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Data for October, November 1998 and Late Data

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Number 652

(Issued in Two Parts)

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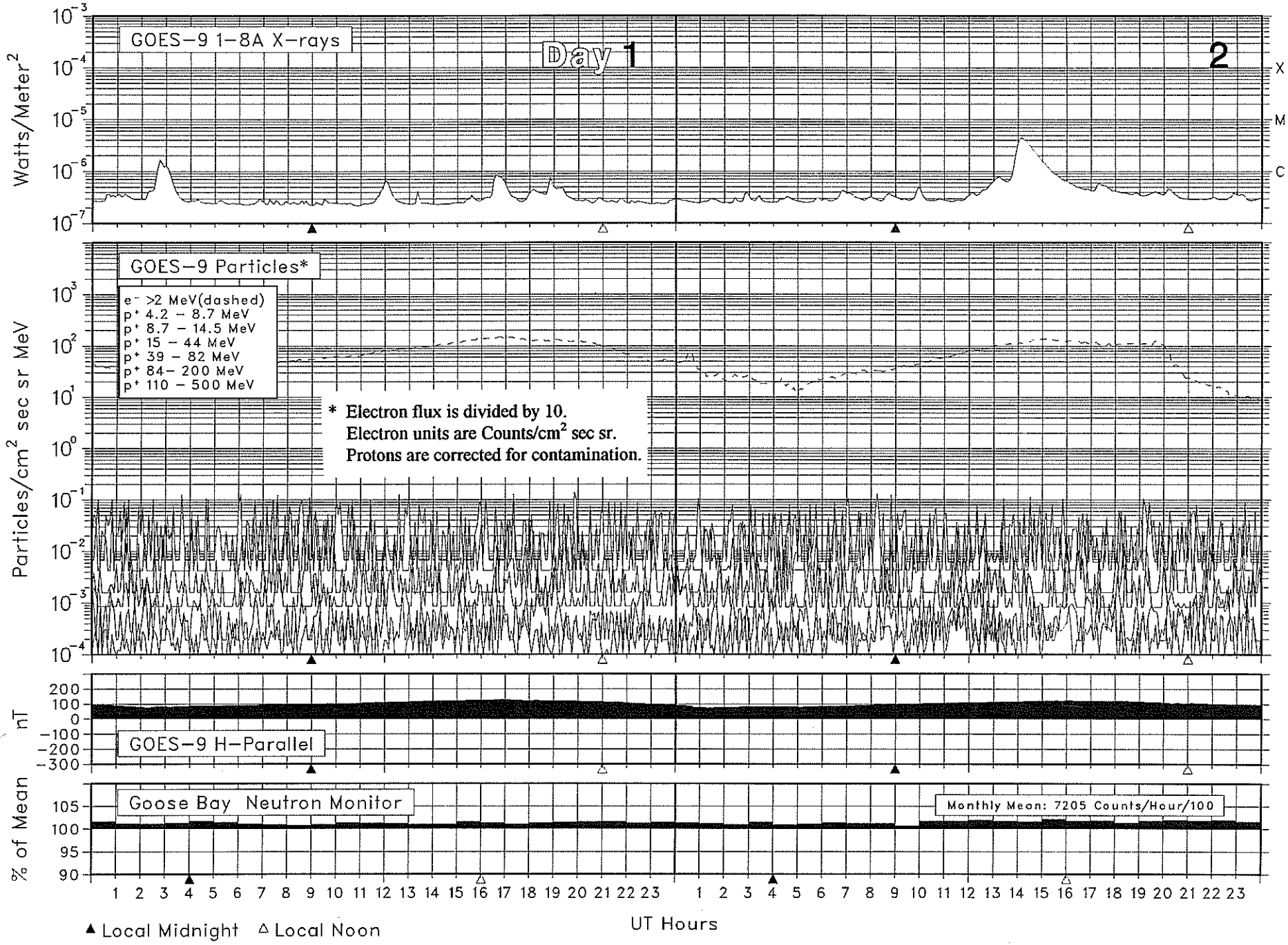
November 1998



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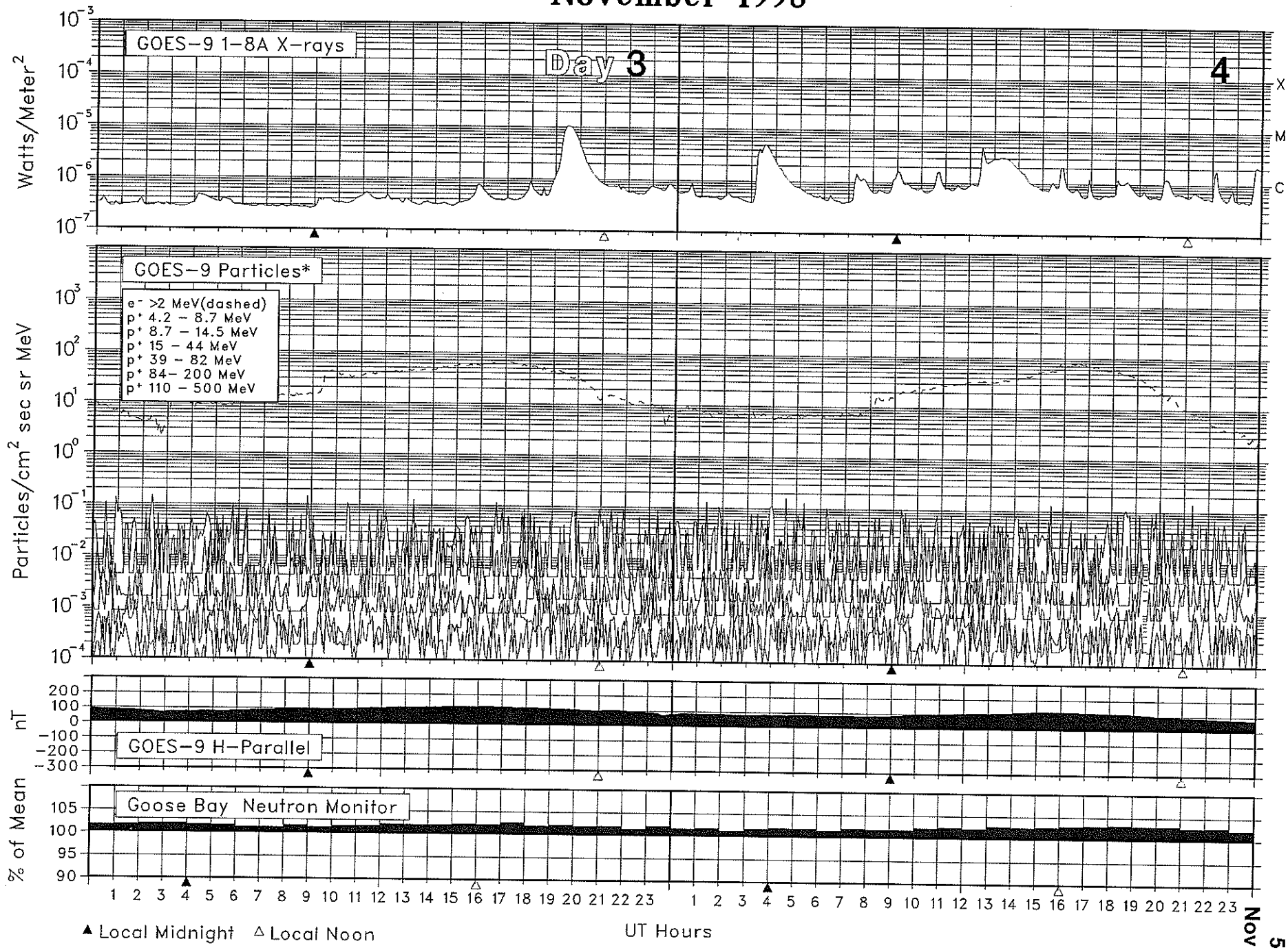
November 1998



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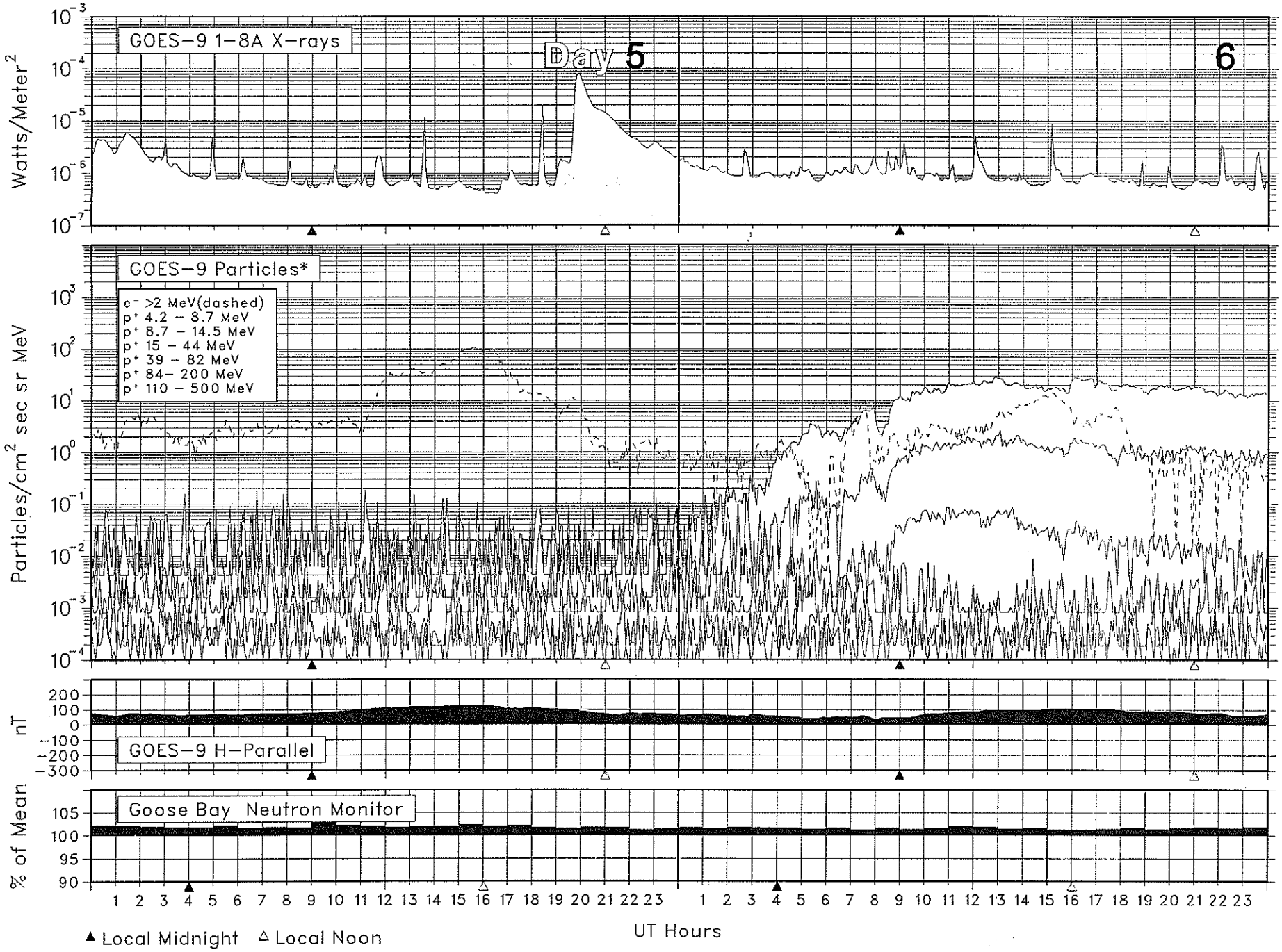
November 1998



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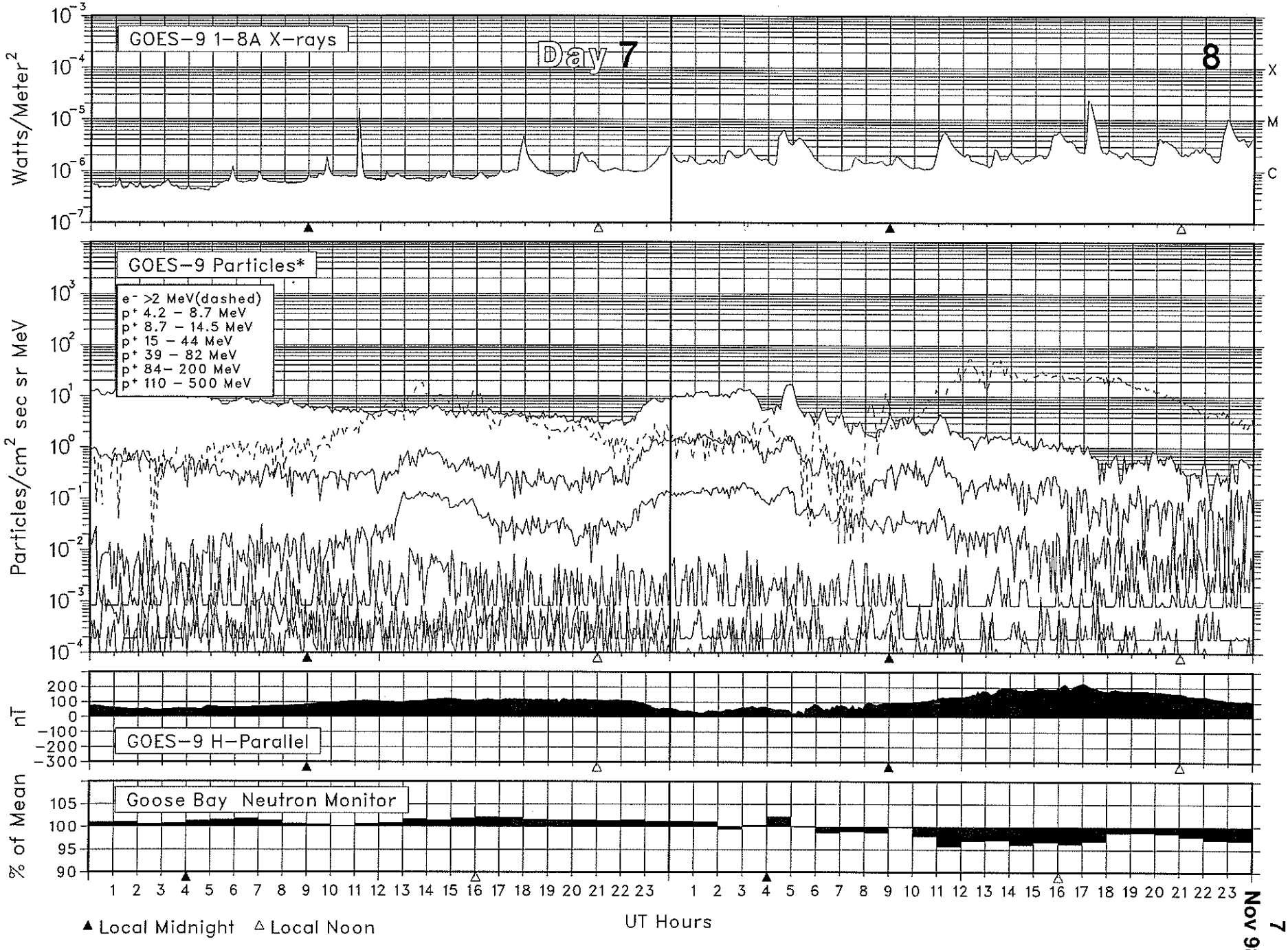

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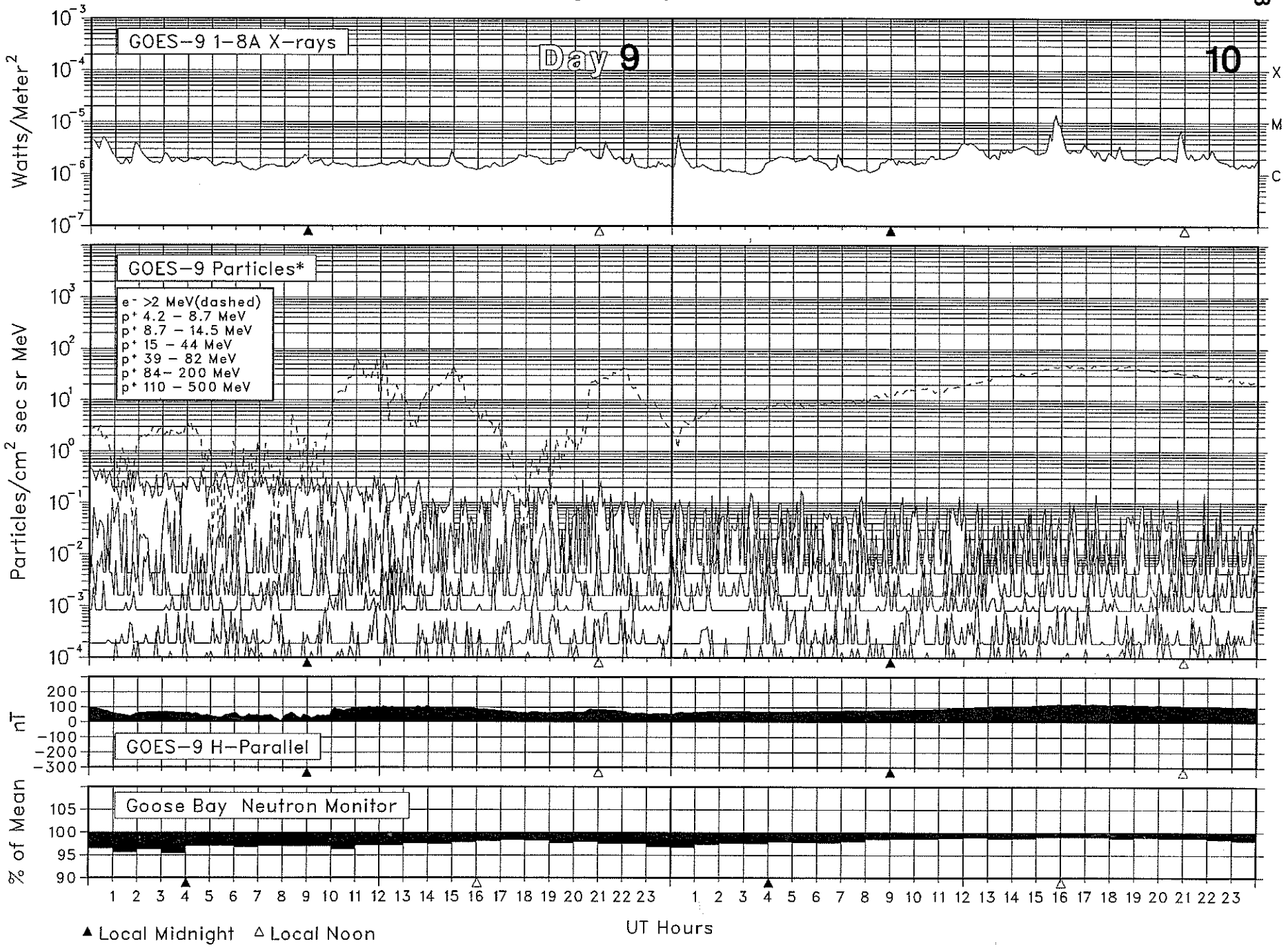

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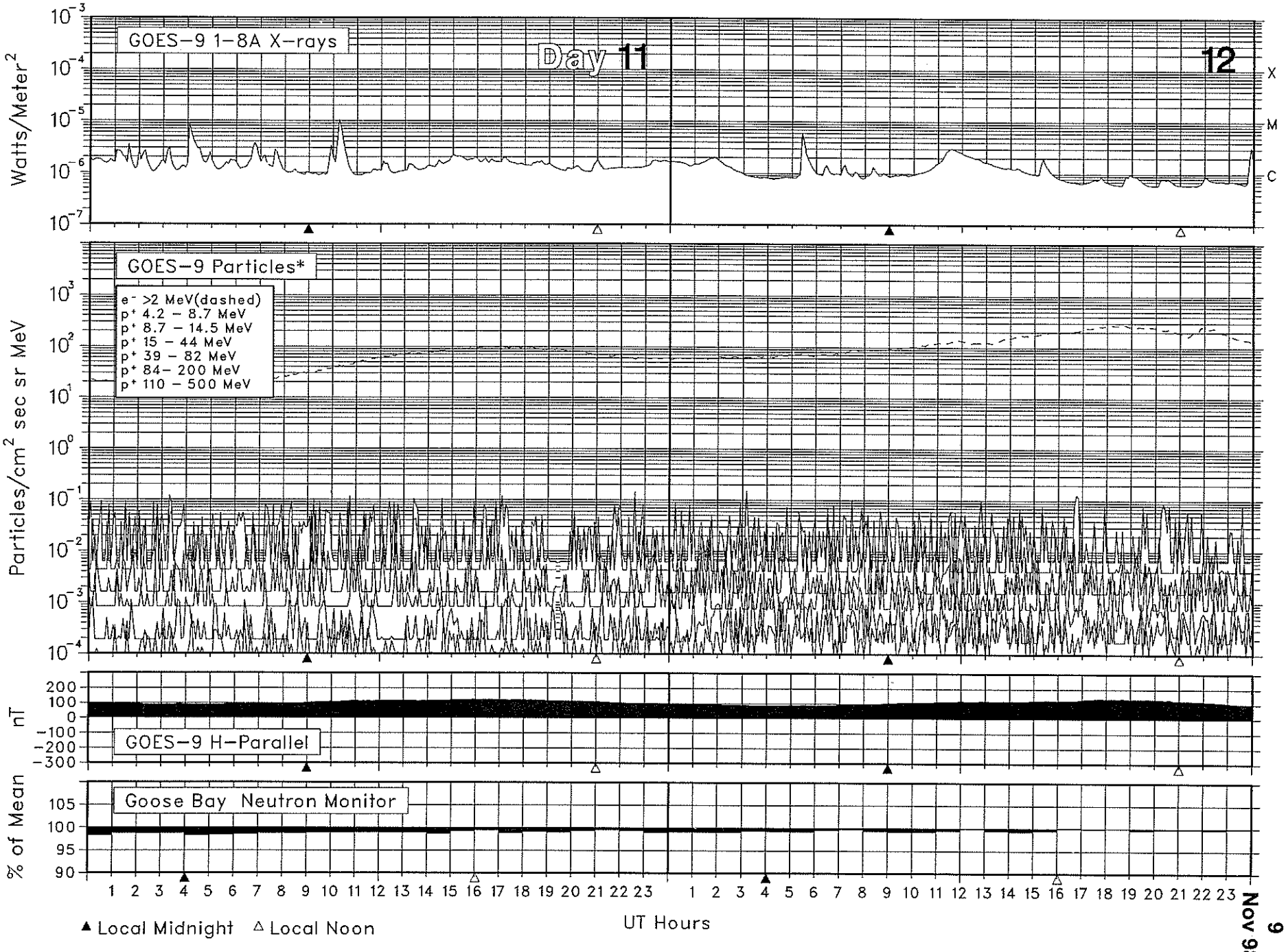

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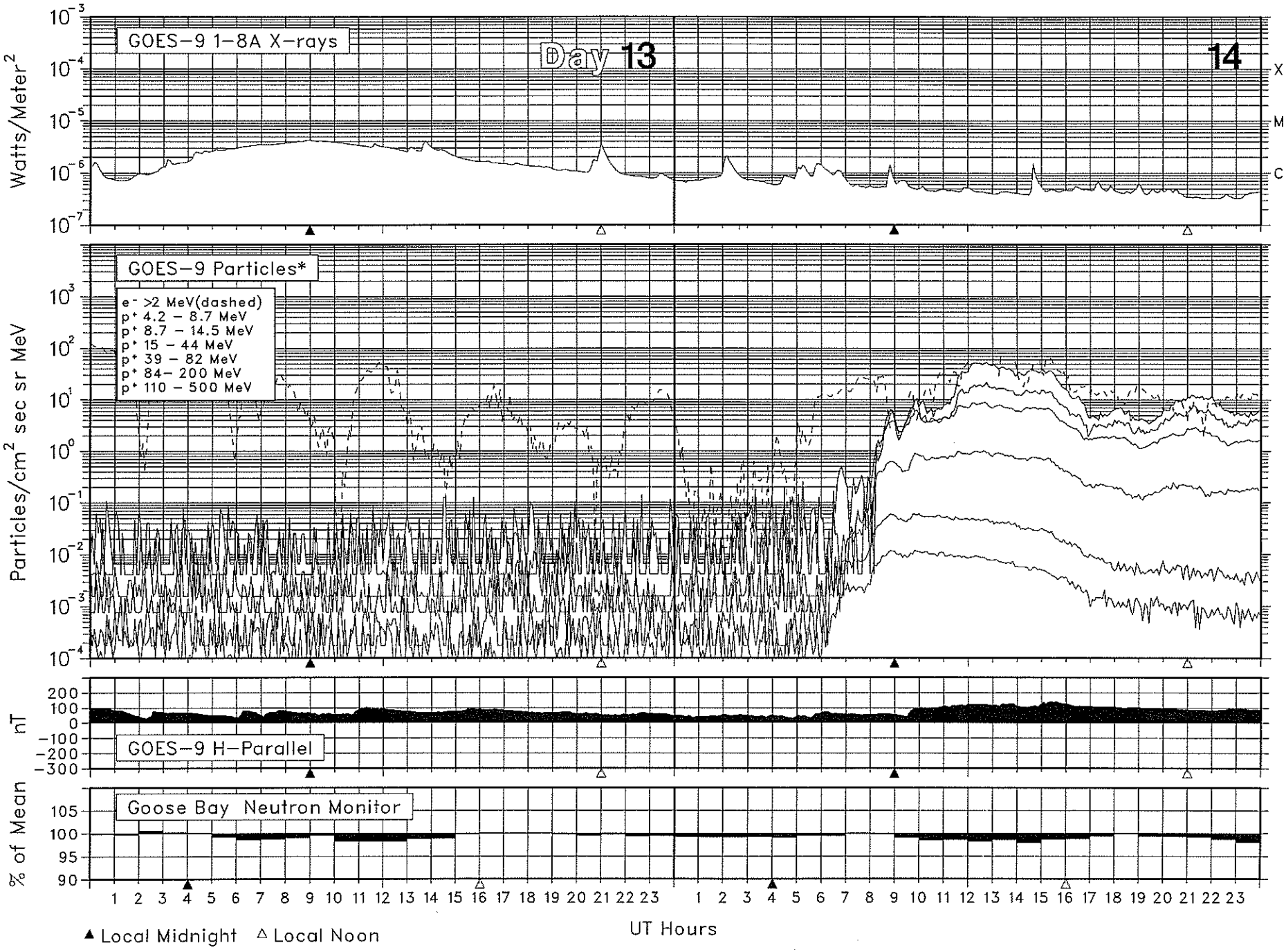

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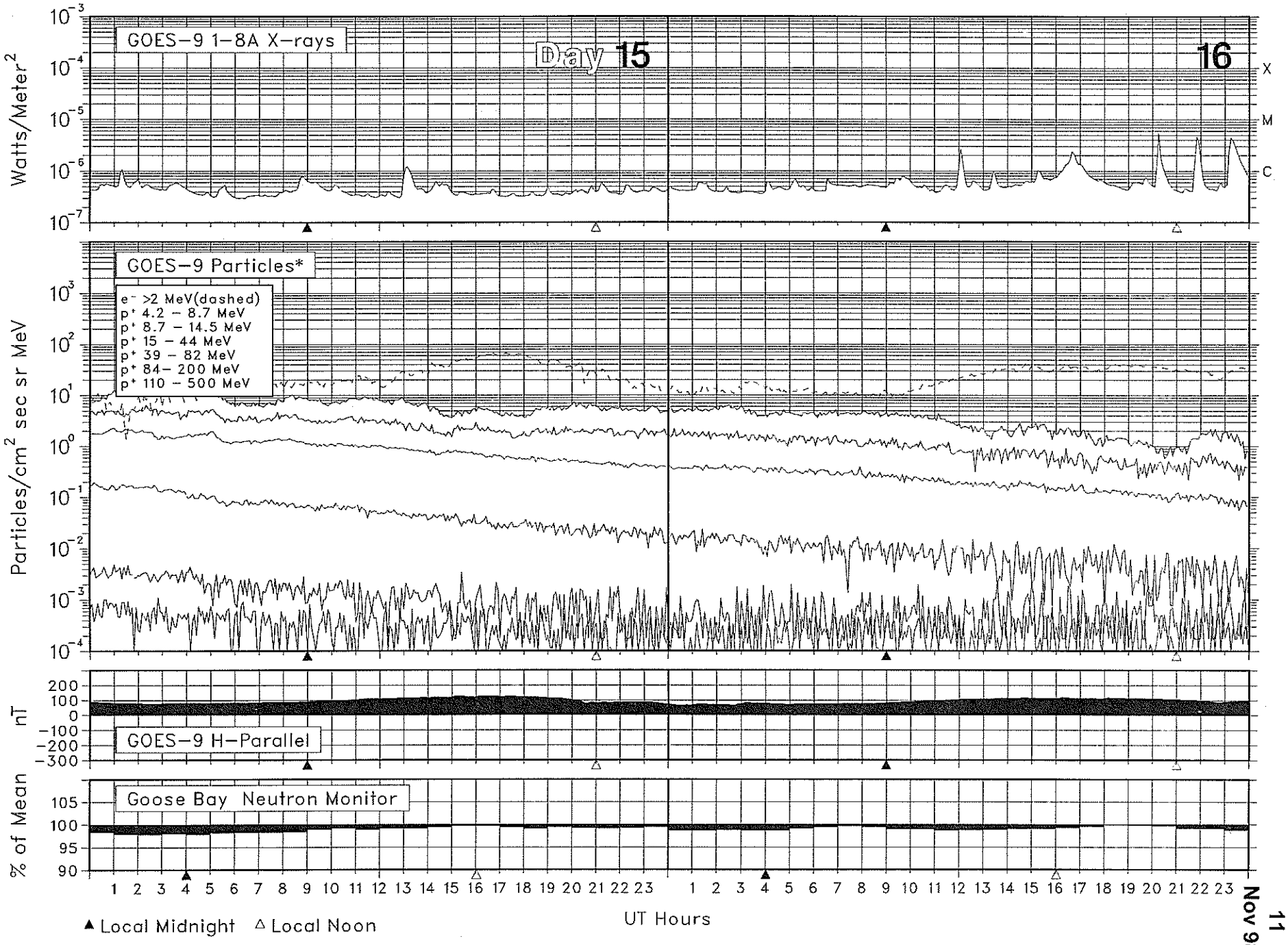
November 1998



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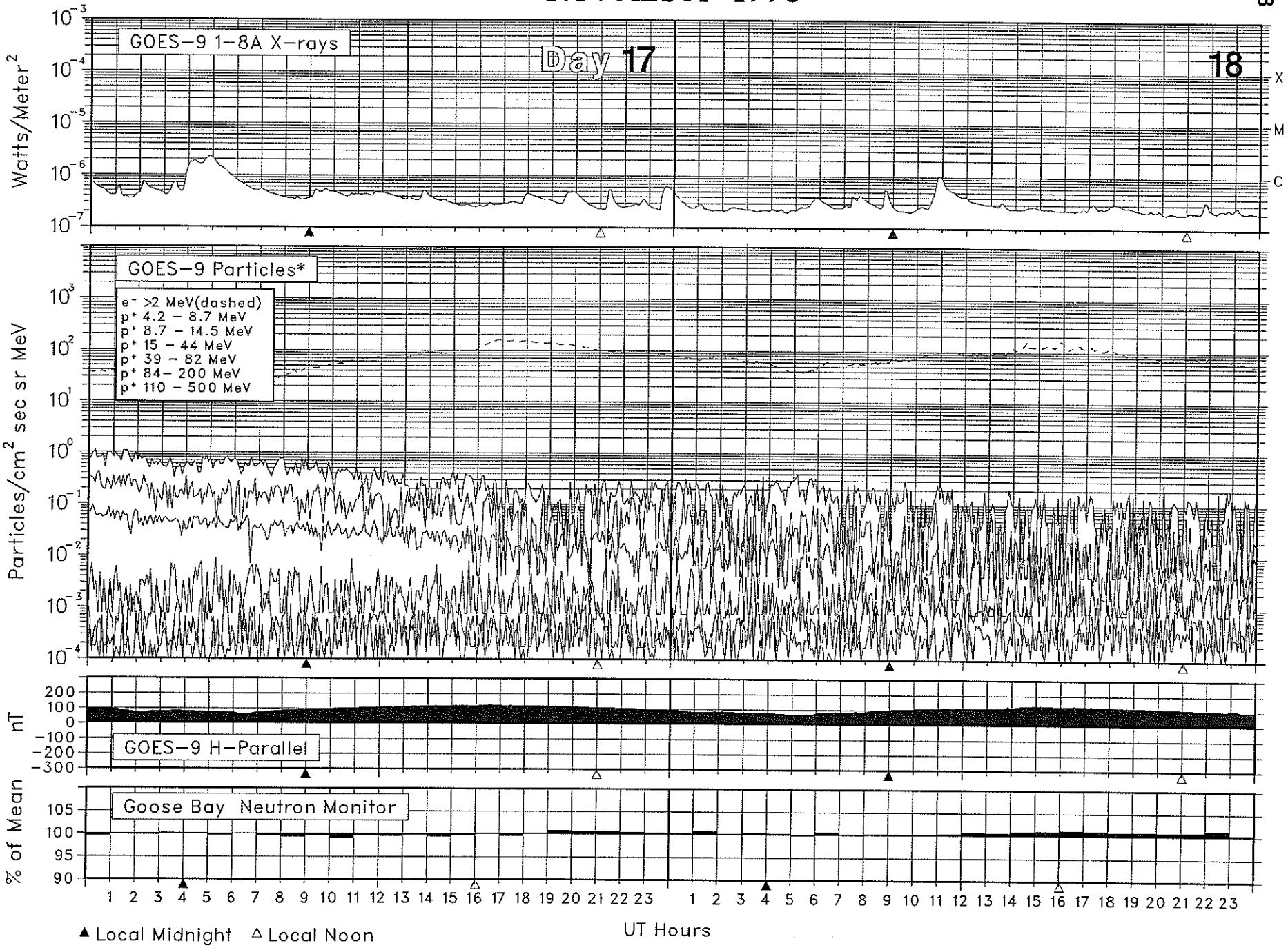

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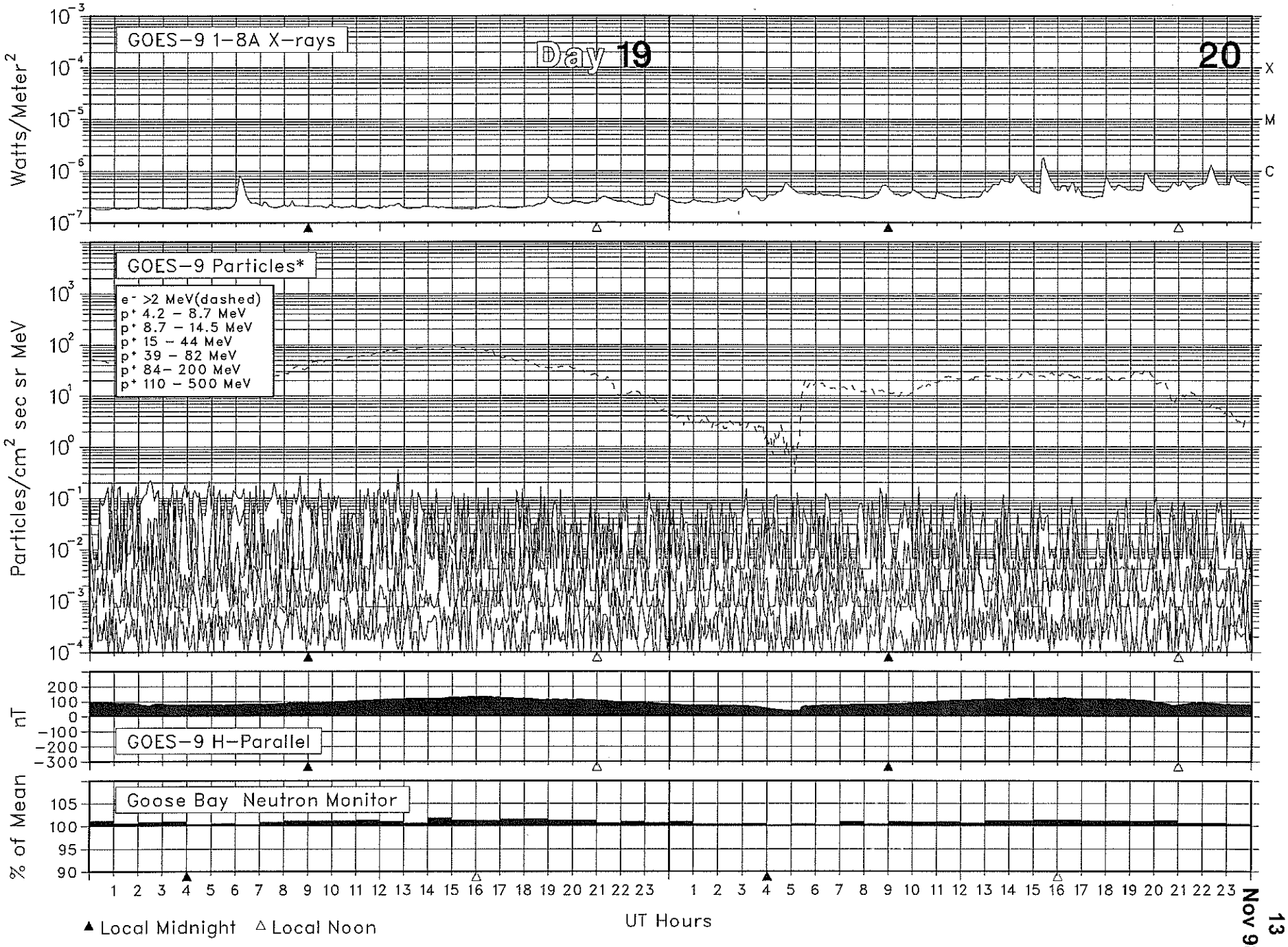

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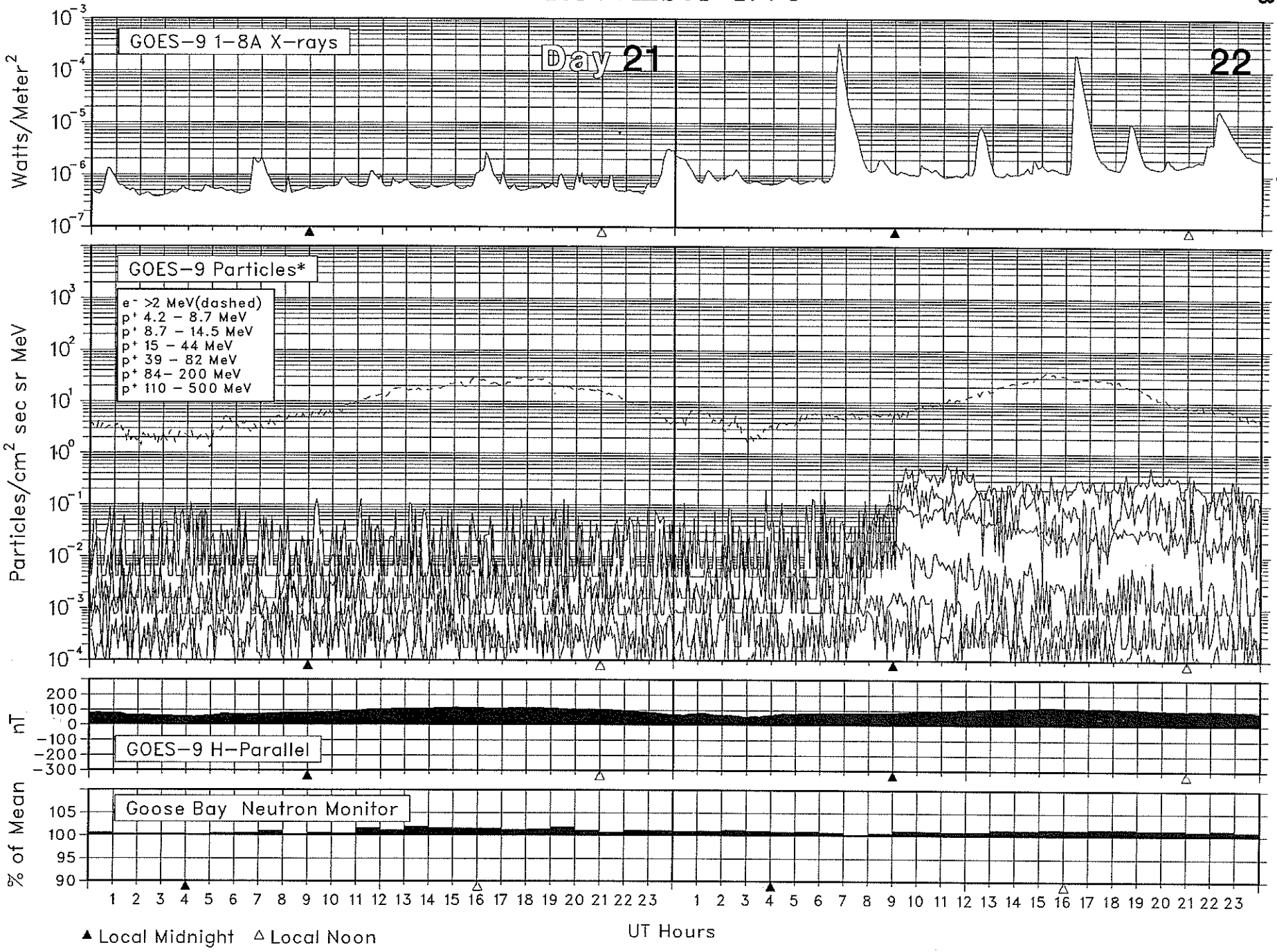

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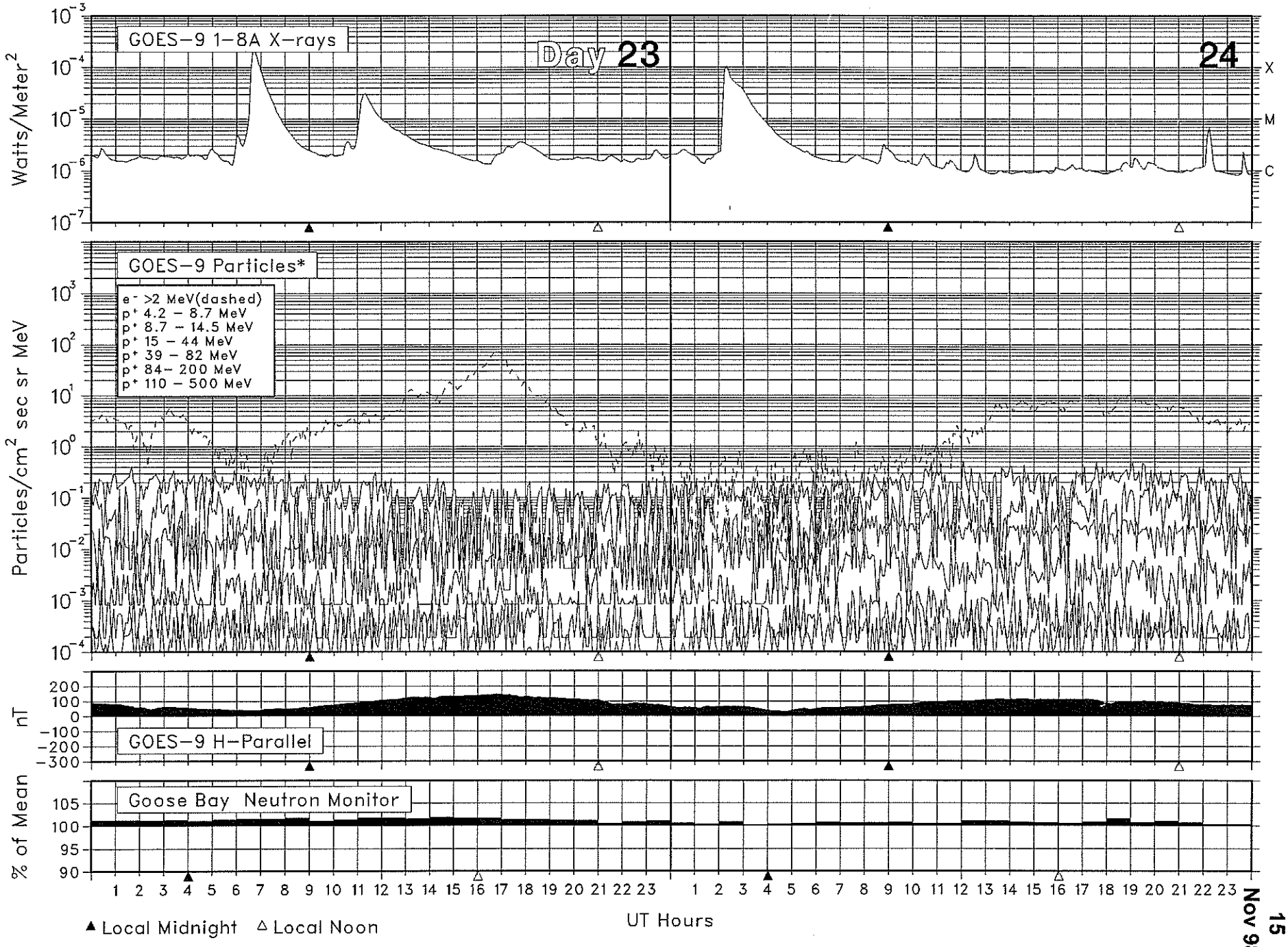

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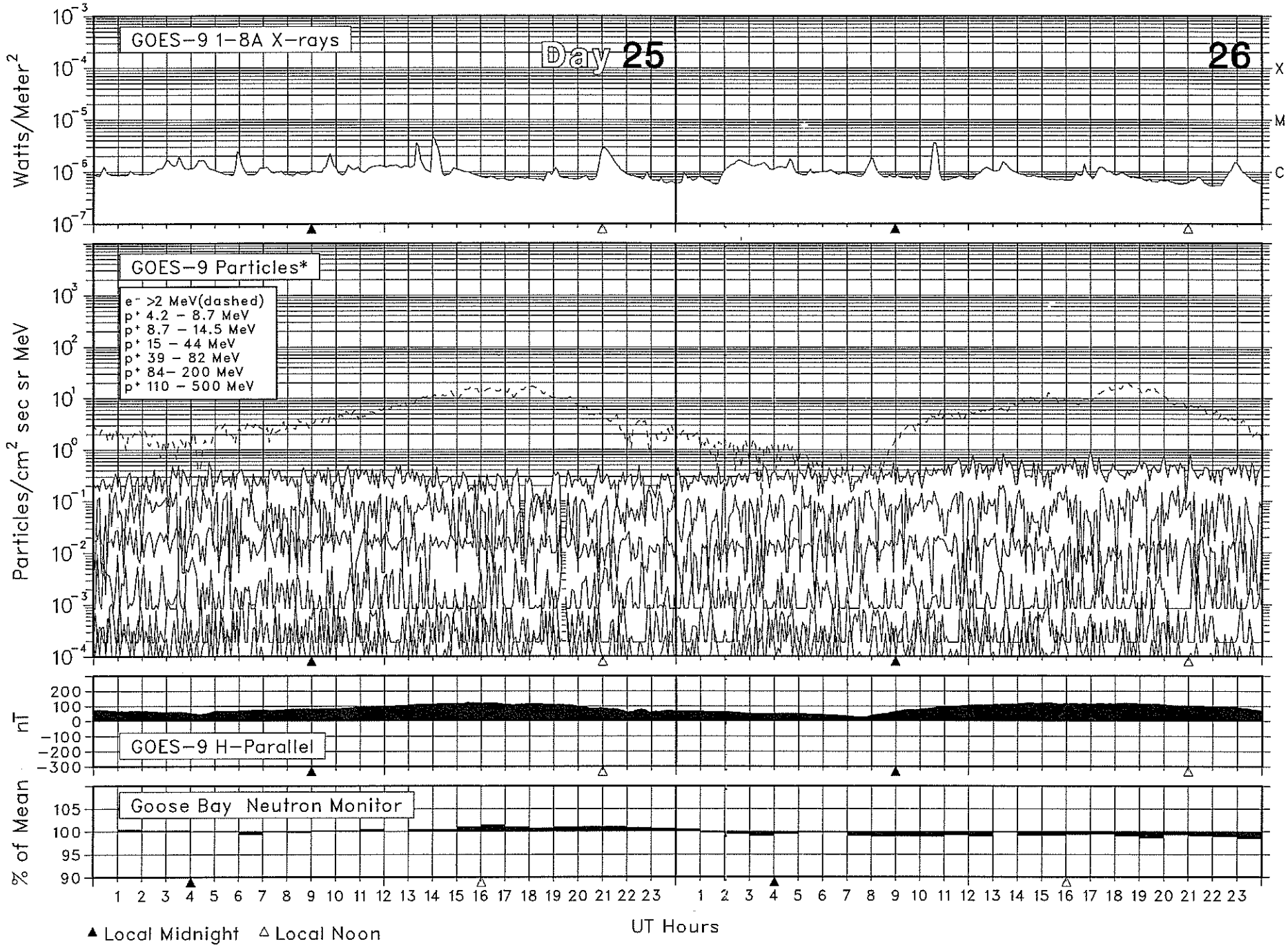

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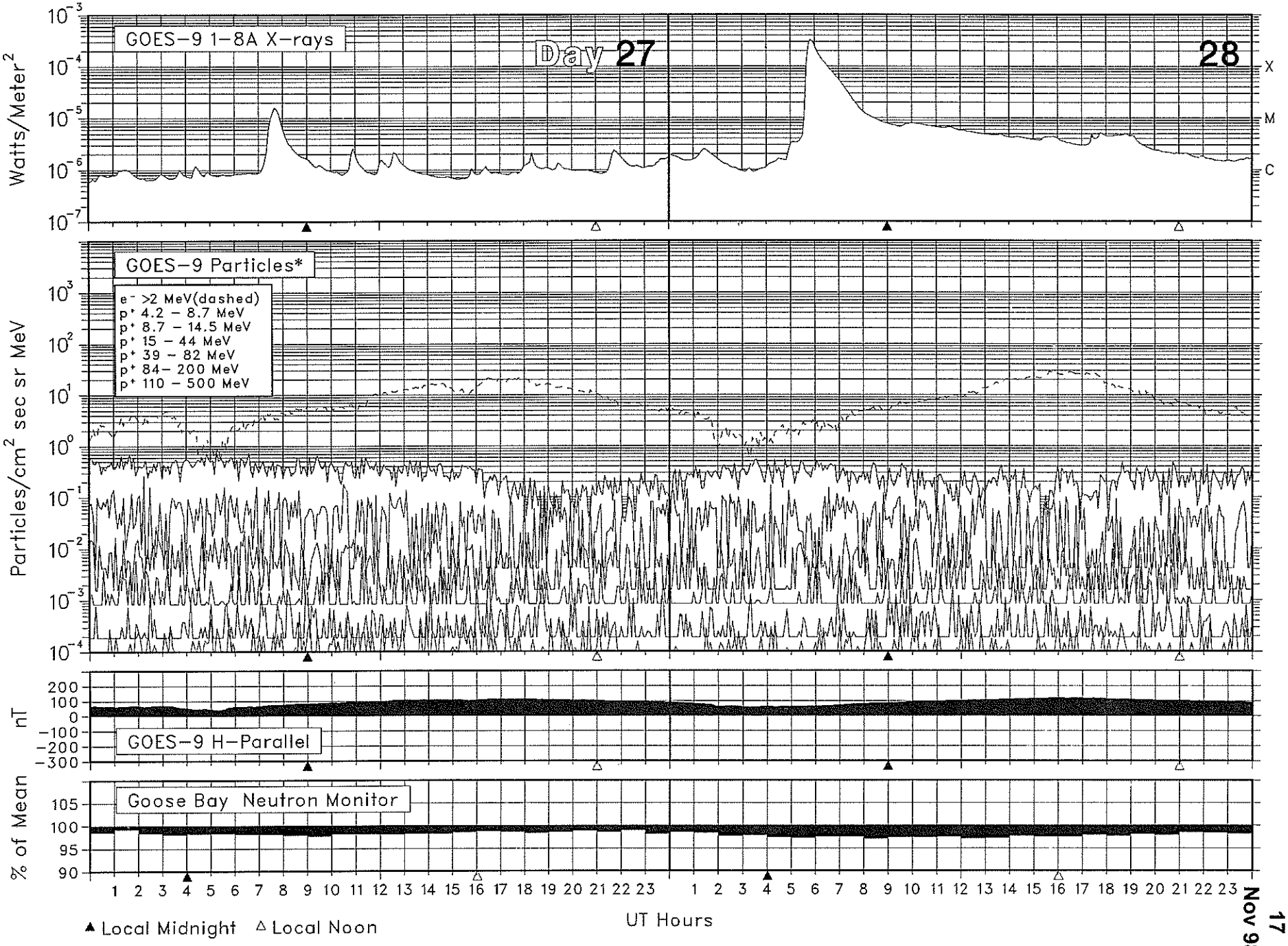

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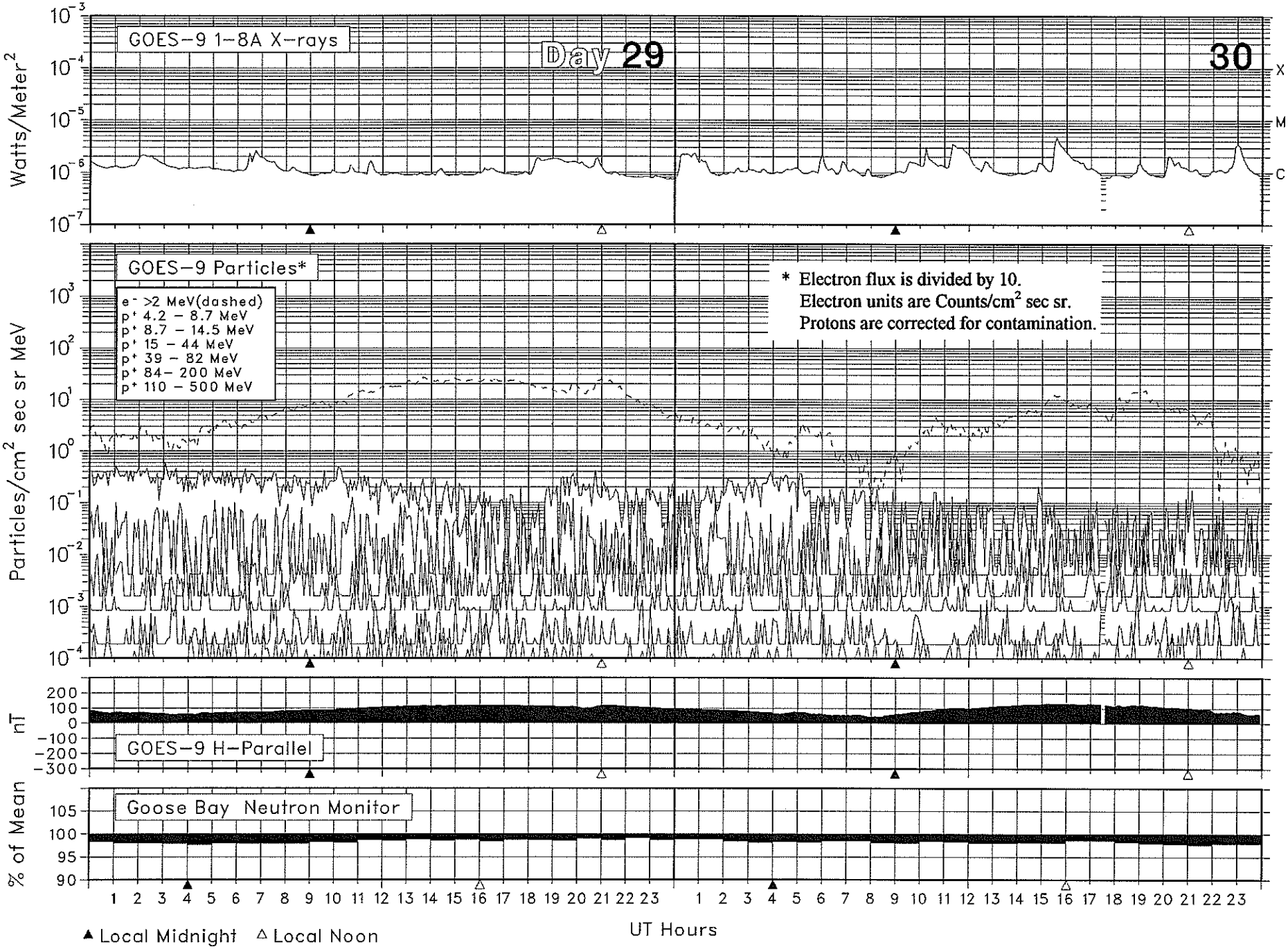


A L E R T P E R I O D S
The International Space Environment Service

NOVEMBER 1998

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location Lat	Location Long	Flares Optical	Flares M	Flares X	Date of Forecast	Region Forecast(1)	Geoadvice(1)
305	01	31	71	119	2	N18	W25	0	0	0	01	Q	SOL: Eruptive
						N21	W09	0	0	0	01	Q	MAG: Quiet
						S24	E29	0	0	0	01	Q	PRO: Quiet
						S18	E39	0	0	0	01	Q	
						N17	E45	0	0	0	01	E	
306	02	01	79	121	2	N18	W39	0	0	0	02	Q	SOL: Eruptive
						S21	W18	0	0	0	02	Q	MAG: Quiet
						N21	W23	0	0	0	02	Q	PRO: Quiet
						S26	E20	1	0	0	02	Q	
						S18	E25	0	0	0	02	Q	
						N17	E32	2	0	0	02	E	
307	03	02	76	126	3	N18	W52	0	0	0	03	Q	SOL: Eruptive
						N18	W41	0	0	0	03	Q	MAG: Quiet
						S24	E06	0	0	0	03	Q	PRO: Quiet
						N19	E20	1	0	0	03	Q	
						N22	E75	0	0	0	03	Q	
308	04	03	81	152	5	N17	W66	0	0	0	04	Q	SOL: Eruptive
						S25	W05	0	0	0	04	Q	MAG: Quiet
						N18	E07	7	1	0	04	E	PRO: Quiet
						N22	E63	0	0	0	04	Q	
						N17	E76	0	0	0	04	Q	
309	05	04	124	141	4	N18	W79	0	0	0	05	Q	SOL: Eruptive
						S22	W20	0	0	0	05	Q	MAG: Quiet
						N18	W07	11	0	0	05	E	PRO: Quiet
						N22	E49	0	0	0	05	Q	
						N14	E63	2	0	0	05	Q	
						S18	W28	2	0	0	05	Q	
						S20	E65	0	0	0	05	Q	
310	06	05	137	153	6	S22	W31	0	0	0	06	Q	SOL: Major
						N18	W21	19	2	0	06	Q	MAG: Active
						N22	E36	0	0	0	06	Q	PRO: Warning
						N14	E50	1	0	0	06	Q	
						S18	W42	2	0	0	06	Q	
						S20	E51	2	0	0	06	Q	
						N22	E16	0	0	0	06	Q	
311	07	06	142	141	20	S22	W45	0	0	0	07	Q	SOL: Active
						N18	W35	27	0	0	07	Q	MAG: Minor
						N22	E24	3	0	0	07	Q	PRO: Warning
						N13	E36	0	0	0	07	Q	
						S18	W55	4	0	0	07	Q	
						S22	E38	0	0	0	07	Q	
						N21	E02	0	0	0	07	Q	
312	08	07	144	149	18	N18	W49	11	0	0	08	Q	SOL: Active
						N22	E10	0	0	0	08	Q	MAG: Minor
						N14	E23	0	0	0	08	Q	PRO: Warning
						S18	W70	1	0	0	08	Q	
						S22	E30	0	0	0	08	Q	
						N22	W11	0	0	0	08	Q	
						N18	W32	0	0	0	08	Q	
313	09	08	137	153	47	N19	W62	17	2	0	09	Q	SOL: Major
						N23	E00	0	0	0	09	Q	MAG: Minor
						N17	E11	1	0	0	09	Q	PRO: Warning
						S19	W79	0	0	0	09	Q	
						N22	W23	0	0	0	09	Q	
						N18	W45	0	0	0	09	Q	
						S14	E76	0	0	0	09	Q	
314	10	09	107	162	38	N21	W75	10	0	0	10	A	SOL: Active
						N23	W14	0	0	0	10	A	MAG: Active

A L E R T P E R I O D S
The International Space Environment Service

NOVEMBER 1998

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location Lat	Location Long	Flares Optical	Flares M	Flares X	Date of Forecast	Region Forecast(1)	Geoadvice(1)
						N14	W03	0	0	0	10	A	PRO: Warning
						S18	W93	0	0	0	10	A	
						S15	E62	0	0	0	10	A	
						S27	E77	0	0	0	10	A	
315	11	10	81	154	4	N21	W85	15	1	0	11	E	SOL: Active
						N22	W29	1	0	0	11	Q	MAG: Quiet
						N14	W16	0	0	0	11	Q	PRO: Warning
						S15	E52	1	0	0	11	Q	
						S27	E64	0	0	0	11	Q	
316	12	11	82	147	0	N22	W42	0	0	0	12	A	SOL: Active
						N14	W29	0	0	0	12	A	MAG: Quiet
						S15	E40	1	0	0	12	A	PRO: Quiet
						S27	E53	0	0	0	12	A	
						N19	W30	0	0	0	12	A	
317	13	12	85	142	1	N22	W54	0	0	0	13	Q	SOL: Active
						N14	W42	0	0	0	13	Q	MAG: Active
						S16	E27	2	0	0	13	Q	PRO: Quiet
						S28	E39	0	0	0	13	Q	
						N19	W44	3	1	0	13	Q	
318	14	13	97	135	44	N22	W68	0	0	0	14	Q	SOL: Active
						N15	W56	0	0	0	14	Q	MAG: Active
						S16	E14	1	0	0	14	Q	PRO: Quiet
						S27	E27	0	0	0	14	Q	
						N20	W58	2	0	0	14	Q	
						S20	E57	0	0	0	14	Q	
319	15	14	129	127	26	N22	W81	2	0	0	15	Q	SOL: Eruptive
						N15	W69	0	0	0	15	Q	MAG: Active
						S15	E02	2	0	0	15	Q	PRO: IP
						S28	E14	1	0	0	15	Q	
						N21	W69	3	0	0	15	Q	
						S20	E43	0	0	0	15	Q	
						N22	E46	0	0	0	15	Q	
						N23	E55	0	0	0	15	Q	
320	16	15	110	126	8	N22	W92	0	0	0	16	Q	SOL: Eruptive
						N15	W80	0	0	0	16	Q	MAG: Quiet
						S15	W11	0	0	0	16	Q	PRO: IP
						S28	E02	0	0	0	16	Q	
						N21	W81	1	0	0	16	Q	
						S21	E31	0	0	0	16	Q	
						N21	E30	0	0	0	16	Q	
						N22	E43	0	0	0	16	Q	
321	17	16	76	125	9	S14	W31	3	0	0	17	Q	SOL: Eruptive
						S28	W10	0	0	0	17	Q	MAG: Quiet
						N19	E15	0	0	0	17	Q	PRO: Quiet
						N23	E29	0	0	0	17	Q	
						S20	W53	0	0	0	17	Q	
322	18	17	92	121	4	S13	W43	0	0	0	18	Q	SOL: Eruptive
						S27	W24	0	0	0	18	E	MAG: Active
						N22	E02	0	0	0	18	Q	PRO: Quiet
						N24	E17	0	0	0	18	Q	
						S20	W62	0	0	0	18	Q	
						N18	W47	0	0	0	18	Q	
323	19	18	72	115	7	S14	W58	0	0	0	19	Q	SOL: Eruptive
						S28	W36	0	0	0	19	Q	MAG: Active
						S19	W15	0	0	0	19	Q	PRO: Quiet
						N23	E02	0	0	0	19	Q	
						S17	E61	0	0	0	19	Q	

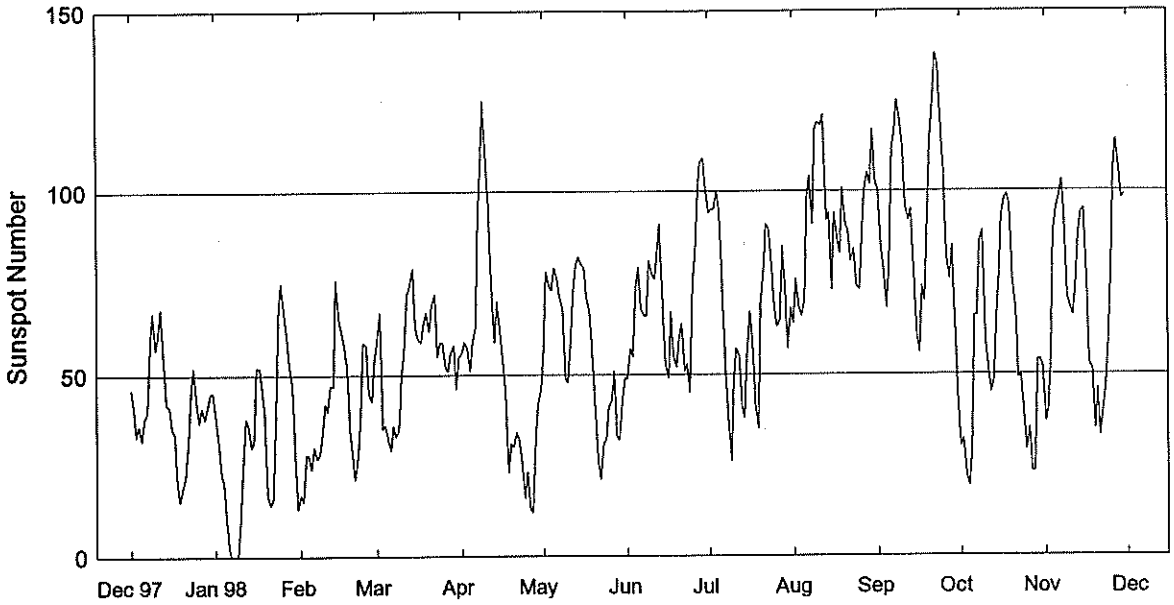
A L E R T P E R I O D S
The International Space Environment Service

NOVEMBER 1998

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location Lat	Location Long	Flares Optical	Flares M	Flares X	Date of Forecast	Region Forecast(1)	Geoadvice(1)
324	20	19	57	117	7	S16	W66	0	0	0	20	Q	SOL: Eruptive
						S27	W49	0	0	0	20	Q	MAG: Quiet
						N24	W10	0	0	0	20	Q	PRO: Quiet
						S16	E48	1	0	0	20	Q	
325	21	20	58	122	11	S16	W73	0	0	0	21	Q	SOL: Eruptive
						S28	W62	3	0	0	21	Q	MAG: Active
						S17	E34	5	0	0	21	E	PRO: Quiet
326	22	21	55	121	7	S27	W75	12	0	0	22	Q	SOL: Eruptive
						S17	E21	4	0	0	22	E	MAG: Active
						S22	E74	0	0	0	22	Q	PRO: Quiet
327	23	22	56	126	7	S26	W88	7	0	2	23	A	SOL: Eruptive
						S17	E07	5	0	0	23	A	MAG: Minor
						S23	E59	0	0	0	23	A	PRO: Quiet
328	24	23	56	130	9	S17	W80	1	0	0	24	Q	SOL: Active
						S16	W07	1	0	0	24	Q	MAG: Active
						S22	E48	1	0	0	24	E	PRO: Quiet
						S18	E71	0	0	0	24	Q	
329	25	24	74	140	12	S14	W25	0	0	0	25	Q	SOL: Active
						S25	E34	0	0	0	25	Q	MAG: Active
						S19	E68	2	0	0	25	Q	PRO: Quiet
						S16	W50	1	0	0	25	Q	
						N17	E77	1	0	0	25	Q	
330	26	25	102	150	9	S14	W38	0	0	0	26	Q	SOL: Eruptive
						S23	E21	3	0	0	26	Q	MAG: Active
						S19	E50	5	0	0	26	E	PRO: Quiet
						S15	W64	0	0	0	26	Q	
						N17	E68	3	0	0	26	E	
331	27	26	132	156	10	S15	W52	0	0	0	27	Q	SOL: Eruptive
						S23	E08	3	0	0	27	Q	MAG: Quiet
						S19	E38	2	0	0	27	E	PRO: Quiet
						S15	W79	0	0	0	27	Q	
						N17	E56	4	0	0	27	E	
						N28	W45	0	0	0	27	Q	
332	28	27	121	159	10	S15	W66	0	0	0	28	Q	SOL: Eruptive
						S23	W05	3	1	0	28	Q	MAG: Quiet
						S19	E24	1	0	0	28	E	PRO: Quiet
						S14	W90	0	0	0	28	Q	
						N19	E44	3	0	0	28	E	
						N26	W59	0	0	0	28	Q	
333	29	28	110	165	3	S15	W77	0	0	0	29	Q	SOL: Active
						S22	W20	0	0	0	29	Q	MAG: Quiet
						S18	E12	0	0	0	29	E	PRO: Quiet
						N20	E33	5	0	1	29	E	
						N26	W72	1	0	0	29	Q	
334	30	29	126	168	4	S18	W03	0	0	0	30	Q	SOL: Active
						N22	E21	4	0	0	30	E	MAG: Quiet
						N27	W84	3	0	0	30	Q	PRO: Quiet
						N15	E70	2	0	0	30	Q	

STRATWARM ALERTS - NONE

International Relative Sunspot Numbers
Dec 1997 - Nov 1998

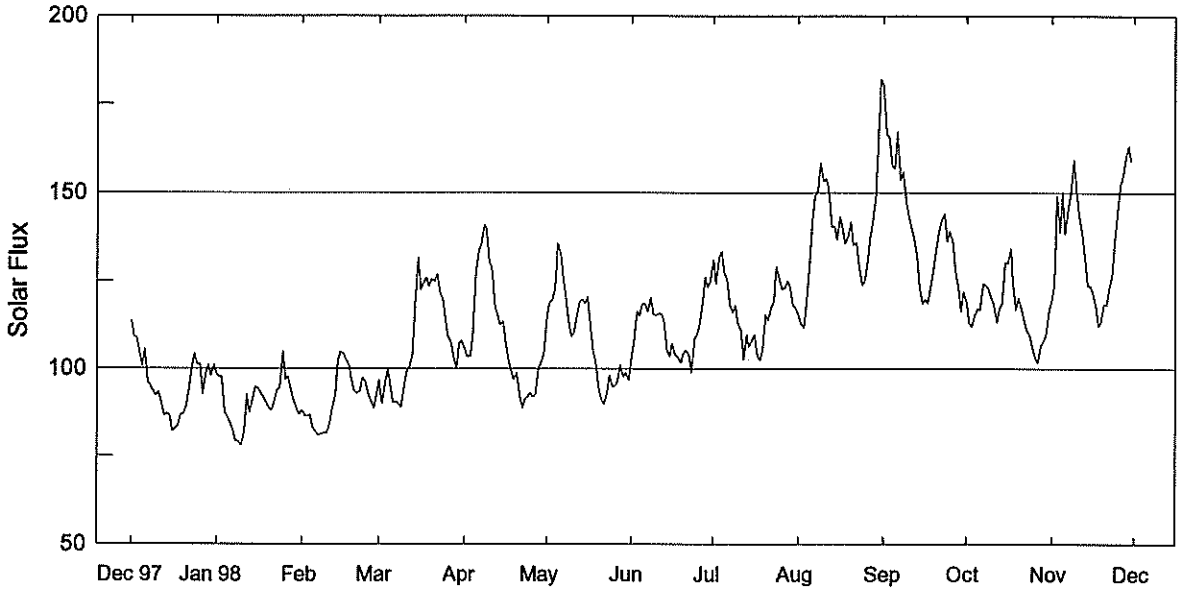


Day	Dec 97	Jan 98	Feb	Mar	Apr	May	Jun	Jul*	Aug*	Sep*	Oct*	Nov*
1	46	39	17	59	56	57	49	94	64	100	30	37
2	41	31	15	67	59	78	57	95	76	85	32	41
3	33	23	28	35	57	74	55	95	68	79	22	56
4	36	20	28	36	51	73	74	100	66	68	19	88
5	32	10	22	32	59	79	79	94	70	80	28	95
6	38	1	30	29	63	76	68	74	98	112	66	98
7	40	0	27	36	93	71	66	51	104	116	66	103
8	58	0	28	33	106	68	66	38	91	125	86	92
9	67	0	33	35	125	49	81	26	117	119	89	71
10	57	10	42	50	108	48	77	49	119	112	60	68
11	61	27	40	56	96	58	76	57	118	96	51	66
12	68	38	47	72	75	73	83	55	121	92	45	73
13	53	36	47	74	59	80	91	41	92	95	48	88
14	42	30	76	79	70	82	69	38	94	78	66	94
15	41	32	65	63	63	80	53	55	73	60	77	95
16	35	52	62	60	54	79	49	67	94	56	93	76
17	34	52	58	59	46	71	67	59	87	74	98	53
18	20	46	52	64	23	67	55	42	83	70	99	51
19	15	39	35	67	31	56	52	35	101	93	96	35
20	19	17	28	62	30	43	60	69	91	114	76	46
21	22	14	21	69	34	26	64	78	89	125	68	33
22	32	16	28	72	32	21	51	91	81	138	49	41
23	45	40	39	55	26	31	53	90	84	135	50	47
24	52	66	59	59	16	32	45	79	74	117	39	59
25	42	75	58	59	23	41	75	68	73	105	29	80
26	37	67	45	52	13	43	83	63	87	82	35	106
27	41	61	43	51	12	51	100	65	100	76	23	114
28	38	53	54	56	32	33	108	85	105	85	23	106
29	41	47		58	42	32	109	74	102	60	54	98
30	45	28		46	46	43	101	57	117	41	54	99
31	45	13		55		49		68	103		52	
Mean	41.2	31.9	40.3	54.8	53.3	56.9	70.5	66.2	91.7	92.9	55.6	73.6

* = Provisional.

Penticton 2800 MHz (10.7cm) Solar Flux
Dec 97 - Nov 98

Adjusted to 1 AU



Day	Dec 97	Jan 98	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1	113.7	98.3	88.1	96.5	105.6	115.1	103.0	131.1	115.4	180.2	119.1	119.5
2	109.0	97.6	86.5	89.9*	103.4	118.8	107.7	124.4	112.9	166.3	112.9	124.1
3	109.0	97.7	86.3	95.0	103.6	119.3	116.4	131.9	111.7	165.5	112.0	149.3
4	104.2	87.7	86.6	100.0	110.2	123.2	115.0	133.5	119.2	157.3	114.9	139.0
5	100.7	86.3	83.1	95.1	126.4	135.7	118.4	127.6	130.5	156.8	117.1	150.1
6	105.6	84.1	81.8	90.3	133.7	132.4	118.5	125.2	142.2	167.1	116.9	138.4
7	96.0	82.1	80.8	90.5	135.5	125.6	116.4	118.5	149.1	153.5	124.1	145.8
8	95.1	79.5	81.3	89.9	141.0	120.2	120.5	116.2	150.9	155.8	123.8	149.9
9	93.8	78.9	81.5	88.7	140.2	112.8	115.7	118.2	158.3	147.4	123.2	159.3
10	92.2	78.0	81.5	95.0	130.2	109.3	115.3	112.9	153.3	143.6	120.3	150.8
11	93.4	82.0	84.0	99.4	128.8	110.2	115.8	111.3	154.1	140.4	118.5	144.1
12	89.6	92.7	88.3	100.3	117.6	114.4	115.7	102.6	150.9	136.6	113.4	138.7
13	86.5	87.5	92.3	103.7	115.5	119.1	113.9	109.7	140.4	132.3	117.5	132.6
14	87.1	90.8	102.3	118.2	112.6	119.8	105.1	106.3	140.6	123.3	118.4	123.8
15	86.3	94.6	104.7	131.6	113.5	118.6	103.6	108.2	136.8	118.6	130.4	123.7
16	82.0	94.4	104.2	122.6	107.2	120.4	107.3	109.7	143.3	119.9	130.1	121.8
17	82.9	92.8	102.4	124.3	102.1	113.0	103.9	103.6	139.7	118.6	134.4	118.0
18	83.5	92.0	100.9	125.9	99.4	104.6	103.3	102.4	135.8	123.7	125.0	112.2
19	86.8	90.5	96.3	123.5	96.7	101.5	101.8	105.2	137.9	128.0	116.8	113.7
20	86.7	88.5	93.6	125.5	98.7	94.1	104.4	115.4	141.9	133.3	120.2	118.6
21	89.0	88.0	92.8	124.9	92.9	91.2	105.4	113.9	135.2	139.4	117.2	118.3
22	93.8	90.1	93.5	126.8	88.5	89.6	103.8	117.8	135.9	142.1	113.8	123.0
23	100.7	93.9	97.3	121.3	91.3	92.6	98.9	119.1	129.3	144.1	111.4	126.7
24	104.3	94.5	96.6	119.9	91.7	98.0	108.8	129.2	123.9	136.2	109.6	136.7
25	101.3	105.0	92.9	114.4	93.0	94.7	109.7	125.5	124.8	139.2	106.3	145.6
26	101.3	96.9	90.9	109.5	91.8	94.9	112.8	122.8	129.6	136.2	102.8	152.3
27	92.7	97.7	88.6	107.7	92.6	96.6	119.1	123.2	137.8	128.0	101.8	154.7
28	98.7	93.7	92.3	103.6	99.8	101.1	126.1	125.1	142.0	123.0	106.4	160.4
29	101.0	90.9		100.0	102.0	97.6	123.3	123.1	149.4	116.3	108.0	163.2
30	98.0	88.4		107.2	104.1	98.8	125.0	118.3	166.4	121.8	109.9	158.9
31	101.1	86.8		107.9		96.8		117.2	181.8		117.0	
Mean	95.7	90.4	91.1	108.0	109.0	109.0	111.8	117.7	139.4	139.8	116.6	137.1

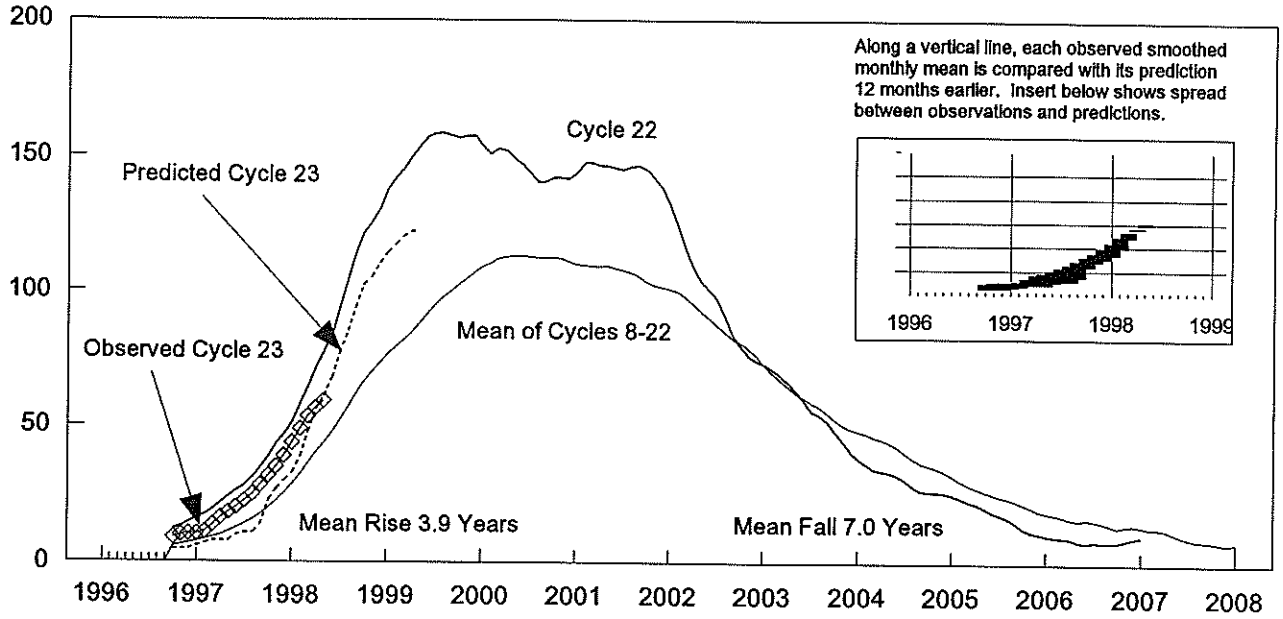
NOTE: *=1700UT reading, snow on antenna at 2000UT.

DAILY SOLAR INDICES
November 1998

Day	Day of Year	Bartels Cycle Day	Sunspot Numbers Int	Sunspot Numbers Amer	Obs Flux Penticton (2800)	Solar Flux Adjusted to 1 Astronomical Unit LEAR (15400)	LEAR (8800)	LEAR (4995)	Pentic (2800)	LEAR (2695)	LEAR (1415)	LEAR (610)	LEAR (410)	LEAR (245)
1	305	13	37	34	121.4	--	247	155	119.5	117	89	59	42	17
2	306	14	41	30	126.1	567	242	157	124.1	118	91	58	43	17
3	307	15	56	50	151.8	567	250	162	149.3	121	95	62	42	18
4	308	16	88	74	141.4	585	268	181	139.0	142	106	67	46	23
5	309	17	95	89	152.7	587	267	188	150.1	140	111	64	45	27
6	310	18	98	83	140.9	563	261	178	138.4	142	109	71	49	24
7	311	19	103	89	148.5	574	254	176	145.8	141	107	60	44	27
8	312	20	92	79	152.7	--	275	193	149.9	145	109	66	--	20
9	313	21	71	68	162.4	588	285	203	159.3	150	109	67	45	20
10	314	22	68	67	153.8	586	280	202	150.8	153	112	62	42	16
11	315	23	66	60	147.1	560	268	182	144.1	134	105	59	44	18
12	316	24	73	65	141.6	574	269	184	138.7	140	107	65	46	20
13	317	25	88	80	135.4	569	262	174	132.6	137	102	61	43	37
14	318	26	94	93	126.5	566	256	165	123.8	126	98	63	45	19
15	319	27	95	89	126.4	565	251	164	123.7	126	97	--	45	20
16	320	1	76	53	124.6	522	225	154	121.8	123	95	57	44	25
17	321	2	53	49	120.8	543	245	155	118.0	119	89	56	43	47
18	322	3	51	36	114.8	551	244	150	112.2	113	87	58	42	23
19	323	4	35	34	116.5	532	245	148	113.7	106	83	61	42	26
20	324	5	46	45	121.5	546	249	154	118.6	110	86	57	41	19
21	325	6	33	39	121.2	534	246	154	118.3	116	88	59	43	21
22	326	7	41	37	126.1	537	234	151	123.0	113	87	51	39	21
23	327	8	47	51	129.9	552	260	168	126.7	129	96	54	48	--
24	328	9	59	61	140.2	556	267	175	136.7	132	98	--	50	23
25	329	10	80	86	149.5	529	258	180	145.6	140	104	70	--	--
26	330	11	106	112	156.4	543	263	184	152.3	149	107	--	54	28
27	331	12	114	112	158.9	554	260	183	154.7	151	118	68	60	46
28	332	13	106	105	164.8	542	261	184	160.4	156	118	--	56	--
29	333	14	98	103	167.8	550	268	189	163.2	157	121	--	51	26
30	334	15	99	92	163.4	554	265	188	158.9	162	122	87	52	26
MEAN			73.6	68.8	140.2	557	257	172	137.1	133	101	62	45	24

The International numbers shown above are preliminary values; the American numbers are final.

Cycle 23 Smoothed Sunspot Numbers: Observed and Predicted



Smoothed Sunspot Numbers (observed and Predicted) for Parts of Solar Cycles 22 and 23

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
1992	124	115	108	103	100	97	91	84	80	76	74	73	94
1993	71	69	67	64	60	56	55	52	48	45	41	38	56
1994	37	35	34	34	33	31	29	27	27	27	26	26	31
1995	24	23	22	21	19	18	17	15	13	12	11	11	17
1996	10	10	10	9	8*	9	8	8	8	9**	10	10	8
1997	11	11	14	17	18	20	23	25	28	32	35	39	23
1998	44	49	53	57	59	65	71	78	85	91	96	100	71
						(3)	(5)	(7)	(9)	(11)	(13)	(16)	(5)
1999	105	109	112	118	122	127	130	133	135	139	142	144	126
	(18)	(19)	(18)	(18)	(17)	(18)	(21)	(24)	(27)	(30)	(33)	(35)	(23)
2000	144	144	145	145	144	143	142	141	140	139	136	134	141
	(38)	(41)	(43)	(44)	(45)	(44)	(43)	(43)	(44)	(44)	(44)	(44)	(43)

Solar Cycle 22 | Solar Cycle 23 | Min, Max, and Predictions

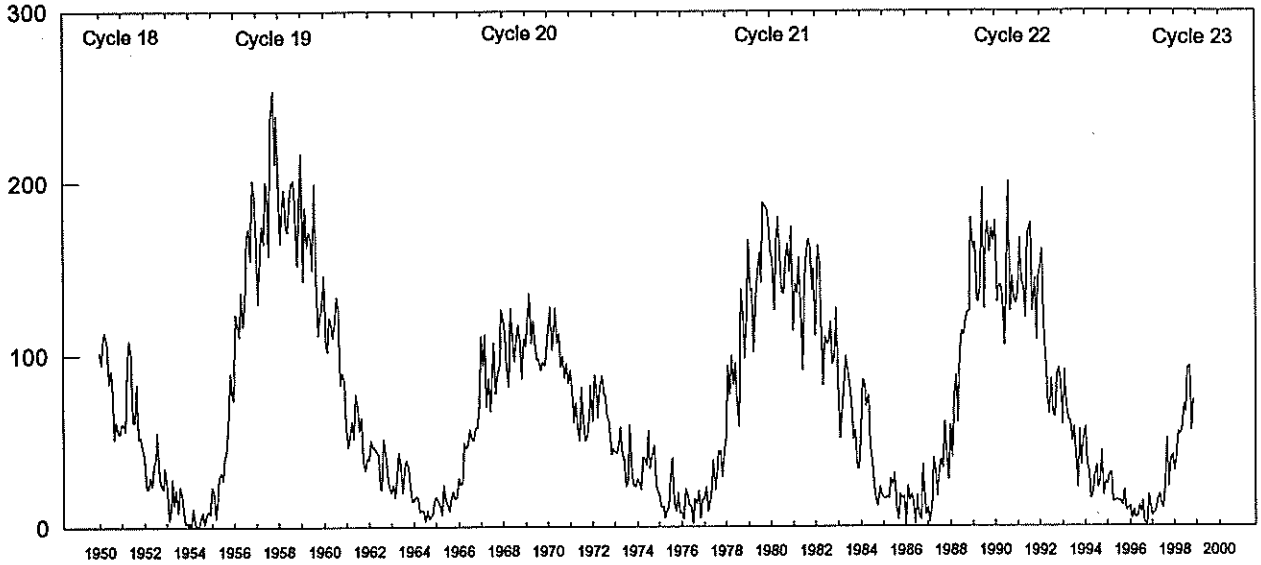
*** May 1996 marks Cycle 22's mathematical minimum. ** October 1996 marks the consensus minimum NGDC is now using.**

Observed and Predicted Numbers. For the end of Cycle 22, and the rise and decline of Cycle 23, the table above lists observed smoothed sunspot numbers up to the one that includes the most recent monthly mean. We based these smoothed values on final monthly means through Jun 1998 and on provisional numbers thereafter. Table entries with numbers in parentheses below them denote predictions by the McNish-Lincoln method. (See page 9 in the Jul 1987 supplement to *Solar-Geophysical Data*.) Adding the number in parentheses to the predicted value generates the upper limit of the 90% confidence interval. Subtracting the number from the predicted value generates the lower limit. Consider, for example, the May 1999 prediction. There exists a 90% chance that in May 1999, the actual smoothed number will fall somewhere between 105 and 139.

Points to Ponder. The McNish-Lincoln prediction method generates useful estimates of smoothed, monthly mean sunspot numbers for no more than 12 months ahead. Beyond 12 months, the predictions regress toward the mean of all 15 cycles of observations used in the computation. Moreover, the method remains very sensitive to the date defining the onset of the current cycle, that is, to the date of the most recent sunspot minimum. The new cycle predictions tabulated above are based on the consensus minimum value of 8.8 that occurred in October 1996.

Note: Please visit http://www.sec.noaa.gov for solar minimum and Cycle 23 discussions.

Mean Monthly Sunspot Numbers
Jan 1950 - Nov 1998



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	101.6	94.8	109.7	113.4	106.2	83.6	91.0	85.2	51.3	61.4	54.8	54.1	83.9
1951	59.9	59.9	55.9	92.9	108.5	100.6	61.5	61.0	83.1	51.6	52.4	45.8	69.4
1952	40.7	22.7	22.0	29.1	23.4	36.4	39.3	54.9	28.2	23.8	22.1	34.3	31.5
1953	26.5	3.9	10.0	27.8	12.5	21.8	8.6	23.5	19.3	8.2	1.6	2.5	13.9
1954	0.2	0.5	10.9	1.8	0.8	0.2	4.8	8.4	1.5	7.0	9.2	7.6	4.4 m
1955	23.1	20.8	4.9	11.3	28.9	31.7	26.7	40.7	42.7	58.5	89.2	76.9	38.0
1956	73.6	124.0	118.4	110.7	136.6	116.6	129.1	169.6	173.2	155.3	201.3	192.1	141.7
1957	165.0	130.2	157.4	175.2	164.6	200.7	187.2	158.0	235.8	253.8	210.9	239.4	190.2 M
1958	202.5	164.9	190.7	196.0	175.3	171.5	191.4	200.2	201.2	181.5	152.3	187.6	184.8
1959	217.4	143.1	185.7	163.3	172.0	168.7	149.6	199.6	145.2	111.4	124.0	125.0	159.0
1960	146.3	106.0	102.2	122.0	119.6	110.2	121.7	134.1	127.2	82.8	89.6	85.6	122.3
1961	57.9	46.1	53.0	61.4	51.0	77.4	70.2	55.8	63.6	37.7	32.6	39.9	53.9
1962	38.7	50.3	45.6	46.4	43.7	42.0	21.8	21.8	51.3	39.5	26.9	23.2	37.6
1963	19.8	24.4	17.1	29.3	43.0	35.9	19.6	33.2	38.8	35.3	23.4	14.9	27.9
1964	15.3	17.7	16.5	8.6	9.5	9.1	3.1	9.3	4.7	6.1	7.4	15.1	10.2 m
1965	17.5	14.2	11.7	6.8	24.1	15.9	11.9	8.9	16.8	20.1	15.8	17.0	15.1
1966	28.2	24.4	25.3	48.7	45.3	47.7	56.7	51.2	50.2	57.2	57.2	70.4	47.0
1967	110.9	93.6	111.8	69.5	86.5	67.3	91.5	107.2	76.8	88.2	94.3	126.4	93.8
1968	121.8	111.9	92.2	81.2	127.2	110.3	96.1	109.3	117.2	107.7	86.0	109.8	105.9 M
1969	104.4	120.5	135.8	106.8	120.0	106.0	96.8	98.0	91.3	95.7	93.5	97.9	105.5
1970	111.5	127.8	102.9	109.5	127.5	106.8	112.5	93.0	99.5	86.6	95.2	83.5	104.5
1971	91.3	79.0	60.7	71.8	57.5	49.8	81.0	61.4	50.2	51.7	63.2	82.2	66.6
1972	61.5	88.4	80.1	63.2	80.5	88.0	76.5	76.8	64.0	61.3	41.6	45.3	68.9
1973	43.4	42.9	46.0	57.7	42.4	39.5	23.1	25.6	59.3	30.7	23.9	23.3	38.0
1974	27.6	26.0	21.3	40.3	39.5	36.0	55.8	33.6	40.2	47.1	25.0	20.5	34.5
1975	18.9	11.5	11.5	5.1	9.0	11.4	28.2	39.7	13.9	9.1	19.4	7.8	15.5
1976	8.1	4.3	21.9	18.8	12.4	12.2	1.9	16.4	13.5	20.6	5.2	15.3	12.6 m
1977	16.4	23.1	8.7	12.9	18.6	38.5	21.4	30.1	44.0	43.8	29.1	43.2	27.5
1978	51.9	93.6	76.5	99.7	82.7	95.1	70.4	58.1	138.2	125.1	97.9	122.7	92.5
1979	166.6	137.5	138.0	101.5	134.4	149.5	159.4	142.2	188.4	186.2	183.3	176.3	155.4 M
1980	159.6	155.0	126.2	164.1	179.9	157.3	136.3	135.4	155.0	164.7	147.9	174.4	154.6
1981	114.0	141.3	135.5	156.4	127.5	90.9	143.8	158.7	167.3	162.4	137.5	150.1	140.4
1982	111.2	163.6	153.8	122.0	82.2	110.4	106.1	107.6	118.8	94.7	98.1	127.0	115.9
1983	84.3	51.0	66.5	80.7	99.2	91.1	82.2	71.8	50.3	55.8	33.3	33.4	66.6
1984	57.0	85.4	83.5	69.7	76.4	46.1	37.4	25.5	15.7	12.0	22.8	18.7	45.9
1985	16.5	15.9	17.2	16.2	27.5	24.2	30.7	11.1	3.9	18.6	16.2	17.3	17.9
1986	2.5	23.2	15.1	18.5	13.7	1.1	18.1	7.4	3.8	35.4	15.2	6.8	13.4 m
1987	10.4	2.4	14.7	39.6	33.0	17.4	33.0	38.7	33.9	60.6	39.9	27.1	29.4
1988	59.0	40.0	76.2	88.0	60.1	101.8	113.8	111.6	120.1	125.1	125.1	179.2	100.2
1989	161.3	165.1	131.4	130.6	138.5	196.2	126.9	168.9	176.7	159.4	173.0	165.5	157.6 M
1990	177.3	130.5	140.3	140.3	132.2	105.4	149.4	200.3	125.2	145.5	131.4	129.7	142.6
1991	136.9	167.5	141.9	140.0	121.3	169.7	173.7	176.3	125.3	144.1	108.2	144.4	145.7
1992	150.0	161.1	106.7	99.8	73.8	65.2	85.7	64.5	63.9	88.7	91.8	82.6	94.3
1993	59.3	91.0	69.8	62.2	61.3	49.8	57.9	42.2	22.4	56.4	35.6	48.9	54.6
1994	57.8	35.5	31.7	16.1	17.8	28.0	35.1	22.5	25.7	44.0	18.0	26.2	29.9
1995	24.2	29.9	31.1	14.0	14.5	15.6	14.5	14.3	11.8	21.1	9.0	10.0	17.5
1996	11.5	4.4	9.2	4.8	5.5	11.8	8.2	14.4	1.6	0.9	17.9	13.3	8.6 m
1997	5.7	7.6	8.7	15.5	18.5	12.7	10.4	24.4	51.3	22.8	39.0	41.2	21.5
1998	31.9	40.3	54.8	53.4	56.3	70.7	66.2	91.7	92.9	55.6	73.6		62.5

Values are preliminary after Jun 98. For the yearly means, each 'M' marks a sunspot cycle maximum and each 'm' a minimum.

