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Solar - Geophysical Data

NO. 413 JANUARY 1979

Part I (Prompt Reports)

DATA FOR
DECEMBER 1978
NOVEMBER 1978

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BOULDER, COLORADO

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

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SOLAR-GEOPHYSICAL DATA

No. 413

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Chief
Solar-Terrestrial Physics Division

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----- = no data available.
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DECEMBER 1978 DATA

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INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

DECEMBER 1978

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11 DECEMBER 1978 BOULDER 11/2115Z SOFLARE X1/2B S16W48 11/1807Z DURATION 68 MINUTES.
TENFLARE 25000 FLUX UNITS 11/1918Z IN PROGRESS AT 11/2120Z.
SOFLARE X1/2B S17E14 11/1833Z DURATION 70 MINUTES.
12 DECEMBER 1978 BOULDER 12/1520Z SOFLARE X2/2B S16W58 12/1500Z DURATION 27 MINUTES.
TENFLARE 277 FLUX UNITS 15/1510Z DURATION 49 MINUTES.
18 DECEMBER 1978 BOULDER 18/0213Z SOFLARE M8/1B S15W51 17/0730Z DURATION 25 MINUTES.
TENFLARE 280 FLUX UNITS 17/0732Z DURATION 26 MINUTES.
27 DECEMBER 1978 BOULDER 27/1744Z SOFLARE X1/2B S17E43 27/1625Z DURATION 26 MINUTES.
TENFLARE 540 FLUX UNITS 27/1627Z DURATION 40 MINUTES.
30 DECEMBER 1978 BOULDER 30/1424Z SOFLARE M3/3B S12E63 30/0540Z DURATION 53 MINUTES TO HALF POWER, PARALLEL RIBBONS. WHITE LIGHT FLARE.

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
335	1	30	176	172	004	N13W82	1	0	0		1	N13W82	E	SOLALERT MAGALERT MINOR 01/02
						N15W40	0	0	0			N15W40	Q	
						S14W34	0	0	0			S14W34	Q	
						N09W15	0	0	0			N09W15	Q	
						N14E02	0	0	0			N14E02	Q	
						N15E11	2	0	0			N15E11	CA	
						N24E23	0	0	0			N24E23	Q	
						S18E40	7	0	0			S18E40	CA	
						S20E50	0	0	0			S20E50	E	
						N18E78	0	0	0			N18E78	Q	
336	2	1	170	171	009	N14W53	0	0	0		2	N14W53	Q	SOLALERT MAGNIL
						S27W38	0	0	0			S27W38	Q	
						N09W27	0	0	0			N09W27	Q	
						N13W06	0	0	0			N13W06	CE	
						N13W00	0	0	0			N13W00	CE	
						N24E09	0	0	0			N24E09	Q	
						S18E27	6	0	0			S18E27	CA	
						S19E36	0	0	0			S19E36	CA	
						N18E65	0	0	0			N18E65	Q	
						N23E67	0	0	0			N23E67	Q	
337	3	2	293	172	004	N18W68	0	0	0		3	N18W68	Q	SOLNIL MAGQUIET
						S26W48	3	0	0			S26W48	E	
						N09E42	0	0	0			N09E42	Q	
						N14W21	0	0	0			N14W21	Q	
						N13W12	0	0	0			N13W12	Q	
						S28W11	0	0	0			S28W11	Q	
						N24W04	0	0	0			N24W04	Q	
						S30W00	0	0	0			S30W00	Q	
						S18E14	5	0	0			S18E14	CA	
						S19E24	3	0	0			S19E24	CA	
						N28E37	0	0	0			N28E37	Q	
						S21E45	0	0	0			S21E45	Q	
						S34E52	0	0	0			S34E52	Q	
						N17E55	0	0	0			N17E55	Q	
						N23E55	0	0	0			N23E55	Q	
						S17E60	0	0	0			S17E60	Q	
						S24E72	0	0	0			S24E72	Q	
338	4	3	238	169	003	N18W82	0	0	0		4	N18W82	Q	SOLQUIET MAGQUIET
						N09W57	0	0	0			N09W57	Q	
						N13W25	0	0	0			N13W25	Q	
						N15W36	0	0	0			N15W36	Q	
						N23W16	0	0	0			N23W16	Q	
						S18W00	1	0	0			S18W00	E	
						S20E11	0	0	0			S20E11	E	
						N16E41	1	0	0			N16E41	Q	
						S26W64	0	0	0			S26W64	Q	
						N25E43	0	0	0			N25E43	Q	
						S30W14	0	0	0			S30W14	Q	
						S24E59	2	1	0			S24E59	E	
339	5	4	226	169	008	N13W38	0	0	0		5	N13W38	Q	SOLQUIET MAGQUIET
						N14W50	0	0	0			N14W50	Q	
						N24W28	0	0	0			N24W28	Q	
						S18W13	2	0	0			S18W13	A	
						S20W01	1	0	0			S20W01	E	
						N17E28	0	0	0			N17E28	Q	
						S26W77	0	0	0			S26W77	Q	
						N25E30	0	0	0			N25E30	Q	
						S30W27	1	0	0			S30W27	Q	
						S24E46	4	0	0			S24E46	E	
						S20E24	0	0	0			S20E24	Q	
340	6	5	225	174	006	N13W52	0	0	0		6	N13W52	Q	SOLQUIET MAGQUIET
						N14W63	0	0	0			N14W63	Q	
						N24W41	0	0	0			N24W41	Q	
						S18W25	5	0	0			S18W25	A	
						S21W14	0	0	0			S21W14	Q	
						N17E16	0	0	0			N17E16	Q	
						N25E18	0	0	0			N25E18	Q	
						S30W41	2	0	0			S30W41	E	
						S24E33	2	0	0			S24E33	E	
						S20E12	0	0	0			S20E12	Q	
341	7	6	246	169	004	N13W65	0	0	0		7	N13W65	Q	SOLQUIET MAGQUIET
						N14W76	0	0	0			N14W76	Q	
						N22W54	0	0	0			N22W54	Q	
						S18W39	2	0	0			S18W39	Q	
						S21W26	0	0	0			S21W26	Q	
						N16E02	0	0	0			N16E02	Q	
						N24E05	0	0	0			N24E05	Q	
						S30W51	4	0	0			S30W51	Q	
						S24E19	1	0	0			S24E19	Q	
						S20W01	0	0	0			S20W01	Q	
						S16E75	3	0	0			S16E75	Q	
						S15E40	0	0	0			S15E40	Q	
						N22E74	1	0	0			N22E74	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE
DECEMBER 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
342	8	7	223	186	002	N13W78	0	0	0		8	N13W78	Q	MAGQUIET SOLALERT 08/10
						N22W67	0	0	0			N22W67	Q	
						S18W54	1	1	0			S18W54	E	
						S21W43	0	0	0			S21W43	Q	
						N16W11	0	0	0			N16W11	Q	
						N25W08	0	0	0			N25W08	Q	
						S30W67	0	0	0			S30W67	E	
						S23E03	0	0	0			S23E03	Q	
						S19W15	0	0	0			S19W15	Q	
						S15E65	1	1	0			S15E65	A	
						S22E41	0	0	0			S22E41	Q	
						N22E63	0	0	0			N22S63	E	
						S17W01	0	0	0			S17W01	Q	
343	9	8	274	195	004	N23W81	0	0	0		9	N23W81	Q	SOLALERT 09/XX MAGQUIET
						S18W68	2	0	0			S18W68	CA	
						S21W56	0	0	0			S21W56	Q	
						N16W23	0	0	0			N16W23	Q	
						N26W21	0	0	0			N26W21	Q	
						S29W80	3	0	0			S29W80	DA	
						S23W10	2	0	0			S23W10	E	
						S18W27	0	0	0			S18W27	Q	
						S14E52	1	0	0			S14E52	A	
						S22E26	0	0	0			S22E26	Q	
						N22E48	0	0	0			N22E48	Q	
						S16W12	0	0	0			S16W12	Q	
						S12E61	0	0	0			S12E61	Q	
						N26E72	0	0	0			N26E72	Q	
344	10	9	286	206	004	S18W81	1	0	0		10	S18W81	Q	SOLALERT 10/XX MAGQUIET
						S20W71	0	0	0			S20W71	Q	
						N16W36	0	0	0			N16W36	Q	
						S23W23	0	0	0			S23W23	E	
						S18W41	0	0	0			S18W41	Q	
						S16E38	0	0	0			S16E38	A	
						S23E12	0	0	0			S23E12	Q	
						N21E33	4	0	0			N21E33	CA	
						S18W25	4	0	0			S18W25	Q	
						S12E45	0	0	0			S12E45	Q	
						N26E59	0	0	0			N26E59	Q	
						S19E04	0	0	0			S19E04	Q	
						N42E61	0	0	0			N42E61	Q	
345	11	10	217	211	001	S20W84	0	0	0		11	S20W84	Q	SOLALERT 11/XX MAGQUIET
						N17W49	0	0	0			N17W49	Q	
						S23W36	3	0	0			S23W36	E	
						S16E25	4	0	0			S16E25	A	
						N21E20	0	0	0			N21E20	A	
						S17W38	6	0	0			S17W38	A	
						S13E32	0	0	0			S13E32	E	
						N26E47	0	0	0			N26E47	Q	
						S18E12	1	0	0			S18E12	Q	
346	12	11	278	217	00	N17W62	0	0	0	SOFLARE X1/2B	12	N17W62	Q	SOLALERT 12/XX MAGALERT 12/13
						S23W49	0	0	0	S16W48 11/1807Z		S23W49	Q	
						S16E12	2	0	1	DURATION 68 MINUTES		S16E12	A	
						N22E07	3	0	0	SOFLARE X1/2B		N22E07	E	
						S17W51	5	2	0	S17E14 11/1833Z		S17W51	A	
						S12E17	0	0	0	DURATION 70 MINUTES		S12E17	Q	
						N26E33	0	0	0	TENFLARE 25000 FLUX		N26E33	Q	
						S17W00	0	0	0	UNITS 11/1918Z		S17W00	E	
						S17E22	0	0	0	IN PROGRESS AT		S17E22	Q	
						S23E72	0	0	0	2120Z		S23E72	Q	
						S11E41	0	0	0			S11E41	Q	
347	13	12	239	237	005	N18W77	0	0	0	SOFLARE X2/2B	13	N18W77	Q	PROTON FLARE ALERT 13/XX
						S24W64	2	0	0	S16W58 12/1500Z		S24W64	Q	MAGALERT 13/15
						S15W01	6	0	0	DURATION 27 MINUTES		S15W01	A	
						N22W06	4	0	0			N22W06	Q	
						S18W64	11	5	1	TENFLARE 277 FLUX		S18W64	P	
						S12E03	4	0	0	UNITS 15/1510Z		S12E03	E	
						N25E21	0	0	0	DURATION 49 MINUTES		N25E21	Q	
						S20W15	1	0	0			S20W15	Q	
						S17E09	0	0	0			S17E09	Q	
						S23E57	0	0	0			S23E57	Q	
						S12E28	0	0	0			S12E28	Q	
348	14	13	229	231	006	N17W88	0	0	0		14	N17W88	Q	PROTON FLARE ALERT 14/XX
						S24W77	0	0	0			S24W77	Q	MAGALERT 14/16
						S17W11	11	1	0			S17W11	A	
						N21W19	0	0	0			N21W19	Q	
						S17W79	20	4	1			S17W79	P	
						S12W11	2	0	0			S12W11	Q	
						N25E09	0	0	0			N25E09	Q	
						S20W28	1	0	0			S20W28	Q	
						S17E00	3	0	0			S17E00	E	
						S23E46	0	0	0			S23E46	Q	
						S12E16	0	0	0			S12E16	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
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DECEMBER 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
349	15	14	197	202	019	S23W90	0	0	0	KAKIOKA MAGSTORM	15	S23W90	Q	PROTON FLARE ALERT 15/XX
						S17W25	6	1	0	14/0129Z TOYOKAWA		S17W25	CP	MAJOR FLARE ALERT 15/XX
						N20W32	4	1	0	TENFLARE 160 FLUX		N20W32	DP	MAGALERT 15/17
						S12W25	0	0	0	UNITS DURATION 10		S12W25	Q	
						N26W05	0	0	0	MINUTES		N26W05	Q	
						S20W41	0	0	0	MAJOR FLARES X1/1B		S20W41	Q	
						S17W15	0	0	0	S17W79 14/0004Z		S17W15	Q	
						S22E33	1	0	0	DURATION 29 MINUTES		S22E33	Q	
						S12E02	0	0	0	X1/SN S15W80		S12E02	Q	
						S15W10	0	0	0	14/0722Z DURATION		S15W10	Q	
						N21E75	0	0	0	13 MINUTES		N21E75	Q	
350	16	15	227	199	023	S16W38	7	0	0	KAKIOKA MAGSTORM	16	S16W38	CA	MAJOR FLARE ALERT 16/18
						N21W46	7	0	0	15/0015Z		N21W46	E	PROTON FLARE ALERT 16/18
						S12W38	2	1	0			S12W38	CA	MAGALERT 16/17
						N26W16	0	0	0			N26W16	Q	
						S18W56	0	0	0			S18W56	E	
						S18W28	0	0	0			S18W28	CA	
						S23E21	0	0	0			S23E21	Q	
						S13W10	0	0	0			S13W10	Q	
						S16W23	0	0	0			S16W23	Q	
						N21E60	0	0	0			N21E60	Q	
						N12W16	0	0	0			N12W16	Q	
						S22E38	3	0	0			S22E38	Q	
						N10E76	0	0	0			N10E76	Q	
351	17	16	225	187	016	S15W50	3	0	0		17	S15W50	DP	PROTON ALERT NIL
						N21W59	2	0	0			N21W59	Q	SOLALERT 17/XX
						S19W68	0	0	0			S19W68	Q	MAGALERT 17/18
						S18W40	3	0	0			S18W40	CA	
						S23E08	0	0	0			S23E08	Q	
						S16W35	0	0	0			S16W35	Q	
						N20E50	0	0	0			N20E50	Q	
						S22E25	2	0	0			S22E25	Q	
						N11E67	0	0	0			N11E67	Q	
						N18W23	0	0	0			N18W23	Q	
						N19W08	4	0	0			N19W08	E	
352	18	17	221	184	007	S15W64	3	1	0	PRESTO BOULDER	18	S15W64	CA	SOLALERT 18/19 MAGALERT 18/XX
						N21W73	1	0	0	SOFLARE M8/1B		N21W73	E	
						S19W86	0	0	0	S15W51 17/0730Z		S19W86	Q	
						S18W53	1	0	0	DURATION 25 MINUTES		S18W53	E	
						S23W04	1	0	0	TENFLARE 280 FLUX		S23W04	Q	
						N20E35	0	0	0	UNITS 17/0732Z		N20E35	Q	
						S22E10	1	0	0	DURATION 26 MINUTES		S22E10	E	
						N12E54	0	0	0			N12E54	Q	
						N18W38	0	0	0			N18W38	Q	
						N20W21	1	0	0			N20W21	CA	
353	19	18	186	167	032	S15W81	2	0	0		19	S15W81	A	SOLALERT 19 MAGALERT 19
						N20W86	0	0	0			N20W86	Q	
						S18W67	2	1	0			S18W67	E	
						S24W17	0	0	0			S24W17	Q	
						N20E21	0	0	0			N20E21	Q	
						S22W01	0	0	0			S22W01	Q	
						N11E40	0	0	0			N11E40	Q	
						N18W52	0	0	0			N18W52	Q	
						N20W35	0	0	0			N20W35	E	
						S16E63	0	0	0			S16E63	Q	
354	20	19	152	159	025	S25W31	0	0	0		20	S25W31	Q	SOLNIL MAGALERT MINOR 20
						N21E10	0	0	0			N21E10	Q	
						S22W14	0	0	0			S22W14	Q	
						N11E26	1	0	0			N11E26	E	
						N18E66	0	0	0			N18E66	Q	
						N20W49	1	0	0			N20W49	E	
						N15E49	0	0	0			N15E49	Q	
						S22W00	0	0	0			S22W00	Q	
355	21	20	151	143	018	S26W43	0	0	0		21	S26W43	Q	SOLQUIET MAGNIL
						N20W02	0	0	0			N20W02	Q	
						S22W31	0	0	0			S22W31	Q	
						N11E13	2	0	0			N11E13	Q	
						N18W80	0	0	0			N18W80	Q	
						N20W62	3	0	0			N20W62	E	
						N15E34	0	0	0			N15E34	Q	
						N10E63	0	0	0			N10E63	Q	
						N22W46	0	0	0			N22W46	Q	
356	22	21	124	143	008	S27W55	2	0	0		22	S27W55	Q	SOLQUIET MAGQUIET
						N19W19	0	0	0			N19W19	Q	
						S23W45	1	0	0			S23W45	Q	
						N12E00	0	0	0			N12E00	Q	
						N19W74	5	0	0			N19W74	E	
						N12E49	2	0	0			N12E49	Q	
						N22W58	0	0	0			N22W58	Q	
						N24W22	0	0	0			N24W22	Q	
						S17E79	0	0	0			S17E79	Q	

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INTERNATIONAL URSIGRAM
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DECEMBER 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	Flares: Total	Flares: M	Flares: X	Outstanding events
357	23	22	120	137	018	S26W68	0	0	0	
						N19W32	0	0	0	
						S23W59	1	0	0	
						N12W13	0	0	0	
						N20W87	0	0	0	
						S22W42	0	0	0	
						N12E35	0	0	0	
						N26W36	2	0	0	
						S17E64	0	0	0	
358	24	23	132	138	009	S26W80	0	0	0	
						N21W45	0	0	0	
						S22W72	1	0	0	
						N12W25	0	0	0	
						N12E25	1	0	0	
						N24W50	1	0	0	
						S17E49	0	0	0	
						S28W71	0	0	0	
						N17W61	2	0	0	
						N20E09	0	0	0	
						N27E65	0	0	0	
359	25	24	146	143	007	N18W59	0	0	0	
						N12W39	0	0	0	
						N13E12	0	0	0	
						N26W63	0	0	0	
						S28W83	0	0	0	
						N19E00	0	0	0	
						S24E16	0	0	0	
						N12E51	0	0	0	
						S29E70	0	0	0	
						S13E75	0	0	0	
360	26	25	150	143	023	S17E65	1	0	0	SYDNEY SSC 25/1212Z-FIELD DISTURBED 1200-1500Z THEN QUIET
						S29E58	1	0	0	
						N11E38	1	0	0	
						S25E03	0	0	0	
						N27E41	0	0	0	
						N19E14	0	0	0	
						N12W03	0	0	0	
						N12W52	0	0	0	
361	27	26	165	149	009	N12W66	0	0	0	
						N12W18	0	0	0	
						N19W27	0	0	0	
						S25W10	0	0	0	
						N11E24	0	0	0	
						S30E47	0	0	0	
						S17E53	1	0	0	
						S11W08	0	0	0	
						S19E61	0	0	0	
362	28	27	196	170	010	N12W81	0	0	0	PRESTO BOULDER 27/1744Z SOFLARE X1/2B S17E43 27/1625Z DURATION 26 MINUTES TENFLARE 540 FLUX UNITS 27/1627Z DURATION 40 MINUTES
						N12W32	0	0	0	
						N20W40	0	0	0	
						N23E18	0	0	0	
						S24W23	0	0	0	
						N11E12	0	0	0	
						S30E36	1	0	0	
						S14W40	3	0	1	
						S11W21	0	0	0	
						S19E46	1	0	0	
						S22W52	1	0	0	
363	29	28	223	174	011	N13W42	0	0	0	
						N19W54	0	0	0	
						N21E05	0	0	0	
						N12W01	7	0	0	
						S29E22	0	0	0	
						S15E26	2	0	0	
						S11W34	0	0	0	
						S18E35	0	0	0	
						S22W67	0	0	0	
						S18E13	1	0	0	
						S22E40	0	0	0	
						S33E47	2	0	0	
						S35E73	1	0	0	
364	30	29	233	173	008	N19W67	0	0	0	
						N12W14	0	0	0	
						S29E10	0	0	0	
						S15E12	0	0	0	
						S19E21	0	0	0	
						S21W80	1	0	0	
						S19W00	0	0	0	
						S22E28	0	0	0	
						S32E32	0	0	0	
						S35E61	0	0	0	
						S34W64	0	0	0	
						N15E64	0	0	0	
						S14E64	0	0	0	
						S22E70	0	0	0	
						N12E80	0	0	0	

Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
23	S26W68	Q	SOLQUIET MAGQUIET
	N19W32	Q	
	S23W59	Q	
	N12W13	Q	
	N20W87	E	
	S22W42	Q	
	N12E35	Q	
	N26W36	Q	
	S17E64	Q	
24	S26W80	Q	SOLQUIET MAGQUIET
	N21W45	Q	
	S22W72	Q	
	N12W25	Q	
	N12E25	E	
	N24W50	E	
	S17E49	Q	
	S28W71	Q	
	N17W61	E	
	N20E09	Q	
	N27E65	Q	
25	N18W59	Q	SOLQUIET MAGQUIET
	N12W39	DA	
	N13E12	Q	
	N26W63	Q	
	S28W83	Q	
	N19E00	Q	
	S24E16	Q	
	N12E51	Q	
	S29E70	DE	
	S13E75	Q	
26	S17E65	DA	SOLQUIET MAGQUIET
	S29E58	Q	
	N11E38	E	
	S25E03	Q	
	N27E41	Q	
	N19E14	Q	
	N12W03	Q	
	N12W52	Q	
27	N12W66	Q	SOLQUIET MAGQUIET
	N12W18	Q	
	N19W27	Q	
	S25W10	Q	
	N11E24	E	
	S30E47	Q	
	S17E53	E	
	S11W08	Q	
	S19E61	Q	
28	N12W81	Q	MAJOR FLARE ALERT MAGQUIET
	N12W32	Q	
	N20W40	Q	
	N23E18	Q	
	S24W23	Q	
	N11E12	A	
	S30E36	E	
	S14W40	A	
	S11W21	Q	
	S19E46	Q	
	S22W52	Q	
29	N13W42	Q	MAJOR FLARE ALERT 29/XX MAGQUIET
	N19W54	Q	
	N21E05	Q	
	N12W01	A	
	S29E22	E	
	S15E26	DP	
	S11W34	Q	
	S18E35	Q	
	S22W67	CE	
	S18E13	Q	
	S22E40	E	
	S33E47	E	
	S35E73	CA	
30	N19W67	Q	SOLALERT 30/XX MAGQUIET
	N12W14	CA	
	S29E10	CE	
	S15E12	DP	
	S19E21	Q	
	S21W80	Q	
	S19W00	Q	
	S22E28	Q	
	S32E32	Q	
	S35E61	A	
	S34W64	Q	
	N15E64	Q	
	S14E64	Q	
	S22E70	A	
	N12E80	Q	

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365	31	30	229	190	015	N12W28	3	0	0	PRESTO BOULDER	31	N12W28	CA	SOLALERT 31/XX MAGQUIET
						S29W01	1	0	0	30/1424Z		S29W01	DA	
						S15W00	0	0	0	SOFLARE M3/3B		S15W00	CA	
						S19E08	0	0	0	S12E63 30/0540Z		S19E08	E	
						S19W13	0	0	0	DURATION 53 MINUTES		S19W13	E	
						S22E15	3	0	0	TO HALF POWER		S22E15	DA	
						S32E32	1	0	0	PARALLEL RIBBONS,		S32E32	Q	
						S35E52	0	0	0	WHITE LIGHT FLARE		S35E52	DP	
						N16E52	0	0	0			N16E52	Q	
						S13E53	3	1	0			S13E53	DA	
						S22E57	0	0	0			S22E57	Q	
						N13E68	1	0	0			N13E68	Q	
001	1	31	257	203	014	N12W42	0	0	0		1	N12W42	E	SOLNIL MAGQUIET
						S29W13	0	0	0			S29W13	Q	
						S15W13	0	0	0			S15W13	E	
						S18W05	0	0	0			S18W05	Q	
						S19W26	0	0	0			S19W26	Q	
						S22E02	2	0	0			S22E02	A	
						S33E07	1	0	0			S33E07	Q	
						S35E42	0	0	0			S35E42	E	
						N17E39	0	0	0			N17E39	Q	
						S12E41	1	0	0			S12E41	Q	
						S21E44	0	0	0			S21E44	Q	
						N13E54	3	0	0			N13E54	Q	
						N18W29	0	0	0			N18W29	Q	

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

ERRATA: An inconsistent error has appeared in the Alert Periods table in a number of SGD issues. The "Date of Forecasts" in these tables should be the same as the "Date of issue of the Geoalert WWA Messages", rather than the "Date of Observation". The following table lists the SGD issues where these dates were reversed. We thank Dr. T. Takiguchi, RWC Tokyo, Radio Research Laboratories, Technical Service Section, Japan, for kindly bringing this discrepancy to our attention.

Alert periods (December 1977 to November 1978) which should be corrected are as follows:

Date of Data	SGD Issue
December 1977	January 1978 SGD 401 Part I
January 1978	February 1978 SGD 402 Part I
February 1978	March 1978 SGD 403 Part I
March 1978	April 1978 SGD 404 Part I
May 1978	June 1978 SGD 406 Part I
June 1978	July 1978 SGD 407 Part I
July 1978	August 1978 SGD 408 Part I
August 1978	September 1978 SGD 409 Part I
September 1978	October 1978 SGD 410 Part I
October 1978	November 1978 SGD 411 Part I
November 1978	December 1978 SGD 412 Part I

RELATIVE SUNSPOT NUMBERS

ZURICH, R_z

1978 PROVISIONAL

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	84	128	93	70	77	119	46	42	127	90	109	110
2	88	120	83	68	85	93	61	48	167	119	122	110
3	102	131	95	71	91	74	47	38	151	107	125	117
4	102	138	103	75	76	60	34	62	161	91	129	108
5	73	137	76	94	74	51	54	74	175	55	116	104
6	69	129	67	92	73	29	57	66	178	71	103	122
7	42	121	90	88	70	39	84	58	148	95	110	132
8	36	89	99	105	56	45	105	62	120	103	118	142
9	36	94	85	126	59	36	108	64	109	121	108	152
10	15	96	92	111	57	29	115	67	105	149	116	138
11	18	95	85	109	63	57	127	58	84	158	122	170
12	26	92	78	107	65	62	111	71	72	158	99	168
13	26	93	65	93	72	56	114	85	88	156	90	165
14	36	82	62	75	72	62	109	93	113	170	78	150
15	30	59	72	61	78	89	102	72	133	166	59	140
16	23	64	70	85	91	97	110	42	148	163	77	138
17	24	56	66	99	79	103	98	49	136	137	92	139
18	14	55	72	100	85	115	78	53	158	123	88	120
19	8	53	64	107	84	109	74	42	150	154	85	90
20	7	52	51	115	74	109	76	28	163	151	76	70
21	20	63	77	112	73	154	77	26	172	144	62	58
22	30	74	82	109	73	158	48	36	148	125	77	50
23	43	69	85	105	72	158	33	45	156	116	53	57
24	37	78	82	102	82	154	38	45	167	103	57	68
25	32	94	70	139	86	135	30	54	163	96	85	79
26	47	86	53	115	84	152	13	37	152	91	101	93
27	69	79	50	90	97	134	21	55	140	115	118	110
28	79	88	49	75	90	130	31	58	122	117	118	122
29	90		48	72	103	115	48	59	122	137	109	135
30	104		44	70	107	99	35	70	91	129	96	148
31	118		70		109		36	100		98		167
MEAN	49.3	89.8	73.5	94.7	79.3	94.1	68.4	56.7	137.3	122.8	96.6	119.1

1977 yearly mean = 27.5

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

1978

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	126.9*	139.1	136.3	130.0	181.4	149.1	142.9	106.0	159.8	139.0	152.0	166.6
2	133.9	152.6	141.1	129.8	183.0	147.0*	127.6	105.0	171.7*	137.8	159.0	167.6
3	130.2	156.6*	146.6	134.5	182.2A	130.8	116.5	109.6	167.0	131.7	169.9	164.2
4	124.8	154.0	148.4	143.3*	178.4	118.6	117.4	112.3	174.4*	132.0*	177.4	165.3
5	119.2	159.0	154.5	146.7*	173.9*	116.9	118.9	117.6	179.4	138.7*	181.2	169.5
6	118.7*	156.1	162.8	145.3*	173.1	109.8	119.3*	122.6	181.1	137.4	172.2*	164.5
7	111.6	157.3	165.2	146.9	162.6*	110.6	128.9	128.2	177.5	141.6	174.6	178.5*
8	102.8	157.0*	168.7	148.6	143.4	109.3	135.9	130.6	167.1	150.1	168.0*	189.9
9	97.0	155.2	163.7	156.1	135.1	106.5	147.1*	128.1*	157.6*	155.8	164.9*	189.6
10	93.5	148.7	179.1	155.4	129.5	108.4	156.0*	127.5	149.8	162.3	166.3	204.7
11	93.1	154.2	175.2	162.8*	133.8	113.2	163.2*	121.7	141.5	171.6*	163.7	210.5
12	92.1	159.0	169.8	156.2	138.2	116.4*	174.2*	124.5	138.5	177.2	150.4	217.3
13	90.3	151.2	160.9	145.6	140.2	120.3*	165.5	134.9	138.0	178.5	145.3	210.6*
14	88.6	148.4	160.5	139.1	143.7	126.4*	163.1	132.7	143.5*	180.1	136.3	197.0
15	89.6	136.8	154.2	141.4	146.1	132.5	169.5	130.0*	152.6	182.0	133.8	192.7
16	86.4	130.2	143.3	137.6	147.8*	139.5*	163.4	123.6	161.5	176.7*	128.8	180.5
17	83.8	125.9	135.4	133.4	143.8	149.0	159.5	119.3*	161.8	171.5	128.1	177.7
18	84.7	124.9	132.3	134.1	135.6	153.5*	154.1*	115.6	169.3*	169.4	127.4	161.5
19	85.4	119.1	128.1	139.5*	133.6	162.0*	148.6	111.6	168.8*	170.4	128.9	152.9
20	87.0	122.2	125.3	138.1	132.3*	174.2	142.9*	107.5	168.6	171.0	134.9	138.1
21	91.4	122.2	118.2	138.4*	132.7	185.4*	140.2	104.8	172.5	166.9*	126.0	132.1*
22	96.9	127.7	117.0	146.4	135.7*	190.3	127.0	106.0	171.5*	161.4	127.1	132.7
23	99.6	131.8	116.4	162.9	142.9*	196.7	123.4*	104.1	165.5*	161.4	121.9	133.4
24	100.4	135.6	117.5	159.8	146.5*	194.8	118.5	105.4	158.9	156.9	123.5	135.2*
25	103.3	139.3	118.2	159.1*	147.6	183.5	113.7	104.2	157.2	156.1	124.7*	138.0
26	112.7	134.8	112.5	166.7	152.8	182.4*	112.2	100.7	148.5	154.4	132.7	144.2
27	116.4	137.5	114.1	172.8	150.6*	179.5	110.8	107.3*	146.2*	150.7	144.4*	148.7*
28	127.7*	139.4	112.7	176.6*	147.1*	174.1	109.9	107.7*	147.8	148.4*	154.1	164.1
29	132.2*		111.1	185.2	148.6	167.4	109.2	116.2	148.1	149.8	162.2	166.2
30	134.9		115.4*	182.1*	147.2*	154.6*	109.2	124.1	142.6	146.5	167.8	181.7
31	133.3*		124.5		152.6		108.8	133.9*		144.0		195.1
MEAN	106.1	141.8	140.3	150.5	149.7	146.8	135.4	116.9	159.6	157.1	148.2	170.0

* adjusted for burst
A = interpolated data point

DAILY SOLAR INDICES

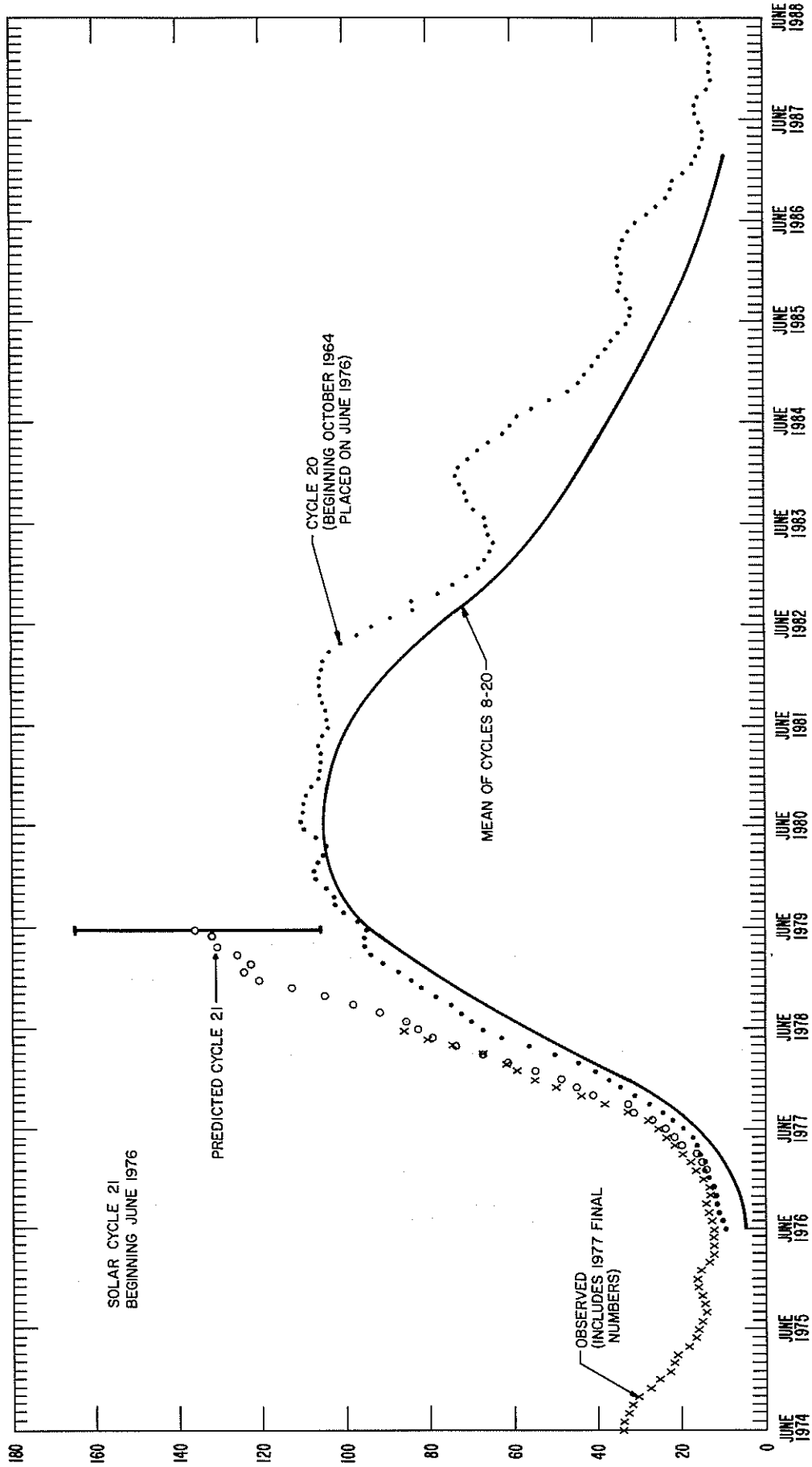
DECEMBER 1978

DEC' 1978'	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	335	1	110	100	171.4	582	353	197	166.6	175.0	120.6	74.5	41.3	15.4
2	336	2	110	101	172.4	590	351	200	167.6	178.9	129.0	79.2	41.4	14.2
3	337	3	117	132	169.1	583	354	196	164.2	176.1	125.6	78.4	44.1	15.9
4	338	4	108	125	170.2	588	351	191	165.3	173.6	124.5	77.8	45.7	19.0
5	339	5	104	100	174.6	594	348	200	169.5	174.9	122.6	75.6	37.3	13.3
6	340	6	122	127	169.4	587	352	211	164.5	181.8	122.5	75.8	35.9	13.4
7	341	7	132	137	184.0*	588	363	216	178.5*	188.7	122.4	74.1	34.2	13.9
8	342	8	142	149	195.8	590	375	233	189.9	193.7	131.5	78.7	35.5	14.4
9	343	9	152	152	195.5	592	387	250	189.6	201.1	122.3	73.4	41.4	15.4
10	344	10	138	144	211.0	594	398	267	204.7	208.5	139.4	77.6	46.8	33.5
11	345	11	170	159	217.2	607	426	288	210.5	222.7	142.5	81.2		
12	346	12	188	174	224.3	613	432	293	217.3	228.0	145.3	82.7		
13	347	13	165	174	217.3*	605	419	267	210.6*	222.9	142.1	79.2	47.8	
14	348	14	150	130	203.3	610	418	246	197.0	210.8	132.1	72.7	36.8	19.4
15	349	15	140	130	198.9	602	397	241	192.7	205.1	130.6	74.6	40.3	22.0
16	350	16	138	149	186.5	597	386	219	180.5	189.6	115.3	69.1	34.3	18.2
17	351	17	139	155	183.6	588	378	218	177.7	183.8	116.9	71.8	37.5	19.3
18	352	18	120	115	166.8	598			161.5		112.6	73.0	39.5	24.8
19	353	19	90	84	158.0	588	357	192	152.9	164.1	105.4	69.4	41.5	17.6
20	354	20	70	78	142.7	580	341	176	138.1	139.7	101.0	74.0	47.0	17.2
21	355	21	58	72	136.5*	577	340	180	132.1*	144.7	96.1	66.7	37.9	24.6
22	356	22	50	72	137.1	586	344	173	132.7	137.8	92.0	67.9	35.3	22.0
23	357	23	57	68	138.0	577	333	170	133.4	137.0	95.5	64.8	46.6	20.1
24	358	24	68	61	139.8*	581	338	176	135.2*	143.2	98.2	69.8	40.4	14.1
25	359	25	79	86	142.7	582	335	176	138.0	143.6	98.5	67.8	30.9	9.3
26	360	26	93	88	149.1	583	331	173	144.2	152.8	105.7	67.0	35.7	11.4
27	361	27	110	92	153.8*	583	354	185	148.7*	163.3	114.8	73.2	39.0	12.4
28	362	1	122	87	169.7	595	355	197	164.1	168.3	121.3	76.1	39.5	12.5
29	363	2	135	139	171.9	591	357	196	166.2	170.8	119.4	74.4	39.8	12.2
30	364	3	148	180	187.9	596	373	222	181.7	186.9	128.1	76.7	39.2	11.9
31	365	4	167	190	201.8	601	379	234	195.1	202.9	133.0	80.0	38.1	14.4
MEAN			119.1	121.0	175.5	591	367	213	170.0	179.0	119.6	74.1	39.7	16.9

* Adjusted for burst.

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

ERRATA: The September 1978 $R_{A'}$ monthly mean value was published as "12.8". This value should read "128.1". These data appear in SGD 410 Part I, page 11, October 1978 issue.



OBSERVED AND PREDICTED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	14.0	14.3	13.4	13.5	14.8
1977	16.7	18.1	20.0	22.2	24.2	26.3	28.8	33.0	38.5	44.6	50.5	55.4
1978	59.6	62.7	67.7	74.9	81.0	87.0	92.0	96.6	100.8	104.4	108.6	114.4
							(3)	(6)	(9)	(11)	(11)	(11)
1979	119.1	123.3	127.3	129.9	132.3	136.4	140.4	143.2	145.1	146.2	146.6*	146.2
	(12)	(14)	(18)	(23)	(27)	(30)	(32)	(34)	(36)	(37)	(38)	(39)
1980	145.0	143.8	143.3	143.9	143.4	140.6	137.4	134.8	133.4	132.5	131.1	129.8
	(39)	(39)	(37)	(37)	(38)	(39)	(41)	(42)	(42)	(43)	(45)	(48)
1981	129.5	128.9	126.6	123.8	121.4	119.1	117.9	117.6	116.7	115.3	113.0	110.1
	(50)	(50)	(48)	(47)	(47)	(47)	(46)	(44)	(44)	(44)	(43)	(41)
1982	107.3	104.3	101.9	99.9	97.8	95.4	91.8	87.6	83.8	79.5	76.4	72.9
	(38)	(37)	(36)	(34)	(32)	(31)	(29)	(27)	(25)	(22)	(20)	(20)
1983	68.8	65.9	63.9	61.7	59.5	57.2	55.2	53.4	51.7	50.5	49.6	48.9
	(20)	(21)	(21)	(22)	(22)	(23)	(24)	(25)	(27)	(29)	(30)	(30)
1984	47.8	46.0	43.5	40.4	37.9	36.8	35.8	34.2	32.7	31.6	30.4	28.8
	(31)	(30)	(28)	(28)	(29)	(31)	(31)	(31)	(30)	(29)	(27)	(27)
1985	27.7	26.8	25.9	25.4	24.7	23.7	23.0	22.2	21.5	20.6	19.7	19.1
	(27)	(26)	(26)	(26)	(25)	(24)	(23)	(22)	(22)	(23)	(23)	(24)
1986	18.7	18.0	17.3	16.3	15.2	14.0	13.1	12.4	12.2	12.0	11.8	11.7
	(24)	(24)	(23)	(22)	(21)	(20)	(19)	(18)	(17)	(16)	(15)	(13)
1987	12.0	12.6	13.4	14.4	15.4	16.4	17.4					
	(12)	(11)	(11)	(11)	(12)	(13)	(13)					

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

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

*Prediction of Sunspot Maximum -- The McNish-Lincoln prediction method is recommended for predictions up to only one year ahead. From that point, the predictions regress rapidly towards the mean value. Combining this McNish-Lincoln prediction of sunspot maximum with the Ohl method (as done by Sargent, see *Explanation of Data Reports*, February 1978) indicates that the most probable value for sunspot maximum is 150 ± 34.

Hα SOLAR FLARES

DECEMBER 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		CORD.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
RAMY	01	1214E	1214	1259	S17	E31	.533		3.8	45D	SN	2	C		19		
RAMY	01	1450E	1458U	1507	S17	E30	.520		3.9	17D	SB	3	C		80		
HOLL	01	1955	1956	2005	S16	E31	.530		4.2	10	SB	3	C		58		
RAMY	01	1955	1955	2017	S17	E34	.574		4.4	22	SB	3	C		133		FDE
PALE	01	2205	2233	2256	S17	E27	.479		3.9	51	SB	3	C		118		DE F
PALE	01	2344	2346	0013D	S17	E27	.479		4.0	29D	SB	3	C		31		DE F
MANI	02	0405E	0407U	0422D	S17	E30	.519		4.4	17D	SN	3	V		50	.6	
MANI	02	0438E	0438U	0455	S15	E24	.426		4.0	17D	SN	3	V		100	1.2	F
MANI	02	0549	0549U	0615D	S15	E25	.440		4.1	26D	SN	3	V		120	1.4	F
TEHR	02	0735	0739	0743D	S18	E29	.510		4.5	8D	SB	1	C		127		FDE
RAMY	02	1403	1404	1414	S26	W46	.745		30.1	11	SN	2	C		34		
RAMY	02	1520	1525	1527	S20	E31	.547		5.0	7	SN	2	C		69		
RAMY	02	1523	1524	1534	S26	W47	.755		30.1	11	SN	2	C		16		
RAMY	02	1713	1714	1720	S26	W48	.765		30.1	7	SN	2	C		34		
RAMY	02	1843	1844	1853	S17	E22	.409		4.4	10	SN	3	C		42		F
RAMY	02	1911	1917	1924	S17	E22	.409		4.4	13	SB	3	C		36		
RAMY	03	1542	1546	1550	S18	E 4	.216		4.0	8	SN	3	C		29		
PALE	03	1839E	1839U	1845	S23	E64	.896		8.6	6D	SN	3	C		15		
HOLL	03	1839	1839	1844	S23	E66	.910		8.7	5	SN	3	C		19		
RAMY	03	1839	1840	1846	S23	E65	.903		8.7	7	SB	3	C		19		
RAMY	03	1938	1939	1952	N17	E44	.758		7.1	14	SN	3	C		35		F
PALE	03	2032	2033U	2042	S22	E65	.903		8.7	10	SB	3	C		40		DE
HOLL	03	2036E	2036U	2044	S23	E65	.903		8.7	8D	SB	1	C		37		
RAMY	03	2037E	2037U	2045D	S25	E64	.898		8.7	8D	SB	3	C		69		
RAMY	04	1320	1324	1325D	S23	E53	.805		8.5	5D	SB	3	V		19		
RAMY	04	1453E	1509	1550	S18	W 8	.244	15687	4.0	57D	1B	3	C		465		U F
RAMY	04	1522	1523	1531	S20	E 5	.252		5.0	9	SB	3	C		63		F
MCMA	04	1529E		1532D	S18	W08	.244	15687	4.0	3D	SN		P	1529	150	1.6	E
RAMY	04	1550	1552	1605	S23	E50	.776		8.4	15	SB	3	C		84		F
MCMA	04	1558E		1604D	S25	E58	.852	15694	9.0	6D	SN		P	1558	35	.8	DH
RAMY	04	1716	1729	1738	S18	W10	.264		4.0	22	SN	3	C		27		
RAMY	04	1819	1819	1829	S30	W23	.532		3.0	10	SN	3	C		29		
RAMY	04	1844	1846	1857	S23	E47	.746		8.3	13	SB	3	C		91		H
MCMA	04	1852E		1855D	S25	E56	.835	15694	9.0	3D	1B		P	1853	100	2.1	EH
MANI	05	0742E	0746U	0810D	S18	W16	.334		4.1	28D	SN	3	P		60	.6	F
RAMY	05	1228	1236	1245	S18	W20	.387		4.0	17	SB	3	C		24		F
RAMY	05	1426	1427	1433	S18	W21	.400		4.0	7	SN	3	C		42		F
RAMY	05	1426	1428	1430	S23	E38	.645		8.5	4	SN	3	C		23		
RAMY	05	1637	1637	1641	S30	W35	.650		3.1	4	SN	3	C		17		
HOLL	05	1839	1847	2003	S18	W23	.427	15687	4.1	84	1B	2	C		207		U
RAMY	05	1843E	1847	1903	S18	W24	.441		4.0	20D	SB	3	C		104		DE
RAMY	05	1940	1942	2013	S30	W36	.660		3.1	33	SN	3	C		30		F
HOLL	05	2315	2320	0000	S18	W25	.455		4.1	45	SB	1	C		103		
RAMY	06	1347	1348	1354	S30	W46	.757		3.1	7	SN	3	C		64		
RAMY	06	1545	1546	1555	S30	W47	.766		3.1	10	SN	3	C		36		
MCMA	06	1846E	1857	1900D	S17	W38	.624	15687	3.9	14D	SN		C	1857	70	1.0	E
MCMA	06	1847	1850	1900D	S24	E24	.485	15694	8.6	13D	SB		C	1850	50	.6	E
RAMY	06	1854	1854	1911	S18	W37	.614		4.0	17	SB	3	C		74		F
MCMA	06	1935		1948D	N21	E85	.999	15700	13.2	13D	SN		P	1938			E
MCMA	06	1938E		1948D	S17	W38	.624	15687	4.0	10D	SN		P	1940	100	1.4	EH
RAMY	06	1942	1943	2002	S18	W37	.614	15687	4.0	20	1B	2	C		213		U F
RAMY	06	1949	1950	1955	S30	W49	.785		3.2	6	SN	2	C		44		
RAMY	06	2002	2008	2025	S30	W49	.785		3.2	23	SN	2	C		27		
PALE	06	2024E	2030U	2135D	N21	E76	.983		12.6	71D	SN	3	C		41		DE
PALE	06	2100	2112	2136D	S16	E79	.977		12.8	36D	SN	3	C		56		DE
PALE	06	2340	2342	2358	S14	E77	.970		12.8	18	SB	3	C		28		FDE
MANI	06	2355E	2355U	0001D	S14	E78	.974		12.8	6D	SF	2	V		20	.5	F
PALE	07	2354E	2357	0013D	S16	W52	.785		4.1	19D	SB	2	C		26		FDE
PALE	08	1809	1826	1841	S23	W 7	.307		8.2	32	SN	3	C		30		DE
PALE	08	1902	1905	1910	S30	W77	.968		3.0	8	SB	3	C		22		DE
HOLL	08	1903	1905	1909	S30	W77	.968		3.0	6	SN	3	C		19		F
HOLL	08	1952	1954	2000	S30	W77	.968		3.1	8	SB	3	C		40		
HOLL	08	2006	2007	2011	S15	E54	.805		12.9	5	SN	3	C		18		F
HOLL	08	2043	2043	2106	S22	W 7	.291		8.3	23	SB	3	C		30		F

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		COORD.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
PALE	09	0024	0025	0027	S18	W70	.934		3.8	3	SN	3	C		42		
PALE	09	0031E	0036	0043	S17	W12	.271		8.1	12D	SN	3	C		26		
PALE	09	0112E	0113	0117	N24	E42	.778		12.2	5D	SB	3	C		100		U
MONT	09	1104E	1104	1119D	S14	E44	.693		12.8	15D	SN		C	1104	150		
RAMY	09	1834	1835	1918	N21	E36	.705		12.5	44	SF	3	C		24		F
RAMY	09	1933	1937	2026	N21	E36	.705		12.5	53	SN	3	C		26		F
RAMY	09	1934	1935	1947	S19	W21	.406		8.2	13	SF	3	C		23		
RAMY	09	2000	2006	2023	S19	W21	.406		8.3	23	SF	3	C		43		F
RAMY	09	2050	2051	2112	N21	E35	.695		12.5	22	SB	3	C		46		F
HOLL	09	2050	2051	2103	N22	E35	.702		12.5	13	SB	2	C		29		F
HOLL	09	2146	2146	2151	S16	W25	.442		8.0	5	SN	2	C		19		F
PALE	10	0206	0207	0208D	S31	W90	.998		3.3	2D	SN	2	C		0		
MANI	10	0207E	0207U	0215D	S30	W90	.998		3.3	8D	SN	3	C		0		
RAMY	10	1233E	1234	1238D	S18	W32	.548		8.1	5D	SB	2	C		44		F
HOLL	10	1634	1634	1641	S16	W34	.568		8.1	7	SN	2	C		25		F
MCMA	10	1658	1659	1710	N21	E28	.629	15700	12.8	12	SN		C	1659	80	1.0	E
MCMA	10	1810E		1823D	S14	E32	.535	15697	13.2	13D	SN		P	1820	125	1.6	EH
HOLL	10	1817	1820	1828	S16	E28	.485		12.9	11	SB	2	C		127		U F
HOLL	10	1827	1827	1831	S18	W53	.797		6.8	4	SN	2	C		62		F
HOLL	10	1832	1919	1932	S16	W35	.581		8.1	60	SB	2	C		102		U
RAMY	10	1834	1836	1852	S23	W32	.572		8.4	18	SN	2	C		61		
HOLL	10	1844	1846	1848	S18	W53	.797		6.8	4	SN	2	C		32		F
RAMY	10	1926	1926	1935	S23	W33	.584		8.3	9	SN	2	C		19		F
HOLL	10	1933	1947	1958	S16	W36	.594		8.1	25	SB	3	C		120		F
HOLL	10	1939	1942	1946	S16	E27	.470		12.8	7	SB	3	C		75		F
RAMY	10	1940	1940	1953	S15	E27	.466		12.8	13	SN	2	C		65		F
RAMY	10	1950	2001	2034	S23	W33	.584		8.4	44	SB	2	C		26		
HOLL	10	1958	2002	2042	S16	W36	.594		8.1	44	SB	3	C		114		Z F
RAMY	10	2001	2001	2031	S15	E27	.466		12.9	30	SN	2	C		68		
PALE	10	2010E		2013D	S18	W36	.600		8.1	3D	SN	2	C		65		DE
RAMY	10	2028	2028	2045	S18	W41	.663		7.8	17	SN	2	C		107		F
HOLL	10	2233	2237	2300	S18	E14	.306		12.0	27	SB	2	C		103		F
PALE	10	2338E	2339	2342D	S13	E33	.546		13.5	4D	SN	2	C		47		FDE
MONT	11	0926E	0926	0934	S17	W42	.673		8.2	8D	SN		C	0926	70		
MONT	11	1003	1007	1035	S17	W42	.673		8.3	32	SN		C	1007	70		E
MONT	11	1055	1057	1125	S14	E19	.343		12.9	30	SN		C	1057	180		E
RAMY	11	1532	1533	1537D	S18	W48	.744		8.0	5D	SN	2	C		18		
RAMY	11	1750	1814	1832	S19	W51	.778		7.9	42	SB	3	C		141		DE
RAMY	11	1806	1810	1823	N21	E11	.495		12.6	17	SB	3	C		95		F
HOLL	11	1807E	1814	1926D	S16	W48	.742	15694	8.2	79D	1N	3	C		162		Z U
HOLL	11	1807E	1925	1926D	S16	W48	.742	15694	8.2	79D	2B	3	C		888		Z U
HOLL	11	1812	1813	1824	N21	E11	.495		12.6	12	SN	3	C		59		F
HOLL	11	1833	1942	2018	S17	E14	.295	15697	12.8	105	2B	3	C		859		Z U
RAMY	11	1833	1947	2100	S19	W52	.788	15694	7.9	147	1B	3	C		305		DE
RAMY	11	1934	1942	1957D	S15	E14	.277	15696	12.9	23D	1B	2	C		317		DE
HOLL	11	2221	2222	2253	N21	E 8	.481		12.5	32	SN	3	C		26		F
HOLL	11	2221	2222	2226	S17	E12	.270		12.8	5	SB	3	C		24		
MANI	12	0435E	0435U	0443	S13	E16	.292		13.4	8D	SN	3	C		30		
MANI	12	0523E	0525	0536	S16	W55	.815		8.1	13D	SN	3	C		30		F
MANI	12	0645	0646	0655	S17	W54	.806		8.2	10	SN	3	C		40		
MANI	12	0646	0650	0654	S14	E 6	.163		12.7	8	SN	3	C		20		
MANI	12	0753E	0755	0804D	S16	W57	.834		8.1	11D	SB	3	C		50		
WEND	12	1002		1152	S17	W56	.825	15694	8.2	110	2N		V		600	11.6	E
RAMY	12	1133	1133	1140	S15	E 6	.177		12.9	7	SN	2	C		46		
RAMY	12	1139E	1159	1312	S19	W71	.939		7.2	93D	SB	2	C		71		F
RAMY	12	1211	1211	1234	S15	E 5	.168		12.9	23	SB	3	C		44		F
RAMY	12	1231	1233	1305	N21	E 0	.465		12.5	34	SB	3	C		48		F
RAMY	12	1328	1332	1401	S24	W55	.823		8.4	33	SB	3	C		101		F
RAMY	12	1402	1403	1406	N21	W 0	.465		12.6	4	SB	3	C		78		
RAMY	12	1414	1418	1440	S24	W55	.823		8.5	26	SB	3	C		102		F
RAMY	12	1414	1418	1425	S19	W72	.945		7.2	11	SB	3	C		31		
RAMY	12	1503	1514	1636	S19	W73	.950	15689	7.2	93	2B	3	C		423		
HOLL	12	1509	1514	1634D	S16	W59	.852	15694	8.2	85D	2B	3	C		508		Z U
HOLL	12	1515	1618	1634D	S19	W11	.281	15696	11.8	79D	1B	3	C		393		FDE
MCMA	12	1521E		1521D	S18	W59	.853	15694	8.2		1B		P	1521	150	3.2	E
RAMY	12	1617	1620	1638	S11	E 9	.172		13.4	21	SB	3	C		33		
RAMY	12	1637	1641	1654	S19	W73	.950		7.2	17	SB	3	C		24		
RAMY	12	1652	1708	1721	S15	E 2	.149		12.9	29	SB	3	C		42		

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	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.	
RAMY	12	1653	1654	1729	S11	E 8	.157		13.3	36	SN	3	C		54		
RAMY	12	1655	1702	1718	S19	W73	.950		7.2	23	SB	3	C		49		
RAMY	12	1726	1836	1840D	S19	W74	.955	15689	7.2	74D	1B	4	C		98		
RAMY	12	1730	1730	1735	S11	E 8	.157		13.3	5	SN	3	C		21		
RAMY	12	1731	1731	1742	S15	E 2	.149		12.9	11	SB	4	C		22		
RAMY	12	1753	1754	1801	N21	W 2	.466		12.6	8	SB	4	C		85		
PALE	12	1836E	1836U	1900D	S17	W64	.893	15694	8.0	24D	2B	3	C		315		
PALE	12	1836E	1836U	1840D	S20	W77	.968	15689	7.0	4D	2B	2	V		237		
RAMY	12	1841	1844	1859	S17	E14	.295		13.8	18	SN	4	C		41		
PALE	12	1841E	1841U	1900D	N21	W 4	.469		12.5	19D	SB	3	C		80		
RAMY	12	1850	1856	1908	N21	W 3	.467		12.6	18	SB	4	C		70		
PALE	12	1926E	2018	2032D	S18	W65	.900		7.9	66D	SN	3	C		104		DE
RAMY	12	2008	2012	2029	S11	E 7	.142		13.4	21	SB	3	C		105		
RAMY	12	2012	2012	2023	S15	E 1	.146		12.9	11	SB	3	C		60		
PALE	12	2053E	2053U	2056	S18	W65	.900	15694	8.0	3D	1B	3	C		256		DE
PALE	12	2056E	2136U	2300D	S19	W67	.914	15694	7.8	124D	1B	3	C		132		DE
PALE	12	2136E	2136U	2149D	S20	W10	.284		12.2	13D	SB	3	C		105		
PALE	12	2301	2307	2357D	S18	W66	.907	15694	8.0	56D	1B	3	C		270		UDE
MANI	13	0014E	0014U	0055	S17	W68	.921		7.9	41D	SB	3	C		40		
PALE	13	0017E	0018U	0103D	S18	W67	.914	15694	8.0	46D	1B	3	C		161		DE F
MANI	13	0210E	0210U	0224D	S15	W 4	.159		12.8	14D	SN	3	C		20		
MANI	13	0210E	0211	0224D	S16	W69	.927		7.9	14D	SB	3	C		60		
TEHR	13	0429E	0431U	0447	S16	W76	.965		7.5	18D	SB	2	C		95		
TEHR	13	0429E	0431U	0436D	S11	W 5	.114	15697	12.8	7D	1B	2	C		222		
TEHR	13	0429E	0431U	0527	S11	W 5	.114	15687	12.8	58D	1B	2	C		222		F
MANI	13	0435E	0435U	0443	S13	E16	.292		14.4	8D	SN	3	C		30		
TEHR	13	0513	0623U	0731	S16	W73	.950	15697	7.7	138	1B	2	C		159		F
TEHR	13	0513	0520U	0731	S16	W73	.950		7.7	138	SB	2	C		95		F
MANI	13	0521E	0521U	0534D	S17	W73	.950		7.7	13D	SB	3	C		60		
MANI	13	0521E	0521U	0534D	S15	W 1	.145	15697	13.1	13D	1B	3	C		400		FDE
MANI	13	0523E	0525	0536	S16	W55	.815		9.1	13D	SN	3	C		30		F
MANI	13	0645	0646	0655	S17	W54	.806		9.2	10	SN	3	C		40		
MANI	13	0646	0650	0654	S14	E 6	.163		13.7	8	SN	3	C		20		
MANI	13	0754E	0755	0804D	S16	W57	.834		9.1	10D	SB	3	C		60		
MONT	13	0856	0904	0912D	S16	W07	.200		12.8	16D	SF		C	0904	50		
RAMY	13	1202	1213	1225	S19	W84	.991		7.2	23	SB	3	C		25		
RAMY	13	1215	1215	1219	S17	E 4	.191		13.8	4	SN	3	C		22		F
RAMY	13	1234	1234	1241	S15	W 8	.198		12.9	7	SB	3	C		33		F
RAMY	13	1408	1408	1410	S19	W85	.993		7.2	2	SB	3	C		13		
RAMY	13	1432	1432	1502	S19	W21	.404		12.0	30	SB	3	C		87		DE
RAMY	13	1442	1450	1451	S19	W85	.993		7.2	9	SB	3	C		7		F
RAMY	13	1622	1623	1632	S15	W10	.222		12.9	10	SB	3	C		40		
RAMY	13	1627	1631	1653	S19	W86	.995		7.2	26	SB	3	C		26		
RAMY	13	1657	1704	1741	S15	W11	.235		12.9	44	SB	3	C		69		
RAMY	13	1717	1718	1733	S19	W86	.995		7.3	16	SB	3	C		12		
RAMY	13	1736	1741	1744	S19	W86	.995		7.3	8	SB	3	C		0		
RAMY	13	1746	1750	1759	S17	E 1	.179		13.8	13	SN	3	C		53		
RAMY	13	1756	1800	1805	S15	W11	.235		12.9	9	SB	3	C		74		
RAMY	13	1802	1826	1906	S19	W87	.996		7.2	64	SB	3	C		0		
RAMY	13	1838	1838	1846	S15	W11	.235		13.0	8	SB	3	C		41		
RAMY	13	1906	1925	1935	S19	W87	.996		7.3	29	SB	3	C		0		
RAMY	13	1952	1952	2006	S19	W88	.997		7.2	14	SB	3	C		0		
RAMY	13	2008	2011	2035	S19	W88	.997		7.2	27	SB	3	C		0		FDE
RAMY	13	2034	2046	2057D	S15	W13	.262	15697	12.9	23D	1B	3	C		222		FDE
RAMY	13	2037	2045	2057D	S17	W 1	.179		13.8	20D	SB	3	C		94		
TEHR	14	0355	0355U	0408D	S15	W60	.980		8.2	13D	SB	1	C		64		FDE
TEHR	14	0438E	0438U	0442D	S15	W14	.276		13.1	4D	SB	1	C		159		FDE
TEHR	14	0722	0724U	0735D	S15	W80	.980		8.3	13D	SB	1	C		64		FDE
TEHR	14	0900	0903	0908	S15	W14	.276		13.3	8	SB	2	C		95		FDE
RAMY	14	1258	1300	1310	S24	E40	.669		17.5	12	SN	3	C		25		
MCMA	14	1428E	1434	1451D	S17	W33	.556	15696	12.1	23D	SN		C	1434	60	.8	E
MCMA	14	1521E		1521D	S23	W15	.370	15696	13.5		SN		P	1521	35	.4	E
RAMY	14	1623	1625	1630	S19	W90	.999		7.9	7	SB	3	C		0		
MCMA	14	1649E		1653D	S16	W23	.412	15697	13.0	4D	SN		P	1650	60	.7	E
HOLL	14	1838	1840	1846	N23	W31	.675		12.5	8	SN	3	C		41		F
RAMY	14	1839	1840	1843	N21	W29	.640		12.6	4	SN	3	C		31		F
RAMY	14	1900E	1918	1945	S15	W25	.436		12.9	45D	SN	3	C		26		F
RAMY	14	2024	2034	2119D	S15	W26	.451		12.9	55D	SB	3	C		142		F
HOLL	14	2025	2033	2142	S15	W25	.436		13.0	77	SB	3	C		126		Z F
HOLL	14	2123	2214	2216D	N23	W33	.693		12.4	53D	SB	3	V		76		

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	DATE DEC	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.	
HOLL	14	2213	2214	22160	N23	W33	.693		12.5	30	SB	3	C		76		
PALE	14	2214E	2215	2219	N21	W32	.668		12.5	50	SN	3	C		20		F
PALE	14	2343E	2343U	0005	S19	W43	.689		11.8	22D	SB	3	C		74		FDE
TEHR	15	0645	0647	0655	N22	W36	.714		12.6	10	SN	1	C		64		FDE
MONT	15	0852	0858	0908	N22	W41	.760		12.3	16	SF		C	0858	50		E
TEHR	15	0857	0900	0907	N22	W36	.714		12.7	10	SB	1	C		127		FDE
RAMY	15	1205	1206	1210	N21	W38	.726		12.7	5	SN	3	C		40		
RAMY	15	1238	1238	1245	N21	W39	.735		12.6	7	SN	3	C		28		
RAMY	15	1303	1342	1517	N21	W40	.745		12.5	134	SB	3	C		106		
MCMA	15	1341E		1351D	N21	W43	.772	15700	12.3	100	SN		P	1349	50	.8	E
RAMY	15	1443	1443	1454	S22	E44	.707		18.9	11	SF	3	C		26		
MCMA	15	1452	1502	16100	S14	W28	.476	15697	13.5	78D	SN		C	1502	150	1.8	E
RAMY	15	1455	1457	1609	S15	W36	.591		12.9	74	SB	3	C		31		
RAMY	15	1457	1542	1637	S11	W31	.513		13.3	100	SN	3	C		65		
RAMY	15	1526	1533	1619	N21	W40	.745		12.6	53	SB	3	C		34		
RAMY	15	1529	1531	1539	S22	E44	.707		18.9	10	SF	3	C		38		
RAMY	15	1654	1656	1700	S15	W37	.604		12.9	6	SB	3	C		20		
RAMY	15	1657	1659	1704	N21	W41	.754		12.6	7	SN	3	C		20		
MCMA	15	1820	1826	19020	S13	W36	.587	15697	13.1	42D	SN		C	1826	60	.8	E
RAMY	15	1830E	1830U	1933D	S11	W32	.528		13.4	63D	SB	2	C		96		F
RAMY	15	1848	1849	1854	S22	E42	.685		18.9	6	SF	2	C		35		
MCMA	15	1937E		19580	S16	W42	.670	15697	12.7	21D	SF		C	1941	80	1.1	E
RAMY	15	1948E	1951	2001D	S12	W42	.665		12.7	13D	SN	2	C		73		F
RAMY	15	1948E	1957	2001D	S12	W42	.665		12.7	13D	SB	2	C		110		F
HOLL	15	2259E	2259U	2312D	S15	W39	.631		13.0	13D	SB	1	C		115		DE
RAMY	16	1651	1653	1658	N22	W57	.890		12.4	7	SB	3	C		76		F
MCMA	16	1651	1652	1656	N22	W58	.897	15700	12.4	5	SN		C	1652	40	1.0	E
RAMY	16	1707	1708	1710	N19	W 5	.444		16.3	3	SF	3	C		26		
RAMY	16	1715	1720	1735	N19	W 5	.444		16.3	20	SN	3	C		60		
RAMY	16	1740	1743	1749	N19	W 5	.444		16.4	9	SF	3	C		29		F
RAMY	16	1806	1806	1816	S18	W38	.624		13.9	10	SN	3	C		20		F
RAMY	16	1808	1810	1819	S22	E29	.527		18.9	11	SB	3	C		72		F
MCMA	16	1815E		1857	N19	W06	.447	15704	16.3	42D	SN		C	1835	80	.9	E
MCMA	16	1900		1907D	N19	W06	.447	15704	16.3	7D	SN		P	1902	50	.5	E
RAMY	16	1901	1905	1917	N19	W 6	.447		16.3	16	SB	3	C		55		F
RAMY	16	1957	1958	2003	N22	W58	.897		12.5	6	SN	2	C		39		
RAMY	16	2036	2040	2050	S15	W51	.773		13.0	14	SN	2	C		31		
MANI	17	0350E	0350U	04020	N18	W10	.451		16.4	12D	SN	3	C		20		
MANI	17	0559E	0559U	0604D	S25	E 6	.325		17.7	5D	SN	3	C		15		
TEHR	17	0733	0743	0806	S15	W51	.773	15697	13.5	33	1B	1	C		286		F
MANI	17	0734E	0741	0754	S17	W48	.742	15714	13.7	20D	1B	3	C		250		FDE
RAMY	17	1217	1218	1241	N18	W16	.492		16.3	24	SB	3	C		24		
RAMY	17	1357	1358	1524	N18	W16	.492		16.4	87	SN	3	C		52		F
RAMY	17	1357	1427	1524	N18	W16	.492		16.4	87	SB	3	C		151		F
MCMA	17	1432	1500	1535	S23	E22	.447	15709	19.3	63	SN		C	1500	75	.9	E
RAMY	17	1433	1434	1521	S25	E24	.488		19.4	48	SB	3	C		86		F
MCMA	17	1507	1512	1522	S17	W62	.877	15697	13.0	15	SF		C	1512	30	.8	D
RAMY	17	1526	1532	1537	N18	W17	.501		16.4	11	SN	3	C		21		
MCMA	17	1545	1552	1604	S17	W49	.753	15697	14.0	19	SB		C	1552	100	1.6	E
RAMY	17	1549	1552	1558	S18	W49	.754		14.0	9	SB	3	C		50		F
MCMA	17	1549	1550	1557	N24	W70	.965	15700	12.4	8	SB		C	1550	25	1.0	D
RAMY	17	1550	1550	1554	N20	W66	.941		12.7	4	SB	3	C		20		
RAMY	17	1553	1557	1634	N18	W18	.509		16.3	41	SB	3	C		68		F
MCMA	17	1607	1608	1617	S17	W49	.753	15697	14.0	10	SF		C	1608	50	.8	D
MCMA	17	1609	1613	1624	S14	W60	.860	15697	13.2	15	SN		C	1613	40	.9	E
MCMA	17	1645	1656	17020	N18	W20	.527	15704	16.2	17D	SB		C	1656	100	1.2	EK
RAMY	17	1646	1650	1653	N18	W18	.509		16.3	7	SB	3	C		73		F
RAMY	17	1654	1657	1717	N18	W18	.509	15704	16.4	23	1B	3	C		239		DE
RAMY	17	1718	1719	1730	N18	W18	.509		16.4	12	SN	3	C		25		F
RAMY	17	1731	1735	1755	N18	W19	.518		16.3	24	SB	3	C		59		F
MCMA	17	1800E	1811	1833	S14	W60	.860	15697	13.3	33D	1B		C	1811	100	2.4	E
MCMA	17	1800	1824	1833	N18	W20	.527	15704	16.3	33	SN		C	1824	80	1.0	E
RAMY	17	1807	1808	1850	S16	W62	.877		13.1	43	SB	3	C		120		DE
RAMY	17	1815	1825	1838	N18	W19	.518		16.3	23	SB	3	C		143		
PALE	17	1821E	1825	1849	N19	W19	.529	15704	16.3	28D	1B	3	C		234		FDE
PALE	17	1821E	1821U	1826	S15	W64	.892		13.0	5D	SB	3	C		110		FDE
PALE	17	1850E	1915U	1934	N19	W20	.538		16.3	44D	SN	3	C		68		FDE
RAMY	17	1855	1907	1936	N18	W19	.518		16.4	41	SB	3	C		75		
RAMY	17	1857	1858	1931D	N18	W16	.492		16.6	34D	SN	3	C		52		F

Hα SOLAR FLARES

DECEMBER 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	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.	
RAMY	17	1912	1920	1934	S16	W63	.885		13.1	22	SB	3	C		14		F
PALE	17	1935	1936	1939	N19	W20	.538		16.3	4	SN	3	C		47		
PALE	17	2000	2024	2057	N19	W20	.538		16.3	57	SB	3	C		134		FDE
PALE	17	2011E	2013	2017D	S15	W65	.900		13.0	6D	SN	3	C		42		FDE
PALE	17	2058	2102	2128	S16	W65	.900		13.0	30	SB	3	C		97		FDE
PALE	17	2111	2114	2133	N19	W21	.547		16.3	22	SN	3	C		93		DE
PALE	17	2129	2129	2134	S22	E20	.415		19.4	5	SN	3	C		30		DE
PALE	17	2250E	2252	2310D	N19	W22	.556		16.3	20D	SN	3	C		41		FDE
TEHR	18	0859E	0900U	0912	S58	W17	.796		17.1	13D	SB	2	C		95		
RAMY	18	1416	1418	1444	S16	W74	.955		13.0	28	SB	2	C		33		F
MCMA	18	1545	1548	1552	N16	W76	.980	15697	13.0	7	SN		C	1548			D,
MCMA	18	1633	1636	1656	N12	W85	.998	15697	12.3	23	1B		C	1636			AR
MANI	18	2348	2350	0004	S20	W90	.999	15697	12.2	16	1B	3	C		0		
PALE	19	0032E	0034	0044	N12	E41	.707		22.1	12D	SN	3	C		42		F
TEHR	19	0833E	0836	0844	S18	W70	.933		14.1	11D	SB	2	C		95		F
RAMY	19	1839	1839	1852	N18	W45	.777		16.4	13	SN	3	C		20		
RAMY	19	1940	1941	1947	S18	W78	.972		14.0	7	SN	3	C		0		
RAMY	20	1621	1622	1624	N11	E17	.418		22.0	3	SN	2	C		26		H
HOLL	20	2011	2015	2024	N19	W61	.910		16.3	13	SN	2	C		20		
HOLL	20	2155	2202	2226	N12	E15	.409		22.0	31	SN	2	C		52		
PALE	20	2155E	2203	2218	N11	E15	.397		22.0	23D	SB	2	C		77		FDE
HOLL	20	2213	2213	2216	N19	W62	.916		16.3	3	SN	2	C		15		F
HOLL	20	2251	2253	2257	N19	W62	.916		16.3	6	SN	2	C		38		
PALE	21	0040	0042	0044	N19	W64	.928		16.2	4	SN	3	C		22		
TEHR	21	0730E	0730U	0743D	S27	W46	.742		17.9	13D	SN	1	C		64		FDE
RAMY	21	1312E	1314	1317	N10	E56	.851		25.8	5D	SN	3	C		18		
RAMY	21	1451	1451	1501	N10	E55	.842		25.7	10	SN	3	C		16		
RAMY	21	1645	1649	1722	N18	W71	.963		16.4	37	SB	2	C		92		F
HOLL	21	1646	1650	1742	N19	W71	.964	15704	16.4	56	1B	3	C		152		U F
PALE	21	1858	1859	1906	S25	W53	.805		17.8	8	SN	3	C		14		
RAMY	21	1905	1907	1914	N21	W72	.970		16.4	9	SB	2	C		19		
HOLL	21	1907	1908	1912	N19	W72	.968		16.4	5	SB	3	C		24		
PALE	21	1907	1908	1911	N19	W74	.976		16.2	4	SB	3	C		29		
RAMY	21	1925	1927	1939	S23	W36	.617		19.1	14	SN	2	C		36		
HOLL	21	2136	2139	2143	N19	W73	.972		16.4	7	SB	3	C		25		F
PALE	21	2137	2139	2142	N19	W73	.972		16.4	5	SB	3	C		32		
RAMY	22	1257	1308	1317	S23	W45	.720		19.2	20	SB	3	C		84		F
RAMY	22	1620	1620	1629	N24	W32	.695		20.3	9	SN	2	C		53		F
RAMY	22	1720	1720	1727	N24	W32	.695		20.3	7	SN	2	C		22		F
MCMA	22	1836	1840	1846	N28	E90	1.002	15731	1.5	10	SN		C	1840			DH
TEHR	23	0514	0520	0524	S23	W61	.871		18.6	10	SB	1	C		127		DE
MANI	23	0516E	0516U	0625	S26	W60	.866		18.7	69D	SN	3	C		20		
RAMY	23	1550	1551	1603	N11	E28	.548		25.8	13	SB	3	C		32		F
MCMA	23	1626	1628	1643	N27	E75	.985	15731	1.3	17	SN		C	1628			E
RAMY	23	1628	1629	1633	N28	E72	.977		1.1	5	SN	3	C		12		
RAMY	23	1903	1917	1924	N17	W59	.892		19.4	21	SN	3	C		84		F
HOLL	23	1905	1911	1924	N17	W58	.884		19.4	19	SN	3	C		21		
RAMY	23	1932	1935	1946	N17	W59	.892		19.4	14	SN	3	C		78		F
PALE	24	2043	2044	2054	N19	E 2	.442		25.0	11	SN	3	C		37		DE
TEHR	25	0453	0456	0508D	N12	E50	.802		1.0	15D	SB	1	C		95		FDE
PALE	25	2022	2022	2024	S15	E71	.939		3.2	2	SN	3	C		17		DE
HOLL	25	2022	2022	2027	S17	E68	.920		2.9	5	SN	3	C		38		
HOLL	25	2131	2136	2152	S30	E62	.885		2.5	21	SB	3	C		76		
PALE	25	2133	2136	2155D	S28	E67	.916	15734	2.9	22D	1B	3	C		171		H
MANI	26	0327E	0327U	0334	S15	E60	.859		2.6	7D	SB	3	C		100		F
RAMY	27	1236	1237	1246	S18	E51	.775		3.4	10	SN	3	C		22		
RAMY	27	1551	1551	1554	S15	E41	.655		2.7	3	SN	3	C		22		
RAMY	27	1626	1637	1813	S13	E41	.653	15733	2.8	107	3B	3	C		683		U F
HOLL	27	1627	1631	1634D	S16	E43	.681	15733	2.9	7D	2B	3	C		393		UDE
RAMY	27	1629	1633	1642	S18	E71	.938		5.0	13	SB	3	C		51		F
PALE	27	1759	1801	1802	S23	W46	.730		24.3	3	SN	3	C		17		DE
RAMY	27	1759	1800	1804	S22	W47	.739		24.2	5	SN	3	C		19		

Hα SOLAR FLARES

DECEMBER 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	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	0046	0047	0111D	S15	E41	.655		3.1	25D	SB	3	C		41		DE
RAMY	28	1153	1154	1204	S35	E86	.992		6.9	11	SN	2	C		0		
RAMY	28	1328	1328	1350	N11	E 4	.319		28.9	22	SN	3	C		23		
RAMY	28	1401	1401	1404	S15	E33	.549		3.1	3	SN	3	C		24		
RAMY	28	1501	1534	1625	N11	E 3	.316		28.9	84	SB	2	C		53		
MCMA	28	1532	1542	1551	S29	W90	.998	15714	21.9	19	SN		C	1542			E
RAMY	28	1626	1629	1649	N11	E 3	.316		28.9	23	SN	2	C		39		
RAMY	28	1629	1632	1634	S32	E50	.795		4.4	5	SF	2	C		18		
RAMY	28	1637	1638	1643	S32	E50	.795		4.4	6	SF	2	C		32		
MCMA	28	1703		1708D	S13	E30	.501	15733	3.0	5D	SF		P	1707	80	1.0	E
RAMY	28	1744	1747	1750	S22	W62	.878		24.1	6	SN	2	C		14		
RAMY	28	1836	1836	1841	N11	E 2	.314		28.9	5	SN	2	C		33		
RAMY	28	1920	1925	1928	N11	E 1	.313		28.9	8	SN	2	C		31		
RAMY	28	2003	2003	2010	N11	E 1	.313		28.9	7	SN	2	C		23		
RAMY	28	2024	2034	2042D	S32	E47	.768		4.4	18D	SB	2	C		50		
PALE	28	2154E	2157U	2158D	S23	W64	.893		24.1	4D	SB	3	C		32		DE
RAMY	29	1350	1352	1357	S22	W73	.949		24.1	7	SN	2	C		33		
MANI	30	0549	0607	0620	S20	E67	.913	15746	7.3	31	2B	2	C		300		U
TEHR	30	0604E	0608U	0702	S12	E63	.884	15741	7.0	58D	3B	2	C		732		U
RAMY	30	1200	1202	1220	S32	E27	.578		4.5	20	SN	3	C		25		
RAMY	30	1216	1220	1234	N13	E74	.971		8.1	18	SN	3	C		16		
RAMY	30	1332	1332	1342	S31	E 4	.408		2.9	10	SN	3	C		28		
RAMY	30	1507	1507	1511	N11	W23	.489		28.9	4	SN	3	C		32		
RAMY	30	1609	1611	1627	N11	W24	.501		28.9	18	SB	3	C		80		
RAMY	30	1725	1725	1728	S22	E19	.399		4.2	3	SN	3	C		20		
RAMY	30	1833	1847	1855	S22	E19	.399		4.2	22	SN	3	C		33		
PALE	30	2305	2306	2321	S11	E54	.803		7.0	16	SN	2	C		66		DE
PALE	30	2332	2333	2336	S21	E15	.342		4.1	4	SN	2	C		28		DE
TEHR	31	0802	0805	0812	N13	E64	.918		8.1	10	SB	2	C		95		
RAMY	31	1213E	1214	1245	S32	E14	.469		4.6	32D	SN	2	C		74		U F
RAMY	31	1316	1316	1321	N12	E60	.888		8.1	5	SN	3	C		23		
RAMY	31	1446	1447	1507	S12	E45	.702		7.0	21	SN	3	C		28		
RAMY	31	1645	1650	1657	S23	E 6	.289		4.1	12	SN	2	C		45		
RAMY	31	1726	1727	1741	S23	E 6	.289		4.2	15	SN	2	C		80		
RAMY	31	1906	1906	1909	N12	E57	.865		8.1	3	S3	2	C		19		

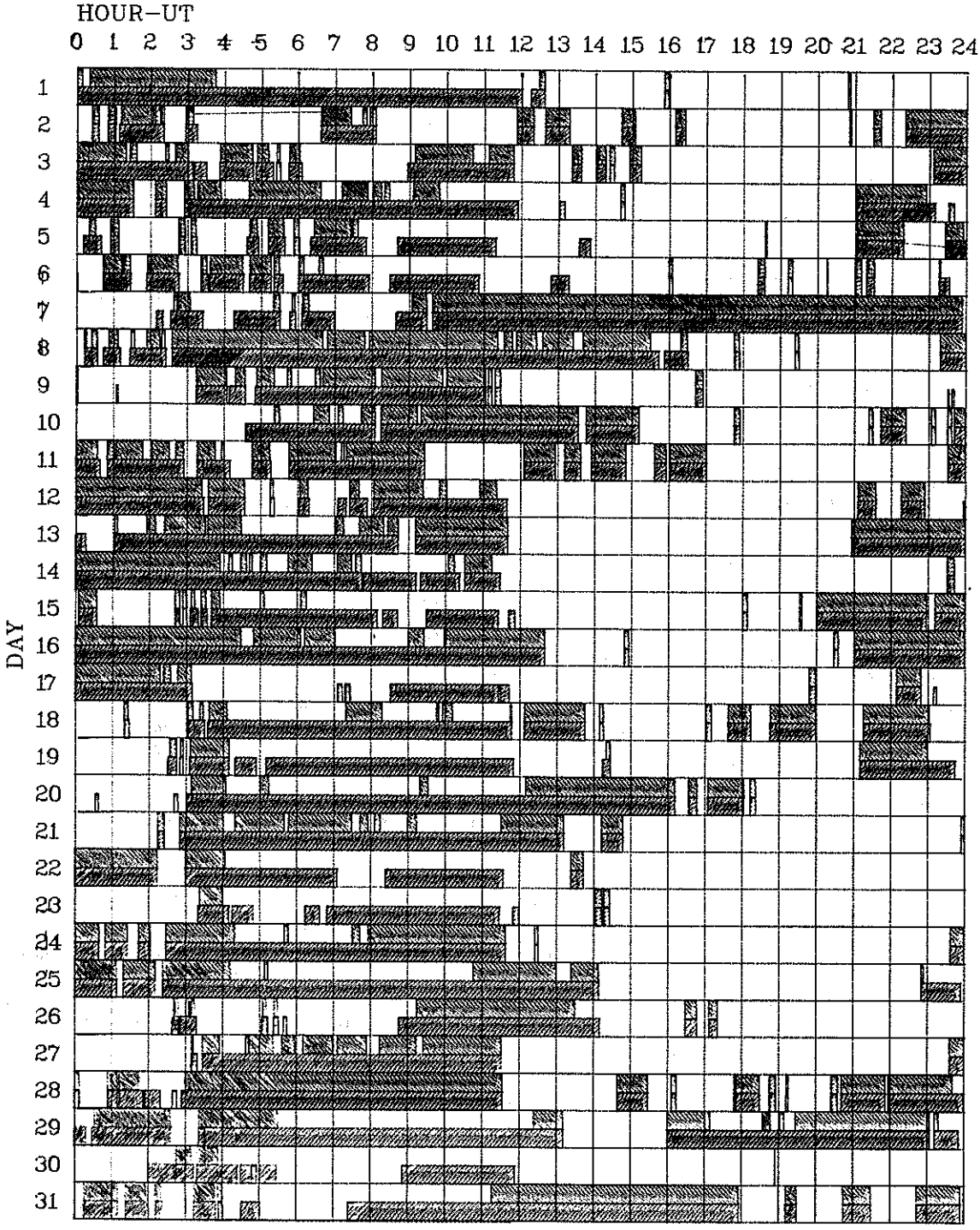
"Remarks":

