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Data for January, February 1999 and Late Data

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SOLAR-GEOPHYSICAL DATA

Number 655

(Issued in Two Parts)

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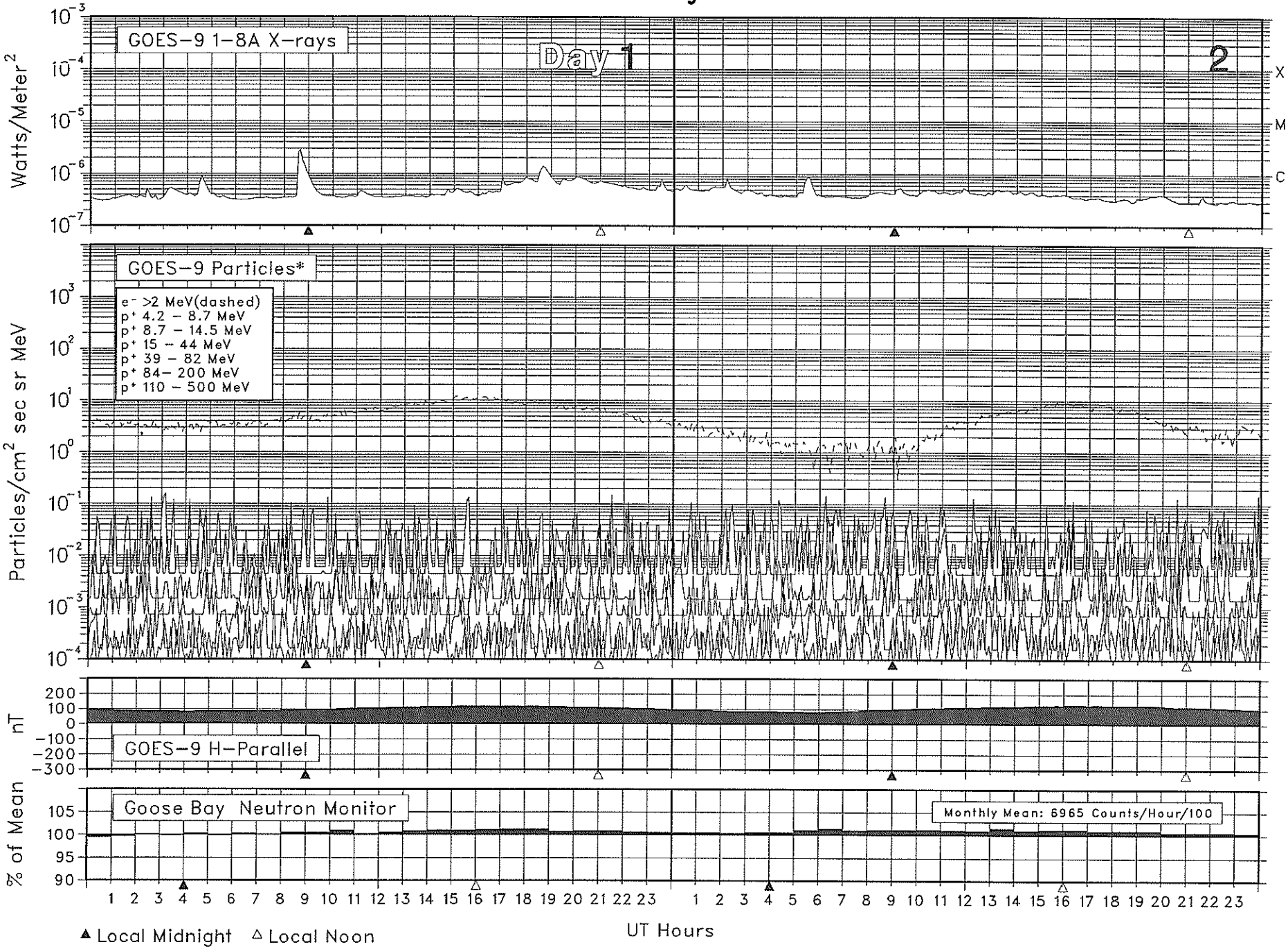

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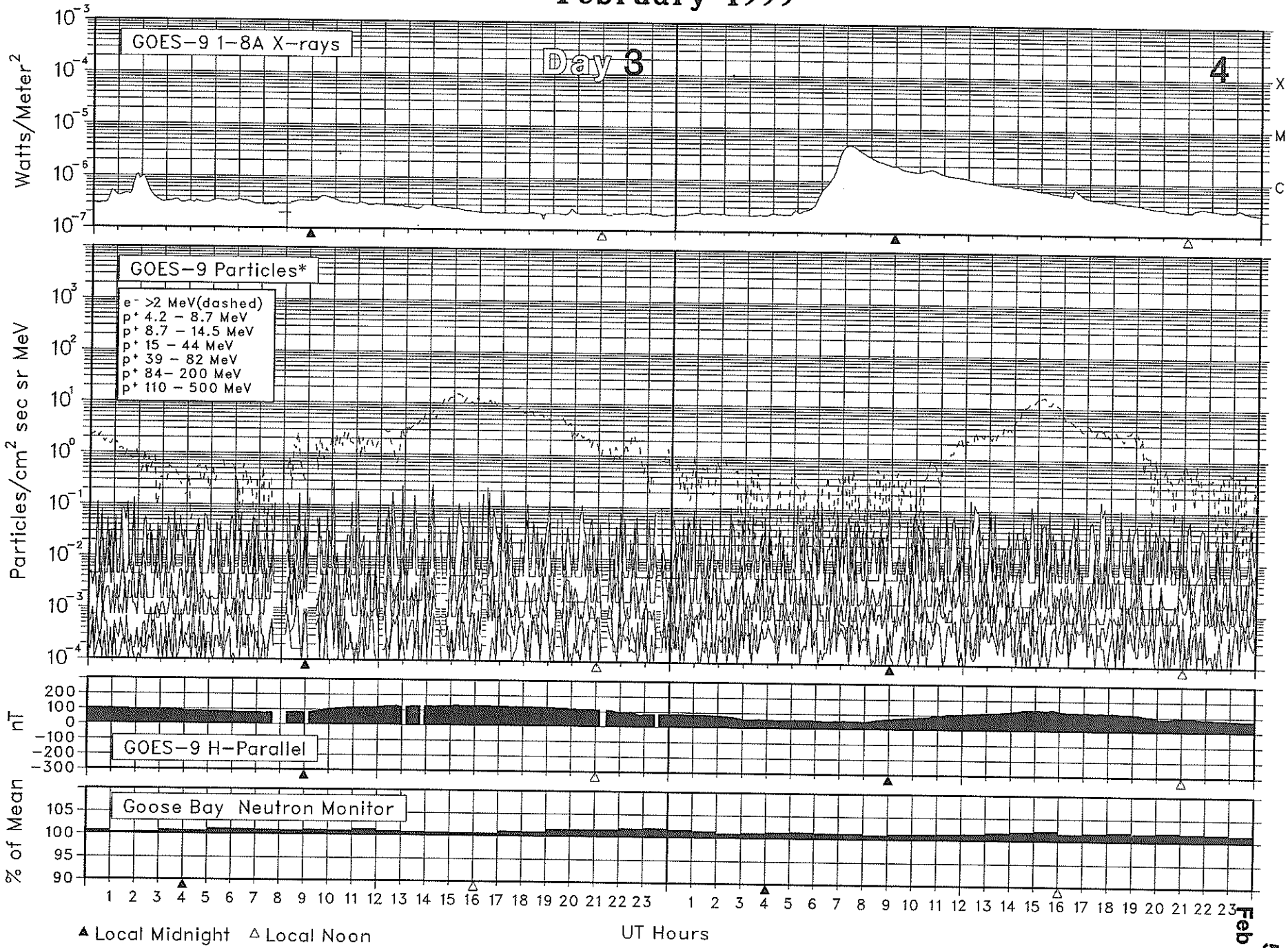

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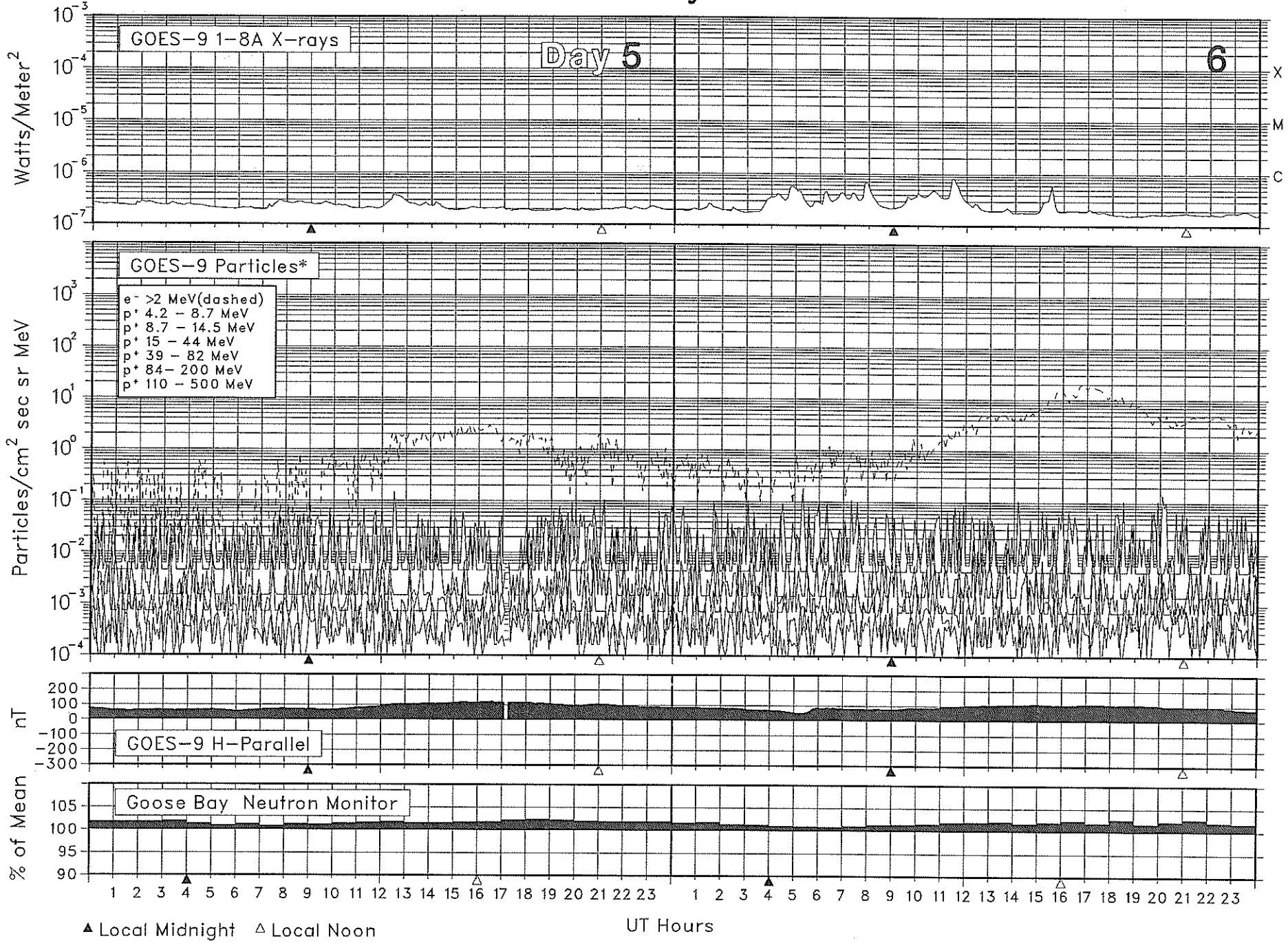

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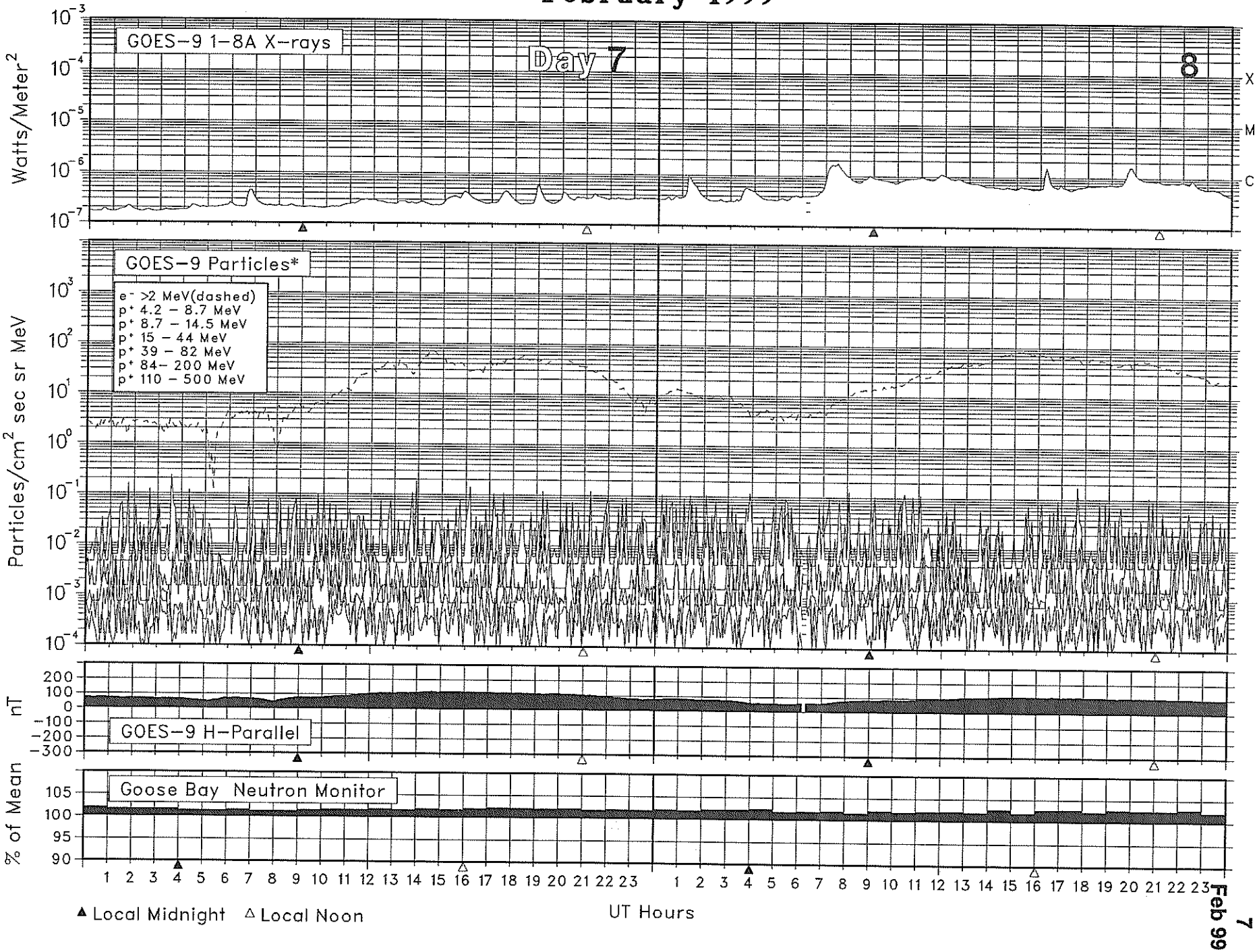

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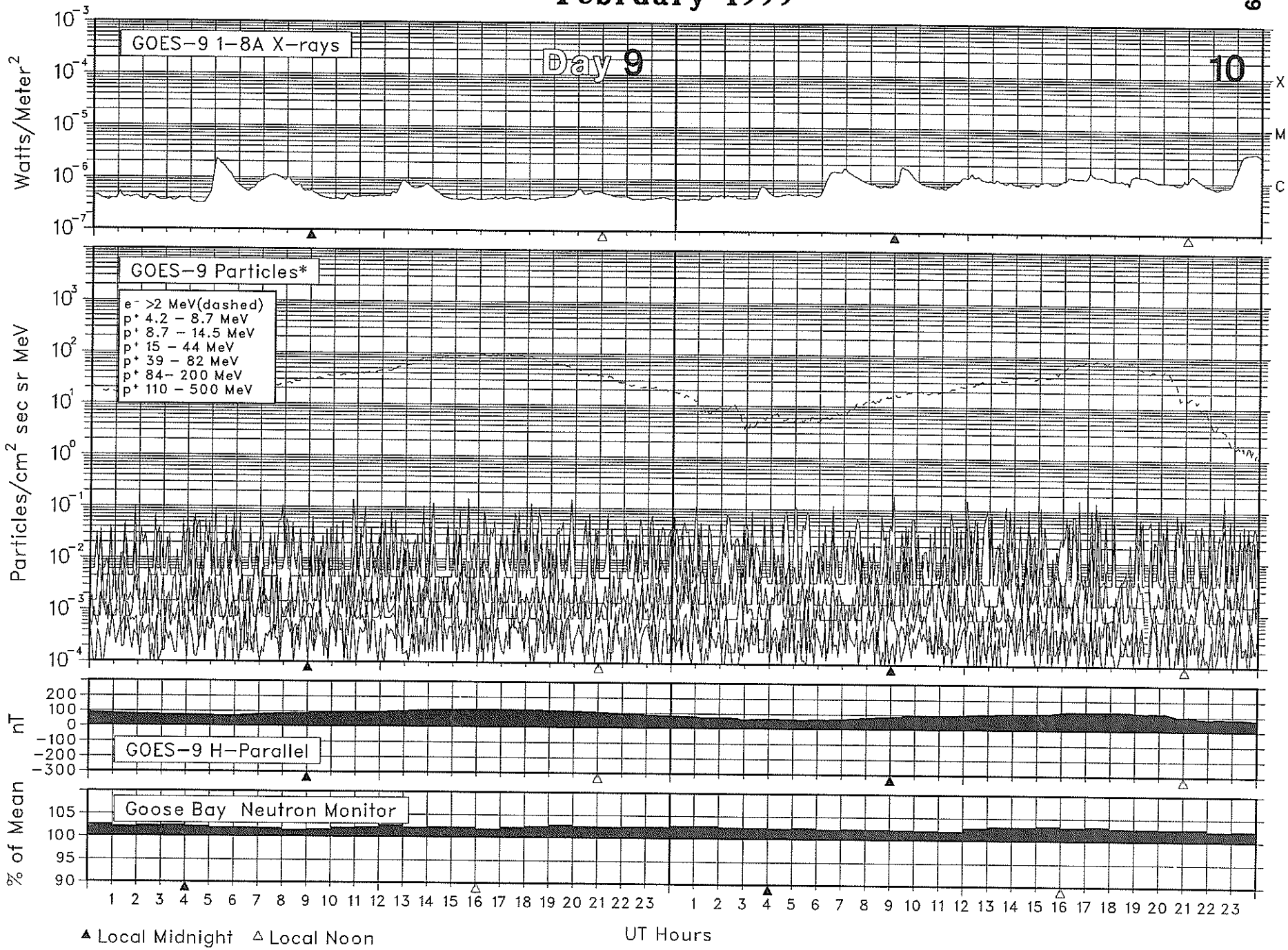

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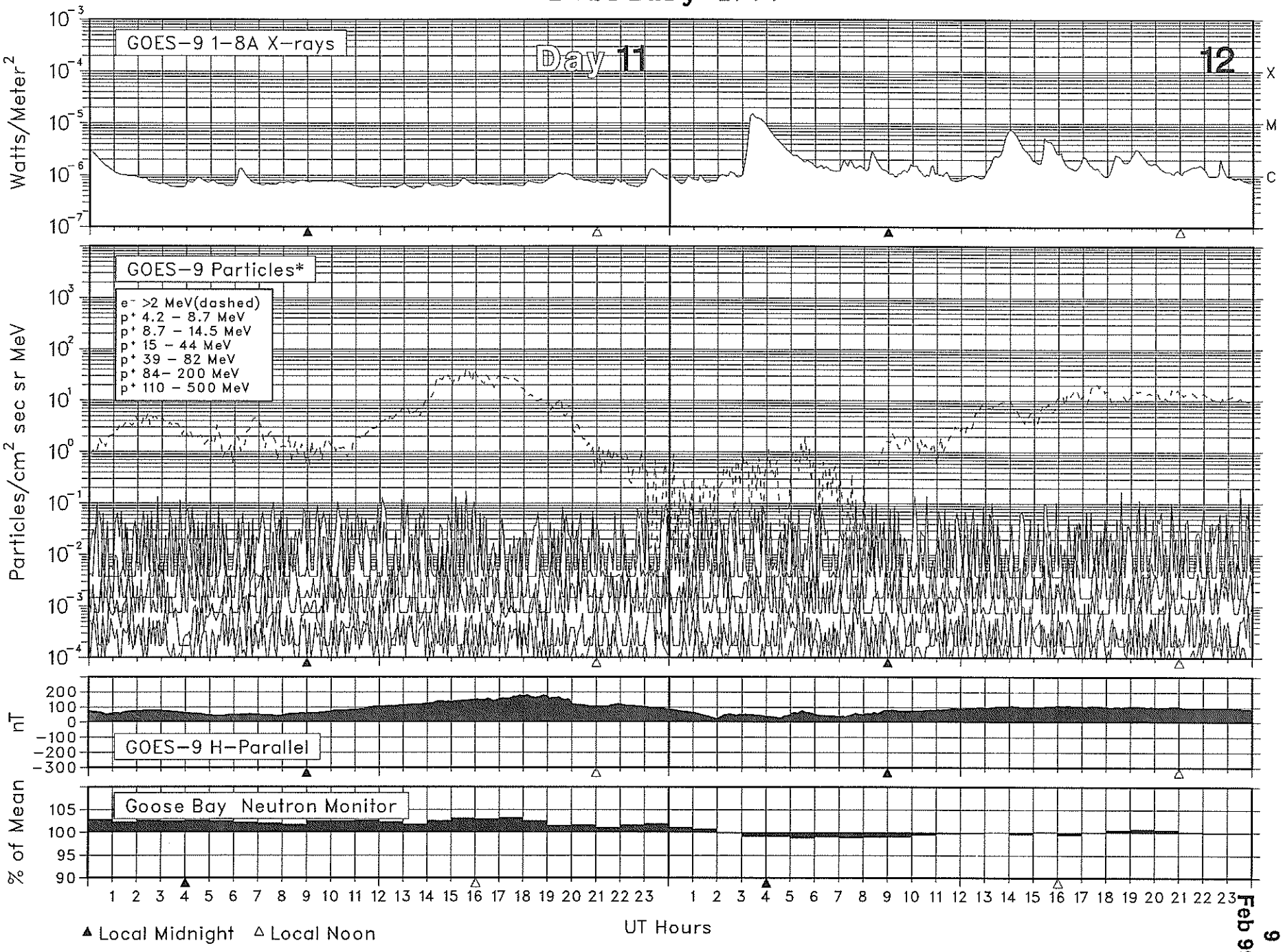

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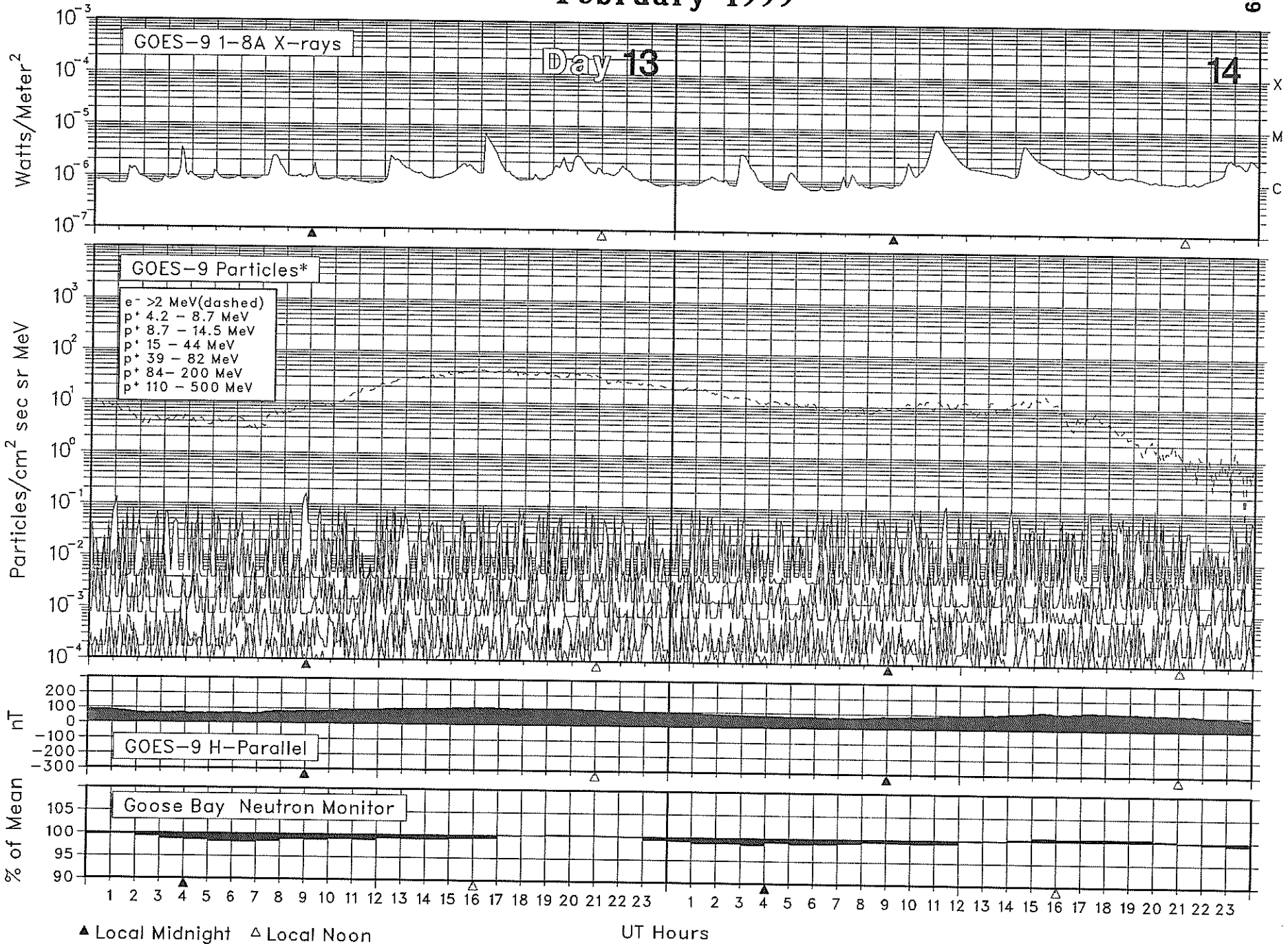

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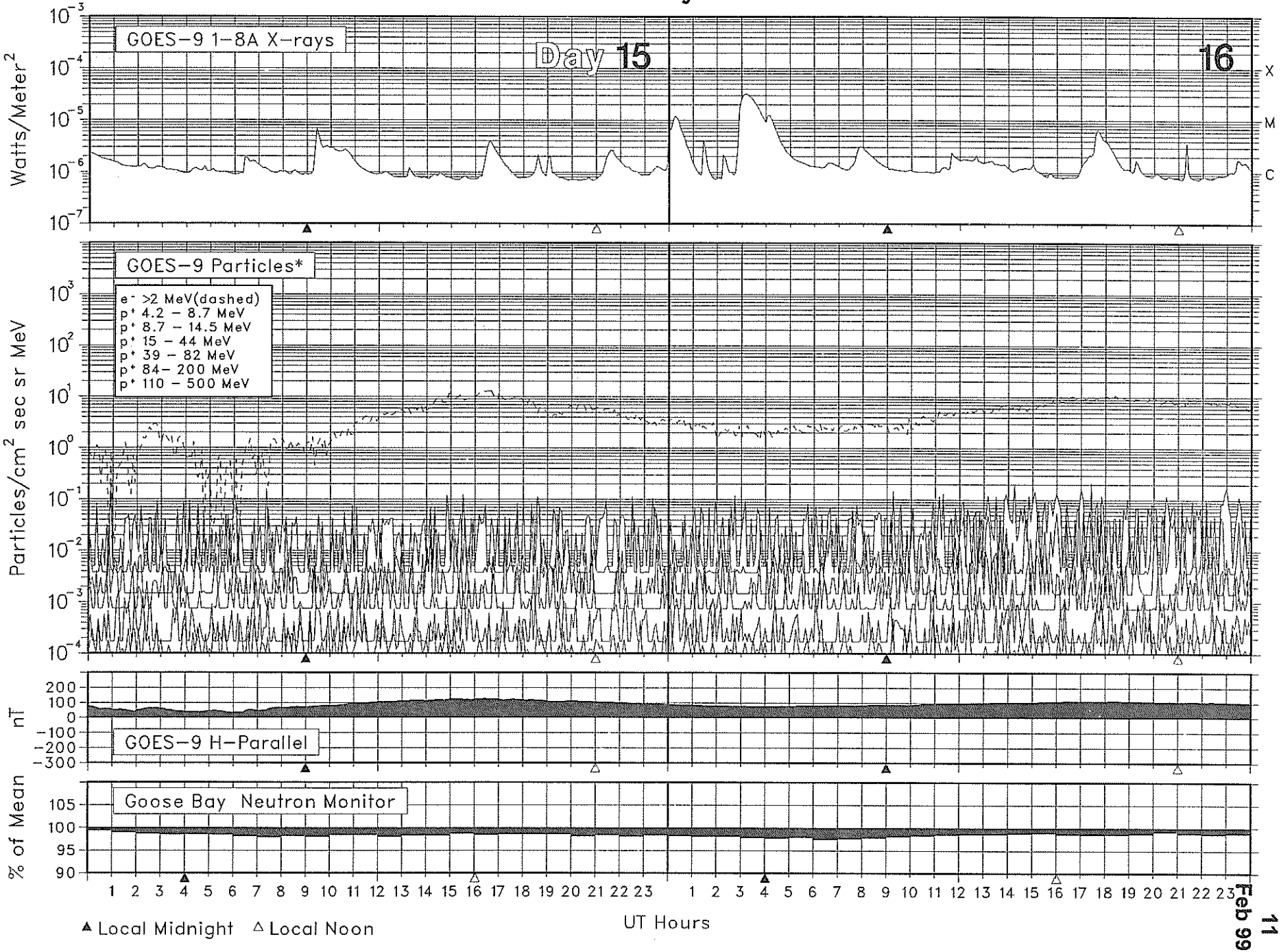