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NOVEMBER 1998

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Imp See	Obs Type	Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	01	0235	0246	0308						33		C 1.6						2.5E-03
GOES		0730	0733	0736						6		B 3.2						1.0E-04
GOES		0929	0933	0936						7		B 3.3						1.2E-04
GOES		1147	1203	1213	N17	E43	8375			26	SF	B 6.6						8.1E-04
SVTO		1201E	1202U	1217	N17	E43	8375	11	4.8	16D	SF		3	E		28		F
RAMY		1220	1220	1259	N16	E44	8375	11	4.8	39	SF		3	E		29		H
GOES		1318	1322	1325	S25	E25	8373			7	SF	B 5.2						1.6E-04
RAMY		1321	1322	1327	S25	E25	8373	11	3.5	6	SF		3	E		17		F
GOES		1626	1636	1702	S27	E58				36	SF	B 8.6						1.5E-03
HOLL		1643	1643	1652	S27	E58		11	6.2	9	SF		3	E		12		F
GOES		1846	1851	1856						10		B 8.1						3.9E-04
GOES	02	0956	0959	1003						7		B 5.8						2.2E-04
RAMY		1348	1358	1518	S25	E45		11	6.1	90	1F		3	E		109		UF
SVTO		1354E	1359U	1412D	S26	E47		11	6.2	18D	1F		3	E		162		UF
GOES		1355	1409	1433	S25	E44				38	1N	C 4.4						8.5E-03
HOLL		1402E	1406U	1604	S25	E44		11	6.0	122D	1N		3	E		220		UF
HOLL		2017	2021	2029	N19	E16	8375	11	4.1	12	SF		3	E		13		
GOES	03	1159	1202	1204						5		B 5.3						1.4E-04
SVTO		1330	1331	1335	N20	E06	8375	11	4.0	5	SF		3	E		19		H
RAMY		1330	1331	1335	N17	E08	8375	11	4.2	5	SF		4	E		13		H
HOLL		1753	1756	1811	N18	E05	8375	11	4.1	18	SF		3	E		43		
GOES		1753	1757	1803	N18	E05				10	SF	B 9.2						5.0E-04
GOES		1830	1833	1835	N17	E08				5	SF	B 9.4						2.1E-04
RAMY		1832	1833	1836	N16	E09	8375	11	4.4	4	SF		3	E		58		
HOLL		1832	1833	1836	N17	E08	8375	11	4.4	4	SF		3	E		54		
HOLL		1852	1924	2028	N21	E02	8375	11	3.9	96	2N		3	E		388		
GOES		1911	1933	1955	N21	E02				44		M 1.0						2.2E-02
RAMY		2013E	2014U	2021	N20	E02	8375	11	4.0	8D	SF		2	E		16		
HOLL		2135	2138	2140	N16	E06	8375	11	4.3	5	SF		3	E		22		
HOLL		2336	2338	2342	N15	E01	8375	11	4.0	6	SF		3	E		27		
GOES	04	0031	0036	0040	N16	E05	8375			9	SF	B 9.4						4.4E-04
LEAR		0033	0034	0037	N16	E05	8375	11	4.4	4	SF		3	E		20		
GOES		0310	0337	0358	N17	E01	8375			48	SF	C 5.2						1.1E-02
LEAR		0314	0317	0407	N17	E01	8375	11	4.2	53	SF		3	E		56		EH
LEAR		0615	0620	0627	N17	W01	8375	11	4.2	12	SF		3	E		14		
GOES		0713	0719	0731	N17	W01	8375			18	SF	C 1.6						1.3E-03
LEAR		0717	0719	0746	N17	W01	8375	11	4.2	29	SF		3	E		34		
GOES		0849	0903	0913	N17	W03	8375			24	SF	C 1.7						2.0E-03
LEAR		0853	0902	0916	N17	W03	8375	11	4.1	23	SF		3	E		26		EH
SVTO		0855E	0906U	0916D	N18	W05	8375	11	4.0	21D	SF		2	E		86		F
LEAR		0925	0925	0934	S28	E23	8376	11	6.2	9	SF		3	E		14		
GOES		1036	1044	1049						13		C 2.0						1.2E-03
RAMY		1205	1206	1209	N15	W01	8375	11	4.4	4	SF		3	E		29		
RAMY		1206	1208	1222	S19	W22		11	2.8	16	SF		3	E		13		
GOES		1225	1231	1239	N16	W04	8375			14	1N	C 5.0						2.9E-03
RAMY		1225	1231	1404	N16	W04	8375	11	4.2	99	1N		3	E		131		FH
RAMY		1312	1312	1319	S19	W23		11	2.8	7	SF		3	E		10		
HOLL		1525	1548	1605	N18	W08	8375	11	4.0	40	SF		3	E		30		F
GOES		1542	1549	1555	N18	W08	8375			13		C 2.4						1.4E-03
RAMY		1545	1548	1601	N17	W07	8375	11	4.1	16	SF		3	E		25		
RAMY		1623	1625	1633	N12	E67	8378	11	9.7	10	SF		3	E		19		
HOLL		1623	1625	1634	N13	E67	8378	11	9.7	11	SF		3	E		35		
GOES		1654	1657	1700						6		C 1.6						4.3E-04
GOES		1802	1806	1808						6		C 1.6						3.9E-04
GOES		1958	2004	2008	N18	W11	8375			10	SF	C 1.6						7.1E-04
HOLL		2002	2005	2011	N18	W11	8375	11	4.0	9	SF		3	E		96		
GOES		2202	2210	2214	N19	W08	8375			12	1F	C 2.4						1.1E-03
HOLL		2208	2210	2230	N19	W08	8375	11	4.3	22	1F		3	E		105		
GOES		2241	0000	2255			8378			14		B 8.4						5.6E-04
HOLL		2242	2243	2254	N16	W12	8375	11	4.0	12	SF		3	E		25		
HOLL		2242	2247	2256	N13	E64	8378	11	9.8	14	SF		3	E		64		
GOES		2340	2416	2453	N19	W10				73	SN	C 4.6						1.4E-02
LEAR		2344	2525	2532	N19	W10	8375	11	4.2	108	SN		3	E		95		T
GOES	05	0121	0124	0128						7		C 7.1						2.5E-03

Hα SOLAR FLARES

NOVEMBER 1998

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
LEAR	05	0133	0134	0142	N19	W10	8375	11	4.3	9	SF		3	E		12		
LEAR		0236	0236	0249	S29	E14	8376	11	6.2	13	SF		3	E		12		
GOES		0257	0300	0304	N19	W11	8375			7	SF	C 5.4						1.6E-03
LEAR		0259	0302	0308	N19	W11	8375	11	4.3	9	SF		3	E		40		
GOES		0454	0457	0500	N19	W12	8375			6	SN	C 7.7						1.7E-03
LEAR		0457	0459	0503	N19	W12	8375	11	4.3	6	SN		3	E		46		
LEAR		0608	0615	0620	N16	W14	8375	11	4.2	12	SF		3	E		37		
GOES		0609	0614	0616	N16	W14	8375			7		C 2.7						8.4E-04
LEAR		0644	0644	0649	N19	W13	8375	11	4.3	5	SF		3	E		16		
LEAR		0655	0656	0700	N19	W13	8375	11	4.3	5	SF		3	E		33		
GOES		0801	0806	0808	N19	W13	8375			7	SF	C 2.5						6.1E-04
LEAR		0804	0806	0812	N19	W13	8375	11	4.3	8	SF		3	E		58		
GOES		0842	0846	0848	N19	W14	8375			6	SF	B 9.2						2.8E-04
LEAR		0845	0847	0851	N19	W14	8375	11	4.3	6	SF		3	E		16		
LEAR		0901	0902	0904	N19	W14	8375	11	4.3	3	SF		3	E		26		
LEAR		0923	0923	0926	N16	W16	8375	11	4.2	3	SF		3	E		22		
GOES		0942	0946	0949	S23	E66	8380			7	SF	B 8.9						3.3E-04
LEAR		0944	0945	0949	S23	E66	8380	11	10.5	5	SF		2	E		31		E
GOES		0953	0959	1001						8		C 2.0						6.2E-04
GOES		1050	1054	1056	N16	W15				6	SF	C 1.0						3.0E-04
RAMY		1051E	1052U	1106	N16	W15	8375	11	4.3	15D	SF		2	E		14		
GOES		1106	1110	1112	N16	W15	8375			6	SF	C 1.3						3.5E-04
RAMY		1108	1109	1123	N16	W15	8375	11	4.3	15	SF		2	E		18		
GOES		1133	1138	1152	N15	W17				19	SF	C 2.8						2.1E-03
RAMY		1138E	1139U	1158	N15	W17	8375	11	4.2	20D	SF		3	E		35		H
GOES		1301	1305	1308	N16	W17	8375			7	SF	C 1.2						4.2E-04
RAMY		1303	1305	1321	N16	W17	8375	11	4.2	18	SF		3	E		35		
GOES		1330	1336	1339	N15	W17	8375			9	1B	M 1.5						3.9E-03
RAMY		1333	1335	1345	N15	W17	8375	11	4.3	12	1B		3	E		177		H
HOLL		1510	1511	1515	N17	W15	8375	11	4.5	5	SF		3	E		10		
GOES		1704	1710	1717						13		C 1.2						8.4E-04
HOLL		1831E	1950	2334D	N22	W18	8375	11	4.4	303D	2B		3	E		464		T
GOES		1900	1955	2012	N22	W18				72		M 8.4						1.1E-01
HOLL		2101	2107	2115	S18	W41	8379	11	2.7	14	SF		3	E		28		
HOLL		2157	2159	2212	S21	E58	8380	11	10.4	15	SF		3	E		21		
LEAR		2215E	2219U	2239	N19	W21	8375	11	4.3	24D	SF		2	E		23		
HOLL		2248	2249	2302	S18	W42	8379	11	2.7	14	SF		3	E		39		
LEAR		2255	2301	2317	N19	W22	8375	11	4.3	22	SF		3	E		81		
HOLL		2313	2314	2317	N11	E48	8378	11	9.6	4	SF		3	E		32		
GOES	06	0239	0243	0246	N19	W24	8375			7	SF	C 4.4						1.2E-03
LEAR		0242	0243	0254	N19	W24	8375	11	4.3	12	SF		3	E		58		
LEAR		0307	0307	0310	N19	W24	8375	11	4.3	3	SF		3	E		20		
LEAR		0417	0417	0421	N19	W24	8375	11	4.3	4	SF		3	E		18		
GOES		0434	0438	0443	N19	W25	8375			9	SF	C 1.1						5.7E-04
LEAR		0442	0446	0448	N19	W25	8375	11	4.3	6	SF		3	E		16		
LEAR		0452	0458	0502	N19	W25	8375	11	4.3	10	SF		3	E		17		
GOES		0453	0456	0502	N19	W25	8375			9		C 1.4						6.7E-04
LEAR		0508	0522	0528	N19	W25	8375	11	4.3	20	SF		3	E		44		
GOES		0709	0712	0719						10		C 1.6						8.5E-04
GOES		0755	0758	0800	N20	W26	8375			5	SF	C 2.4						6.5E-04
LEAR		0757	0759	0802	N20	W26	8375	11	4.3	5	SF		3	E		16		
GOES		0828	0833	0835	N19	W27				7	SF	C 3.5						9.7E-04
LEAR		0831	0833	0837	N19	W27	8375	11	4.3	6	SF		3	E		44		
GOES		0849	0853	0855	N19	W27				6	SF	C 3.0						7.7E-04
LEAR		0852	0852	0857	N19	W27	8375	11	4.3	5	SF		3	E		34		
GOES		0907	0911	0915	N19	W27	8375			8	SN	C 4.2						1.4E-03
LEAR		0909	0910	0925	N19	W27	8375	11	4.3	16	SN		3	E		99		H
GOES		0928	0933	0938	N19	W27	8375			10	SF	C 1.3						7.3E-04
LEAR		0929	0929	0937	N19	W27	8375	11	4.3	8	SF		3	E		12		
GOES		1105	1110	1112	N16	W29	8375			7	SN	C 2.3						6.3E-04
RAMY		1109E	1110U	1119	N16	W29	8375	11	4.3	10D	SN		2	E		31		H
GOES		1201	1206	1210	N15	W30	8375			9	SB	C 6.4						2.0E-03
RAMY		1203	1204	1217	N15	W30	8375	11	4.2	14	SB		3	E		71		H
SVTO		1204	1207U	1227	N15	W30	8375	11	4.2	23	SF		2	E		61		F
RAMY		1315	1318	1321	N15	W31	8375	11	4.2	6	SF		3	E		12		
RAMY		1321	1323	1339	N21	E26	8377	11	8.5	18	SF		3	E		17		
GOES		1347	1351	1353						6		C 1.2						3.4E-04

Hα SOLAR FLARES

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Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	06	1507	1511	1513	N15	W32	8371			6	1B	M 1.7						2.6E-03
RAMY		1510	1511	1533	N15	W32	8375	11	4.2	23	1B		3	E		149		
HOLL		1511	1511	1523	N15	W33	8375	11	4.1	12	1F		3	E		151		
GOES		1525	1528	1531						6		C 1.4						4.6E-04
RAMY		1624	1624	1641	N19	W30	8375	11	4.4	17	SF		3	E		10		
HOLL		1825	1825	1836	N18	W37	8375	11	3.9	11	SF		3	E		12		
GOES		1847	1851	1853	N15	W35	8375			6	SF	C 3.1						5.8E-04
RAMY		1849	1850	1856	N15	W35	8375	11	4.1	7	SF		3	E		44		
HOLL		1849	1851	1858	N15	W35	8375	11	4.1	9	SF		3	E		47		
RAMY		1903	1903	1916	N20	E24	8377	11	8.6	13	SF		3	E		10		
HOLL		1919	1920	1923	N14	W37	8375	11	4.0	4	SF		3	E		24		F
RAMY		1919	1921	1923	N14	W36	8375	11	4.1	4	SF		3	E		15		
HOLL		1920	1921	1923	S20	W53	8379	11	2.7	3	SF		3	E		12		
GOES		1952	1958	2000	N19	W34	8375			8	1F	C 1.6						5.5E-04
HOLL		1955	1958	2007	N19	W34	8375	11	4.2	12	1F		3	E		118		F
RAMY		1956	1958	2004	N19	W33	8375	11	4.3	8	SF		3	E		58		
HOLL		2007	2008	2016	S20	W54	8379	11	2.7	9	SF		3	E		12		
HOLL		2046	2046	2053	N17	W36	8375	11	4.1	7	SF		3	E		12		
HOLL		2057	2102	2111	N17	W36	8375	11	4.1	14	SF		3	E		15		F
HOLL		2110	2110	2118	S20	W54	8379	11	2.7	8	SF		3	E		14		
HOLL		2202	2209	2226	N15	W37	8375	11	4.1	24	SN		3	E		98		
GOES		2205	2209	2211	N15	W37	8375			6		C 9.4						1.7E-03
HOLL		2207	2211	2227	N13	E39	8378	11	9.9	20	SF		3	E		10		
HOLL		2210	2219	2226	S19	W56	8379	11	2.6	16	SF		3	E		11		
GOES		2227	2230	2232	N16	W35	8375			5	SF	C 1.0						2.7E-04
HOLL		2229	2229	2235	N16	W35	8375	11	4.3	6	SF		3	E		20		F
HOLL		2241	2254	2300	N19	W35	8375	11	4.3	19	SF		3	E		25		
HOLL		2301	2304	2314	N20	W34	8375	11	4.3	13	SF		3	E		40		
LEAR		2303	2303	2312	N19	W34	8375	11	4.4	9	SF		3	E		15		
HOLL		2314	2325	2331	N18	W36	8375	11	4.2	17	SF		3	E		14		
HOLL		2329	2336	2359D	N20	E20	8377	11	8.5	30D	SF		3	E		91		
LEAR		2331	2340	2350	N20	E21	8377	11	8.6	19	SF		3	E		41		FE
HOLL		2333	2334	2339	N14	W34	8375	11	4.4	6	SF		3	E		66		
LEAR		2334	2334	2339	N15	W33	8375	11	4.5	5	SF		3	E		55		
LEAR	07	0112	0112	0115	N19	W36	8375	11	4.3	3	SF		3	E		22		
GOES		0159	0202	0204	N19	W36	8375			5	SF	B 7.7						1.9E-04
LEAR		0202	0203	0206	N19	W36	8375	11	4.3	4	SF		3	E		23		
GOES		0546	0551	0554	N15	W40	8375			8	SF	C 1.3						5.4E-04
LEAR		0549	0551	0554	N15	W40	8375	11	4.2	5	SF		4	E		21		E
GOES		0941	0946	0949						8		C 2.3						7.5E-04
GOES		1102	1106	1109						7		M 2.4						4.9E-03
GOES		1212	1216	1219						7		C 1.1						3.8E-04
HOLL		1414	1416	1420	N20	W44	8375	11	4.2	6	SF		3	E		13		
HOLL		1426	1426	1436	N19	W44	8375	11	4.2	10	SF		3	E		12		F
GOES		1446	1450	1453						7		C 1.1						4.3E-04
HOLL		1603	1609	1621	N18	W46	8375	11	4.2	18	SF		3	E		25		F
RAMY		1607	1608	1616	N14	W46	8375	11	4.2	9	SF		3	E		17		
RAMY		1659	1700	1707	N18	W43	8375	11	4.4	8	SF		3	E		12		
HOLL		1659	1701	1707	N19	W45	8375	11	4.3	8	SF		3	E		13		F
HOLL		1742	1749	1814	N19	W48	8375	11	4.1	32	1F		3	E		109		F
GOES		1742	1758	1802	N19	W48				20	1F	C 5.3						3.6E-03
RAMY		1742	1758	1813	N19	W47	8375	11	4.1	31	SF		3	E		88		F
HOLL		1829	1830	1832	N19	W47	8375	11	4.2	3	SF		3	E		19		F
HOLL		1934	1934	1945	N22	W48	8375	11	4.1	11	SF		3	E		16		F
GOES		2007	2020	2034	S20	W67	8379			27	SF	C 2.4						3.1E-03
RAMY		2009	2018	2035	S20	W67	8379	11	2.7	26	SF		3	E		47		F
HOLL		2010	2018	2028	S20	W68	8379	11	2.6	18	SF		3	E		21		F
HOLL		2042	2043	2047	N19	W47	8375	11	4.3	5	SF		3	E		19		
HOLL		2142	2142	2146	N19	W47	8375	11	4.3	4	SF		3	E		15		
LEAR	08	0151	0152	0203	N22	W49	8375	11	4.3	12	SF		3	E		21		
GOES		0215	0220	0236	N20	W51	8375			21	SF	C 2.5						2.9E-03
LEAR		0220	0221	0233	N15	W54	8375	11	4.0	13	SF		3	E		26		
LEAR		0235	0236	0238	N20	W51	8375	11	4.2	3	SF		3	E		25		F
LEAR		0311	0314	0317	N20	W53	8375	11	4.1	6	SF		3	E		26		E
GOES		0422	0439	0450			8375			28		C 6.9						8.5E-03
LEAR		0426	0439	0505	N20	W52	8375	11	4.2	39	1F		3	E		145		FH

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Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Area Measurement Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
LEAR	08	0515	0515	0518	N23	W49	8375	11	4.4	3	SF		3	E		26		
GOES		0730	0734	0739	N19	W53	8375			9	SF	C 2.1						9.9E-04
LEAR		0733	0734	0736	N19	W53	8375	11	4.3	3	SF		3	E		15		
LEAR		0913	0916	0930	N21	W53	8375	11	4.3	17	SF		3	E		18		H
GOES		1055	1115	1131						36		C 5.9						9.4E-03
RAMY		1253	1254	1258	N15	W61	8375	11	3.9	5	SF		3	E		24		
RAMY		1316	1322	1340	S22	W70	8373	11	3.2	24	1F		3	E		135		
GOES		1318	1323	1328	S22	W70	8373			10		C 2.8						1.6E-03
RAMY		1337	1337	1344	N14	W58	8375	11	4.2	7	SF		3	E		13		
HOLL		1344E	1344U	1425	N18	W57	8375	11	4.2	41D	SF		2	E		67		F
HOLL		1427	1712	1921	N19	W58	8375	11	4.2	294	2B		3	E		480		FT
RAMY		1529	1626	1651	N20	W59	8375	11	4.1	82	SF		3	E		68		
GOES		1539	1559	1611	N20	W59	8375			32		C 6.0						1.0E-02
GOES		1704	1712	1722	N19	W58	8375			18	1N	M 2.7						1.8E-02
RAMY		1708	1714	1745	N19	W58	8375	11	4.3	37	1N		3	E		227		FH
RAMY		1750	1847	1905	N19	W60	8375	11	4.2	75	SF		3	E		45		
RAMY		1939	1943	1948	N20	W59	8375	11	4.3	9	SF		3	E		12		
HOLL		1940	1941	1950	N20	W60	8375	11	4.2	10	SF		3	E		20		
RAMY		1956	2009	2055	N20	W59	8375	11	4.3	59	1F		3	E		106		F
HOLL		1957	2003	2056	N21	W57	8375	11	4.5	59	SF		3	E		96		
GOES		2001	2009	2016	N20	W59	8375			15		C 4.8						3.6E-03
HOLL		2112	2212	2219	N22	W59	8375	11	4.3	67	SF		3	E		38		
HOLL		2155	2158	2203	S28	W35	8376	11	6.2	8	SF		3	E		17		
GOES		2237	2256	2310	N21	W61	8375			33	1F	M 1.1						1.4E-02
HOLL		2244	2254	2331D	N20	W63	8375	11	4.1	47D	1F		3	E		183		
LEAR		2246	2248	2323	N21	W61	8375	11	4.3	37	1F		3	E		144		E
HOLL		2320	2328	2331D	N18	E14	8378	11	10.0	11D	SF		3	E		52		S
LEAR		2327	2333	2350	N19	E17	8378	11	10.3	23	SF		3	E		45		FH
LEAR	09	0002	0003	0019	N22	W61	8375	11	4.3	17	SF		3	E		22		
LEAR		0022	0029	0056	N19	W62	8375	11	4.3	34	SF		3	E		32		
GOES		0023	0034	0042	N19	W62	8375			19		C 5.3						5.1E-03
LEAR		0122	0129	0151	N17	W61	8375	11	4.4	29	SF		4	E		97		E
GOES		0143	0153	0204			8375			21		C 3.9						4.3E-03
LEAR		0258	0310	0332	N19	W63	8375	11	4.3	34	SF		4	E		33		
LEAR		0527	0528	0530	N19	W65	8375	11	4.3	3	SF		3	E		15		
GOES		1326	1330	1334						8		C 2.2						9.5E-04
HOLL		1441	1443	1448	N23	W68	8375	11	4.4	7	SF		3	E		13		
GOES		1451	1455	1500	N23	W69	8375			9	SF	C 3.1						1.4E-03
HOLL		1453	1455	1506	N23	W69	8375	11	4.3	13	SF		3	E		71		
HOLL		1506	1509	1517	N19	W70	8375	11	4.3	11	SF		3	E		22		
GOES		1939	2014	2040						61		C 3.4						1.1E-02
GOES		2111	2114	2120						9		C 4.9						2.1E-03
LEAR		2219	2223	2226	N19	W74	8375	11	4.3	7	SF		3	E		97		
GOES		2220	2223	2225	N19	W74	8375			5		C 3.3						7.5E-04
LEAR		2326	2327	2332	N24	W71	8375	11	4.5	6	SF		3	E		44		
LEAR	10	0003	0006	0009	N24	W71	8375	11	4.5	6	SF		3	E		37		
GOES		0010	0015	0019	N21	W75	8375			9	1N	C 7.9						2.6E-03
LEAR		0013	0015	0020	N21	W75	8375	11	4.2	7	1N		3	E		100		
LEAR		0157	0157	0201	N21	W61	8375	11	5.4	4	SF		3	E		22		
LEAR		0225	0225	0228	S16	E58	8383	11	14.5	3	SF		3	E		19		
LEAR		0539	0541	0546	N21	W63	8375	11	5.4	7	SF		3	E		27		
GOES		0649	0653	0656	N21	W64	8375			7	SF	C 3.3						9.9E-04
LEAR		0652	0653	0657	N21	W64	8375	11	5.4	5	SF		3	E		32		
GOES		0917	0920	0926						9		C 2.0						9.9E-04
GOES		1137	1202	1236						59		C 4.0						1.2E-02
RAMY		1328	1332	1337	N20	W81	8375	11	4.4	9	SF		3	E		47		
GOES		1328	1333	1337	N20	W81	8375			9	SF	C 3.5						1.6E-03
HOLL		1429	1429	1435	N19	W83	8375	11	4.3	6	SF		3	E		18		
HOLL		1442	1444	1447	N22	W76	8375	11	4.8	5	SF		3	E		21		
HOLL		1452	1453	1459	N23	W77	8375	11	4.7	7	SF		3	E		23		F
HOLL		1523	1545	1609	N23	W77	8375	11	4.7	46	SF		3	E		59		
GOES		1527	1532	1536	N23	W77	8375			9		C 6.7						2.9E-03
GOES		1540	1544	1550	N23	W77				10		M 1.8						7.8E-03
RAMY		1635	1635	1655	N23	W22	8377	11	9.0	20	SF		3	E		11		
GOES		1724	1728	1731						7		C 3.5						1.2E-03
GOES		1751	1754	1758						7		C 3.3						1.2E-03

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Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
HOLL	10	1814	1815	1824	N23	W81	8375	11	4.5	10	SF		3	E		30		
RAMY		1815	1815	1822	N20	W80	8375	11	4.6	7	SN		3	E		26		
GOES		1817	1822	1825	N23	W81	8375			8		C 3.7						1.6E-03
HOLL		1830	1831	1838	N23	W80	8375	11	4.6	8	SF		3	E		16		
HOLL		1935	1935	1939	N23	W79	8375	11	4.7	4	SF		3	E		24		
GOES		2043	2050	2057	N23	W84	8375			14	SN	C 8.1						4.8E-03
RAMY		2047E	2048U	2058	N21	W81	8375	11	4.6	11D	SN		3	E		39		
HOLL		2047	2051	2058	N23	W84	8375	11	4.4	11	SN		3	E		59		
GOES	11	0103	0107	0118						15		C 3.2						2.3E-03
LEAR		0135	0136	0138	N25	W85	8375	11	4.5	3	SF		3	E		23		H
GOES		0157	0203	0206	N24	W84	8375			9	SF	C 3.0						1.3E-03
LEAR		0159	0201	0211	N24	W84	8375	11	4.6	12	SF		3	E		56		
GOES		0210	0215	0218	N25	W86	8375			8	SF	C 3.2						1.3E-03
LEAR		0212	0215	0218	N25	W86	8375	11	4.4	6	SF		3	E		67		
GOES		0309	0316	0319						10		C 3.6						1.7E-03
GOES		0402	0407	0412						10		M 1.0						4.0E-03
GOES		0450	0456	0500						10		C 2.6						1.3E-03
GOES		0639	0645	0654						15		C 3.8						2.9E-03
GOES		0705	0708	0713	N22	W71	8375			8	SF	C 2.5						1.0E-03
LEAR		0707	0708	0716	N22	W71	8375	11	5.8	9	SF		3	E		33		
GOES		0733	0738	0743						10		C 3.5						1.6E-03
GOES		0950	0955	0959	N24	W81	8375			9	SF	C 4.2						1.5E-03
LEAR		0954	0956	0959	N24	W81	8375	11	5.1	5	SF		3	E		16		
GOES		1010	1016	1024						14		M 1.1						6.4E-03
RAMY		1133E	1134U	1144	S15	E50	8383	11	15.3	11D	SF		2	E		13		
GOES		1203	1207	1211						8		C 1.9						7.6E-04
GOES		1309	1312	1323						14		C 1.5						1.2E-03
HOLL		1423	1423	1429	N23	W82	8375	11	5.3	6	SF		3	E		21		
RAMY		1423	1424	1431	N23	W86	8375	11	5.0	8	SF		3	E		16		
GOES	12	0523	0528	0530	N21	W34	8385			7	1N	M 1.0						2.2E-03
LEAR		0526	0528	0546	N21	W34	8385	11	9.6	20	1N		4	E		108		EH
LEAR		0535	0537	0541	S16	E36	8383	11	15.0	6	SF		3	E		18		
GOES		0620	0624	0630						10		C 1.6						8.4E-04
GOES		0705	0709	0713	S16	E39	8383			8	SF	C 1.9						7.1E-04
LEAR		0708	0708	0715	S16	E39	8383	11	15.2	7	SF		3	E		32		
SVTO		0708E	0709U	0715	S15	E39	8383	11	15.2	7D	SF		3	E		23		
GOES		0816	0820	0828						12		C 1.4						8.9E-04
GOES		0950	1135	1300						190		C 3.0						2.1E-02
GOES		1514	1520	1528						14		C 2.1						1.4E-03
GOES		1841	1858	1917						36		C 1.1						1.9E-03
HOLL		2155	2200	2210	N19	W44	8385	11	9.5	15	SF		3	E		10		
LEAR		2301	2307	2311	N22	W55	8385	11	8.7	10	SF		3	E		18		F
GOES		2348	2355	0000	N19	W44				12	SF	C 3.8						1.7E-03
LEAR		2352	2354	2405	N19	W44	8385	11	9.6	13	SF		3	E		69		F
GOES	13	0309	0313	0320	S16	E27	8383			11	SF	C 1.9						1.2E-03
LEAR		0312	0312	0319	S16	E27	8383	11	15.2	7	SF		3	E		20		
LEAR		0812	0819	0826	N20	W51	8385	11	9.4	14	SF		3	E		42		
GOES		2055	2059	2102	N19	W59				7	SF	C 5.1						1.4E-03
HOLL		2058	2059	2128	N19	W59	8385	11	9.4	30	SF		3	E		55		
GOES	14	0203	0210	0216						13		C 2.5						1.5E-03
GOES		0500	0508	0515						15		C 1.3						1.1E-03
GOES		0515	0518	0522			8385			7		C 1.7						6.1E-04
LEAR		0518	0519	0522	N24	W69	8377	11	8.9	4	SF		3	E		11		
LEAR		0518	0519	0529	N20	W60	8385	11	9.6	11	SF		3	E		43		
LEAR		0545	0546	0553	S15	E13	8383	11	15.2	8	SF		3	E		22		
LEAR		0641	0642	0653	N20	W62	8385	11	9.5	12	SF		3	E		19		
GOES		0843	0851	0854	N20	W63				11	SF	C 1.7						7.7E-04
LEAR		0847	0850	0900	N20	W63	8385	11	9.5	13	SF		3	E		75		
SVTO		1011	1011	1014	N22	E50		11	18.3	3	SF		3	E		16		
GOES		1436	1441	1446	S15	E06	8383			10	SF	C 1.6						6.7E-04
RAMY		1440	1440	1448	S15	E06	8383	11	15.1	8	SF		3	E		36		
HOLL		1955	1957	1959	N19	W71	8377	11	9.4	4	SF		3	E		12		
HOLL		2334	2335	2339	S30	E17	8384	11	16.3	5	SF		3	E		15		
GOES	15	0114	0119	0124						10		C 1.2						6.1E-04

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Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
LEAR	15	0455	0456	0459	N20	W69	8385	11	9.9	4	SF		3	E		27		
GOES		1258	1311	1323						25		C 1.2						1.5E-03
GOES		1858	1901	1904						6		B 5.2						1.7E-04
GOES		2046	2049	2052						6		B 6.9						1.9E-04
GOES	16	0402	0411	0415	S20	E29				13	SF	B 6.5						4.5E-04
GOES		0555	0558	0600						5		B 5.7						1.4E-04
GOES		0632	0636	0639						7		B 8.8						2.6E-04
GOES		1159	1206	1211						12	SF	C 2.9						1.4E-03
GOES		1321	1328	1333						12		C 1.0						6.3E-04
GOES		1512	1519	1527						15		C 1.0						8.6E-04
GOES		1619	1643	1653						34	SF	C 2.5						3.4E-03
GOES		1939	1946	1948						9		B 8.5						4.0E-04
GOES		2009	2015	2018						9		C 7.9						1.8E-03
GOES		2120	2123	2126						6		B 5.5						1.7E-04
GOES		2144	2153	2200						16	SF	C 4.9						3.1E-03
GOES		2246	2250	2254						8		B 6.7						2.8E-04
GOES		2307	2316	2332						25		C 4.5						4.6E-03
GOES	17	0106	0110	0113						7		B 7.9						2.6E-04
GOES		0351	0456	0523						92		C 2.3						9.7E-03
GOES		2116	2125	2131						15		B 5.8						4.2E-04
GOES		2328	2343	2408						40		B 6.3						1.3E-03
GOES	18	0719	0723	0727						8		B 4.9						2.0E-04
GOES		0837	0843	0851						14		B 6.2						4.2E-04
GOES		1044	1055	1106						22		C 1.0						1.2E-03
GOES		2146	2149	2151						5		B 4.9						1.1E-04
GOES	19	0604	0613	0621						17		B 8.5						6.9E-04
GOES		2322	2327	2351						29		B 3.8						5.8E-04
GOES	20	1058	1102	1105						7		B 4.7						1.6E-04
GOES		1517	1524	1529	S17	E40				12	SF	C 2.5						1.1E-03
GOES		1635	1639	1642						7		B 8.2						2.7E-04
GOES		1649	1653	1656	S27	W56				7	SF	B 5.5						2.0E-04
GOES		1755	1801	1810	S17	E37				15	SF	B 8.5						5.8E-04
GOES		1932	1938	1951	S17	E37				19	SF	B 9.8						9.0E-04
GOES		2216	2221	2228						12		C 1.3						8.4E-04
GOES	21	0030	0042	0059						29		C 1.3						1.8E-03
GOES		0634	0641	0710	S17	E34				36	SF	C 2.2						3.8E-03
GOES		0805	0808	0810						5		C 1.5						3.1E-04
GOES		1125	1132	1144	S28	W70				19	SF	C 1.1						1.2E-03
GOES		1223	1227	1230						7		B 9.5						3.4E-04
GOES		1548	1616	1626	S28	W77				38	SF	C 3.0						3.5E-03
GOES		1654	1658	1701	S28	W77				7	SF	C 1.2						4.6E-04
GOES		1914	1918	1924	S30	W72				10	SF	C 1.3						6.0E-04
GOES		1955	2000	2002	S28	W80				7	1F	C 1.7						4.7E-04
GOES		2006	2010	2013	S14	W93				7	SF	C 1.3						4.2E-04
GOES		2051	2055	2057	S30	W72				6	SF	C 1.2						3.2E-04
GOES		2121	2124	2126						5		C 1.7						3.8E-04
GOES		2328	2358	2410						42		C 3.2						6.7E-03
LEAR	22	0114	0116	0118	S17	E24	8391	11	23.9	4	SF		3	E		11		
GOES		0630	0642	0649	S27	W82				19	1N	X 3.7						2.0E-01
GOES		1002	1007	1025	S17	E19				23	SF	C 1.6						2.0E-03
GOES		1215	1231	1247						32		C 8.8						1.1E-02
GOES		1421	1424	1428						7		C 1.6						6.1E-04
GOES		1439	1443	1447						8		C 2.5						9.8E-04
GOES		1610	1623	1632	S30	W89				22	2N	X 2.5						1.6E-01
GOES		1828	1839	1851						23		M 1.0						1.1E-02
GOES		2140	2215	2235						55		M 1.8						3.1E-02
GOES	23	0022	0028	0035						13		C 2.8						2.0E-03
GOES		0357	0400	0402						5		C 2.9						6.9E-04
GOES		0556	0604	0613						17		C 4.9						4.1E-03
GOES		0628	0644	0658	S28	W89	8384			30	SF	X 2.2						2.4E-01

Hα SOLAR FLARES

NOVEMBER 1998

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Area Measurement Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
LEAR	23	0650	0653	0702	S28	W89	8384	11	16.3	12	SF		3	E		50		
GOES		1028	1040	1046						18		C 3.8						3.6E-03
GOES		1059	1121	1140						41		M 3.1						5.2E-02
RAMY		1151E	1153U	1325	S23	E58	8392	11	28.0	94D	1N		2	E		185		F
RAMY		1421	1424	1428	S14	W05	8391	11	23.2	7	SF		3	E		26		
RAMY		1426	1426	1436	S20	W74	8386	11	17.9	10	SF		3	E		10		
HOLL		1426	1427	1435	S21	W76	8386	11	17.8	9	SF		3	E		10		
GOES	24	0207	0220	0237						30		X 1.0						1.2E-01
LEAR		0256	0256	0259	S30	W81	8384	11	17.7	3	SF		3	E		35		
LEAR		0413	0413	0418	S18	W89	8386	11	17.4	5	SF		3	E		42		
LEAR		0541	0542	0545	S18	W89	8386	11	17.4	4	SF		3	E		30		
GOES		0848	0851	0855						7		C 3.4						1.3E-03
GOES		1026	1030	1035						9		C 2.3						1.1E-03
GOES		1233	1237	1242						9		C 2.3						1.1E-03
RAMY		1627	1628	1632	S16	E62	8393	11	29.4	5	SF		4	E		24		
RAMY		1652	1652	1656	S17	W47		11	21.1	4	SF		3	E		13		
RAMY		1653	1654	1700	S19	W89	8386	11	17.9	7	SF		3	E		23		
GOES		1907	1913	1922						15		C 1.9						1.5E-03
GOES		2209	2215	2219	N17	E72	8395			10	1F	C 8.4						3.3E-03
LEAR		2214	2215	2221	N17	E72	8395	11	30.4	7	1F		3	E		116		
GOES		2338	2342	2345	S16	E57	8393			7	SF	C 2.9						8.4E-04
LEAR		2341	2342	2346	S16	E57	8393	11	29.3	5	SF		3	E		49		
GOES	25	0021	0025	0030						9		C 1.3						6.4E-04
LEAR		0125	0126	0128	S17	E54	8393	11	29.2	3	SF		3	E		29		
GOES		0328	0333	0337	N17	E74	8395			9	SF	C 2.0						9.8E-04
LEAR		0330	0335	0343	N17	E74	8395	11	30.8	13	SF		3	E		79		E
GOES		0550	0559	0604	N18	E72	8395			14	SF	C 2.7						1.7E-03
LEAR		0551	0556	0613	N18	E72	8395	11	30.7	22	SF		3	E		87		F
LEAR		0651	0652	0708	S19	E58	8393	11	29.7	17	SF		3	E		23		
GOES		0940	0945	0950	S19	E59	8393			10	SF	C 2.4						1.2E-03
LEAR		0944	0947	0953	S19	E59	8393	11	29.9	9	SF		3	E		15		F
LEAR		0955	1000	1005	S16	E51	8393	11	29.3	10	SF		3	E		21		
GOES		1317	1323	1328						11		C 4.5						2.1E-03
GOES		1358	1403	1408						10		C 6.4						2.6E-03
RAMY		1412E	1412U	1432D	N18	E68	8395	11	30.8	20D	1N		3	E		103		
HOLL		1417	1420	1428	N20	E68	8395	11	30.8	11	SF		3	E		75		
HOLL		1454	1455	1501	S19	E51	8393	11	29.5	7	SF		3	E		15		
RAMY		1901	1908	1916	S24	E22	8392	11	27.5	15	SF		3	E		32		
RAMY		2008	2018	2037	S24	E21	8392	11	27.5	29	SF		3	E		32		H
HOLL		2016	2017	2020	S22	E21	8392	11	27.4	4	SF		3	E		20		
GOES		2051	2107	2124						33		C 2.9						4.8E-03
GOES		2246	2250	2253	S23	E20	8392			7	SF	C 1.1						4.2E-04
HOLL		2248	2251	2259	S23	E20	8392	11	27.5	11	SF		3	E		41		
LEAR		2249	2251	2256	S23	E18	8392	11	27.3	7	SF		3	E		21		
GOES	26	0018	0023	0027	S24	E18	8392			9	SF	C 1.0						4.7E-04
LEAR		0021	0024	0030	S24	E18	8392	11	27.4	9	SF		3	E		28		
GOES		0149	0238	0313						84		C 1.7						6.8E-03
LEAR		0436	0439	0456	N19	E61	8395	11	30.8	20	SF		3	E		70		
GOES		0437	0443	0447	S24	E16	8392			10	SF	C 1.8						1.0E-03
LEAR		0443	0443	0455	S24	E16	8392	11	27.4	12	SF		3	E		22		
GOES		0526	0530	0535	S20	E42	8393			9	SF	C 1.2						5.9E-04
LEAR		0528	0529	0538	S20	E42	8393	11	29.4	10	SF		3	E		36		
GOES		0740	0804	0810	S23	E14	8392			30	SF	C 2.0						2.4E-03
LEAR		0759	0805	0817	S23	E14	8392	11	27.4	18	SF		3	E		40		F
SVTO		0800	0805	0811	S22	E09	8392	11	27.0	11	SF		3	E		24		F
SVTO		0944	0947	0950	S18	E44	8393	11	29.7	6	SF		3	E		22		F
LEAR		0944	0947	0951	S19	E36	8393	11	29.1	7	SF		3	E		49		
GOES		1026	1039	1046	N18	E57	8395			20	1F	C 4.0						3.3E-03
SVTO		1028	1040	1051	N18	E57	8395	11	30.8	23	SF		3	E		126		F
GOES		1136	1139	1141						5		C 1.0						2.6E-04
SVTO		1259	1259	1306	N27	W38		11	23.6	7	SF		3	E		10		
GOES		1319	1328	1339						20		C 1.6						1.7E-03
GOES		1643	1647	1650	N15	E57	8395			7	SF	C 1.7						5.5E-04
RAMY		1644	1644	1652	N15	E57	8395	12	1.0	8	SF		4	E		39		H
GOES		1710	1730	1739						29		C 1.2						1.9E-03

Hα SOLAR FLARES

NOVEMBER 1998

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
RAMY	26	1747	1747	1757	N19	E54	8395	11	30.9	10	SF		4	E		58		F
RAMY		1813	1817	1821	N25	W42	8396	11	23.5	8	SF		4	E		17		
GOES		2223	2259	2317						54		C 1.5						3.5E-03
LEAR	27	0302	0304	0310	N19	E47	8395	11	30.7	8	SF		3	E		24		
GOES		0330	0348	0352						22		C 1.1						1.1E-03
GOES		0419	0425	0436						17		C 1.2						1.1E-03
LEAR		0452	0453	0503	S23	E03	8392	11	27.4	11	SF		3	E		33		
SVTO		0708	0738	0932	S26	E10	8392	11	28.1	144	2N		3	E		340		UE
LEAR		0715	0741	0851	S24	E09	8392	11	28.0	96	2N		3	E		359		UE
GOES		0721	0743	0757	S24	E09				36		M 1.6						2.4E-02
LEAR		0852	0853	0905	S22	E08	8392	11	28.0	13	SF		3	E		17		
GOES		1048	1056	1103	N21	E51	8395			15	SF	C 2.6						1.9E-03
SVTO		1052	1055	1102	N21	E51	8395	12	1.4	10	SF		3	E		13		
GOES		1155	1205	1217						22		C 1.6						1.7E-03
GOES		1232	1237	1248						16		C 2.2						1.9E-03
GOES		1549	1552	1555						6		C 1.2						3.8E-04
GOES		1612	1625	1631						19		C 1.2						1.2E-03
RAMY		1801	1813	1830	N18	E63	8395	12	2.5	29	SF		3	E		47		
GOES		1818	1821	1824	N19	E53	8395			6	SF	C 2.4						7.3E-04
HOLL		1819	1820	1826	N19	E53	8395	12	1.8	7	SF		3	E		69		
GOES		1925	1928	1932	S21	E25	8393			7	SF	C 1.4						5.7E-04
RAMY		1926	1927	1932	S21	E25	8393	11	29.7	6	SF		3	E		12		
GOES		2137	2147	2159						22		C 2.4						2.8E-03
GOES	28	0454	0552	0613	N17	E32				79	3N	X 3.3						5.0E-01
LEAR		0605E	0609U	0810	N17	E32	8395	11	30.7	125D	3N		3	E		983		ZF
RAMY		1219	1225	1257	N18	E44	8395	12	1.9	38	SF		3	E		44		
RAMY		1258	1319	1328	N22	E41	8395	12	1.7	30	SF		3	E		71		
RAMY		1329	1338	1350	N18	E45	8395	12	2.0	21	SF		3	E		48		
GOES		1723	1726	1730						7		C 5.1						1.9E-03
RAMY		1824E	1824U	1834D	N16	E44	8395	12	2.1	10D	SF		3	E		18		
LEAR		2258	2300	2309	N27	W67	8396	11	23.7	11	SF		3	E		19		
GOES	29	0156	0207	0242						46		C 2.1						5.4E-03
GOES		0626	0630	0633						7		C 2.8						8.4E-04
GOES		0640	0645	0654						14		C 2.8						2.0E-03
GOES		1040	1043	1046						6		C 1.6						5.1E-04
GOES		1124	1131	1138						14		C 1.6						1.3E-03
RAMY		1410	1415	1442	N17	E17	8395	11	30.9	32	SF		3	E		21		
RAMY		1417	1418	1427	N25	E50		12	3.5	10	SF		3	E		35		
RAMY		1425	1426	1430	N14	E87	8397	12	6.2	5	SF		3	E		14		
RAMY		1449	1453	1510	N17	E17	8395	11	30.9	21	SF		3	E		12		
RAMY		1516	1518	1522	N26	W72	8396	11	24.0	6	SF		3	E		39		
RAMY		1547	1547	1551	N28	W73	8396	11	23.9	4	SF		3	E		11		
RAMY		1553	1555	1558	N28	W74	8396	11	23.9	5	SF		3	E		17		
RAMY		1838	1847	1929D	N16	E27	8395	12	1.8	51D	SF		3	E		55		
HOLL		1845	1855	1905	N19	E26	8395	12	1.8	20	SF		3	E		27		F
GOES		2045	2049	2053	N23	E34				8	SF	C 2.1						9.1E-04
RAMY		2051E	2051U	2116D	N23	E34	8395	12	2.5	25D	SF		2	E		22		
LEAR	30	0009	0013	0017	N22	E31	8395	12	2.4	8	SF		3	E		24		
GOES		0011	0050	0057			8395			46		C 2.5						5.9E-03
LEAR		0026	0027	0035	N30	W84	8396	11	23.4	9	SF		3	E		28		
LEAR		0042	0053	0058	N22	E30	8395	12	2.3	16	SF		3	E		37		
GOES		0554	0600	0606			8396			12		C 2.5						1.4E-03
LEAR		0556	0558	0602	N22	E27	8395	12	2.3	6	SF		3	E		14		
LEAR		0557	0558	0602	N26	W83	8396	11	23.8	5	SF		3	E		30		
LEAR		0645	0656	0709	S22	W31	8392	11	27.9	24	SF		3	E		39		E
GOES		0648	0654	0659	S22	W31	8392			11		C 1.7						1.0E-03
LEAR		0649	0651	0715	N17	E32	8395	12	2.7	26	SF		3	E		91		U
LEAR		0717	0717	0729	N24	E24	8395	12	2.1	12	SF		3	E		40		E
GOES		0747	0756	0759						12		C 1.3						8.2E-04
GOES		0929	0938	0953	S22	W33	8392			24	SF	C 1.8						2.2E-03
LEAR		0936	0938	0941	S22	W33	8392	11	27.9	5	SF		3	E		10		
GOES		1012	1016	1020						8		C 3.7						1.3E-03
GOES		1114	1123	1156						42		C 3.6						7.4E-03
GOES		1237	1242	1250						13		C 1.7						1.2E-03

Hα SOLAR FLARES

NOVEMBER 1998

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	30	1450	1454	1456						6		C 2.0						5.9E-04
GOES		1526	1536	1553						27		C 4.9						5.7E-03
GOES		1854	1900	1906						12		C 1.6						1.0E-03
GOES		2005	2013	2024						19		C 2.1						2.1E-03
HOLL		2114	2115	2118	N17	E72	8397	12	6.3	4	SF		3	E		14		
GOES		2251	2301	2312	N16	E70	8397			21	SF	C 3.5						3.8E-03
HOLL		2253	2300	2314	N16	E70	8397	12	6.3	21	SF		3	E		96		

"Remarks"

A = Eruptive prominence whose base is less than 90 degrees from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by high-speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the H and K lines of Ca II.
P = Flare shows Helium D3 in emission.
Q = Flare shows Balmer continuum in emission.
R = Marked asymmetry in H-alpha line suggests ejection of high-velocity material.
S = Brightness follows disappearance of filament in same position.
T = Region active all day.
U = Two bright branches, parallel or converging.
V = Occurrence of an explosive phase; important, expansion within roughly 1 minute that often includes a significant intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide H-alpha line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

Observation Type: C=Cinematographic, E=Electronic, P=Photographic, V=Visual

NOTE: Beginning July 1997, the times of all GOES X-ray events are now included in this table.

SOLAR RADIO EMISSION
Selected Fixed Frequency Events

NOVEMBER 1998

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 -22 W/m 2 Hz)	Flux Density Mean (10 -22 W/m 2 Hz)	Int	Remarks
02	2695	SVTO	4	S/F	1356.0	1358.0	20.0	180.0			QL=4 ST=2 TYP=3
	2695	SGMR	4	S/F	1357.0	1358.0	18.0	140.0			QL=4 ST=2 TYP=3
	8800	SGMR	20	GRF	1358.0	1404.0	15.0	33.0			QL=4 ST=2 TYP=2
	8800	SVTO	8	S	1359.0	1359.0	U	24.0			QL=4 ST=2 TYP=3
03	2695	SGMR	20	GRF	1919.0	1926.0	54.0	30.0			QL=4 ST=2 TYP=2
	8800	SGMR	20	GRF	1924.0	1946.0	49.0	61.0			QL=4 ST=2 TYP=2
	2695	PALE	4	S/F	1929.0E	1929.0	12.0D	36.0			QL=4 ST=2 TYP=3
05	8800	LEAR	8	S	0614.0	0614.0	1.0	25.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0614.0	0614.0	1.0	60.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1334.0	1335.0	1.0	270.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	1334.0	1335.0	1.0	250.0			QL=4 ST=2 TYP=3
	2695	SGMR	8	S	1335.0	1335.0	1.0	45.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1335.0	1335.0	U	52.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	1824.0	1824.0	U	110.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1824.0	1824.0	2.0	130.0			QL=4 ST=2 TYP=3
	2695	SGMR	48	C	1941.0	1952.0	21.0	350.0			QL=4 ST=2 TYP=8
	8800	SGMR	48	C	1941.0	1943.0	25.0	870.0			QL=4 ST=2 TYP=8
	8800	PALE	48	C	1941.0	1944.0	60.0	830.0			QL=4 ST=2 TYP=8
	2695	PALE	48	C	1941.0	1952.0	74.0	400.0			QL=4 ST=2 TYP=8
	2695	SGMR	20	GRF	2016.0	2035.0	31.0	110.0			QL=2 ST=3 TYP=2
	8800	SGMR	4	S/F	2026.0	2027.0	19.0	95.0			QL=2 ST=3 TYP=3
06	8800	PALE	4	S/F	0240.0	0242.0	3.0	54.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	0240.0	0241.0	2.0	23.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0241.0	0241.0	2.0	60.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0830.0	0830.0	1.0	73.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	0830.0	0830.0	2.0	110.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0909.0	0909.0	1.0	370.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	0909.0	0909.0	1.0	410.0			QL=4 ST=2 TYP=3
	8800	SGMR	4	S/F	1203.0	1204.0	3.0	360.0			QL=2 ST=2 TYP=3
	2695	SGMR	4	S/F	1203.0	1204.0	3.0	57.0			QL=2 ST=2 TYP=3
	8800	SVTO	49	GB	1203.0	1204.0	2.0	510.0			QL=4 ST=2 TYP=6
	2695	SVTO	8	S	1203.0	1204.0	1.0	88.0			QL=4 ST=2 TYP=3
	8800	SGMR	49	GB	1509.0	1510.0	4.0	620.0			QL=4 ST=2 TYP=6
	2695	SGMR	4	S/F	1510.0	1510.0	3.0	150.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1510.0	1510.0	1.0	240.0			QL=4 ST=2 TYP=3
	8800	SVTO	49	GB	1510.0	1510.0	1.0	820.0			QL=4 ST=2 TYP=6
	8800	PALE	8	S	2208.0	2208.0	U	300.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	2208.0	2208.0	U	66.0			QL=4 ST=2 TYP=3
08	8800	PALE	8	S	0018.0	0018.0	U	31.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	2255.0	2255.0	U	88.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	2255.0	2255.0	U	100.0			QL=4 ST=2 TYP=3
10	8800	LEAR	8	S	0012.0	0012.0	1.0	110.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	0012.0	0012.0	4.0	250.0			QL=4 ST=2 TYP=3
12	2695	LEAR	8	S	0527.0	0527.0	U	51.0			QL=4 ST=2 TYP=3
23	8800	SVTO	49	GB	0633.0	0636.0	20.0	620.0			QL=2 ST=2 TYP=6
	2695	LEAR	4	S/F	0634.0	0636.0	5.0	110.0			QL=4 ST=2 TYP=3
	8800	LEAR	4	S/F	0634.0	0636.0	6.0	440.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	0634.0	0636.0	5.0	130.0			QL=4 ST=2 TYP=3
	2695	SGMR	48	C	1209.0	1221.0	18.0	200.0			QL=4 ST=2 TYP=8
	8800	SGMR	8	S	1215.0	1216.0	2.0	13.0			QL=4 ST=2 TYP=3
24	8800	PALE	49	GB	0208.0	0215.0	17.0	1400.0			QL=4 ST=2 TYP=6
	2695	PALE	4	S/F	0208.0	0214.0	14.0	470.0			QL=4 ST=2 TYP=3
	8800	LEAR	49	GB	0209.0	0215.0	17.0	1400.0			QL=4 ST=2 TYP=6
	2695	LEAR	4	S/F	0209.0	0214.0	11.0	380.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	2212.0	2212.0	1.0	28.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	2212.0	2212.0	1.0	39.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	2340.0	2341.0	1.0	29.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	2340.0	2341.0	1.0	34.0			QL=4 ST=2 TYP=3
27	2695	LEAR	48	C	0731.0	0737.0	13.0	390.0			QL=4 ST=2 TYP=8

S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

NOVEMBER 1998

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 -22 W/m 2 Hz)	Flux Density Mean (10 -22 W/m 2 Hz)	Int	Remarks
27	2695	SVTO	4	S/F	0732.0	0737.0	15.0	440.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	0732.0	0739.0	24.0	170.0			QL=4 ST=2 TYP=3
	8800	LEAR	20	GRF	0733.0	0739.0	14.0	130.0			QL=4 ST=2 TYP=2
28	2695	LEAR	49	GB	0531.0	0540.0	116.0	3600.0			QL=4 ST=3 TYP=6
	8800	LEAR	49	GB	0531.0	0540.0	124.0	2000.0			QL=4 ST=3 TYP=6
	8800	SVTO	20	GRF	0613.0E	0619.0U	54.0D	230.0			QL=2 ST=2 TYP=2
	2695	SVTO	4	S/F	0613.0E	0624.0U	90.0D	210.0			QL=2 ST=2 TYP=3

Reports are received routinely from the following observatories:
LEAR = Learmonth PALE = Palehua SGMR = Sagamore Hill SVTO = San Vito

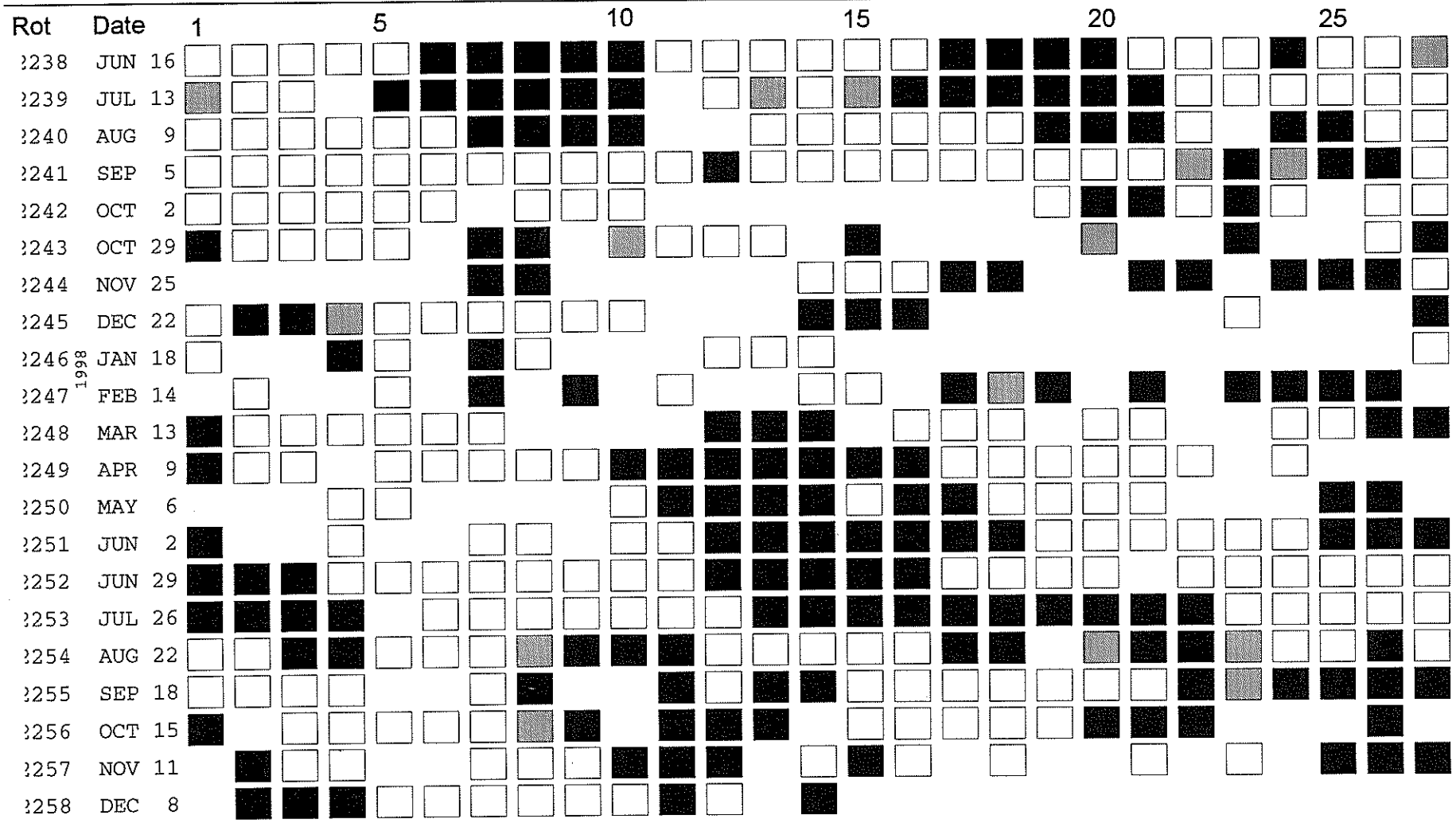
Explanation of Type Code:

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

1A Simple 1A	4A Simple 2AF	24PF Post Rise F	27F Rise and Fall F
3A Simple 2A	40 Rise Only	16A Fall A	27AF Rise and Fall AF
21A Simple 3A GRF	40F Rise Only F	260 Fall Only	31A Post Burst Decrease A
2A Simple 1AF	4P Post Rise	26F Fall F	32A Absorption A

RSTN Site Information: Beginning in April 1986, the RSTN sites LEAR, PALE, SGMR, and SVTO fixed frequency solar radio data are periodically adjusted to several world standard stations. These world standard stations include: Kislovodsk, USSR 15,500 MHz; Penticton, Canada 2800 MHz; and Hiraiso, Japan 500 and 200 MHz.

STANFORD MEAN SOLAR MAGNETIC FIELD

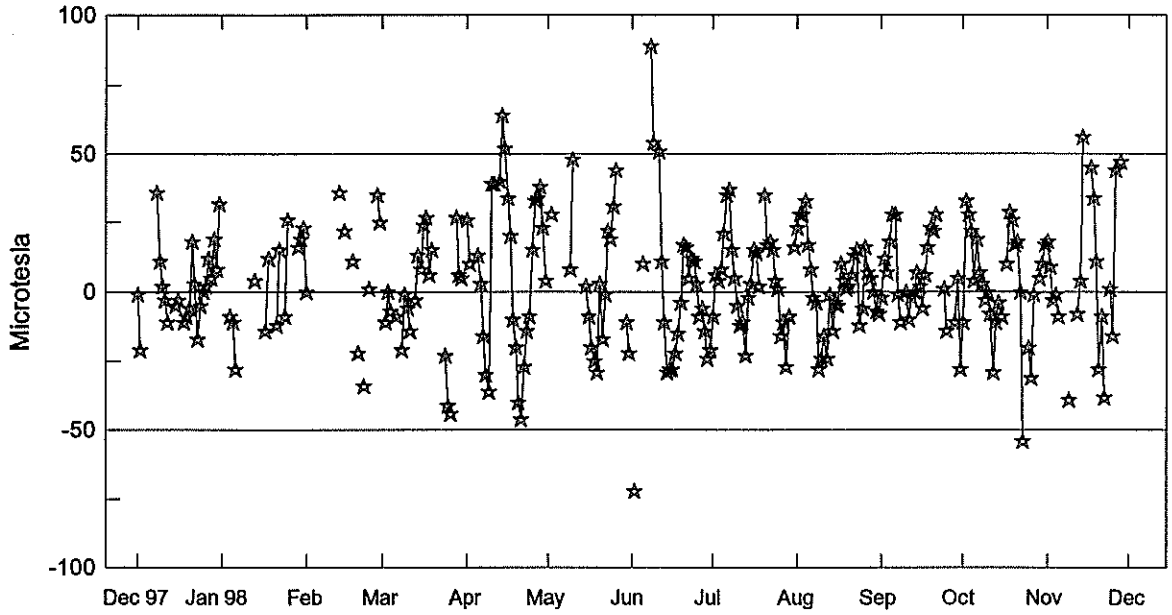


Mean Solar Magnetic Field Polarity: □ = field > 2 microT; ▒ = -2 microT ≤ field ≤ 2 microT

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

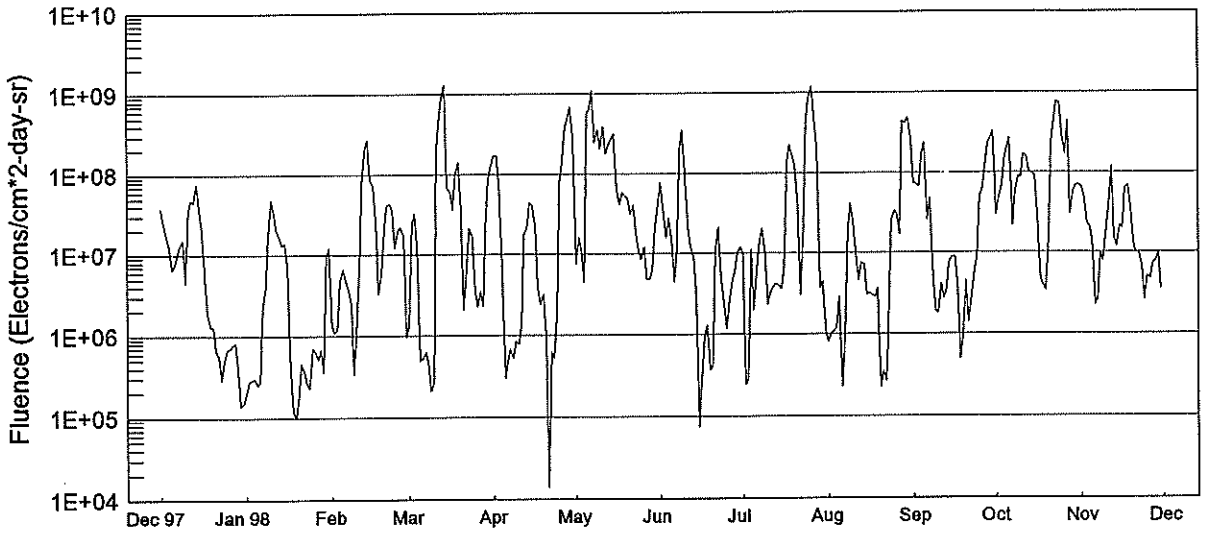
Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates are five days earlier, to mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

Stanford Mean Solar Magnetic Field (Microtesla)
"Sun-As-A-Star"



Day	Dec 97	Jan 98	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1	-1	---	---	---	26	28	---	-9	23	-2	-11	18
2	-21	---	---	-11	10	---	-72	6	28	12	33	9
3	---	---	---	0	---	---	---	4	28	7	28	-3
4	---	-9	---	-7	---	---	---	8	33	18	22	-1
5	---	-11	---	---	13	---	10	21	17	28	4	-9
6	---	-28	---	-9	3	---	---	35	8	28	19	---
7	---	---	---	---	-16	---	---	37	-2	-1	7	---
8	36	---	---	-21	-30	---	89	15	-4	-11	3	---
9	11	---	---	-1	-36	8	54	5	-28	---	-3	-39
10	2	---	---	-6	39	48	---	-5	-24	0	0	---
11	-3	---	---	-14	39	---	51	-12	-16	-10	-8	---
12	-11	---	---	---	---	---	11	-11	-24	-2	-29	-8
13	---	4	36	-3	40	---	-11	-23	-1	0	-11	4
14	---	---	---	13	64	---	-29	-2	-14	7	-4	56
15	-5	---	22	8	52	2	-28	3	-4	2	-9	---
16	-3	---	---	24	34	-9	-28	15	-5	-6	---	---
17	---	-14	---	27	20	-20	-22	14	10	6	10	45
18	-11	12	11	6	-10	-25	-15	2	4	16	29	34
19	-9	---	---	15	-20	-29	-4	---	1	23	26	11
20	-6	---	-22	---	-40	3	17	35	2	22	17	-28
21	18	-12	---	---	-46	-17	16	17	6	28	18	-9
22	3	15	-34	---	-27	-1	5	18	13	---	0	-38
23	-17	---	---	---	-14	22	12	15	15	---	-54	---
24	-5	-9	1	-23	-9	19	11	4	-12	1	---	1
25	0	26	---	-41	15	31	3	1	-6	-14	-20	-16
26	2	---	---	-44	33	44	-9	-16	16	---	-31	44
27	12	---	35	---	34	---	-6	-11	7	---	-1	---
28	5	---	25	27	38	---	-14	-27	5	-11	---	47
29	19	16		6	23	---	-24	-9	0	5	5	---
30	8	19		5	4	-11	-21	---	-7	-28	10	---
31	32	23		---		-22		16	-8		17	

GOES Daily Electron Fluence
Dec 97 - Nov 98



Day	Dec 97	Jan 98	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1	3.8E+07	2.0E+05	1.4E+06	1.3E+06	1.7E+08	7.6E+06	7.8E+07	9.6E+06	8.1E+05	7.4E+07	3.0E+07	6.6E+07
2	2.4E+07	2.8E+05	1.1E+06	2.3E+07	1.7E+08	1.6E+07	3.9E+07	2.4E+05	1.0E+06	7.4E+07	4.8E+07	5.1E+07
3	1.7E+07	2.9E+05	1.2E+06	3.3E+07	6.2E+07	1.1E+07	1.6E+07	2.8E+05	1.1E+06	6.8E+07	7.0E+07	2.3E+07
4	1.3E+07	3.0E+05	4.6E+06	1.3E+07	7.3E+06	4.5E+06	2.8E+07	1.1E+07	1.2E+06	1.7E+08	1.5E+08	2.1E+07
5	6.7E+06	2.5E+05	6.6E+06	4.9E+05	3.0E+05	5.7E+08	1.4E+07	2.0E+06	2.9E+06	2.4E+08	2.1E+08	1.4E+07
6	7.4E+06	2.8E+05	4.9E+06	5.2E+05	4.9E+05	6.4E+08	4.5E+06	6.5E+06	2.3E+05	2.6E+07	2.7E+08	2.3E+06
7	9.8E+06	2.2E+06	3.9E+06	6.3E+05	6.7E+05	1.1E+09	1.1E+07	1.3E+07	9.5E+05	4.8E+07	2.2E+07	2.7E+06
8	1.3E+07	4.0E+06	2.6E+06	4.5E+05	5.3E+05	2.5E+08	2.0E+08	2.0E+07	1.8E+07	4.9E+06	5.8E+07	9.9E+06
9	1.5E+07	1.7E+07	3.3E+05	2.1E+05	8.5E+05	3.6E+08	3.5E+08	1.0E+07	4.2E+07	1.9E+06	9.0E+07	8.0E+06
10	4.5E+06	4.9E+07	1.1E+06	2.7E+05	7.8E+05	2.1E+08	1.1E+08	2.3E+06	2.5E+07	1.8E+06	8.9E+07	1.9E+07
11	3.7E+07	3.4E+07	6.9E+06	1.8E+08	1.4E+06	3.9E+08	2.1E+07	3.2E+06	1.1E+07	4.1E+06	1.7E+08	4.5E+07
12	4.8E+07	2.0E+07	7.6E+07	4.4E+08	1.8E+07	1.8E+08	1.2E+07	3.8E+06	4.6E+06	2.8E+06	1.6E+08	1.2E+08
13	4.6E+07	1.7E+07	2.1E+08	8.5E+08	2.1E+07	2.3E+08	9.0E+06	4.2E+06	7.5E+06	3.4E+06	1.0E+08	1.5E+07
14	7.6E+07	1.3E+07	2.7E+08	1.3E+09	4.4E+07	2.7E+08	2.6E+06	3.9E+06	7.2E+06	7.6E+06	1.0E+08	1.2E+07
15	3.9E+07	1.4E+07	8.5E+07	6.7E+07	4.2E+07	3.2E+08	7.5E+04	3.6E+06	3.1E+06	8.9E+06	9.2E+07	2.2E+07
16	2.1E+07	7.5E+06	7.4E+07	6.1E+07	2.3E+07	6.5E+07	2.7E+05	6.6E+06	3.2E+06	8.9E+06	3.1E+07	2.0E+07
17	5.0E+06	3.7E+05	2.7E+07	3.7E+07	3.9E+06	4.2E+07	9.6E+05	1.3E+08	3.0E+06	3.5E+06	4.7E+06	6.4E+07
18	1.8E+06	1.2E+05	3.3E+06	1.0E+08	2.4E+06	5.9E+07	1.3E+06	2.3E+08	2.9E+06	5.0E+05	4.0E+06	7.0E+07
19	1.3E+06	9.7E+04	6.2E+06	1.4E+08	3.2E+06	5.3E+07	3.7E+05	1.7E+08	3.6E+06	9.0E+05	3.4E+06	3.7E+07
20	1.3E+06	1.8E+05	1.9E+07	3.8E+07	1.0E+06	4.9E+07	4.2E+05	1.3E+08	2.2E+05	4.5E+06	1.5E+07	1.2E+07
21	6.7E+05	4.5E+05	4.1E+07	2.1E+06	1.4E+04	3.2E+07	1.0E+07	4.0E+07	3.5E+05	1.4E+06	2.3E+08	9.8E+06
22	5.5E+05	3.6E+05	4.3E+07	6.6E+06	6.3E+05	4.0E+07	2.1E+07	3.0E+06	2.7E+05	2.5E+06	4.2E+08	1.0E+07
23	2.9E+05	2.6E+05	3.6E+07	2.1E+07	5.3E+05	1.8E+07	5.2E+06	2.1E+07	2.5E+06	5.6E+06	7.5E+08	6.6E+06
24	4.8E+05	2.3E+05	1.2E+07	1.7E+07	2.2E+06	1.1E+07	2.7E+06	4.1E+08	2.6E+07	8.7E+06	7.4E+08	2.6E+06
25	6.9E+05	7.1E+05	2.0E+07	3.6E+06	7.8E+07	8.5E+06	1.2E+06	8.5E+08	3.4E+07	5.2E+07	3.0E+08	5.1E+06
26	7.0E+05	6.5E+05	2.2E+07	2.3E+06	1.3E+08	1.2E+07	2.4E+06	1.2E+09	3.0E+07	6.2E+07	1.7E+08	4.8E+06
27	7.7E+05	5.2E+05	1.7E+07	3.5E+06	3.8E+08	4.8E+06	4.6E+06	4.9E+08	1.7E+07	1.2E+08	4.4E+08	7.3E+06
28	8.3E+05	6.9E+05	9.7E+05	2.3E+06	4.9E+08	4.9E+06	6.0E+06	2.2E+08	4.4E+08	2.4E+08	3.1E+07	8.0E+06
29	3.8E+05	3.6E+05		2.2E+07	6.9E+08	6.5E+06	1.0E+07	3.8E+06	4.2E+08	2.7E+08	6.1E+07	1.0E+07
30	1.4E+05	1.0E+07		8.3E+07	2.7E+08	2.0E+07	1.2E+07	4.4E+06	4.9E+08	3.3E+08	6.9E+07	3.5E+06
31	1.5E+05	1.2E+07		1.3E+08		4.1E+07		1.1E+06	2.7E+08		7.2E+07	

NOTE: The electron detector responds significantly to protons above 32 MeV; therefore, electron data are contaminated when a proton event is in progress. These days are indicated with '-999' in the table and are not plotted. '--' indicates data not available.

NOTE: GOES9 data began April, 1996 and ended on 26 July, 1998. GOES8 is primary satellite as of 27 July, 1998.

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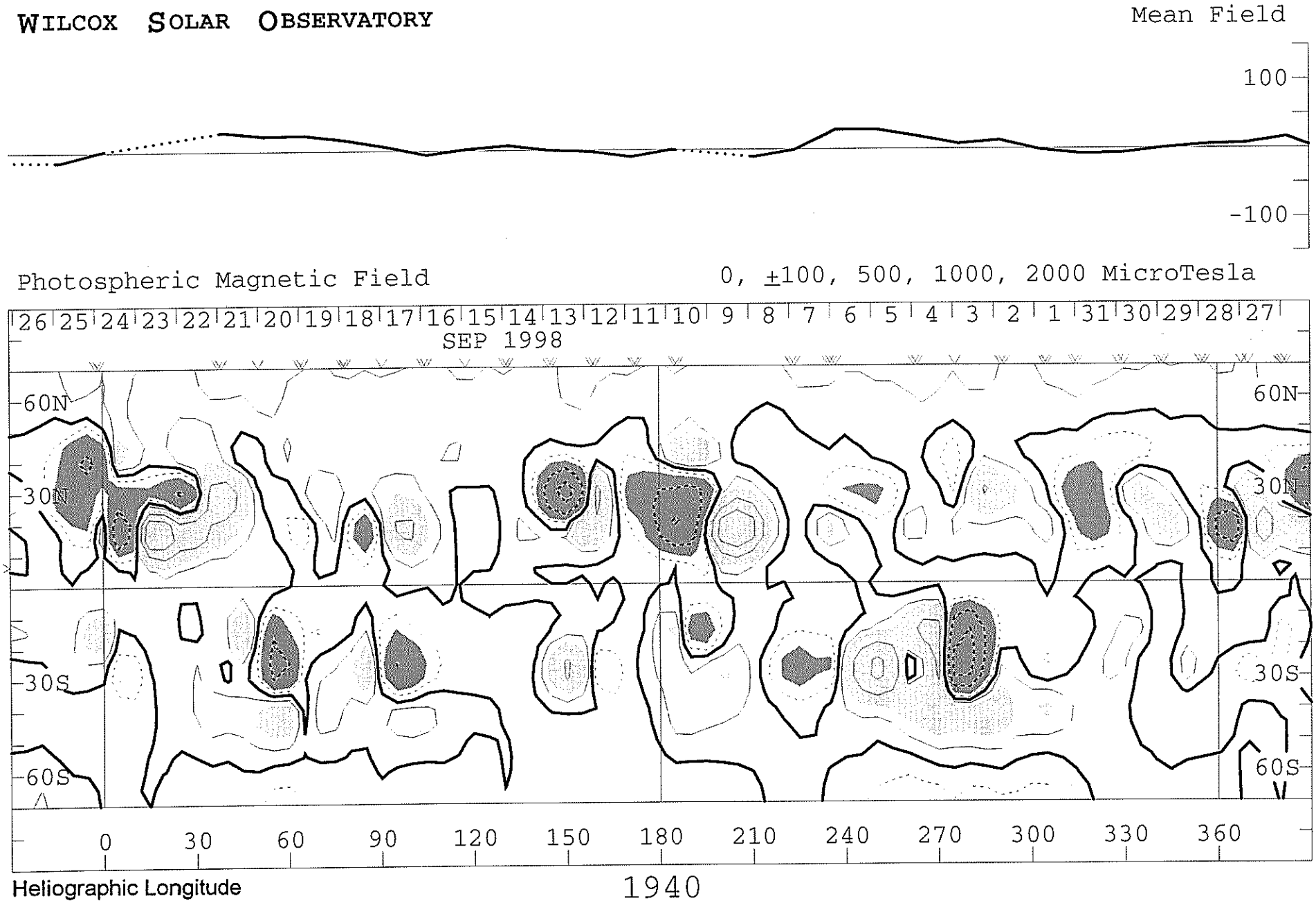
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1940

(28 August to 24 September 1998)

WILCOX SOLAR OBSERVATORY

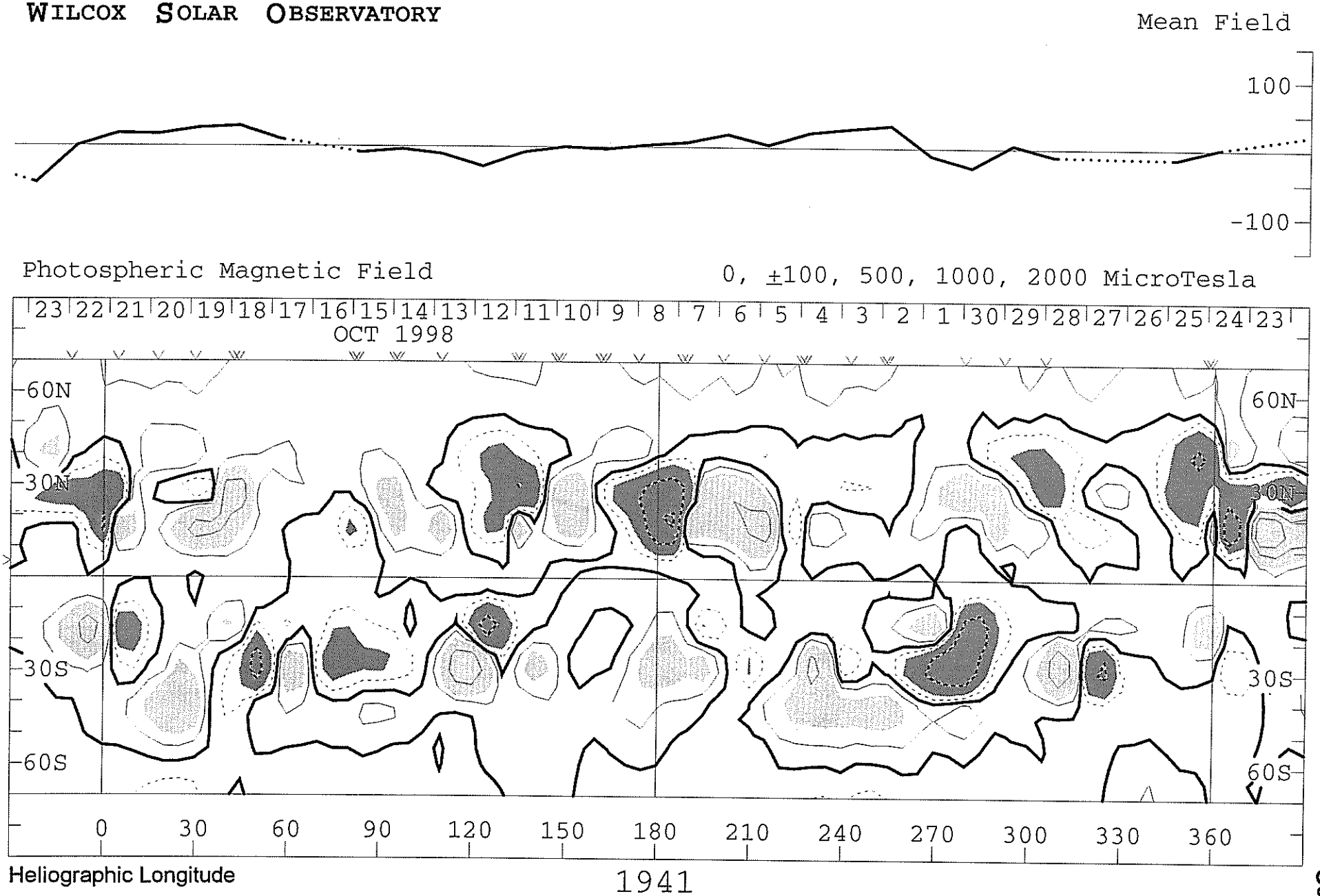


SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1941

(24 September to 22 October 1998)

WILCOX SOLAR OBSERVATORY



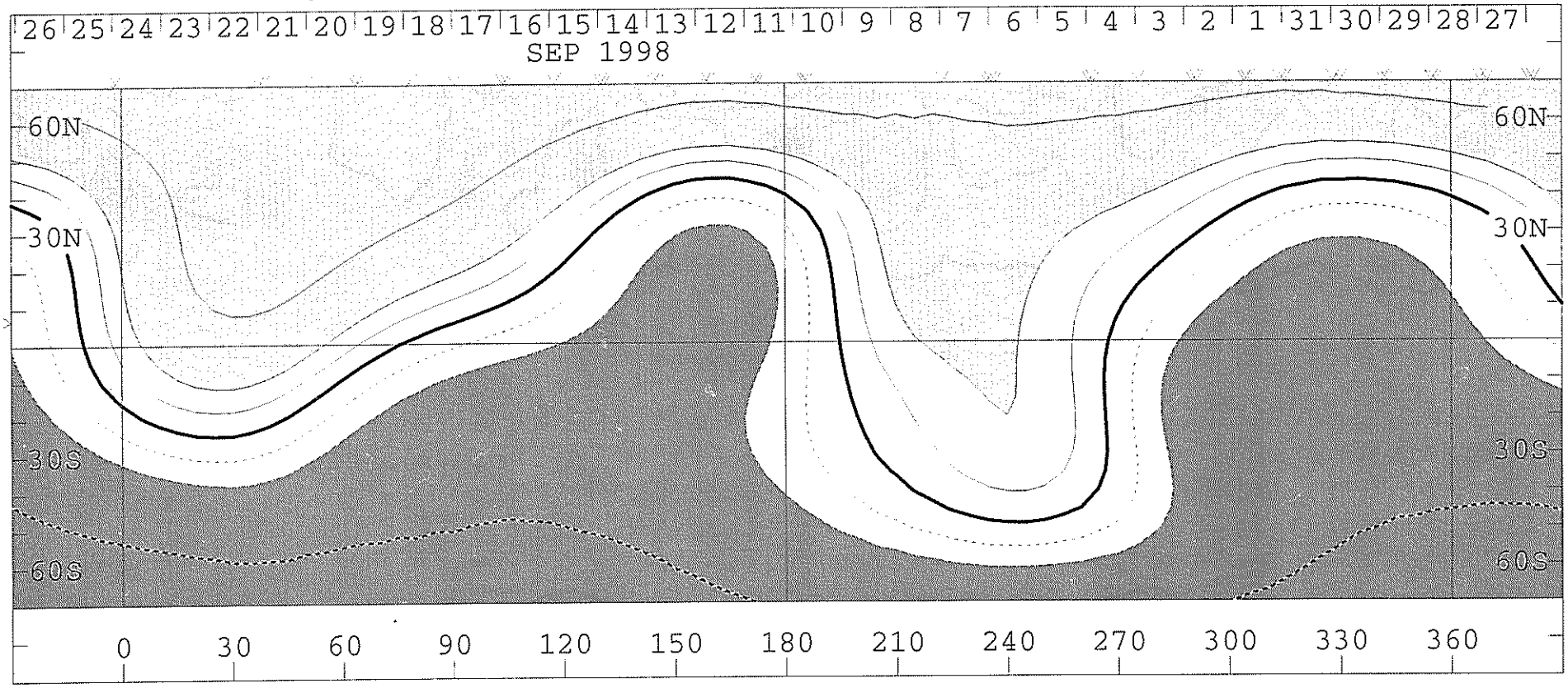
SOLAR MAGNETIC FIELD SYNOPTIC CHART

SOURCE SURFACE FIELD

CARRINGTON ROTATION NUMBER 1940
(28 August to 24 September 1998)

Wilcox Solar Observatory

0, ±1, 2, 5, 10, 20 microTesla



SOLAR MAGNETIC FIELD SYNOPTIC CHART

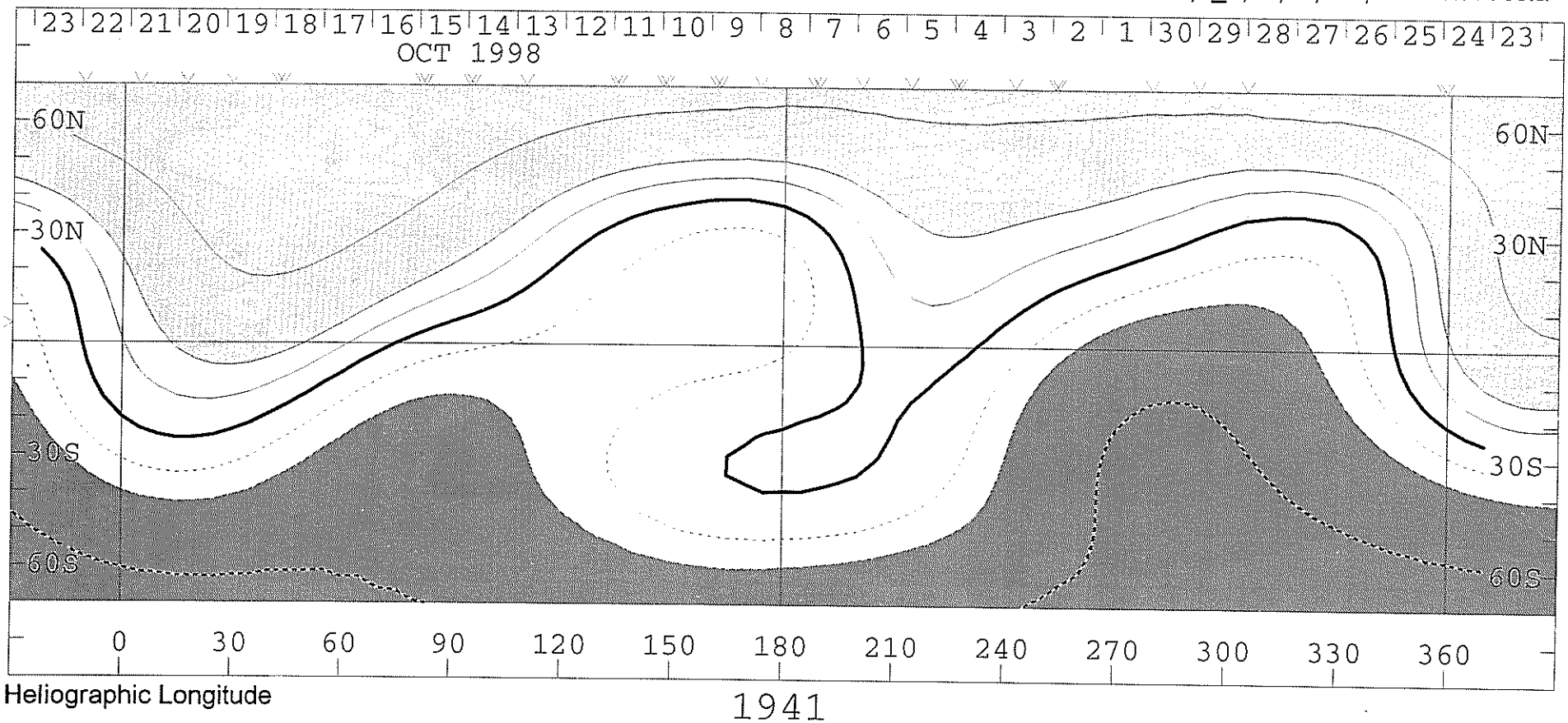
SOURCE SURFACE FIELD

CARRINGTON ROTATION NUMBER 1941

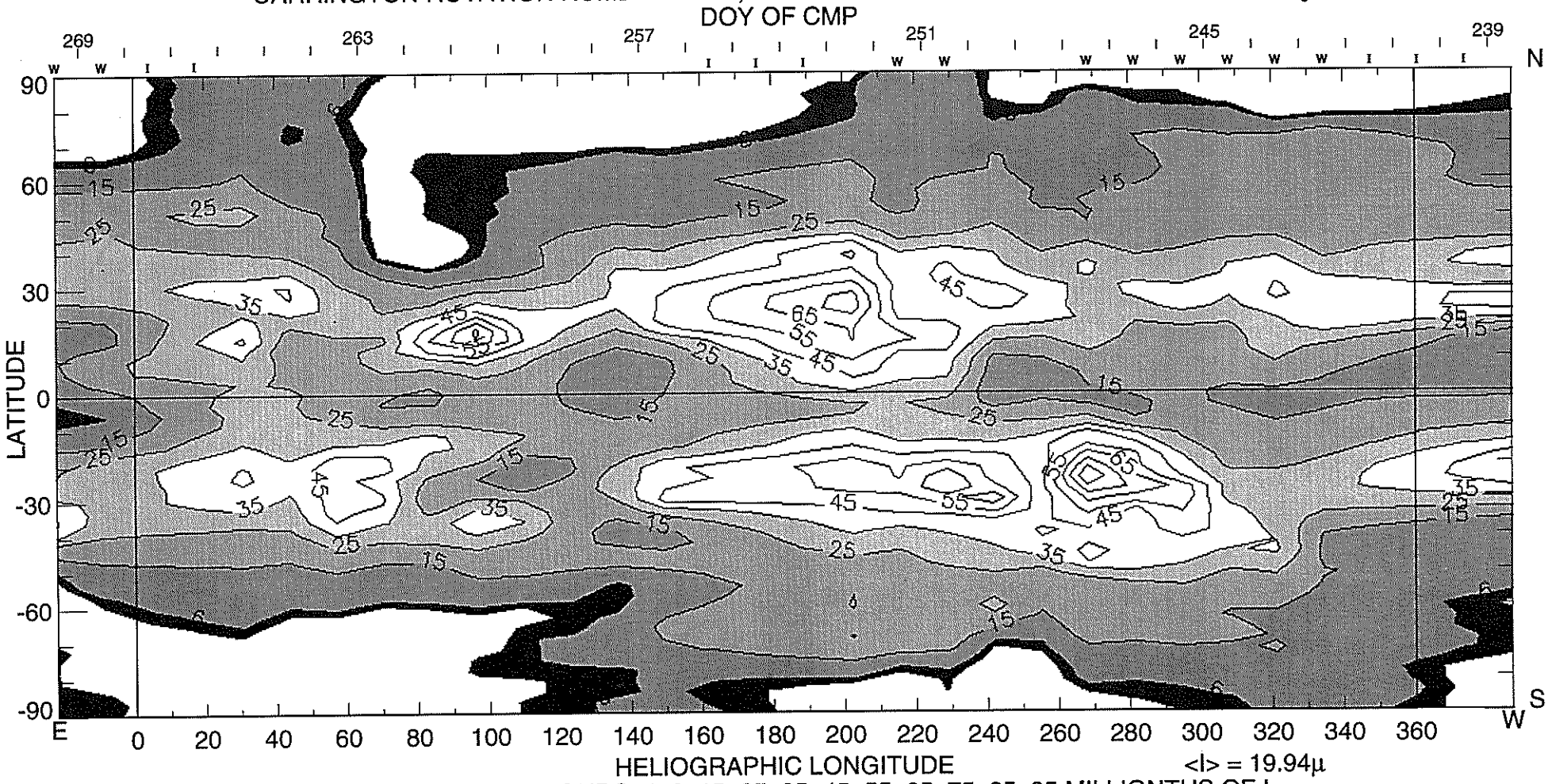
(24 September to 22 October 1998)

