF
B: WNG WIT AQU KAK HUA DRV
C: MMB EBR KNY (si: A: FUR - bps: A: LMN)

01 1835 A: EBR COI KAK QUE SZT HUA LMN LAS
B: WIT DOU MMB AQU KNY
C: NGK (si: A: FUR)

02 2318 A: AQU EBR COI QUE HUA
B: WIT KNY SZT
C: NGK KAK (si: A: FUR TOL: B: LMN - bs: A: KSA)

07 2155 A: HUA
B: SOD SZT
C: VIC AQU (si: A: OTT; B: EBR; C: TOL? - b: A: LMN)

10 2005 A: OTT COI TOL FRD HUA LAS TRW
B: SOD NUR ESK WNG WIT DOU VIC AQU KSA QUE DRV
C: HAD MMB EBR KAK LMN (si: A: FUR)

21 0241 B: QUE SZT HUA
C: WNG WIT MMB AQU TOL (bps: C: EBR)

29 1831 A: SOD ESK WNG WIT DOU VIC FUR EBR COI TOL FRD HUA LMN LAS TRW PAF
B: NUR HAD OTT AQU KAK QUE CZT
C: NGK MMB (bs: A: KSA)

Solar-flare effects (sfe).

Effects confirmed by ionospheric or solar observations are underlined.

05 1027 - 1036 WNG

06 2015 - 2025 HUA

07 0324 - 0505 MMB KAK KNY

07 1550 - 1618 HUA

23 0020 - 0105 KNY

26 1748 - 1803 HUA

Very unusual events.

01 1237 bp PAF (+926 +574 +380) DRV (-1000 -869 -1600)