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

DECEMBER 1978

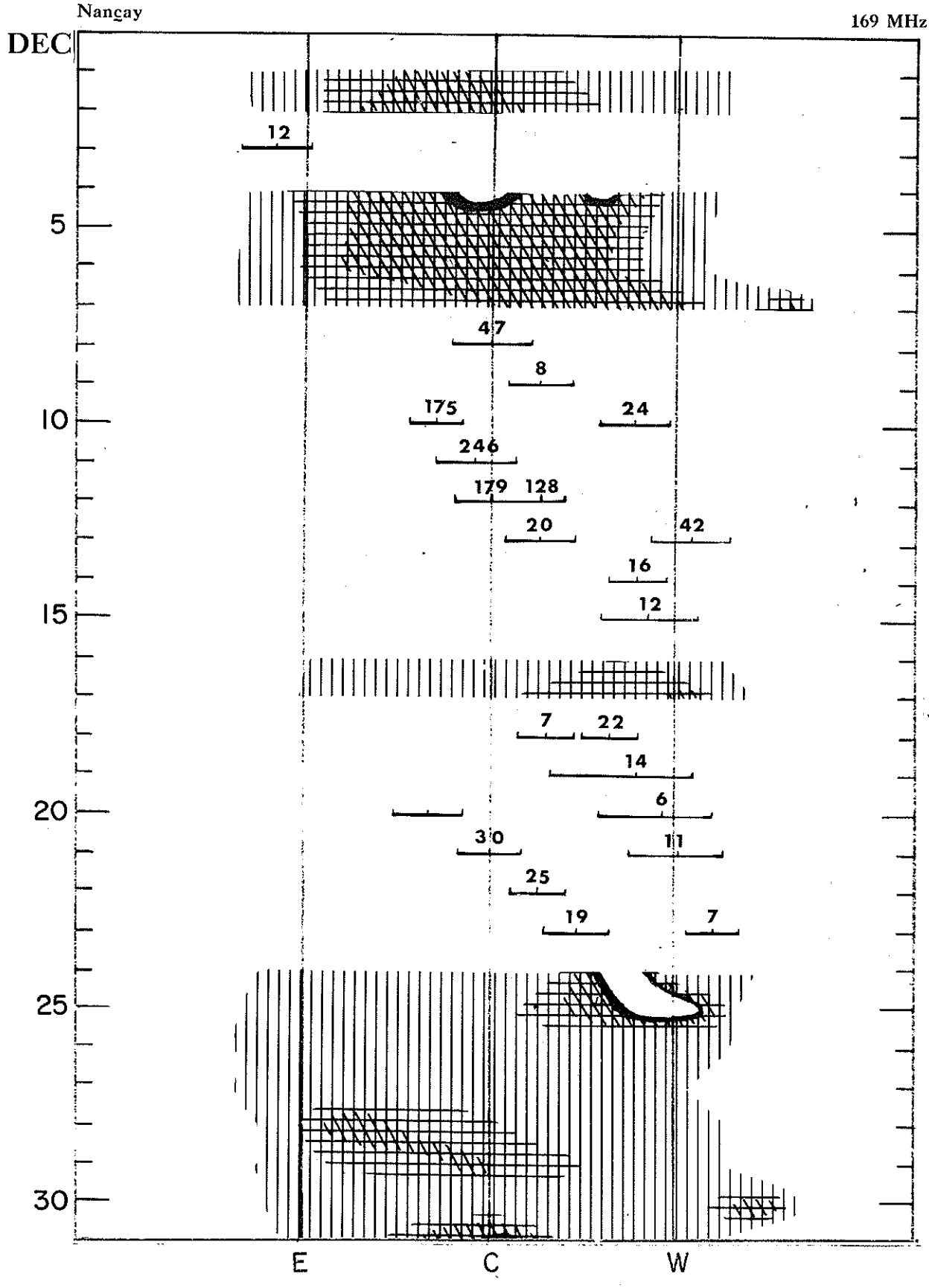


Bucharest	Kandilli	McMath-Hulbert	Ramey	Upice
Herstmonceux	Locarno	Monte Mario	Tehran	Wendelstein
Holloman	Manila	Palehua		

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

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

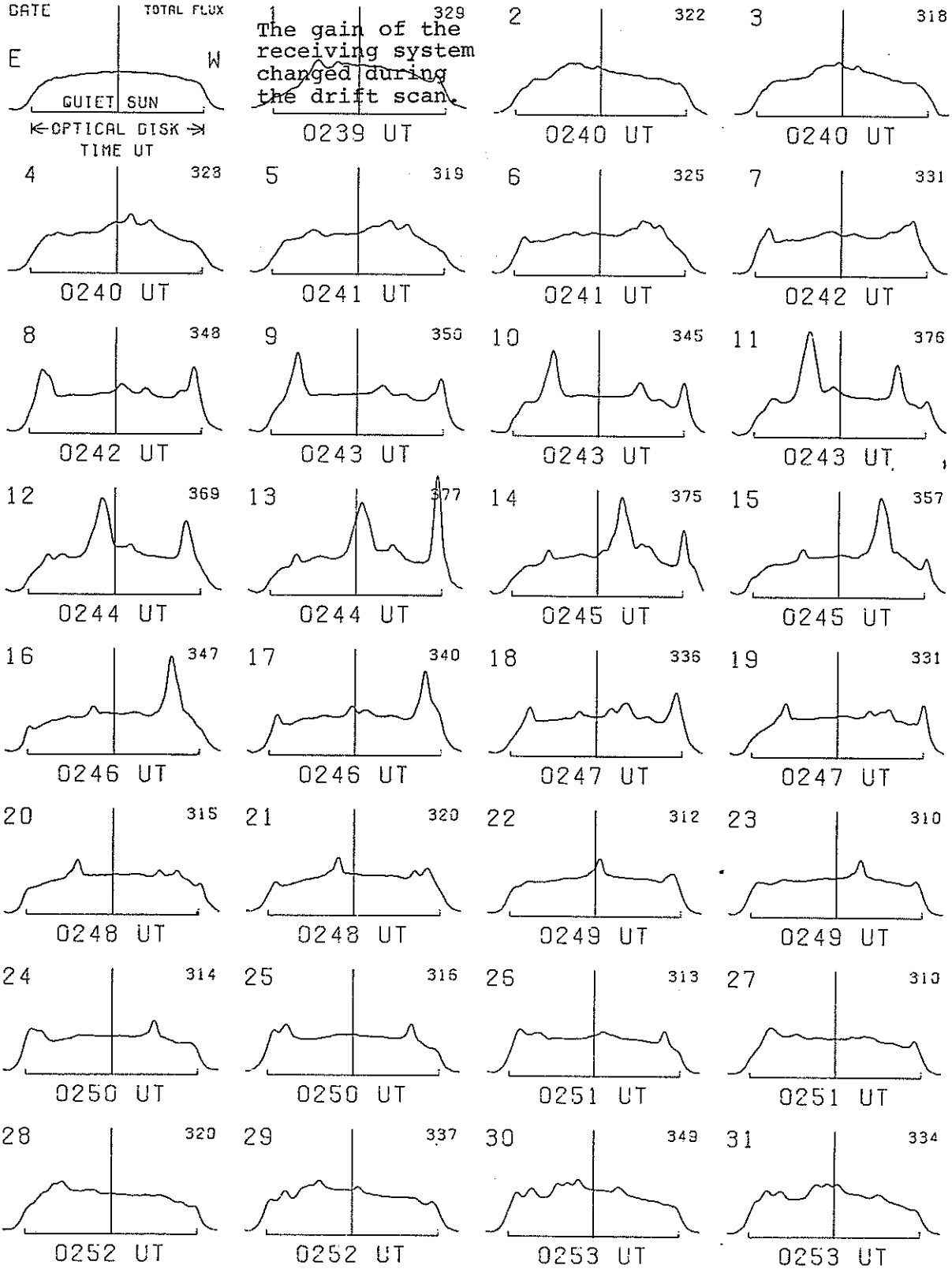
DECEMBER 1978



EAST-WEST SOLAR SCANS
DECEMBER 1978

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC

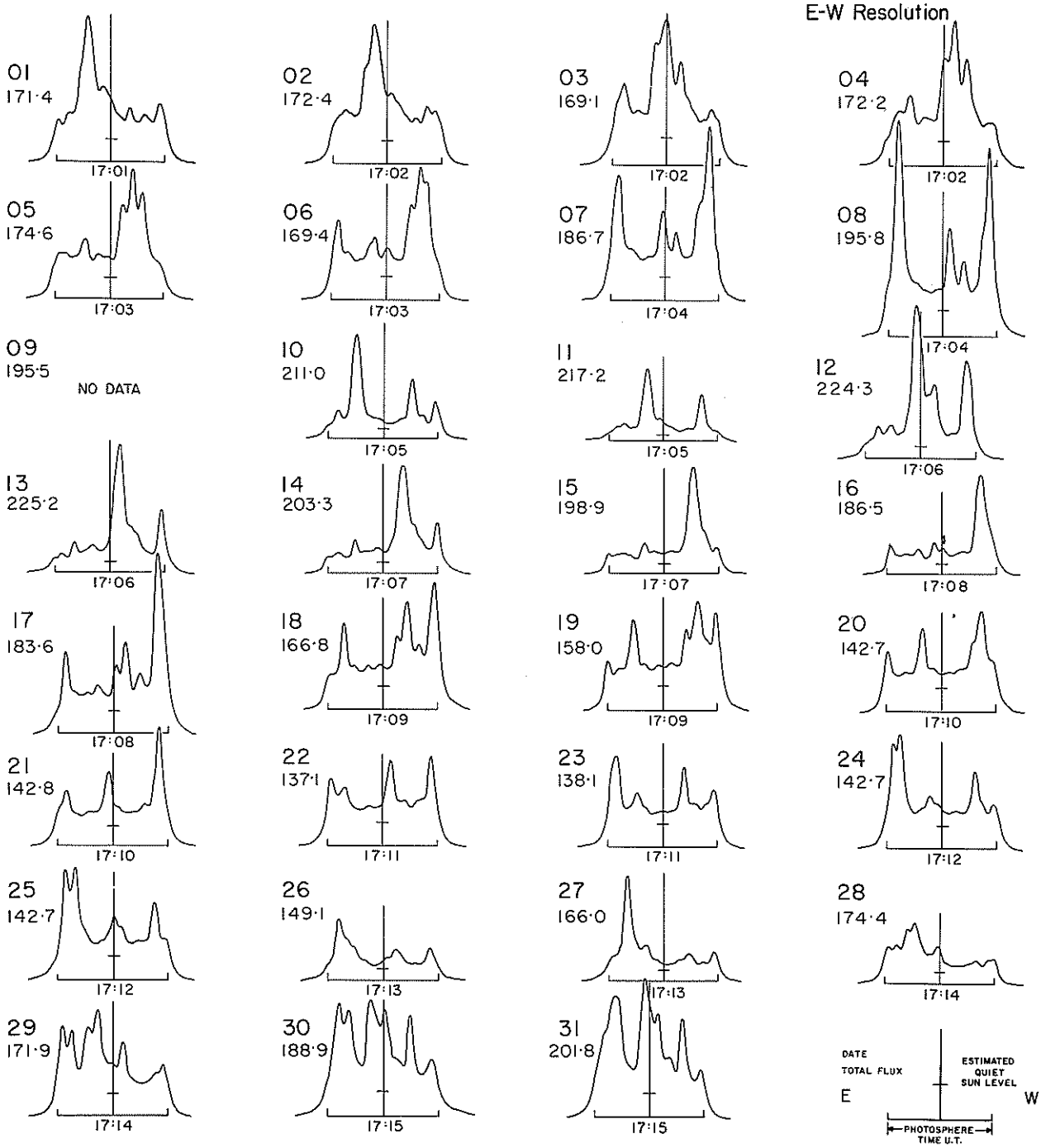


EAST-WEST SOLAR SCANS

DECEMBER 1978

ALGONQUIN RADIO OBSERVATORY
CANADA

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

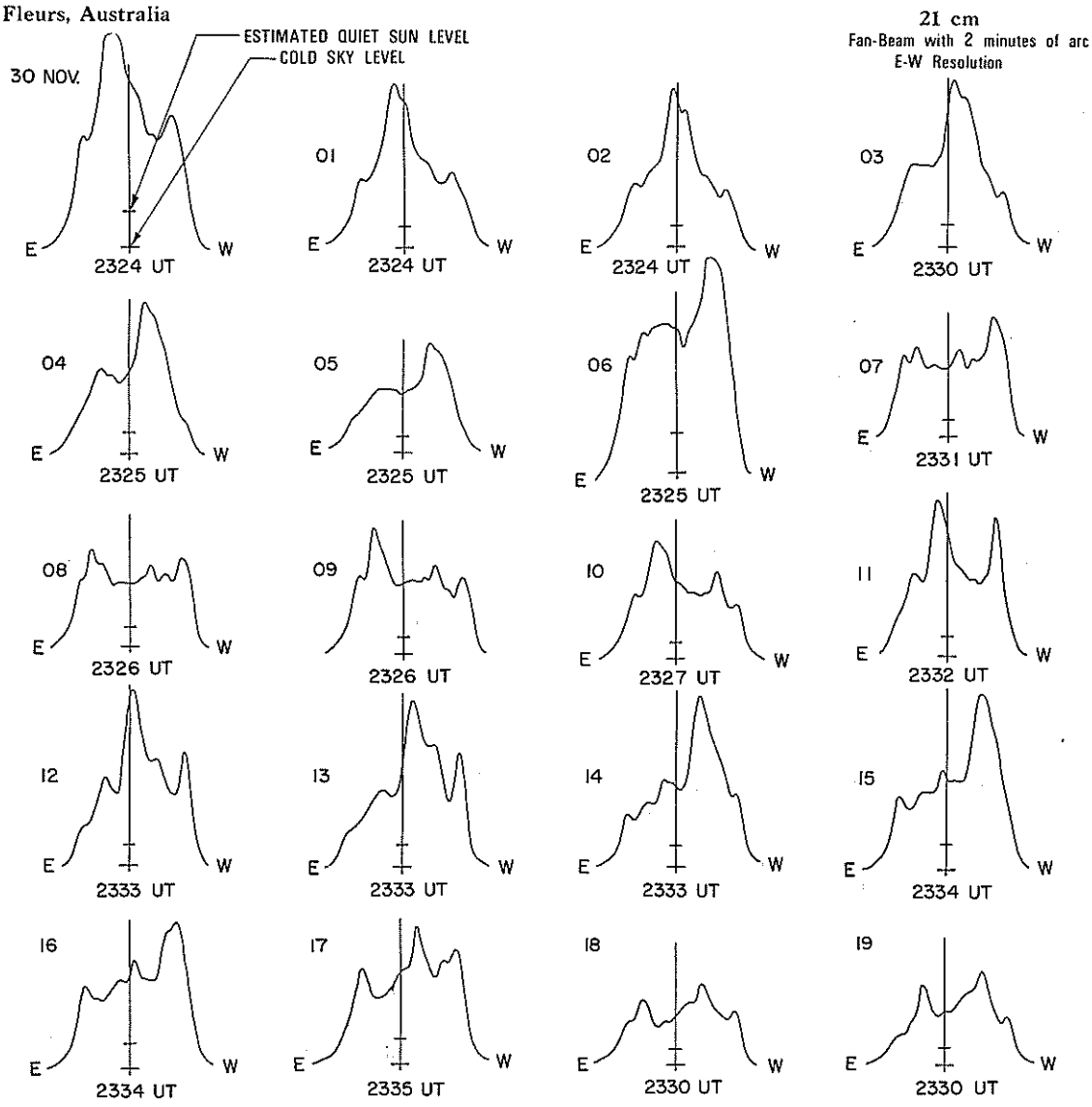


EAST-WEST SOLAR SCANS

DECEMBER 1978

Fleurs, Australia

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



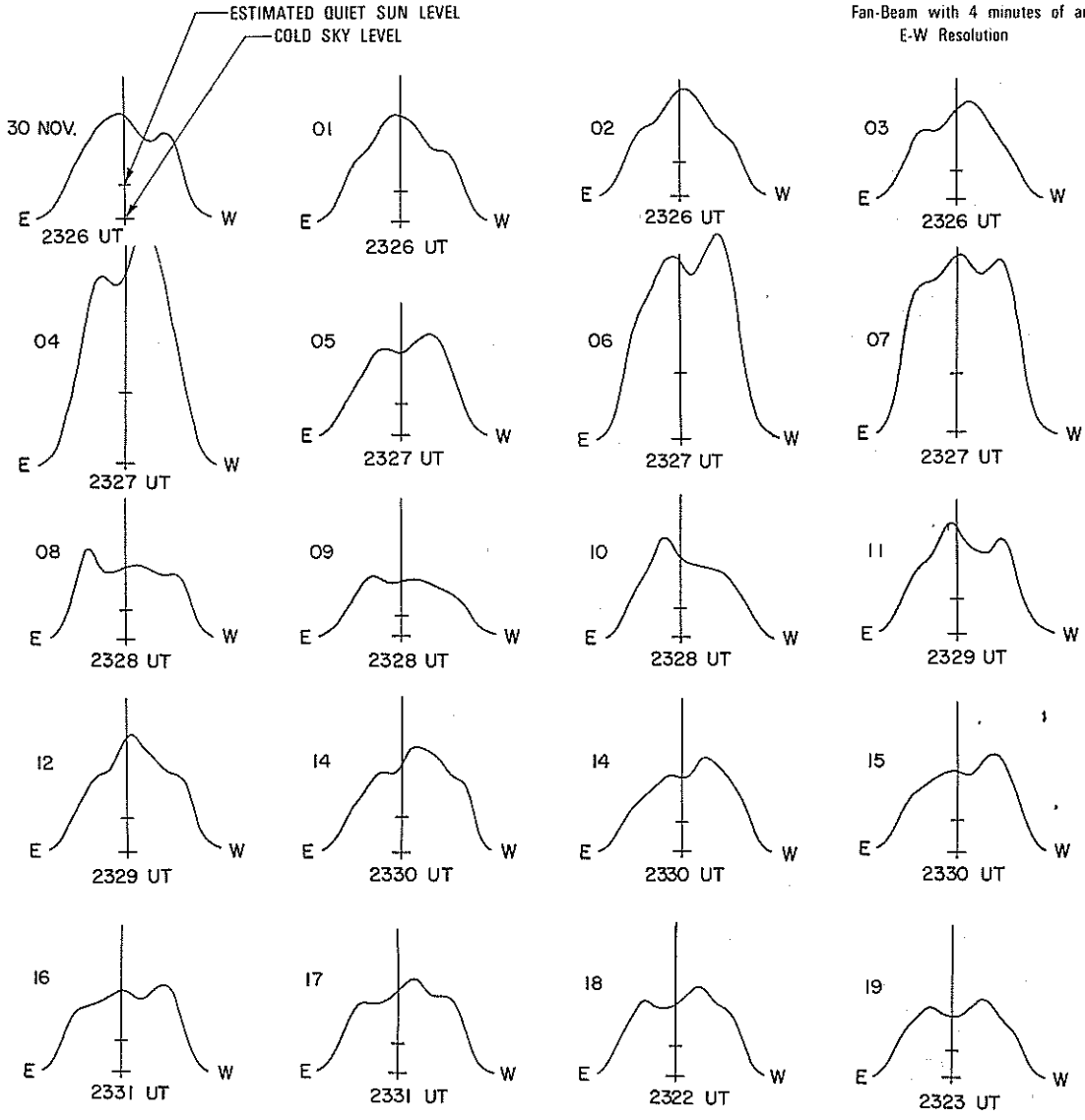
NO DATA DEC. 20-31

EAST-WEST SOLAR SCANS

DECEMBER 1978

Fleurs, Australia

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



NO DATA DEC. 20-31

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

DECEMBER 1978

DEC 1978	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22}Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
1	8400	BERN	3	1213.2	1214.8	11	20			0
	2800	CTTA	20 GRF	1440	1447	18	3	1.4		
	2800	OTTA	240 R	1512	1545	33	3	1.5		
	2800	OTTA	20 GRF	1650	1720	130	2.6	1.3		
	2800	OTTA	1 S	1954	1955.5	3	9	4.5		
	2800	OTTA	29 PBI	1957	1957	15	3.4	1.7		
	2695	BOUL	41 F	2152 E	2154	2.5D	16	5		
2	2695	MANI	3 S	0548.4	0550.6	4.7	23.3	7.7		
	2800	OTTA	20 GRF	1455	1545	175	3.4	2.8		
3	8400	BERN	3	1108.6	1109	6	19			0
	2800	OTTA	1 S	1839	1840	2	3.4	1.7		
	2800	OTTA	8 S	1937.5	1937.8	.5	3.4	1.7		
	2800	OTTA	4 S/F	2031	2032.2	3	78	26		
	2695	BOUL	4 SF	2032	2033.5	5.5	32	11		
	2800	OTTA	29 PBI	2034	2034	4	2.4	1.2		
	2695	BOUL	31 ABS	2037.5	2044.5	11 D	-5	-2		
4	8800	MANI	3 S	0545.2	0546.5	2	54.5	36.3		
	2695	MANI	1 S	0545.5	0546.7	3	6.8	4.5		
	8400	BERN	45	0934.1	0941.1	7	30			30R
	8400	BERN	45	0934.1	0938.2	7	27			11R
	8400	BERN	46	1054.3	1055.6	9	42			0
	8400	BERN	3	1227.6	1229	3.5	35			0
	8400	BERN	45	1249.3	1256.3	8	23			0
	8400	BERN	45	1249.3	1250.1	8	21			0
	8400	BERN	8	1318.4	1320.3	12	298			11L
	2695	SGMR	3 S	1318.5	1319.5	1.5	139	55.6		5
	8800	SGMR	3 S	1318.5	1319.5	1.5	94	37.6		5
	2800	OTTA	3 S	1320	1320.3	2	105	30		
	2800	OTTA	8 S	1431.8	1432	.7	3.4	1.7		
	2800	OTTA	22 GRF	1458	1508	40	4	1.9		
	2695	SGMR	3 S	1547.1	1548	2.2	72.6	29		5+SWF
	2800	OTTA	4 S/F	1547.5	1548.3	3.5	48	18.6		
	2800	OTTA	1 S	1719	1720	3	3	1.5		
	2800	OTTA	4 S/F	1843.5	1844.5	6.5	74	12		
	8800	SGMR	3 S	1844.4	1844.8	4.6	68	27.2		
	2695	SGMR	3 S	1844.4	1844.8	4.6	18.7	42.8		
	2695	BOUL	3 S	1845 D	1845.5	1 D	89	30		
	2695	BOUL	29 PBI	1846	1846	1.5D	11	4		
5	2800	OTTA	1 S	1422.2	1422.5	1	9.2	4		
	2800	OTTA	4 S/F	1425	1425.7	1.5	16.4	8		
	2800	OTTA	20 GRF	1935	1943	20	2.4	1.2		
6	2800	OTTA	20 GRF	1505	1550	170	4.2	2.2		
	2800	OTTA	20 GRF	1843.5	1856	40	4.4	2.2		
	2800	OTTA	1 S	1939	1940	2	3.4	1.7		
	2695	PENT	240 R	2018	2045	27	2.8	1.4		
	2695	PENT	4 S/F	2103	2105	5	20	9.6		
7	2800	OTTA	20 GRF	1635	1720	145	5.4	2.7		
	2800	OTTA	4 S/F	1940	1944	18	97	35		
	2695	SGMR	20 GRF	1942	1945	16	5.5	2		
	2695	BOUL		1942 D	1950.5		68	23		
	2695	BOUL	21 GRF	1942 D	1945	10 D	104	35		
	2695	BOUL	29 PBI	1952	1952	5 D	34	11		
	2800	OTTA	30 PBI	1958	1958	110	10.8	5.4		
	2695	PENT	8 S	2033.9	2034.3	.7	1.6	.8		
	2695	PENT	8 S	2035	2035.2	.6	4	2		
8	2800	OTTA	20 GRF	1455	1505	25	2.2	1.1		
	2800	OTTA	27A RF	1530		230	3.8	3.4		
	2800	OTTA	24 R	1530	1550	20	3.8	2.2		
	2800	OTTA	24P R	1550		180	3.8			
	2800	OTTA	8 S	1608.8	1609	.5	8.8	4.4		
	2800	OTTA	8 S	1616.5	1616.8	.5	7.6			
	2800	OTTA	26 FAL	1850	1920	30	-3.8	-1.9		
	2800	OTTA	32 ABS	1935	1950	30	-3	-1.8		
	2695	PENT	1 S	2019	2020	4	5.4	2.5		
	2695	PENT	20 GRF	2030	2033	25	3.2	1.6		
9	8400	BERN	3	1058.1	1101	10	39			11L
	2800	OTTA	20 GRF	1420	1440	70 D	3			
	2800	OTTA	27 RF	1535		220	5	4.2		
	2800	OTTA	24 R	1535	1555	20	5	2.5		
	2800	OTTA	24P R	1555		150	5			
	2800	OTTA	26 FAL	1825	1915	50	5	2.5		
10	2800	OTTA	27AFRF	1505		225	3.8	3.6		
	2800	OTTA	24 R	1505	1525	20	3.8	2		
	2800	OTTA	24P R	1525		191	3.8			
	2800	OTTA	22 GRF	1805	1818.5	30	5.6	2.2		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

DECEMBER 1978

DEC 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22}Wm^{-2}Hz^{-1}$ PEAK	FLUX DENSITY $10^{-22}Wm^{-2}Hz^{-1}$ MEAN	INT	REMARKS
	2800	OTTA	26 FAL	1836	1850	14	-3.8	-1.9		
	2800	OTTA	23 GRF	1930	2004	35 D	8.4			
	2800	OTTA	40 F	1946.2	1947.2	2	80			
	2695	SGMR	3 S	1946.8	1947.4	1.6	48	14.4		
	2695	MANI	3 S	2330.2	2340.1	46.7	98	32.7		
	8800	MANI	3 S	2338.5	2346.6	45.7	28.7	9.6		
11	8400	BERN	8	0946	0946.3	1	15			0
	2800	OTTA	240 R	1553	1603	10	6	3		
	2800	OTTA	240 R	1720	1740	20	4.2	2.1		
	2800	OTTA	21 GRF	1750	1809	40	7.2	4.5		
	2800	OTTA	1 S	1752	1754	4	5.8	2.9		
	2695	BOUL	28 PRE	1909.5U	1944	43.5D	290	97		
	2800	OTTA	28 PRE	1910		22	19			
	8800	SGMR	47 GB	1918	1946.1	107 D	280	1660		SWF
	2695	SGMR	47 GB	1918	2011.5		24600			SWF
	2695	SGMR	47 GB	1918	1946.1	107 D	333	9840		SWF
	8800	SGMR	47 GB	1918	2005.2		4150			SWF
	2800	OTTA	47 GB	1934	2012	160	8320	1128		
	2695	BOUL	47 GB	1953 E	2013.5	43.5D	14332	4777		
	2695	BOUL	29 PBI	2036.5	2036.5	118.5U	2149	716		
	2695	PENT	29 PBI	2214	2214	40 D	20			
12	8800	MANI	3 S	0308.4	0309.2	6.4	80	26.6		
	8800	MANI	3 S	0640.4	0641	1	24	8		
	2695	MANI	3 S	0640.6	0640.8	1	10.2	3.4		
	8400	BERN	2	0939	1031.5	243	67			0
	8400	BERN	2	0939	1211.2	243	47			0
	2800	OTTA	23 GRF	1420	1625	285	46			
	2800	OTTA	1 S	1432	1433	4	3.8	1.7		
	8800	SGMR	45 C	1512	1513.3	29	263	190		
	2695	SGMR	45 C	1512	1517.2		277			
	2695	SGMR	45 C	1512	1513.3	29	29.5	111		
	8800	SGMR	45 C	1512	1517.2		474			
	2800	OTTA	4 S/F	1512	1517	15	185	27		
	2695	BOUL	3 S	1517.5E	1518.5	5 D	203	68		
	2800	OTTA	1 S	1652	1654.5	6	3	1.4		
	2695	PENT	1 S	1850	1851	1.5	5.4	2		
	2800	OTTA	1 S	1856	1856.5	1	3	1.5		
	2695	PENT	21 GRF	1945	2013.5	65	7.6	2.8		
	2695	PENT	1 S	2036	2037	6	6.2	3.1		
13	8800	MANI	3 S	0119.1	0121.2	4	11	3		IG
	2695	MANI	3 S	0120.2	0121.2	3.5	13.4	4.5		
	8800	MANI	3 S	0406.2	0406.9	3.1	91	30		
	2695	MANI	4 S/F	0430.1	0433.8	10.8	60.1	20.1		
	8800	MANI	3 S	0517.4	0518.6	2.6	236.6	78.9		
	8400	BERN	2	1005	1015.5	86	90			0
	8400	BERN	3	1233	1233.5	6	64			0
	2800	OTTA	1 S	1330	1333	6	4.6	2		
	2800	OTTA	21 GRF	1427	1440	35	3.6	1.8		
	2695	SGMR	3 S	1431.6	1432.5	1.7	18	5.4		
	2800	OTTA	3 S	1431.9	1432.4	1	10.4	5.2		
	2800	OTTA		1652	1704	50	12			
	2800	OTTA	240 R	1833	1925	52	11.4	5.7		
	2695	PENT	21 GRF	2020	2044	60	9.2	4.4		
	2695	PENT	2 S/F	2027	2028	2.5	4.2	2.1		
	2800	OTTA	8 S	2045.2	2045.5	.8	2.6	1.3		
	8800	MANI	47 GB	2352.7	2354.3	6.3	1575	509.8		
	2695	MANI	3 S	2352.8	2354.5	7	18.4	6.1		
14	2695	MANI	4 S/F	0431.1	0433	7.1	38.7	12.9		
	8800	MANI	47 GB	0722.5	0723.1	6.1	966.9	322.3		
	2695	MANI	3 S	0722.8	0723.3	5	52.4	17.4		
	8400	BERN	8	0903.1	0903.5	1	15			
	2800	OTTA	27 RF	1428		140	4.6	4.2		
	2800	OTTA	24 R	1428	1432	4	4.6	2.3		
	2800	OTTA	24P R	1432		118	4.6			
	2800	OTTA	26 FAL	1630	1648	18	4.6	2.3		
	2800	OTTA	20 GRF	1840	1851	90	6	2.8		
	2800	OTTA	20 GRF	2015	2037	50	10.6	3.6		
	2695	PENT	26 FAL	2115	2145	30	-6.4			
	2695	PENT	3 S	2212.5	2213.7	2	11.2	3.8		
15	2800	OTTA	20 GRF	1450	1520	70	4	2		
	2800	OTTA	1 S	1800	1807	8	2.8	1.4		
	2800	OTTA	21 GRF	1820	1850	60	3	1.5		
	2800	OTTA	1 S	1822	1823	2	3.6	1.8		
	2695	PENT	26 FAL	2005	2020	15	-3.6	-1.8		
	8800	MANI	4 S/F	2241	2242.9	3.2	115.4	38.5		
	2695	BOUL	4 SF	2243 E	2244 U	2.5U	17	6		
	2695	BOUL	29 PBI	2245.5U	2245.5U	2.5U	11	4		
16	2695	MANI	4 S/F	0135.6	0136	3.5	51.7	17.2		
	2695	MANI	3 S	0351	0351.9	2	32.8	10.9		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS
DECEMBER 1978

DEC 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22}Wm^{-2}Hz^{-1}$ PEAK	FLUX DENSITY $10^{-22}Wm^{-2}Hz^{-1}$ MEAN	INT	REMARKS
	2695	PENT	240 R	1955	2005	10	3	1.5		
	2695	PENT	20 GRF	2025	2030	45	3.8	1.8		
17	2695	MANI	4 S/F	0348	0349.3	4.2	21.2	7.1		
	2695	MANI	4 S/F	0732.7	0735.3	25.3	244.5	81.5		
	8400	BERN	8	1134.2	1134.7	1.5	22			16L
	2800	OTTA	21 GRF	1420	1500	120	7.4	3.8		
	2800	OTTA	8 S	1616.8	1616.8	.5	4			
	2695	SGMR	3 S	1807.8	1808.4	1.4	66.3	19.9		SWF
	8800	SGMR	3 S	1807.9	1808.4	1.3	93.8	28.1		SWF
	2800	OTTA	3 S	1807	1808.2	5	58	20		
	2695	BOUL	3 S	1808 E	1809	2 D	62	21		
	2695	BOUL	29 PBI	1810	1810	25.5	16	5		
	2800	OTTA	30 PBI	1812	1812	28	8.4	4.2		
	2800	OTTA	8 S	1815	1815.3	.6	3.4	1.7		
	2800	OTTA	8 S	1907.1	1907.1	.1E	4.2			
	2800	OTTA	26 FAL	1910	1945	35	-7.4	-3.7		
	2800	OTTA	8 S	1956.3	1956.3	.1E	2.8			
	2800	OTTA	1 S	2023	2023.3	1	1.4	.7		
18	2800	OTTA	4 S/F	1635.5	1636	3	10.6	2.6		
	2800	OTTA	26 FAL	1710	1755	45	-3.2	-1.6		
	2695	PENT	1 S	2017.9	2018.2	1	2.6	1.3		
	2695	PENT	8 S	2153.9	2154	.2	2.8	1.4		
	2695	MANI	4 S/F	2347.6	2348.1	3.7	23.8	17.5		
	8800	MANI	4 S/F	2347.6	2349	1.4	421.2	269.7		I
19	2800	OTTA	240 R	1430	1500	30	3.6	1.8		
	2800	OTTA	26 FAL	1720	1840	80	-6.2	-4		
21	2800	OTTA	21 GRF	1520	1655	180	6.4	3.2		
	2800	OTTA	2 S/F	1646.5	1648	2.5	5.2	2.6		
	2800	OTTA	2 S/F	1731.8	1733.5	2.2	9.2			
	2695	BOUL	3 S	1734.5E	1735	1 D	20	7		
	2800	OTTA	21 GRF	1855	1910	65	1.8			
	2800	OTTA	40 F	1957	1957.7	2	11.4			
22	2800	OTTA	23 GRF	1832	1837	28	6.6	2.2		
	2800	OTTA	1 S	1841	1841.2	1	8.6	4.3		
23	2800	OTTA	1 S	1731	1731.4	2.5	7.4	3		
	2800	OTTA	1 S	2028	2029	2	3	1.3		
	2695	PENT	1 S	2052	2054.5	4.5	2.6			
	2695	PENT	40 F	2226	2226.5	9	13			
	2695	BOUL	22 GRF	2227.5E	2234.5	10 D	15	5		
24	2800	OTTA	20 GRF	1455	1650	225	4	2		
25	2695	MANI	1 S	0003.1	0006.4	4.9	7.9	2.6		
	2800	OTTA	20 GRF	1510	1525	50	2.2	1.1		
26	2800	OTTA	20 GRF	1950	1955	15	1.4	.7		
27	2800	OTTA	240 R	1505	1515	10	2.6	1.3		
	2695	SGMR	47 GB	1627.8	1638.1	39.2	540	162		2,SWF
	2800	OTTA	4 S/F	1627	1637.5	31	380	117		
	2695	BOUL	45 C	1628 E	1639	17 D	420	140		
	8800	SGMR	3 S	1629	1637.3	36	428	128		2,SWF
	2695	BOUL	29 PBI	1645	1645	17	44	15		
	2800	OTTA	29 PBI	1658	1658	80	13.8	7.2		
28	2800	OTTA	240 R	1455	1540	45	5.4	2.5		
	2800	OTTA	20 GRF	1755	1810	30	2.6	1.3		
	2800	OTTA	20 GRF	1900	1912	60	4.8			
	2695	PENT	1 S	2106	2108	5	1.4	.7		
29	2800	OTTA	20 GRF	1810	1912	80	2.8	1.4		
	2695	PENT	20 GRF	2010	2055	90	2	1.2		
30	2695	MANI	3 S	0600 E	0605	11 D	29	9.7		
	2695	MANI	4 S/F	0852.5	0852.9	2	24.6	8.2		I
	2800	OTTA	21 GRF	1530	1620	110	3.8	1.9		
	2800	OTTA	1 S	1608.5	1610	10	6	2.4		
	2800	OTTA	22 GRF	1735		45	2.2			
	2695	PENT	20 GRF	1835	1900	45	2	1.1		
	2695	PENT	240 R	2030	2056	26	2.8			
31	2800	OTTA	20 GRF	1550	1612	70	14	4.6		
	2800	OTTA	20 GRF	1724	1727	20	2	1		
	2800	OTTA	40 F	1805	1806.8	3	5			
	2800	OTTA	3A S	1905.8	1906.5	2	45	12		
	2800	OTTA	8 S	1906.5	1906.5	.1E	57			
	2695	BOUL	8 S	1907 E	1907.5	1 D	90	30		
	2695	PENT	3 S	2112	2112.8	2	12.4	4.2		
	2695	BOUL	3 S	2113 E	2114	1.5D	13	4		

Observatories:

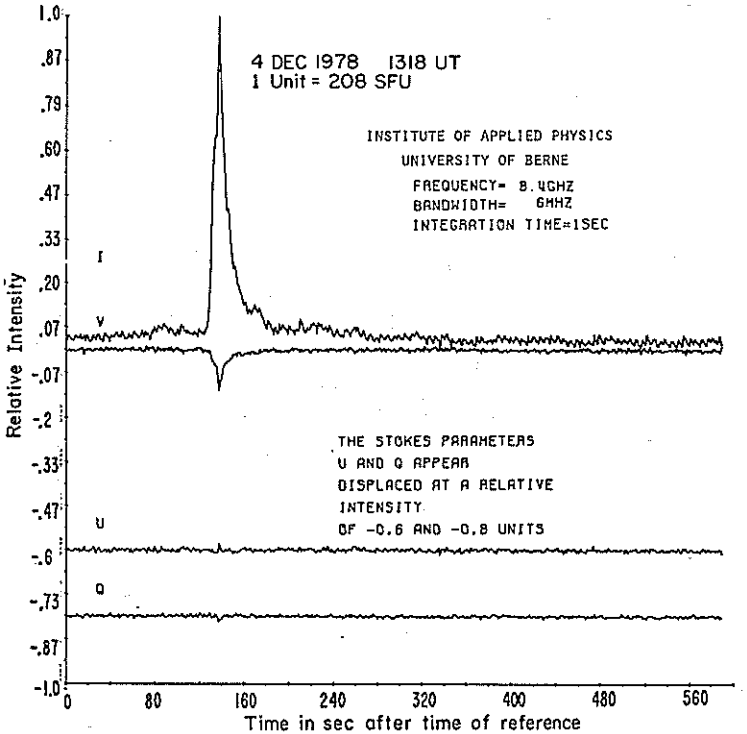
BERN = Berne BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

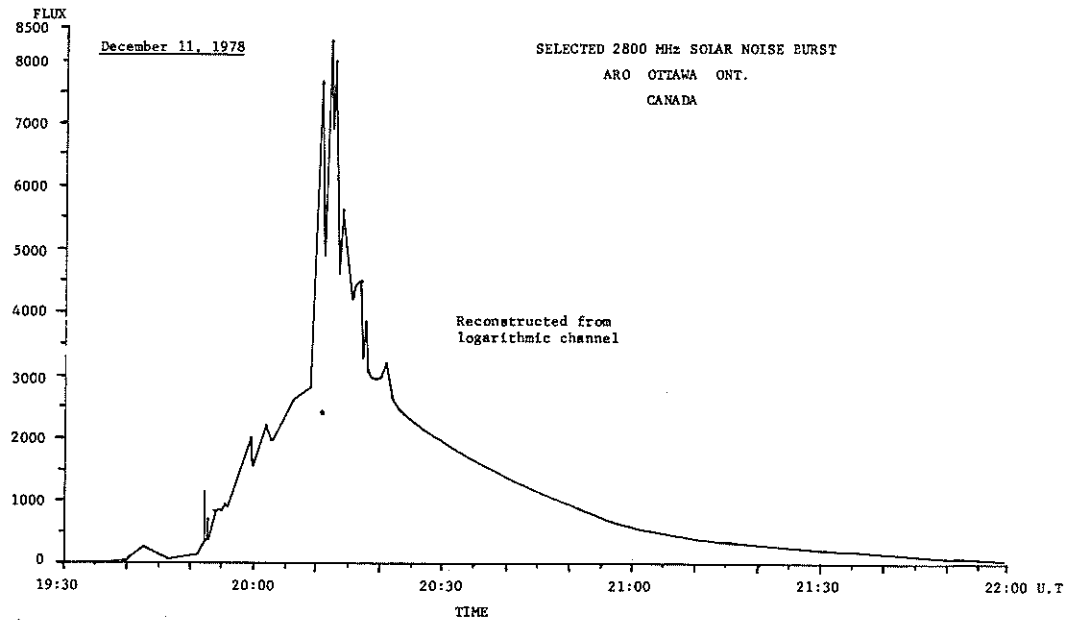
Explanation of Type Code:

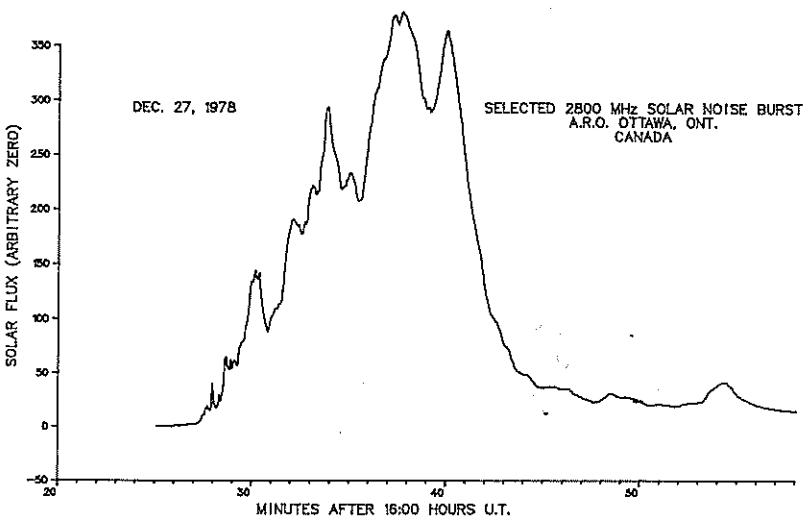
1 Simple 1	6 Minor	22 Simple 3F	27 Rise and Fall	32 Absorption	44 Noise Storm in Progress
2 Simple 1F	7 Minor +	23 Simple 3AF	28 Precursor	40 Fluctuation	45 Complex
3 Simple 2	8 Spike	24 Rise	29 Post Burst Increase	41 Group of Bursts	46 Complex F
4 Simple 2F	20 Simple 3	25 Rise A	30 Post Burst Increase 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 BURSTS

DECEMBER 1978







SOLAR X-RAYS BY SATELLITE
SMS GOES
DECEMBER 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
12/ 1	.001	.002	.002	.001	B	.001	B	.002	B	B	B	B	.004	B	.003	B	B	.003	B	.007	.002	B	.005	.001	.002
12/ 2	B	.001	.001	.001	.157	.004	.006	.001	.002	.003	.006	B	B	B	B	B	B	B	B	B	B	B	B	B	.008
12/ 3	B	B	B	.001	.001	B	b	B	B	B	B	.214	.024	.002	.002	.001	B	B	.002	B	.052	B	.001	.002	.005
12/ 4	.006	.001	.007	B	B	.019	B	B	.002	M	.017	.007	.002	.011	.001	.015	.002	.011	.015	B	B	B	B	B	.005
12/ 5	.005	.001	B	.015	B	B	B	.020	.003	.001	B	B	B	B	B	B	B	B	.002	.002	.001	.001	B	.002	.003
12/ 6	.001	.001	.002	.002	B	B	.001	.001	B	.001	.023	F	.001	.002	B	.002	.002	.004	.009	.002	.013	.013	.006	.003
12/ 7	.017	.003	.004	.001	.002	.002	.003	.004	.001	.005	.070	.002	.001	.002	.001	B	.001	.002	.002	.052	.031	.002	.009	.033	.010
12/ 8	.012	.002	B	B	.005	.001	.002	.002	.002	.017	.012	.007	.002	.002	.003	B	.001	.002	.001	.001	.005	.001	.003	B	.005
12/ 9	.002	.013	.001	.002	.002	.003	.002	.002	.002	.001	.002	.003	.001	.001	.003	.017	.002	.002	.029	.004	.003	.001	.002	.004	.005
12/10	.001	.001	.009	.002	.005	.005	.006	.002	.003	.001	.003	.005	B	.010	.003	.004	.001	.002	.004	.005	.011	.003	.001	.117	.011
12/11	.175	.006	.007	.005	.009	.002	.002	.004	.001	.002	.006	.006	.001	.002	.003	.007	.007	.010	.077	1.03	.302	.105	.025	.014	.097
12/12	.012	.003	.015	.091	.047	.072	.041	.020	.059	.003	.520	.055	.021	.010	.013	1.85	.154	.054	.055	.022	.105	.025	.023	.071	.135
12/13	.240	.098	.087	.050	.714	.245	.748	.074	.012	.010	.334	.009	.012	.004	.010	.007	.009	.021	.120	.033	.097	.013	.024	.054	.136
12/14	.009	.006	.016	.057	.127	.010	.003	.442	.005	.005	.014	.002	.002	.003	.043	.003	.043	.004	.007	.010	.053	.007	.003	.025	.064
12/15	.002	.002	.002	.003	.004	.010	.005	.041	.035	.002	.002	B	.002	.007	.005	.008	.003	.003	.018	.007	.003	.009	.047	.016	.010
12/16	.001	.006	.002	.008	.027	.013	.002	.002	.002	.007	.011	.002	.001	M	.003	.002	.003	.002	.002	.002	.004	.002	.001	.002	.005
12/17	.002	.002	.012	.017	.007	.001	.002	.459	.051	.010	.002	.005	.051	.002	.036	.007	.016	.005	.127	.014	.004	.005	.001	.024	.035
12/18	.004	.002	.003	.002	.003	.002	.002	.040	.004	.002	.458	.003	.002	.003	.009	.003	.007	.026	.002	.029	.003	.111	.003	.059	.032
12/19	.003	.002	.001	.002	.002	.002	.002	.022	.009	.012	.012	B	.002	.002	.004	.001	.001	.019	.019	.002	.001	.011	B	B	.005
12/20	B	.002	B	.001	.001	.001	.010	.003	.012	B	B	B	B	.001	B	B	B	.001	.012	.014	.012	.011	.014	.001	.004
12/21	B	.002	.001	B	.035	B	B	.003	.001	.003	B	.004	B	.003	.002	.002	.031	.013	.002	.012	.011	.012	.001	.013	.009
12/22	.002	.001	.002	.002	.011	.002	.002	.001	.002	B	.045	B	.014	.026	.002	.015	.010	.011	.013	.005	.001	.011	.001	.011	.003
12/23	.032	B	B	B	.003	.006	.013	.040	.002	.002	.004	.005	.012	.007	.001	B	.004	.003	.005	.003	.003	.008	.253	.045	.016
12/24	.005	.002	.007	.002	.002	.002	B	.001	.004	.011	.002	.006	.002	.001	.032	.004	.001	.011	.035	3	3	.001	.045	.010	.012
12/25	.005	.001	.002	.002	.037	.001	.014	.011	.010	B	.012	.003	.012	.001	.001	.010	B	.002	.002	.002	.002	.003	B	.001	.007
12/26	.004	.001	.001	.007	.004	.018	.003	.001	.002	.011	.003	.001	B	B	.001	B	B	.003	B	.001	.012	.005	B	.002	.007
12/27	B	.002	B	B	B	B	.003	.002	B	.001	.011	.002	B	B	.023	.001	.522	.002	.017	.013	.014	.003	.003	.042	.035
12/28	.002	.003	.043	.001	.003	.002	.001	.004	.015	.002	.002	.045	.003	.001	.023	.002	.012	.002	.002	.003	.002	.003	.002	.015	.009
12/29	.002	.002	.001	.002	.031	.002	.002	.001	.001	B	.003	.001	B	.024	.013	.012	.014	.013	.013	.003	.012	B	.001	B	.007
12/30	B	.005	.003	.004	.001	.075	.307	.015	.003	.001	.255	.015	.005	.003	.002	.002	.031	.013	.003	.002	.009	.002	.015	.015	.028
12/31	.003	.003	.015	.014	.005	.003	.003	.004	.014	.002	.005	.002	.005	.011	.005	.037	.001	.013	.005	.002	.002	.007	.001	B	.010

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

SOLAR X-RAYS BY SATELLITE
SMS GOES
DECEMBER 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
12/ 1	.010	.015	.020	.010	.009	.010	.009	.010	.008	.007	.007	.023	.015	.023	.011	.003	.008	.008	.009	.013	.012	.009	.220	.009	.006
12/ 2	.003	.009	.009	.009	.115	.012	.019	.009	.009	.210	.229	.223	.006	.028	.009	.009	.007	.007	.007	.007	.007	.007	.007	.006	.010
12/ 3	.006	.006	.006	.007	.007	.007	.006	.006	.005	.005	.007	.033	.040	.012	.011	.010	.008	.008	.009	.008	.032	.009	.009	.009	.008
12/ 4	.012	.010	.014	.008	.008	.022	.009	.007	.012	M	.015	.213	.009	.012	.006	.024	.008	.007	.017	.007	.007	.007	.006	.007	.008
12/ 5	.012	.008	.007	.013	.007	.007	.007	.024	.021	.010	.008	.008	.008	.007	.007	.008	.008	.008	.010	.009	.009	.008	.008	.010	.005
12/ 6	.009	.009	.012	.011	.009	.008	.008	.009	.009	.010	.013	.008	.011	.013	.009	.011	.011	.011	.013	.021	.013	.025	.014	.017	.008
12/ 7	.040	.022	.018	.013	.013	.012	.014	.014	.012	.020	.075	.015	.012	.014	.012	.011	.011	.017	.014	.049	.051	.020	.027	.043	.017
12/ 8	.029	.019	.017	.013	.019	.014	.014	.033	.014	.035	.038	.029	.021	.015	.022	.017	.017	.015	.015	.017	.023	.017	.020	.017	.012
12/ 9	.016	.014	.012	.017	.018	.017	.019	.015	.025	.013	.014	.260	.014	.021	.032	.012	.013	.013	.032	.014	.023	.014	.015	.013	.012
12/10	.014	.012	.048	.013	.035	.025	.041	.026	.018	.013	.015	.024	.017	.032	.034	.034	.030	.017	.022	.022	.034	.022	.019	.035	.019
12/11	.185	.070	.036	.029	.032	.022	.020	.023	.015	.018	.021	.225	.018	.014	.019	.017	.025	.029	.092	.545	.553	.129	.252	.242	.091
12/12	.033	.031	.046	.107	.035	.104	.032	.257	.032	.033	.311	.117	.055	.235	.039	.781	.194	.098	.075	.249	.113	.049	.051	.080	.125
12/13	.175	.127	.113	.055	.432	.245	.405	.129	.033	.044	.204	.036	.036	.024	.033	.023	.029	.045	.102	.355	.030	.053	.060	.153	.124
12/14	.355	.059	.044	.057	.123	.032	.018	.211	.025	.020	.033	.053	.018	.015	.043	.015	.048	.013	.221	.027	.070	.025	.017	.037	.061
12/15	.013	.013	.012	.015	.017	.019	.017	.035	.027	.013	.013	.011	.013	.023	.025	.027	.019	.019	.035	.027	.025	.023	.048	.033	.015
12/16	.019	.019	.013	.013	.055	.034	.013	.013	.013	.021	.013	.213	.012	M	.017	.015	.015	.014	.012	.011	.013	.020	.014	.012	.011
12/17	.012	.013	.032	.030	.023	.012	.012	.235	.034	.033	.224	.227	.043	.015	.048	.032	.021	.019	.272	.015	.014	.015	.013	.011	.038
12/18	.018	.013	.015	.014	.014	.014	.013	.013	.024	.015	.299	.214	.013	.026	.019	.014	.015	.023	.012	.012	.013	.032	.193	.243	.035
12/19	.213	.213	.012	.013	.013	.032	.014	.213	.019	.015	.013	.211	.010	.012	.013	.016	.011	.010	.010	.010	.002	.008	.008	.007	.009
12/20	.007	.007	.008	.008	.008	.009	.013	.033	.012	.007	.006	.226	.006	.006	.007	.007	.009	.012	.008	.208	.010	.210	.010	.009	.008
12/21	.009	.240	.009	.008	.042	.008	.207	.008	.008	.009	.009	.207	.007	.017	.012	.012	.050	.029	.011	.210	.008	.008	.227	.223	.012
12/22	.006	.021	.009	.010	.026	.026	.471	.393	.012	.208	.210	.209	.210	.229	.011	.023	.010	.009	.025	.027	.008	.008	.227	.008	.028
12/23	.007	.026	.006	.006	.010	.022	.013	.251	.013	.010	.015	.214	.007	.007	.010	.009	.025	.015	.015	.214	.011	.012	.245	.237	.013
12/24	.023	.030	.029	.014	.011	.012	.009	.029	.013	.027	.012	.010	.023	.029	.025	.225	.010	.009	.010	.008	.009	.010	.056	.037	.015
12/25	.025	.011	.012	.010	.031	.010	.017	.009	.008	.007	.227	.208	.007	.006	.027	.005	.006	.007	.007	.227	.008	.010	.007	.008	.008
12/26	.210	.029	.010	.015	.019	.034	.031	.013	.009	.008	.213	.212	.005	.007	.009	.008	.007	.009	.006	.007	.007	.007	.026	.005	.009
12/27	.007	.008	.007	.006	.006	.007	.008	.212	.008	.008	.209	.211	.008	.008	.008	.010	.321	.115	.220	.050	.013	.014	.013	.015	.032
12/28	.014	.011	.031	.011	.016	.019	.014	.013	.014	.013	.014	.215	.015	.013	.014	.014	.014	.015	.017	.221	.020	.013	.215	.216	.012
12/29	.014	.014	.011	.013	.027	.012	.013	.212	.011	.011	.210	.011	.010	.009	.010	.009	.012	.013	.013	.011	.012	.010	.012	.008	.009
12/30	.010	.010	.010	.019	.014	.078	.254	.049	.027	.013	.025	.017	.019	.222	.017	.015	.015	.012	.012	.011	.010	.012	.211	.030	.029
12/31	.015	.011	.010	.030	.019	.013	.011	.013	.017	.017	.018	.014	.023	.017	.013	.013	.025	.013	.013	.013	.011	.012	.211	.210	.013

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

SOLAR X-RAYS BY SATELLITE

GOES

DECEMBER 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	1212	0.0E+00	6.9E-07	1221	1.4E-07	3.1E-06	1234	2.6E-08	1.8E-06
1	1443	6.8E-09	8.2E-07	1450	2.0E-07	3.5E-06	1455	3.1E-08	2.0E-06
1	1952	1.5E-08	9.5E-07	1958	7.1E-07	6.8E-06	2003	9.9E-08	3.2E-06
1	2223	4.1E-08	1.4E-06	2229	8.7E-07	7.1E-06	2231	3.5E-08	1.3E-06
2	0401	1.1E-08	9.0E-07	0409	1.0E-05	1.4E-06	0412	1.9E-08	1.1E-06
2	0435	1.5E-05	1.8E-06	0439	1.0E-06	8.6E-06	0443	1.8E-07	4.8E-06
2	0546	8.7E-09	8.5E-07	0602	2.7E-07	4.2E-06	0614	8.8E-08	2.5E-06
2	0739	7.0E-09	7.8E-07	0742	5.1E-08	1.3E-06	0746	1.4E-08	1.0E-06
2	0800	2.3E-08	1.0E-06	0803	8.1E-08	1.7E-06	0807	4.4E-08	1.3E-06
3	0452	4.2E-09	6.0E-07	0458	1.2E-07	2.3E-06	0502	2.7E-08	1.3E-06
3	1101	4.5E-08	1.3E-06	1138	2.2E-07	4.8E-06	1213	7.5E-08	3.0E-06
3	1836	6.2E-09	7.3E-07	1841	2.3E-07	2.5E-06	1845	7.7E-08	1.5E-06
3	2028	1.5E-08	9.7E-07	2035	5.7E-06	2.4E-05	2038	7.7E-07	8.4E-06
3	2300	6.2E-09	7.9E-07	2305	4.0E-08	1.2E-06	2312	1.0E-08	9.9E-07
3	2356	1.1E-08	8.9E-07	0002	5.3E-07	4.2E-06	0006	1.0E-07	2.2E-06
4	0205	2.3E-08	1.1E-06	0216	3.4E-07	3.4E-06	0223	6.8E-08	1.9E-06
4	0541	2.8E-08	1.1E-06	0547	2.3E-06	1.3E-05	0550	4.6E-07	5.3E-06
4	1052	8.6E-09	7.6E-07	1058	2.6E-06	1.3E-05	1102	6.4E-07	6.2E-06
4	1318	6.4E-09	7.0E-07	1322	1.8E-06	9.7E-06	1324	6.4E-08	2.1E-06
4	1434	5.5E-09	6.7E-07	1437	1.1E-07	1.9E-06	1439	2.4E-08	1.0E-06
4	1456	9.5E-09	8.0E-07	1510	6.9E-07	6.6E-06	1514	1.3E-07	3.6E-06
4	1545	4.1E-09	6.7E-07	1550	8.2E-07	7.2E-06	1552	2.0E-07	3.7E-06
4	1842	6.0E-09	6.5E-07	1846	2.1E-06	1.2E-05	1850	3.0E-07	5.1E-06
4	1933	9.2E-09	7.2E-07	1936	4.3E-08	1.0E-06	1938	1.2E-08	8.1E-07
5	0735	3.7E-08	1.2E-06	0752	8.0E-07	7.5E-06	0803	1.7E-07	4.2E-06
5	0810	9.5E-08	2.7E-06	0814	5.0E-07	5.6E-06	0817	1.4E-07	3.7E-06
5	0943	9.5E-09	8.9E-07	0946	6.1E-08	1.6E-06	0948	2.1E-08	1.0E-06
5	1203	8.7E-09	8.2E-07	1206	6.2E-08	1.9E-06	1208	1.3E-08	9.7E-07
5	1421	3.3E-09	6.8E-07	1425	6.0E-08	1.4E-06	1427	7.3E-09	8.1E-07
5	2118	9.3E-09	8.3E-07	2122	5.1E-08	1.3E-06	2126	1.4E-08	1.0E-06
5	2219	8.9E-09	7.6E-07	2222	3.7E-08	1.1E-06	2224	1.6E-08	9.0E-07
5	2314	9.3E-09	7.6E-07	2320	1.1E-07	2.1E-06	2325	3.9E-08	1.4E-06
6	0005	5.1E-09	7.3E-07	0008	8.3E-08	1.9E-06	0010	4.8E-08	1.2E-06
6	0332	1.5E-08	1.1E-06	0337	5.9E-08	1.8E-06	0340	3.3E-08	1.4E-06
6	0717	7.3E-09	8.4E-07	0721	4.9E-08	1.2E-06	0725	1.4E-08	1.0E-06
6	1543	1.2E-08	1.1E-06	1546	5.4E-08	1.9E-06	1558	2.7E-08	1.4E-06
6	1843	8.9E-09	9.3E-07	1859	1.4E-07	3.1E-06	1906	2.8E-08	2.0E-06
6	1936	1.2E-08	1.0E-06	1943	5.9E-07	7.0E-06	1947	2.3E-07	3.9E-06
6	2101	6.6E-09	9.5E-07	2108	8.9E-07	7.9E-06	2116	1.6E-07	4.4E-06
6	2334	2.7E-08	1.3E-06	0021	2.4E-07	5.0E-06	0054	1.0E-07	3.1E-06
7	0221	3.1E-08	1.3E-06	0229	1.5E-07	2.9E-06	0244	3.6E-08	2.1E-06
7	0632	2.6E-08	1.4E-06	0635	2.8E-08	2.2E-06	0637	3.1E-08	1.5E-06
7	0915	2.2E-08	1.8E-06	0921	1.3E-07	3.0E-06	0927	4.0E-08	2.3E-06
7	0955	1.1E-08	1.6E-06	1004	4.8E-06	3.3E-05	1009	1.2E-06	1.6E-05
7	1939	2.3E-08	1.4E-06	1951	2.3E-06	2.0E-05	2008	7.5E-07	1.0E-05
7	2226	1.1E-08	1.8E-06	2234	3.9E-07	5.8E-06	2242	1.2E-07	3.6E-06
7	2340	1.2E-08	1.6E-06	2346	2.3E-06	1.8E-05	2353	1.0E-06	1.0E-05
8	0048	3.1E-09	1.7E-06	0052	8.6E-07	6.5E-06	0058	2.1E-07	3.9E-06
8	0357	2.2E-10	1.7E-06	0403	1.5E-07	3.4E-06	0409	3.6E-08	2.4E-06
8	0723	6.1E-09	1.3E-06	0726	3.4E-09	1.0E-05	0731	0.0E+00	1.4E-06
8	1414	1.0E-08	1.7E-06	1424	9.7E-08	2.9E-06	1434	3.0E-08	2.3E-06
8	2040	2.0E-08	1.4E-06	2050	1.5E-07	3.5E-06	2102	3.7E-08	2.4E-06
9	1056	6.0E-08	2.1E-06	1100	2.9E-06	1.8E-05	1103	9.3E-07	9.9E-06
9	2049	1.3E-08	1.6E-06	2052	1.2E-07	2.7E-06	2055	3.2E-08	2.1E-06
9	2342	1.5E-08	1.6E-06	2349	1.7E-07	3.2E-06	2358	4.6E-08	2.3E-06
10	0201	3.0E-08	1.5E-06	0209	2.7E-06	2.0E-05	0215	9.6E-07	1.0E-05
10	0440	1.1E-08	1.6E-06	0448	1.5E-06	1.1E-05	0457	3.4E-07	6.5E-06
10	0602	2.2E-08	1.5E-06	0611	1.1E-06	8.4E-06	0624	2.2E-07	4.9E-06
10	0825	3.3E-08	1.8E-06	0829	2.7E-07	4.1E-06	0833	9.1E-08	2.8E-06
10	1339	7.2E-08	2.7E-06	1355	2.9E-07	6.2E-06	1411	1.2E-07	4.3E-06
10	1534	1.4E-08	1.5E-06	1545	1.4E-07	3.5E-06	1551	2.8E-08	2.5E-06
10	1816	4.2E-08	2.2E-06	1821	1.8E-07	3.7E-06	1828	7.6E-08	2.9E-06
10	2332	3.2E-08	1.9E-06	0003	4.0E-06	3.0E-05	0029	1.2E-06	1.6E-05

SOLAR X-RAYS BY SATELLITE

GOES

DECEMBER 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}
11	1001	2.2E-08	1.6E-06	1005	1.2E-07	2.5E-06	1011	4.1E-08	2.0E-06
11	1909	1.7E-07	5.8E-06	1927	1.3E-05	7.5E-05	1937	0.0E+00	0.0E+00
11	1937	6.0E-06	4.3E-05	1945	2.3E-05	1.1E-04	2017	1.0E-05	7.7E-05
12	0012	1.3E-07	3.6E-06	0017	3.3E-07	5.4E-06	0023	1.5E-07	4.4E-06
12	0131	1.5E-07	4.5E-06	0136	3.9E-06	2.1E-05	0147	8.9E-07	1.2E-05
12	0306	2.2E-07	5.5E-06	0314	3.2E-06	2.0E-05	0327	8.5E-07	1.2E-05
12	0343	3.0E-07	7.7E-06	0346	9.3E-07	1.1E-05	0348	3.6E-07	8.1E-06
12	0519	2.1E-06	1.1E-05	0522	2.2E-06	1.8E-05	0525	1.4E-06	1.4E-05
12	0638	1.6E-07	5.9E-06	0650	1.0E-06	1.2E-05	0655	3.9E-07	8.6E-06
12	0747	1.0E-07	4.0E-06	0755	5.5E-07	8.1E-06	0802	1.6E-07	5.9E-06
12	0826	2.5E-07	6.0E-06	0833	2.2E-06	1.4E-05	0844	6.7E-07	1.0E-05
12	0959	4.9E-08	3.1E-06	1040	1.1E-05	5.8E-05	1057	2.6E-06	2.9E-05
12	1329	9.0E-08	3.2E-06	1336	3.7E-07	6.5E-06	1343	1.4E-07	4.8E-06
12	1415	1.5E-07	3.8E-06	1419	4.6E-07	6.3E-06	1422	1.6E-07	5.0E-06
12	1509	5.1E-07	7.6E-06	1520	8.2E-05	2.5E-04	1527	2.6E-05	1.2E-04
12	1806	5.4E-07	5.6E-06	1811	1.5E-06	1.2E-05	1817	4.1E-07	8.4E-06
12	1832	1.0E-07	4.0E-06	1836	3.4E-06	1.8E-05	1840	9.7E-07	1.0E-05
12	2002	3.1E-07	5.6E-06	2011	2.0E-06	2.0E-05	2030	1.1E-06	1.2E-05
12	2133	1.4E-07	4.2E-06	2136	1.2E-06	1.0E-05	2140	3.2E-07	6.7E-06
12	2226	1.8E-07	4.8E-06	2230	1.2E-06	1.1E-05	2233	5.3E-07	7.7E-06
13	0008	1.4E-07	4.3E-06	0014	5.6E-06	2.5E-05	0026	1.5E-06	1.4E-05
13	0037	3.6E-06	1.9E-05	0042	6.1E-06	3.2E-05	0050	2.8E-06	2.4E-05
13	0109	1.0E-06	1.2E-05	0120	2.4E-06	2.1E-05	0128	1.2E-06	1.7E-05
13	0231	9.4E-07	1.2E-05	0237	2.3E-06	2.0E-05	0240	1.2E-06	1.5E-05
13	0352	3.2E-07	5.5E-06	0410	2.8E-05	9.5E-05	0422	6.0E-06	4.9E-05
13	0516	1.3E-06	1.9E-05	0521	9.7E-06	4.9E-05	0528	3.5E-06	3.3E-05
13	0615	3.9E-07	1.0E-05	0622	3.6E-05	1.2E-04	0633	9.3E-06	6.0E-05
13	0736	3.3E-07	7.8E-06	0739	1.2E-06	1.1E-05	0743	6.6E-07	9.4E-06
13	1011	1.8E-07	3.6E-06	1019	2.0E-05	6.8E-05	1029	4.2E-06	3.4E-05
13	1429	6.0E-08	2.6E-06	1433	2.6E-07	5.1E-06	1459	1.0E-07	3.7E-06
13	1822	5.2E-07	6.7E-06	1831	4.5E-06	2.4E-05	1838	1.4E-06	1.5E-05
13	2006	1.6E-07	4.3E-06	2012	3.1E-06	1.6E-05	2018	1.0E-06	1.0E-05
13	2036	1.7E-07	4.6E-06	2046	2.3E-06	1.8E-05	2050	8.2E-07	1.0E-05
13	2351	2.0E-07	6.0E-06	0004	3.0E-05	1.1E-04	0016	6.3E-06	5.4E-05
14	0221	8.0E-08	3.5E-06	0228	6.5E-07	8.1E-06	0234	2.0E-07	5.6E-06
14	0350	2.5E-07	5.6E-06	0400	3.2E-06	1.9E-05	0414	1.0E-06	1.2E-05
14	0423	3.9E-07	7.8E-06	0435	2.0E-06	1.7E-05	0443	8.2E-07	1.2E-05
14	0647	1.2E-08	1.6E-06	0650	2.2E-07	3.2E-06	0657	6.0E-08	2.3E-06
14	0714	1.6E-08	1.8E-06	0725	3.2E-05	1.0E-04	0732	9.5E-06	5.2E-05
14	0854	7.6E-09	1.7E-06	0910	1.9E-07	3.5E-06	0914	6.8E-08	2.6E-06
14	1109	9.1E-08	3.0E-06	1119	6.6E-07	6.7E-06	1130	1.9E-07	4.7E-06
14	1359	3.4E-08	1.6E-06	1412	2.2E-06	1.1E-05	1422	4.7E-07	6.3E-06
14	1536	1.7E-08	1.2E-06	1540	2.1E-07	3.0E-06	1543	5.8E-08	2.0E-06
14	1619	2.5E-08	1.3E-06	1633	2.0E-06	1.2E-05	1642	4.3E-07	5.7E-06
14	1832	5.1E-08	1.9E-06	1837	2.1E-07	3.2E-06	1849	7.5E-08	2.5E-06
14	1900	6.7E-08	2.3E-06	1905	3.2E-07	4.4E-06	1913	1.3E-07	3.3E-06
14	2010	9.6E-09	1.6E-06	2015	1.0E-06	7.2E-06	2024	1.7E-07	4.2E-06
14	2029	1.7E-07	3.5E-06	2041	1.3E-06	9.8E-06	2055	3.3E-07	5.2E-06
14	2210	3.2E-08	1.5E-06	2214	9.6E-08	2.5E-06	2217	3.0E-08	1.3E-06
14	2307	2.8E-08	1.7E-06	2315	1.3E-06	9.8E-06	2325	2.2E-07	5.5E-06
15	0357	3.3E-08	1.5E-06	0403	1.5E-07	3.2E-06	0410	3.3E-08	2.3E-06
15	0456	1.7E-08	1.2E-06	0459	1.7E-07	2.4E-06	0505	2.3E-08	1.7E-06
15	0507	0.0E+20	1.5E-06	0512	4.3E-07	3.5E-06	0519	1.4E-07	2.5E-06
15	0552	2.7E-08	1.2E-06	0559	4.6E-07	4.3E-06	0606	1.3E-07	2.7E-06
15	0640	3.8E-08	1.2E-06	0643	4.9E-08	1.3E-06	0647	3.3E-08	1.5E-06
15	0721	3.7E-08	1.6E-06	0727	4.3E-07	4.5E-06	0735	1.4E-07	3.0E-06
15	0747	4.3E-08	1.3E-06	0754	2.1E-06	1.1E-05	0801	3.7E-07	6.2E-06
15	0854	4.4E-08	1.9E-06	0858	9.6E-08	2.7E-06	0900	4.2E-08	2.2E-06
15	1220	2.5E-08	1.3E-06	1223	5.5E-08	2.1E-06	1228	4.2E-08	1.5E-06
15	2203	5.8E-08	2.5E-06	2206	2.0E-07	3.9E-06	2209	7.2E-08	2.9E-06
15	2239	1.1E-07	2.6E-06	2251	1.7E-06	1.2E-05	2303	3.5E-07	7.2E-06
16	0116	2.1E-08	1.5E-06	0119	9.9E-08	2.5E-06	0121	2.2E-08	1.9E-06

SOLAR X-RAYS BY SATELLITE

GOES

DECEMBER 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}
16	0134	1.9E-08	1.4E-05	0137	3.7E-07	6.4E-05	0140	1.2E-07	3.5E-06
16	0349	1.8E-08	1.2E-06	0407	6.3E-07	9.0E-05	0422	2.0E-07	5.1E-06
16	0515	3.1E-09	1.7E-05	0520	1.5E-07	3.2E-05	0624	3.9E-08	2.3E-06
16	0941	1.5E-08	1.6E-05	0951	3.9E-07	5.8E-05	0955	1.2E-07	3.6E-06
16	1643	1.2E-08	1.2E-06	1552	9.9E-08	2.3E-05	1655	1.9E-08	1.7E-06
17	0201	1.3E-08	1.2E-05	0215	3.1E-07	4.9E-05	0237	8.7E-08	3.1E-06
17	0340	2.0E-08	1.7E-05	0354	8.2E-07	7.7E-05	0405	2.1E-07	4.5E-06
17	0730	2.2E-08	1.4E-05	0743	1.7E-05	3.5E-05	0755	5.5E-06	4.3E-05
17	1353	2.4E-09	1.5E-05	1357	7.4E-08	2.2E-06	1403	1.5E-08	1.9E-06
17	1405	3.5E-09	1.5E-06	1427	2.8E-07	4.4E-06	1501	6.5E-08	2.9E-06
17	1652	3.6E-08	1.5E-06	1658	2.5E-06	1.4E-05	1700	4.4E-07	6.1E-06
17	1805	1.9E-08	1.3E-06	1810	3.2E-06	1.7E-05	1813	9.4E-07	8.9E-05
17	2000	3.0E-08	1.3E-05	2003	2.7E-07	3.2E-05	2007	5.5E-08	2.1E-06
17	2055	2.4E-09	1.1E-05	2102	1.5E-07	2.3E-05	2105	3.4E-08	1.3E-06
17	2107	3.3E-09	1.6E-05	2113	1.5E-07	2.6E-06	2115	5.2E-08	2.0E-06
18	0225	1.3E-08	1.1E-06	0233	1.0E-07	2.3E-06	0243	1.5E-08	1.7E-06
18	0839	1.8E-08	1.4E-05	0842	4.5E-07	4.6E-05	0844	6.9E-08	2.2E-06
18	0854	2.4E-08	1.4E-05	0859	1.7E-07	4.0E-05	0903	4.5E-08	2.4E-06
18	1152	3.7E-08	1.5E-05	1157	9.9E-08	2.3E-05	1201	2.3E-08	1.3E-05
18	1412	1.7E-08	1.2E-06	1422	4.3E-07	4.3E-05	1429	1.0E-07	2.3E-06
18	2344	1.3E-08	1.1E-06	2350	5.7E-05	3.5E-05	2354	1.1E-06	1.3E-05
19	0341	1.3E-08	1.2E-05	0344	4.5E-08	2.0E-06	0353	2.3E-08	1.5E-06
19	0353	1.1E-08	1.2E-05	0401	9.2E-08	2.3E-05	0404	2.7E-08	1.7E-05
19	0828	1.2E-08	1.2E-05	0837	5.0E-07	5.8E-05	0841	9.5E-08	3.3E-06
19	1359	1.9E-08	1.4E-05	1402	1.9E-07	3.0E-05	1409	2.5E-08	1.5E-06
20	0540	6.2E-09	3.5E-07	0543	1.0E-05	4.3E-06	0651	1.0E-07	2.3E-06
20	1330	3.5E-09	7.4E-07	1333	7.5E-06	1.4E-06	1335	1.1E-08	7.3E-07
20	1342	1.1E-08	7.8E-07	1345	1.0E-07	2.2E-05	1347	1.3E-08	7.7E-07
20	1904	9.8E-09	7.2E-07	1907	7.0E-06	1.3E-05	1909	1.0E-08	7.4E-07
20	1941	1.2E-08	7.7E-07	1944	5.3E-07	1.3E-05	1945	1.2E-08	7.3E-07
20	2012	2.0E-08	1.0E-06	2015	5.3E-05	1.5E-05	2013	2.5E-08	1.1E-06
20	2249	1.1E-08	8.5E-07	2252	4.5E-08	1.2E-05	2254	1.7E-08	1.0E-06
21	0100	2.9E-08	1.2E-05	0103	5.5E-08	2.1E-06	0107	3.2E-08	1.5E-06
21	0741	2.3E-08	9.9E-07	0744	1.1E-06	2.3E-05	0747	1.3E-08	9.7E-07
21	0829	7.9E-09	7.3E-07	0832	7.3E-08	1.3E-05	0844	1.8E-08	9.5E-07
21	1218	3.9E-10	6.4E-07	1221	1.4E-08	1.3E-05	1223	9.6E-10	5.3E-07
21	1306	1.5E-09	6.9E-07	1309	7.3E-08	1.4E-05	1312	4.2E-09	7.5E-07
21	1357	2.6E-09	8.0E-07	1405	9.0E-08	2.1E-06	1421	2.7E-08	1.4E-06
21	1544	2.2E-08	1.3E-05	1549	1.3E-06	1.5E-05	1655	8.3E-07	8.1E-05
21	1913	2.4E-08	1.0E-05	1915	8.2E-08	1.6E-05	1920	2.9E-08	1.1E-06
21	2308	1.1E-08	7.6E-07	2313	7.3E-08	1.9E-05	2321	3.7E-08	1.3E-06
22	0409	3.6E-08	1.3E-05	0420	3.3E-07	4.7E-05	0432	1.1E-07	2.9E-06
22	0833	6.0E-09	8.3E-07	0839	1.7E-07	2.5E-05	0842	3.5E-08	1.5E-06
22	1244	2.4E-10	6.2E-07	1243	4.4E-07	4.0E-05	1252	7.3E-08	2.2E-06
22	1605	3.9E-08	1.4E-05	1608	5.7E-05	2.6E-05	1610	3.7E-08	1.5E-06
23	0102	7.3E-09	6.4E-07	0105	8.7E-08	1.4E-05	0108	1.2E-08	8.2E-07
23	0447	3.7E-08	1.2E-05	0513	1.3E-07	4.3E-05	0519	6.1E-08	2.5E-06
23	0553	1.9E-08	1.7E-06	0559	1.2E-07	2.8E-06	0617	4.5E-08	2.2E-05
23	0710	3.1E-08	1.3E-05	0728	5.1E-07	7.2E-05	0742	1.4E-07	4.2E-05
23	0928	1.7E-08	8.6E-07	0933	7.4E-08	2.2E-05	0935	5.1E-08	1.4E-05
23	0947	1.2E-08	8.6E-07	0951	6.7E-08	1.4E-05	0953	2.4E-08	1.1E-06
23	1021	5.3E-08	1.3E-05	1109	1.2E-07	3.2E-06	1111	2.3E-08	1.6E-06
23	1451	1.3E-08	9.5E-07	1455	7.1E-08	1.5E-06	1458	2.0E-08	1.2E-06
23	1601	3.1E-09	7.4E-07	1607	4.1E-07	3.9E-05	1610	8.9E-08	2.1E-06
23	1626	5.4E-09	7.6E-07	1632	3.7E-08	1.3E-05	1641	1.3E-08	1.2E-05
23	1728	1.9E-08	1.1E-05	1733	7.5E-07	5.5E-05	1737	5.5E-08	2.5E-06
23	1843	2.9E-08	1.3E-05	1846	1.1E-07	2.1E-05	1849	4.3E-08	1.6E-06
23	2057	3.2E-08	1.1E-05	2102	2.5E-07	3.2E-06	2104	4.4E-08	1.5E-06
23	2137	1.3E-08	8.7E-07	2144	1.2E-07	2.2E-06	2149	4.1E-08	1.3E-06
23	2221	1.2E-08	8.0E-07	2235	1.3E-06	1.0E-05	2250	3.6E-07	5.7E-06
24	0005	6.9E-08	2.7E-06	0010	1.5E-06	9.9E-06	0012	1.0E-07	3.5E-06
24	0837	1.0E-08	8.9E-07	0914	2.0E-06	4.5E-06	0932	5.7E-08	2.7E-06
24	1835	1.1E-08	9.1E-07	1839	1.2E-07	2.0E-06	1843	1.7E-08	1.2E-06