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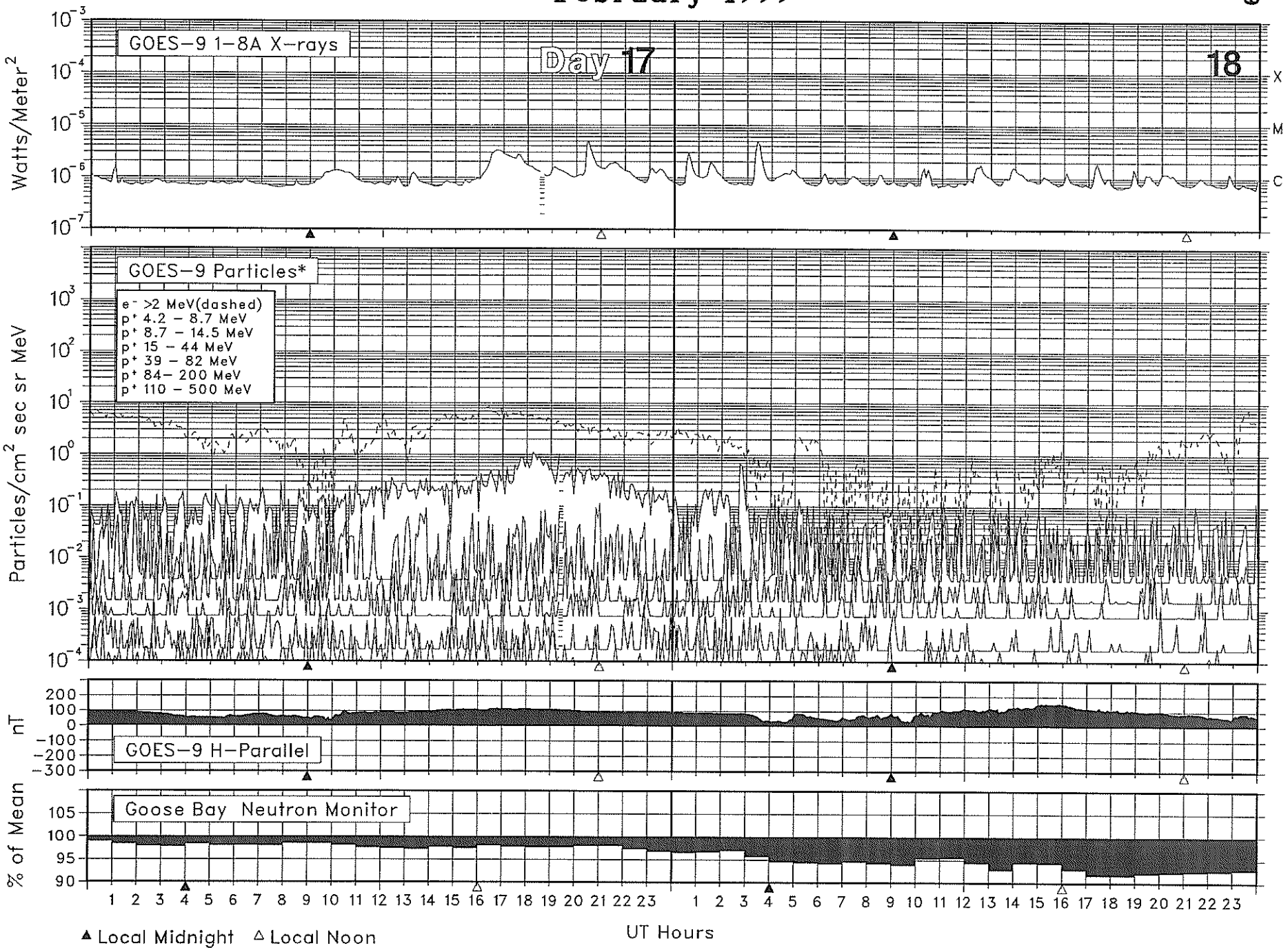

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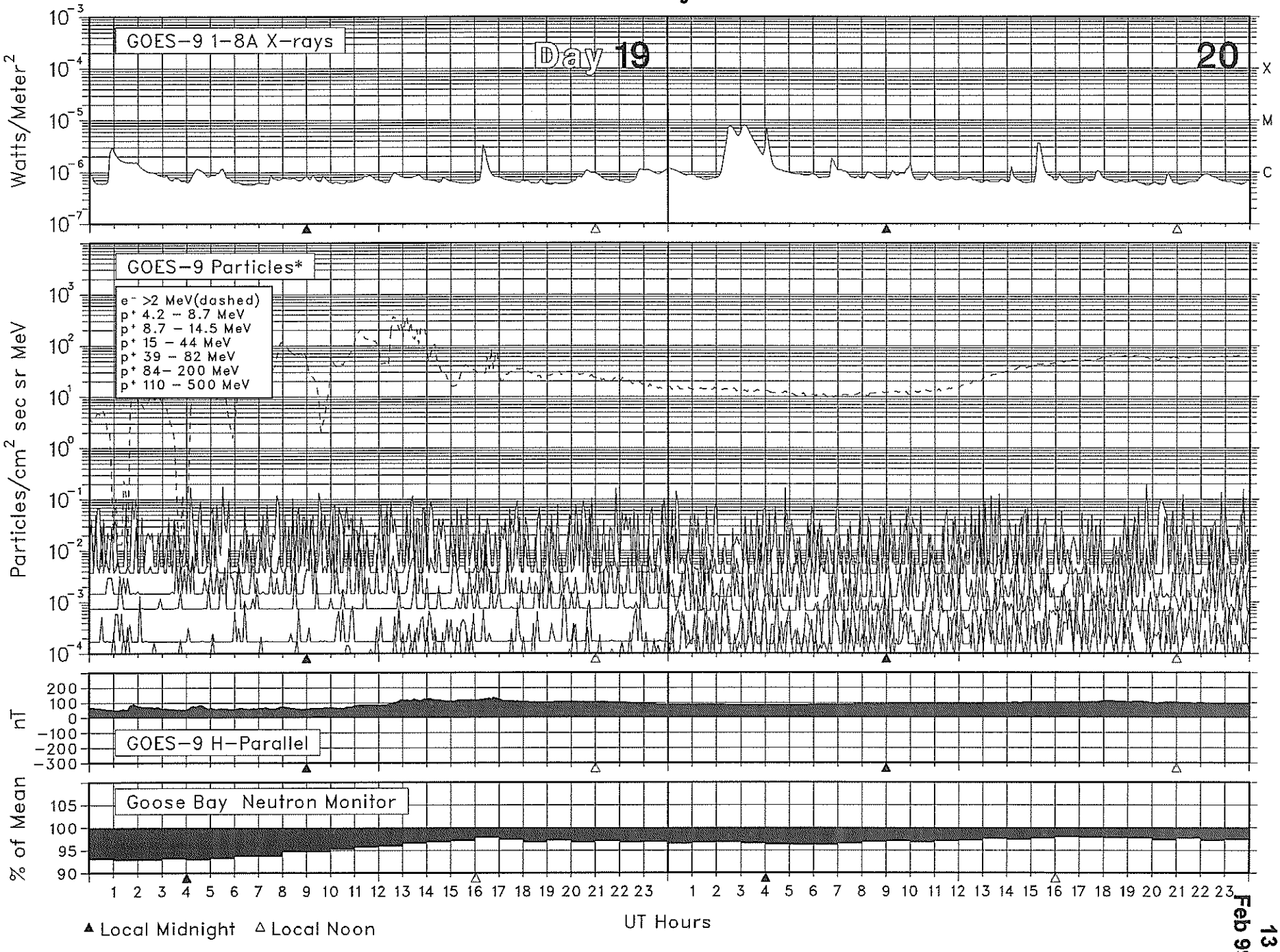

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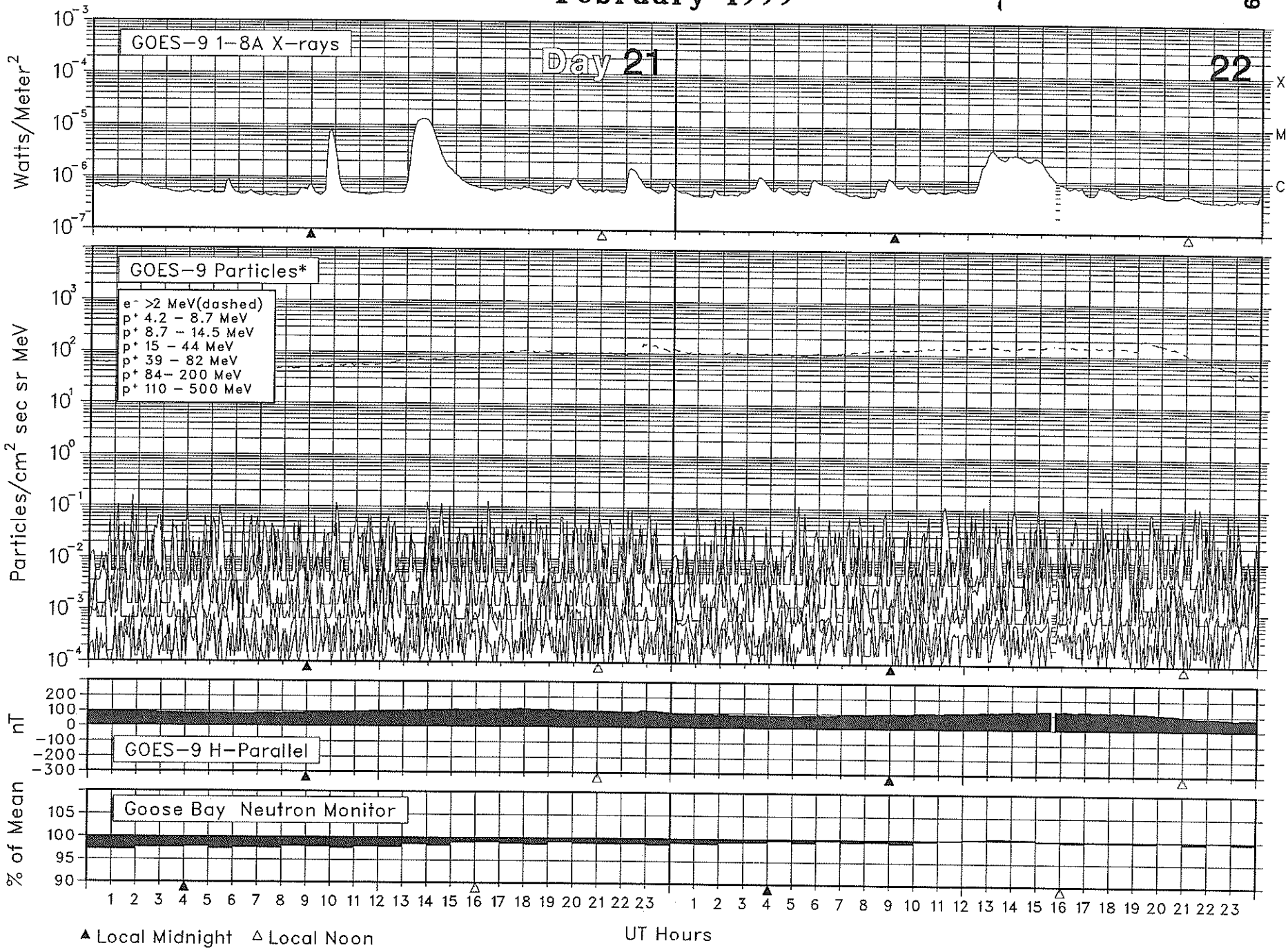

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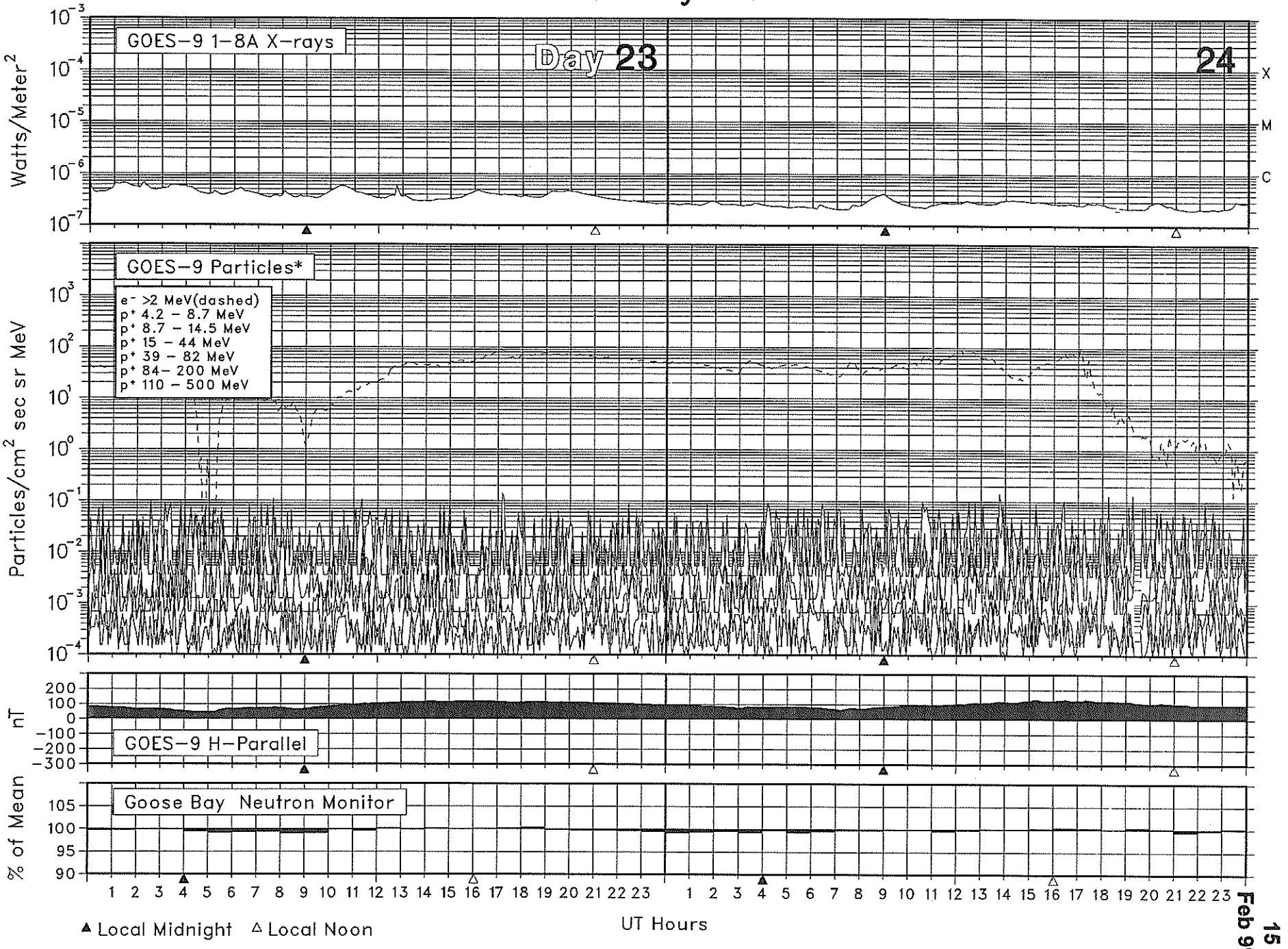

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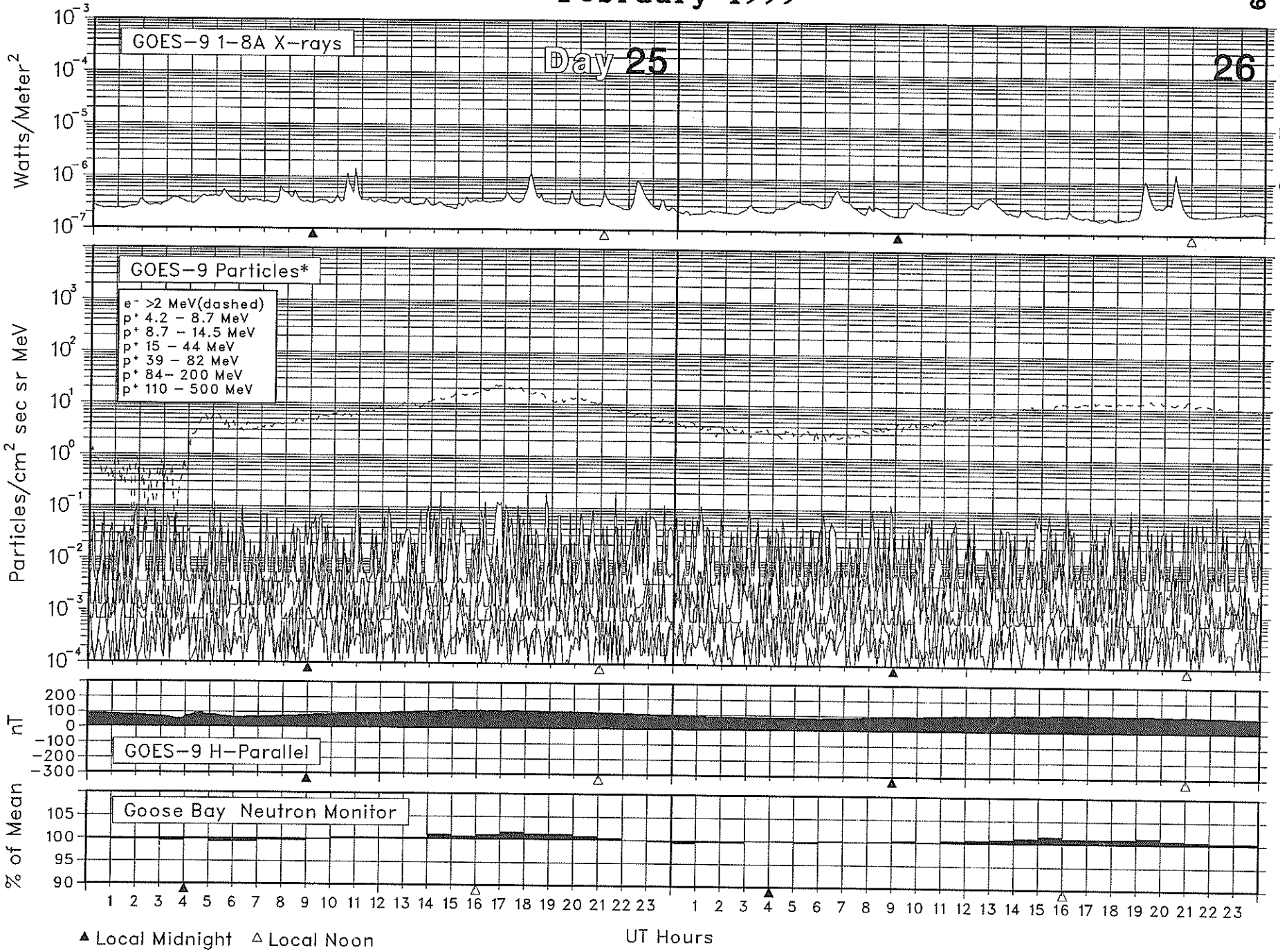

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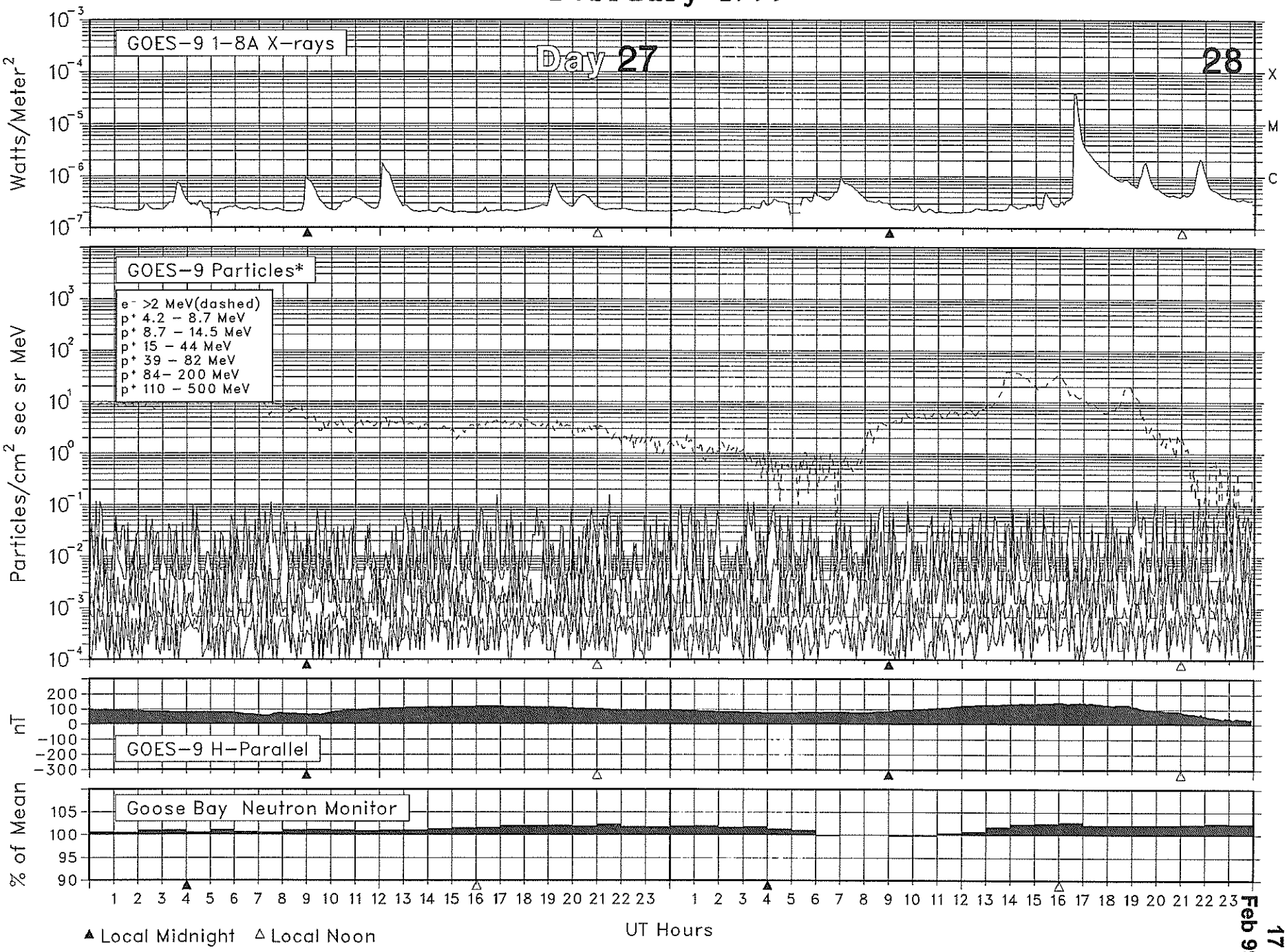

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A L E R T P E R I O D S
The International Space Environment Service

FEBRUARY 1999

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Region Forecast(1)	Geoadvice(1)
						Lat	Long	Optical	M	X			
032	01	31	59	115	3	N17	W72	1	0	0	01	E	SOL: Quiet
						N26	W86	1	0	0	01	Q	MAG: Quiet
						N28	W40	0	0	0	01	Q	PRO: Quiet
						N22	W30	0	0	0	01	Q	
033	02	01	36	118	0	N18	W82	1	0	0	02	E	SOL: Quiet
						N27	W54	0	0	0	02	Q	MAG: Quiet
						N24	W44	0	0	0	02	Q	PRO: Quiet
034	03	02	47	111	0	N22	W60	0	0	0	03	Q	SOL: Quiet
						S26	E44	2	0	0	03	Q	MAG: Quiet
						S22	E16	0	0	0	03	Q	PRO: Quiet
035	04	03	42	109	3	N19	W70	0	0	0	04	Q	SOL: Quiet
						S26	E32	0	0	0	04	Q	MAG: Quiet
						S22	E04	0	0	0	04	Q	PRO: Quiet
036	05	04	20	107	9	S23	E19	0	0	0	05	Q	SOL: Quiet
								0	0	0	05		MAG: Quiet
								0	0	0	05		PRO: Quiet
037	06	05	15	104	8	S26	E04	0	0	0	06	Q	SOL: Quiet
								0	0	0	06		MAG: Active
								0	0	0	06		PRO: Quiet
038	07	06	27	99	13	S26	W10	0	0	0	07	Q	SOL: Quiet
						S19	E33	0	0	0	07	Q	MAG: Active
								0	0	0	07		PRO: Quiet
039	08	07	36	110	12	S26	W21	0	0	0	08	Q	SOL: Quiet
						S18	E19	0	0	0	08	Q	MAG: Quiet
						N23	E65	0	0	0	08	Q	PRO: Quiet
040	09	08	75	125	4	S25	W35	3	0	0	09	Q	SOL: Eruptive
						S18	E05	0	0	0	09	Q	MAG: Quiet
						N23	E55	5	0	0	09	Q	PRO: Quiet
						N18	E73	0	0	0	09	Q	
						S23	E76	0	0	0	09	Q	
						S29	E48	0	0	0	09	Q	
041	10	09	57	129	2	N24	E42	2	0	0	10	Q	SOL: Eruptive
						N18	E61	0	0	0	10	Q	MAG: Quiet
						S22	E65	0	0	0	10	Q	PRO: Quiet
						S30	E39	0	0	0	10	Q	
042	11	10	69	152	5	N23	E30	0	0	0	11	E	SOL: Eruptive
						N17	E48	3	0	0	11	E	MAG: Quiet
						S19	E55	6	0	0	11	E	PRO: Quiet
						S17	E70	0	0	0	11	Q	
043	12	11	84	164	17	N23	E16	2	0	0	12	E	SOL: Eruptive
						N16	E36	0	0	0	12	E	MAG: Quiet
						S22	E42	0	0	0	12	E	PRO: Quiet
						S17	E61	0	0	0	12	Q	
044	13	12	165	188	22	N23	E04	2	0	0	13	E	SOL: Active
						N15	E23	10	1	0	13	E	MAG: Active
						S23	E29	3	0	0	13	E	PRO: Quiet
						S16	E50	0	0	0	13	Q	
						S32	E27	0	0	0	13	Q	
						N20	E34	1	0	0	13	Q	
						S16	E59	0	0	0	13	Q	
						N19	E64	0	0	0	13	Q	
045	14	13	199	198	7	N23	W09	5	0	0	14	Q	SOL: Active
						N15	E10	2	0	0	14	E	MAG: Active
						S22	E16	2	0	0	14	E	PRO: Quiet