RADIO PROPAGATION QUALITY INDICES

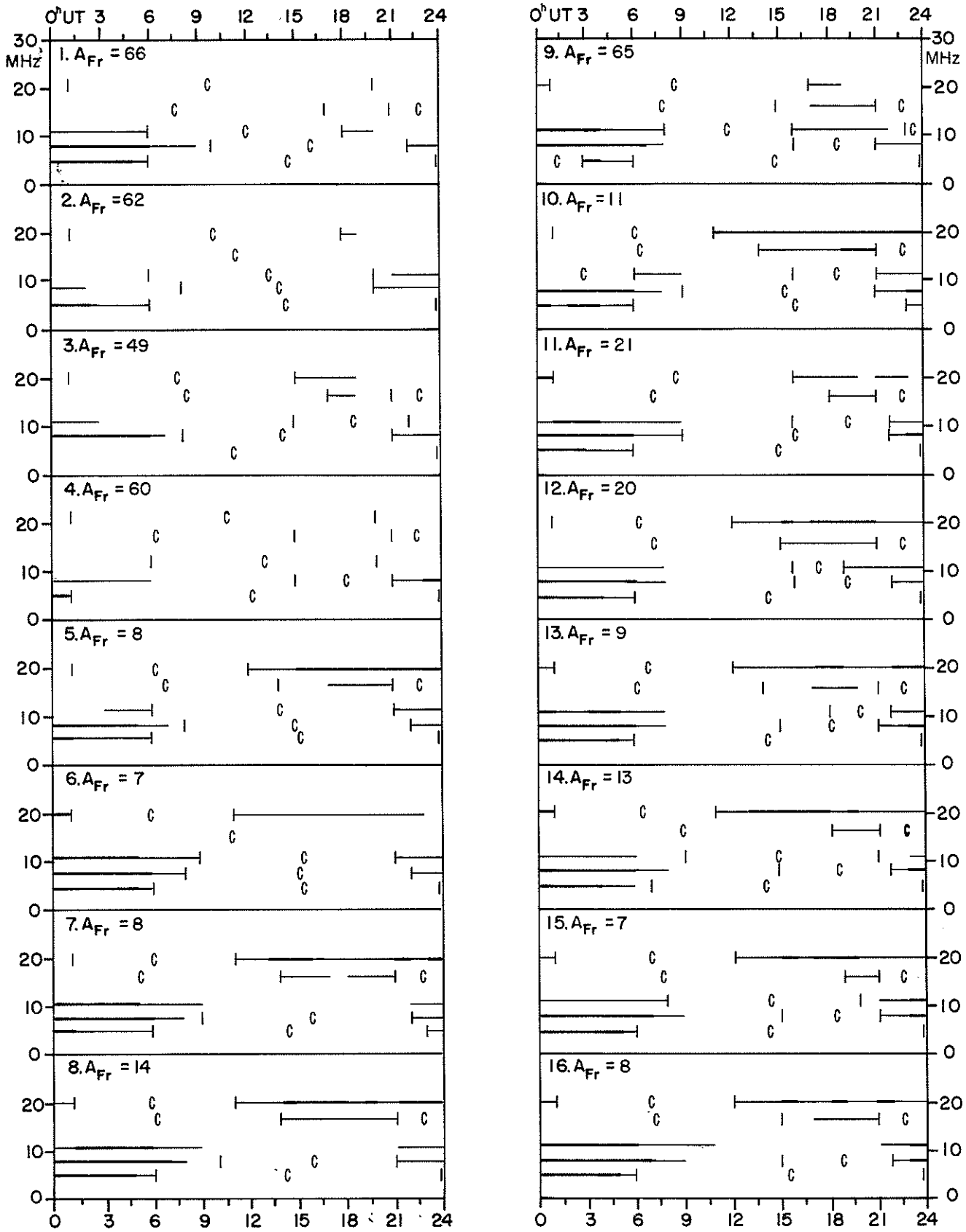
MAY 1978

Quality indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	2.1	3.4	10.5	2.2	12.3
2	2.0	3.5	10.7	3.1	11.8
3	2.4	3.4	11.1	3.8	13.3
4	2.3	3.2	10.3	4.9	12.3
5	4.4	4.8	11.7	4.9	14.7
6	5.8	4.2	12.2	4.3	14.2
7	6.0	4.7	11.5	4.8	14.8
8	6.3	4.6	12.2	4.8	13.7
9	4.1	3.9	11.6	5.0	12.7
10	6.6	5.1	12.1	5.0	14.6
11	3.7	4.1	12.1	5.0	13.5
12	5.0	4.4	12.7	5.2	14.5
13	5.9	4.5	11.9	6.0	13.8
14	5.2	4.8	12.0	6.0	14.2
15	6.8	4.7	12.2	5.6	14.1
16	5.8	4.7	12.3	5.5	14.4
17	5.3	4.9	12.1	5.6	14.8
18	5.5	5.4	11.6	4.9	13.8
19	7.0	5.3	11.9	5.1	13.5
20	7.1	6.9	12.9	5.9	14.9
21	5.8	4.6	12.6	6.0	13.5
22	4.0	4.2	11.2	5.4	13.3
23	3.5	3.9	11.1	5.1	13.0
24	4.3	4.2	11.4	4.7	13.1
25	5.4	5.0	11.8	5.0	14.9
26	6.1	4.0	11.3	5.1	13.8
27	5.6	5.4	11.3	5.5	14.3
28	5.6	4.8	11.1	5.9	14.9
29	4.6	4.2	11.8	5.2	13.7
30	4.0	3.4	11.4	5.0	13.6
31	5.4	3.6	11.3	4.8	13.2
MEAN	5.0	4.4	11.7	5.0	13.8

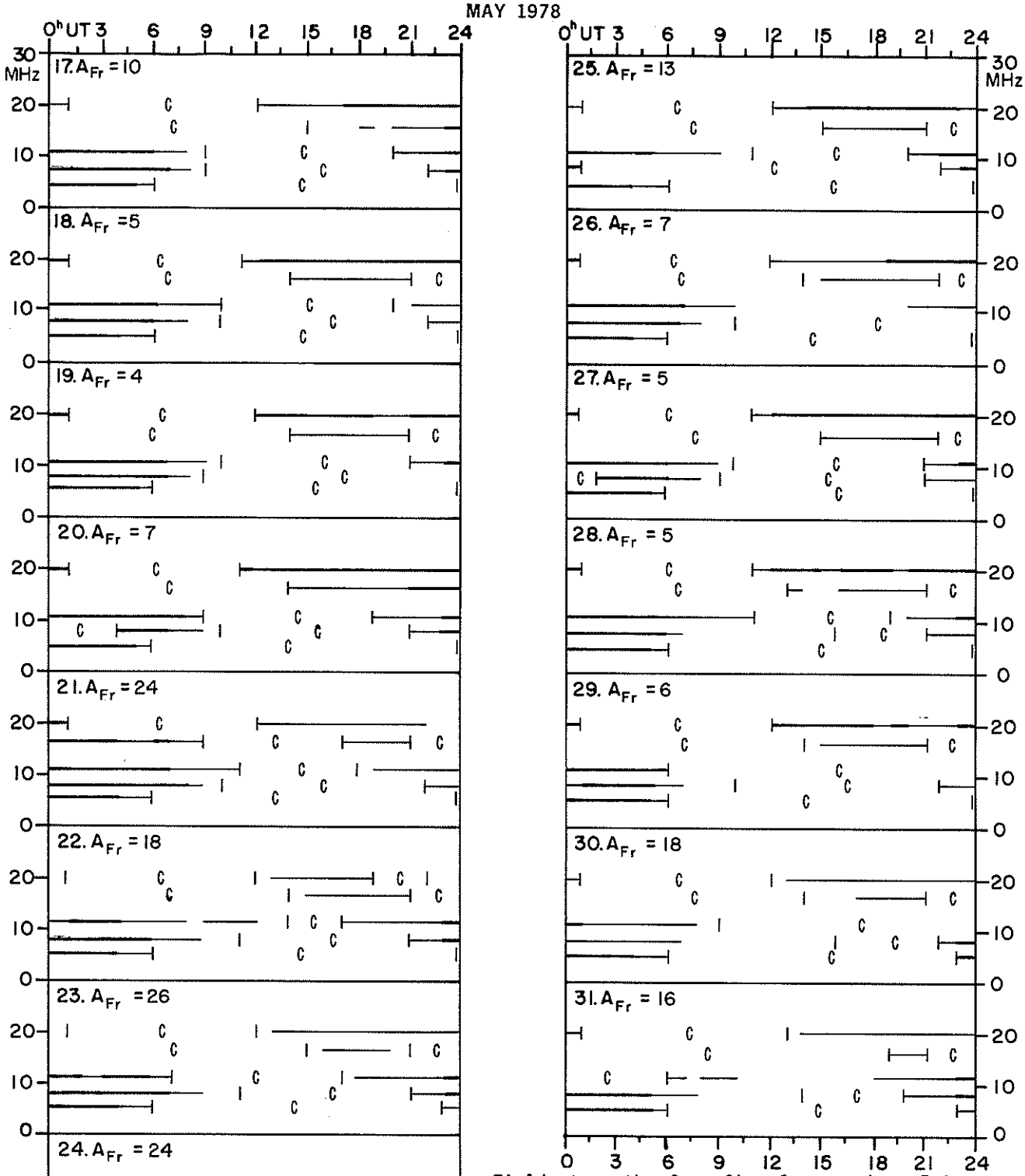
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

MAY 1978



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

MAY 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-8/78/950

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."