SOLAR X-RAYS BY SATELLITE

GOES

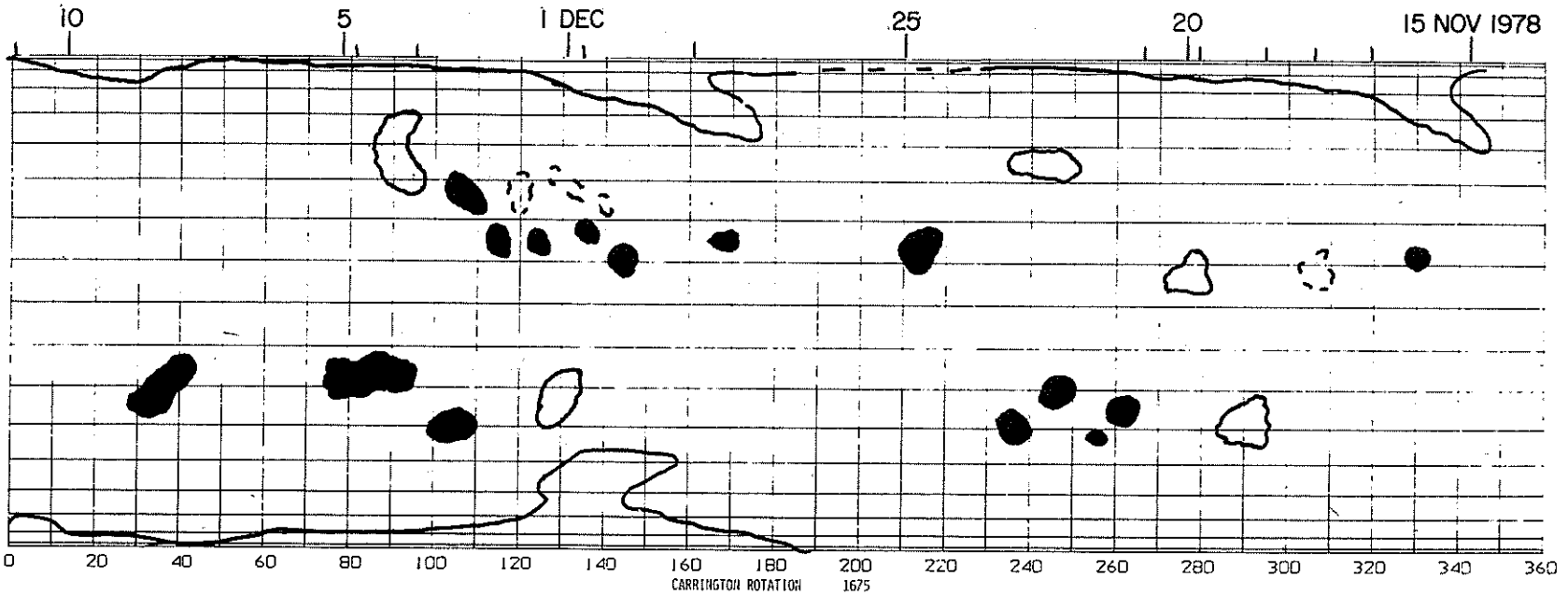
DECEMBER 1978

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}
24	2123	3.0E-09	9.3E-07	2126	5.9E-03	1.6E-05	2123	2.0E-03	1.2E-05
24	2218	1.4E-09	1.1E-06	2231	1.3E-05	1.5E-05	2241	4.3E-07	7.7E-06
25	0003	3.9E-09	2.3E-06	0003	3.3E-07	5.7E-06	0015	9.5E-03	3.7E-06
25	0307	2.0E-08	1.0E-06	0310	5.6E-08	1.7E-06	0315	4.3E-03	1.3E-06
25	0443	8.8E-09	8.1E-07	0452	2.3E-07	3.7E-06	0500	5.0E-03	2.1E-06
25	0559	3.1E-08	1.2E-06	0611	6.6E-06	3.0E-06	0617	4.9E-03	2.1E-06
25	1101	5.0E-09	7.2E-07	1105	2.2E-08	1.1E-05	1111	3.6E-09	9.8E-07
25	2019	7.5E-09	7.0E-07	2023	4.5E-08	1.1E-05	2032	1.7E-08	8.9E-07
25	2129	1.1E-08	8.6E-07	2132	1.1E-06	2.1E-06	2142	3.2E-09	1.4E-06
26	0038	3.2E-08	1.0E-06	0041	1.3E-05	2.3E-06	0044	2.6E-03	1.1E-06
26	2259	4.1E-09	6.8E-07	2302	6.5E-07	1.3E-05	2311	1.9E-03	9.5E-07
26	0536	3.4E-08	1.9E-06	0550	6.5E-07	8.4E-06	0603	1.7E-07	5.1E-06
26	2259	4.1E-09	6.8E-07	2302	6.5E-07	1.3E-05	2311	1.9E-08	9.5E-07
27	0548	2.9E-09	6.2E-07	0552	3.8E-03	1.8E-05	0557	8.3E-09	8.2E-07
27	0659	6.2E-09	7.4E-07	0703	1.6E-07	2.2E-06	0711	2.5E-03	1.1E-06
27	0357	3.7E-09	6.6E-07	0902	4.0E-03	1.2E-05	0912	1.3E-08	9.4E-07
27	1625	3.8E-08	1.8E-06	1640	2.2E-05	1.0E-04	1651	5.7E-06	5.3E-05
27	2310	2.8E-08	1.5E-06	2313	2.3E-05	3.4E-05	2313	2.2E-03	1.6E-05
28	0044	1.5E-08	1.2E-06	0053	3.5E-03	1.9E-05	0059	2.5E-03	1.5E-06
28	0738	5.1E-08	1.3E-06	0741	2.2E-07	3.4E-05	0747	6.4E-08	2.5E-06
28	1148	1.6E-08	1.2E-06	1154	3.1E-07	3.8E-06	1157	9.5E-08	2.5E-06
28	2338	2.7E-08	1.3E-06	2341	9.0E-06	2.6E-05	2343	2.8E-08	1.9E-06
29	0307	1.7E-03	1.3E-05	0310	3.1E-03	2.5E-05	0314	2.0E-08	1.7E-06
29	1141	5.2E-09	9.1E-07	1144	1.1E-07	2.3E-05	1143	3.7E-08	1.5E-05
29	1433	4.7E-09	8.7E-07	1443	6.5E-06	1.5E-06	1451	1.2E-03	1.1E-05
29	1640	1.8E-08	1.1E-06	1643	4.1E-08	2.1E-06	1655	2.3E-03	1.5E-05
29	1707	2.1E-08	1.2E-06	1712	3.2E-03	1.8E-05	1715	3.1E-03	1.4E-05
29	1749	1.5E-08	1.3E-06	1752	2.2E-08	1.9E-05	1755	2.3E-03	1.3E-06
30	0326	8.3E-09	9.1E-07	0342	8.0E-03	2.3E-05	0421	1.0E-03	1.5E-05
30	0537	1.7E-08	1.2E-06	0610	1.3E-05	7.0E-05	0612	2.8E-06	2.9E-05
30	0351	2.8E-08	2.2E-06	0354	1.7E-07	3.6E-05	0356	5.9E-03	2.5E-05
30	1048	1.1E-08	1.7E-06	1101	4.2E-08	3.3E-05	1104	2.0E-03	2.2E-05
30	1608	2.0E-08	1.4E-06	1613	1.5E-07	3.1E-05	1613	3.0E-03	2.2E-05
30	2247	1.1E-08	1.1E-06	2310	5.1E-07	5.3E-05	2321	1.0E-07	3.6E-06
30	2349	1.7E-08	1.3E-06	2354	9.9E-03	2.1E-05	2359	2.3E-03	1.5E-06
31	0307	2.4E-03	1.2E-06	0317	4.3E-07	5.4E-06	0334	1.4E-07	3.3E-05
31	0719	1.3E-08	1.3E-06	0721	3.5E-08	2.4E-06	0723	2.7E-03	1.5E-06
31	0755	1.4E-08	1.2E-06	0805	1.0E-07	2.8E-06	0814	1.9E-03	1.9E-06
31	0905	1.5E-08	1.2E-06	0910	9.4E-03	2.5E-05	0919	1.5E-05	1.9E-06
31	1039	1.7E-08	1.4E-06	1043	2.3E-03	4.3E-05	1045	1.4E-08	1.3E-06
31	1607	2.5E-08	1.4E-06	1615	5.1E-07	5.7E-06	1625	1.0E-07	3.4E-06
31	1725	1.7E-08	1.2E-06	1723	3.7E-08	1.8E-05	1735	2.3E-03	1.5E-06
31	1758	1.5E-08	1.2E-06	1801	7.2E-06	1.9E-05	1804	2.0E-03	1.3E-05
31	1903	3.3E-09	1.4E-06	1907	5.9E-08	2.2E-05	1909	2.5E-03	1.5E-05

HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1675

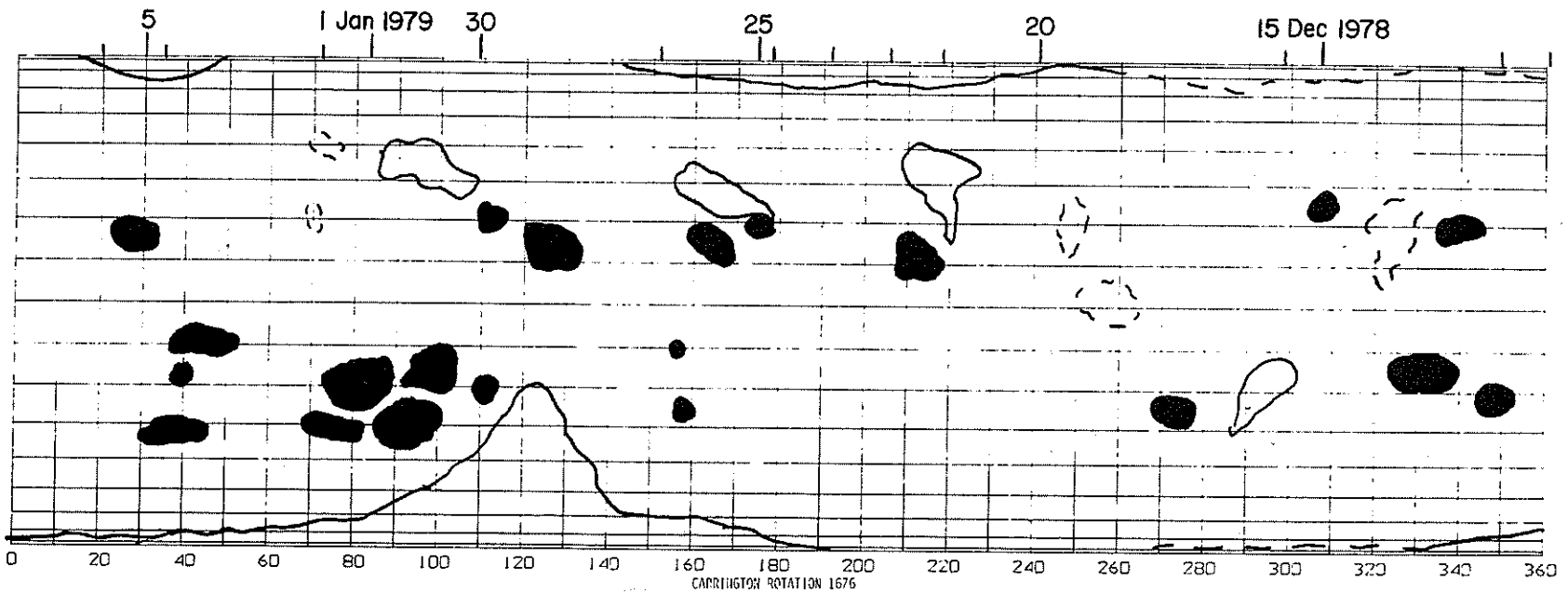
KITT PEAK NATIONAL OBSERVATORY



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1676

KITT PEAK NATIONAL OBSERVATORY

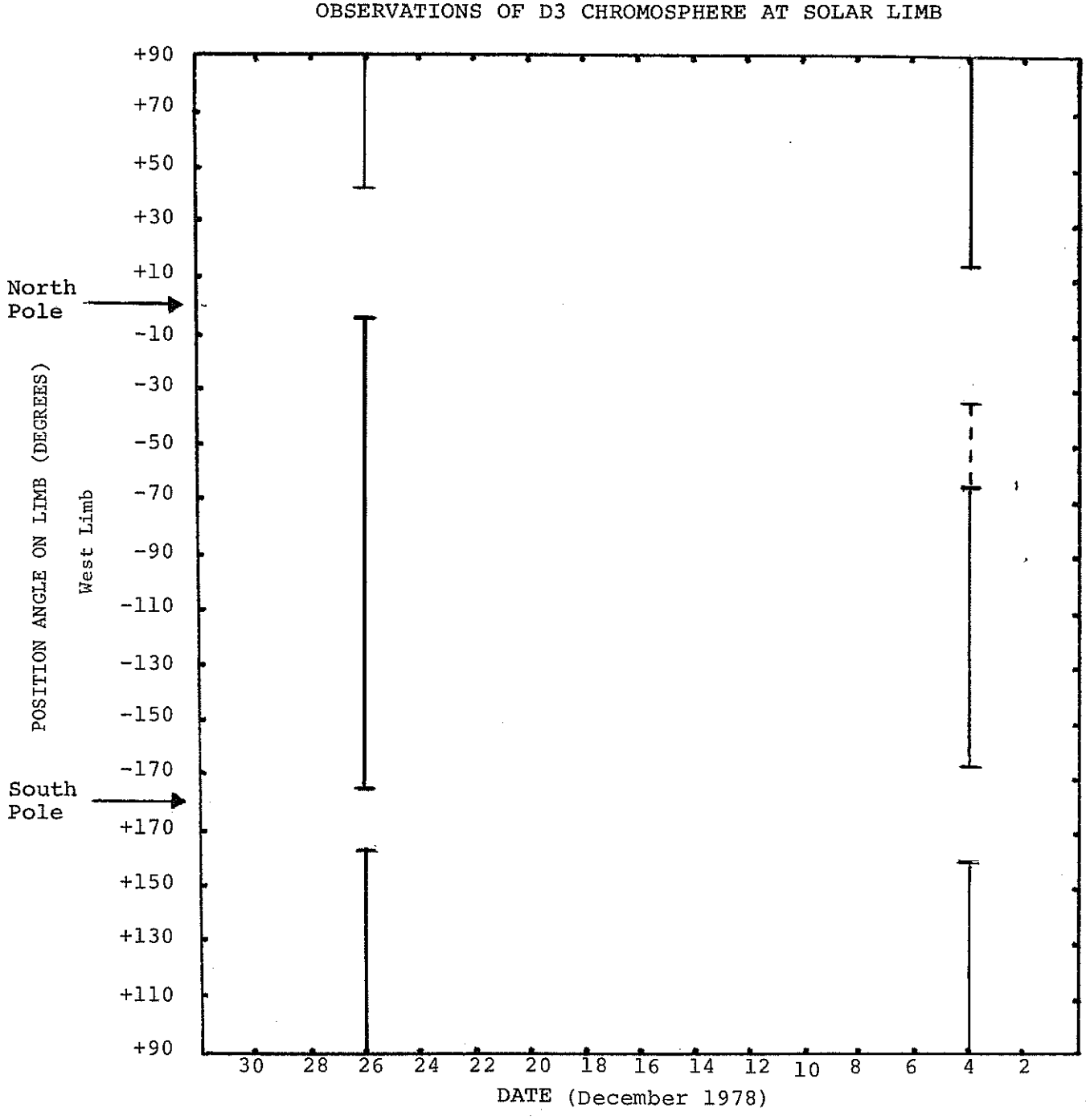


CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

DECEMBER 1978

Big Bear Solar Observatory



SOLAR WIND

Interplanetary Scintillations

DECEMBER 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	546	56							204	20	276	3	312	4	479	6
2	498	21							274	5	250	3	299	4	434	4
3	509	54							281	8	244	3	286	3	401	26
4	422	29							226	15	285	2	281	3		
5	313	3									320	5	305	3	461	30
6											363	4	306	4	493	56
7	360	33									335	5	312	9		
8											304	6	318	5		
9											314	21				
10															238	44
11											272	27	311	3	302	50
12													318	16	365	9
13	407	7							222	20	261	3	378	3	435	13
14	355	7							395	3	353	3	397	7	594	6
15	431	9							449	31	311	4	423	4	456	15
16									377	11	372	5	322	3	623	10
17	394	5							362	11	298	4	315	3		
18	422	14							350	4	327	3	385	4		
19	456	30							398	11	343	7	313	4		
20	309	18							563	53	330	27	365	4		
21	446	69							391	73	324	27	386	8		
22									367	6	289	40	366	9	694	13
23											494	40	377	12	518	37
24	382	46									391	47	350	7	628	22
25	436	21									351	7	332	3	670	15
26	532	15							402	6	313	6	310	2		
27	417	47							233	8	320	4	358	12		
28	533	18									273	3	353	11	600	130
29	543	4									316	3	317	3		
30	520	25														
31									347	89	394	24	296	13		

DECEMBER	5 UT	LAT	DIST	DLON	15 UT	LAT	DIST	DLON	25 UT	LAT	DIST	DLON
3C48	5.	6.	1.23	-8.	4.	5.	1.21	-9.	4.	4.	1.17	-11.
3C144	9.	0.	1.30	2.	8.	-1.	1.30	-0.	7.	-2.	1.30	-2.
3C147	8.	5.	1.27	3.	7.	4.	1.28	1.	7.	3.	1.27	-1.
3C161	10.	-7.	1.25	4.	10.	-7.	1.26	2.	9.	-8.	1.27	-0.
3C237	14.	-2.	1.11	15.	13.	-3.	1.15	14.	12.	-4.	1.19	12.
3C273	16.	0.	0.93	22.	15.	-1.	0.98	17.	14.	-2.	1.03	17.
3C298	18.	13.	0.73	41.	17.	7.	0.83	33.	16.	3.	0.91	24.
3C459	2.	4.	1.08	-15.	2.	3.	1.03	-16.	1.	2.	0.98	-17.

INFERRED IP MAGNETIC FIELD

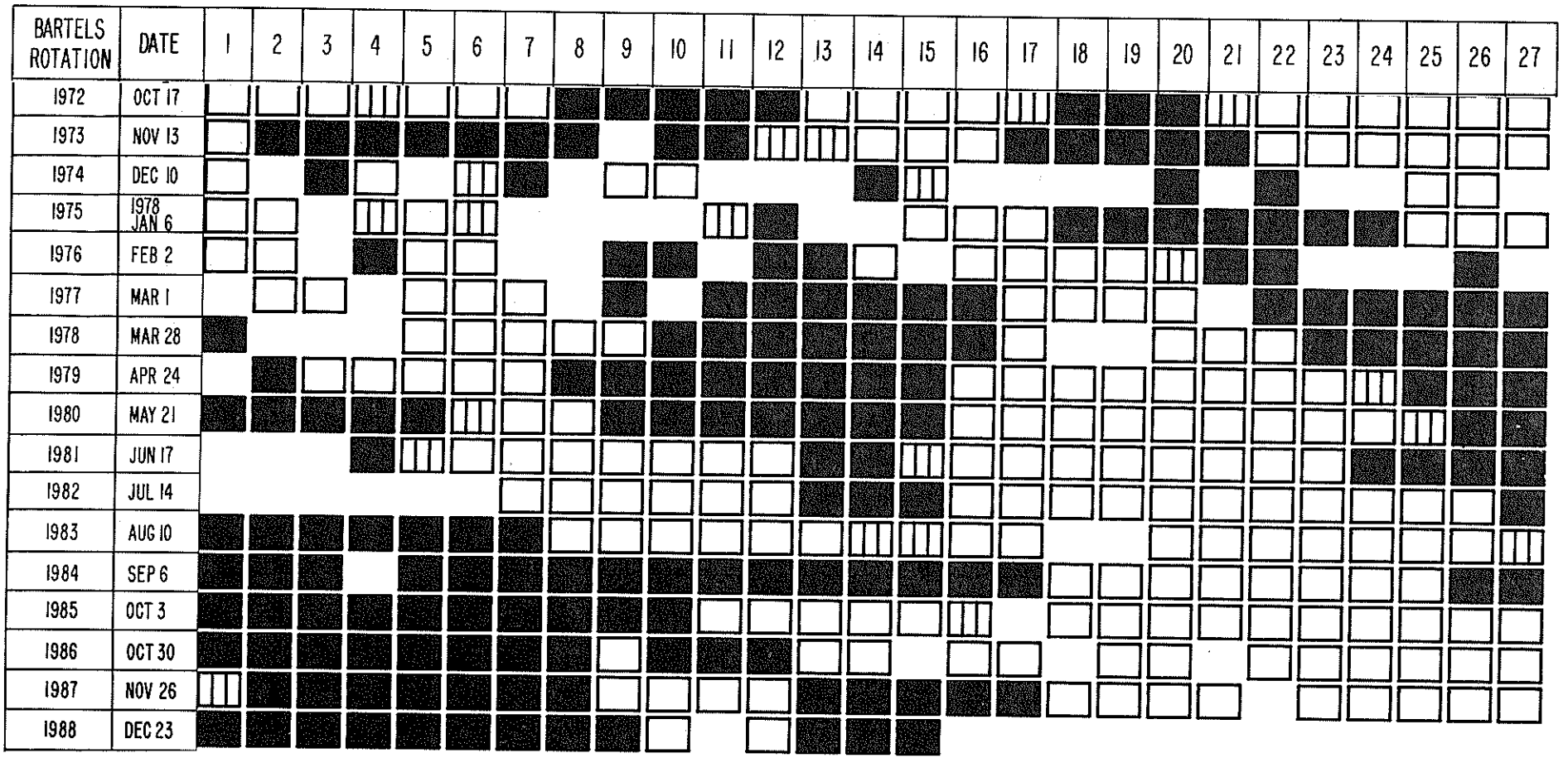
BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1972	OCT 22					-	AT														AT	AT				*		
1973	NOV 18			TA	AT						-		AT								*			*			*	
1974	DEC 15				-	-	-		AT	-		AT			AT		AT		AT		TA		TA		TA		*	
1975	1978 JAN 11		*	*					*		*	*						*			TA		-	AT			-	-
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*					-	TA	TA	TA	AT			*					*	AT	AT	-	AT	
1982	JUL 19									TA								-		TA				AT	AT	*		TA	
1983	AUG 15					TA			AT		AT	AT		AT	TA						A*						TA	
1984	SEP 11			TA		AT				TA		T*						A*		—				—		A*	TA	-
1985	OCT 8	*	TA		T*		AT				-	-	-						TA	TA	-		AT		-			
1986	NOV 4		-				-	AT	-		-							*	AT		-		AT	AT	AT	AT			
1987	DEC 1	AT	AT		-				-		-	TA		-	-	AT	-	-	AT	-	TA	-		-	A*	-			AT	-		-	
1988	DEC 28		-	-	-																		*				-	

= 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.

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)

1978

DAY	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
01	.	16	.	52	-12	-28	1	40	26	-11	-18	-72
02	.	31	22	46	-34	-22	13	39	32	-20	-21	-39
03	14	26	12	43	-27	-12	15	42	15	-14	-36	-7
04	31	.	.	13	-27	-5	18	39	18	-8	-28	17
05	.	-5	8	4	-29	6	24	31	2	-3	-19	19
06	27	4	11	-15	-27	5	43	29	-24	-7	-12	9
07	15	9	4	-32	-23	21	42	30	-12	-20	3	5
08	.	.	.	-53	-12	33	36	17	-7	-29	-6	-15
09	-1	.	-31	-52	3	41	16	-11	.	-37	-17	-26
10	11	-28	.	-41	24	40	-11	-10	-35	-29	-3	-37
11	0	-43	-70	-32	41	23	-17	-15	-34	-32	5	-19
12	.	.	-78	-4	50	12	-12	-22	-42	-14	9	-16
13	.	-41	-56	22	47	8	-38	-33	-36	2	.	13
14	.	-23	-49	.	30	0	.	-43	-27	7	16	31
15	.	3	-28	.	16	-24	.	-31	-26	8	20	43
16	0	.	-3	58	5	-38	.	-9	-36	9	.	65
17	-3	31	18	37	1	.	.	5	-48	5	34	.
18	.	22	54	11	-29	.	.	13	-44	-1	42	59
19	.	37	48	-9	-49	.	.	7	-50	.	.	30
20	18	22	24	-30	-75	-16	23	7	-33	4	55	18
21	39	-1	.	-49	-79	0	21	5	-21	3	35	32
22	10	-18	-23	-50	-59	24	16	4	-14	19	40	27
23	-4	-49	-49	-62	-37	51	6	-1	5	20	28	-3
24	-15	.	-69	.	-21	52	3	1	31	25	27	-20
25	-17	.	-79	-13	-9	48	3	5	43	23	18	-26
26	-36	.	-73	10	1	30	-7	18	42	24	2	-32
27	-48	-34	-53	13	27	12	-13	.	40	29	-17	-63
28	-33	.	-28	6	14	3	-6	.	29	30	-48	-51
29	-15		.	13	-10	-5	14	41	15	17	-61	-36
30	14		.	18	-20	-10	27	41	2	-3	-65	-22
31	10		.		-27		33	35		-16		-21

Dot symbol entry indicates no data available for the day.

BOULDER GEOMAGNETIC SUBSTORM LOG

DECEMBER 1978

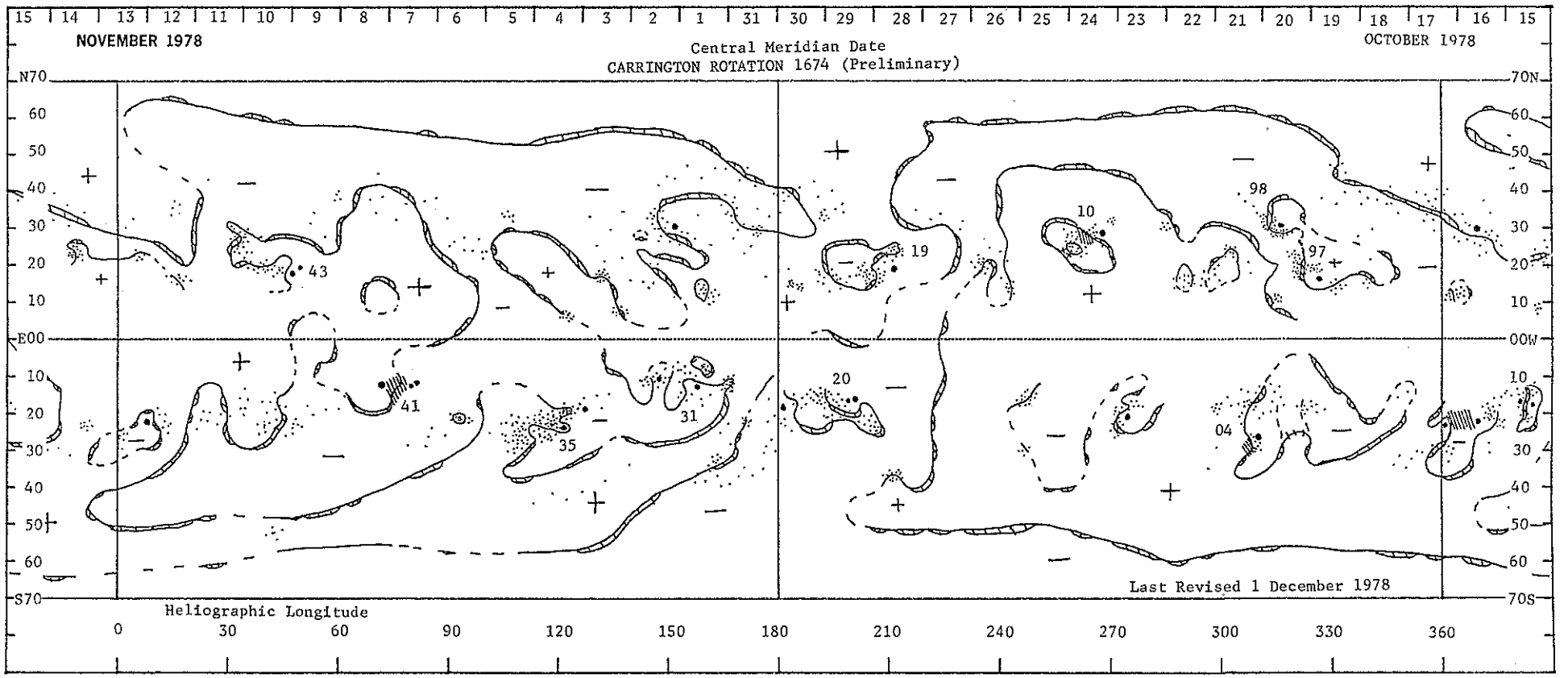
DATE	ONSET TIME	DIR	COMMENTS
01	0805	≈ center	Moderate SS
	1020	West	1st of double onset SS
	1100	West	2nd of double onset SS, moderate
02			Quiet day
03			Quiet day
04	0740	West	Weak SS
	1100	West	
	1610		Slow onset SS
05			Minor perturbations, no distinctive SS
06			Quiet day
07			Quiet day
08	1045	West	Weak SS
09			Quiet day
10	0935		Weak SS, Sachs Harbour to Inuvik; otherwise quiet day
11			Quiet day
12	1015	West	Weak SS
	1310		Weak SS, slow onset
13			0140-0800 UT, unsettled period no distinctive SS onset
14	0128		SSC-brief Magstorm through 1500 UT.
15	0350	≈ center	Strong Substorm near Boulder
	0750	West	Centered between Fort Smith and Fort Simpson
	0850	West	
	1115	West	1st of double onset
	1155	West	2nd of double onset
	1445		
16	0335	East	1st of double onset
	0410	East	2nd of double onset
	0845	West	
	0955	West	
	1700		Slow onset
17			Minor perturbations, no significant SS activity
18	0450		Sharp negative impulse H-Component all mid and low latitude stations
	0720	≈ center	Strong SS, beginning of Magstorm conditions lasting through 2100 UT.
	1145		Very strong SS
19	0350	East	
	0500	East	
	0850	West	
	1305	West	Very strong SS
20	0125	East	
	0425		Beginning of Magstorm conditions lasting through 1700 UT.
	0900	West	Strong SS
	1145	West	Strong SS
	1400		
21	0315	East	Weak SS, beginning of unsettled conditions lasting through 1400 UT.
	0715	West	Weak SS
	0940	West	Weak SS
	1125	West	Weak SS
22	0230	East	
	0340	East	
	0400	East	
	0420	East	
	0835	West	
	1100	West	Strong SS
	1155	West	
	1250	West	
	1440		
	1530		
23	0120	East	Weak SS
	0655	West	1st of double onset
	0730	West	2nd of double onset
24	0545	≈ center	Weak SS
	1050	West	
25	0735	≈ center	1st of multiple onset
	0805	≈ center	2nd of multiple onset
	0840	West	3rd of multiple onset
	1055	West	
	1210		Positive impulse H-Component low latitude stations
	1245	West	1st of multiple onset
	1325	West	2nd of multiple onset
	1400	West	3rd of multiple onset
26			0700-1700 UT, unsettled field
	0730	≈ center	
27	0425	East	
	1240	West	1st of double onset
	1310	West	2nd of double onset
28	0315	East	
	1550		Slow onset
	1725		Slow onset
29	1630		Strong SS
30			Field disturbed throughout day
	0250		Strong negative H-Component excursion at mid and low latitude stations. Auroral stations quiet.
	0345	East	
	0425	East	
	1005	West	
	1200	West	
	1300	West	
	1450		
	1825		Slow onset
31			No data-computer malfunction

NOVEMBER 1978 DATA

Contents

Hα SYNOPTIC CHART

CARRINGTON ROTATION 1674 (PRELIMINARY)



Hα SYNOPTIC CHART

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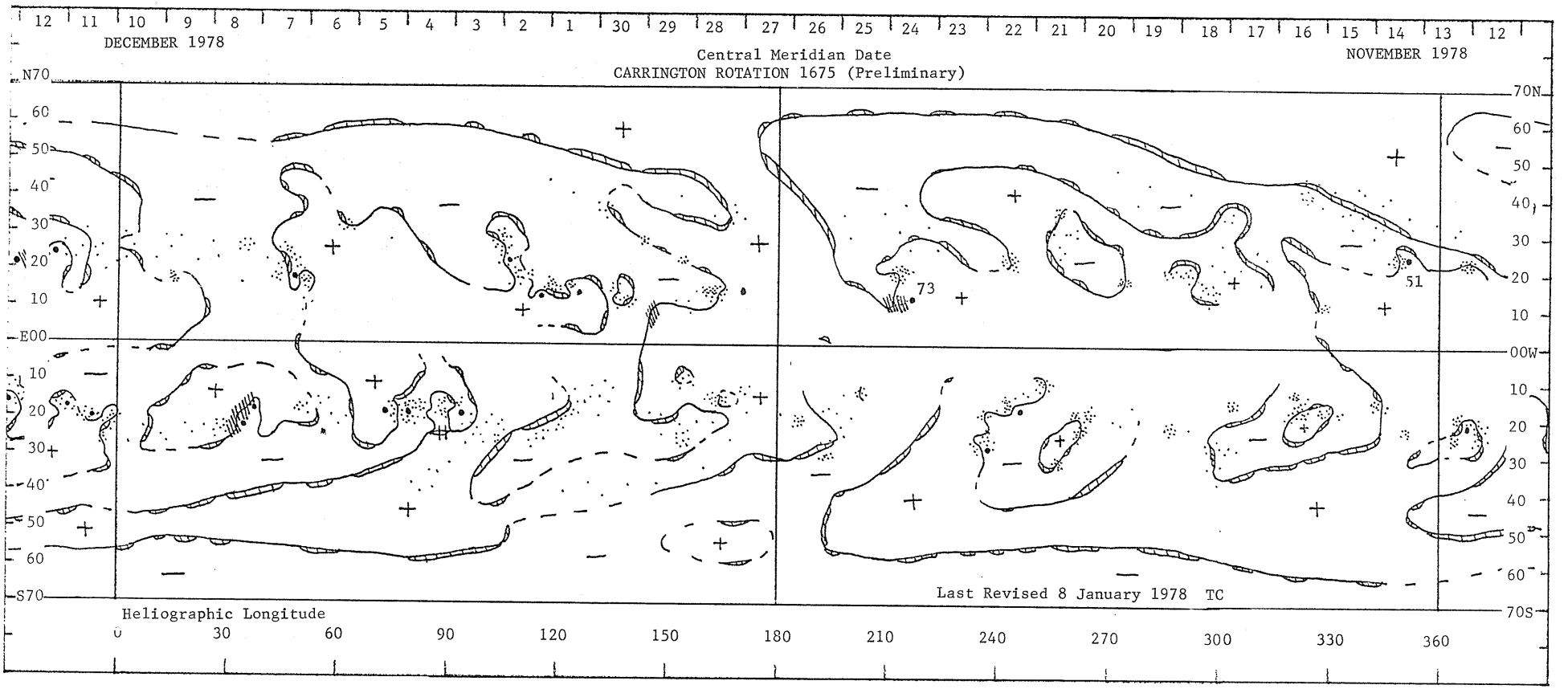
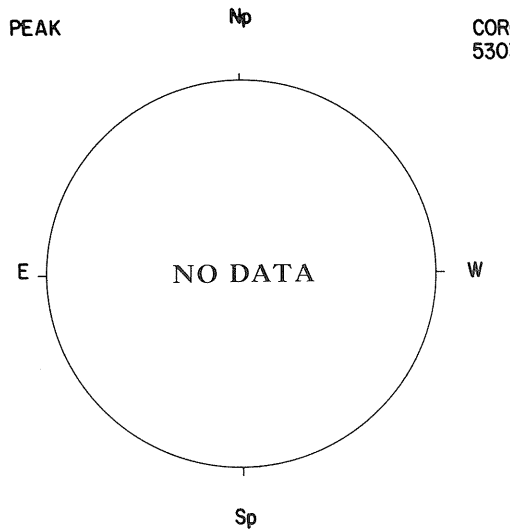
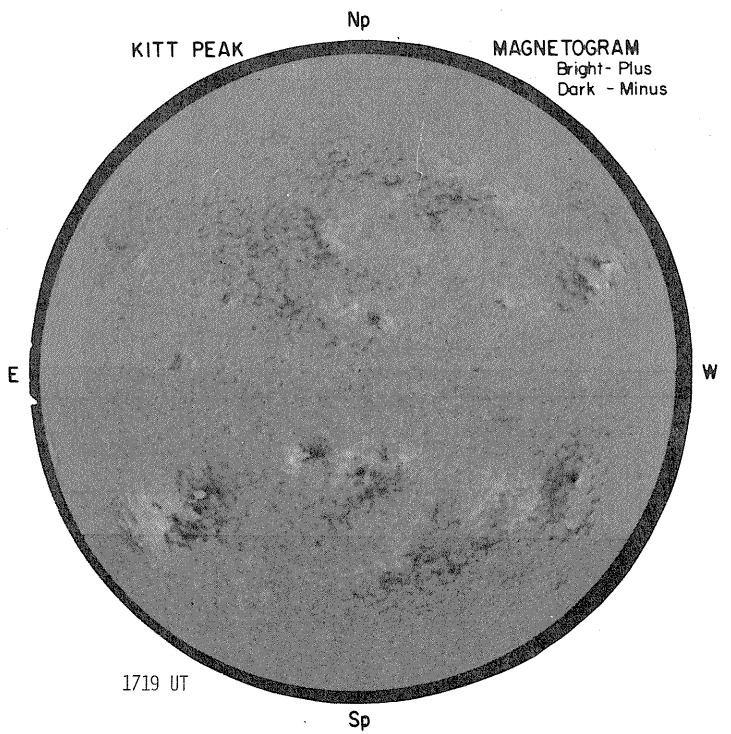


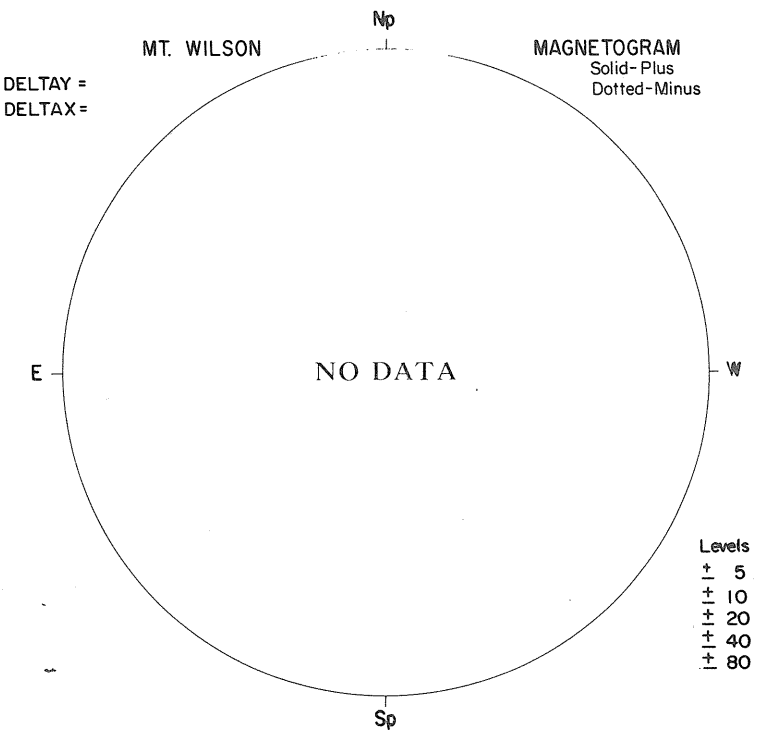
NOVEMBER 1, 1978 (P = 24.59, B_o = 4.38, L_o = 166.65)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å







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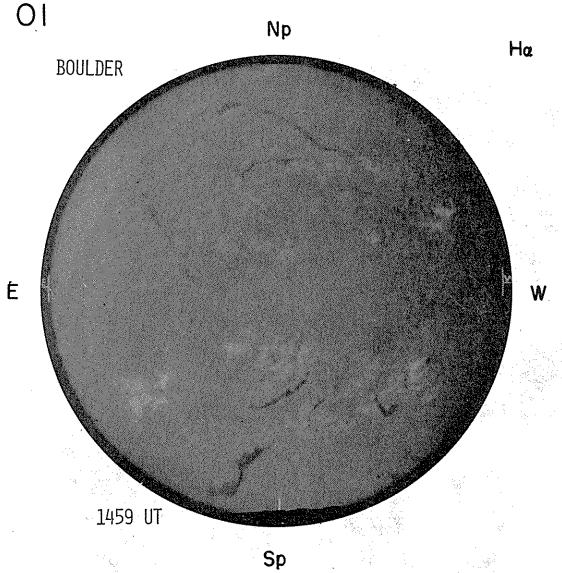
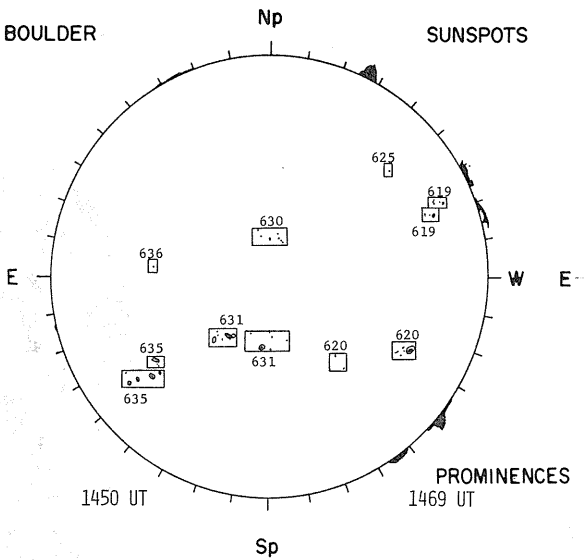

Np
BOULDER
Hα
E
W
1459 UT
Sp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BOULDER
SUNSPOTS
625
619
619
630
636
631
635
631
620
620
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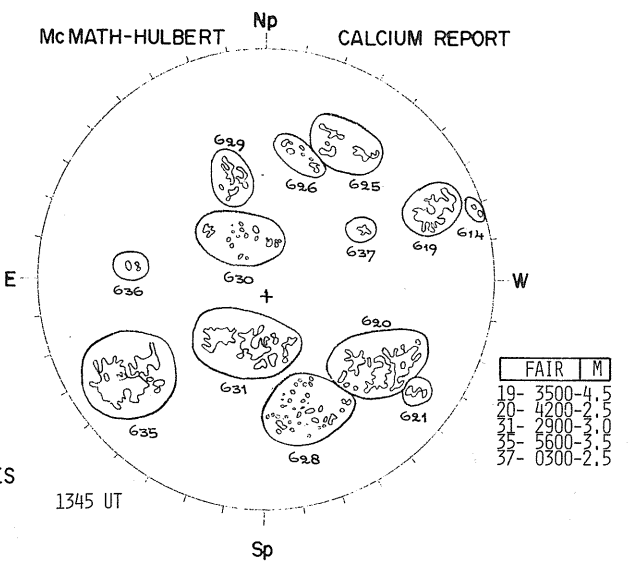
E
W
1450 UT
Sp
PROMINENCES
1469 UT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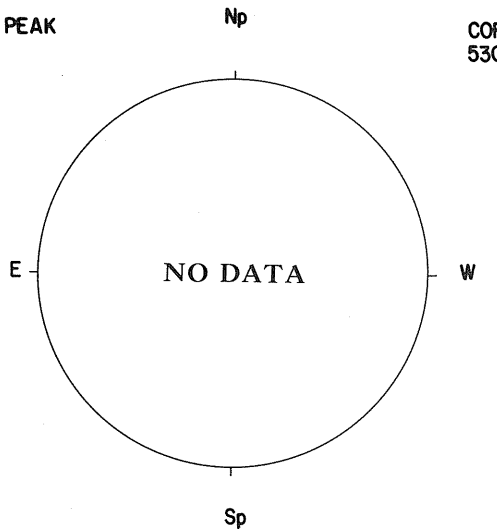
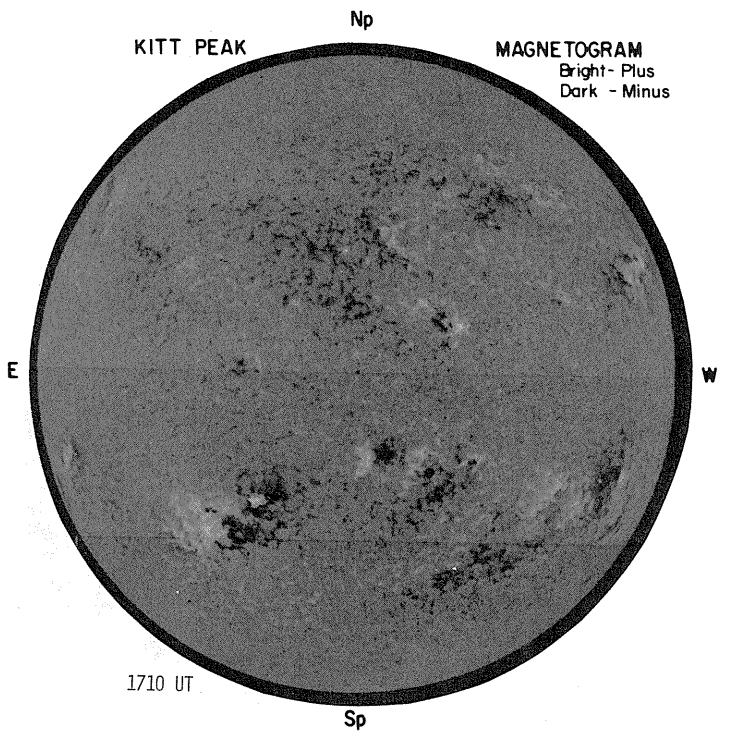
McMATH-HULBERT
CALCIUM REPORT
629
626
625
614
619
637
630
636
631
620
621
635
628
E
W
1345 UT
Sp
FAIR | M
19- 3500-4.5
20- 4200-2.5
31- 2900-3.0
35- 5600-3.5
37- 0300-2.5

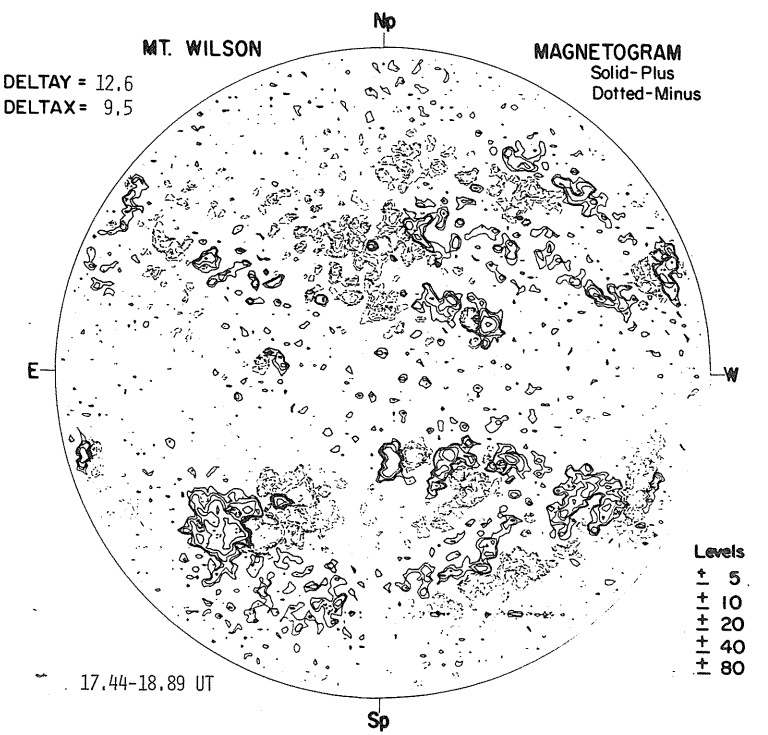
NOVEMBER 2, 1978 (P = 24.43, B_o = 4.28, L_o = 153.46)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

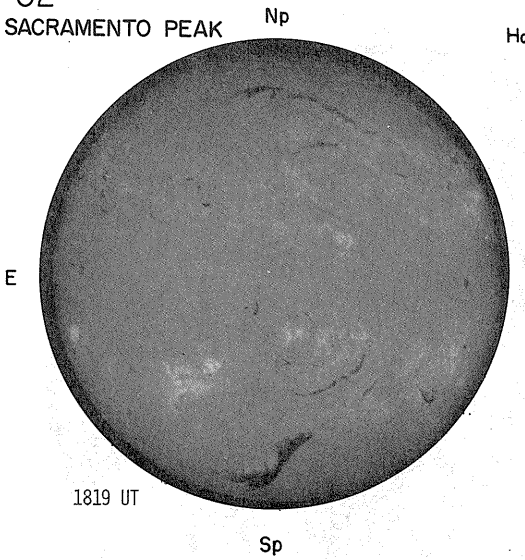




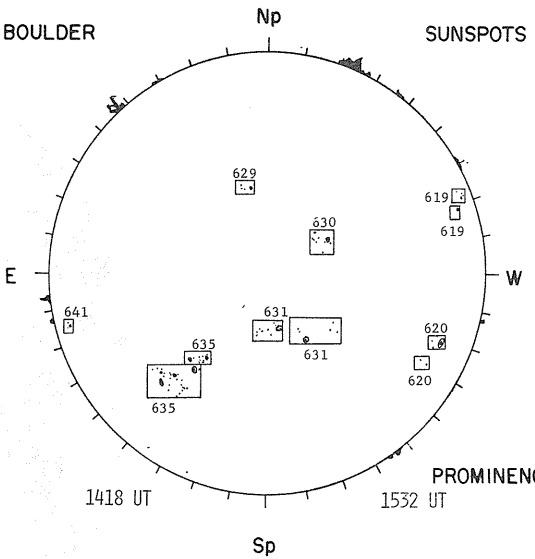


02

SACRAMENTO PEAK

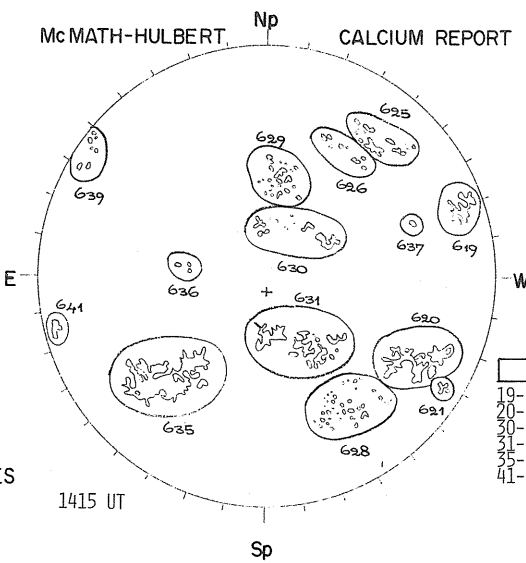


BOULDER SUNSPOTS



PROMINENCES

McMATH-HULBERT CALCIUM REPORT

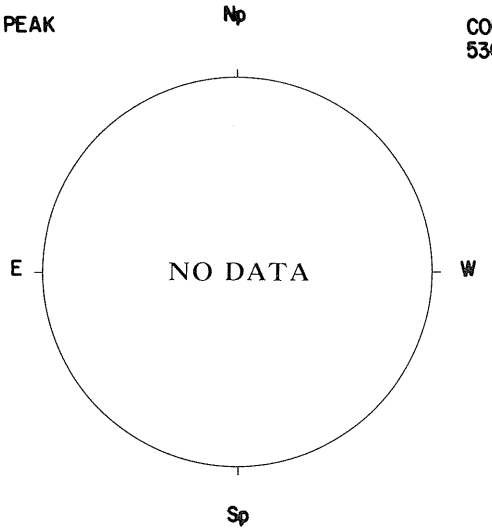


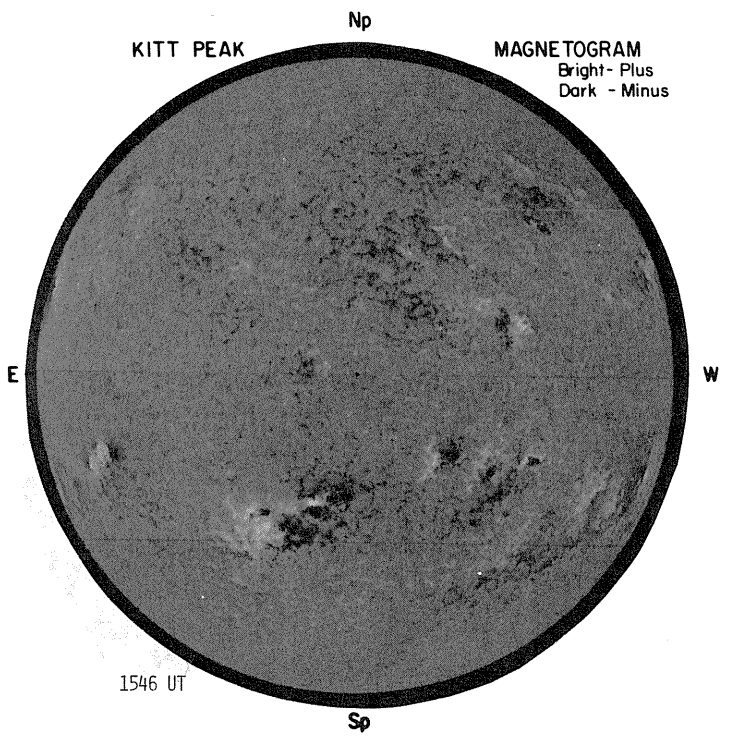
FAIR	M
19-	3000-3.5
20-	3800-2.5
30-	1400-3.0
31-	2500-3.5
35-	6000-4.0
41-	0900-3.5

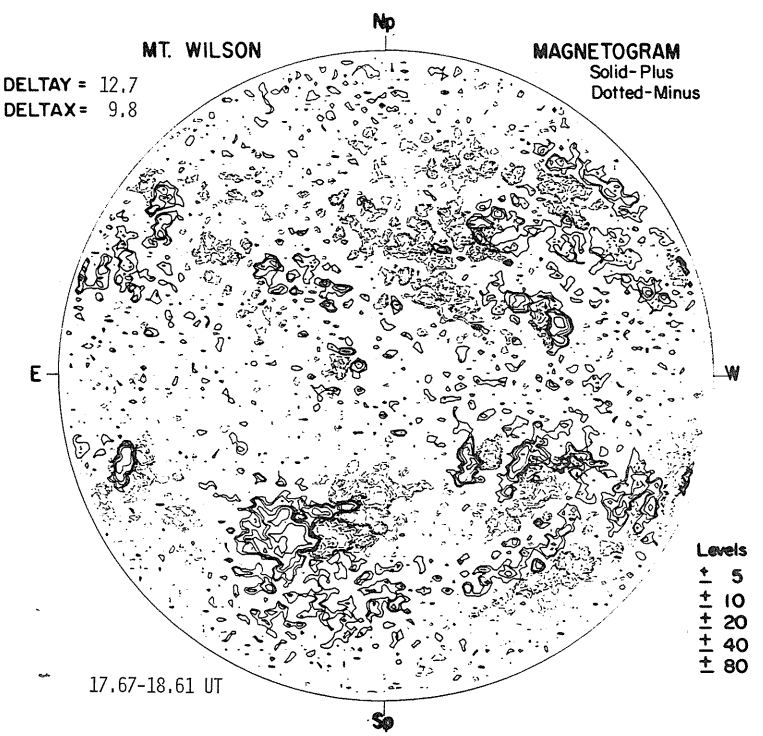
NOVEMBER 3, 1978 (P = 24.25, B_o = 4.18, L_o = 140.28)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

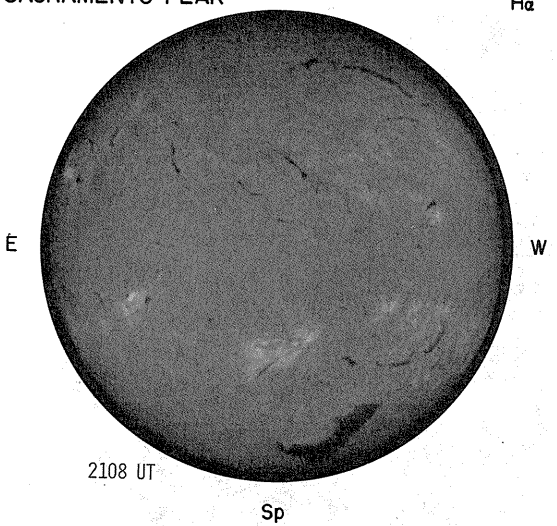






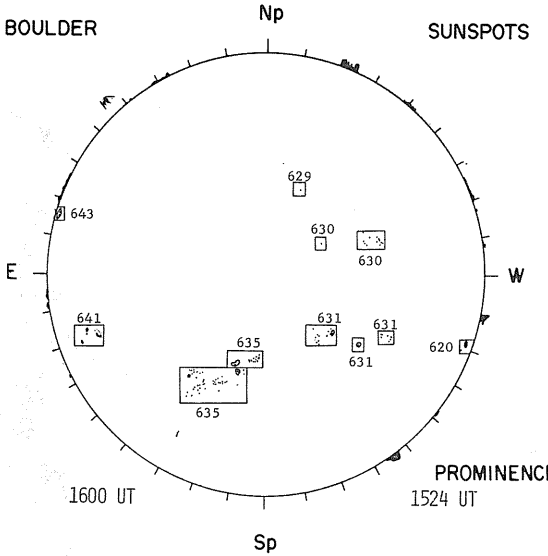
03

SACRAMENTO PEAK



Hα

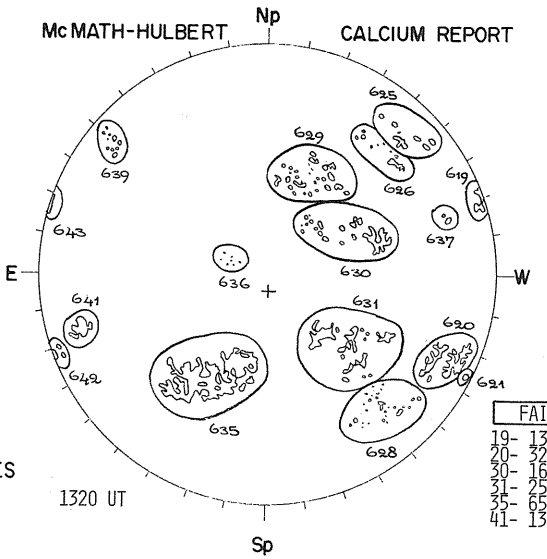
BOULDER SUNSPOTS



PROMINENCES

1524 UT

McMATH-HULBERT CALCIUM REPORT

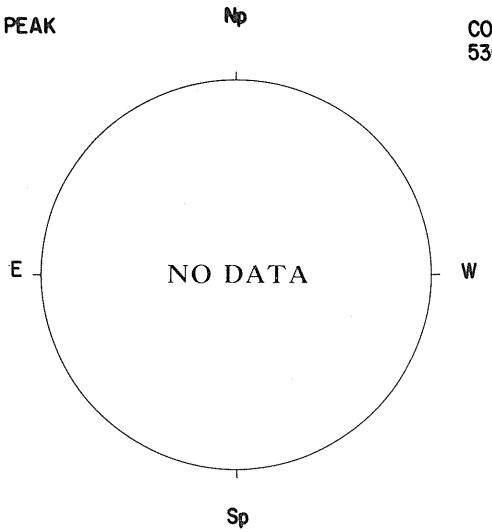


FAIR	D
19- 1300-3.0	
20- 3200-2.5	
30- 1600-3.0	
31- 2500-3.0	
35- 6500-3.5	
41- 1300-3.5	

NOVEMBER 4, 1978 (P = 24.07, B_o = 4.07, L_o = 127.09)

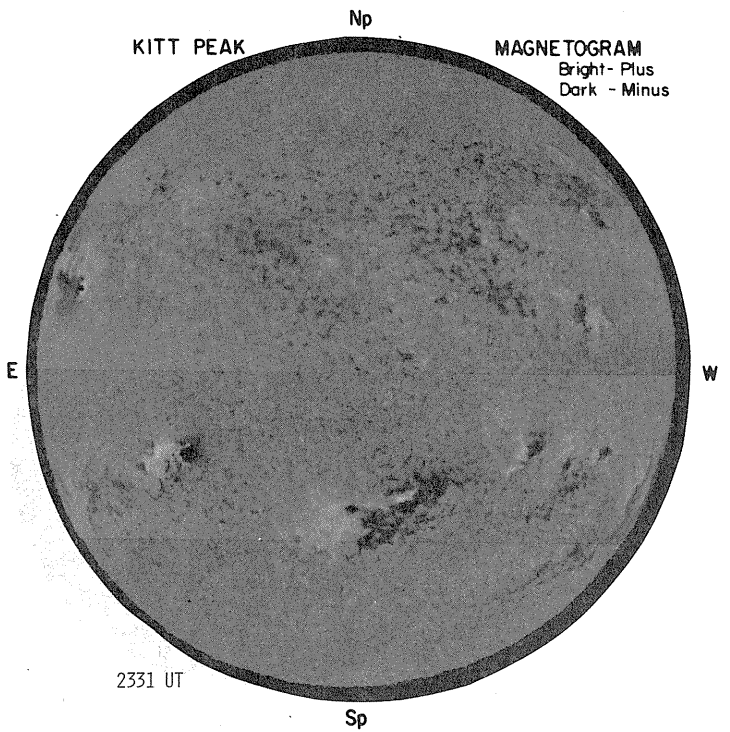
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

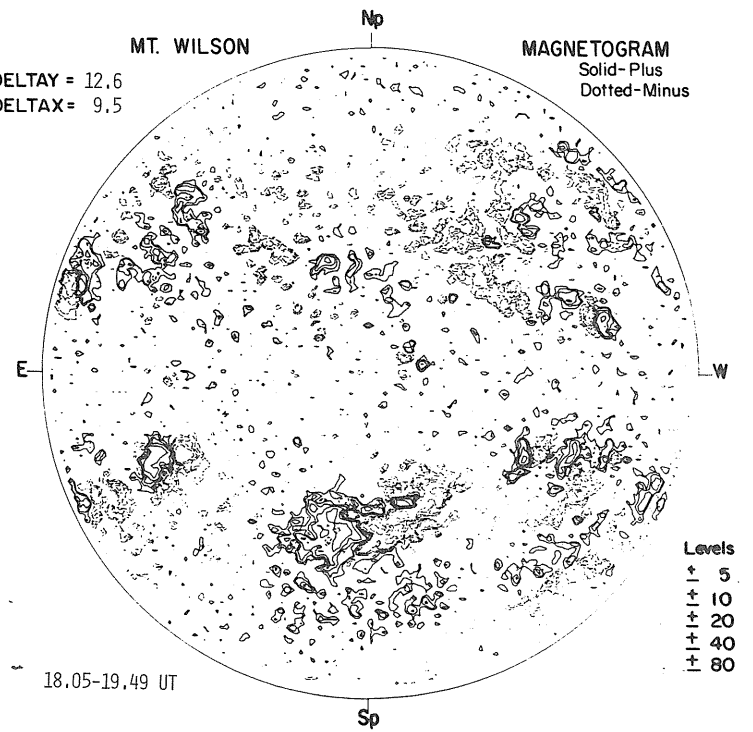


2331 UT

MT. WILSON

DELTAY = 12.6
DELTAX = 9.5

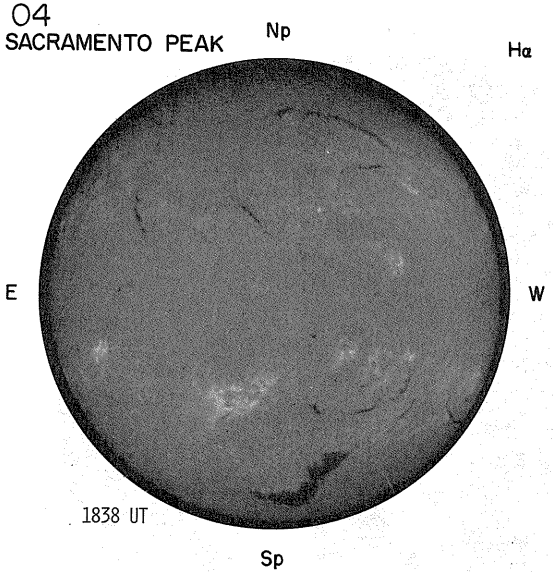
MAGNETOGRAM
Solid - Plus
Dotted - Minus



18.05-19.49 UT

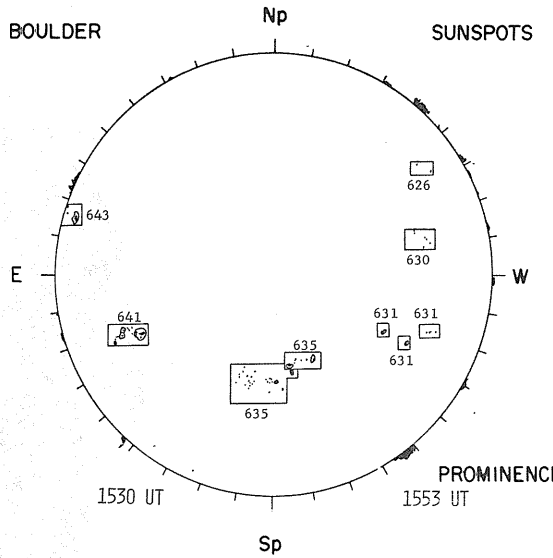
04

SACRAMENTO PEAK



Hα

BOULDER

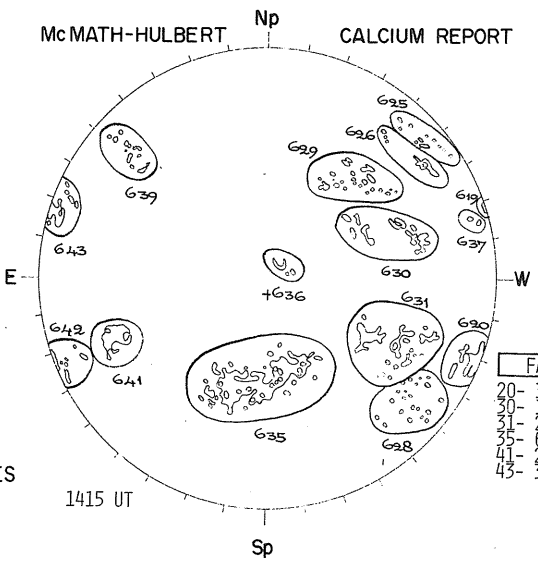


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

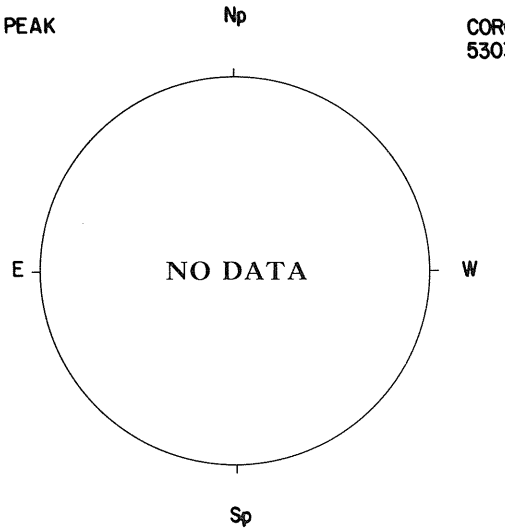


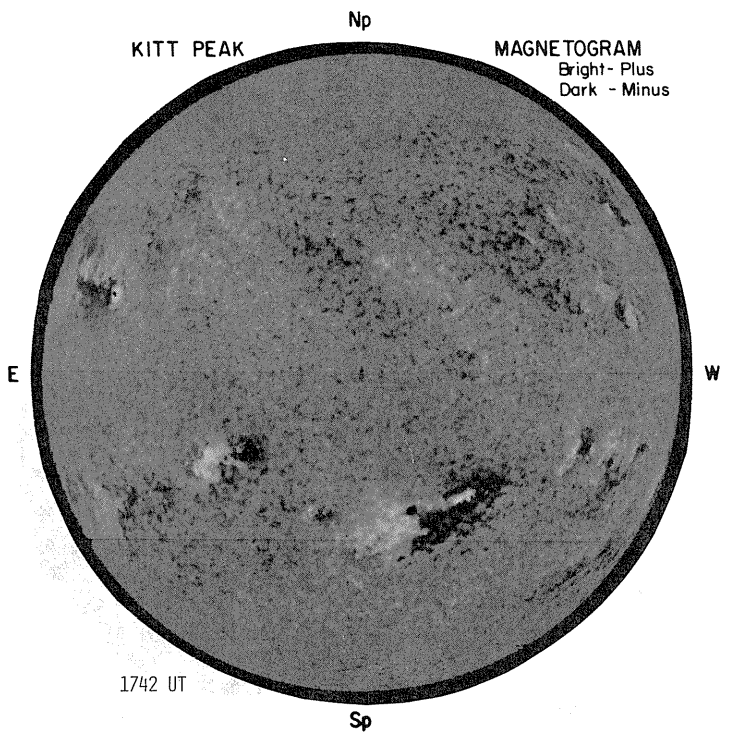
FAIR	S
20- 3000	2.0
30- 1600	3.0
31- 2500	3.0
35- 6500	3.0
41- 2000	3.5
43- 3000	3.5

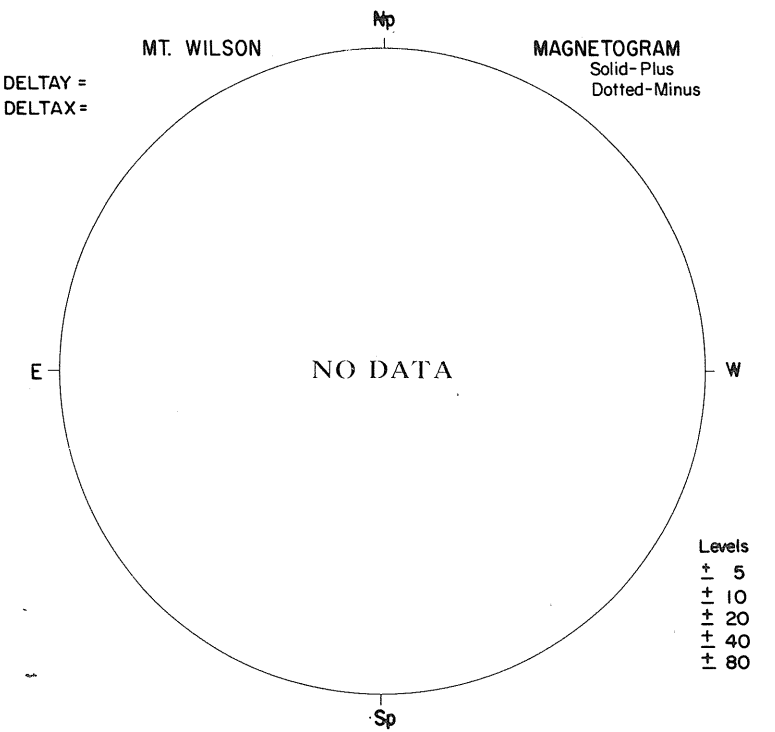
NOVEMBER 5, 1978 (P = 23.87, B_0 = 3.97, L_0 = 113.91)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

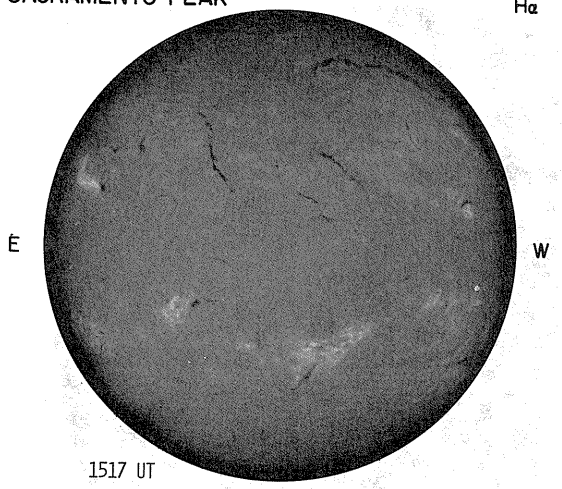




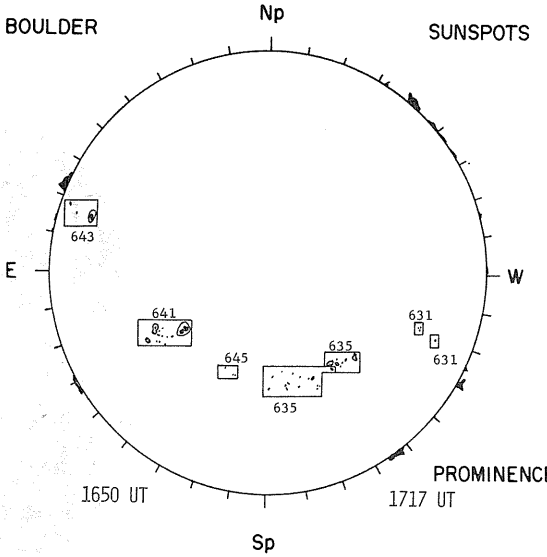


05

SACRAMENTO PEAK

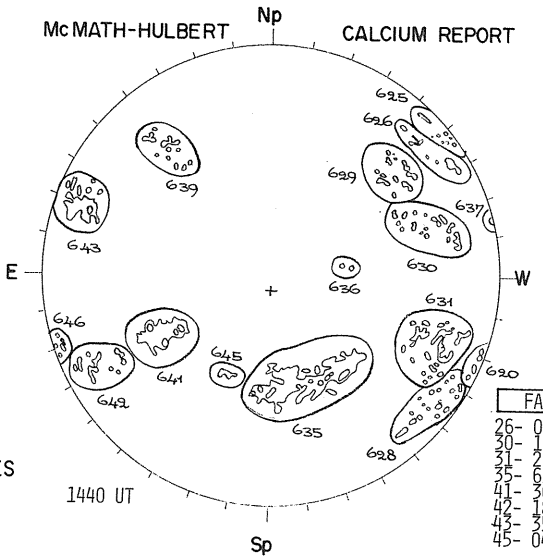


BOULDER SUNSPOTS



PROMINENCES

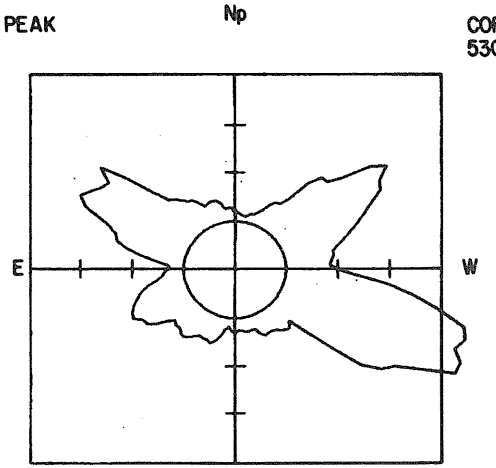
McMATH-HULBERT CALCIUM REPORT



FAIR	S
26-	0900-2.5
30-	1700-3.0
31-	2500-3.0
35-	6500-3.0
41-	3000-3.0
42-	1800-2.5
43-	3500-3.5
45-	0400-2.5

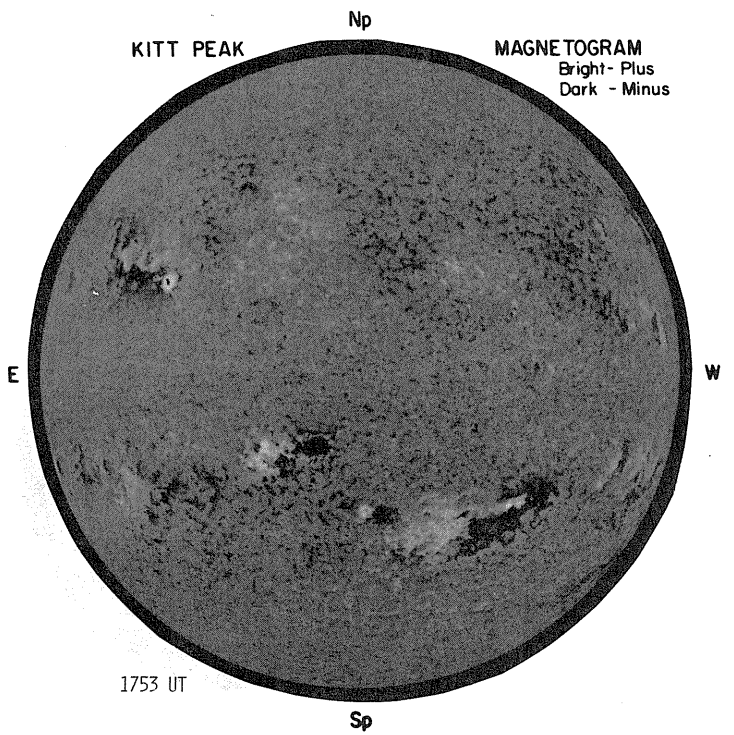
NOVEMBER 6, 1978 (P = 23.67, B_o = 3.86, L_o = 100.72)

SACRAMENTO PEAK

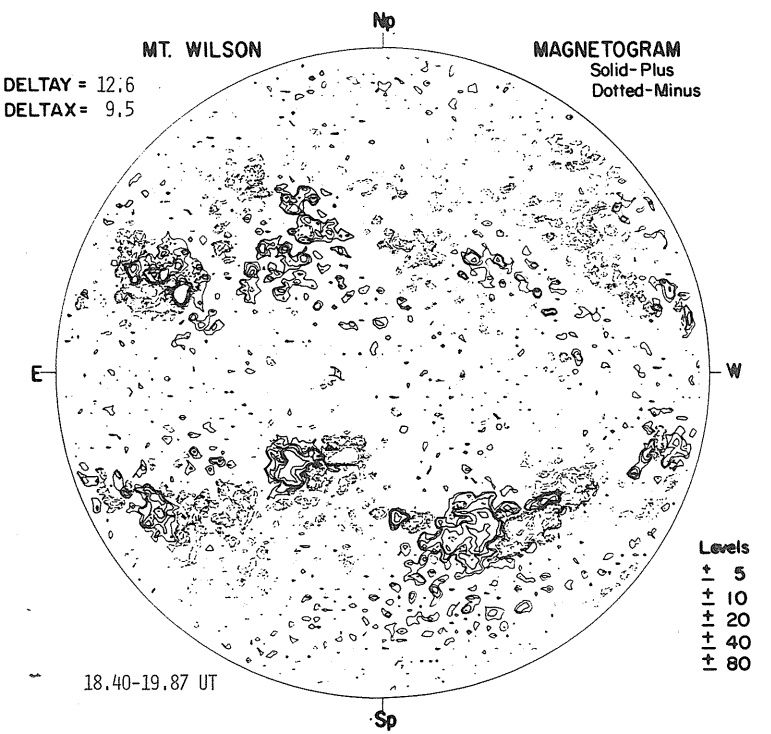


CORONA (1.15 $R_\odot$)
5303 Å

1713 UT



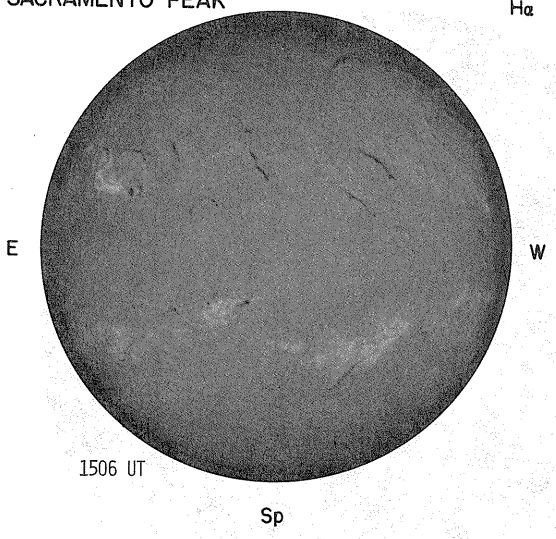
1753 UT



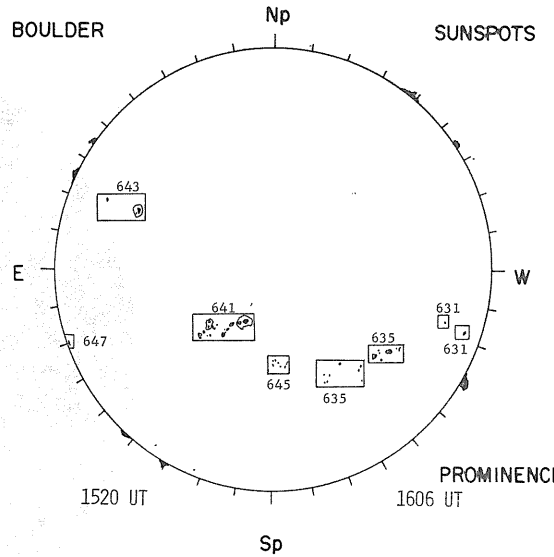
18.40-19.87 UT

06

SACRAMENTO PEAK



Hα BOULDER



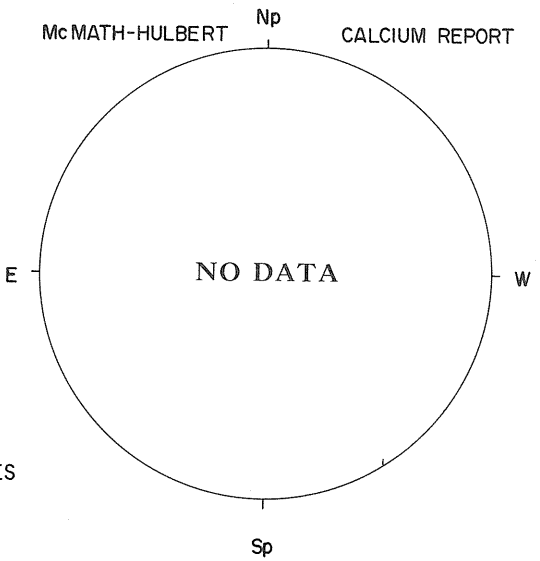
SUNSPOTS

PROMINENCES

1606 UT

McMATH-HULBERT

CALCIUM REPORT

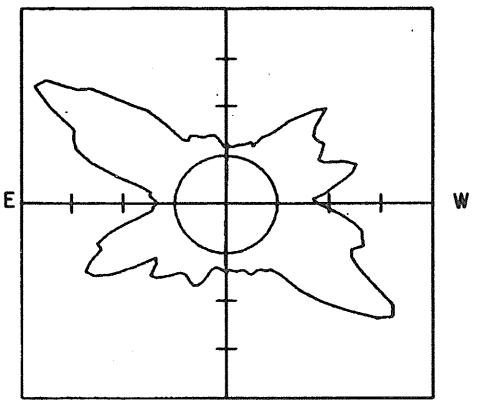


NOVEMBER 8, 1978 (P = 23.25, B_o = 3.64, L_o = 74.35)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å



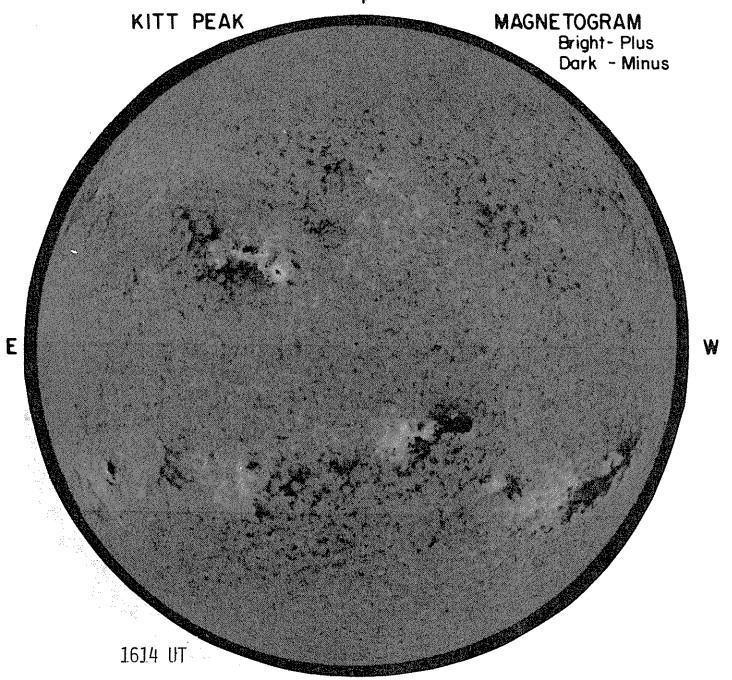
1748 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus



1614 UT

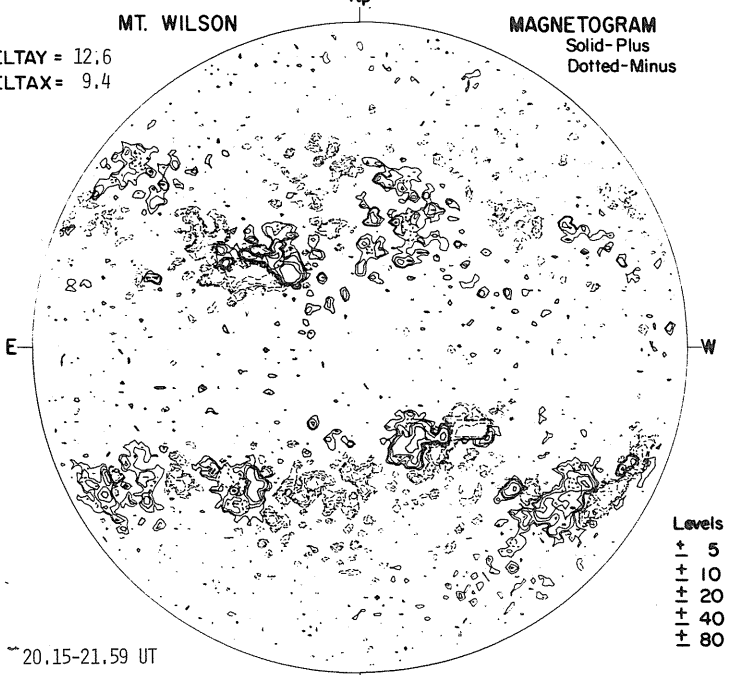
Sp

MT. WILSON

Np

DELTAY = 12.6
DELTAX = 9.4

MAGNETOGRAM
Solid - Plus
Dotted - Minus

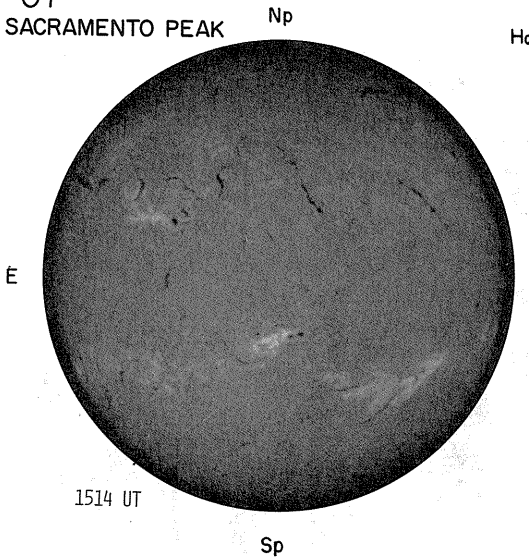


20.15-21.59 UT

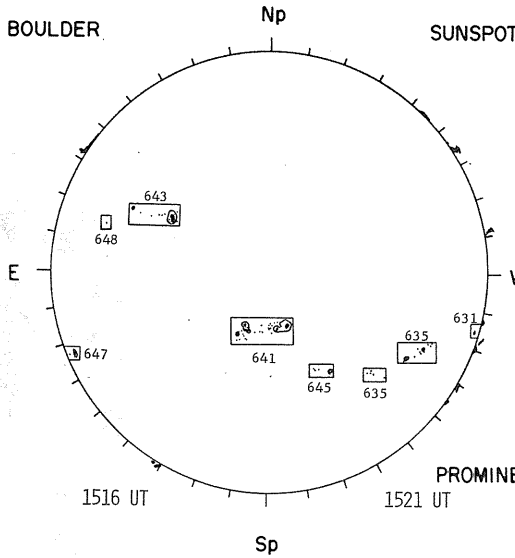
Sp

07

SACRAMENTO PEAK

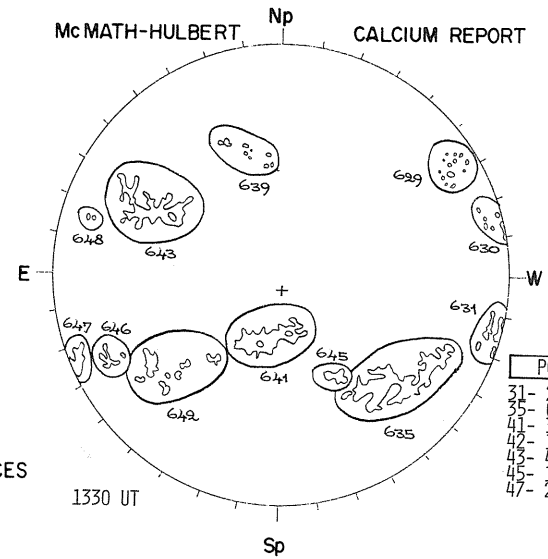


BOULDER SUNSPOTS



PROMINENCES

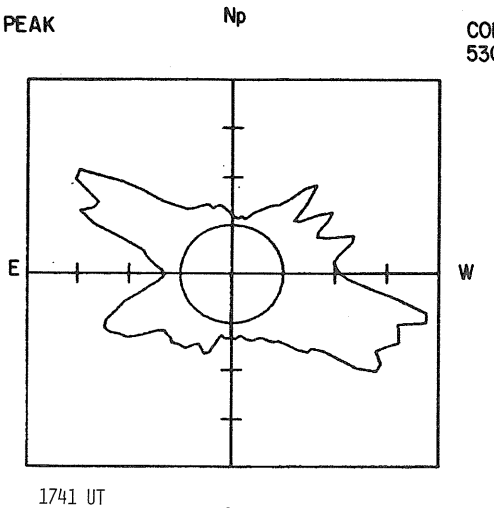
McMATH-HULBERT CALCIUM REPORT

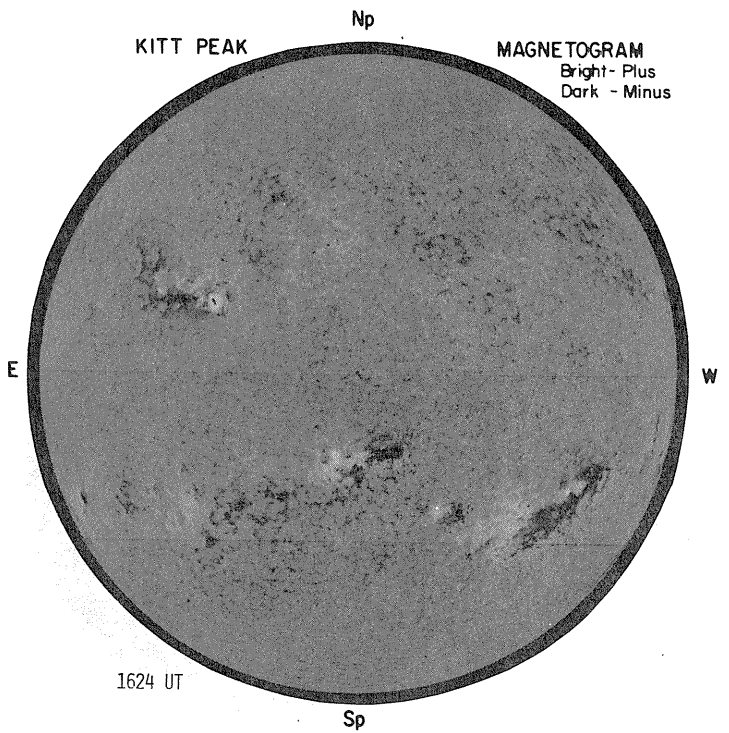


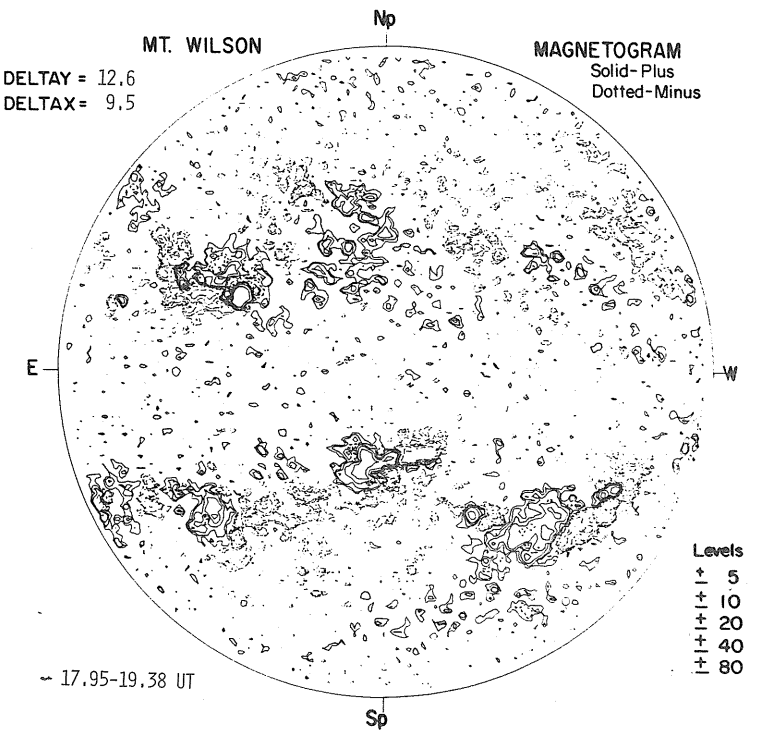
POOR	D
31-	2300-2.5
35-	6600-3.0
41-	3400-3.0
42-	1900-2.5
43-	4500-3.0
45-	1000-2.5
47-	2500-2.5

NOVEMBER 7, 1978 (P = 23.47, B_o = 3.75, L_o = 87.54)

SACRAMENTO PEAK

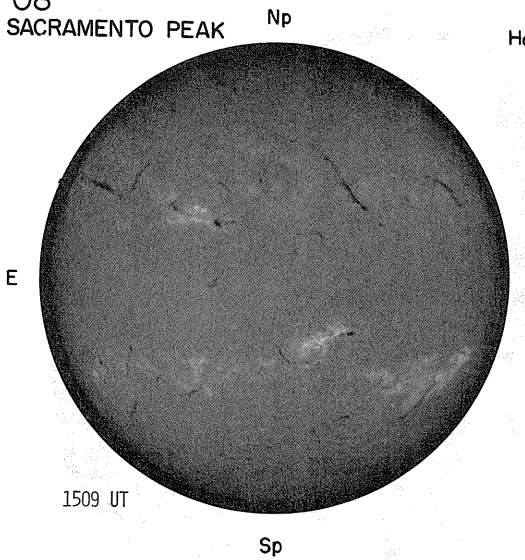




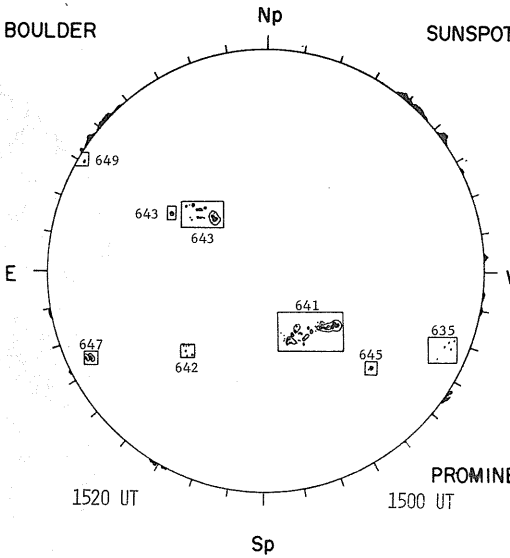


08

SACRAMENTO PEAK Hα

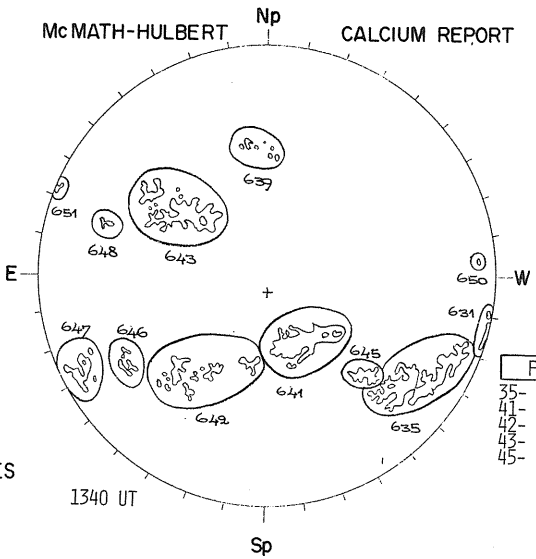


BOULDER SUNSPOTS



PROMINENCES

McMATH-HULBERT CALCIUM REPORT



FAIR	M
35- 7000-3.0	
41- 3600-3.5	
42- 2200-2.5	
43- 4500-3.5	
45- 1000-2.5	

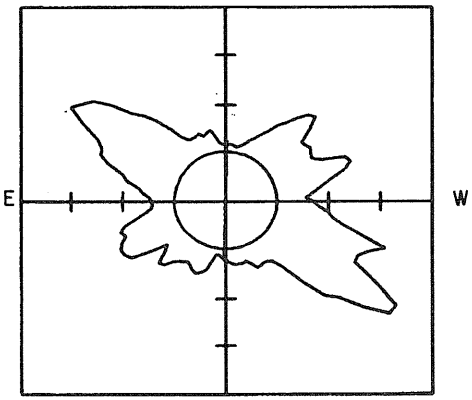
63
Nov 78

NOVEMBER 9, 1978 (P = 23.03, B_o = 3.53, L_o = 61.17)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å



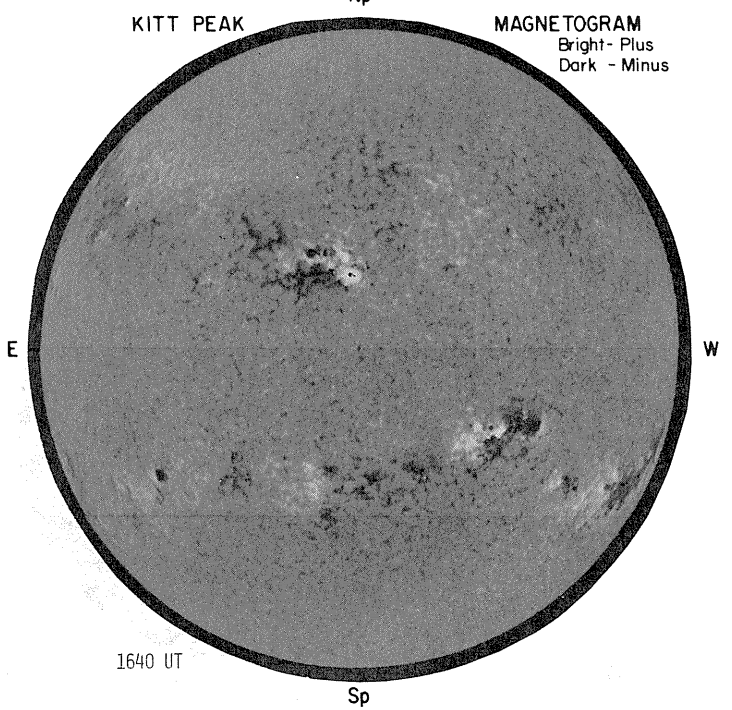
1553 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus



1640 UT

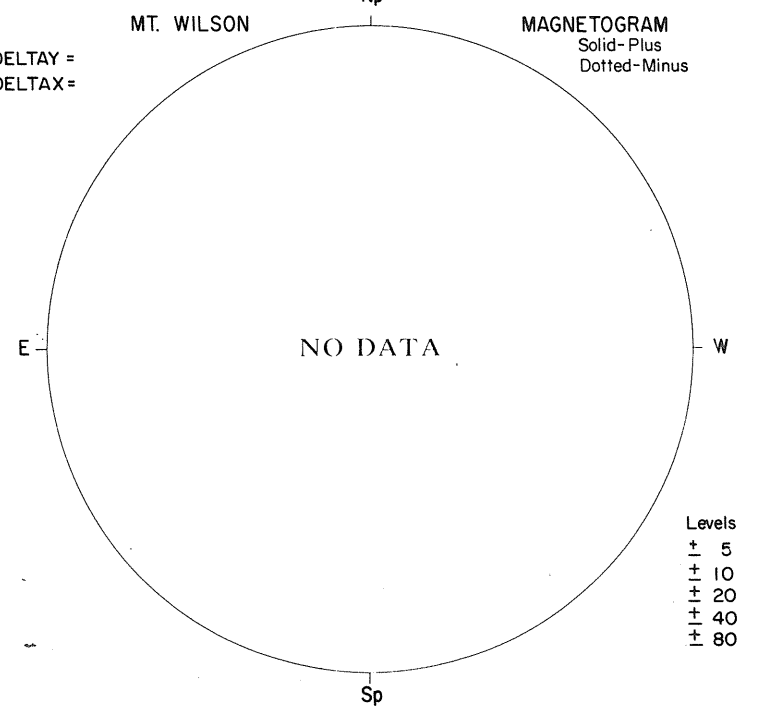
Sp

MT. WILSON

Np

DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

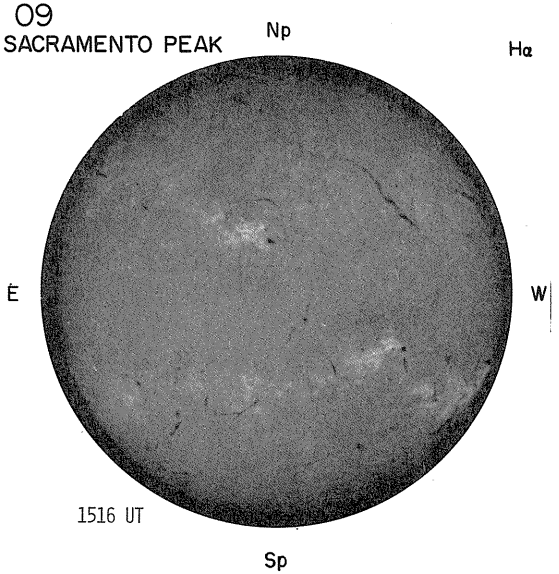


Levels
± 5
± 10
± 20
± 40
± 80

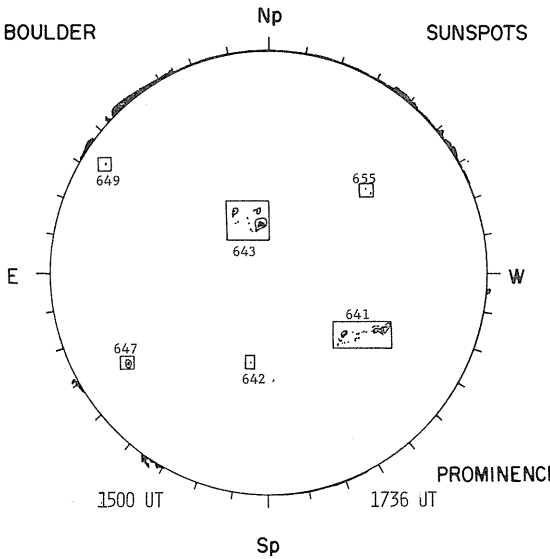
Sp

09

SACRAMENTO PEAK

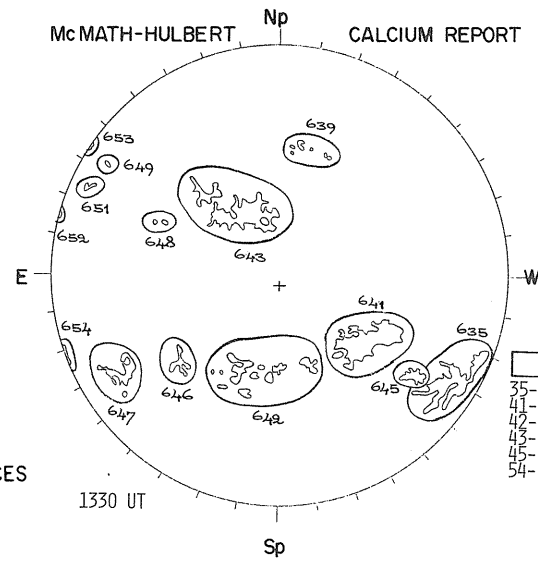


BOULDER SUNSPOTS



PROMINENCES

McMATH-HULBERT CALCIUM REPORT

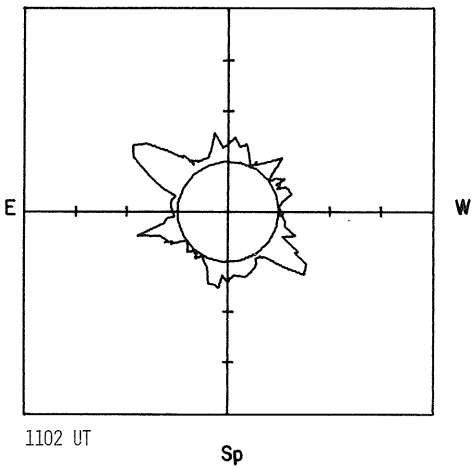


POOR	D
35- 7000-3.0	
41- 4000-3.5	
42- 2200-2.5	
43- 4300-3.5	
45- 0900-2.5	
54- 0900-2.5	

NOVEMBER 10, 1978 (P = 22.80, B_o = 3.42, L_o = 47.98)

SACRAMENTO PEAK
WENDELSTEIN

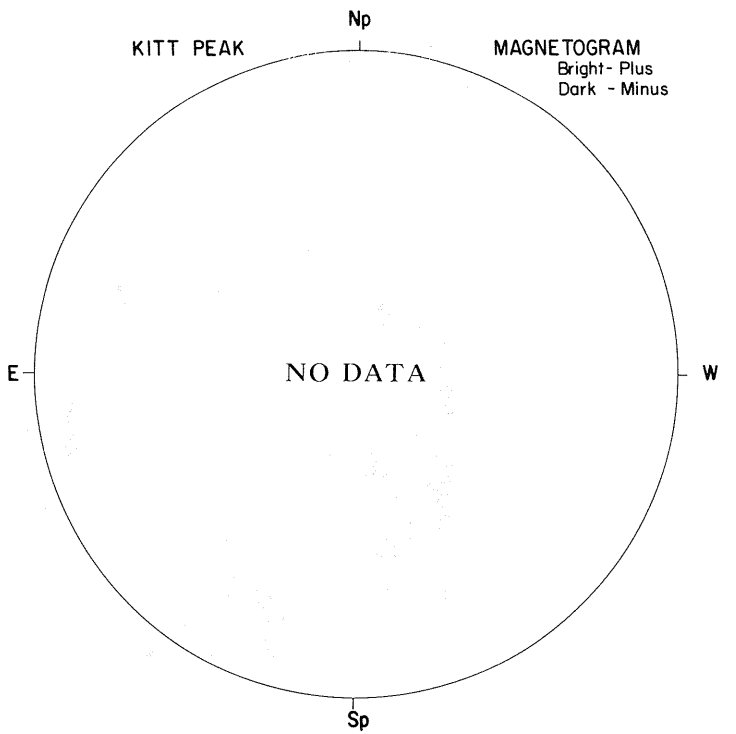
CORONA (1.15 $R_\odot$)
5303 Å



1102 UT

KITT PEAK

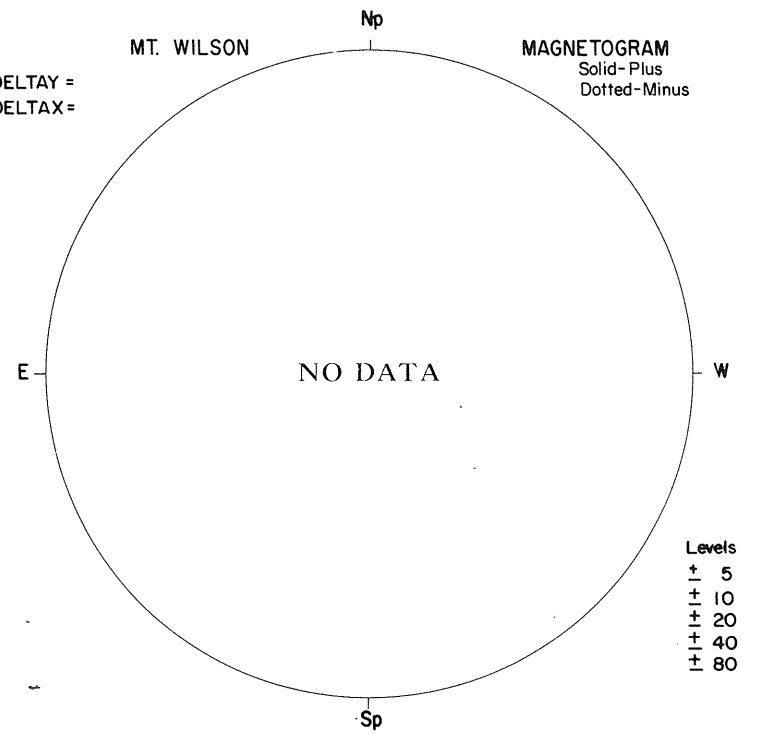
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

DELTAY =
DELTAX =

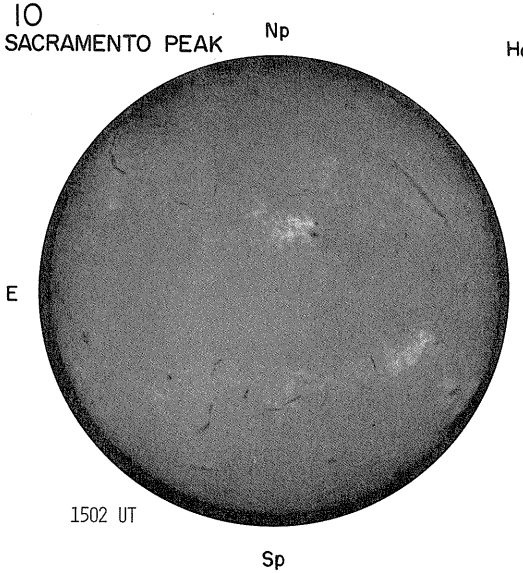
MAGNETOGRAM
Solid - Plus
Dotted - Minus



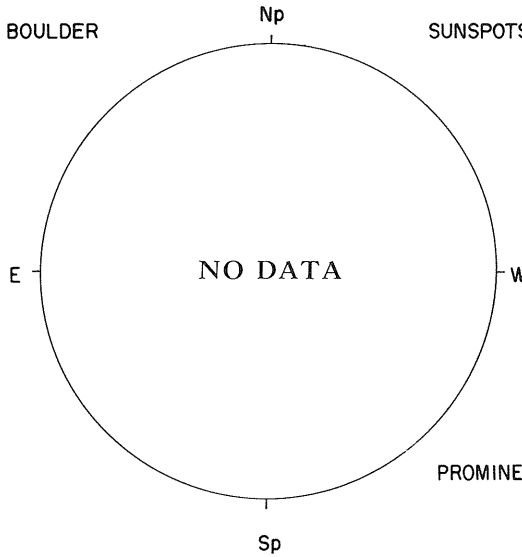
Levels
± 5
± 10
± 20
± 40
± 80

10

SACRAMENTO PEAK



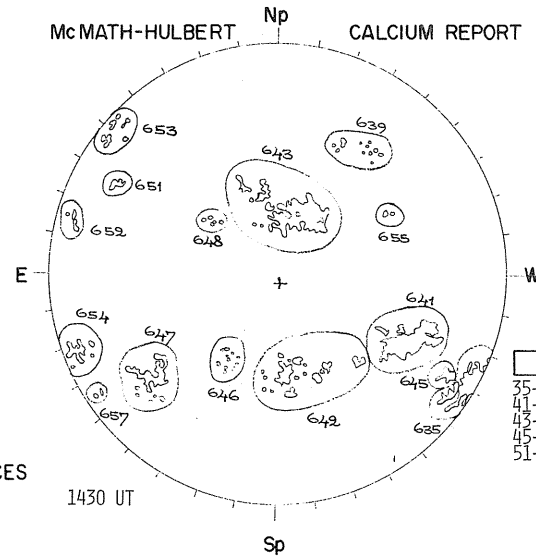
Hα BOULDER



SUNSPOTS

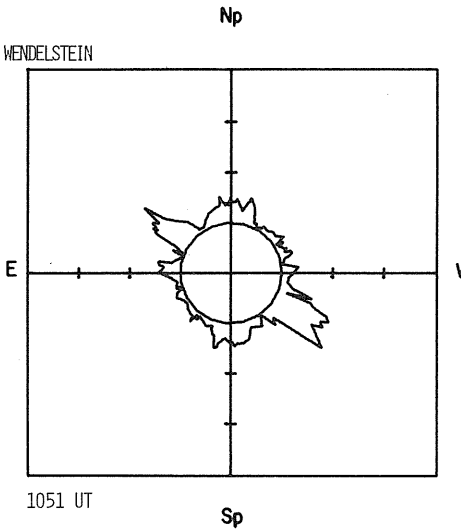
PROMINENCES

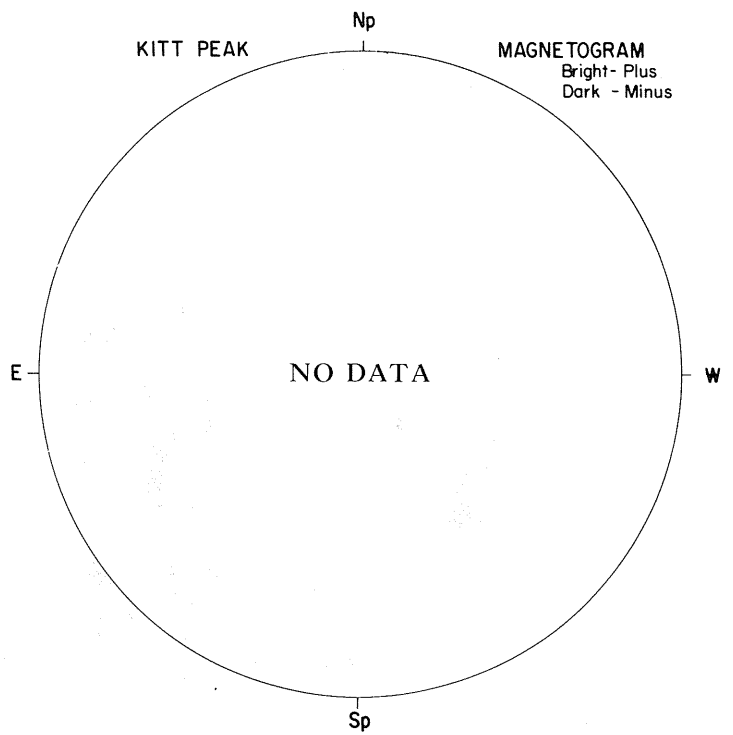
McMATH-HULBERT CALCIUM REPORT

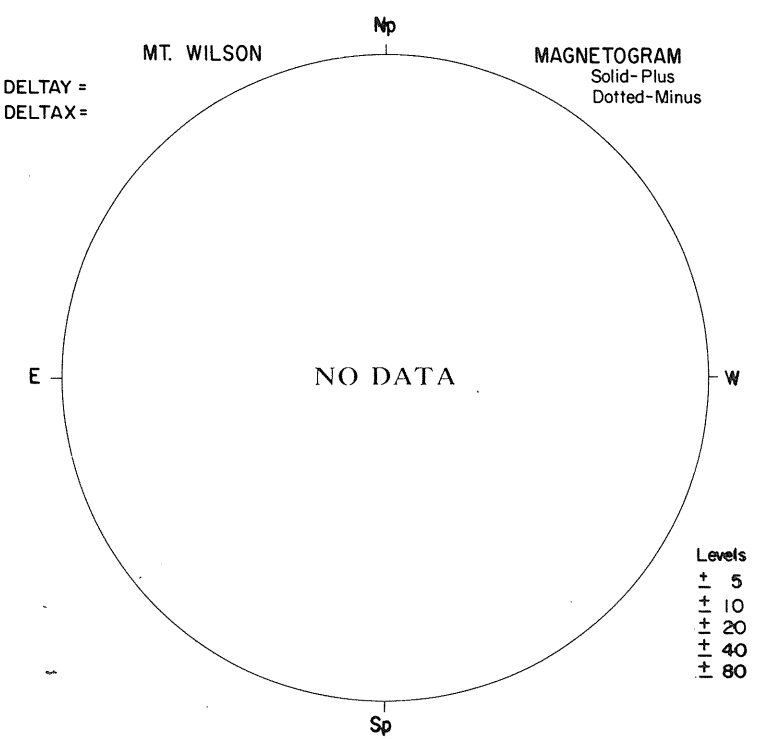


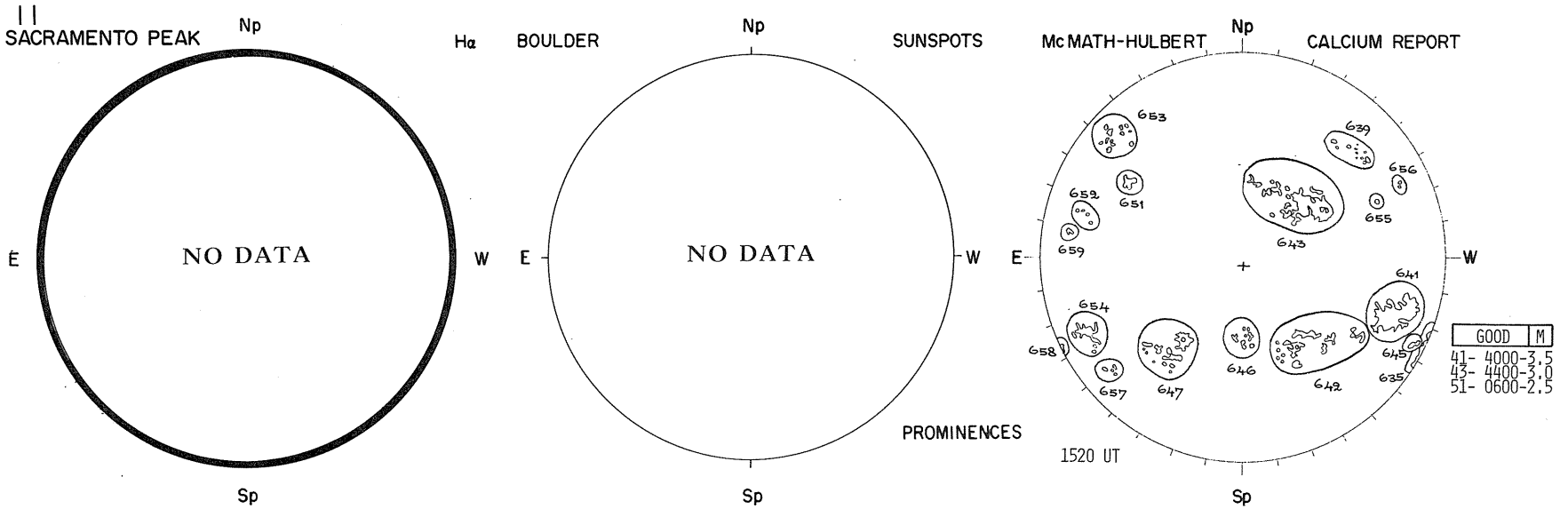
GOOD	M
35- 5500-3.0	
41- 4000-3.5	
43- 4300-3.5	
45- 0900-2.5	
51- 0300-2.5	

NOVEMBER 11, 1978 (P = 22.56, B_o = 3.31, L_o = 34.80)

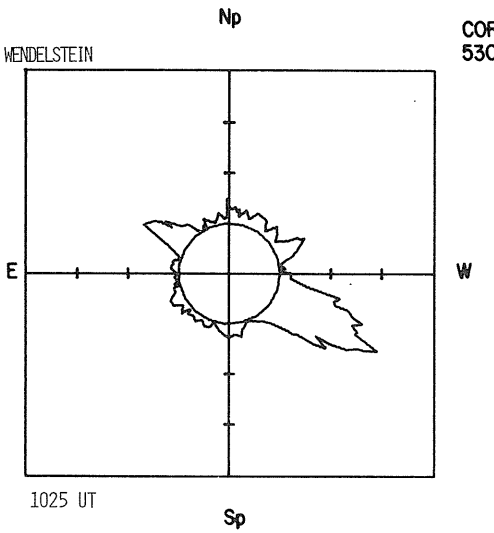


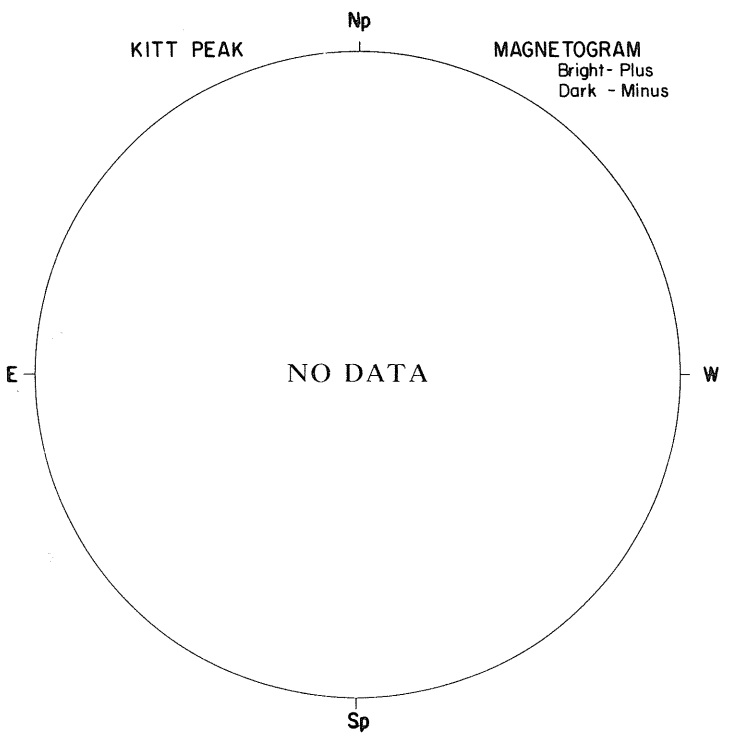


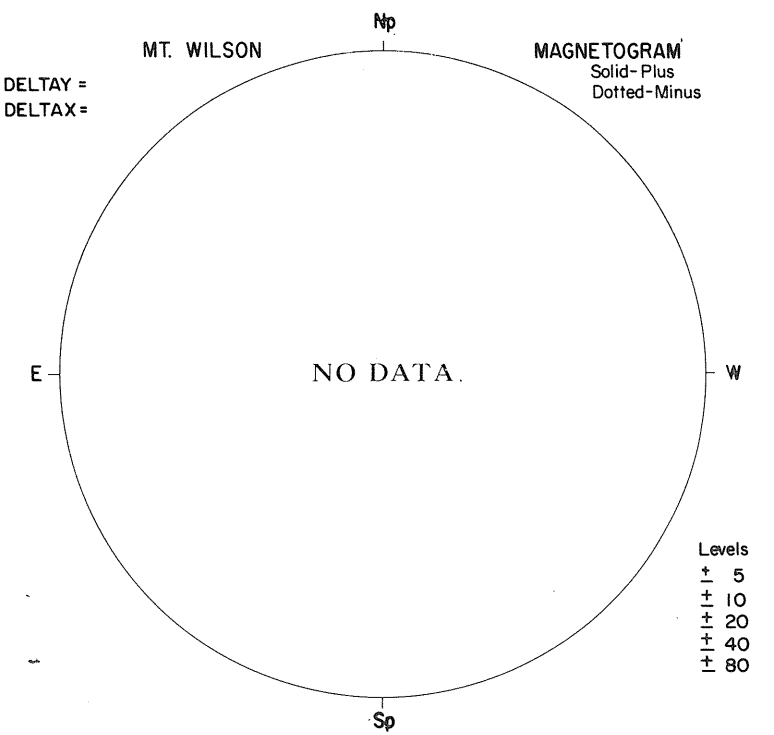



SACRAMENTO PEAK
Np
Hα
NO DATA
E
W
Sp
BOULDER
Np
SUNSPOTS
NO DATA
E
W
Sp
PROMINENCES
McMATH-HULBERT
Np
CALCIUM REPORT
653
639
656
651
652
655
659
643
641
654
658
657
647
646
642
645
635
E
W
Sp
1520 UT
GOOD | M
41- 4000-3.5
43- 4400-3.0
51- 0600-2.5

NOVEMBER 12, 1978 (P = 22.31, B_o = 3.20, L_o = 21.61)

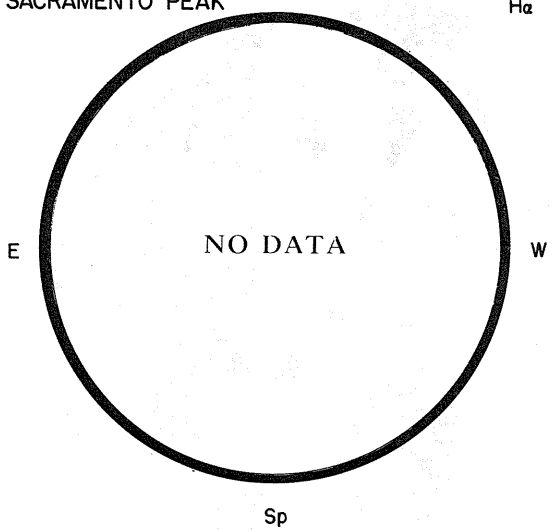




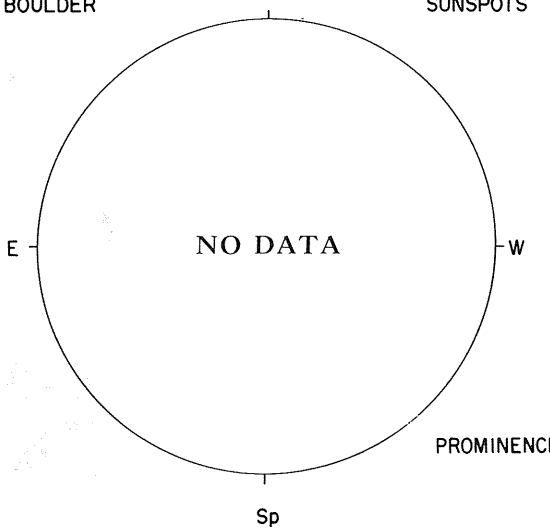


12

SACRAMENTO PEAK Np Hα

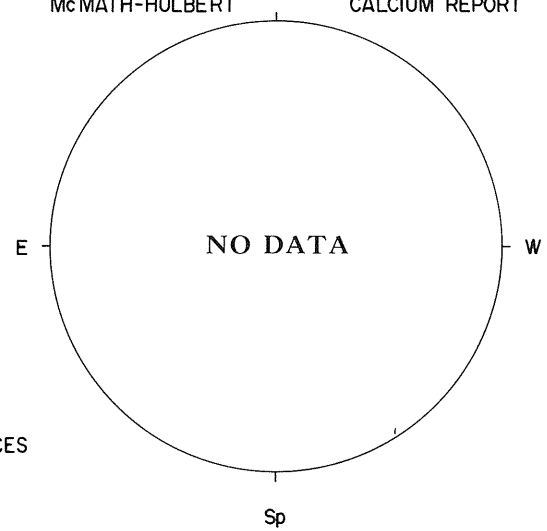


BOULDER Np SUNSPOTS



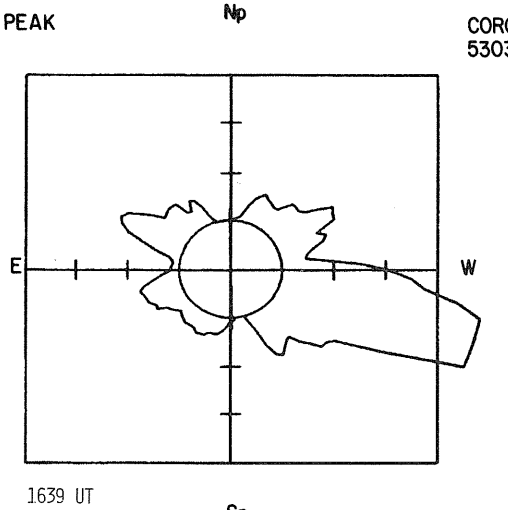
PROMINENCES

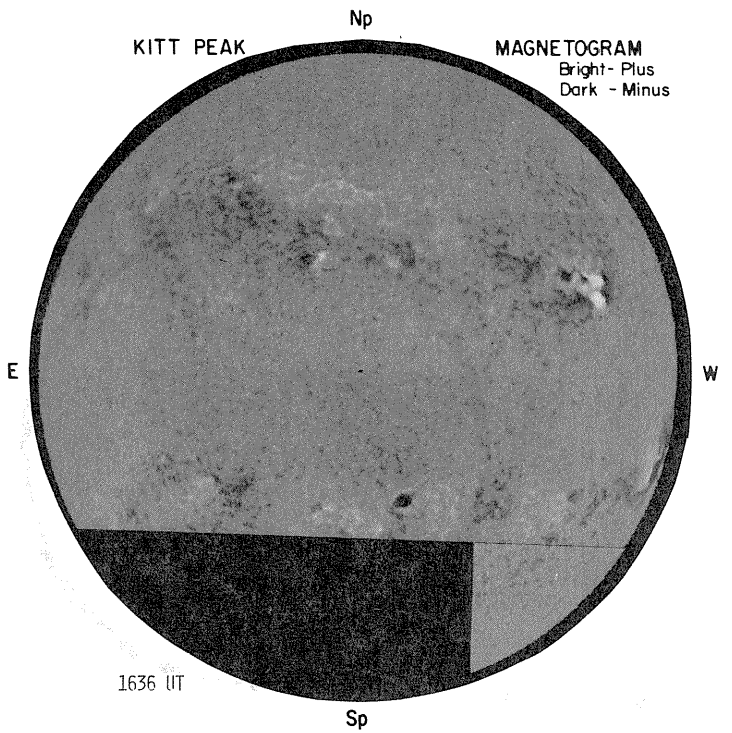
McMATH-HULBERT Np CALCIUM REPORT

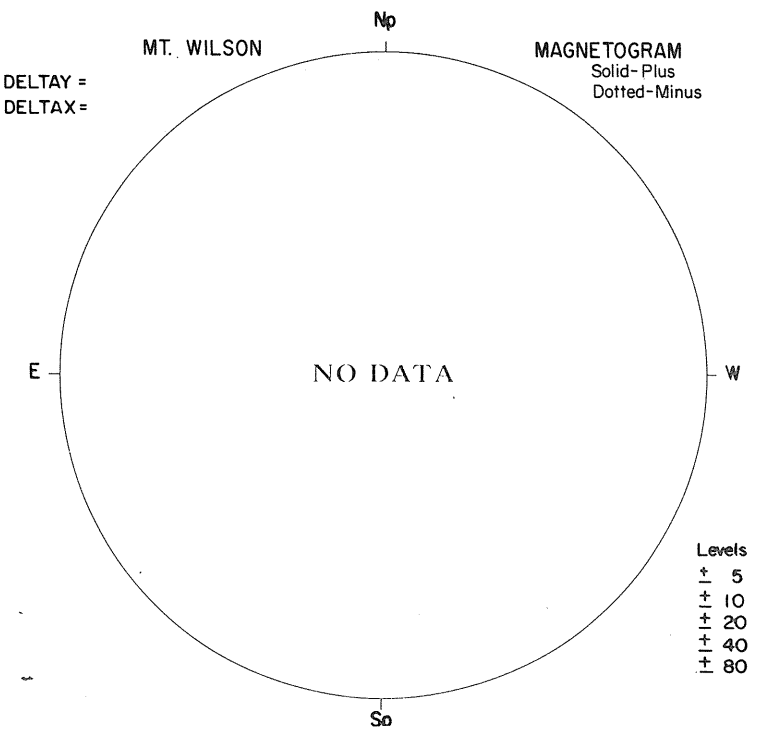


NOVEMBER 13, 1978 (P = 22.06, B_o = 3.08, L_o = 8.43)

SACRAMENTO PEAK

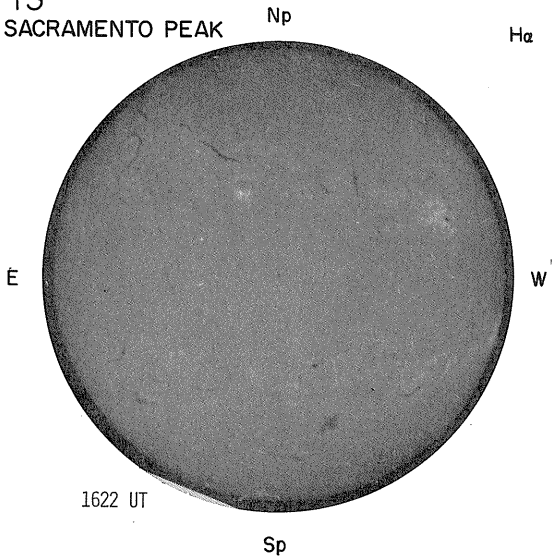




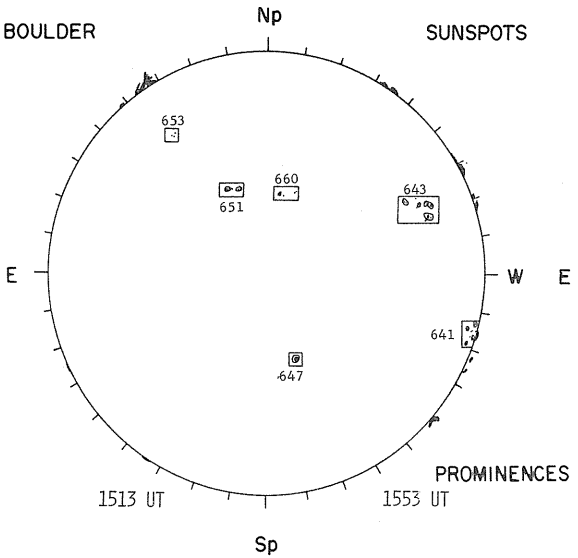


13

SACRAMENTO PEAK

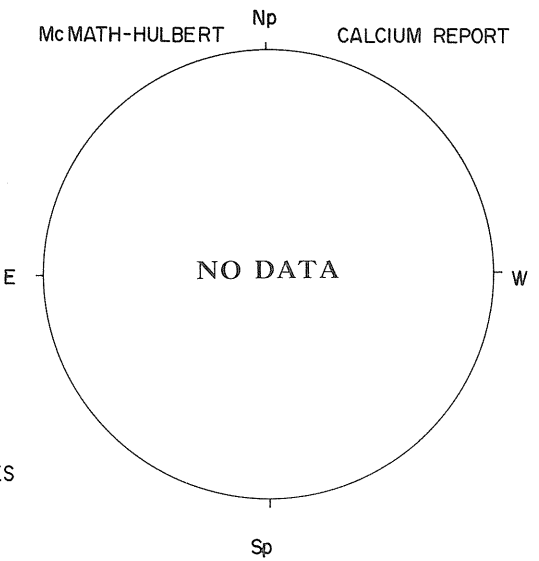


BOULDER SUNSPOTS



PROMINENCES

McMATH-HULBERT CALCIUM REPORT

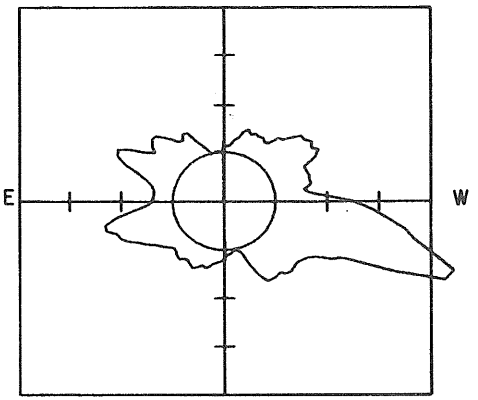


NOVEMBER 14, 1978 (P = 21.80, B_o = 2.97, L_o = 355.25)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å



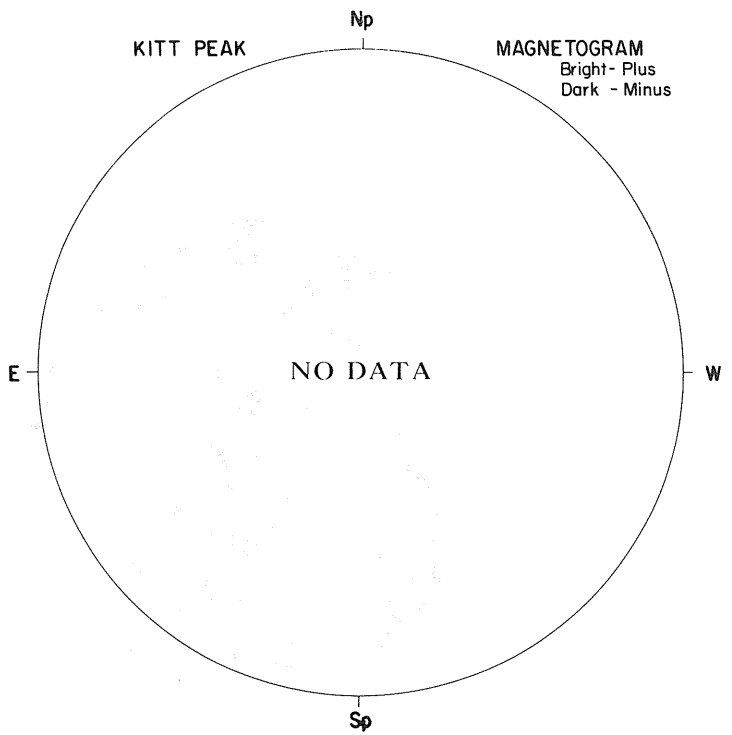
1514 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus

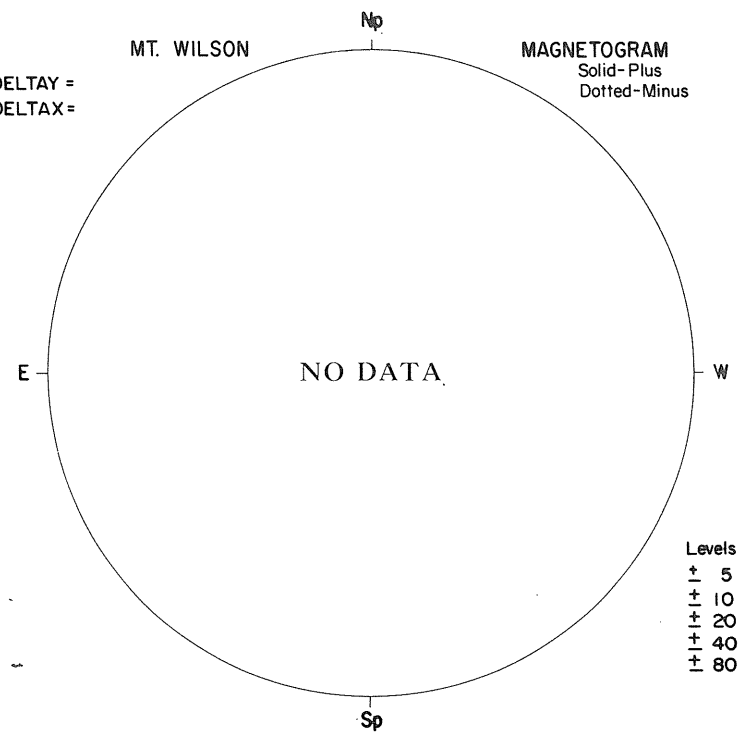


MT. WILSON

Np

DELTAY =
DELTAX =

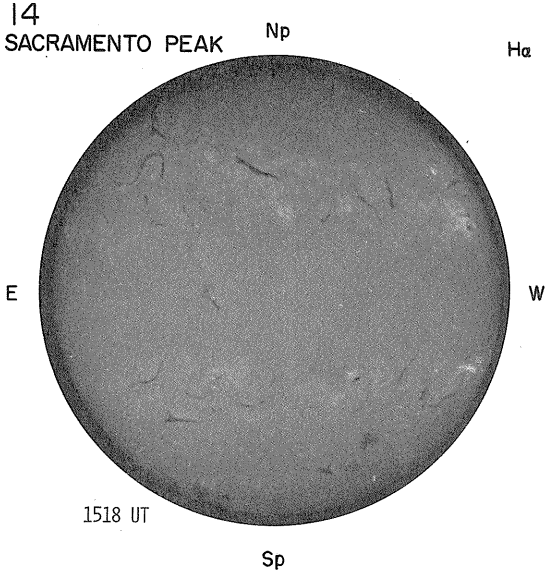
MAGNETOGRAM
Solid - Plus
Dotted - Minus



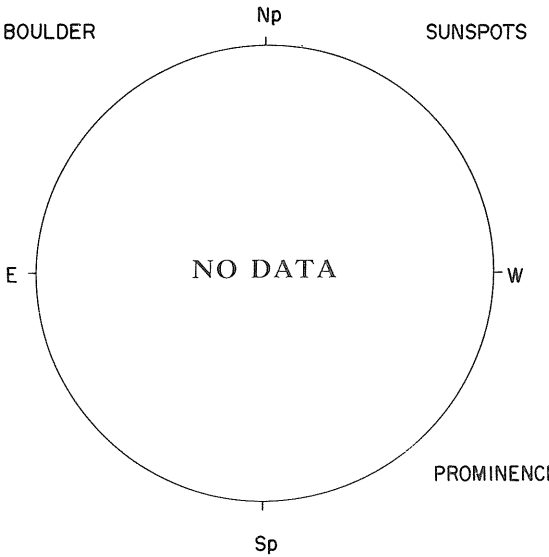
Levels
± 5
± ± 10
± ± ± 20
± ± ± ± 40
± ± ± ± ± 80

14

SACRAMENTO PEAK Hα

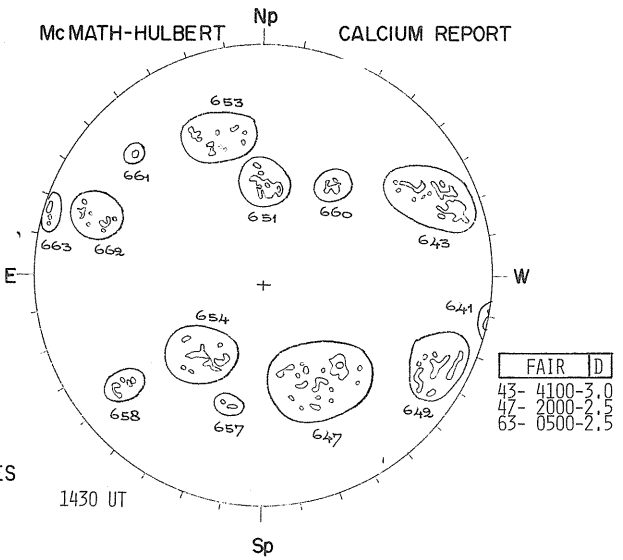


BOULDER SUNSPOTS



PROMINENCES

McMATH-HULBERT CALCIUM REPORT

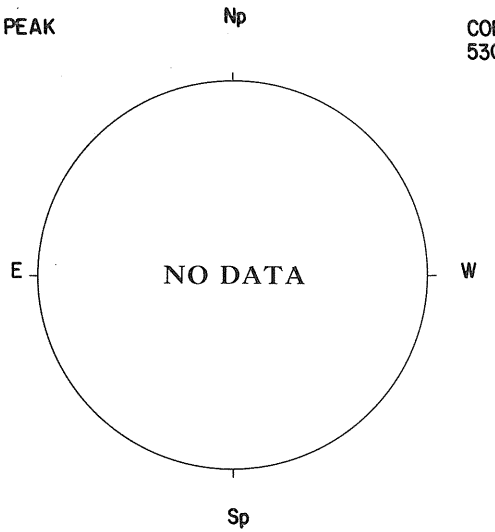


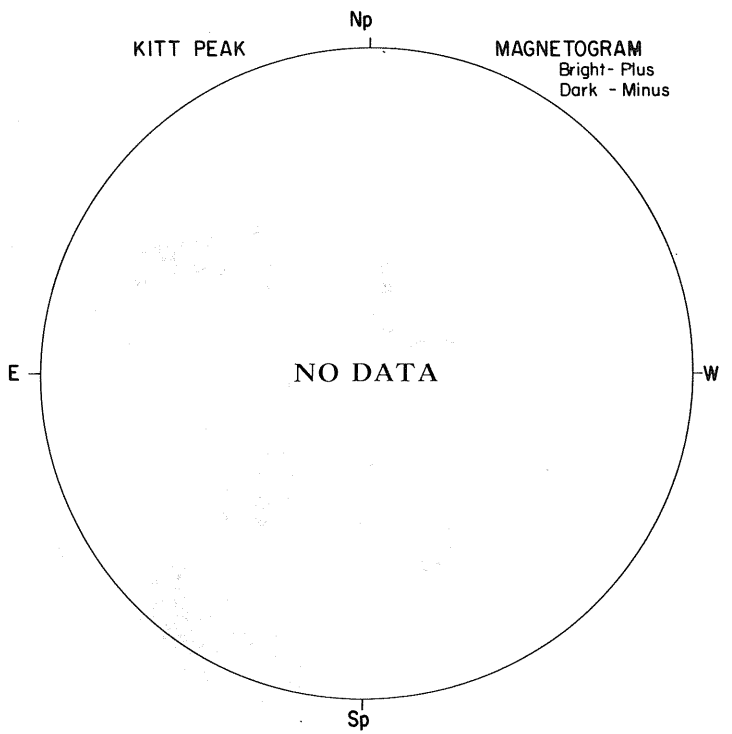
FAIR	D

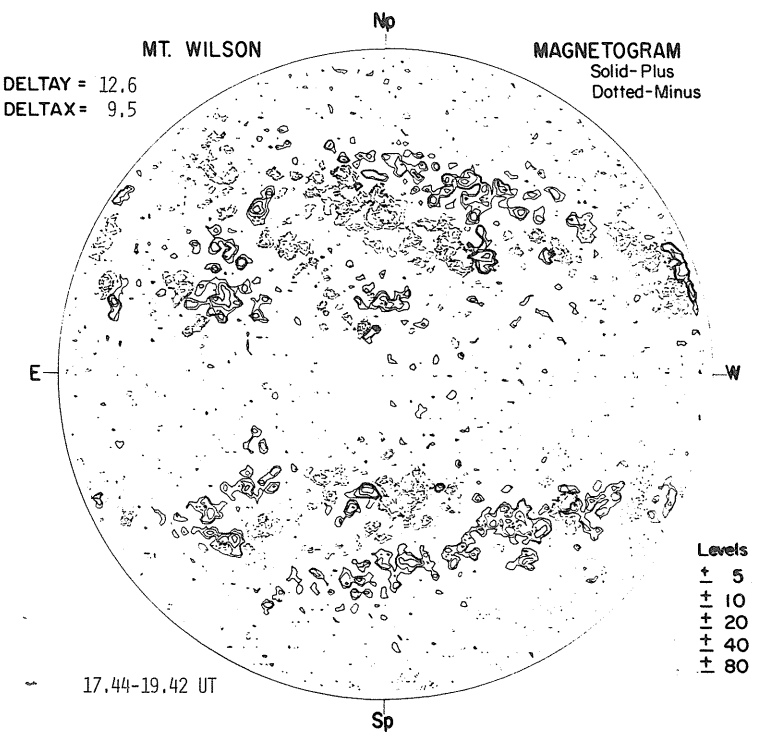
43- 4100-3.0
47- 2000-2.5
63- 0500-2.5

NOVEMBER 15, 1978 (P = 21.53, B_0 = 2.85, L_0 = 342.06)

SACRAMENTO PEAK

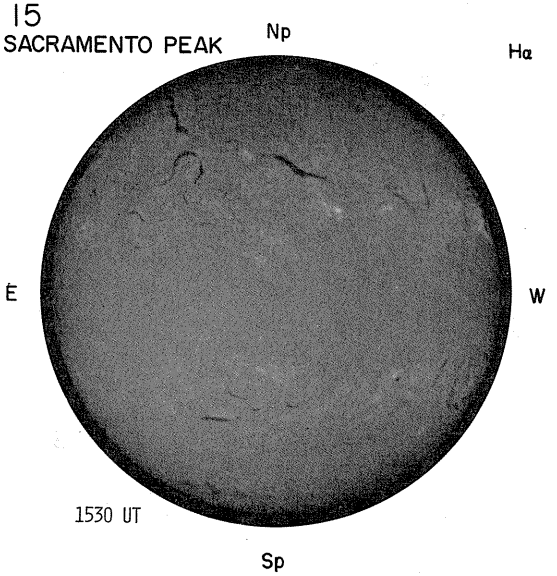






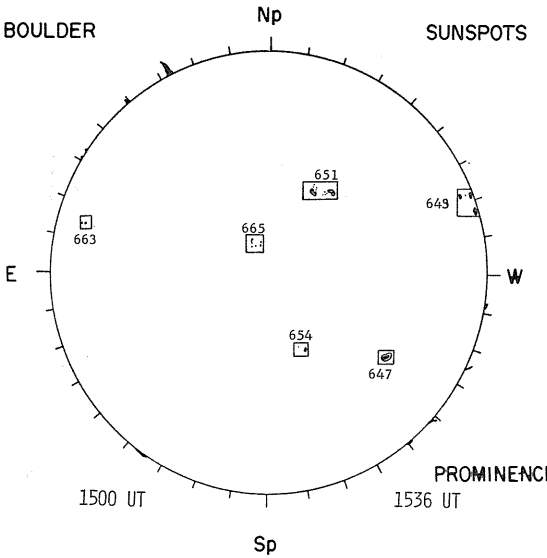
15

SACRAMENTO PEAK

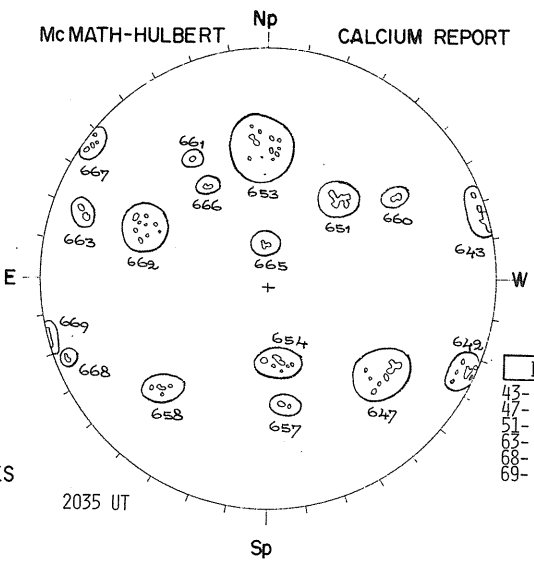


Hα

BOULDER



SUNSPOTS



PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

BAD	M
43- 2700-3.0	
47- 1800-2.5	
51- 1400-2.5	
63- 0500-2.5	
68- 0400-2.5	
69- 1200-2.5	

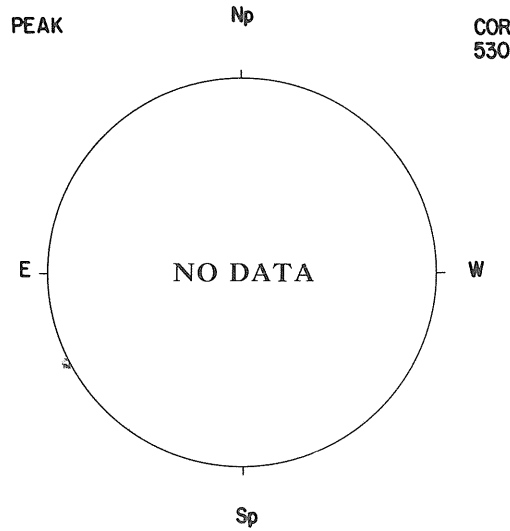
77 Nov 78

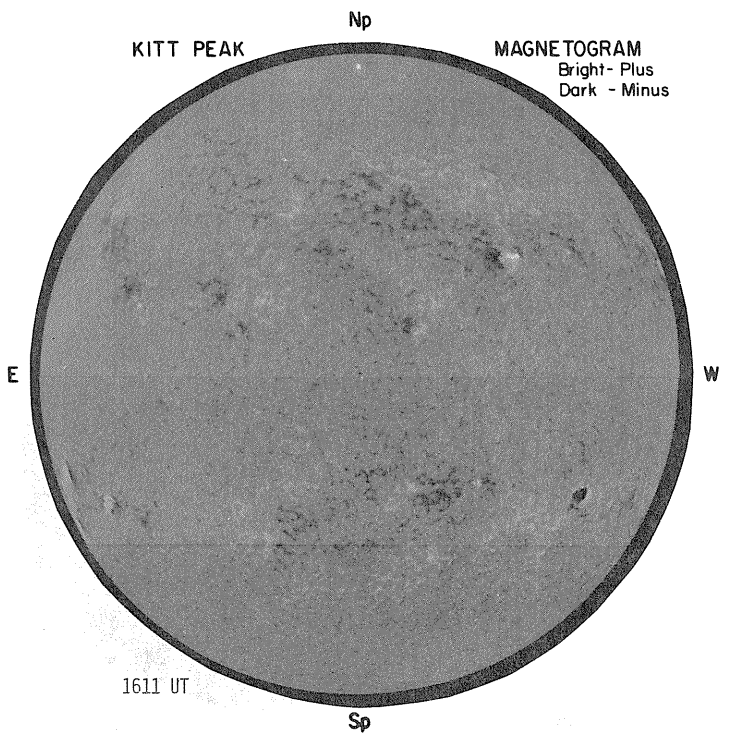
NOVEMBER 16, 1978 (P = 21.25, B_o = 2.73, L_o = 328.88)

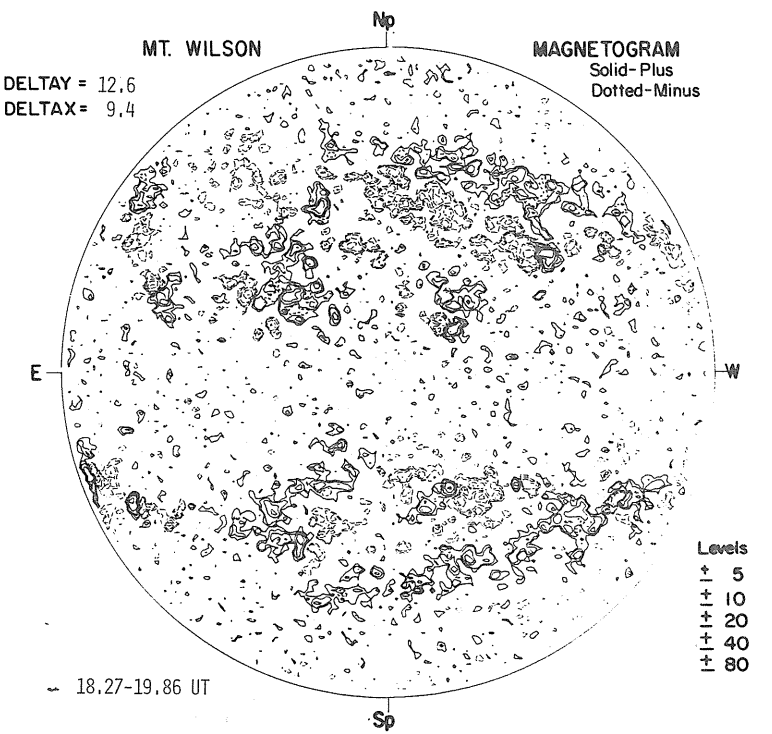
78 Nov 78

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

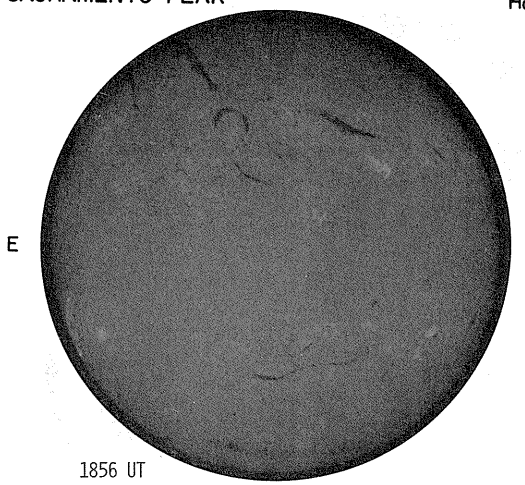






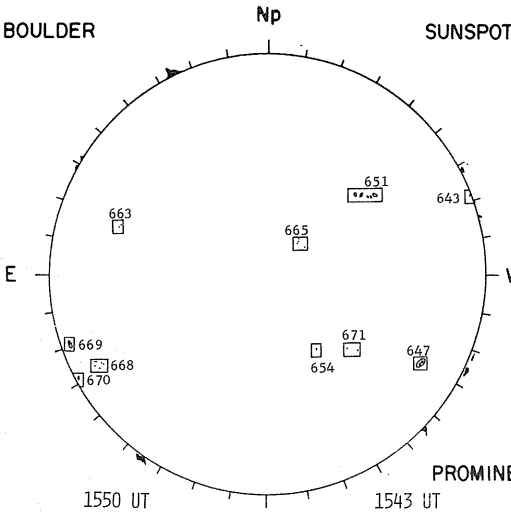
16

SACRAMENTO PEAK Hα



1856 UT

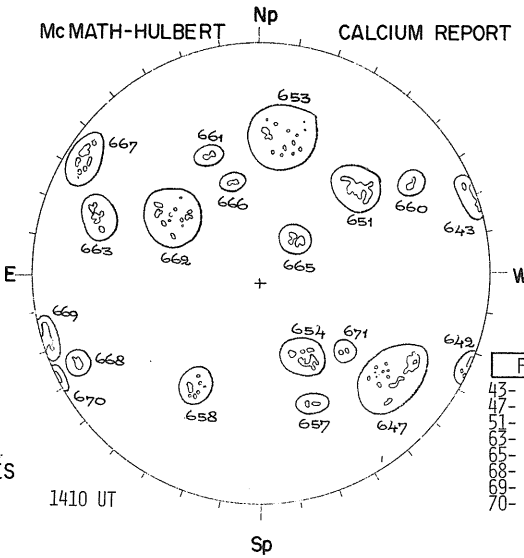
BOULDER SUNSPOTS



1550 UT 1543 UT

PROMINENCES

McMATH-HULBERT CALCIUM REPORT



1410 UT

FAIR	M
43- 2100-3.0	
47- 1600-2.5	
51- 1600-3.0	
63- 0700-2.5	
65- 0300-2.5	
68- 0500-3.0	
69- 3500-2.5	
70- 0900-2.5	

NOVEMBER 17, 1978 (P = 20.97, B_o = 2.61, L_o = 315.70)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

E

W

1844 UT

Sp

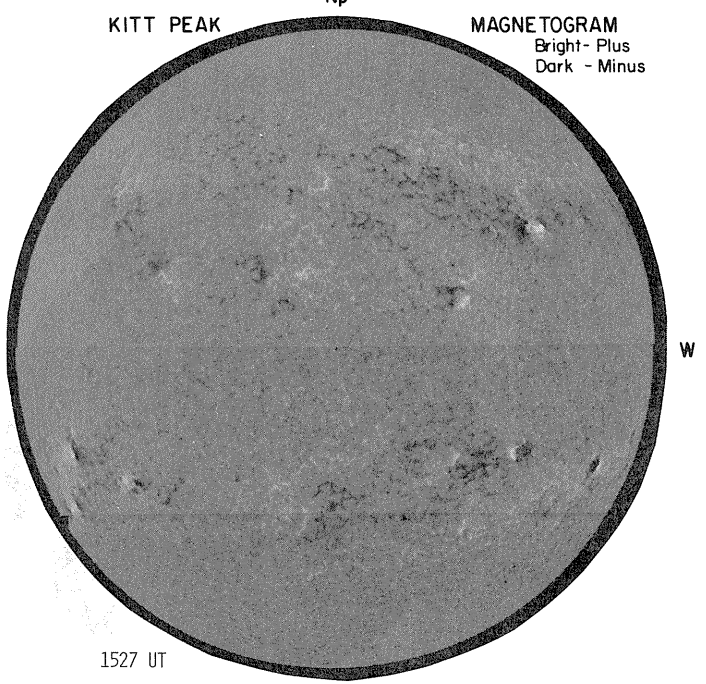
KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus

E

W



1527 UT

Sp

MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

E

NO DATA

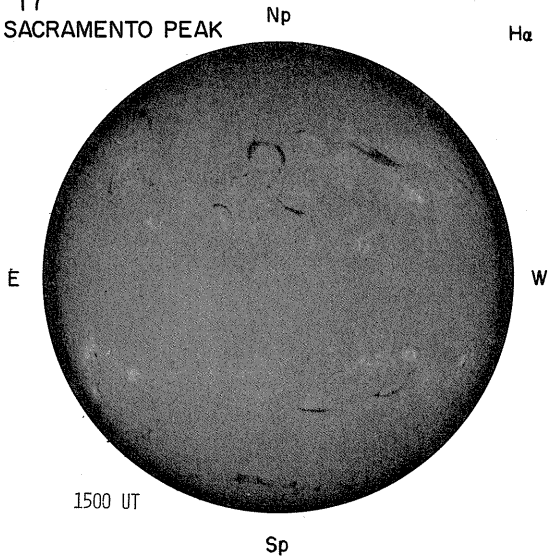
W

Levels
1+ 5
1+1+ 10
1+1+1+ 20
1+1+1+1+ 40
1+1+1+1+1+ 80

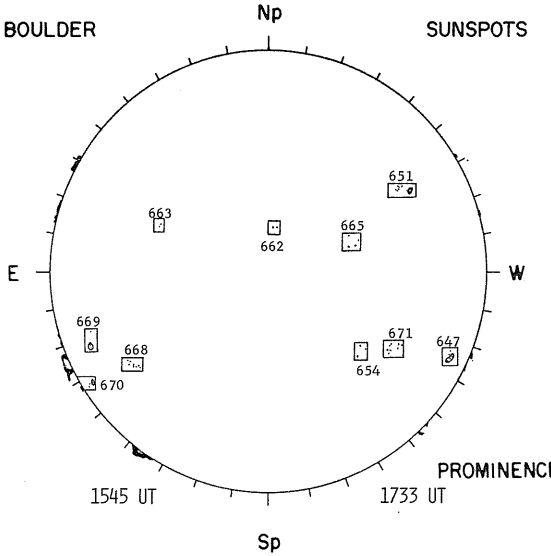
Sp

17

SACRAMENTO PEAK Hα

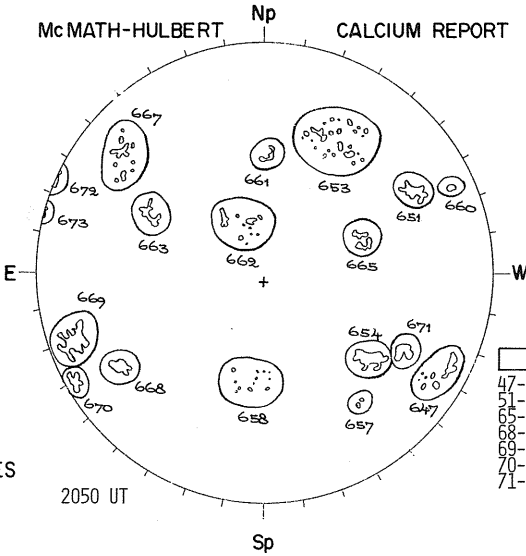


BOULDER SUNSPOTS



PROMINENCES

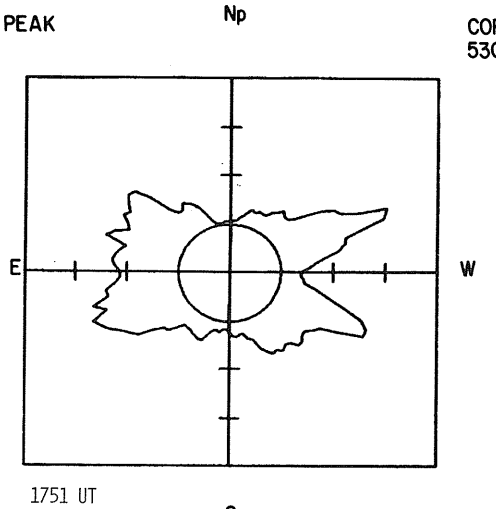
McMATH-HULBERT CALCIUM REPORT

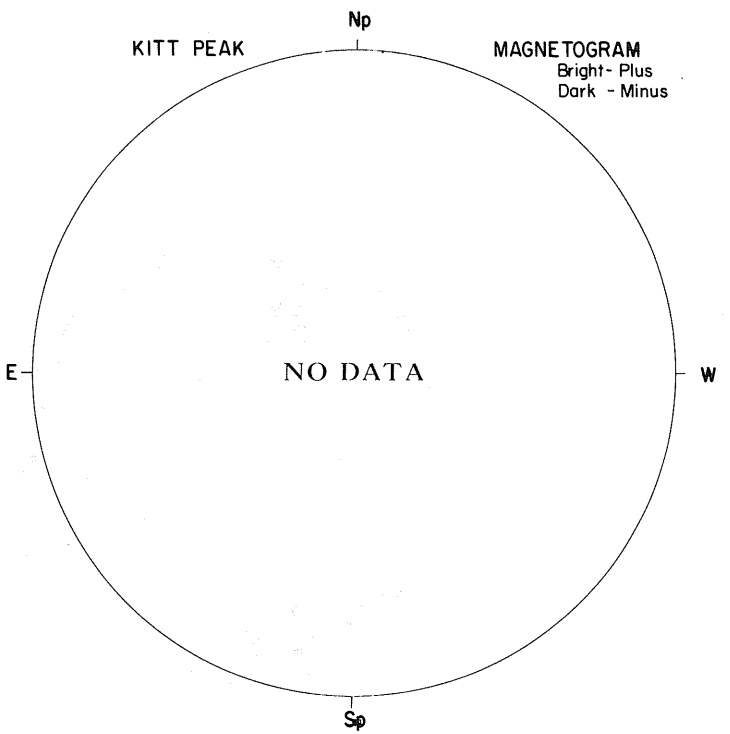


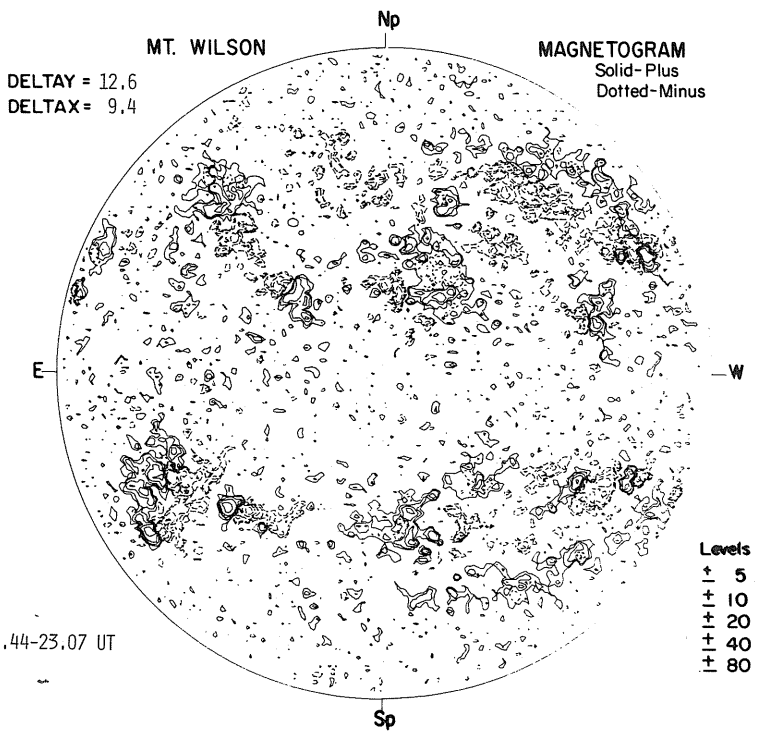
POOR	M
47-	1300-2.5
51-	1600-3.0
65-	0500-2.5
68-	0800-3.0
69-	2700-3.0
70-	1300-3.0
71-	1200-2.5