Wilcox Solar Observatory

0, ±1, 2, 5, 10, 20 microTesla



CARRINGTON ROTATION NUMBER 1940 ; NSO/SACRAMENTO PEAK FE XIV @ R = 1.15R_o

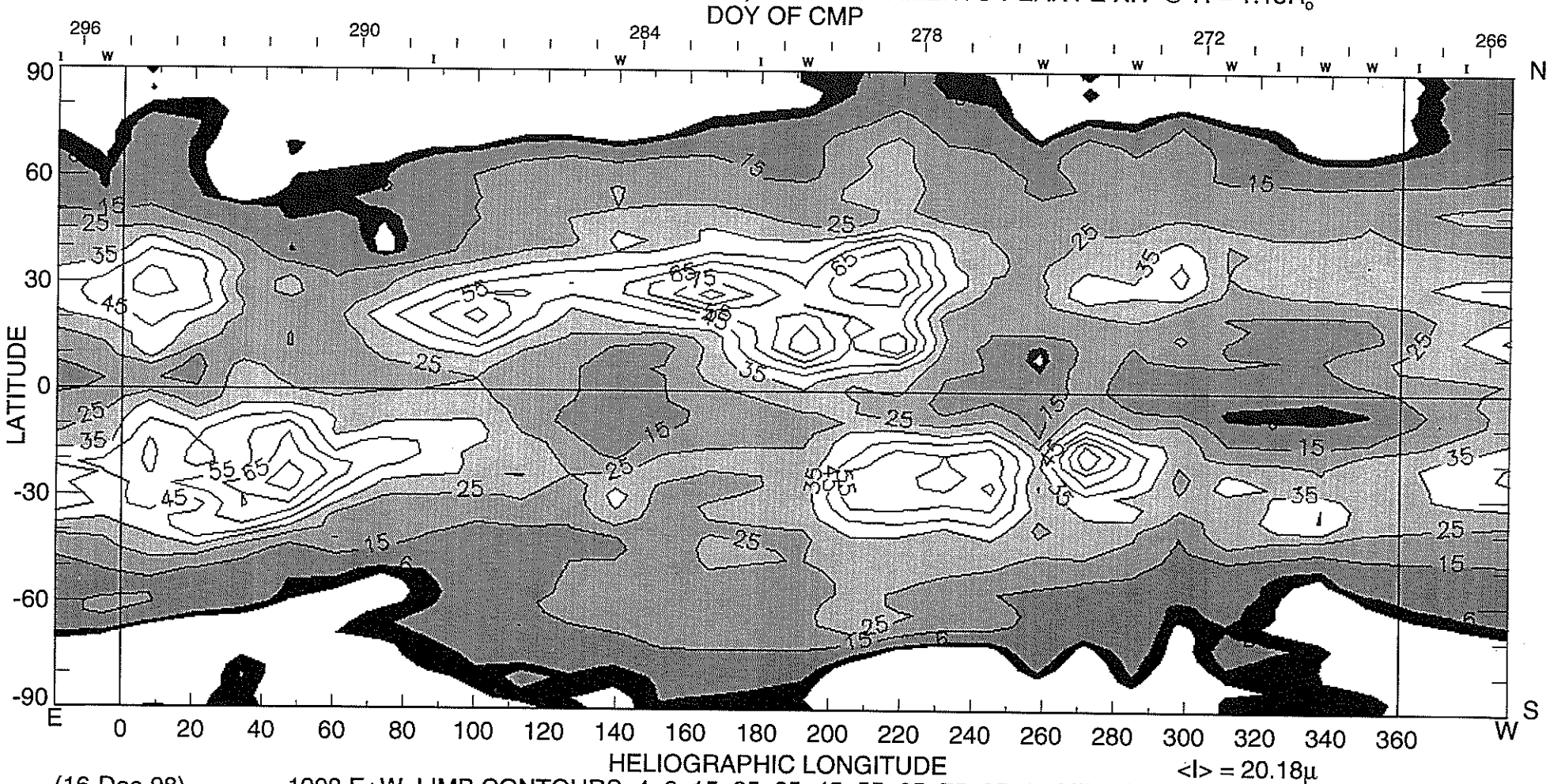


<I> = 19.94μ

(27-Nov-98) 1998 E+W LIMB CONTOURS: 4, 6, 15, 25, 35, 45, 55, 65, 75, 85, 95 MILLIONTHS OF I_o

CORONAL HOLES ARE SHOWN AS WHITE BORDERED BY BLACK

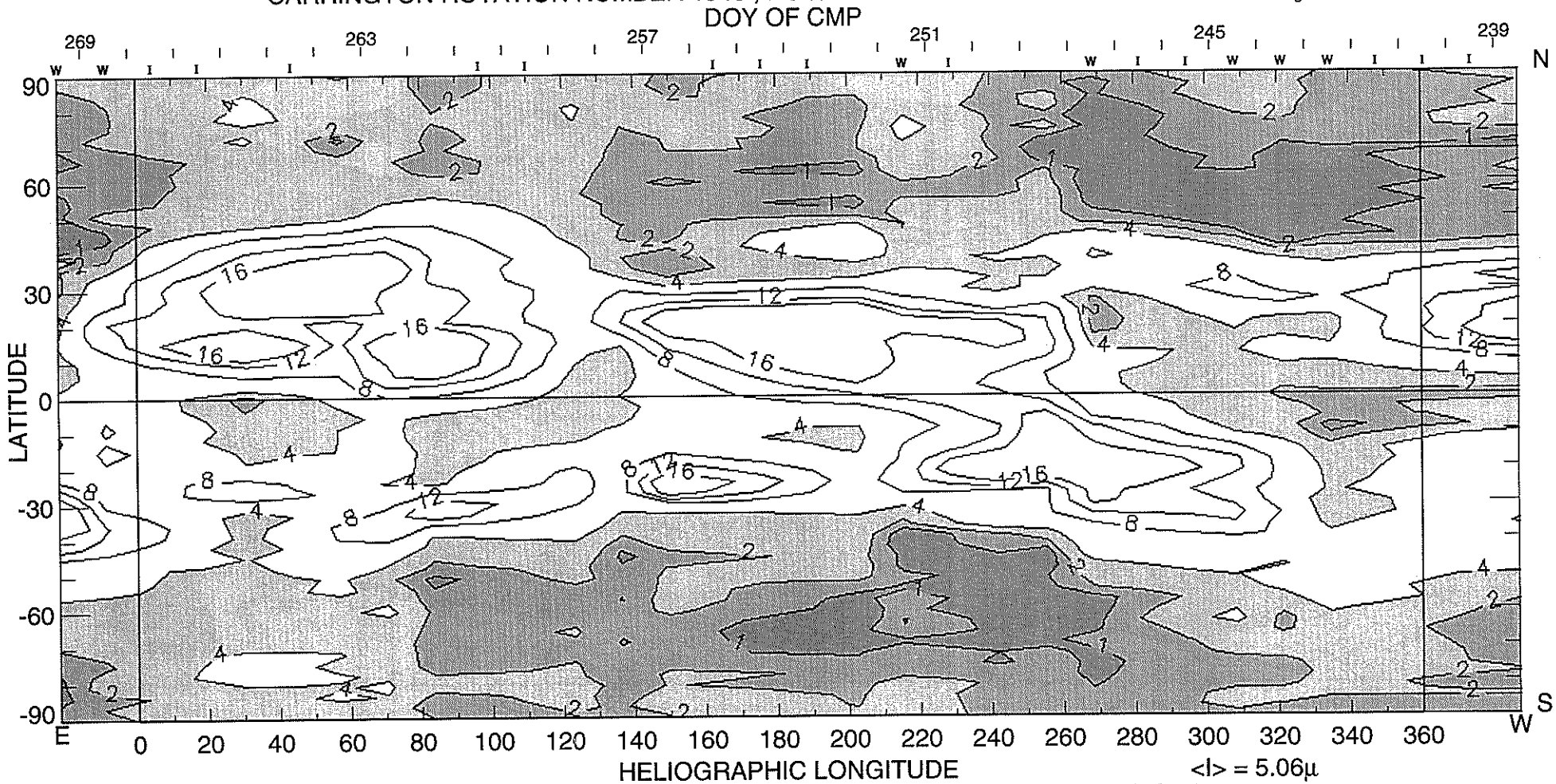
CARRINGTON ROTATION NUMBER 1941 ; NSO/SACRAMENTO PEAK FE XIV @ R = 1.15R_o



(16-Dec-98) 1998 E+W LIMB CONTOURS: 4, 6, 15, 25, 35, 45, 55, 65, 75, 85, 95 MILLIONTHS OF I_o <I> = 20.18μ

CORONAL HOLES ARE SHOWN AS WHITE BORDERED BY BLACK

CARRINGTON ROTATION NUMBER 1940 ; NSO/SACRAMENTO PEAK FE X @ R = 1.15R_o

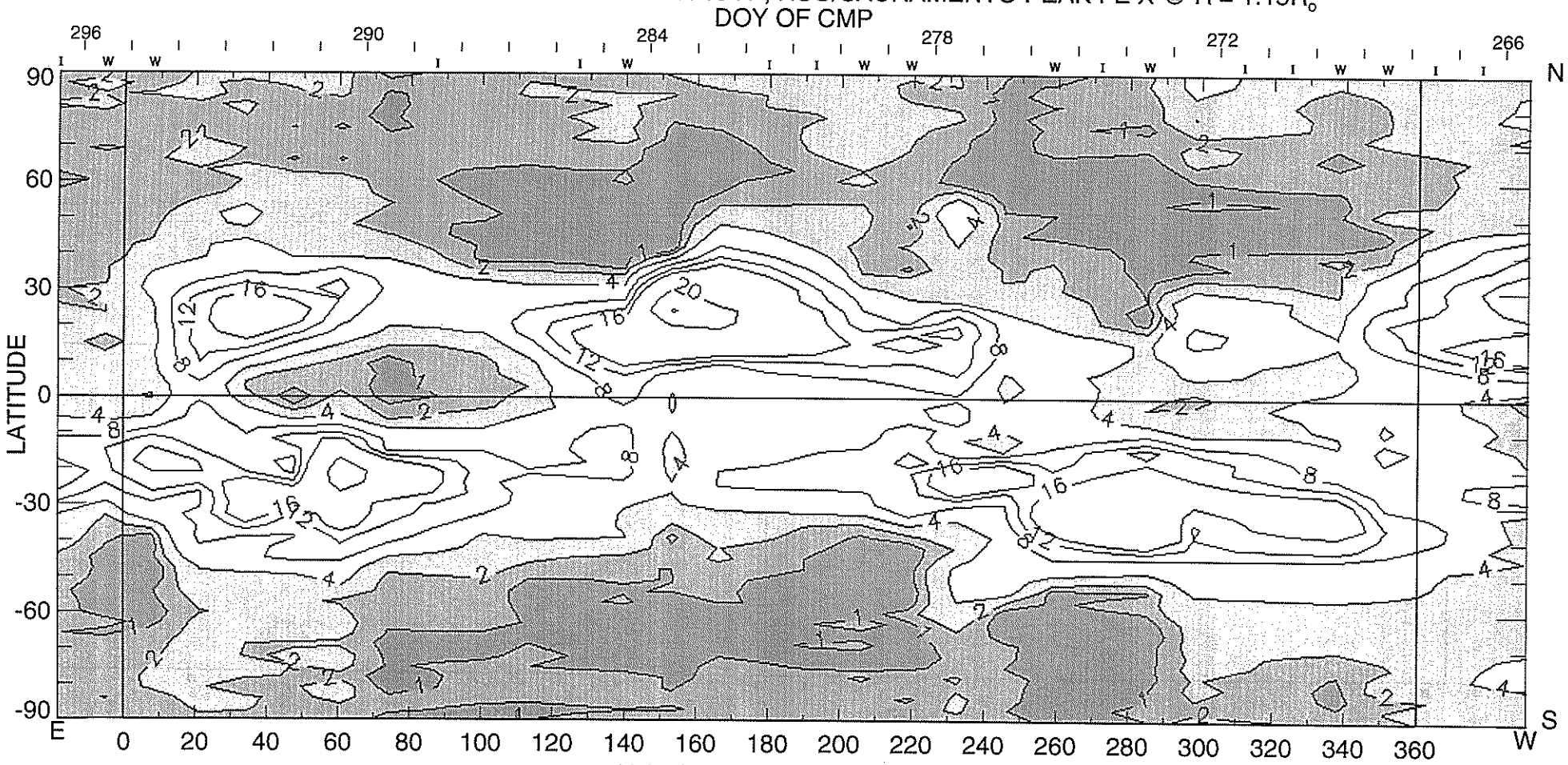


<I> = 5.06μ

(16-Dec-98)

1998 E+W LIMB CONTOURS: 1, 2, 4, 8, 12, 16, 32, 48 MILLIONTHS OF I_o

CARRINGTON ROTATION NUMBER 1941 ; NSO/SACRAMENTO PEAK FE X @ R = 1.15R_o

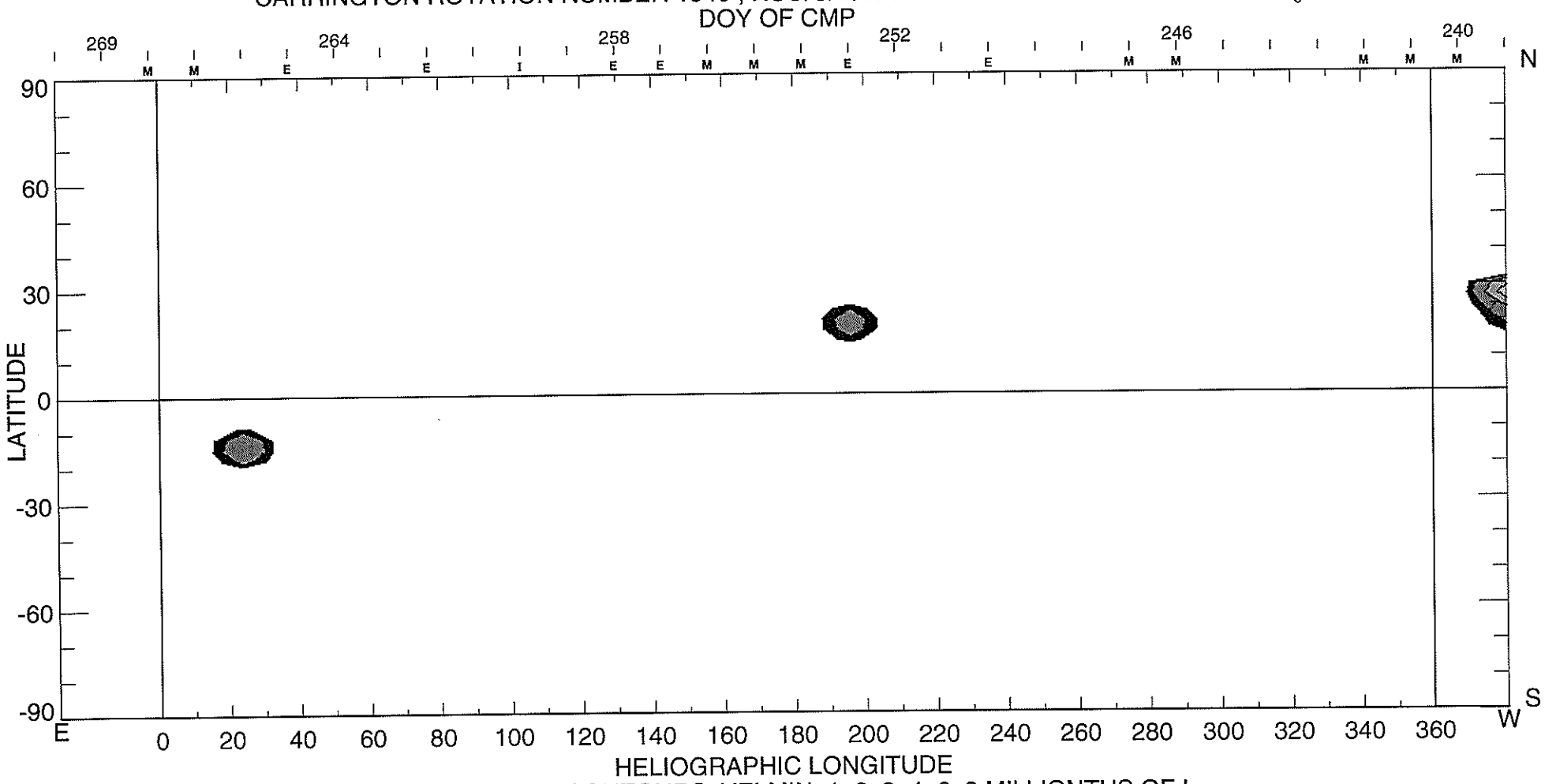


(16-Dec-98)

<I> = 4.84μ

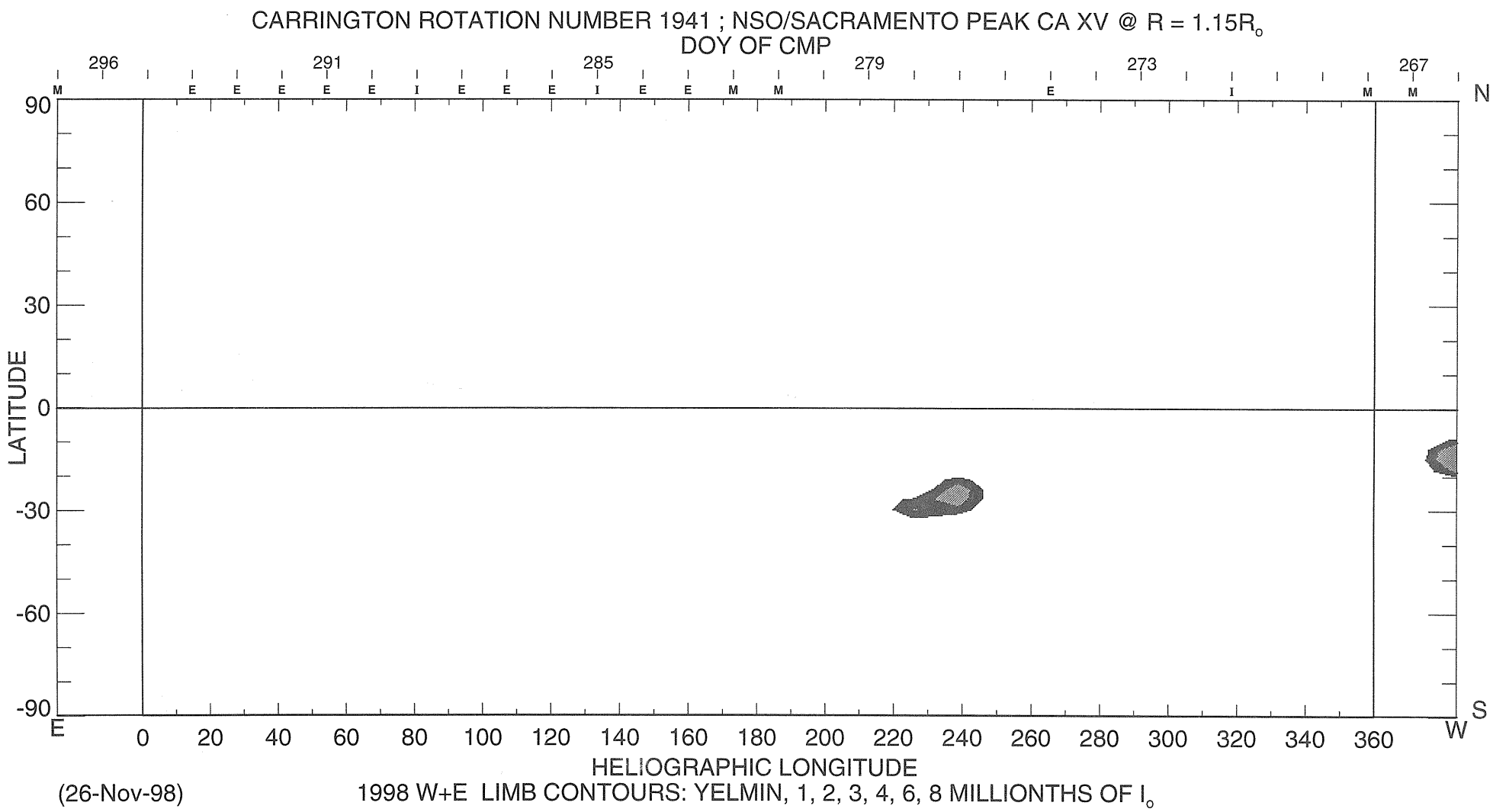
1998 E+W LIMB CONTOURS: 1, 2, 4, 8, 12, 16, 32, 48 MILLIONTHS OF I_o

CARRINGTON ROTATION NUMBER 1940 ; NSO/SACRAMENTO PEAK CA XV @ R = 1.15R_o



(26-Nov-98)

1998 W+E LIMB CONTOURS: YELMIN, 1, 2, 3, 4, 6, 8 MILLIONTHS OF I_o


CARRINGTON ROTATION NUMBER 1941 ; NSO/SACRAMENTO PEAK CA XV @ R = 1.15R$_o$
DOY OF CMP
296
291
285
279
273
267
M E E E E E I E E E I E E M M E I M M
N
S
90
60
30
0
-30
-60
-90
LATITUDE
E
W
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
HELIOGRAPHIC LONGITUDE
(26-Nov-98)
1998 W+E LIMB CONTOURS: YELMIN, 1, 2, 3, 4, 6, 8 MILLIONTHS OF I$_o$

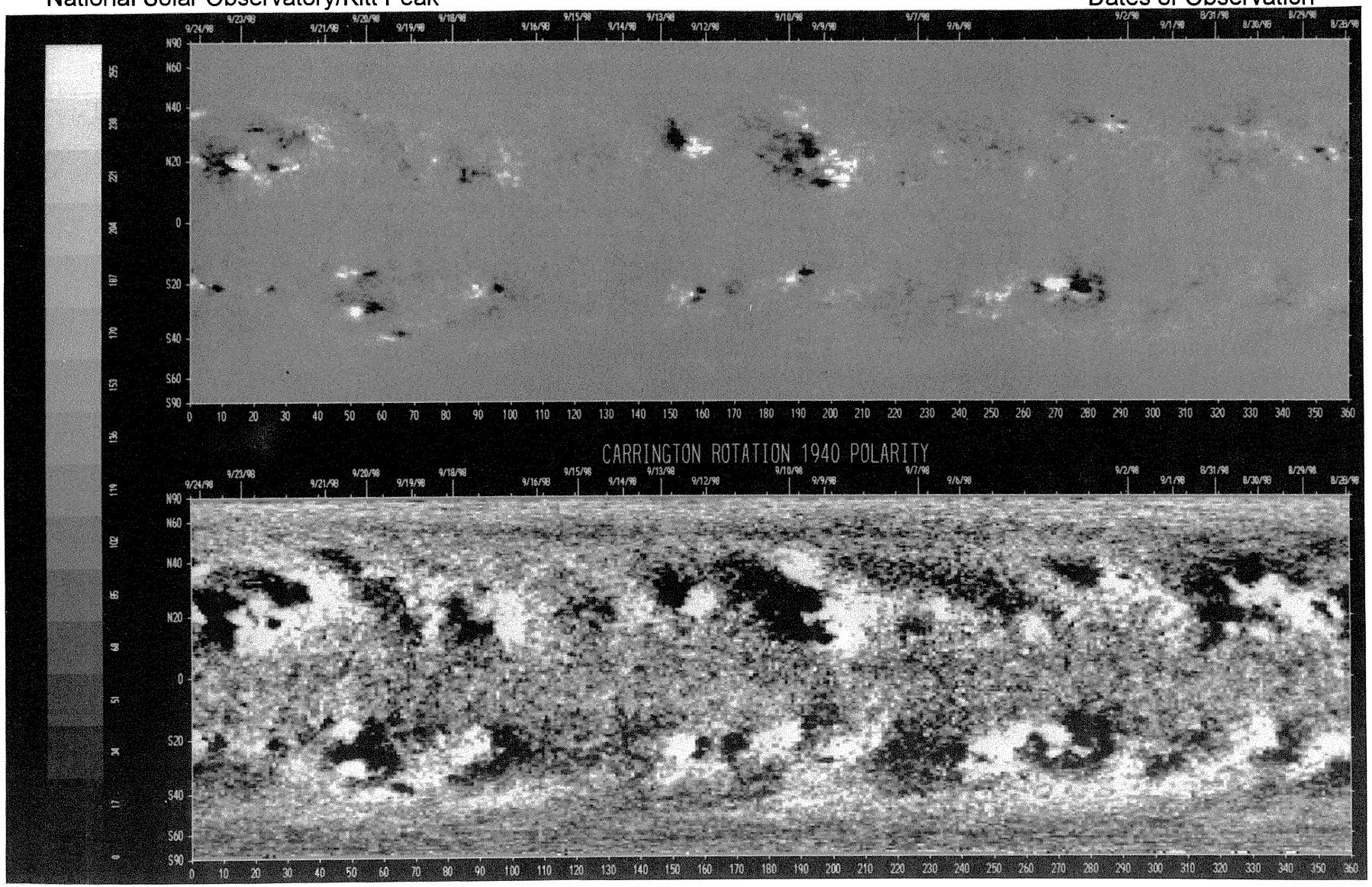
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1940

(28 August to 24 September 1998)

National Solar Observatory/Kitt Peak

Dates of Observation



Heliographic Longitude

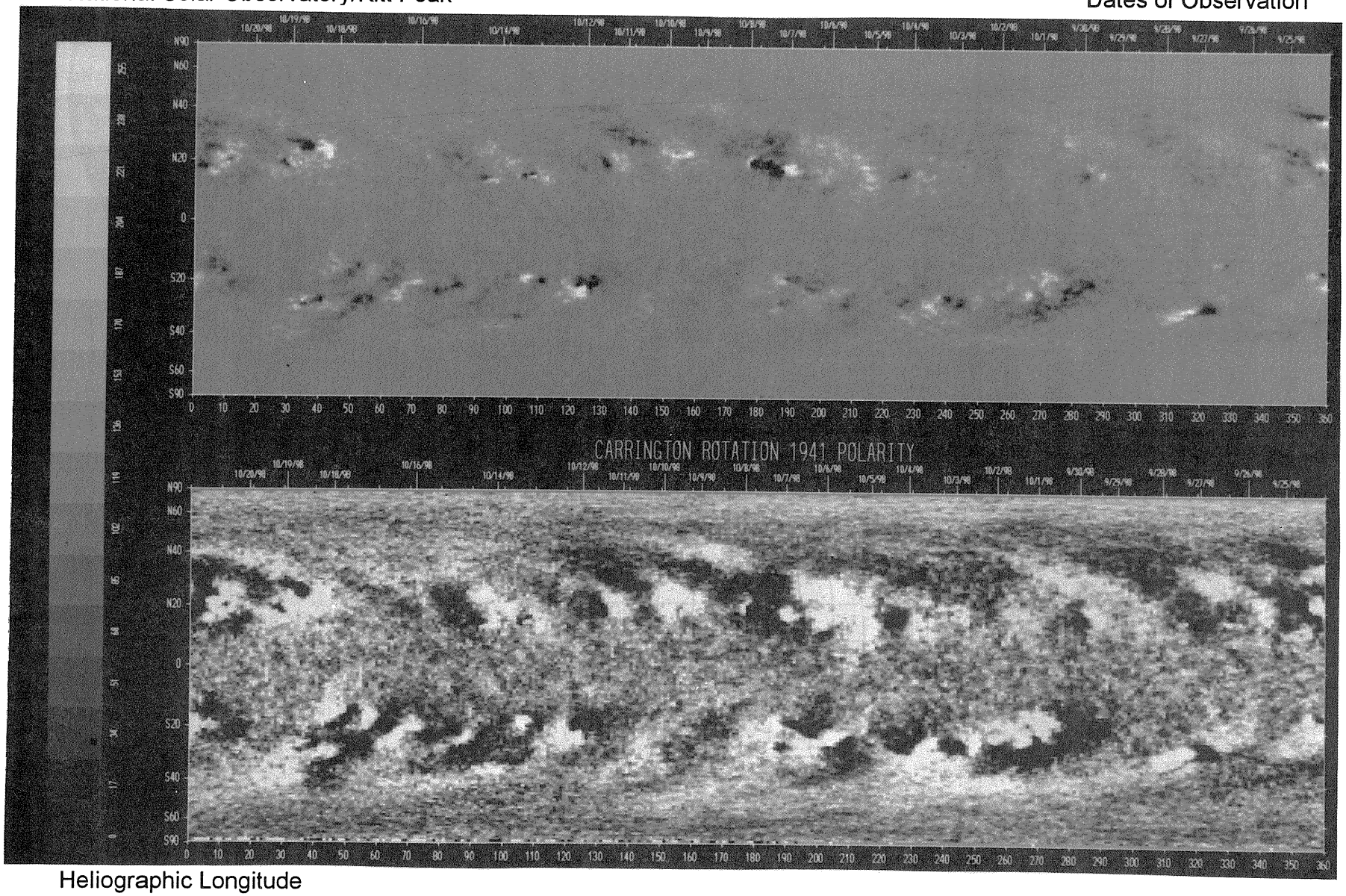
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1941

(24 September to 22 October 1998)

National Solar Observatory/Kitt Peak

Dates of Observation



Heliographic Longitude

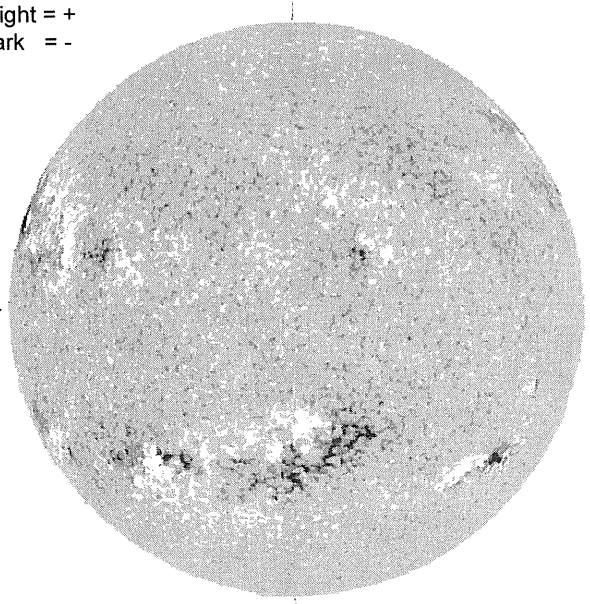
KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -

E--

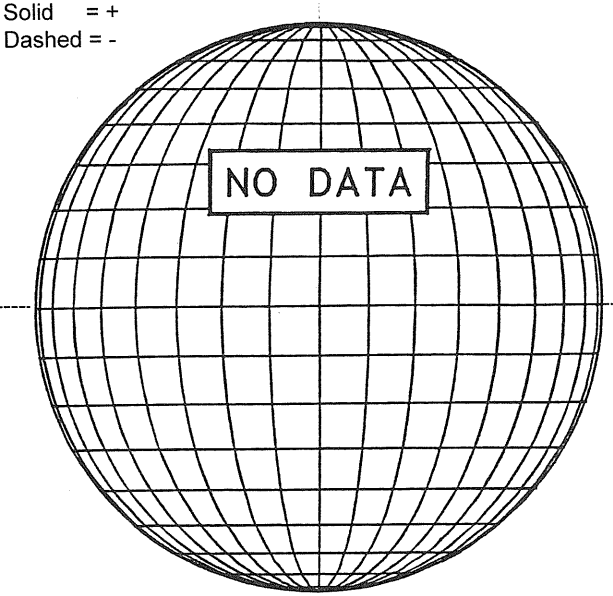


1430 UT

STANFORD MAGNETOGRAM

N

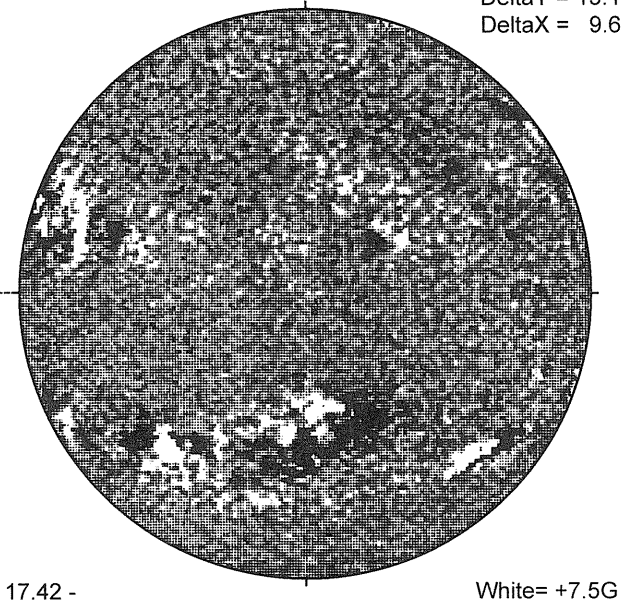
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

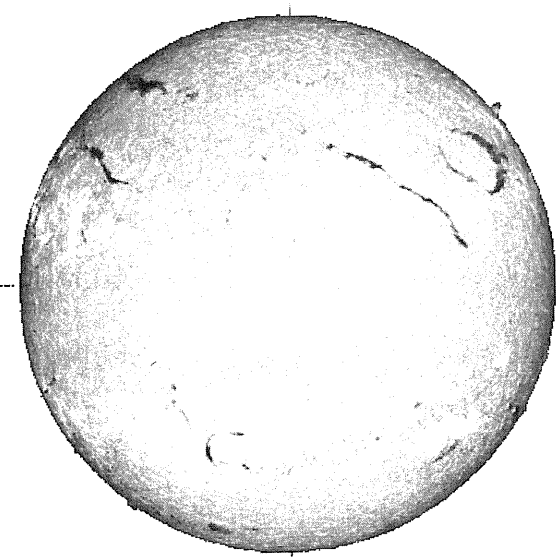


17.42 -
18.37 UT

White= +7.5G
Black = -7.5G

----- MEUDON H-ALPHA

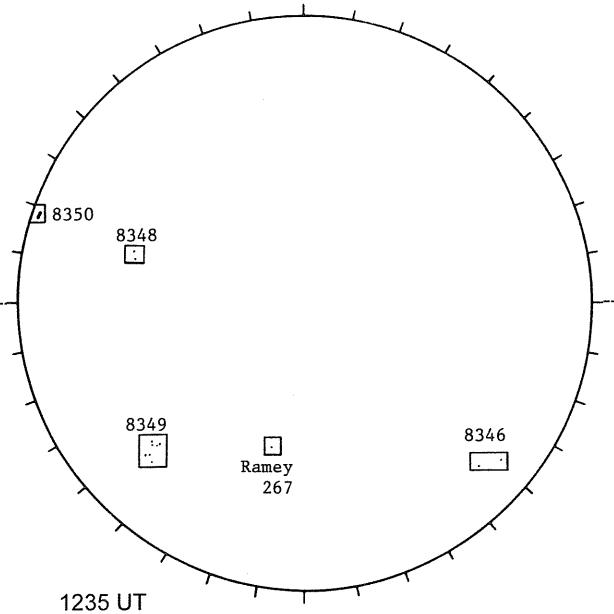
E----



1320 UT

S

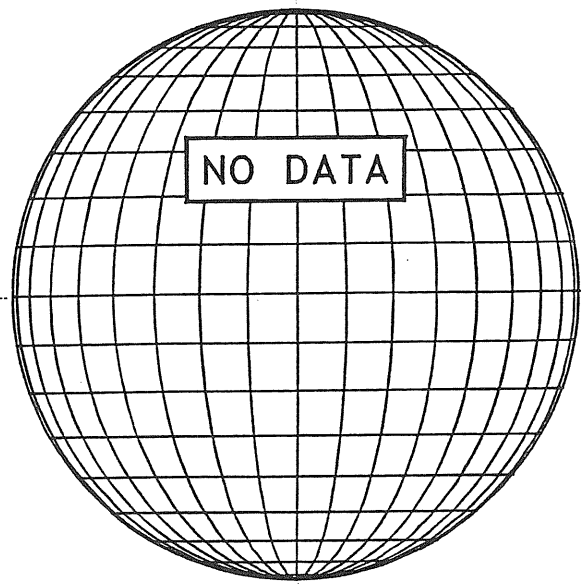
RAMEY SUNSPOT



1235 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

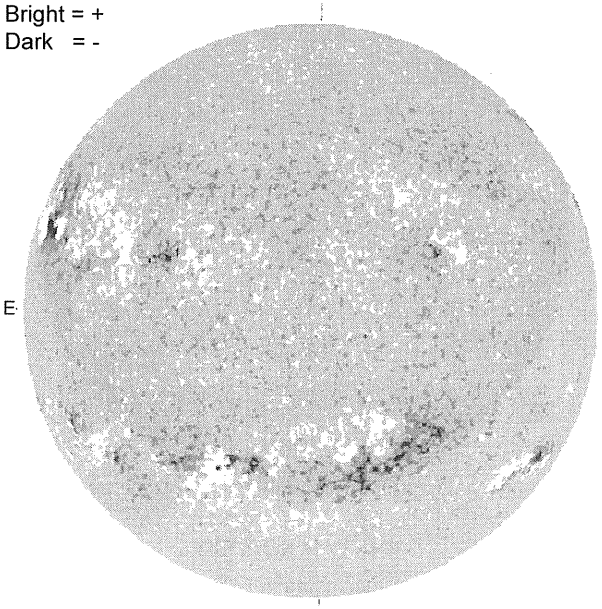


S

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



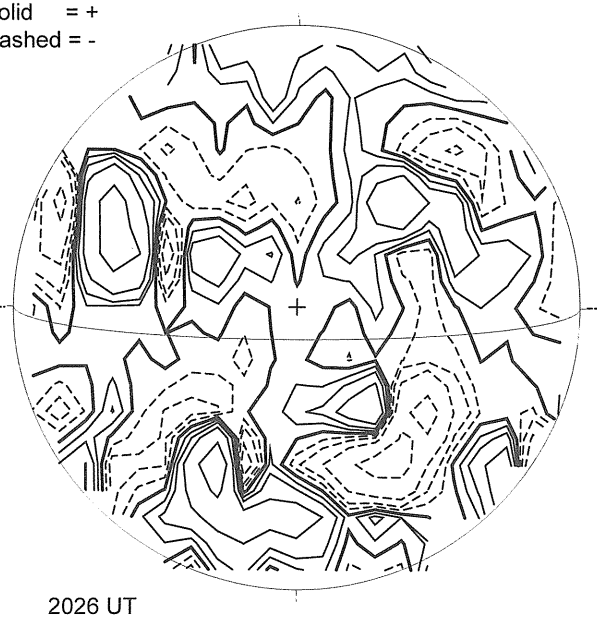
E

1434 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

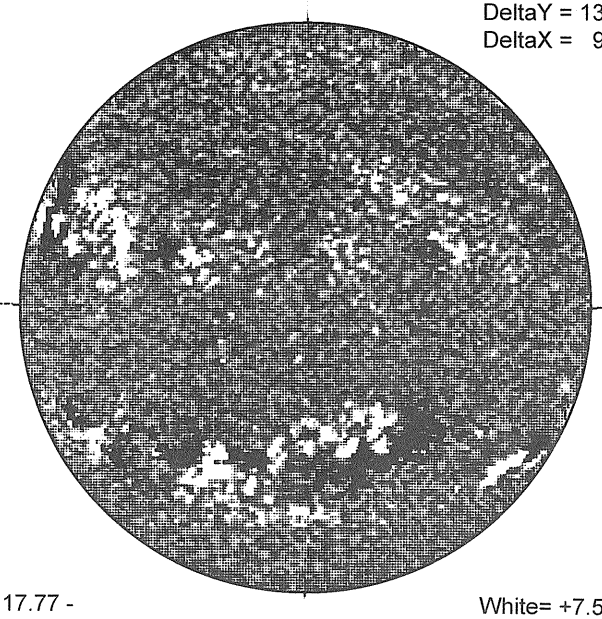


2026 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

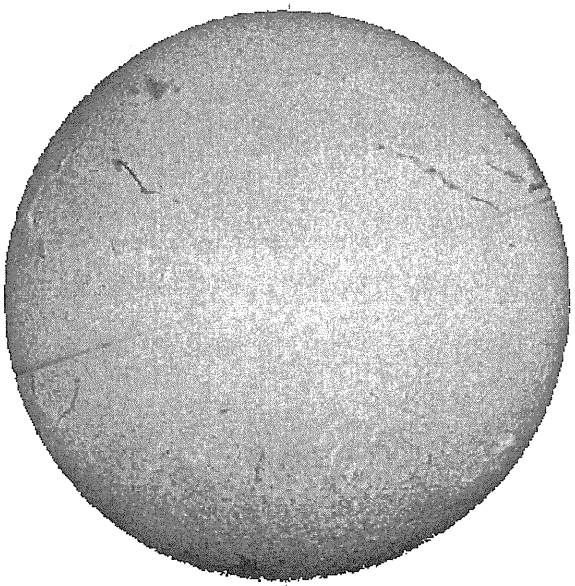


W

17.77 -
18.71 UT

White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA

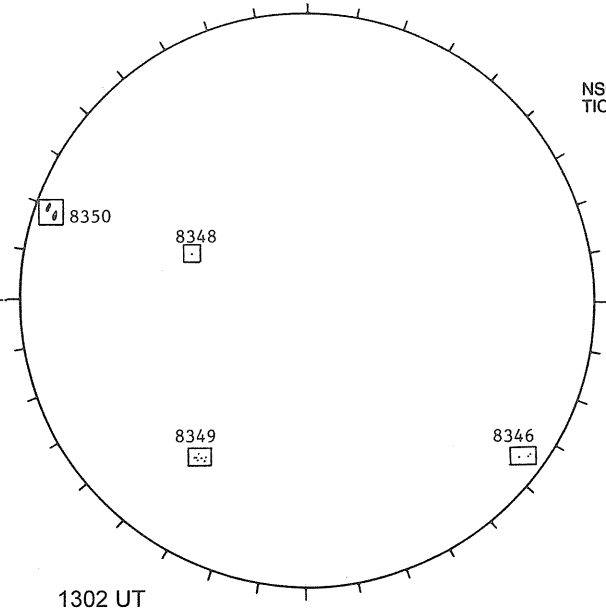


E

1348 UT

S

RAMEY SUNSPOT

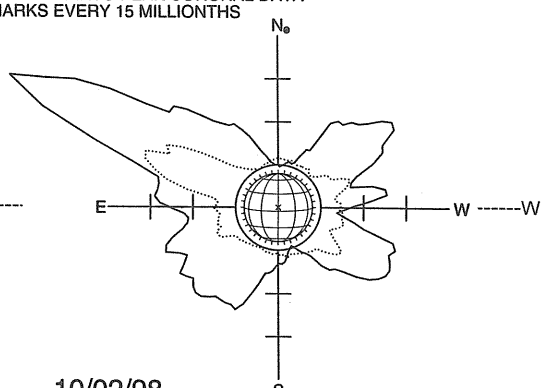


1302 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS



10/02/98
(DOY 275)

FE XIV 14:23 UT 1.15 $R_\odot$
FE X 15:15 UT 1.15 $R_\odot$
xxxxx CA XV 14:58 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

S

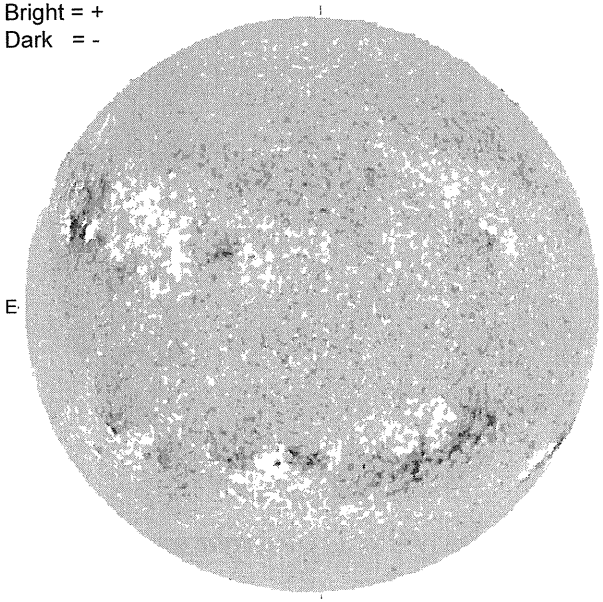
55
Oct 98

OCTOBER 3, 1998 (P = + 26.09 , Bo = + 6.63 , Lo = 252.01)

KITT PEAK MAGNETOGRAM

868.8 nm

Bright = +
Dark = -



1421 UT

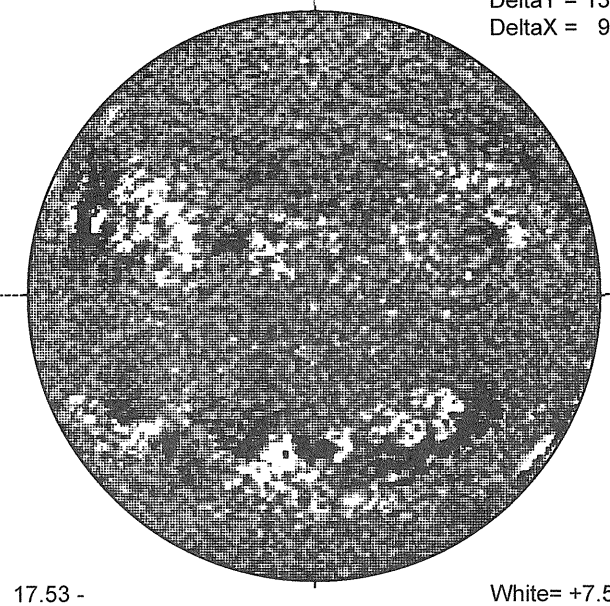
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

1808 UT

MT. WILSON MAGNETOGRAM

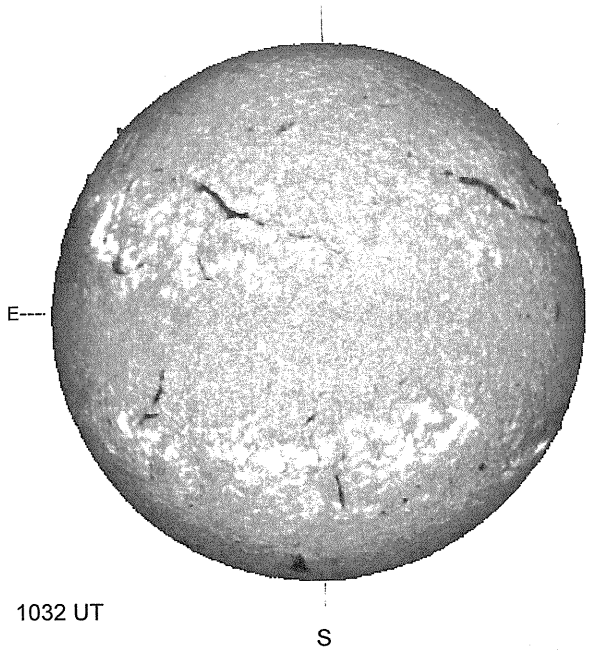
DeltaY = 13.1
DeltaX = 9.6



17.53 -
18.48 UT

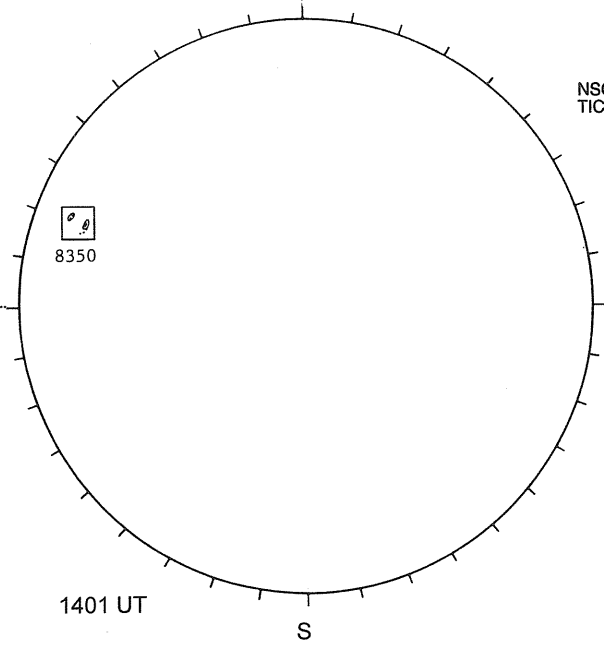
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



1032 UT

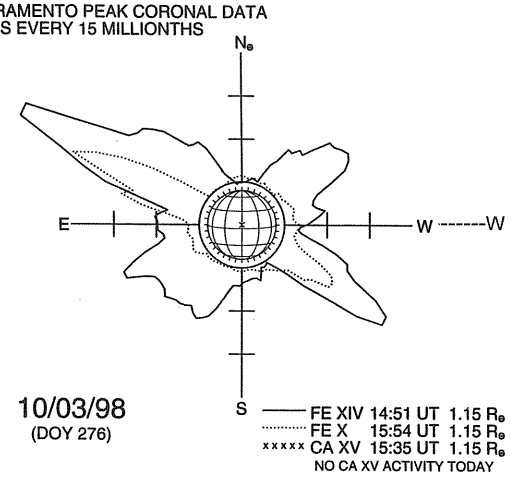
RAMEY SUNSPOT



1401 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS



10/03/98
(DOY 276)

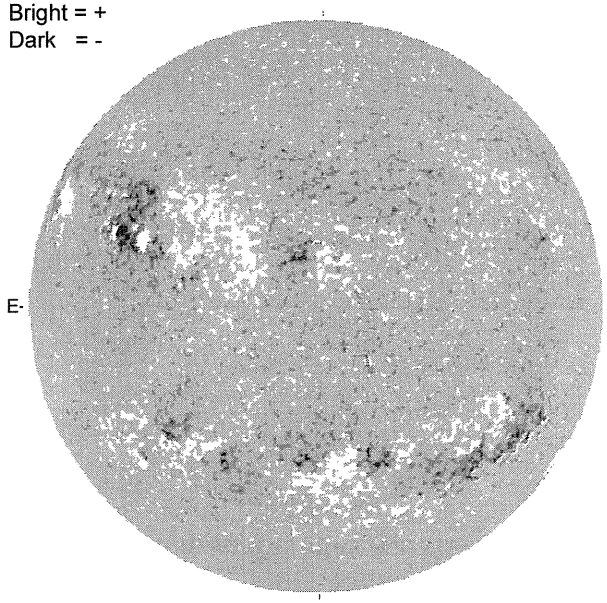
S

OCTOBER 4, 1998 (P = + 26.14 , Bo = + 6.58 , Lo = 238.81)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



E-

1744 UT

STANFORD MAGNETOGRAM

N

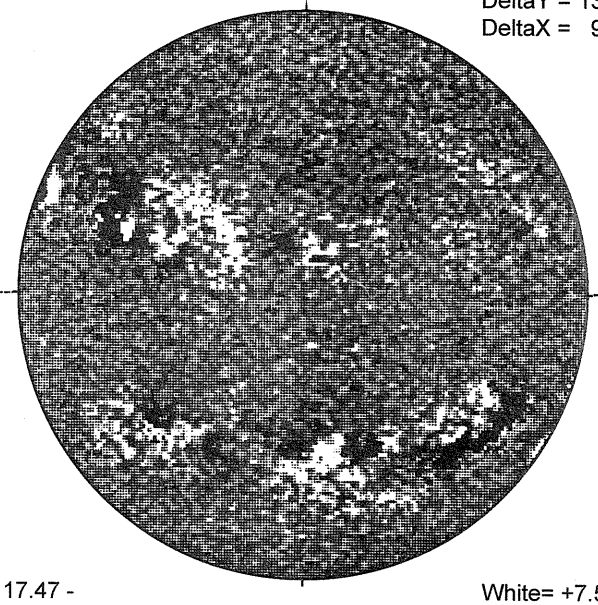
Solid = +
Dashed = -

2058 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

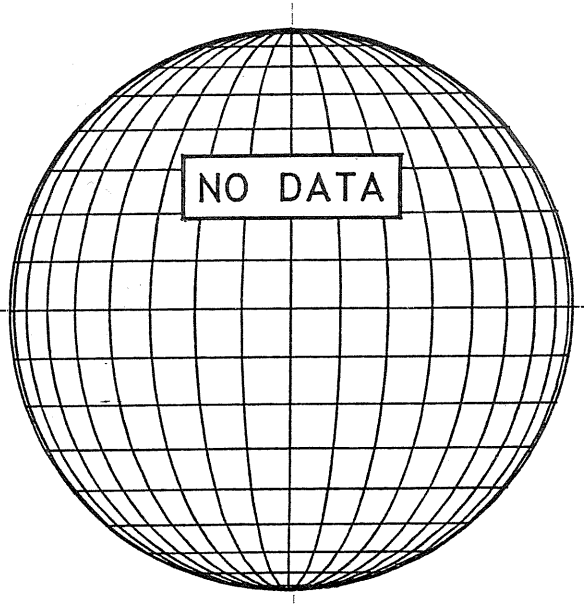


-W

17.47 -
18.41 UT

White= +7.5G
Black = -7.5G

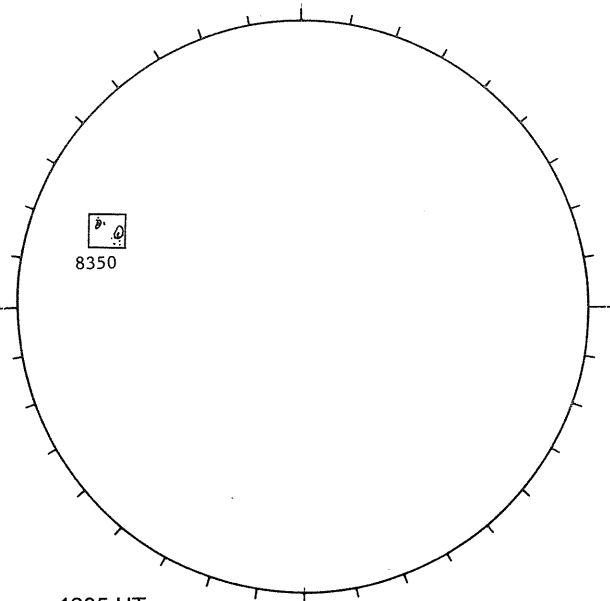
MEUDON H-ALPHA



E-

S

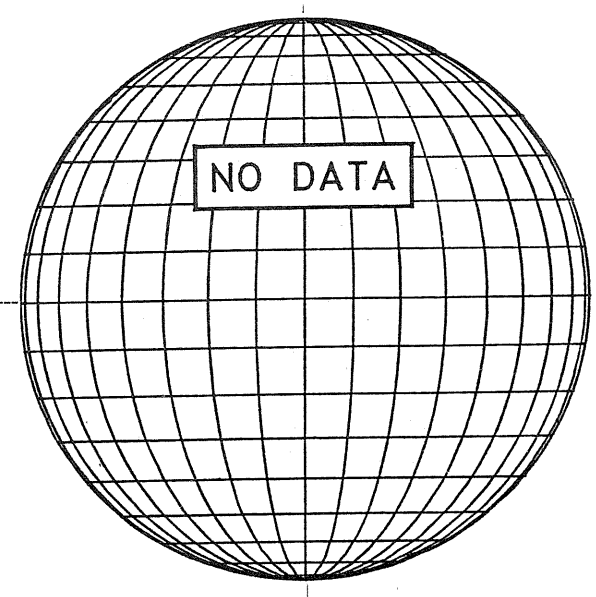
RAMEY SUNSPOT



1235 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

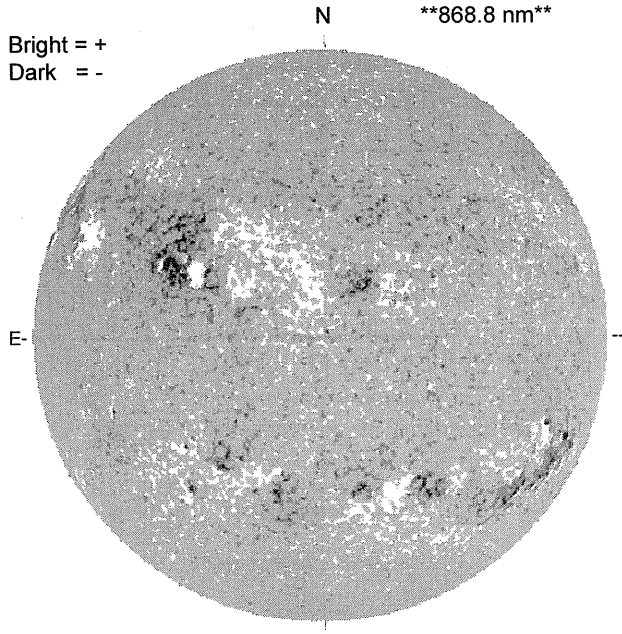


S

57
Oct 9

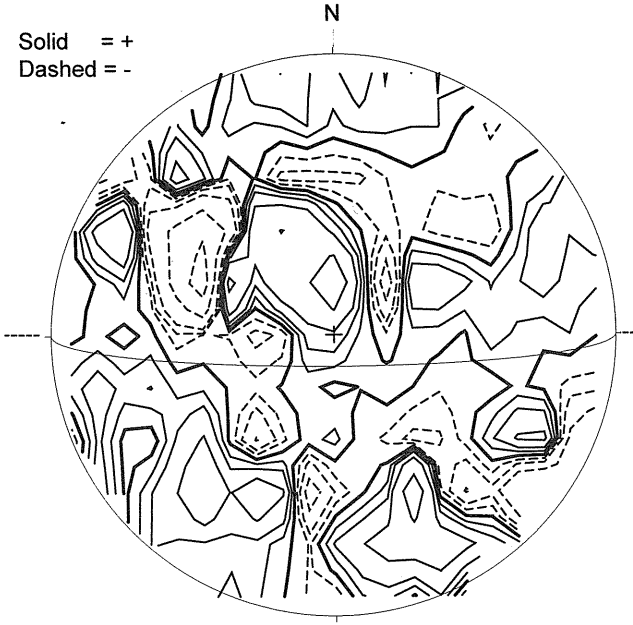
OCTOBER 5, 1998 (P= + 26.18 , Bo = + 6.52 , Lo = 225.62)

KITT PEAK MAGNETOGRAM



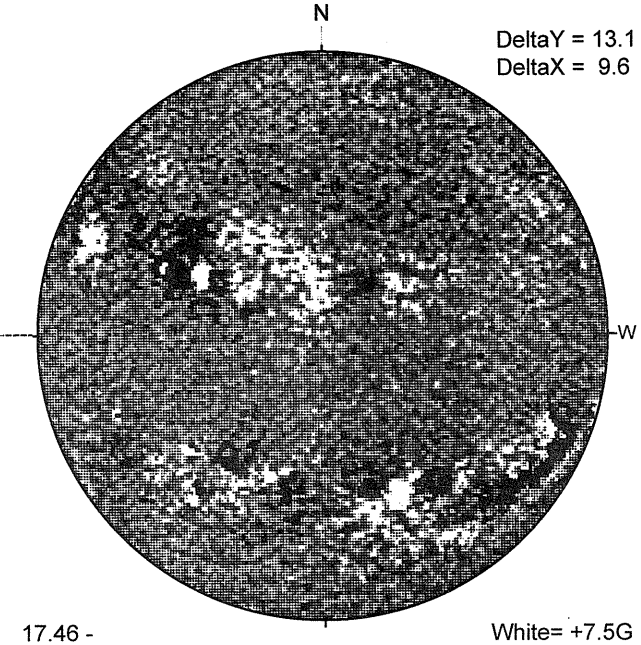
1542 UT

STANFORD MAGNETOGRAM



2110 UT

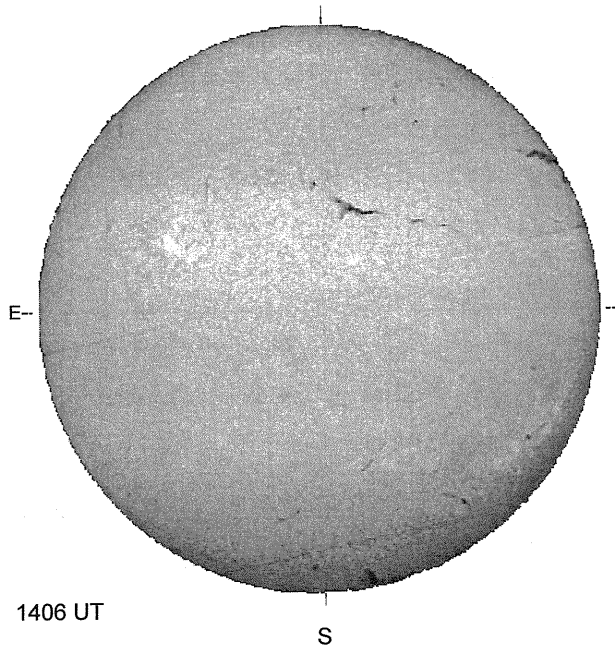
MT. WILSON MAGNETOGRAM



17.46 -
18.41 UT

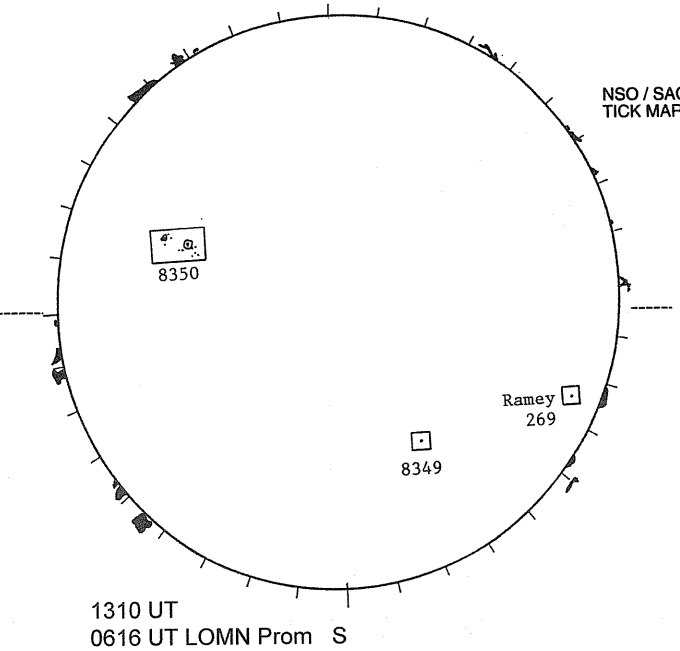
White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



1406 UT

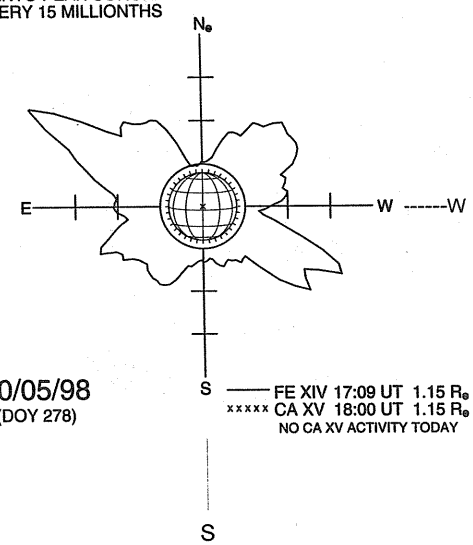
RAMEY SUNSPOT



1310 UT
0616 UT LOMN Prom

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS

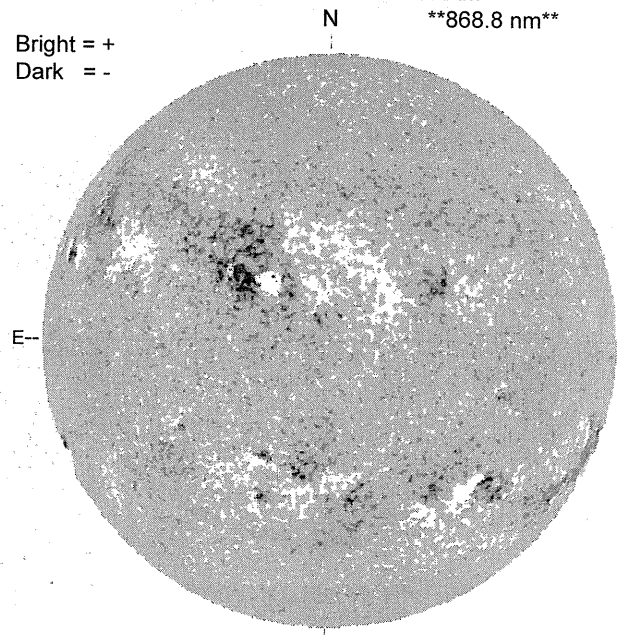


10/05/98
(DOY 278)

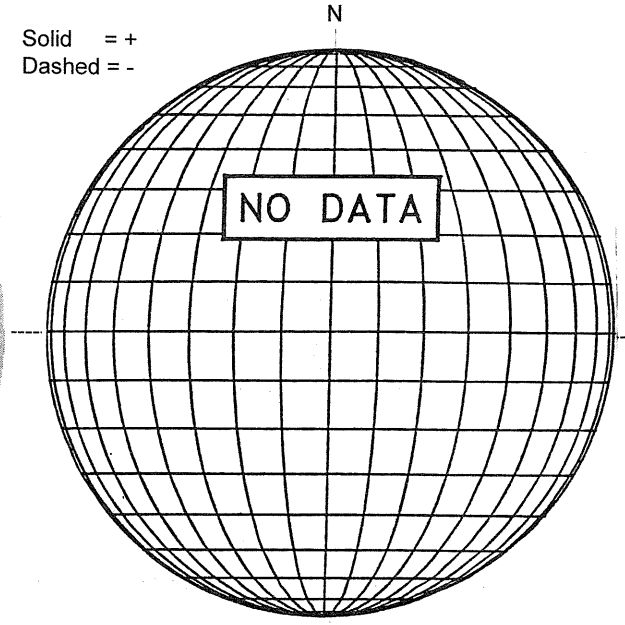
—— FE XIV 17:09 UT 1.15 $R_\odot$
xxxxx CA XV 18:00 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

OCTOBER 6, 1998 (P= + 26.22 , Bo = + 6.47 , Lo = 212.42)

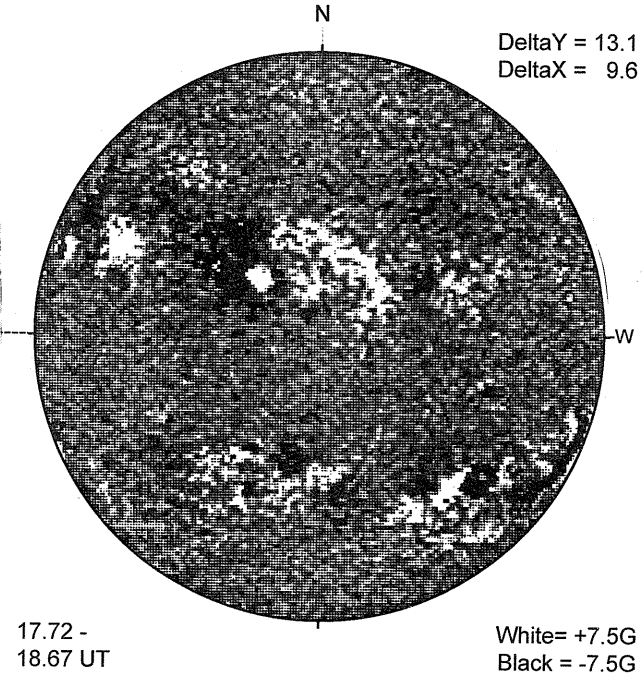
KITT PEAK MAGNETOGRAM



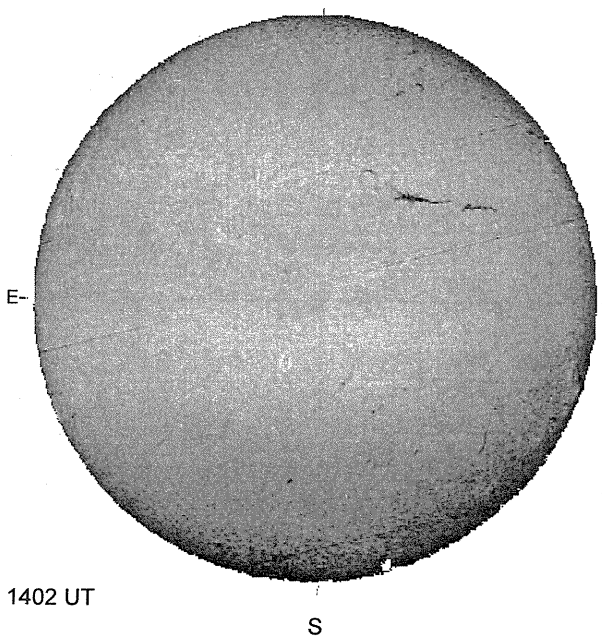
STANFORD MAGNETOGRAM



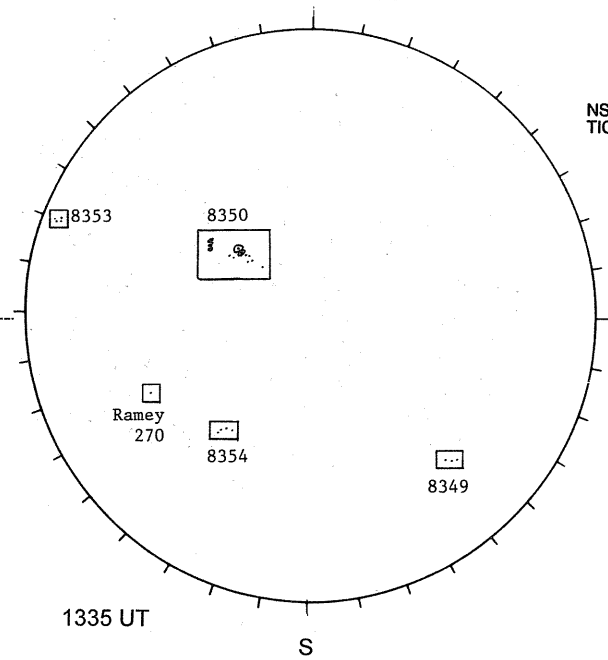
MT. WILSON MAGNETOGRAM



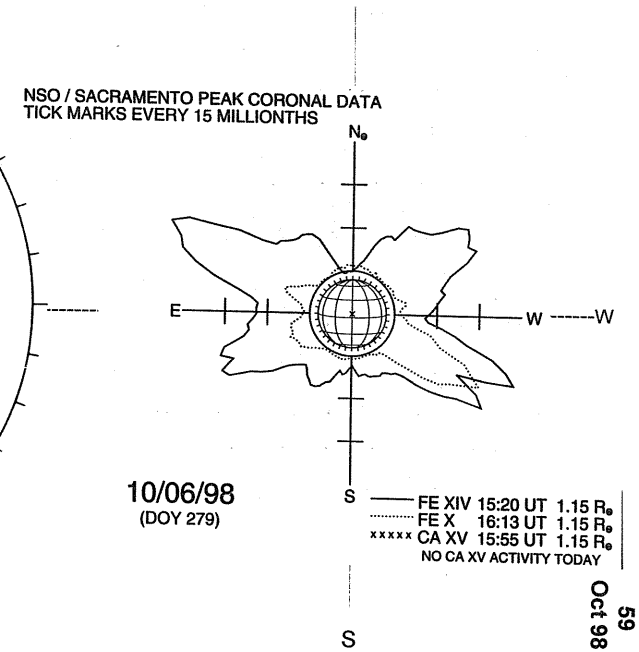
SACRAMENTO PEAK H-ALPHA



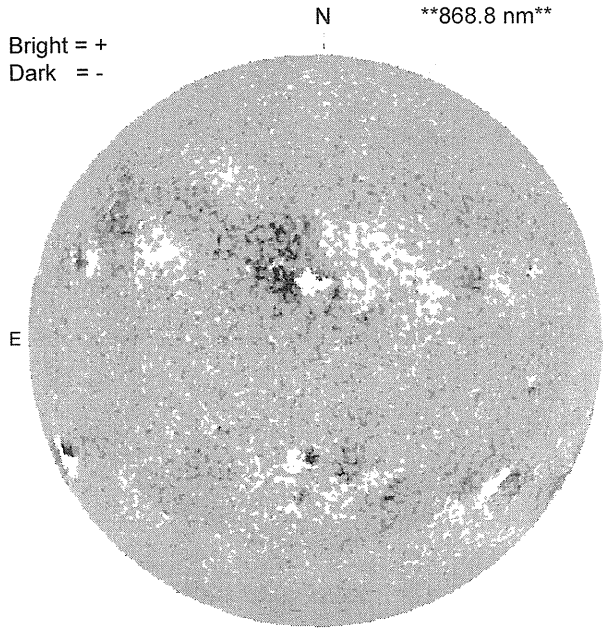
RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----



KITT PEAK MAGNETOGRAM

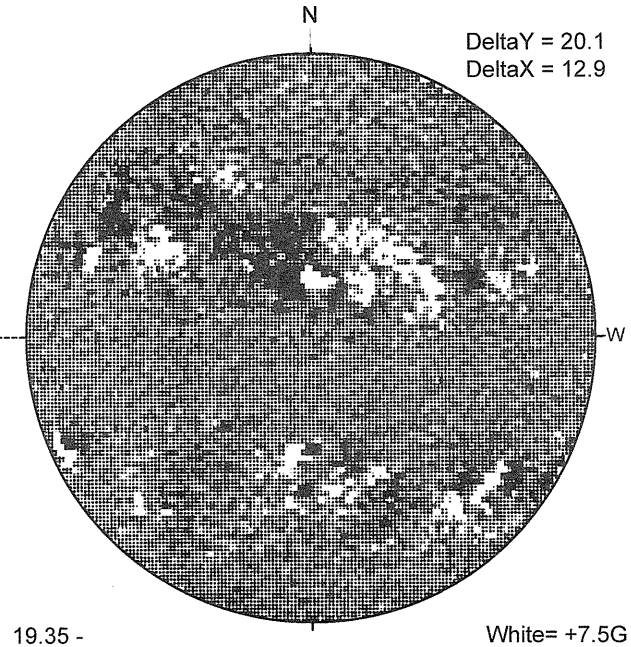


1603 UT

STANFORD MAGNETOGRAM

2114 UT

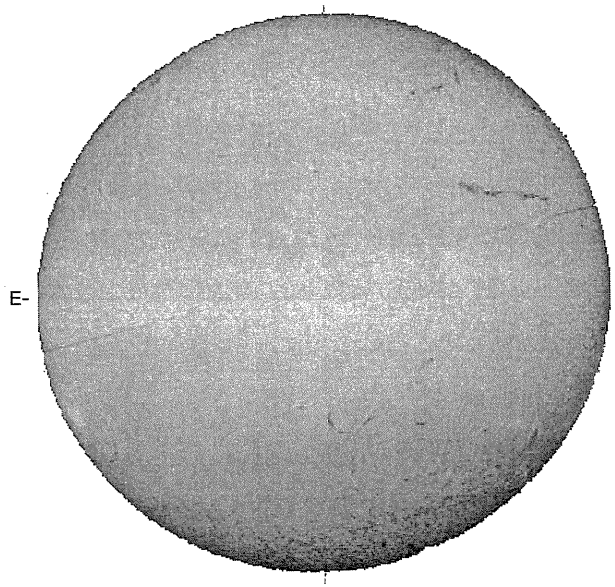
MT. WILSON MAGNETOGRAM



19.35 -
19.78 UT

White= +7.5G
Black = -7.5G

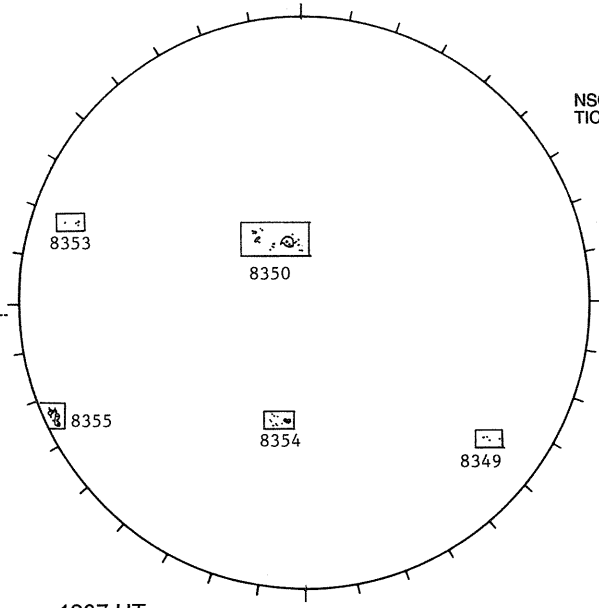
SACRAMENTO PEAK H-ALPHA



1359 UT

S

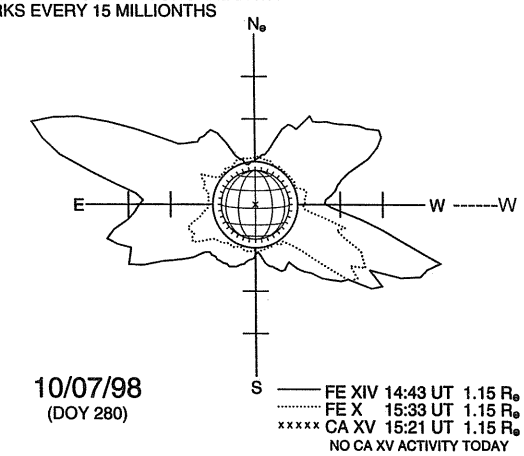
RAMEY SUNSPOT



1237 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)



S

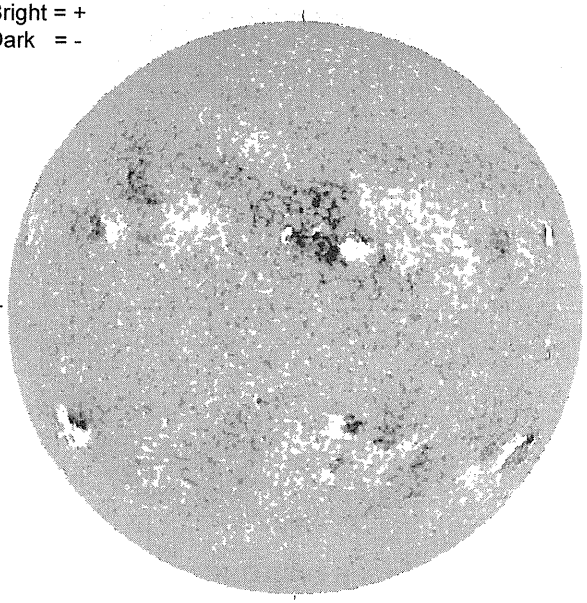
KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -

E-



1603 UT

STANFORD MAGNETOGRAM

N

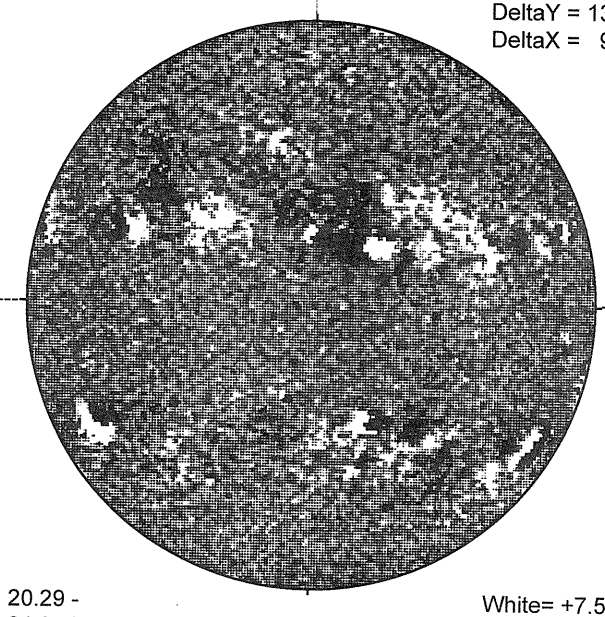
Solid = +
Dashed = -

2317 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6



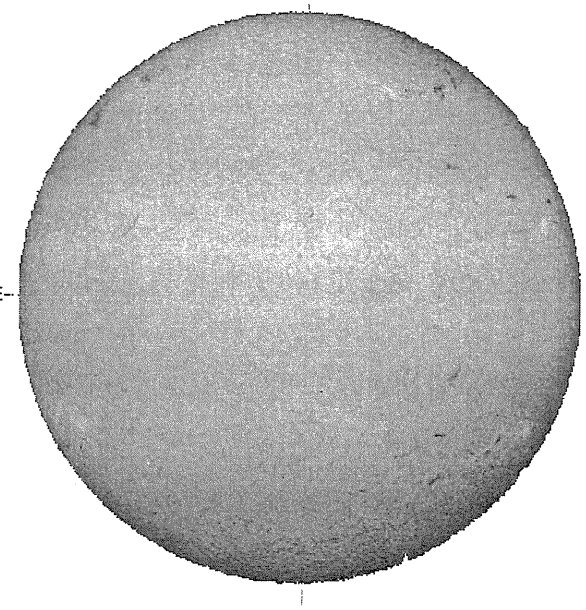
-W

20.29 -
21.24 UT

White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA

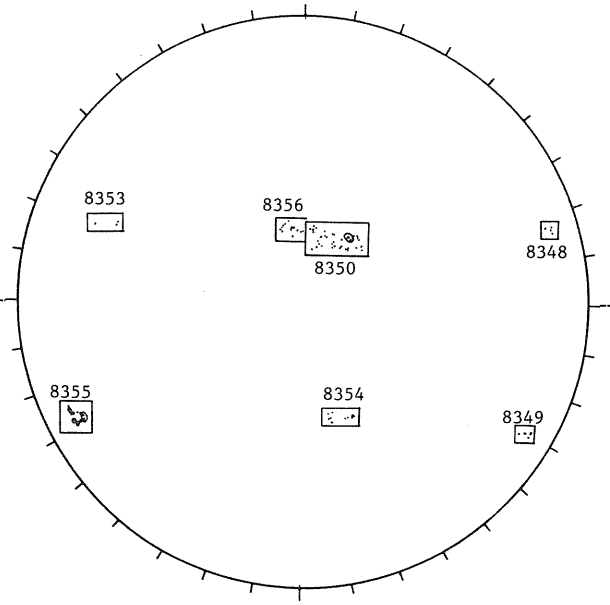
E-



1403 UT

S

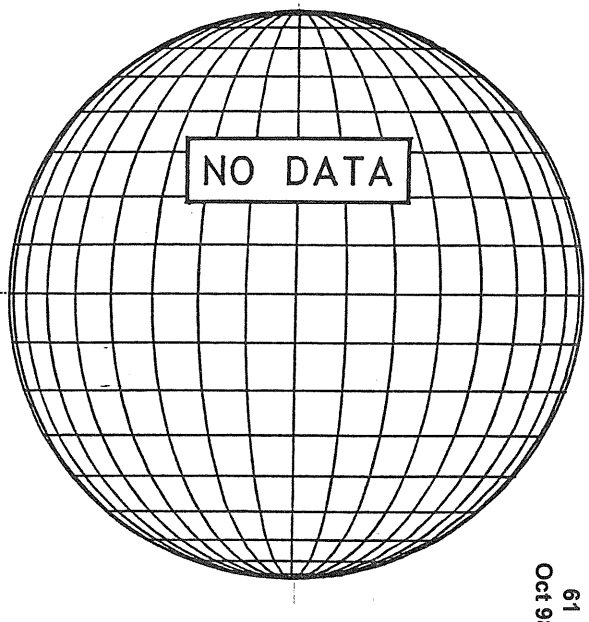
RAMEY SUNSPOT



1221 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)



S

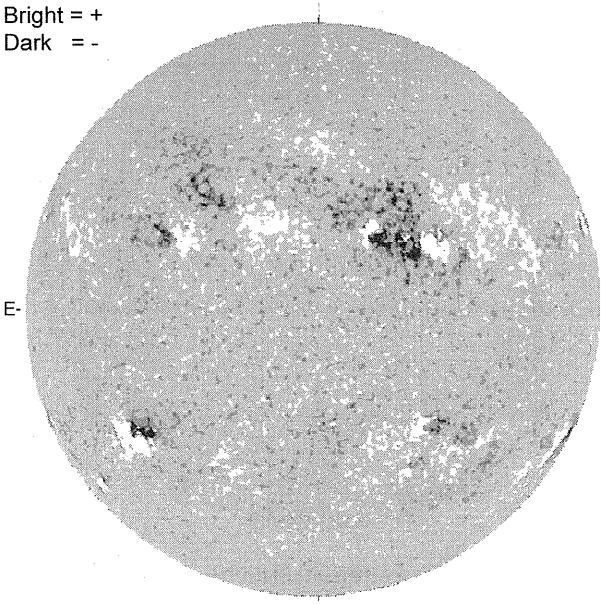
61
Oct 98

OCTOBER 9, 1998 (P= + 26.29 , Bo = + 6.29 , Lo = 172.84)

KITT PEAK MAGNETOGRAM

N **868.8 nm

Bright = +
Dark = -



E-

1800 UT

STANFORD MAGNETOGRAM

N

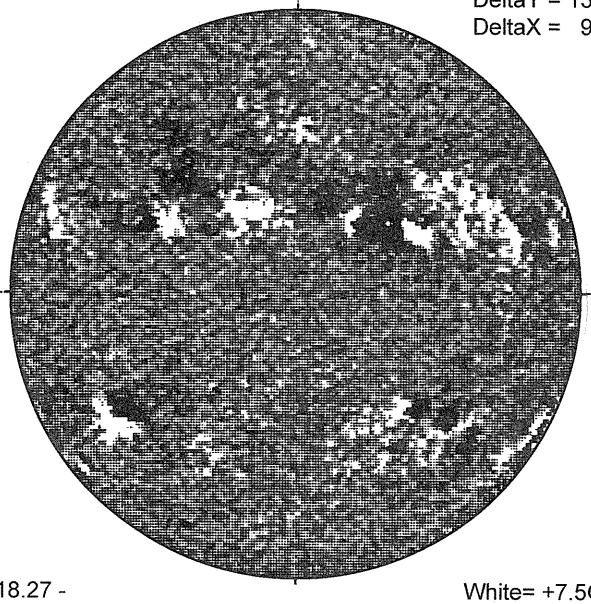
Solid = +
Dashed = -

1856 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

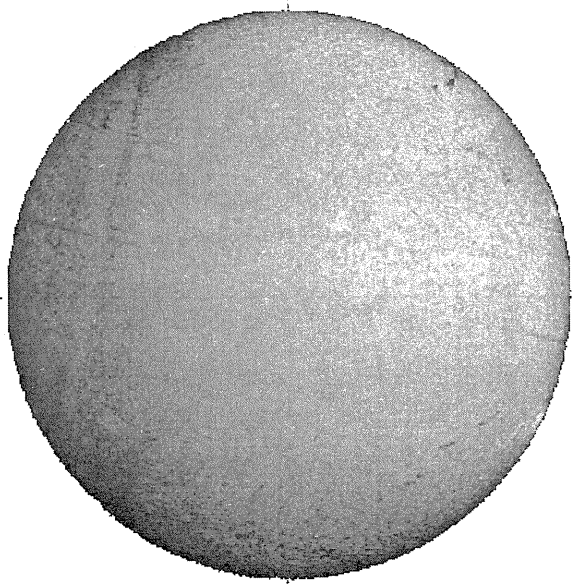


-W

18.27 -
19.21 UT

White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA

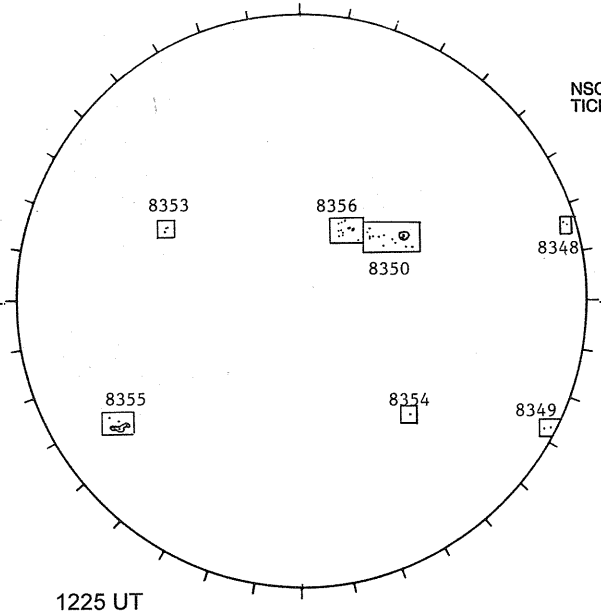


E--

1547 UT

S

RAMEY SUNSPOT

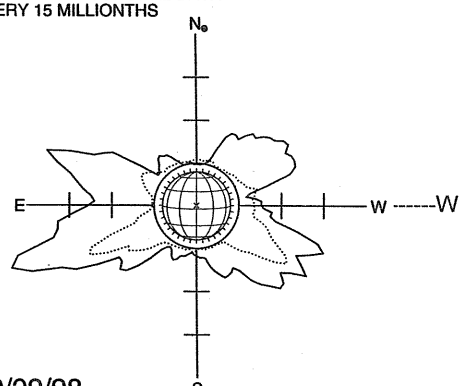


1225 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)---

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS



10/09/98
(DOY 282)