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

FEBRUARY 1999

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Region Forecast(1)	Geoadvice(1)
						Lat	Long	Optical	M	X			
						S16	E30	0	0	0	14	Q	
						S31	E10	0	0	0	14	Q	
						N21	E21	11	0	0	14	E	
						S15	E45	0	0	0	14	Q	
						N21	E55	0	0	0	14	Q	
						S33	W60	0	0	0	14	Q	
046	15	14	211	205	7	N23	W22	1	0	0	15	Q	SOL: Active
						N15	W03	2	1	0	15	E	MAG: Quiet
						S22	E03	4	0	0	15	E	PRO: Quiet
						S30	W30	0	0	0	15	Q	
						S17	E17	0	0	0	15	Q	
						N20	E07	3	0	0	15	E	
						S16	E33	0	0	0	15	Q	
						N20	E42	0	0	0	15	Q	
						S32	W76	0	0	0	15	Q	
047	16	15	167	190	12	N22	W37	2	0	0	16	Q	SOL: Active
						N15	W18	8	0	0	16	E	MAG: Quiet
						S22	W09	0	0	0	16	E	PRO: Quiet
						S30	W43	0	0	0	16	Q	
						S17	E04	0	0	0	16	Q	
						N19	W06	3	0	0	16	E	
						S16	E20	0	0	0	16	Q	
						N20	E28	1	0	0	16	Q	
048	17	16	176	192	3	N22	W49	0	0	0	17	Q	SOL: Active
						N14	W30	0	0	0	17	E	MAG: Quiet
						S22	W23	3	1	0	17	E	PRO: Quiet
						S30	W57	0	0	0	17	Q	
						S18	W10	0	0	0	17	Q	
						N18	W20	7	1	0	17	E	
						S17	E06	0	0	0	17	Q	
						N19	E15	0	0	0	17	Q	
						S23	E59	0	0	0	17	Q	
						N16	E65	0	0	0	17	Q	
049	18	17	135	190	15	N15	W42	0	0	0	18	E	SOL: Active
						S23	W36	1	0	0	18	E	MAG: Active
						S30	W69	1	0	0	18	Q	PRO: Quiet
						S17	W22	0	0	0	18	Q	
						N20	W27	8	0	0	18	E	
						S17	W07	0	0	0	18	Q	
						N20	E02	0	0	0	18	Q	
						S24	E44	0	0	0	18	Q	
						N16	E56	0	0	0	18	Q	
050	19	18	135	168	63	N15	W55	1	0	0	19	E	SOL: Active
						S22	W48	3	0	0	19	E	MAG: Active
						S29	W80	4	0	0	19	Q	PRO: Quiet
						S17	W35	0	0	0	19	Q	
						N20	W40	6	0	0	19	E	
						S17	W19	0	0	0	19	Q	
						N18	W11	1	0	0	19	Q	
						S24	E32	0	0	0	19	Q	
						N16	E43	0	0	0	19	Q	
051	20	19	122	164	32	N15	W69	1	0	0	20	Q	SOL: Eruptive
						S23	W61	2	0	0	20	E	MAG: Active
						S28	W94	0	0	0	20	Q	PRO: Quiet
						N20	W50	2	0	0	20	E	
						S18	W33	0	0	0	20	Q	
						N18	W26	1	0	0	20	Q	
						S22	E20	0	0	0	20	Q	
						N16	E29	0	0	0	20	Q	
052	21	20	118	157	4	N15	W82	0	0	0	21	Q	SOL: Eruptive

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

FEBRUARY 1999

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Region Forecast(1)	Geoadvice(1)
						Lat	Long	Optical	M	X			
						S22	W74	2	0	0	21	E	MAG: Quiet
						N21	W65	6	0	0	21	E	PRO: Quiet
						S17	W46	0	0	0	21	Q	
						N18	W40	0	0	0	21	Q	
						S22	E05	0	0	0	21	Q	
						N16	E16	0	0	0	21	Q	
						N35	W66	1	0	0	21	Q	
053	22	21	103	147	3	S23	W86	0	0	0	22	Q	SOL: Eruptive
						N20	W79	3	1	0	22	E	MAG: Quiet
						S17	W62	0	0	0	22	Q	PRO: Quiet
						N18	W53	1	0	0	22	Q	
						S22	W14	0	0	0	22	Q	
						N16	E03	0	0	0	22	Q	
						N35	W75	0	0	0	22	Q	
						N15	W18	0	0	0	22	Q	
054	23	22	108	130	6	N21	W90	1	0	0	23	Q	SOL: Eruptive
						S17	W72	0	0	0	23	Q	MAG: Active
						N18	W65	0	0	0	23	Q	PRO: Quiet
						S21	W25	0	0	0	23	Q	
						N16	W10	0	0	0	23	Q	
						N35	W87	0	0	0	23	Q	
						N15	W32	0	0	0	23	Q	
						S23	E72	0	0	0	23	Q	
055	24	23	38	127	9	N17	W23	0	0	0	24	Q	SOL: Eruptive
						S24	E59	0	0	0	24	Q	MAG: Quiet
						N28	E55	0	0	0	24	Q	PRO: Quiet
056	25	24	56	120	10	N16	W36	2	0	0	25	Q	SOL: Quiet
						S24	E45	0	0	0	25	Q	MAG: Quiet
						N29	E41	0	0	0	25	Q	PRO: Quiet
						N28	E63	0	0	0	25	Q	
057	26	25	66	120	8	N15	W49	0	0	0	26	Q	SOL: Eruptive
						S23	E32	1	0	0	26	Q	MAG: Quiet
						N30	E26	1	0	0	26	Q	PRO: Quiet
						N30	E50	1	0	0	26	Q	
058	27	26	70	116	2	S24	E19	1	0	0	27	Q	SOL: Eruptive
						N28	E15	2	0	0	27	Q	MAG: Quiet
						N29	E40	0	0	0	27	Q	PRO: Quiet
						N18	E10	0	0	0	27	Q	
059	28	27	93	115	4	S23	E04	0	0	0	28	Q	SOL: Quiet
						N29	E01	3	0	0	28	Q	MAG: Quiet
						N30	E27	0	0	0	28	Q	PRO: Quiet
						N18	W04	0	0	0	28	Q	
						S24	W38	0	0	0	28	Q	
						N32	E43	0	0	0	28	Q	

(1) Region Forecast and Flare (SOL) Advice
- Q = Quiet (<50% probability of C-class flares)
- E = Eruptive (C-class flares expected, probability >=50%)
- A = Active (M-class flares expected, probability >=50%)
- M = Major (X-class flares expected, probability >=50%)
- P = Proton (Proton flares expected, probability >=50%)
- W = Warning (activity levels are expected to increase, but no numerical forecast given)
- / = No forecast available

Magnetic (MAG) Geoadvice

'Quiet'		
'Active'	conditions expected	(A>= 20 or K =4)
'Minor'	storm expected	(A>= 30 or K =5)
'Major'	storm expected	(A>= 50 or K>=6)
'Severe'	storm expected	(A>=100 or K>=7)

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

FEBRUARY 1999

'IP'	magstorm in progress	(A>= 30 or K>=4)
'Warning'	(activity levels are expected to increase, but no numerical forecast given)	
'/'	no forecast available	

Proton (PRO) Geoadvice

'Quiet'		
'Proton'	event expected	(10pfu at > 10 MeV)
'Major'	proton event expected	(100pfu at >100 MeV)
'IP'	proton event in progress	(>10 MeV)
'Warning'	(activity levels are expected to increase, but no numerical forecast given)	
'/'	no forecast available	

STRATWARM ALERTS

02/19/99 03:30:00 GEOALERT WWA050 STRATWARM ALERT/THURSDAY/STRATWARM EXISTS.
INTENSIFYING WARMING OVER NORTHEASTERN / EASTERN SIBERIA AND ALEUTIAN AREA CONTINUES. THE WARM AIR SPREADING NORTHWARDS. A SECOND INTENSIFYING WARMING EXISTS OVER BLACK SEA, INFLUENCING THE EUROPEAN PART OF RUSSIA.

02/20/99 03:30:00 GEOALERT WWA051 STRATWARM ALERT/FRIDAY/STRATWARM EXISTS.
AN INTENSIFYING LARGE WARM REGION FURTHER EXISTS FROM ALEUTIAN AREA, NORTHEASTERN SIBERIA WITH THE ADJACENT ARCTIC ACROSS EASTERN SIBERIA / NORTHERN MONGOLIA TO BLACK SEA. THE WARM AIR, WITH THE CENTRE OVER EASTERN SIBERIA, SPREADING NORTHWESTWARDS, TODAY.

02/21/99 03:30:00 GEOALERT WWA052 STRATWARM ALERT/SATURDAY/STRATWARM EXISTS.
INTENSE LARGE WARM REGION EXISTS FROM ALEUTIAN AREA, SIBERIA WITH SIBERIAN ARCTIC TO BLACK SEA. THE WARM AIR OVER SIBERIA IS EXTENDING FURTHER NORTHWARDS.

02/22/99 03:30:00 GEOALERT WWA053 STRATWARM ALERT/SUNDAY/STRATWARM EXISTS.
INTENSE LARGE WARM REGION EXISTS OVER SIBERIA, SIBERIAN ARCTIC, ALASKA, AND CANADIAN ARCTIC. TODAY THE WARM AIR IS SPREADING NORTHEASTWARDS.

02/23/99 03:30:00 GEOALERT WWA054 STRATWARM ALERT/MONDAY/STRATWARM EXISTS.
AN INTENSE LARGE WARM REGION CONTINUES OVER SIBERIA, ALASKA, WESTERN CANADA, AND THE SIBERIAN/CANADIAN ARCTIC. WARM AIR IS SPREADING NORTH AND NORTHEASTWARDS.

02/24/99 03:30:00 GEOALERT WWA055 STRATWARM ALERT/TUESDAY/STRATWARM EXISTS.
A LARGE AND VERY INTENSE WARM REGION EXISTS FROM SOUTHERN EUROPE ACROSS SIBERIA/ALASKA AND THE ADJACENT ARCTIC TO WESTERN CANADA. WARM AIR IS SPREADING NORTH AND NORTHEASTWARDS. COLD AIR OVER THE EUROPEAN ARCTIC IS WEAKENING. TEMPERATURE GRADIENT IS REVERSED BETWEEN 60N AND THE POLE AT 10HPA, TODAY. MEAN ZONAL WIND AT 60N IS WEAKENING IN THE MIDDLE AND UPPER STRATOSPHERE. FINAL WARMING IS IN PROGRESS.

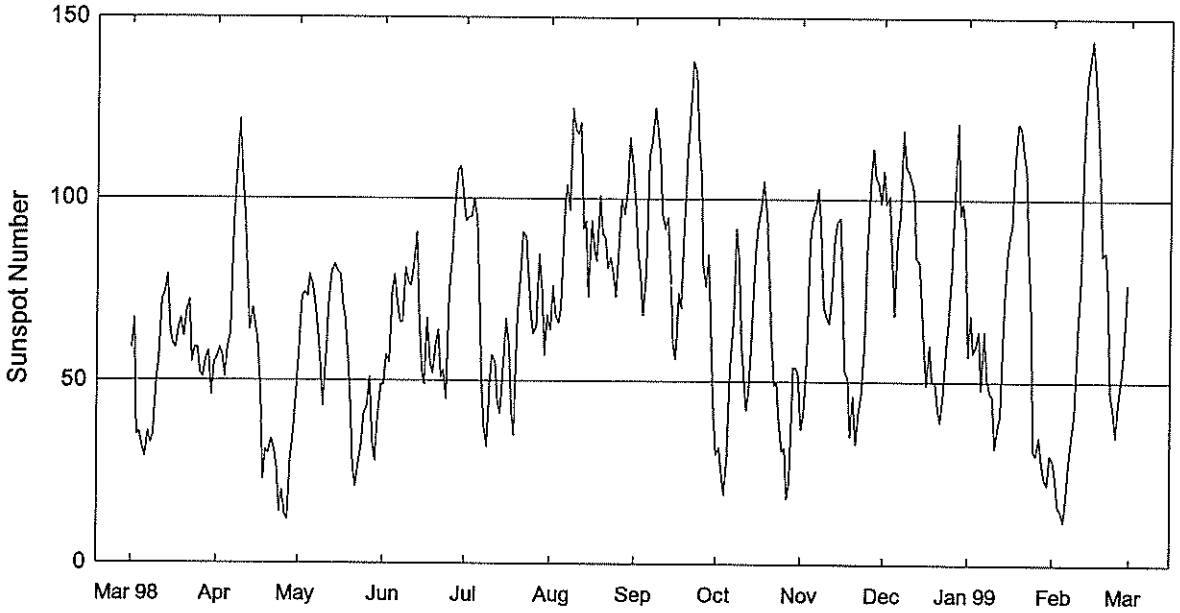
02/25/99 03:30:00 GEOALERT WWA056 STRATWARM ALERT/WEDNESDAY/STRATWARM EXISTS.
AN INTENSE WARMING,CENTERED OVER THE SIBERIAN ARCTIC,COVERS THE WHOLE POLAR REGION,NORTHERN SIBERIA,ALASKA AND WESTERN CANADA AT 10HPA.THE COLD CENTRE SOUTH OF ICELAND WEAKENING. MEAN ZONAL WIND AT 60N WEAKENING IN THE LOWER AND MIDDLE STRATOSPHERE AND REACHED EASTERLY DIRECTION AT 1HPA.TEMPERATURE GRADIENT REVERSED BETWEEN 60N AND THE POLE AT 30HPA AND ABOVE IN THE MIDDLE AND UPPER STRATOSPHERE. FINAL WARMING IN PROGRESS.

02/26/99 03:30:00 GEOALERT WWA057 STRATWARM ALERT/THURSDAY/STRATWARM EXISTS.
AN INTENSE WARMING, CENTERED OVER THE SIBERIAN ARCTIC, COVERS THE WHOLE POLAR REGION, SIBERIA, ALASKA AND WESTERN CANADA AT 10HPA. A LOCAL WARMING EXISTS OVER CENTRAL AND EASTERN EUROPE, SPREADING NORTHEASTWARDS. THE COLD CENTER SOUTH OF ICELAND IS WEAKENING. MEAN ZONAL WIND AT 60N IS WEAKENING IN THE LOWER AND MIDDLE STRATOSPHERE AND REACHED EASTERLY DIRECTION IN THE UPPER STRATOSPHERE. TEMPERATURE GRADIENT REVERSED BETWEEN 60N AND THE POLE AT 50HPA AND ABOVE IN THE MIDDLE AND UPPER STRATOSPHERE. FINAL WARMING IN PROGRESS.

02/27/99 03:30:00 GEOALERT WWA058 STRATWARM ALERT/FRIDAY/STRATWARM EXISTS.
INTENSE WARMING CONTINUES. TEMPERATURE GRADIENT REVERSED BETWEEN 60N AND THE POLE THROUGHOUT THE STRATOSPHERE, AND MEAN ZONAL WIND AT 60N FROM THE EAST IN THE UPPER STRATOSPHERE. FINAL WARMING IN PROGRESS.

02/28/99 03:30:00 GEOALERT WWA059 STRATWARM ALERT/SATURDAY/STRATWARM EXISTS.
FINAL WARMING CONTINUES. TEMPERATURE GRADIENT REVERSED BETWEEN 60N AND THE POLE THROUGHOUT THE STRATOSPHERE, AND MEAN ZONAL WIND AT 60N FROM THE EAST AT 10 HPA AND ABOVE.

International Relative Sunspot Numbers
Mar 1998 - Feb 1999

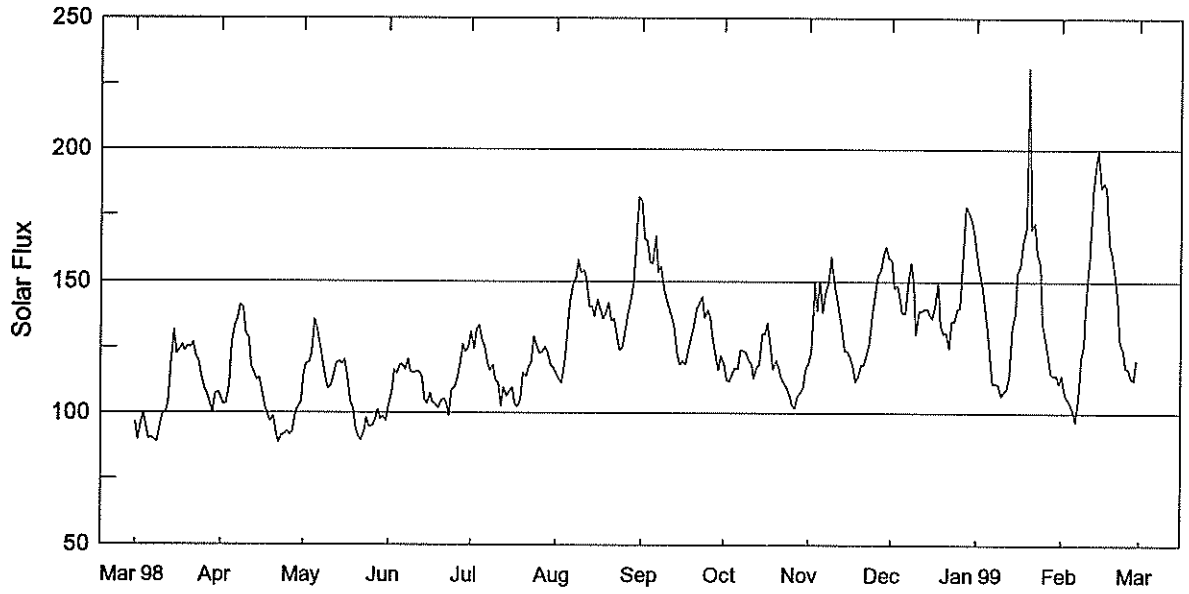


Day	Mar 98	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99*	Feb*
1	59	56	57	49	94	64	100	30	37	108	57	29
2	67	59	73	57	95	76	85	32	41	99	68	25
3	35	57	74	55	95	68	79	25	56	101	58	16
4	36	51	73	74	100	66	68	19	88	86	60	15
5	32	59	79	79	94	70	80	30	95	68	64	12
6	29	63	76	72	74	98	112	54	98	89	48	19
7	36	93	71	66	51	104	116	66	103	95	64	28
8	33	106	63	66	38	97	125	92	92	119	51	36
9	35	122	54	81	32	125	119	84	71	109	47	41
10	50	108	43	77	49	119	112	60	68	108	46	60
11	56	96	58	76	57	118	96	51	66	105	32	78
12	72	80	73	83	55	121	92	42	73	102	38	115
13	74	64	80	91	44	92	95	48	88	84	41	134
14	79	70	82	69	41	94	78	66	94	83	65	138
15	63	65	80	53	55	73	60	84	95	72	83	144
16	60	61	79	49	67	94	56	93	76	60	90	133
17	59	46	71	67	59	87	74	98	53	49	93	122
18	64	23	67	55	42	83	70	105	51	60	111	105
19	67	31	56	52	35	101	93	96	35	50	121	85
20	62	30	43	60	69	91	114	81	46	50	120	86
21	69	34	26	64	78	89	125	63	33	43	114	74
22	72	32	21	51	91	81	138	49	41	39	108	47
23	55	26	28	53	90	84	135	50	47	47	87	42
24	59	14	32	45	79	79	117	39	59	58	68	35
25	59	20	41	75	68	73	105	31	85	66	31	44
26	52	13	43	83	63	87	82	32	106	81	30	51
27	51	12	51	100	65	100	76	18	114	100	35	59
28	56	28	33	108	85	96	85	23	106	121	28	77
29	58	36	28	109	74	102	60	54	105	96	24	
30	46	46	40	101	57	117	41	54	99	99	22	
31	55		49		68	109		52		92	30	
Mean	54.8	53.4	56.3	70.7	66.6	92.2	92.9	55.5	74.0	81.9	62.4	66.1

* = Provisional.

Penticton 2800 MHz (10.7cm) Solar Flux
Mar 98 - Feb 99

Adjusted to 1 AU



Day	Mar 98	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb
1	96.5	105.6	115.1	103.0	131.1	115.4	180.2	119.1	119.5	158.2	161.6	114.5
2	89.9*	103.4	118.8	107.7	124.4	112.9	166.3	112.9	124.1	147.4	154.8	107.7
3	95.0	103.6	119.3	116.4	131.9	111.7	165.5	112.0	149.3	148.7	149.4	105.8
4	100.0	110.2	123.2	115.0	133.5	119.2	157.3	114.9	139.0	144.0	142.0	104.3
5	95.1	126.4	135.7	118.4	127.6	130.5	156.8	117.1	150.1	138.3	132.0	100.9
6	90.3	133.7	132.4	118.5	125.2	142.2	167.1	116.9	138.4	138.1	121.6	96.6
7	90.5	135.5	125.6	116.4	118.5	149.1	153.5	124.1	145.8	148.7	111.3	106.5
8	89.9	141.0	120.2	120.5	116.2	150.9	155.8	123.8	149.9	157.1	111.7	121.1
9	88.7	140.2	112.8	115.7	118.2	158.3	147.4	123.2	159.3	149.3	111.0	125.9
10	95.0	130.2	109.3	115.3	112.9	153.3	143.6	120.3	150.8	129.8	106.7	148.4
11	99.4	128.8	110.2	115.8	111.3	154.1	140.4	118.5	144.1	138.8	108.2	159.3
12	100.3	117.6	114.4	115.7	102.6	150.9	136.6	113.4	138.7	138.9	109.1	183.6
13	103.7	115.5	119.1	113.9	109.7	140.4	132.3	117.5	132.6	139.7	114.7	193.4
14	118.2	112.6	119.8	105.1	106.3	140.6	123.3	118.4	123.8	139.9	132.4	199.6
15	131.6	113.5	118.6	103.6	108.2	136.8	118.6	130.4	123.7	137.2	138.0	185.5
16	122.6	107.2	120.4	107.3	109.7	143.3	119.9	130.1	121.8	136.1	153.4	187.3
17	124.3	102.1	113.0	103.9	103.6	139.7	118.6	134.4	118.0	141.5	156.2	185.3
18	125.9	99.4	104.6	103.3	102.4	135.8	123.7	125.0	112.2	149.8	165.4	164.2
19	123.5	96.7	101.5	101.8	105.2	137.9	128.0	116.8	113.7	133.6	170.3	160.5
20	125.5	98.7	94.1	104.4	115.4	141.9	133.3	120.2	118.6	130.4	231.3	153.6
21	124.9	92.9	91.2	105.4	113.9	135.2	139.4	117.2	118.3	130.9	169.7	144.0
22	126.8	88.5	89.6	103.8	117.8	135.9	142.1	113.8	123.0	124.6	172.3	127.0
23	121.3	91.3	92.6	98.9	119.1	129.3	144.1	111.4	126.7	135.2	160.8	124.3
24	119.9	91.7	98.0	108.8	129.2	123.9	136.2	109.6	136.7	134.9	156.8	117.3
25	114.4	93.0	94.7	109.7	125.5	124.8	139.2	106.3	145.6	139.6	133.9	117.1
26	109.5	91.8	94.9	112.8	122.8	129.6	136.2	102.8	152.3	140.2	129.1	113.4
27	107.7	92.6	96.6	119.1	123.2	137.8	128.0	101.8	154.7	161.4	121.6	112.9
28	103.6	99.8	101.1	126.1	125.1	142.0	123.0	106.4	160.4	178.3	115.2	120.7
29	100.0	102.0	97.6	123.3	123.1	149.4	116.3	108.0	163.2	176.8	114.2	
30	107.2	104.1	98.8	125.0	118.3	166.4	121.8	109.9	158.9	173.1	114.5	
31	107.9		96.8		117.2	181.8		117.0		168.8	111.5	
Mean	108.0	109.0	109.0	111.8	117.7	139.4	139.8	116.6	137.1	145.5	138.1	138.6

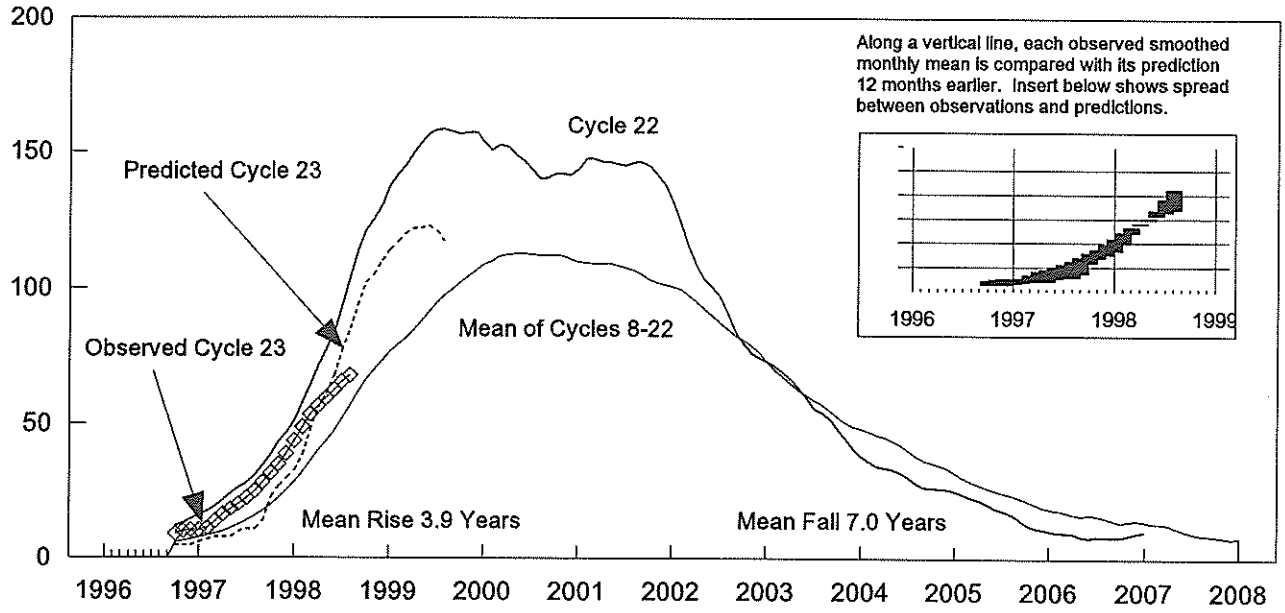
NOTE: *=1700UT reading, snow on antenna at 2000UT.

DAILY SOLAR INDICES
February 1999

Day	Day of Year	Bartels Cycle Day	Sunspot Numbers Int	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	32	24	29	32	118.0	--	305	153	114.5	99	87	67	46	19
2	33	25	25	23	110.9	--	312	146	107.7	106	84	67	46	19
3	34	26	16	21	108.8	545	298	143	105.8	101	80	65	45	19
4	35	27	15	19	107.3	554	317	142	104.3	99	79	64	45	19
5	36	1	12	14	103.7	530	299	137	100.9	96	77	61	45	21
6	37	2	19	20	99.3	522	305	133	96.6	88	67	59	45	19
7	38	3	28	28	109.5	540	289	131	106.5	86	71	57	41	20
8	39	4	36	49	124.5	556	300	146	121.1	98	74	60	44	30
9	40	5	41	45	129.3	555	299	154	125.9	104	77	66	58	50
10	41	6	60	66	152.4	565	--	162	148.4	96	83	66	53	27
11	42	7	78	80	163.5	568	306	184	159.3	134	102	71	53	32
12	43	8	115	114	188.4	595	307	192	183.6	139	95	90	88	152
13	44	9	134	130	198.4	584	349	201	193.4	131	98	76	63	72
14	45	10	138	144	204.6	574	324	200	199.6	--	--	79	62	43
15	46	11	144	133	190.1	591	243	199	185.5	138	124	85	63	--
16	47	12	133	137	191.8	590	275	210	187.3	157	132	122	101	139
17	48	13	122	127	189.8	--	--	--	185.3	--	--	--	--	--
18	49	14	105	100	168.1	551	260	177	164.2	136	117	92	73	150
19	50	15	85	87	164.2	588	315	195	160.5	162	122	84	55	33
20	51	16	86	82	157.1	602	323	200	153.6	165	123	78	56	66
21	52	17	74	78	147.2	599	304	179	144.0	144	112	76	54	23
22	53	18	47	48	129.7	540	299	172	127.0	138	106	75	65	29
23	54	19	42	38	127.0	556	249	149	124.3	123	98	70	49	19
24	55	20	35	38	119.8	592	263	151	117.3	116	97	71	51	25
25	56	21	44	45	119.5	590	262	148	117.1	114	92	66	43	19
26	57	22	51	45	115.6	559	251	142	113.4	109	88	62	40	16
27	58	23	59	58	115.1	578	233	137	112.9	109	86	61	42	18
28	59	24	77	73	123.0	569	273	147	120.7	111	86	62	43	18
MEAN			66.1	67.0	142.0	567	290	164	138.6	119	94	72	54	42

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	63	65	68	74	79	84	88	65
									(2)	(5)	(8)	(11)	(2)
1999	92	95	99	104	108	112	115	117	120	123	125	127	111
	(13)	(14)	(14)	(13)	(13)	(15)	(19)	(24)	(27)	(31)	(33)	(35)	(21)
2000	128	129	130	130	129	129	128	128	128	127	125	124	128
	(38)	(40)	(42)	(43)	(43)	(42)	(41)	(41)	(41)	(41)	(42)	(42)	(41)

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

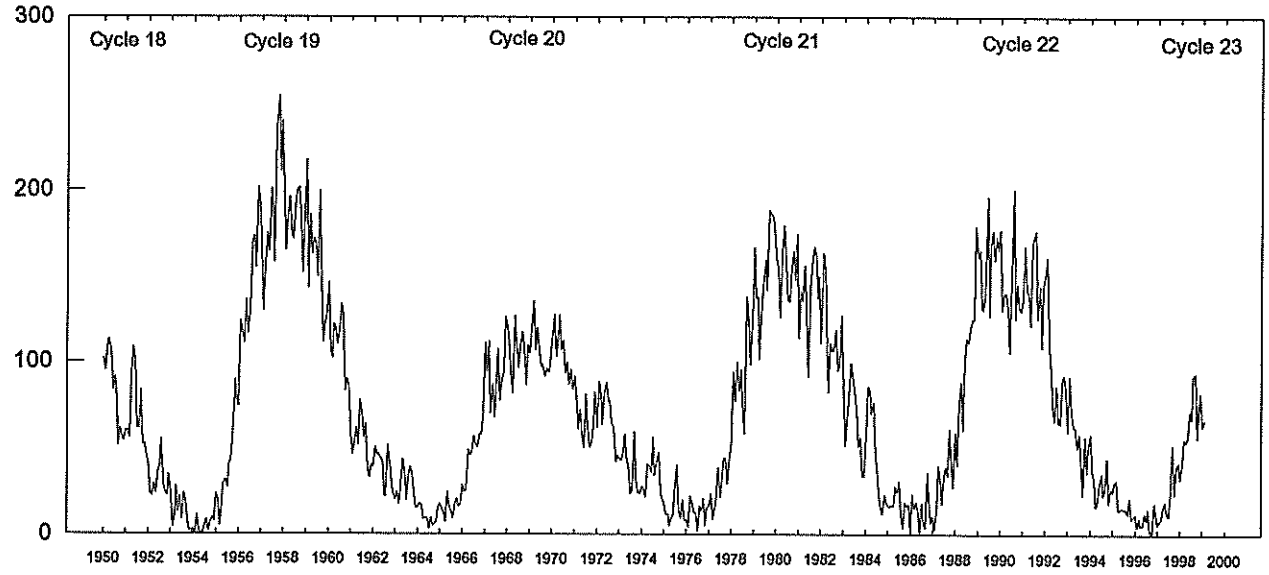
*** May 1996 marks Cycle 22's mathematical minimum. ** October 1996 marks the consensus minimum NGDC is now using.**

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 Dec 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 August 1999 prediction. There exists a 90% chance that in August 1999, the actual smoothed number will fall somewhere between 93 and 141.