NOVEMBER 18, 1978 (P = 20.68, B_o = 2.49, L_o = 302.52)

SACRAMENTO PEAK

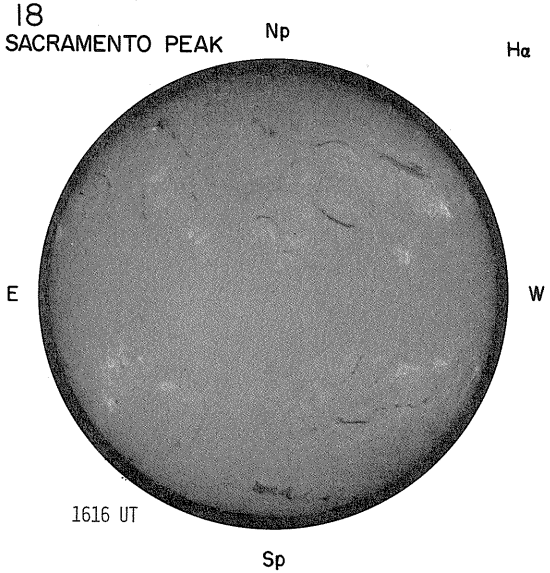




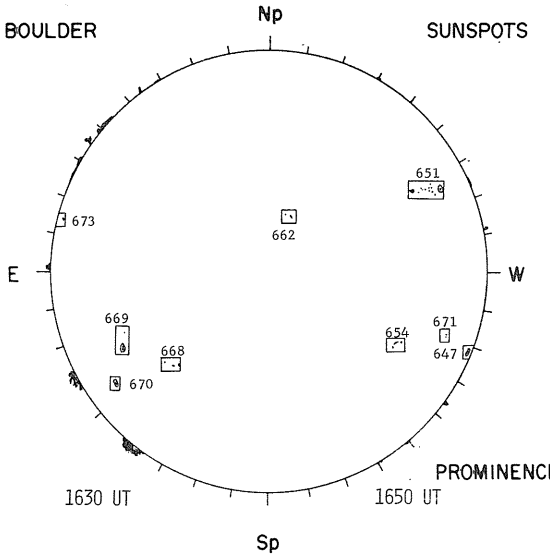


18

SACRAMENTO PEAK



Hα BOULDER

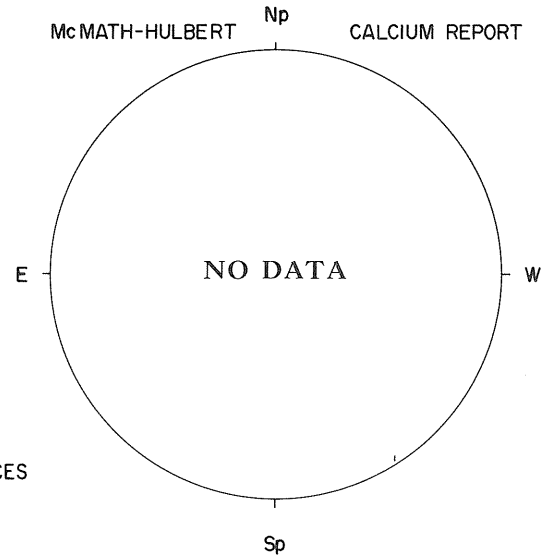


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT



NOVEMBER 19, 1978 (P = 20.38, B_o = 2.38, L_o = 289.33)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

E W

1616 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus

E W

1747 UT

Sp

MT. WILSON

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

E W

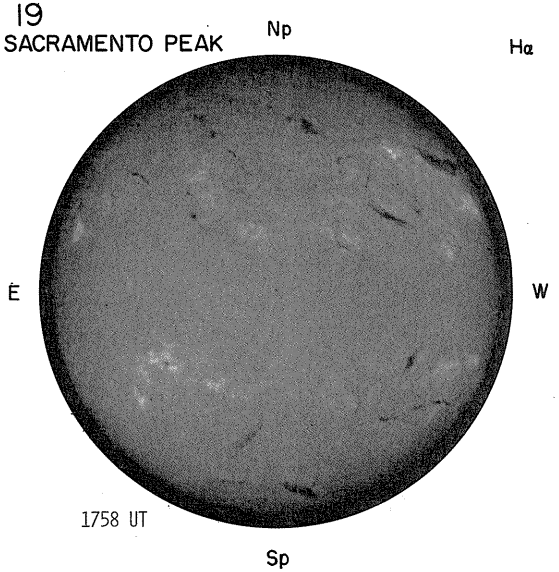
NO DATA

Levels
+ 5
++ 10
+++ 20
++++ 40
+++++ 80

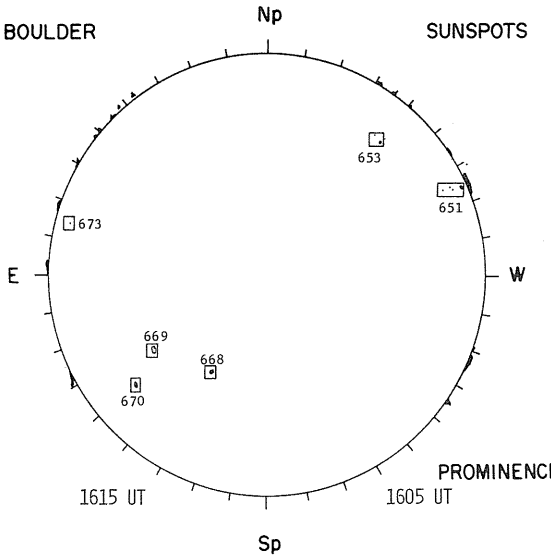
Sp

19

SACRAMENTO PEAK

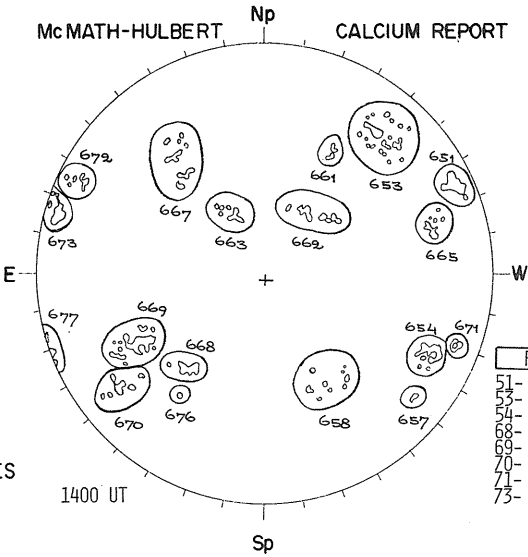


BOULDER SUNSPOTS



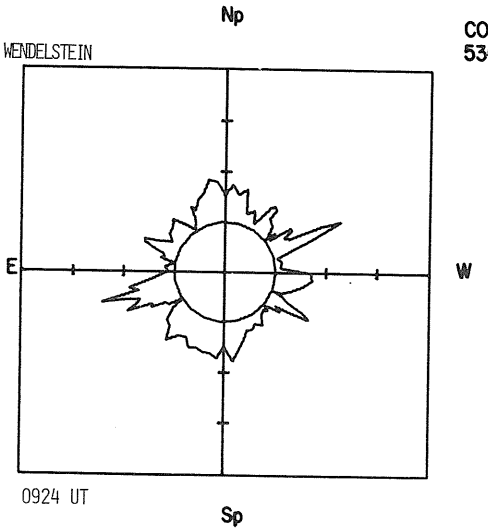
PROMINENCES

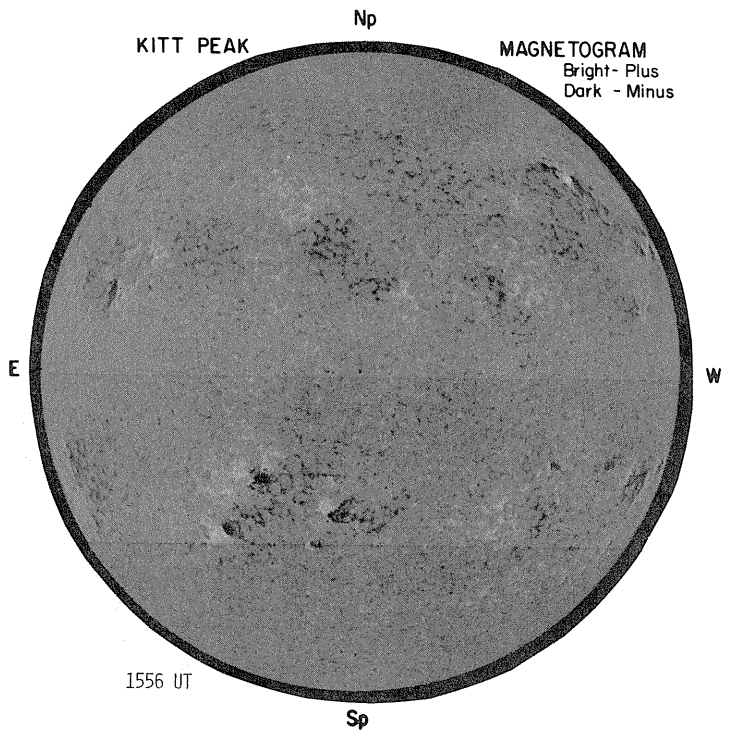
McMATH-HULBERT CALCIUM REPORT

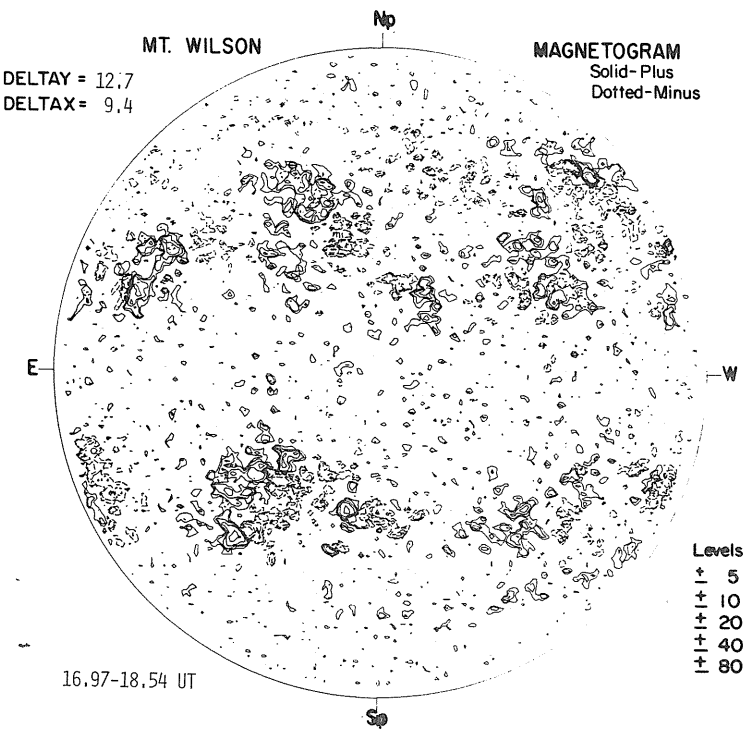


FAIR	D
51- 1600	3.0
52- 1700	3.5
54- 1000	2.5
68- 0800	3.0
69- 1800	3.0
70- 1000	3.5
71- 0700	2.5
73- 1400	2.5

NOVEMBER 20, 1978 (P = 20.07, B_o = 2.25, L_o = 276.15)

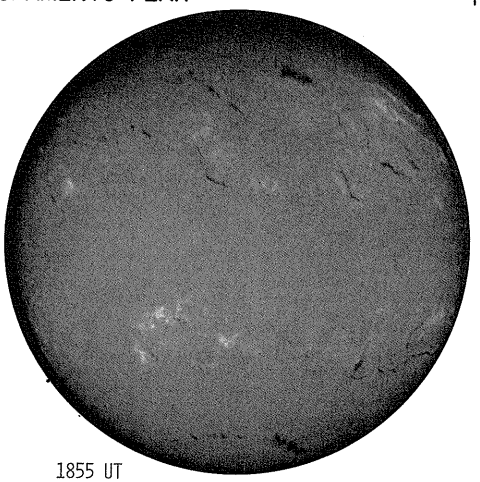




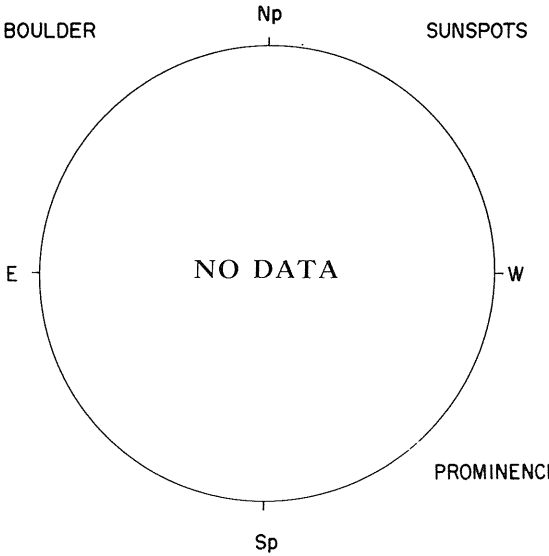


20

SACRAMENTO PEAK Hα

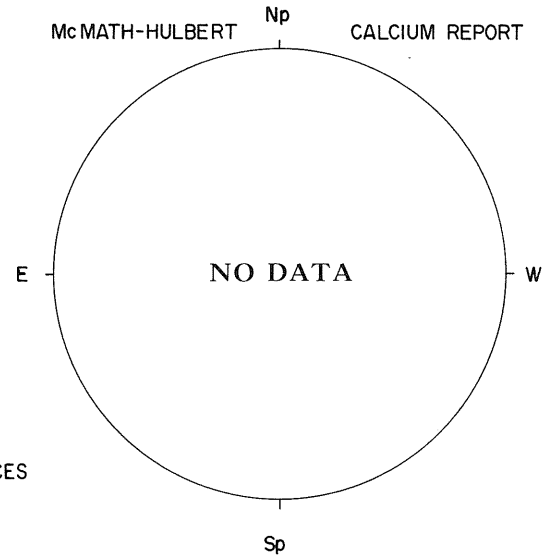


BOULDER SUNSPOTS



PROMINENCES

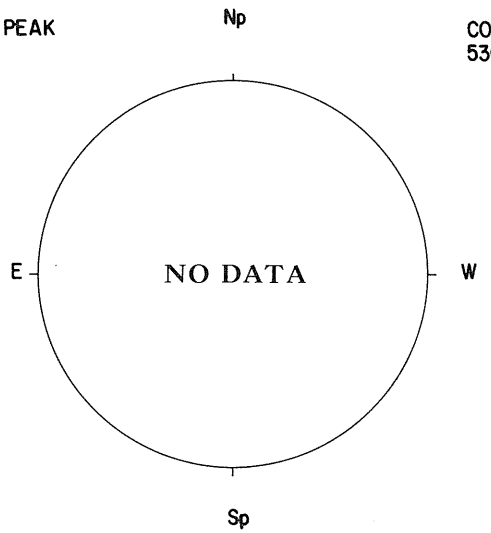
McMATH-HULBERT CALCIUM REPORT



NOVEMBER 21, 1978 (P = 19.76, B_0 = 2.13, L = 262.97)

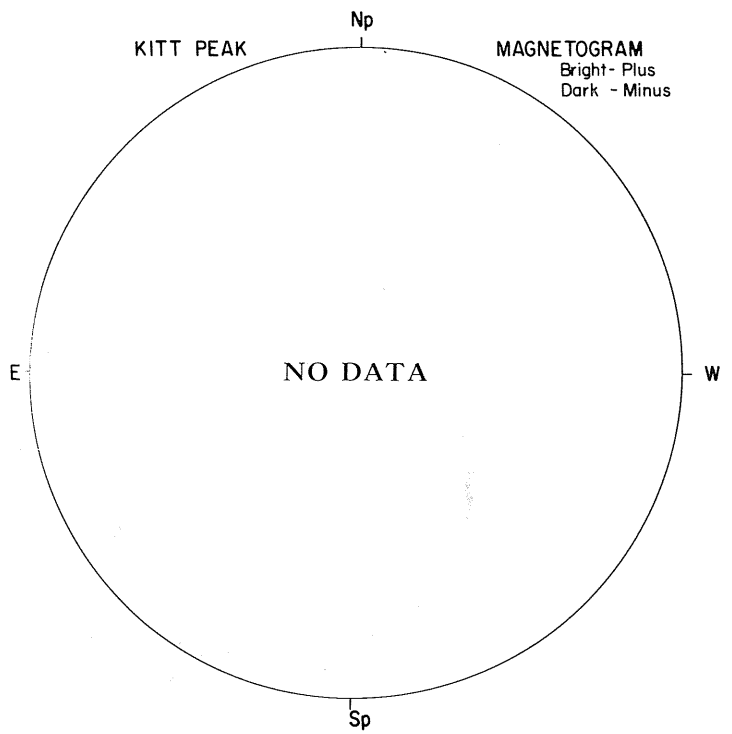
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

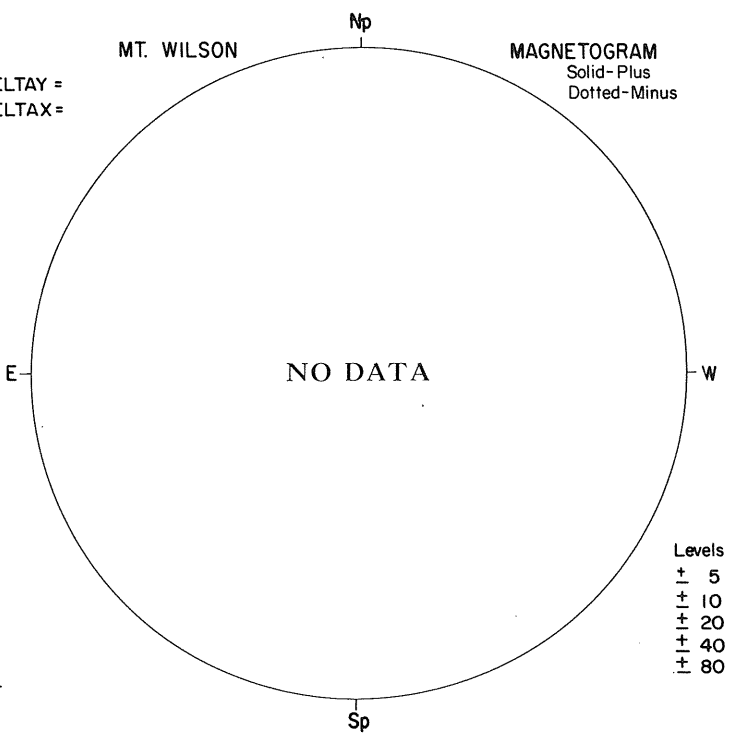
MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON

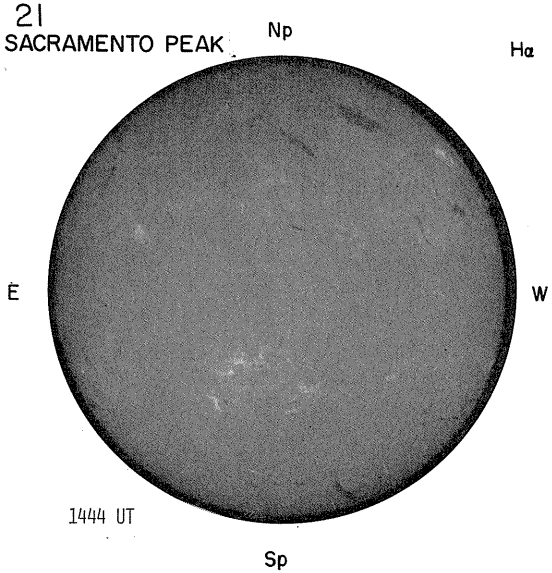
DELTAY =
DELTAX =

MAGNETOGRAM
Solid- Plus
Dotted- Minus



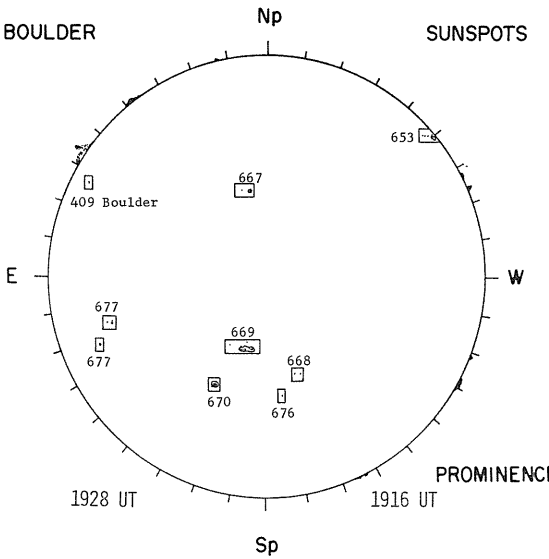
21

SACRAMENTO PEAK



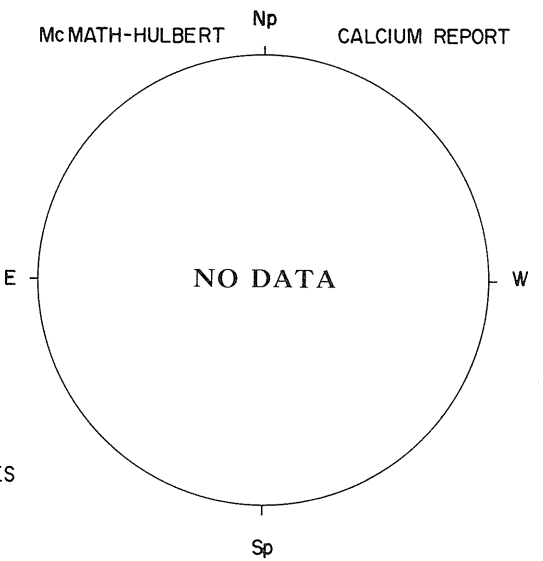
Hα

BOULDER SUNSPOTS

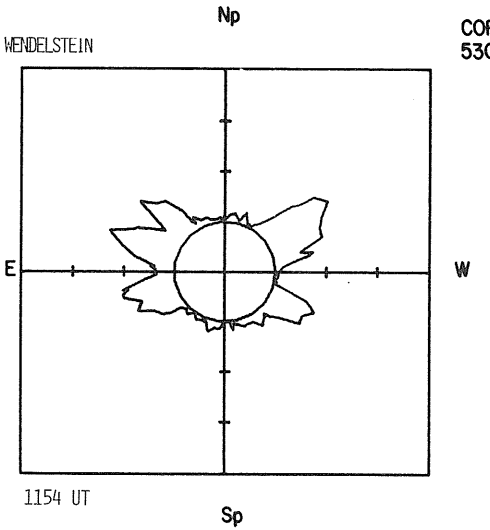


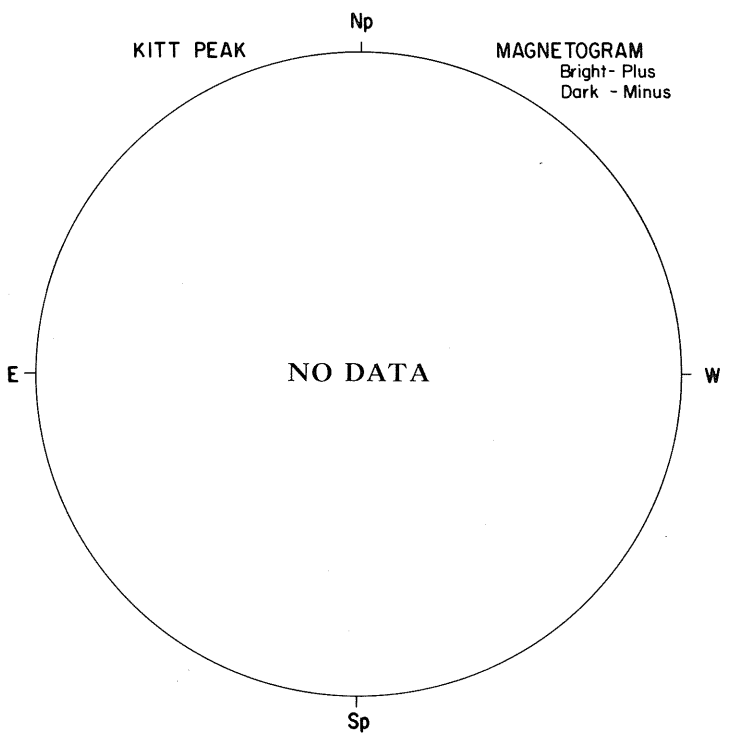
PROMINENCES

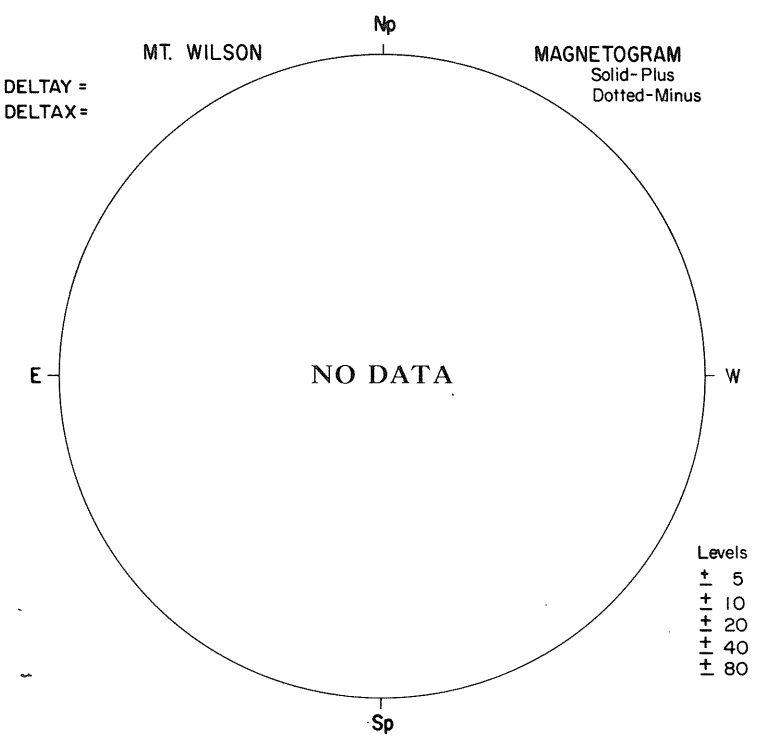
McMATH-HULBERT CALCIUM REPORT



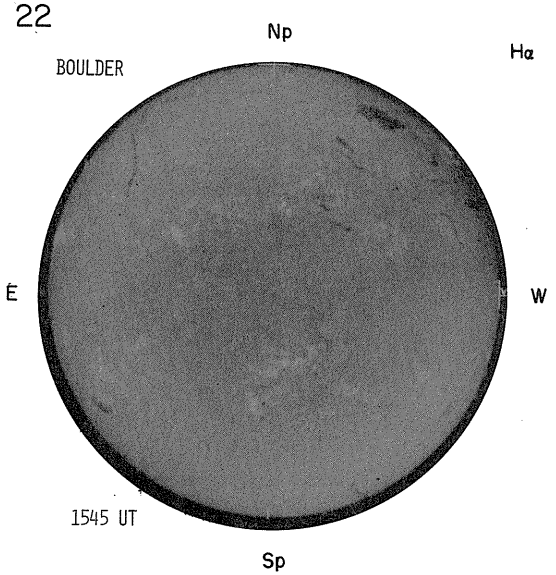
NOVEMBER 22, 1978 (P = 19.44, B_o = 2.01, L_o = 249.79)

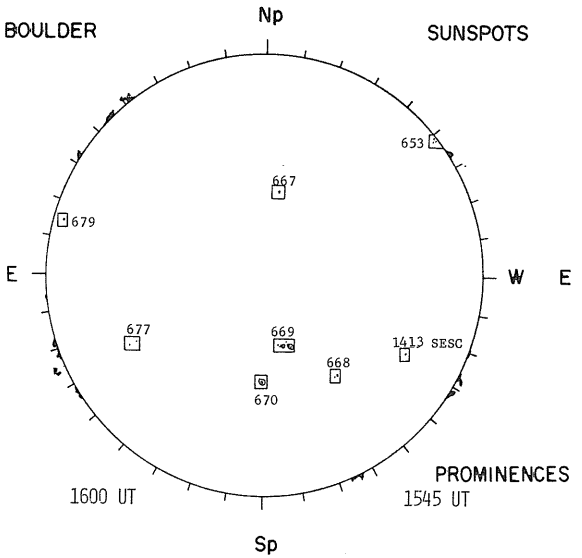


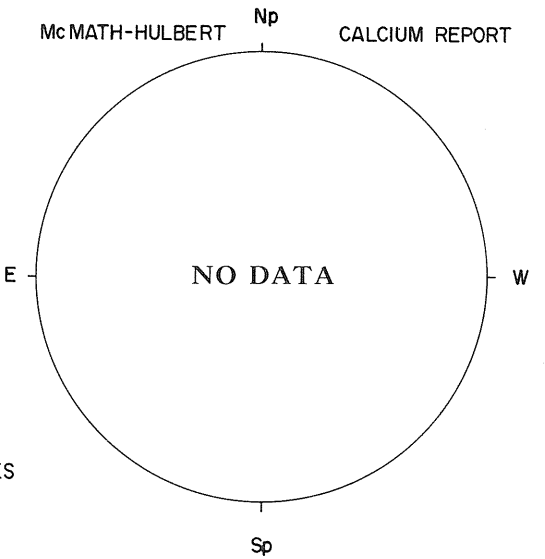




22


Np
BOULDER
Hα
E
W
1545 UT
Sp

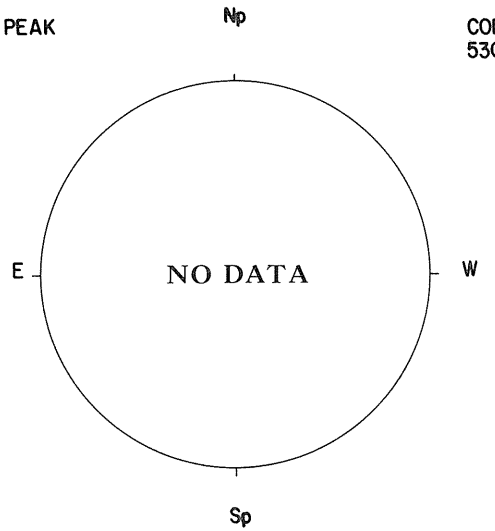

Np
BOULDER
SUNSPOTS
653
667
679
E
W
677
669
1413 SESC
668
670
PROMINENCES
1600 UT
1545 UT
Sp

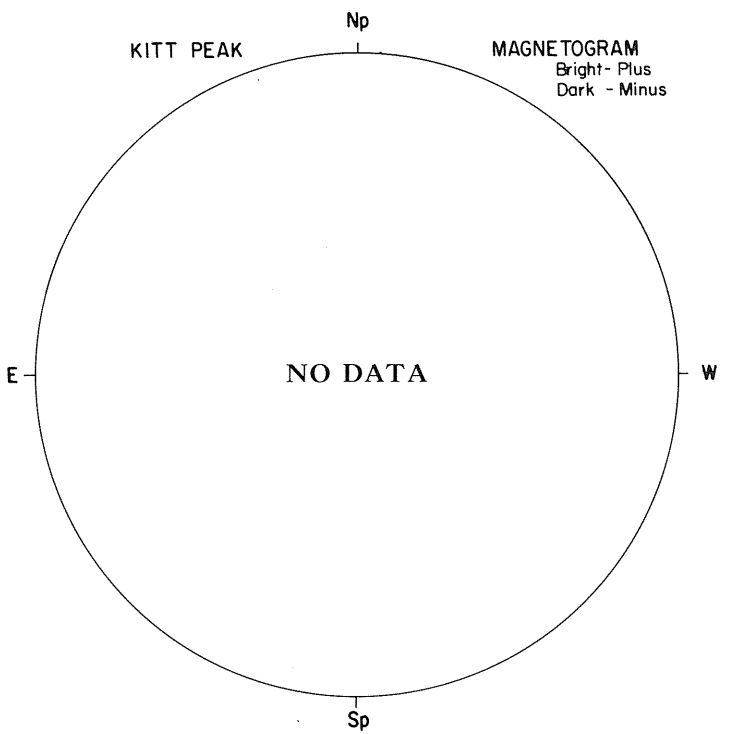

Np
McMATH-HULBERT
CALCIUM REPORT
E
NO DATA
W
Sp

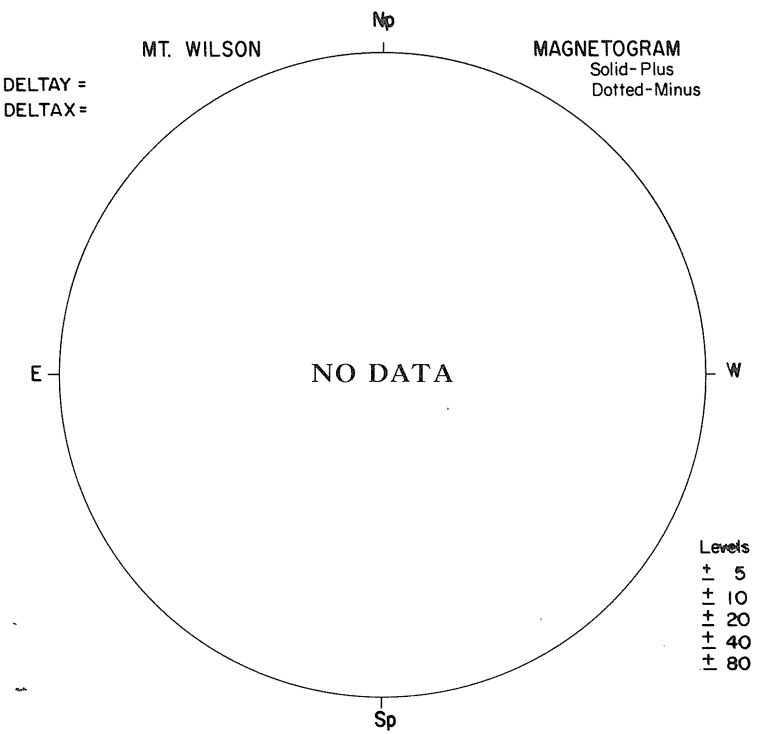
NOVEMBER 23, 1978 (P = 19.11, B_o = 1.89, L_o = 236.61)

SACRAMENTO PEAK

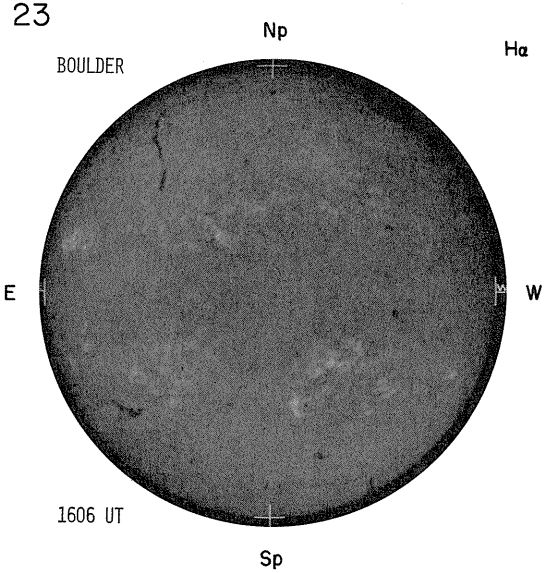
CORONA (1.15 $R_\odot$)
5303 Å

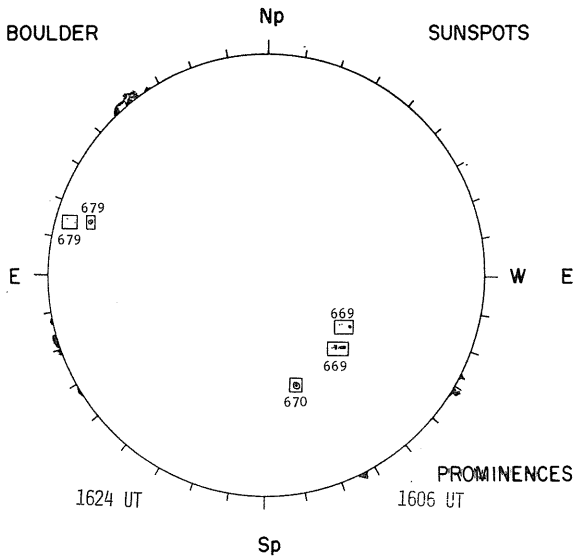


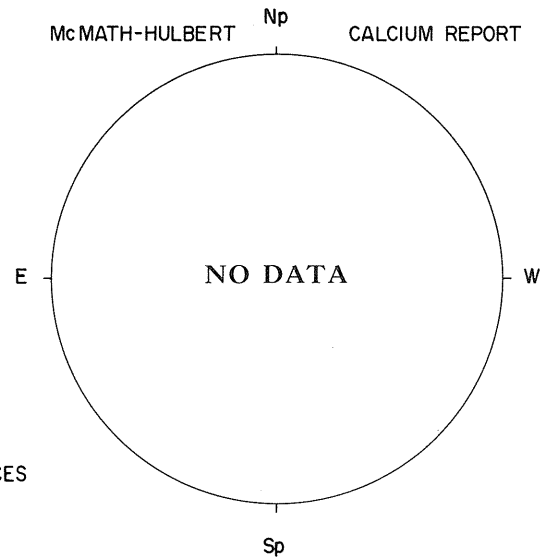




23


Np
BOULDER
Hα
E
W
1606 UT
Sp

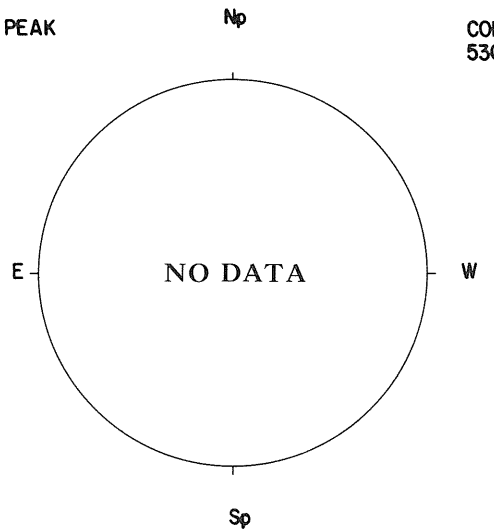

Np
BOULDER
SUNSPOTS
679
679
669
669
670
E
W
1624 UT
1606 UT
PROMINENCES
Sp

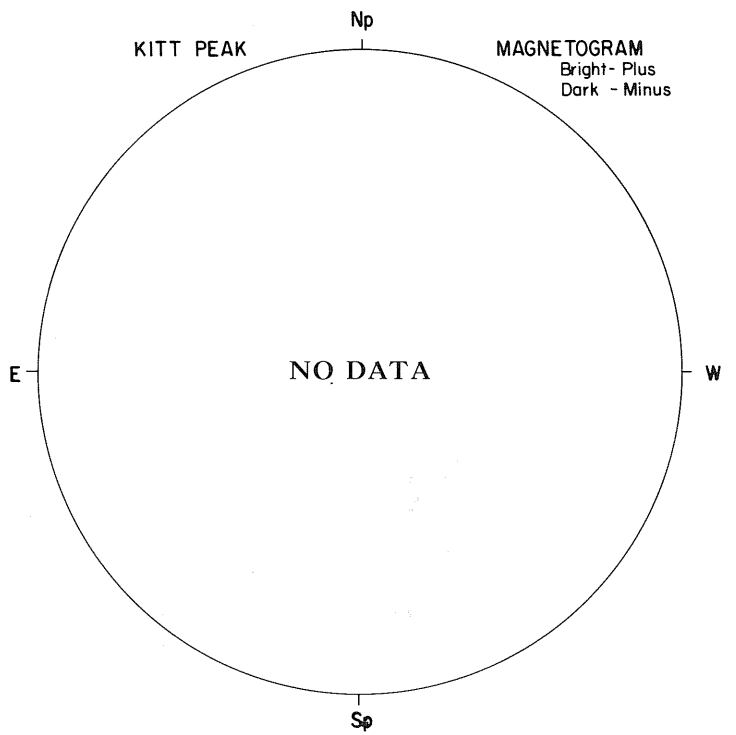

Np
McMATH-HULBERT
CALCIUM REPORT
NO DATA
E
W
Sp

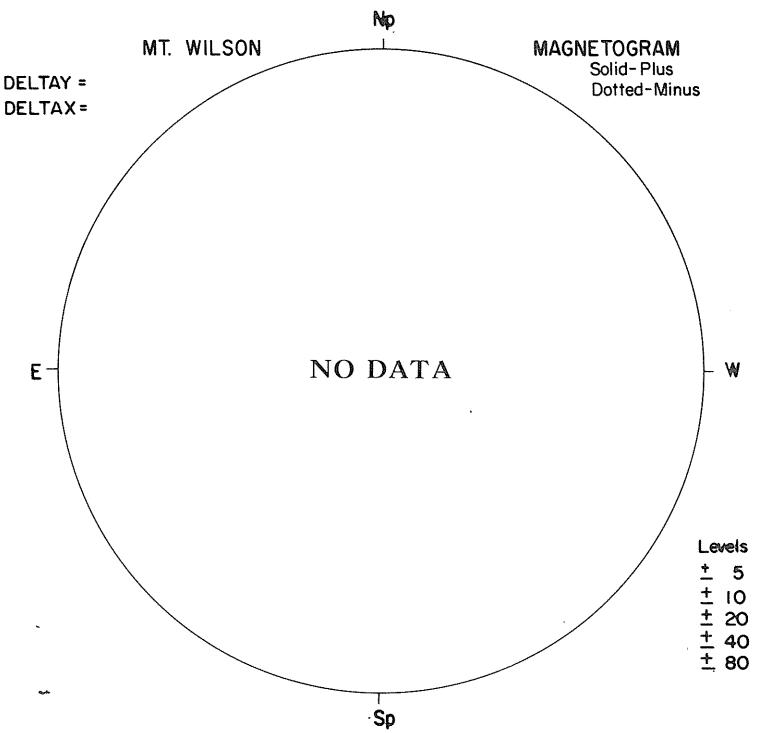
NOVEMBER 24, 1978 (P = 18.78, B_0 = 1.76, L_0 = 223.43)

SACRAMENTO PEAK

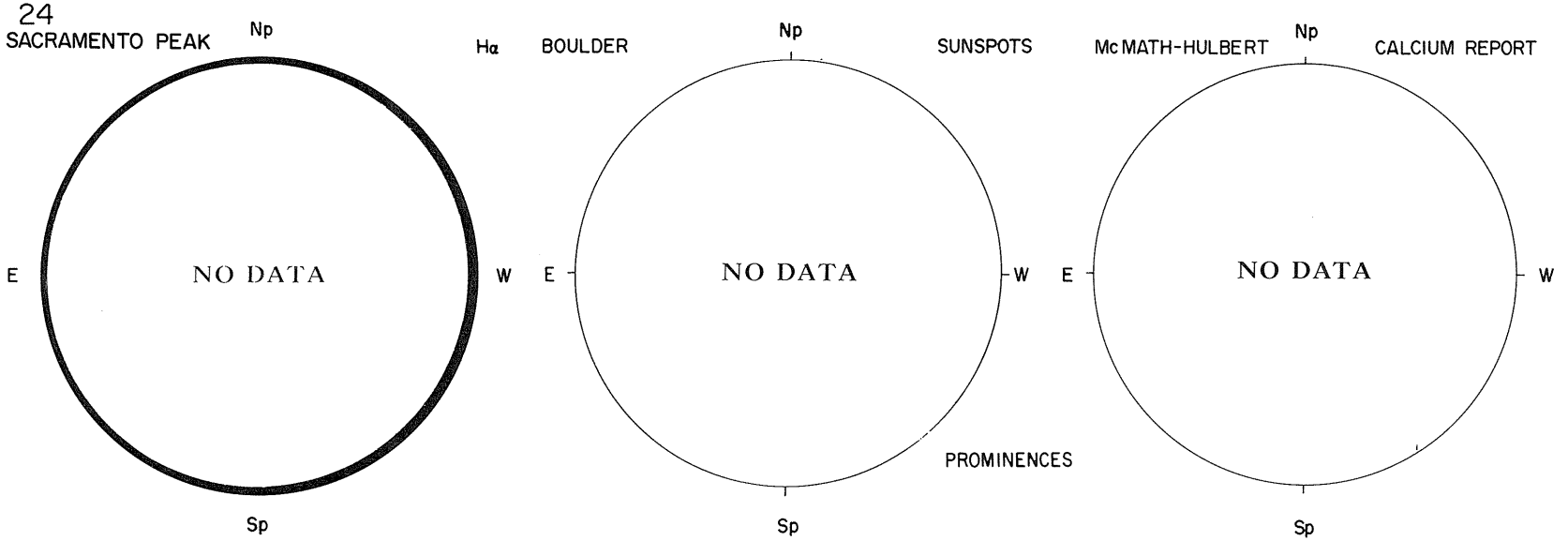
CORONA (1.15 $R_\odot$)
5303 Å



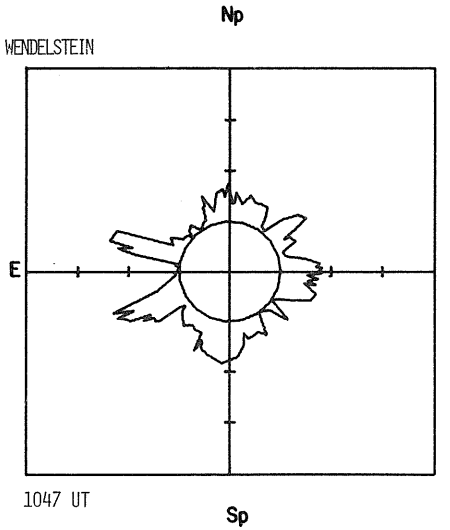


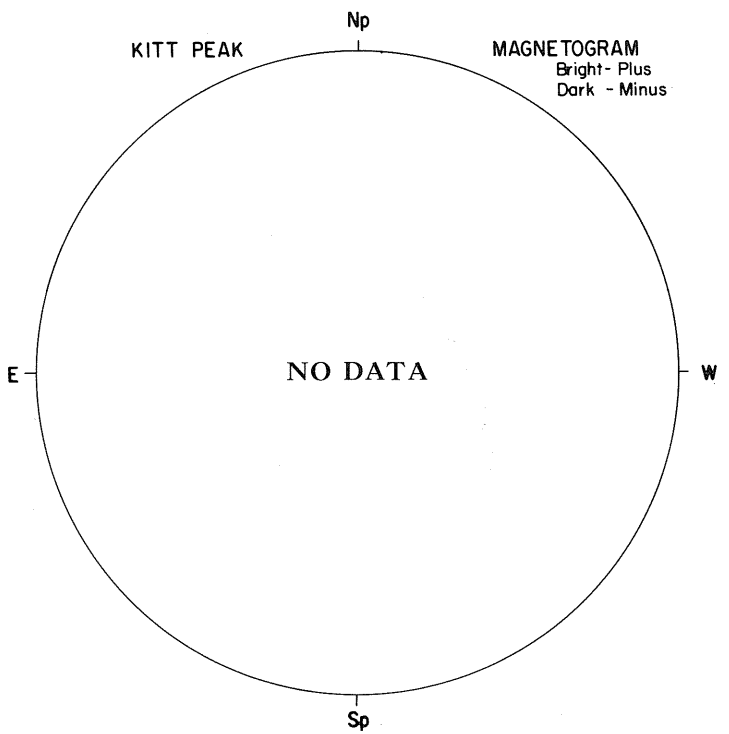


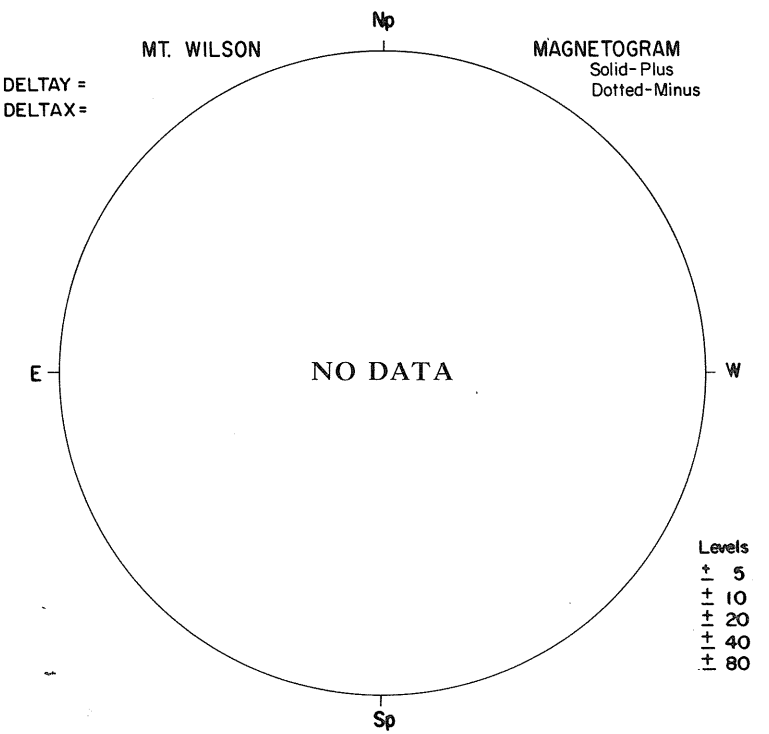
24


SACRAMENTO PEAK
Np
Hα
E
NO DATA
W
Sp
BOULDER
Np
SUNSPOTS
E
NO DATA
W
Sp
PROMINENCES
McMATH-HULBERT
Np
CALCIUM REPORT
E
NO DATA
W
Sp

NOVEMBER 25, 1978 (P = 18.44, B_o = 1.64, L_o = 210.25)

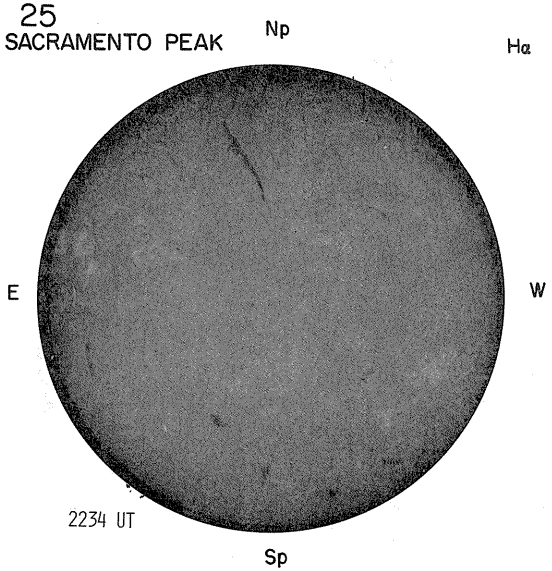




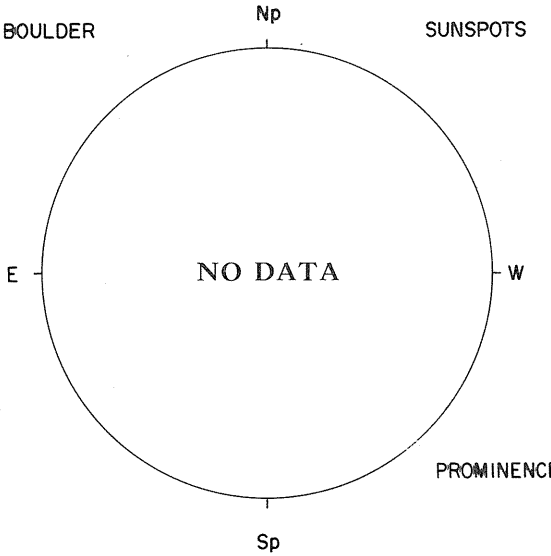


25

SACRAMENTO PEAK

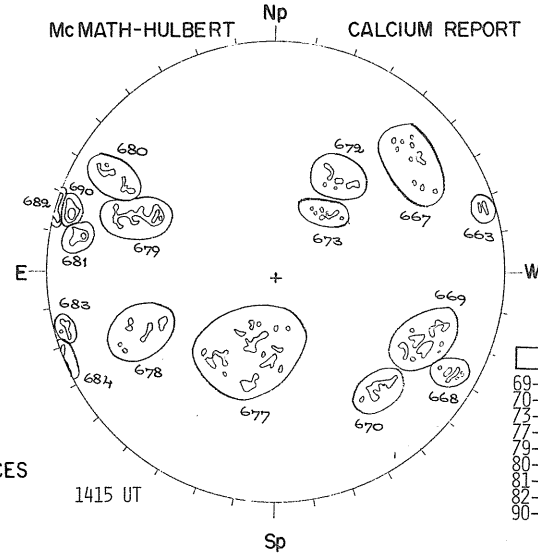


Hα BOULDER



SUNSPOTS

McMATH-HULBERT



CALCIUM REPORT

FAIR	S
69-	2000-3.0
70-	1000-3.0
73-	0800-2.5
77-	2600-2.5
79-	2000-3.0
80-	0900-2.5
81-	1100-3.5
82-	2000-2.5
90-	0800-3.0

PROMINENCES

NOVEMBER 26, 1978 (P = 18.09, B_o = 1.52, L_o = 197.07)

SACRAMENTO PEAK

Np

CORONA (1.15 $R_\odot$)
5303 Å

E W

1527 UT

Sp

KITT PEAK

Np

MAGNETOGRAM
Bright - Plus
Dark - Minus

E W

1604 UT

Sp

MT. WILSON

Np

DELTAY = 12.6
DELTAX = 9.5

MAGNETOGRAM
Solid - Plus
Dotted - Minus

E W

Levels
± 5
± 10
± 20
± 40
± 80

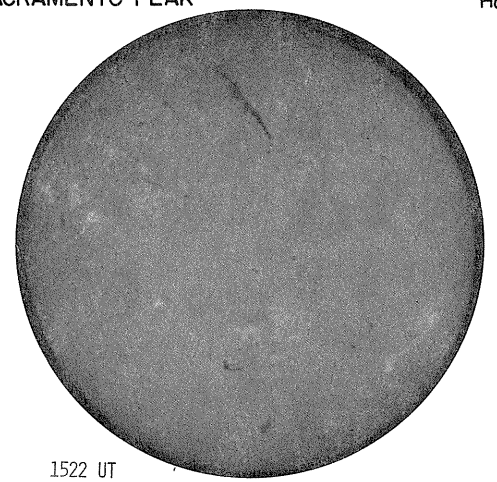
16.93-18.38 UT

Sp

26

SACRAMENTO PEAK Np

Hα



E W

1522 UT

Sp

BOULDER Np SUNSPOTS

E NO DATA W

PROMINENCES

Sp

McMATH-HULBERT Np CALCIUM REPORT

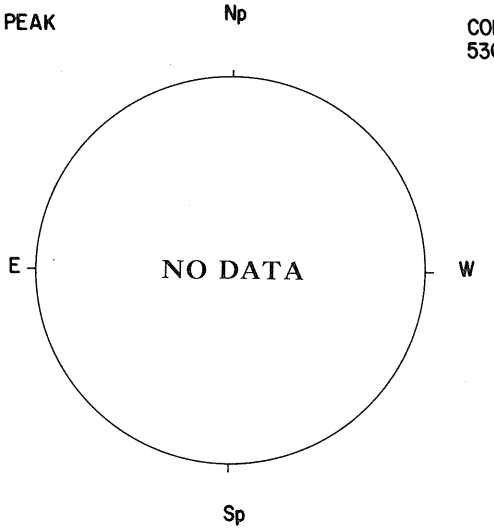
E NO DATA W

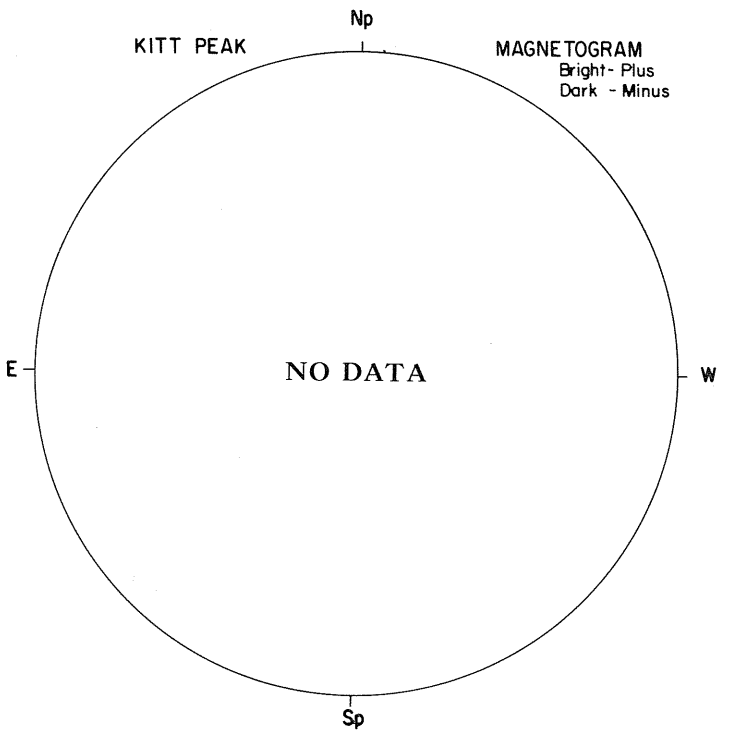
Sp

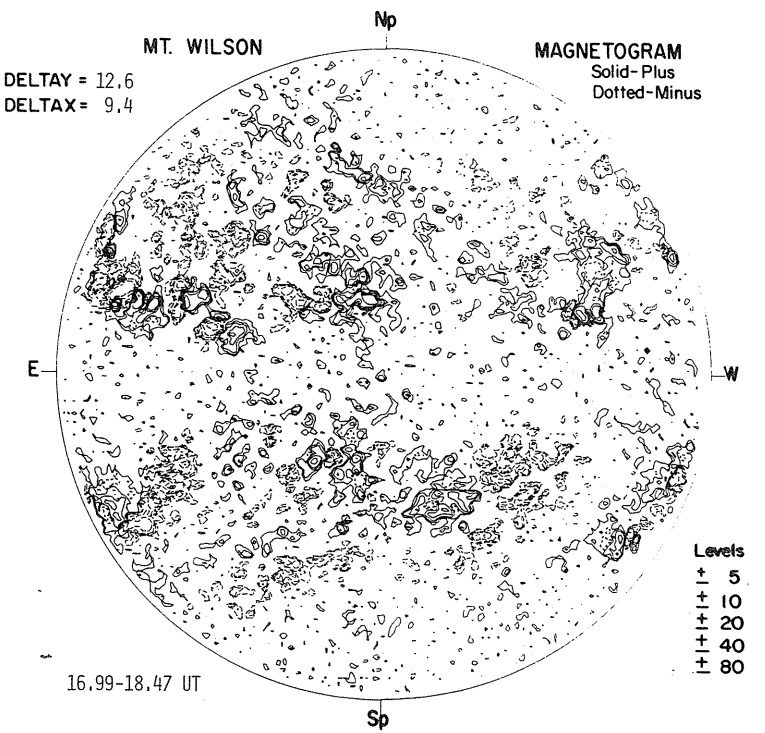
NOVEMBER 27, 1978 (P = 17.73, B_o = 1.39, L_o = 183.89)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



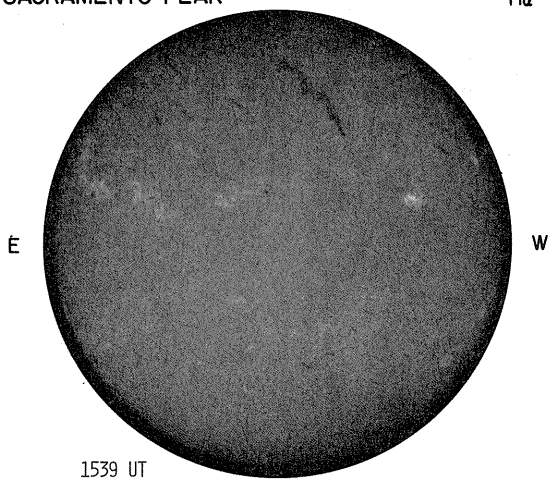




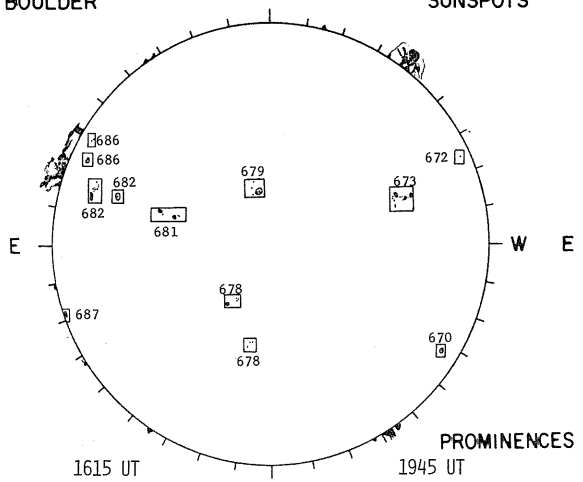
27

SACRAMENTO PEAK

Hα

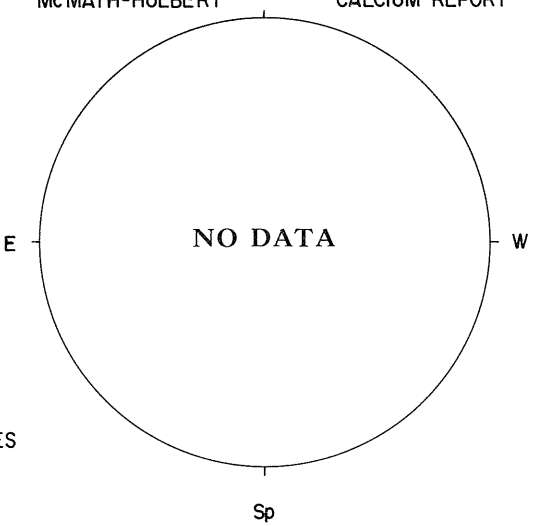


BOULDER SUNSPOTS



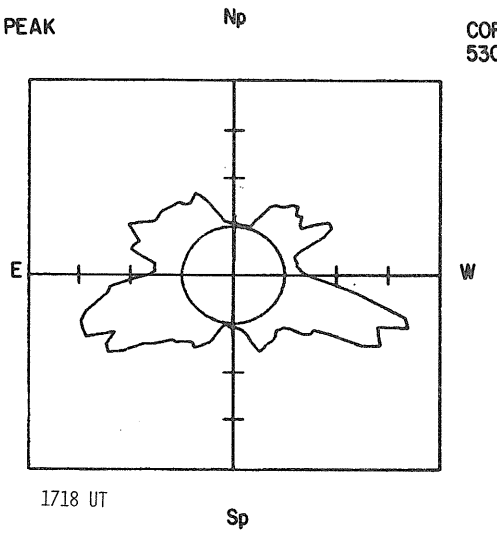
PROMINENCES

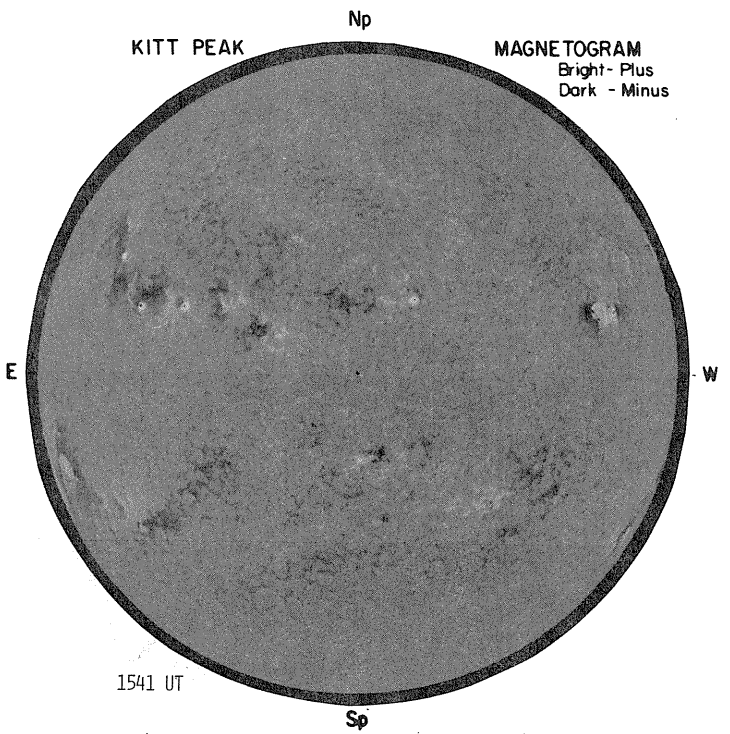
McMATH-HULBERT CALCIUM REPORT

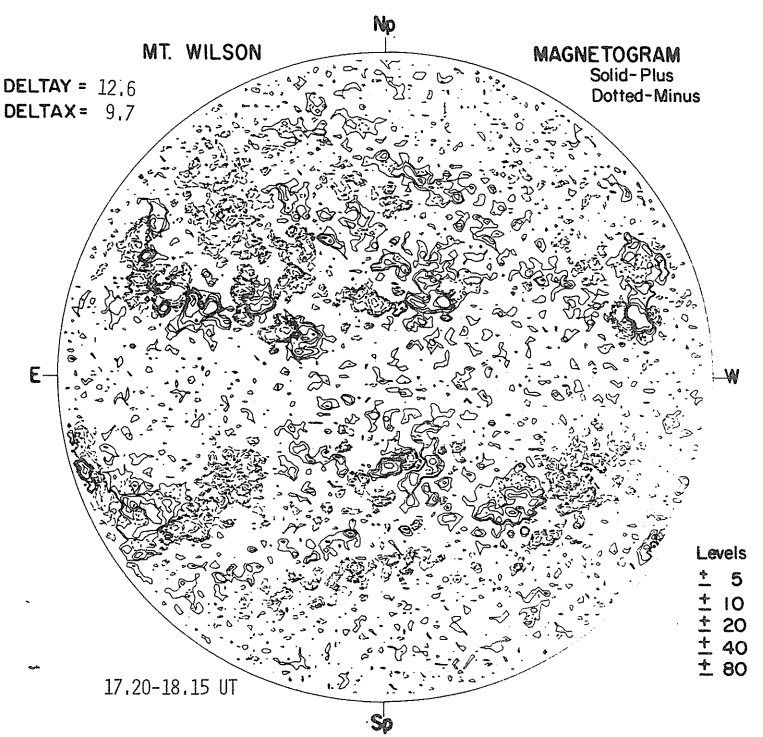


NOVEMBER 28, 1978 (P = 17.37, B_o = 1.26, L_o = 170.71)

SACRAMENTO PEAK

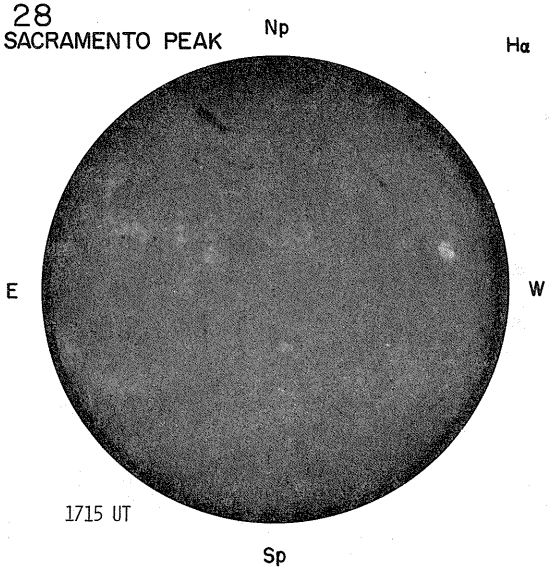






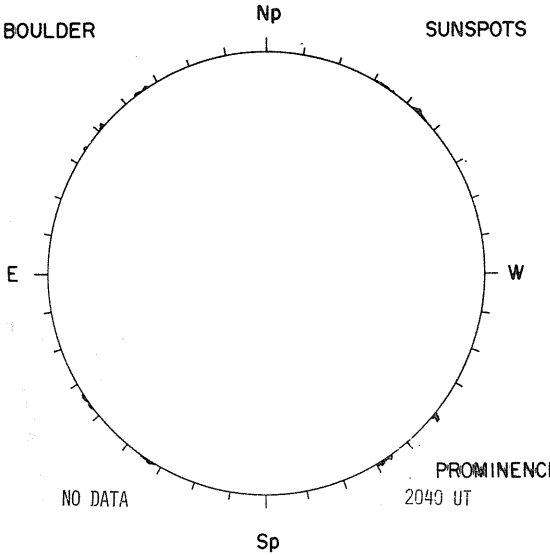
28

SACRAMENTO PEAK



1715 UT

BOULDER SUNSPOTS

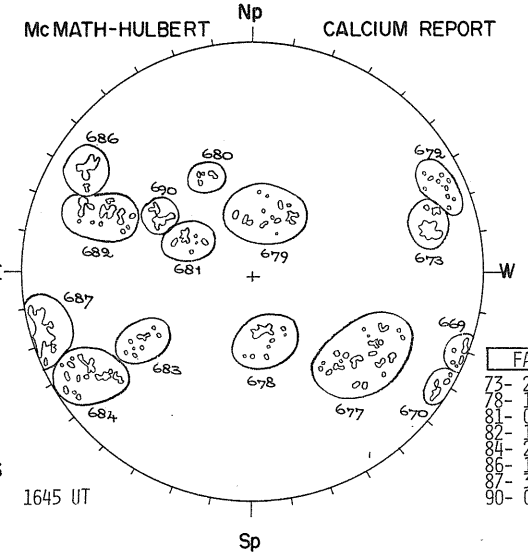


NO DATA

PROMINENCES

2040 UT

McMATH-HULBERT CALCIUM REPORT



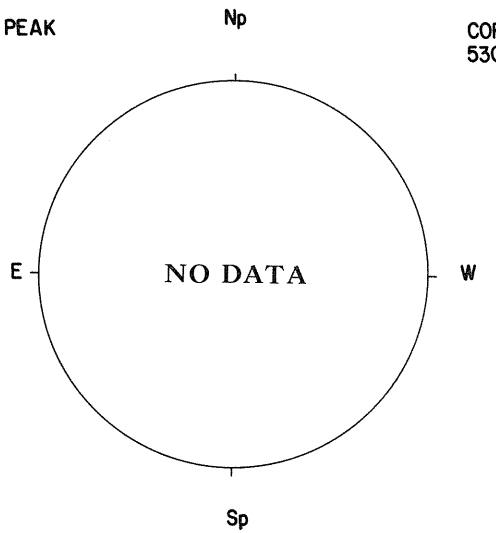
1645 UT

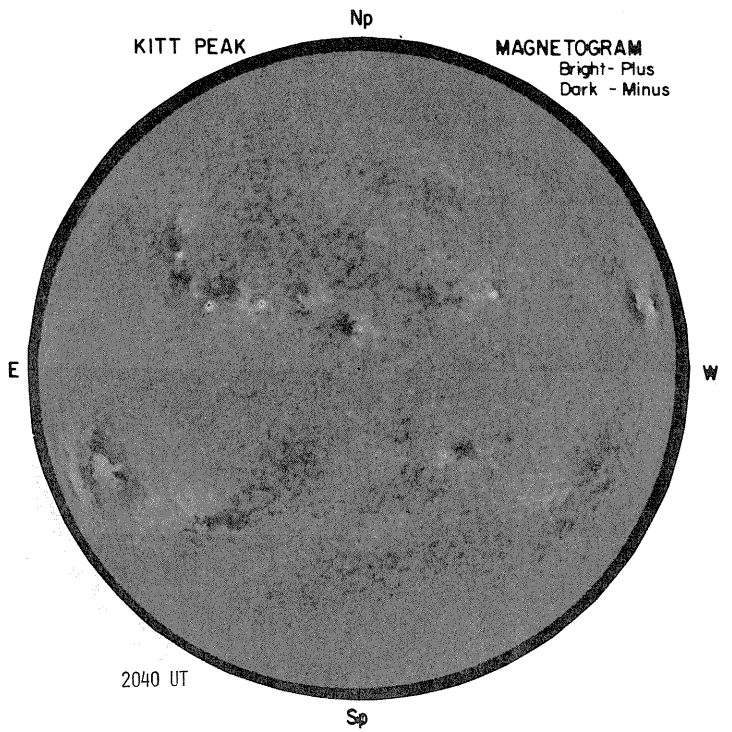
FAIR	D
73- 2000	4.0
78- 1000	2.5
81- 0800	2.5
82- 1800	3.0
84- 2300	2.5
86- 1300	3.0
87- 3300	3.0
90- 0700	2.5

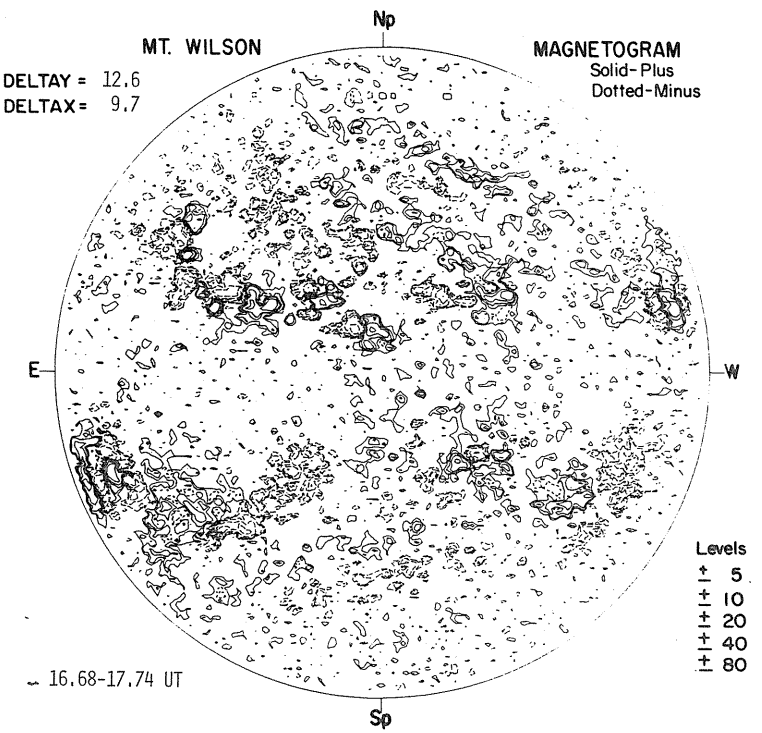
NOVEMBER 29, 1978 (P = 17.01, B_o = 1.14, L_o = 157.53)

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

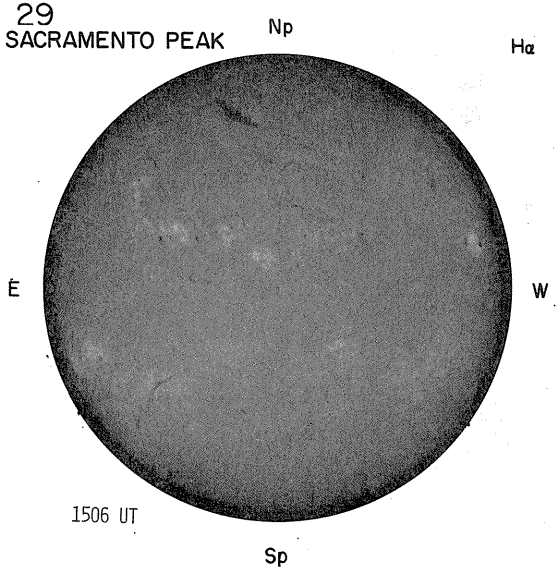






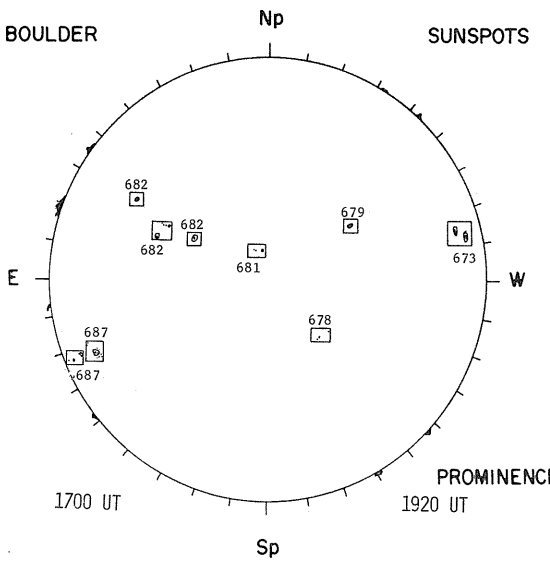
29

SACRAMENTO PEAK



Hα

BOULDER

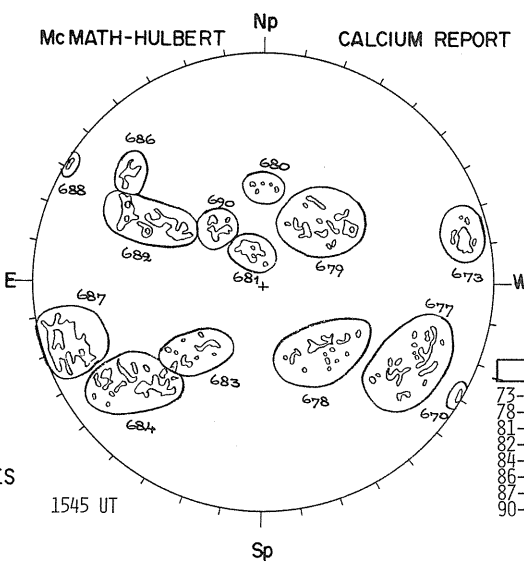


SUNSPOTS

PROMINENCES

McMATH-HULBERT

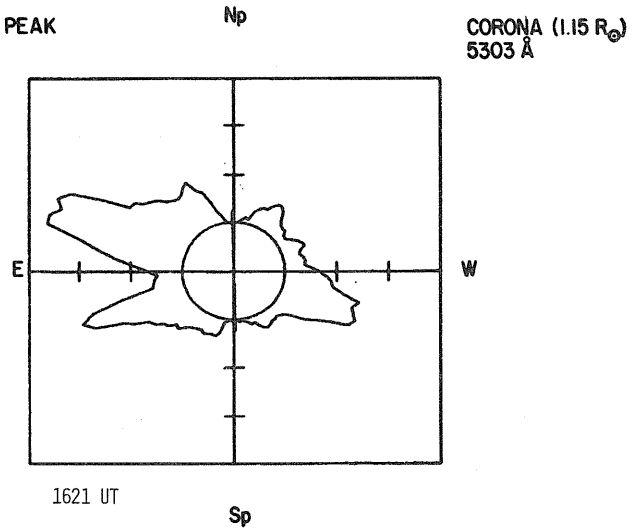
CALCIUM REPORT

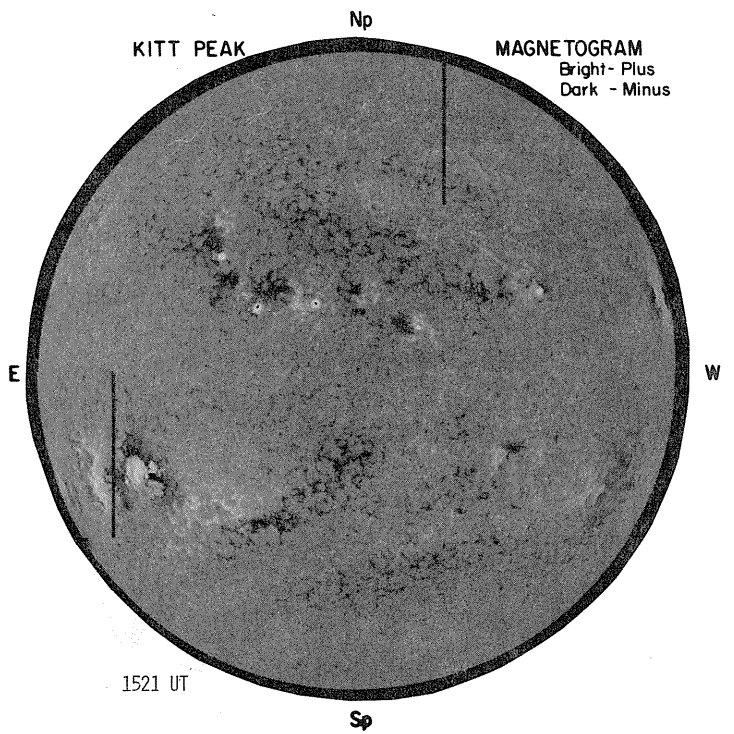


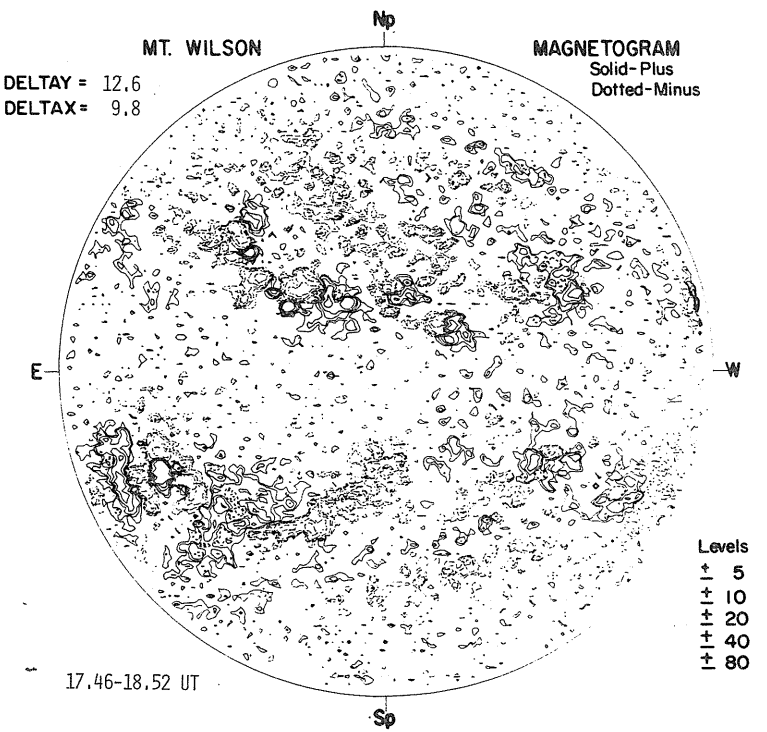
FAIR	M
73-	1800-3.0
78-	1200-2.5
81-	1000-3.0
82-	2400-3.5
84-	2800-2.5
86-	1000-3.0
87-	5000-3.5
90-	0800-3.0