FE XIV 20:19 UT 1.15 $R_\odot$
FE X 21:17 UT 1.15 $R_\odot$
xxxxx CA XV 20:58 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

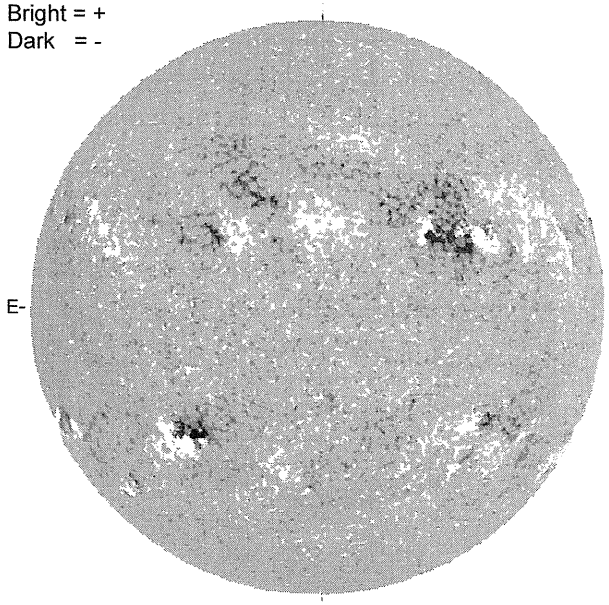
S

OCTOBER 10, 1998 (P= + 26.29 , Bo = + 6.23 , Lo = 159.65)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



E-

1458 UT

STANFORD MAGNETOGRAM

N

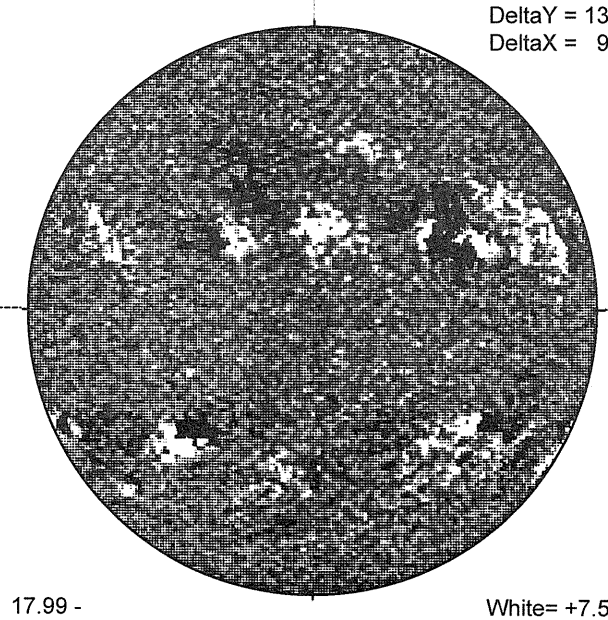
Solid = +
Dashed = -

2118 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

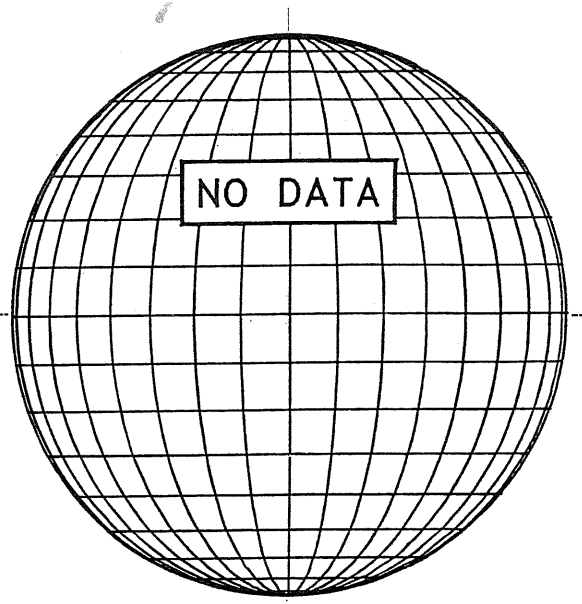


-W

17.99 -
18.94 UT

White= +7.5G
Black = -7.5G

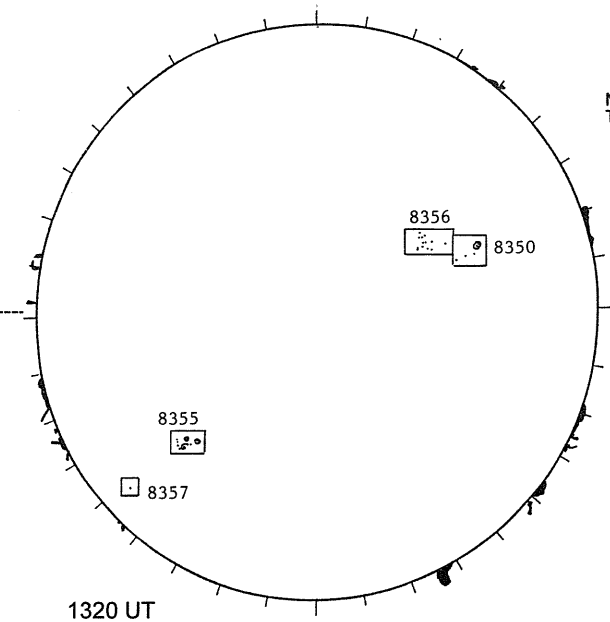
----- SACRAMENTO PEAK H-ALPHA



E---

S

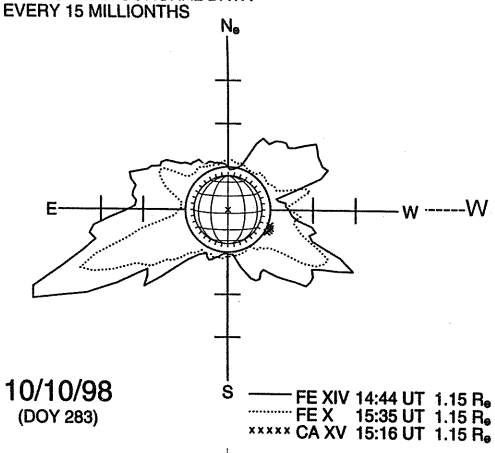
RAMEY SUNSPOT



1320 UT
0634 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS



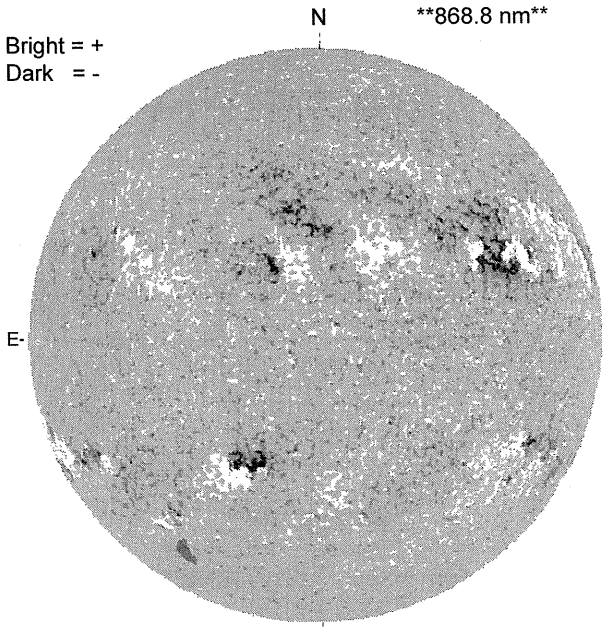
10/10/98
(DOY 283)

FE XIV 14:44 UT 1.15 $R_\odot$
FE X 15:35 UT 1.15 $R_\odot$
xxxxx CA XV 15:16 UT 1.15 $R_\odot$

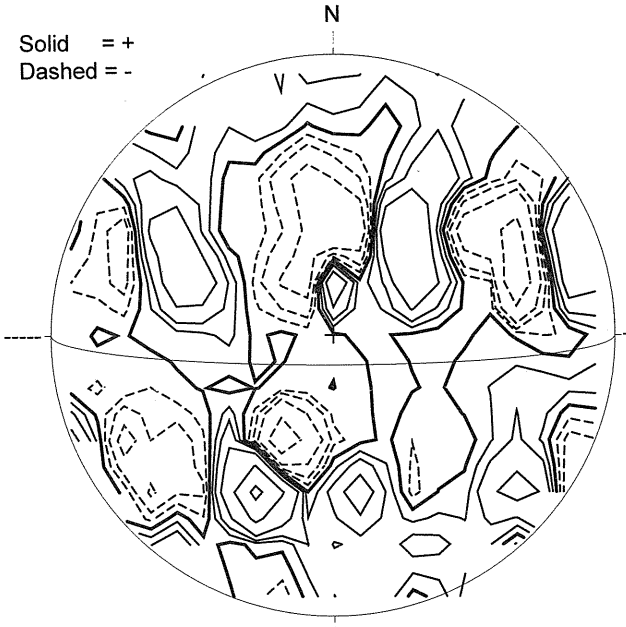
S

OCTOBER 11, 1998 (T = 2[illegible]; B0 = [illegible]; L0 = [illegible])

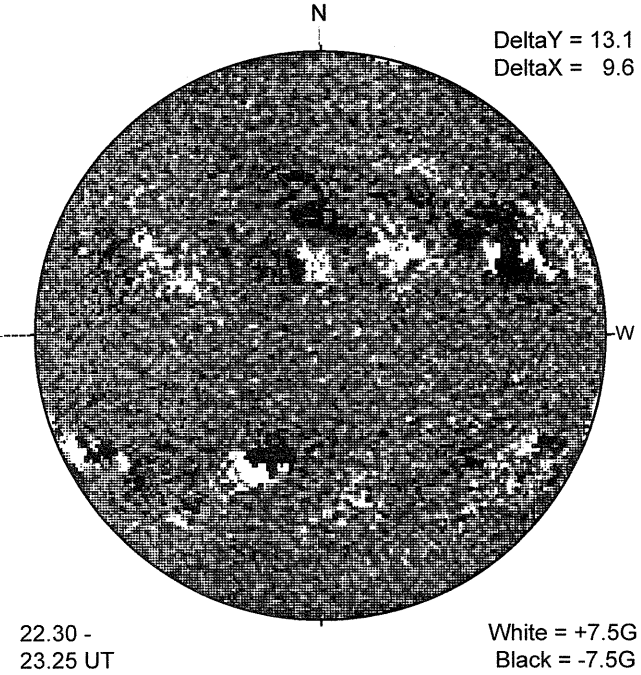
KITT PEAK MAGNETOGRAM



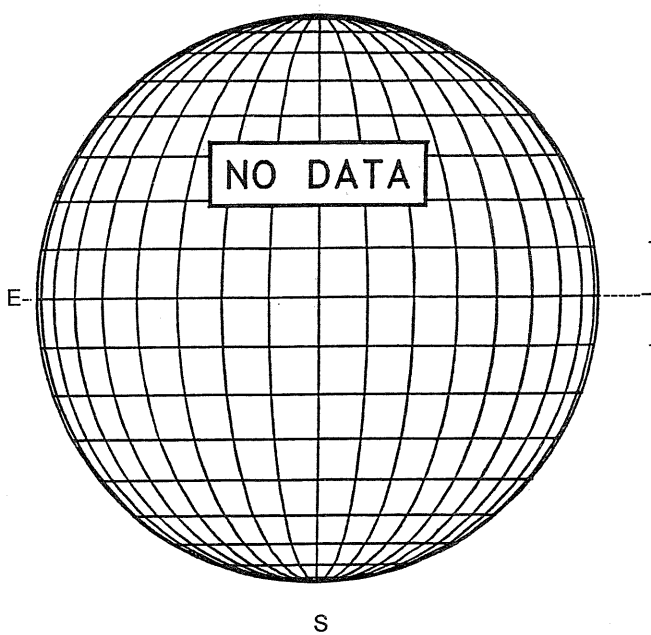
STANFORD MAGNETOGRAM



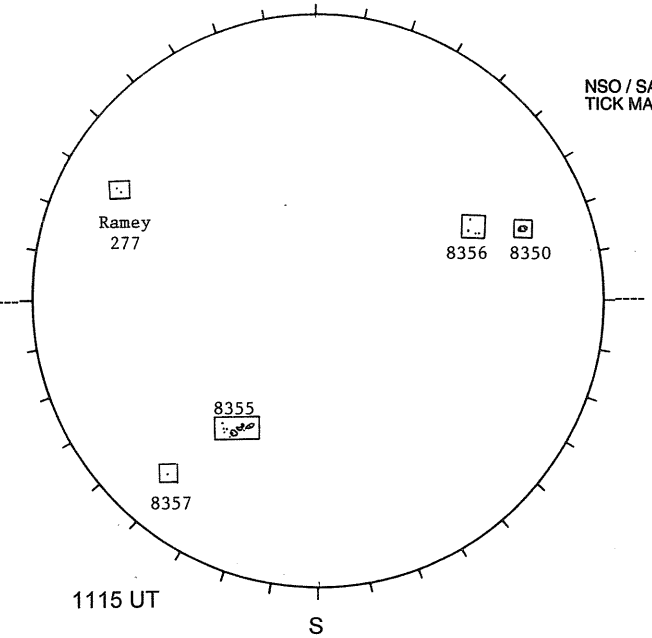
MT. WILSON MAGNETOGRAM



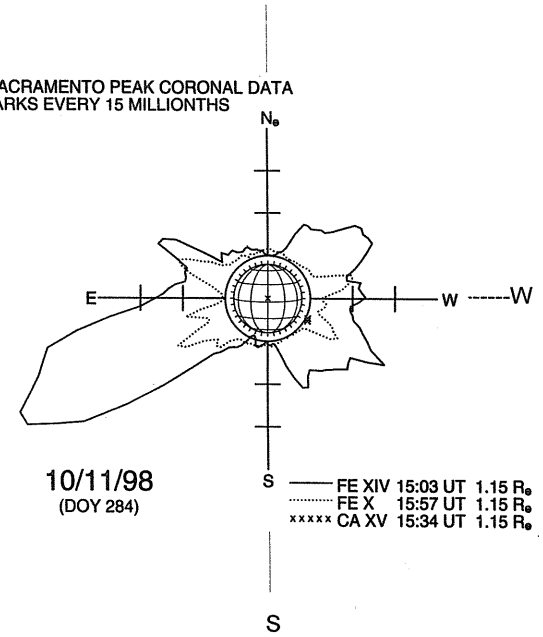
MEUDON H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----

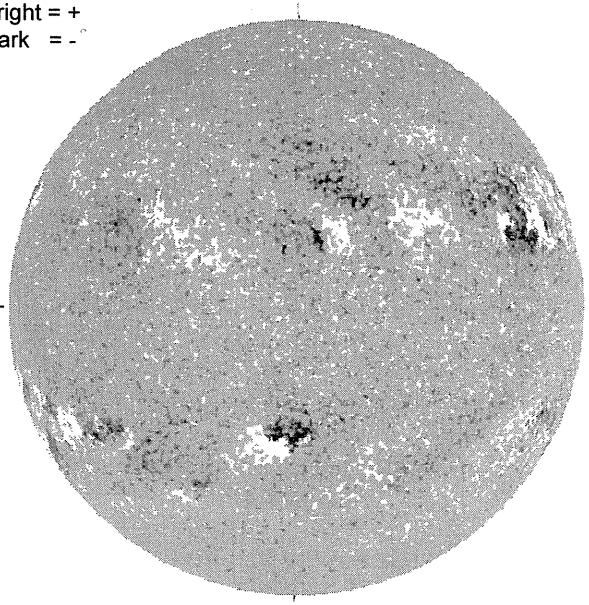


OCTOBER 12, 1998 (P= + 26.29 , Bo = + 6.10 , Lo = 133.26)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



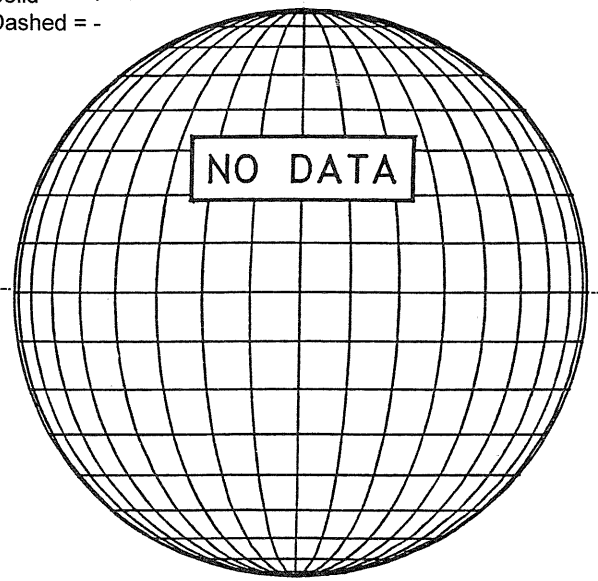
E--

1506 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

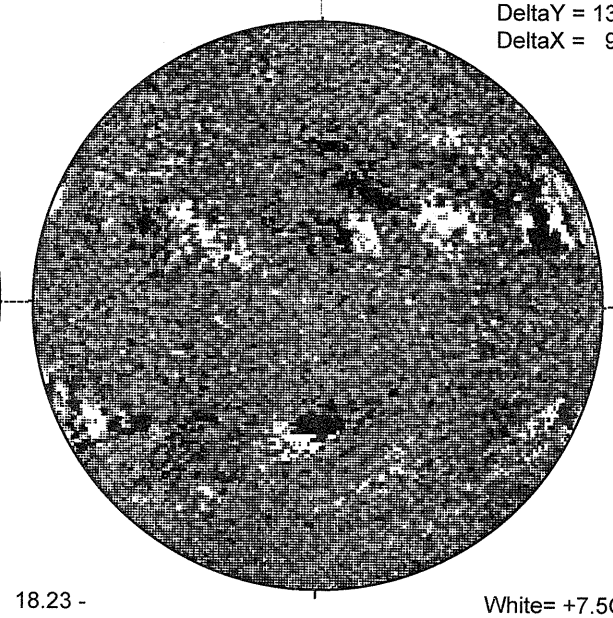


18.23 -
19.18 UT

MT. WILSON MAGNETOGRAM

N

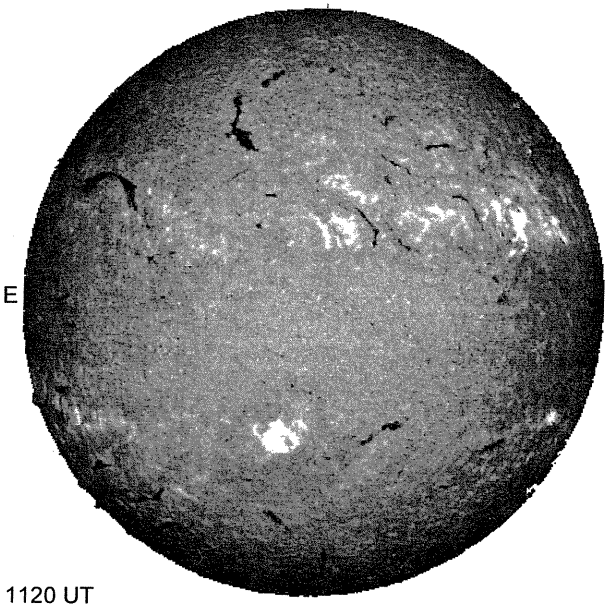
DeltaY = 13.1
DeltaX = 9.6



--W

White= +7.5G
Black = -7.5G

---- MEUDON H-ALPHA

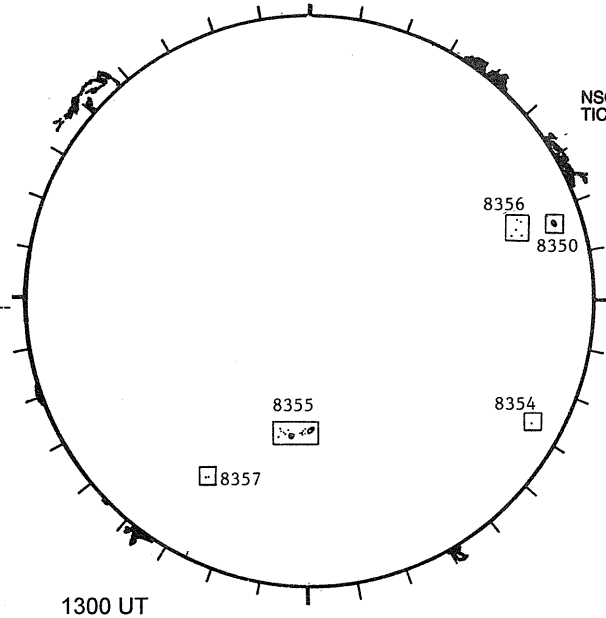


E

1120 UT

S

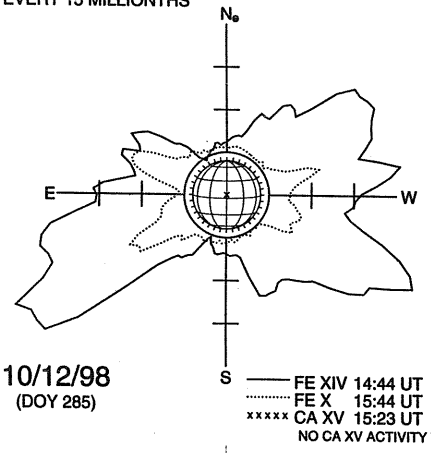
RAMEY SUNSPOT



1300 UT
1002 UT VALA Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS

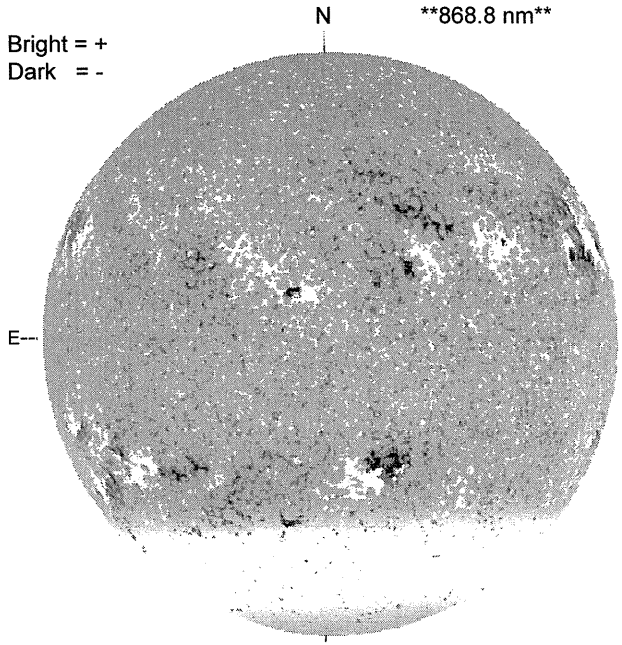


10/12/98
(DOY 285)

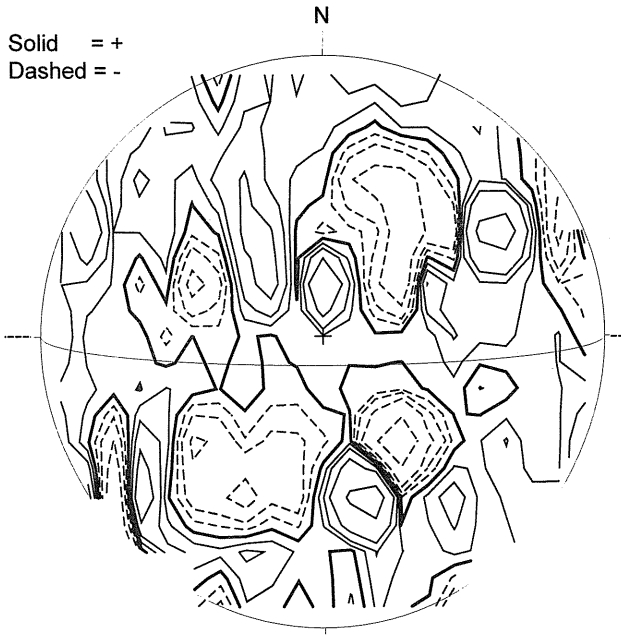
—— FE XIV 14:44 UT 1.15 R
..... FE X 15:44 UT 1.15 R
xxxxx CA XV 15:23 UT 1.15 R
NO CA XV ACTIVITY TODAY

S

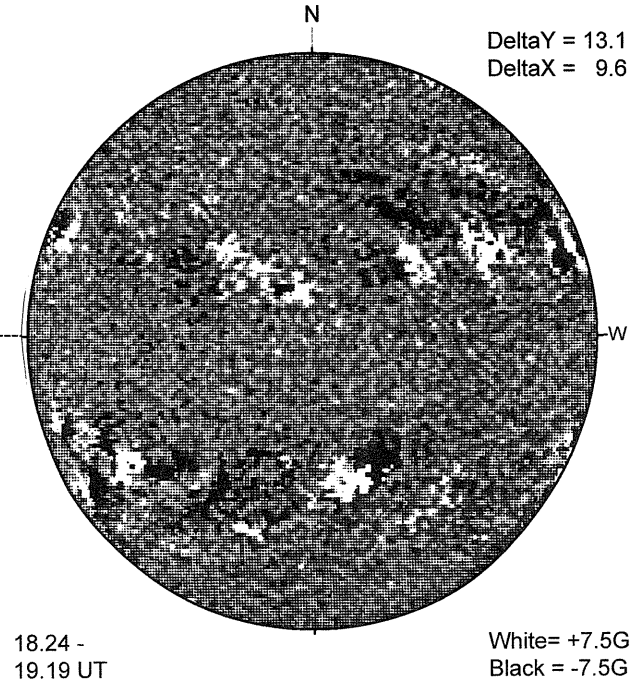
KITT PEAK MAGNETOGRAM



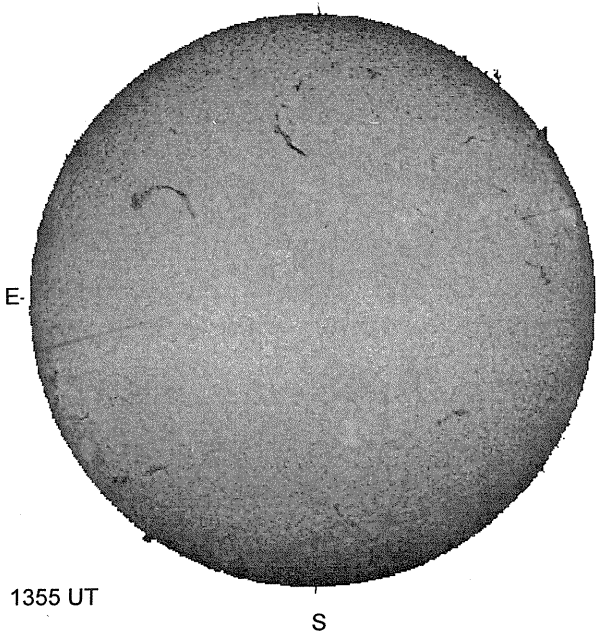
STANFORD MAGNETOGRAM



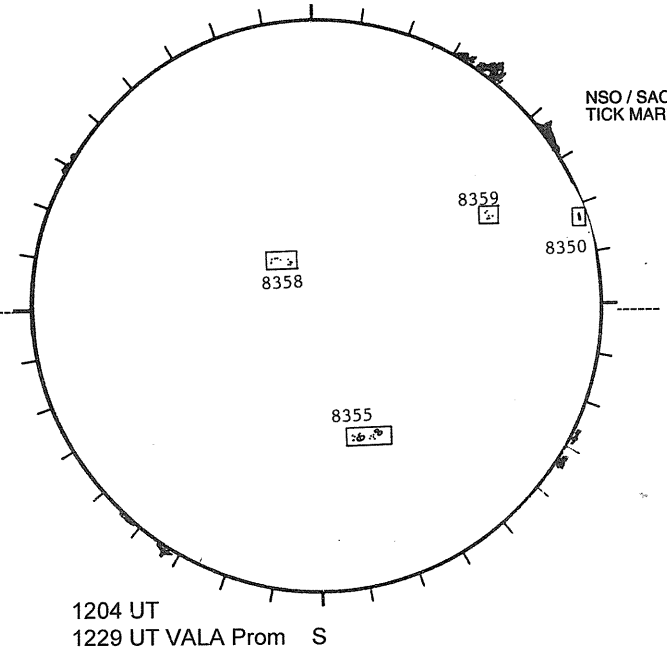
MT. WILSON MAGNETOGRAM



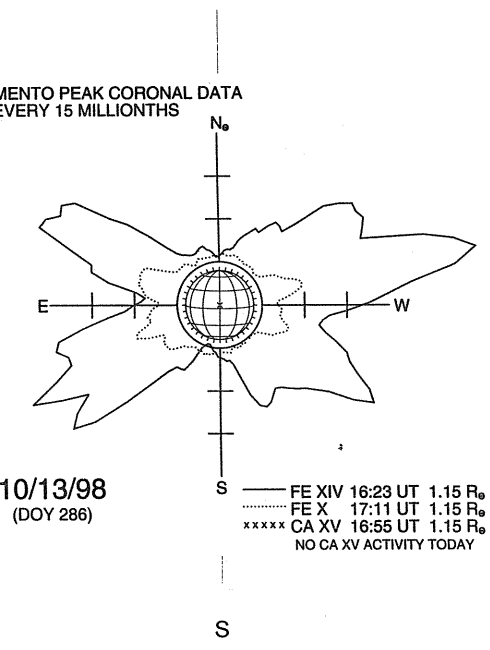
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----

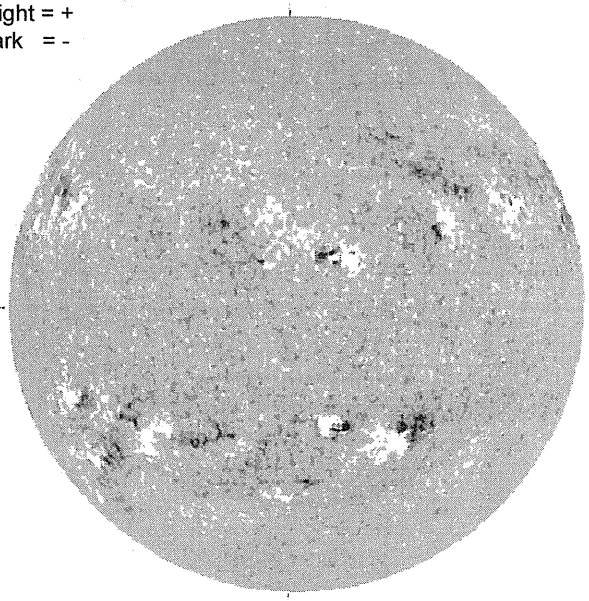


OCTOBER 14, 1998 (P= + 26.25 , Bo = + 5.96 , Lo= 106.88)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



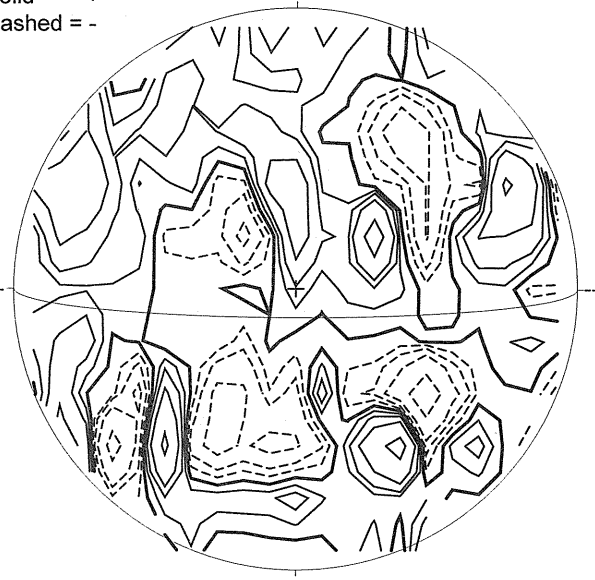
E---

1540 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

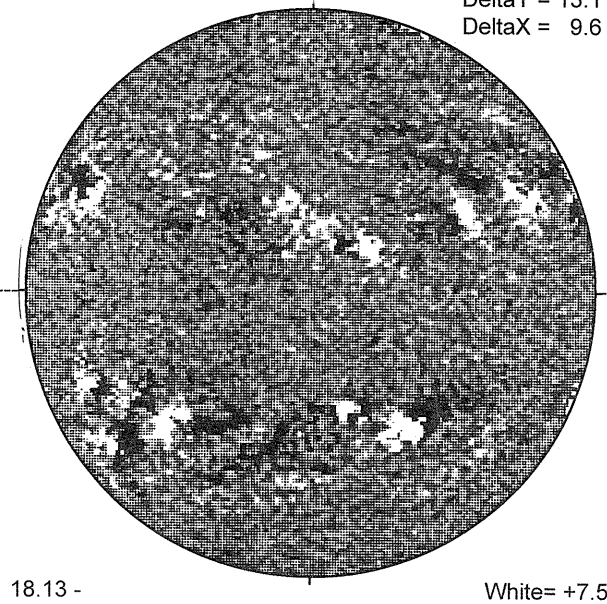


2051 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

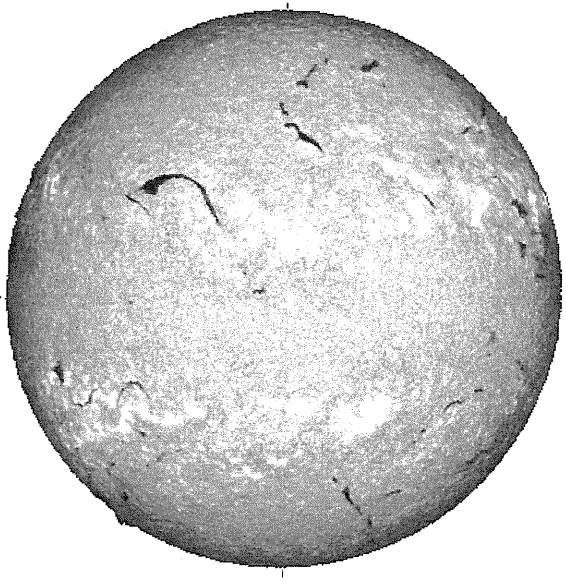


-W

18.13 -
19.08 UT

White= +7.5G
Black = -7.5G

---- MEUDON H-ALPHA

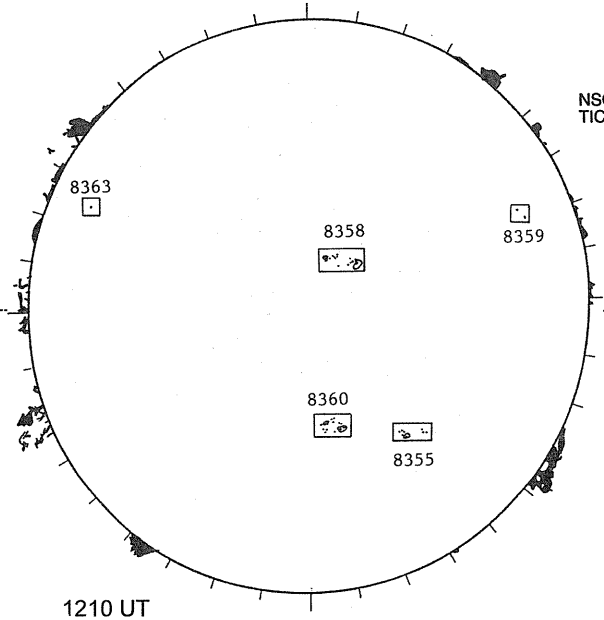


E--

0858 UT

S

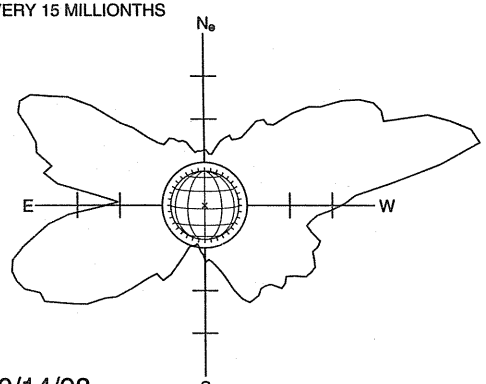
RAMEY SUNSPOT



1210 UT
0640 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)--

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS



10/14/98
(DOY 287)

FE XIV 14:38 UT 1.15 R⊙

S

OCTOBER 15, 1998 (P= + 26.22 , B0 = + 5.88 , L0 = 93.69)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -

E-

1540 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

2048 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 20.1
DeltaX = 12.9

-W

16.27 -
16.69 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

NO DATA

E--

S

RAMEY SUNSPOT

8363
8362
8361
8358
Ramey
280
8360
8355

1329 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NO DATA

S

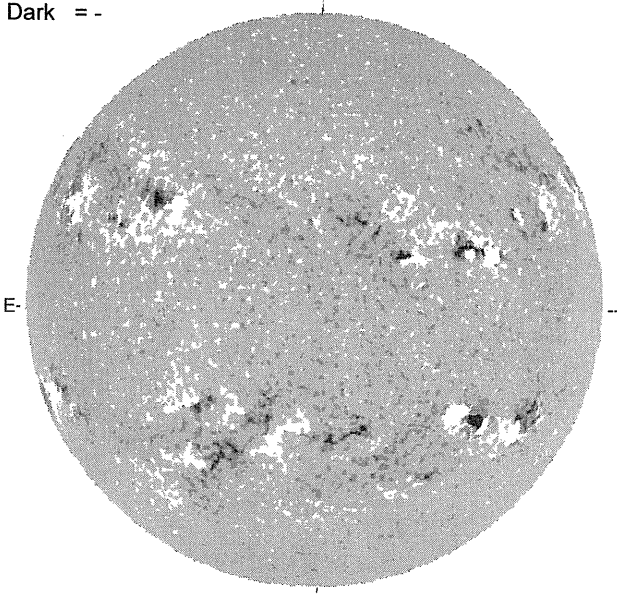
OCTOBER 16, 1998 (P = + 26.18 , Bo = + 5.81 , Lo = 80.50)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



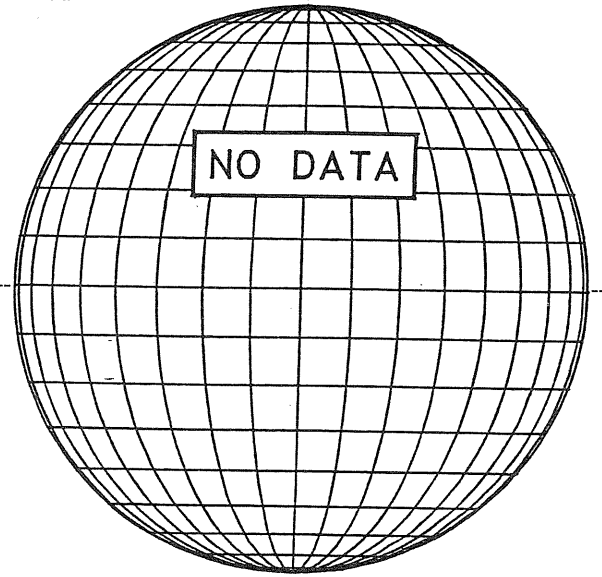
E-

1533 UT

STANFORD MAGNETOGRAM

N

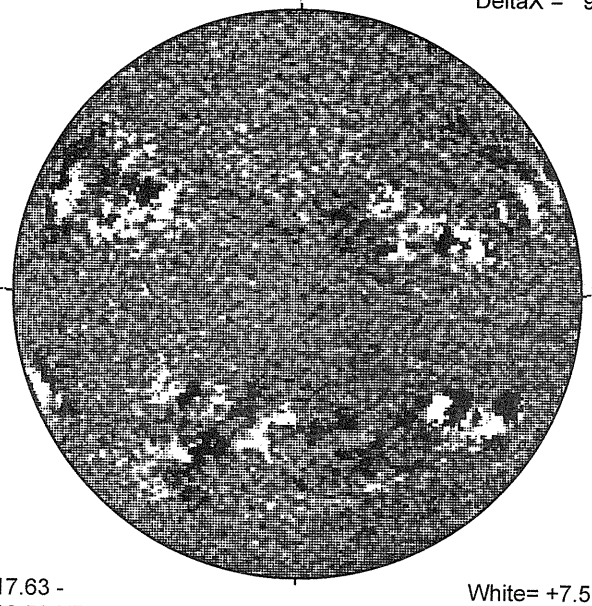
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

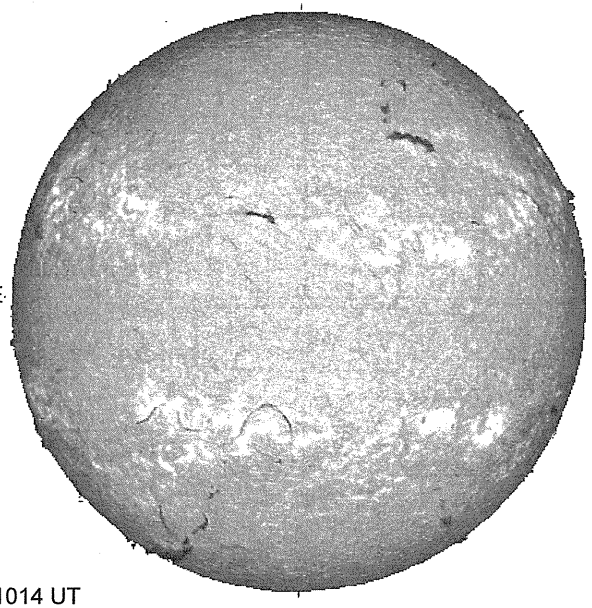


W

17.63 -
18.58 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

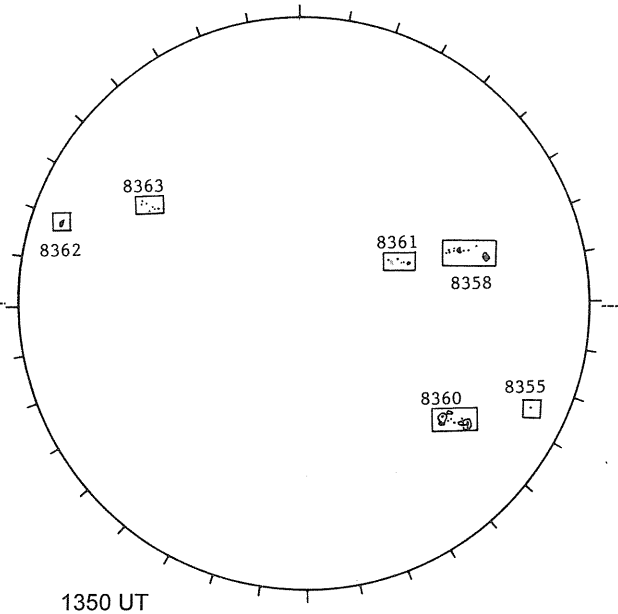


E-

1014 UT

S

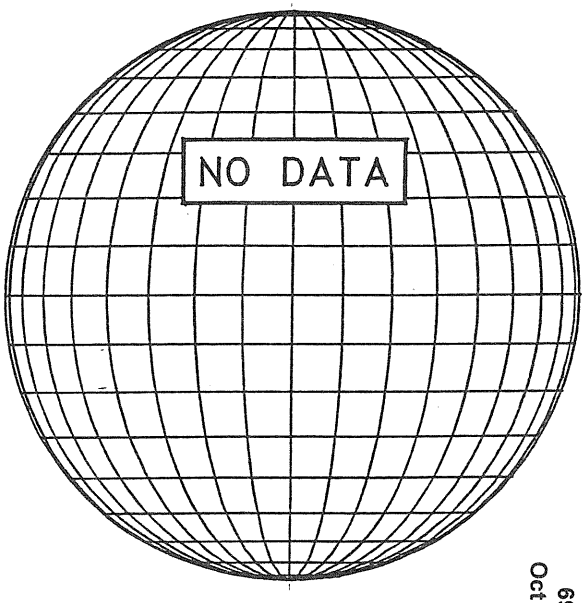
RAMEY SUNSPOT



1350 UT

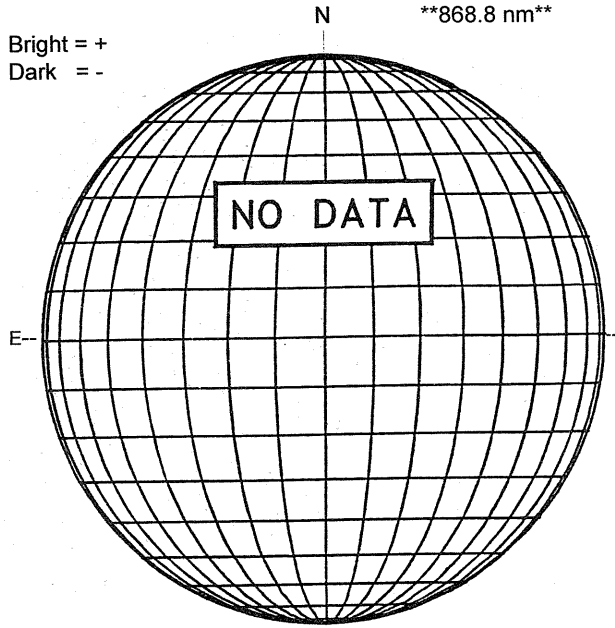
S

SACRAMENTO PEAK CORONA (1.15 Radii)----

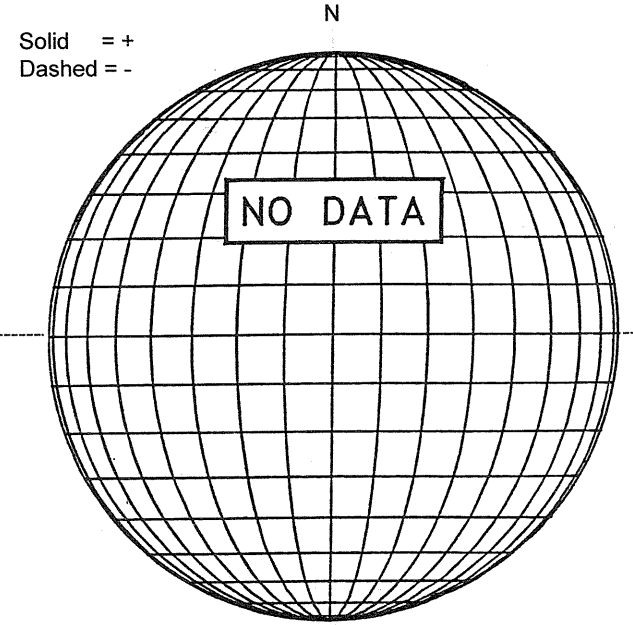


S

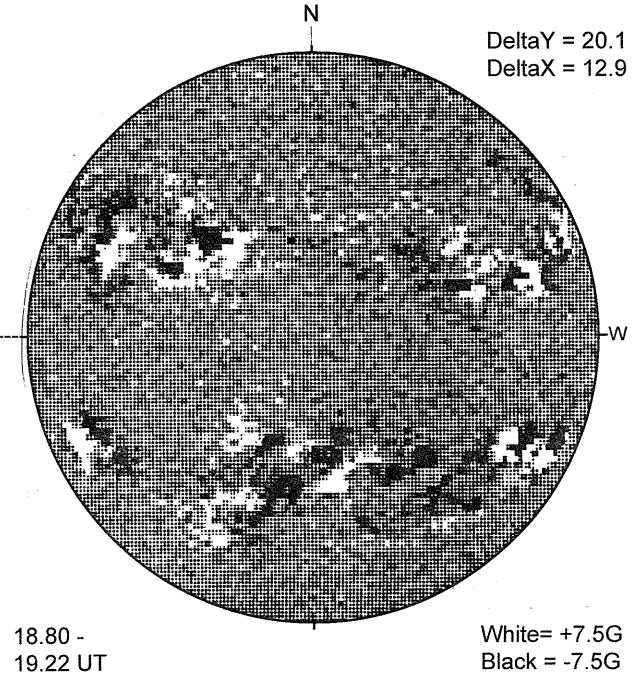
KITT PEAK MAGNETOGRAM



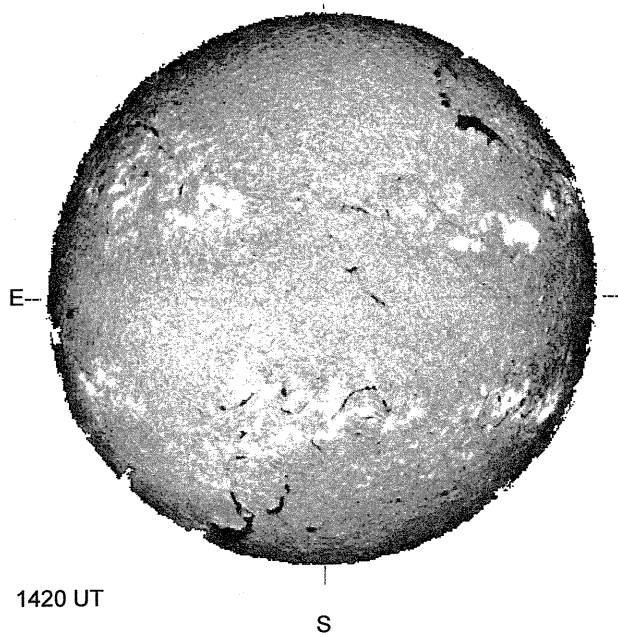
STANFORD MAGNETOGRAM



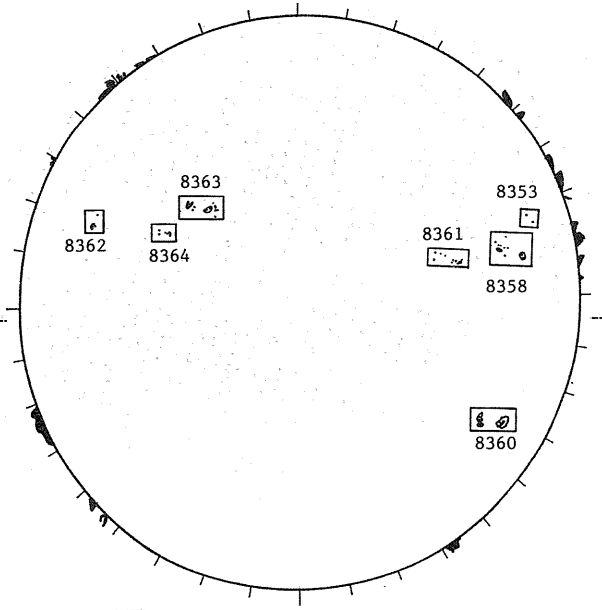
MT. WILSON MAGNETOGRAM



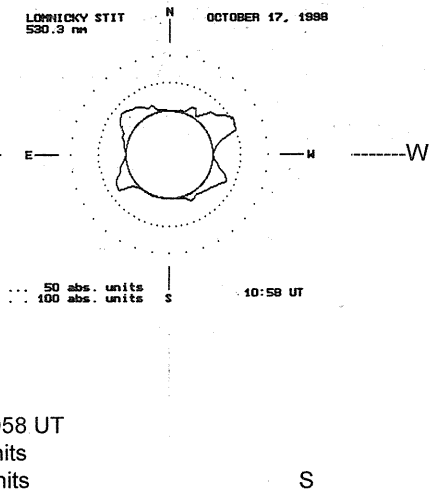
MEUDON H-ALPHA



RAMEY SUNSPOT

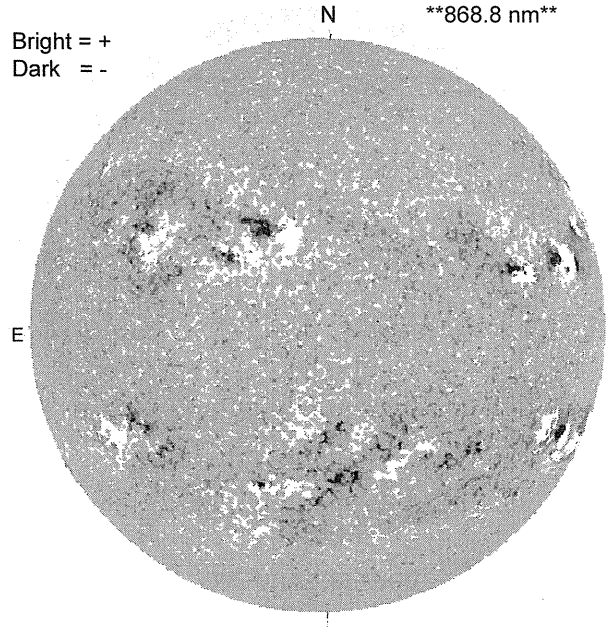


LOMNICKY PEAK CORONA (1.04 Radii)----

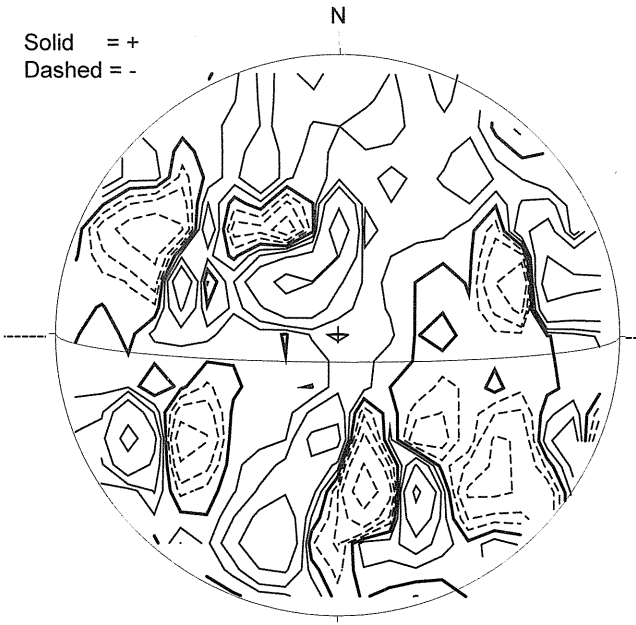


OCTOBER 18, 1998 (P= + 26.09 , Bo = + 5.66 , Lo = 54.12)

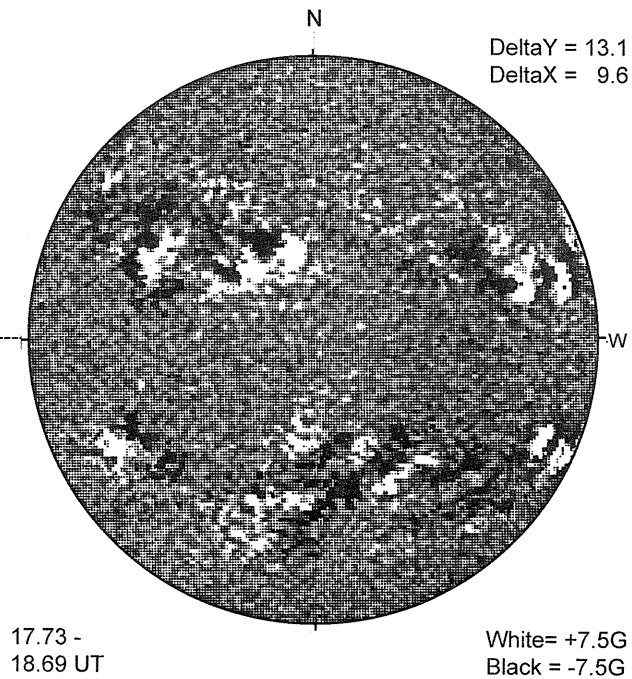
KITT PEAK MAGNETOGRAM



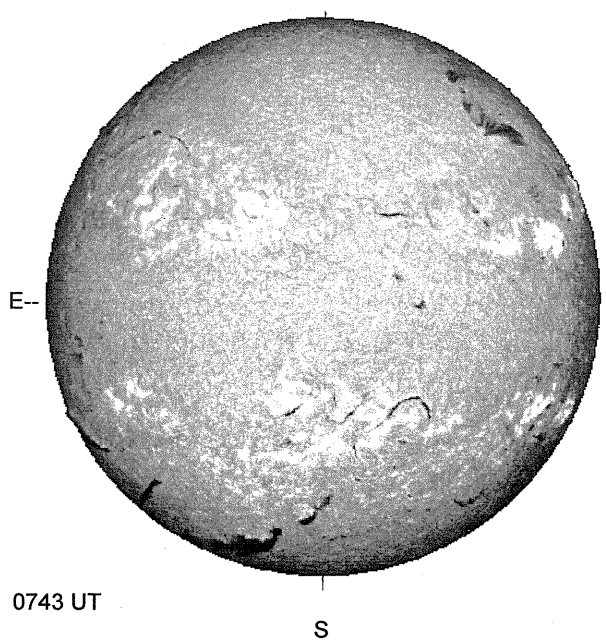
STANFORD MAGNETOGRAM



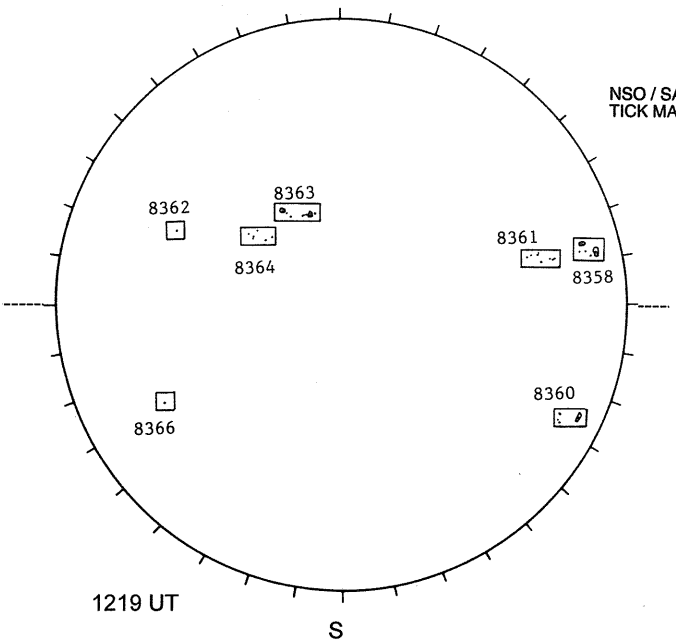
MT. WILSON MAGNETOGRAM



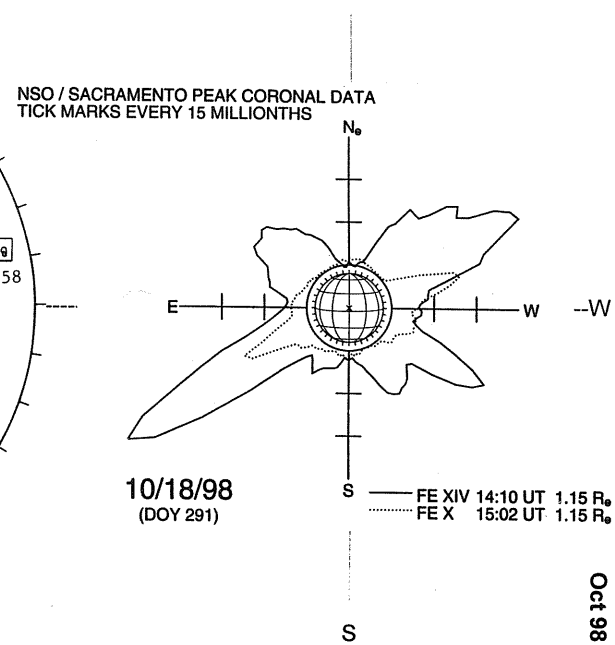
MEUDON H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----



OCTOBER 19, 1998 (P= + 26.03 , B0 = + 5.58 , L0 = 40.93)

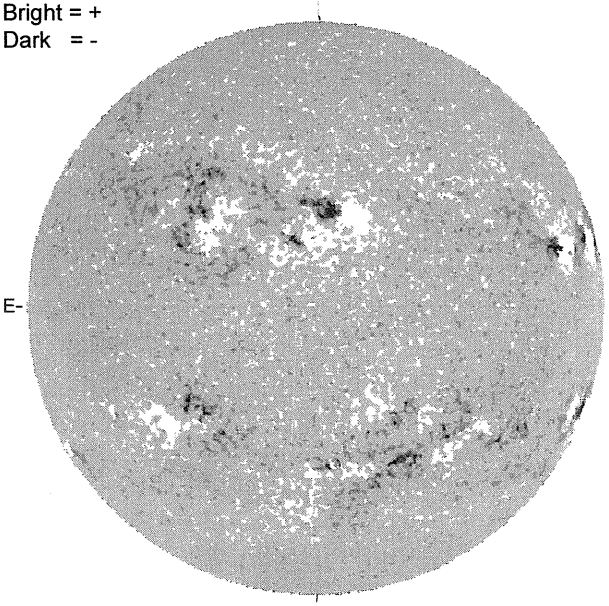
KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -

E-



1739 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

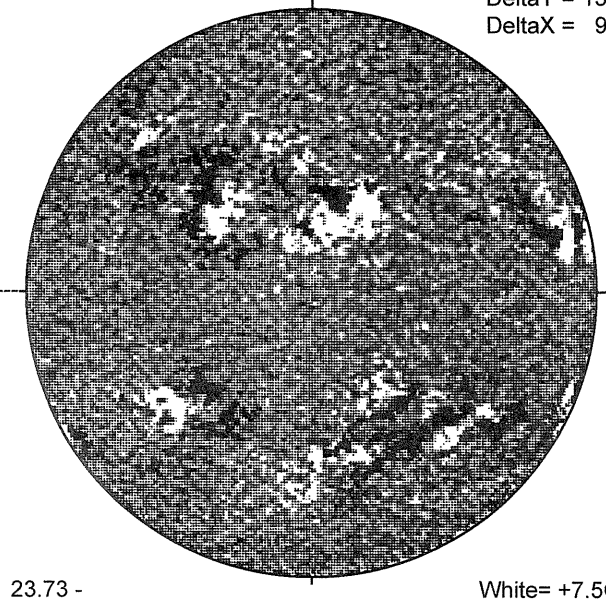
2056 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.7

-W

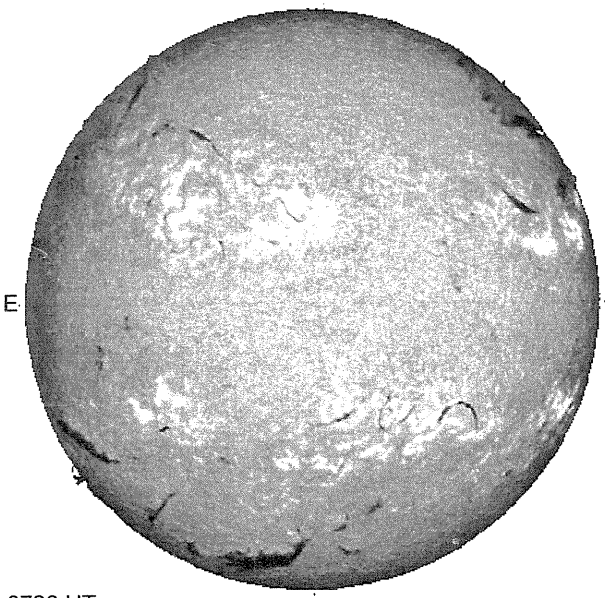


23.73 -
24.68 UT

White= +7.5G
Black = -7.5G

---- MEUDON H-ALPHA

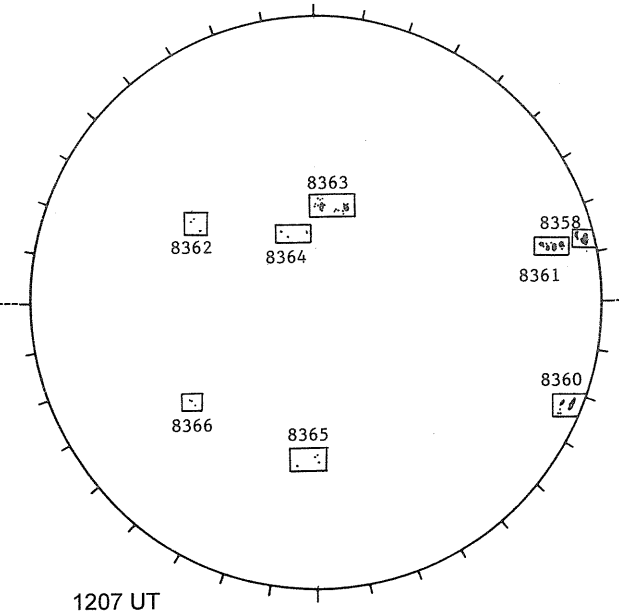
E-



0726 UT

S

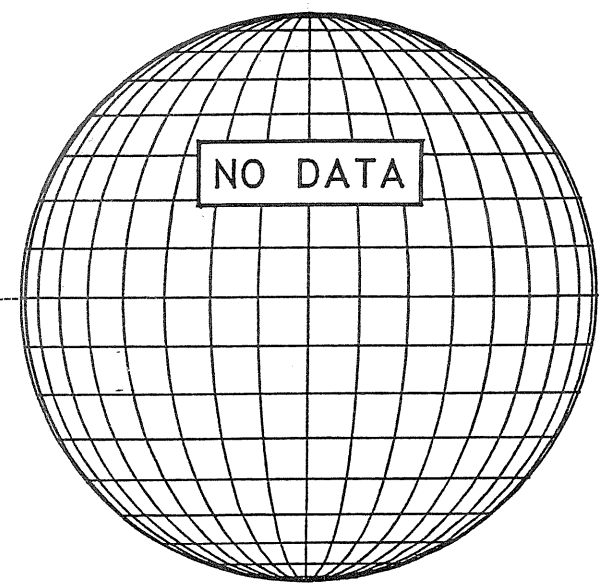
RAMEY SUNSPOT



1207 UT

S

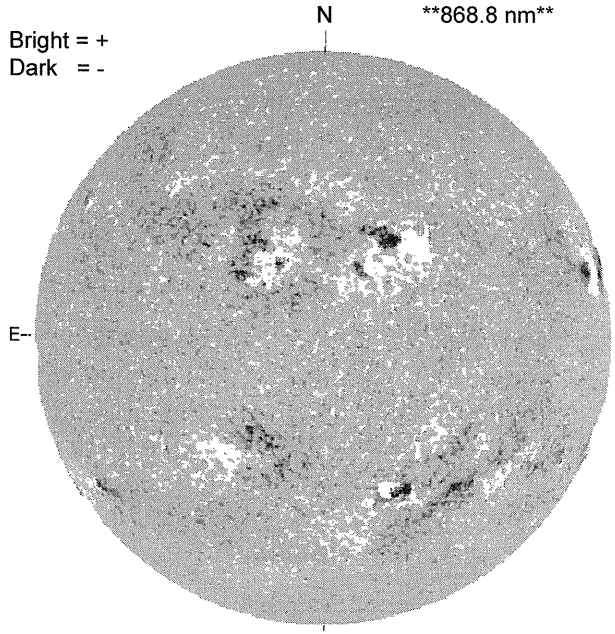
SACRAMENTO PEAK CORONA (1.15 Radii)----



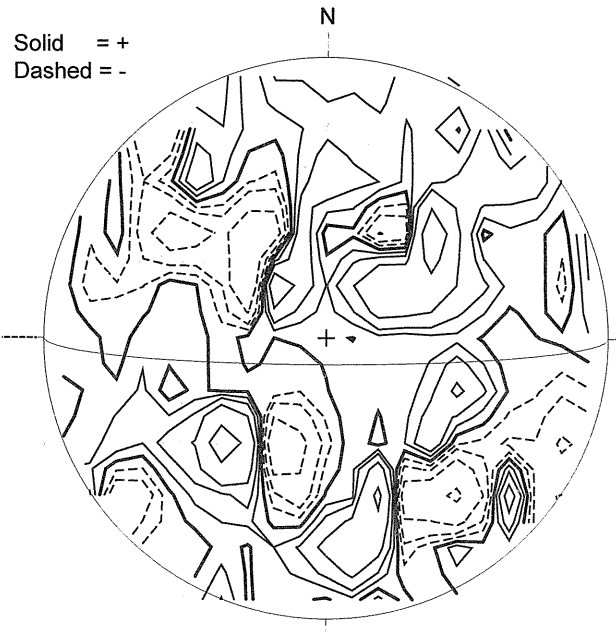
S

OCTOBER 20, 1998 (P= + 25.96 , Bo = + 5.50 , Lo = 27.74)

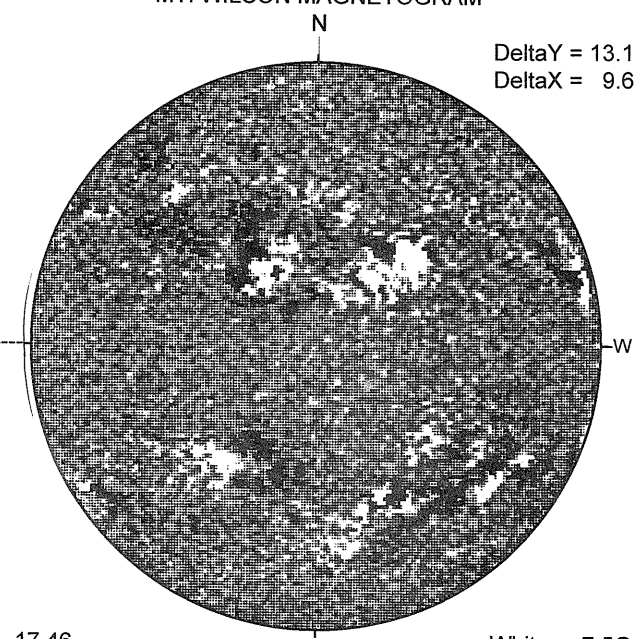
KITT PEAK MAGNETOGRAM



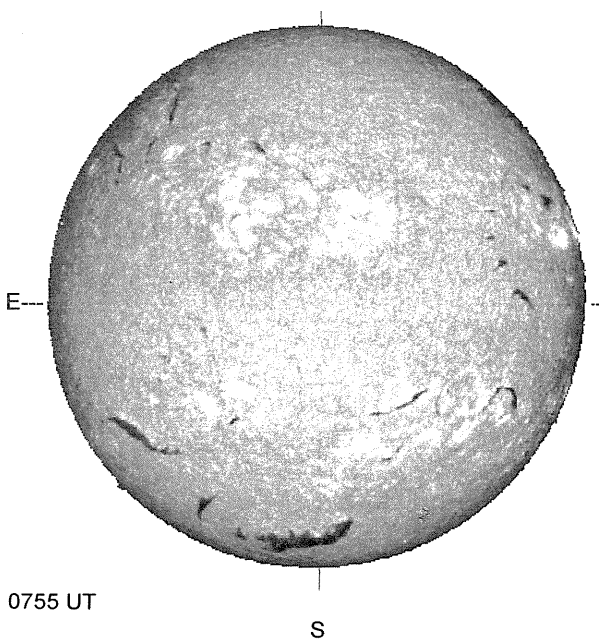
STANFORD MAGNETOGRAM



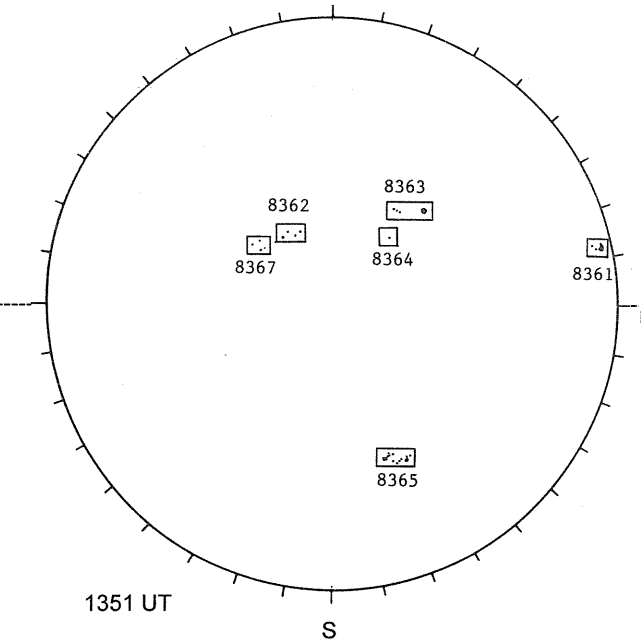
MT. WILSON MAGNETOGRAM



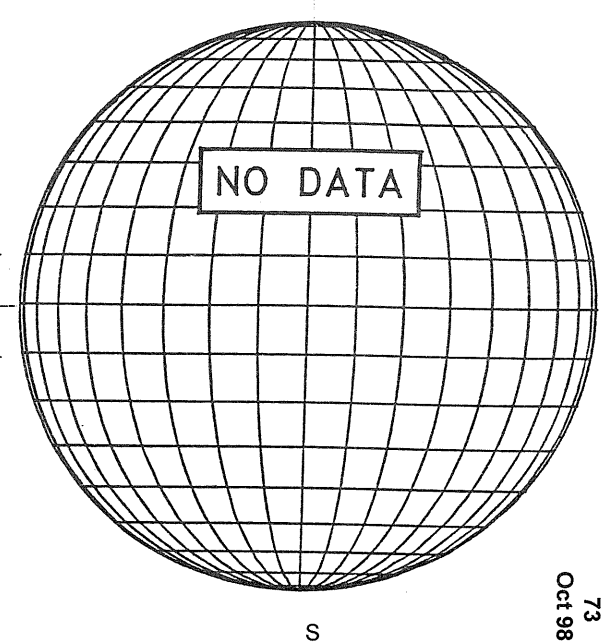
MEUDON H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----



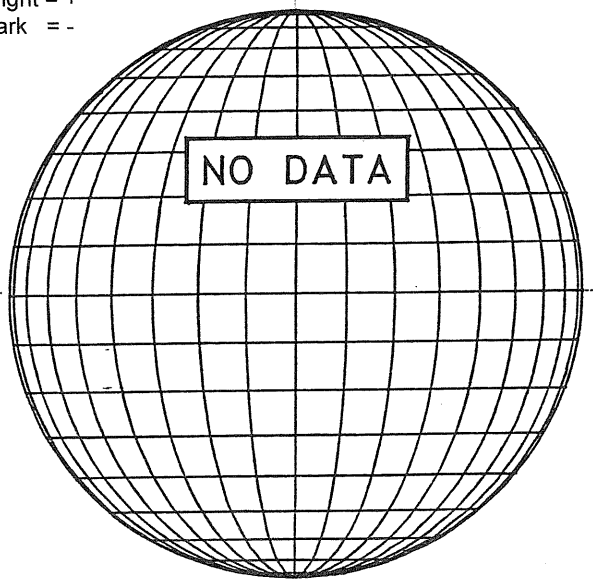
OCTOBER 21, 1998 (P= + 25.89 , B0 = + 5.41 , L0 = 14.55)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -

E-



STANFORD MAGNETOGRAM

N

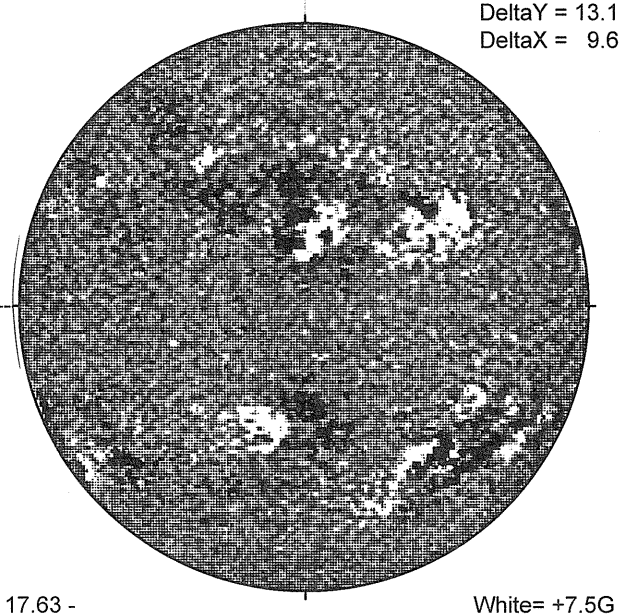
Solid = +
Dashed = -

1839 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

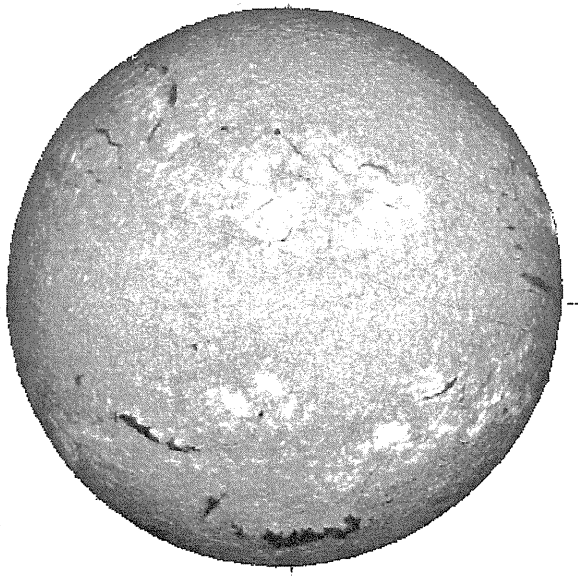


17.63 -
18.58 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

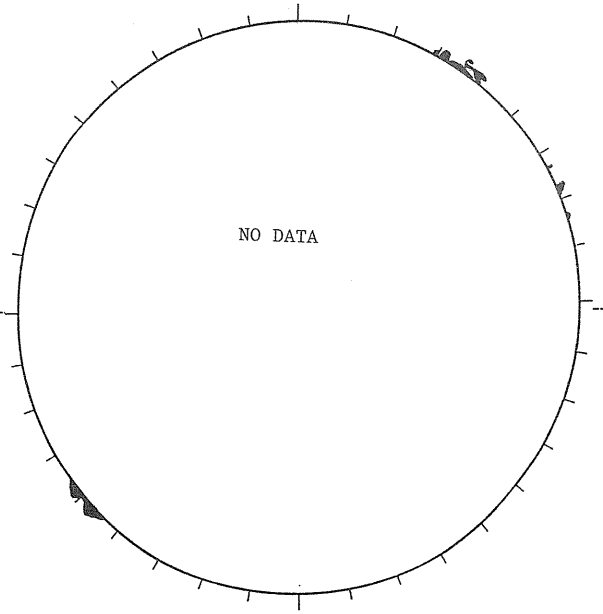
E-



1000 UT

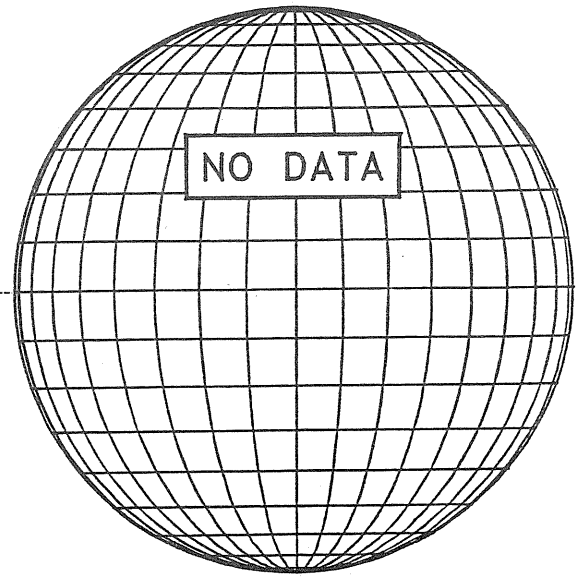
S

HOLLOMAN SUNSPOT



0737 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)---



S

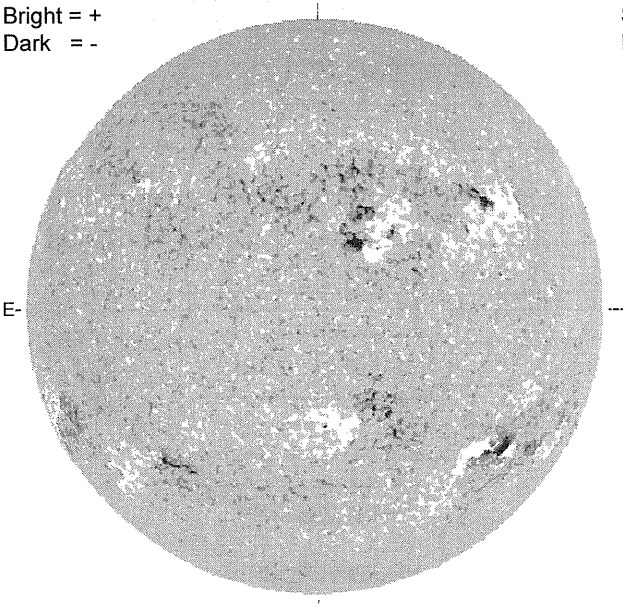
OCTOBER 22, 1998 (P= + 25.80 , Bo = + 5.33 , Lo = 1.36)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



E-

1455 UT

STANFORD MAGNETOGRAM

N

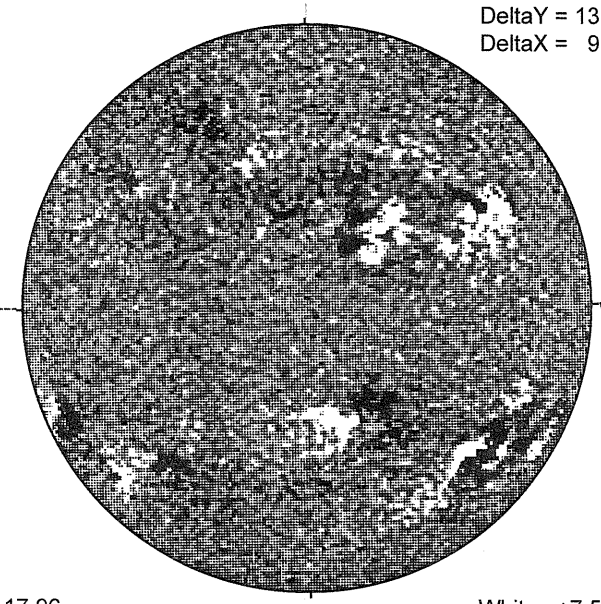
Solid = +
Dashed = -

2213 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

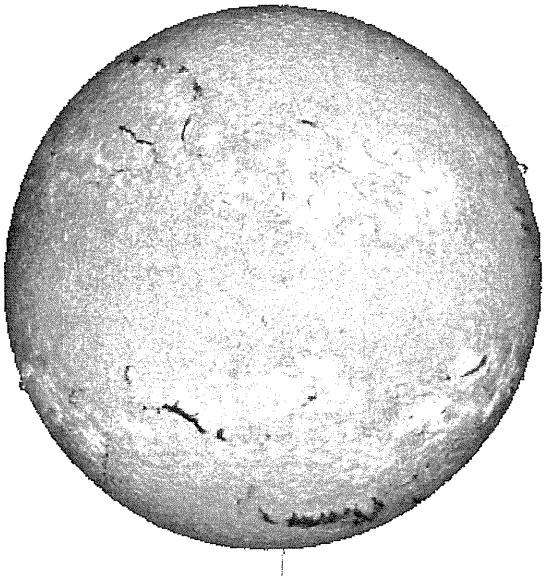


W

17.96 -
18.92 UT

White= +7.5G
Black = -7.5G

---- MEUDON H-ALPHA

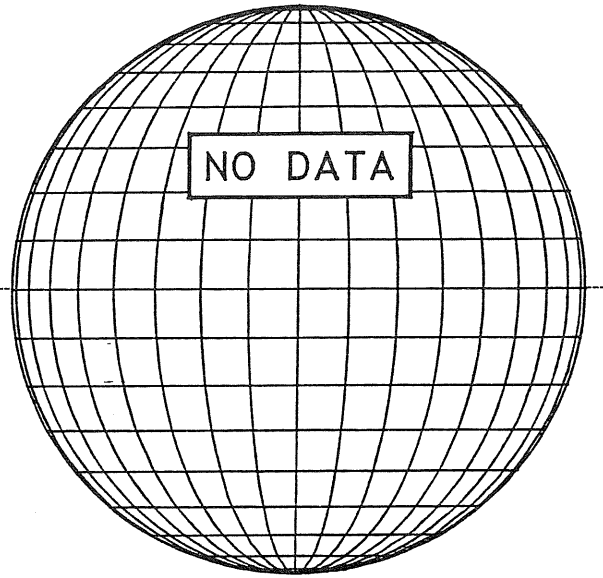


E--

1116 UT

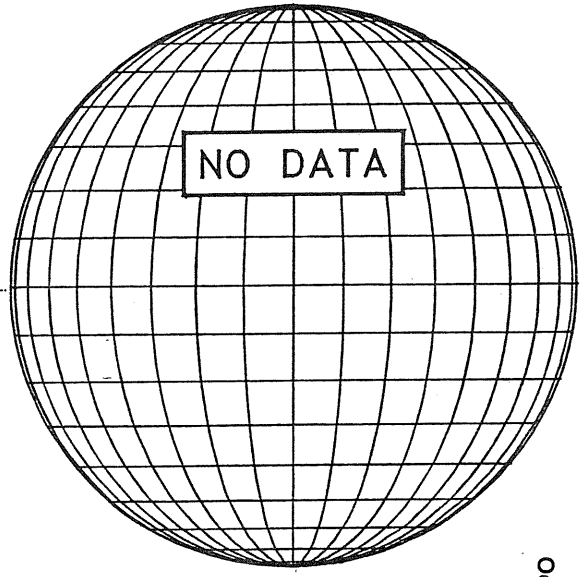
S

HOLLOMAN SUNSPOT



S

SACRAMENTO PEAK CORONA (1.15 Radii)---

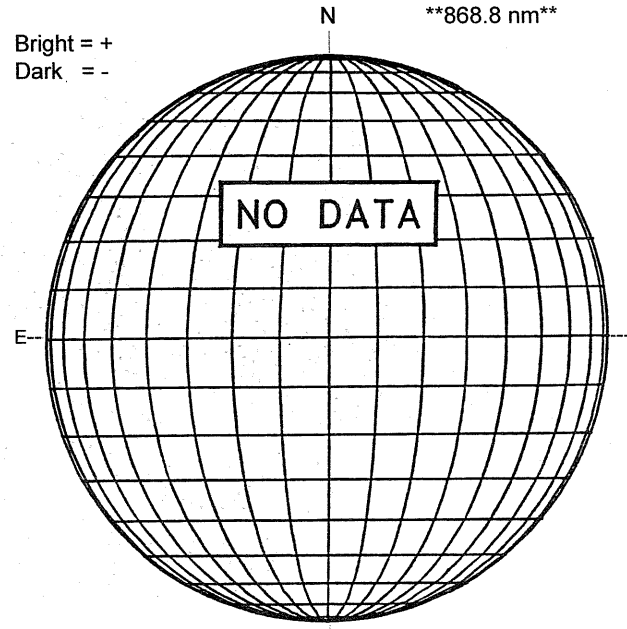


S

75
Oct 98

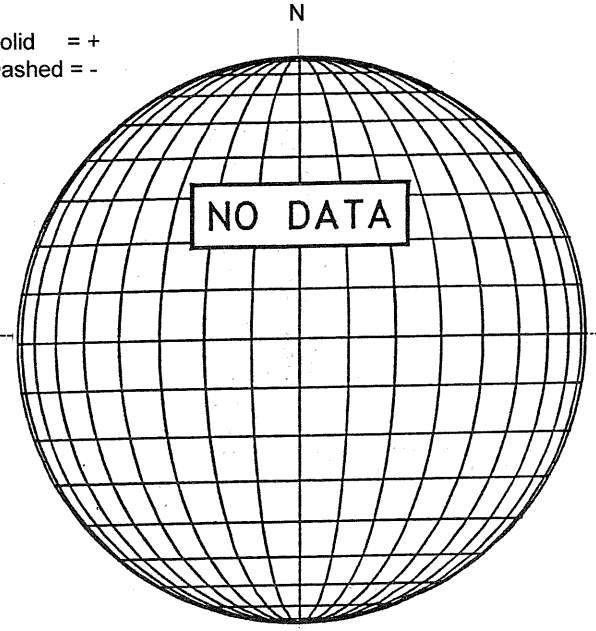
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



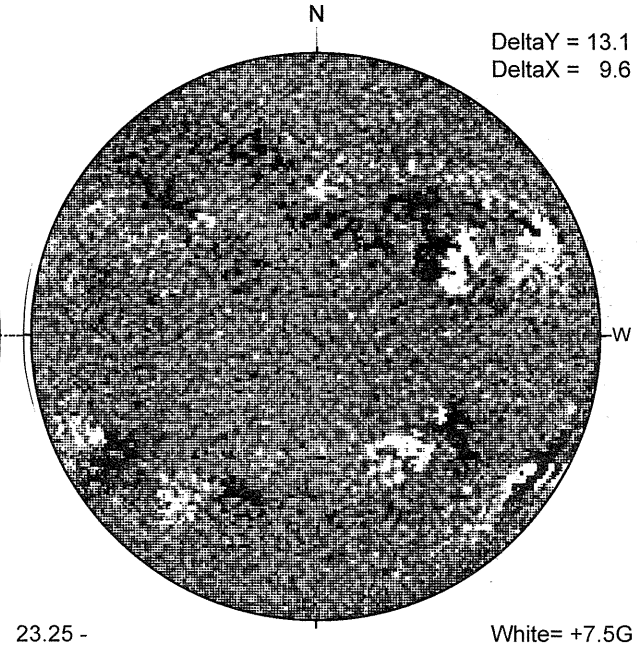
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

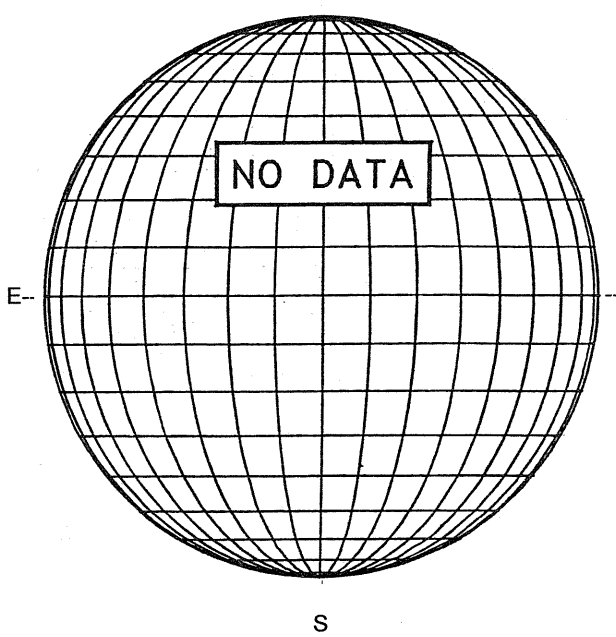
DeltaY = 13.1
DeltaX = 9.6



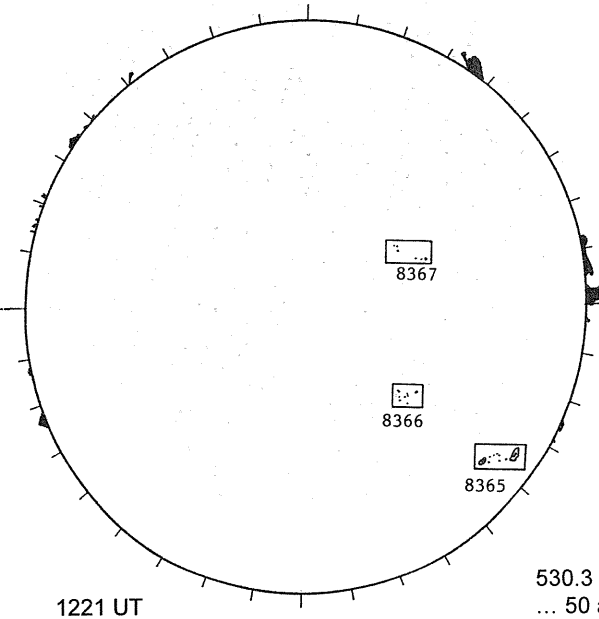
23.25 -
24.20 UT

White= +7.5G
Black = -7.5G

MENDON H-ALPHA

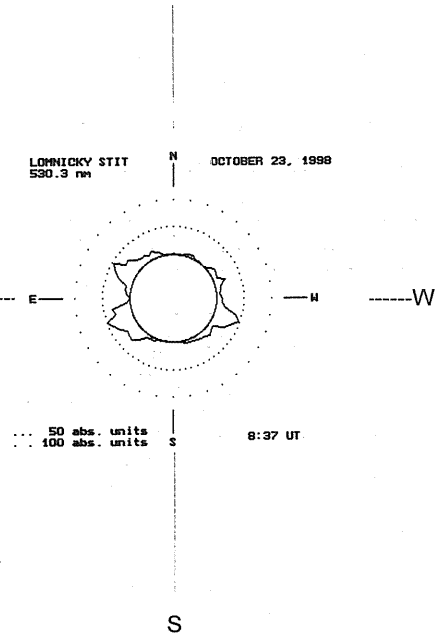


RAMEY SUNSPOT



1221 UT
0737 UT LOMN Prom

LOMNICKY PEAK CORONA (1.04 Radii)---



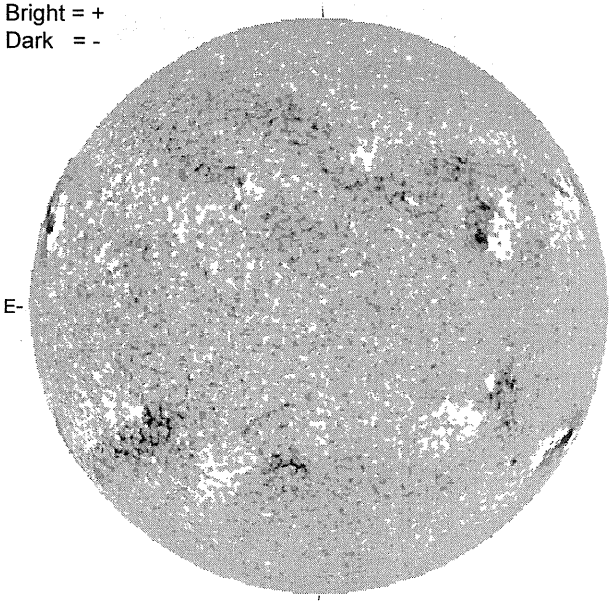
530.3 nm, 0837 UT
... 50 abs. units
. .100 abs. units