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 - Feb 1999



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	66.6	92.2	92.9	55.5	74.0	81.9	64.2	
1999	62.4	66.1											64.3	

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

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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	01	0218	0222	0226						8		B 5.7						2.3E-04
GOES		0429	0436	0446						17		B 9.0						7.7E-04
GOES		0832	0839	0844	N18	W76	8446			12	SF	C 3.8						1.7E-03
LEAR		0836	0837	0843	N18	W76	8446	01	26.7	7	SF		3	E		68		
GOES		1657	1701	1706						9		B 9.4						4.1E-04
GOES		2328	2331	2335						7		B 8.5						3.1E-04
GOES	02	0208	0212	0215						7		B 9.8						3.3E-04
GOES		0506	0509	0511						5		B 5.5						1.5E-04
GOES		0516	0531	0540						24		B 9.2						1.1E-03
RAMY		1855	1855	1859	S26	E47	8453	02	6.4	4	SF		3	E		22		
GOES		2130	2134	2138	S25	E46	8453			8	SF	B 4.3						1.8E-04
HOLL		2134	2135	2142	S25	E46	8453	02	6.5	8	SF		3	E		17		
GOES	03	0139	0152	0159						20		C 1.1						1.1E-03
GOES	04	0624	0706	0758						94		C 5.1						1.9E-02
GOES		1620	1623	1627						7		B 9.6						3.3E-04
GOES	06	0609	0614	0621						12		B 5.3						3.2E-04
GOES		0746	0755	0805						19		B 6.9						6.7E-04
GOES		1120	1127	1138						18		B 8.6						7.8E-04
GOES		1527	1531	1534						7		B 6.8						2.3E-04
GOES	07	0637	0649	0659						22		B 4.7						5.0E-04
GOES		1851	1859	1905	N21	E18				14	SF	B 6.6						4.5E-04
RAMY		1852	1858	1923	N21	E18		02	9.2	31	SF		3	E		70		
HOLL		1853	1900	1912	N22	E18		02	9.2	19	SF		3	E		52		F
HOLL		2220	2221	2227	N22	E75		02	13.7	7	SF		3	E		18		
GOES	08	0111	0117	0126	S27	W19				15	SF	C 1.0						7.3E-04
LEAR		0116	0117	0127	S27	W19	8453	02	6.6	11	SF		3	E		36		
GOES		0655	0731	0804						69		C 1.8						5.3E-03
LEAR		0731	0731	0734	S28	W23	8453	02	6.5	3	SF		3	E		15		E
GOES		0846	0851	0916						30		C 1.0						1.7E-03
SVTO		1101	1109	1114	N22	E65	8456	02	13.4	13	SF		3	E		16		
SVTO		1139	1151	1203	S30	W22	8453	02	6.7	24	SF		3	E		33		F
HOLL		1555	1612	1644	N23	E63	8456	02	13.5	49	SF		3	E		26		
RAMY		1603	1612	1638	N22	E60	8456	02	13.3	35	SF		3	E		21		
GOES		1609	1616	1621	N22	E60	8456			12	SF	C 1.6						9.0E-04
RAMY		1650	1653	1658	N22	E59	8456	02	13.2	8	SF		3	E		16		
HOLL		1650	1653	1712	N23	E62	8456	02	13.5	22	SF		3	E		26		
GOES		1928	1949	2000	N22	E58	8456			32	SF	C 1.6						2.4E-03
HOLL		1941	1947U	2005	N23	E61	8456	02	13.5	24	SF		2	E		11		
RAMY		1950	1952	2007	N22	E58	8456	02	13.3	17	SF		3	E		12		
RAMY		2108	2118	2121D	N22	E55	8456	02	13.1	13D	SF		3	E		10		
HOLL	09	0012	0013	0030D	N23	E56	8456	02	13.3	18D	SF		3	E		16		
GOES		0454	0508	0531	S29	W36	8453			37	SF	C 2.3						3.8E-03
LEAR		0456	0506	0524	S29	W36	8453	02	6.4	28	SF		3	E		67		
GOES		0640	0728	0800						80		C 1.1						4.6E-03
GOES		0801	0805	0809						8		C 1.0						4.9E-04
RAMY		1647	1653	1701	N22	E47	8456	02	13.3	14	SF		3	E		16		
HOLL		1653	1653	1658	N23	E49	8456	02	13.5	5	SF		3	E		10		
GOES	10	0325	0339	0347						22		B 7.6						9.2E-04
GOES		0557	0658	0726	S27	E63	8458			89	SF	C 1.7						6.8E-03
LEAR		0607	0616	0653	S27	E63	8458	02	15.2	46	SF		3	E		42		
GOES		0913	0919	0939						26		C 1.9						2.6E-03
RAMY		1337	1343	1400	S26	E58	8458	02	15.1	23	SF		3	E		14		
RAMY		1345	1347	1357	N13	E54	8457	02	14.6	12	SF		3	E		28		
HOLL		1520	1524	1536	N12	E56	8457	02	14.8	16	SF		3	E		14		
RAMY		1524	1524	1532	S22	E56	8458	02	14.9	8	SF		3	E		26		
RAMY		1541	1551	1607	S22	E56	8458	02	14.9	26	SF		3	E		24		
RAMY		1613	1613	1638	S29	E62	8458	02	15.5	25	SF		3	E		59		
HOLL		1625	1625	1631	S30	E63	8458	02	15.6	6	SF		3	E		17		
HOLL		1657	1700	1712	S26	W57	8453	02	6.3	15	SF		3	E		53		F
HOLL		1659	1700	1703	N13	E54	8457	02	14.8	4	SF		3	E		17		

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	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
RAMY	10	1806	1806	1812	S34	E58	8458	02	15.4	6	SF		3	E		11		
RAMY		1858	1916	1943	S34	E53	8458	02	15.0	45	SF		3	E		15		
GOES		2241	2346	2420						99		C 3.7						1.6E-02
GOES	11	0604	0615	0626	N20	E25	8456			22	SF	C 1.4						1.5E-03
LEAR		0610	0614	0636	N20	E25	8456	02	13.2	26	SF		4	E		29		
RAMY		1514	1532	1557	N18	E21	8456	02	13.2	43	SF		3	E		16		
HOLL		1514	1536	1547	N19	E20	8456	02	13.2	33	SF		3	E		14		
GOES		2303	2315	2333						30		C 1.3						2.1E-03
GOES	12	0304	0325	0406	N18	E36				62	1N	M 1.5						3.8E-02
LEAR		0305	0324	0501	N18	E36	8457	02	14.9	116	1N		3	E		205		F
GOES		0723	0726	0732						9		C 2.1						1.0E-03
GOES		0816	0821	0828						12		C 3.0						1.9E-03
GOES		0952	0956	1013						21		C 1.7						1.9E-03
GOES		1044	1049	1053						9		C 2.0						8.5E-04
RAMY		1217	1223	1232	N13	E28	8457	02	14.6	15	SF		3	E		13		
RAMY		1242	1244	1251	N17	E40		02	15.6	9	SF		3	E		17		
RAMY		1302	1303	1311	S26	E38	8458	02	15.5	9	SF		3	E		17		
RAMY		1320	1404	1543	S27	E30	8458	02	14.9	143	1N		3	E		149		
RAMY		1323	1323	1347	S31	E30		02	14.9	24	SF		3	E		11		
RAMY		1326	1326	1339	N12	E28	8457	02	14.7	13	SF		3	E		16		
RAMY		1340	1343	1348	N15	E33	8457	02	15.1	8	SF		3	E		12		
GOES		1340	1407	1422	N15	E33	8457			42	SF	C 7.7						1.5E-02
HOLL		1423	1437	1518	S27	E29	8458	02	14.8	55	SF		2	E		66		
GOES		1520	1527	1548	N12	E27	8456			28	SF	C 5.7						7.4E-03
HOLL		1522	1524	1619	N12	E27	8457	02	14.7	57	SF		3	E		95		
RAMY		1543	1543	1553	N21	E09	8456	02	13.3	10	SF		3	E		10		
HOLL		1647	1701	1712	N16	E27	8457	02	14.7	25	SF		3	E		37		
HOLL		1656	1657	1702	N22	E05	8456	02	13.1	6	SF		3	E		22		
GOES		1656	1703	1710	N22	E05	8456			14	SF	C 2.4						1.8E-03
HOLL		1737	1738	1744	N17	E28	8457	02	14.9	7	SF		3	E		17		
GOES		1815	1824	1838			8457			23		C 2.5						3.1E-03
HOLL		1816	1819	1851	N16	E25	8457	02	14.6	35	SF		3	E		53		
RAMY		1817	1818	1835D	N15	E28	8457	02	14.9	18D	SF		3	E		20		
HOLL		1857	1912	1931	N17	E27	8457	02	14.8	34	SF		3	E		21		
GOES		1859	1914	1924	N17	E27	8457			25	SF	C 3.2						4.2E-03
RAMY		1910	1913	1924	N16	E28	8457	02	14.9	14	SF		3	E		14		
GOES		2237	2241	2246	N19	E35	8462			9	SF	C 2.3						9.6E-04
HOLL		2239	2241	2247	N19	E35	8462	02	15.6	8	SF		3	E		65		
GOES	13	0122	0127	0146						24		C 1.5						1.9E-03
GOES		0331	0339	0342	N22	W02	8456			11	SF	C 4.5						1.9E-03
LEAR		0334	0345	0351	N22	W02	8456	02	13.0	17	SF		4	E		15		F
GOES		0454	0458	0501						7		C 1.5						5.2E-04
GOES		0714	0729	0740						26		C 2.6						3.4E-03
GOES		0904	0907	0909	N21	W04	8456			5	SF	C 2.4						5.4E-04
LEAR		0906	0907	0913	N21	W04	8456	02	13.1	7	SF		2	E		31		
GOES		1210	1216	1242	N19	E27	8462			32	SF	C 2.6						4.1E-03
RAMY		1214	1215	1258	N19	E27	8462	02	15.6	44	SF		3	E		34		
RAMY		1301	1301	1308	N20	E29	8462	02	15.8	7	SF		3	E		11		
RAMY		1327	1331	1336	N20	E28	8462	02	15.7	9	SF		3	E		19		
RAMY		1408	1409	1427	N20	E27	8462	02	15.6	19	SF		3	E		10		
RAMY		1501	1521	1557	S26	E16	8458	02	14.9	56	SF		3	E		26		
HOLL		1507	1536	1606	S27	E15	8458	02	14.8	59	SF		3	E		53		
RAMY		1517	1521	1527	N21	W08	8456	02	13.0	10	SF		3	E		21		
HOLL		1519	1521	1525	N21	W07	8456	02	13.1	6	SF		3	E		15		
GOES		1607	1611	1622	N19	E24	8456			15	SN	C 9.4						5.1E-03
RAMY		1609	1611	1647	N19	E24	8462	02	15.5	38	SN		3	E		82		
HOLL		1609	1614	1647	N20	E24	8462	02	15.5	38	1F		3	E		108		
RAMY		1613	1617	1646	S32	W57		02	9.2	33	SF		3	E		20		
HOLL		1615	1622	1641	N17	E16	8457	02	14.9	26	SF		3	E		19		
RAMY		1621	1623	1626	N21	W09	8456	02	13.0	5	SF		3	E		17		
RAMY		1708	1708	1717	N24	W07	8456	02	13.2	9	SF		3	E		42		
GOES		1812	1816	1820	N20	E25	8462			8	SF	C 1.2						5.4E-04
RAMY		1813	1814	1824	N20	E25	8462	02	15.7	11	SF		3	E		16		
HOLL		1905	1906	1914	N19	E26	8462	02	15.8	9	SF		3	E		15		
RAMY		1919	1921	1936	S22	E17	8458	02	15.1	17	SF		3	E		43		

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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	Obs See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
HOLL	13	1919	1927	1934	S26	E19	8458	02	15.3	15	SF		3	E		33		
GOES		1921	1926	1930	N20	E22	8462			9	SF	C 2.6						1.3E-03
HOLL		1924	1925	1929	N20	E22	8462	02	15.5	5	SF		3	E		20		
RAMY		1924	1925	1931	N20	E23	8462	02	15.6	7	SF		3	E		65		
RAMY		1929	1930	1939	N15	E12	8457	02	14.7	10	SF		3	E		21		
GOES		1948	2002	2017	N19	E24	8462			29	SF	C 2.7						4.3E-03
RAMY		1950	1952	2041	N19	E23	8462	02	15.6	51	SF		3	E		40		
HOLL		1952	1953	2004	N19	E24	8462	02	15.6	12	SF		4	E		19		
HOLL		2011	2016	2025	N18	E24	8462	02	15.7	14	SF		4	E		28		F
GOES		2050	2053	2058	N20	E24	8462			8	SF	C 1.8						7.9E-04
HOLL		2052	2053	2103	N20	E24	8462	02	15.7	11	SF		3	E		20		F
GOES	14	0204	0207	0208	S26	E17	8458			4	SF	C 1.1						2.5E-04
LEAR		0206	0207	0212	S26	E17	8458	02	15.4	6	SF		4	E		19		F
GOES		0235	0244	0303	N11	E66	8462			28	SF	C 3.4						4.5E-03
LEAR		0239	0239	0254D	N11	E66	8462	02	19.1	15D	SF		2	E		46		FE
GOES		0435	0447	0458						23		C 1.5						1.8E-03
GOES		0650	0655	0657	N21	W15	8456			7	SF	C 1.7						5.1E-04
LEAR		0654	0656	0659	N21	W15	8456	02	13.1	5	SF		3	E		25		
GOES		0711	0717	0726						15		C 1.4						1.1E-03
GOES		0930	0936	0944						14		C 2.4						1.7E-03
GOES		0959	1045	1110	N17	E05	8457			71	SF	M 1.0						2.2E-02
LEAR		1008	1034U	1039D	N17	E05	8457	02	14.8	31D	SF		2	E		77		E
RAMY		1113E	1114U	1136D	N16	E09	8457	02	15.2	23D	SF		2	E		55		F
GOES		1411	1425	1444	S27	E04	8458			33	SF	C 5.3						8.3E-03
HOLL		1444E	1444U	1616	S23	E06	8458	02	15.1	92D	SF		3	E		89		
RAMY		1450	1450	1616	S27	E04	8458	02	14.9	86	SF		3	E		92		
RAMY		1624	1627	1633	S27	E02	8458	02	14.8	9	SF		3	E		28		
GOES		1704	1708	1713	N17	E10	8462			9	SF	C 2.5						1.1E-03
HOLL		1705	1708	1722	N17	E10	8462	02	15.5	17	SF		3	E		69		
GOES		2240	2252	2303	N20	E08	8462			23	SF	C 3.3						3.9E-03
HOLL		2252	2252	2255	N20	E08	8462	02	15.6	3	SF		3	E		25		
GOES		2336	2340	2343	S21	E06	8458			7	SF	C 3.4						1.2E-03
LEAR		2338	2339	2344	S21	E06	8458	02	15.4	6	SF		3	E		21		
LEAR		2338	2340	2410	N13	W06	8457	02	14.5	32	SF		3	E		26		
LEAR		2355	2356	2412	N22	W22	8456	02	13.3	17	SF		3	E		13		
GOES	15	0444	0446	0447	N17	W05	8457			3	SF	C 1.3						2.3E-04
LEAR		0444	0447	0451	N17	W05	8457	02	14.8	7	SF		3	E		13		
GOES		0622	0629	0656	N16	E61				34	SF	C 2.0						3.4E-03
LEAR		0624	0626	0639	N16	E61		02	19.9	15	SF		3	E		66		
GOES		0918	0927	0934	N20	E03	8462			16	1N	C 7.3						4.5E-03
LEAR		0921	0929	0955D	N20	E03	8462	02	15.6	34D	1N		2	E		119		
LEAR		0945	0947	1020D	N23	W28	8456	02	13.2	35D	SF		2	E		37		
GOES		1314	1317	1319	N15	W08	8457			5	SF	C 1.7						3.6E-04
RAMY		1316	1317	1319	N15	W08	8457	02	14.9	3	SF		3	E		33		
RAMY		1321	1321	1327	N18	W07	8457	02	15.0	6	SF		3	E		20		
RAMY		1535	1535	1539	N18	W06	8457	02	15.2	4	SF		3	E		14		
RAMY		1614	1614	1617	N19	W02	8462	02	15.5	3	SF		3	E		26		
GOES		1618	1638	1655	N20	W02	8462			37	1F	C 4.0						6.1E-03
RAMY		1621	1636	1738	N20	W01	8462	02	15.6	77	1F		3	E		100		FE
HOLL		1621	1637	1706	N20	W02	8462	02	15.5	45	1F		3	E		110		F
RAMY		1632	1634	1654	N14	W13	8457	02	14.7	22	SF		3	E		10		
HOLL		1722	1722	1726	N16	W10	8457	02	15.0	4	SF		3	E		17		
RAMY		1827	1828	1830	N14	W15	8457	02	14.6	3	SF		3	E		19		
RAMY		1831	1833	1839	N22	W34	8456	02	13.1	8	SF		3	E		11		
GOES		1831	1837	1840			8464			9		C 2.4						9.9E-04
RAMY		1832	1837	1856	N19	E34	8464	02	18.4	24	SF		3	E		96		
HOLL		1834	1837	1844	N20	E34	8464	02	18.4	10	SF		3	E		58		
GOES		1900	1904	1906	N16	W11	8457			6	1N	C 4.2						8.3E-04
HOLL		1901	1904	1909	N16	W11	8457	02	14.9	8	1N		3	E		102		
GOES		2121	2140	2151	N21	W01	8462			30	SF	C 2.7						4.0E-03
HOLL		2139	2139	2203	N21	W01	8462	02	15.8	24	SF		3	E		48		
HOLL		2220	2229	2235	N21	W01	8462	02	15.8	15	SF		3	E		21		
GOES		2356	2403	2407	N20	E30	8464			11	SF	C 9.4						3.4E-03
HOLL		2358	2401	2415	N20	E30	8464	02	18.3	17	SF		3	E		93		
HOLL	16	0001	0003	0043D	N20	W07	8462	02	15.5	42D	1F		3	E		141		

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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
GOES	16	0123	0128	0131						8		C 6.1						1.7E-03
GOES		0213	0217	0222						9		C 2.8						1.0E-03
GOES		0249	0312	0345	S23	W14	8458			56	SF	M 3.2						7.9E-02
LEAR		0333E	0352U	0409D	S23	W14	8458	02	15.1	36D	SF		2	E		90		F
GOES		0404	0408	0414						10		M 1.5						7.5E-03
GOES		0730	0753	0822						52		C 3.1						7.2E-03
GOES		1136	1144	1147						11		C 2.8						1.4E-03
RAMY		1459	1500	1507	N20	W09	8462	02	15.9	8	SF		3	E		22		
HOLL		1500	1505	1507	N20	W09	8462	02	15.9	7	SF		3	E		10		
RAMY		1657	1734	1833	N21	W13	8462	02	15.7	96	1F		3	E		132		FH
HOLL		1659	1735	1821	N20	W14	8462	02	15.6	82	1F		3	E		104		
GOES		1731	1742	1755	N20	W14	8462			24		C 6.8						7.6E-03
RAMY		1853	1855	1858	N20	W13	8462	02	15.8	5	SF		3	E		18		
RAMY		1855	1857	1901	S26	W16	8458	02	15.5	6	SF		3	E		18		
RAMY		1901	1901	1905	N19	W16	8462	02	15.6	4	SF		3	E		26		
RAMY		1910	1917	1927	S28	W17	8458	02	15.5	17	SF		3	E		36		FH
GOES		1912	1916	1922	S28	W17	8458			10	SF	C 1.8						9.2E-04
RAMY		2003	2004	2011	N19	W16	8462	02	15.6	8	SF		3	E		29		
GOES		2116	2121	2123	N19	W12	8462			7	1N	C 5.3						1.2E-03
RAMY		2117	2121	2128	N19	W12	8462	02	16.0	11	1N		3	E		105		
GOES		2325	2329	2333						8		C 1.9						8.6E-04
GOES	17	0056	0059	0101	N18	W15				5	SF	C 3.2						6.0E-04
LEAR		0059	0059	0106	N18	W15	8462	02	15.9	7	SF		3	E		36		
GOES		0115	0119	0121						6		C 1.2						3.3E-04
LEAR		0531E	0532U	0537	N19	W18	8462	02	15.8	6D	SF		4	E		12		
RAMY		1222	1222	1227	N20	W24	8462	02	15.7	5	SF		3	E		17		
GOES		1234	1238	1240	S21	W33	8458			6	SF	C 1.2						3.6E-04
RAMY		1237	1238	1247	S21	W33	8458	02	15.0	10	SF		3	E		16		
RAMY		1243	1244	1247	N20	W20	8462	02	16.0	4	SF		3	E		20		
GOES		1307	1317	1327	N20	W23	8462			20	SF	C 1.2						1.3E-03
RAMY		1311	1321	1328	N20	W23	8462	02	15.8	17	SF		3	E		17		
RAMY		1520	1520	1528	N20	W23	8462	02	15.9	8	SF		3	E		15		
RAMY		1531	1531	1532	N20	W23	8462	02	15.9	1	SF		3	E		17		
RAMY		1548	1552	1603	N20	W24	8462	02	15.8	15	SF		3	E		13		
GOES		1627	1646	1708						41		C 3.4						7.7E-03
RAMY		1736	1743	1753	N20	W24	8462	02	15.9	17	SF		3	E		29		
RAMY		1902	1905	1942	S29	W68	8459	02	12.5	40	SF		3	E		39		
GOES		2021	2029	2037						16		C 6.0						3.9E-03
GOES	18	0029	0035	0042						13		C 3.4						1.9E-03
GOES		0124	0131	0141						17		C 2.0						1.8E-03
GOES		0316	0329	0336						20		C 5.1						4.2E-03
GOES		0825	0829	0831	N21	W34	8462			6	SF	C 1.4						4.4E-04
LEAR		0829	0829	0843D	N21	W34	8462	02	15.7	14D	SF		2	E		26		
GOES		1009	1014	1018						9		C 2.1						7.6E-04
RAMY		1209	1209	1213	N20	W34	8462	02	15.9	4	SF		3	E		12		
GOES		1219	1236	1241	N20	W34	8462			22	SF	C 2.0						2.1E-03
RAMY		1229	1230	1232	N20	W34	8462	02	15.9	3	SF		3	E		14		
RAMY		1235	1239	1241	N20	W34	8462	02	15.9	6	SF		3	E		33		
RAMY		1324	1325	1329	S21	W47	8458	02	14.9	5	SF		3	E		14		
RAMY		1414	1414	1418	N20	W39	8462	02	15.6	4	SF		3	E		16		
RAMY		1418	1420	1424	S27	W82	8459	02	12.2	6	SF		3	E		17		
GOES		1601	1605	1612	S29	W80	8459			11	SF	C 1.4						7.8E-04
RAMY		1603	1604	1610	S29	W80	8459	02	12.4	7	SF		3	E		46		
GOES		1713	1720	1728						15		C 2.0						1.5E-03
HOLL		1746	1748	1756	N20	W42	8462	02	15.5	10	SF		3	E		16		
RAMY		1838	1852	1905	S21	W50	8458	02	14.9	27	SF		3	E		58		
GOES		1848	1853	1858	S21	W50	8458			10	SF	C 1.6						8.1E-04
HOLL		1850	1852	1902	S19	W47	8458	02	15.2	12	SF		3	E		51		
RAMY		1921	1921	1925	S28	W86	8459	02	12.1	4	SF		3	E		13		
HOLL		1928	1928	1933	S28	W84	8459	02	12.2	5	SF		3	E		14		
RAMY		1929	1930	1938	S28	W87	8459	02	12.0	9	SF		3	E		18		
RAMY		1936	1936	1938	N14	W55	8457	02	14.7	2	SF		3	E		13		
RAMY		2021	2022	2034	S23	W48	8458	02	15.1	13	SF		3	E		11		
HOLL		2027	2027	2031	N20	W39	8462	02	15.9	4	SF		3	E		10		
GOES		2242	2247	2252						10		C 1.3						6.7E-04
GOES		2353	2405	2407	N20	W11	8464			14	SF	C 1.1						8.0E-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	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
LEAR	18	2356		2403	N20	W11	8464	02	18.1	7	SF		4	E		10		E
GOES	19	0048	0054	0111			8459			23		C 3.2						3.3E-03
GOES		0728	0733	0736	N20	W15	8464			8	SF	C 1.0						4.1E-04
LEAR		0731	0732	0739	N20	W15	8464	02	18.2	8	SF		3	E		33		
GOES		0940	0943	0946						6		B 9.8						3.1E-04
RAMY		1343	1344	1347	N20	W48	8456	02	15.9	4	SF		3	E		27		
RAMY		1344	1345	1346	N20	W48	8462	02	15.9	2	SF		3	E		12		
RAMY		1441	1441	1447	S19	W56	8458	02	15.3	6	SF		3	E		12		
GOES		1615	1623	1628	N21	W52	8458			13	SF	C 3.8						1.9E-03
RAMY		1617	1623	1629	N21	W52	8462	02	15.7	12	SF		3	E		49		
RAMY		1618	1620	1626	N21	W52	8456	02	15.7	8	SF		3	E		50		
HOLL		1618	1624	1631	N20	W55	8462	02	15.5	13	SF		3	E		52		
RAMY		1621	1623	1630	N14	W66	8457	02	14.7	9	SF		3	E		36		
RAMY		1627	1630	1642	S23	W59	8458	02	15.1	15	SF		3	E		12		
LEAR	20	0016	0016	0019	N19	W54	8462	02	15.9	3	SF		4	E		17		
GOES		0217	0310	0331						74		C 8.2						2.7E-02
GOES		0400	0406	0410	S21	W63				10	SF	C 8.2						3.2E-03
LEAR		0404	0404	0418	S21	W63	8458	02	15.3	14	SF		4	E		35		E
GOES		0642	0647	0655						13		C 2.0						1.2E-03
GOES		0911	0918	0924	N19	W61	8462			13	SF	C 1.1						7.9E-04
LEAR		0913	0913	0921	N19	W61	8462	02	15.7	8	SF		3	E		12		
GOES		0951	0954	0956	N18	W60	8462			5	SF	C 1.7						4.1E-04
LEAR		0952	0952	0959	N18	W60	8462	02	15.8	7	SF		3	E		28		
GOES		0958	1001	1004	N20	W61	8462			6	SF	C 1.7						5.2E-04
LEAR		1000	1000	1010	N20	W61	8462	02	15.7	10	SF		3	E		33		
RAMY		1241	1243	1246	N20	W61	8462	02	15.9	5	SF		3	E		12		
GOES		1409	1412	1414	N20	W63				5	SF	C 2.1						3.8E-04
RAMY		1411	1412	1413	N20	W63	8462	02	15.8	2	SF		3	E		17		
GOES		1511	1519	1528	S17	W71	8458			17	SF	C 4.2						3.0E-03
RAMY		1514	1514	1531	S17	W71	8458	02	15.2	17	SF		3	E		23		F
HOLL		1617	1617	1621	N34	W62	8468	02	15.7	4	SF		3	E		14		
GOES		1739	1742	1754						15		C 1.0						9.2E-04
GOES		2034	2040	2045						11		C 1.0						6.0E-04
GOES	21	0528	0536	0543						15		B 9.1						7.1E-04
LEAR		0857	0858	0909	N19	W45	8464	02	17.9	12	SF		3	E		13		
GOES		0938	0950	1001						23		C 8.6						7.8E-03
GOES		1303	1345	1408	N24	W81	8462			65	SF	M 1.3						3.8E-02
RAMY		1322E	1326	1338	N24	W81	8462	02	15.3	16D	SF		3	E		40		
HOLL		1637	1637	1639	N21	W79	8462	02	15.6	2	SF		3	E		24		
HOLL		1700	1700	1704	N21	W81	8462	02	15.5	4	SF		3	E		14		
GOES		2202	2210	2230						28		C 1.6						2.3E-03
GOES		2341	2347	2356						15		B 9.0						7.2E-04
GOES	22	0134	0138	0143						9		B 7.4						3.5E-04
GOES		1230	1301	1425						115		C 3.8						1.9E-02
HOLL		2338	2339	2342	N19	W68	8462	02	17.8	4	SF		3	E		28		
GOES		2355	2359	2403						8		B 7.8						3.2E-04
GOES	23	1243	1246	1250						7		B 6.1						2.3E-04
RAMY	24	1657	1658	1701	N18	W29	8467	02	22.5	4	SF		3	E		66		
RAMY		1726	1726	1729	N17	W28	8467	02	22.6	3	SF		3	E		52		
GOES	25	0614	0617	0619						5		B 4.8						1.2E-04
GOES		0736	0741	0750						14		B 6.7						4.6E-04
GOES		0812	0816	0819						7		B 5.9						2.1E-04
GOES		0957	1000	1003						6		B 4.8						1.5E-04
GOES		1020	1027	1032						12		C 1.1						6.5E-04
GOES		1043	1048	1050						7		C 2.4						5.2E-04
RAMY		1241	1242	1254	N29	E37	8471	02	28.4	13	SF		3	E		11		
GOES		1339	1342	1345						6		B 4.2						1.4E-04
RAMY		1520	1521	1524	N32	E54	8472	03	1.9	4	SF		4	E		24		F
RAMY		1751	1757	1812	S24	E36	8470	02	28.5	21	SF		3	E		61		FH
HOLL		1752E	1756U	1842D	S24	E37	8470	02	28.6	50D	SF		3	E		54		
GOES		1753	1800	1806	S24	E36				13	SF	C 1.2						8.2E-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	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	25	1823	1826	1828						5		B 5.5						1.5E-04
GOES		1936	1940	1945						9		B 6.7						2.8E-04
GOES		2056	2101	2103						7		B 6.5						2.1E-04
GOES		2215	2223	2234						19		B 9.1						8.8E-04
GOES		2318	2324	2328						10		B 4.8						2.3E-04
GOES	26	0746	0750	0756	S22	E29	8470			10	SF	B 3.6						1.9E-04
LEAR		0748	0750	0755	S22	E29	8470	02	28.5	7	SF		3	E		32		
GOES		0921	0943	1045						84		B 3.9						1.6E-03
RAMY		1156E	1156U	1200	N31	E62		03	3.4	40	SF		3	E		16		
GOES		1856	1909	1915	N30	E18	8471			19	SF	C 1.1						9.2E-04
HOLL		1903	1905	1914	N30	E18	8471	02	28.2	11	SF		3	E		26		F
GOES		2015	2021	2027	N30	E19	8471			12	SF	C 1.5						7.9E-04
HOLL		2019	2021	2034	N30	E19	8471	02	28.3	15	SF		3	E		48		F
GOES	27	0329	0337	0349						20		B 7.8						7.7E-04
GOES		0851	0857	0917	N30	E09	8471			26	SF	C 1.0						1.2E-03
LEAR		0855	0856	0904	N30	E09	8471	02	28.1	9	SF		3	E		42		F
GOES		1200	1208	1218	N27	E09				18	SF	C 2.1						1.4E-03
RAMY		1203	1208	1233	N27	E09	8471	02	28.2	30	SF		3	E		61		F
GOES		1902	1914	1920	N28	E04	8471			18	SF	B 8.5						6.5E-04
HOLL		1912	1913	1922	N28	E04	8471	02	28.1	10	SF		3	E		17		
GOES	28	0346	0349	0352						6		B 4.0						1.3E-04
GOES		0522	0555	0628						66		B 5.4						1.5E-03
LEAR		0657	0701	0711	N27	W06	8471	02	27.8	14	SF		3	E		15		F
GOES		0657	0702	0707	N27	W06	8471			10	SF	C 1.0						5.4E-04
RAMY		1402	1402	1406	N28	W10	8471	02	27.8	4	SF		4	E		23		
GOES		1520	1524	1529	N28	W10	8471			9	SF	B 6.3						2.6E-04
RAMY		1523	1524	1534	N28	W10	8471	02	27.8	11	SF		4	E		16		F
RAMY		1618	1619	1621	N28	W06	6732	02	28.2	3	SF		3	E		12		
GOES		1631	1639	1643	N28	W06				12	2B	M 6.6						2.2E-02
RAMY		1635	1638	1745	N28	W06	8471	02	28.2	70	2B		3	E		304		UF
HOLL		1635	1642	1802	N28	W09	8471	02	28.0	87	2B		3	E		257		F
GOES		1914	1930	1938	N28	W09				24	SF	C 2.0						2.0E-03
HOLL		1917	1931	1950	N28	W09	8471	02	28.1	33	SF		3	E		45		
RAMY		1923	1931	2001	N28	W11	8471	02	27.9	38	SF		3	E		70		
RAMY		2049	2059	2104	N31	E31	8475	03	3.3	15	1F		3	E		109		
RAMY		2049	2059	2104	N18	E22	8476	03	2.5	15	SF		3	E		30		
RAMY		2049	2103	2111	N28	W10	8471	02	28.1	22	2F		3	E		340		FE
HOLL		2116	2118	2121	N29	W12	8471	02	27.9	5	SF		3	E		14		
GOES		2134	2148	2157	N28	W14	8471			23	SF	C 2.2						2.3E-03
HOLL		2135	2138	2219	N28	W14	8471	02	27.8	44	SF		3	E		67		