NOVEMBER 30, 1978 (P = 16.63, B_o = 1.01, L_o = 144.35)

SACRAMENTO PEAK







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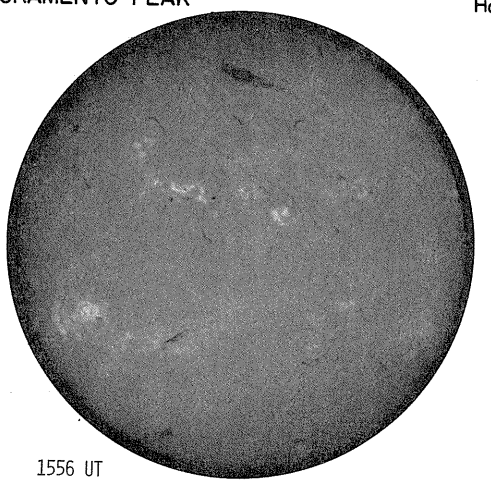
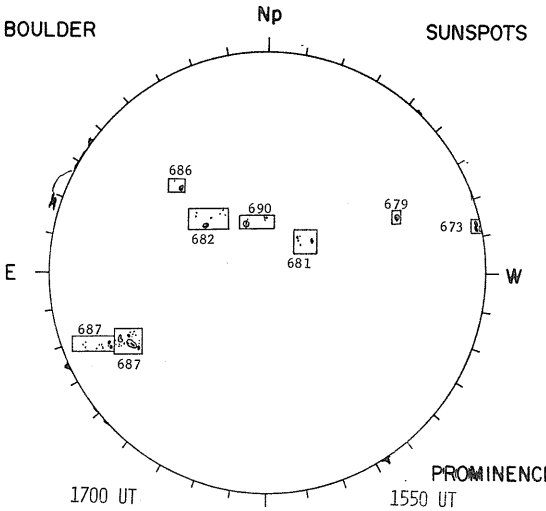
SACRAMENTO PEAK Hα



1556 UT

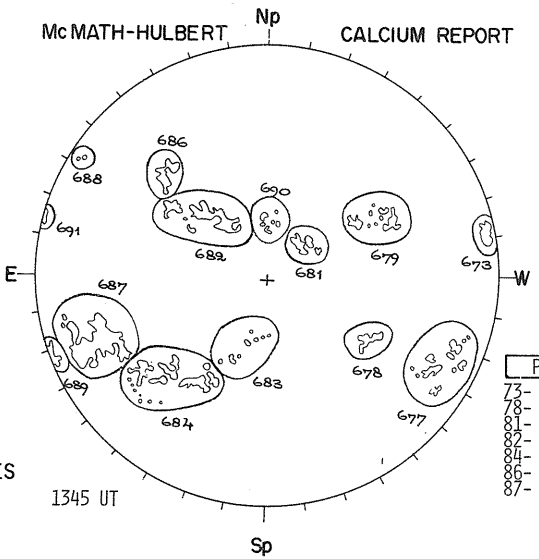
BOULDER SUNSPOTS



1700 UT 1550 UT

PROMINENCES

McMATH-HULBERT CALCIUM REPORT



1345 UT

	POOR	M
73-	1800-	3.0
78-	1000-	2.5
81-	0700-	3.0
82-	3000-	3.5
84-	2800-	2.5
86-	1000-	2.5
87-	5400-	3.5

REGIONS OF SOLAR ACTIVITY

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MCMATH REGION 15631 CMP DATE 1.9 RETURN OF REGION 15570 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	10	26	15631	S15 E88	149	2000	2.5	20280	S14 E75	163	(BF)	3				
78	10	27	15631	S13 E67	158	2200	2.0	20280	S13 E68	156	(AP)	3				
78	10	28	15631	S13 E55	157	2000	2.5	20280	S13 E53	159	(AP)	3				
78	10	29	15631	S13 E42	156	2200	3.0	20280	S13 E40	158	(BP)	4				
78	10		15631					20286	S12 E51	147	(B)	2				
78	10	30	15631	S14 E30	155	2900	3.0									
78	10	31	15631	S14 E17	156	2900	3.5									
78	11	1	15631	S14 E05	154	2900	3.0		S13 W03				B	50	4	CSO
78	11		15631						S12 E12				B	100	15	DAI
78	11	2	15631	S14 W09	154	2500	3.5	20280	S15 W13	157	(AP)	4	B	80	6	CSO
78	11		15631					20286	S11 W03	147	(B)	4	B	100	11	DAO
78	11	3	15631	S14 W22	154	2500	3.0	20280	S14 W25	156	(AP)	4	B	60	1	HSX
78	11		15631					20286	S11 W17	148	(BP)	4	B	50	15	DSO
78	11		15631					20295	S12 W33	164	(B)	3	B	30	9	CRO
78	11	4	15631	S14 W36	155	2500	3.0	20280	S14 W41	158	(AP)	3	B	50	1	HSX
78	11		15631					20286	S11 W31	148	(AP)	2	B	40	3	HSX
78	11		15631					20295	S11 W49	166	(B)	2	B	10	3	BXO
78	11	5	15631	S14 W50	155	2500	3.0		S12 W46				B	20	4	HRX
78	11		15631						S15 W54				B	20	1	HRX
78	11	6	15631						S13 W56				B	40	1	AXX
78	11		15631						S16 W67				B	50	1	HSX
78	11	7	15631	S14 W76	155	2300	2.5	20280	S14 W78	156	AP	3	B	20	1	HSX
78	11	8	15631	S14 W89	155	1200	1.0									

MCMATH REGION 15629 CMP DATE 2.3 RETURN OF REGIONS 15576 AND 15577 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	10	26	15629	N29 E85	152	900	2.0	20281	N28 E85	153	AP	3				
78	10	27	15629	N29 E72	153	800	1.5	20281	N29 E75	149	(AP)	3				
78	10	28	15629	N30 E60	152	600	2.0	20281	N29 E57	155	(AP)	3				
78	10	29	15629	N30 E46	152	800	2.0	20281	N29 E44	154	(AP)	2				
78	10	30	15629	N31 E34	151	1100	2.0									
78	10	31	15629	N31 E22	151	1100	2.0									
78	11	1	15629	N31 E10	149	1000	1.5									
78	11	2	15629	N30 E00	145	1000	1.5	20292	N27 E04	140	(B)	3	B	20	4	CRO
78	11	3	15629	N30 W12	144	1100	1.5		N26 W11				B	10	1	AXX
78	11	4	15629	N30 W25	144	1000	1.5									
78	11	5	15629	N30 W36	141	1000	1.5									
78	11	7	15629	N30 W62	141	700	1.0									

MCMATH REGION 15630 CMP DATE 2.3 RETURN OF REGION 15569 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	10	26	15630	N14 E88	149	600	1.5									
78	10	27	15630	N16 E76	149	800	1.5									
78	10	28	15630	N16 E63	149	600	2.0									
78	10	29	15630	N16 E50	148	600	2.0									
78	10	30	15630	N16 E36	149	600	2.0									
78	10	31	15630	N16 E22	151	600	2.0									
78	11	1	15630	N16 E09	150	1000	2.0		N14 W01				B	30	6	CRO
78	11	2	15630	N16 W06	151	1400	3.0	20291	N13 W17	161	(B)	3	B	70	17	DAI
78	11	3	15630	N16 W20	152	1600	3.0	20291	N13 W30	161	(B)	3	B	70	13	DRO
78	11		15630					20296	N12 W15	146	(AP)	3	B	10	1	AXX
78	11	4	15630	N16 W33	152	1600	3.0	20291	N14 W45	162	(B)	2	B	20	7	CRO
78	11	5	15630	N16 W45	150	1700	3.0									
78	11	7	15630	N16 W72	151	1800	2.0									

MCMATH REGION 15632 CMP DATE 3.0

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	10	28	15632	N08 E70	142	100	1.5									
78	10	29	15632	N08 E57	141	100	1.5									
78	10	30	15632	N09 E44	141	100	1.0									

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MCMATH REGION 15650 CMP DATE 3.3

				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	11	8	15650	N05 W70	136	100	1.0									

MCMATH REGION 15636 CMP DATE 4.2

				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	10	30	15636	N07 E65	120	100	2.0									
78	10	31	15636	N07 E52	121	300	2.0									
78	11	1	15636	N07 E37	122	300	1.5		N06 E33				B	10	1	HRX
78	11	2	15636	N07 E22	123	100	1.0									
78	11	3	15636	N07 E08	124	100	1.0									
78	11	4	15636	N07 W04	123	300	1.5									
78	11	5	15636	N07 W18	123	200	1.0									

MCMATH REGION 15635 CMP DATE 4.7 RETURN OF REGION 15582 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	10	29	15635	S22 E79	119	1800	2.5	20287	S22 E71	127	(B)	2				
78	10	30	15635	S24 E70	115	4000	2.5									
78	10	31	15635	S24 E58	115	4700	3.0									
78	11	1	15635	S24 E45	114	5600	3.5		S24 E37				B	210	10	EAI
78	11	2	15635	S24 E31	114	6000	4.0	20287	S20 E19	125	(BY)	4	B	180	24	DAI
78	11		15635					20293	S25 E23	116	(BY)	3	B	260	33	FAI
78	11	3	15635	S24 E17	115	6500	3.5	20287	S20 E06	125	(BY)	5	B	250	23	DKI
78	11		15635					20293	S24 E17	114	(BY)	3	B	280	59	FSI
78	11	4	15635	S24 E02	117	6500	3.0	20287	S19 W10	127	(BY)	4	B	140	10	DSI
78	11		15635					20293	S24 E02	115	(B)	3	B	90	31	FSI
78	11	5	15635	S23 W10	115	6500	3.0		S19 W22				B	200	15	DAI
78	11		15635						S25 W10				B	70	21	FSI
78	11	6	15635						S25 W23				B	80	8	BXO
78	11		15635						S19 W35				B	170	7	DAI
78	11	7	15635	S24 W36	115	6600	3.0	20287	S19 W47	125	(B)	3	B	120	14	DSI
78	11		15635						S24 W35				B	30	5	BXO
78	11	8	15635	S24 W50	116	7000	3.0	20287	S19 W58	123	(B)	1	B	50	5	BXI
78	11		15635					20303	S24 W45	110	(AF)	2				
78	11	9	15635	S25 W62	115	7000	3.0	20305	S26 W58	109	AF	3				
78	11	10	15635	S26 W75	115	5500	3.0		S24 W75				M	30	2	BXO
78	11	11	15635	S26 W88	114	2000	1.0									

MCMATH REGION 15645 CMP DATE 6.4

				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	11	5	15645	S21 E11	94	400	2.5		S22 E09				B	10	3	BXO
78	11	6	15645						S21 W03				B	80	8	BXI
78	11	7	15645	S22 W15	94	1000	2.5	20299	S22 W17	95	(B)	3	B	70	7	CRO
78	11	8	15645	S22 W28	94	1000	2.5	20299	S23 W29	94	(AP)	2	B	40	2	CSO
78	11	9	15645	S23 W40	93	900	2.5									
78	11	10	15645	S23 W53	93	900	2.5									
78	11	11	15645	S23 W66	92	600	1.5									

MCMATH REGION 15656 CMP DATE 7.2

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	11	15656	N24 W58	84	100	1.5									

MCMATH REGION 15641 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	11	2	15641	S13 E70	75	900	3.5	20294	S13 E65	79	(AP)	3	B	20	3	CSO
78	11	3	15641	S13 E56	76	1300	3.5	20294	S12 E55	76	(B)	4	B	240	18	DSC
78	11	4	15641	S13 E42	77	2000	3.5	20294	S12 E39	78	(B)	5	B	720	21	EHI
78	11	5	15641	S13 E28	77	3000	3.0		S12 E25				B	650	26	EHO
78	11	6	15641						S11 E12				B	740	16	FKI

CONTD

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MCMATH REGION 15641 (CONT) 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	11	7	15641	S13 E04	75	3400	3.0	20294	S11 W01	79	(B)	4	B	630	32	EKI
78	11	8	15641	S13 W10	76	3600	3.5	20294	S11 W13	78	(BY)	4	B	730	31	FKI
78	11	9	15641	S14 W23	76	4000	3.5	20294	S12 W28	79	(BY)	4	B	790	39	FKI
78	11	10	15641	S14 W36	76	4000	3.5		S12 W28				M	870	40	FKI
78	11	11	15641	S14 W51	77	4000	3.5		S12 W40				M	870	35	FKC
78	11	12	15641						S12 W58				M	940	24	FKI
78	11	13	15641						S14 W79				B	460	11	FKI
78	11	14	15641	S12 W88	76	500	1.0									

MCMATH REGION 15655 CMP DATE 8.3

				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	11	10	15655	N19 W30	70	100	1.5		N24 W34				M	10	1	AXX
78	11	11	15655	N19 W44	70	100	1.5									

MCMATH REGION 15639 CMP DATE 8.5 RETURN OF REGION 15580 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	11	2	15639	N37 E73	72	600	1.0									
78	11	3	15639	N37 E60	72	600	1.0									
78	11	4	15639	N37 E47	72	800	1.5									
78	11	5	15639	N38 E32	73	800	1.0									
78	11	7	15639	N38 E13	66	600	1.5									
78	11	8	15639	N38 E02	64	400	1.5									
78	11	9	15639	N37 W10	63	300	1.0		N24 W30							
78	11	10	15639	N37 W23	63	300	1.0									
78	11	11	15639	N36 W37	63	400	1.5									

MCMATH REGION 15642 CMP DATE 9.7 RETURN OF REGION 15587 ROTATIONS 3 AND 4

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	3	15642	S21 E82	50	500	1.0									
78	11	4	15642	S22 E72	47	1200	2.0									
78	11	5	15642	S22 E52	53	1800	2.5									
78	11	7	15642	S22 E28	51	1900	2.5									
78	11	8	15642	S22 E15	51	2200	2.5	20304	S18 E22	43	(B)	2	B	20	4	BXO
78	11	9	15642	S22 E02	51	2200	2.5	20304	S19 E05	46	(AP)	2	B	10	1	AXX
78	11	10	15642	S22 W14	54	2000	2.0									
78	11	11	15642	S23 W26	52	2100	2.0									
78	11	14	15642	S22 W57	45	2000	2.0									
78	11	15	15642	S22 W72	43	1700	2.0									
78	11	16	15642	S23 W82	44	800	1.0									

MCMATH REGION 15643 CMP DATE 10.5 RETURN OF REGION 15589 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	11	3	15643	N17 E87	45	800	2.0	20297	N17 E80	51	AP	5	B	250	2	HHX
78	11	4	15643	N18 E80	39	3000	3.5	20297	N16 E68	49	(BP)	5	B	470	3	CHO
78	11	5	15643	N18 E62	43	3500	3.5		N17 E62				B	560	3	FHO
78	11	6	15643						N19 E48				B	460	3	EHO
78	11	7	15643	N19 E38	41	4500	3.0	20297	N17 E29	49	(BP)	5	B	390	11	FHO
78	11		15643					20300	N18 E41	37	(AP)	3				
78	11	8	15643	N20 E26	40	4500	3.5	20297	N18 E17	48	(BY)	5	B	430	17	DHI
78	11		15643					20300	N20 E27	38	(AP)	4	B	30	1	HSX
78	11	9	15643	N20 E13	40	4300	3.5	20297	N20 E07	44	(BP)	4	B	560	17	EHI
78	11	10	15643	N20 W01	41	4300	3.5		N19 E04				M	460	27	EHI
78	11	11	15643	N19 W15	41	4400	3.0		N19 W08				M	400	29	EHI
78	11	13	15643						N18 W49				B	640	15	EKI
78	11	14	15643	N20 W60	48	4100	3.0	20297	N18 W63	50	(BP)	3	M	620	11	EHI
78	11	15	15643	N19 W75	46	2700	3.0	20297	N20 W74	48	BP	4	B	240	5	ESO
78	11	16	15643	N20 W85	47	2100	3.0		N21 W68				B	10	1	HRX

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MCMATH REGION 15646 CMP DATE 11.6 RETURN OF PART OF REGION 15591 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	5	15646	S20 E78	27	500	1.0
78	11	7	15646	S20 E53	26	700	2.0
78	11	8	15646	S20 E40	26	500	1.5
78	11	9	15646	S20 E27	26	500	1.5
78	11	10	15646	S20 E14	26	400	1.0
78	11	11	15646	S20 E00	26	300	1.0

SUNSPOT DATA

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

MCMATH REGION 15648 CMP DATE 12.0

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	7	15648	N17 E60	19	200	1.0
78	11	8	15648	N17 E48	18	300	1.0
78	11	9	15648	N17 E34	19	200	1.0
78	11	10	15648	N17 E19	21	100	1.0

SUNSPOT DATA

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

MCMATH REGION 15647 CMP DATE 13.2 RETURN OF PART OF REGION 15591 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	7	15647	S23 E74	5	2500	2.5
78	11	8	15647	S24 E62	4	2800	2.0
78	11	9	15647	S24 E50	3	2100	2.0
78	11	10	15647	S24 E37	3	2100	2.0
78	11	11	15647	S24 E24	2	1700	2.0
78	11	12	15647				
78	11	13	15647				
78	11	14	15647	S23 W18	6	2000	2.5
78	11	15	15647	S23 W34	5	1800	2.5
78	11	16	15647	S23 W44	6	1600	2.5
78	11	17	15647	S23 W60	4	1300	2.5
78	11	18	15647				

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20301	S22 E68	10	(AP)	3	B	120	2	CSO
20301	S19 E54	11	(AP)	4	B	130	1	HHX
20301	S21 E43	8	(AP)	4	B	170	1	HHX
	S20 E40				M	110	1	HSX
	S20 E28				M	110	1	HSX
	S20 E13				M	140	1	HSX
	S20 W09				B	160	1	HHX
20301	S21 W22	9	(BP)	4	M	180	3	CSO
20301	S21 W34	8	(AP)	4	B	190	1	HHX
20301	S21 W47	8	(AP)	4	B	200	4	CHO
20301	S21 W59	6	(AP)	4	B	260	5	HKX
20301	S22 W72	6	(AP)	4	B	200	5	HKX

MCMATH REGION 15660 CMP DATE 13.2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	14	15660	N25 W19	7	500	2.0
78	11	15	15660	N25 W36	7	400	2.0
78	11	16	15660	N25 W46	8	400	2.0
78	11	17	15660	N25 W62	6	300	1.5

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20306	N24 W17	4	AP	3	M	10	1	AXX

MCMATH REGION 15649 CMP DATE 14.3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	07	15649				
78	11	08	15649				
78	11	09	15649	N31 E63	351	200	2.0

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20302	N30 E83	356	AP	3	B	10	1	AXX
20302	N32 E70	356	(AP)	3	B	20	1	HRX
20302	N29 E56	356	(AP)	4	B	20	1	HRX

MCMATH REGION 15651 CMP DATE 14.5

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	11	8	15651	N24 E80	347	700	2.0
78	11	9	15651	N24 E67	347	400	2.0
78	11	10	15651	N24 E51	350	300	2.5
78	11	11	15651	N24 E38	349	600	2.5
78	11	14	15651	N25 W02	350	1000	2.0
78	11	15	15651	N24 W18	349	1400	2.5
78	11	16	15651	N24 W27	349	1600	3.0
78	11	17	15651	N24 W44	348	1600	3.0
78	11	18	15651				
78	11		15651				
78	11	19	15651	N24 W65	347	1600	3.0
78	11		15651				
78	11	20	15651				

SUNSPOT DATA

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
20307	N24 W03	350	(B)	4	M	80	7	DSO
20307	N24 W16	350	(B)	3	B	140	18	DAI
20307	N24 W28	349	(B)	4	B	130	11	DAI
20307	N23 W42	349	(B)	4	B	120	11	CAO
20307	N22 W53	347	(BP)	4	B	200	14	EAO
20316	N22 W46	340	(B)	3				
20307	N22 W69	350	(AP)	4	B	120	4	CAO
20316	N22 W60	341	(B)	3				
	N24 W78				R	120	3	CSO

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MCMATH REGION 15671 CMP DATE 14.9

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	11	16	15671	S17 W22	344	100	2.0	20310	S18 W22	343	B	1	B	10	2	BXO
78	11	17	15671	S17 W39	343	1200	2.5	20310	S17 W37	344	(BP)	3	B	50	8	CRO
78	11	18	15671					20310	S17 W53	347	(AP)	3	B	20	2	AXX
78	11	19	15671	S17 W61	343	700	2.5	20310	S17 W66	347	(AP)	3				

MCMATH REGION 15657 CMP DATE 15.4 RETURN OF REGION 15601 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	11	10	15657	S31 E66	335	200	1.0									
78	11	11	15657	S31 E50	337	200	1.0									
78	11	14	15657	S32 E10	338	200	1.0									
78	11	15	15657	S31 W05	336	100	1.0									
78	11	16	15657	S31 W15	337	100	1.5									
78	11	17	15657	S31 W30	334	100	1.5									
78	11	19	15657	S31 W51	333	200	1.0									

MCMATH REGION 15652 CMP DATE 15.8 RETURN OF REGION 15617 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	11	9	15652	N15 E88	326	300	1.0									
78	11	10	15652	N14 E72	329	500	1.5									
78	11	11	15652	N14 E55	332	200	1.0									

MCMATH REGION 15654 CMP DATE 15.8

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	11	9	15654	S20 E86	328	900	2.5									
78	11	10	15654	S20 E73	328	1100	2.0									
78	11	11	15654	S20 E56	331	1300	2.0									
78	11	12	15654						S19 E47				M	10	3	BXO
78	11	14	15654	S18 E15	333	1300	2.0	20308	S18 E14	333	(AP)	2	M	0	1	AXX
78	11	15	15654	S18 W01	332	1000	2.0									
78	11	16	15654	S18 W12	334	600	2.0	20312	S18 W13	334	(AP)	1	B	10	1	AXX
78	11	17	15654	S18 W29	333	700	2.0		S17 W27				B	20	3	BXO
78	11	18	15654					20317	S18 W37	331	(B)	3	B	40	5	BXO
78	11	19	15654	S18 W50	332	1000	2.5	20317	S19 W47	328	(B)	2				
78	11	20	15654						S17 W60				R	10	1	AXX

MCMATH REGION 15665 CMP DATE 15.9

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	11	15	15665	N11 E01	330	200	2.0		N10 E05				B	10	6	BXO
78	11	16	15665	N11 W09	331	300	2.5	20311	N12 W09	330	(AP)	2	B	20	4	CRO
78	11	17	15665	N11 W25	329	500	2.5	20311	N10 W24	331	(AP)	3	B	30	4	BXO
78	11	19	15665	N13 W50	332	800	2.0									

MCMATH REGION 15653 CMP DATE 16.0 RETURN OF REGION 15592 ROTATIONS 3 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	11	9	15653	N34 E88	326	300	1.0									
78	11	10	15653	N37 E74	327	600	1.0									
78	11	11	15653	N37 E57	330	900	1.0									
78	11	13	15653						N39 E35				B	20	3	BXO
78	11	14	15653	N38 E17	331	800	2.0									
78	11	15	15653	N38 E02	329	600	1.5									
78	11	16	15653	N39 W07	329	500	1.5									
78	11	17	15653	N39 W23	327	700	1.0									
78	11	19	15653	N40 W44	326	1700	3.5	20319	N39 W41	322	(BP)	4	B	50	2	CRO
78	11	20	15653					20319	N38 W51	319	(AP)	3	R	90	14	CSO
78	11	21	15653						N38 W70				B	100	5	CSO
78	11	22	15653						N38 W82				B	60	3	CSO

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MCMATH REGION 15659 CMP DATE 16.2

				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	11	11	15659	N09 E60	327	200	1.0										

MCMATH REGION 15666 CMP DATE 17.3

				CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT		MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	15	15666	N27 E19	312	100	1.0										
78	11	16	15666	N27 E09	313	100	1.0										

MCMATH REGION 15661 CMP DATE 17.9 RETURN OF REGION 15599 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	11	14	15661	N34 E42	306	200	2.0										
78	11	15	15661	N34 E25	306	100	1.5										
78	11	16	15661	N34 E17	305	200	1.5										
78	11	17	15661	N34 E00	304	200	1.0										
78	11	19	15661	N34 W21	303	200	1.5										

MCMATH REGION 15658 CMP DATE 18.2 RETURN OF REGION 15604 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	11	11	15658	S27 E84	303	300	1.0									1	
78	11	14	15658	S27 E44	304	500	1.5			S28 E38			M		10	2	BXO
78	11	15	15658	S27 E30	301	400	1.5										
78	11	16	15658	S27 E20	302	300	1.5										
78	11	17	15658	S27 E04	300	300	1.0										
78	11	19	15658	S27 W18	300	300	1.0										

MCMATH REGION 15662 CMP DATE 18.5 RETURN OF REGION 15613 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	11	14	15662	N16 E51	297	500	2.0										
78	11	15	15662	N16 E35	296	500	1.5										
78	11	16	15662	N16 E25	297	600	1.5										
78	11	17	15662	N16 E08	296	500	1.5										
78	11	19	15662	N16 W13	295	500	2.0										

MCMATH REGION 15663 CMP DATE 20.3

				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	11	14	15663	N17 E80	268	500	2.5		20309	N14 E72	275	AP	3	M	30	1	HRX
78	11	15	15663	N18 E60	271	500	2.5		20309	N14 E59	275	AP	3	B	30	1	HRX
78	11	16	15663	N17 E49	273	700	2.5		20309	N14 E46	275	(AP)	3	B	20	2	HRX
78	11	17	15663	N17 E33	271	700	2.0			N15 E31				B	10	2	AXX
78	11	19	15663	N17 E09	273	500	2.0										
78	11	25	15663	N17 W70	273	400	1.0										

MCMATH REGION 15668 CMP DATE 21.2

				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	11	15	15668	S20 E70	261	400	2.5										
78	11	16	15668	S21 E59	263	500	3.0		20313	S23 E57	264	B	3	B	20	5	BXI
78	11	17	15668	S22 E43	261	800	3.0		20313	S22 E43	264	(B)	3	B	90	9	CRO
78	11	18	15668						20313	S24 E32	262	(B)	3	B	30	2	CRO
78	11	19	15668	S22 E22	260	800	3.0		20313	S24 E16	265	(AP)	3	B	20	1	HRX
78	11	20	15668						20313	S25 E04	264	(AP)	2	R	10	4	BXO
78	11	21	15668							S23 W10				B	20	2	BXO
78	11	25	15668	S24 W58	261	700	2.0										

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MCMATH REGION 15676 CMP DATE 21.4

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	11	19	15676	S30 E24	258	100	1.0									
78	11	20	15676					20320	S31 E08	260	(AP)	2	R	10	2	AXX
78	11	21	15676						S30 W06				B	10	1	AXX

MCMATH REGION 15667 CMP DATE 21.9 RETURN OF REGION 15610 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	11	15	15667	N35 E78	253	500	1.5									
78	11	16	15667	N34 E66	256	1300	1.5									
78	11	17	15667	N34 E50	254	1100	1.5									
78	11	19	15667	N34 E28	254	1000	2.0									
78	11	25	15667	N34 W49	252	800	1.5									

MCMATH REGION 15669 CMP DATE 22.4 RETURN OF REGION 15615 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	11	15	15669	S16 E85	246	1200	2.5									
78	11	16	15669	S16 E76	246	3500	2.5	20314	S17 E70	251	AP	4	B	130	2	HSX
78	11	17	15669	S16 E62	242	2700	3.0	20314	S18 E59	248	(AP)	4	B	250	3	HHX
78	11	18	15669					20314	S18 E46	248	(AP)	4	B	140	2	HHX
78	11	19	15669	S16 E39	243	1800	3.0	20314	S18 E32	249	(AP)	4	B	130	2	HSX
78	11	20	15669					20314	S18 E19	249	(BP)	4	R	230	6	CKO
78	11	21	15669						S18 E06				B	180	10	CKO
78	11	22	15669						S18 W08				B	140	9	DAI
78	11	23	15669					20314	S18 W22	250	(AP)	2	B	50	9	DAC
78	11		15669					20322	S12 W23	251	(B)	3	B	20	3	CSO
78	11	25	15669	S16 W42	245	2000	3.0									
78	11	26	15669						S18 W49				M	10	2	BXO
78	11	27	15669						S18 W60				M	10	2	BXO
78	11	28	15669	S18 W78	239	1200	1.5									

MCMATH REGION 15670 CMP DATE 23.2 RETURN OF REGION 15634 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	11	16	15670	S27 E85	237	900	2.5	20315	S27 E77	244	AP	4	B	60	1	HSX
78	11	17	15670	S27 E70	234	1300	3.0	20315	S27 E65	242	(AP)	4	B	130	5	CSO
78	11	18	15670					20315	S28 E53	241	(AP)	4	B	120	1	HSX
78	11	19	15670	S27 E47	235	1000	3.5	20315	S28 E41	240	(AP)	4	B	100	1	HSX
78	11	20	15670					20315	S28 E28	240	(AP)	4	R	140	1	HSX
78	11	21	15670						S28 E14				B	130	1	HSX
78	11	22	15670						S28 E02				B	110	1	HSX
78	11	23	15670					20315	S28 W10	238	(AP)	3	B	120	1	HHX
78	11	24	15670						S28 W25				M	80	1	HSX
78	11	25	15670	S27 W31	234	1000	3.0									
78	11	26	15670					20315	S28 W48	237	(AP)	3	M	90	1	HSX
78	11	27	15670					20315	S28 W60	235	(AP)	3	B	70	2	HSX
78	11	28	15670	S27 W71	232	1000	2.0	20315	S30 W73	235	(AP)	2	M	100	1	HSX
78	11	29	15670	S28 W83	232	300	1.5									

MCMATH REGION 15672 CMP DATE 24.2 RETURN OF PARTS OF REGION 15619 ROTATIONS 3 AND 4

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	17	15672	N24 E86	218	600	1.5									
78	11	19	15672	N25 E65	217	700	1.5									
78	11	25	15672	N26 W18	221	500	2.0									
78	11	28	15672	N26 W60	221	600	1.0									

MCMATH REGION 15673 CMP DATE 24.5 RETURN OF PARTS OF REGION 15619 ROTATIONS 3 AND 4

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	17	15673	N15 E89	215	400	2.0									
78	11	18	15673					20318	N14 E78	216	(AP)		B	10	1	AXX

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MCMATH REGION 15673 (CONT) CMP DATE 24.5 RETURN OF REGION 15619 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	11	19	15673	N16	E71	211	1400	2.5	20318	N14	E64	217	(AP)	3	B	10	1	AXX
78	11	20	15673						20318	N15	E51	217	(AP)	3	R	10	1	AXX
78	11	25	15673	N16	W14	217	800	2.5										
78	11	27	15673						20330	N13	W37	212	(B)	4	B	80	20	DAI
78	11	28	15673	N17	W54	215	2000	4.0	20330	N12	W50	212	(B)	5	M	110	15	DSO
78	11	29	15673	N14	W65	214	1800	3.0	20330	N13	W61	210	(B)	4	B	680	11	DHO
78	11	30	15673	N14	W77	214	1800	3.0	20330	N12	W75	211	(B)	4	R	470	3	EKO

MCMATH REGION 15677 CMP DATE 26.3 RETURN OF REGION 15620 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	11	19	15677	S20	E88	194	500	1.0										
78	11	20	15677						20321	S17	E68	200	(AP)	3	R	10	3	AXX
78	11	25	15677	S20	E09	194	2600	2.5										
78	11	21	15677							S17	E55				B	30	1	HRX
78	11	22	15677							S17	E40				B	10	2	BXO
78	11	26	15677							S18	W06				M	10	2	BXO
78	11	28	15677	S20	W30	191	2000	2.0										
78	11	29	15677	S20	W44	193	2800	2.0										
78	11	30	15677	S20	W57	194	2500	2.0										

MCMATH REGION 15692 CMP DATE 28.1

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	12	01	15692						20336	S26	W33		(B)	2	B	30	4	C
78	12	02	15692						20336	S26	W44		(AP)	3	B	40	8	C
78	12	03	15692						20336	S28	W58		(AP)	3	B	30	4	C
78	12	04	15692	S27	W72		400	3.0		S27	W77				B	40	3	C

MCMATH REGION 15678 CMP DATE 28.3 RETURN OF REGION 15631 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	11	25	15678	S13	E35	168	800	2.0										
78	11	26	15678						20324	S13	E24	165	(B)	2	M	50	6	CRO
78	11	27	15678						20331	S15	E13	162	(AF)	2	B	20	3	BXO
78	11	28	15678	S13	W05	166	1000	2.5	20331	S14	W02	164	(B)	3	M	60	7	CRO
78	11	29	15678	S14	W16	165	1200	2.5	20331	S13	W15	164	(BF)	2	B	20	3	CRO
78	11	30	15678	S14	W28	165	1000	2.5		S14	W29				R	10	2	AXX
78	12	04	15678	S15	W85		300	1.0										

MCMATH REGION 15693 CMP DATE 28.4

CALCIUM PLAGE DATA | SUNSPOT DATA

YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	12	04	15693	S10	W66		300	1.5										
78	12	05	15693	S11	W79		300	2.0										

MCMATH REGION 15679 CMP DATE 28.5 RETURN OF REGION 15630 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	11	23	15679						20323	N15	E57	171	AP	4	B	60	1	HSX
78	11	25	15679	N15	E38	165	2000	3.0										
78	11	26	15679						20323	N15	E17	172	(AP)	4	M	50	4	CSO
78	11	27	15679						20323	N15	E04	171	(AP)	4	B	80	5	HSX
78	11	28	15679	N15	W03	164	1200	2.0	20323	N14	W10	172	(AP)	4	M	50	3	CSO
78	11	29	15679	N15	W16	165	2000	2.0	20323	N15	W23	172	(AP)	4	B	70	1	HHX
78	11	30	15679	N15	W29	166	1700	2.0	20323	N14	W36	172	(AP)	4	R	110	5	CSO
78	12	01	15679						20323	N14	W48		(AP)	4				
78	12	02	15679						20323	N14	W62		(AP)	3				
78	12	03	15679						20323	N13	W78		(AP)	3				

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1978

MCMATH REGION 15680 CMP DATE 29.5 RETURN OF REMNANTS OF REGION 15629 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	11	25	15680	N25 E51	152	900	2.5									
78	11	28	15680	N25 E11	150	400	1.0									
78	11	29	15680	N26 E09	149	300	1.0									

MCMATH REGION 15681 CMP DATE 29.9

			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	11	25	15681	N10 E60	143	1100	3.5									
78	11	26	15681					20325	N08 E45	144	(B)	2	M	70	9	DRO
78	11	27	15681					20325	N08 E31	144	(B)	2	B	70	8	DAO
78	11	28	15681	N10 E16	145	800	2.5	20325	N09 E17	145	(B)	3				
78	11	29	15681	N10 E03	146	1000	3.0	20325	N08 E04	145	(B)	4	B	20	3	CRO
78	11	30	15681	N10 W10	147	700	3.0	20325	N09 W08	144	(AP)	3	R	30	4	CRO
78	12	01	15681					20325	N09 W23		(B)	3				
78	12	04	15681	N09 W64		800	2.5									
78	12	05	15681	N09 W77		600	2.5									

MCMATH REGION 15690 CMP DATE 30.6

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	25	15690	N14 E67	136	800	3.0									
78	11	26	15690						N15 E54				M	70	1	HSX
78	11	27	15690						N14 E46				B	90	1	HSX
78	11	28	15690	N14 E25	136	700	2.5		N10 E27				M	60	9	DRO
78	11	29	15690	N14 E13	136	800	3.0		N11 E20				B	120	1	HSX
78	11	30	15690	N14 E00	137	300	2.0									

MCMATH REGION 15683 CMP DATE 30.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	11	25	15683	S13 E68	135	500	1.0									
78	11	28	15683	S14 E28	133	600	1.5									
78	11	29	15683	S15 E16	133	700	1.5									
78	11	30	15683	S16 E04	133	400	1.5									
78	12	04	15683	S16 W49		700	1.5									
78	12	05	15683	S16 W63		700	1.5									
78	12	06	15683	S16 W76		700	1.0									

NOTE: NO CALCIUM SPECTROHELIOGRAMS WERE SECURED AT THE MCMATH-HULBERT OBSERVATORY ON NOV. 6,12,13,18,20,21,22,23,24, 26, AND 27, 1978.
NO SUNSPOT OBSERVATIONS WERE MADE AT MT. WILSON ON NOV. 1,5,6,10,11,12,13,21,22,24, AND 25,1978.

DAILY CALCIUM PLAGE INDEX

NOVEMBER 1978

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
78	11	1	46.2	78	11	11	30.9	78	11	21	*
78	11	2	46.6	78	11	12	*	78	11	22	*
78	11	3	41.8	78	11	13	*	78	11	23	*
78	11	4	39.9	78	11	14	19.7	78	11	24	*
78	11	5	45.0	78	11	15	15.1	78	11	25	27.2
78	11	6	*	78	11	16	15.8	78	11	26	*
78	11	7	45.8	78	11	17	19.1	78	11	27	*
78	11	8	48.0	78	11	18	*	78	11	28	29.5
78	11	9	45.3	78	11	19	21.7	78	11	29	39.9
78	11	10	38.4	78	11	20	*	78	11	30	40.2

* NO OBSERVATIONS

ERRATA: McMath Region 15626, which passed CMP on 31.8 October 1978, was the return of part of Region 15557, rotation 3. This Region information appears in SGD 412 Part I, page 114, December 1978.

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 1978

DAY	UNIVERSAL TIME				WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE							KNOWN FLARE	McMATH REGION
	START	END	MAX	IMP		SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD		
01	0338	0500	0405	1-	1				1				0338	15631
01	1330	1515	1355	1-	5			4	2		5		1329	15619
01	2127	2306U	2159	1-	1				1				*	
02	0231	0306	0237	1-	1				1				0221	15620
02	0629	0737	0645	1-	1				1				0627	X-RAY
02	1058	1145	1106	1-	5			2	1		1		1057	15641
02	1404	1500	1442	1-	5				2	1	2		1401	15635
02	2004	2040	2010	1-	3						3		2002	X-RAY
03	0007	0216	0034	1+	5	1		1		1	1		0003	15631
03	1723	1817	1728	1-	5						6		1722	X-RAY
03	2214	2246	2221	1-	1				1				2213	X-RAY
03	2253	0004	2305	1-	1				1				2253	X-RAY
04	0140	0220	0150	1-	1				1				*	
05	1515	1545	1525	1-	5			1	1		5		1512	15634
05	1915	2000	1926	1-	5						6		1913	15643
06	1225	1300	1231	1+	5				1	1	2		1225E	15642
06	2326	0028	2341	1-	1				1				2330	15641
07	0812	0830	0816	1-	1						1		0811	15641
07	1620	1712	1-	5				1		1	4		1618E	15643
08	1221	1310	1240	1-	1			1					1218	15642
08	1651	1717	1702	1-	5			1	1	1	8		1649	15641
08	1751	1813	1757	1-	5				1	1	7		1751	15643
10	0045	0242	0126	2-	3	1			1		1		0048E	15643
10	1400	1505	1408	1+	5	1	1	5	3		10		1359	15641
10	1732	1800	1748	1-	5	1		1			8		1727	15643
10	1940	2012	1953	1-	5				1		4		1940	15641
11	0355	0424	0403	1-	1				1				0355	X-RAY
11	0858	0909	0902	1	3			2	2				0840	15643
11	1029	1040	1031	1	5	1	1	1	3		2		1029	15643
11	1415	1450	1419	1-	5				1		5		1414	15643
12	1338	1405	1345	1-	1				1		1		1334	X-RAY
13	0409	0511	0419	1-	1				1				0408	X-RAY
13	0822	0843	0841	2	5			1	4		1		0826	15643
13	0923	0935	0928	1-	1				1				0923	15643
13	0958	1028	1005	1-	5				2		1		0956	15643
13	1351	1428	1356	1-	3			2					1350	15643
13	2159	2220U	2224	1-	1				1				*	
15	1037	1044D	1044	1-	5			2	1		1		1039	15643
15	1926	2004	1937	1-	5				1	1	5		1925	15643
15	2321	0002	2327	1-	1				1				2320	X-RAY
16	0815	0835	0821	1-	5			1	2		1		0815	15643
16	1810	1824	1915	1-	5				1	1	3		1808	15651
20	0944	1023	0949	1-	5				4		1		0945	15653
24	2220	0103	2254	1-	1				1				2218	X-RAY
25	1415	1522	1434	1-	1				1		1		1412	X-RAY
27	1142	1216	1150	1-	1			1					*	
27	1408	1510	1419	1-	5				2		1		*	
27	1613	1820	1630	1	3			1			3		*	
28	0248	0407	0303	1-	1				1				0256E	15673
28	0514	0746	0556	1-	3	1			1				0513	15673
28	0806	0903	0814	1-	3				2				0807	X-RAY
28	1025	1205	1030	1	5	1		3	3		1		1023	X-RAY
29	0504	0833	0526	1-	3	1			1				0505	15682
30	0113	0234	0201	1-	1				1				0114	X-RAY
30	0151	0400	0208	1+	5	1		1	1		1		0147	15682
30	0635	0738	0642	1-	1				1				0640E	15687

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 1978

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-03	0000-2400 A3
01-02	0000-2400 A45
04	0000-2400 A3
06	0000-2400 A3
07-09	0000-2400 A45
09	1200-1430 UM (13 kHz)
11-25	0000-2400 A3
11	0548-1555 TM
12-29	0000-2400 A28
14	1000-1400 UM (16 kHz), 2315-2400 TM
15	0000-1816 TM
16	0630-1310 UM (16 kHz)
21	1005-1330 UM (16 kHz)
23-25	0000-2400 A45
26	0900-1800 UM (13 kHz), 0900-1800 UM (16 kHz)
27-30	0000-2400 A3
28	0000-2400 TN, 1005-1350 UM (16 kHz), 1510-2400 UM (16 kHz)
29	0000-1823 UM (16 kHz), 1300-2000 UM (13 kHz), 1300-2000 UM (16 kHz)

STATIONS REPORTING FOR NOVEMBER 1978

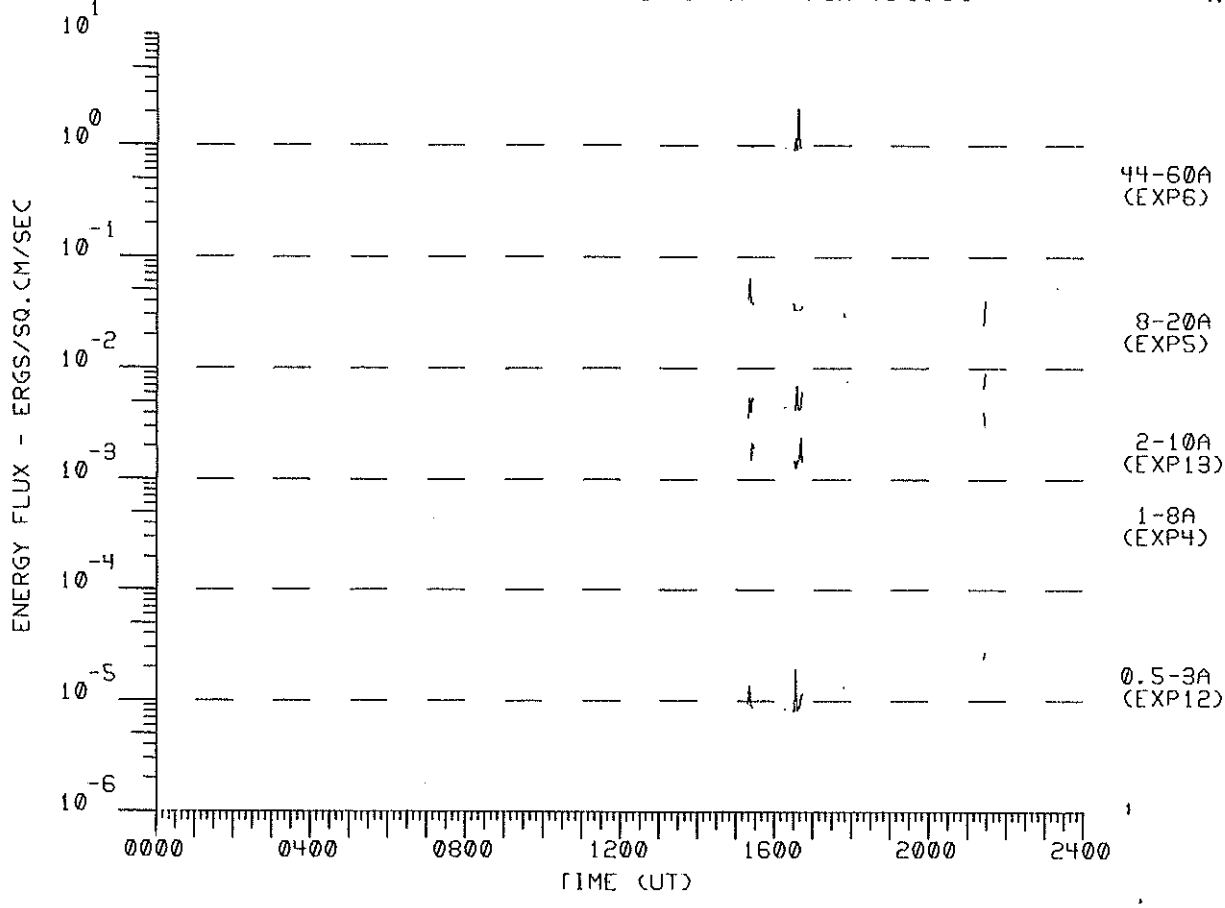
AAVSO (A1, A3, A19, A26, A28, A31, A40, A45, A46) (SES) (A1, A31) (SEA)
CHILWORTH (CL) (SCNA)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
INUBO (IN) (SPA)
JULIUSRUH (SWF)
KUHLUNGSBORN (KU) (SEA, SPA)
MC MATH (MC) (SWF, SCNA)
PRESTON (L0) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SEA)
UPICE (UI) (SEA)
VSETIN (VS) (SEA)

SIDs BY McMATH REGION

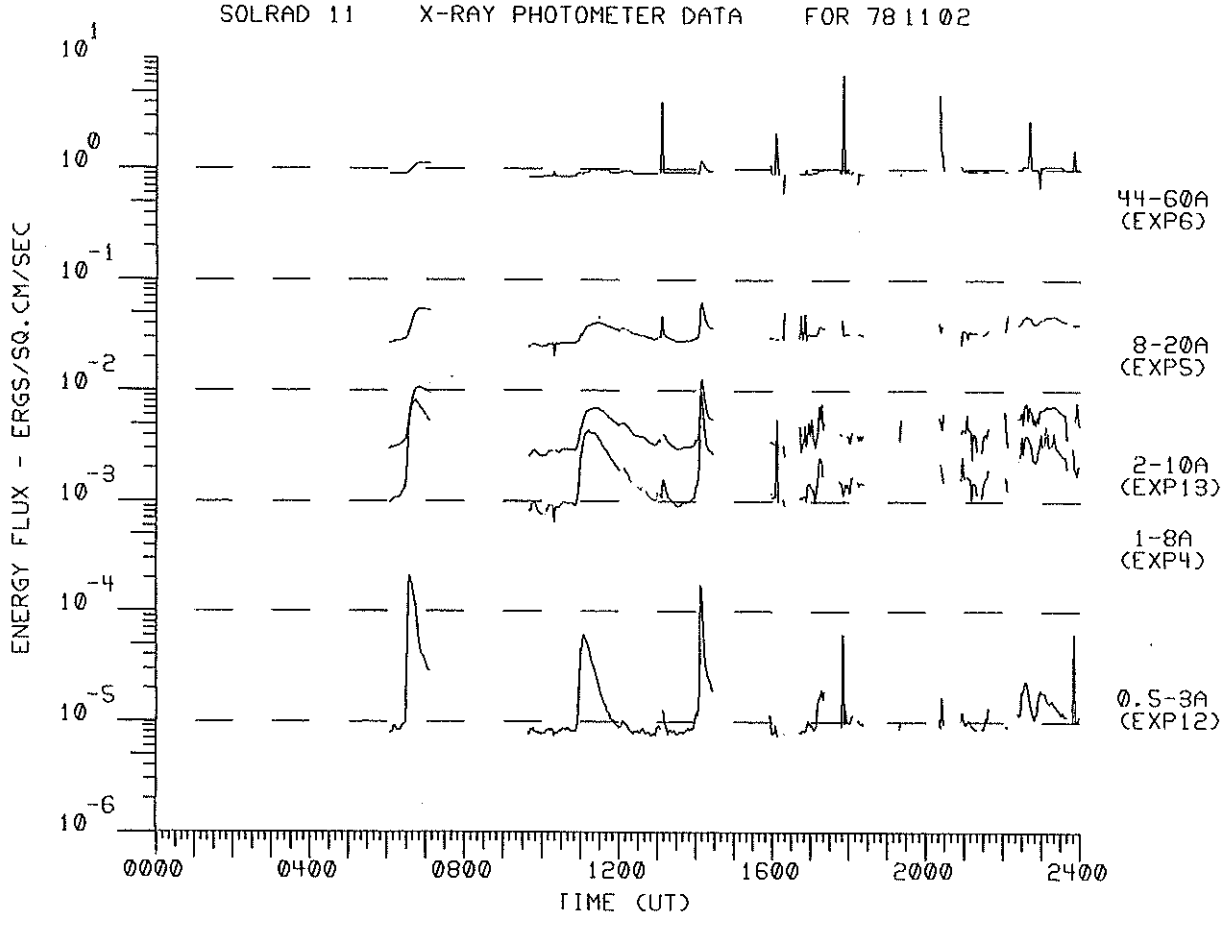
NOVEMBER 1978

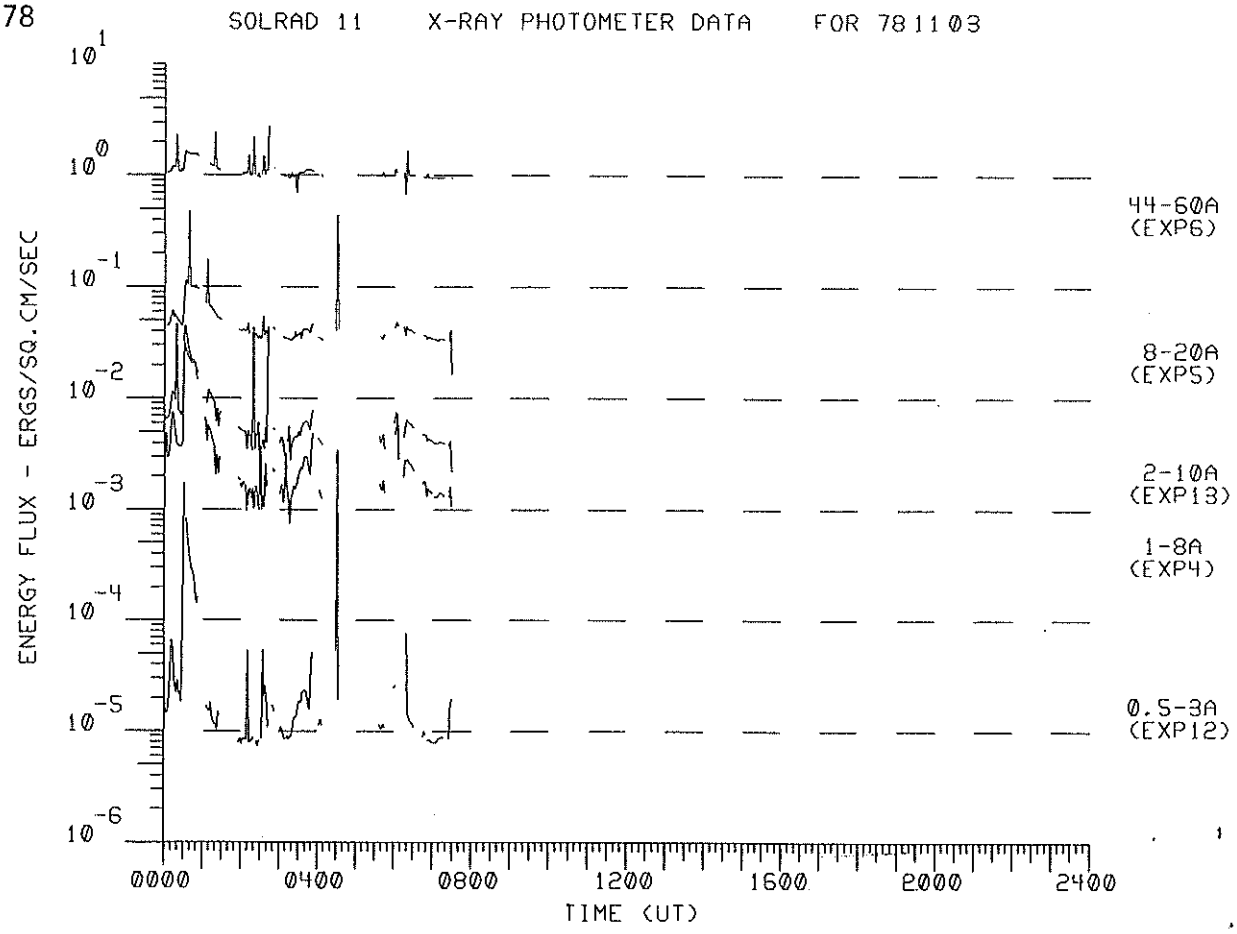
DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
REGION																														
15619	1																													
15620		1																												
15631	1		1																											
15634					1																									
15635		1																												
15641		1				1	1	1		2																				
15642						1		1																						
15643					1		1	1		2	3		4		2	1														
15651																1														
15653																				1										
15673																											2			
15682																												1	1	
15687																													1	
X-RAY		2	3								1	1	1		1									1	1			2		1
UNKNOWN																														
NO FP	1			1									1														3			

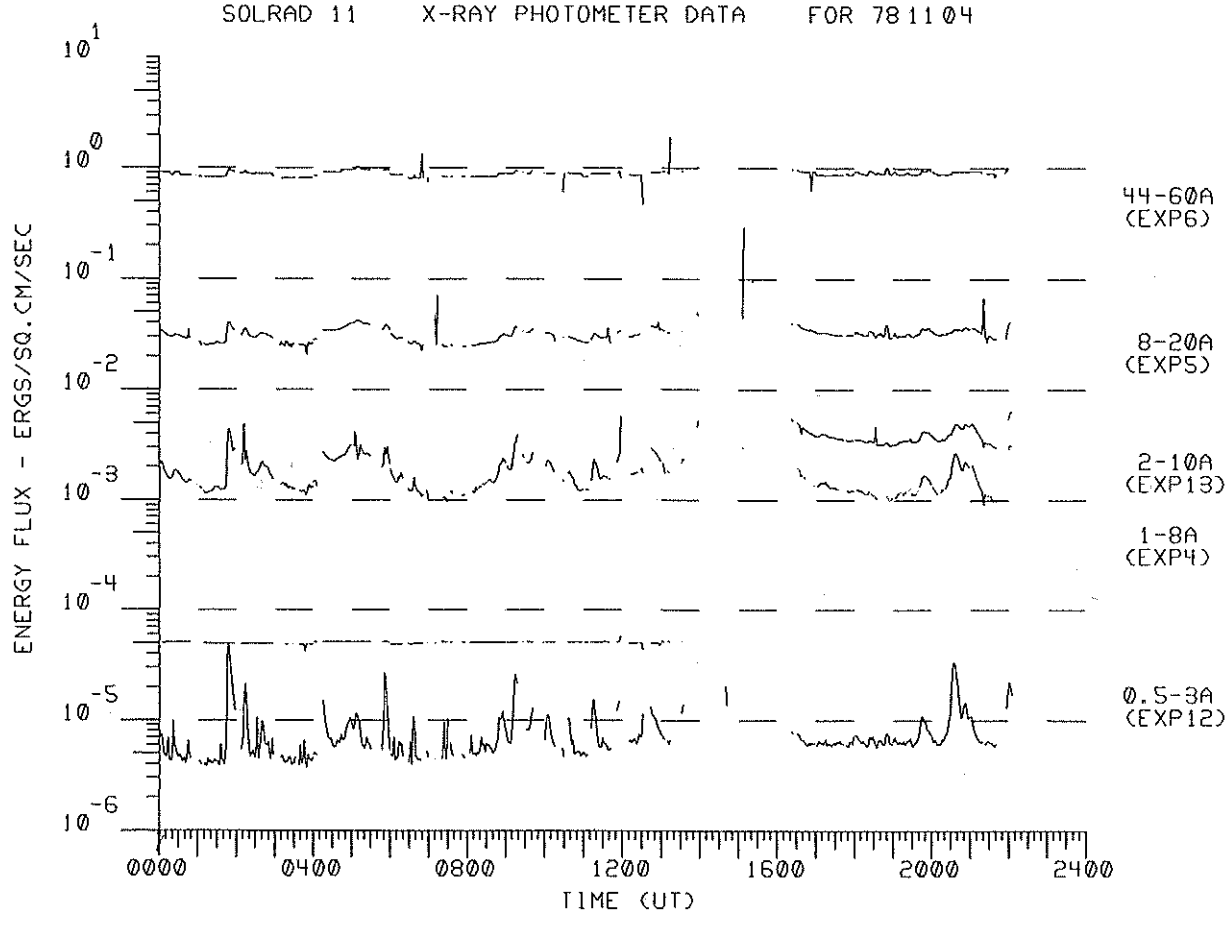
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781101



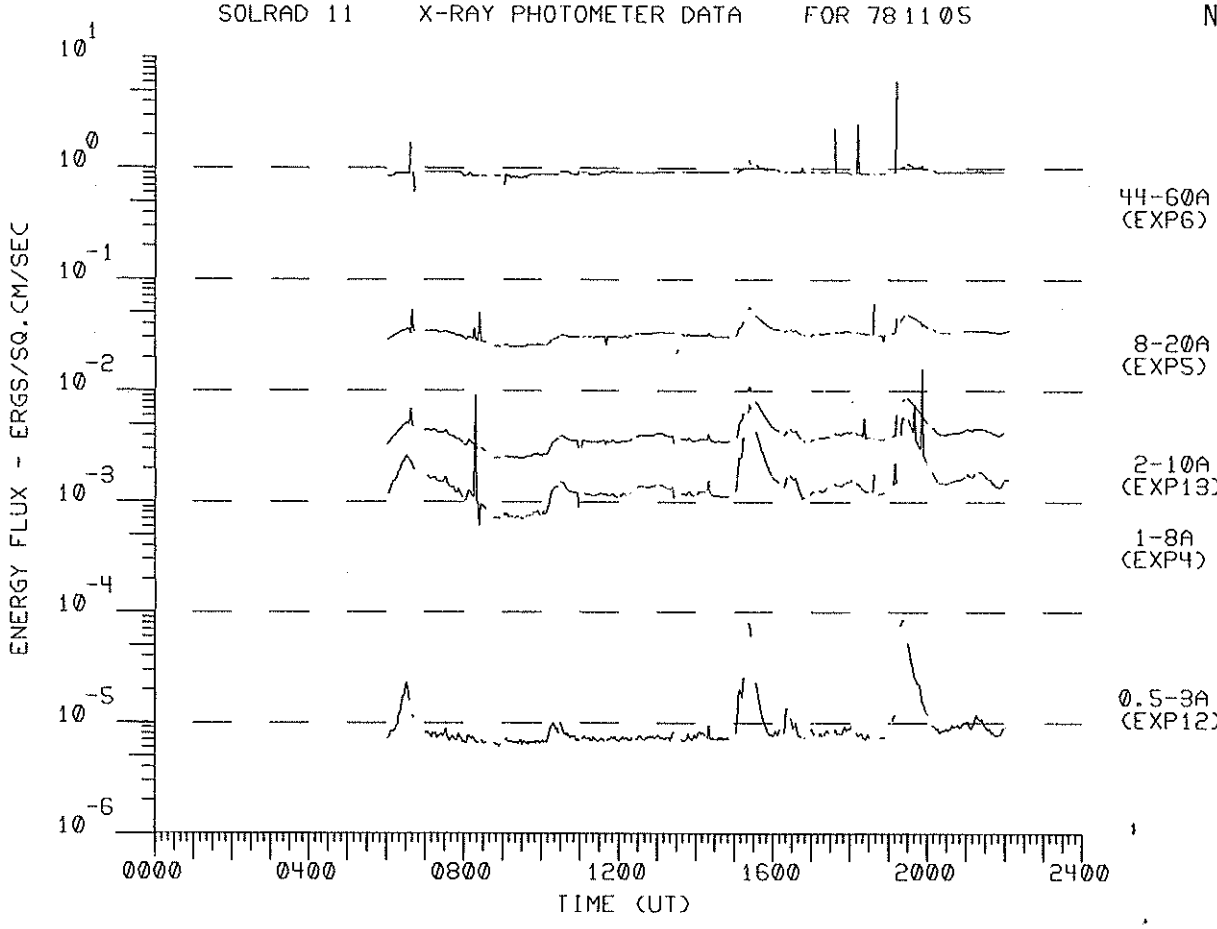
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781102



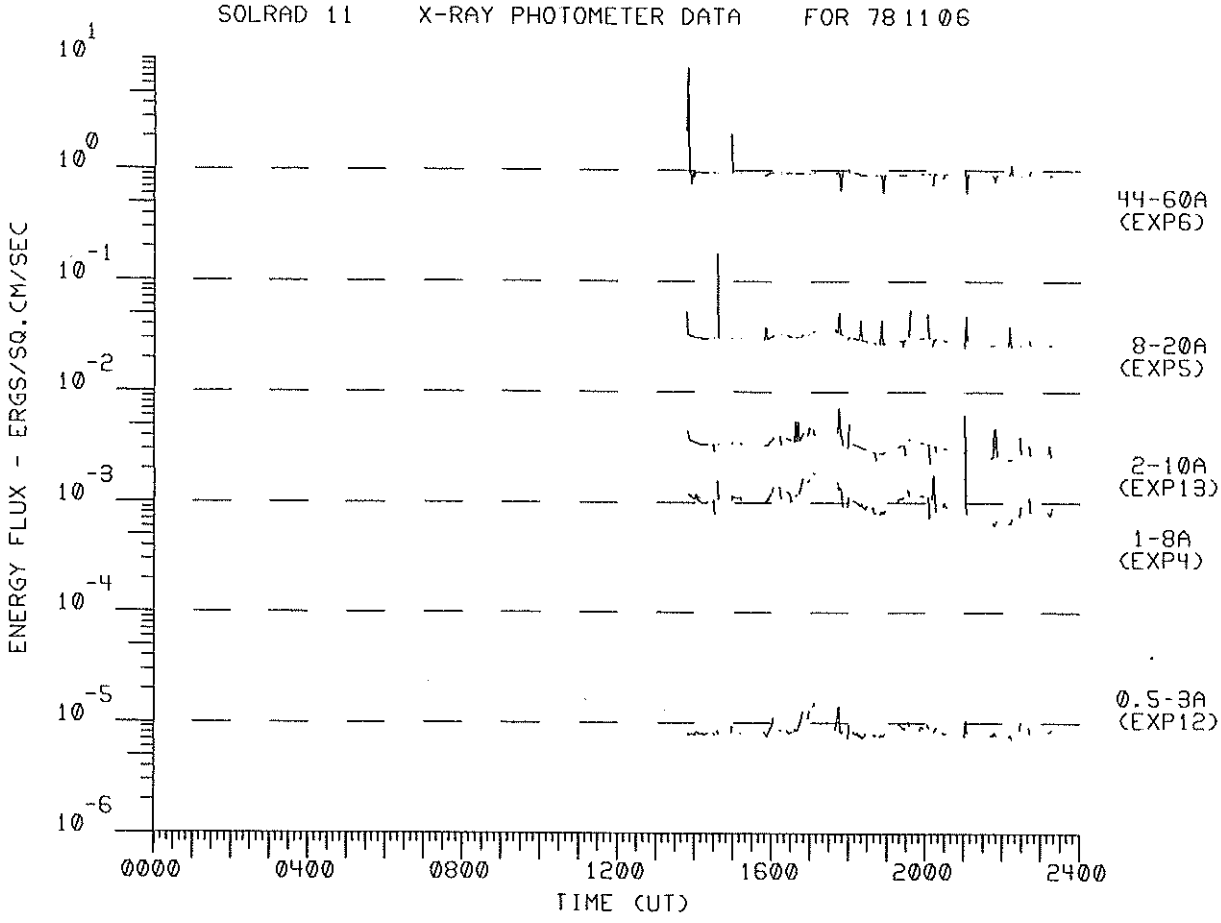

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781103
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781104
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)

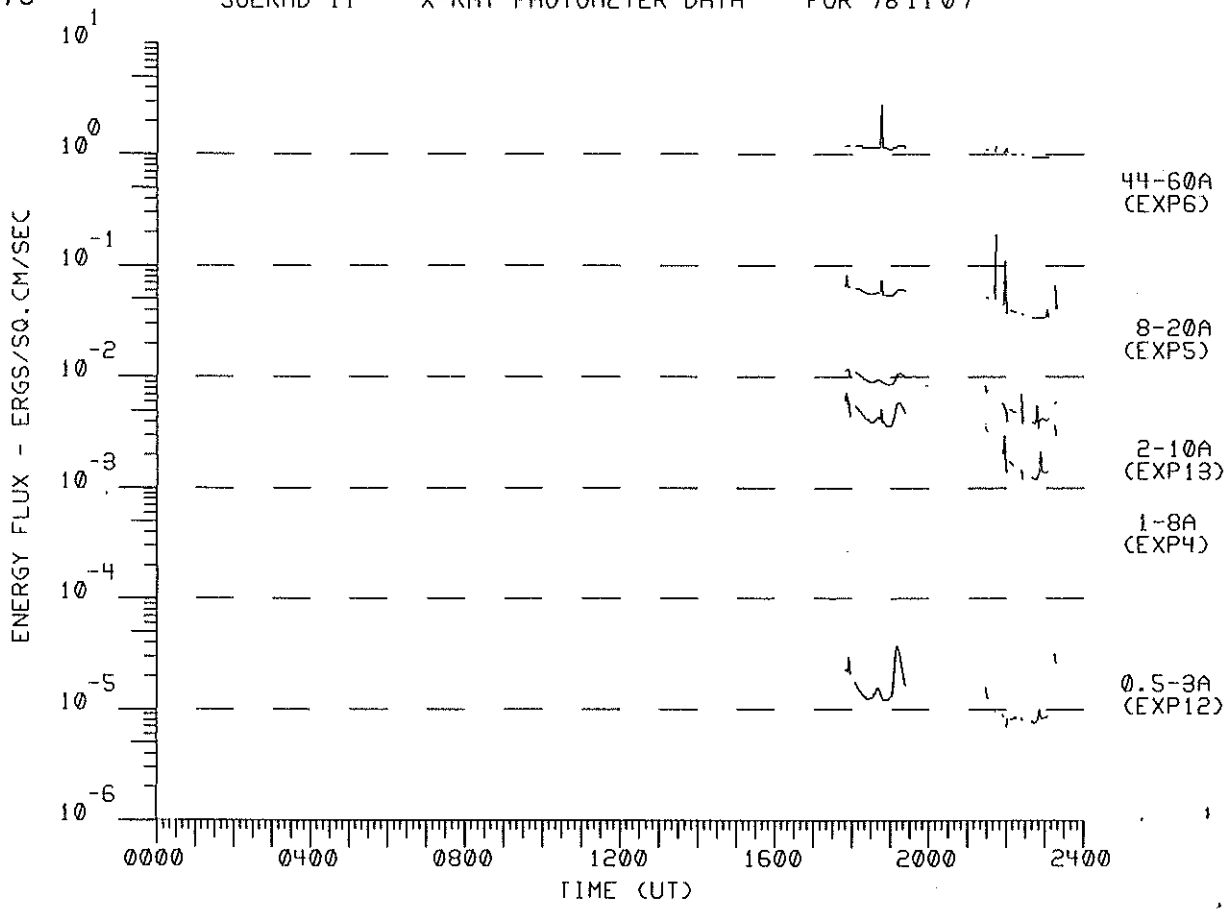
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781105



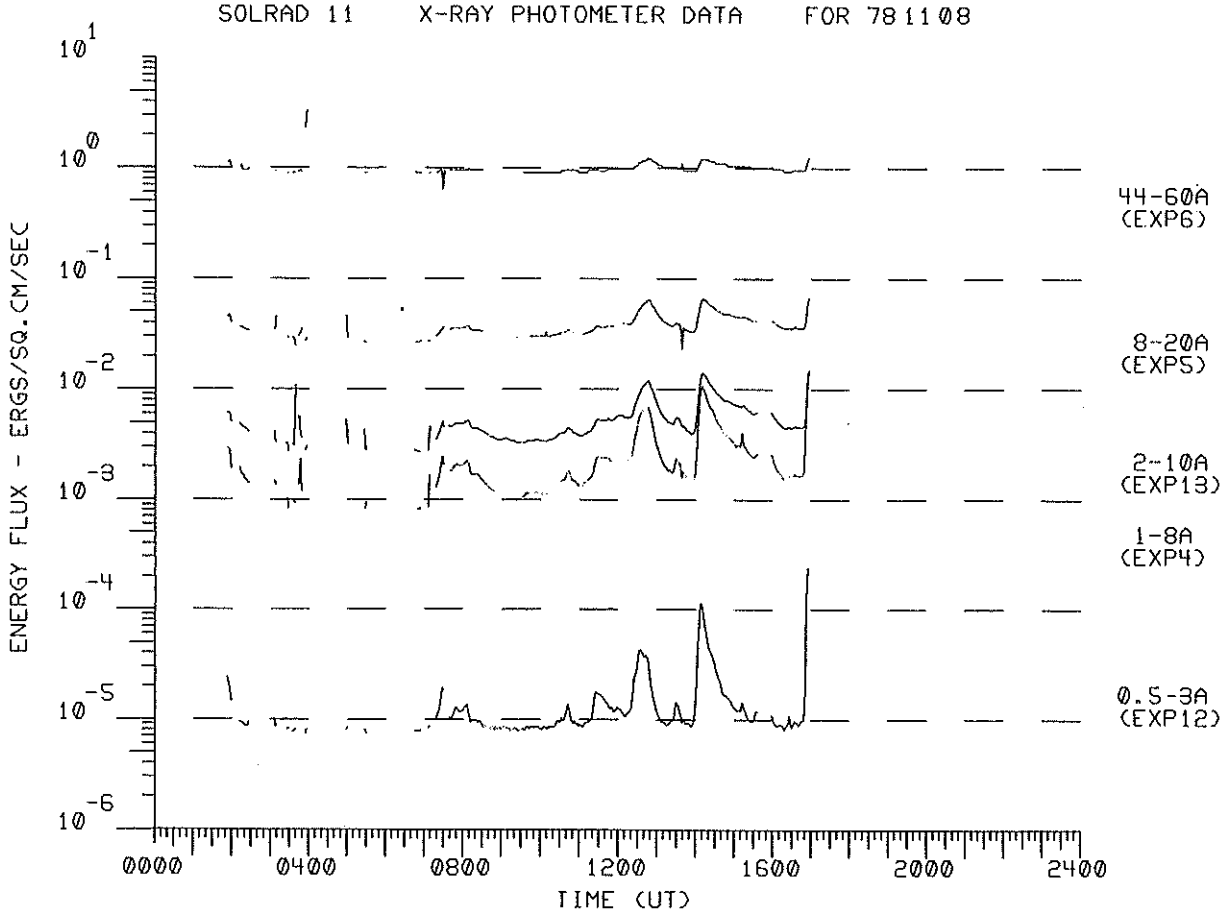
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781106



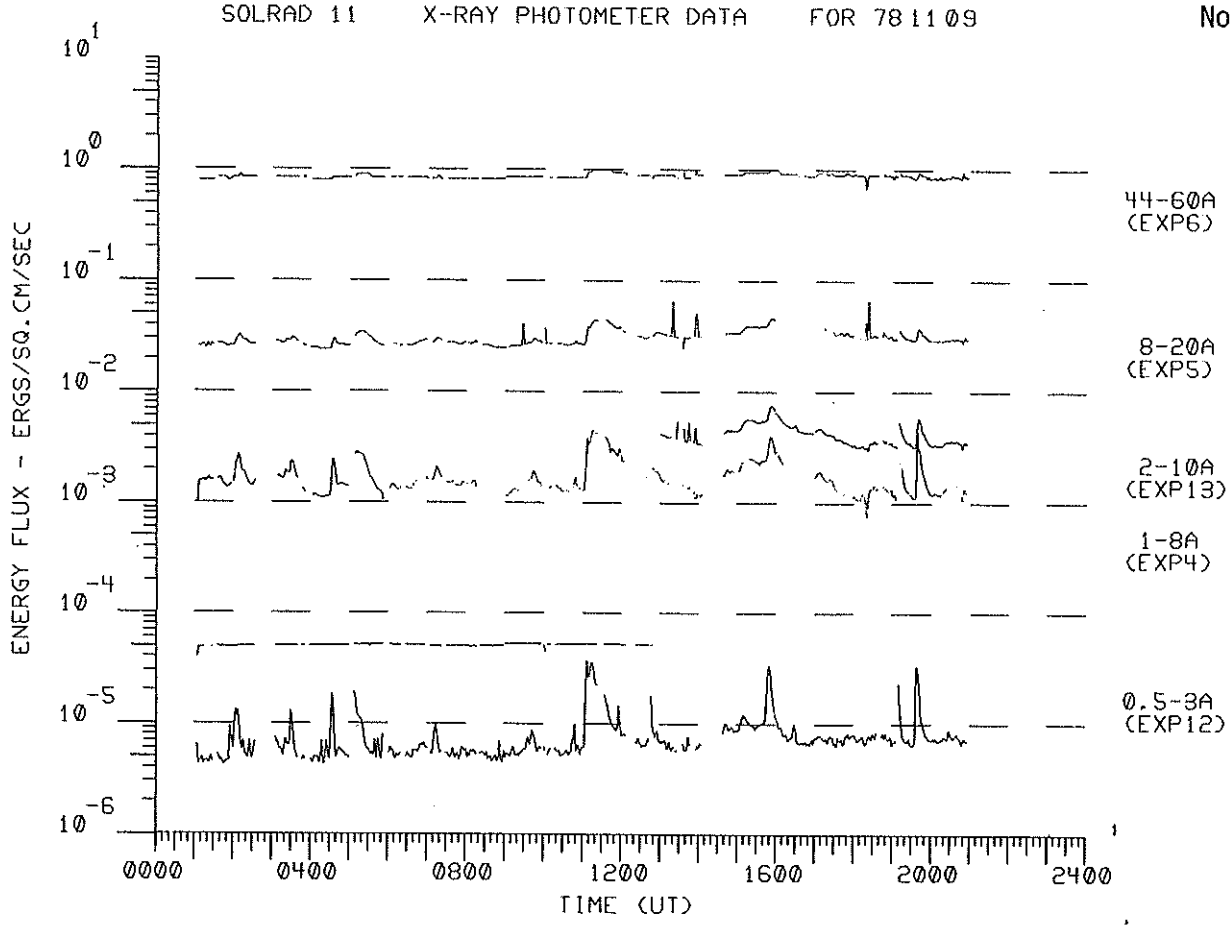
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781107



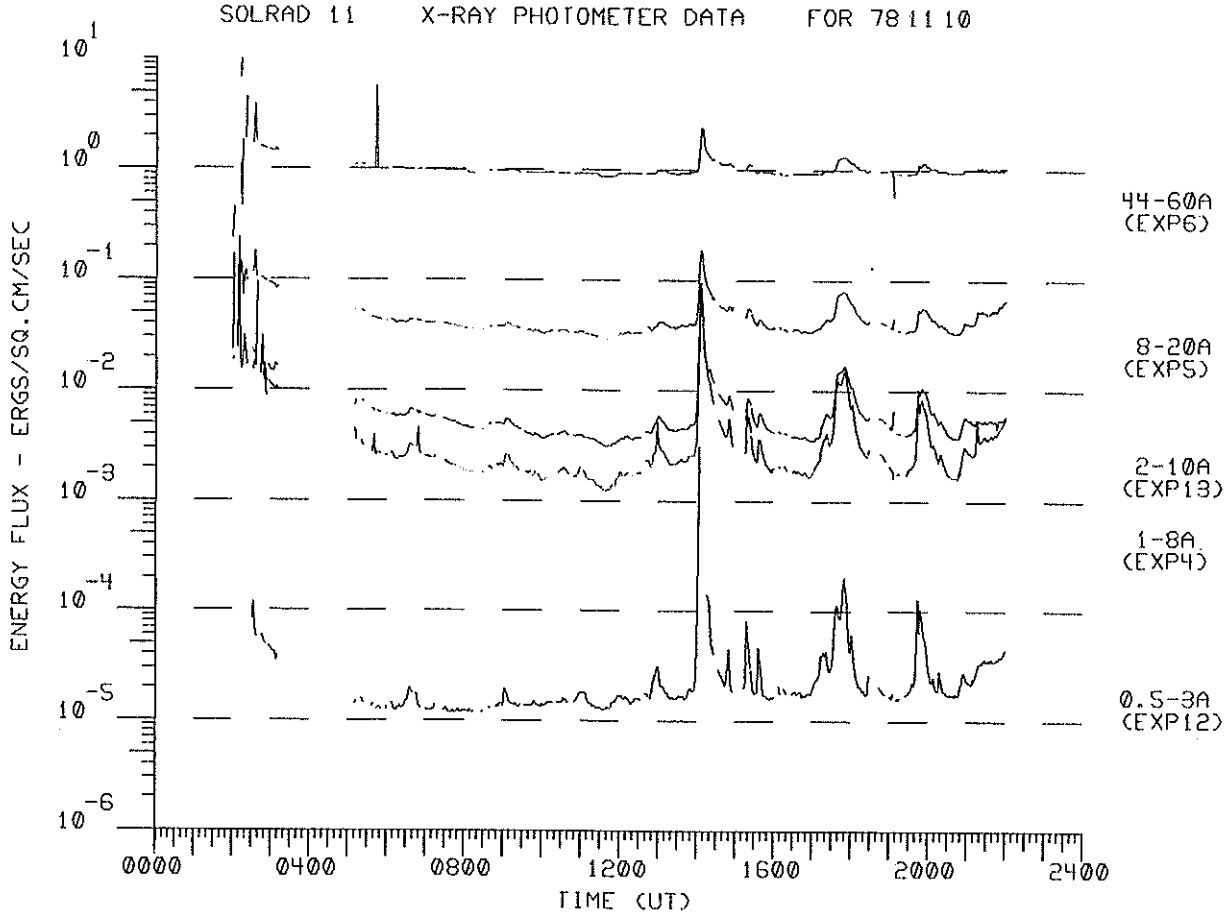
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 781108