OCTOBER 24, 1998 (P= + 25.61 , Bo = + 5.15 , Lo = 334.99)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



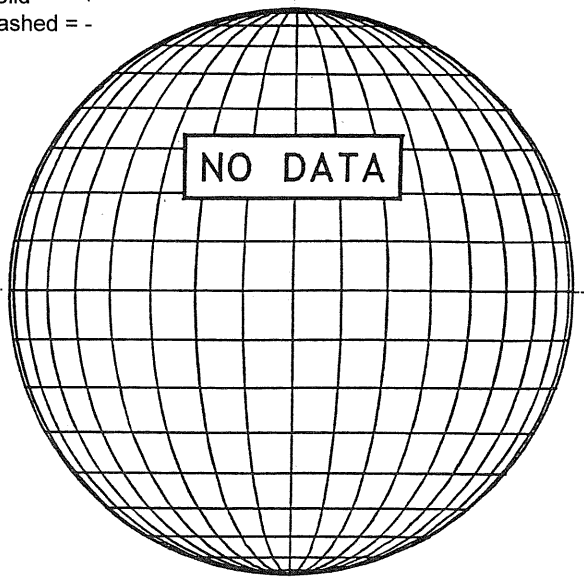
E-

1759 UT

STANFORD MAGNETOGRAM

N

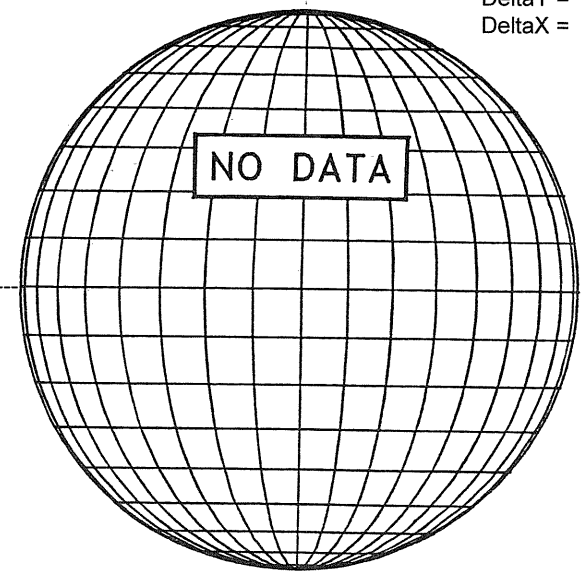
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

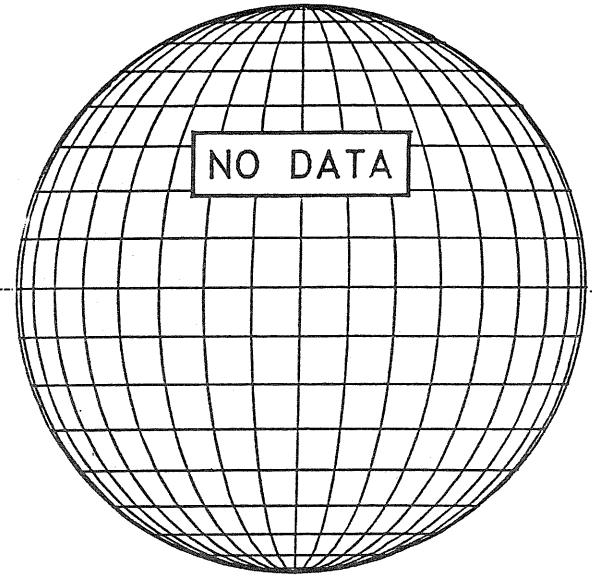
DeltaY =
DeltaX =



--W

White= +7.5G
Black = -7.5G

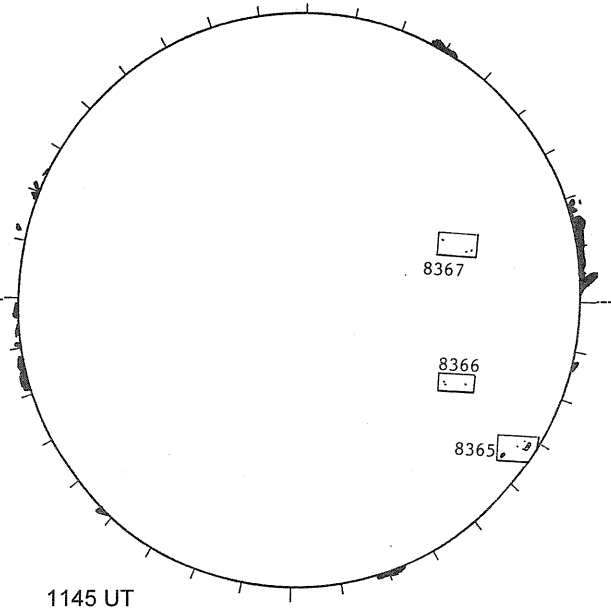
----- MEUDON H-ALPHA



E--

S

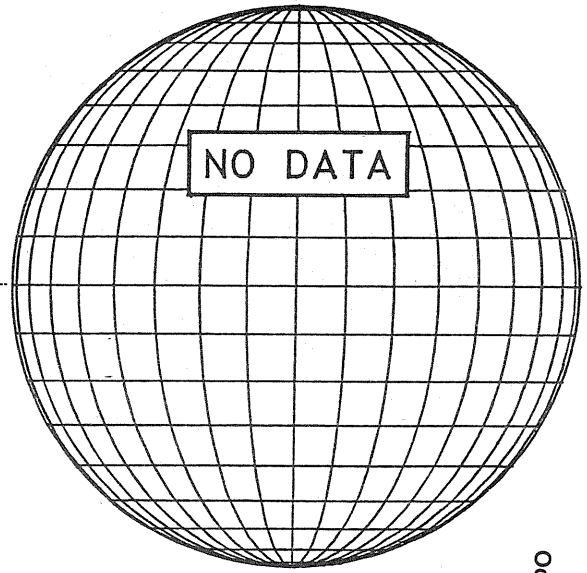
RAMEY SUNSPOT



1145 UT
0655 LOMN Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)----



S

77
Oct 98

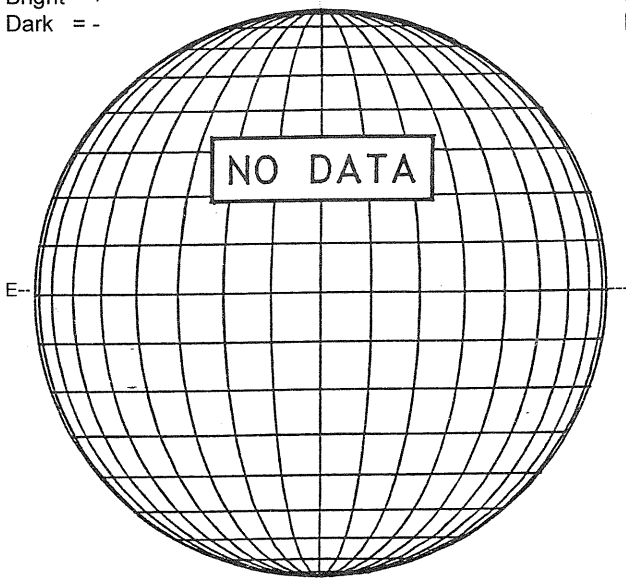
OCTOBER 25, 1998 (P= + 25.51 , Bo = + 5.06 , Lo = 321.80)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -

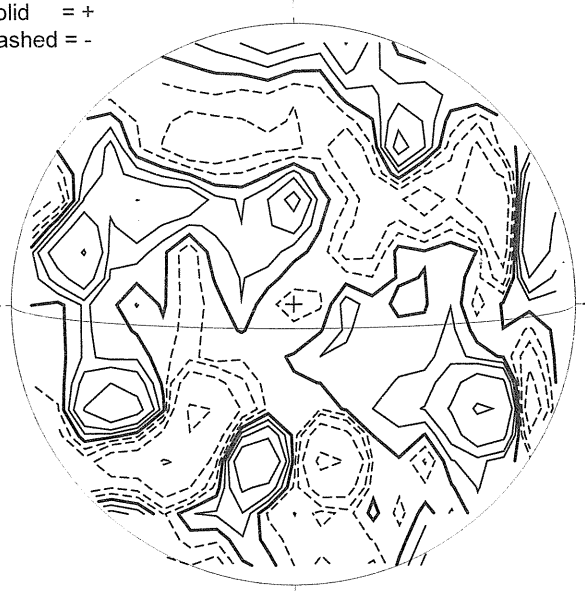


E--

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

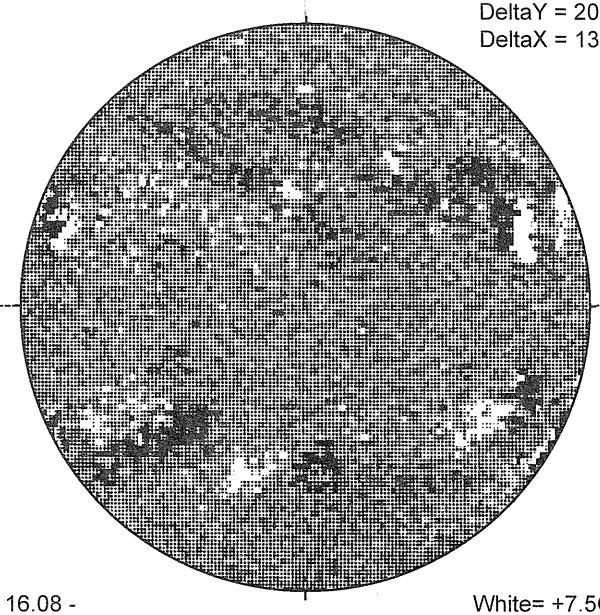


2343 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 20.1
DeltaX = 13.0

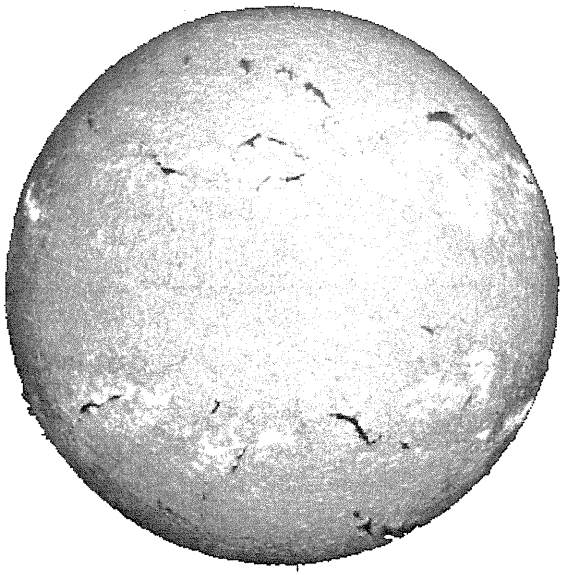


-W

16.08 -
16.50 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

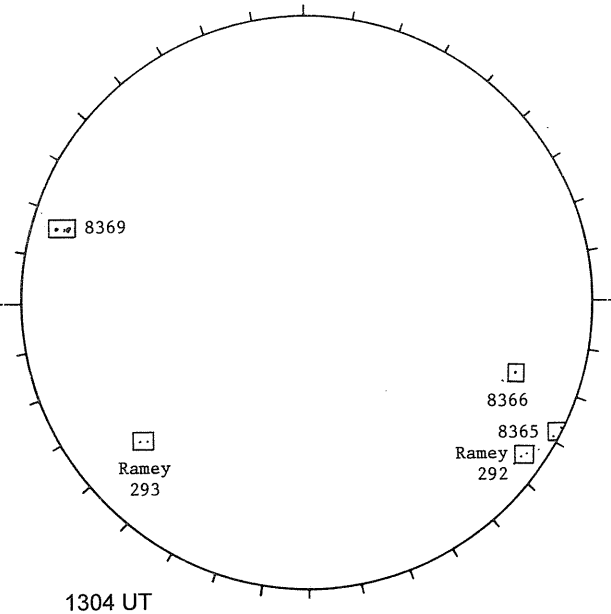


E-

0726 UT

S

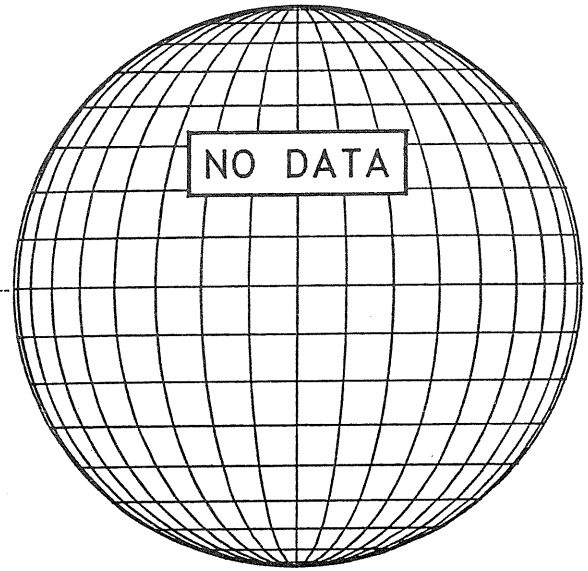
RAMEY SUNSPOT



1304 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----



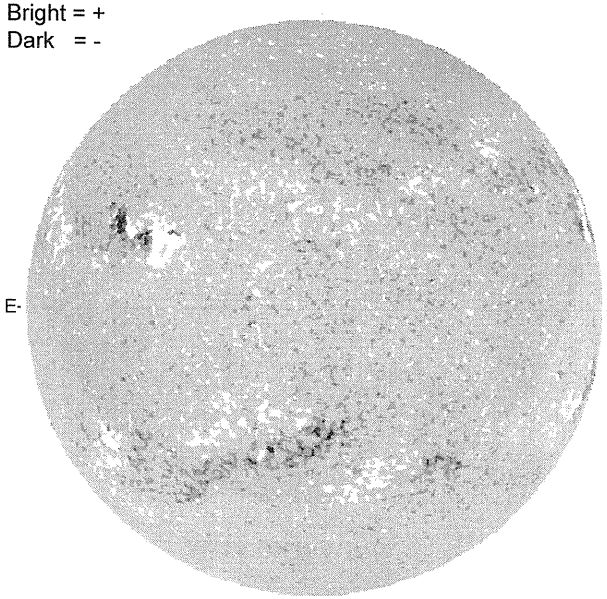
S

OCTOBER 26, 1998 (P= + 25.39 , Bo = + 4.97 , Lo = 308.61)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



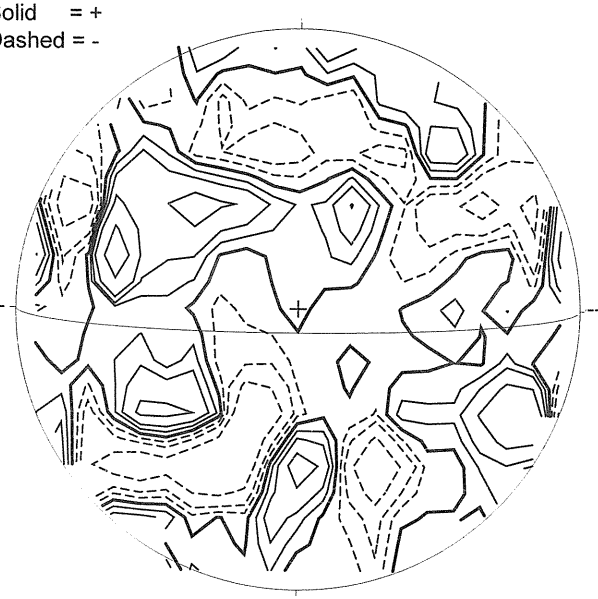
E-

1721 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

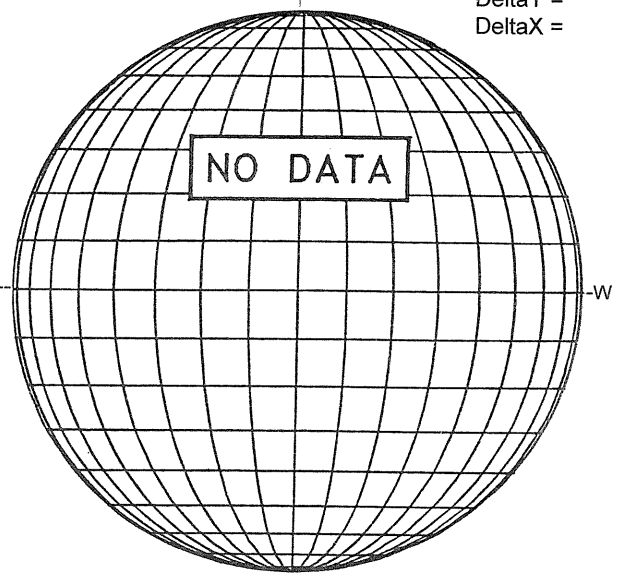


2108 UT

MT. WILSON MAGNETOGRAM

N

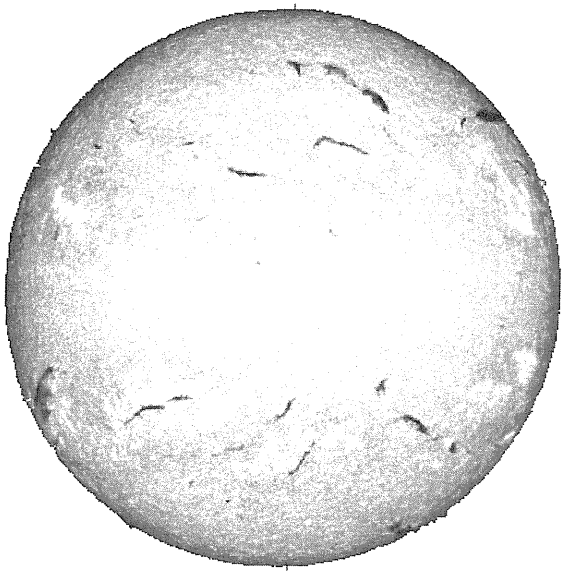
DeltaY =
DeltaX =



-W

White= +7.5G
Black = -7.5G

---- MEUDON H-ALPHA

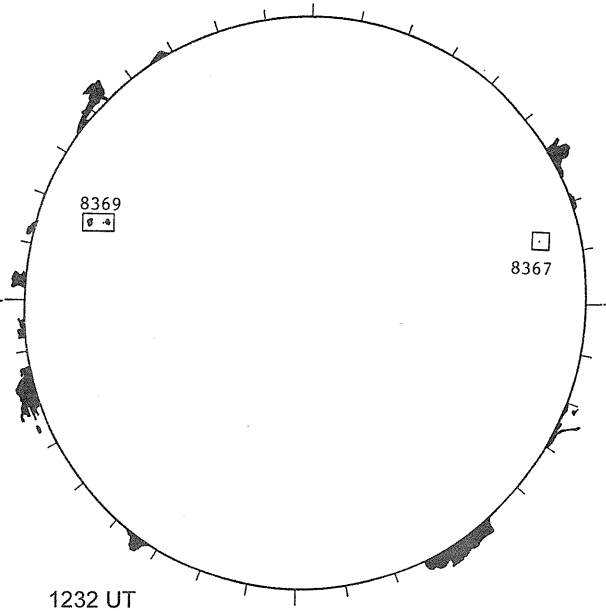


E-

1430 UT

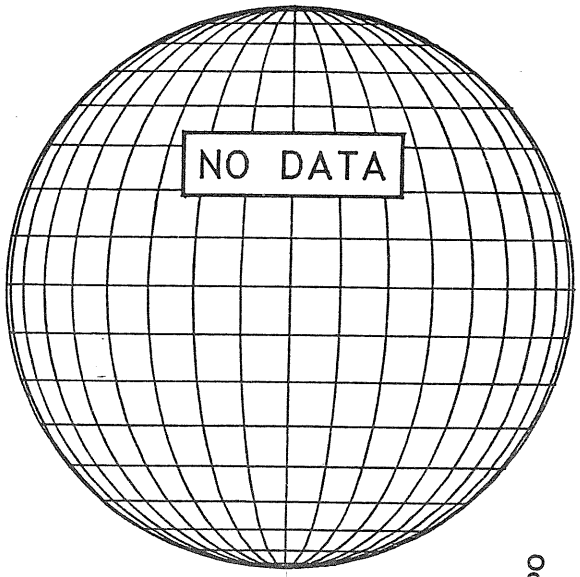
S

RAMEY SUNSPOT



1232 UT
1339 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



S

79
Oct 98

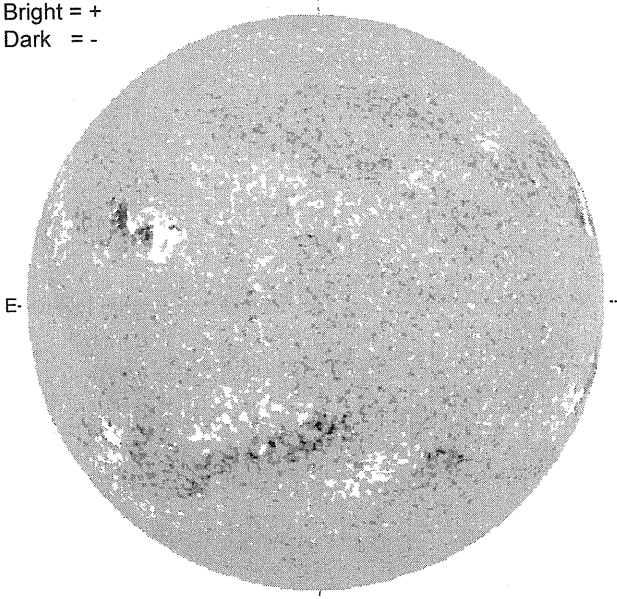
OCTOBER 27, 1998 (P= + 25.27 , Bo = + 4.88 , Lo = 295.42)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -

E-



1811 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

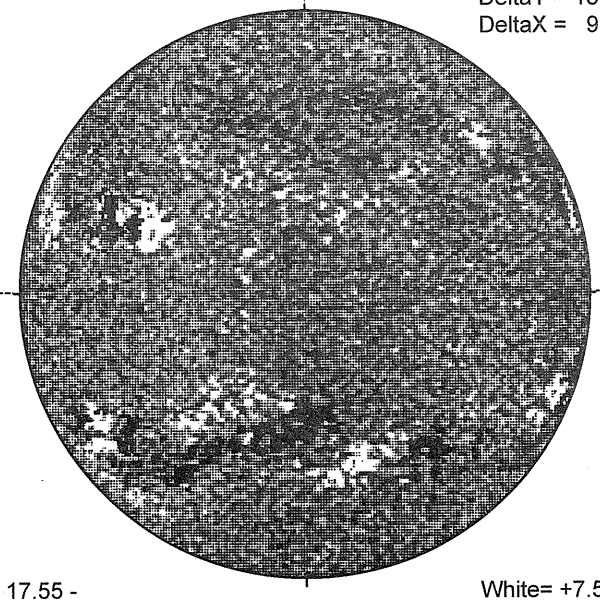
2225 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

-W

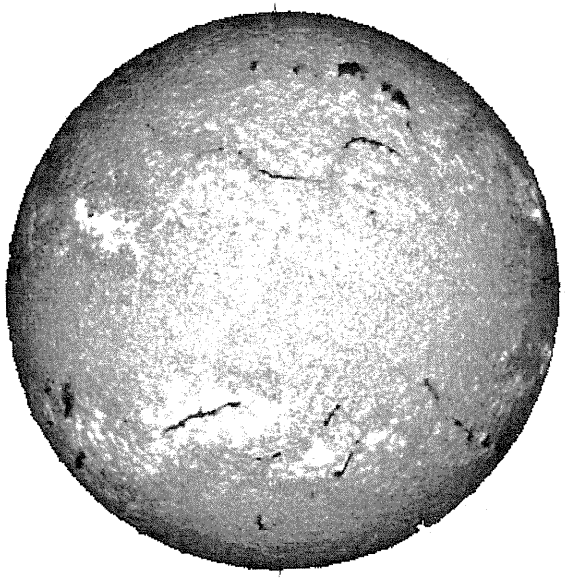


17.55 -
18.51 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

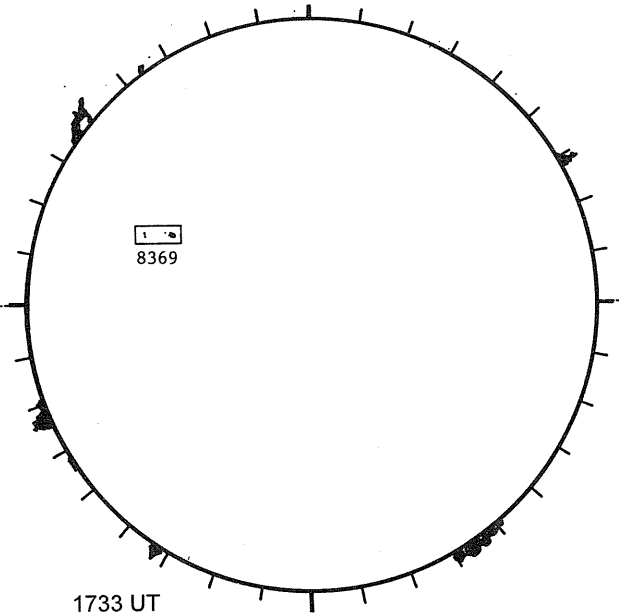
E---



0844 UT

S

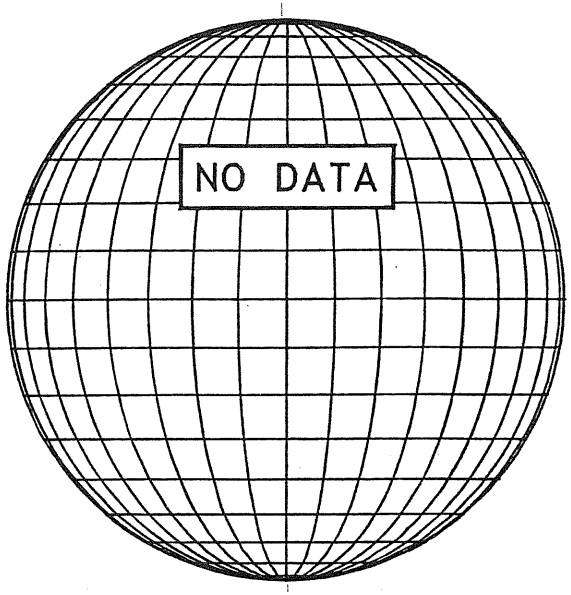
RAMEY SUNSPOT



1733 UT
1007 UT VALA Prom

S

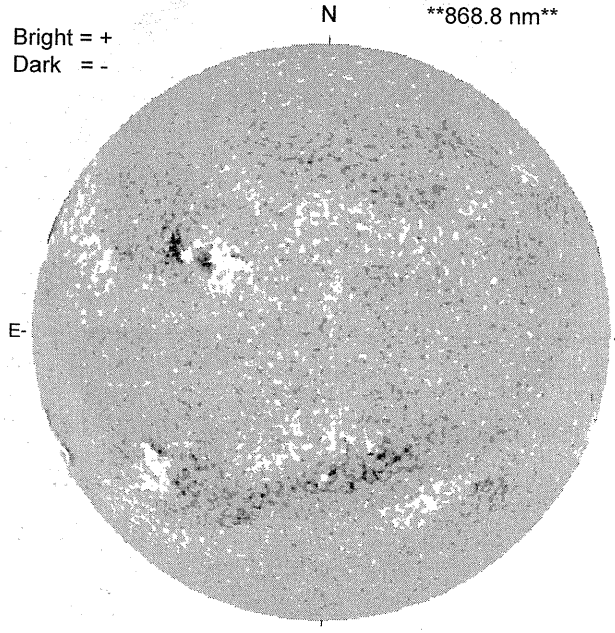
SACRAMENTO PEAK CORONA (1.15 Radii)----



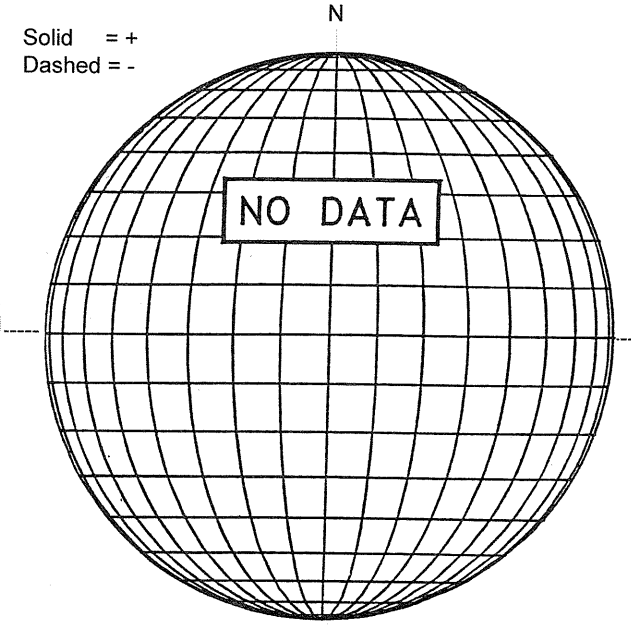
S

OCTOBER 28, 1998 (P= + 25.14 , Bo = + 4.79 , Lo = 282.23)

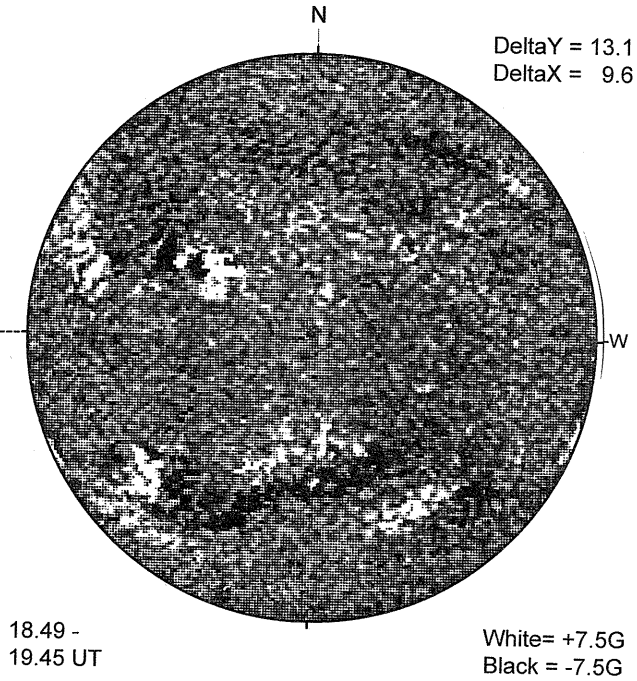
KITT PEAK MAGNETOGRAM



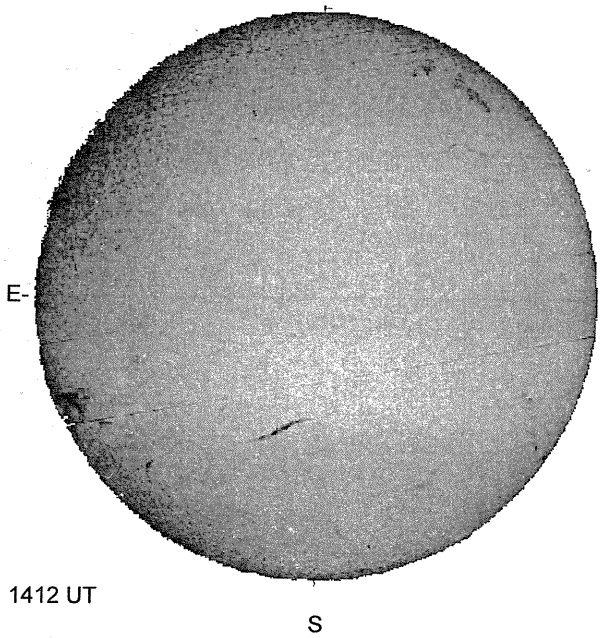
STANFORD MAGNETOGRAM



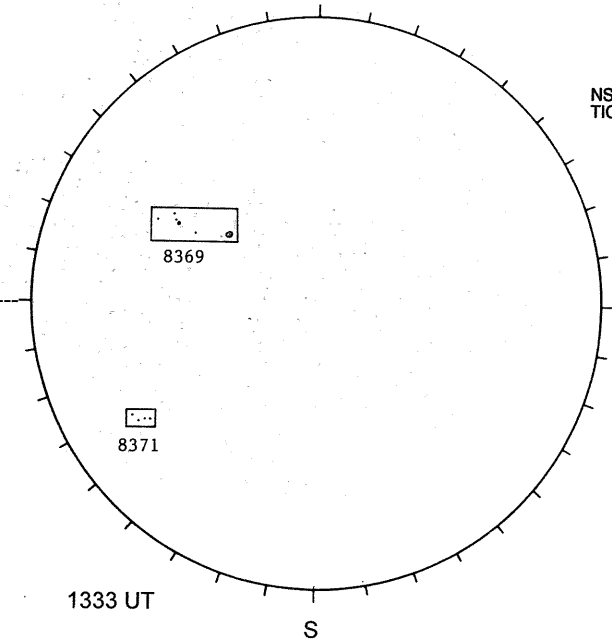
MT. WILSON MAGNETOGRAM



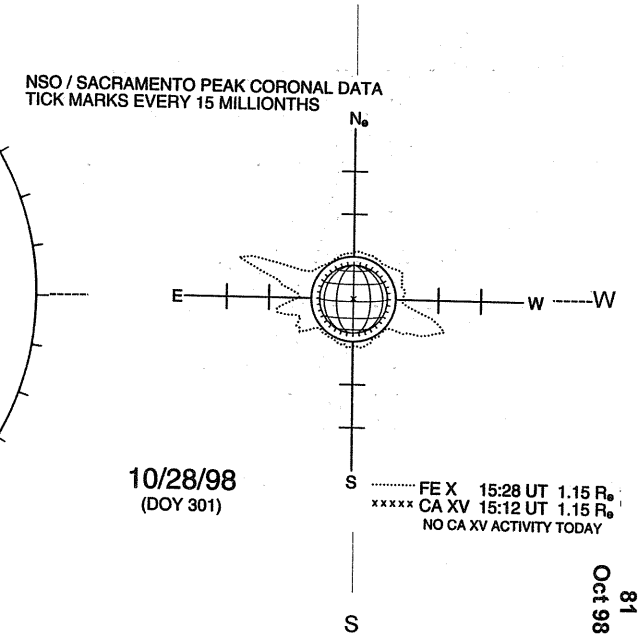
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)----

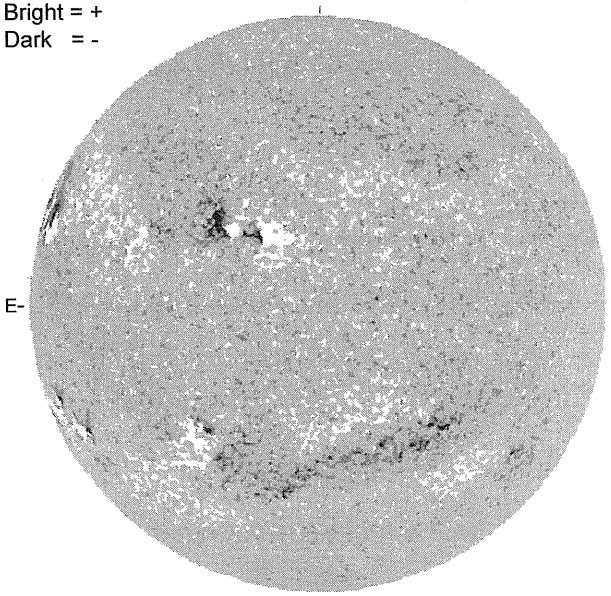


OCTOBER 29, 1998 (P= + 25.01 , Bo = + 4.69 , Lo = 269.05)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



E-

1441 UT

STANFORD MAGNETOGRAM

N

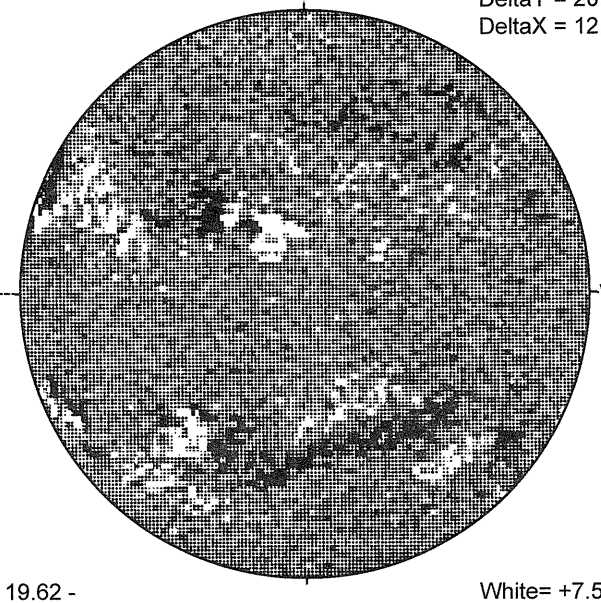
Solid = +
Dashed = -

2051 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 20.1
DeltaX = 12.9

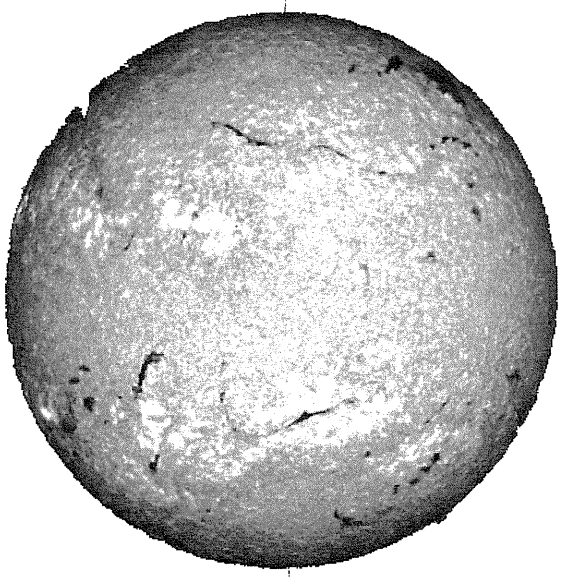


-W

19.62 -
20.04 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

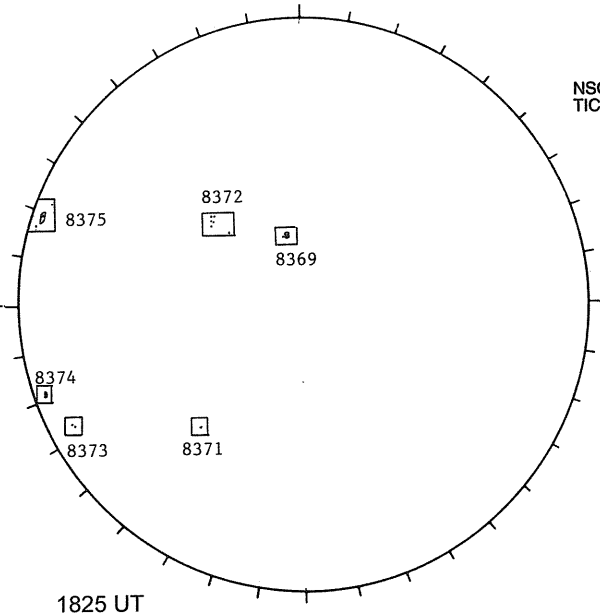


E--

0806 UT

S

RAMEY SUNSPOT

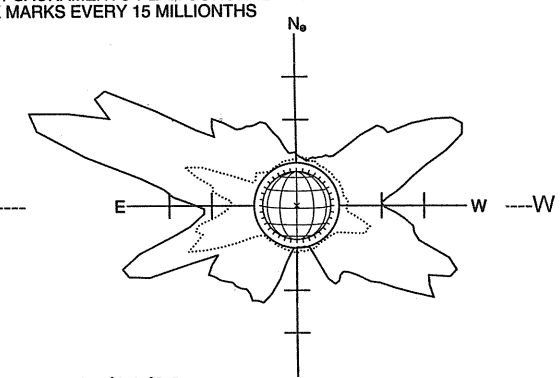


1825 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVERY 15 MILLIONTHS



10/29/98
(DOY 302)

—— FE XIV 14:38 UT 1.15 $R_\odot$
..... FE X 15:27 UT 1.15 $R_\odot$
xxxxx CA XV 15:16 UT 1.15 $R_\odot$
NO CA XV ACTIVITY TODAY

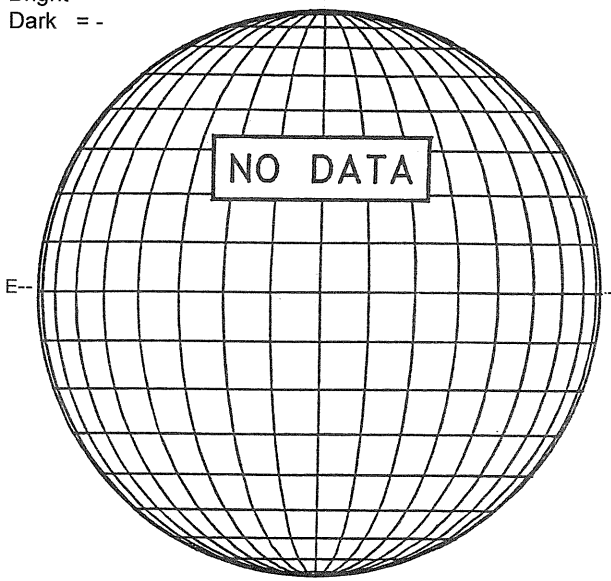
S

OCTOBER 30, 1998 (P= + 24.86 , Bo = + 4.59 , Lo = 255.86)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



E--

STANFORD MAGNETOGRAM

N

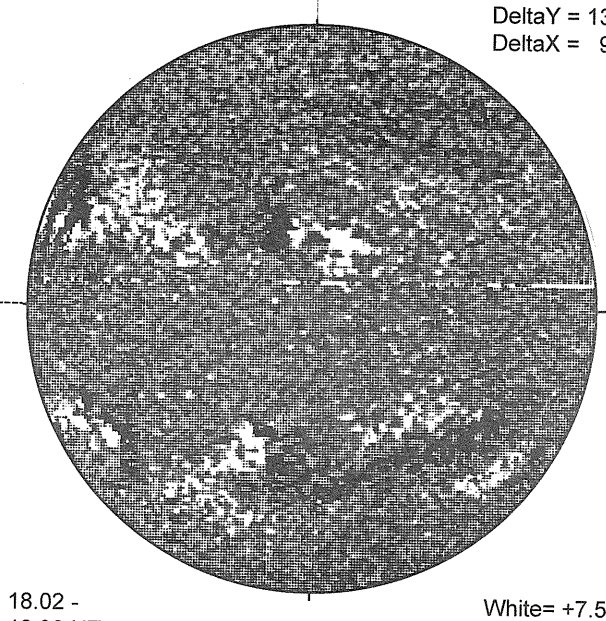
Solid = +
Dashed = -

2323 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

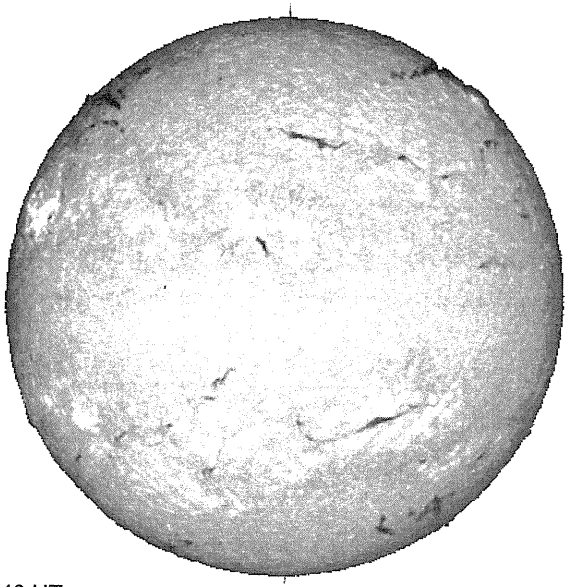


-W

18.02 -
18.98 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

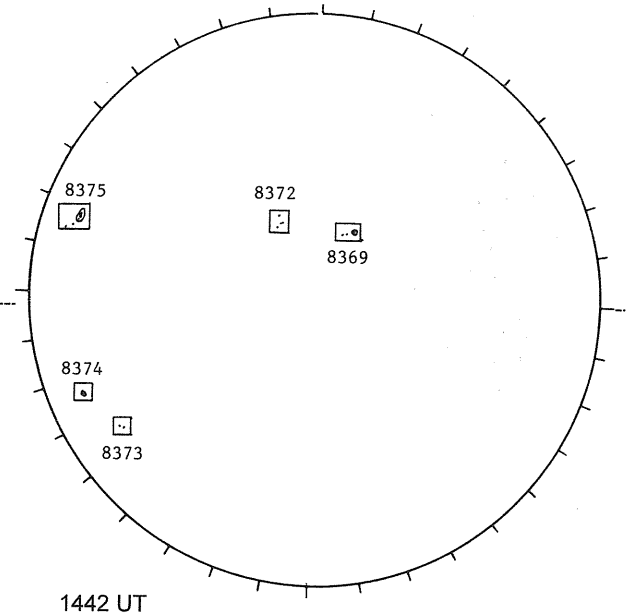


E--

1240 UT

S

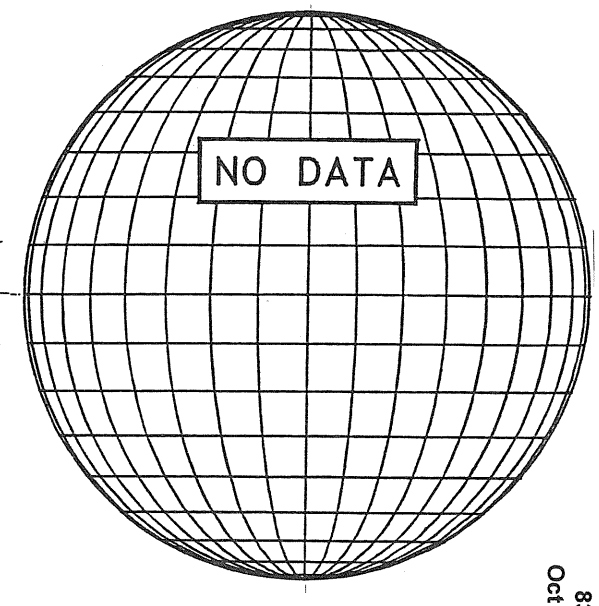
RAMEY SUNSPOT



1442 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

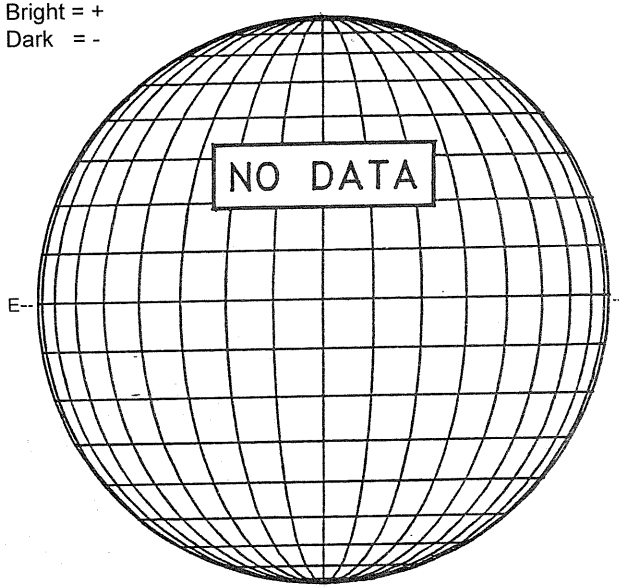


S

83
Oct 98

OCTOBER 31, 1998 (P= + 24.71 , Bo = + 4.50 , Lo = 242.67)

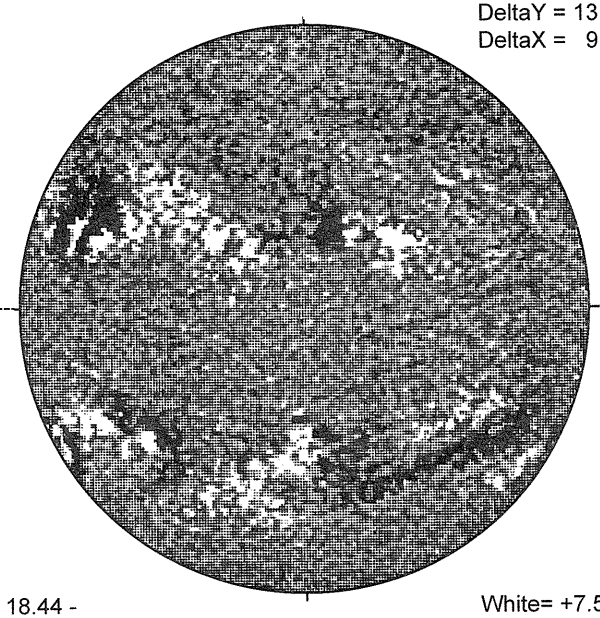
KITT PEAK MAGNETOGRAM
N
868.8 nm
Bright = +
Dark = -



STANFORD MAGNETOGRAM
N
Solid = +
Dashed = -

1911 UT

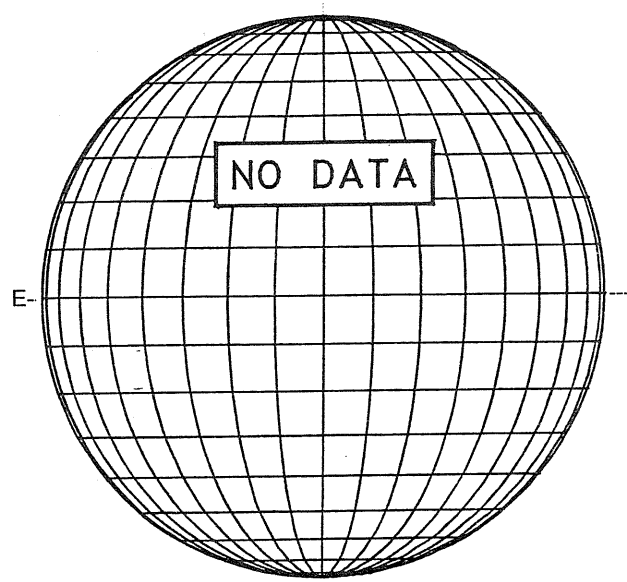
MT. WILSON MAGNETOGRAM
N
DeltaY = 13.1
DeltaX = 9.6



18.44 -
19.40 UT

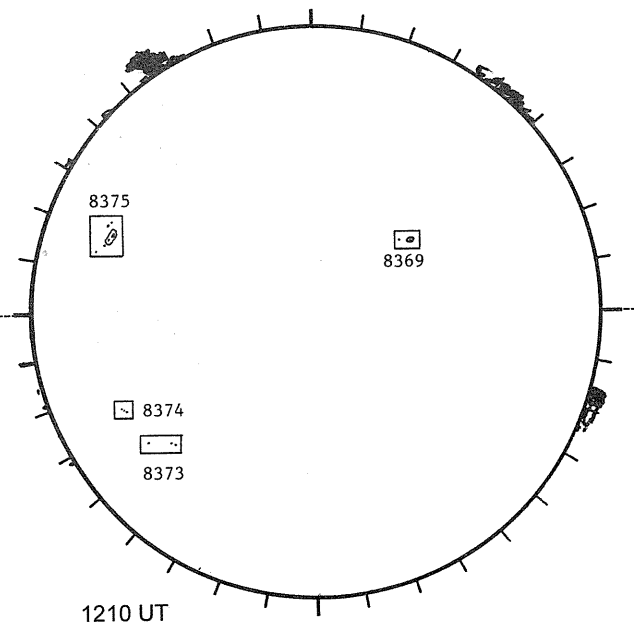
White= +7.5G
Black = -7.5G

----- MEUDON H-ALPHA



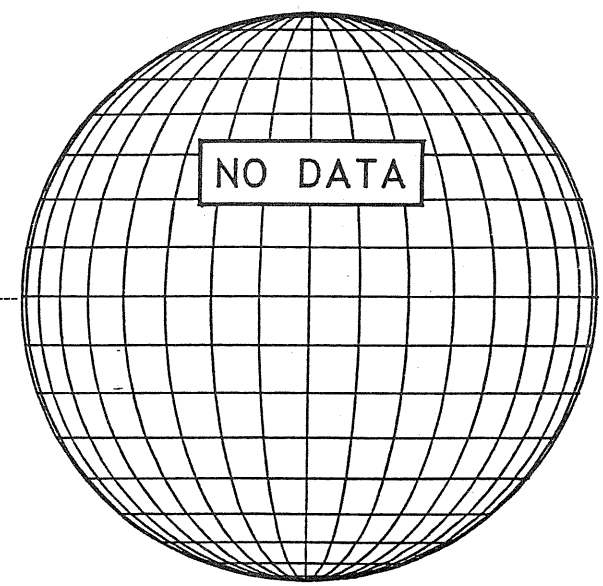
S

RAMEY SUNSPOT



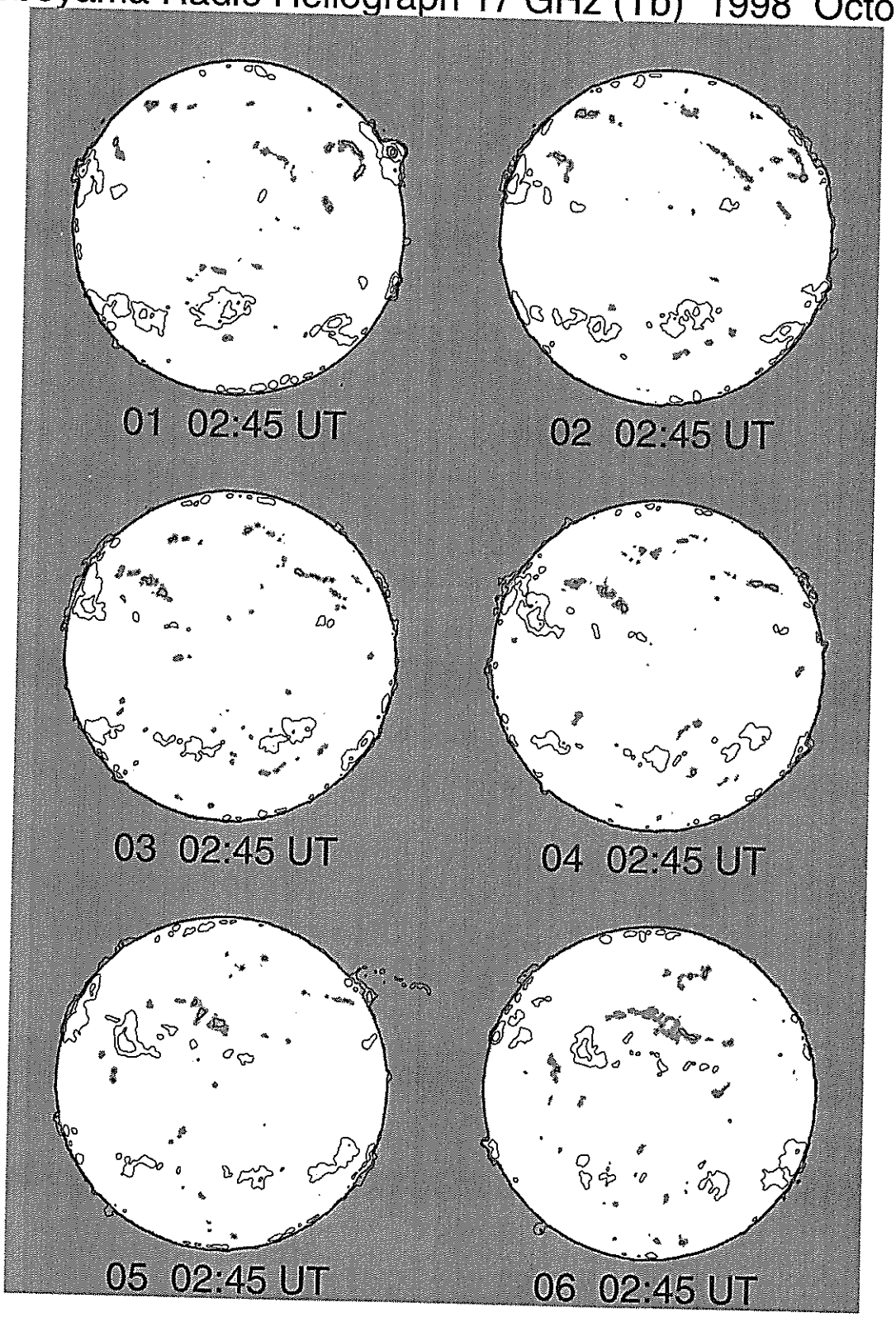
1210 UT
1317 UT VALA Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



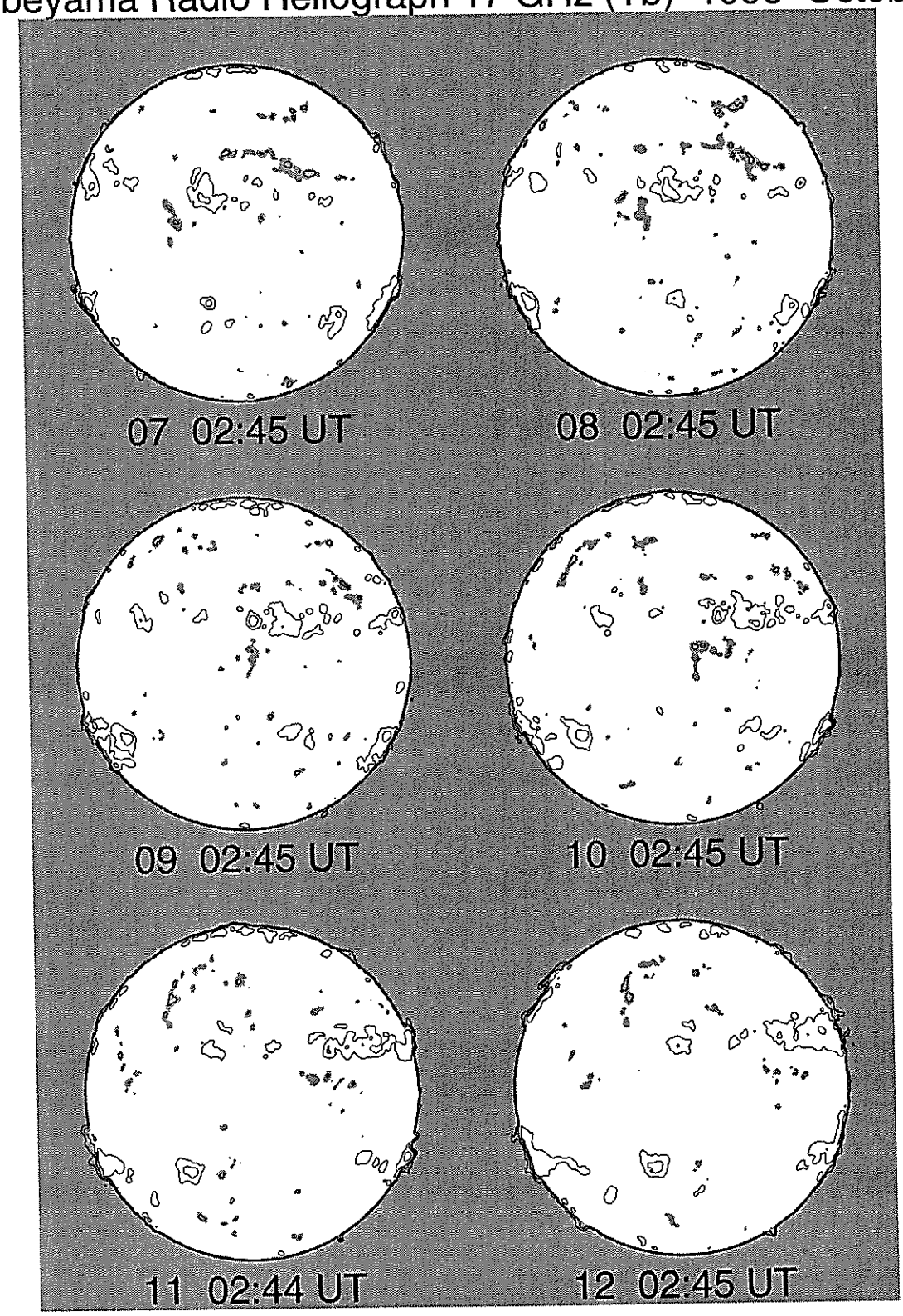
S

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 October



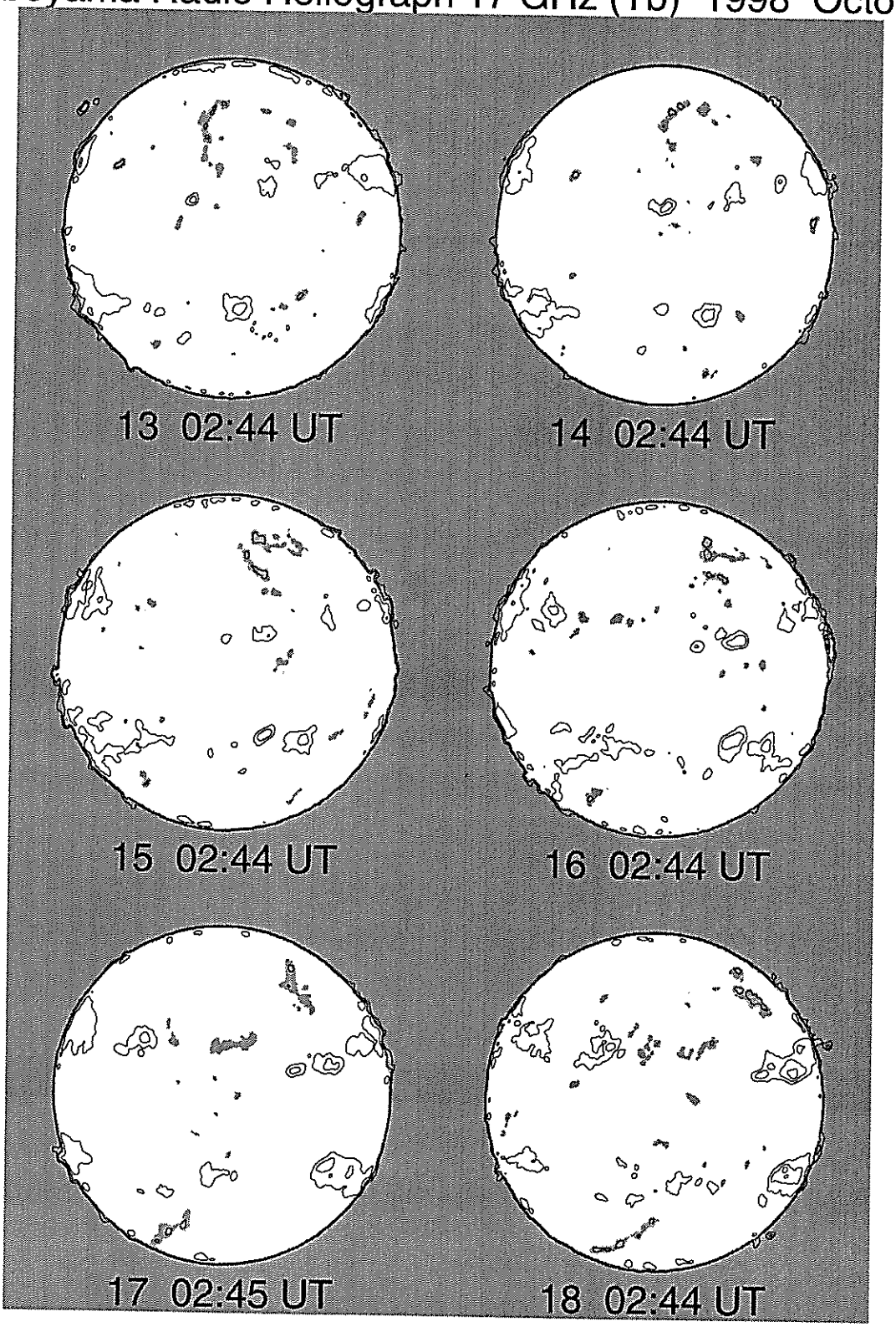
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 October



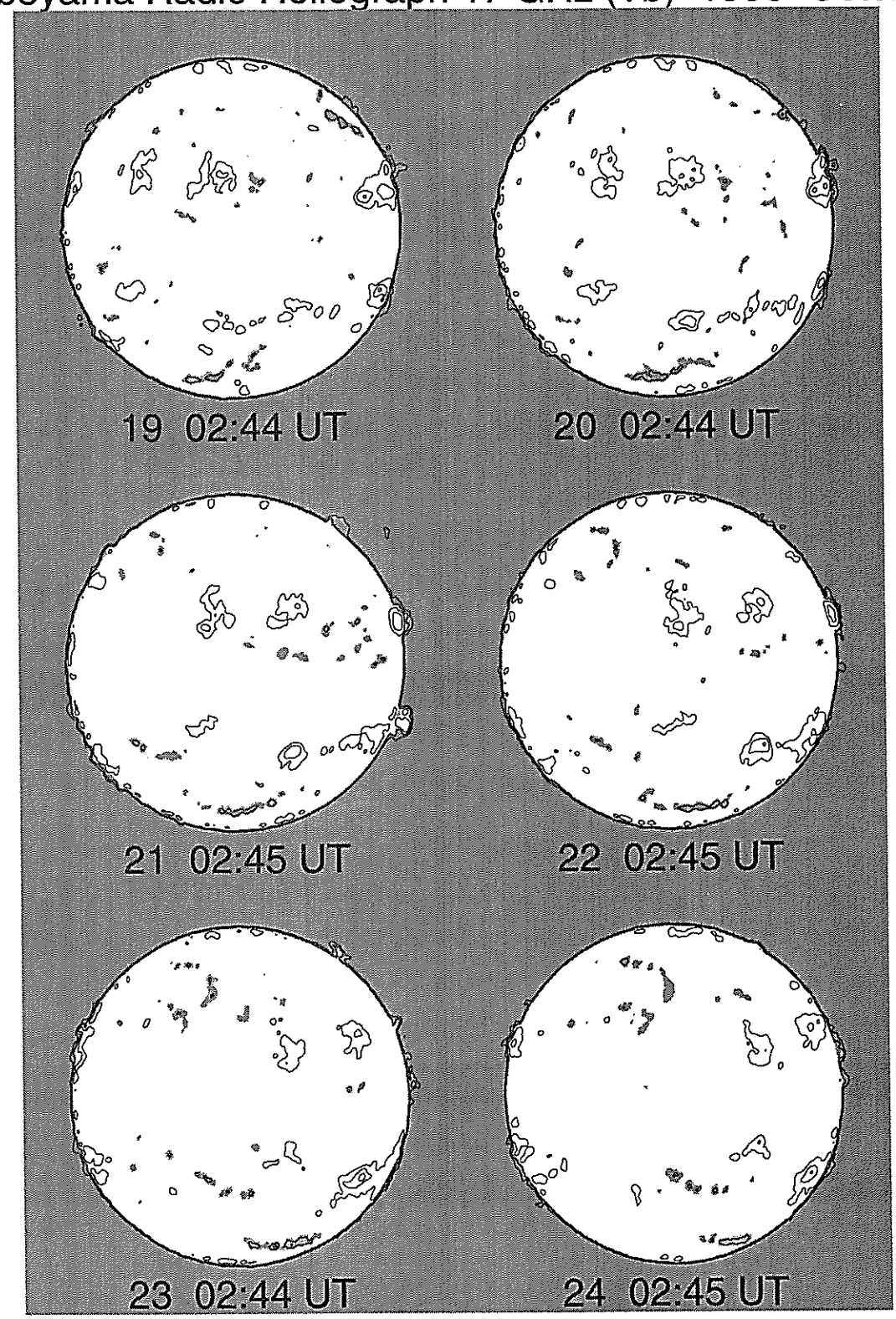
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 October



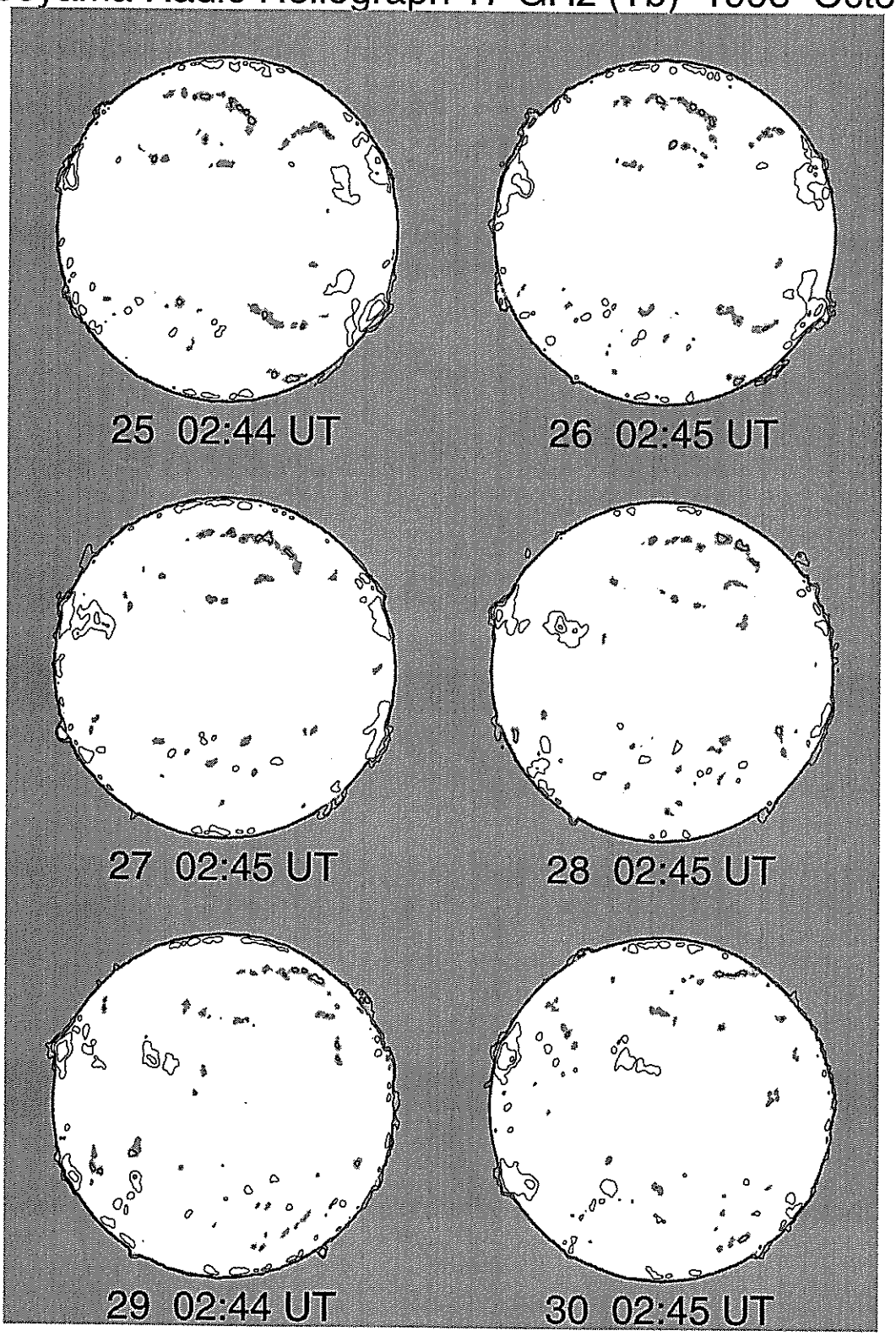
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 October



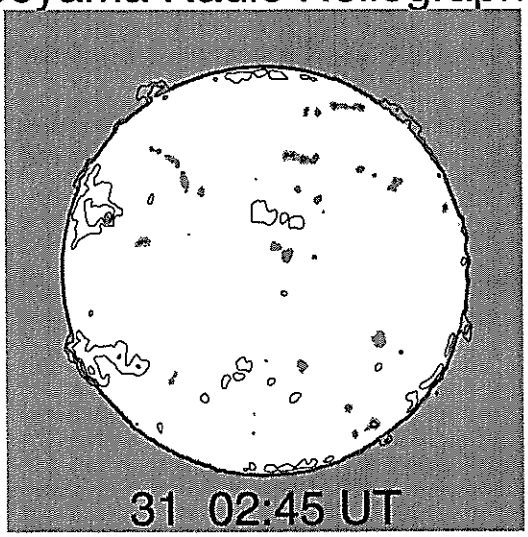
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 October



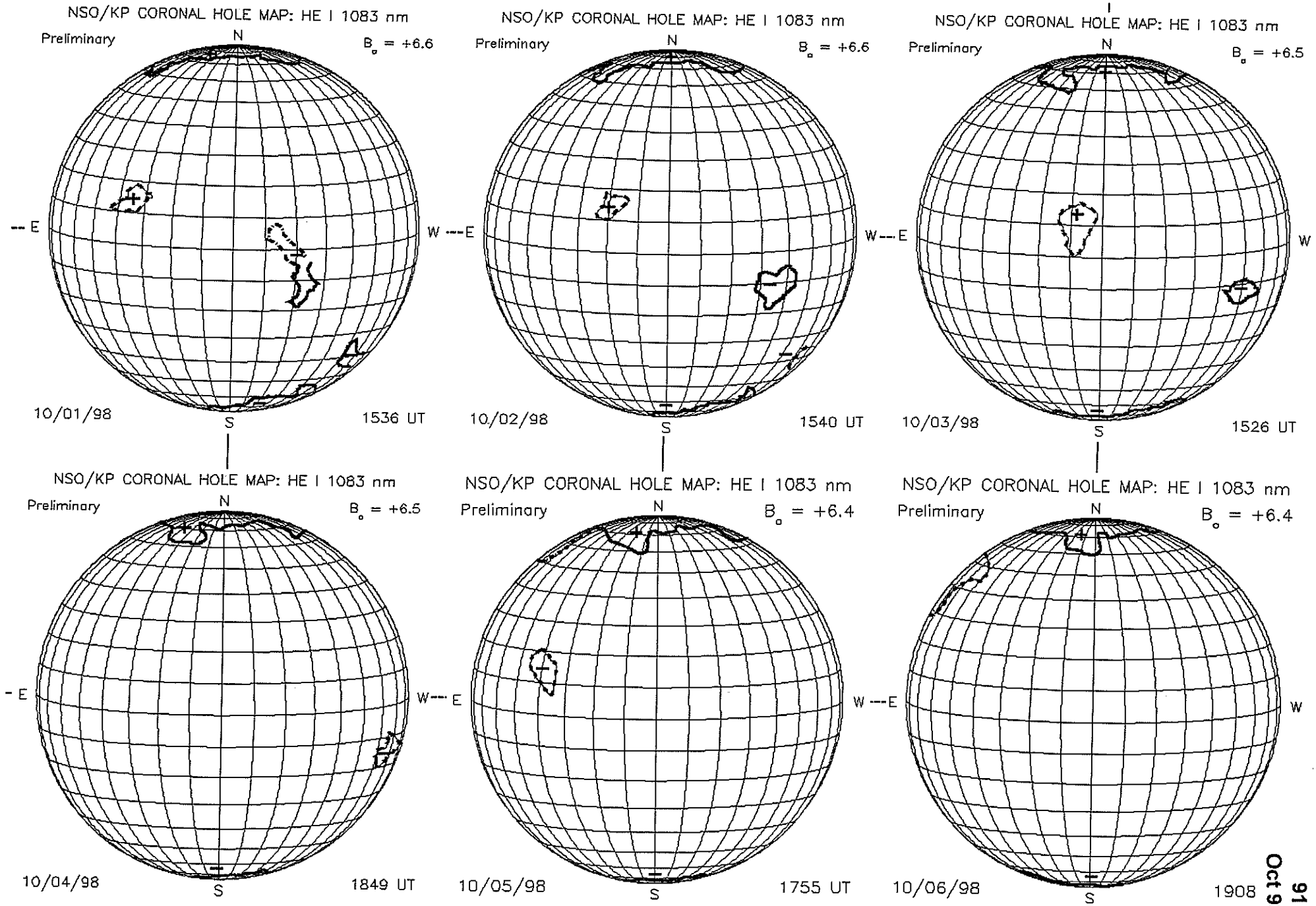
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1998 October

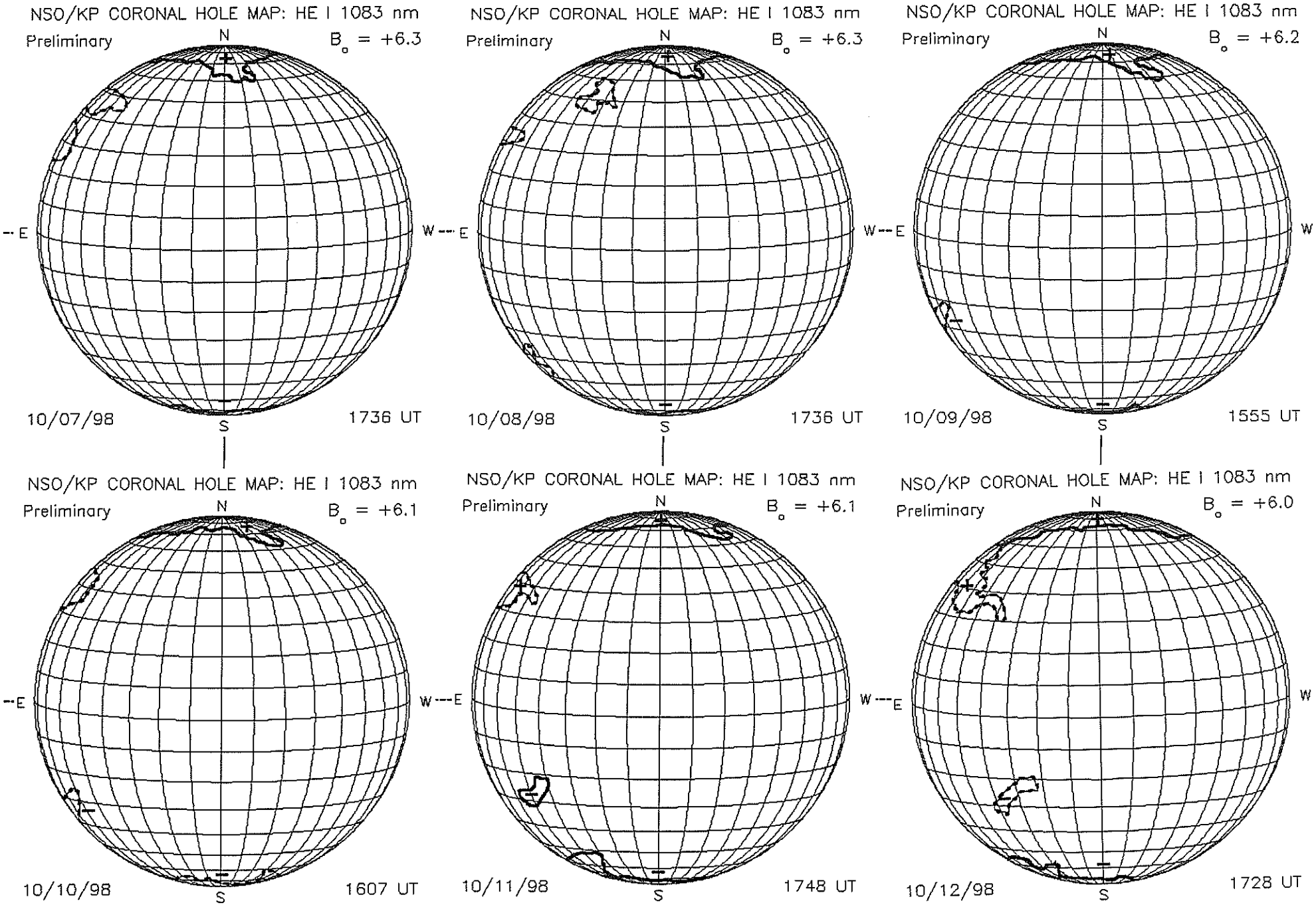


Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

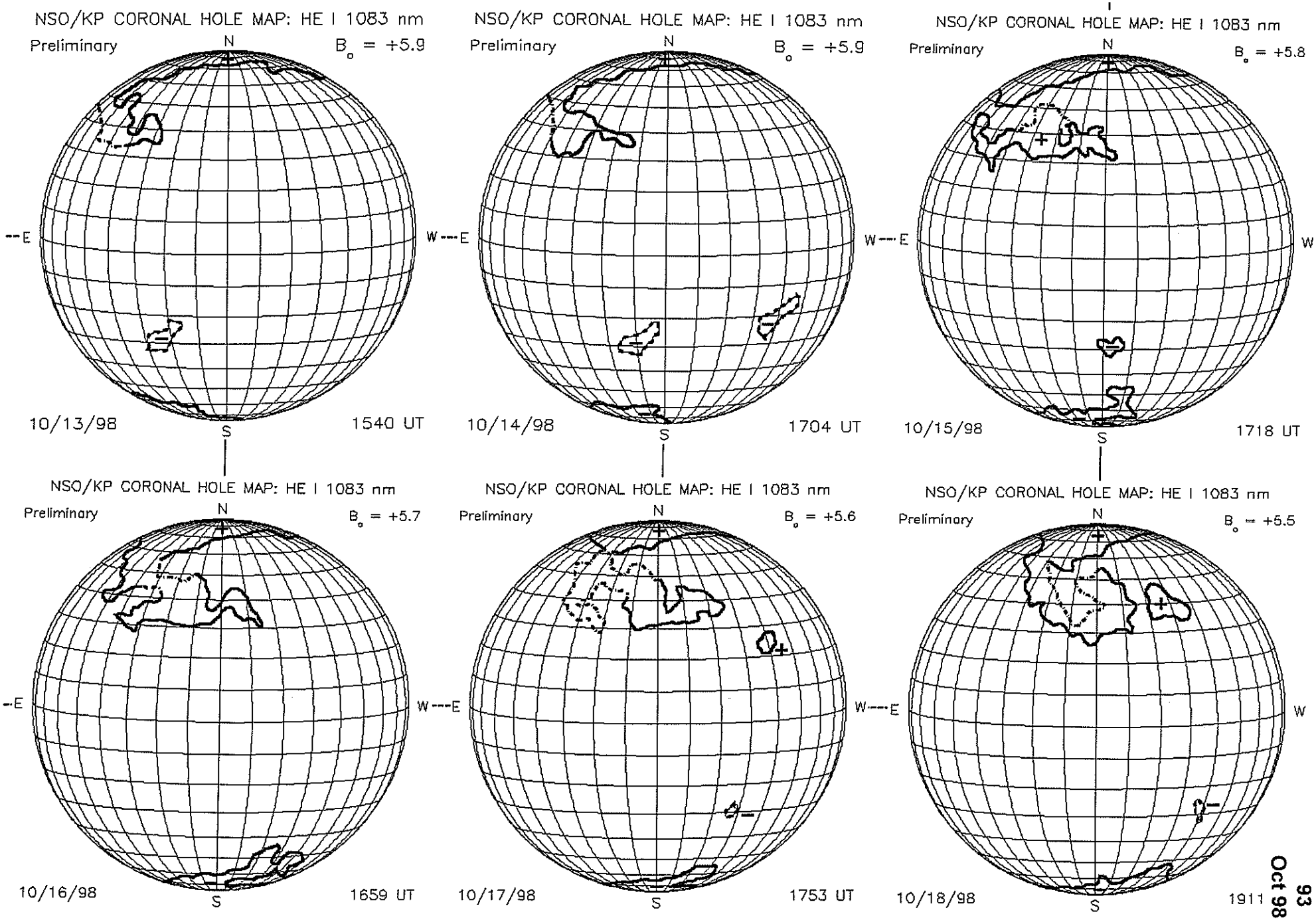
KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
October 1998



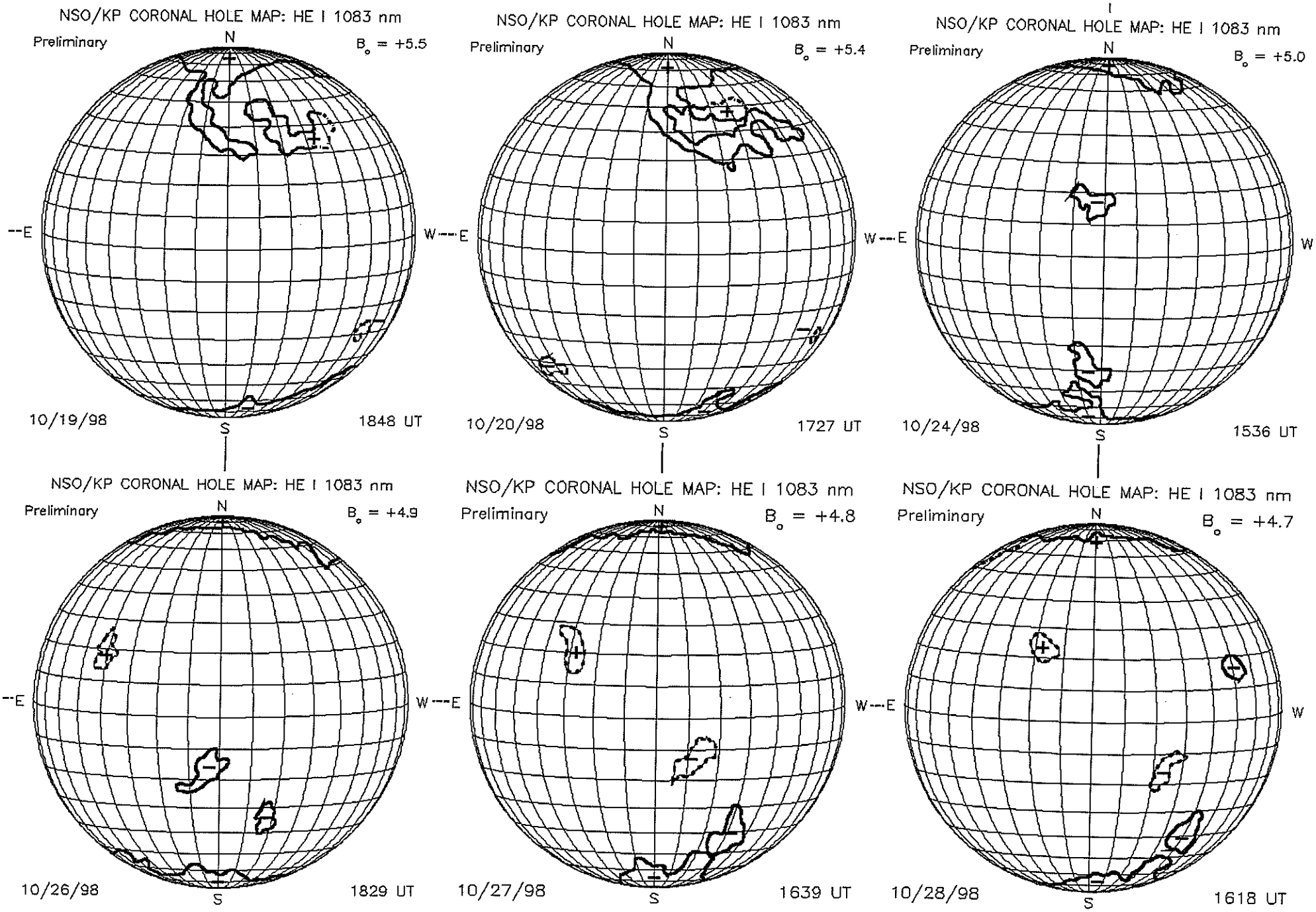
KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
October 1998



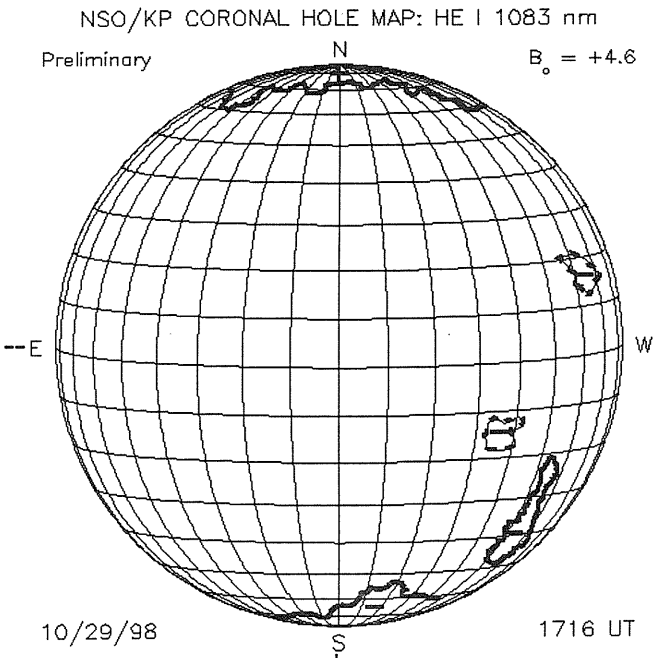
KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
October 1998



KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
October 1998

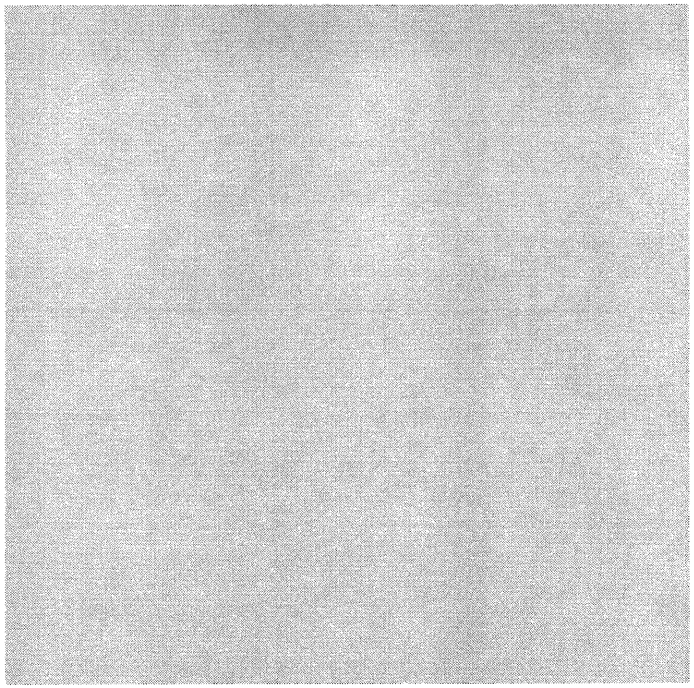


KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
October 1998

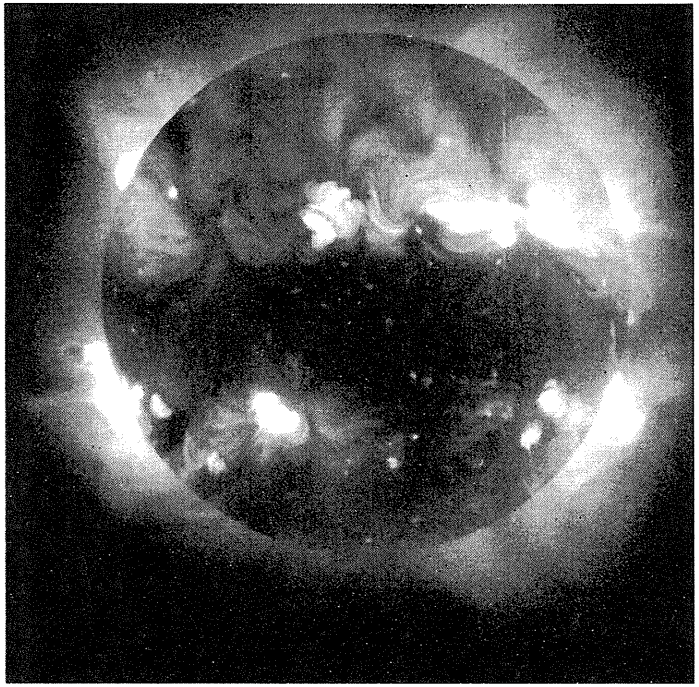


YOHKOH SOFT X-RAY TELESCOPE IMAGES

October 1998



Day 9



Day 11
09:01:48 UT

EDITOR'S NOTE:
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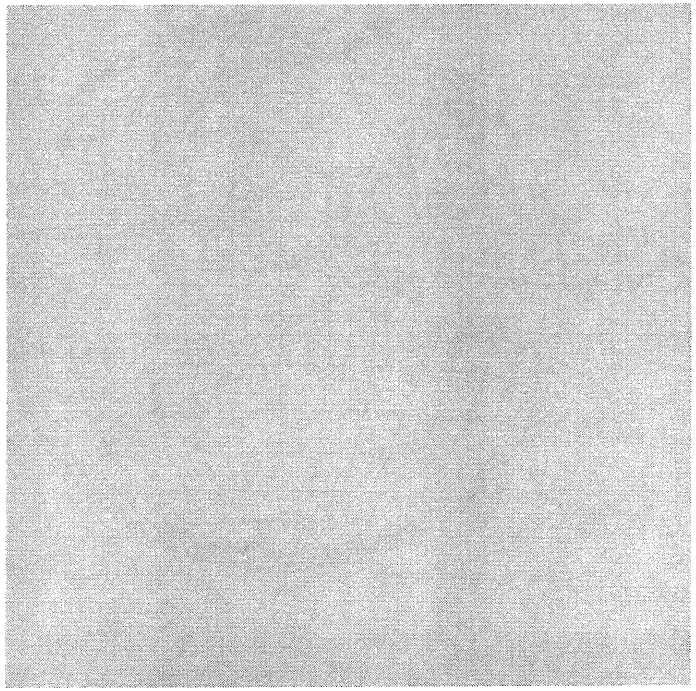
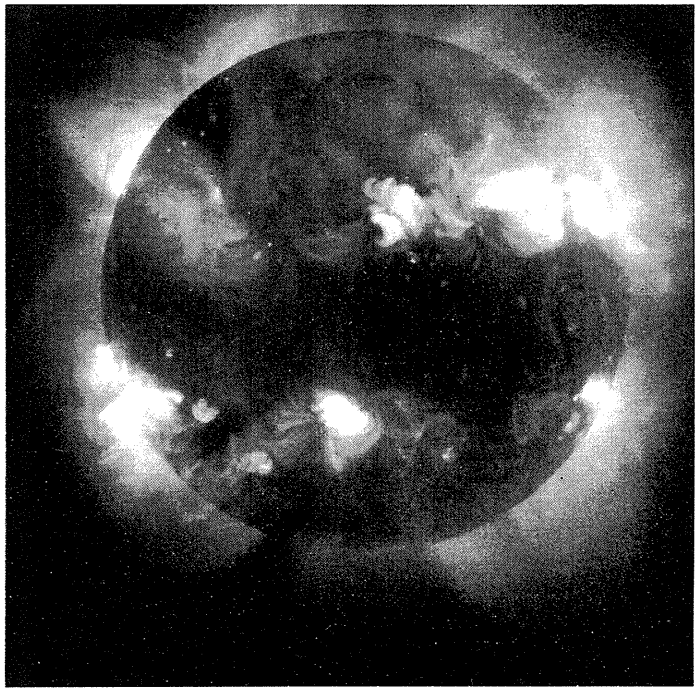
days 1-10 October 1998.