"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.

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

FEBRUARY 1999

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
01	2695	LEAR	8 S	0836.0	0836.0	2.0	78.0			QL=4 ST=2 TYP=3
	8800	LEAR	8 S	0836.0	0837.0	1.0	56.0			QL=4 ST=2 TYP=3
	8800	SVTO	8 S	0836.0	0836.0	1.0	66.0			QL=4 ST=2 TYP=3
	2695	SVTO	8 S	0836.0	0836.0	2.0	94.0			QL=4 ST=2 TYP=3
12	2695	PALE	4 S/F	0318.0	0318.0	45.0	31.0			QL=4 ST=2 TYP=3
	8800	PALE	46 C	0339.0	0342.0	5.0	48.0			QL=4 ST=2 TYP=8
	2695	LEAR	8 S	0431.0	0432.0	2.0	28.0			QL=4 ST=2 TYP=3
	8800	SGMR	8 S	1524.0	1524.0	U	33.0			QL=4 ST=2 TYP=3
	2695	SGMR	8 S	1524.0	1524.0	U	32.0			QL=4 ST=2 TYP=3
13	8800	SGMR	4 S/F	1610.0	1611.0	3.0	39.0			QL=4 ST=2 TYP=3
	2695	SGMR	4 S/F	1610.0	1611.0	3.0	34.0			QL=4 ST=2 TYP=3
14	2695	LEAR	4 S/F	1023.0	1023.0	20.0	25.0			QL=4 ST=2 TYP=3
	8800	LEAR	4 S/F	1034.0	1036.0	9.0	85.0			QL=4 ST=2 TYP=3
	2695	LEAR	4 S/F	1043.0	1045.0	4.0	100.0			QL=4 ST=2 TYP=3
	2695	SGMR	8 S	1215.0	1215.0	U	38.0			QL=4 ST=2 TYP=3
	2695	SGMR	4 S/F	1408.0	1412.0	18.0	64.0			QL=4 ST=2 TYP=3
16	8800	PALE	4 S/F	0000.0	0001.0	5.0	210.0			QL=4 ST=2 TYP=3
	2695	LEAR	49 GB	0252.0	0256.0	50.0	560.0			QL=4 ST=2 TYP=6
	8800	LEAR	49 GB	0253.0	0258.0	49.0	560.0			QL=4 ST=2 TYP=6
	2695	PALE	8 S	2120.0	2120.0	1.0	65.0			QL=4 ST=2 TYP=3
	8800	PALE	8 S	2120.0	2120.0	U	68.0			QL=4 ST=2 TYP=3
	2695	SGMR	8 S	2120.0	2120.0	1.0	79.0			QL=4 ST=2 TYP=3
	8800	PALE	8 S	2322.0	2322.0	U	95.0			QL=4 ST=2 TYP=3
17	2695	PALE	8 S	0059.0	0059.0	U	36.0			QL=4 ST=2 TYP=3
20	8800	LEAR	8 S	0404.0	0404.0	1.0	65.0			QL=4 ST=2 TYP=3
	2695	SGMR	8 S	1513.0	1513.0	U	33.0			QL=4 ST=2 TYP=3
	8800	SGMR	8 S	1513.0	1513.0	2.0	64.0			QL=4 ST=2 TYP=3
28	8800	SGMR	49 GB	1635.0	1638.0	6.0	520.0			QL=4 ST=2 TYP=6
	2695	SGMR	4 S/F	1635.0	1636.0	6.0	310.0			QL=4 ST=2 TYP=3

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

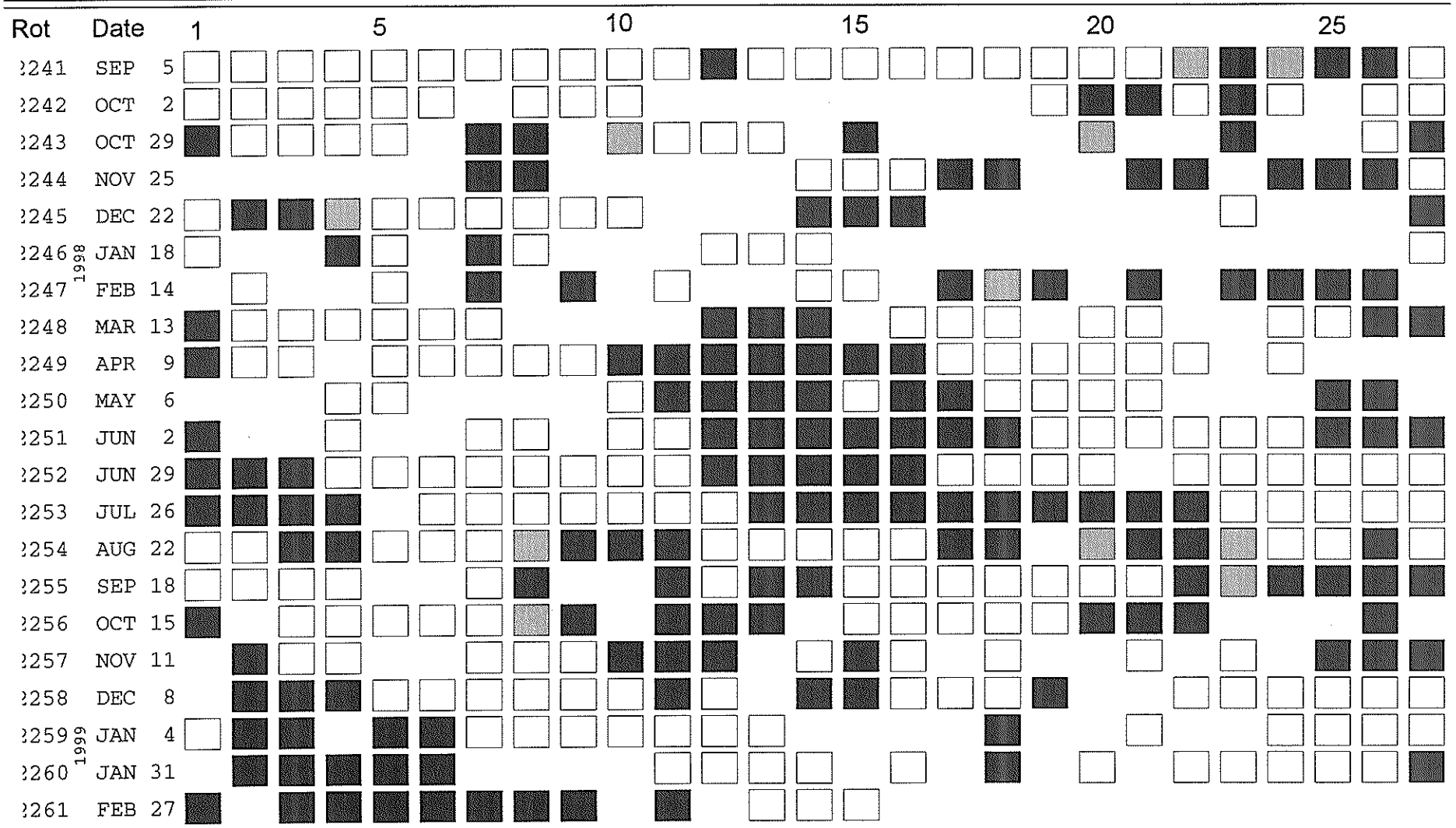
Explanation of Type Code:

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

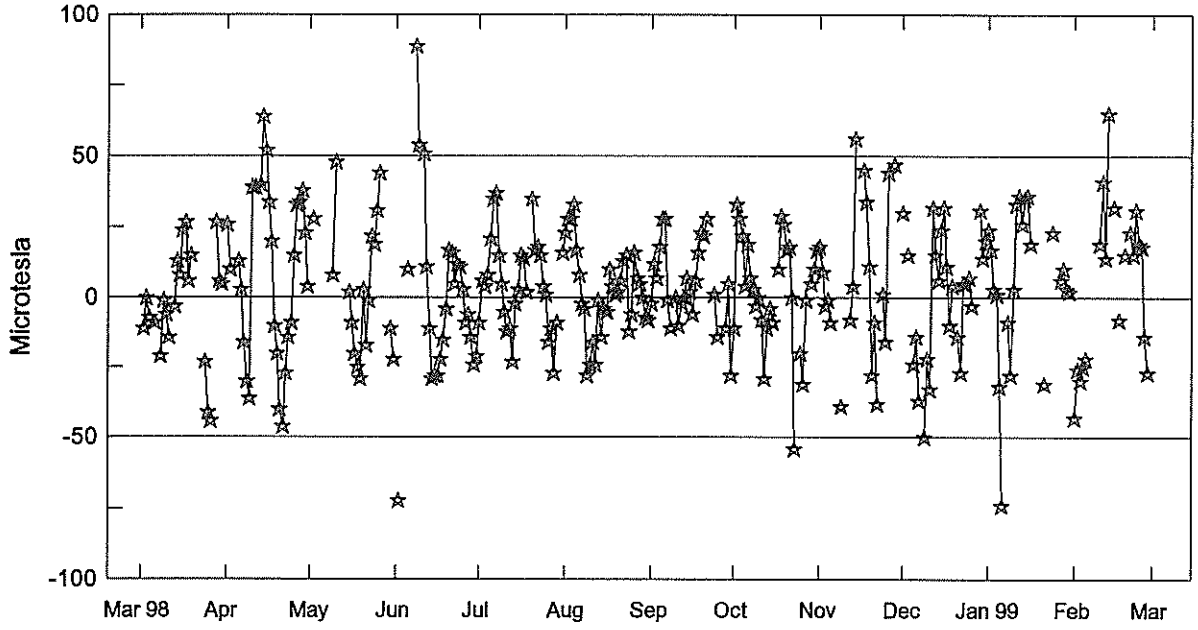


Mean Solar Magnetic Field Polarity: = field > 2 microT; = -2 microT ≤ field ≤ 2 microT

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

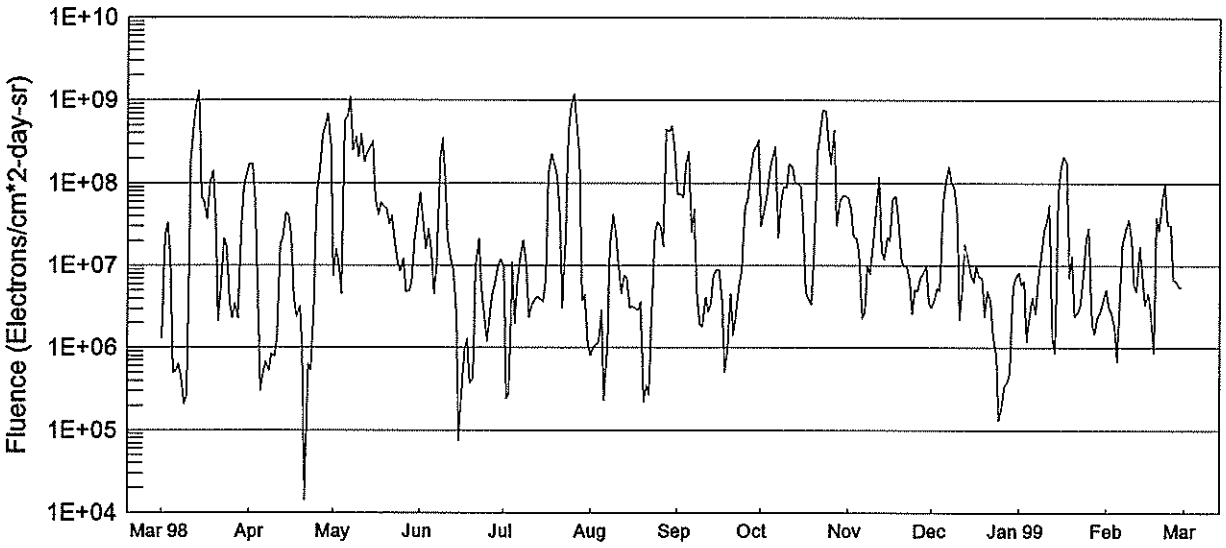
Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates are five days earlier, to mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

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



Day	Mar 98	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb
1	---	26	28	---	-9	23	-2	-11	18	30	24	-43
2	-11	10	---	-72	6	28	12	33	9	---	17	-26
3	0	---	---	---	4	28	7	28	-3	15	3	-30
4	-7	---	---	---	8	33	18	22	-1	---	1	-25
5	---	13	---	10	21	17	28	4	-9	-24	-32	-22
6	-9	3	---	---	35	8	28	19	---	-14	-74	---
7	---	-16	---	---	37	-2	-1	7	---	-37	---	---
8	-21	-30	---	89	15	-4	-11	3	---	---	-9	---
9	-1	-36	8	54	5	-28	---	-3	-39	-50	-28	---
10	-6	39	48	---	-5	-24	0	0	---	-22	3	19
11	-14	39	---	51	-12	-16	-10	-8	---	-33	33	41
12	---	---	---	11	-11	-24	-2	-29	-8	32	36	14
13	-3	40	---	-11	-23	-1	0	-11	4	15	26	65
14	13	64	---	-29	-2	-14	7	-4	56	6	35	---
15	8	52	2	-28	3	-4	2	-9	---	24	36	32
16	24	34	-9	-28	15	-5	-6	---	---	32	19	---
17	27	20	-20	-22	14	10	6	10	45	11	---	-8
18	6	-10	-25	-15	2	4	16	29	34	-10	---	---
19	15	-20	-29	-4	---	1	23	26	11	4	---	15
20	---	-40	3	17	35	2	22	17	-28	---	---	---
21	---	-46	-17	16	17	6	28	18	-9	-14	-31	23
22	---	-27	-1	5	18	13	---	0	-38	-27	---	15
23	---	-14	22	12	15	15	---	-54	---	5	---	31
24	-23	-9	19	11	4	-12	1	---	1	5	23	19
25	-41	15	31	3	1	-6	-14	-20	-16	7	---	18
26	-44	33	44	-9	-16	16	---	-31	44	-3	---	-14
27	---	34	---	-6	-11	7	---	-1	---	---	6	-27
28	27	38	---	-14	-27	5	-11	---	47	---	10	---
29	6	23	---	-24	-9	0	5	5	---	31	3	
30	5	4	-11	-21	---	-7	-28	10	---	14	2	
31	---		-22		16	-8		17		20	---	

GOES Daily Electron Fluence
Mar 98 - Feb 99



Day	Mar 98	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb
1	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	3.1E+06	8.3E+06	5.2E+06
2	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	3.9E+06	5.9E+06	3.2E+06
3	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	5.4E+06	6.5E+06	2.7E+06
4	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	4.9E+06	1.2E+06	1.8E+06
5	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	5.8E+07	2.7E+06	6.8E+05
6	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	1.0E+08	4.1E+06	3.4E+06
7	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	1.6E+08	2.6E+06	1.8E+07
8	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	1.0E+08	6.8E+06	2.7E+07
9	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	9.1E+07	1.2E+07	3.6E+07
10	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	4.3E+07	2.7E+07	2.2E+07
11	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	2.2E+06	3.4E+07	5.9E+06
12	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	5.1E+06	5.5E+07	4.9E+06
13	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	1.8E+07	1.3E+06	1.7E+07
14	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	1.2E+07	8.6E+05	7.8E+06
15	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	7.5E+06	7.7E+07	3.4E+06
16	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	6.4E+06	1.6E+08	4.6E+06
17	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	1.0E+07	2.1E+08	2.9E+06
18	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	7.3E+06	1.8E+08	8.7E+05
19	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	7.2E+06	7.1E+06	3.9E+07
20	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	2.4E+06	1.3E+07	2.7E+07
21	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	4.9E+06	2.4E+06	6.3E+07
22	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	3.8E+06	2.7E+06	1.0E+08
23	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	1.4E+06	3.2E+06	3.2E+07
24	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	8.5E+05	7.8E+06	3.1E+07
25	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	1.3E+05	2.1E+07	6.8E+06
26	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	1.8E+05	2.9E+07	6.4E+06
27	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	3.5E+05	2.0E+06	5.5E+06
28	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	3.8E+05	1.5E+06	5.6E+06
29	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	5.0E+05	2.3E+06	
30	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	5.4E+06	2.8E+06	
31	1.3E+08		4.1E+07		1.1E+06	2.7E+08		7.2E+07		7.1E+06	3.6E+06	

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.

CONTENTS

Prompt Reports

Number 655 Part I

DATA FOR JANUARY 1999

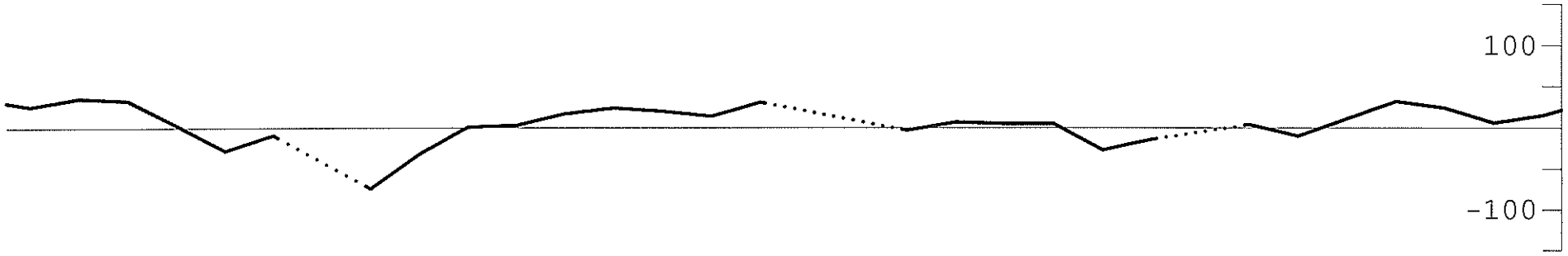
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1944

(15 December 1998 to 12 January 1999)