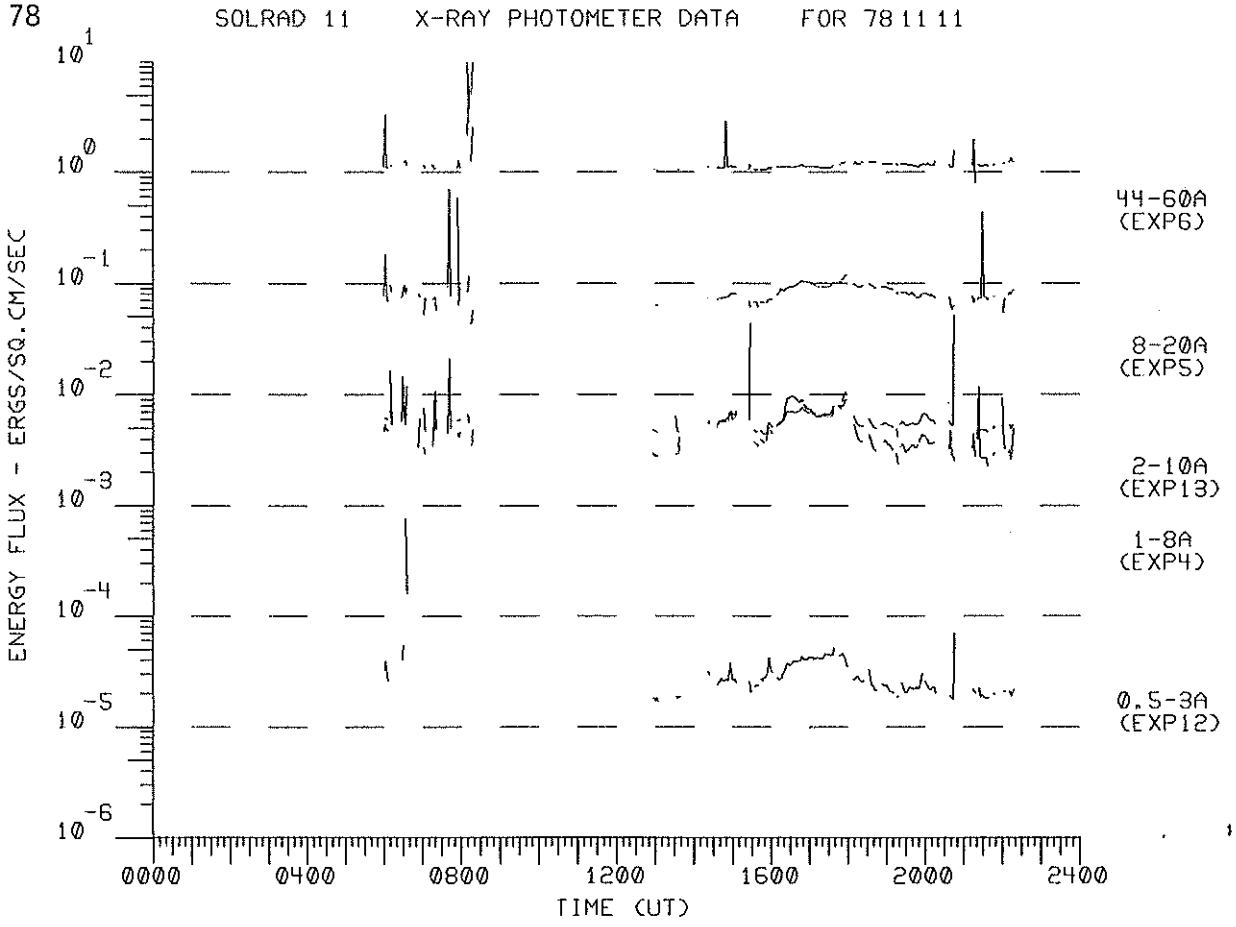


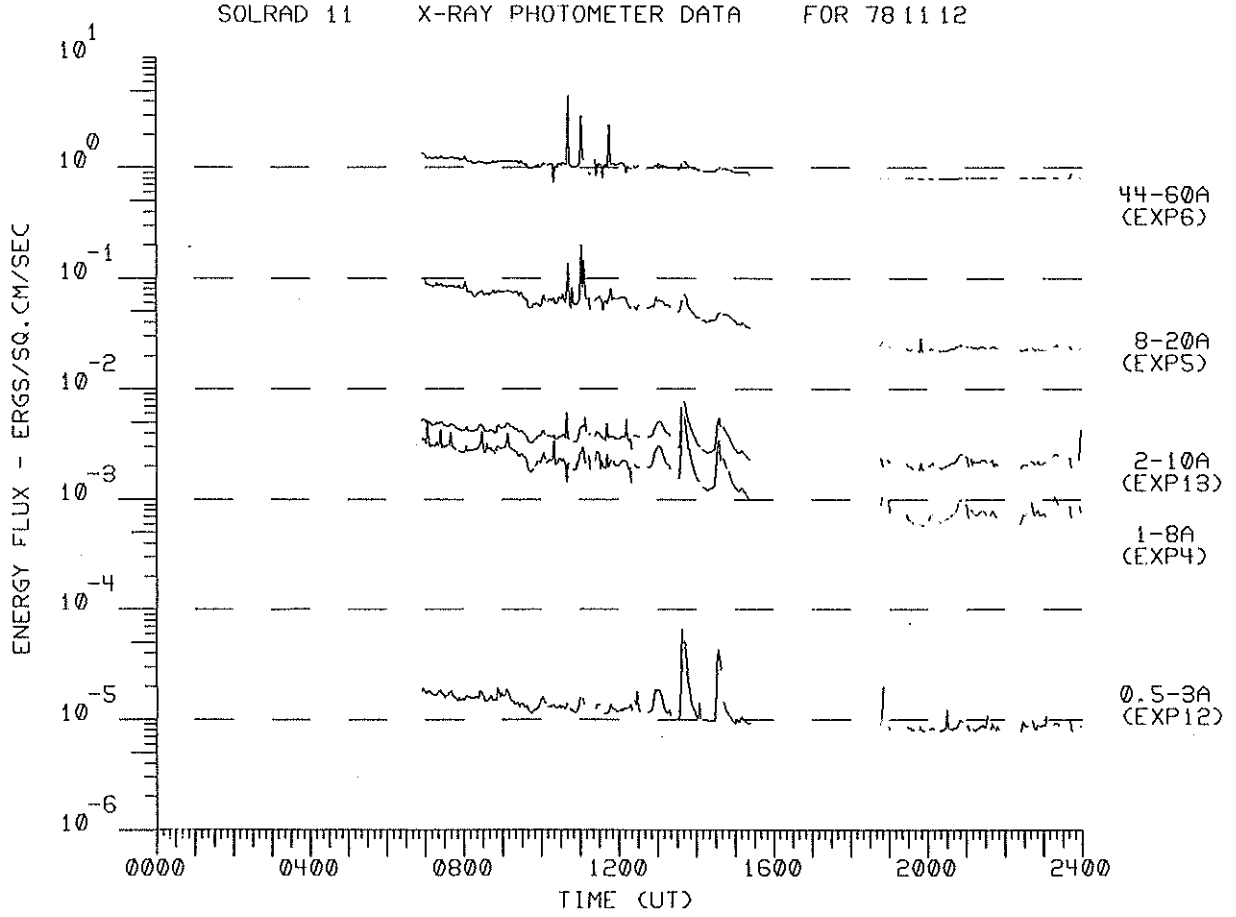
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 09



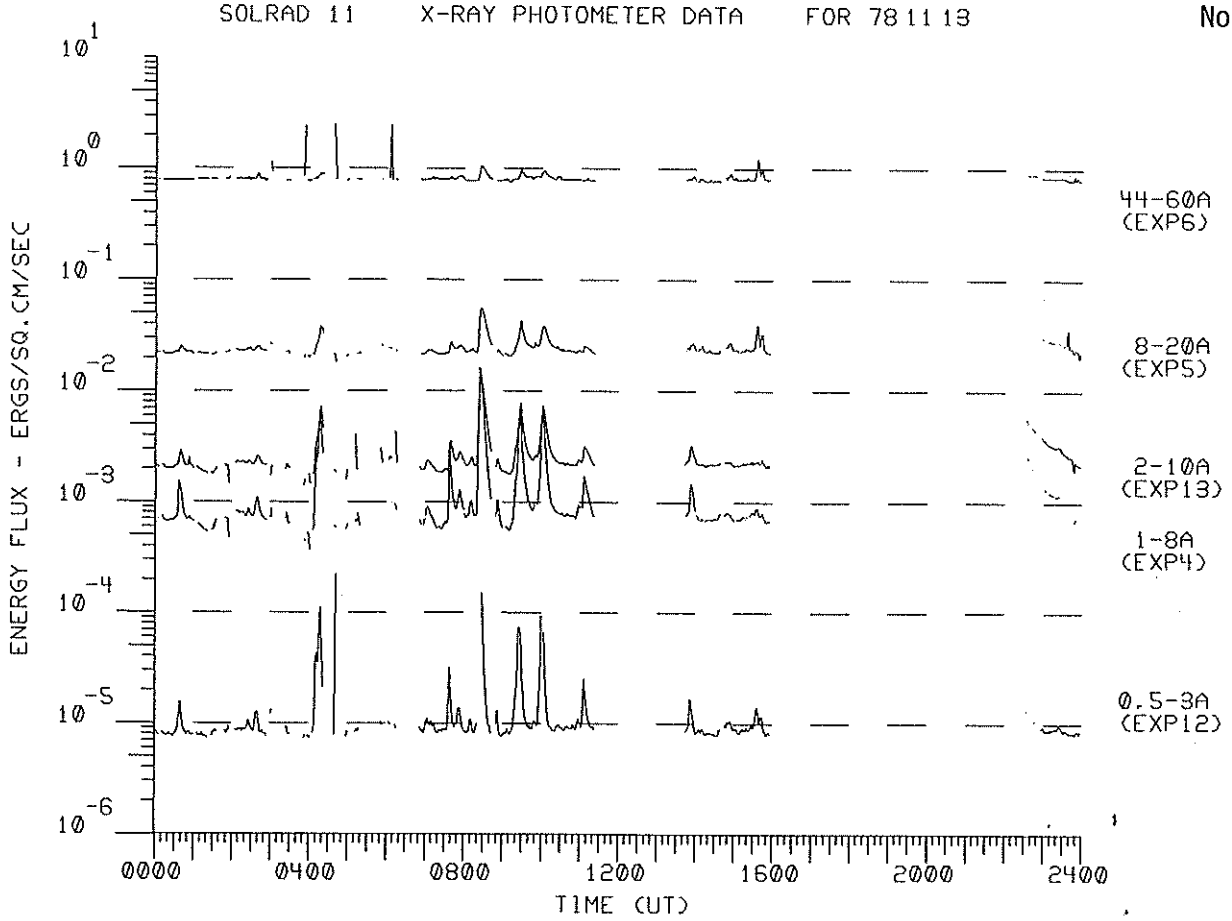
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 10



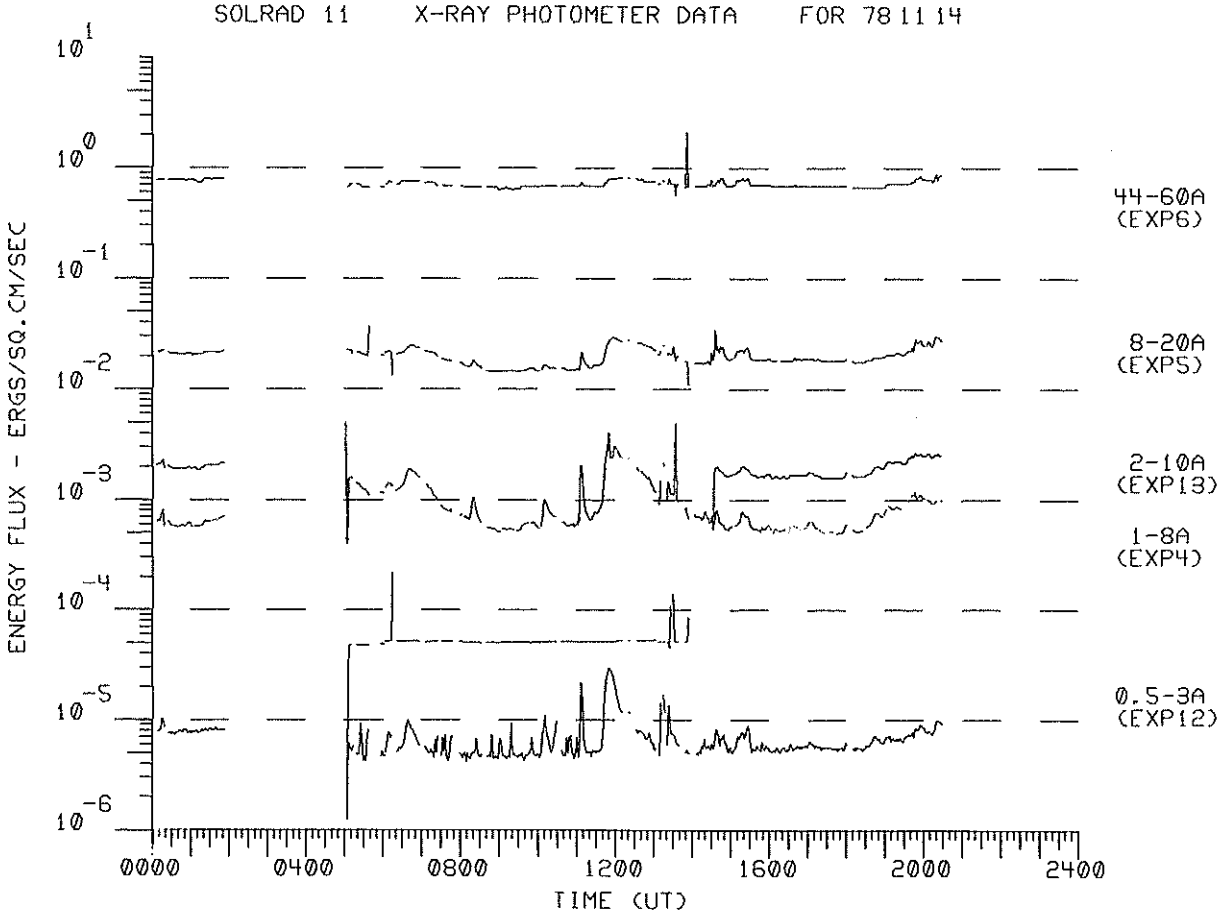

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 11
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 12
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)

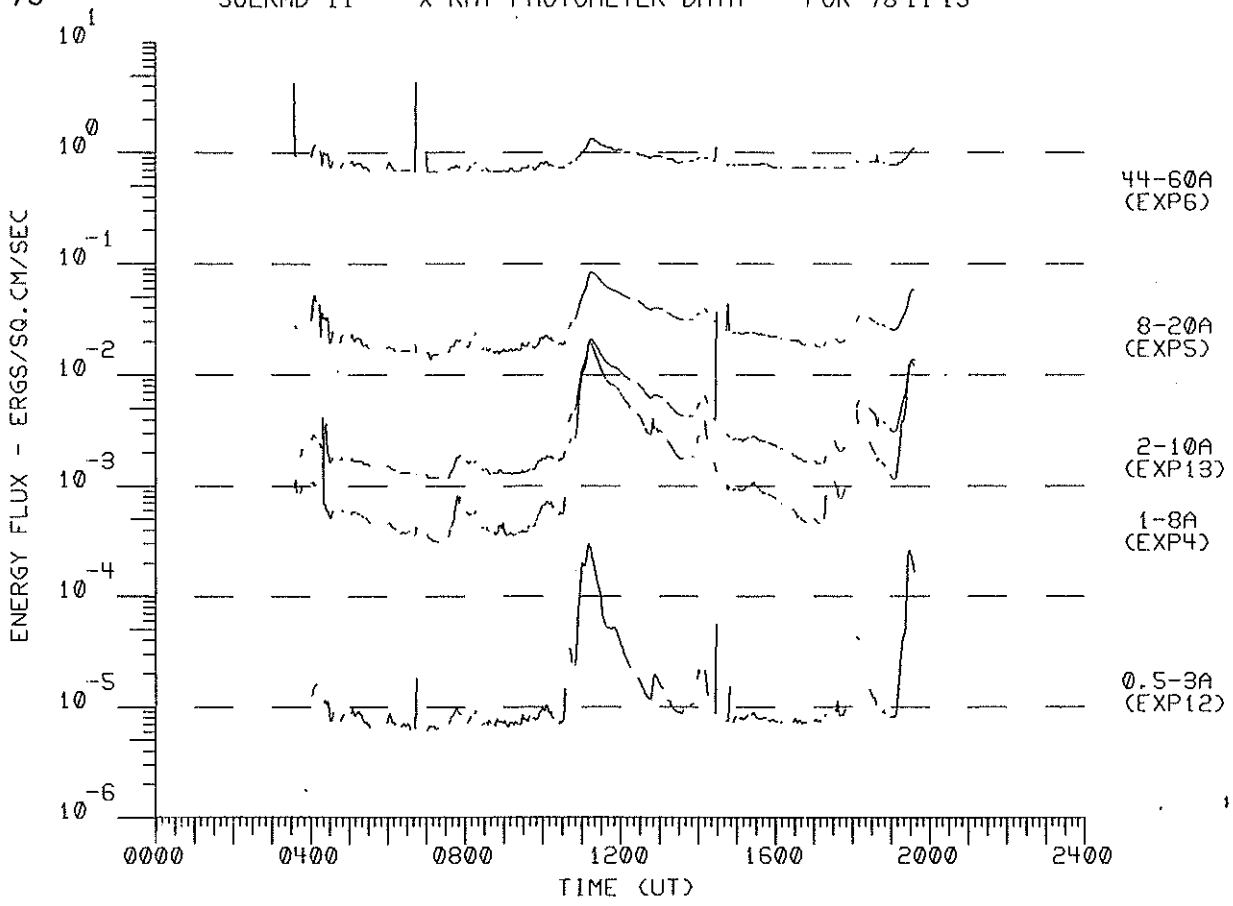
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 13



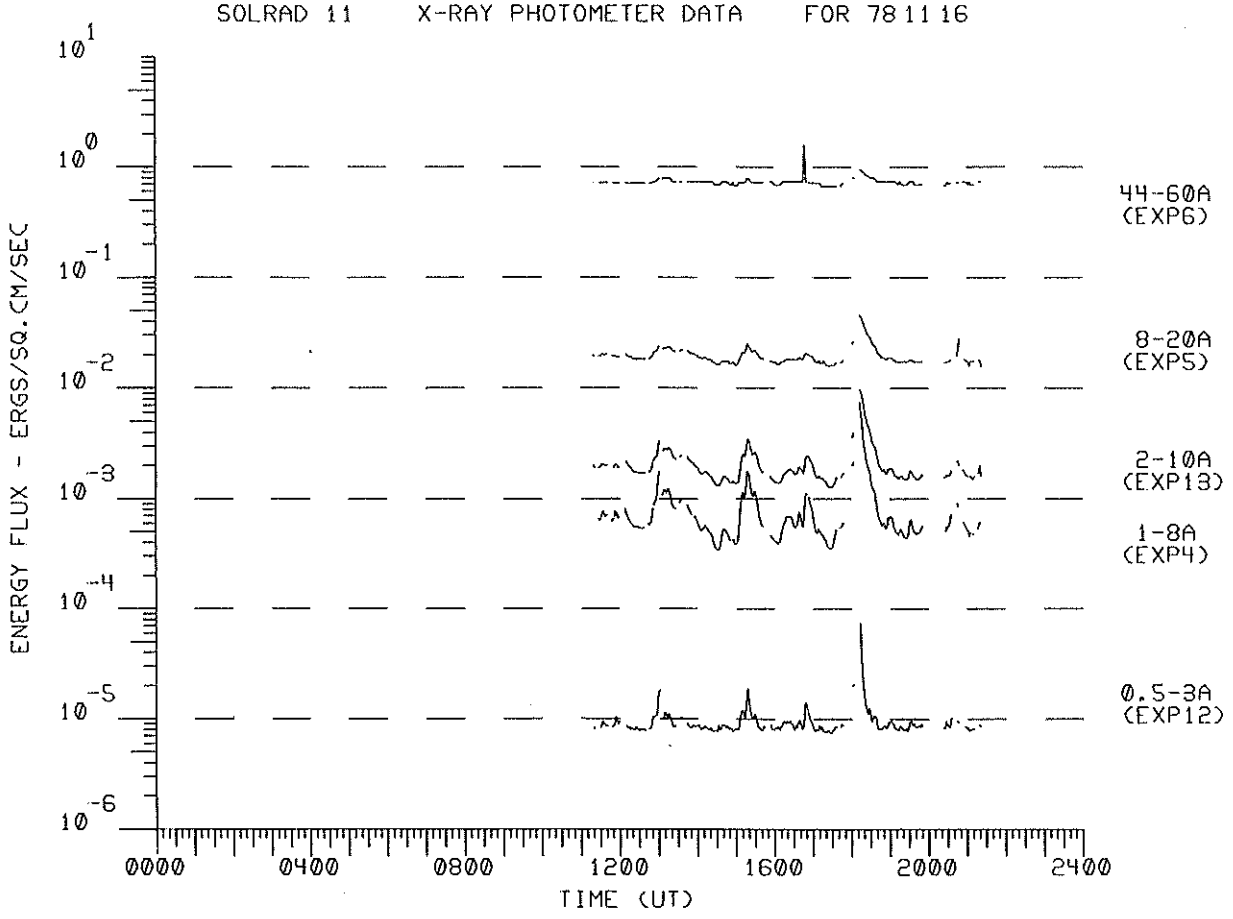
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 14

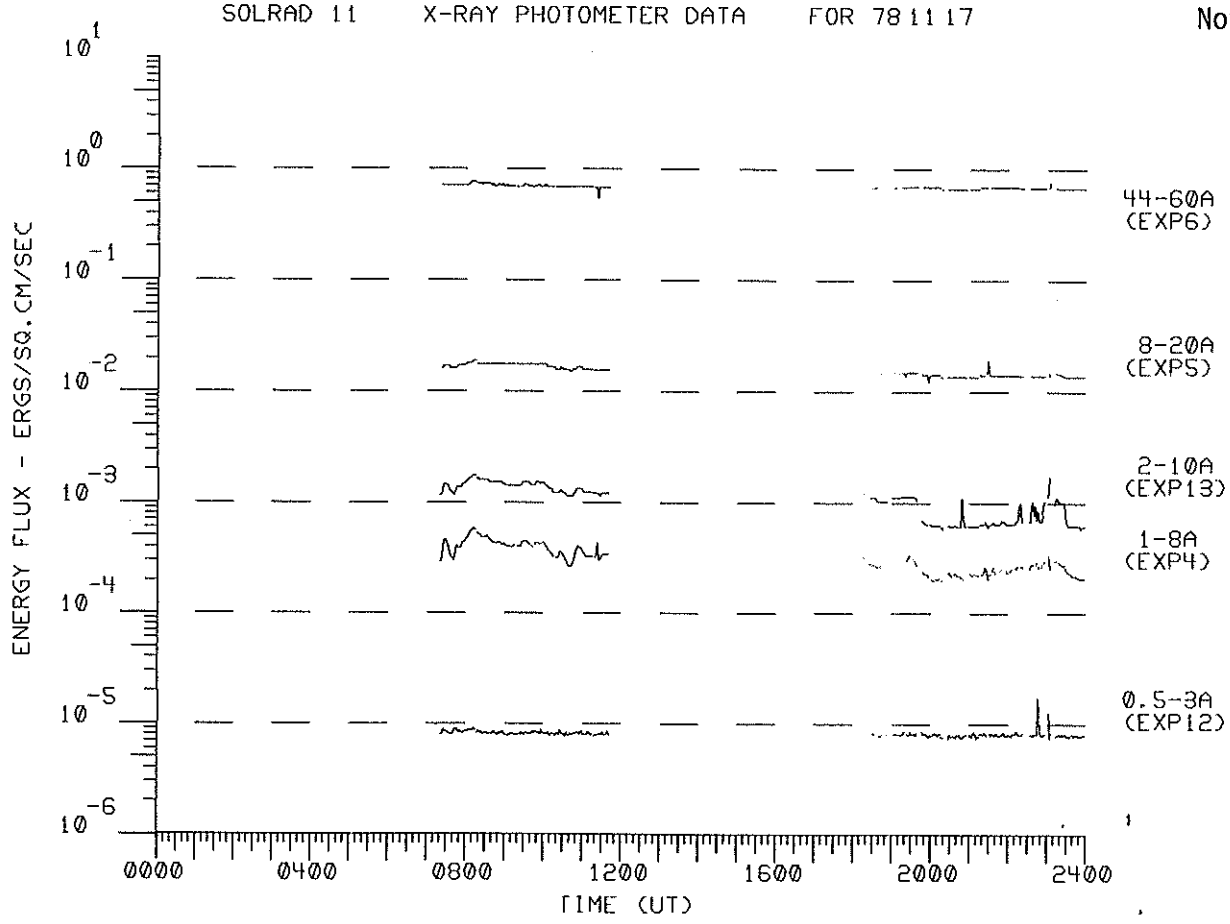


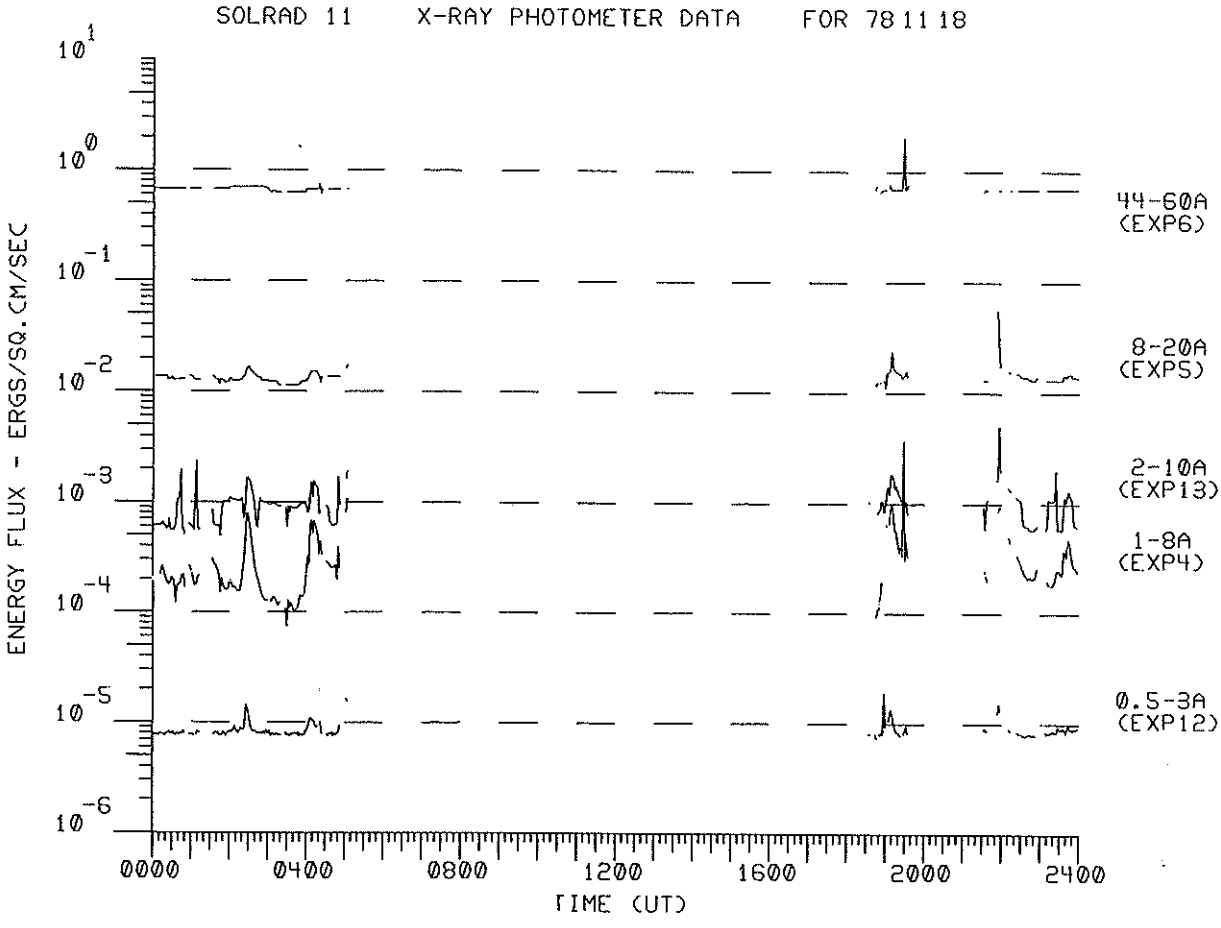
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 15



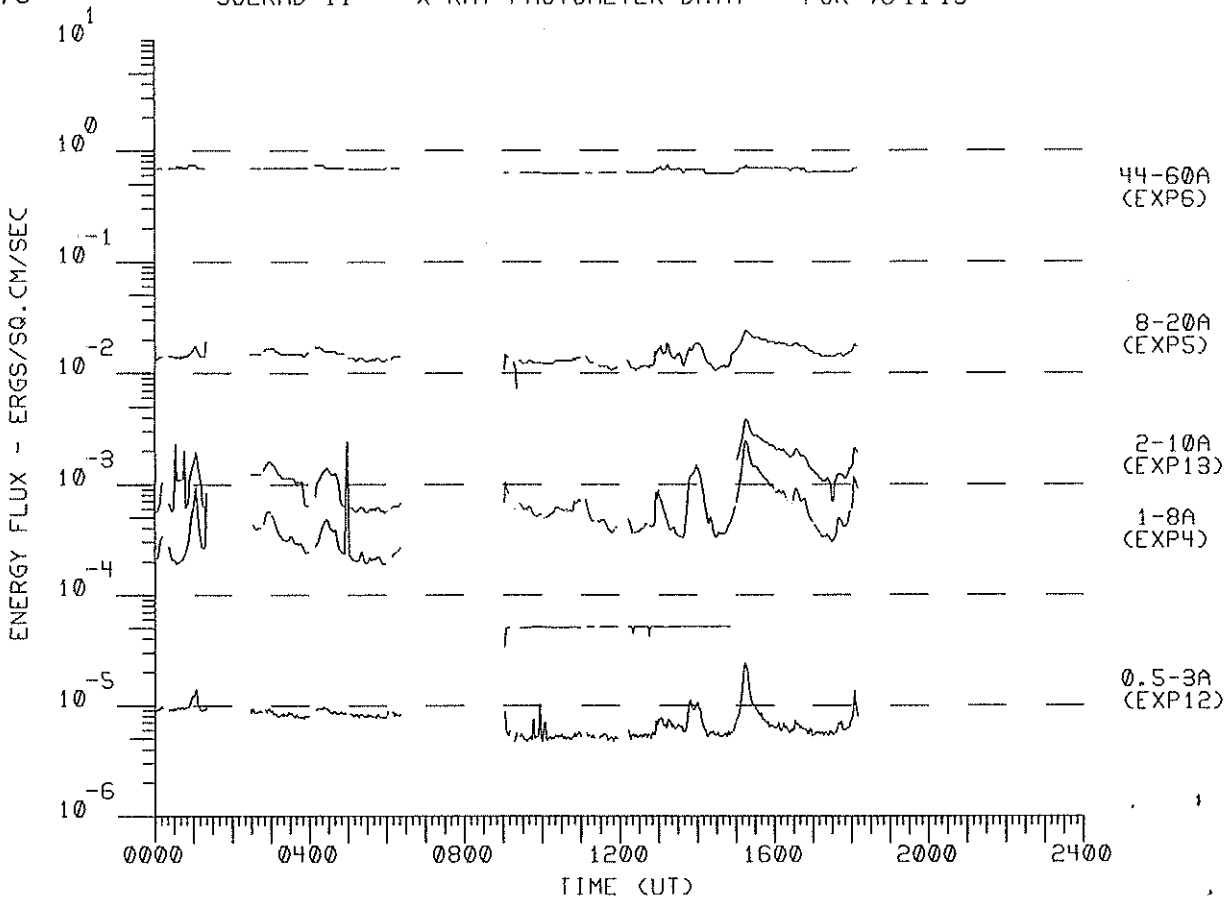
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 16



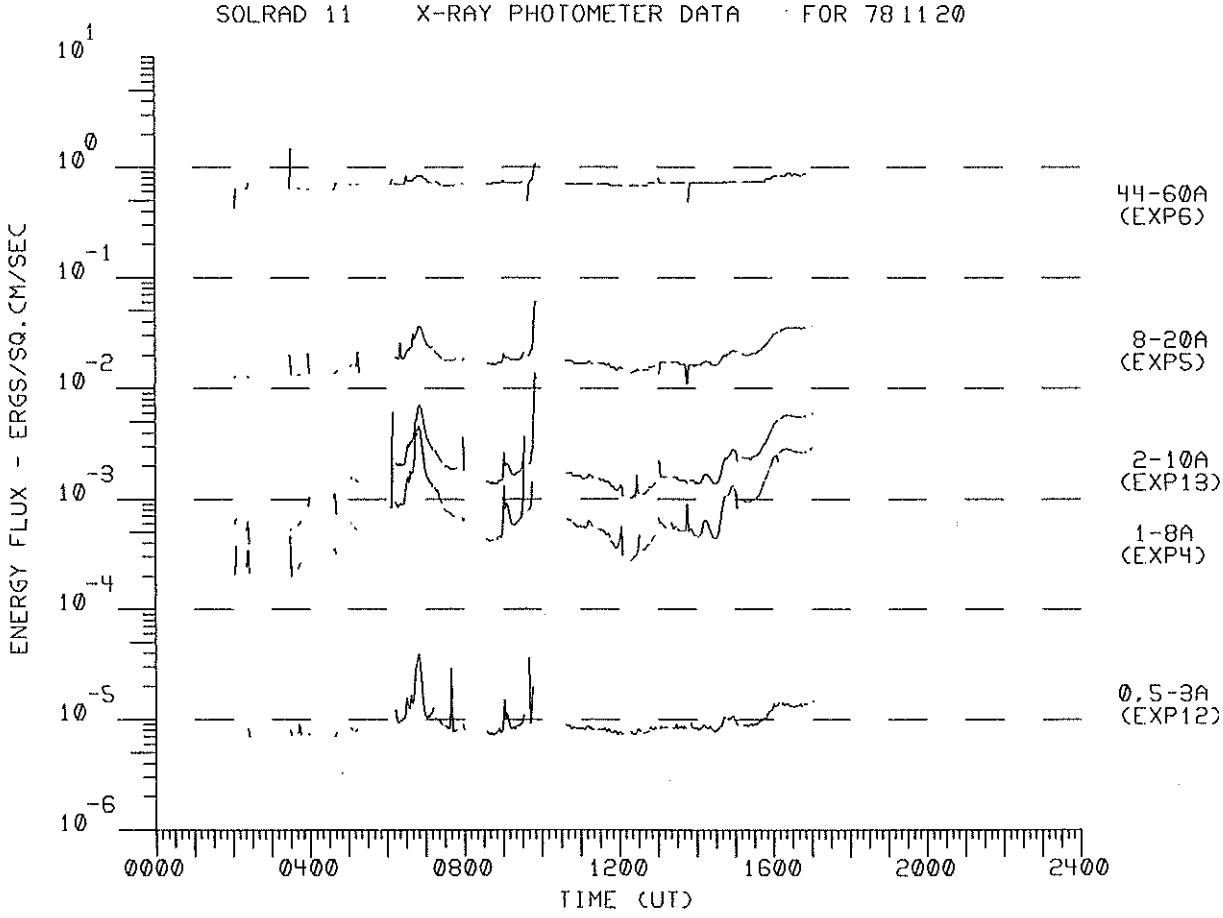

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 17
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 18
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)

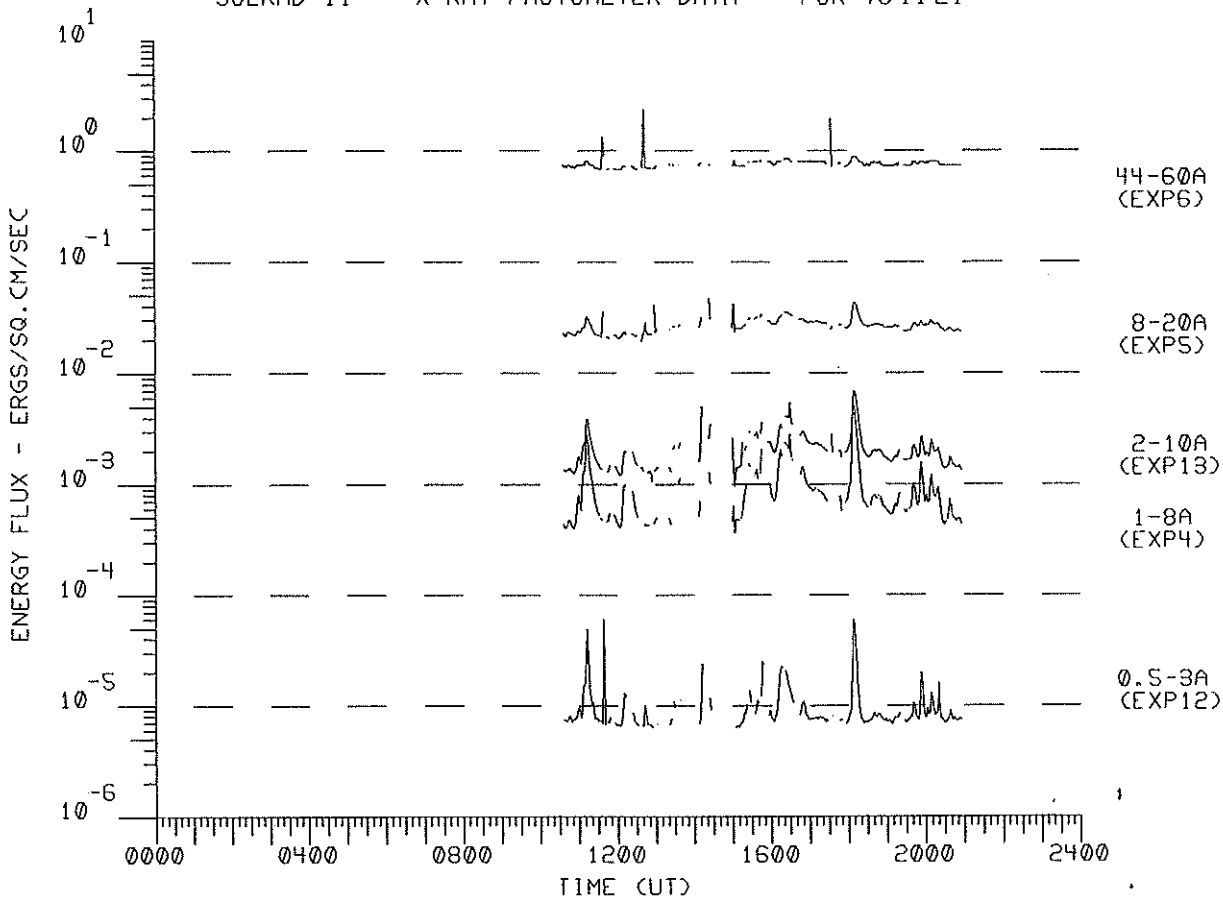
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 19



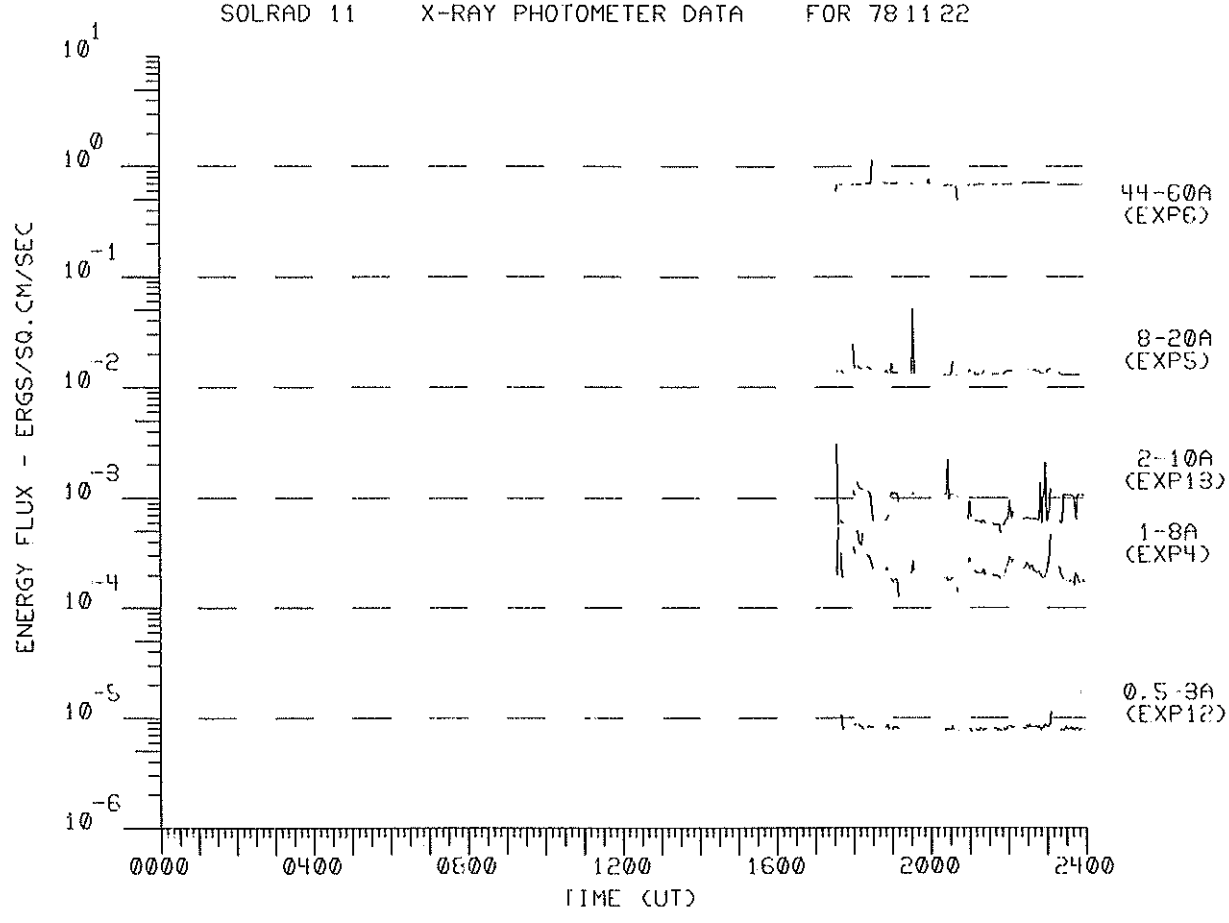
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 20

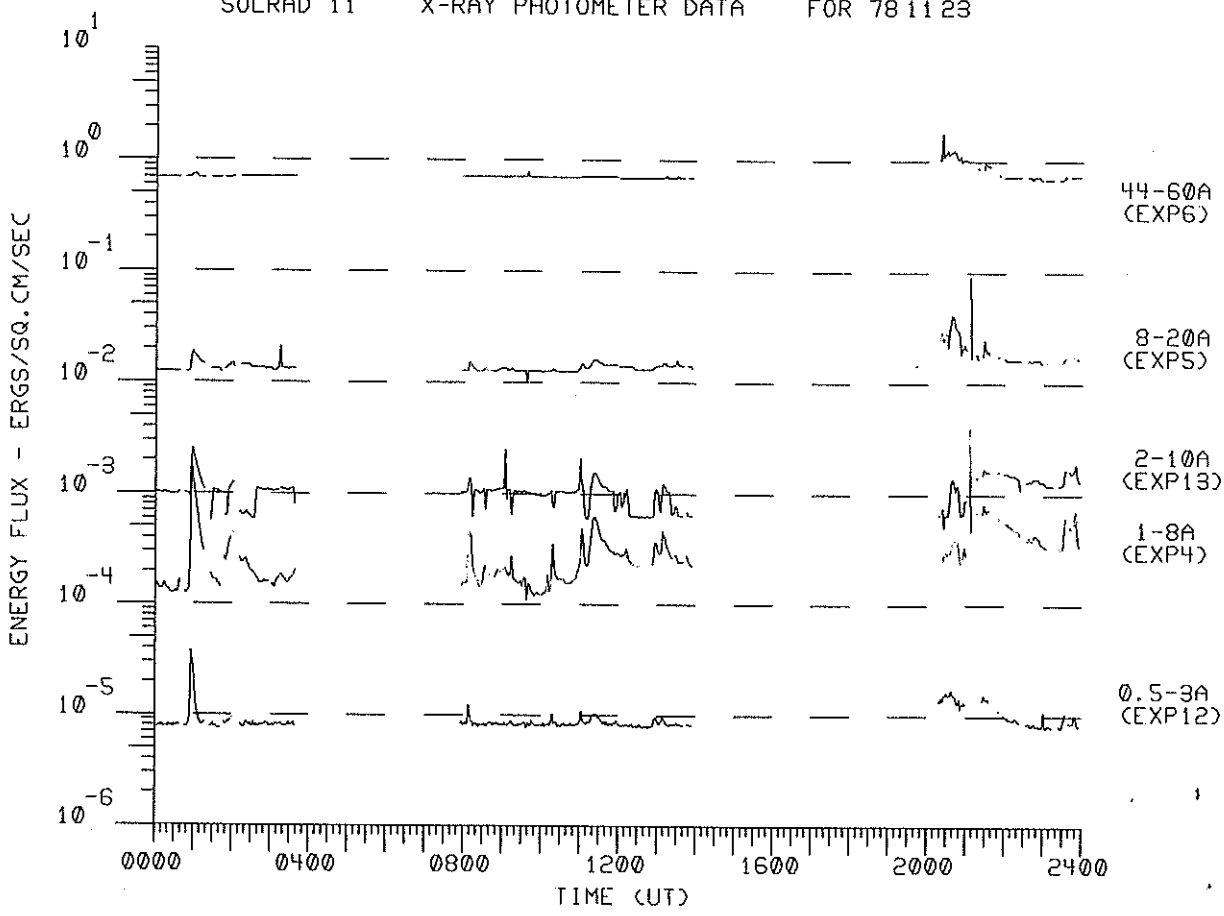


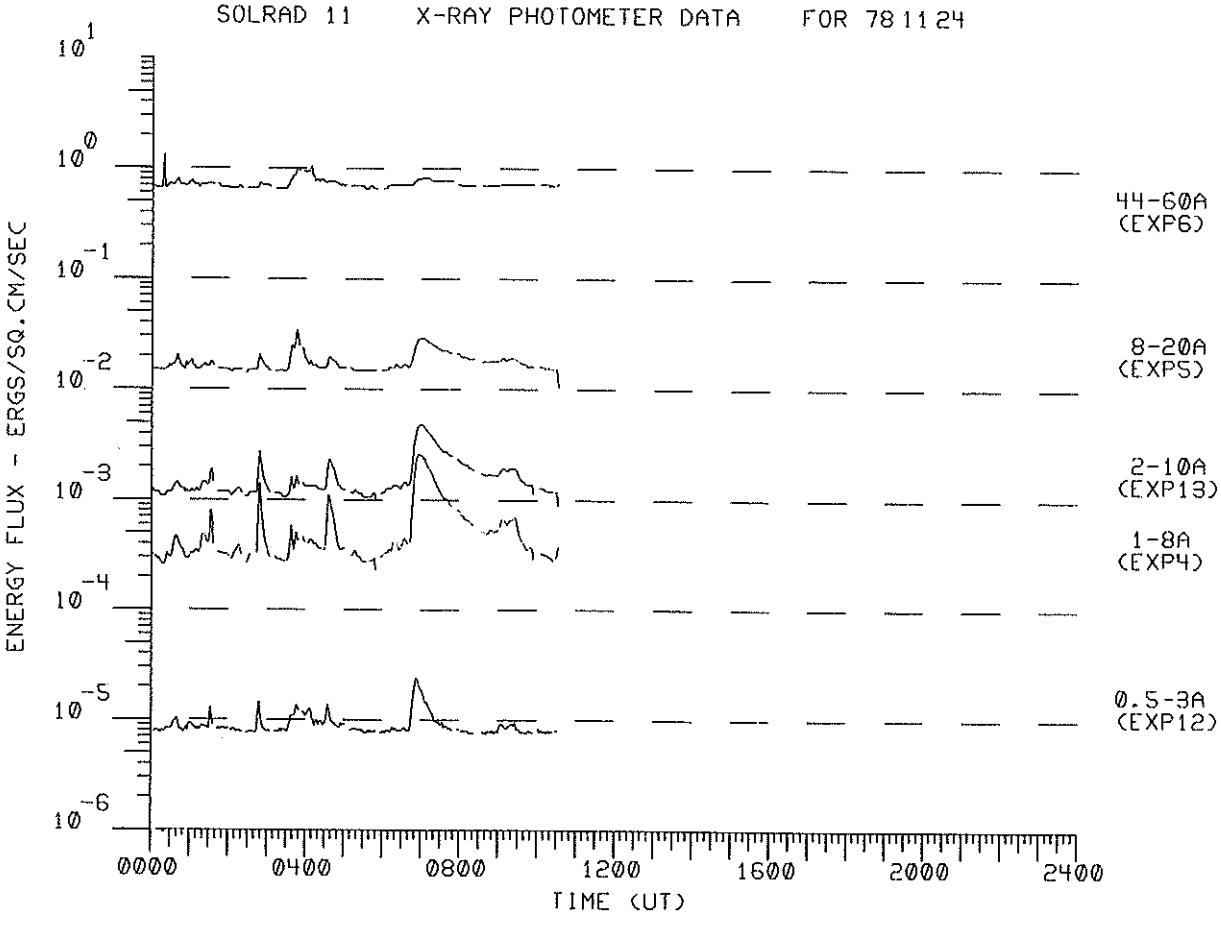
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 21



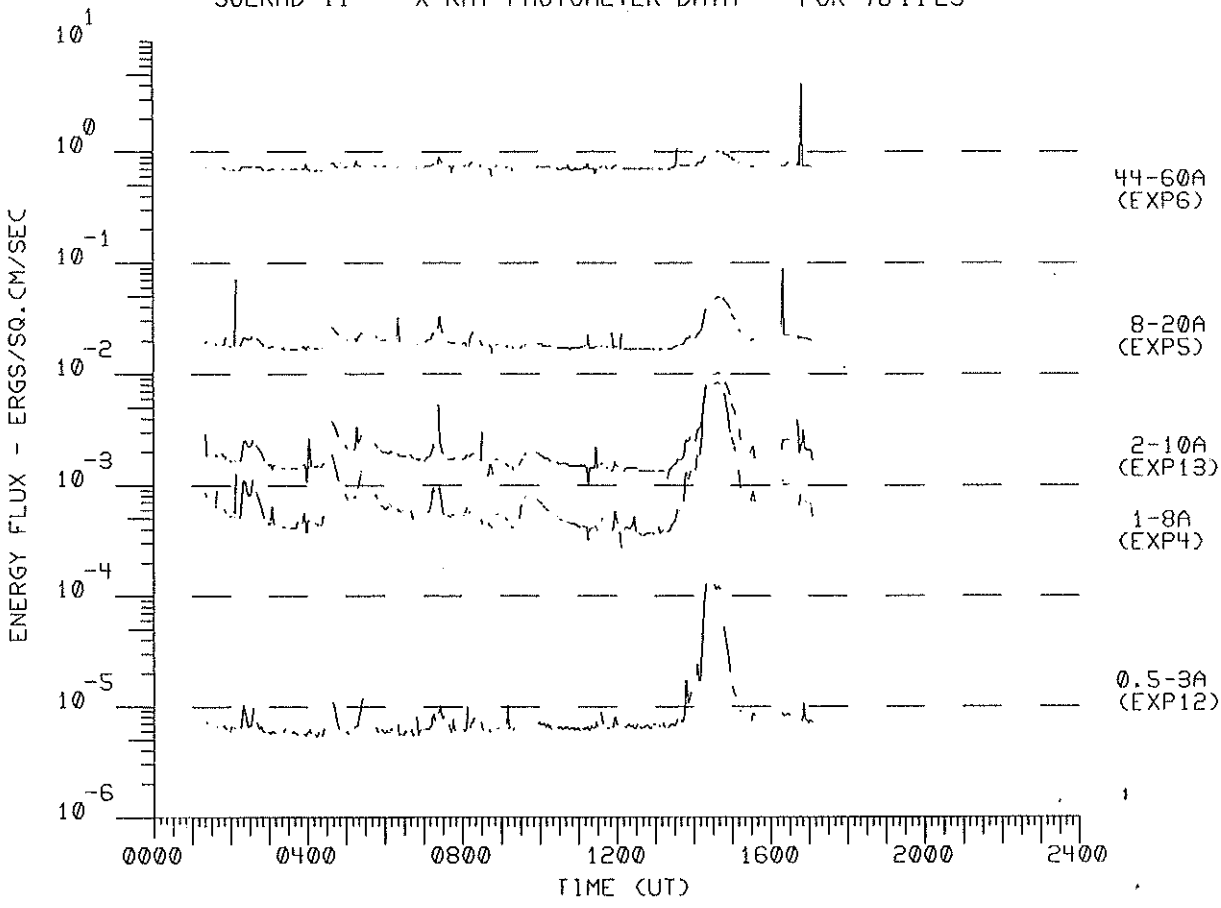
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 22



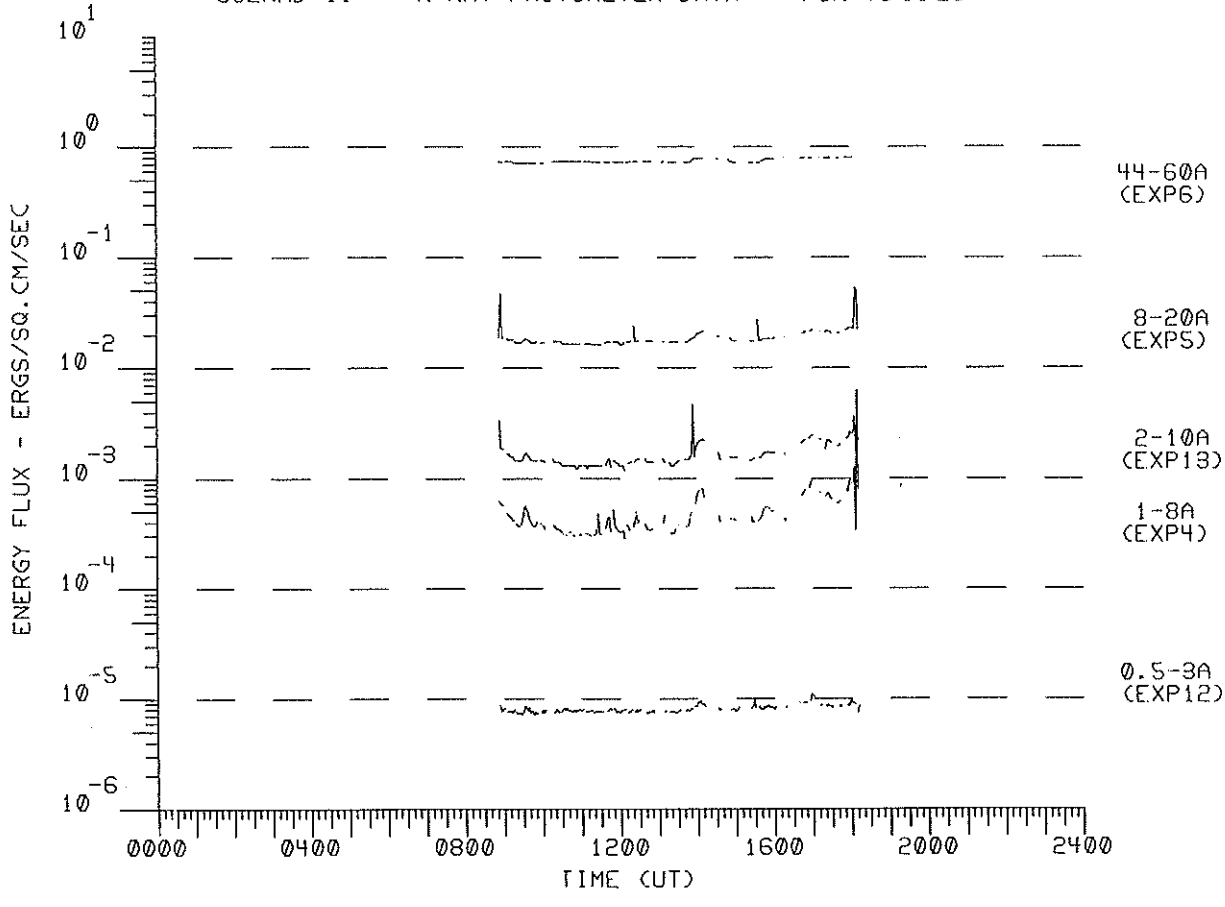

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 23
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

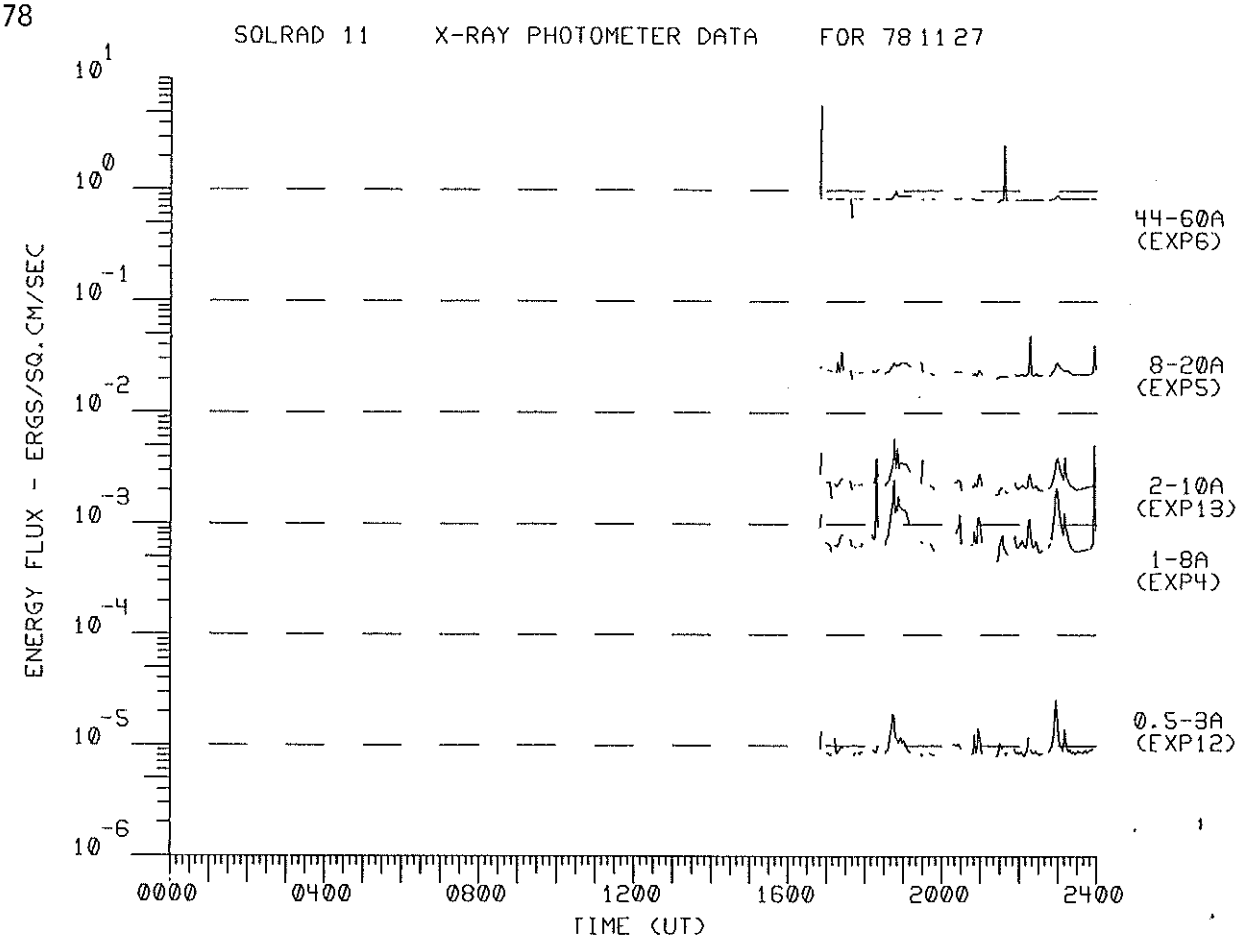

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 24
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

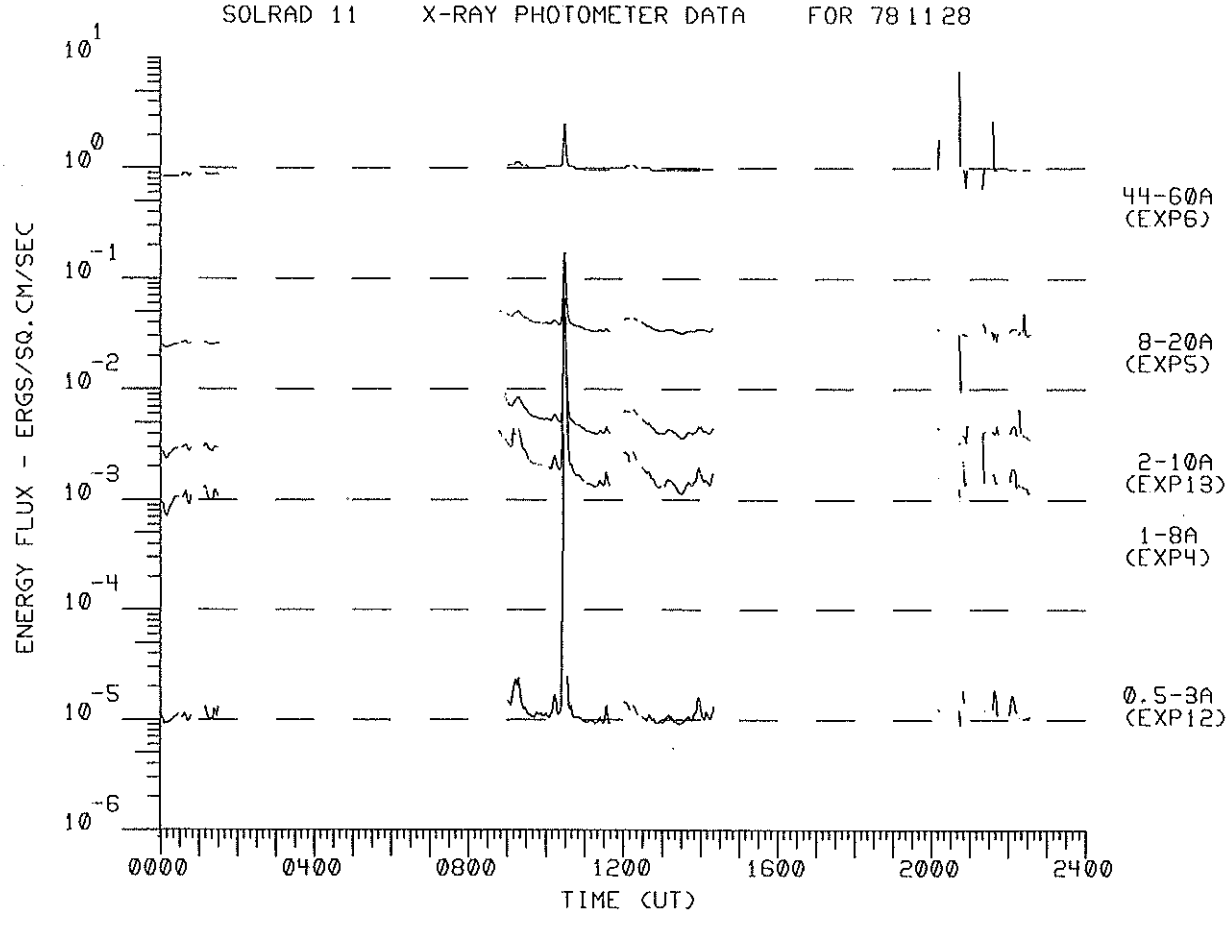
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 25

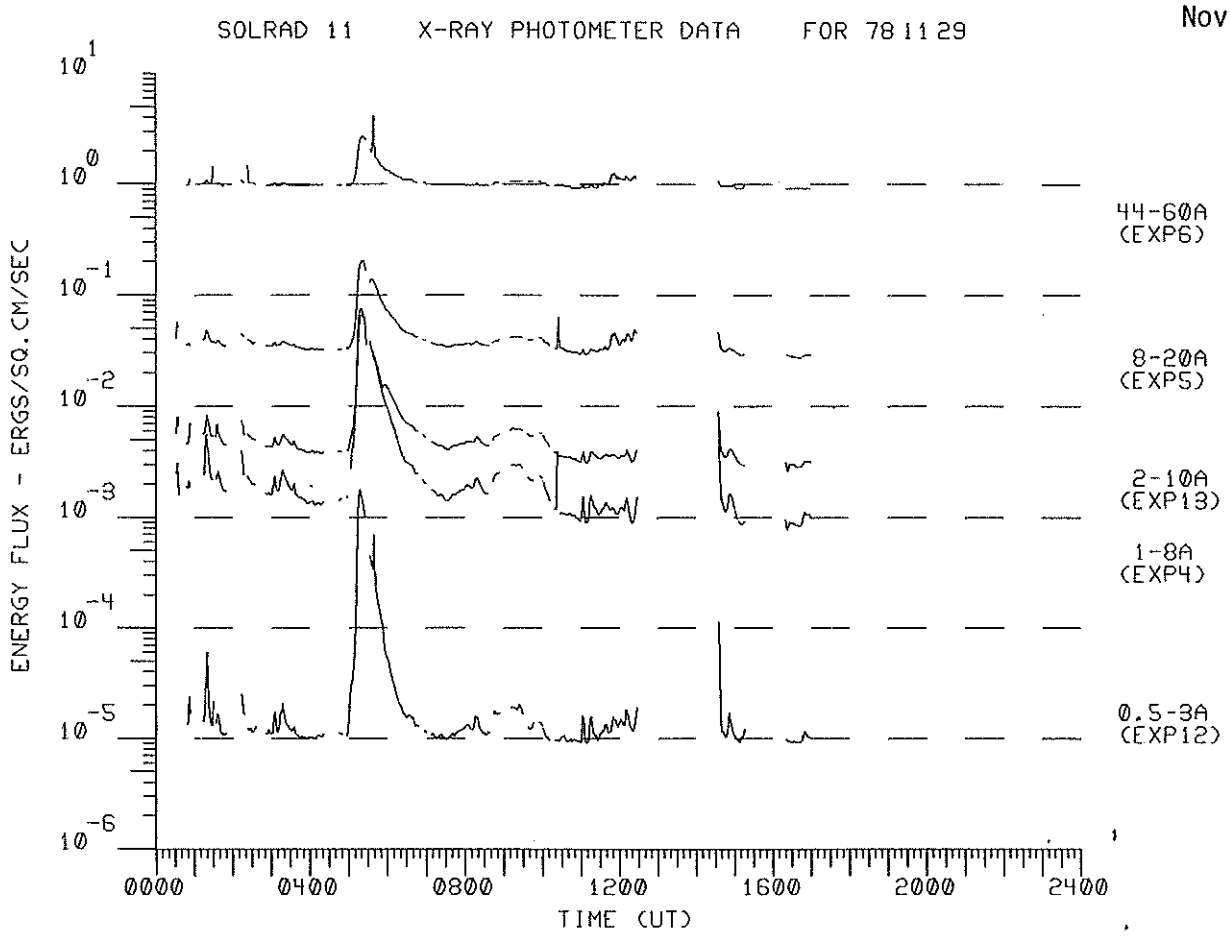


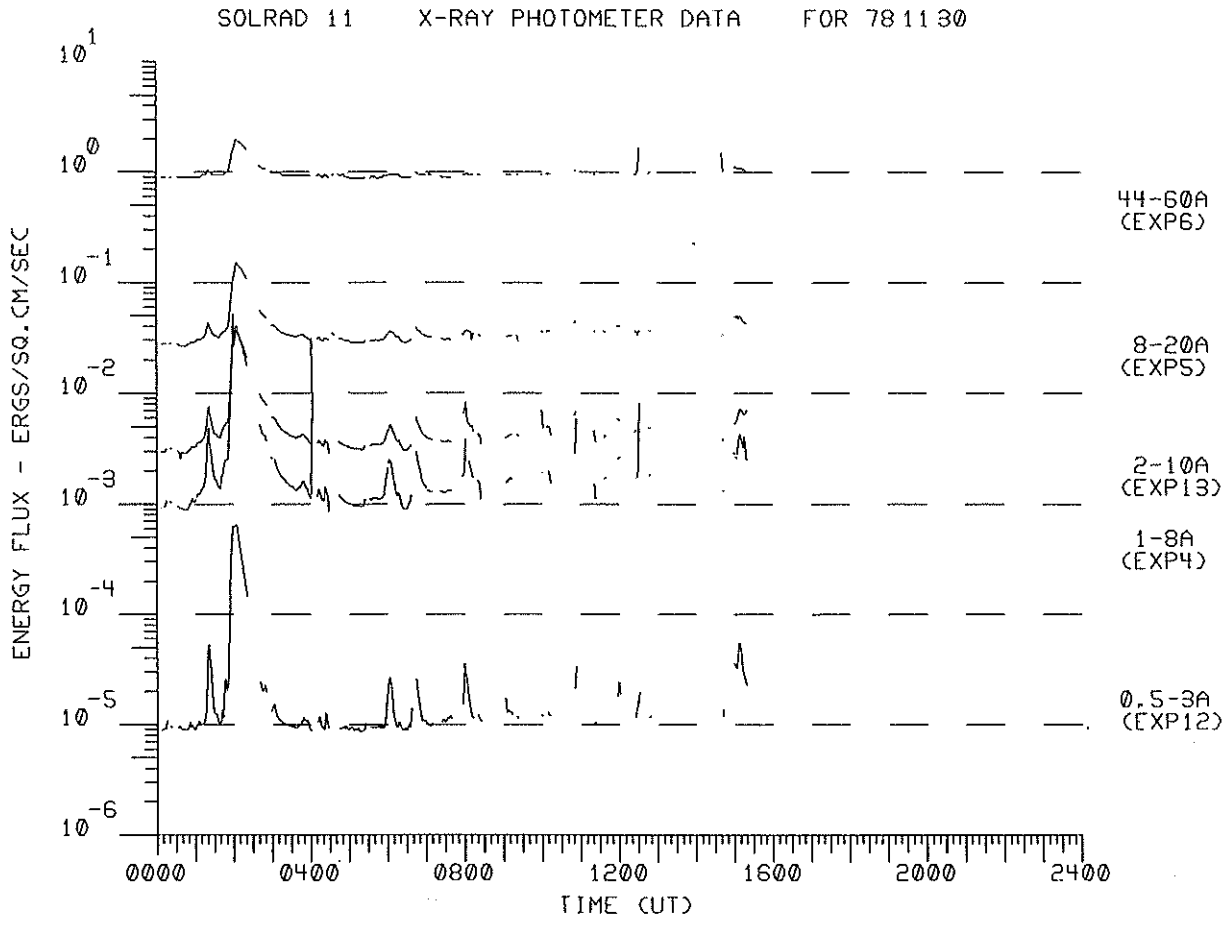
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 26




SOLRAD 11 X-RAY PHOTOMETER DATA FOR 78 11 27
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 78 11 28
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 78 11 29
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 78 11 30
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1978

NOV 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	
01	0000	0711	CULG				0000	0711					IIIN,W
			CULG				0054	0055	1				IIIG,U
			CULG				0125	0125.5	1				IIIB,U
			CULG				0244.5		1				IIIB,U
			CULG	0318	0319	1							IIIG
	1121	2132	SGMR										
	0643	1528	WEIS				1152.3	1152.4	1				IIIG
	0720	1610	DURN	1155.5	1155.8	1	1152.4	1155.8	3				IIIG,RS
			WEIS				1155.7	1155.8	2				IIIB,UU
			WEIS				1221.6	1221.9	2				IIIG
			WEIS				1340.8	1341.0	1				IIIG
			WEIS				1343.9	1347.8	2				IIIG
			DURN	1346.2	1346.5	3							IIIGG
			DURN	1403.8	1404.1	3							IIIG
			WEIS	1403.8	1404.2	2							RS
			WEIS				1406.7	1406.8	1				IIIB
			WEIS				1414.5	1414.7	1				IIIG
			WEIS				1451.7	1454.2	2				IIIG
			DURN	1451.8	1453.3	1	1451.8	1453.5	3				IIIG
			DURN	1538.0	1541.6	3	1538.0	1541.6	3				IIIG
	2115	2400	CULG				2203.5	2204.5					IIIG,W
			CULG				2243						IIIB,W
			CULG	2336.5	2340	1							IN
			CULG	2350	2400	1							IS
02	0000	0321	CULG	0000	0040	1							IS
			CULG				0128						IIIB,W
			CULG				0218		1				IIIB
			CULG	0310.5	0311.5	1							IIIG
	0412	0715	CULG				0532.5	0533.5	2				IIIG,U
			CULG				0640.5						IIIB,W
			CULG				0711.5	0712					IIIG,W
	0725	1600	DURN										
	0646	1327	WEIS				0824.2	0824.3	1				IIIB
			WEIS				0846.7	0847.0	2				IIIG,U
	1122	2131	SGMR										
	1342	1526	WEIS										
	2016	2400	CULG				2016	2400					IIIS,W
			CULG	2145	2339	1							F DRIFT,N
			CULG				2206.5						IIIB,W,U
			CULG							2256.5	2400	1	S.W.F.
03	0000	0715	CULG							0000	0150	1	S.W.F.
			CULG				0010	0715					IIIN,W
			CULG	0015.5	0016	1	0015.5		1				IIIG
			CULG				0027	0121	1				IS
			CULG	0040		1	0040	0041.5	3	0040	0041	3	IIIG,V
			CULG				0044.5		2				IIIB
			CULG	0129		1	0129		1				IIIB
			CULG	0132	0132.5	1	0132	0132.5	1				IIIG
			CULG	0137	0137.5	2	0136.5	0139.5	2	0136.5	0138.5	2	IIIGG,V
			CULG	0158.5	0159.5	2	0159	0159.5	1				IIIG
			CULG				0235	0239					IIIGG,W
			CULG				0237.5	0238.5	1				IIIG
			CULG				0245	0247	1				I
			CULG	0250	0251	1	0249.5	0253	1				IIIGG
			CULG				0349.5	0354	2	0350.5	0353	1	IIIGG,V
			CULG				0418.5	0419.5	2				IIIG
			CULG				0437	0437.5	1				IIIG
			CULG				0444		1				IIIB
			CULG				0446.5		1				IIIB
			CULG				0555.5	0557	1				IIIG
	0648	1524	WEIS				0717.5	0717.6	1				IIIB
			WEIS				0739.5	0740.0	1				IIIG
			WEIS				0743.1	0743.2	1				IIIB
			WEIS				0801.3	0801.8	2				IIIG
			WEIS				0803.5	0803.7	2				IIIB
	0725	1600	DURN				0803.6	0818.1	3				IIIGG,N
			WEIS				0807.0	0808.8	2				IIIGG
			WEIS				0814.6	0815.0	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1978

NOV 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	
03			WEIS				0817.3	0818.1	3				IIIG
			WEIS				0822.7	0823.0	2				IIIB,U
			WEIS				0825.6	0826.0	3				IIIG
			DURN				0825.7	0825.9	3				IIIG
			WEIS				0841.8	0842.1	1				IIIB
			WEIS				0850.9	0851.2	1				IIIG
			WEIS				0857.6	0858.4	1				IIIG
			WEIS				0905.9	0906.4	2				IIIG
			WEIS				0908.0	0909.6	3				IIIG
			DURN				0908.1	0909.5	3				IIIGG
			WEIS				0932.3	0932.7	1				IIIG
			WEIS				0935.0	0935.3	2				IIIG
			WEIS				0943.9	0945.2	1				IIIG
			WEIS				1024.4	1025.8	1				IIIG
	1124	2130	SGMR										
			WEIS				1514.6	1514.8	2				IIIG
	2018	2400	CULG				2018	2210					IIIS,W
			CULG				2018	2400	1				IIIN
			CULG				2036	2036.5	1				IIIG
			CULG	2044		1	2044		1				IIIB
			CULG				2154.5	2155	2	2154.5	2155	1	IIIB,U
			CULG				2210	2335.5					IIIN,W
			CULG	2226	2226.5								F DRIFT,W
			CULG	2229	2229.5	1							FAST DRIFT
			CULG	2309.5	2310	1	2309.5	2311	2				IIIG
			CULG	2355	2355.5	1							FAST DRIFT
			CULG	2359	2400	1							F DRIFT,W
04			CULG				0000	0715					IIIN,W
	0000	0715	CULG	0000	0000.5	1							F DRIFT,W
	0000	0900	MANI										
			CULG	0004.5	0005.5	2	0005	0005.5	1				IIIG
			CULG				0023	0026	1				IIIG
			CULG				0025		1	0025	0025.5	1	IIIB
			CULG	0145.5	0146	1							FAST DRIFT
			CULG	0514			0514						IIIB,W
			CULG				0532.5		1				IIIB
			CULG	0649.5	0650	1	0649.5	0650	1				IIIG
			WEIS				0817.4	1409.4	2				IS
	0725	1600	DURN				0840	1150	1				I,DC
	0649	1523	WEIS				0902.2	0903.3	1				IIIG
			WEIS				0908.7	0909.2	1				IIIG
			WEIS				1106.7	1106.8	2				IIIG
	1125	2128	SGMR										
	2015	2400	CULG				2015	2135	1				IIIS
			CULG	2015	2225								IS,W
			CULG				2015	2223	1				IS,DC
			CULG				2015	2106	1				N,RS,DP
			CULG				2135	2400					IIIS,W
	2200	2400	MANI										
			CULG				2223	2338					IS,W
			CULG	2225	2354								IN,W
			CULG	2354	2400	1	2338	2400	1				IS
05	0000	0715	CULG				0000	0715					IIIS,W
			CULG	0000	0134								IN,W
			CULG				0000	0214	1				IS
	0000	0900	MANI										
			CULG	0015	0017.5	1							IIIG
			CULG				0036.5	0037	2				IIIG,U
			CULG	0134	0715		0214	0715					IS,W
			CULG	0405	0430	1							IS
			CULG	0420	0422	1	0419.5	0423.5	2	0420	0423.5	2	IIIGG
			CULG				0447.5		1				IIIB
			CULG	0539	0631	1							IS
			CULG				0637	0701	1				IIIS
	0651	0804	WEIS				0713.0	1519.5	2				IIIS
	0857	1521	WEIS				1038.6	1038.8	3				IIIG
			WEIS				1056.3	1056.8	2				IIIG
	1126	2127	SGMR										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1978

NOV 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	
05	1141	1608	DURN				1141 E	1600 D	1				I
			CULG				2015	2341	1				N,RS,DP
	2015	2400	CULG				2015	2400	1				IIIS
			CULG	2015	2350								IS,W
			CULG				2015	2400	1				IS,DC
	2158	2400	MANI										
			CULG				2248.5		2				IIIB
			CULG	2306		1	2306		2				IIIB
			CULG	2335	2335.5	1	2335	2335.5	2				IIIG
			CULG	2350	2400	1							IS
			CULG	2356.5	2357	1	2356.5	2357	2				IIIG
06	0000	0612	CULG				0000	0612					IIIS,W
			CULG	0000	0217								IS,W
			CULG				0000	0612	1				IS,DC
			CULG				0000	0612	1				IIIN
	0000	0900	MANI										
			CULG	0001	0001.5	1	0001	0001.5	1				IIIG
			CULG	0044	0045	2	0044	0045.5	3				IIIG,V
			CULG	0047		1	0047		1				IIIB
			CULG	0050.5	0051	1	0050.5	0051	2				IIIG
			CULG	0053.5	0054	1	0053.5	0054	1				IIIG
			CULG	0124.5	0127	1	0124.5	0127	1				IIIG
			CULG	0217	0612	1							IS
			CULG	0309.5			0309.5						IIIB,W
			CULG	0556.5	0557	1	0556.5	0557	1				IIIG
	0652	1519	WEIS				0702.0	1448.0	2				IS
	0715	1550	DURN				0715 E	1400	2				I,DC
			WEIS				0738.5	1508.2	2				IIIS
			DURN				0820.0	0820.8	1				IIIG
			DURN				0847.3	0847.5	2				IIIG
			DURN				0928.4	0928.6	3				IIIG
			DURN				1018.3	1020.3	3				IIIGG
			WEIS				1018.3	1021.5	3				IIIG
			WEIS				1324.8	1326.3	3				IIIG
			DURN				1324.9	1325.1	3				IIIGG
	1127	2126	SGMR				1325.5	1326.3	2				III
			DURN				1348.8	1349.3	3				IIIG
			DURN				1427.4	1427.6	3				IIIG,U
			DURN				1507.9	1508.1	3				IIIG
			CULG				2108	2400	1				IS,C,DC
	2108	2400	CULG				2108	2400	1				IIIS
	2146	2400	MANI										
			CULG				2239	2240	2				IIIG
			CULG				2252.5	2253	3				IIIB
07			CULG				0000	0715					IIIS,W
			CULG	0000	0715	1							IS
	0000	0715	CULG				0000	0222	1				IS,C,DC
	0000	0858	MANI										
			CULG				0032		1				IIIB
			CULG				0222	0355	2				IS,C,DC
			CULG				0326.5		2				IIIB
			CULG				0338.5						IIIB
			CULG				0355	0715	1				IS,C,DC
			CULG				0455.5	0456.5	1				IIIG
			CULG				0648		2				IIIB
	0655	1158	WEIS				0658.5	1518.0	2				IS
	1203	1518	WEIS				0712.6	1514.0	2				IIIS
	0714	1542	DURN				0714 E	1542 D	3				I,C,DC
	1129	2125	SGMR				1838.5	1844.7	2				IIIG
			SGMR				1955.3	1955.7	2				IIIG
			CULG				2015	2400	1				N,RS,DP
	2015	2400	CULG				2015	2400	1				IIIS
			CULG	2015	2400	1							IS
			CULG				2015	2400	2				IS,C,DC
			CULG							2111	2145	1	IIIN
			CULG				2118	2120.5	2	2118.5	2119.5	1	IIIGG
			CULG				2121.5		2	2121.5		2	IIIB
			CULG				2202.5	2203	1				DP

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1978

NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
07	2204	2400	MANI										
			CULG				2254		2				IIIB
08	0000	0657	CULG				0000	0657	1				IIIS
			CULG	0000	0657	1							IS
			CULG				0000	0657	1				IS,C,DC
	0000	0858	MANI										
			CULG				0006	0657	1				N,RS,DP
			CULG	0007.5	0008	1	0007.5	0008	2				IIIG
			CULG	0244	0254.5	2	0247	0253	3	0247	0253	3	IIIGG
			CULG	0301	0302.5	1							IIIG
			CULG	0442.5	0443	1	0442.5	0443	2				IIIG
			WEIS				0659.0	1458.0	2				IS,CONT
	0656	1516	WEIS				0659.0	1511.3	2				IIIS
	0714	1510	DURN				0714 E	1510 D	2				I,C,DC
			DURN				1030.2	1031.5	2				IIIGG
			DURN				1246.9	1247.5	2				IIIG
	1130	2124	SGMR				1312.5	2124.0D	1				CONT
			SGMR				1751.3	1754.2	3				IIIG
	2017	2400	CULG				2017	2400	1				IS,C,DC
			CULG				2017	2132	1				N,RS,DP
			CULG				2017	2153	1				IIIS
			CULG	2017	2400	1							IS
			CULG				2029.5	2030	2				IIIB
			CULG				2153	2400					IIIS,W
	2153	2400	MANI										
09	0000	0907	MANI										
	0000	0715	CULG				0000	0715					IIIS,W
			CULG	0000	0141								IS,W
			CULG				0000	0715	1				IIIN
			CULG				0000	0210	1				IS,C,DC
			CULG				0019	0020.5	1				DP
			CULG				0112.5	0455	1				N,RS,DP
			CULG				0119	0121	1	0121		1	IIIGG
			CULG	0141	0553	1							IS
			CULG				0142.5	0143	2	0142.5		1	IIIB
			CULG	0146	0147	1	0146	0147.5	2	0146	0147	1	IIIGG
			CULG	0203	0204.5	2	0203	0205	3	0203	0205	2	IIIGG,U
			CULG	0205.5	0210	1	0205.5	0210	2	0206	0209.5	1	IIIGG
			CULG				0210	0715	1				IS,DC
	0714	1550	DURN				0714 E	1550 D	1				I,DC
			WEIS				0840.5	1513.0	1				IIIN
	0739	1416	WEIS				0954.1	0955.6	3				IIIG
			DURN				0954.1	0955.6	3				IIIGG
			DURN				1003.6	1003.9	3				IIIG
			WEIS				1003.6	1003.9	3				IIIG
	1457	1516	WEIS				1043.6	1515.0	1				IN,DC
			DURN	1047.7	1047.9	3							IIIG
	1131	2123	SGMR										
			DURN	1154.9	1156.4	1							IIIG
			CULG				2016	2400	1				IIIN
	2016	2400	CULG				2016	2400					IIIS,W
			CULG	2016	2049	1	2016	2400	1				IS
			CULG				2028	2115	1				N,RS,DP
			CULG				2031.5	2032	1	2031.5	2032	1	IIIG
			CULG				2049.5		1				IIIB
			CULG	2117	2117.5		2117	2117.5					IIIG,W
			CULG	2125	2126.5	1	2125.5	2127	1				IIIG
			CULG				2139		1	2139		1	IIIB
			CULG	2155	2247	1							IS
	2155	2400	MANI										
			CULG	2247	2400								IS,W
10	0000	0716	CULG				0000	0249	1				IIIS
			CULG				0000	0716	1				IS,DC
	0000	0858	MANI										
			CULG	0014	0054	1							IS
			CULG							0050	0135	1	S.W.F.
			CULG				0059	0716	2	0108	0510		IV