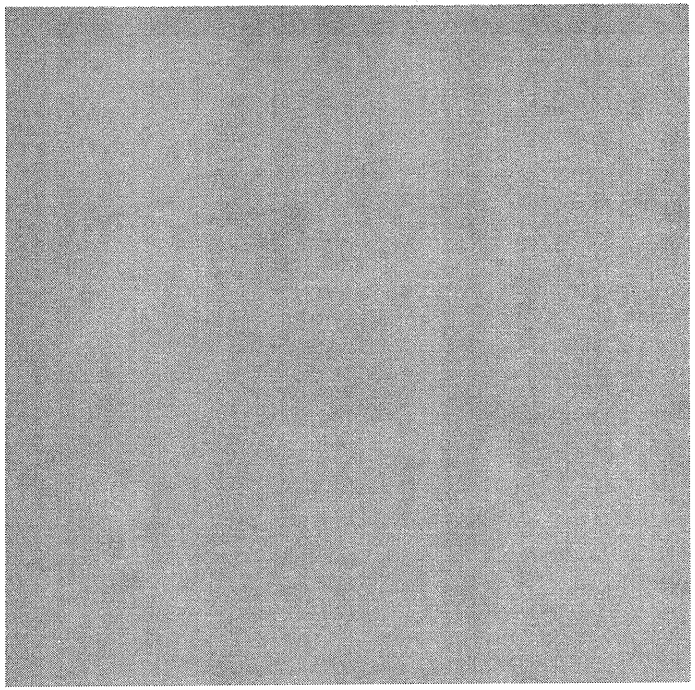
Day 10



Day 12
13:28:08 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

October
1998



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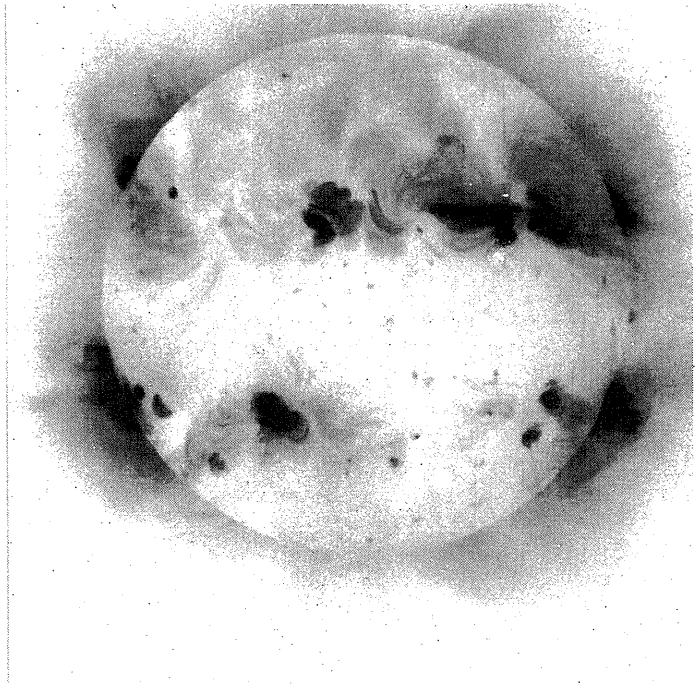

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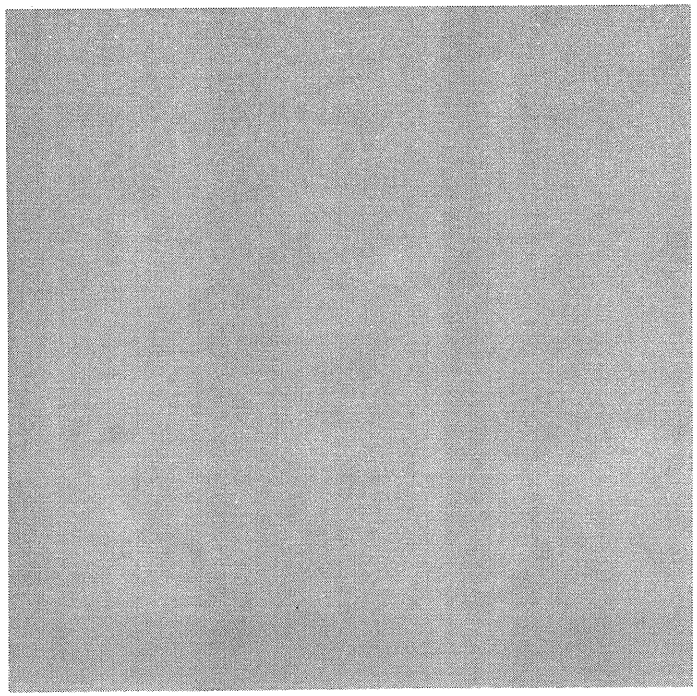
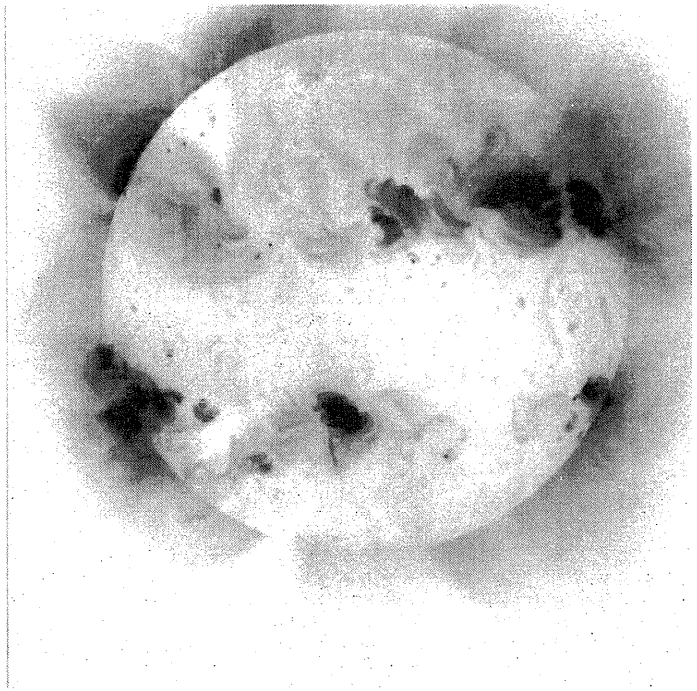


Day 10



Day 12
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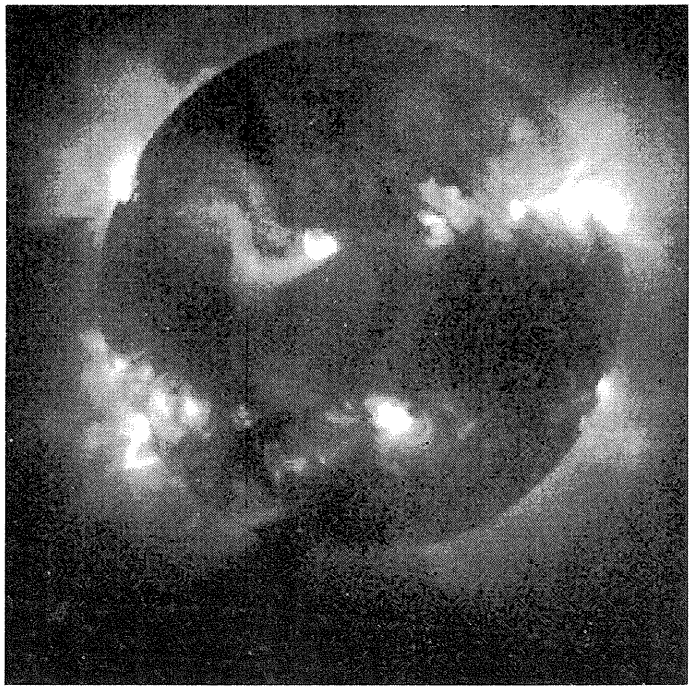
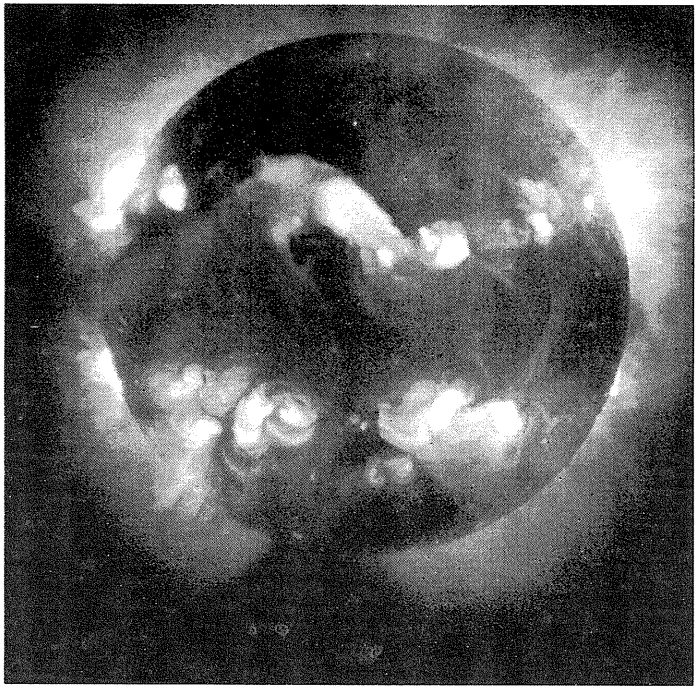
YOHKOH SOFT X-RAY TELESCOPE IMAGES

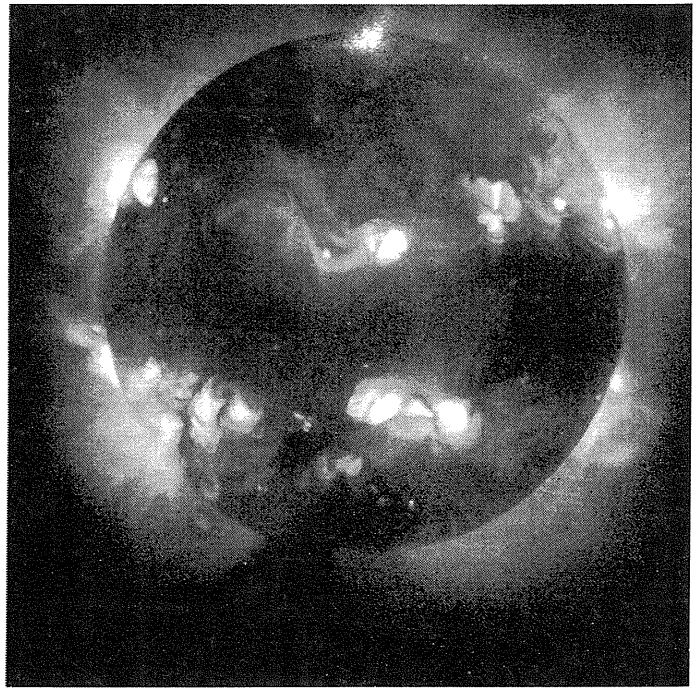
October 1998



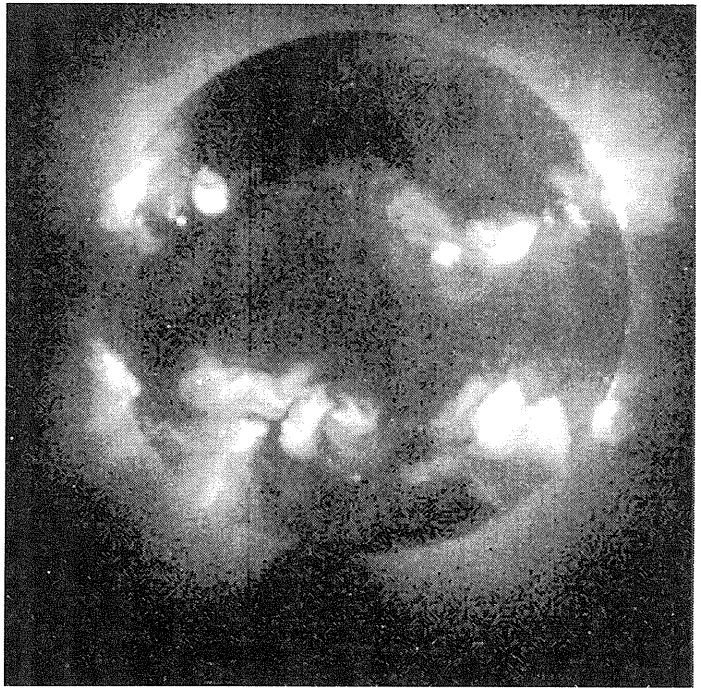
Day 13
12:04:38 UT



Day 15
11:32:09 UT



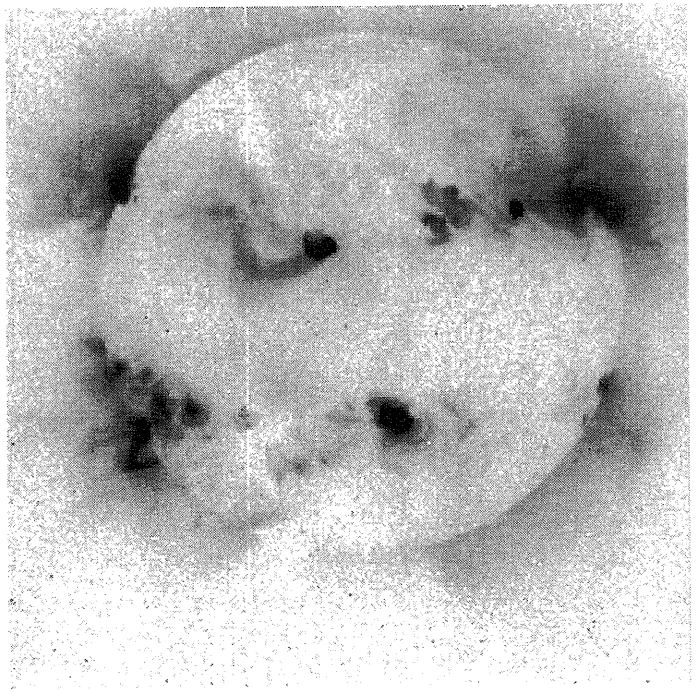
Day 14
12:17:59 UT



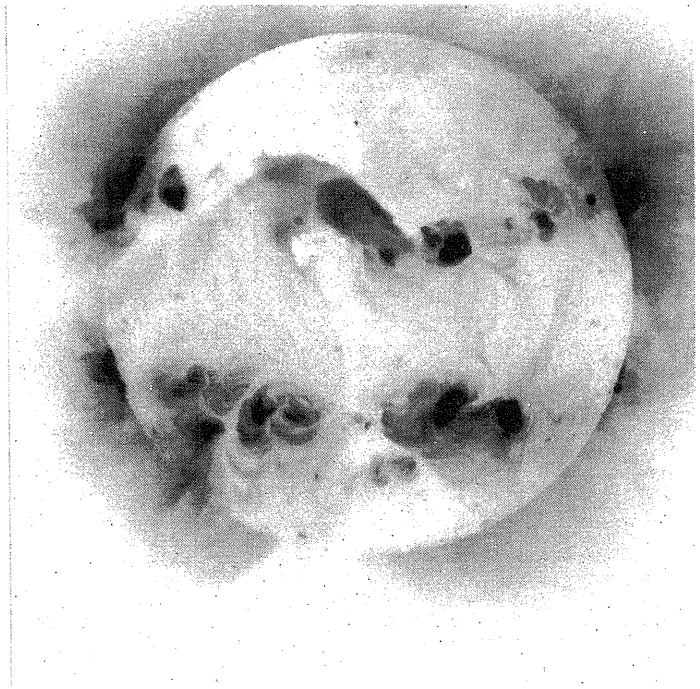
Day 16
12:00:37 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

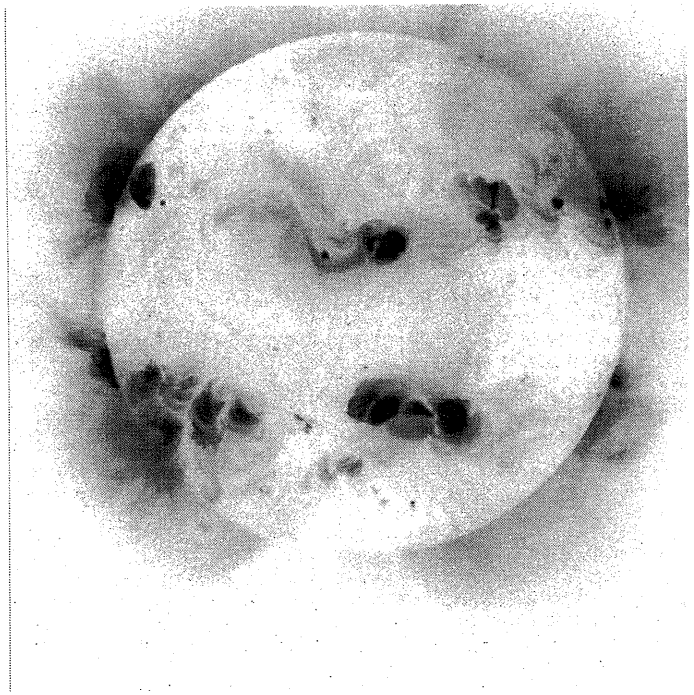
October 1998



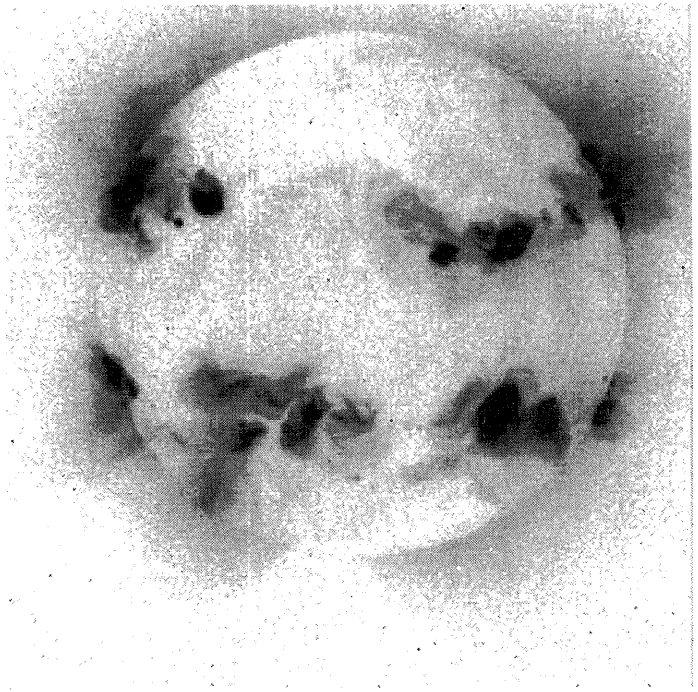
Day 13
12:04:38 UT



Day 15
11:32:09 UT



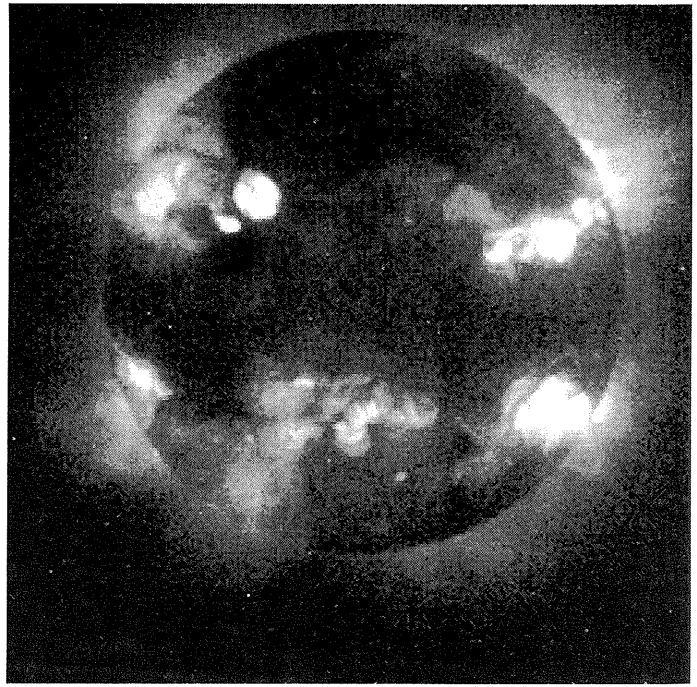
Day 14
12:17:59 UT



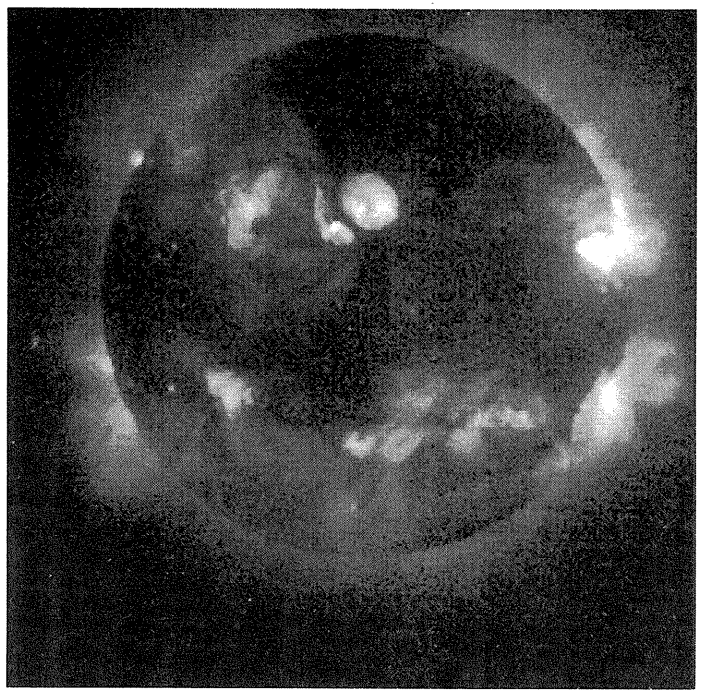
Day 16
12:00:37 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

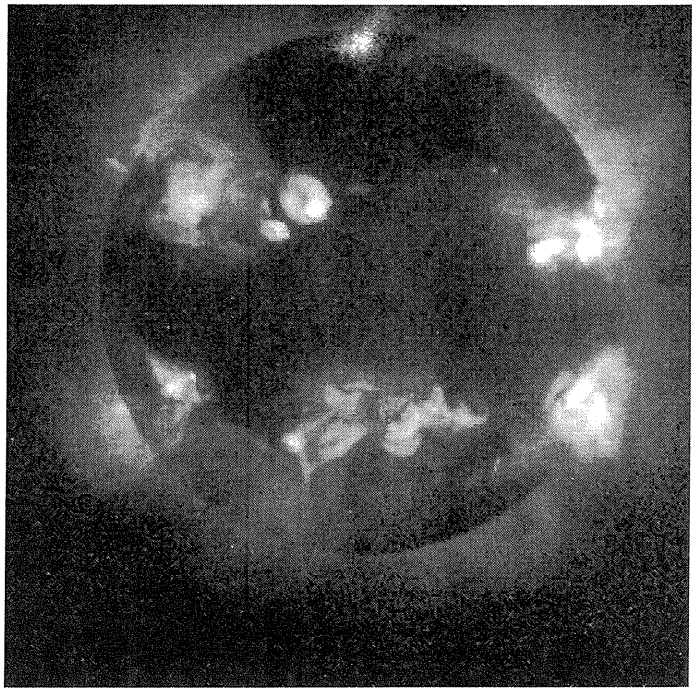
October
1998



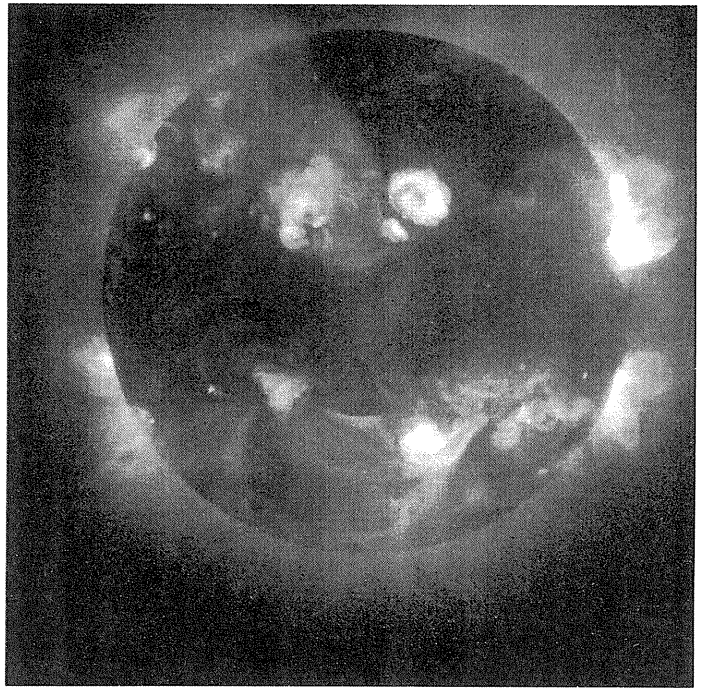
Day 17
12:10:29 UT



Day 19
14:19:00 UT



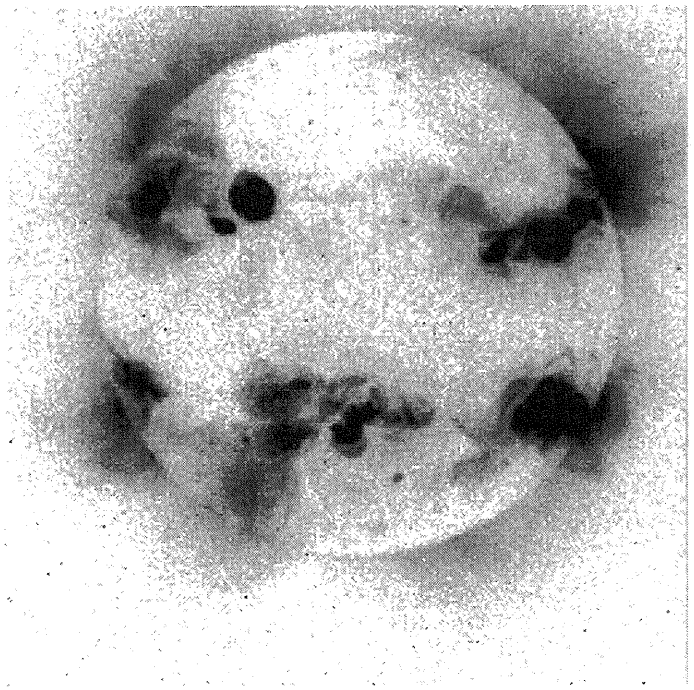
Day 18
11:43:49 UT



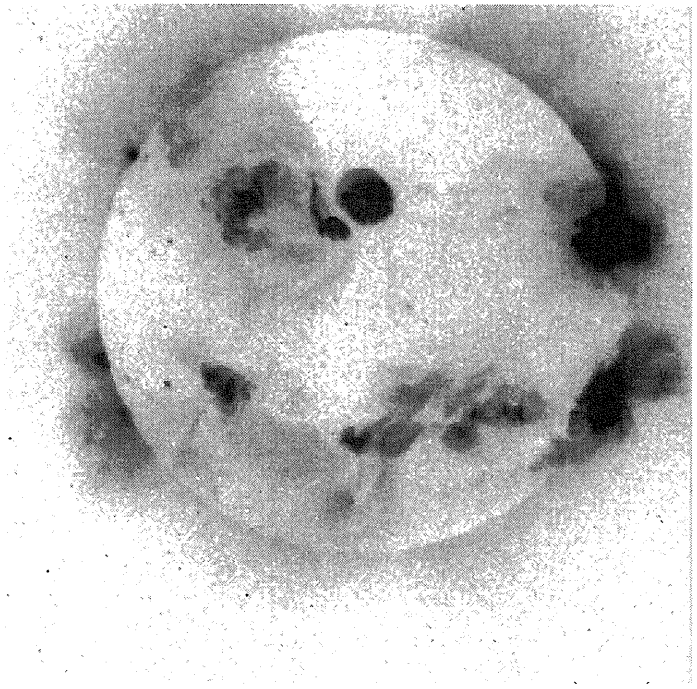
Day 20
12:17:40 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

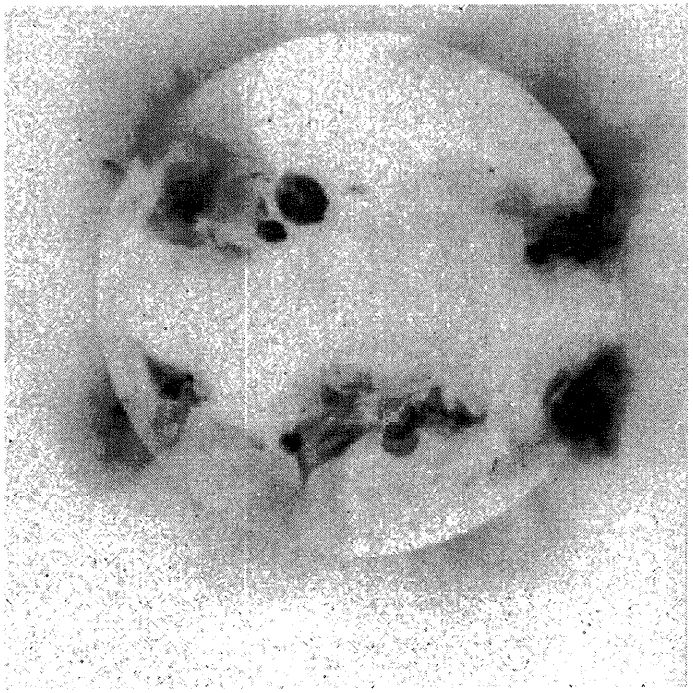
October 1998



Day 17
12:10:29 UT



Day 19
14:19:00 UT



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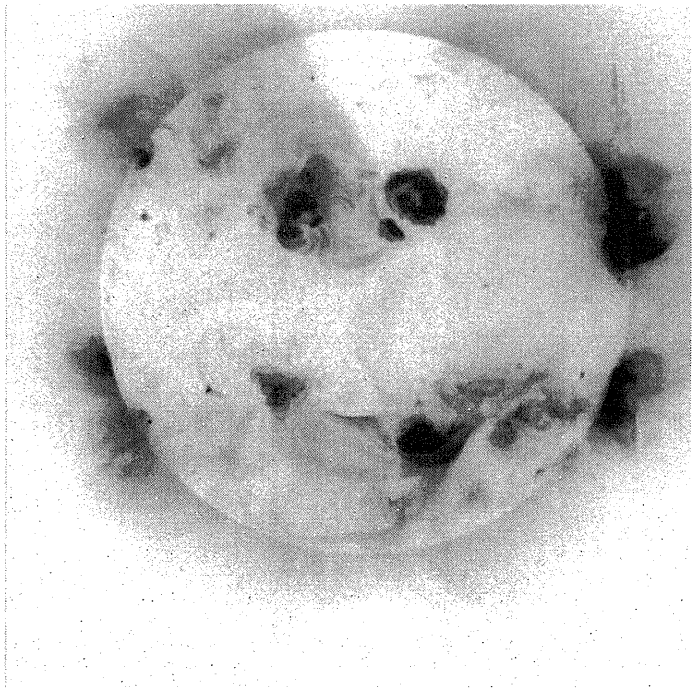
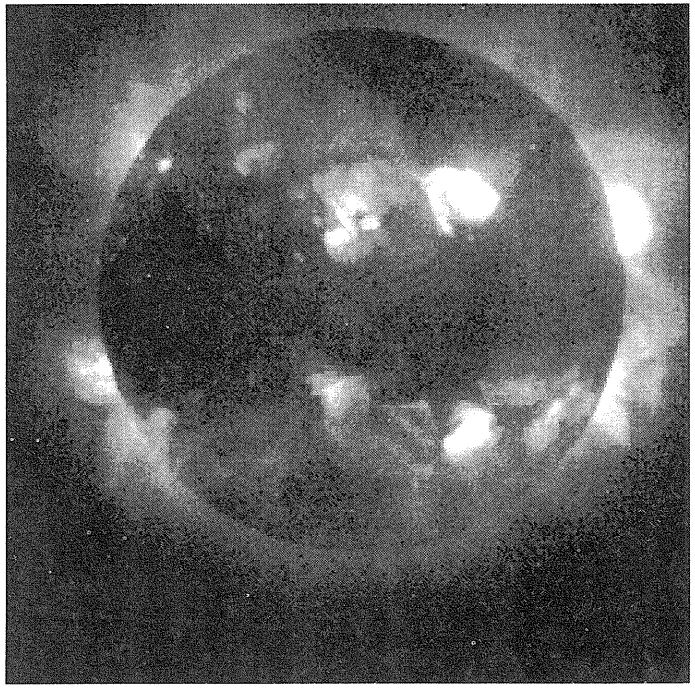


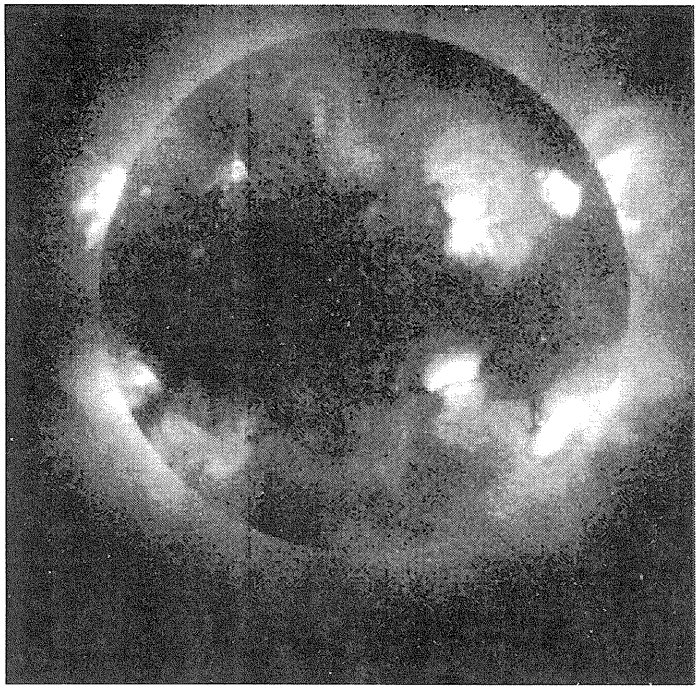
Day 20
12:17:40 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

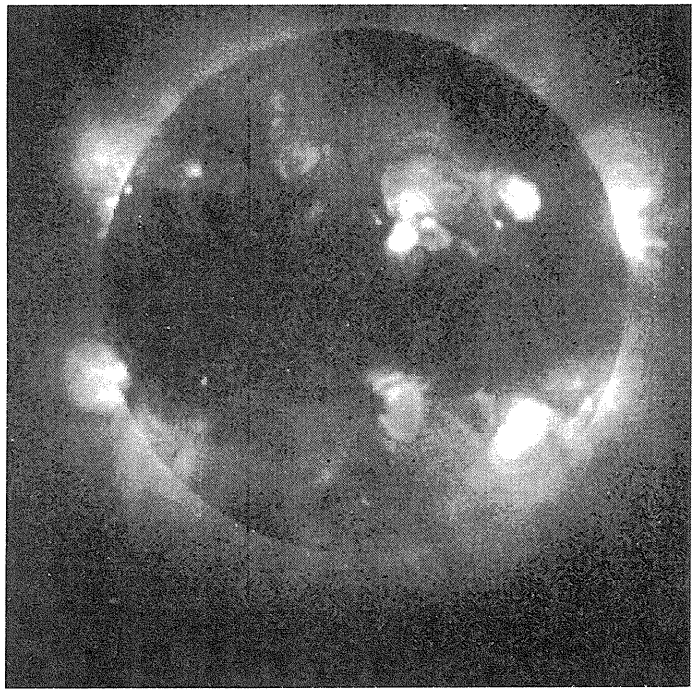
October
1998



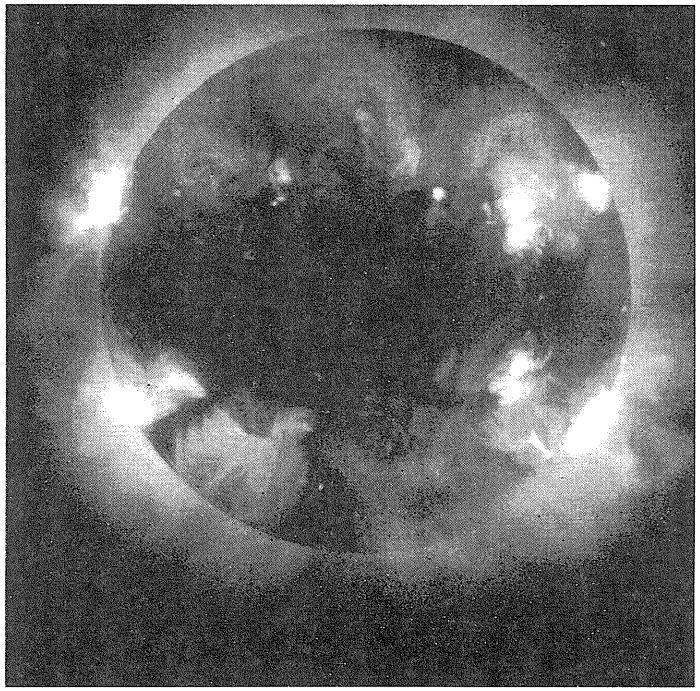
Day 21
11:43:16 UT



Day 23
11:59:00 UT



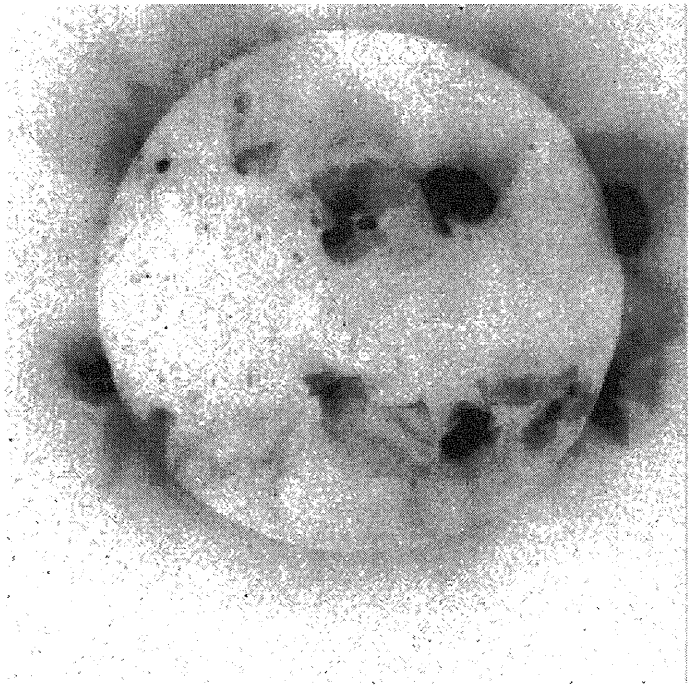
Day 22
11:58:12 UT



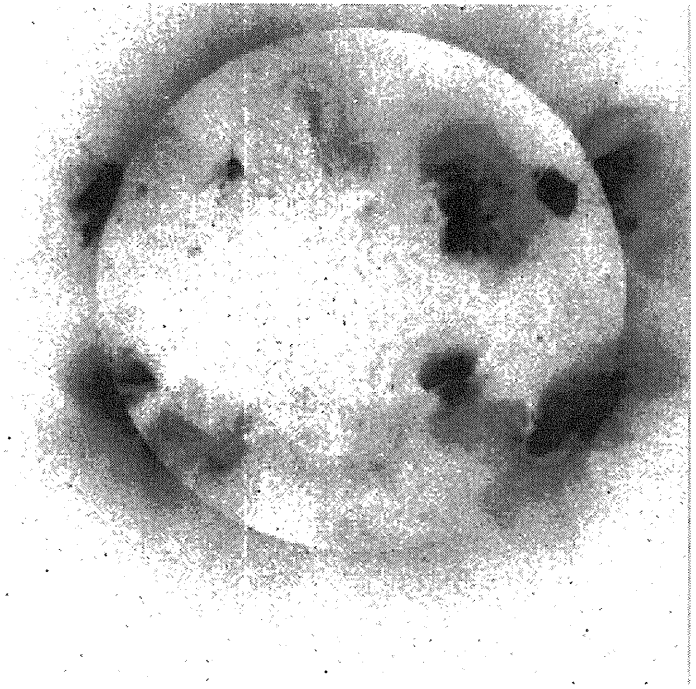
Day 24
12:26:51 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

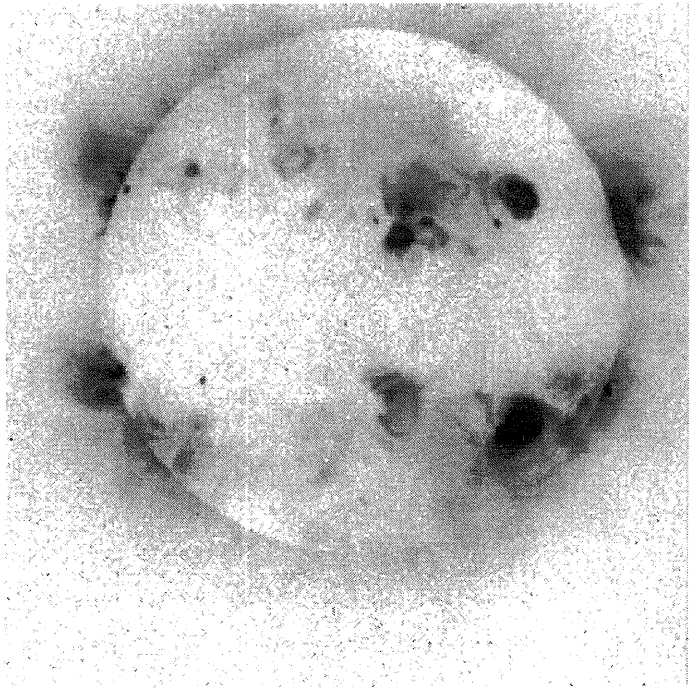
October 1998



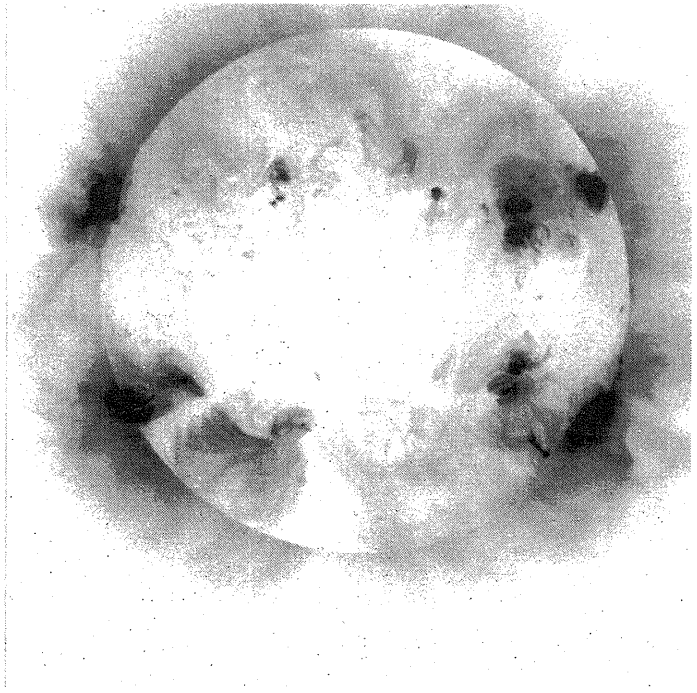
Day 21
11:43:16 UT



Day 23
11:59:00 UT



Day 22
11:58:12 UT



Day 24
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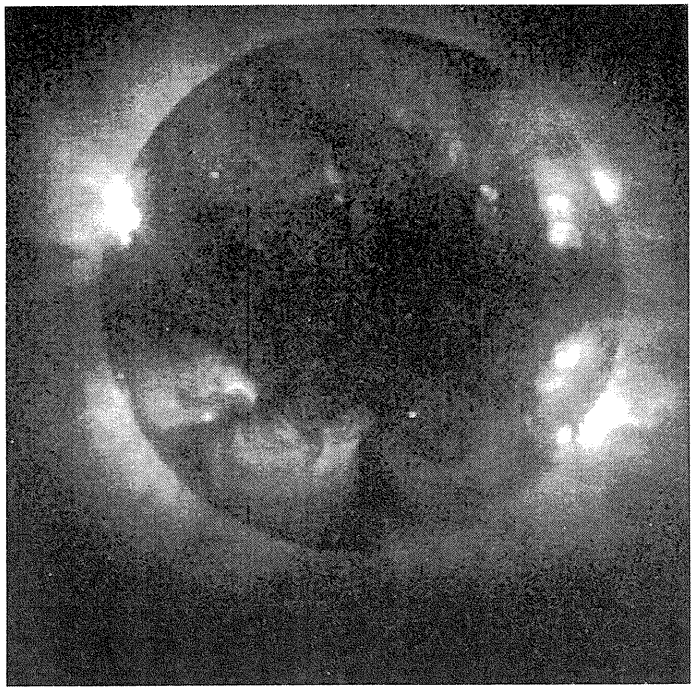
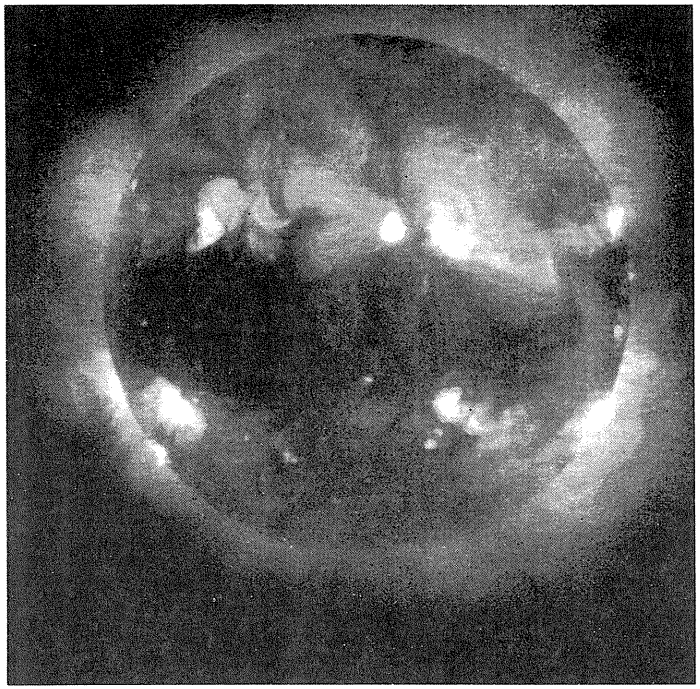
YOHKOH SOFT X-RAY TELESCOPE IMAGES

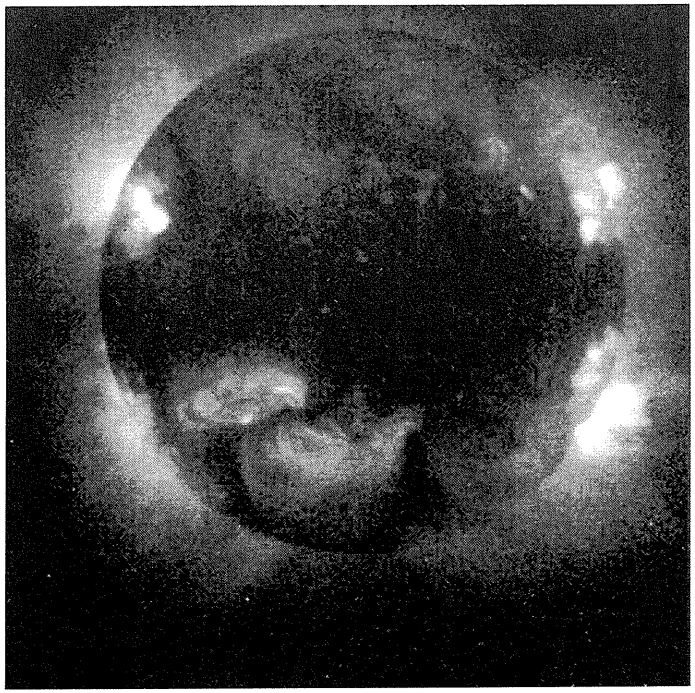
October
1998



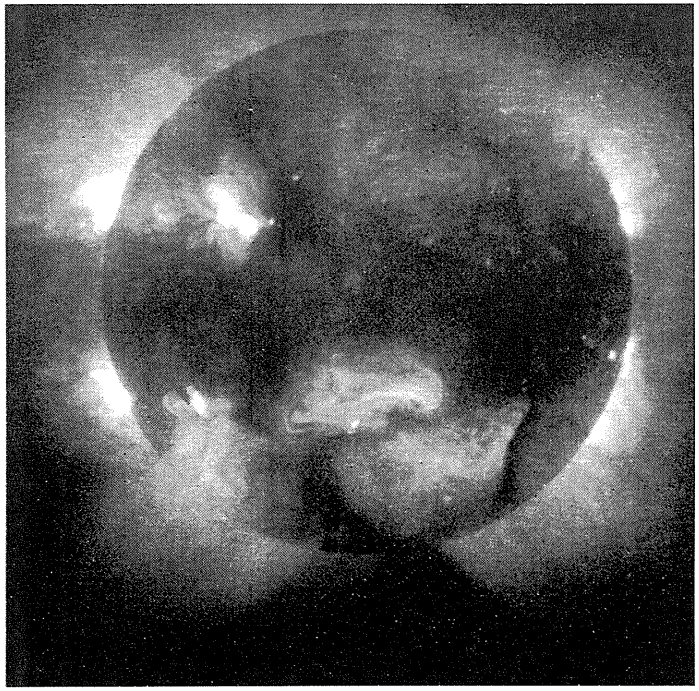
Day 25
14:12:51 UT



Day 27
11:31:09 UT



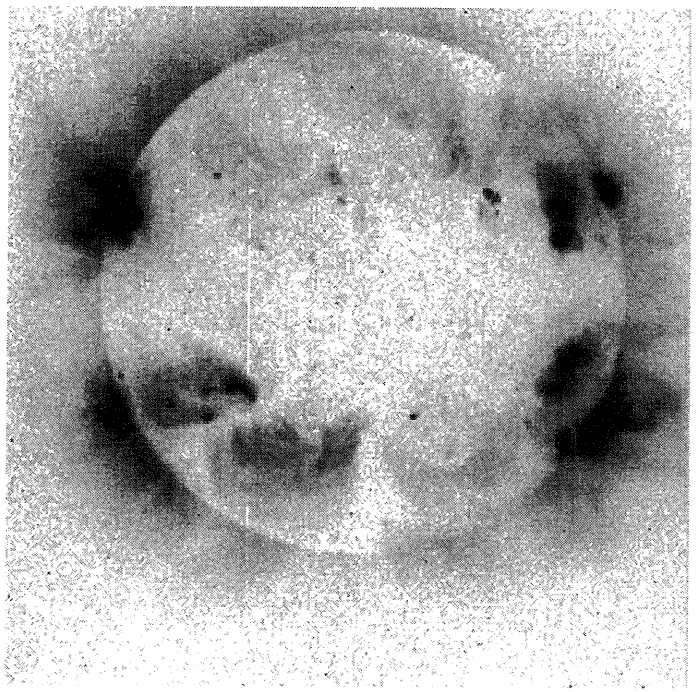
Day 26
11:30:27 UT



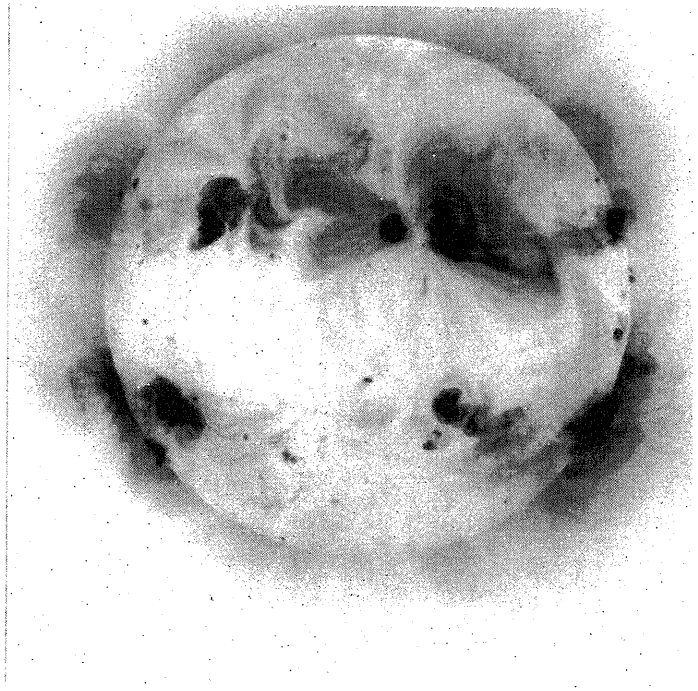
Day 28
11:54:33 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

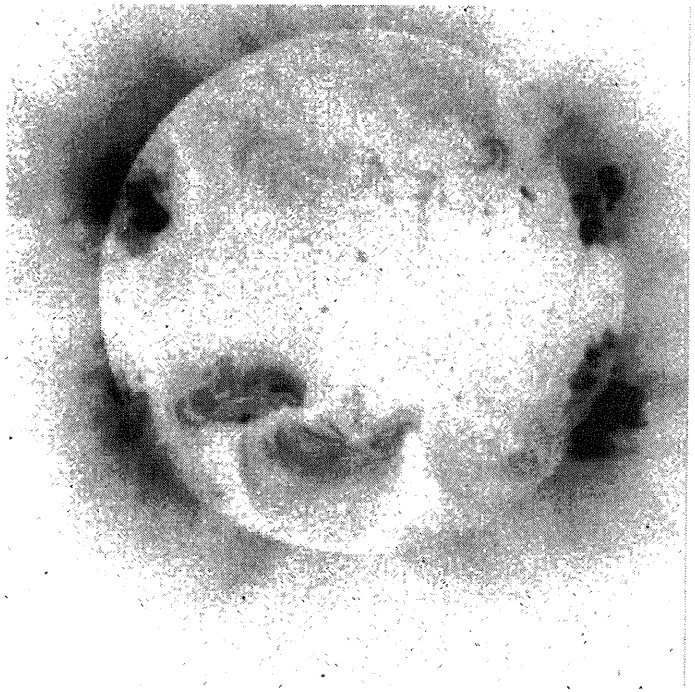
October 1998



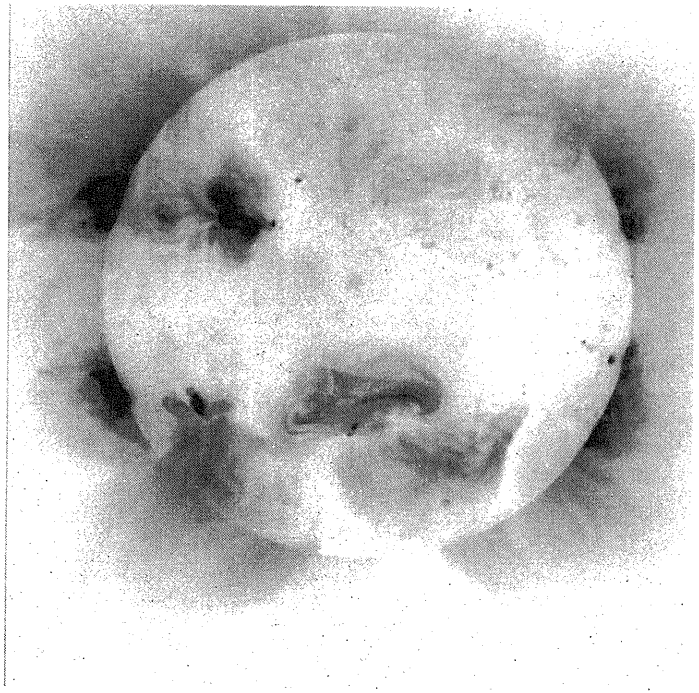
Day 25
14:12:51 UT



Day 27
11:31:09 UT



Day 26
11:30:27 UT



Day 28
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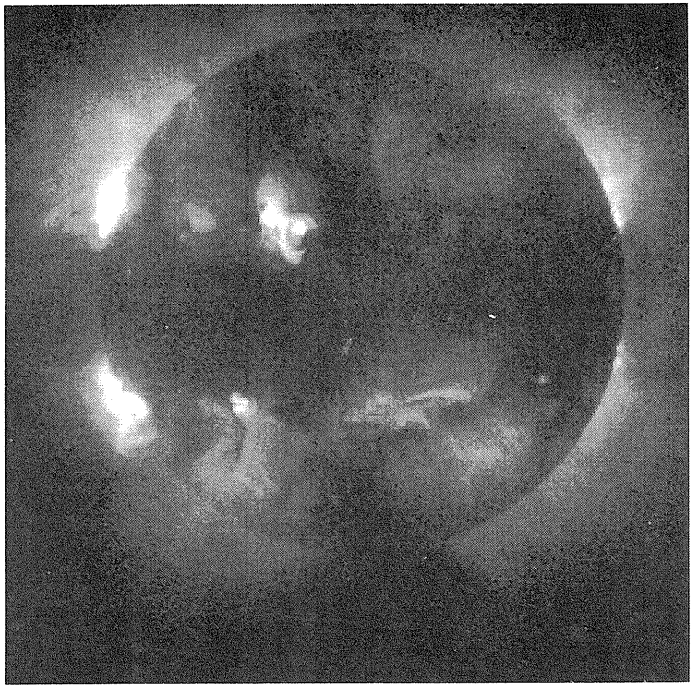
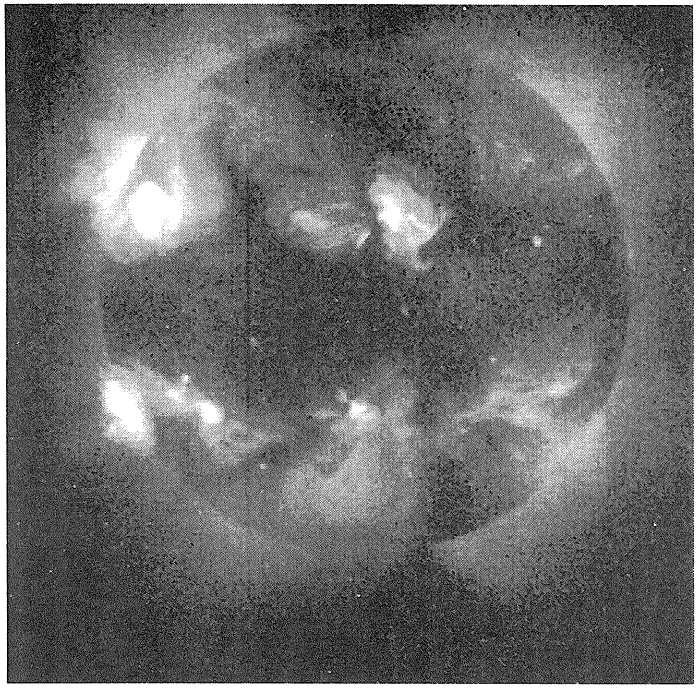
YOHKOH SOFT X-RAY TELESCOPE IMAGES

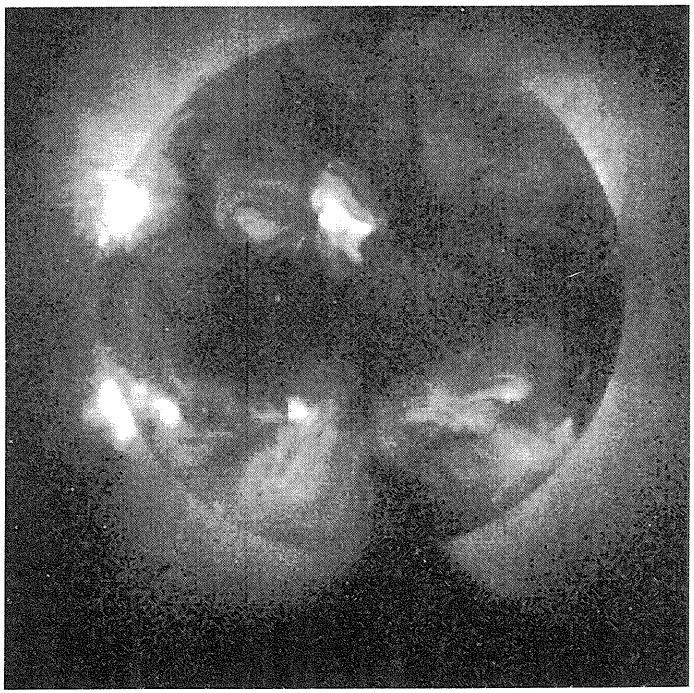
October
1998



Day 29
10:39:46 UT



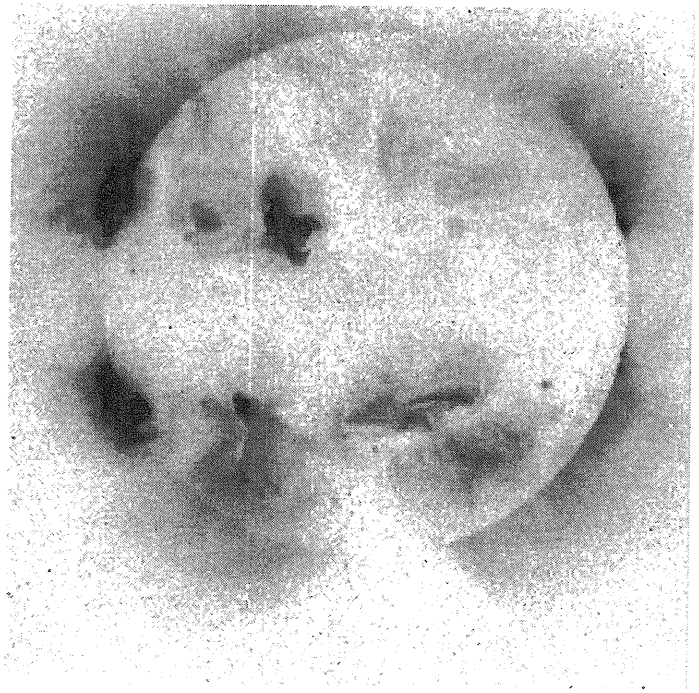
Day 31
12:27:14 UT



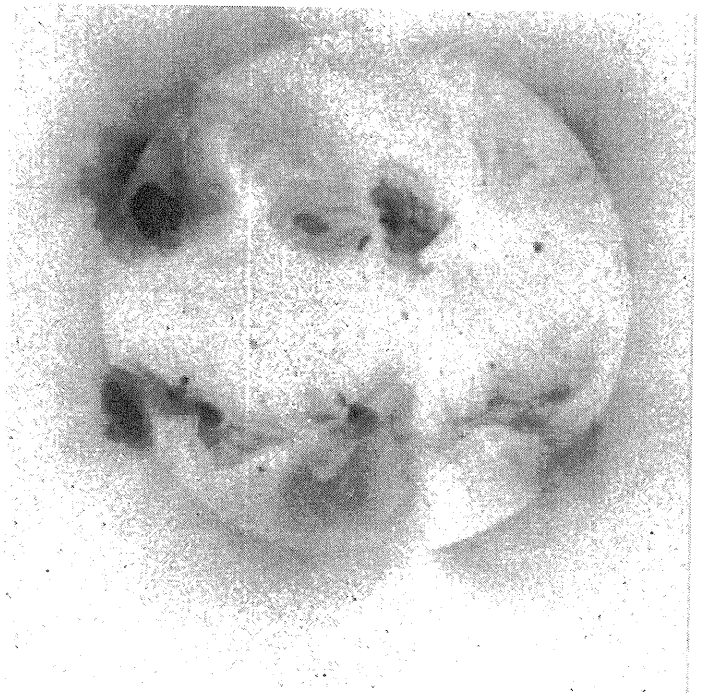
Day 30
12:09:06 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

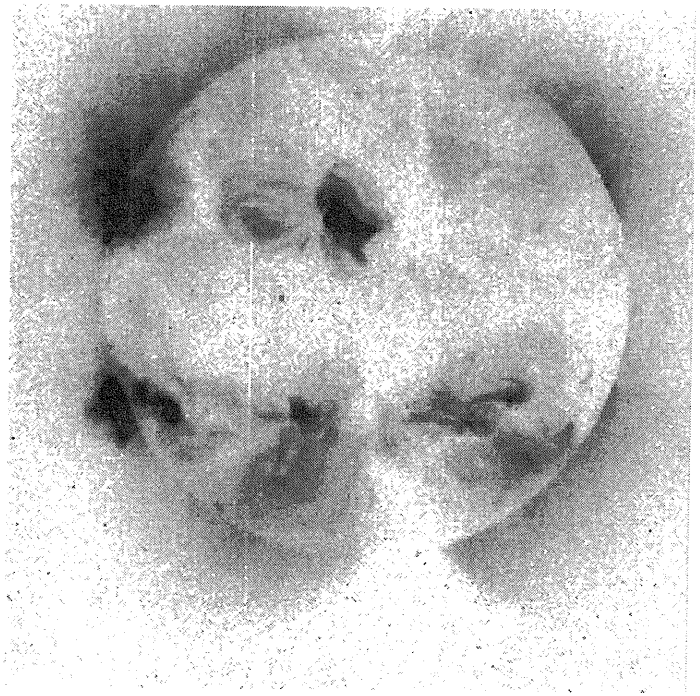
October
1998



Day 29
10:39:46 UT



Day 31
12:27:14 UT



Day 30
12:09:06 UT

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

OCTOBER 1998

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Mo	Day	Time (UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8346B		KAND	09	26	0640	N30	E64	10	1.3			AX		2	1	5
8347B	28822	MWIL	10	01	1445	S23	E05	10	2.0	4	(AF)					
8347B	28826	MWIL	10	03	1445	S23	W22	10	1.9	3	(AF)					
8347C	28827	MWIL	10	03	1445	S26	W00	10	3.6	3	(AP)					
8351		HOLL	10	06	1505	S24	W33	10	4.1		B	BXO	20	3	6	2
8351		TACH	10	07	0436	S23	W40	10	4.1			AR	17	3	2	3
8348		RAMY	09	28	1254	N16	E85	10	5.0		A	AX		1		3
8348	28820	MWIL	09	28	1500	N16	E78	10	4.5	4	(AP)					
8348		HOLL	09	28	1515	N17	E79	10	4.6		A	AX	20	2	2	4
8348		TACH	09	29	0426	N16	E68	10	4.3			AXX	5	1	1	4
8348		SVTO	09	29	0840	N16	E68	10	4.5		A	AX		1		2
8348		RAMY	09	29	1235	N16	E66	10	4.5		A	AX		1		3
8348	28820	MWIL	09	29	1445	N16	E64	10	4.5	4	(AP)					
8348		HOLL	09	29	1626	N17	E65	10	4.6		A	AX	10	1		3
8348		LEAR	09	30	0315	N16	E59	10	4.6		A	AX	20	1	1	3
8348		TACH	09	30	0444	N14	E55	10	4.3			AXX	10	1	1	3
8348		SVTO	09	30	0740	N16	E55	10	4.5		A	HR	30	1	1	3
8348		KAND	09	30	1115	N15	E54	10	4.5			AX		1	1	2
8348		RAMY	09	30	1212	N16	E52	10	4.4		A	AX		2		3
8348	28820	MWIL	09	30	1445	N16	E51	10	4.5	4	(AP)					
8348		HOLL	09	30	1710	N18	E49	10	4.4		A	AX	10	1		2
8348		SVTO	10	01	0737	N16	E42	10	4.5		A	AX		1		2
8348		KAND	10	02	0630	N15	E28	10	4.4			BXO		2	2	5
8348		RAMY	10	02	1302	N16	E25	10	4.4		A	AX		1		3
8348	28833	MWIL	10	07	1430	N18	W51	10	3.7	4	(BP)					
8348		HOLL	10	07	1455	N18	W51	10	3.7		B	BXO	20	3	3	3
8348		VORO	10	07	2348	N17	W57	10	3.7			BXO	32	2	3	3
8348		TACH	10	08	0605	N18	W60	10	3.7			AR	5	2	2	3
8348		KAND	10	08	0715	N17	W62	10	3.6			BXO		2	2	3
8348		RAMY	10	08	1221	N17	W66	10	3.5		B	BXO	10	4	5	4
8348		SVTO	10	08	1335	N18	W66	10	3.5		A	AX	10	3	2	2
8348	28833	MWIL	10	08	1445	N18	W66	10	3.6	4	(B)					
8348		HOLL	10	08	2235	N17	W72	10	3.5		A	AX	10	2		2
8348		VORO	10	08	2245	N17	W71	10	3.5			AXX	26	1		3
8348		LEAR	10	09	0035	N19	W73	10	3.4		A	AX	10	2	1	3
8348		KAND	10	09	0710	N18	W75	10	3.6			BXO		2	5	4
8348		RAMY	10	09	1225	N18	W77	10	3.6		B	BXO	10	2	3	4
8348	28833	MWIL	10	09	1445	N18	W79	10	3.6	4	(B)					
8349		KAND	09	28	0820	S26	E74	10	4.1			BXO		2	2	4
8349		RAMY	09	28	1254	S27	E73	10	4.2		A	AX		1		3
8349	28819	MWIL	09	28	1500	S27	E67	10	3.8	4	(B)					
8349		HOLL	09	28	1515	S25	E67	10	3.8		A	AX	20	2	2	4
8349		RAMY	09	29	1235	S26	E54	10	3.7		A	AX		1		3
8349		KAND	10	01	0750	S25	E38	10	4.3			BXO		4	4	5
8349	28823	MWIL	10	01	1445	S26	E35	10	4.3	4	(AF)					
8349		HOLL	10	01	1700	S26	E36	10	4.5		A	AX	10	2	1	2
8349		SVTO	10	02	1010	S28	E26	10	4.4		B	DRO	20	2	1	3
8349		RAMY	10	02	1302	S26	E24	10	4.4		B	BXO	10	7	3	3
8349	28823	MWIL	10	02	1445	S27	E22	10	4.3	4	(BF)					
8349		HOLL	10	02	1551	S27	E22	10	4.4		B	BXO	10	5	3	3
8349		VORO	10	02	2237	S28	E20	10	4.5			AXX	40	3		2
8349		KAND	10	03	0705	S27	E14	10	4.4			AX		2	1	4
8349		SVTO	10	03	0723	S27	E15	10	4.5		B	BXO	10	5	3	4
8349	28823	MWIL	10	03	1445	S27	E10	10	4.4	3	(AF)					
8349		HOLL	10	03	1631	S27	E09	10	4.4		B	BXO	10	3	3	2
8349		RAMY	10	05	1310	S23	W21	10	3.9		A	AX		1		2
8349	28830	MWIL	10	05	1445	S24	W20	10	4.1	4	(B)					
8349		SVTO	10	06	0608	S24	W30	10	3.9		B	CRO	20	6	4	4
8349		KAND	10	06	0810	S23	W31	10	3.9			CAO		3	4	5
8349		RAMY	10	06	1335	S25	W33	10	4.0		B	BXO	10	3	4	3
8349	28830	MWIL	10	06	1445	S24	W34	10	4.0	4	(B)					
8349		HOLL	10	06	1505	S24	W33	10	4.1		B	BXO	20	3	6	2
8349		SVTO	10	07	1113	S24	W44	10	4.1		A	AX	10	2	1	2
8349		RAMY	10	07	1335	S25	W47	10	3.9		B	BXO	10	4	5	3

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8349	28830	MWIL	10	07	1430	S23	W46	10	4.0	4	(B)					
8349		HOLL	10	07	1455	S25	W47	10	4.0		B	BXO	30	4	5	3
8349		RAMY	10	08	1221	S25	W61	10	3.8		B	BXO	20	4	5	4
8349		SVTO	10	08	1335	S25	W67	10	3.4		A	AX		1		2
8349	28830	MWIL	10	08	1445	S23	W61	10	3.9	4	(BP)					
8349		HOLL	10	08	2235	S24	W66	10	3.8		A	AX		1		2
8349		LEAR	10	09	0035	S22	W68	10	3.8		B	BXO	10	3	5	3
8349		RAMY	10	09	1225	S25	W75	10	3.7		B	BXO	10	2	15	4
8349	28830	MWIL	10	09	1445	S23	W74	10	3.9	4	(B)					
8349		HOLL	10	09	1539	S25	W78	10	3.6		B	BXO	10	2	5	3
8349A	28825	MWIL	10	02	1445	N16	E43	10	5.9	3	(AP)					
8349A		VORO	10	02	2237	N13	E37	10	5.7			AXX	10	2		2
8349B	28828	MWIL	10	03	1445	S22	E49	10	7.4	2	(B)					
8354		SVTO	10	06	0608	S18	E21	10	7.8		B	BXO	10	4	4	4
8354		KAND	10	06	0810	S18	E19	10	7.8			BXO		3	5	5
8354		RAMY	10	06	1335	S18	E17	10	7.9		B	BXO	10	4	4	3
8354		TACH	10	07	0436	S17	E09	10	7.9			BRO	21	4	2	3
8354		KAND	10	07	0645	S18	E08	10	7.9			CAO		5	4	3
8354		SVTO	10	07	1113	S18	E06	10	7.9		B	CRO	20	4	4	2
8354		RAMY	10	07	1335	S18	E05	10	7.9		B	CSO	30	13	4	3
8354	28834	MWIL	10	07	1430	S18	E04	10	7.9	5	(B)					
8354		HOLL	10	07	1455	S18	E04	10	7.9		B	DAO	70	11	6	3
8354		VORO	10	07	2348	S18	W01	10	7.9			CAI	54	7	4	3
8354		TACH	10	08	0605	S18	W05	10	7.9			BRO	27	4	5	3
8354		KAND	10	08	0715	S18	W06	10	7.8			CAO		4	7	3
8354		RAMY	10	08	1221	S18	W08	10	7.9		B	CRO	20	8	6	4
8354		SVTO	10	08	1335	S18	W09	10	7.9		B	CRO	20	7	7	2
8354	28834	MWIL	10	08	1445	S18	W10	10	7.8	5	(B)					
8354		HOLL	10	08	2235	S18	W15	10	7.8		B	CSO	30	3	6	2
8354		VORO	10	08	2245	S18	W13	10	7.9			BXI	23	2	4	3
8354		LEAR	10	09	0035	S17	W16	10	7.8		B	BXO	10	4	6	3
8354		KAND	10	09	0710	S18	W20	10	7.8			DRO		2	8	4
8354		RAMY	10	09	1225	S18	W25	10	7.6		A	AX	10	1	1	4
8354	28834	MWIL	10	09	1445	S18	W24	10	7.8	4	(B)					
8354		HOLL	10	09	1539	S18	W27	10	7.6		A	AX	10	1		3
8354		VORO	10	09	2234	S18	W31	10	7.6			AXX	12	1		3
8354		LEAR	10	10	0200	S18	W34	10	7.5		A	AX		1		2
8354		RAMY	10	12	1300	S22	W59	10	8.0		A	AX		1		3
8354	28842	MWIL	10	12	1445	S21	W60	10	8.0	4	(AF)					
8354		HOLL	10	12	1520	S21	W59	10	8.1		A	AX	10	1		3
8350		VORO	10	01	0012	N19	E79	10	7.0			HAX	260	1		2
8350		SVTO	10	01	0737	N19	E87	10	7.9		A	HS	80	1	5	2
8350		KAND	10	01	0750	N20	E88	10	8.0			HA		1	2	5
8350	28824	MWIL	10	01	1445	N18	E83	10	7.9	4	(AP)					
8350		HOLL	10	01	1700	N22	E80	10	7.8		A	HS	120	1	2	2
8350		TACH	10	02	0436	N19	E80	10	8.3			CSO	61	3	9	3
8350		KAND	10	02	0630	N19	E78	10	8.2			DSO		2	9	5
8350		SVTO	10	02	1010	N19	E73	10	8.0		B	DAO	360	2	10	3
8350		RAMY	10	02	1302	N22	E73	10	8.1		B	DSO	210	3	9	3
8350	28824	MWIL	10	02	1445	N19	E72	10	8.1	4	(B)					
8350		HOLL	10	02	1551	N20	E70	10	8.0		B	ESO	210	2	11	3
8350		VORO	10	02	2237	N20	E68	10	8.1			DAO	447	2	7	2
8350		TACH	10	03	0556	N20	E64	10	8.1			DSO	270	3	8	2
8350		KAND	10	03	0705	N20	E64	10	8.2			DAO		3	10	4
8350		SVTO	10	03	0723	N19	E64	10	8.2		B	DAO	280	3	10	4
8350	28824	MWIL	10	03	1445	N19	E59	10	8.1	5	(B)					
8350		HOLL	10	03	1631	N19	E57	10	8.0		B	DAO	210	3	9	2
8350		VORO	10	03	2230	N19	E55	10	8.1			DAI	569	7	7	2
8350		TACH	10	04	0434	N20	E50	10	8.0			DAI	165	9	8	3
8350		SVTO	10	04	0558	N20	E50	10	8.1		B	ESO	200	10	11	3
8350		RAMY	10	04	1235	N21	E47	10	8.1		B	DHO	290	10	9	3
8350		KAND	10	04	1310	N20	E46	10	8.1			DAI		11	9	3
8350	28824	MWIL	10	04	1445	N19	E45	10	8.0	5	(B)					
8350		HOLL	10	04	1506	N18	E45	10	8.0		B	DSO	340	15	10	1
8350		VORO	10	04	2230	N19	E40	10	8.0			DAI	404	3	9	2

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8350		TACH	10	05	0428	N19	E37	10	8.0			DAO	472	8	7	3
8350		KAND	10	05	0630	N20	E36	10	8.0			DAO		8	10	3
8350		SVTO	10	05	0700	N20	E36	10	8.0		B	DAO	160	9	10	3
8350		RAMY	10	05	1310	N20	E31	10	7.9		B	DSO	240	13	10	2
8350	28824	MWIL	10	05	1445	N18	E32	10	8.0	5	(B)					
8350		HOLL	10	05	1457	N18	E32	10	8.0		B	DSO	310	25	10	3
8350		VORO	10	05	2234	N19	E27	10	8.0			DAI	448	8	9	2
8350		TACH	10	06	0518	N19	E24	10	8.0			CAI	161	12	7	3
8350		SVTO	10	06	0608	N18	E23	10	8.0		B	EAO	310	22	12	4
8350		KAND	10	06	0810	N19	E21	10	7.9			DAO		13	10	5
8350		RAMY	10	06	1335	N19	E17	10	7.9		B	EAO	210	18	12	3
8350	28824	MWIL	10	06	1445	N18	E19	10	8.1	5	(B)					
8350		HOLL	10	06	1505	N21	E19	10	8.1		B	EAO	310	19	11	2
8350		VORO	10	06	2158	N19	E13	10	7.9			DAI	403	7	10	2
8350		TACH	10	07	0436	N20	E11	10	8.0			CAI	315	12	7	3
8350		KAND	10	07	0645	N19	E10	10	8.0			EAO		14	11	3
8350		SVTO	10	07	1113	N18	E06	10	7.9		B	EAO	170	9	11	2
8350		RAMY	10	07	1335	N18	E06	10	8.0		B	EAO	200	29	11	3
8350	28824	MWIL	10	07	1430	N19	E05	10	8.0	5	(B)					
8350		HOLL	10	07	1455	N19	E08	10	8.2		B	EKO	280	17	13	3
8350		VORO	10	07	2348	N20	E01	10	8.1			DAI	281	20	16	3
8350		TACH	10	08	0605	N21	W01	10	8.2			DAI	225	18	14	3
8350		KAND	10	08	0715	N20	W02	10	8.1			EAI		20	18	3
8350		RAMY	10	08	1221	N18	W06	10	8.0		B	EAO	150	38	11	4
8350		SVTO	10	08	1335	N18	W07	10	8.0		B	EAI	150	29	11	2
8350	28824	MWIL	10	08	1445	N19	W08	10	8.0	5	(BG)					
8350		HOLL	10	08	2235	N20	W08	10	8.3		B	FSO	320	26	17	2
8350		VORO	10	08	2245	N21	W08	10	8.3			DAI	349	13	14	3
8350		LEAR	10	09	0035	N19	W12	10	8.1		B	EAC	130	15	11	3
8350		KAND	10	09	0710	N20	W13	10	8.3			FAI		31	16	4
8350		RAMY	10	09	1225	N18	W19	10	8.1		B	ESO	140	13	13	4
8350	28824	MWIL	10	09	1445	N20	W22	10	7.9	5	(BP)					
8350		HOLL	10	09	1539	N20	W18	10	8.3		B	FSO	90	28	18	3
8350		VORO	10	09	2234	N21	W22	10	8.2			DAI	331	10	13	3
8350		LEAR	10	10	0200	N20	W25	10	8.2		B	CAO	110	13	11	2
8350		TACH	10	10	0648	N21	W26	10	8.3			DAI	182	9	13	2
8350		KAND	10	10	0650	N20	W28	10	8.1			CAO		21	16	4
8350		RAMY	10	10	1320	N18	W35	10	7.9		B	CSO	110	5	10	2
8350	28824	MWIL	10	10	1445	N20	W35	10	7.9	5	(BG)					
8350		HOLL	10	10	1558	N19	W35	10	8.0		B	CSO	100	8	10	3
8350		VORO	10	10	2220	N20	W34	10	8.3			DAI	181	7	14	3
8350		LEAR	10	11	0033	N21	W38	10	8.1		B	CAO	80	6	9	4
8350		KAND	10	11	0600	N20	W40	10	8.2			CAO		15	15	4
8350		SVTO	10	11	0750	N19	W48	10	7.7		A	HA	50	2	2	2
8350		RAMY	10	11	1115	N18	W49	10	7.7		A	HS	100	2	2	3
8350	28824	MWIL	10	11	1445	N20	W48	10	7.9	5	(BP)					
8350		VORO	10	11	2305	N18	W48	10	8.3			DAI	145	3	13	3
8350		TACH	10	12	0428	N21	W59	10	7.7			HA	80	2	3	3
8350		KAND	10	12	0630	N19	W61	10	7.6			HA		4	2	3
8350		SVTO	10	12	1139	N18	W64	10	7.6		A	HS	80	1	2	3
8350		RAMY	10	12	1300	N18	W65	10	7.6		A	HS	60	2	2	3
8350	28824	MWIL	10	12	1445	N20	W63	10	7.8	5	(BP)					
8350		HOLL	10	12	1520	N18	W65	10	7.7		B	CAO	40	3	2	3
8350		LEAR	10	13	0045	N20	W69	10	7.7		A	HA	80	2	2	3
8350		TACH	10	13	0436	N19	W72	10	7.7			HA	60	2	2	4
8350		KAND	10	13	1020	N19	W76	10	7.6			HA		1	2	3
8350		RAMY	10	13	1204	N19	W77	10	7.6		A	HS	30	1	2	4
8350		HOLL	10	13	1440	N19	W78	10	7.6		A	HA	90	1	2	4
8350	28824	MWIL	10	13	1445	N20	W77	10	7.7	5	(BP)					
8350		SVTO	10	13	1500	N19	W80	10	7.5		A	HA	60	1	1	2
8350		LEAR	10	14	0030	N21	W82	10	7.7		A	AX	10	1	1	3
8354A		KAND	10	05	0630	S29	E38	10	8.2			AX		1		3
8350A	28831	MWIL	10	06	1445	N24	E20	10	8.1	3	(AF)					
8350A	28831	MWIL	10	07	1430	N27	E09	10	8.3	3	(AF)					
8356		RAMY	10	08	1221	N21	E02	10	8.7		B	CRO	30	12	4	4
8356		SVTO	10	08	1335	N21	E03	10	8.8		B	DRO	50	3	3	2

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8356	28837	MWIL	10	08	1445	N21	E02	10	8.8	5	(B)					
8356		LEAR	10	09	0035	N21	W03	10	8.8		B	DAC	90	12	4	3
8356		RAMY	10	09	1225	N20	W10	10	8.7		B	CSO	60	13	6	4
8356	28837	MWIL	10	09	1445	N21	W11	10	8.8	4	(B)					
8356		HOLL	10	09	1539	N21	W11	10	8.8		B	CSO	20	19	4	3
8356		LEAR	10	10	0200	N21	W17	10	8.8		B	CAO	60	19	6	2
8356		RAMY	10	10	1320	N22	W25	10	8.6		B	CRO	70	13	8	2
8356	28837	MWIL	10	10	1445	N21	W25	10	8.7	4	(B)					
8356		HOLL	10	10	1558	N21	W26	10	8.7		B	BXO	30	17	6	3
8356		LEAR	10	11	0033	N21	W29	10	8.8		B	BXO	20	15	5	4
8356		SVTO	10	11	0750	N21	W34	10	8.7		B	BXO	10	6	4	2
8356		RAMY	10	11	1115	N20	W35	10	8.8		B	BXO	10	4	4	3
8356	28837	MWIL	10	11	1445	N21	W37	10	8.8	4	(B)					
8356		RAMY	10	12	1300	N19	W50	10	8.7		B	BXO	20	5	5	3
8356	28837	MWIL	10	12	1445	N21	W50	10	8.8	4	(BG)					
8356A		SVTO	10	06	0608	S12	E38	10	9.1		A	AX		1		4
8356A		KAND	10	06	0810	S11	E37	10	9.1			AX		1	1	5
8356A		RAMY	10	06	1335	S12	E35	10	9.2		A	AX		1		3
8356A		HOLL	10	06	1505	S12	E34	10	9.2		A	AX	10	2	1	2
8356A	28835	MWIL	10	07	1430	S12	E22	10	9.3	3	(AF)					
8359	28839	MWIL	10	10	1445	N23	W06	10	10.1	4	(AP)					
8359		KAND	10	13	1020	N22	W40	10	10.3			BXO		5	3	3
8359		RAMY	10	13	1204	N23	W41	10	10.3		B	BXO	10	6	2	4
8359		HOLL	10	13	1440	N23	W42	10	10.4		B	BXO	30	4	4	4
8359	28843	MWIL	10	13	1445	N23	W42	10	10.4	4	(B)					
8359		SVTO	10	13	1500	N23	W42	10	10.4		B	BXO	30	3	3	2
8359		LEAR	10	14	0030	N23	W46	10	10.5		B	BXO	20	2	3	3
8359		TACH	10	14	0522	N23	W49	10	10.4			BXO	15	2	2	3
8359		SVTO	10	14	0731	N23	W51	10	10.4		B	BXO	60	2	4	3
8359		RAMY	10	14	1210	N23	W54	10	10.3		B	BXO	10	2	3	3
8359	28843	MWIL	10	14	1445	N25	W55	10	10.3	4	(B)					
8359		HOLL	10	14	1528	N23	W55	10	10.4		B	BXO	10	2	4	3
8359		VORO	10	14	2237	N24	W58	10	10.5			HAX	30	1		3
8359		LEAR	10	15	0017	N25	W58	10	10.5		B	BXO	20	2	6	3
8359		SVTO	10	15	0625	N24	W63	10	10.4		A	HR	10	1		3
8359		RAMY	10	15	1329	N24	W68	10	10.3		A	AX		1		3
8359	28843	MWIL	10	15	1445	N24	W67	10	10.4	3	X					
8359		HOLL	10	15	1715	N24	W68	10	10.5		A	AX	10	1		1
8359		VORO	10	15	2239	N24	W70	10	10.5			AXX	17	1		3
8359		LEAR	10	16	0107	N25	W72	10	10.5		A	AX	10	1		3
8353		SVTO	10	06	0608	N19	E77	10	12.1		B	CSO	40	3	5	4
8353		KAND	10	06	0810	N20	E78	10	12.3			CSO		3	6	5
8353		RAMY	10	06	1335	N21	E73	10	12.2		B	BXO	20	4	6	3
8353	28832	MWIL	10	06	1445	N19	E71	10	12.0	4	(B)					
8353		HOLL	10	06	1505	N21	E70	10	12.0		A	AX	20	2	1	2
8353		TACH	10	07	0436	N20	E63	10	12.0			AR	12	2	1	3
8353		KAND	10	07	0645	N20	E65	10	12.2			BXO		3	7	3
8353		SVTO	10	07	1113	N21	E61	10	12.1		B	BXO	10	3	6	2
8353		RAMY	10	07	1335	N20	E60	10	12.1		B	CRO	20	5	6	3
8353	28832	MWIL	10	07	1430	N20	E58	10	12.0	4	(BP)					
8353		HOLL	10	07	1455	N21	E57	10	12.0		B	BXO	30	3	8	3
8353		VORO	10	07	2348	N20	E56	10	12.3			BXO	39	3	6	3
8353		TACH	10	08	0605	N22	E48	10	11.9			AR	6	2	1	3
8353		KAND	10	08	0715	N20	E50	10	12.1			BXO		3	8	3
8353		RAMY	10	08	1221	N20	E47	10	12.1		B	BXO	10	3	7	4
8353		SVTO	10	08	1335	N20	E48	10	12.2		B	BXO	10	3	8	2
8353	28832	MWIL	10	08	1445	N20	E44	10	12.0	4	(BP)					
8353		HOLL	10	08	2235	N20	E38	10	11.8		A	AX	10	2		2
8353		VORO	10	08	2245	N21	E39	10	11.9			HRX	32	1		3
8353		LEAR	10	09	0035	N19	E37	10	11.8		A	AX	10	2	1	3
8353		KAND	10	09	0710	N20	E33	10	11.8			AX		2	1	4
8353		RAMY	10	09	1225	N19	E31	10	11.9		A	AX	10	2	1	4
8353	28832	MWIL	10	09	1445	N20	E29	10	11.8	4	(AP)					
8353		HOLL	10	09	1539	N19	E28	10	11.8		A	AX	10	2		3
8353A	28840	MWIL	10	11	1445	N20	E09	10	12.3	4	(AF)					