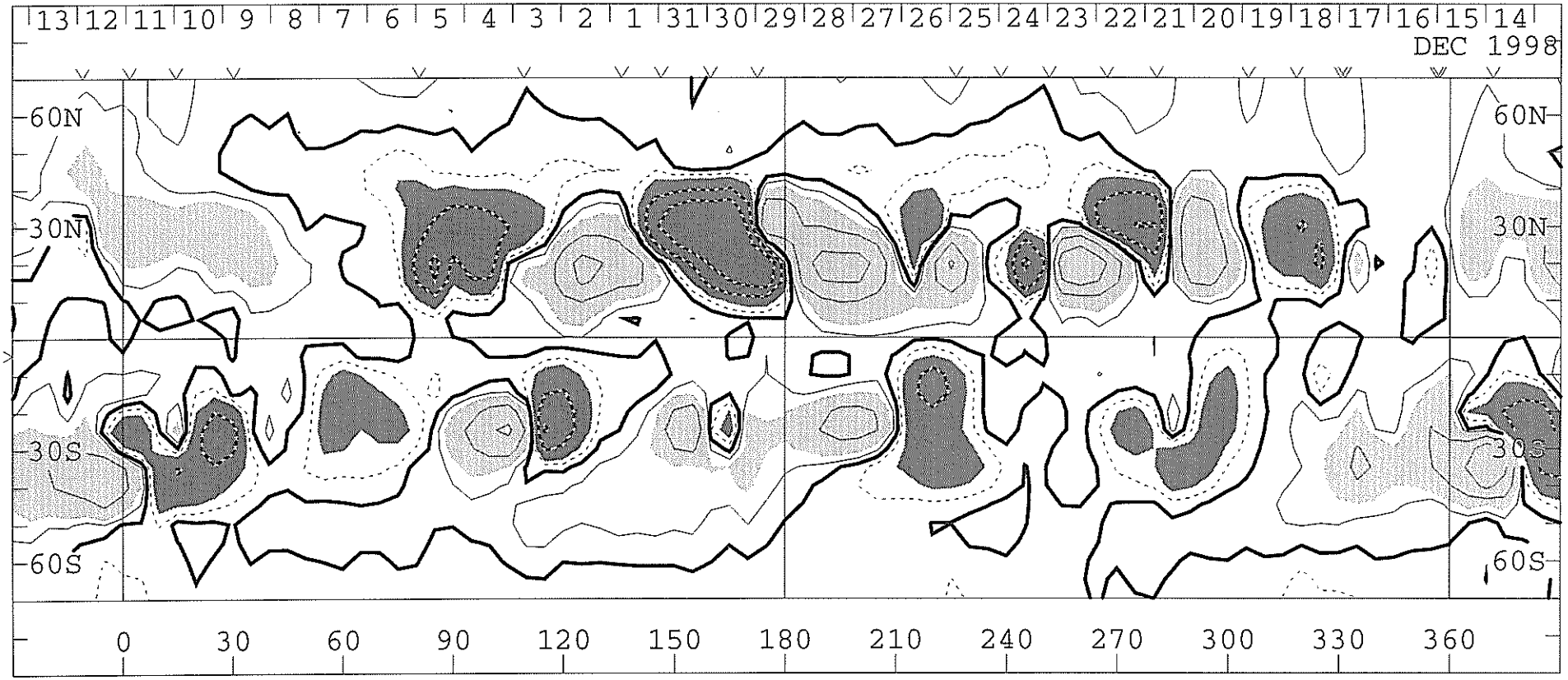
WILCOX SOLAR OBSERVATORY

Mean Field



Photospheric Magnetic Field

0, ±100, 500, 1000, 2000 MicroTesla



Heliographic Longitude

1944

SOLAR MAGNETIC FIELD SYNOPTIC CHART

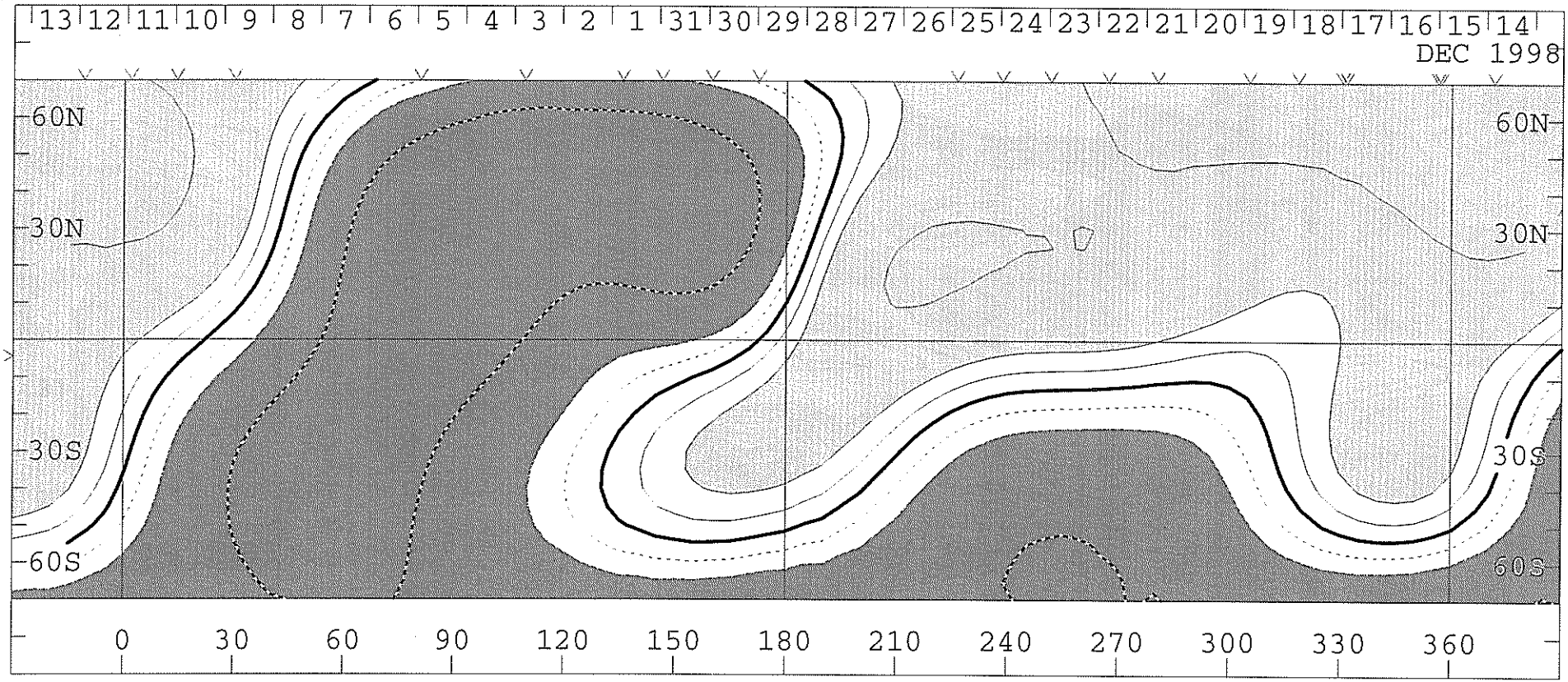
SOURCE SURFACE FIELD

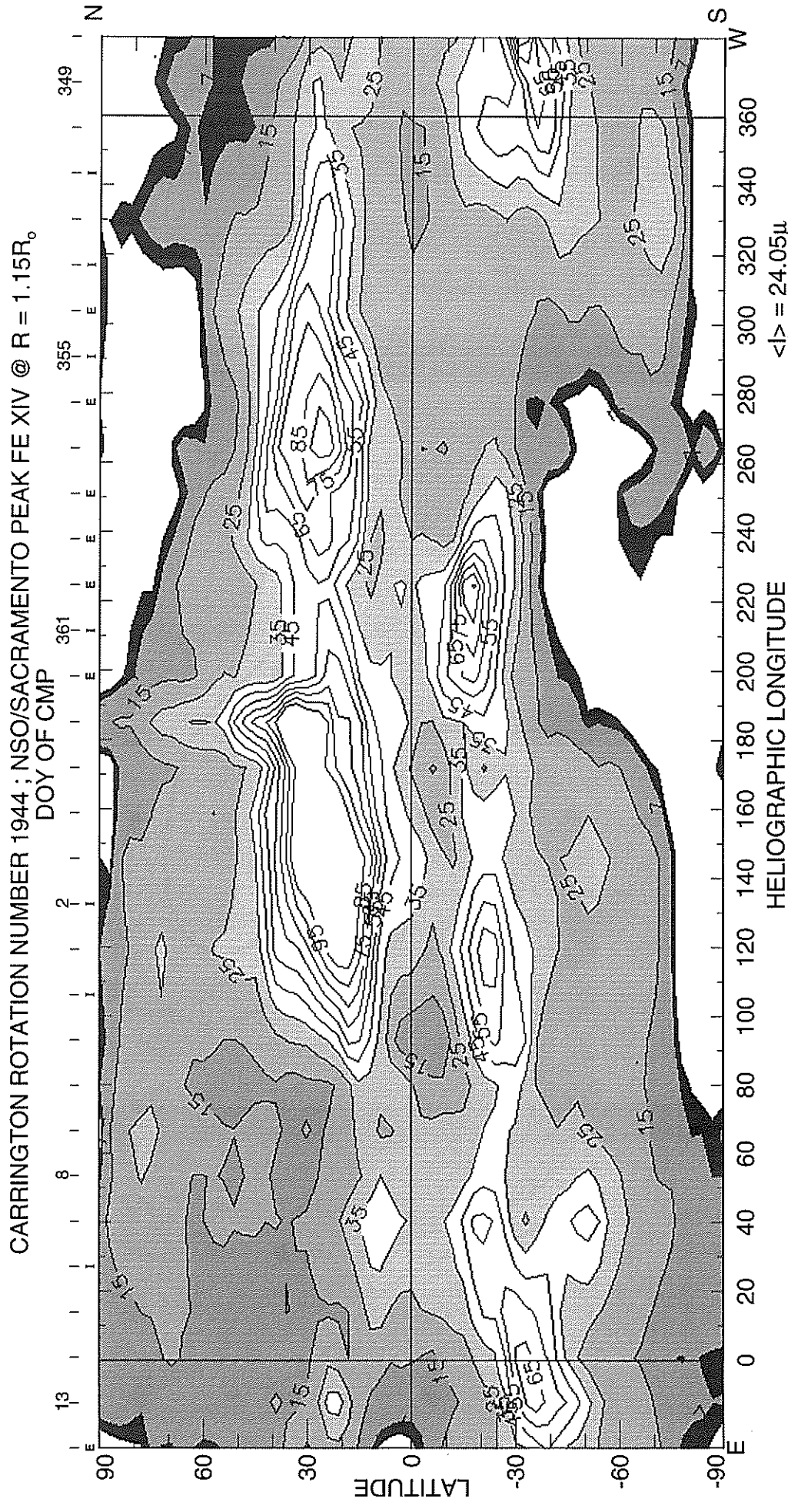
CARRINGTON ROTATION NUMBER 1944

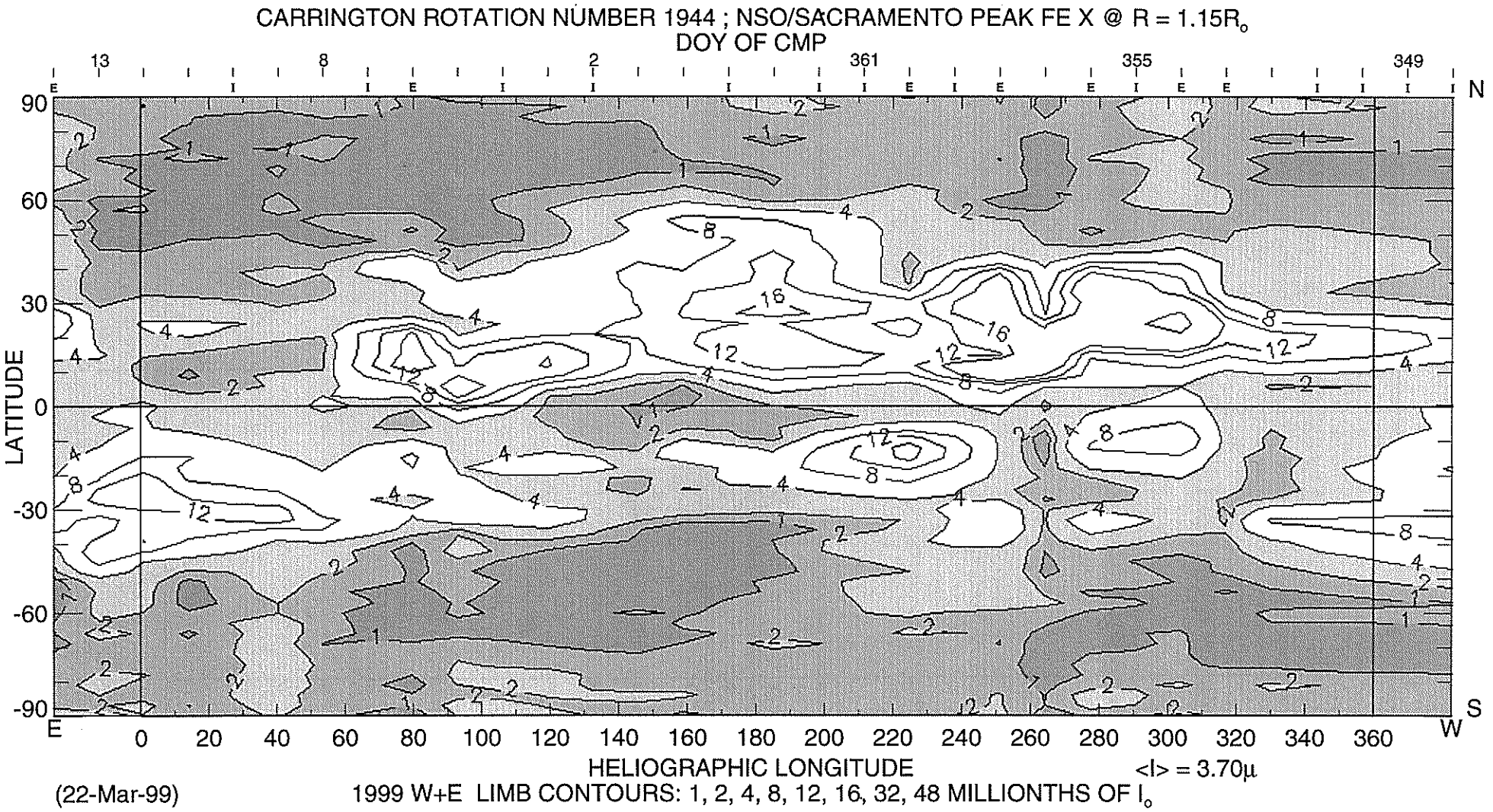
(15 December 1998 to 12 January 1999)

Wilcox Solar Observatory

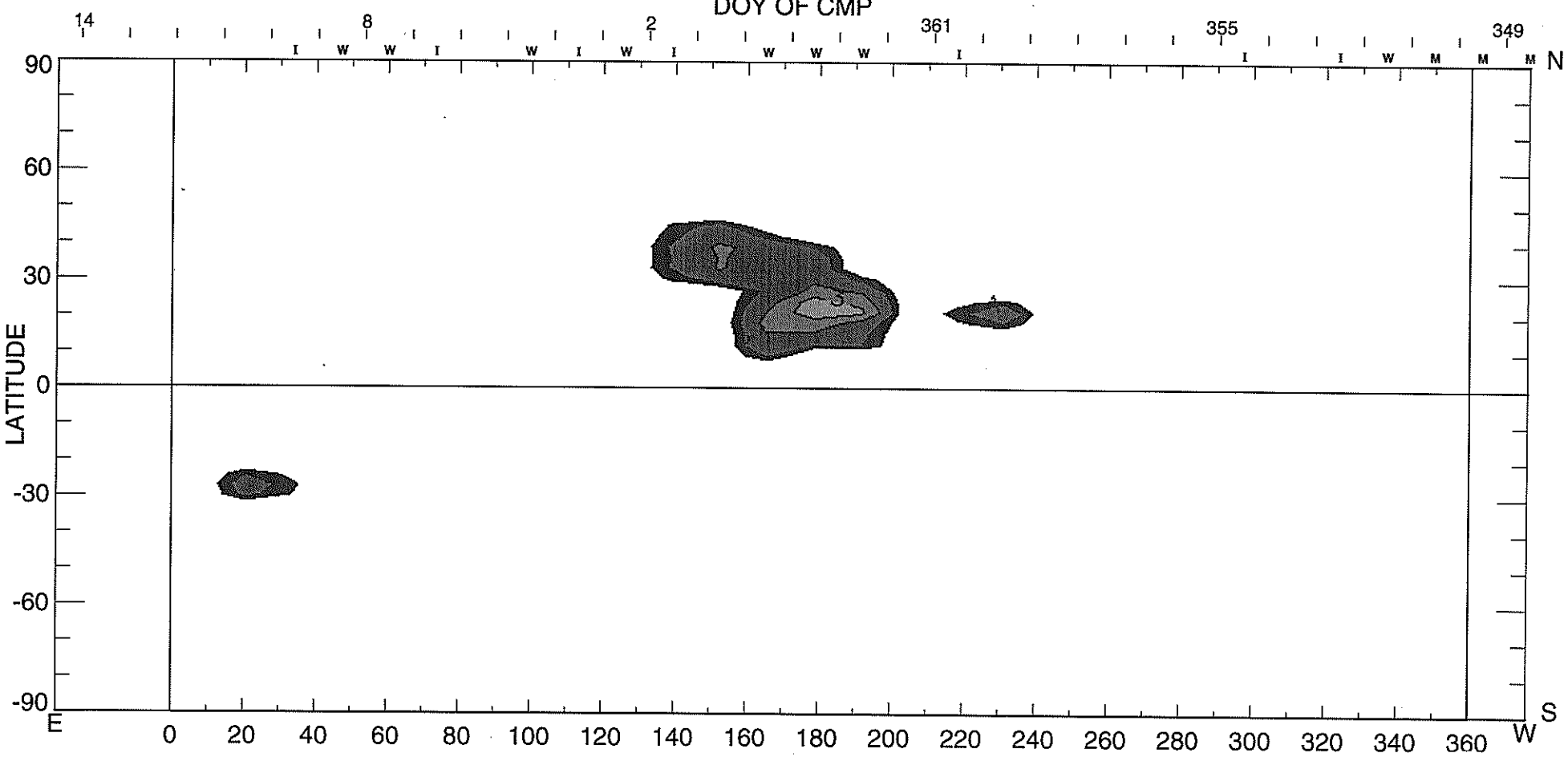
0, ±1, 2, 5, 10, 20 microTesla




CARRINGTON ROTATION NUMBER 1944 ; NSO/SACRAMENTO PEAK FE XIV @ R = 1.15R$_o$
DOY OF CMP
13
2
8
361
355
349
N
S
E
W
90
60
30
0
-30
-60
-90
LATITUDE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
HELIOGRAPHIC LONGITUDE
1999 W+E LIMB CONTOURS: 5, 7, 15, 25, 35, 45, 55, 65, 75, 85, 95 MILLIONTHS OF I$_o$
<I> = 24.05μ
CORONAL HOLES ARE SHOWN AS WHITE BORDERED BY BLACK
(26-Feb-99)


CARRINGTON ROTATION NUMBER 1944 ; NSO/SACRAMENTO PEAK FE X @ R = 1.15R$_o$
DOY OF CMP
13
8
2
361
355
349
N
S
E
W
90
60
30
0
-30
-60
-90
LATITUDE
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
HELIOGRAPHIC LONGITUDE
<I> = 3.70μ
(22-Mar-99)
1999 W+E LIMB CONTOURS: 1, 2, 4, 8, 12, 16, 32, 48 MILLIONTHS OF I$_o$

CARRINGTON ROTATION NUMBER 1944 ; NSO/SACRAMENTO PEAK CA XV @ R = 1.15R_o



(26-Feb-99)

1999 E+W LIMB CONTOURS: YELMIN, 1, 2, 3, 4, 6, 8 MILLIONTHS OF I_o

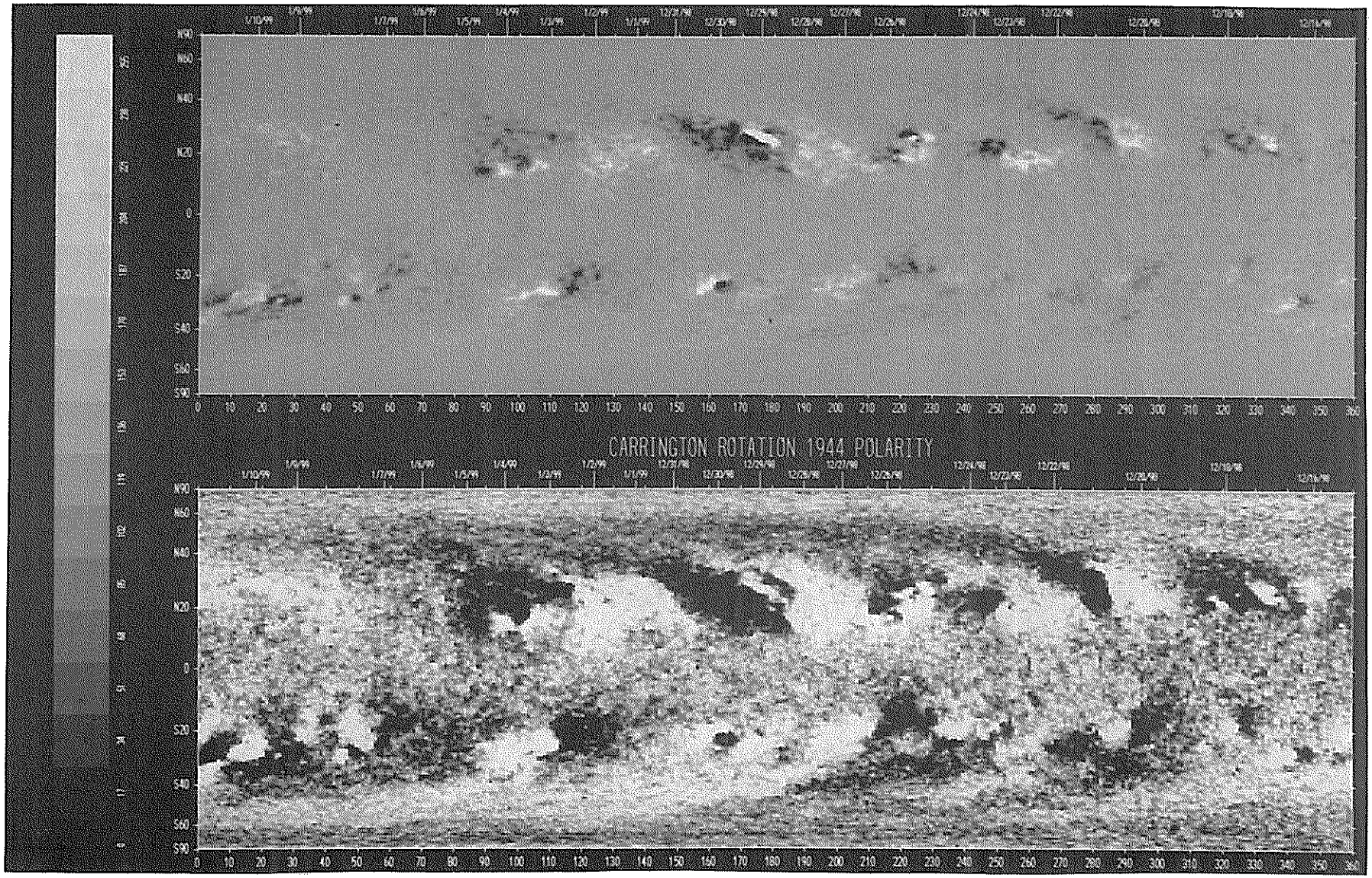
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1944

(15 December 1998 to 12 January 1999)

National Solar Observatory/Kitt Peak

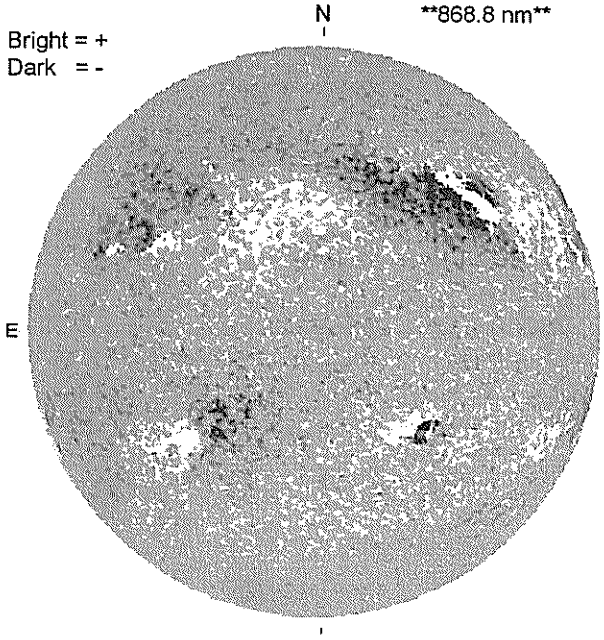
Dates of Observation



Heliographic Longitude

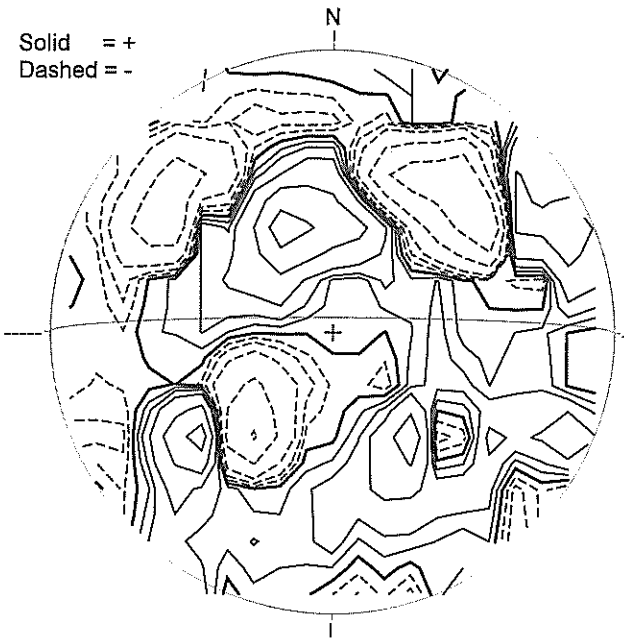
JANUARY 1, 1999 (P= 2.26, Bo = -2.98, Lo = 145.58)

KITT PEAK MAGNETOGRAM



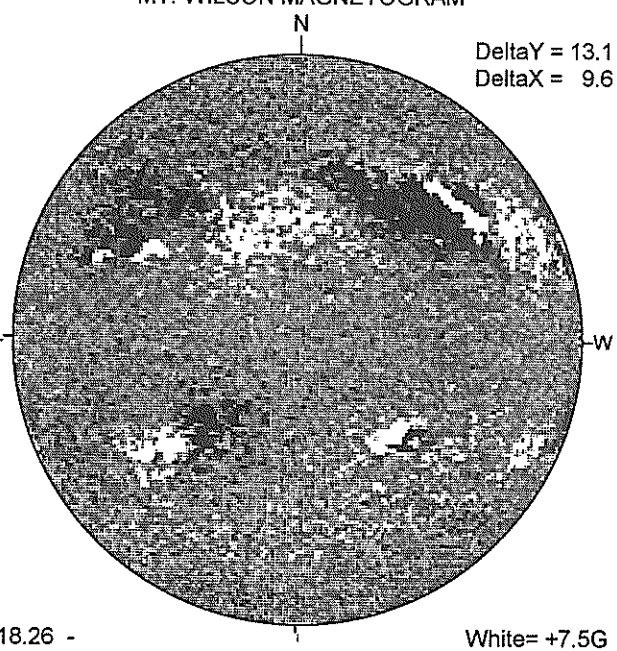
1601 UT

STANFORD MAGNETOGRAM



1802 UT

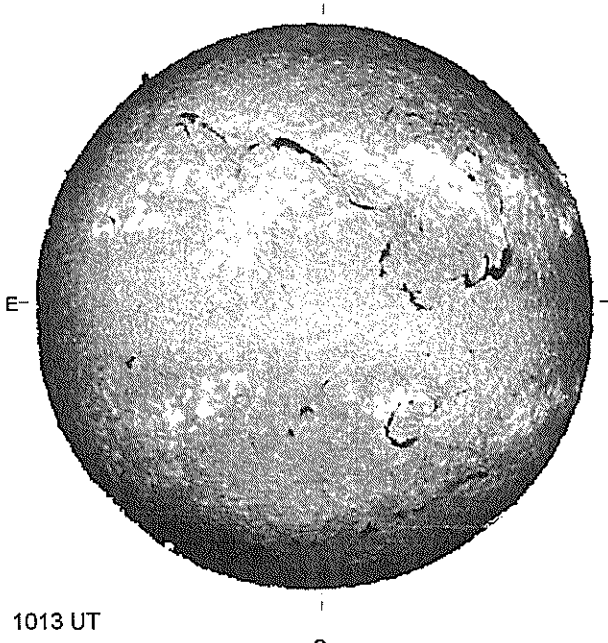
MT. WILSON MAGNETOGRAM



18.26 -
19.24 UT

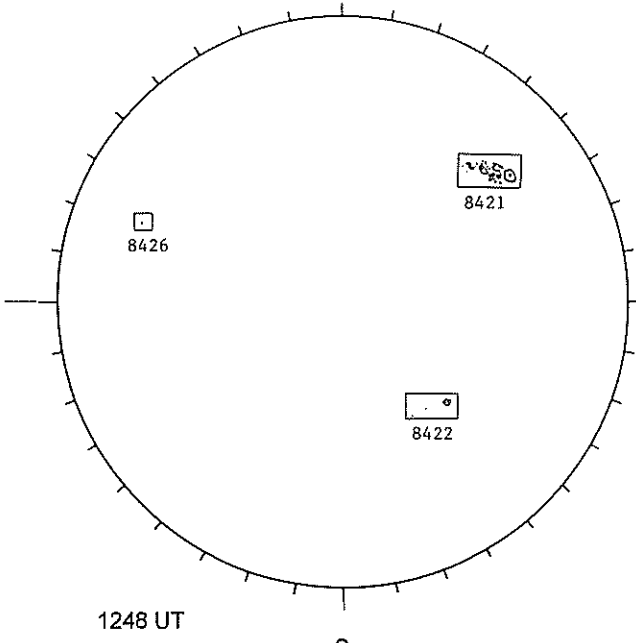
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



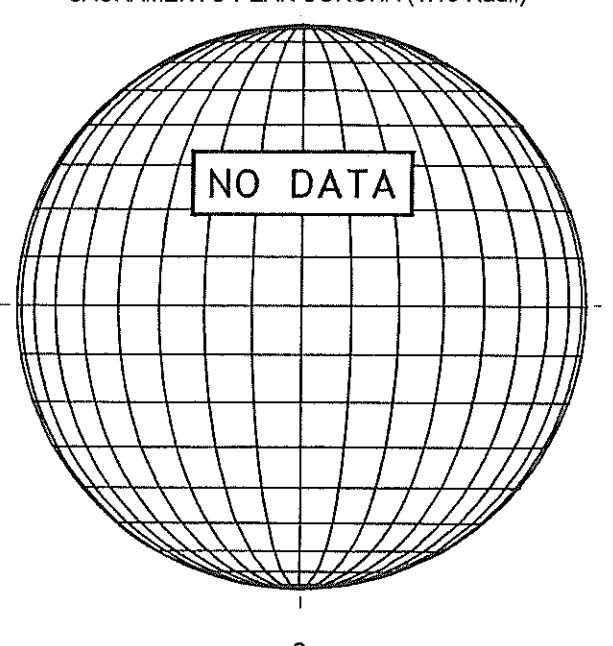
1013 UT

RAMEY SUNSPOT



1248 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

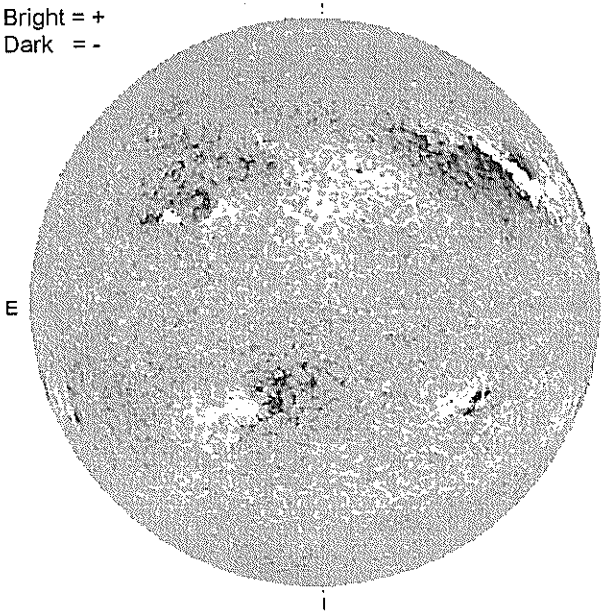


JANUARY 2, 1999 (P= 1.77, Bo = -3.10, Lo = 132.41)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