SOLAR RADIO EMISSION
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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
10			CULG				0109.5	0128.5	3				II
			CULG							0120.5	0121	2	UNCLF
			CULG							0142.5	0144	1	SLOW DRIFT
			CULG							0243	0313		IIIS,W
			CULG				0249	0322	2				IIIS
			CULG				0252	0255	3				IIIG
			CULG				0259	0259.5	3	0259		2	IIIG
			CULG				0301	0302.5	2				IIIG
			CULG							0313	0403	1	IIIS
	0714	1550	DURN				0714 E	1230	1				I
	0658	0830	WEIS				0740.5	1512.2	1				IIIN
	0835	1515	WEIS				0916.7	0917.5	3				IIIG
			DURN				0916.8	0920.4	3				IIIGG
			WEIS				0920.0	0921.2	3				IIIG
	1132	2121	SGMR										
			WEIS				1158.1	1159.8	3				IIIG
			DURN	1356.6	1356.6	3							III
			DURN	1443.8	1444.6	3							IIIGG
			DURN	1533.6	1534.0	3							IIIGG
	2016	2400	CULG	2016	2042	1							IS
			CULG				2016	2400	1				IIIS
			CULG				2016	2302	1				IS,DC
			CULG	2028	2028.5	1	2028	2028.5	1				IIIG
			CULG				2119.5	2121.5	1	2119.5	2121.5	1	IIIGG
			CULG				2127.5	2129.5	1	2127	2129	1	IIIGG
			CULG				2138.5	2139.5	1	2139	2139.5	1	IIIG
	2154	2400	MANI										
			CULG	2203.5	2204.5	2							FAST DRIFT
			CULG	2210	2302								IS,W
			CULG	2214.5	2215	1	2214.5	2215	1				IIIG
			CULG				2217.5	2218	1	2217.5	2218	1	IIIG
			CULG	2302	2339	1	2302	2319	1				IS
			CULG				2306	2307	1	2306	2307	1	IIIG
			CULG				2316.5		1	2316.5		1	IIIB
			CULG				2319	2400	1				IS
			CULG	2327	2327.5	2	2327	2327.5	3				IIIG
			CULG	2333	2333.5	2	2333	2333.5	2				IIIG
			CULG	2343		2	2343		3				IIIB
11	0000	0716	CULG				0000	0236	1				IS,DC
			CULG				0000	0032	1				IIIS
	0000	0854	MANI										
			CULG				0032.5	0042	2	0032.5	0042	2	IIIGG
			CULG				0042	0716	1				IIIS
			CULG				0046		1	0046		1	IIIB
			CULG				0117.5	0118	2	0117.5	0118	2	IIIG
			CULG				0132.5	0133	2	0132.5	0133	2	IIIG
			CULG	0204.5	0205	1							IIIG
			CULG				0205	0206	1				IIIG
			CULG	0208.5	0209.5	2	0208.5	0209	1				IIIG
			CULG	0220.5	0221	1							FAST DRIFT
			CULG				0236	0716	1				IS
			CULG	0324	0324.5	1							FAST DRIFT
			CULG	0330.5	0331	2	0330.5	0331	1				IIIG
			CULG	0348.5	0349	1	0348.5	0349	2				IIIG
			CULG	0355.5		1							FAST DRIFT
			CULG				0418	0418.5	2	0418	0418.5	1	IIIG
			CULG				0420.5		2				IIIB
			CULG				0513.5	0514	2				IIIB
			CULG	0609	0609.5	1							FAST DRIFT
			CULG				0612	0612.5	2				IIIG
	0700	1513	WEIS				0708.0	1512.0	2				IS,DC
			WEIS				0725.0	1457.0	2				IIIS
	0714	0740	DURN				0725.3	0738.0					IIIGG,N
			WEIS				0730.0	0738.5	3				IIIG
	0823	1550	DURN				0823 E	1430	1				I,DC
			DURN				0840.3	0845.0	3				IIIGG
			WEIS				0840.3	0845.5	3				IIIGG
			WEIS				0858.3	0904.2	3				IIIGG,V
			DURN	0858.3	0904.2	2	0858.3	0904.2	3				IIIGG,V

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
11			OURN				1008.0	1008.4	1				IIIG
			WEIS				1026.5	1032.5	3				IIIGG,V
			OURN	1030.6	1040.0	3	1028.4	1040.0	3				IIIGG,N
			WEIS				1036.0	1040.0	3				IIIGG
			OURN				1200.1	1200.5	1				IIIG
			OURN				1216.4	1217.2	3				IIIGG
			WEIS				1216.4	1217.8	3				IIIGG
	1134	2120	SGMR				1216.8	1217.9	2				V
			SGMR				1217.9	1729.0	2				CONT
			WEIS				1223.6	1225.3	3				IIIG
			OURN				1223.7	1224.6	3				IIIG
			SGMR				1224.3	1224.7	2				V
			OURN	1224.6	1225.7	3							IIIG
			WEIS				1227.5	1228.0	2				IIIG
			WEIS				1311.2	1313.6	3				IIIGG
			OURN				1311.2	1314.9	3				IIIGG
			WEIS				1412.1	1417.3	3				IIIGG,IV
			OURN				1412.2	1417.3	3				IIIGG
			SGMR				1412.3	1417.0	3				IIIG
			OURN				1450.5	1450.8	2				IIIG
			OURN				1535.9	1536.0	2				III
			CULG				2016	2212	1				IS,C,DC
	2016	2400	CULG				2016	2212	1				IIIS
			CULG	2036	2110	1							IS
			CULG	2110	2200	1							IS
			CULG	2130	2130.5	1				2130	2130.5	1	IIIG
			CULG							2138	2144	1	IIIN
			CULG	2200	2230	1							IS
	2200	2400	MANI										
			CULG				2212	2341	2				IS,C,DC
			CULG				2212	2322	2				IIIS
			CULG							2229	2320	1	IIIN
			CULG	2230	2400	1							IS
			CULG				2322	2400	1				IIIS
			CULG				2341	2400	1				IS,C,DC
12	0000	0715	CULG				0000	0715					IIIS,W
			CULG				0000	0715	1				IS,C,DC
	0000	0533	MANI										
			CULG	0254	0254.5	2							FAST DRIFT
			CULG	0546.5	0549	1							FAST DRIFT
			CULG				0637.5		2				IIIB
			CULG				0639		2				IIIB
			CULG	0649	0715								IS,W
	1327	1512	WEIS				0705.0	1158.0					CONT
	0700	1158	WEIS				0705.0	1426.0	2				IS
	0714	1550	OURN				0714 E	0930	1				I,C,DC
			OURN				1116.5	1116.9	3				IIIG
	1135	2119	SGMR										
			CULG				2018	2200					IIIS,W
	2018	2400	CULG				2018	2214	1				IS,C
			CULG	2018	2108.5	1							FAST DRIFT
			CULG	2046.5	2047	1							IIIG
			CULG				2049.5	2050	1				IIIB
			CULG	2049	2049.5	1							IIIG
			CULG	2109		1							FAST DRIFT
	2153	2400	MANI										
			CULG				2200	2400					IIIN,W
			CULG				2214	2400	1				IS,C
			CULG				2347.5	2348	3				IIIB,U
13			CULG				0000	0715					IIIN,W
	0000	0715	CULG				0000	0111	1				IS
	0000	0900	MANI										
			CULG				0035.5		1				IIIB
			CULG	0047	0049	1							IIIG
			CULG				0111	0259	1				IS
			CULG	0211.5	0212	1							FAST DRIFT
			CULG				0259	0715	1				IS
			CULG	0339	0339.5	1							FAST DRIFT

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NOV 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	
13			CULG				0429	0429.5	1				UNCLF
			CULG	0601	0601.5	1	0601	0602	2				IIIG
			CULG				0626.5		1				IIIB
			CULG				0628	0629.5	2				IIIG
			CULG	0713.5	0714	2	0713.5	0714.5	2	0713.5	0714	1	IIIG
	0703	1510	WEIS				0713.7	0714.3	2				IIIG
	0714	1550	DURN				0714 E	0925	1				I
			DURN				0730.5	0730.6	2				IIIG
			WEIS				0731.1	0731.5	1				IIIG
			WEIS				0903.7	0903.9	2				IIIB
			WEIS				0917.2	0918.1	2				IIIG
			DURN	0926.6	0926.6	1							III,RS
	1136	2118	SGMR										
			WEIS				1204.8	1205.1	1				IIIG
			DURN	1302.7	1302.9	2							IIIG
			WEIS				1304.0	1306.0	2				IIIG
	2018	2400	CULG				2018	2400					IIIN,W
			CULG				2018	2051					IN,W
	2150	2400	MANI										
			CULG				2151.5		1				IIIB
			CULG				2159		2				IIIB
			CULG							2200.5		1	IIIB
			CULG				2203	2203.5	3	2203	2203.5	1	IIIG
			CULG				2204	2204.5	3	2204	2204.5	2	IIIB
			CULG				2207	2208.5	3	2207	2208	2	IIIG,V
			CULG				2210.5	2212	3	2210.5	2212	2	IIIG,V
			CULG				2212.5		1				IIIB
			CULG	2223.5	2400	1	2311.5	2400	1				IS
14			CULG				0000	0127					IIIS,W
	0000	0716	CULG	0000	0155.5	1	0000	0131	1				IS
	0000	0857	MANI										
			CULG				0127	0716					IIIN,W
			CULG	0232	0504		0131	0418					IN,W
			CULG				0418	0503					IS,W
			CULG	0504.5	0551	1							IS
			CULG	0551	0716								IN,W
			CULG				0657.5	0658	2				IIIB
	0714	1550	DURN				0714 E	1110	1				I
	0705	1509	WEIS				0803.0	1508.0	2				IS
			WEIS				0817.0	1004.0	2				IIIN
			WEIS				1024.4	1024.6	3				IIIG
	1138	2117	SGMR										
	2017	2225	CULG										
	2156	2400	MANI										
	2235	2400	CULG				2245	2246	3				IIIG,U
15			CULG				0000.5	0001					IIIG,W
	0000	0716	CULG	0000	0016								IS,W
	0000	0855	MANI										
			CULG				0027.5						IIIB,W
			CULG	0108	0240								IS,W
			CULG				0129	0251	1				IS
			CULG				0157						IIIB,W
	0718	1550	DURN										
	0918	1506	WEIS										
	0705	0913	WEIS				1059.5	1101.6	1				IIIG
	1139	2116	SGMR										
	2017	2400	CULG	2128	2140								IS,W
			CULG				2132						IIIB,W
	2200	2400	MANI										
			CULG	2232	2324	1							IS
			CULG				2306.5						IIIB,W
			CULG				2324	2400					IS,W
16	0000	0901	MANI										
	0000	0716	CULG	0009	0716		0000	0017					IN,W
	0709	1505	WEIS										
	0714	1150	DURN										
	1140	2115	SGMR										

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
16	1340	1550	DURN										
	2017	2400	CULG	2033	2041								IN,W
			CULG				2034						IIIB,W
			CULG	2058.5		1	2058.5		1				IIIB,U
	2200	2400	MANI										
			CULG				2231.5						IIIB,W,U
			CULG	2234	2301		2246	2255					IN,W
			CULG				2309	2309.5	1				UNCLF
			CULG	2341		1							FAST DRIFT
			CULG				2342	2342.5					IIIG,W
17	0000	0618	MANI										
	0000	0717	CULG				0204		3	0204		2	IIIB
			CULG				0323		1				IIIB,W
			CULG				0404						IIIB,W
			CULG				0518.5	0519.5					IIIG,W
			CULG				0539	0539.5	1				IIIG
	0623	0720	MANI										
	0711	1358	WEIS										
	0714	1550	DURN										
	0804	0852	MANI										
	1141	2115	SGMR										
	1405	1503	WEIS										
	2017	2400	CULG										
	2200	2400	MANI										
18	0000	0852	MANI										
	0000	0716	CULG										
	0714	1550	DURN										
	1143	2114	SGMR										
	0713	1502	WEIS				1226.6	1226.8	1				IIIG
	2018	2400	CULG				2040.5		1	2040.5	2041	1	IIIB
			CULG				2117.5	2118	1				IIIG
	2149	2400	MANI										
			CULG				2152.5	2153.5					IIIG,W
			CULG				2202.5	2203					IIIG,W
			CULG				2203	2203.5	2				IIIB
19	0000	0853	MANI										
	0000	0717	CULG				0009.5		1				III8
			CULG				0021.5	0023.5					IIIG,W
			CULG							0022	0022.5	1	IIIG
			CULG				0211.5	0223					IIIGG,W
			CULG				0218	0219.5	3	0218	0219.5	3	IIIG,V
			CULG	0223		1	0223		1	0223		1	IIIB
			CULG				0328		2				IIIB
			CULG				0332.5	0333					IIIG,W
			CULG				0358.5	0403					IIIG,W
			CULG				0401	0401.5	2	0401.5		1	IIIG
			CULG				0431	0432.5					IIIG,W
			CULG				0439.5	0442	2	0440.5	0441	1	IIIGG
			CULG				0530	0551					IIIS,W
	0712	1501	WEIS				0923.8	0928.5	3				IIIGG
			WEIS				1135.5	1135.6	1				IIIB
			WEIS				1257.2	1257.3	1				IIIB
			WEIS				1300.4	1304.3	2				IIIGG
	1144	2113	SGMR				1506.5	1507.8	1				IIIG
			SGMR				1727.0	1728.4	1				IIIG
			SGMR				1854.9	1855.1	2				IIIG
	2017	2400	CULG	2049	2051		2048.5	2050					IIIG,W
			CULG	2053.5	2054	1							IIIG
			CULG				2100.5	2102	1				IIIG
			CULG				2113.5		1				IIIB
			CULG				2115	2116	1				IIIG
			CULG	2127	2131	1							IIIG
			CULG				2127	2129					IIIG,W
			CULG				2128.5		1				IIIB
	2200	2400	MANI										
			CULG	2212	2213.5	1	2208.5	2215.5	1				IIIG
			CULG	2220.5	2222	1	2220.5	2222	1				IIIG

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NOVEMBER 1978

NOV 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
19			CULG				2221.5	2222	3				IIIG,U
			CULG	2224	2225	2	2224	2225	3	2224	2224.5	3	IIIG,U
			CULG				2225	2227.5					IIIG,W
			CULG	2239.5	2240	1	2239.5	2240.5	1				IIIG,U
			CULG	2243.5	2245	1	2243.5	2245	1				IIIG
			CULG	2358.5	2359.5	1	2358.5	2400	1				IIIG,U
20	0000	0855	MANI										
	0000	0717	CULG	0002	0002.5		0001.5	0002.5					IIIG,W
			CULG	0201	0202		0201	0206					IIIG,W,U
			CULG				0204		2				IIIB
			CULG				0206		2				IIIB
			CULG	0354	0355.5	1	0354	0355.5	1				IIIGG
			CULG				0357.5						IIIB,W
	0714	1545	DURN										
	0717	1044	WEIS										
	1046	1459	WEIS										
	1145	1351	SGMR										
	1837	2112	SGMR										
	2017	2400	CULG	2146	2147	1	2146	2147	2				IIIG
	2200	2400	MANI										
			CULG	2237.5		1	2237.5		1				IIIB
21	0000	0852	MANI										
	0000	0717	CULG				0029	0641					IIIN,W
			CULG	0036.5			0036.5						IIIB,W
			CULG				0140.5	0141	1				UNCLF
			CULG	0640.5	0641.5		0640.5	0641					IIIG,W
	0718	1500	WEIS										
	0714	1550	DURN				1140.5	1141.7	2				IIIGG
	1146	2112	SGMR										
	2018	2333	CULG				2026	2243					IIIN,W
			CULG	2029.5	2030	2	2029.5	2030	3	2030	2030.5	2	IIIG
			CULG	2031.5	2032.5	2	2031	2032.5	2	2032	2032.5	1	IIIG
			CULG				2112.5	2113	1				IIIG
	2200	2400	MANI										
			CULG				2225.5	2226	2				IIIB
			CULG				2225.5		2				IIIB
			CULG				2236	2237	2				IIIG
			CULG				2238.5		1				IIIB
	2346	2400	CULG										
22	0000	0855	MANI										
	0000	0718	CULG				0033.5	0543					IIIN,W
			CULG				0043		1				IIIB
	0714	1545	DURN										
	0718	1458	WEIS				1111.4	1111.5	1				IIIB
			WEIS				1219.4	1219.7	1				IIIG
			WEIS				1348.4	1348.7	2				IIIG
			WEIS				1407.7	1410.2	3				IIIG
	1148	2111	SGMR				1407.8	1410.0	2				IIIG
			WEIS				1443.6	1443.8	1				IIIG
			WEIS				1445.4	1445.7	2				IIIG
			SGMR				1445.5	1736.0	2				IIIS
	2018	2400	CULG				2018	2027					IW
			CULG				2056.5	2058	2				IIIG
			CULG				2101.5	2102	1				IIIG
	2158	2400	MANI										
			CULG				2304.5	2305	2				IIIG
			CULG				2305.5	2307	3	2306	2306.5	2	IIIG,V,U
			CULG				2314.5	2315.5	1				IIIG
23	0000	0700	MANI										
	0000	0715	CULG				0208	0208.5					IIIG,W
			CULG				0258.5						IIIB,W
			CULG				0419	0420	2				IIIG
	0714	1510	DURN										
	0720	0727	WEIS										
	0733	1457	WEIS										
	1149	2110	SGMR										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

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NOV 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	
23	2018	2400	CULG				2101.5	2102	1				UNCLF
24	0000	0854	MANI										
	0000	0717	CULG	0009.5	0011.5		0010	0012					IIIG,W
			CULG	0022		1	0022	0022.5	1				IIIB
			CULG				0101	0102	1				IIIG
			CULG							0101	0101.5		IIIG,W
			CULG				0103.5	0105		0104.5	0105		IIIG,W
			CULG				0115	0115.5		0115	0115.5		IIIG,W
			CULG				0122.5	0123					IIIG,W
			CULG	0130	0130.5	1	0129.5	0130.5	1	0129.5	0130.5	2	IIIG
			CULG	0132	0133		0132	0133.5					IIIG,W
			CULG				0138	0138.5					IIIG,W
			CULG				0241		1				IIIB
			CULG	0245	0246	1	0244.5	0246.5	3	0245	0246.5	3	IIIGG
			CULG	0246.5	0248								IIIG,W
			CULG				0255.5	0257	2	0256	0257	2	IIIGG
			CULG	0442.5	0444	1	0443	0443.5	1	0443	0443.5	2	IIIG
	0714	0820	DURN										
	0720	1456	WEIS				1236.3	1236.8	2				IIIG
			WEIS				1238.2	1238.3	1				IIIB
			WEIS				1256.6	1257.3	2				IIIG
			WEIS				1329.3	1329.4	1				IIIG
			WEIS				1429.7	1430.0	2				IIIG
	1150	2110	SGMR				1429.8	1430.0	1				III
			WEIS				1443.4	1444.6	2				IIIG
	2017	2400	CULG	2124.5	2125	1	2124.5	2125.5	2	2124.5	2125.5	3	IIIG,V
			CULG				2127	2128	2	2127	2128	2	IIIG
			CULG	2147	2149	2							IIIGG
	2200	2400	MANI										
25	0000	0901	MANI										
	0000	0717	CULG				0003.5	0004.5	1				IIIG
	0723	1220	WEIS										
	0820	1540	DURN										
	1227	1455	WEIS										
	1151	2109	SGMR				1255.9	1256.0	2				III
			SGMR				1523.9	1524.5	2				V
	2018	2400	CULG				2116.5						IIIB,W
			CULG				2146	2147.5					IIIG,W
			CULG				2154	2154.5					UNCLF,W
			CULG				2156	2157					UNCLF,W
			CULG				2204		1				IIIB
	2212	2400	MANI										
26	0000	0857	MANI										
	0000	0719	CULG	0019.5		1	0019.5		1				IIIB
			CULG	0033.5	0034								IIIG,W
			CULG	0036.5	0037	2	0036.5	0037.5	2	0036.5	0037	1	IIIG,V
			CULG	0303	0303.5		0303	0303.5					IIIG,W
			CULG				0414						IIIB,W
			CULG	0519	0615								IN,W
	0720	1540	DURN										
	0724	1454	WEIS				0828.9	0829.7	2				IIIG
	1152	2108	SGMR										
	2019	2400	CULG				2022	2059					IN,W
			CULG				2059	2210	1				IS
	2200	2400	MANI										
			CULG				2210	2400					IS,W
			CULG				2213	2213.5	2				IIIG
			CULG				2214.5	2215.5	1				IIIG
			CULG				2216.5	2217	1				IIIG
27	0000	0858	MANI										
	0000	0719	CULG				0016	0017					IIIG,W
			CULG				0047.5	0048	1				UNCLF
			CULG	0111	0247								IS,W
			CULG				0244.5						IIIB,W
			CULG				0341	0341.5					IIIG,W
			CULG				0401	0521					IS,W

SOLAR RADIO EMISSION
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NOV 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	0602	0606	1							FAST DRIFT
	0720	1540	DURN										
	0725	1401	WEIS										
	1420	1441	WEIS										
	1447	1453	WEIS				1449.0	1449.8	2				IIIG
	1154	2108	SGMR				1449.2	1454.4	3				IIIG
	2019	2400	CULG	2057	2059.5	1	2056	2059.5	3	2057.5	2058	1	IIIGG
			CULG				2102	2353					IIIN,W
			CULG	2148.5	2150	1	2145.5	2150	1				IIIGG
			CULG				2148.5	2149	2				IIIG
	2202	2400	MANI										
			CULG				2214.5	2216.5	3	2215	2216.5	2	IIIG
			CULG				2305.5	2306.5	1				IIIG
			CULG				2332.5		1				IIIB
28	0000	0719	CULG				0000.5	0001	2	0000.5	0001.5	1	IIIB
	0000	0857	MANI										
			CULG				0009.5		1				IIIB
			CULG	0038	0039.5		0038	0039.5					IIIG,W
			CULG				0040	0040.5	3				IIIB
			CULG				0043	0458					IIIN,W
			CULG				0044.5		1				IIIB
			CULG	0046	0141	1							IS
			CULG				0142		2	0142		1	IIIB
			CULG	0233	0234		0233	0233.5					IIIG,W
			CULG				0235	0236	2	0235.5	0236	1	IIIG
			CULG	0239.5		1							IIIB
			CULG				0248		1				IIIB
			CULG	0248	0341								IS,W
			CULG				0314	0317	3	0314	0317	3	IIIGG
			CULG	0330.5	0331	1							IIIG
			CULG	0341	0502	1							IS
			CULG	0448	0448.5	2							FAST DRIFT
			CULG	0502	0711	1							IS
			CULG				0529.5	0536					POSS II,W
			CULG	0530	0629	1	0540	0719	2				IV
			CULG				0531	0545					IIIS,W
			CULG				0542	0556	1				P
			CULG	0627.5	0630	2							FAST DRIFT
			CULG	0650.5	0651.5	1							FAST DRIFT
			CULG				0701	0702	1				IIIB
			CULG	0701	0711	1							IIIN
			CULG				0703.5	0704.5	3	0703.5	0704	1	IIIB,V
	0720	1539	DURN	0725.8	0725.9	1							IIIG,RS
			DURN				0806.4	0813.4	3				IIIG,N,RS
	0734	1040	WEIS				0809.3	0814.4	2				IIIGG
			DURN	0811.3	0813.9	2							IIIG,N
			DURN	0920.3	0920.6	1							IIIG,RS
			WEIS				1024.2	1032.8	3				IIIGG
			DURN	1027.6	1032.3	3	1026.6	1033.8	3				IIIGG
			DURN	1039.6	1039.7	3							IIIG
	1046	1453	WEIS				1049.6	1050.0	2				IIIG
			DURN	1050.7	1051.0	1	1050.6	1050.8	3				IIIG
			WEIS				1122.3	1124.6	3				IIIGG
			DURN	1123.4	1125.3	2	1123.2	1125.6	3				IIIGG
			WEIS				1132.7	1133.7	3				IIIGG
			DURN	1133.7	1134.7	3	1133.7	1134.8	3				IIIGG
			WEIS				1150.5	1152.7	2				IIIGG
			DURN	1151.5	1152.1	1	1151.5	1152.2	3				IIIGG
			WEIS				1203.4	1203.7	2				IIIG
			DURN				1204.5	1204.7	3				IIIG
			WEIS				1237.8	1238.2	2				IIIG
			DURN	1238.8	1239.0	3	1238.8	1239.0	3				IIIGG
			WEIS	1304.5	1304.7	1							IIIG
			WEIS				1405.7	1406.5	2				IIIG
	1155	2107	SGMR				1405.8	1406.5	1				IIIG
	2022	2400	CULG	2022	2400	1							IS
			CULG	2040.5	2041	2							IIIG
			CULG	2046.5	2048	2	2044	2048	1				IIIGG
			CULG	2103.5	2104	2	2103.5	2104.5	2				IIIG

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SPECTRAL OBSERVATIONS

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NOV 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
28			CULG				2106	2226					IS,W
			CULG	2113	2113.5	1							IIIG
			CULG				2117	2117.5	1				IIIG
			CULG				2123.5		1				IIIB
			CULG	2132	2132.5	1							IIIG
	2200	2400	MANI										
			CULG	2215.5	2216	2							IIIG
			CULG				2226	2400	1				IS
			CULG				2234		1				IIIB
			CULG				2237		1				IIIB
			CULG	2334.5		1	2334.5	2335	2				IIIG
			CULG				2338.5						IIIB,W
			CULG				2341.5						IIIB,W
			CULG	2356.5	2357	1	2356.5	2357	1				IIIG
			CULG	2357.5	2358	1	2357.5	2358	1				IIIG
			CULG	2358	2358.5	2	2358	2358.5	2				IIIG
29			CULG				0000	0511					IS,W
	0000	0720	CULG	0000	0720	1							IS
	0000	0858	MANI										
			CULG	0021	0021.5	1	0021	0021.5	1				IIIG
			CULG				0310.5	0318					IIIG,W
			CULG				0508	0558					IIIS,W
			CULG				0511	0720	1				IS
			CULG							0514	0533	1	S.W.F.
			CULG				0517.5	0526	2				II HB
			CULG				0519	0550					POSS IV,W
			CULG				0523.5	0525	2				IIIG
			CULG				0532	0534	2				IIIG
			CULG				0542.5		1				IIIB
	0720	0918	DURN				0720 E	0918 D	1				I,C
			WEIS				0800.0	1450.0	1				IN
	0729	1451	WEIS				0947.7	0948.0	1				IIIG
	1000	1021	DURN				1000 E	1021 D	1				I,DC
			WEIS				1012.4	1017.3	2				IIIG,U
			WEIS				1041.4	1041.8	2				IIIG
			WEIS				1054.7	1055.6	2				IIIG
			WEIS				1108.8	1109.0	2				IIIG
			WEIS				1153.4	1153.6	1				IIIG
			WEIS				1213.2	1214.1	3				IIIG
			WEIS				1233.4	1234.3	2				IIIG
			WEIS				1242.5	1243.3	1				IIIG
			WEIS				1343.3	1343.6	2				IIIG
			WEIS				1402.4	1405.8	3				IIIGG
	1156	2107	SGMR				1403.3	1404.8	1				IIIG
			WEIS				1425.8	1426.2	2				IIIG
			WEIS				1428.2	1428.5	2				IIIG
			WEIS				1431.4	1435.6	3				IIIGG
			SGMR				1432.0	1434.2	2				IIIG
			SGMR				1523.2	1524.9	2				IIIG
			SGMR				1846.8	1847.3	2				IIIG
			SGMR				1937.2	1940.0	2				V
			SGMR				1944.8	1948.7	2				II
	2020	2400	CULG	2020	2400	1							IS
			CULG				2110	2400					IIIS,W
			CULG				2121	2400	1				IS,DC
			CULG				2137	2140.5	3				IIIGG
			CULG	2143	2143.5	1							IIIG
			CULG				2150.5	2152	3				IIIGG
			CULG	2153.5	2154	2	2153.5	2155	2				IIIG
			CULG				2206.5	2207	2				IIIG
			CULG				2209	2210	2				IIIG
			CULG	2213	2213.5	1	2213	2214	2				IIIG
			CULG	2216.5	2217	1	2216.5	2217	2				IIIG
			CULG	2218.5	2219	1	2218.5	2219	1				IIIG
			CULG	2226.5	2227	1	2226.5	2227	1				IIIG
			CULG				2229	2229.5	1				IIIB
			CULG				2238	2239	2				IIIGG
			CULG				2254.5		2				IIIB
			CULG	2257.5	2258	1	2254	2258	1				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

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NOV 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	
29	2205	2400	MANI							2337.8	2338.9	2	III
			CULG	2339.5	2341.5	1	2337.5	2341.5	3	2337.5	2339	3	IIIGG,V
30	0000	0720	CULG	0000	0720	1	0000	0534	1				IS
			CULG				0018	0019	2				IIIG
			CULG				0024.5	0025.5	2				IIIG,U
			CULG				0048	0641					IIIGN,W
			CULG				0107	0108.5	3				IIIG
	0000	0857	MANI							0117.4	0119.5	2	IIIG
			CULG	0117	0118.5	2	0117	0120	3	0117.5	0120	3	IIIGG,V
			CULG	0124	0124.5	2	0124	0125.5	1				IIIG
			CULG				0131.5		1				IIIB
			CULG	0154	0212	2						IV	
			CULG				0158.5	0206	1				POSS II
			CULG				0201	0208	1			IV	
			CULG				0345.5		2				IIIB
			CULG				0352	0352.5	1				IIIG
			CULG				0409	0410	2				IIIG
			CULG				0424		2				IIIB
			CULG				0430.5	0431.5	1				UNCLF
			CULG	0446	0447	2							IIIG
			CULG	0450.5	0451	2							IIIG
			CULG	0522.5		2	0522.5		1				IIIB
			CULG				0525	0526	2				IIIG
			CULG				0534	0552	2				IS
			CULG				0552	0720	1				IS
			CULG				0553.5	0555	3				IIIG,V
			MANI							0553.8	0554.0	1	III
			CULG	0601	0601.5	2							IIIG
			WEIS				0736.0	1444.5	2				I
	0731	1450	WEIS				0754.4	0756.7	3				IIIGG
			WEIS				0759.9	0801.8	1				IIIGG
			WEIS				0905.0	0906.8	3				IIIG
			WEIS				0927.3	0927.5	2				IIIG
			WEIS				0933.3	0933.7	3				IIIG
			WEIS				0937.1	0937.3	1				IIIG
			WEIS				0938.0	0938.6	2				IIIG
			WEIS				0944.5	0944.7	2				IIIG
			WEIS				1153.4	1154.6	2				IIIG
			WEIS				1244.0	1245.2	2				IIIG
			WEIS				1330.5	1332.2	2				IIIG
			WEIS				1420.0	1420.2	1				IIIG
			WEIS				1442.9	1443.3	2				IIIB
	1157	2107	SGMR				1801.9	1803.3	3				V
	2020	2400	CULG	2020	2400	1	2135	2400	1				IS
	2200	2400	MANI										
			CULG				2204	2400					IIIN,W
			CULG				2253.5		1				IIIB
			CULG				2311	2311.5	1				IIIG,U
			CULG	2316	2316.5	1	2316	2316.5	2				IIIG

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: The 25-580 MHz solar radio burst observations are being continued at the Harvard Radio Astronomy Station at Fort Davis, Texas, but the preparation of data summaries will be delayed somewhat.

ERRATA: The Culgoora spectral data entry on 12 October 1978 in the metric band at 0150-0310 UT had an error in the Spectral Type. "IS,DC,C" should read "CONT,IS,DC". These data appear in SGD 412 Part I, page 139, December 1978 issue.

SELECTED SOLAR EVENTS

NOVEMBER 1978

Culgoora

UT Date 197Å November	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
1	0054	0055	43.25) 80) 160)	1.0	310))	-	2))	IIIG,U	*
2	0218.		80) 160)	.8	250))	-	2) 1)	IIIB	*
	0311	0312	160	.9	105	-	2	IIIG	
3	0018	0230	160	1.3	270	R	2	IS	
	0040	0042	43.25) 80) 160)	1.4 1.2 1.1	300) 295) 290)	-	3) 3) 2)	IIIG,V	* Type III activity from this region also on 4th
	0350	0353	43.25) 80) 160)	1.3	270	-	) 3))	IIIGG,V	*
	0420	0425	43.25) 80) 160)	.6 .6 .7	100 135 180		3) 2) 2)	IIIGG	*
5/6	2300	0500	80) 160)	.6	160	R to varying	2-3))	IS	Complex source Type I activity persisted from 5th to 10th.
	0045	0046	43.25) 80) 160)	1.2 1.0 .9	) 95))	-	) 3))	IIIG,V	
6	2252.5	2253	43.25) 80)	.3 .2	120))	-	3))	IIIB	
7/8	2300	0500	160	.2	320	L to varying	2	IS	Type I activity persisted until 10th.
8	0247	0253	43.25) 80) 160)	.6 .4 .2	335 335 325	-	)) 3)	IIIGG	*
9	0203	0209	43.25) 80) 160)	0	0	-	) 3))	IIIGG,U	*
10	0110	0126	43.25) 80) 160)	0	0	-	) 3))	II	Complex source.
	0110	0126	43.25) 80)	1.0	50	-	3)	) II	Complex source

Days without Heliograph observations: Nil

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

UT Date 197Å November	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
10	0126	0220	43.25) 80) 160)	0	0	-	3	IV	Complex source
10/11	2300	0500	43.25) 80) 160)	.3	355	L	2	IS	Complex source Continued until 17th.
12	2347.5	2349	43.25	1.2	280	-	3	IIIB,U	
14	2245	2246	43.25) 80) 160)	1.1	310		3) 2) 1)	IIIG,U	
15	0000	0001	80) 160)	.2	90		2))	IIIG,W	
17	0203.5	0204	43.25) 80) 160)	.9	90		3) 2) 1)	IIIB	
19	0217	0223	43.25) 80) 160)	.3 .9 1.0	) 130) 115		3) 3) 2)	IIIG	*
19/20	2358	2400	80) 160)	.8	190		2))	IIIG,U	Type III activity persisted from this region also on 22nd.
	0204		43.25) 80) 160)	.4 .8 .8	)) 190)		3) 2) 2)	IIIB	
22	2305	2307	80) 160)	1.2 1.1	) 50)		3) 1)	IIIG,V,U	*
23	0419	0420	43.25) 80)	1.0	120		3	IIIG	Type III activity persisted from this region also on 22nd, 24th.
24	0244.5	0246	43.25) 80) 160)	1.0	)) 235)	-	3	IIIGG *	
26	0019.5		43.25) 80) 160)	.8	)) 90)			IIIB	*

Days without Heliograph observations: Nil

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

SELECTED SOLAR EVENTS

NOVEMBER 1978

Culgoora

UT Date 197.8 November	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. (R_o)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
27	2305.5	2306.5	43.25)	1.1	)		2)		
			80)	1.1	) 240		2)	IIIG	*
			160)	1.0	)		1)		
	0247	0251	43.25)		)		)		
			80)	1.0	) 110		2)	IIIG	*
			160)		)		)		
	0313.5	0317	43.25)	1.3	)		3)		
			80)	1.2	) 320		3)	IIIGG	*
			160)	1.1	)		1)		
28/29	2300	0500	160	1.0	310	0-ℓ	2	IS	Type I activity
29/30	2300	0500	160	1.0	90		2	IS	from this region persisted until
	0115	0120	43.25)		)		)		
			80)	.8	) 160		3)	IIIGG,V *	30th.
			160)		) 160		)		
	0159	0200	43.25)	.8	) 160		2)	Possible	II
			80)		)		3)		

Days without Heliograph observations: ..Nil.....

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

COSMIC RAY INDICES

(Neutron Monitors)

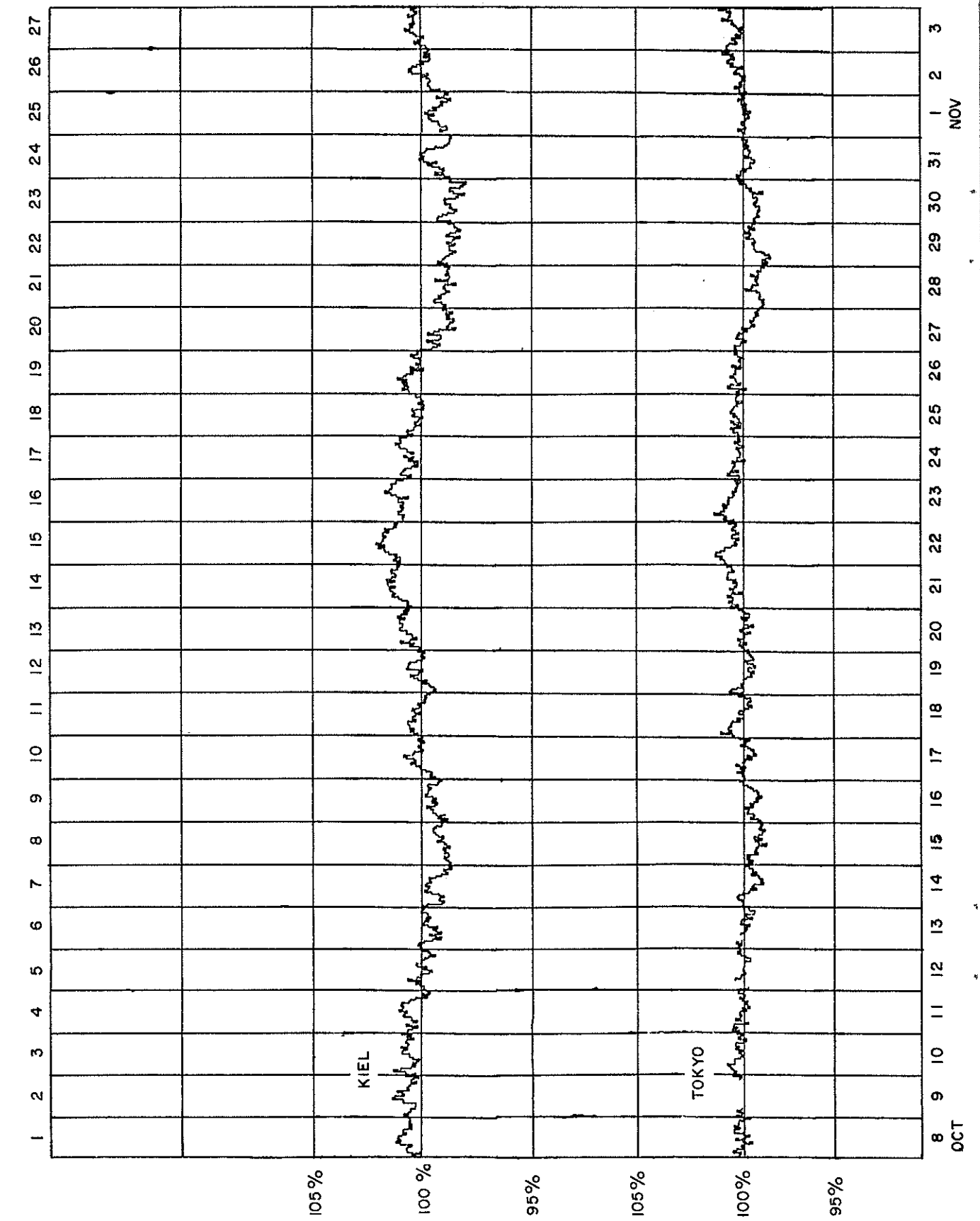
NOVEMBER 1978

Nov. 1978	THULE	ALERT	DEEP RIVER	CALGARY	SULPHUR MT.	KIEL	CLIMAX	TOKYO	KULA
	Average cts/hr	Average cts/hr	Average cts/hr	Average cts/hr	Average cts/hr	Average cts/hr	Average cts/hr	Average cts/hr	Average cts/hr
1						6065.8		3622.9	
2						6113.4		3636.8	
3						6143.5		3644.6	
4						6182.8		3647.7	
5						6210.8		3652.2	
6						6229.8		3648.2	
7						6254.6		3654.3	
8						6231.0		3655.7	
9						6247.3		3658.5	
10						6247.2		3648.2	
11						6251.2		3660.0	
12						6077.9		3609.8	
13						6050.4		3599.9	
14						6079.5		3616.6	
15						6135.5		3636.6	
16						6196.3		3644.4	
17						6185.3		3648.7	
18						6211.6		3646.3	
19						6209.7		3645.5	
20						6165.0		3629.6	
21						6141.4		3615.7	
22						6098.0		3621.9	
23						6104.7		3614.2	
24						6105.2		3618.0	
25						6084.0		3616.3	
26						6143.8		3616.3	
27						6189.2		3617.7	
28						6196.0		3632.0	
29						6215.1		3641.8	
30						6232.2		3639.5	
MEAN						6166.6		3634.7	

Data not available at time of publication

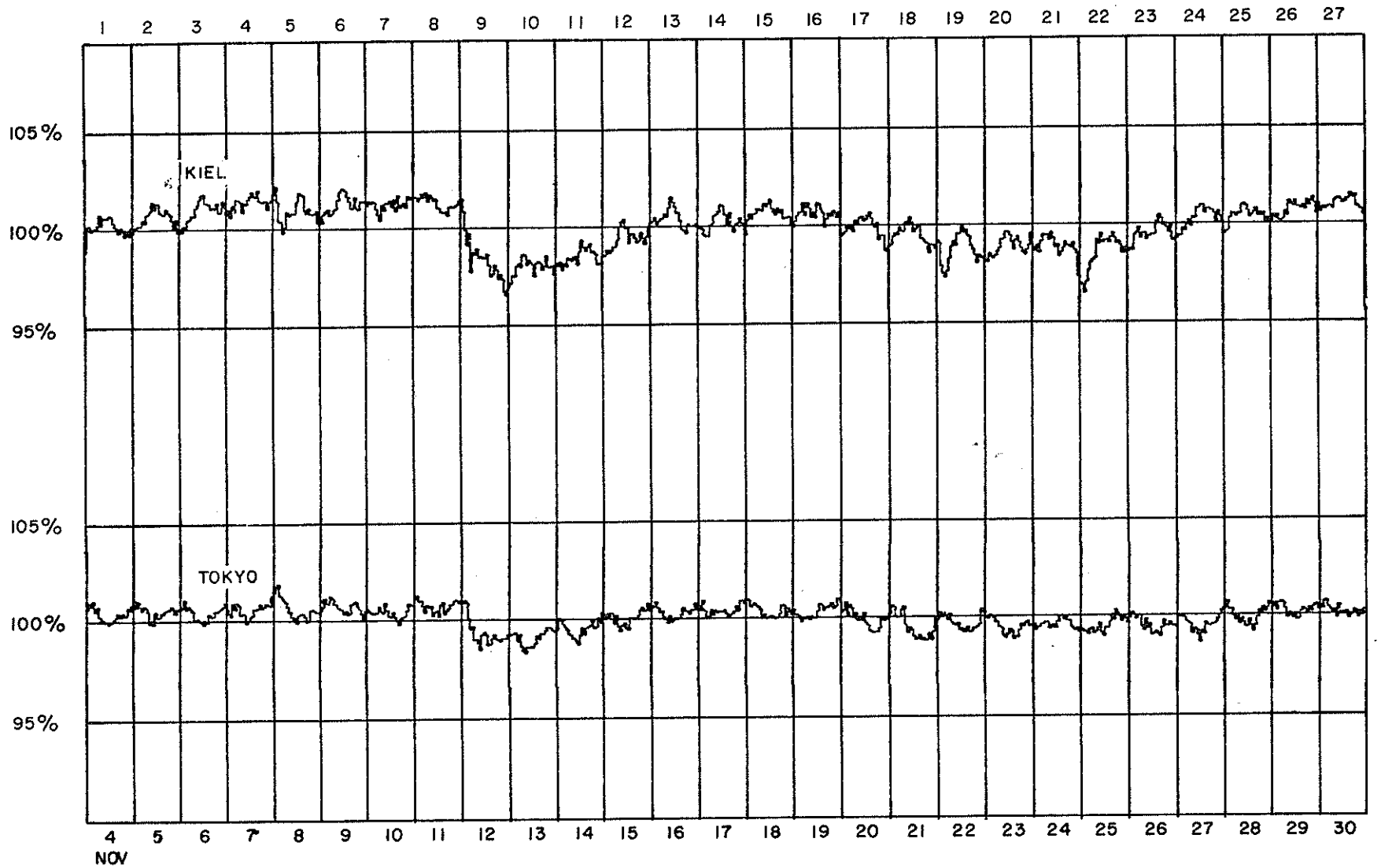
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1985 (October–November 1978)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1986 (November 1978)



GEOMAGNETIC ACTIVITY INDICES

NOVEMBER 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		2+	3	3+	4	2+	2	2	2+	21+	2	2+	3	4-	2+	2+	2	2+	13	18	20	22	16	0.7
2		1-	2-	2	3+	3+	3+	2	2	18+	1-	1	2	3+	4-	3+	2	2+	10	18	30	17	30	0.6
3		3-	3-	3-	2+	2-	2	4-	3+	21	2+	2+	2	2	2-	2	4-	3+	12	22	20	19	24	0.7
4	Q6	2+	2-	2+	1-	1+	1-	0+	2-	11	2	2+	2	1-	2-	1+	1-	2-	5	9	15	14	11	C 0.2
5	Q8K	3-	3+	1	1	1+	1+	1-	0	11+	2+	3-	1+	1+	2-	2-	0+	0+	5	12	10	17	6	CC 0.3
6	Q1	0	0	0+	1	1-	1	1-	1-	4+	0+	0	1-	1-	1	2-	1	1	2	4	8	4	7	CC 0.0
7	Q0A	1-	0	0	0+	0+	1-	3-	5	10-	1	0	0	0	1-	2-	3-	4+	9	19	11	3	27	0.5
8		4+	4+	3-	2	2-	3-	2	2	22-	4-	3+	2+	2+	2-	3	2+	2	14	22	27	34	16	0.8
9		3-	3-	3	2	2	1+	0	1-	14+	2+	2	3	2-	2	1+	0+	1	8	15	15	21	10	0.4
10		1+	1	0+	1+	1+	4-	5-	5	19-	2-	2-	0+	1+	2	4	5-	4+	16	34	31	9	57	0.9
11		3	3	2+	1-	1	1-	3+	3	17	3-	2	2+	1	1	1	3	3-	10	22	11	16	17	0.6
12	D2	6-	4	6-	6	5+	4-	5+	5	41-	5	4-	5+	6	5	4-	5-	4+	53	87	88	97	77	1.6
13		4+	4	3-	2+	4	4+	4+	1+	27+	4-	3+	2+	3-	4-	4-	4-	2-	22	38	27	27	38	1.1
14		1-	0+	1-	1-	4+	4	3-	1+	15-	0+	0+	1-	1	4-	4-	3	2-	11	17	18	4	31	0.6
15		2	3+	2	2	0+	2-	2	2+	16-	2-	3-	2-	2	0+	2-	2+	2+	8	15	13	16	12	0.4
16	Q9	2	1	2-	2-	3-	1+	2+	1-	13+	2-	1	1+	2	3	2-	2+	1	6	9	15	11	14	CC 0.3
17	Q7	2	0+	2+	2+	2	1	2-	1	13-	2-	0+	2	3-	2-	1-	2	1+	6	9	12	11	10	CC 0.3
18	Q5	2-	2	1+	1	1-	1-	1	2+	11-	1+	1+	1+	1-	1-	1+	1+	3-	5	8	10	10	9	CK 0.2
19		3-	4-	2	3	4-	3-	1	2	21-	2+	3-	2	3-	4-	3	2-	3-	13	19	25	24	20	0.7
20	Q5	3	4+	3	3-	3+	4	4	4+	29-	3	4-	3	3-	3+	4	5-	4-	22	35	44	31	48	1.1
21		4+	4-	3+	3-	2-	2+	2	4-	24-	3	3	3-	2+	2-	2+	2+	3+	16	27	17	26	19	0.9
22	Q4	4	4-	4+	4-	5	5	3	2+	31	3	3-	3+	3+	5-	5-	3-	2	28	45	38	34	49	1.2
23		2-	1-	1	3	4-	3+	3	3-	19	1+	1-	1-	2+	3+	3+	3	3-	12	20	23	10	34	0.7
24		2+	3-	2	2-	4-	4-	4+	4+	25-	2	2	2-	2-	3+	4-	4+	4	18	29	32	14	48	1.0
25	Q1	4-	4	4+	5	6	7	6+	5	41+	3-	3	4-	5	6	6+	6-	4	60	81	81	43	120	1.7
26	Q3	5-	5	5-	4	4+	4+	4	3+	34+	4-	4+	4-	4-	4+	5-	4-	3	33	45	41	41	45	1.3
27		3-	3+	3	3	3	4-	4	3	26-	2+	2+	2	3-	3	4-	4-	3	17	30	30	20	41	0.9
28	Q2	2-	2-	1+	1-	1+	2-	1	1-	10	1	1+	1-	0+	2	2	1	1	5	6	6	7	5	C 0.2
29	Q3	1+	1	0+	2	1-	2+	1	0+	9	1+	1-	0	2	1	2+	1	0+	4	8	8	9	7	CC 0.2
30	Q4	2	1+	0+	1-	1+	1-	2-	2+	10+	2-	1+	0+	1-	1	1+	2+	3-	5	11	11	7	14	KK 0.2
																		Mean	15	24.5	24.6	24.7		0.68

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

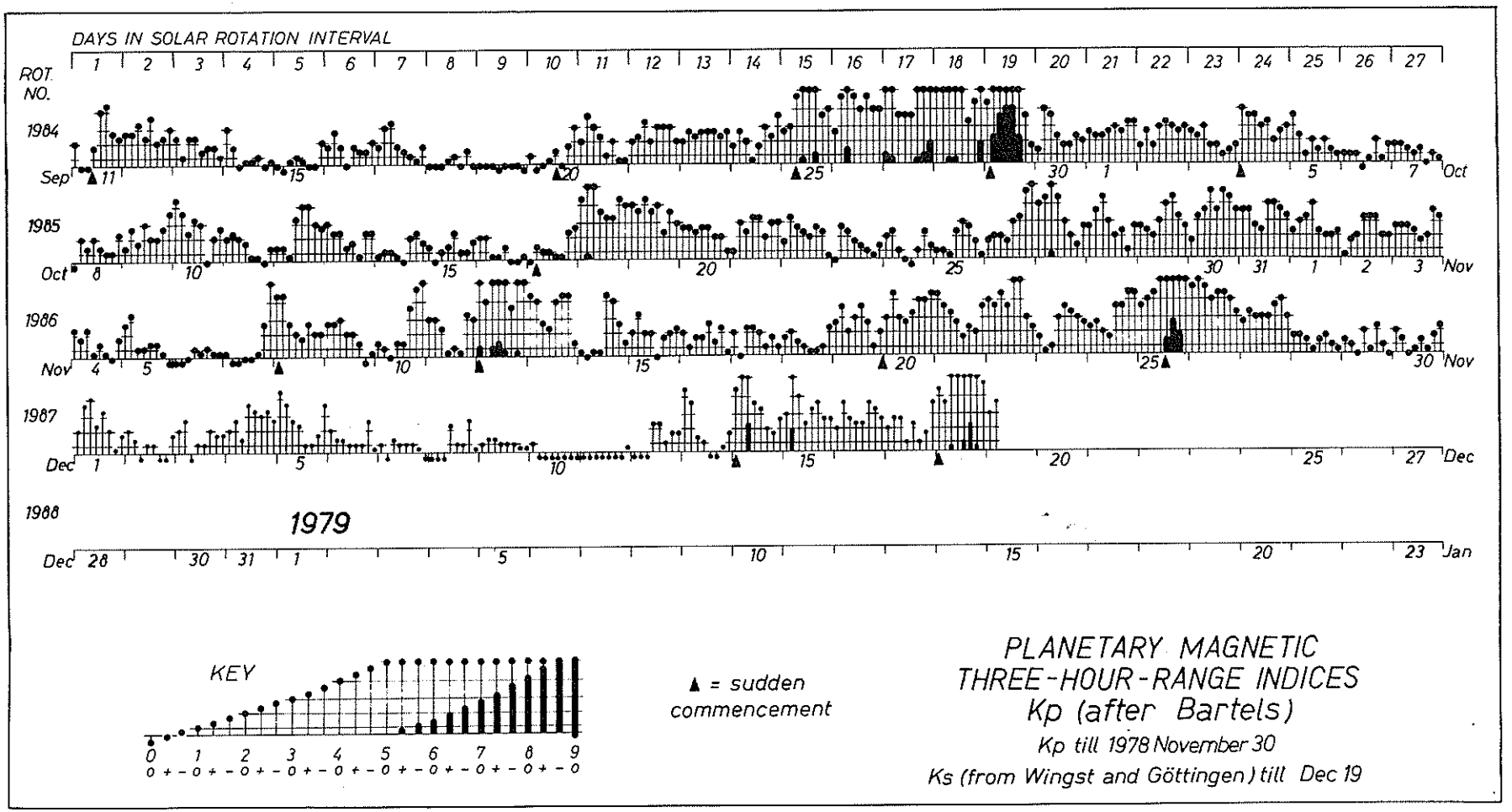
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen,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

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

DAILY AVERAGE INDICES Ap

	1977	1978										
DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	6	7	15	33	12	88	9	6	4	21	13	13
2	69	8	14	27	15	94	82	5	4	20	12	10
3	9	13	14	15	41	83	31	11	16	11	8	12
4	14	89	11	3	55	96	26	80	30	8	17	5
5	18	31	17	6	21	7	38	53	22	7	8	6
6	5	34	14	7	9	5	8	13	16	14	4	2
7	3	13	7	9	5	7	11	14	7	6	4	9
8	2	19	10	20	5	16	10	14	6	24	5	14
9	3	23	16	14	6	85	4	8	5	31	11	8
10	4	21	7	12	36	10	24	10	6	12	15	16
11	38	7	5	7	64	30	17	6	11	12	5	10
12	21	4	10	3	29	18	10	4	21	13	14	53
13	16	8	8	12	24	11	7	20	13	6	8	22
14	8	3	11	10	51	9	4	48	6	5	5	11
15	5	2	48	17	19	5	6	6	3	3	5	8
16	9	14	11	24	8	7	6	6	4	6	4	6
17	12	9	10	25	7	8	9	6	9	8	5	6
18	3	12	10	24	19	5	11	18	24	3	32	5
19	3	6	12	15	38	4	17	11	11	2	22	13
20	4	3	12	9	23	8	11	5	3	5	9	22
21	6	1	12	7	9	26	33	6	6	9	13	16
22	6	3	22	13	8	24	15	8	6	12	10	28
23	4	2	6	15	22	24	18	8	4	11	6	12
24	5	6	5	6	48	26	19	6	4	10	5	18
25	5	12	12	3	17	10	24	8	9	36	7	60
26	11	12	37	49	18	7	46	5	4	36	18	33
27	6	5	42	70	16	5	15	4	29	51	23	17
28	10	9	46	17	12	7	12	6	124	50	14	5
29	8	36		14	6	8	32	4	40	109	16	4
30	5	36		16	58	18	31	3	31	11	25	5
31	6	23		8		12		2	45		20	
MEAN	10	15	16	16	23	25	20	13	17	18	12	15

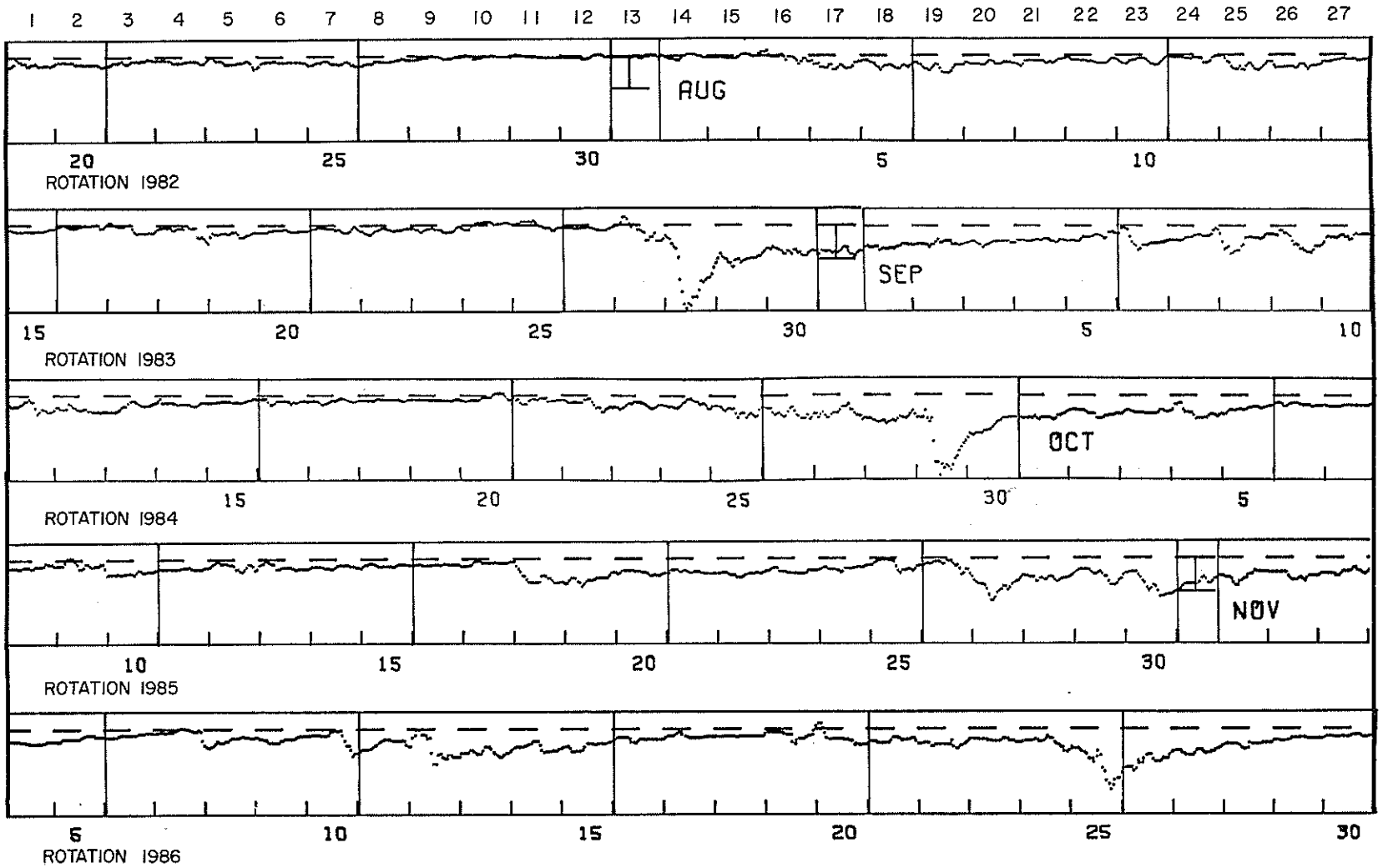
GEOMAGNETIC ACTIVITY INDICES



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.

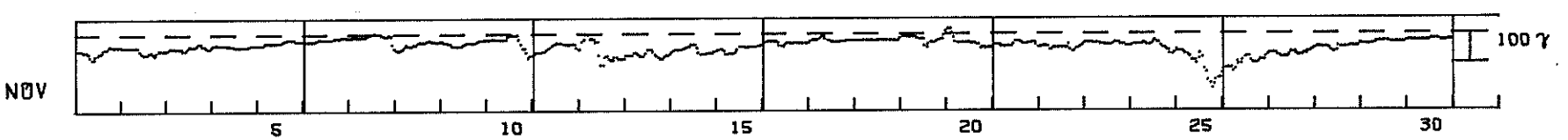
HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

NOVEMBER 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	-57	-57	-58	-60	-62	-61	-65	-76	-83	-80	-70	-65	-61	-59	-52	-47	-45	-38	-43	-44	-42	-41	-44	-44
2	-46	-46	-44	-44	-46	-42	-42	-44	-47	-57	-63	-68	-67	-64	-61	-57	-66	-71	-61	-53	-54	-56	-55	-53
3	-50	-45	-45	-48	-50	-49	-48	-51	-55	-53	-47	-40	-40	-39	-39	-37	-30	-29	-39	-42	-46	-50	-47	-40
4	-36	-34	-37	-39	-37	-38	-39	-41	-41	-42	-43	-45	-46	-45	-45	-45	-45	-42	-40	-38	-36	-36	-36	-37
5	-38	-38	-36	-29	-33	-31	-31	-32	-32	-29	-28	-29	-25	-22	-19	-17	-17	-19	-16	-25	-24	-25	-25	-28
6	-29	-28	-24	-25	-26	-26	-21	-17	-18	-18	-18	-18	-18	-17	-19	-15	-13	-13	-14	-11	-12	-11	-13	-13
7	-12	-11	-10	-12	-13	-11	-10	-10	-9	-5	-2	1	2	0	-1	-1	-6	-10	-12	-12	-3	-10	-37	-50
8	-56	-60	-53	-50	-44	-36	-43	-44	-39	-36	-36	-30	-27	-28	-27	-26	-23	-21	-27	-29	-30	-31	-26	-24
9	-29	-33	-34	-36	-37	-42	-44	-39	-45	-41	-39	-34	-33	-30	-30	-34	-33	-29	-26	-22	-20	-20	-19	-20
10	-19	-18	-16	-19	-22	-22	-23	-23	-22	-18	-10	-6	-2	-9	-8	-4	-20	-37	-51	-53	-63	-83	-72	-70
11	-66	-61	-62	-61	-60	-58	-54	-49	-46	-40	-36	-33	-30	-33	-34	-37	-38	-39	-37	-34	-33	-38	-49	-54
12	-55	-26	-19	-2	-2	-20	-17	-22	-29	-26	-74	-106	-107	-77	-72	-86	-89	-91	-78	-76	-86	-85	-83	-86
13	-73	-70	-71	-72	-63	-64	-70	-75	-78	-74	-64	-53	-55	-55	-62	-71	-76	-81	-86	-84	-76	-71	-70	-66
14	-61	-55	-52	-53	-53	-52	-49	-47	-44	-42	-36	-36	-38	-50	-65	-71	-66	-67	-65	-63	-67	-66	-60	-57
15	-54	-51	-51	-61	-69	-68	-65	-65	-65	-62	-54	-44	-43	-46	-48	-47	-46	-42	-43	-47	-46	-39	-38	-36
16	-33	-27	-24	-26	-29	-30	-30	-33	-41	-44	-46	-36	-31	-31	-35	-35	-30	-31	-33	-33	-34	-34	-33	-30
17	-26	-21	-20	-20	-19	-14	-9	-12	-19	-25	-27	-30	-32	-30	-28	-26	-26	-25	-24	-22	-24	-25	-24	-25
18	-25	-23	-22	-24	-21	-22	-26	-26	-26	-27	-24	-21	-22	-24	-24	-23	-21	-22	-26	-23	-22	-23	-23	-15
19	-9	-11	-13	-14	-11	-11	-14	-15	-18	-21	-18	-20	-42	-48	-35	-28	-29	-30	-24	-21	-19	-17	-6	8
20	15	13	-1	-15	-29	-34	-34	-34	-29	-30	-32	-28	-35	-34	-35	-38	-39	-51	-44	-49	-52	-45	-45	-46
21	-40	-36	-37	-41	-45	-46	-45	-40	-43	-42	-35	-26	-26	-28	-31	-37	-36	-33	-32	-31	-28	-31	-39	-47
22	-47	-42	-40	-43	-46	-54	-52	-47	-51	-46	-45	-48	-48	-49	-48	-36	-57	-62	-57	-50	-48	-43	-38	-33
23	-30	-29	-29	-33	-35	-34	-35	-36	-38	-38	-40	-37	-38	-38	-35	-29	-33	-34	-38	-38	-38	-44	-45	-43
24	-38	-36	-38	-37	-37	-35	-31	-37	-41	-40	-36	-29	-23	-32	-34	-42	-48	-52	-57	-60	-70	-72	-64	-56
25	-62	-60	-58	-65	-70	-74	-79	-90	-92	-91	-100	-84	-64	-82	-119	-130	-157	-166	-183	-168	-151	-146	-144	-131
26	-117	-113	-112	-114	-116	-127	-117	-93	-105	-99	-88	-78	-75	-76	-90	-99	-99	-101	-93	-86	-90	-90	-76	-69
27	-65	-63	-63	-68	-73	-77	-81	-79	-77	-79	-72	-62	-65	-64	-70	-76	-70	-70	-66	-66	-61	-58	-54	-49
28	-47	-44	-45	-49	-50	-45	-47	-53	-61	-64	-62	-58	-42	-49	-45	-48	-48	-44	-41	-45	-45	-44	-41	-34
29	-34	-38	-39	-40	-37	-35	-34	-32	-27	-26	-28	-25	-26	-28	-30	-33	-33	-31	-33	-30	-29	-30	-29	-26
30	-23	-22	-25	-27	-27	-28	-25	-23	-25	-25	-26	-23	-19	-19	-18	-18	-24	-28	-28	-26	-23	-21	-22	-24



NOTE: Starting May 1978, hourly values of the provisional Dst index have been based on data from Hermanus, Kakioka, and San Juan only, because the magnetometer at Honolulu has not been operated.

PRINCIPAL MAGNETIC STORMS

NOVEMBER 1976

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
HYB	07.6N	2	0700	..	..	..	..	02(5,6) 03(7)	4	2	138	20	04	07
HUA	00.6S	7	1403	..	..	..	..	07(8)	6	7	283	55	07	24
HYB	07.6N	8	0153	SC	- .6	+15	- 2	08(2)	4	3	68	19	09	09
GUA	04.0N	8	0152	SC	--	+45	-13	08(1)	5	--	80	40	09	09
HUA	00.6S	8	0152	SC	1	29	3	08(6)	6	7	255	37	08	21
HYB	07.6N	10	0600	..	..	..	..	10(7)	6	3	138	24	11	09
HER	33.7S	10	1500	..	..	..	..	10(6,8)	5	17	78	96	11	15
GNA	43.3S	10	15--	..	..	..	..	10(7)	6	16	100	80	11	02
KGL	56.5S	10	10--	..	..	..	..	10(8)	7	--	--	--	11	10
KGL	56.5S	11	2009	SC*	--	--	--	12(4)	7	--	--	--	13	21
COL	64.6N	12	0100	SC*	..	+289	-62	12(3,4,5) 13(6,7)	6	225	1630	1100	13	20
NEW	55.1N	12	0101	SC	3	53	6	12(3,4)	6	32	278	232	13	21
WIT	54.2N	12	0100	SC*	-10 *	+47		12(1,7,8)	6	43	165	60	13	20
FRD	49.6N	12	0101	SC	--	--	--	12(5)	6	24	133	57	15	13
SJG	29.9N	12	0100	SC	+ 2	+26	+ 7	12(4)	6	12	70	18	13	06
HYB	07.6N	12	0101	SC	- .7	+17	- 1	12(4,5)	7	5	274	30	13	22
GUA	04.0N	12	0100	SC*	+ 1	+62	-19	12(4)	7	--	240	40	13	20
HUA	00.6S	12	0101	SC	1	49	8	12(5)	7	14	319	47	13	20
PMG	18.6S	12	0100	SC*	- .8*	+40	+30	12(4)	7	6	230	130	13	18
HER	33.7S	12	0101	SC	+ 6	+34	+27	12(4)	7	36	176	163	14	01
GNA	43.3S	12	0100	SC*	-13.6*	-13 *	-52 *	12(1)	7	31	160	190	13	21
TOO	46.7S	12	0101	SC*	- 6.5*	+13 *	+ 6	12(3,4)	6	22	210	85	13	19
KGL	56.5S	12	0100	SC*	--	--	--	12(4)	7	--	--	--	13	21
NEW	55.1N	14	10--	..	..	..	..	14(5,6)	5	23	62	71	16	04
NEW	55.1N	18	2340	SC	2	13	--	19(5) 22(3,5)	5	36	115	168	23	01
HYB	07.6N	18	2300	..	..	..	..	19(5)	5	3	136	19	19	19
HUA	00.6S	18	2340	SC	--	12	3	20(5,6)	6	12	315	--	20	23
HYB	07.6N	19	2200	..	..	..	..	22(5,6)	5	4	132	27	22	22
GUA	04.0N	19	2320	SC	--	+17	- 5	20(1)	5	--	150	30	21	11
GNA	43.3S	19	2320	SC*	- 3.2*	+ 5	-11 *	20(8)	5	19	60	90	21	12
KGL	56.5S	19	2320	SC*	--	--	--	20(7,8)	5	--	--	--	22	05
KGL	56.5S	19	1155	SC*	--	--	--	20(7,8)	5	--	--	--	22	05
COL	64.6N	22	05--	..	..	..	..	22(5,6)	7	207	1370	850	22	24
HUA	00.6S	22	1138	..	..	..	..	22(5,6)	6	10	266	39	24	00
HER	33.7S	22	1454	SC	- 2	+ 7	+ 5	22(6)	5	24	78	65	24	03
COL	64.6N	24	09--	..	..	..	..	25(5)	9	719	2300	1730	27	23
NEW	55.1N	24	08--	..	..	..	..	25(4,5)	7	70	291	284	28	01
FRD	49.6N	24	14--	..	+ 2	+44	- 6	25(4)	6	22	186	85	27	23
SJG	29.9N	24	0900	..	..	..	..	25(6)	6	12	172	42	26	12
HYB	07.6N	24	0600	..	..	..	..	25(5,6,7)	7	5	288	27	27	23
TOO	46.7S	24	14--	..	..	..	..	25(5,6)	6	31	220	110	26	23
KGL	56.5S	24	13--	..	..	..	..	24(7)	7	--	--	--	25	01
WIT	54.2N	25	1222	SC*	+ 1	+13 *		25(6,7)	7	48	340	195	26	23
HUA	00.6S	25	1224	SC*	1	45	2	25(6,7)	7	14	420	76	26	22
PMG	18.6S	25	03--	..	..	..	..	25(5)	6	7	130	60	26	21
HER	33.7S	25	1223	SC*	- 2	+10	+ 5	25(6)	7	43	166	222	28	01
GNA	43.3S	25	05--	..	..	..	..	25(6)	7	32	140	140	26	23
KGL	56.5S	25	1225	SC	--	--	--	25(5,6)	8	--	--	--	26	15
IRK	41.0N	26	1200	..	..	..	..	26(7)	5	16	165	53	27	19
IRK	41.0N	29	0900	..	..	..	..	29(6) 30(6,7)	5	29	99	44	30	23

Reports were received from the following observatories:

College Fredericksburg Gnangara Guam Hermanus Hyderabad
Kerguelen Newport Port Moresby San Juan Toolangi Witteveen

158
Nov 78

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

NOVEMBER 1978

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS

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)

08	0152	A:	VIC	COI	LMM	DRV	;B:	WNG	WIT	;C:	CZT	(si:	A:	FUR		
													B:	EBR	;C:	NGK)
12	0100	A:	SOD	WIT	VIC	DOU	FUR	EBR	COI	FRD	KSA	KNY	LMM	KNY	LMM	CZT
			DRV	;B:	WNG	NGK	MMB	KAK	HAZ							
19	2320	A:	VIC	LMM	;B:	WNG	OTT	COI	;C:	WIT	MMB	EBR	HAZ			
25	1222	A:	LMM	;B:	WNG	FUR	CZT	DRV	;C:	WIT	NGK					

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined.

03 0026 - 0031 HAZ

Very unusual events

none

RADIO PROPAGATION QUALITY INDICES

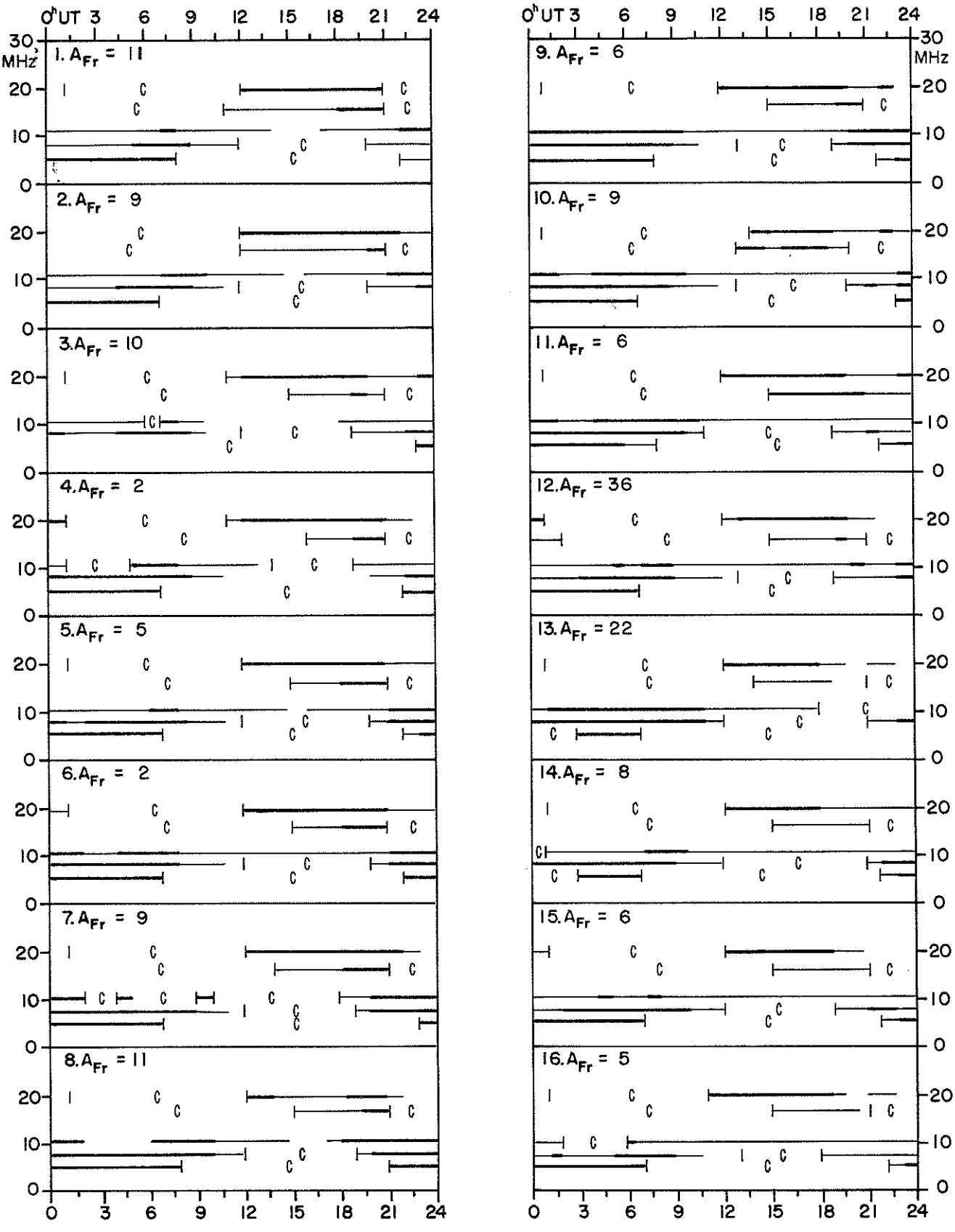
NOVEMBER 1978

Quality Indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKWELL
1	4.7	5.8	11.5	3.2	12.0
2	5.5	5.3	13.2	4.4	14.0
3	7.1	5.4	13.1	4.1	14.1
4	5.8	6.6	12.8	3.8	13.8
5	4.9	6.2	12.9	3.9	13.5
6	5.4	6.9	12.6	4.7	13.6
7	7.3	6.9	13.1	4.7	13.9
8	7.3	6.9	12.9	5.3	14.0
9	5.7	6.5	12.9	4.5	13.8
10	7.8	6.6	13.2	4.8	13.9
11	7.4	6.9	12.4	4.4	13.2
12	6.0	6.8	12.2	4.0	13.9
13	5.6	6.6	12.6	3.3	13.3
14	6.1	5.9	12.4	3.7	13.2
15	4.4	6.4	11.5	3.7	12.7
16	4.1	7.0	12.5	3.1	13.0
17	4.9	6.4	11.7	3.3	13.5
18	4.2	6.7	12.2	3.5	13.5
19	4.3	5.8	12.1	3.8	13.4
20	4.2	6.2	12.8	4.1	13.8
21	4.7	5.7	11.5	3.6	12.7
22	3.3	5.6	11.7	4.1	13.2
23	5.2	5.5	11.6	3.7	13.3
24	5.0	5.7	12.1	3.7	12.8
25	3.3	5.5	11.3	3.0	11.2
26	4.3	4.4	11.2	2.6	12.5
27	4.5	4.7	11.2	2.6	12.8
28	2.7	4.8	11.0	2.7	12.2
29	2.5	5.3	10.9	2.9	11.9
30	4.4	6.4	11.2	3.3	13.1
MEAN	5.1	6.0	12.1	3.7	13.2

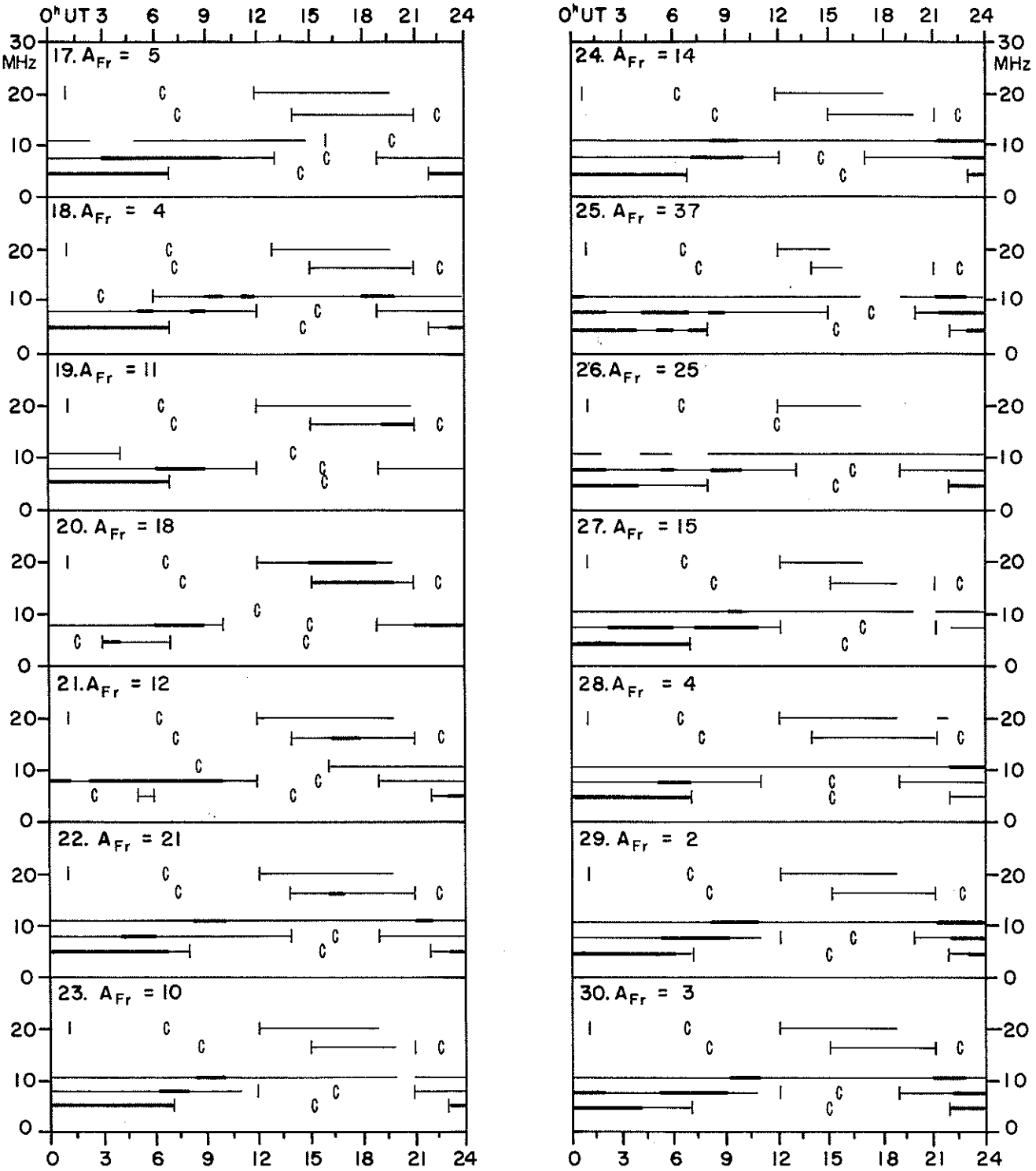
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 1978



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 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,N.C.-2/79/950

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."