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8353A	28840	MWIL	10	12	1445	N20	W04	10	12.3	4	(BF)					
8353A		LEAR	10	15	0017	N21	W32	10	12.5		B	BXO	30	5	7	3
8353A		TACH	10	17	0716	N22	W56	10	13.0			AXX	5	1	1	2
8353A		RAMY	10	17	1230	N21	W60	10	12.9		A	AX	10	2	2	4
8353A	28851	MWIL	10	17	1500	N22	W60	10	13.0	3	(B)					
8353A		KAND	10	18	0925	N22	W70	10	13.0			BXO		2	4	3
8353A	28851	MWIL	10	18	1500	N22	W71	10	13.2	4	(BF)					
8353A		HOLL	10	18	1500	N22	W72	10	13.1		A	AX	20	1		4
8355		VORO	10	06	2158	S22	E76	10	12.7			HAX	101	1		2
8355		TACH	10	07	0436	S21	E76	10	13.0			DAO	60	3	4	3
8355		KAND	10	07	0645	S21	E71	10	12.7			DAO		4	10	3
8355		SVTO	10	07	1113	S21	E72	10	13.0		B	DKO	300	4	10	2
8355		RAMY	10	07	1335	S22	E71	10	13.0		B	EKI	270	11	11	3
8355	28836	MWIL	10	07	1430	S22	E68	10	12.8	4	(B)					
8355		HOLL	10	07	1455	S21	E68	10	12.8		B	DAO	330	7	8	3
8355		VORO	10	07	2348	S21	E66	10	13.0			DAI	352	4	1	3
8355		TACH	10	08	0605	S21	E62	10	13.0			DAI	92	4	3	3
8355		KAND	10	08	0715	S22	E60	10	12.9			DSI		6	7	3
8355		RAMY	10	08	1221	S22	E58	10	13.0		B	DAI	240	12	7	4
8355		SVTO	10	08	1335	S22	E55	10	12.8		B	DSO	180	7	6	2
8355	28836	MWIL	10	08	1445	S21	E55	10	12.8	5	(D)					
8355		HOLL	10	08	2235	S20	E50	10	12.8		B	CAO	230	9	6	2
8355		VORO	10	08	2245	S20	E51	10	12.8			DAI	264	5	4	3
8355		LEAR	10	09	0035	S22	E49	10	12.8		B	DAC	220	9	6	3
8355		KAND	10	09	0710	S21	E46	10	12.8			DAI		9	7	4
8355		RAMY	10	09	1225	S22	E43	10	12.8		B	DAO	180	5	8	4
8355	28836	MWIL	10	09	1445	S21	E41	10	12.7	5	(B)					
8355		HOLL	10	09	1539	S21	E40	10	12.7		B	DAI	140	24	5	3
8355		VORO	10	09	2234	S21	E37	10	12.8			DAI	209	5	3	3
8355		LEAR	10	10	0200	S23	E33	10	12.6		B	DAC	240	23	8	2
8355		TACH	10	10	0648	S21	E32	10	12.7			DSI	115	3	4	2
8355		KAND	10	10	0650	S21	E33	10	12.8			DAI		21	7	4
8355		RAMY	10	10	1320	S22	E29	10	12.8		B	DSO	120	8	6	2
8355	28836	MWIL	10	10	1445	S21	E28	10	12.8	5	(BG)					
8355		HOLL	10	10	1558	S22	E28	10	12.8		B	DAI	170	19	7	3
8355		VORO	10	10	2220	S21	E23	10	12.7			DAI	246	6	4	3
8355		LEAR	10	11	0033	S22	E23	10	12.8		B	DAI	90	22	7	4
8355		KAND	10	11	0600	S21	E20	10	12.8			DAC		9	8	4
8355		SVTO	10	11	0750	S22	E18	10	12.7		B	DSO	130	11	8	2
8355		RAMY	10	11	1115	S21	E17	10	12.8		B	DSO	130	12	7	3
8355	28836	MWIL	10	11	1445	S21	E15	10	12.8	5	(BG)					
8355		VORO	10	11	2305	S24	E10	10	12.7			DAI	331	5	4	3
8355		TACH	10	12	0428	S21	E07	10	12.7			DAI	141	8	6	3
8355		KAND	10	12	0630	S21	E06	10	12.7			DAC		15	7	3
8355		SVTO	10	12	1139	S22	E04	10	12.8		B	DSO	90	13	8	3
8355		RAMY	10	12	1300	S21	E04	10	12.8		B	DSO	110	14	7	3
8355	28836	MWIL	10	12	1445	S21	E02	10	12.8	5	(BG)					
8355		HOLL	10	12	1520	S22	E02	10	12.8		B	DSI	280	15	7	3
8355		LEAR	10	13	0045	S21	W04	10	12.7		B	DAC	110	15	7	3
8355		TACH	10	13	0436	S20	W06	10	12.7			CAI	181	10	4	4
8355		KAND	10	13	1020	S21	W09	10	12.7			DSO		8	7	3
8355		RAMY	10	13	1204	S21	W11	10	12.6		B	DSO	90	21	6	4
8355		HOLL	10	13	1440	S21	W12	10	12.7		B	DAI	140	12	7	4
8355	28836	MWIL	10	13	1445	S20	W11	10	12.8	4	(BG)					
8355		SVTO	10	13	1500	S21	W12	10	12.7		B	DAO	130	14	7	2
8355		LEAR	10	14	0030	S21	W17	10	12.7		B	DSC	110	15	7	3
8355		TACH	10	14	0522	S20	W19	10	12.8			CAI	60	8	4	3
8355		SVTO	10	14	0731	S22	W21	10	12.7		B	DAO	120	6	6	3
8355		RAMY	10	14	1210	S21	W23	10	12.7		B	CAO	40	10	6	3
8355	28836	MWIL	10	14	1445	S20	W25	10	12.7	5	(BG)					
8355		HOLL	10	14	1528	S21	W25	10	12.7		B	DAO	50	8	6	3
8355		VORO	10	14	2237	S21	W29	10	12.7			BXO	33	3	3	3
8355		LEAR	10	15	0017	S21	W32	10	12.5		B	BXO	30	5	7	3
8355		SVTO	10	15	0625	S21	W34	10	12.7		B	CRO	20	4	5	3
8355		RAMY	10	15	1329	S21	W37	10	12.7		B	BXO	10	5	5	3
8355	28836	MWIL	10	15	1445	S20	W39	10	12.6	3	(BP)					
8355		HOLL	10	15	1715	S21	W38	10	12.8		B	BXO	10	2	4	1
8355		SVTO	10	16	0750	S22	W51	10	12.4		A	AX		2		3

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8358		LEAR	10	13	0045	N15	E14	10	14.1		B	BXO	10	5	3	3
8358		TACH	10	13	0436	N16	E12	10	14.1			BRO	61	5	3	4
8358		KAND	10	13	1020	N15	E09	10	14.1			CAO		8	6	3
8358		RAMY	10	13	1204	N15	E07	10	14.0		B	CRO	20	10	5	4
8358		HOLL	10	13	1440	N16	E07	10	14.1		B	CAO	60	8	6	4
8358	28844	MWIL	10	13	1445	N15	E06	10	14.1	5	(B)					
8358		SVTO	10	13	1500	N15	E06	10	14.1		B	CSO	100	10	5	2
8358		LEAR	10	14	0030	N15	E01	10	14.1		B	DSO	90	14	8	3
8358		TACH	10	14	0522	N15	W02	10	14.1			CAI	112	9	7	3
8358		SVTO	10	14	0731	N15	W04	10	14.0		B	DSO	100	10	8	3
8358		RAMY	10	14	1210	N15	W06	10	14.0		B	DSO	90	16	8	3
8358	28844	MWIL	10	14	1445	N15	W08	10	14.0	5	(B)					
8358		HOLL	10	14	1528	N15	W09	10	14.0		B	DSO	140	11	8	3
8358		VORO	10	14	2237	N15	W12	10	14.0			DAI	158	8	8	3
8358		LEAR	10	15	0017	N15	W13	10	14.0		B	CSO	90	15	9	3
8358		SVTO	10	15	0625	N15	W17	10	14.0		BG	DSO	80	11	9	3
8358		RAMY	10	15	1329	N15	W22	10	13.9		B	DSO	50	15	9	3
8358	28844	MWIL	10	15	1445	N15	W22	10	13.9	5	(BG)					
8358		HOLL	10	15	1715	N15	W24	10	13.9		B	DSI	110	15	10	1
8358		VORO	10	15	2239	N14	W28	10	13.8			DAI	169	12	6	3
8358		LEAR	10	16	0107	N15	W28	10	13.9		B	CSO	80	18	9	3
8358		TACH	10	16	0608	N15	W30	10	14.0			BRI	53	11	9	3
8358		SVTO	10	16	0750	N15	W33	10	13.8		B	ESO	140	12	11	3
8358		HOLL	10	16	1540	N16	W37	10	13.8		BG	CSO	140	16	11	3
8358	28844	MWIL	10	16	2000	N15	W40	10	13.8	4	(BG)					
8358		VORO	10	16	2240	N14	W42	10	13.8			DAI	246	5	7	3
8358		LEAR	10	17	0326	N17	W43	10	13.9		B	DSO	190	9	9	2
8358		KAND	10	17	0700	N15	W47	10	13.7			DSO		10	9	4
8358		TACH	10	17	0716	N15	W47	10	13.7			CAI	149	9	7	2
8358		SVTO	10	17	1218	N15	W50	10	13.7		B	CAO	120	7	9	3
8358		RAMY	10	17	1230	N15	W49	10	13.8		B	DAO	160	12	8	4
8358	28844	MWIL	10	17	1500	N16	W50	10	13.8	4	(D)					
8358		HOLL	10	17	1600	N16	W51	10	13.8		BG	CSO	210	12	8	3
8358		LEAR	10	18	0037	N16	W56	10	13.8		B	DSC	290	15	9	4
8358		TACH	10	18	0424	N15	W60	10	13.6			CSI	158	5	6	5
8358		SVTO	10	18	0735	N16	W61	10	13.7		BG	DAO	300	9	10	3
8358		KAND	10	18	0925	N15	W64	10	13.5			DAI		9	10	3
8358		RAMY	10	18	1219	N13	W65	10	13.6		B	DAO	140	6	9	2
8358		HOLL	10	18	1500	N14	W65	10	13.7		B	DAO	360	7	9	4
8358	28844	MWIL	10	18	1500	N15	W64	10	13.8	5	(BG)					
8358		LEAR	10	19	0020	N16	W69	10	13.8		B	DAO	180	8	9	3
8358		TACH	10	19	0424	N16	W71	10	13.8			DAO	100	4	8	3
8358		SVTO	10	19	0910	N14	W75	10	13.7		B	DAO	300	2	9	2
8358		KAND	10	19	1045	N14	W78	10	13.5			DAO		2	10	4
8358		RAMY	10	19	1207	N14	W76	10	13.8		B	DSO	140	4	8	4
8358	28844	MWIL	10	19	1500	N15	W78	10	13.7	4	(B)					
8358		VORO	10	19	2230	N14	W82	10	13.7			DAO	250	2	5	3
8358		LEAR	10	20	0020	N17	W80	10	13.9		B	DAO	60	2	8	3
8358		TACH	10	20	0436	N16	W82	10	14.0			AXX	10	1	2	3
8360		LEAR	10	14	0030	S19	E01	10	14.1		B	BXO	10	2	3	3
8360		TACH	10	14	0522	S18	W02	10	14.1			BRO	52	5	3	3
8360		SVTO	10	14	0731	S19	W03	10	14.1		B	DAO	130	8	5	3
8360		RAMY	10	14	1210	S19	W06	10	14.0		B	DAO	90	15	6	3
8360	28845	MWIL	10	14	1445	S19	W07	10	14.1	5	(BP)					
8360		HOLL	10	14	1528	S19	W08	10	14.0		B	DSO	150	13	6	3
8360		VORO	10	14	2237	S19	W11	10	14.1			DAI	268	6	5	3
8360		LEAR	10	15	0017	S18	W13	10	14.0		B	DSI	200	20	8	3
8360		SVTO	10	15	0625	S19	W17	10	14.0		B	DSO	230	10	9	3
8360		RAMY	10	15	1329	S19	W19	10	14.1		B	DAI	360	13	7	3
8360	28845	MWIL	10	15	1445	S19	W21	10	14.0	5	(B)					
8360		HOLL	10	15	1715	S19	W23	10	14.0		B	DSC	310	8	8	1
8360		VORO	10	15	2239	S20	W25	10	14.0			DKI	723	8	7	3
8360		LEAR	10	16	0107	S18	W27	10	14.0		B	DSC	270	22	8	3
8360		TACH	10	16	0608	S19	W28	10	14.1			DAI	452	7	6	3
8360		SVTO	10	16	0750	S18	W30	10	14.0		B	DSO	350	10	10	3
8360		HOLL	10	16	1540	S18	W35	10	14.0		B	DAO	390	22	10	3
8360	28845	MWIL	10	16	2000	S19	W37	10	14.0	5	(B)					

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8360		VORO	10	16	2240	S20	W38	10	14.0			DKI	670	8	7	3
8360		LEAR	10	17	0326	S18	W41	10	14.0		B	DKO	460	13	10	2
8360		KAND	10	17	0700	S20	W40	10	14.2			EAO		7	11	4
8360		TACH	10	17	0716	S19	W44	10	13.9			DSO	550	3	8	2
8360		SVTO	10	17	1218	S20	W47	10	13.9		B	EKO	320	5	10	3
8360		RAMY	10	17	1230	S20	W46	10	14.0		B	DKO	400	9	10	4
8360	28845	MWIL	10	17	1500	S19	W47	10	14.0	5	(B)					
8360		HOLL	10	17	1600	S19	W48	10	14.0		B	DAO	400	7	9	3
8360		LEAR	10	18	0037	S18	W52	10	14.1		B	EHC	380	5	11	4
8360		TACH	10	18	0424	S19	W56	10	13.9			CSO	270	4	8	5
8360		SVTO	10	18	0735	S19	W57	10	14.0		B	EKO	300	5	11	3
8360		KAND	10	18	0925	S20	W60	10	13.8			EHO		5	12	3
8360		RAMY	10	18	1219	S20	W58	10	14.1		B	CAO	130	6	10	2
8360		HOLL	10	18	1500	S19	W59	10	14.1		B	DAO	270	5	9	4
8360	28845	MWIL	10	18	1500	S19	W59	10	14.1	5	(B)					
8360		LEAR	10	19	0020	S18	W65	10	14.1		B	DKO	240	5	10	3
8360		TACH	10	19	0424	S18	W66	10	14.1			DSO	150	5	7	3
8360		SVTO	10	19	0910	S21	W72	10	13.9		B	EHO	210	4	14	2
8360		KAND	10	19	1045	S20	W71	10	14.0			DHO		5	9	4
8360		RAMY	10	19	1207	S20	W71	10	14.1		B	EHO	120	7	12	4
8360	28845	MWIL	10	19	1500	S19	W73	10	14.0	4	(BP)					
8360		VORO	10	19	2230	S20	W81	10	13.7			HKX	436	1		3
8360		LEAR	10	20	0020	S18	W79	10	14.0		A	HK	120	1	4	3
8357		KAND	10	09	0710	S35	E69	10	14.8			AX		1		4
8357	28838	MWIL	10	09	1445	S35	E65	10	14.8	4	(BP)					
8357		VORO	10	09	2234	S33	E61	10	14.8			HRX	35	1		3
8357		LEAR	10	10	0200	S35	E58	10	14.7		A	AX	10	1		2
8357		KAND	10	10	0650	S33	E55	10	14.6			AX		1		4
8357		RAMY	10	10	1320	S33	E52	10	14.7		A	AX	10	1	1	2
8357	28838	MWIL	10	10	1445	S35	E50	10	14.6	4	(BP)					
8357		HOLL	10	10	1558	S34	E48	10	14.5		A	AX	10	1		3
8357		LEAR	10	11	0033	S34	E45	10	14.6		A	AX	10	1	1	4
8357		KAND	10	11	0600	S34	E41	10	14.5			AX		1		4
8357		SVTO	10	11	0750	S35	E41	10	14.6		A	AX		1		2
8357		RAMY	10	11	1115	S33	E39	10	14.6		A	AX		1		3
8357	28838	MWIL	10	11	1445	S34	E36	10	14.5	4	(AP)					
8357		RAMY	10	12	1300	S32	E26	10	14.6		A	AX		2	1	3
8357	28838	MWIL	10	12	1445	S32	E23	10	14.4	3	(AP)					
8357	28838	MWIL	10	13	1445	S33	E11	10	14.5	3	(AP)					
8361		VORO	10	14	2237	N13	E03	10	15.2			AXX	18	2		3
8361		LEAR	10	15	0017	N14	E03	10	15.2		B	BXO	10	2	3	3
8361		SVTO	10	15	0625	N14	W02	10	15.1		B	CRO	10	3	4	3
8361		RAMY	10	15	1329	N15	W05	10	15.2		B	BXO	10	5	4	3
8361	28847	MWIL	10	15	1445	N14	W07	10	15.1	4	(B)					
8361		HOLL	10	15	1715	N13	W08	10	15.1		B	CSO	30	2	4	1
8361		VORO	10	15	2239	N14	W10	10	15.2			CAO	37	2	3	3
8361		LEAR	10	16	0107	N14	W12	10	15.1		B	BXO	30	4	5	3
8361		TACH	10	16	0608	N14	W15	10	15.1			BRI	39	5	4	3
8361		SVTO	10	16	0750	N14	W17	10	15.0		B	DSO	40	5	4	3
8361		HOLL	10	16	1540	N15	W21	10	15.1		B	CSO	20	8	6	3
8361	28847	MWIL	10	16	2000	N14	W23	10	15.1	4	(B)					
8361		VORO	10	16	2240	N14	W24	10	15.1			CAI	82	4	5	3
8361		LEAR	10	17	0326	N15	W26	10	15.2		B	CSO	40	9	7	2
8361		KAND	10	17	0700	N14	W30	10	15.0			DAO		8	6	4
8361		TACH	10	17	0716	N15	W29	10	15.1			BRI	28	6	5	2
8361		SVTO	10	17	1218	N14	W33	10	15.0		B	BXO	10	6	7	3
8361		RAMY	10	17	1230	N14	W33	10	15.0		B	CSO	30	12	6	4
8361	28847	MWIL	10	17	1500	N15	W33	10	15.1	4	(BP)					
8361		HOLL	10	17	1600	N14	W34	10	15.1		B	BXO	60	7	7	3
8361		LEAR	10	18	0037	N16	W38	10	15.1		B	DSC	70	8	8	4
8361		TACH	10	18	0424	N15	W42	10	15.0			BRI	35	6	7	5
8361		SVTO	10	18	0735	N15	W43	10	15.1		B	CSO	70	9	9	3
8361		KAND	10	18	0925	N15	W45	10	15.0			CAO		9	10	3
8361		RAMY	10	18	1219	N13	W46	10	15.0		B	BXO	30	8	8	2
8361	28847	MWIL	10	18	1500	N14	W47	10	15.1	4	(B)					
8361		HOLL	10	18	1500	N14	W48	10	15.0		B	CAO	100	9	7	4
8361		LEAR	10	19	0020	N15	W53	10	15.0		B	DAC	70	10	8	3

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8361		TACH	10	19	0424	N15	W54	10	15.1			DAI	86	9	5	3
8361		SVTO	10	19	0910	N14	W58	10	15.0		B	DSO	140	4	9	2
8361		KAND	10	19	1045	N14	W60	10	14.9			DAO		7	10	4
8361		RAMY	10	19	1207	N14	W60	10	15.0		B	DSI	80	14	8	4
8361	28847	MWIL	10	19	1500	N15	W61	10	15.0	5	(D)					
8361		VORO	10	19	2230	N14	W64	10	15.1			DAI	178	4	5	3
8361		LEAR	10	20	0020	N15	W66	10	15.0		B	CAO	50	10	9	3
8361		TACH	10	20	0436	N15	W67	10	15.1			CSO	34	4	4	3
8361		KAND	10	20	0705	N13	W70	10	15.0			BXI		7	10	4
8361		RAMY	10	20	1351	N13	W75	10	14.9		B	CSO	40	3	8	2
8361	28847	MWIL	10	20	1500	N14	W76	10	14.9	4	(BP)					
8361		VORO	10	20	2231	N14	W80	10	14.9			CAO	104	2	7	3
8361		LEAR	10	21	0115	N15	W82	10	14.8		A	HS	10	1		3
8361A		RAMY	10	11	1115	N26	E52	10	15.5		A	AX	10	2	2	3
8361A	28841	MWIL	10	11	1445	N26	E50	10	15.5	4	(B)					
8363A		RAMY	10	14	1210	N24	E57	10	18.9		A	AX		1		3
8363A	28846	MWIL	10	14	1445	N23	E56	10	18.9	4	(AP)					
8363		RAMY	10	15	1329	N26	E52	10	19.6		B	BXO	10	5	4	3
8363	28848	MWIL	10	15	1445	N25	E50	10	19.5	3	(B)					
8363		HOLL	10	15	1715	N24	E48	10	19.4		B	BXO	30	5	3	1
8363		VORO	10	15	2239	N25	E44	10	19.3			HAX	106	5		3
8363		LEAR	10	16	0107	N23	E42	10	19.3		B	BXO	40	6	4	3
8363		TACH	10	16	0608	N24	E42	10	19.5			BXO	38	3	4	3
8363		SVTO	10	16	0750	N25	E40	10	19.4		B	DAO	30	5	5	3
8363		HOLL	10	16	1540	N24	E36	10	19.4		B	DSO	40	10	6	3
8363	28848	MWIL	10	16	2000	N25	E33	10	19.4	4	(B)					
8363		VORO	10	16	2240	N25	E32	10	19.4			DAI	118	5	5	3
8363		LEAR	10	17	0326	N24	E29	10	19.4		B	DAC	110	9	6	2
8363		KAND	10	17	0700	N25	E25	10	19.2			DRI		17	8	4
8363		TACH	10	17	0716	N24	E26	10	19.3			BRI	92	10	6	2
8363		SVTO	10	17	1218	N25	E22	10	19.2		B	DSO	60	15	8	3
8363		RAMY	10	17	1230	N25	E23	10	19.3		B	DAO	120	17	7	4
8363	28848	MWIL	10	17	1500	N25	E23	10	19.4	4	(B)					
8363		HOLL	10	17	1600	N24	E21	10	19.3		B	DAO	110	12	7	3
8363		LEAR	10	18	0037	N25	E17	10	19.3		B	DSC	130	11	8	4
8363		TACH	10	18	0424	N25	E14	10	19.3			BRI	58	7	6	5
8363		SVTO	10	18	0735	N25	E14	10	19.4		B	DSO	80	8	9	3
8363		KAND	10	18	0925	N25	E12	10	19.3			DAI		15	8	3
8363		RAMY	10	18	1219	N25	E10	10	19.3		B	DAO	70	8	7	2
8363		HOLL	10	18	1500	N24	E09	10	19.3		B	DAI	120	15	7	4
8363	28848	MWIL	10	18	1500	N25	E09	10	19.3	4	(B)					
8363		LEAR	10	19	0020	N25	E04	10	19.3		B	DAI	60	13	8	3
8363		TACH	10	19	0424	N25	E01	10	19.3			CAI	93	12	6	3
8363		SVTO	10	19	0910	N25	W03	10	19.1		B	DSO	120	9	9	2
8363		KAND	10	19	1045	N25	W03	10	19.2			DAO		13	8	4
8363		RAMY	10	19	1207	N25	W04	10	19.2		B	DAO	70	22	7	4
8363	28848	MWIL	10	19	1500	N25	W04	10	19.3	5	(B)					
8363		VORO	10	19	2230	N25	W08	10	19.3			CAI	149	9	7	3
8363		LEAR	10	20	0020	N26	W09	10	19.3		B	CSO	30	14	8	3
8363		TACH	10	20	0436	N24	W12	10	19.3			CSI	47	10	6	3
8363		KAND	10	20	0705	N23	W14	10	19.2			CAO		8	7	4
8363		RAMY	10	20	1351	N24	W17	10	19.3		B	CSO	20	4	8	2
8363	28848	MWIL	10	20	1500	N24	W17	10	19.3	5	(B)					
8363		VORO	10	20	2231	N25	W22	10	19.2			CAI	37	4	6	3
8363		LEAR	10	21	0115	N24	W25	10	19.1		B	CSO	30	4	8	3
8363		TACH	10	21	0440	N25	W26	10	19.2			BXO	20	4	5	2
8363		KAND	10	21	0640	N24	W26	10	19.3			CSO		3	9	3
8363		SVTO	10	21	0735	N23	W27	10	19.2		B	BXO	20	5	8	3
8363	28848	MWIL	10	21	1445	N24	W31	10	19.2	4	(B)					
8363		VORO	10	21	2230	N25	W38	10	19.0			AXX	14	1		3
8363		LEAR	10	22	0041	N25	W39	10	19.0		A	AX		1		3
8363		TACH	10	22	0454	N25	W38	10	19.3			BXO	8	2	6	3
8363		KAND	10	22	0630	N25	W40	10	19.2			BXO		2	7	3
8363		SVTO	10	22	0635	N25	W39	10	19.2		B	DRO	20	4	7	3
8363	28848	MWIL	10	22	1445	N25	W45	10	19.1	4	(B)					
8363		LEAR	10	23	0052	N26	W44	10	19.6		A	AX		1		3

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8365		HOLL	10	18	1500	S28	E14	10	19.7		B	BXO	30	3	4	4
8365	28852	MWIL	10	18	1500	S28	E14	10	19.7	4	(B)					
8365		LEAR	10	19	0020	S29	E09	10	19.7		B	CAO		4	3	3
8365		TACH	10	19	0424	S28	E06	10	19.6			BXO	7	2	4	3
8365		SVTO	10	19	0910	S28	E04	10	19.7		B	DRO	10	2	5	2
8365		KAND	10	19	1045	S29	E03	10	19.7			CSO		2	5	4
8365		RAMY	10	19	1207	S29	E02	10	19.7		B	BXO	10	4	5	4
8365	28852	MWIL	10	19	1500	S28	E01	10	19.7	4	(BG)					
8365		VORO	10	19	2230	S28	W07	10	19.4			BXO	23	2	3	3
8365		LEAR	10	20	0020	S26	W09	10	19.3		B	BXO		4	3	3
8365		TACH	10	20	0436	S26	W10	10	19.4			BRI	28	7	4	3
8365		KAND	10	20	0705	S28	W12	10	19.3			BXO		13	6	4
8365		RAMY	10	20	1351	S28	W15	10	19.4		B	DRO	40	13	6	2
8365	28852	MWIL	10	20	1500	S27	W16	10	19.4	5	(B)					
8365		VORO	10	20	2231	S27	W20	10	19.4			CAI	213	19	7	3
8365		LEAR	10	21	0115	S27	W23	10	19.2		B	CSI	80	22	8	3
8365		TACH	10	21	0440	S25	W24	10	19.3			BRI	167	12	7	2
8365		KAND	10	21	0640	S27	W24	10	19.4			DAC		17	10	3
8365		SVTO	10	21	0735	S28	W25	10	19.4		B	DAI	160	16	10	3
8365	28852	MWIL	10	21	1445	S27	W29	10	19.3	5	(B)					
8365		VORO	10	21	2230	S27	W33	10	19.4			DKI	529	12	9	3
8365		LEAR	10	22	0041	S26	W35	10	19.3		B	EKC	340	17	12	3
8365		TACH	10	22	0454	S25	W38	10	19.3			DAI	318	7	6	3
8365		KAND	10	22	0630	S27	W38	10	19.3			ESO		8	12	3
8365		SVTO	10	22	0635	S27	W38	10	19.3		BG	EAO	290	11	12	3
8365	28852	MWIL	10	22	1445	S27	W42	10	19.3	6	(BG)					
8365		VORO	10	22	2320	S27	W47	10	19.3			DKI	202	6	11	2
8365		LEAR	10	23	0052	S25	W48	10	19.3		B	EKC	340	17	11	3
8365		TACH	10	23	0416	S26	W49	10	19.4			DSI	457	7	11	4
8365		SVTO	10	23	0738	S27	W52	10	19.3		B	EHO	310	8	14	3
8365		KAND	10	23	0745	S26	W51	10	19.4			EHC		11	15	3
8365		RAMY	10	23	1221	S28	W53	10	19.4		B	EKO	360	10	13	3
8365	28852	MWIL	10	23	1545	S26	W56	10	19.3	5	(B)					
8365		LEAR	10	24	0106	S25	W60	10	19.4		B	ESO	270	7	15	3
8365		VORO	10	24	0116	S28	W61	10	19.3			DKI	351	7	12	2
8365		TACH	10	24	0556	S28	W62	10	19.4			DAO	164	5	11	2
8365		KAND	10	24	0600	S26	W65	10	19.2			EAO		4	14	3
8365		RAMY	10	24	1145	S27	W66	10	19.3		B	EAO	180	6	12	3
8365		SVTO	10	24	1405	S26	W68	10	19.3		B	FAO	160	5	17	1
8365		HOLL	10	24	2206	S27	W72	10	19.3		B	CSO	80	2	16	3
8365		VORO	10	25	0120	S28	W75	10	19.2			DKI	344	5	14	2
8365		KAND	10	25	0630	S28	W80	10	19.0			HA		1	2	2
8365		SVTO	10	25	0811	S27	W79	10	19.2		A	AX	30	1	2	2
8365		RAMY	10	25	1304	S26	W81	10	19.2		B	BXO	10	2	5	3
8365	28852	MWIL	10	25	1500	S26	W75	10	19.8	2	AF					
8364		HOLL	10	15	1715	N24	E58	10	20.2		B	BXO	30	5	3	1
8364		HOLL	10	16	1540	N18	E42	10	19.8		A	AX	10	2	2	3
8364	28850	MWIL	10	16	2000	N19	E42	10	20.0	3	(BP)					
8364		VORO	10	16	2240	N19	E38	10	19.8			AXX	14	1		3
8364		LEAR	10	17	0326	N17	E37	10	19.9		B	BXO	10	3	5	2
8364		KAND	10	17	0700	N20	E33	10	19.8			AX		2	2	4
8364		TACH	10	17	0716	N19	E32	10	19.7			AXX	20	1	1	2
8364		SVTO	10	17	1218	N19	E29	10	19.7		B	AX	10	1	1	3
8364		RAMY	10	17	1230	N19	E30	10	19.8		B	CRO	20	5	3	4
8364	28850	MWIL	10	17	1500	N19	E29	10	19.8	4	(AP)					
8364		HOLL	10	17	1600	N18	E28	10	19.8		A	AX	10	1		3
8364		LEAR	10	18	0037	N18	E25	10	19.9		B	CSO	30	3	5	4
8364		TACH	10	18	0424	N20	E21	10	19.8			BXO	11	2	4	5
8364		SVTO	10	18	0735	N19	E22	10	20.0		B	DRO	20	5	6	3
8364		KAND	10	18	0925	N19	E20	10	19.9			CAO		8	7	3
8364		RAMY	10	18	1219	N20	E18	10	19.9		B	BXO	10	6	7	2
8364	28850	MWIL	10	18	1500	N19	E17	10	19.9	4	(B)					
8364		HOLL	10	18	1500	N19	E18	10	20.0		B	CSO	40	5	6	4
8364		LEAR	10	19	0020	N19	E11	10	19.8		B	BXO	10	4	4	3
8364		TACH	10	19	0424	N19	E08	10	19.8			BXO	15	2	8	3
8364		SVTO	10	19	0910	N19	E06	10	19.8		B	CSO	10	2	5	2
8364		KAND	10	19	1045	N19	E05	10	19.8			CSO		2	5	4

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8364		RAMY	10	19	1207	N19	E04	10	19.8		B	BXO	10	4	5	4
8364	28850	MWIL	10	19	1500	N19	E03	10	19.8	4	(B)					
8364		VORO	10	19	2230	N19	W01	10	19.9			BXO	27	2	4	3
8364		LEAR	10	20	0020	N19	W01	10	19.9		B	BXO		3	5	3
8364		TACH	10	20	0436	N19	W04	10	19.9			BXO	13	2	6	3
8364		KAND	10	20	0705	N18	W05	10	19.9			BXO		5	6	4
8364		RAMY	10	20	1351	N18	W13	10	19.6		A	AX		1		2
8364	28850	MWIL	10	20	1500	N19	W09	10	19.9	4	(BP)					
8364		VORO	10	20	2231	N20	W13	10	19.9			BXO	13	2	5	3
8364		LEAR	10	21	0115	N18	W15	10	19.9		B	BXO	10	4	7	3
8364		TACH	10	21	0440	N20	W17	10	19.9			BRI	17	4	6	2
8364		KAND	10	21	0640	N18	W18	10	19.9			BXO		4	6	3
8364		SVTO	10	21	0735	N19	W18	10	19.9		B	BXO	10	3	5	3
8364	28850	MWIL	10	21	1445	N19	W21	10	20.0	4	(B)					
8370		RAMY	10	25	1304	S31	W62	10	20.6		B	BXO	10	2	2	3
8370	28856	MWIL	10	25	1500	S30	W61	10	20.8	4	(B)					
8370		HOLL	10	25	1937	S30	W63	10	20.9		A	AX	10	1		2
8370		LEAR	10	26	0219	S28	W65	10	21.0		A	AX	10	2	2	2
8362		SVTO	10	15	0625	N19	E79	10	21.3		A	HS	30	1	1	3
8362	28849	MWIL	10	15	1445	N19	E77	10	21.5	3	(AP)					
8362		HOLL	10	15	1715	N18	E77	10	21.6		A	HS	80	1	2	1
8362		LEAR	10	16	0107	N17	E69	10	21.3		A	AX	20	1	1	3
8362		TACH	10	16	0608	N18	E72	10	21.7			AXX	15	1	1	3
8362		SVTO	10	16	0750	N18	E67	10	21.4		A	HS	50	1	2	3
8362		HOLL	10	16	1540	N18	E63	10	21.4		A	HS	30	1	1	3
8362	28849	MWIL	10	16	2000	N19	E59	10	21.3	4	(AP)					
8362		LEAR	10	17	0326	N18	E57	10	21.5		B	CSO	30	2	2	2
8362		KAND	10	17	0700	N21	E54	10	21.4			CRO		2	2	4
8362		TACH	10	17	0716	N19	E54	10	21.4			AXX	25	1	1	2
8362		SVTO	10	17	1218	N21	E52	10	21.5		B	BXO	20	2	4	3
8362		RAMY	10	17	1230	N22	E51	10	21.4		B	CRO	30	4	3	4
8362	28849	MWIL	10	17	1500	N19	E50	10	21.4	4	(AP)					
8362		HOLL	10	17	1600	N18	E50	10	21.5		A	HS	30	2	1	3
8362		LEAR	10	18	0037	N18	E46	10	21.5		A	HS	10	1	1	4
8362		TACH	10	18	0424	N20	E41	10	21.3			AXX	10	1	1	5
8362		SVTO	10	18	0735	N19	E41	10	21.4		A	HS	30	1	1	3
8362		KAND	10	18	0925	N19	E41	10	21.5			HR		1	1	3
8362		RAMY	10	18	1219	N20	E38	10	21.4		A	AX		1		2
8362		HOLL	10	18	1500	N18	E38	10	21.5		A	AX	10	1		4
8362	28849	MWIL	10	18	1500	N19	E38	10	21.5	4	(AP)					
8362		LEAR	10	19	0020	N19	E31	10	21.4		A	HS	10	1	1	3
8362		TACH	10	19	0424	N19	E30	10	21.5			AXX	20	1	1	3
8362		SVTO	10	19	0910	N19	E27	10	21.4		A	HR	10	1		2
8362		KAND	10	19	1045	N20	E28	10	21.6			CSO		3	3	4
8362		RAMY	10	19	1207	N21	E27	10	21.6		B	BXO	10	3	3	4
8362	28849	MWIL	10	19	1500	N20	E25	10	21.5	4	(AP)					
8362		LEAR	10	20	0020	N18	E21	10	21.6		B	BXO		3	5	3
8362		TACH	10	20	0436	N19	E16	10	21.4			AXX	10	1	1	3
8362		KAND	10	20	0705	N19	E16	10	21.5			BXO		3	2	4
8362		RAMY	10	20	1351	N19	E09	10	21.3		B	BXO	10	4	4	2
8362	28849	MWIL	10	20	1500	N20	E10	10	21.4	4	(BG)					
8362		LEAR	10	21	0115	N19	E05	10	21.4		B	BXO	10	4	5	3
8362		TACH	10	21	0440	N18	E09	10	21.9			BRI	41	5	4	2
8362		TACH	10	21	0440	N20	E01	10	21.3			BXO	15	4	4	2
8362		KAND	10	21	0640	N20	E00	10	21.3			BXO		3	4	3
8362		SVTO	10	21	0735	N17	E00	10	21.3		B	BXO	10	6	7	3
8362	28849	MWIL	10	21	1445	N19	W03	10	21.4	4	(B)					
8362		TACH	10	22	0454	N17	W05	10	21.8			BRI	96	6	4	3
8362		TACH	10	23	0416	N17	W18	10	21.8			BRI	37	8	5	4
8362		TACH	10	24	0556	N16	W32	10	21.8			BRO	14	3	6	2
8366		RAMY	10	18	1219	S16	E41	10	21.6		A	AX		1		2
8366	28853	MWIL	10	18	1500	S16	E40	10	21.6	4	(AP)					
8366		RAMY	10	19	1207	S16	E33	10	22.0		B	BXO		3	1	4
8366		TACH	10	23	0416	S12	W18	10	21.8			BRI	11	6	4	4
8366		SVTO	10	23	0738	S12	W20	10	21.8		B	CRO	20	5	4	3
8366		KAND	10	23	0745	S12	W20	10	21.8			BXO		6	5	3

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8366		RAMY	10	23	1221	S13	W22	10	21.8		B	CRO	20	9	5	3
8366		LEAR	10	24	0106	S11	W31	10	21.7		B	DSO	20	4	5	3
8366		VORO	10	24	0116	S12	W30	10	21.8			BXI	33	3	5	2
8366		TACH	10	24	0556	S12	W33	10	21.8			BXO	8	3	5	2
8366		KAND	10	24	0600	S12	W31	10	21.9			AX		2	2	3
8366		RAMY	10	24	1145	S12	W37	10	21.7		B	BXO	10	3	7	3
8366		SVTO	10	24	1405	S11	W37	10	21.8		B	CSO	20	2	6	1
8366		HOLL	10	24	2206	S11	W44	10	21.6		B	CSO	30	2	7	3
8366		VORO	10	25	0120	S12	W44	10	21.7			BXO	24	2	6	2
8366		KAND	10	25	0630	S12	W47	10	21.7			BXO		2	7	2
8366		SVTO	10	25	0811	S13	W46	10	21.9		A	AX	10	1	1	2
8366		RAMY	10	25	1304	S12	W49	10	21.8		A	AX		1		3
8366	28857	MWIL	10	25	1500	S11	W49	10	21.9	4	(AF)					
8366		HOLL	10	25	1937	S11	W52	10	21.9		A	AX	10	1		2
8366		LEAR	10	26	0219	S09	W55	10	22.0		A	HS	10	1	1	2
8367		RAMY	10	15	1329	N21	E81	10	21.8		A	HS	40	1	2	3
8367		VORO	10	15	2239	N20	E73	10	21.5			HAX	65	1		3
8367		VORO	10	16	2240	N20	E59	10	21.4			HAX	42	1		3
8367		VORO	10	19	2230	N20	E20	10	21.5			AXX	16	1		3
8367		KAND	10	20	0705	N16	E20	10	21.8			BXO		4	5	4
8367		RAMY	10	20	1351	N16	E16	10	21.8		B	BXO	10	4	3	2
8367	28855	MWIL	10	20	1500	N17	E17	10	21.9	4	(BP)					
8367		VORO	10	20	2231	N20	E09	10	21.6			BXI	72	9	12	3
8367		LEAR	10	21	0115	N15	E12	10	22.0		BG	CSO	50	5	6	3
8367		KAND	10	21	0640	N17	E08	10	21.9			DSO		6	6	3
8367		SVTO	10	21	0735	N16	E08	10	21.9		B	DRO	30	5	6	3
8367	28855	MWIL	10	21	1445	N17	E04	10	21.9	5	(B)					
8367		VORO	10	21	2230	N17	W01	10	21.9			DAI	100	13	6	3
8367		LEAR	10	22	0041	N17	W02	10	21.9		B	DSC	70	12	7	3
8367		KAND	10	22	0630	N17	W05	10	21.9			DSO		8	8	3
8367		SVTO	10	22	0635	N17	W06	10	21.8		B	DSO	100	12	8	3
8367	28855	MWIL	10	22	1445	N17	W10	10	21.8	5	(B)					
8367		VORO	10	22	2320	N17	W16	10	21.7			BXI	38	4	6	2
8367		LEAR	10	23	0052	N17	W15	10	21.9		B	CSO	50	12	8	3
8367		SVTO	10	23	0738	N17	W19	10	21.9		B	CAO	30	7	8	3
8367		KAND	10	23	0745	N16	W20	10	21.8			CAO		11	8	3
8367		RAMY	10	23	1221	N16	W23	10	21.8		B	CRO	20	6	7	3
8367	28855	MWIL	10	23	1545	N16	W23	10	21.9	5	(B)					
8367		LEAR	10	24	0106	N18	W29	10	21.8		B	CSO	30	5	7	3
8367		VORO	10	24	0116	N17	W30	10	21.8			BXI	49	4	7	2
8367		KAND	10	24	0600	N16	W33	10	21.7			CRO		3	8	3
8367		RAMY	10	24	1145	N16	W36	10	21.7		B	BXO	10	4	7	3
8367		SVTO	10	24	1405	N16	W40	10	21.5		B	CRO	10	2	3	1
8367		HOLL	10	24	2206	N16	W44	10	21.6		A	AX		2	1	3
8367		RAMY	10	26	1232	N16	W59	10	22.0		A	AX		1		3
8368		HOLL	10	25	1635	N18	W43	10	22.4		A	HS	50	1	2	2
8368		LEAR	10	26	0219	N18	W53	10	22.1		A	AX		1		2
8368A	28854	MWIL	10	18	1500	S21	E49	10	22.4	3	(AF)					
8368B		HOLL	10	24	2206	N27	W21	10	23.3		A	AX		1		3
8368B		HOLL	10	25	1635	N31	W28	10	23.5		A	HS	50	2	2	2
8368C		HOLL	10	25	1635	N19	W24	10	23.8		B	DKI	460	16	7	2
8368D		HOLL	10	25	1635	S19	W12	10	24.8		BG	CAO	70	11	15	2
8368E		HOLL	10	25	1635	N40	W06	10	25.2		A	AX	10	2	1	2
8367A		VORO	10	22	2320	S28	E66	10	28.1			HAX	21	1		2
8367A		VORO	10	24	0116	S27	E50	10	27.9			HAX	31	1		2
8367A		RAMY	10	25	1304	S25	E40	10	28.6		B	BXO		2	2	3
8367A		HOLL	10	25	1635	S29	E31	10	28.1		B	DAO	100	6	11	2
8369		SVTO	10	24	1405	N19	E76	10	30.4		A	AX		1	1	1
8369		HOLL	10	24	2206	N17	E70	10	30.2		A	AX	20	2	1	3
8369		VORO	10	25	0120	N17	E74	10	30.7			CAI	103	4	7	2

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8369		KAND	10	25	0630	N17	E67	10	30.4			AX		3	2	2
8369		SVTO	10	25	0811	N17	E69	10	30.6		B	BXO	30	3	4	2
8369		RAMY	10	25	1304	N17	E65	10	30.5		B	DAO	40	4	7	3
8369	28858	MWIL	10	25	1500	N18	E63	10	30.4	4	(BP)					
8369		HOLL	10	25	1937	N17	E60	10	30.4		B	DSO	80	5	6	2
8369		LEAR	10	26	0219	N17	E56	10	30.3		B	DAO	50	6	7	2
8369		VORO	10	26	0400	N18	E57	10	30.5			DAI	107	6	6	2
8369		RAMY	10	26	1232	N18	E51	10	30.4		B	DAO	70	5	6	3
8369	28858	MWIL	10	26	1500	N17	E50	10	30.4	4	(B)					
8369		HOLL	10	26	1610	N17	E48	10	30.3		B	DSO	80	6	7	3
8369		VORO	10	26	2252	N17	E46	10	30.4			DAI	122	5	6	2
8369		SVTO	10	27	0835	N18	E40	10	30.4		B	DAO	50	7	8	3
8369		RAMY	10	27	1232	N18	E35	10	30.2		B	CSO	30	6	7	3
8369	28858	MWIL	10	27	1500	N18	E36	10	30.4	4	(B)					
8369		VORO	10	27	2320	N18	E32	10	30.4			CAI	83	5	8	2
8369		LEAR	10	27	2322	N16	E36	10	30.7		B	DSO	60	8	8	3
8369		KAND	10	28	0900	N20	E30	10	30.7			CSO		6	18	2
8369		SVTO	10	28	1000	N19	E29	10	30.6		B	FAO	140	16	16	3
8369		RAMY	10	28	1333	N20	E30	10	30.8		B	FSO	60	6	18	3
8369	28858	MWIL	10	28	1515	N18	E22	10	30.3	4	(BP)					
8369		HOLL	10	28	1830	N20	E24	10	30.6		B	CSO	70	6	16	3
8369		VORO	10	28	2255	N20	E24	10	30.8			CAI	96	3	15	3
8369		TACH	10	29	0436	N18	E11	10	30.0			AXX	30	1	1	3
8369		LEAR	10	29	0527	N18	E19	10	30.7		B	CSO	50	3	17	2
8369		SVTO	10	29	0710	N20	E17	10	30.6		BG	ESO	100	8	13	2
8369		KAND	10	29	0900	N18	E10	10	30.1			CSO		4	4	5
8369		HOLL	10	29	1456	N19	E09	10	30.3		B	CSO	50	5	7	4
8369		RAMY	10	29	1825	N19	E04	10	30.1		B	CSO	40	2	2	2
8369		LEAR	10	30	0052	N18	E02	10	30.2		A	HS	40	2	2	4
8369		TACH	10	30	0528	N18	W02	10	30.1			HSX	50	1	1	4
8369		KAND	10	30	0730	N18	W02	10	30.2			HS		1	2	2
8369		SVTO	10	30	0730	N18	W04	10	30.0		B	CSO	90	7	4	3
8369		RAMY	10	30	1442	N19	W07	10	30.1		B	CSO	50	3	3	4
8369		HOLL	10	30	1455	N19	W08	10	30.0		A	HS	20	1	2	2
8369	28858	MWIL	10	30	1530	N18	W08	10	30.0	5	(AP)					
8369		LEAR	10	31	0049	N18	W13	10	30.0		A	HS	30	1	2	3
8369		VORO	10	31	0116	N18	W13	10	30.1			HSX	49	1		3
8369		TACH	10	31	0556	N18	W15	10	30.1			HSX	50	1	2	4
8369		SVTO	10	31	0920	N18	W17	10	30.1		B	CSO	40	3	3	3
8369		RAMY	10	31	1210	N18	W18	10	30.1		B	CSO	20	3	3	4
8369	28858	MWIL	10	31	1500	N18	W21	10	30.0	4	(AP)					
8369		HOLL	10	31	1656	N19	W22	10	30.0		A	HS	20	1	1	3
8369		VORO	10	31	2239	N18	W25	10	30.0			HSX	58	1		3
8369		LEAR	11	01	0018	N18	W26	10	30.1		A	HS	20	1	1	3
8369		TACH	11	01	0506	N18	W29	10	30.1			AXX	20	1	1	3
8369		SVTO	11	01	0716	N18	W31	10	30.0		A	AX	10	2	2	2
8369		KAND	11	01	0945	N18	W31	10	30.1			HS		1	1	5
8369		RAMY	11	01	1230	N18	W33	10	30.1		A	AX	10	1	1	3
8369	28857	MWIL	11	01	1500	N18	W35	10	30.0	4	(AP)					
8369		LEAR	11	02	0050	N18	W39	10	30.2		A	AX	10	1	1	4
8369		TACH	11	02	0516	N18	W42	10	30.1			AXX	20	1	1	3
8369		VORO	11	02	0545	N18	W44	10	30.0			HSX	39	1		2
8369		SVTO	11	02	1215	N18	W48	10	29.9		A	HR	10	2	1	3
8369		KAND	11	02	1245	N18	W47	10	30.0			AX		2	1	3
8369		RAMY	11	02	1340	N17	W47	10	30.1		A	AX		1		4
8369	28857	MWIL	11	02	1500	N18	W48	10	30.1	4	(AP)					
8369		HOLL	11	02	1525	N17	W48	10	30.1		A	AX	10	1	1	3
8369		VORO	11	02	2316	N18	W53	10	30.0			AXX	19	1		2
8369		LEAR	11	03	0030	N19	W53	10	30.1		A	AX		1		3
8369		TACH	11	03	0416	N18	W55	10	30.1			AXX	10	1	1	2
8369		SVTO	11	03	0710	N17	W59	10	29.9		A	HS	40	1	1	3
8369		KAND	11	03	0725	N18	W58	10	30.0			AX		1		3
8369		RAMY	11	03	1213	N17	W61	10	30.0		A	AX		1		4
8369	28857	MWIL	11	03	1515	N18	W61	10	30.1	4	(AP)					
8369		HOLL	11	03	1520	N17	W62	10	30.0		A	AX	20	1		4
8369		LEAR	11	04	0040	N18	W67	10	30.0		A	AX	10	1	1	4
8369		TACH	11	04	0512	N17	W70	10	30.0			AXX	5	1	1	3
8369C	28867	MWIL	11	03	1515	N16	W52	10	30.8	4	(AF)					

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8372	28859	MWIL	10	27	1500	N21	E49	10	31.4	4	(B)					
8372	28859	MWIL	10	28	1515	N21	E33	10	31.2	4	(B)					
8372		TACH	10	29	0436	N21	E24	10	31.0			BXO	4	2	2	3
8372		KAND	10	29	0900	N21	E23	10	31.1			BXO		2	5	5
8372		HOLL	10	29	1456	N21	E21	10	31.2		B	BXO	30	7	6	4
8372		RAMY	10	29	1825	N22	E19	10	31.2		B	BXO	10	6	6	2
8372		LEAR	10	30	0052	N21	E17	10	31.3		B	BXO	10	8	2	4
8372		TACH	10	30	0528	N20	E14	10	31.3			AR	5	3	2	4
8372		KAND	10	30	0730	N20	E12	10	31.2			BXI		6	3	2
8372		SVTO	10	30	0730	N21	E13	10	31.3		B	BXI	30	10	4	3
8372		RAMY	10	30	1442	N22	E08	10	31.2		B	BXO	10	4	3	4
8372		HOLL	10	30	1455	N21	E09	10	31.3		B	BXO	20	3	2	2
8372	28859	MWIL	10	30	1530	N19	E08	10	31.2	3	(AF)					
8372		LEAR	10	31	0049	N21	E04	10	31.3		B	BXO	10	4	2	3
8372		VORO	10	31	0116	N20	E03	10	31.3			AXX	10	1		3
8372		TACH	10	31	0556	N20	W01	10	31.2			AXX	5	1	1	4
8372		SVTO	10	31	0920	N21	W02	10	31.2		B	BXO	20	10	6	3
8372	28859	MWIL	10	31	1500	N21	W04	10	31.3	3	(AF)					
8372		HOLL	10	31	1656	N21	W07	10	31.2		B	BXO	20	4	5	3
8372		VORO	10	31	2239	N22	W09	10	31.2			AXX	10	1		3
8372		LEAR	11	01	0018	N21	W10	10	31.2		B	BXO	10	4	5	3
8372		VORO	11	02	0545	N24	W28	10	31.1			AXX	11	1		2
8372		SVTO	11	02	1215	N18	W35	10	30.9		B	BXO	10	3	7	3
8372		KAND	11	02	1245	N20	W30	10	31.2			BXO		2	3	3
8372	28859	MWIL	11	02	1500	N21	W33	10	31.1	4	(BF)					
8372		SVTO	11	03	0710	N20	W43	10	31.0		A	AX		1		3
8372		VORO	11	04	0342	N16	W50	10	31.4			AXX	17	1		3
8372		VORO	11	05	2319	N20	W73	10	31.4			AXX	17	1		3
8371		SVTO	10	28	1000	S21	E43	10	31.7		B	BXO	30	5	3	3
8371		RAMY	10	28	1333	S21	E42	10	31.8		B	BXO	10	4	5	3
8371	28860	MWIL	10	28	1515	S20	E40	10	31.7	4	(B)					
8371		HOLL	10	28	1830	S21	E38	10	31.7		B	BXO	30	4	4	3
8371		VORO	10	28	2255	S21	E36	10	31.7			BXO	25	2	3	3
8371		TACH	10	29	0436	S21	E32	10	31.6			BXO	7	2	3	3
8371		LEAR	10	29	0527	S21	E29	10	31.4		A	HS	20	1	1	2
8371		SVTO	10	29	0710	S22	E31	10	31.7		B	CRO	20	3	4	2
8371		KAND	10	29	0900	S21	E29	10	31.6			BXO		4	5	5
8371		HOLL	10	29	1456	S20	E27	10	31.7		B	BXO	20	4	6	4
8371		RAMY	10	29	1825	S21	E24	10	31.6		A	AX		1		2
8371		LEAR	10	30	0052	S21	E17	10	31.3		A	AX		1	1	4
8371		TACH	10	30	0528	S22	E13	10	31.2			AXX	5	1	1	4
8371		KAND	10	30	0730	S21	E16	10	31.5			AX		1	1	2
8371		SVTO	10	30	0730	S23	E14	10	31.4		A	AX	10	1		3
8371	28864	MWIL	10	31	1500	S21	E01	10	31.7	3	(AF)					
8371		HOLL	10	31	1656	S20	E01	10	31.8		A	AX	10	1	1	3
8371		LEAR	11	01	0018	S21	W05	10	31.6		A	AX		1		3

Stations reporting:

HOLL = Holloman
KAND = Kandilli
LEAR = Learmonth
MWIL = Mt. Wilson
PALE = Palehua
RAMY = Ramey
SVTO = San Vito
TACH = Tashkent
VORO = Voroshilov

OCTOBER 1998

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Flare (UT)	X-ray Class	NOAA Region
01	0826	0844	0855	1	3		2				0849	C1.1	
02	1218	1233	1336	1	1		1				No flare		
03	0755	0819	0833	1	3		2				No flare		
05	0902	0929	0954	1	3		2				No flare		
07	0702	0746	0819	2	1		1				0749	B6.1	
07	0710	0831	0843	2	1		1				0749	B6.1	
07	1041	1045	1100	1-	1					1	1036	C3.2	
07	1247	1251	1320	2	5	1	3	1		2	1242	M1.6	8355
07	1525	1532	1556	1+	5		1			2	1536	C3.1	8355
07	1614	1627	1659	2-	5		2			2	1611	C4.2	8355
07	1710	1714	1806	2	5					5	1704	M2.3	8355
07	1945	1948	2005	1	1					1	1944	C2.0	8355
08	0836	0840	0857	1-	1					1	0821	C4.5	
08	1700	1703	1727	1	1					1	1654	C3.3	
09	0737	0745	0806	1+	1					1	0742	C1.3	
09	1536	1552	1613	1	3		2				1545		8349
10	0604	0610	0637	1+	1					1	0611	C1.4	
10	0935	0938	1000	1	1					1	0938	C1.8	
10	1054	1113	1143	1	1		1				*		
10	1140	1147	1222	2-	3		2			1	1139	C2.4	
10	1314	1316	1351	2	5	1	3	1		4	1311	C7.9	
10	1943	1950	2040	2+	5					2	1943	C2.4	
10	2002	2010	2100	2+	1					1	1943	C2.4	
11	0744	0746	0805	1-	1					1	0748	C1.3	
13	1047	1057	1119	1	1		1				1045	C1.2	8356
14	1712	1716	1745	1+	1					1	1710	C1.6	
16	2130	2132	2212	2	1					1	2123	C2.7	8358
17	1843	1850	1944	2	5					4	1839	C9.1	8358
17	2223	2231	2337	2+	5					2	2217	C5.1	8358
17	2355	0005	0102	2+	5					2	2351	C8.1	8358
18	0145	0146	0220	2	1					1	0138	M2.4	8358
18	0537	0540	0612	1+	1					1	0533	C2.6	8358
19	0934	0952	1021	1	1		1				No flare		
19	1127	1132	1224	1	1		1				1124	C1.9	
19	1224	1233	1408	2	3		2			1	1218	C7.1	8361
19	1504	1510	1554	1	1		1				No flare		
19	1553	1600	1630	1	3		2				No flare		
19	2231	2233	2247	1	1					1	2232	C3.2	
20	0146	0150	0205	1-	1					1	0144	C5.1	
20	1134	1148	1201	1	1		1				1116	C1.1	
20	1203	1229	1257	1+	3		2				No flare		
20	1423	1428	1511	2	5					5	1421	C3.3	
20	1758	1801	1835	2-	5					4	1753	C3.2	
20	2025	2030	2135	2+	1					1	2030	C7.4	
20	2030	2047	2225	3-	5					2	2030	C7.4	
21	1432	1435	1510	1	1		1				1457E		8365
21	1524	1531	1632	2+	3					2	No flare		
21	1530	1545	1640	2+	1					1	*		
21	1815	1827	1905	2	3					2	1812	C1.2	
24	0445	0450	0513	1+	1					1	0444	C1.3	8365

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES

OCTOBER 1998

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Flare (UT)	X-ray Class	NOAA Region
26	0803	0820	0853	1	3		2				0815	B6.2	
26	1814	1820	1845	1+	1					1	1810	C2.0	
28	1315	1317	1334	1-	3					2	1313	C2.3	
28	1335	1336	1430	2+	1					1	No flare		

* = no flare patrol.

OBSERVATORIES REPORTING FOR OCTOBER 1998

Banning, California, USA	SES	Panska Ves, Czech Republic	SES, SEA, SWF
Cambridge, England, UK	SES	Rimavska Sobota, Slovakia	SEA
Columbia City, Indiana, USA	SES	Rochester, New Hampshire, USA	SES
Edenvale, Rep of S. Africa	SES	Sun City Center, FL, USA	SES
Houston, Texas, USA	SES	Tucson, Arizona, USA	SES
Hudson, Ohio, USA	SES	Upice, Czech Republic	SEA
Koniz, Switzerland	SES	Ziar nad Hronom, Slovakia	SEA
Marlboro, Massachusetts, USA	SES	Zilina, Slovakia	SEA
Nerja, Spain	SES		

Observations are not necessarily continuous.

S O L A R R A D I O E M I S S I O N
Spectral Observations

OCTOBER 1998

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
01	0000	0828	HIRA								
			LEAR	0250.0	0252.0	III		1	30	53	
	0000	0720	CULG	0250.0	0252.0	III	G	1	25	180	
			CULG	0332.0	0335.0	III	G	1	30	140	
			SVTO	0531.0	0532.0	III		2	35U	85U	
	0539	1532	POTS	0540	1532 U	I	S,W	1	110U	250	
	0622	1605	BLEN								
			POTS	0652.6	0652.7	III	G	2	110U	170U	
			POTS	0814.5	0814.6	III	B	1	110U	170U	
	0609	1528	ONDR	0938.0	0941.3	DCIM	G	1	2000X	4410X	
			POTS	1021.5	1021.6	III	B	1	200U	375	
			POTS	1131.1	1131.2	III	B	1	130	170U	
			POTS	1329.2	1329.3	III	B	1	250	375	
			PALE	1913.0	1913.0	III		1	30	60	
			SGMR	1913.0	1913.0	III		1	30	50	
	2028	2400	HIRA								
02	0000	0826	HIRA								
	0000	0720	CULG	0331.0	0332.0	III	G	1	27	90	
	0611	1528	ONDR								
	0557	1042	POTS	0648.7	0648.8	III	B	1	130	150	
	0837	1604	BLEN								
	2029	2400	HIRA								
	2030	2400	CULG								
	2030	2400	CULG								
03	0000	0720	CULG								
	0000	0825	HIRA								
	0613	1525	ONDR								
	0623	1603	BLEN								
	0557	1042	POTS	0738.6	0738.7	III	B	2	110U	170U	
			POTS	0947.0	0947.3	III	G	2	110U	170U	
	2030	2400	CULG								
	2030	2400	HIRA								
04	0000	0720	CULG								
	0000	0823	HIRA								
	0614	1523	ONDR								
	0630	1602	BLEN								
	0557	1042	POTS	0942.3	0952	I	S	1	350	400	
			POTS	1026.6	1028.5	I	S	1	130	150	
	2030	2400	CULG								
	2031	2400	HIRA								
05	0000	0342	CULG								
	0000	0822	HIRA								
	0616	1520	ONDR								
			LEAR	0655.0	0656.0	III		2	37	65	
			SVTO	0655.0	0656.0	III		3	05U	85U	
			SVTO	0655.0	0656.0	III		3	35U	85U	
	0427	0720	CULG	0656.0	0656.0	III	B	1	23	70	
	1057	1532	POTS								
			SGMR	1216.0	1610.0	III	N	1	30	80	
	2032	2400	HIRA								
	2030	2400	CULG	2328.0	2330.0	III	G	1	30	170	
06	0000	0703	HIRA								
	0000	0720	CULG	0037.0	0037.0	III	B	1	60	250	
			CULG	0258.0	0259.0	III	B	1	25	80	
			LEAR	0258.0	0258.0	III		1	30	60	
			CULG	0339.0	0340.0	III	G	1	100	300	
			LEAR	0406.0	0407.0	III		1	30	65	
			CULG	0407.0	0407.0	III	B	1	23	80	
			CULG	0432.0	0432.0	III	B	1	25	180	
			LEAR	0432.0	0432.0	III		1	30	65	
			CULG	0502.0	0503.0	III	G	1	35	180	
			LEAR	0502.0	0503.0	III		1	30	70	
	0618	1518	ONDR								
	1009	1600	BLEN								

S O L A R R A D I O E M I S S I O N
Spectral Observations

OCTOBER 1998

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
06	2140	2400	CULG	2148.0	2148.0	III	B	2	25	45	
	2307	2400	HIRA								
07			LEAR	0015.0	0016.0	III		2	30	65	
			PALE	0015.0	0022.0	III		2	25	60	
	0000	0720	CULG	0016.0	0021.0	III	G	2	18X	75	
			LEAR	0019.0	0022.0	III		2	30	80	
	0000	0819	HIRA	0019.3	0019.9	III	G	1	25X	50X	
			LEAR	0034.0	0035.0	III		1	30	65	
			LEAR	0158.0	0159.0	III		1	30	55	
			CULG	0207.0	0207.0	III	B	1	18X	70	
			LEAR	0207.0	0208.0	III		2	30	80	
			HIRA	0207.5	0207.7	III	B	1	25X	50X	
			LEAR	0509.0	0510.0	III		1	30	53	
			LEAR	0538.0	0540.0	III		2	30	71	
			SVTO	0538.0	0539.0	III		2	38	66	
	0556	1532	POTS	0556 E	1532 U	I	S	1	40X	450	
			POTS	0600.2	0600.3	III	B	2	110U	170U	
			LEAR	0623.0	0623.0	III		1	38	52	
			POTS	0704.2	0704.4	DCIM		2	325	500	
			LEAR	0727.0	0727.0	III		1	30	54	
			SVTO	0727.0	0727.0	III		1	35	45	
			POTS	0727.2	0727.4	III	B	2	40X	70	
			POTS	0740.4	0745.0	III	GG	3	40X	550	
			LEAR	0743.0	0743.0	III		1	45	56	
			LEAR	0755.0	0755.0	III		1	30	47	
			SVTO	0755.0	0818.0	III	N	2	36	81	
			POTS	0755.6	0755.9	UNCLF		2	40X	50	
			POTS	0802.1	0802.2	UNCLF		2	40X	50	
			LEAR	0818.0	0818.0	III		2	30	80	
			POTS	0818.0	0818.9	III	G	2	40X	170U	
			POTS	0828.0	0828.4	UNCLF		2	40X	145	
			POTS	0835.5	0837.6	III	G	3	40X	500	
			POTS	0840.4	0852.2	III	G	2	40X	170U	
			LEAR	0851.0	0851.0	III		1	35	60	
			SVTO	0851.0	0851.0	III		2	35	47	
			ONDR	0901.1	0901.3	DCIM	G	1	800X	1590	
			POTS	0913.2	0922.1	III	GG	3	40X	800X	
			LEAR	0914.0	0917.0	III		2	40	80	
			SVTO	0914.0	0922.0	III		2	35	78	
			ONDR	0916.3	0918.5	DCIM	GG	2	800X	1735	
			POTS	0952.0	0952.4	III	G	2	40X	120	
			SVTO	0952.0	0952.0	III		2	35	42	
			POTS	1041.2	1043.1	III	G	2	40X	170U	
			POTS	1116.0	1116.8	III	G	2	110U	150	
	0620	1516	ONDR	1245.5	1250.4	DCIM	G	2	1000X	4395X	
			ONDR	1246.2	1250.5	DCIM	GG	1	965	2000X	
	0635	1558	BLEN	1246.2	1248.1	DCIM	P		1600	2600X	
			BLEN	1246.3	1250.6	III	G,U		1000X	2130	
			SGMR	1247.0	1252.0	III		1	30	80	
			SVTO	1247.0	1249.0	III		2	36U	76U	
			POTS	1247.3	1254.6	III	G	2	40X	170U	
			POTS	1250.5	1250.6	DCIM		1	500	620	
			POTS	1320.7	1321.4	III	G	2	40X	220	
			POTS	1418.9	1441.2	III	GG,C	3	40X	750	
			SGMR	1440.0	1441.0	V		3	30	80	
			SVTO	1440.0	1441.0	III		3	35	85	
			POTS	1502.5	1504.1	III	G	2	110U	170U	
			POTS	1523.2	1523.3	III	G	2	110U	220	
			SGMR	1717.0	1830.0	III	N	1	30	50	
			PALE	1808.0	1808.0	III		1	30	70	
			PALE	1829.0	1830.0	III		1	25	56	
			PALE	1907.0	1907.0	III		1	30	55	
	2030	2400	CULG	2119.0	2119.0	III	B	1	30	130	
			CULG	2159.0	2159.0	III	B	1	18	70	
			CULG	2217.0	2225.0	III	G	1	18	300	
			LEAR	2255.0	2256.0	III		2	30	80	
			PALE	2255.0	2333.0	III	N	2	25	70	
			CULG	2256.0	2256.0	III	B	2	20	130	

S O L A R R A D I O E M I S S I O N
Spectral Observations

OCTOBER 1998

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
07			CULG	2305.0	2306.0	III	G	1	30	160	
			CULG	2312.0	2315.0	III	G	3	18	300	
			LEAR	2312.0	2315.0	III		2	30	80	
	2032	2400	HIRA	2312.4	2312.7	III	B	1	25X	50X	
			CULG	2333.0	2336.0	III	G	3	18X	320	
			LEAR	2333.0	2336.0	III		3	30	80	
			HIRA	2334.0	2335.4	III	G	3	25X	50X	
08	0000	0720	CULG	0008.0	0009.0	III	G	1	25	80	
			CULG	0012.0	0015.0	III	G	1	18	200	
			LEAR	0014.0	0015.0	III		2	30	80	
			PALE	0014.0	0104.0	III	N	2	30	60	
	0000	0818	HIRA	0014.2	0014.4	III	B	1	25X	50X	
			LEAR	0021.0	0146.0	III	N	3	30	80	
			CULG	0022.0	0023.0	III	G	1	30	150	
			CULG	0035.0	0037.0	III	G	1	18	110	
			CULG	0058.0	0058.0	III	B	2	18	90	
			HIRA	0103.7	0104.2	III	G	1	25X	50X	
			CULG	0104.0	0105.0	III	G	2	18	90	
			PALE	0140.0	0146.0	III		2	25	55	
			HIRA	0141.0	0141.5	III	G	1	25X	50X	
			LEAR	0239.0	0239.0	III		1	30	45	
			CULG	0240.0	0240.0	III	B	1	20	40	
			LEAR	0300.0	0302.0	III		1	30	60	
			LEAR	0449.0	0449.0	III		1	30	51	
			CULG	0506.0	0509.0	III	G	1	40	160	
			LEAR	0506.0	0506.0	III		1	30	80	
	0555	1532	POTS	0555 E	1532 U	I	S	2	40X	250	
			POTS	0602.2	0602.3	III	B	2	110U	150	
			SVTO	0634.0	0634.0	III		1	35	58	
			POTS	0634.6	0634.9	III	G	2	40X	170U	
			CULG	0635.0	0635.0	III	B	1	25	90	
	0636	0725	BLEN								
			POTS	0656.6	0656.7	III	G	2	110U	170U	
			POTS	0706.9	0721.1	III	GG,RS	3	40X	550	
			CULG	0707.0	0718.0	III	GG	1	20	200	
			LEAR	0709.0	0716.0	V		3	30	80	
			SVTO	0709.0	0716.0	V		3	36	82	
			CULG	0714.0	0716.0	V		1	23	110	
			POTS	0724.1	0724.4	UNCLF		2	110U	140	
			ONDR	0832.2	0836.5	DCIM	GG	2	800X	2000X	
	0621	1511	ONDR	0832.2	0836.1	DCIM	GG	2	1000X	4400	
			LEAR	0835.0	0838.0	III		3	30	80	
			SVTO	0835.0	0839.0	V		3	35	85	
			POTS	0835.1	0838.5	IV	P	3	40X	750	
			SVTO	0840.0	0849.0	II		3	35	85	ESS 0600
			POTS	0841.6	0847.7	II	SH,H	3	75	145	
			POTS	0842.7	0847.6U	II	F,H	2	40X	70	
			POTS	0910.9	0911.2	III	G	2	40X	170U	
	0956	1548	BLEN								
			SVTO	1006.0	1006.0	III		1	35	71	
			POTS	1006.1	1029.8	III	GG	2	40X	250	
			ONDR	1008.5	1013.0	DCIM		1	1090	2000X	
			POTS	1012.7	1014.5U	II	SH,H	2	110U	145	
			SVTO	1013.0	1053.0	CONT		2	35	83	
			POTS	1013.9	1025 U	II	F,H	2	40X	80	
			POTS	1017.8	1025 U	II	UE	2	50	75	
			SVTO	1054.0	1056.0	III		1	35	47	
			POTS	1054.2	1100.6	III	GG	2	40X	350	
			POTS	1159.0	1202.6	DCIM		2	200X	400	
			SGMR	1200.0	1213.0	III	N	1	30	80	
			SVTO	1200.0	1216.0	III	N	2	35	85	
			POTS	1200.8	1202.6	III	G	2	40X	300	
			POTS	1213.4	1215.8	III	GG,C	3	40X	650	
			POTS	1307.9	1312.5	III	GG	2	110U	375	
			SGMR	1321.0	1324.0	V		1	30	80	
			SVTO	1321.0	1324.0	V		2	35	85	
			POTS	1321.3	1323.7	III	G,C,P	3	40X	450	
			POTS	1329.0	1329.1	III	B	1	250	450	

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08			POTS	1353.9	1354.0	III	G	2	140	270	
			POTS	1422.8	1425.1	III	G	3	40X	275	
			POTS	1453.3	1455.4	DCIM		2	200U	450	
			POTS	1453.4	1456.4	III	G	3	40X	350	
			SGMR	1454.0	1457.0	V		3	30	80	
			SVTO	1454.0	1457.0	V		3	35	85	
			POTS	1459.0	1459.1	III	B	1	140	375	
			LEAR	2240.0	2242.0	III		1	30	63	
	2033	2400	HIRA	2240.5	2243.1	III	G	2	25X	50X	
	2255	2400	CULG								
09	0000	0720	CULG								
	0000	0816	HIRA								
	0552	1552	POTS	0552 E	1532 U	I	S	1	110U	275	
	0700	1547	BLEN								
			POTS	1003.3	1004.9	III	G	2	200U	400	
	0623	1511	ONDR	1004.0	1004.3	DCIM	G	1	800X	1940	
			POTS	1201.2	1205.7	III	G	2	110U	400	
			POTS	1251.5	1251.6	III	B	2	110U	170U	
			POTS	1320.4	1329.7	III	GG	2	40X	400	
			SGMR	1342.0	1342.0	III		2	30	80	
			POTS	1444.1	1444.2	III	B	1	125	160	
	2030	2400	CULG								
	2034	2400	HIRA								
10	0000	0815	HIRA								
	0553	1532	POTS	0553 E	1532 U	I	S,W	1	110U	220	
	0000	0720	CULG	0608.0	0608.0	III	B	1	24	35	
	0625	1509	ONDR								
	0636	1542	BLEN								
			SVTO	1551.0	1551.0	III		2	38U	82U	
	2030	2400	CULG								
	2035	2400	HIRA								
11	0000	0814	HIRA								
	0000	0720	CULG	0324.0	0325.0	III	B	1	28	140	
			CULG	0432.0	0435.0	III	G	2	20	95	
			LEAR	0432.0	0436.0	III		2	30	80	
	0600	1507	POTS	0600 E	1507 U	I	S,W	1	110U	170U	
			POTS	0624.8	0624.9	III	B	1	40X	60	
	0627	1507	ONDR								
	0637	1545	BLEN								
			POTS	0913.6	0913.9	UNCLF		2	70	165	
			POTS	1416.5	1417.0	UNCLF		2	40X	60	
			SGMR	1606.0	1608.0	III		1	30	50	
	2035	2400	HIRA								
	2030	2400	CULG	2053.0	2054.0	III	G	1	27	90	
12	0000	0812	HIRA								
			LEAR	0041.0	0041.0	III		2	30	80	
			PALE	0041.0	0041.0	III		2	25	55	
	0000	0720	CULG	0042.0	0042.0	III	B	1	18X	180	
			CULG	0337.0	0337.0	III	B	1	20	170	
			LEAR	0337.0	0337.0	III		2	30	63	
	0625	1507	POTS	0625 E	1507 U	I	S	1	110U	170U	
	0628	1504	ONDR								
	0642	1545	BLEN								
	2036	2400	HIRA								
	2030	2400	CULG	2310.0	2310.0	III	B	1	65	170	
			CULG	2326.0	2328.0	III	G	1	75	180	
13	0000	0720	CULG								
	0000	0811	HIRA								
	0620	1504	POTS	0630.5	0630.6	III	B,RS	1	120	150	
			POTS	0718.9	0719.0	III	B	1	110U	155	
			POTS	0751.6	0754.3	III	GG	2	40X	220	
			LEAR	0753.0	0754.0	III		2	30	80	
			SVTO	0753.0	0754.0	III		2	35	75	
			POTS	0801	1504 U	I	S	2	110U	220	

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13			POTS	0915.1	0920.8	III	GG	2	40X	350	
			SVTO	0920.0	0920.0	III		1	56	73	
			POTS	1118.0	1125.6	III	GG	2	40X	300	
			POTS	1155.1	1157.6	III	GG	3	40X	400	
			SGMR	1156.0	1157.0	III		1	30	80	
			SVTO	1156.0	1157.0	III		2	35	85	
	0630	1501	ONDR	1156.3	1156.5	DCIM	GG	2	1465	2000X	
	0645	1542	BLEN	1156.3	1157.1	DCIM	S		1440	2300	
			PALE	1841.0	1843.0	III		3	25	70	
			SGMR	1841.0	1843.0	V		2	30	80	
	2030	2400	CULG								
	2037	2400	HIRA								
14	0000	0720	CULG								
	0000	0809	HIRA								
	0632	1459	ONDR								
	0648	1540	BLEN								
			SVTO	0710.0	0711.0	III		1	68	73	
	1002	1500	POTS	1002 E	1500 U	I	S,C	2	110U	300	
			POTS	1345.7	1345.9	III	B	2	40X	60	
			SGMR	1638.0	1638.0	V		2	30	80	
			CULG	2030.0E	2400.0D	III	S	1	25	180	
	2030	2400	CULG	2030.0E	2400.0D	I	S	2	55	120	
			CULG	2053.0	2054.0	III	B	2	19	250	
			PALE	2053.0	2110.0	III	N	2	27	60	
			SGMR	2053.0	2058.0	V		2	30	80	
	2038	2400	HIRA	2053.4	2058.5	III	G	1	25X	50X	
			CULG	2058.0	2058.0	III	B	2	20	190	
			PALE	2155.0	2155.0	III		1	29	52	
			LEAR	2209.0	1009.0	CONT		1	30	80	
			PALE	2232.0	0044.0	CONT		1	32	55	
			PALE	2304.0	0044.0	III	N	1	29	53	
15	0000	0808	HIRA								
			CULG	0000.0E	0430.0D	III	S	1	25	180	
	0000	0720	CULG	0000.0E	0530.0D	I	S	2	55	130	
			CULG	0042.0	0045.0	III	G	1	18	180	
			PALE	0120.0	0230.0	CONT		1	44	67	
			PALE	0134.0	0204.0	III	N	1	43	55	
			CULG	0430.0	0720.0D	III	S	1	35	180	
			CULG	0530.0	0720.0D	I	S	1	100	180	
	0620	1506	POTS	0620 E	1506 U	I	S,C	2	40X	400	
	0634	1458	ONDR								
	0650	1539	BLEN								
			SVTO	0727.0	0825.0	CONT		1	65	85	
			SVTO	0941.0	0947.0	III		1	35	71	
			POTS	0941.8	1004.5	III	GG	2	40X	90U	
			SVTO	0947.0	1037.0	CONT		1	35	85	
			SVTO	1105.0	1157.0	CONT		2	62	85	
			POTS	1130.4	1130.5	III	B	2	40X	90U	
			SGMR	1202.0	1256.0	CONT		1	30	80	
			SGMR	1737.0	1741.0	III		1	30	70	
			PALE	1820.0	0117.0	CONT		1	40	55	
			SGMR	1820.0	2140.0	CONT		2	30	80	
	2030	2400	CULG	2030.0E	2400.0D	III	S	1	20	160	
	2039	2400	HIRA								
			LEAR	2208.0	1011.0	CONT		1	30	80	
16	0000	0807	HIRA								
	0000	0720	CULG	0000.0E	0720.0D	III	S	1	30	160	
			LEAR	0349.0	0349.0	III		1	30	48	
			CULG	0443.0	0720.0D	I	S	1	120	180	
	0620	1506	POTS	0620 E	1506 U	I	S,C	2	110U	400	
	0636	1455	ONDR								
			POTS	0737.1	0738.2	III	G	2	40X	130	
			POTS	1258.4	1258.5	III	B	2	40X	60	
			POTS	1454.0	1454.9	DCIM		2	350	675	
			CULG	2030.0E	2400.0D	I	S	1	100	180	
	2030	2400	CULG	2030.0E	2350.0	III	N	1	27	170	

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16	2040	2400	HIRA								
17	0000	0806	HIRA								
	0000	0720	CULG	0000.0E	0125.0	I	S	1	130	180	
			CULG	0312.0	0312.0	III	B	1	19	50	
	0620	1506	POTS	0620 E	1506 U	I	S	1	110U	350	
			POTS	0627.3	0628.2	III	G	2	110U	170U	
	0638	1452	ONDR								
	0653	1537	BLEN								
			POTS	0730.7	0731.5	UNCLF		2	40X	50	
			SVTO	0817.0	0818.0	III		1	67	74	
			POTS	1114.6	1117.7	III	GG	2	110U	170U	
			POTS	1258.5	1258.6	III	B	2	110U	170U	
			PALE	1840.0	1841.0	III		1	25	56	
			SGMR	1840.0	1841.0	III		1	30	55	
	2041	2400	HIRA								
18	0000	0804	HIRA								
	0000	0720	CULG	0042.0	0335.0	I	S	1	60	170	
			CULG	0128.0	0128.0	III	B	1	60	130	
			CULG	0130.0	0130.0	III	B	1	25	120	
			LEAR	0130.0	0130.0	III		1	30	60	
			CULG	0213.0	0240.0	III	N	1	25	110	
			LEAR	0213.0	0302.0	CONT		1	30	80	
			CULG	0521.0	0524.0	III	G	1	35	90	
			LEAR	0521.0	0521.0	III		1	30	80	
			SVTO	0539.0	0540.0	III		2	36U	72U	
			CULG	0550.0	0705.0	III	N	1	26	80	
			LEAR	0610.0	0610.0	III		1	30	62	
			LEAR	0613.0	0709.0	CONT		1	30	75	
	0620	1506	POTS	0620 E	1506 U	I	S,C	2	40X	400	
	0640	1451	ONDR								
	0654	1535	BLEN								
			POTS	0733.9	0734.0	III	B	2	110U	170U	
			POTS	1311.7	1311.8	III	B	1	110U	170U	
			POTS	1402.6	1402.8	III	B	2	40X	65	
			POTS	1405.8	1406.3	III	G	2	40X	160	
			PALE	1811.0	1816.0	III		2	25	70	
			SGMR	1811.0	1816.0	V		2	30	80	
			CULG	2030.0E	2249.0	I	S	1	60	160	
	2030	2400	CULG	2030.0E	2051.0	III	N	1	23	170	
	2042	2400	HIRA								
			PALE	2108.0	0348.0	CONT		2	25	55	
	2030	2400	CULG	2108.0	2112.0	III	G	2	19	180	
			CULG	2112.0	2117.0	II	FN	1	30	70	
			CULG	2112.0	2121.0	II	SH	1	60	160	ESS 850
			CULG	2125.0	2127.0	III	G	1	28	85	
			CULG	2327.0	2343.0	III	N	1	28	150	
19	0000	0803	HIRA								
	0620	0849	POTS	0620 E	0849 U	I	S	1	110U	380	
	0655	1530	BLEN								
			LEAR	0658.0	0659.0	III		1	30	57	
			POTS	0658.9	0659.0	III	B	2	40X	65	
	0000	0720	CULG	0659.0	0659.0	III	B	1	30	70	
			POTS	0721.6	0721.7	III	B	2	40X	65	
			POTS	0736.2	0736.3	III	DCIM	2	275	380	
			POTS	0824.0	0824.2	III	B	2	40X	140	
			LEAR	0851.0	0851.0	III		1	30	80	
			SVTO	0851.0	0851.0	III		1	37U	77U	
			SVTO	0858.0	1109.0	CONT		2	35	85	
			LEAR	0900.0	1011.0	CONT		1	30	80	
			LEAR	0902.0	0903.0	III		1	30	52	
	1014	1140	POTS	1014 E	1140 U	I	S,C	2	40X	275	
			POTS	1129.0	1133.0	III	G	2	40X	70	
			SVTO	1129.0	1129.0	III		2	39	45	
	0642	1449	ONDR	1225.0	1228.4	DCIM	G	1	2000X	4395	
			ONDR	1225.2	1230.4	DCIM	G	1	1000	2000X	
			SGMR	1416.0	1419.0	III		1	30	60	

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19	2030	2400	CULG	2030.0E	2400.0D	I	S	1	110	170	
	2043	2400	HIRA								
20	0000	0802	HIRA								
	0000	0720	CULG	0000.0E	0229.0	I	S	1	100	170	
			CULG	0030.0	0031.0	III	G	1	18	85	
			LEAR	0030.0	0030.0	III		2	30	60	
			LEAR	0845.0	0848.0	III		1	30	60	
	1051	1508	POTS	1051 E	1508 U	I	S,C	2	40X	300	
			POTS	1254.5	1254.9	UNCLF		2	110U	170U	
			POTS	1408.0	1408.2	III	G,RS	2	130	170U	
			POTS	1422.1	1428.1	III	GG,C	3	40X	400	
			SGMR	1423.0	1425.0	V		2	30	80	
			SVTO	1423.0	1425.0	V		2	36	78	
			ONDR	1423.1	1424.1	DCIM		1	800	2000X	
	0643	1445	ONDR	1423.1	1424.2	DCIM		1	2000X	4235	
	0655	1527	BLEN	1423.5	1424.4	DCIM	C		1000X	2800X	
			SGMR	1525.0	1531.0	V		1	30	60	
	2020	2400	CULG	2027.0	2114.0	IV		1	18	180	
			CULG	2040.0	2053.0	III	GG	1	20	90	
			PALE	2047.0	0128.0	CONT		1	25	45	
			CULG	2258.0	2259.0	III	B	1	18	160	
			LEAR	2258.0	2259.0	III		1	30	80	
			PALE	2258.0	2258.0	III		1	30	54	
			CULG	2316.0	2318.0	III	G	2	18X	130	
			LEAR	2316.0	2318.0	III		2	30	80	
			PALE	2316.0	2318.0	V		2	25	57	
	2044	2400	HIRA	2317.0	2317.5	III	B	2	25X	50X	
			CULG	2320.0	2324.0	II	SH	1	65	140	ESS 1100
			CULG	2322.0	2324.0	II	FN	1	35	45	
			LEAR	2322.0	2323.0	II		1	30	80	ESS 1200
			PALE	2322.0	2323.0	III		1	35	45	
21	0000	0800	HIRA								
			LEAR	0019.0	0020.0	III		1	30	65	
	0000	0720	CULG	0020.0	0020.0	III	B	1	30	160	
			LEAR	0153.0	0156.0	V		2	30	67	
			CULG	0154.0	0155.0	III	G	1	18	70	
	0000	0720	CULG	0552.0	0553.0	UNCLF		1	55	120	
	0645	1443	ONDR								
	0655	1526	BLEN								
			SVTO	1104.0	1428.0	CONT		2	35	85	
	1116	1314	POTS	1116 E	1314 U	I	S,C	2	40X	170U	
			POTS	1116.8	1118.3	III	G	2	40X	150	
			POTS	1120.3	1128.9	III	GG,C	2	40X	270	
			SGMR	1215.0	1445.0	CONT		1	30	60	
	1327	1442	POTS	1327 E	1442 U	I	S,C	2	40X	300	
	2020	2400	CULG								
	2045	2400	HIRA								
22	0000	0759	HIRA								
			LEAR	0501.0	0501.0	III		1	30	53	
	0000	0720	CULG	0501.0	0502.0	III	B	1	18	180	
	0647	1439	ONDR								
			CULG	0654.0	0656.0	III	G	1	19	180	
			LEAR	0655.0	0655.0	III		2	30	74	
			SVTO	0655.0	0655.0	III		1	35	46	
	0656	1525	BLEN								
			SVTO	0924.0	0925.0	III		2	35	69	
	2020	2400	CULG								
	2046	2400	HIRA								
23	0000	0758	HIRA								
			LEAR	0050.0	0050.0	III		2	30	76	
	0000	0730	CULG	0050.0	0051.0	III	B	1	28	90	
	0626	0800	POTS	0630	0800 U	I	S	1	200U	400	
	0649	1439	ONDR								
			POTS	0655.6	0655.7	III	B	1	200U	320	
	0656	1524	BLEN								

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23	0848	0946	POTS								
	1027	1442	POTS	1130	1131	I	S	1	250	360	
			POTS	1156	1158	I	S	1	320	360	
			PALE	1741.0	1741.0	III		1	42	55	
			SGMR	1741.0	1742.0	III		1	30	80	
	2020	2400	CULG								
	2047	2400	HIRA								
24	0000	0757	HIRA								
	0000	0730	CULG	0113.0	0113.0	III	B	1	100	400	
			CULG	0152.0	0158.0	UNCLF		2	30	90	
			LEAR	0152.0	0157.0	III		1	30	80	
			CULG	0202.0	0206.0	UNCLF		1	30	80	
			LEAR	0202.0	0204.0	III		1	30	60	
			CULG	0230.0	0231.0	III	B	2	20	90	
			LEAR	0230.0	0231.0	III		2	30	75	
			CULG	0242.0	0243.0	III	B	1	30	90	
			LEAR	0242.0	0244.0	V		2	30	80	
			CULG	0243.0	0249.0	II	UE	1	50	90	
			LEAR	0248.0	0249.0	III		1	35	75	
			LEAR	0252.0	0253.0	III		1	30	55	
			LEAR	0252.0	0253.0	III		1	33	55	
	0640	1441	POTS	0640	1357	I	S	1	150	400	
	0651	1437	ONDR								
	0658	1523	BLEN								
			POTS	0822.4	0822.6	III	B	1	110U	250	
	2048	2400	HIRA								
	2020	2400	CULG	2117.0	2118.0	III	G	1	60	300	
			CULG	2235.0	2236.0	III	G	1	60	300	
			CULG	2329.0	2329.0	III	G	2	55	270	
			CULG	2342.0	2342.0	III	G	1	60	90	
25			LEAR	0043.0	0044.0	III		2	30	80	
			PALE	0044.0	0044.0	III		1	25	50	
	0000	0730	CULG	0044.0	0045.0	III	G	3	30	90	
	0000	0756	HIRA	0044.1	0044.2	III	B	1	30	50X	
			CULG	0048.0	0048.0	III	B	1	60	220	
	0640	1441	POTS	0640 E	1441 U	I	S	1	150	400	
	0653	1436	ONDR								
			POTS	0859.5	0900.8	III	G	2	40X	130	
	0659	1522	BLEN	0912.1	0927.8	III	G		1900	2800X	
			POTS	1041.5	1045.7	III	G	2	110U	160	
			SGMR	1205.0	1228.0	CONT		1	30	55	
			SVTO	1205.0	1252.0	CONT		2	35	67	
			POTS	1220.2	1225.5U	UNCLF		2	40X	65	
			POTS	1337.6	1337.7	III	B	1	110U	150	
			POTS	1354.3	1400.2	II	SH,H	3	110U	450	
			POTS	1354.7	1359.2	II	F,H	3	45	200U	
			SGMR	1356.0	1358.0	V		3	30	80	
			POTS	1356.5U	1358.3	IV		3	40X	450	
			SGMR	1452.0	1453.0	III		1	30	55	
			SVTO	1452.0	1452.0	III		1	40	49	
			PALE	1956.0	1956.0	III		1	25	40	
	2020	2400	CULG								
	2048	2400	HIRA								
26	0000	0754	HIRA								
			LEAR	0105.0	0105.0	III		1	30	56	
			LEAR	0457.0	0457.0	III		2	30	52	
	0000	0730	CULG	0457.0	0457.0	III	B	1	18	50	
			CULG	0506.0	0508.0	III	G	1	18	50	
			LEAR	0506.0	0507.0	III		2	30	80	
			LEAR	0601.0	0601.0	III		1	42	56	
			LEAR	0613.0	0614.0	III		2	43	63	
			SVTO	0613.0	0614.0	III		1	53U	61U	
	0655	1431	ONDR								
			LEAR	0839.0	0840.0	III		2	30	80	
	1110	1518	BLEN								
	2020	2400	CULG								