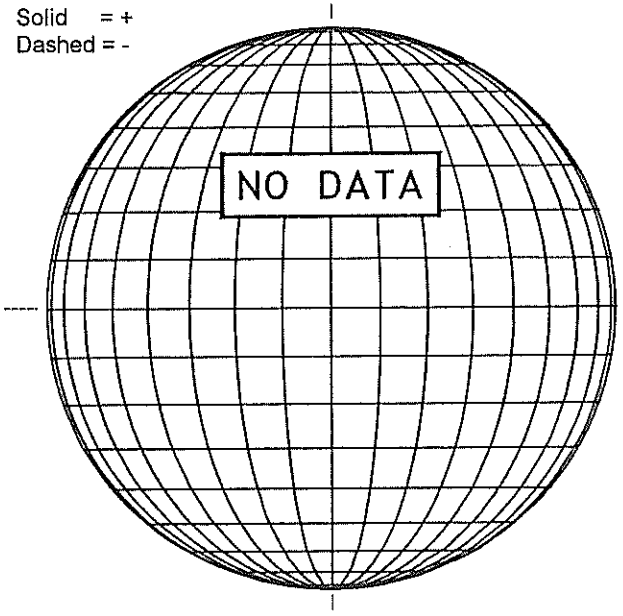
E

1610 UT

STANFORD MAGNETOGRAM

N

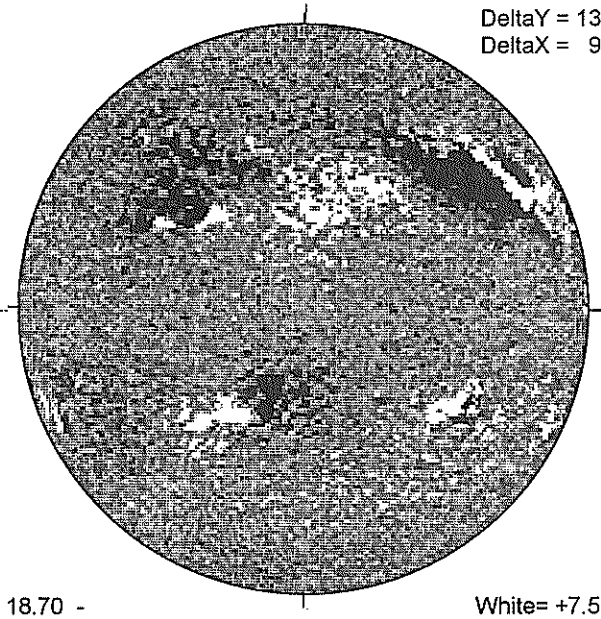
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

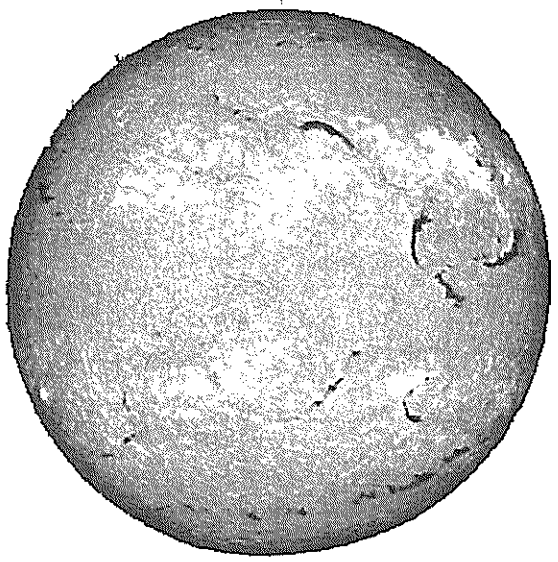


W

18.70 -
19.68 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

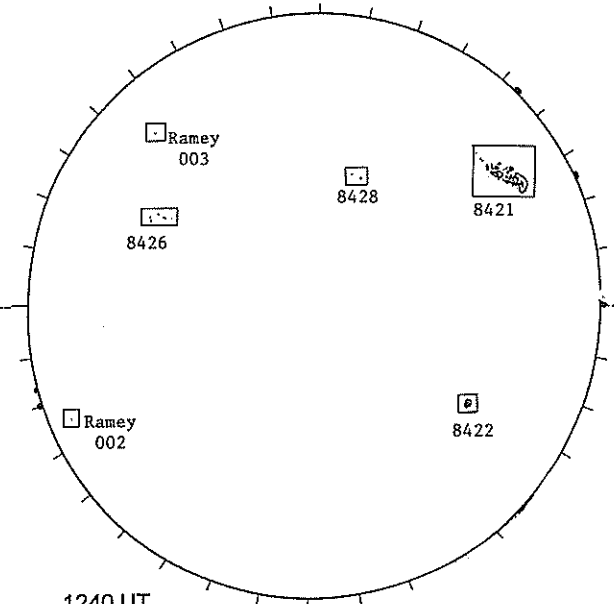


E

1418 UT

S

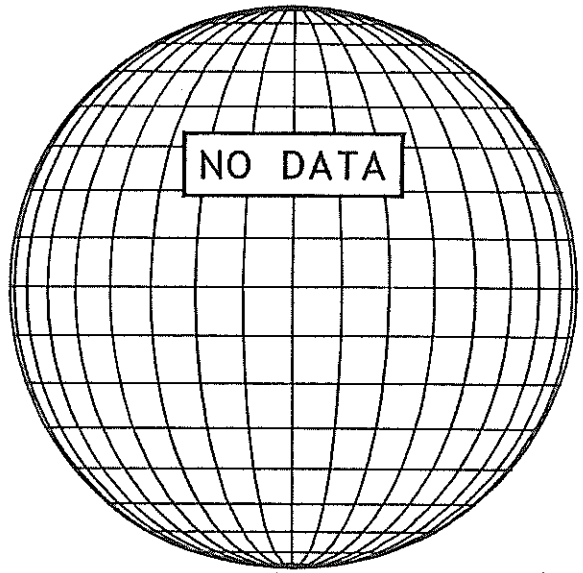
RAMEY SUNSPOT



1240 UT
1052 UT LOMN Prom

S

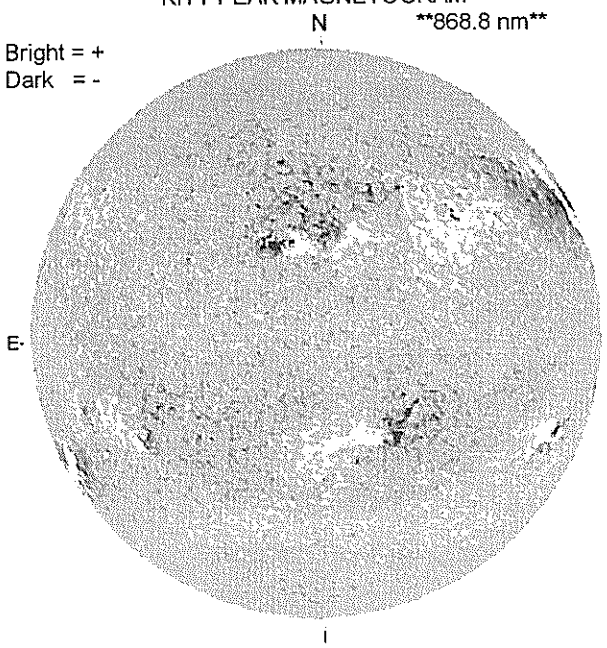
SACRAMENTO PEAK CORONA (1.15 Radii)



S

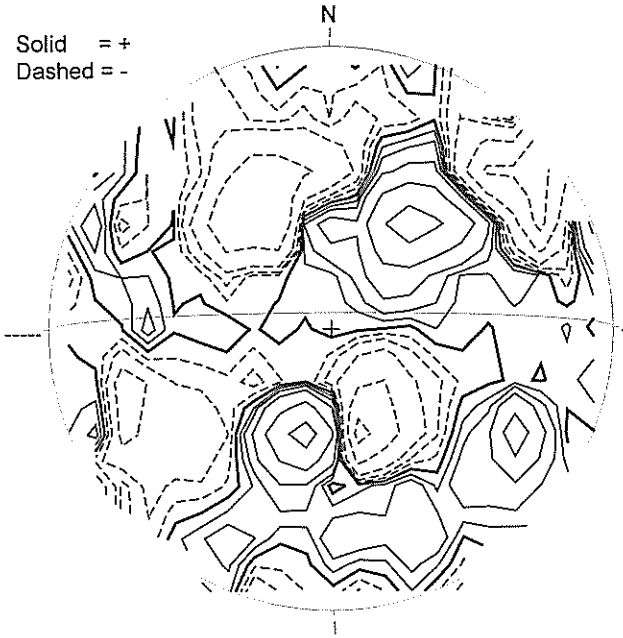
JANUARY 3, 1999 (P= 1.29, Bo = -3.22, Lo = 119.24)

KITT PEAK MAGNETOGRAM



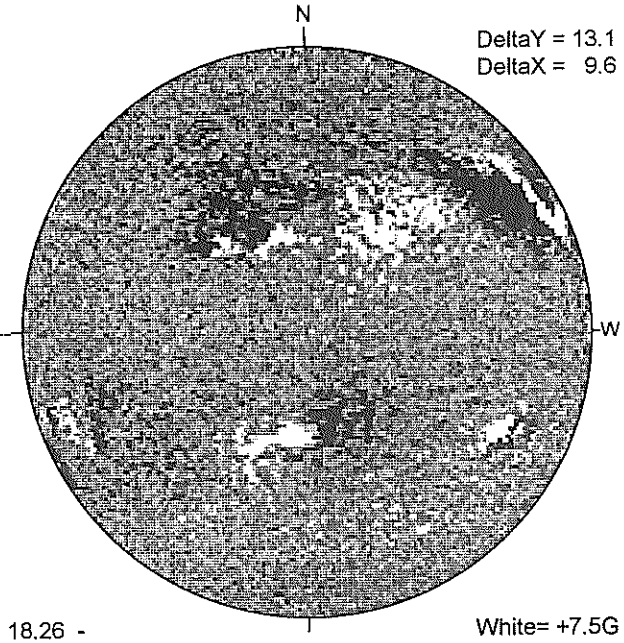
1601 UT

STANFORD MAGNETOGRAM



1827 UT

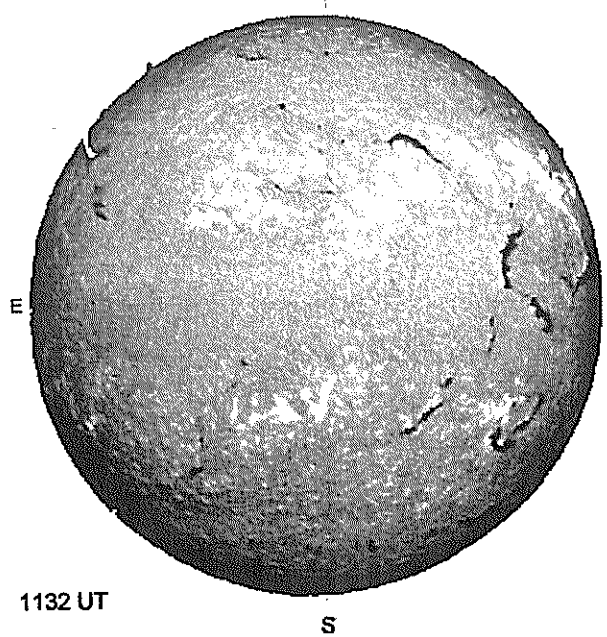
MT. WILSON MAGNETOGRAM



18.26 -
19.24 UT

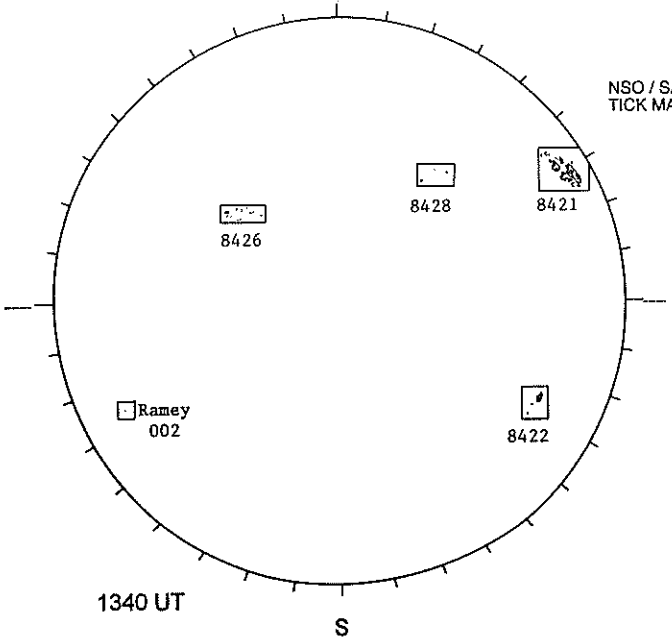
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



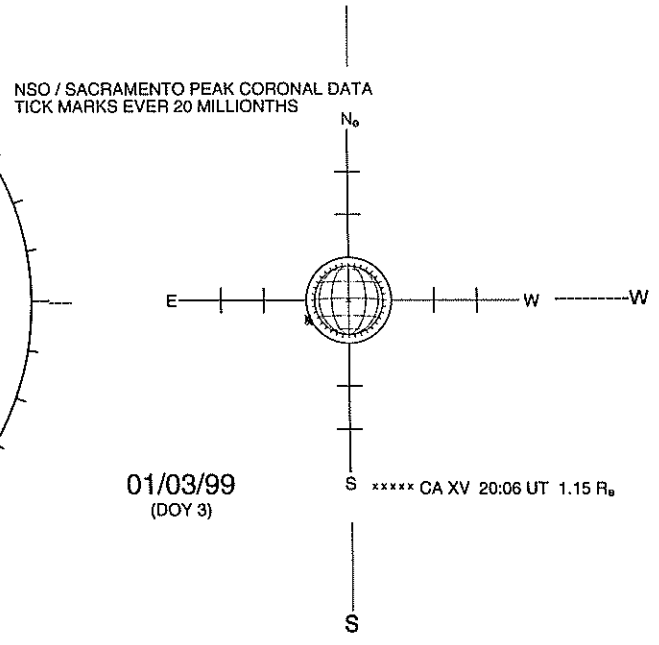
1132 UT

RAMEY SUNSPOT



1340 UT

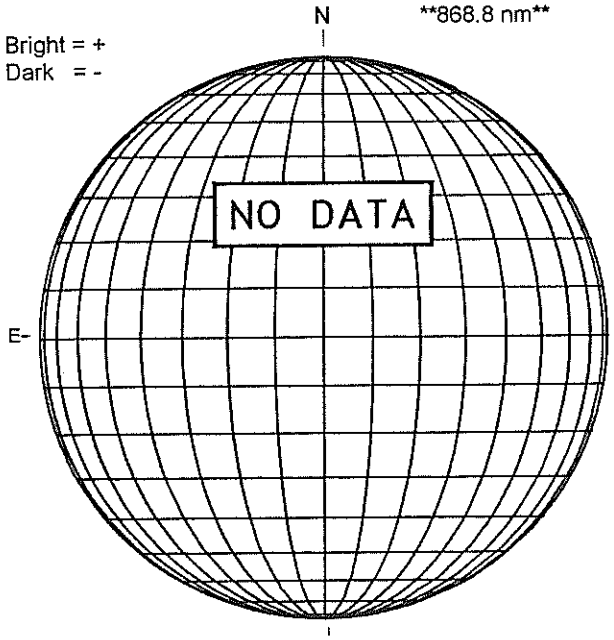
SACRAMENTO PEAK CORONA (1.15 Radii)----



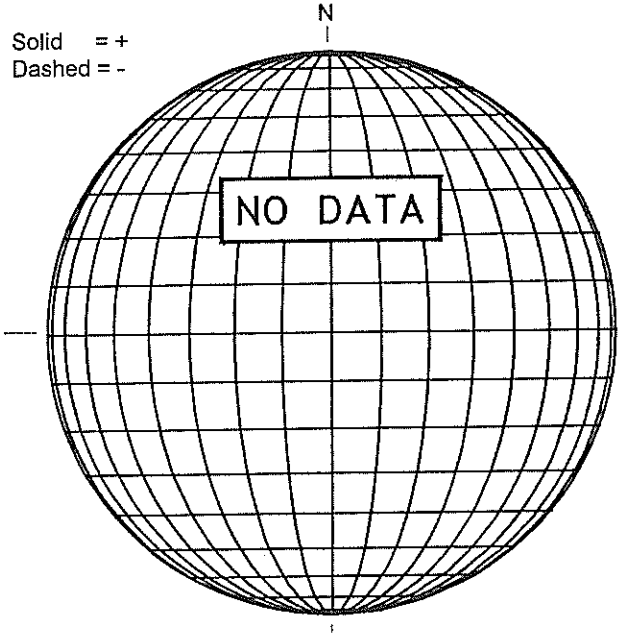
01/03/99
(DOY 3)

JANUARY 4, 1999 (P= 0.80, Bo = -3.33, Lo = 106.07)

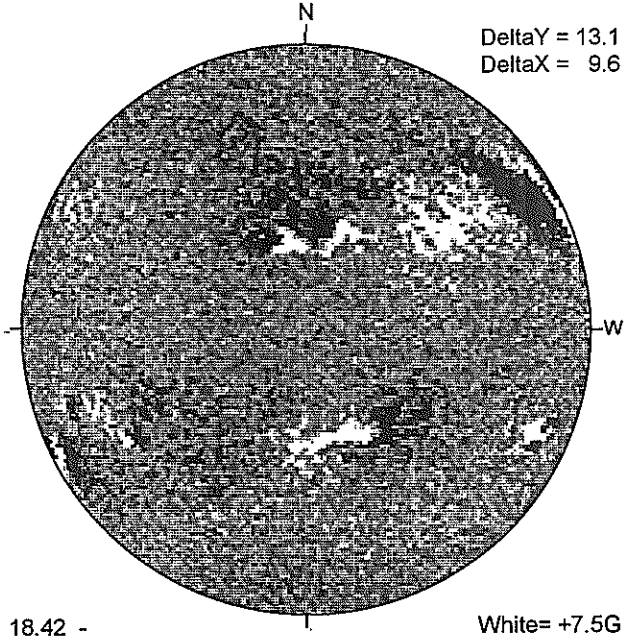
KITT PEAK MAGNETOGRAM



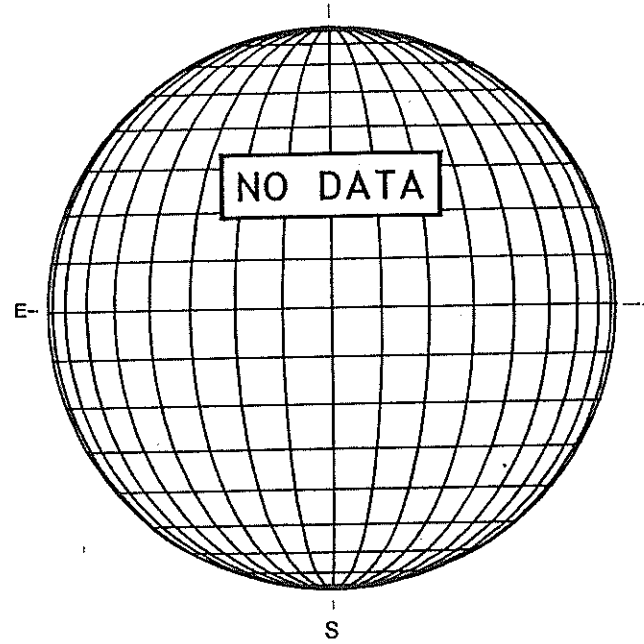
STANFORD MAGNETOGRAM



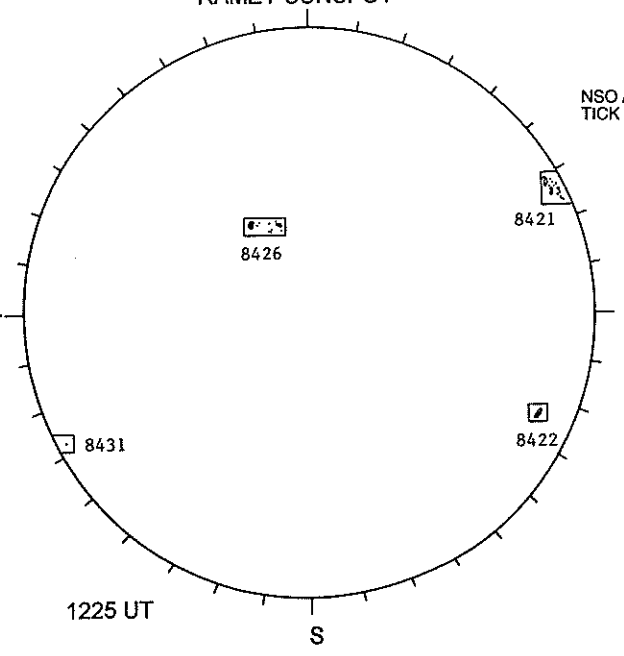
MT. WILSON MAGNETOGRAM



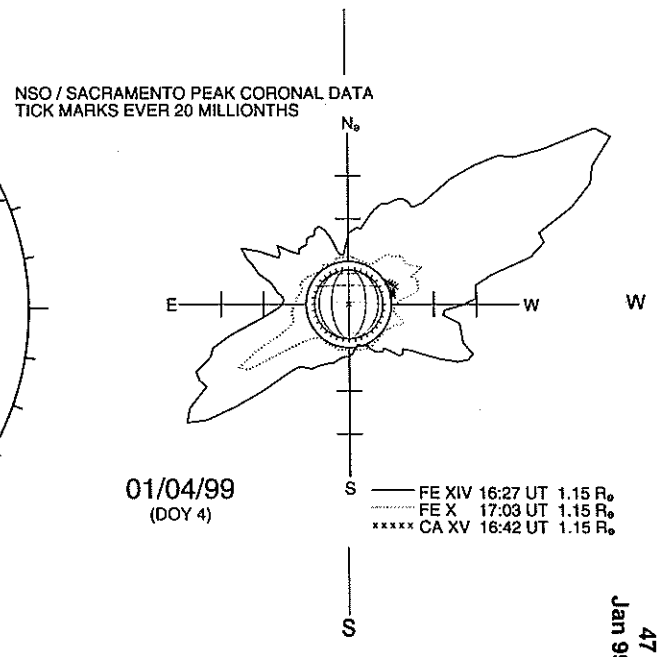
MEUDON H-ALPHA



RAMEY SUNSPOT

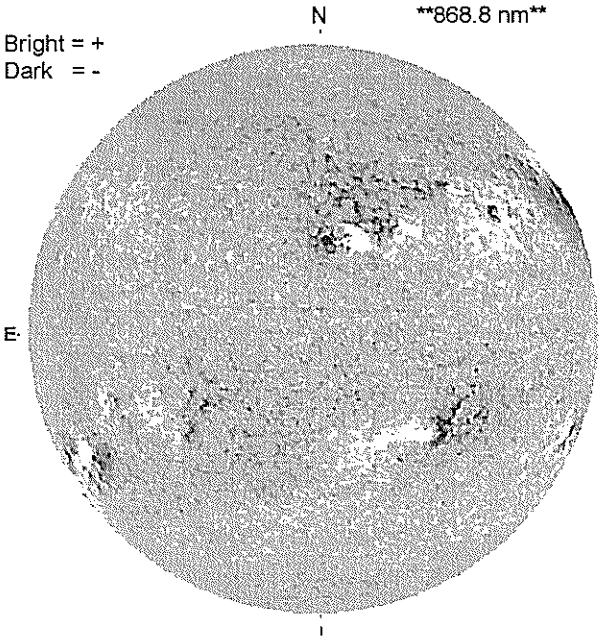


SACRAMENTO PEAK CORONA (1.15 Radii)----



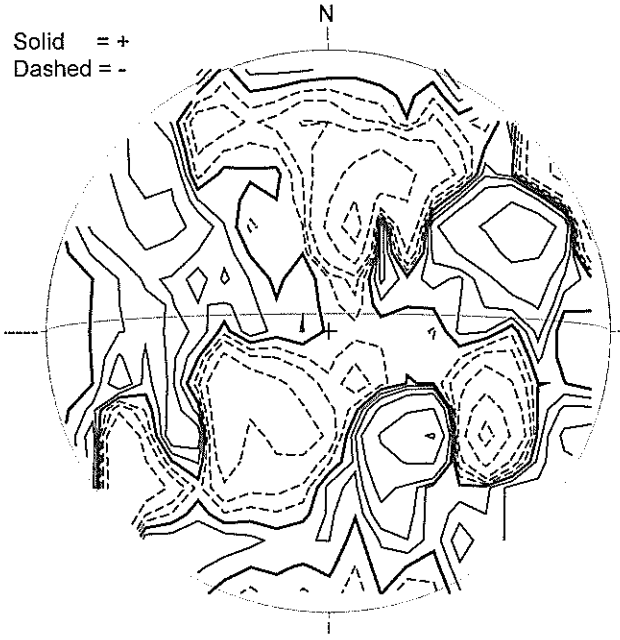
JANUARY 5, 1999 (P= 0.32, Bo = -3.44, Lo = 92.90)

KITT PEAK MAGNETOGRAM



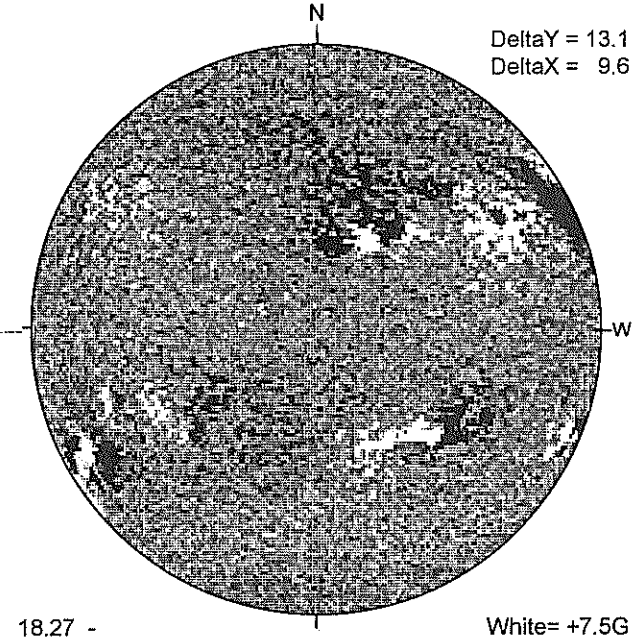
1550 UT

STANFORD MAGNETOGRAM



2218 UT

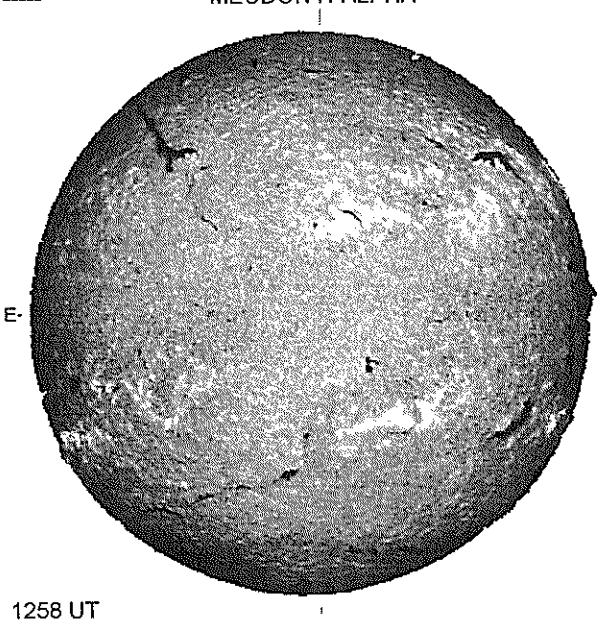
MT. WILSON MAGNETOGRAM



18.27 -
19.25 UT

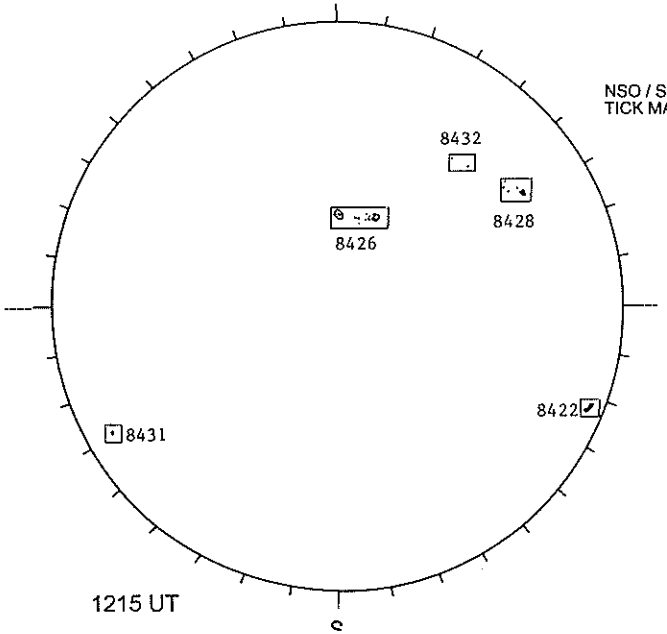
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