S O L A R R A D I O E M I S S I O N
Spectral Observations

OCTOBER 1998

OBSERVATION Day	Start (UT)	End (UT)	Sta	EVENT Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	Upper (MHz)	Remarks
26	2049	2400	HIRA								
27	0000	0753	HIRA								
			SVTO	0620.0	0620.0	III		2	36	85	
	0000	0730	CULG	0620.0	0620.0	III	B	2	18X	90	
	0657	1429	ONDR								
	0638	0736	POTS	0658.5	0658.9	III	G	2	110U	150	
			POTS	0701.2	0701.4	UNCLF		1	110U	170U	
	0707	1517	BLEN								
	0740	1426	POTS	0810	0811	I		1	150	165	
			POTS	0828.6	0829.5	III	G	1	110U	170U	
			POTS	1019.4	1020.4	III	G	2	110U	170U	
			POTS	1024.6	1024.7	III	B	1	110U	170U	
			POTS	1130.9	1131.7	III	G	2	40X	145	
			POTS	1209.8	1212.4	III	G	2	40X	275	
			POTS	1237.7	1237.7	III	B	1	40X	170U	
			POTS	1243.6	1243.9	III	B	2	40X	145	
			SGMR	1801.0	1802.0	III		1	30	47	
			SGMR	2003.0	2004.0	III		1	30	70	
			PALE	2129.0	2130.0	III		2	27	60	
	2050	2400	HIRA	2129.9	2130.2	III	B	2	25X	50X	
	2020	2400	CULG	2130.0	2130.0	III	B	1	18X	75	
			PALE	2209.0	2209.0	III		1	28	46	
			CULG	2210.0	2210.0	III	B	1	20	70	
			LEAR	2258.0	2258.0	III		2	30	62	
			PALE	2258.0	2258.0	III		1	28	48	
			LEAR	2339.0	2339.0	III		2	30	80	
			PALE	2339.0	2339.0	III		1	29	52	
			CULG	2340.0	2340.0	III	B	1	18	80	
			HIRA	2359.8	2359.9	III	B	1	25X	50X	
28			LEAR	0031.0	0032.0	III		3	30	80	
	0000	0730	CULG	0031.0	0032.0	III	B	2	18X	80	
	0000	0752	HIRA	0031.5	0031.8	III	B	2	25X	50X	
			LEAR	0124.0	0130.0	III		2	30	80	
			CULG	0125.0	0139.0	III	G	2	18X	80	
			PALE	0125.0	0138.0	III	N	1	29	54	
			HIRA	0125.4	0125.9	III	G	1	25X	50X	
			HIRA	0128.7	0128.9	III	B	1	30	50X	
			CULG	0135.0	0240.0	CONT		2	20	40	
			LEAR	0136.0	0138.0	III		2	30	80	
			HIRA	0137.5	0138.5	III	G	1	25X	50X	
			LEAR	0209.0	0209.0	III		1	30	46	
			LEAR	0259.0	0303.0	III		3	30	80	
			CULG	0300.0	0303.0	III	G	3	18X	120	
			PALE	0301.0	0302.0	III		1	38	62	
			HIRA	0301.5	0302.5	III	G	2	25X	50X	
			LEAR	0428.0	0429.0	III		1	30	55	
			CULG	0429.0	0430.0	III	G	1	25	55	
			CULG	0552.0	0706.0	III	N	1	20	60	
			LEAR	0611.0	0612.0	III		1	30	50	
	0659	1428	ONDR								
	0640	1317	POTS	0706.9	0709.9	III	GG	2	40X	220	
	0707	1516	BLEN								
			POTS	0752.4	0752.5	III	G	1	110U	135	
			POTS	0932	0933	I		1	150	160	
			POTS	0939.8	0940.9	III	GG	2	40X	170U	
			POTS	0943.4	0943.6	III	B	1	40X	170U	
			POTS	1012.5	1012.9	III	G	2	40X	140	
			POTS	1100.2	1109.8	III	G	2	40X	225	
			POTS	1114.8	1115.5	III	G	2	110U	160	
			POTS	1145	1146	I		1	155	170	
			POTS	1224.2	1224.5	III	G	2	110U	160	
			SGMR	1541.0	1543.0	V		1	30	73	
			PALE	1818.0	1818.0	III		1	25	55	
			SGMR	1818.0	1819.0	III		1	30	65	
			PALE	1916.0	1916.0	III		1	25	35	
			PALE	1937.0	1939.0	III		/	25	55	
			PALE	1937.0	1939.0	III	N	/	25	55	

S O L A R R A D I O E M I S S I O N
Spectral Observations

OCTOBER 1998

Day	OBSERVATION Start (UT)	OBSERVATION End (UT)	Sta	EVENT Start (UT)	EVENT End (UT)	EVENT Spectral Class	EVENT Event Remarks	Int (1-3)	FREQUENCY Lower (MHz)	FREQUENCY Upper (MHz)	Remarks
28			SGMR	1937.0	1937.0	III		1	30	53	
	2020	2400	CULG								
	2051	2400	HIRA								
29	0000	0751	HIRA								
			LEAR	0245.0	0246.0	III		1	30	53	
			LEAR	0308.0	0308.0	III		1	30	48	
			LEAR	0417.0	0418.0	III		2	30	64	
	0000	0730	CULG	0417.0	0419.0	III	G	1	20	60	
	0701	1426	ONDR								
	0640	0740	POTS	0710.8	0724.9	III	GG	3	40X	275	
			CULG	0711.0	0724.0	III	N	2	18X	180	
			LEAR	0711.0	0723.0	III	N	2	30	80	
			SVTO	0711.0	0723.0	III	N	2	35	80	
			POTS	0733.1	0733.2	III	B	1	110U	150	
	0823	1348	POTS	0832	0834	I	S	1	300	375	
			POTS	0852.5	0852.9	III	G	2	40X	170U	
	0708	1514	BLEN	0902.6	0908.2	III	GG		1500	2800X	
			POTS	0911.1	0911.2	III	B	1	110U	170U	
			POTS	1211.6	1212.6	III	G	1	110U	170U	
	2020	2400	CULG								
	2052	2400	HIRA								
30	0000	0730	CULG								
	0000	0750	HIRA								
	0703	1424	ONDR								
	0834	1442	POTS								
	1247	1511	BLEN								
	2020	2400	CULG								
	2053	2400	HIRA								
31	0000	0749	HIRA								
			LEAR	0025.0	0025.0	III		1	30	52	
	0000	0730	CULG	0025.0	0025.0	III	B	1	18	80	
			LEAR	0358.0	0359.0	III		1	30	60	
			CULG	0514.0	0516.0	III	G	1	18	90	
			LEAR	0514.0	0515.0	III		2	30	80	
	0705	1421	ONDR								
	0640	1442	POTS	1142.5	1142.7	III	G	1	300	360	
			POTS	1215.8	1216.2	III	G	1	110U	350	
	1345	1510	BLEN								
	2020	2400	CULG								
	2054	2400	HIRA								

Event Remarks:
- B = Single burst
- C = Underlying continuum (particularly with Type I)
- DC = Drifting chains
- DP = Drifting pairs
- FN = Fundamental emission (Type II)
- FS = Fine structures (Type IV) (includes fiber, pulsations, zebra)
- G = Small group of bursts (<10)
- GG = Large group of bursts (>10)
- H = Herringbone
- HARM = Harmonic
- N = Intermittent activity in this period
- MOV = Moving (Type IV)
- MWB = Meter wave burst
- RS = Reverse slope burst
- S = Storm in the sense of intermittent but apparently connected actively
- SH = Secondary harmonic emission
- STA = Stationary (Type IV)
- U = U-shaped burst of Type III
- UE = Uncertain emission (Type II)
- W = Weak

Frequency qualifiers:
- X = Extends beyond instrument range
- U = Uncertain frequency

Remarks:
- SWF = Associated short wave fade observed
- FLA = Associated flare observed (class optional)
- ESS = Estimated shock speed in km/s (Type II)

Stations Reporting:
BLEN = Bleien, CULG = Culgoora, HIRA = Hiraiso, IZMI = Izmiran, LEAR = Learmonth, ONDR = Ondrejov, PALE = Palehua, POTS = Potsdam, SGMR = Sagamore Hill, SVTO = San Vito

SOLAR RADIO NOISE STORM AT 164 MHZ FROM NANCAY RADIOHELIOGRAPH

OCTOBER 1998

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
06/10/98	-0.45	+0.23	I	7H59 E	15H23 D
06/10/98	-1.04	-0.62	I	7H59 E	15H23 D
07/10/98	-1.27	-0.84	I	7H54 E	15H23 D
08/10/98	-1.10	-0.88	I	8H03 E	15H23 D
08/10/98	-0.98	-0.17	I	10H20	15H23 D
09/10/98	-0.78	-0.88	I	7H54 E	15H23 D
10/10/98	-0.53	-1.01	I	7H54 E	15H22 D
11/10/98	-0.47	-0.90	I	7H54 E	15H23 D
12/10/98	-0.28	-0.98	I	7H54 E	15H23 D
13/10/98	-0.25	-0.20	I	7H52 E	15H21 D
14/10/98	+0.23	-0.53	III	7H52 E	15H21 D
15/10/98	+0.37	-0.67	IV	8H02 E	15H21 D
15/10/98	+0.39	-0.06	IV	11H00	15H21 D
16/10/98	+0.57	-0.54	IV	8H40 E	15H21 D
17/10/98	-0.31	+0.29	I	7H52 E	15H21 D
17/10/98	+0.64	-0.71	II	7H52 E	15H21 D
17/10/98	+0.93	-1.02	I	7H52 E	10H20
18/10/98	-0.14	+0.14	I	7H51 E	9H00
18/10/98	+0.88	+0.42	I	7H51 E	15H20 D
18/10/98	+1.02	-0.57	I	7H51 E	15H20 D
18/10/98	+1.02	-0.22	I	7H51 E	15H20 D
19/10/98	-0.02	+0.59	I	7H51 E	11H21
19/10/98	+0.11	+0.17	I	7H51 E	15H20 D
19/10/98	+1.16	-0.74	I	7H51 E	15H20 D
20/10/98	+1.21	-0.70	II	8H17 E	15H20 D
25/10/98	+1.38	-0.60	I	7H50 E	15H19 D
28/10/98	-0.29	+0.09	I	7H50 E	15H19 D

[1] POSITIVE E-W AND S-N COORDINATES CORRESPOND TO THE N-W QUADRANT

[2] IMP1: FLUX< 5 SFU IMP2: 5< FLUX < 20 SFU IMP3: 20< FLUX <100 SFU
IMP4: 100< FLUX <300 SFU IMP5> 300 SFU

[3] E NOISE STORM IN PROGRESS AT THE BEGINNING OF THE NANCAY OBSERVATIONS
D NOISE STORM IN PROGRESS AT THE END OF THE NANCAY OBSERVATIONS

SOLAR RADIO NOISE STORM AT 327 MHZ
FROM NANCAY RADIOHELIOGRAPH

OCTOBER 1998

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
06/10/98	-0.59	+0.06	I	7H59 E	15H23D
07/10/98	-0.25	+0.20	I	7H54 E	15H23 D
08/10/98	-0.90	-0.60	I	8H03 E	15H23 D
08/10/98	+0.06	-0.34	I	8H03 E	15H23 D
09/10/98	-0.71	-0.64	I	7H54 E	15H23 D
13/10/98	-0.06	+0.06	I	7H52 E	15H21 D
13/10/98	+0.71	+0.17	I	10H58	15H21 D
14/10/98	+0.25	-0.51	II	7H52 E	15H21 D
14/10/98	+0.31	+0.11	II	12H30	15H21 D
15/10/98	+0.31	-0.57	II	12H55	15H21 D
15/10/98	+0.47	-0.51	III	8H02 E	15H21 D
15/10/98	+0.47	+0.08	II	11H10	15H21 D
16/10/98	+0.64	-0.53	III	8H40 E	15H21 D
17/10/98	+0.73	-0.62	II	7H52 E	15H21 D
18/10/98	+1.04	-0.31	I	7H51 E	15H20 D
19/10/98	+1.04	-0.65	I	7H51 E	15H20 D
20/10/98	+0.12	-0.67	I	9H30	15H20 D
20/10/98	+1.07	+0.05	I	8H17 E	10H00
20/10/98	+1.10	-0.67	I	8H17 E	15H20 D
22/10/98	+0.84	-0.79	I	8H00 E	15H20 D
24/10/98	+0.98	-0.79	I	7H50 E	15H19 D
25/10/98	+1.16	-0.62	I	7H50 E	15H19 D
25/10/98	+1.21	-0.51	I	7H50 E	15H19 D
26/10/98	+0.99	-0.81	I	7H50 E	15H19 D
26/10/98	+1.15	-0.53	I	7H50 E	15H19 D

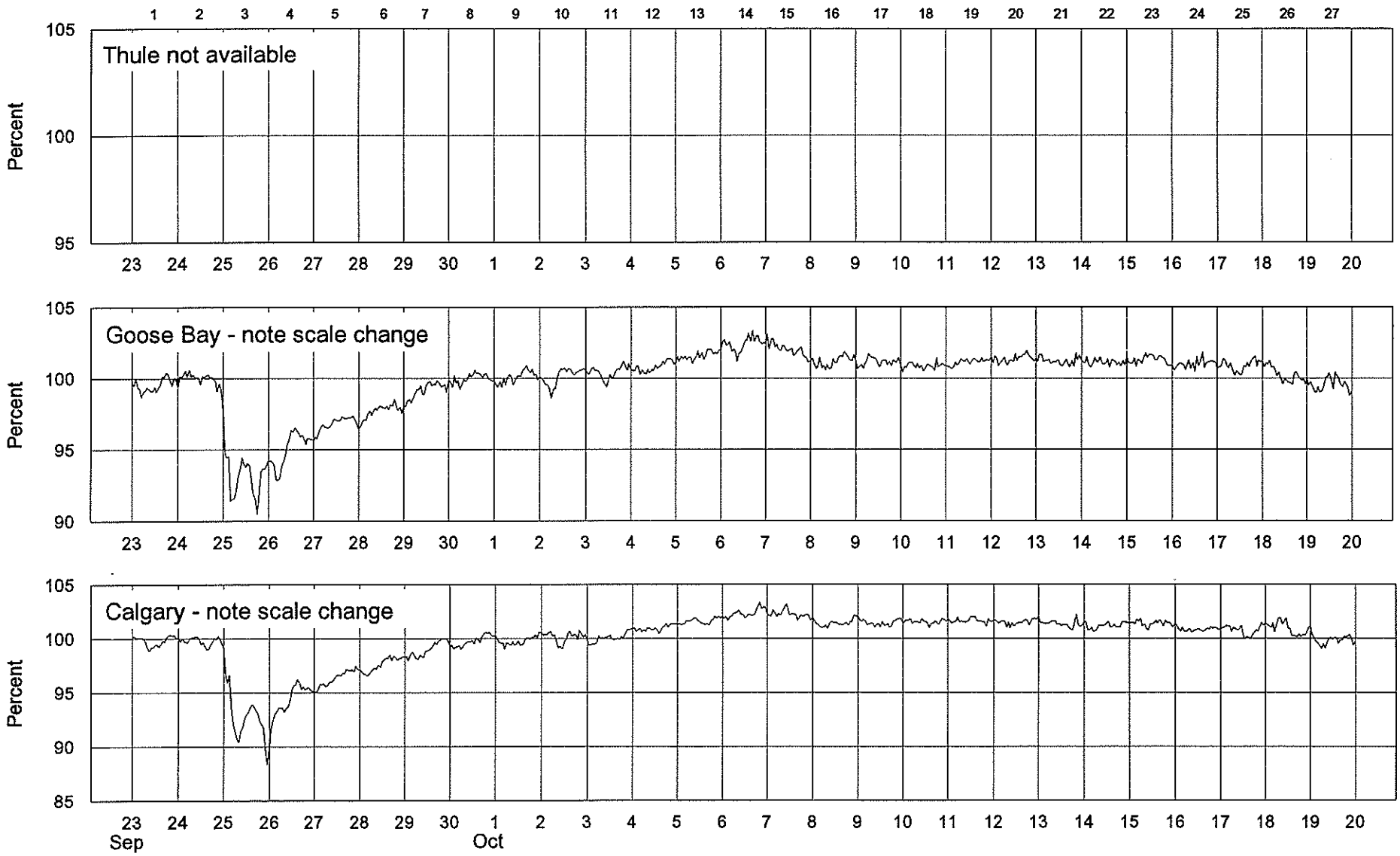
OTHERS DAYS: NO DETECTABLE NOISE STORM

COSMIC RAY INDICES
(Neutron Monitor)
OCTOBER 1998

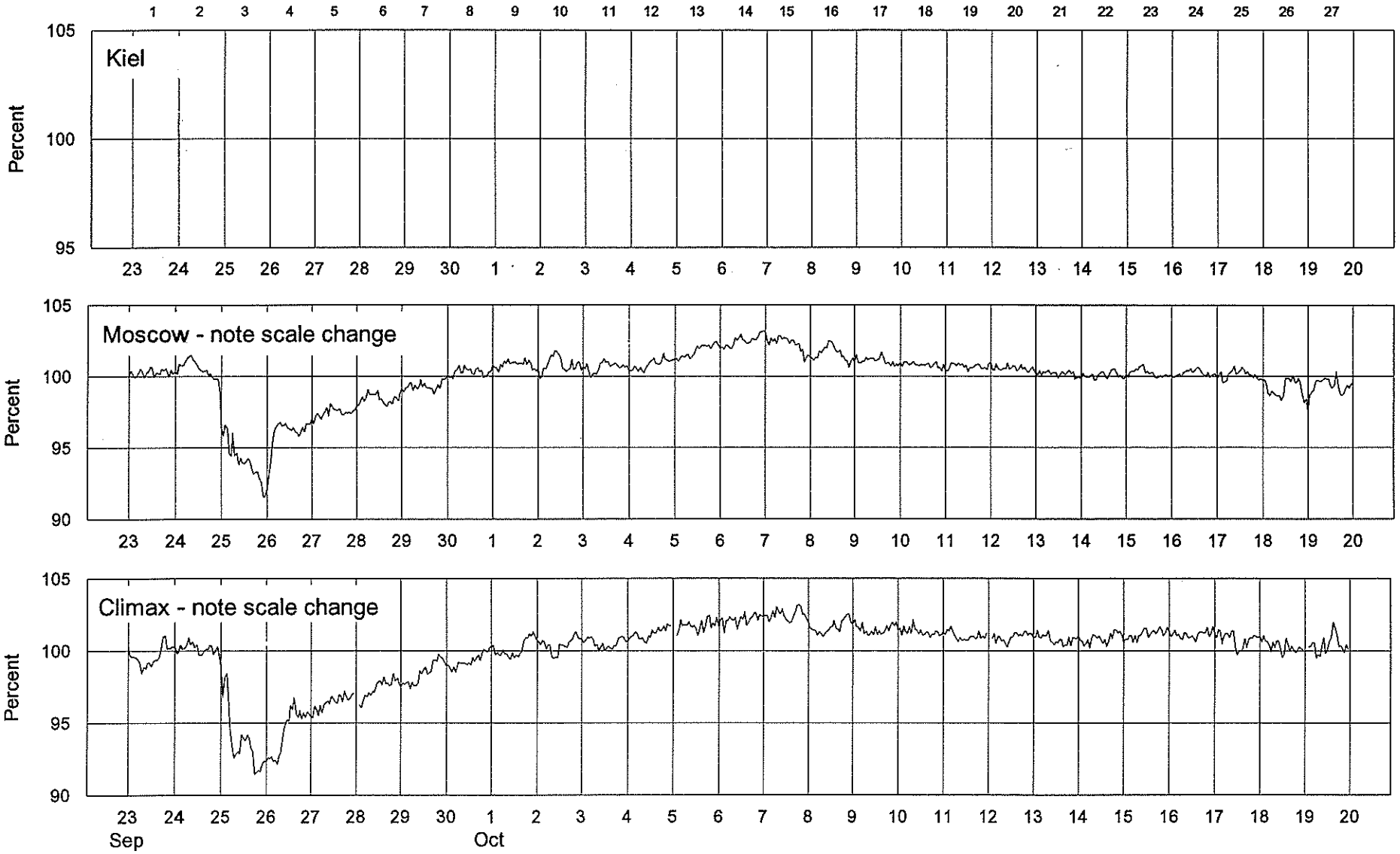
Day	THULE Average (cts/h)/100	GOOSE BAY Average (cts/h)/100	CALGARY Average (cts/h)/300	KIEL Average (cts/h)/100	MOSCOW Average (cts/h)/64	CLIMAX Average (cts/h)/100	BEIJING Average (cts/h)/256	HALEAKALA Average (cts/h)/1000
1	No data	7186.2	3870.2	6157.8	9219.8	4173.1	1944.1	3555.5(57)
2	at time of	7189.4	3885.3	6164.7	9219.6	4184.4	1948.0	3546.2
3	publication	7210.2	3880.7	6189.6	9204.3	4189.4	1955.1	3559.0
4		7237.8	3915.8	6224.6	9220.3	4216.4	1957.4	3570.6
5		7293.8	3940.5	6247.6	9306.8	4240.1	1963.3	3578.0
6		7353.5	3969.7	6296.5	9370.3	4257.0	1970.0	3586.5
7		7327.8	3967.2	6258.6	9357.0	4271.9	1976.7	3586.5
8		7266.1	3934.0	6268.4	9290.7	4236.0	1972.5	3577.7
9		7263.5	3935.5	6255.2	9243.2	4230.0	1972.3	3571.7
10		7242.8	3938.2	6234.6	9218.8	4222.0	1967.2	3564.1
11		7261.5	3942.0	6245.5	9206.1	4210.0	1965.0	3559.8
12		7279.2	3936.5	6239.7	9196.7	4206.8	1962.5	3565.2
13		7268.8	3932.0	6204.2	9161.5	4200.4	1970.5	3560.8
14		7262.0	3924.7	6197.6	9150.9	4203.2	1981.9	3566.2
15		7275.5	3932.7	6189.5	9165.6	4215.0	1981.3	3567.2
16		7253.1	3912.5	6184.5	9164.1	4214.6	1978.9	3557.9
17		7243.1	3908.8	6198.4	9154.8	4200.5	1984.4	3550.8
18		7200.7	3914.8	6192.3	9068.9	4180.8	1987.9	3544.2
19		7152.2	3874.2	6170.4	9079.0	4184.5	1998.3	3552.2
20		7175.6	3873.3	6188.7	9077.4	4166.8	1991.9	3546.7
21		7233.0	3914.2	6187.0	9166.4	4209.3	2001.1	3562.1
22		7219.6	3897.2	6179.5	9111.0	4177.5	1999.1	3552.8
23		7215.2	3898.5	6130.5	9058.5	4169.1	1996.8	3547.8
24		7170.1	3875.7	6131.7	9035.5	4145.5	1997.5	3554.7
25		7278.2	3927.5	6229.8	9150.0	4216.3	2013.3	3580.7
26		7352.9	3945.3	6293.6	9209.4	4234.5	2019.0	3583.9
27		7352.2	3968.5	6305.7	9262.0	4265.2	2027.4	3594.2
28		7317.0	3963.3	6282.9	9253.5	4249.8	2018.4	3586.9
29		7300.8	3960.8	6285.5	9249.1	4236.6	2021.2	3581.8
30		7290.1	3963.3	6281.2	9260.3	4234.9	2018.9	3580.6
31		7295.3	3962.3	6276.2(12)	9247.6	4232.7	2026.8	3574.8
Mean		7257.0	3924.7	6222.3	9196.1	4212.0	1986.1	3566.6

For less than 24-hour coverage, parentheses enclose the number of hours for which data are available. For Climax, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours, and for Haleakala, whenever the sum of all three sections falls below 60 hours.

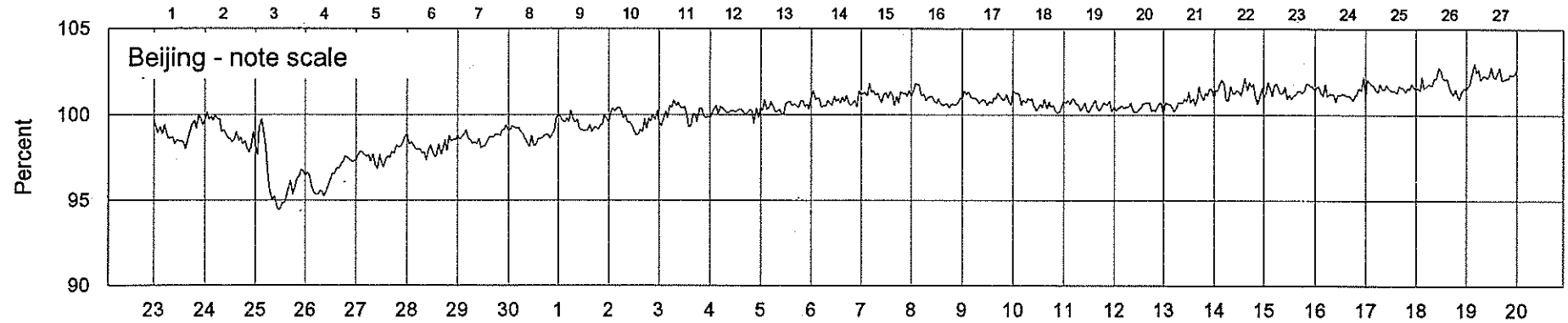
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2255 - Beginning 23 Sep 98

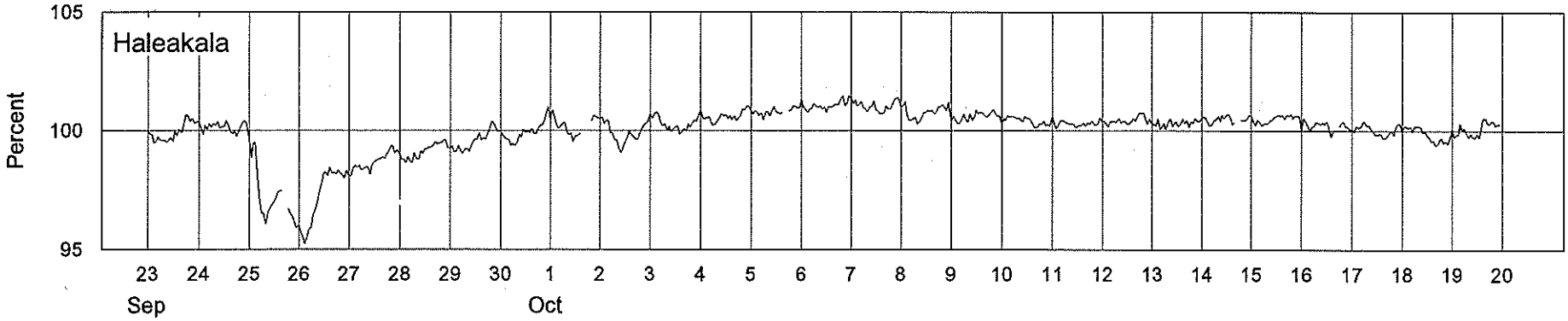


COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2255 - Beginning 23 Sep 98

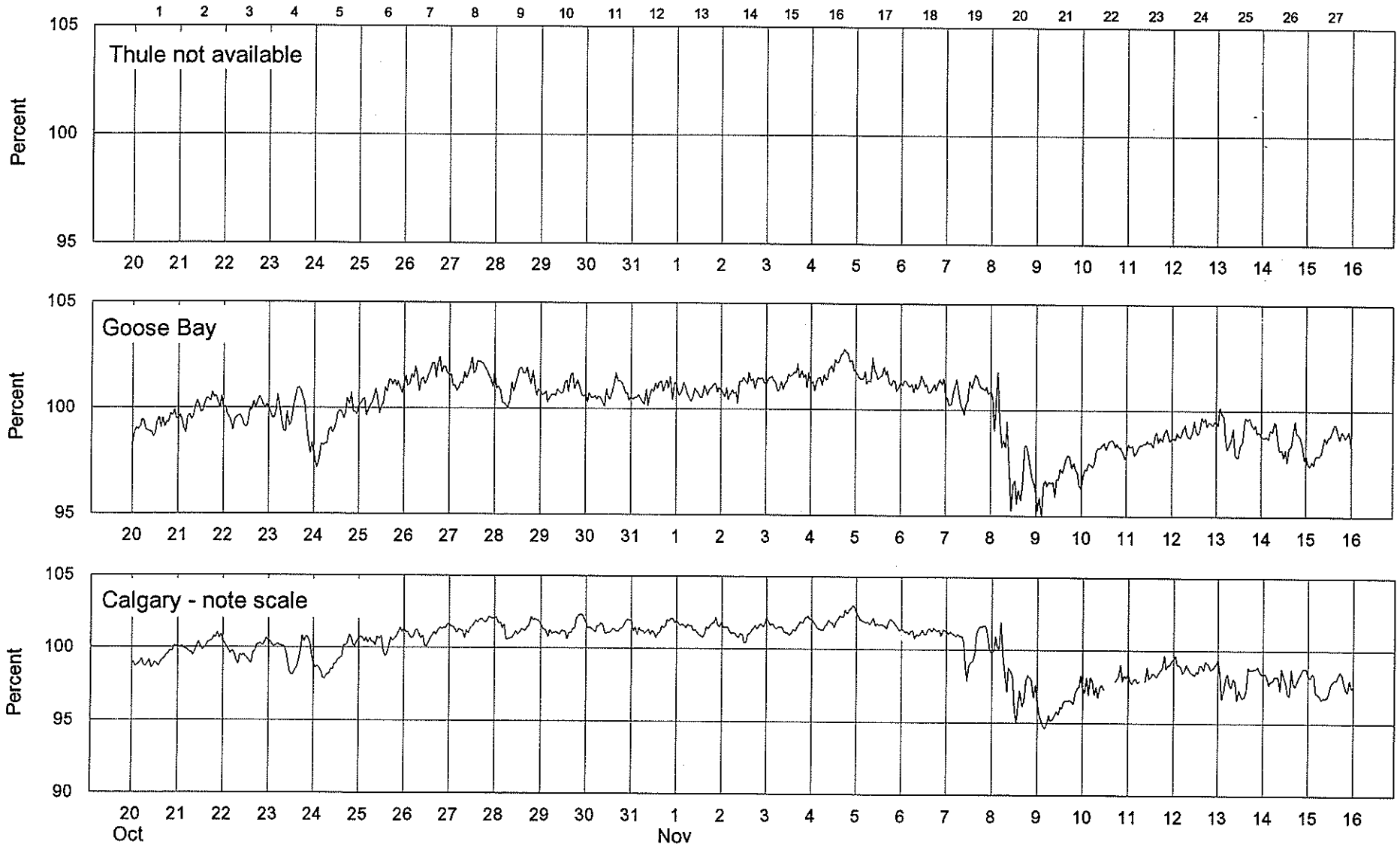


COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2255 - Beginning 23 Sep 98

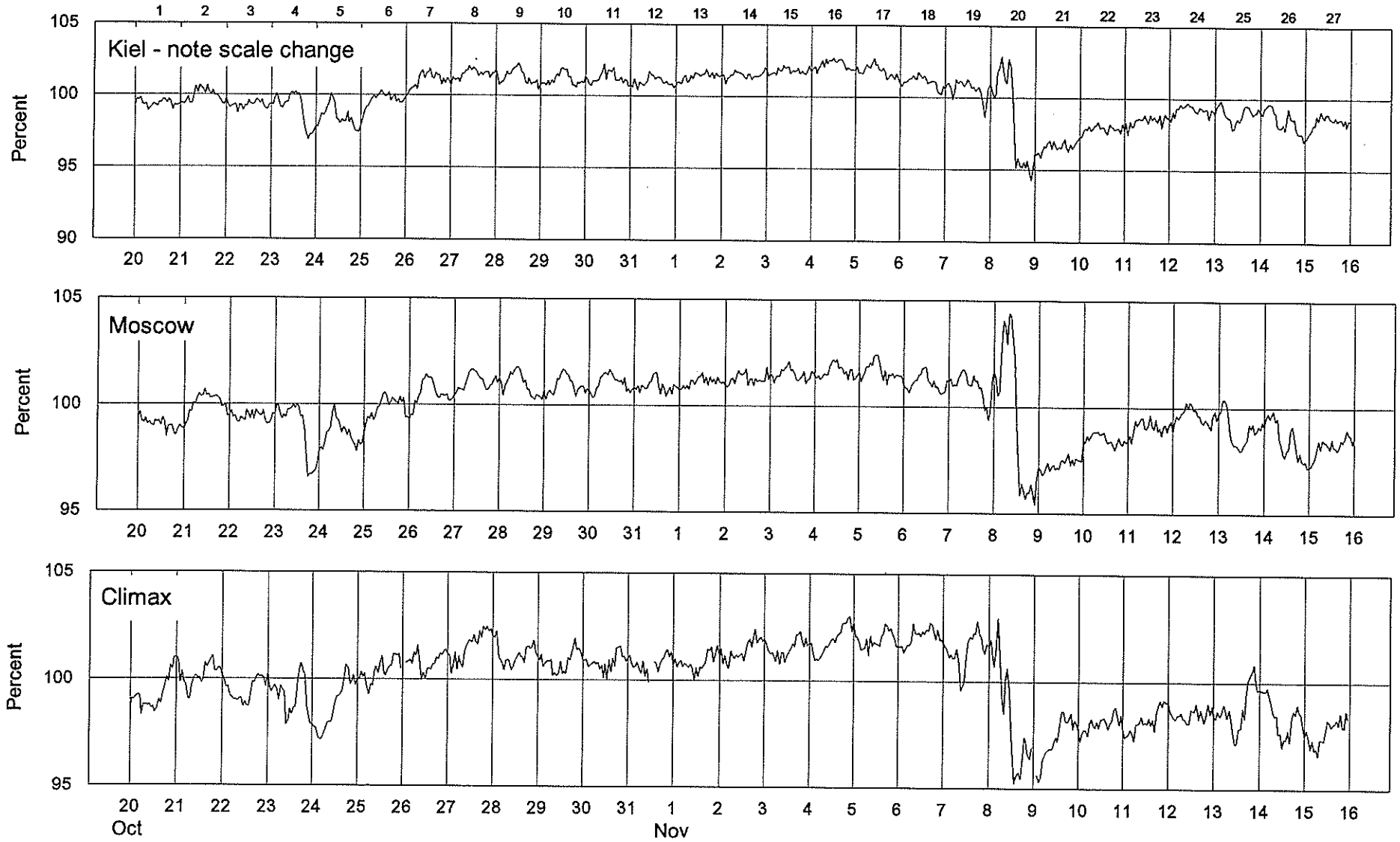




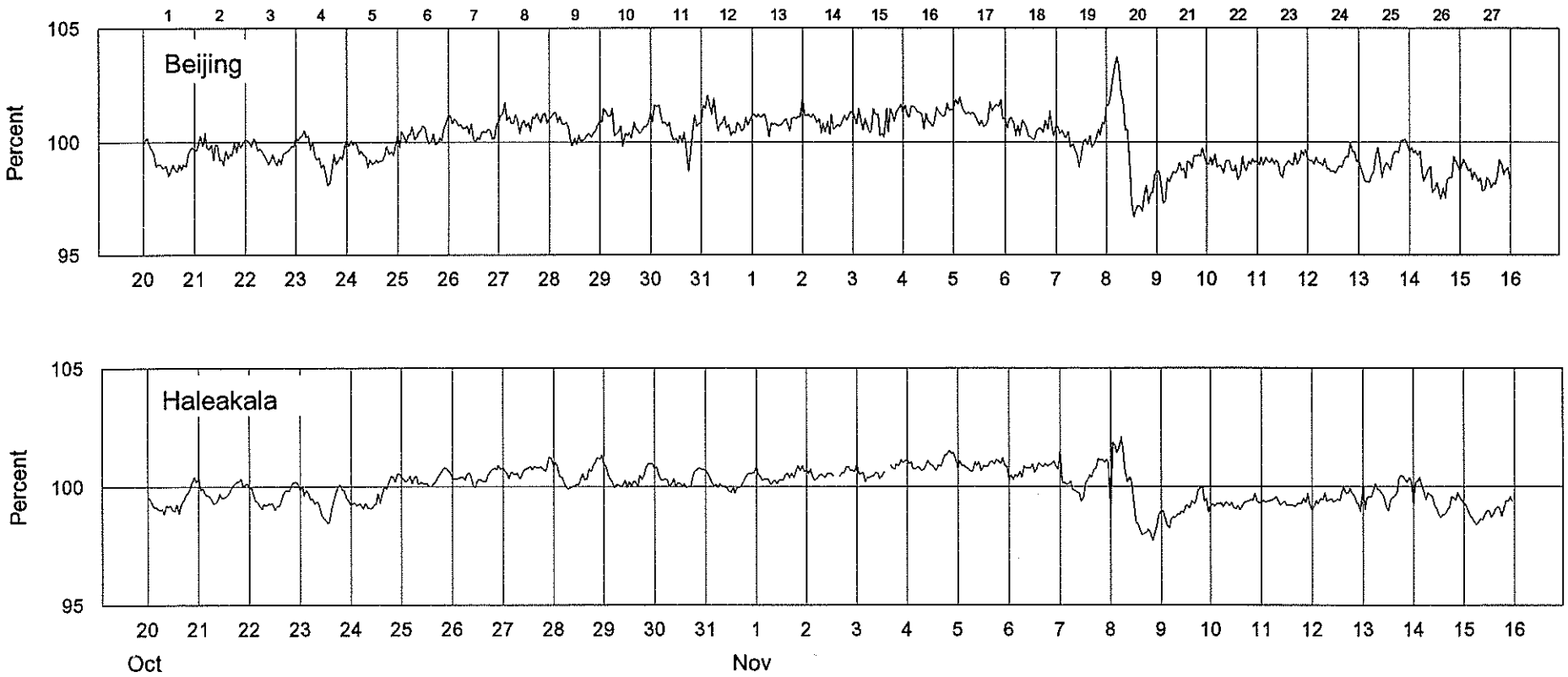
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2256 - Beginning 20 Oct 98



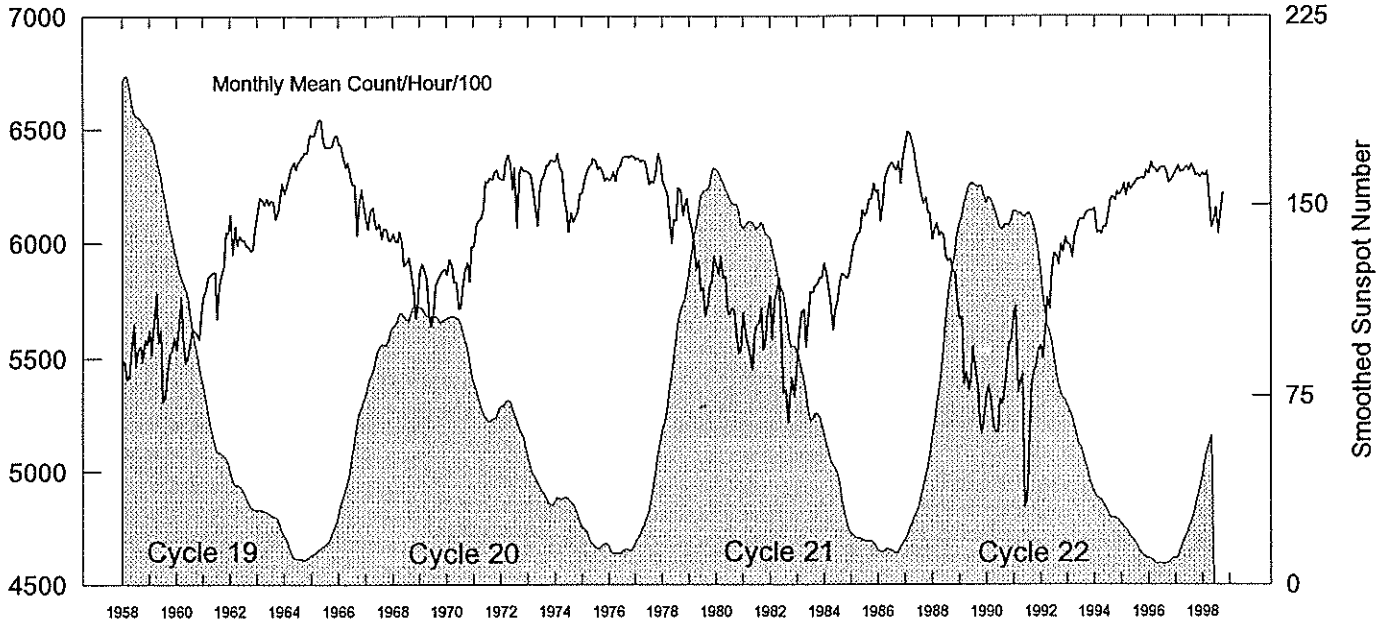
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2256 - Beginning 20 Oct 98



COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2256 - Beginning 20 Oct 98



Kiel Neutron Monitor Pressure-Corrected Values
Jan 1958 - Oct 1998



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1958	5481	5488	5409	5417	5523	5651	5466	5538	5553	5485	5584	5561	5513
1959	5623	5515	5659	5783	5569	5625	5307	5328	5420	5518	5536	5593	5540
1960	5539	5628	5764	5596	5480	5509	5557	5628	5620	5607	5586	5692	5601
1961	5766	5793	5853	5856	5872	5874	5672	5804	5859	5898	6046	6041	5861
1962	6122	5949	6072	5989	6030	6010	6013	5991	5982	5963	5971	6052	6012
1963	6125	6197	6191	6163	6194	6168	6185	6182	6103	6133	6197	6260	6175
1964	6215	6253	6287	6331	6355	6321	6347	6366	6383	6399	6393	6475	6344
1965	6474	6469	6506	6542	6545	6451	6424	6420	6423	6424	6467	6475	6468
1966	6433	6432	6375	6330	6353	6300	6258	6258	6033	6168	6236	6172	6279
1967	6101	6061	6139	6155	6088	6061	6086	6016	6064	6063	6014	6009	6071
1968	6041	6011	6001	6048	5997	5901	5910	5937	5878	5805	5673	5739	5912
1969	5876	5909	5872	5845	5686	5640	5700	5812	5843	5864	5879	5887	5818
1970	5863	5928	5906	5830	5831	5716	5719	5803	5885	5915	5832	5985	5851
1971	5985	6081	6094	6103	6151	6268	6265	6286	6275	6314	6322	6288	6203
1972	6281	6278	6351	6387	6344	6232	6328	6065	6306	6334	6313	6318	6295
1973	6309	6298	6250	6155	6074	6220	6271	6296	6341	6340	6365	6360	6273
1974	6353	6391	6331	6308	6201	6139	6047	6132	6090	6113	6139	6215	6205
1975	6217	6267	6308	6334	6341	6370	6363	6320	6334	6313	6272	6286	6310
1976	6275	6281	6314	6269	6325	6331	6370	6380	6379	6375	6383	6380	6339
1977	6366	6371	6355	6366	6357	6322	6254	6272	6263	6317	6391	6355	6332
1978	6271	6242	6215	6113	5998	6101	6095	6241	6232	6117	6167	6193	6165
1979	6104	6063	6006	5883	5923	5794	5806	5682	5723	5820	5827	5942	5881
1980	5905	5862	5942	5850	5854	5702	5690	5717	5704	5611	5522	5528	5741
1981	5697	5600	5569	5517	5447	5600	5642	5650	5717	5539	5564	5702	5604
1982	5772	5586	5755	5799	5848	5582	5347	5362	5217	5349	5414	5329	5530
1983	5481	5606	5702	5711	5549	5659	5787	5785	5814	5820	5852	5849	5718
1984	5911	5880	5799	5740	5622	5706	5753	5837	5867	5856	5844	5864	5807
1985	5911	5986	6016	6038	6049	6142	6114	6135	6193	6192	6260	6220	6105
1986	6229	6093	6176	6280	6308	6336	6350	6331	6315	6356	6259	6359	6283
1987	6429	6489	6484	6443	6410	6319	6273	6217	6171	6198	6131	6131	6308
1988	6013	6064	6085	6030	6047	6033	5945	5922	5931	5880	5872	5761	5965
1989	5673	5678	5385	5441	5360	5407	5552	5460	5378	5228	5167	5241	5414
1990	5348	5381	5313	5197	5177	5173	5324	5297	5382	5471	5563	5584	5351
1991	5696	5726	5355	5405	5431	4841	4882	5162	5390	5443	5466	5540	5361
1992	5553	5500	5624	5766	5713	5869	5956	5942	5905	5994	5960	6024	5817
1993	5996	5992	5937	6026	6061	6094	6108	6099	6129	6137	6142	6141	6072
1994	6150	6042	6052	6067	6070	6068	6129	6189	6203	6183	6226	6209	6132
1995	6225	6260	6205	6260	6234	6250	6267	6279	6281	6285	6279	6319	6262
1996	6301	6354	6330	6324	6306	6325	6332	6331	6303	6262	6277	6294	6312
1997	6313	6337	6313	6314	6324	6336	6317	6347	6319	6295	6301	6289	6317
1998	6305	6293	6312	6177	6069	6101	6154	6042	6149	6220			6182

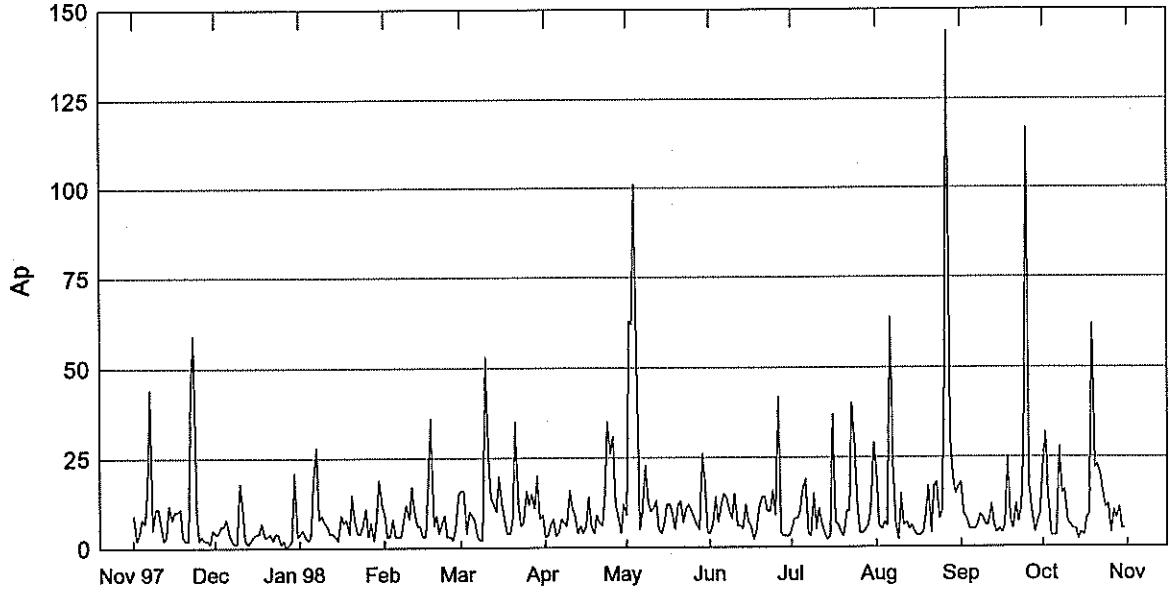
Multiply table entries by 100 to obtain hourly counting rate. Kiel, Germany: N54, E10, Alt= 54 m, Cutoff Rigidity= 2.32GV.

Geomagnetic Activity Indices
October 1998

Day		Kp Three-Hourly Indices 1	2	3	4	5	6	7	8	Sum	Ap	Cp	Km Three-Hourly Indices 1	2	3	4	5	6	7	8	Am	aa Provisional N	S	M	
1	D4	5+	4-	3+	3	3	4+	3+	3	29	24	1.2	5o	3o	3+	3o	3-	4-	3o	3+	40	36	43	40	39	
2	D2	4+	3+	5-	2+	4	5-	5+	5-	33+	32	1.3	4o	3-	4o	2o	4-	4+	5-	4+	49	55	42	36	61	
3		4+	4	3+	2-	3	1	1	1-	19	14	0.8	4-	3+	3o	2-	3-	1o	1+	1o	22	24	19	29	13	
4	Q4	1+	1-	1	0+	1+	0	0	2-	6+	3	0.1	1+	1+	1o	1-	1+	0+	0o	2o	7	11	8	9	10	CC
5	Q2	2-	0+	0	0+	0+	0+	1+	1	5+	3	0.1	2-	0+	0+	0+	0+	1o	1+	1+	6	9	5	7	6	CC
6	Q5	0+	0	0	0	0	2+	1+	1+	5+	3	0.0	0+	0+	0o	0+	0+	2+	2-	2o	7	6	6	2	10	CK
7	D3	3	3-	3-	3-	4+	6-	5+	3	29+	28	1.2	3o	2+	3-	3o	4-	5-	5o	3o	43	41	45	24	63	
8		4+	2+	3+	3	2+	3-	3-	3	24-	15	0.9	4o	2-	3-	3o	3-	3-	3-	3o	28	34	25	30	29	
9		3	4	4-	3	3	2+	2+	3	24+	16	0.9	2+	3+	4-	3-	3-	2+	2+	3-	26	34	19	32	22	
10		2+	3+	2	1+	1+	1-	2	1+	14+	7	0.4	2o	3o	2o	1+	1+	1o	2-	2-	14	18	11	20	9	
11		3	2-	1	1-	2	1-	2	1+	12+	6	0.3	2+	1+	1-	1-	2+	1o	2o	2-	12	15	11	10	16	KK
12	Q9K	3	1+	0	1-	1	1	1	1-	9-	5	0.2	2+	1o	0o	1o	2-	1+	1+	1-	8	11	9	11	9	CC
13	Q8	1+	2-	1	2	1-	1-	1-	2-	10-	5	0.2	1o	1+	1o	3-	1o	1o	1o	2-	9	12	9	12	9	CC
14	Q3	0+	2+	0+	0+	0	0	0+	0	4-	2	0.0	1-	2o	0+	0+	0+	0+	0+	0o	4	5	4	6	2	CC
15	Q7	0	0+	1-	0+	1+	3-	1+	0+	7	4	0.1	0+	0+	1o	0+	1+	3-	2-	1-	8	11	7	4	13	CC
16	Q1	1-	0	0+	1-	1	0	1	2-	5+	3	0.0	1-	0+	1-	1o	1+	0+	1+	2o	7	7	9	7	10	CK
17		1+	2	3-	2	2+	3-	2	2-	17-	8	0.4	1+	2o	3-	2+	3-	2+	2o	2-	17	18	22	19	21	
18		1+	2	2+	2	2-	2	3+	3	18-	9	0.5	2-	2-	3-	2o	2+	2+	3o	3o	19	22	20	13	30	
19	D1	5+	7-	4	5	6+	6	5	4+	43-	62	1.7	5-	6+	3+	5-	6-	5o	4+	4-	91	71	104	91	84	
20		3	3	3+	4-	2	2	5	5	27	22	1.1	2+	2o	3+	4-	2-	2+	4+	5-	36	41	41	41	42	
21	D5	5-	4+	4-	3+	3-	4-	4+	1+	28	23	1.1	5-	4o	3+	3-	3-	3o	4o	1+	39	42	31	37	36	
22		2	2+	4	4	4-	4+	4-	3	27	20	1.0	2-	2+	3+	3+	3+	4-	4-	3-	34	38	32	26	44	
23		2+	3-	1+	2+	4-	4	3+	3+	23	15	0.8	2o	2+	1+	3-	3+	4-	3+	3o	27	36	24	13	47	
24		3+	3+	3-	2-	2	2-	2+	3	20	11	0.7	3o	3-	3-	2-	2+	2-	3-	3o	21	29	14	20	23	
25		3+	4	2+	2	2+	3	2	0+	19+	12	0.7	3-	3o	3-	3-	2+	2+	2o	0+	19	22	15	21	17	
26	Q6	0+	1+	2	1	0+	0+	1-	2	8	4	0.1	0+	1+	2o	2-	0+	1-	1-	1+	8	8	9	9	8	CK
27		2-	1	1	1+	2	2-	3-	5-	16	10	0.6	1o	1-	1+	1+	2o	2-	2+	4o	16	25	14	9	31	
28		3	2	2+	2	2-	2-	2+	2+	17+	8	0.5	3o	2-	2+	2+	2-	2-	2+	3-	18	16	15	16	15	
29		3+	2-	3-	2+	3-	3-	2	2+	20-	11	0.6	3-	2-	2o	2+	3-	3-	2+	3-	20	24	15	18	21	
30		2+	3-	2-	1+	0+	0	0+	0+	9	5	0.2	2+	2+	2o	1+	1-	0+	1-	0+	9	10	7	14	3	CK
31	Q10K	1	1	0+	1-	0+	1-	3+	1-	8	5	0.2	1o	1-	0o	1-	1-	1+	3+	1+	9	11	6	5	12	KC
Mean											13	0.58									21.7	24.0	20.8	22.4	

Day	Kn Three-Hourly Indices 1	2	3	4	5	6	7	8	An	Ks Three-Hourly Indices 1	2	3	4	5	6	7	8	As	Sa	Prov Ri	Ra	Rs	IMF
1	5-	3-	3o	3o	3o	4o	3o	3+	39	5o	3o	3+	3o	3-	4-	3o	3o	41	119.1	30	24	67	
2	4-	3-	4o	2o	4o	4+	4+	4-	46	4o	2+	4o	2o	3+	4o	5o	5-	52	112.9	32	20	60	
3	4o	3+	3+	2o	3o	1+	2-	1o	25	4-	3+	3-	2-	2+	1-	1o	1o	19	112.0	22	18	59	
4	1+	1-	1+	0+	1+	0o	0o	2-	6	1+	1+	1o	1o	2-	1o	0+	2o	8	114.9	19	19	62	
5	2-	0+	0o	0+	0o	1o	1+	2-	6	2-	1-	0+	1-	0+	1o	1+	1o	6	117.1	28	32	64	
6	1-	0o	0o	0o	0o	2o	2-	2-	6	0+	1-	0o	1-	0+	2+	2o	2o	8	116.9	66	46	64	
7	3o	2o	3-	3+	4o	5-	5o	3o	45	3o	3-	3-	3-	4-	4+	5o	3o	41	124.1	66	75	72	
8	4o	2o	3-	4-	3-	3-	3-	3o	30	4o	2-	2+	3-	2+	3-	3-	3o	26	123.8	86	72	72	
9	3-	3+	4-	3o	3-	2+	2+	3-	28	2+	3o	3+	2o	3o	2+	2o	3-	24	123.2	89	78	71	
10	2o	3+	2+	1+	2-	1o	2-	2-	15	2-	3-	1+	1o	1+	1o	2-	2-	12	120.3	60	52	68	
11	3-	1o	0+	1o	3-	1o	2o	2-	12	2+	1+	1o	1-	2o	1+	2o	2-	12	118.5	51	43	66	
12	2+	1o	0o	1o	2-	1+	1+	0+	8	2+	1+	0+	1o	1+	1+	1+	1-	9	113.4	45	38	60	
13	1o	1+	1o	3-	1o	1+	0+	2-	9	1o	1+	1+	2+	1o	1-	1+	2-	9	117.5	48	56	65	
14	0+	2-	0o	0o	0o	0o	0+	0o	3	1-	2+	0+	1-	0+	0+	0+	0+	5	118.4	66	64	66	
15	0o	0o	1o	0+	1+	3-	2-	0+	7	1-	1-	1+	1-	2-	2+	1+	1o	9	130.4	77	76	79	
16	0+	0o	0+	1-	1+	0o	1+	2o	5	1o	1-	1o	1o	1+	0+	2-	2o	8	130.1	93	81	79	
17	1-	2-	3-	2+	3-	2+	2o	2-	16	2-	2+	3-	2+	3-	2+	2o	1+	17	134.4	98	85	83	
18	1+	2-	2+	2o	2+	2o	3+	3o	20	2-	2-	3-	2-	2o	2+	3o	3-	18	125.0	99	92	73	
19	5-	6+	3+	5-	6-	5o	5-	4-	89	5o	6+	3+	5-	6-	5+	4+	4-	94	116.8	96	75	64	
20	2+	2+	3+	4-	2-	2+	4+	4+	36	2o	2-	3+	4-	2-	3-	4+	5-	37	120.2	76	65	68	
21	4+	4+	4o	3o	3-	3+	4+	1+	44	5-	4-	3-	3-	3o	3o	4-	2-	35	117.2	68	51	65	
22	2-	3-	3+	4-	4-	4o	4-	3-	35	2o	2o	4-	3+	3+	4-	3+	3o	32	113.8	49	41	61	
23	2-	2+	1+	3o	4-	4o	3+	3o	30	2+	2o	1o	2o	3+	4-	3+	3o	25	111.4	50	37	58	
24	3o	3-	3o	2-	2+	2-	3-	3o	23	3o	2+	2o	2-	2o	2-	2o	3-	18	109.6	39	44	56	
25	3o	3+	2+	3-	3-	3-	2o	0+	22	3-	3-	3-	3-	2o	2o	2o	1-	17	106.3	29	29	53	
26	0o	1+	2o	2-	0+	1-	0+	1+	7	1-	1+	2o	2-	1-	1-	1o	1+	8	102.8	35	21	49	
27	1o	0+	1+	1+	2-	2-	2+	4o	16	1+	1-	1+	1o	2o	2o	2o	4o	15	101.8	23	16	48	
28	3-	2o	2+	2+	2-	2-	2o	2+	17	3o	1+	2o	2+	2-	2-	3-	3-	18	106.4	23	28	53	
29	3-	2-	2o	2o	3o	3-	2o	2+	19	3o	2-	2o	2+	2+	3-	3-	3-	21	108.0	54	47	55	
30	2o	2+	2o	1o	1-	0o	0+	0+	9	3-	2o	2-	1+	1-	0+	1-	1-	10	109.9	54	48	57	
31	1-	1-	0o	1-	0+	1o	3o	1o	8	1o	1-	0o	1-	1-	1+	3+	1+	10	117.0	52	43	64	
Mean									22.0									21.4	116.6	55.6	48.9	63.9	

Daily Average Indices Ap
Nov 1997 - Oct 1998

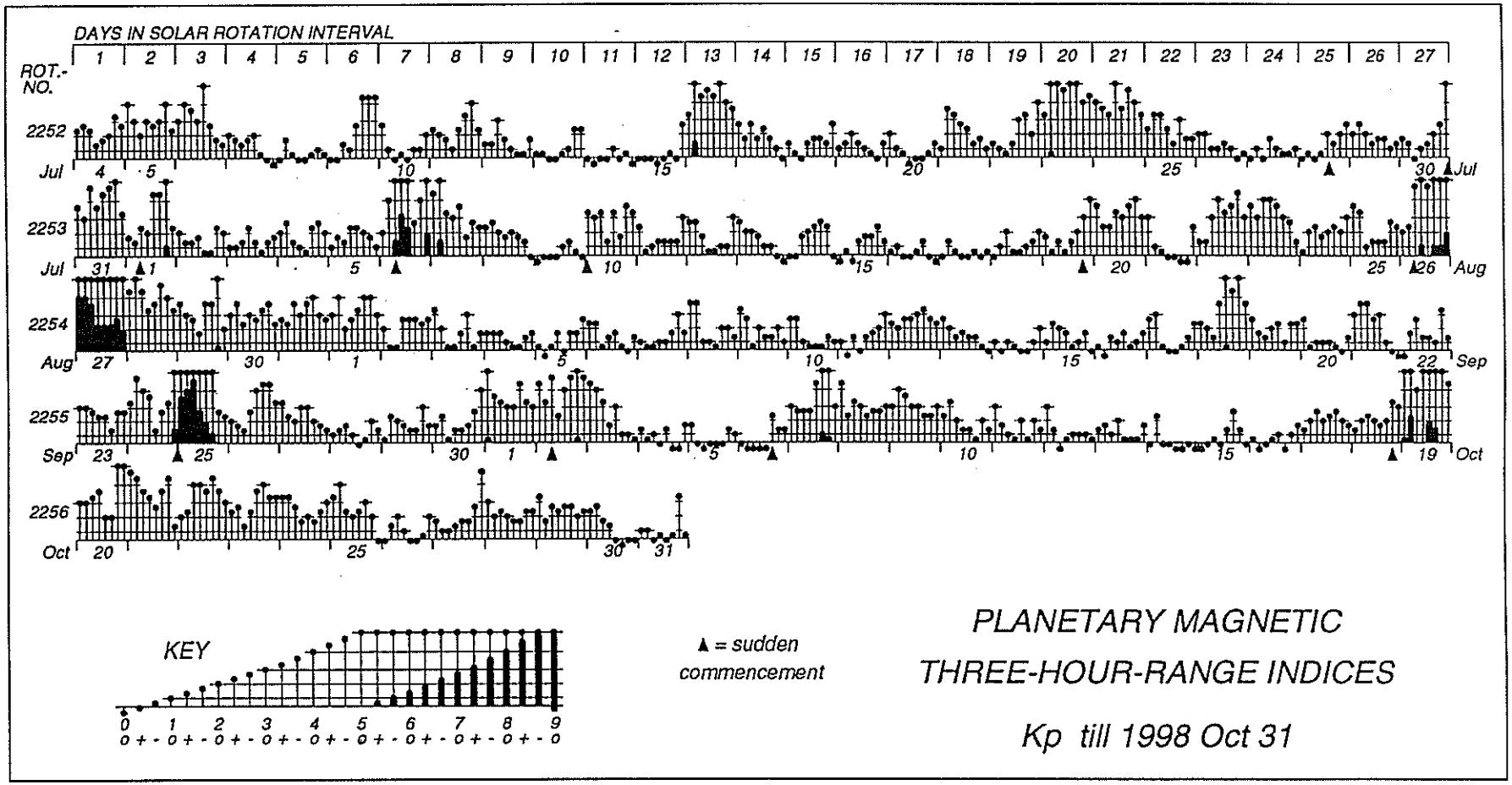


Day	Nov 97	Dec	Jan 98	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov
1	9	4	4	9	16	3	9	4	5	21	18	24
2	2	4	5	3	16	3	63	7	8	6	9	32
3	4	6	3	3	4	6	62	14	8	5	8	14
4	8	6	2	8	10	8	101	7	10	7	5	3
5	7	8	3	3	9	3	42	12	16	6	5	3
6	17	4	18	3	8	4	5	15	19	64	5	3
7	44	2	28	3	3	8	10	14	4	24	6	28
8	5	1	8	8	2	7	23	10	3	7	9	15
9	11	1	9	12	2	6	13	8	15	2	8	16
10	11	18	7	8	53	16	10	15	5	15	6	7
11	7	11	6	17	28	11	11	6	11	6	6	6
12	2	2	4	10	14	9	13	6	6	7	12	5
13	3	1	4	6	12	4	5	5	4	5	6	5
14	12	2	3	6	10	6	4	12	2	6	4	2
15	8	3	2	3	20	4	7	7	3	4	5	4
16	10	4	9	3	12	6	12	6	37	3	4	3
17	10	4	7	18	8	14	12	2	7	3	6	8
18	11	7	8	36	4	6	9	5	6	4	25	9
19	3	3	4	6	4	4	5	11	4	9	8	62
20	2	3	15	9	8	9	12	14	3	17	5	22
21	2	4	8	4	35	7	13	14	10	4	12	23
22	44	2	4	7	12	6	7	10	10	17	7	20
23	59	4	4	9	6	15	11	10	40	18	11	15
24	10	4	6	3	7	35	12	16	28	8	28	11
25	2	1	11	3	16	26	10	9	11	10	117	12
26	3	2	3	2	12	31	8	42	4	49	17	4
27	2	0	7	5	15	12	6	4	4	144	10	10
28	2	1	2	15	11	8	5	3	5	30	4	8
29	1	2	8		20	4	26	3	6	20	7	11
30	5	21	19		8	12	18	3	11	15	9	5
31		3	12		9		4	4	29	17		5
Mean	11	4	8	8	13	10	18	10	11	18	13	13

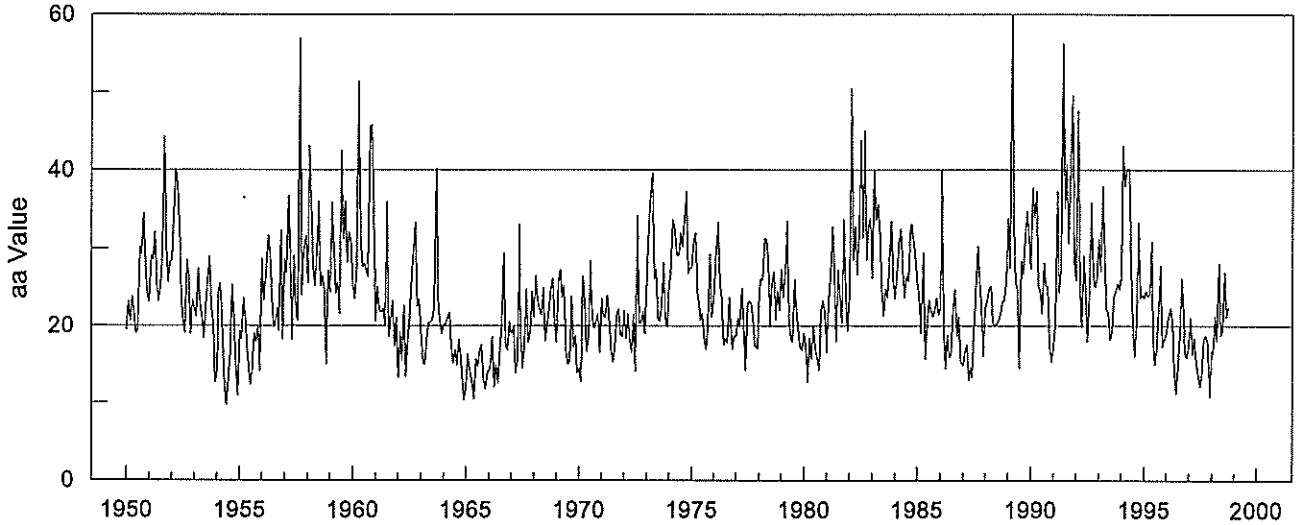
PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

GeoForschungsZentraum Potsdam

Kp through October 31, 1998



Monthly Mean aa Index Jan 1950 - Oct 1998



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	22.5	26.1	29.0	22.4	20.2	12.6	22.2
1954	13.9	24.5	25.5	20.6	12.0	9.7	13.1	16.5	25.4	21.1	14.5	10.9	17.3
1955	19.3	18.2	23.6	21.1	16.7	15.1	12.3	14.3	19.1	17.8	19.9	14.1	17.6
1956	28.7	23.3	27.6	31.7	29.3	23.5	19.8	20.7	22.4	19.3	32.3	18.2	24.7
1957	28.7	26.8	36.7	28.8	18.1	29.1	21.7	20.7	57.0	24.0	29.5	31.7	29.4
1958	25.5	43.2	36.1	27.6	25.2	29.7	36.0	25.1	26.5	24.7	15.0	27.2	28.5
1959	24.3	35.9	29.9	24.2	25.7	21.6	42.5	31.2	36.1	28.2	32.1	30.8	30.2
1960	25.2	23.5	27.6	51.5	31.6	27.6	28.1	27.2	26.4	45.6	45.9	34.5	32.9
1961	20.6	25.1	22.0	21.8	22.3	20.1	36.0	18.5	20.7	23.3	17.3	21.1	22.4
1962	13.2	19.2	15.5	22.6	13.4	18.1	21.0	26.2	29.8	33.3	22.5	23.5	21.5
1963	19.3	15.3	14.9	18.2	20.4	20.5	20.8	22.5	40.2	23.5	20.7	18.9	21.3
1964	20.1	20.1	21.0	21.7	17.5	15.1	16.9	14.8	18.2	16.9	13.8	10.3	17.2
1965	11.8	16.3	14.3	12.6	10.5	15.7	14.7	16.8	17.5	13.1	11.7	13.8	14.1
1966	14.2	14.8	18.6	12.0	14.8	12.5	17.1	20.0	29.4	17.5	16.8	20.5	17.3
1967	18.9	19.8	13.8	15.5	33.1	18.6	14.4	17.5	24.7	17.8	18.9	24.5	19.8
1968	21.1	26.5	23.3	22.2	21.4	24.9	18.0	20.1	22.0	24.8	26.2	20.3	22.6
1969	17.8	25.8	27.3	23.6	25.2	16.7	15.0	15.3	23.8	17.2	18.7	13.8	20.0
1970	14.4	12.7	26.4	23.1	16.6	18.3	28.4	21.0	19.7	20.6	21.6	16.5	19.9
1971	23.5	21.2	21.1	23.9	21.1	17.0	15.2	17.1	21.4	22.2	18.8	18.6	20.1
1972	21.9	18.3	21.5	18.1	16.6	21.5	14.0	34.2	20.4	20.4	21.8	18.9	20.6
1973	26.1	32.7	36.9	39.6	26.1	27.3	20.9	20.6	22.8	28.2	20.7	19.9	26.8
1974	25.8	26.4	33.7	32.9	29.2	29.2	32.0	30.2	33.7	37.3	26.8	27.5	30.4
1975	27.6	31.1	32.0	24.3	22.7	20.7	21.7	18.1	16.9	20.2	29.3	21.1	23.8
1976	23.3	28.5	33.4	25.4	23.7	17.5	18.4	17.7	23.7	20.4	16.9	18.6	22.3
1977	18.7	21.0	19.9	24.9	20.1	14.2	22.9	23.2	23.0	20.9	17.3	17.0	20.3
1978	24.6	26.2	25.9	31.3	31.2	28.3	19.9	25.6	27.0	20.8	24.6	22.0	25.6
1979	27.3	23.7	26.9	33.5	21.0	18.3	17.9	26.0	22.0	19.3	17.1	16.8	22.5
1980	19.0	17.3	12.7	18.4	15.6	20.0	17.0	15.9	14.2	21.9	23.3	21.7	18.1
1981	16.5	23.1	26.6	32.8	26.9	18.0	27.2	24.0	20.4	33.7	24.1	19.3	24.4
1982	24.2	50.6	28.5	32.9	26.7	32.1	43.9	31.4	45.1	28.5	33.0	33.8	34.2
1983	26.2	40.0	33.6	35.7	31.6	24.9	21.3	24.9	23.7	28.3	33.5	26.0	29.1
1984	23.5	26.7	30.7	32.5	27.2	23.7	26.4	25.8	32.6	33.1	31.0	29.0	28.5
1985	25.7	24.1	19.0	29.5	15.6	19.9	23.4	22.0	21.2	22.2	23.7	21.4	22.3
1986	22.4	40.0	21.1	14.3	18.8	15.9	16.3	22.3	24.7	18.6	21.2	15.3	20.9
1987	14.8	16.6	17.6	12.9	14.7	13.2	19.3	24.3	30.3	25.8	22.4	16.0	19.0
1988	22.4	23.4	24.8	25.2	20.5	20.0	20.2	20.6	21.4	23.2	23.3	25.5	22.5
1989	33.9	27.5	60.1	32.8	25.7	24.9	14.4	28.4	26.7	31.4	34.7	31.4	31.0
1990	27.4	37.8	33.9	37.4	25.1	24.6	21.6	28.2	25.1	25.1	17.4	15.2	26.6
1991	17.2	20.1	37.3	24.3	27.3	56.2	35.2	40.8	30.7	44.1	49.7	28.0	34.2
1992	25.9	47.7	24.5	19.8	29.1	24.8	17.9	24.1	35.8	27.0	25.0	26.1	27.3
1993	31.2	27.1	37.9	29.2	22.1	21.8	18.2	19.2	23.8	24.6	25.5	24.8	25.5
1994	26.5	43.2	37.9	40.2	40.2	27.2	20.6	16.0	20.2	33.3	23.6	24.1	29.4
1995	23.6	24.5	23.8	24.2	30.9	19.1	14.9	17.0	22.2	27.9	17.2	18.2	22.0
1996	18.8	20.8	22.3	20.5	14.0	11.1	14.7	18.8	26.2	23.5	16.3	15.9	18.6
1997	17.4	21.0	16.3	18.4	15.1	13.7	12.1	13.7	18.4	18.7	18.0	10.8	16.1
1998	16.8	16.4	21.2	18.0	28.1	18.8	19.3	27.0	21.1	22.4			20.9

PLANETARY GEOMAGNETIC ACTIVITY

3-HOUR-RANGE INDICES Km AND aa BY 27-DAY SOLAR ROTATION INTERVAL

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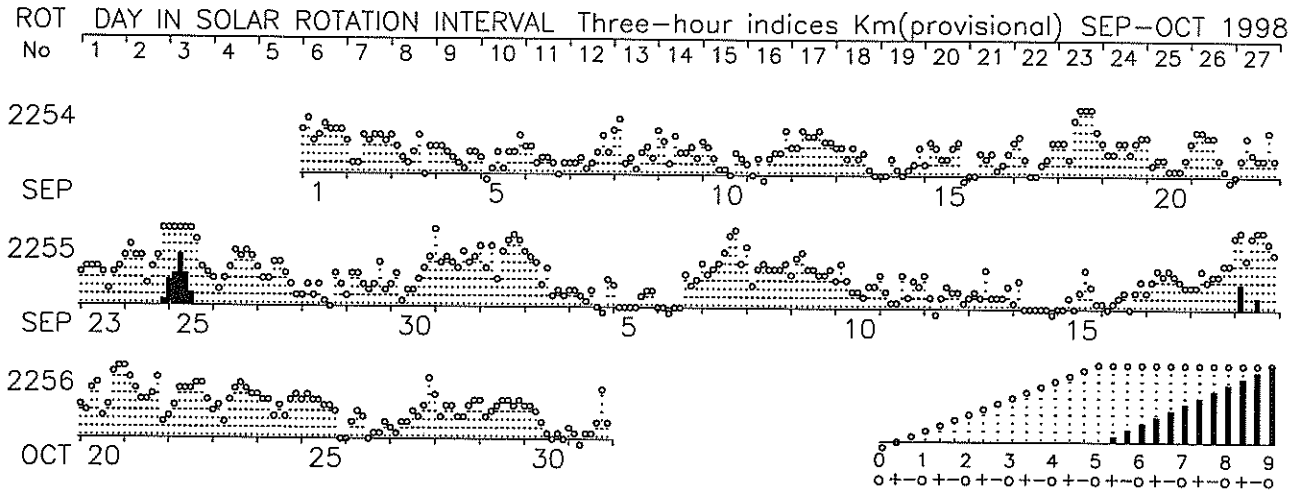
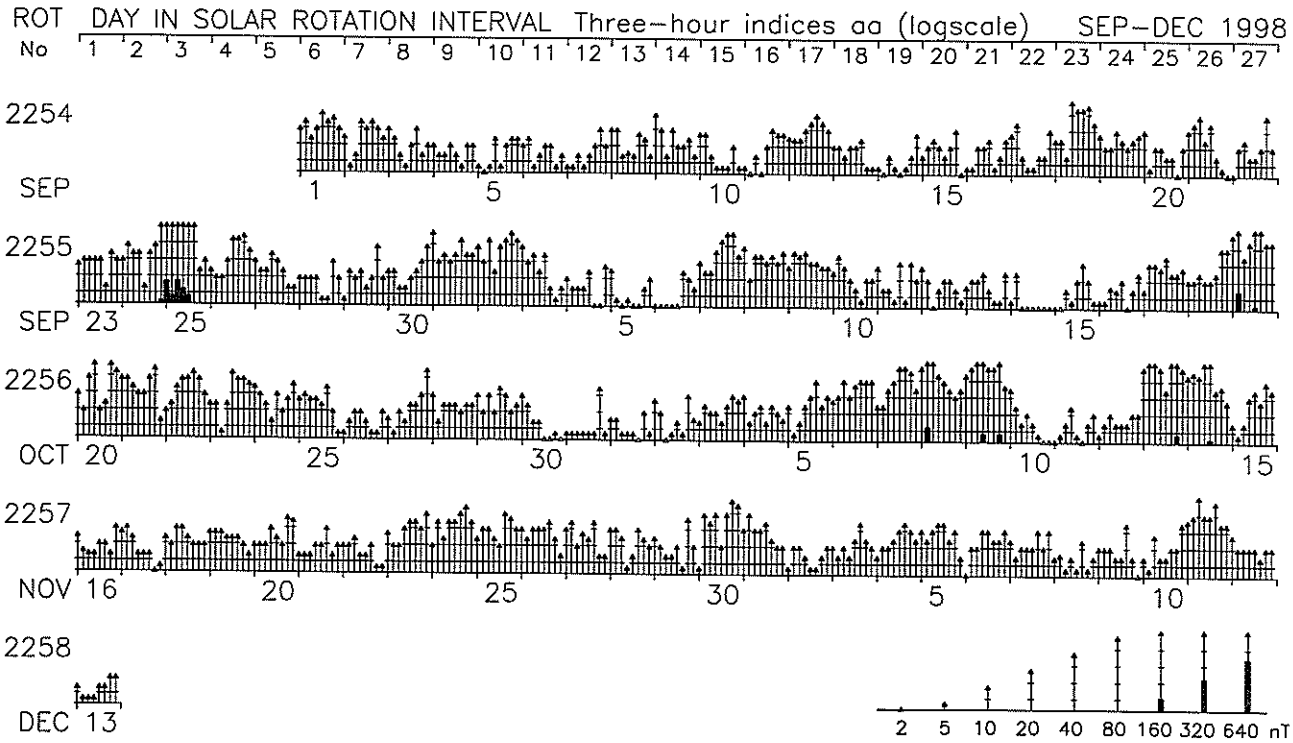
CETP, 4 Avenue de Neptune, F-94107 Saint Maur des Fosses CEDEX – FRANCE



Indices Derivation at Universite Paris Sud; Graph Prepared at ISGI Publication Office.



Indices Derivation at Universite Paris Sud; Graph Prepared at ISGI Publication Office.

WDC-C2 FOR GEOMAGNETISM, KYOTO UNIVERSITY

HOURLY EQUATORIAL DST VALUES(PROVISIONAL)

OCTOBER 1998

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-63	-66	-66	-69	-66	-65	-69	-64	-57	-53	-51	-50	-46	-41	-42	-52	-65	-56	-53	-53	-52	-53	-52	-48
2	-45	-41	-41	-42	-44	-41	-38	-24	-24	-21	-24	-22	-21	-22	-30	-39	-54	-56	-59	-61	-56	-66	-59	-58
3	-54	-62	-67	-70	-69	-64	-66	-63	-57	-52	-50	-47	-44	-43	-43	-44	-44	-43	-44	-45	-45	-45	-45	-43
4	-41	-41	-39	-37	-36	-34	-33	-31	-31	-30	-33	-33	-33	-31	-29	-28	-29	-29	-28	-28	-28	-27	-27	-27
5	-27	-26	-25	-25	-24	-24	-25	-22	-21	-22	-22	-22	-22	-21	-20	-22	-23	-26	-28	-26	-27	-27	-25	-20
6	-19	-19	-18	-16	-15	-16	-16	-14	-15	-17	-17	-18	-18	-16	-17	-16	-11	-5	-6	-3	1	-1	-8	-14
7	-20	-24	-25	-27	-31	-31	-25	-20	-22	-14	-16	-35	-41	-33	-41	-44	-45	-66	-72	-75	-80	-80	-81	-75
8	-72	-74	-70	-67	-63	-59	-55	-51	-53	-57	-55	-52	-51	-49	-49	-47	-46	-44	-46	-48	-49	-44	-41	-44
9	-49	-53	-56	-59	-64	-65	-65	-57	-53	-55	-52	-56	-56	-57	-55	-51	-48	-47	-44	-42	-43	-45	-44	-44
10	-47	-52	-52	-55	-53	-61	-50	-39	-40	-40	-39	-44	-47	-44	-38	-34	-32	-33	-32	-33	-30	-29	-30	-31
11	-33	-33	-39	-43	-44	-42	-37	-31	-33	-34	-33	-32	-36	-36	-36	-35	-33	-31	-31	-33	-29	-26	-26	-25
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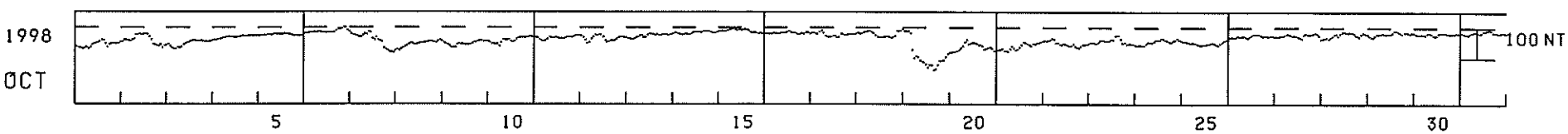
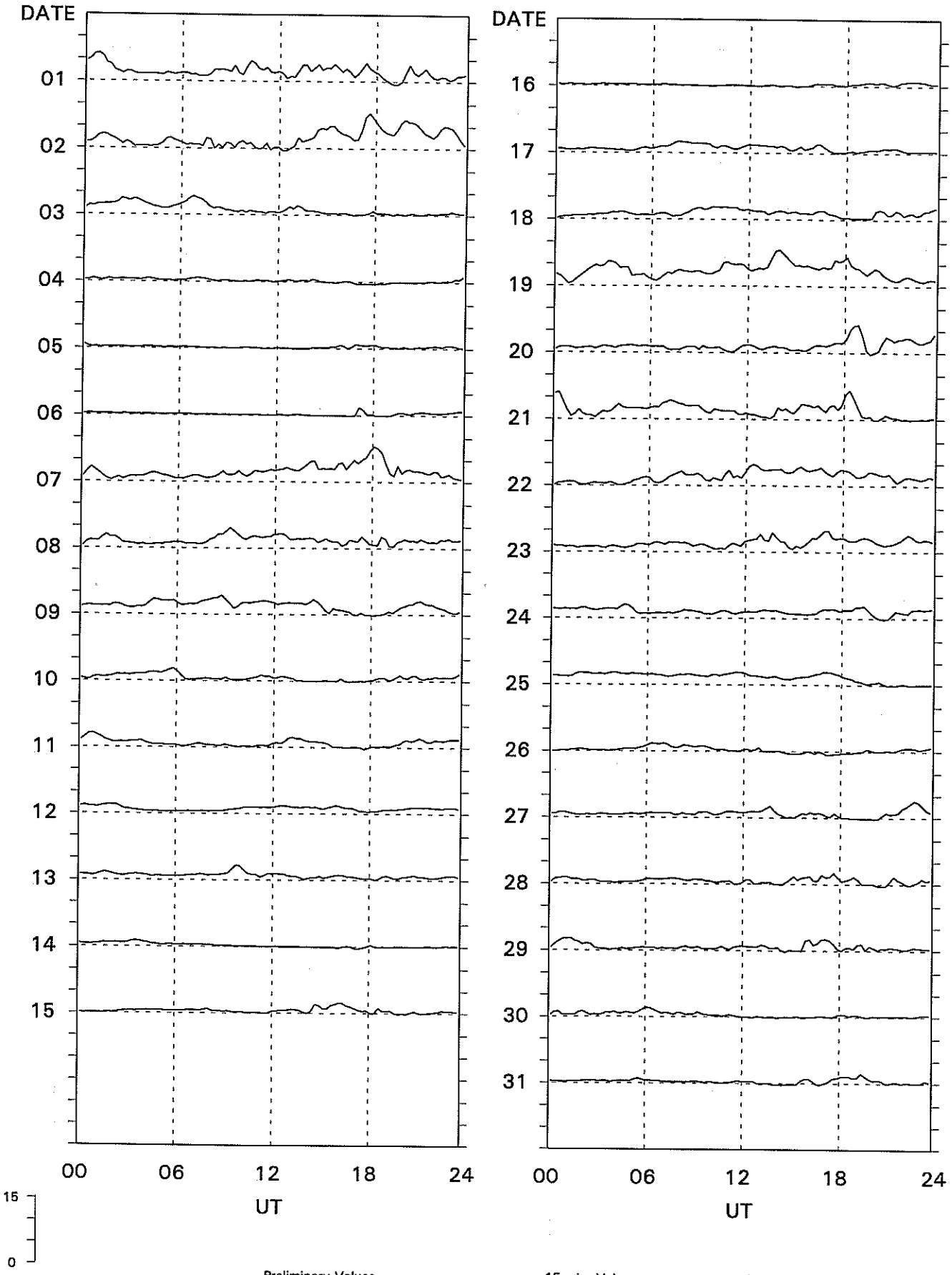


PC-INDEX

Thule

October, 1998



Preliminary Values. 15-min. Values. Danish Meteorological Institute

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

OCTOBER 1998

Sta	Geomag Lat	Commencement Day	Time (UT)	Type	SC Amplitudes D (Min)	H (Gamma)	Z (Gamma)	Maximum 3-Hour K Index Day(3-Hour Periods)	K	Ranges D (Min)	H (Gamma)	Z (Gamma)	End Day	Hour (UT)
KRC	16.4N	01	1739	..	..	..	..	01(6) 02(3,6,7)	5	9	118	40	03	08
UJJ	13.6N	02	0724	SC	--	--	--		-	-	--	--	03	15
NGP	11.3N	02	0724	SC	0.5	41	- 5		-	5	126	29	03	15
ABG	09.7N	02	0724	SC	- 0.4	31	- 3	01(6) 02(6,7)	5	5	117	48	03	15
HYB	07.6N	02	0727	SC	- 0.5	37	- 4	02(6)	5	6	123	28	03	20
PND	02.4N	02	0724	SC	--	--	--		-	-	--	--	03	15
ETT	00.7S	02	0727	SC	0.2	54	39		-	--	177	57	03	15
TRD	01.1S	02	0724	SC	0.2	61	- 67		-	3	192	94	03	15
HER	33.6S	02	17--	..	..	..	..	02(7)	5	17	70	87	03	16
HYB	07.6N	06	1633	SC	- 0.2	9	- 1	07(5,6)	5	4	149	36	08	22
ETT	00.7S	06	1631	SC	- 0.2	9	8		-	--	191	63	09	18
KRC	16.4N	07	0420	..	..	..	..	07(4,5)	5	7	121	36	08	21
UJJ	13.6N	07	1000	..	..	..	..		-	-	--	--	10	14
NGP	11.3N	07	1000	..	..	..	..		-	-	--	--	10	14
ABG	09.7N	07	1000	..	..	..	..	07(5,6)	5	4	113	48	10	14
PND	02.4N	07	1000	..	..	..	..		-	-	--	--	10	14
TRD	01.1S	07	1000	..	..	..	..		-	3	209	70	10	14
HER	33.6S	07	08--	..	..	..	..	07(6,7)	5	25	144	146	07	21
BJI	28.8N	18	1946	SC	0.7	23	1	19(2)	7	17	181	47	20	00
KRC	16.4N	18	1950	SC	- 1.7	40	21	19(2)	7	10	190	106	21	08
UJJ	13.6N	18	1954	SC	--	--	--		-	-	--	--	21	22
NGP	11.3N	18	1954	SC	0.1	20	- 2		-	4	240	30	21	22
ABG	09.7N	18	1954	SC	- 0.2	19	- 2	19(2)	7	4	244	47	21	22
HYB	07.6N	18	1952	SC	- 0.1	18	0	19(2)	7	3	255	39	21	22
PND	02.4N	18	1954	SC	--	--	--		-	-	--	--	21	22
ETT	00.7S	18	1952	SC	- 0.1	15	17		-	--	343	134	21	23
TRD	01.1S	18	1954	SC	--	16	- 19		-	2	--	186	21	22
HER	33.6S	18	18--	..	..	..	..	19(2)	6	28	194	130	21	20
KRC	16.4N	22	0414	..	..	..	..	22(6)	5	5	71	47	23	07

Stations:

ABG = ALIBAG
AMS = MARTIN DE VIVIES
ANN = ANNAMALAINAGAR
BJI = BEIJING
CAN = CANBERRA
CMO = COLLEGE
CZT = PORT ALFRED
DRV = DUMONT D'URVILLE
ETT = ETAIYAPURAM
GNA = GNANGARA
GUA = GUAM
HER = HERMANUS
HON = HONOLULU
HYB = HYDERABAD
JAI = JAIPUR
KRC = KARACHI
NGP = NAGPUR
PAF = PORT AUX FRANCAIS
PMG = PORT MORESBY
PND = PONDICHERRY
SHL = SHILLONG
SIT = SITKA
TRD = TRIVANDRUM
UJJ = UJJAIN

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

OCTOBER 1998

Storm Sudden Commencements (SSC)

Day	Time	Quality: Station Group*
02	0726	A: SOD* WNG* CLF* COI BJI LNP HYB ETT
		B: VAL BDV* HRB* NAG* GCK* SPT* TEN*
		C: NGK
06	1630	A: WNG* SPT
		B: NUR* HRB NAG COI BJI
		C: NGK VAL BDV* TEN LNP HYB ETT
		si: EBR
18	1952	A: NAG SPT
		B: WNG NGK BDV CLF HRB MMB EBR COI KAK HTY KNY LNP HYB ETT
		C: VAL GCK

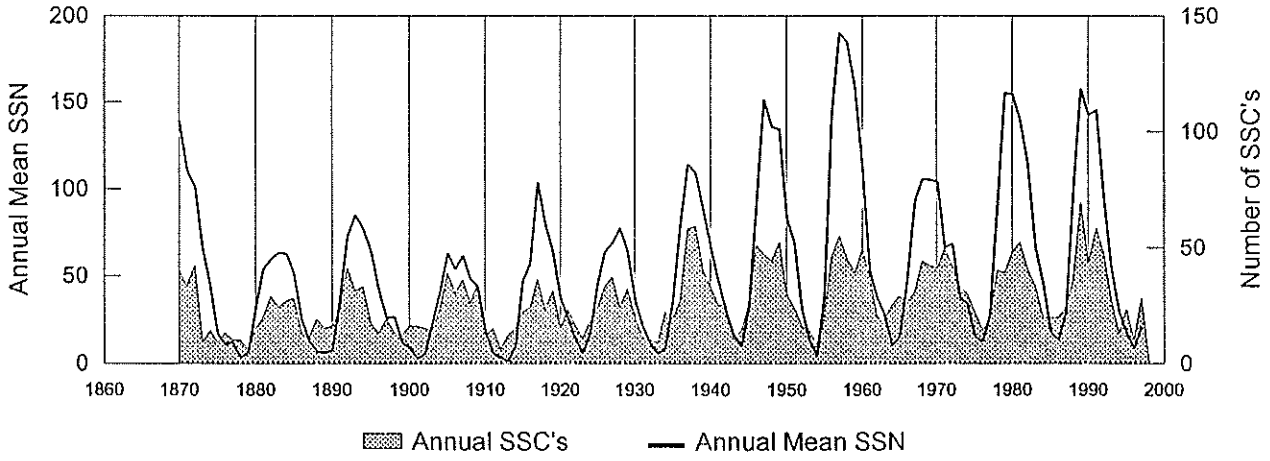
Solar Flare Effects (sfe)

Day	Begin-End	Station(s)
05	1019-1035	BDV
10	1102-1115	NAG
11	0453-0504	HYB ETT
17	1501-1518	EBR
18	0132-0155	KNY+
18	0140-0205	MMB+ KAK+

REPORTING OBSERVATORIES (up to the 2nd of December 1998):
SOD DOB NUR WNG NGK VAL BDV CLF HRB NAG GCK MMB EBR COI BJI SPT KAK HTY KNY TEN LNP HYB ETT

Three-letter codes identify each observatory. Reporting stations have been grouped by the character of the observed event. The letter A means very remarkable; B means fair, but unmistakable; C means very poor, doubtful; and - means no quality figure given. The * means that the SSC, at least in one component, was preceded by a small reversed impulse. SSCs are given only when five or more stations report the event. SFEs include all reports. If an SFE is confirmed by solar or ionospheric events, the name of the station is identified with a plus sign (+).

Storm Sudden Commencements (SSC) and Sunspot Numbers (SSN)



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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."