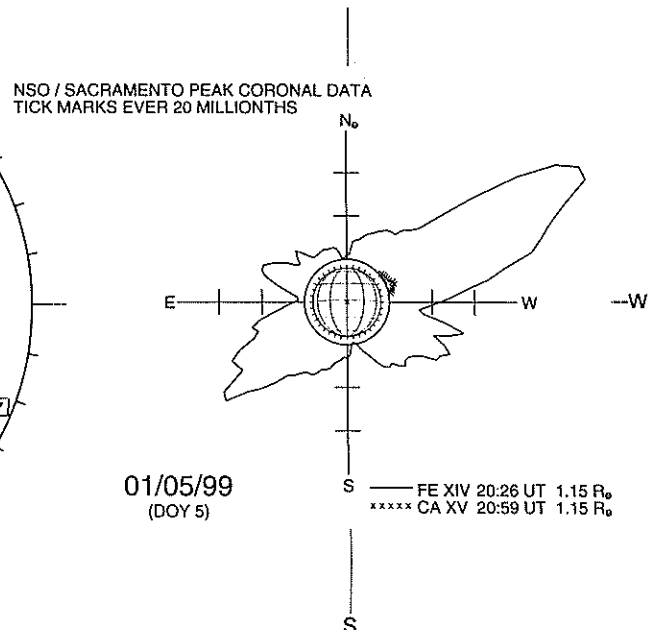
1258 UT

RAMEY SUNSPOT



1215 UT

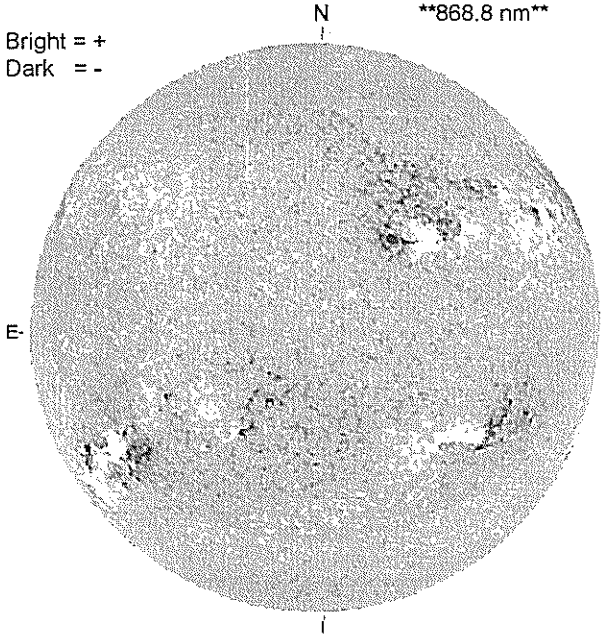
SACRAMENTO PEAK CORONA (1.15 Radii)----



01/05/99
(DOY 5)

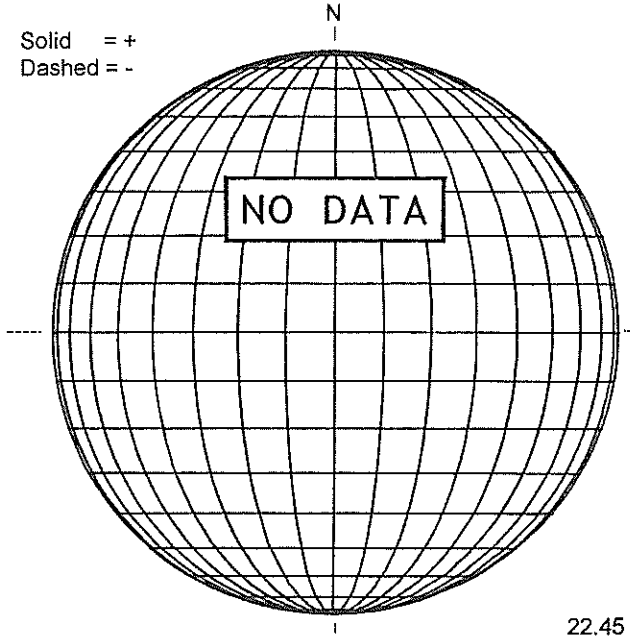
JANUARY 6, 1999 (P= -0.16, Bo = -3.56 Lo = 79.73)

KITT PEAK MAGNETOGRAM



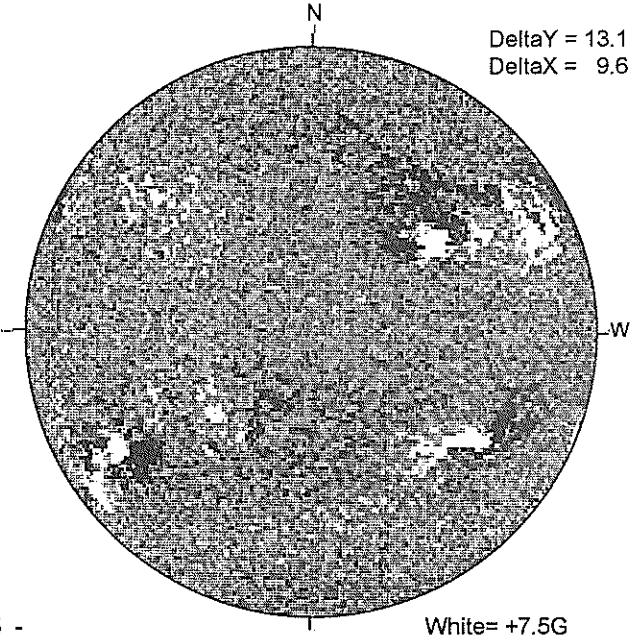
1654 UT

STANFORD MAGNETOGRAM



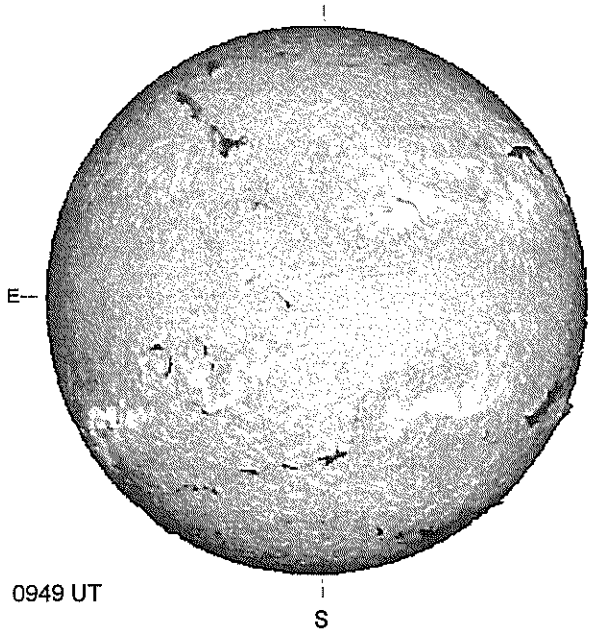
22.45 -
23.43 UT

MT. WILSON MAGNETOGRAM



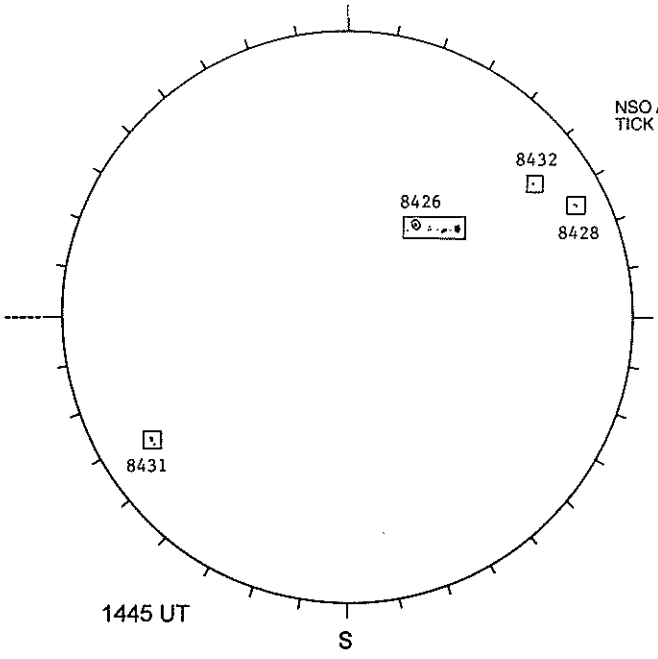
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



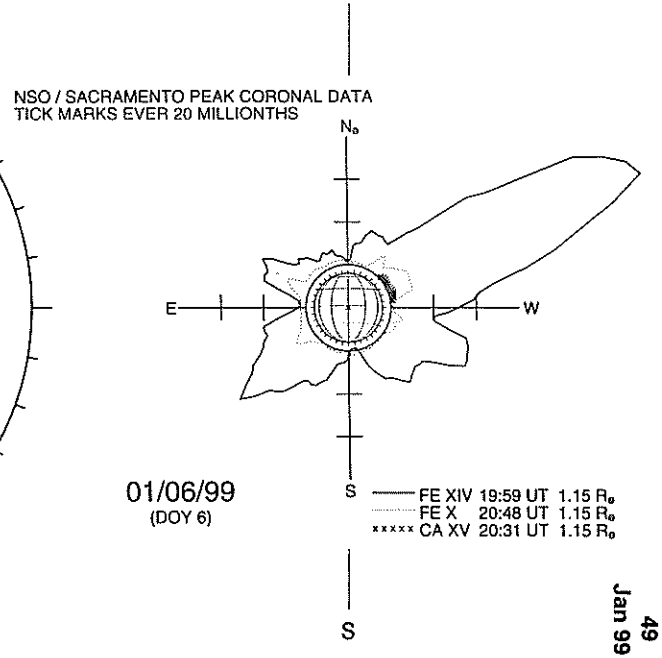
0949 UT

RAMEY SUNSPOT



1445 UT

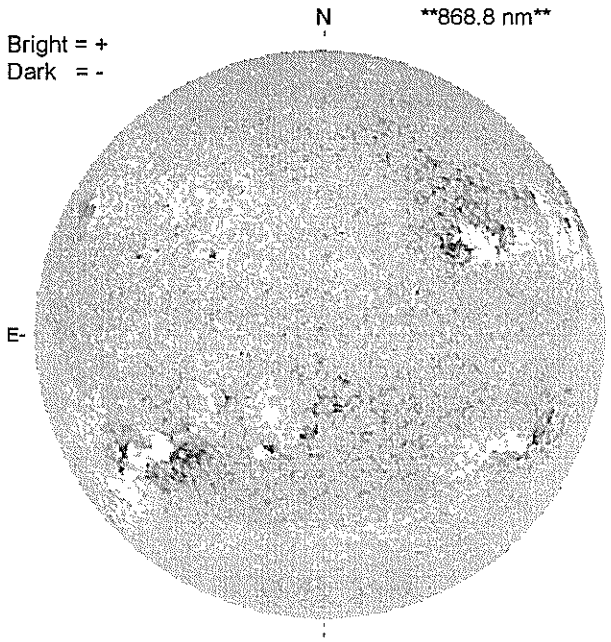
SACRAMENTO PEAK CORONA (1.15 Radii)----



01/06/99
(DOY 6)

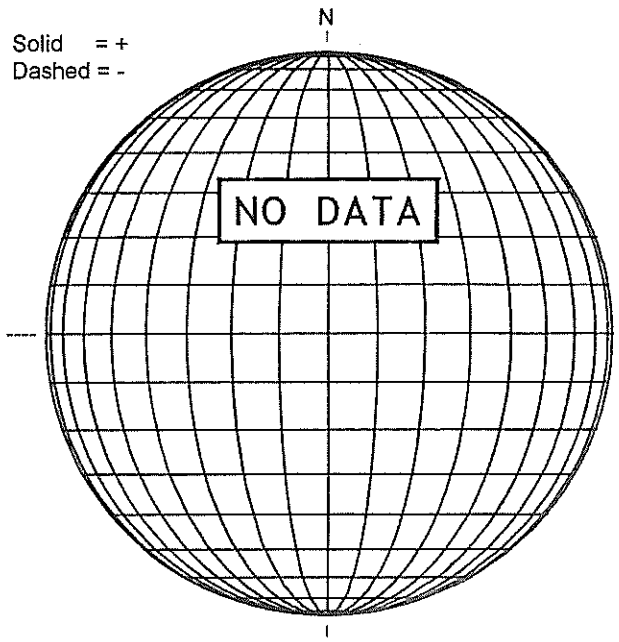
JANUARY 7, 1999 (P= -0.65, Bo = -3.67 Lo = 66.56)

KITT PEAK MAGNETOGRAM

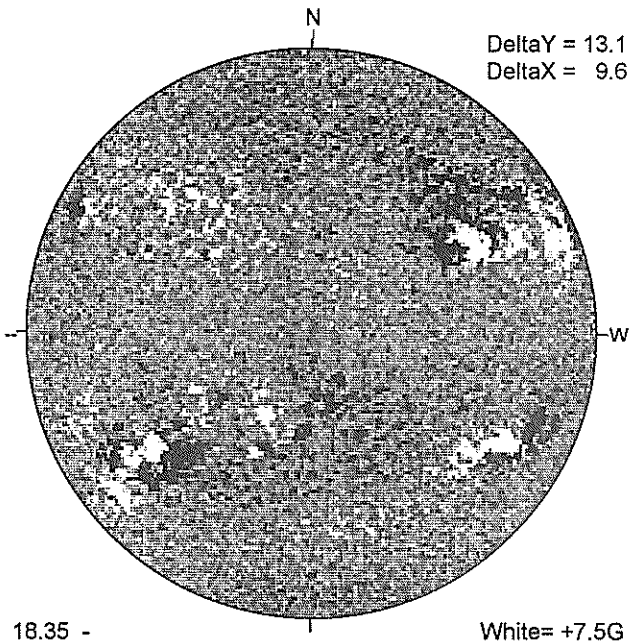


1626 UT

STANFORD MAGNETOGRAM



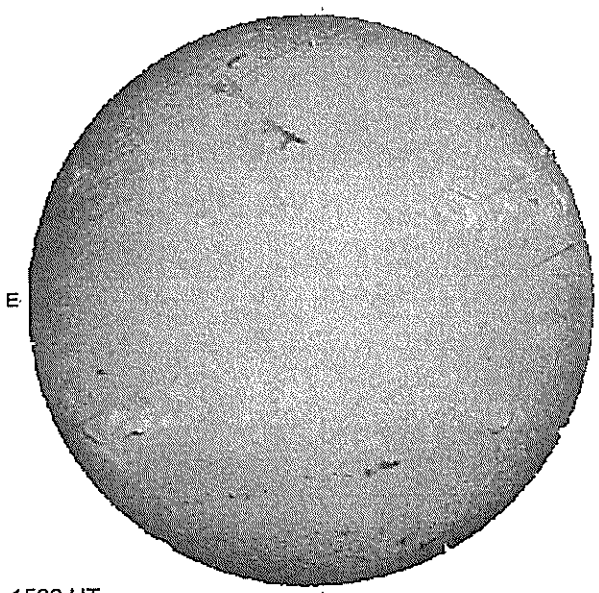
MT. WILSON MAGNETOGRAM



18.35 -
19.33 UT

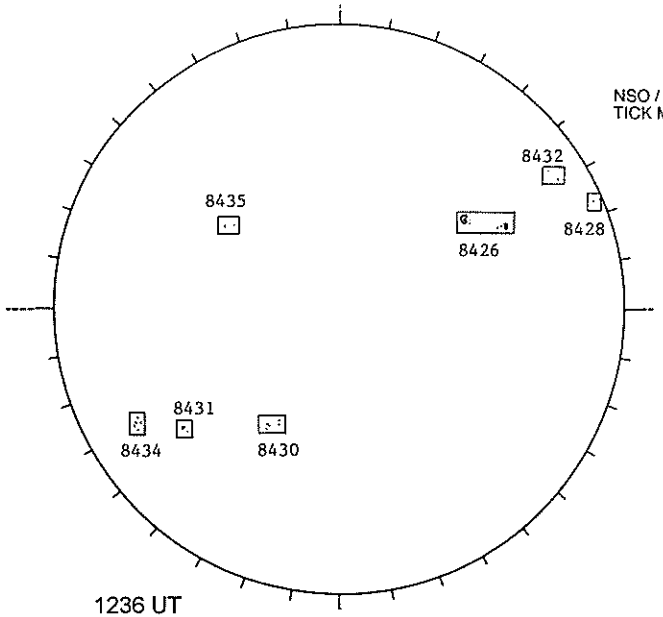
White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



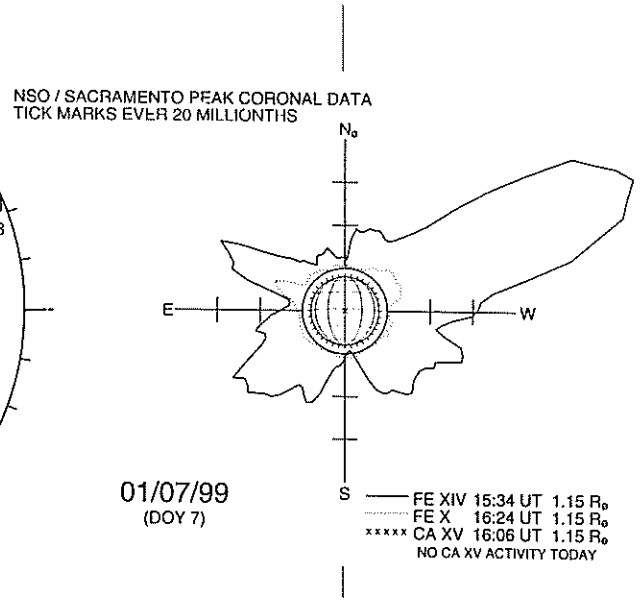
1506 UT

RAMEY SUNSPOT



1236 UT

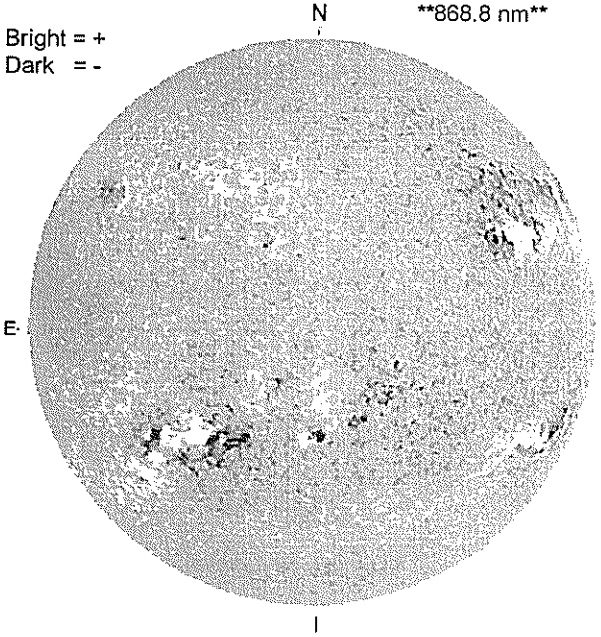
SACRAMENTO PEAK CORONA (1.15 Radii)



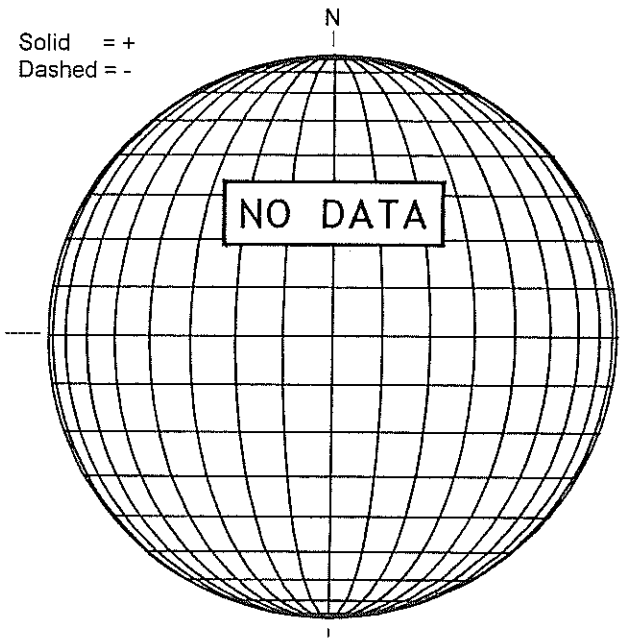
S

JANUARY 8, 1999 (P= -1.13, Bo = -3.78, Lo = 53.39)

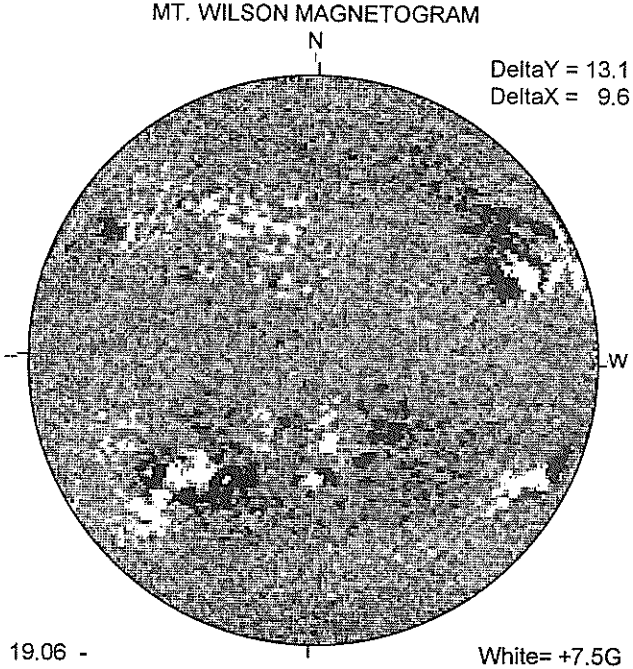
KITT PEAK MAGNETOGRAM



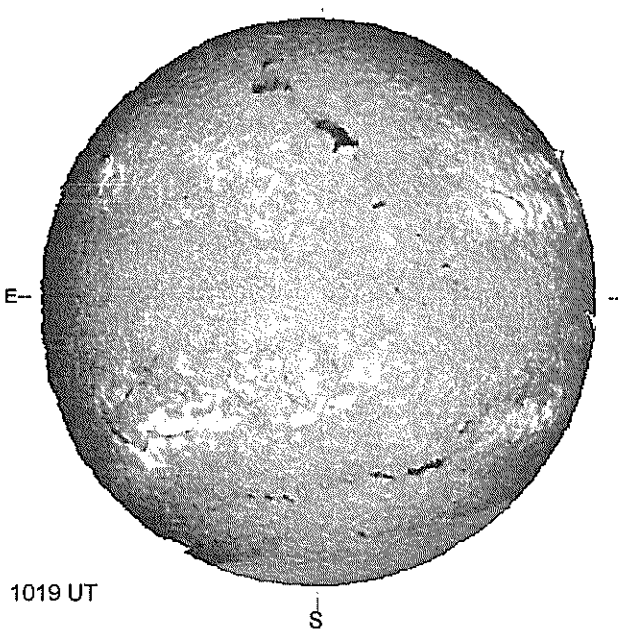
STANFORD MAGNETOGRAM



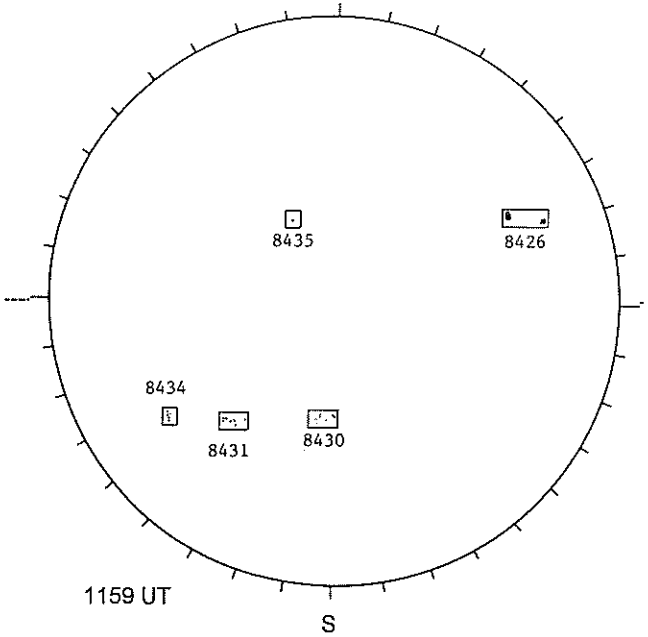
MT. WILSON MAGNETOGRAM



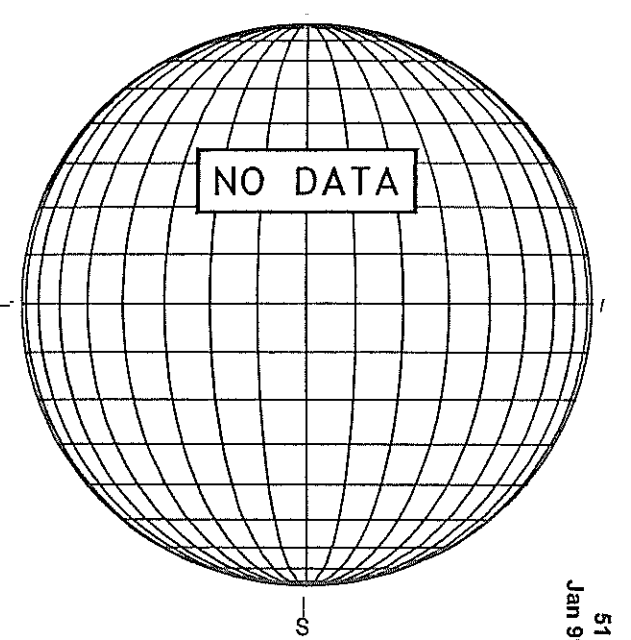
MEUDON H-ALPHA



RAMEY SUNSPOT

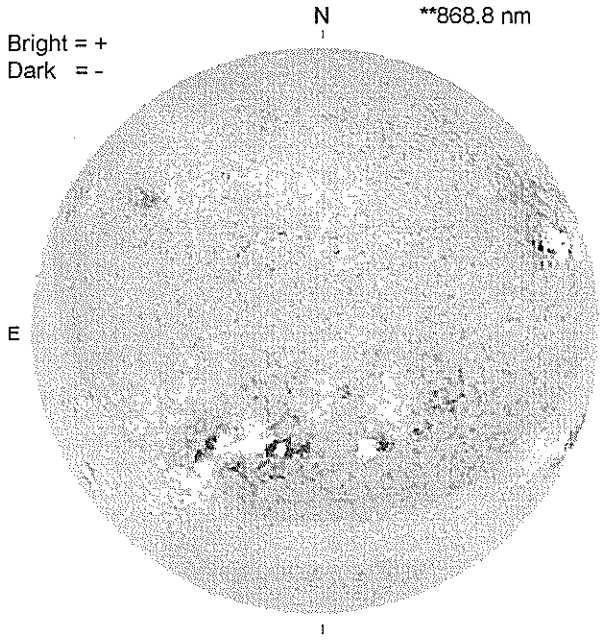


SACRAMENTO PEAK CORONA (1.15 Radii)----



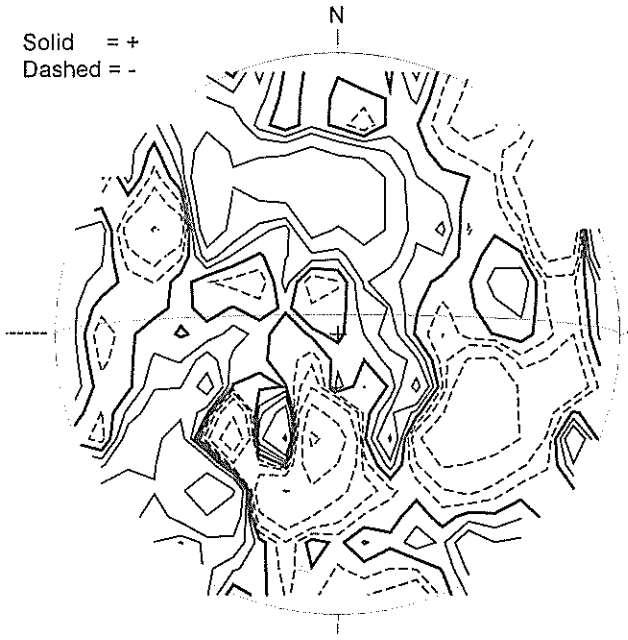
JANUARY 9, 1999 (P= -1.61, Bo = -3.89, Lo = 40.22)

KITT PEAK MAGNETOGRAM



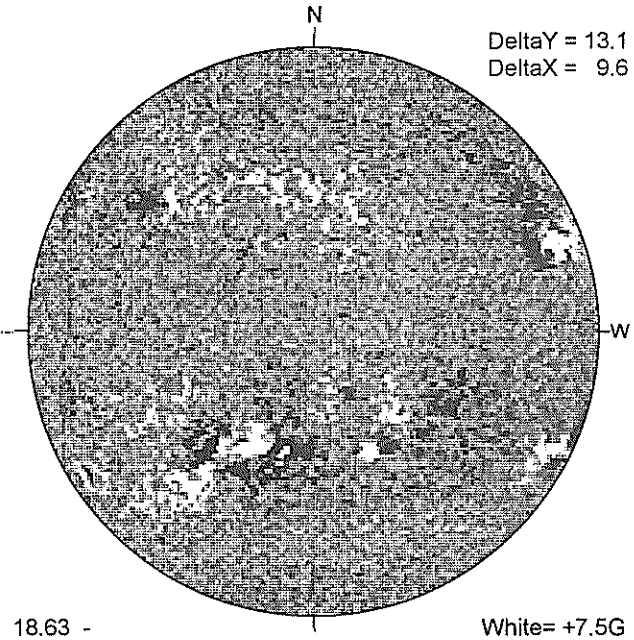
1636 UT

STANFORD MAGNETOGRAM



1824 UT

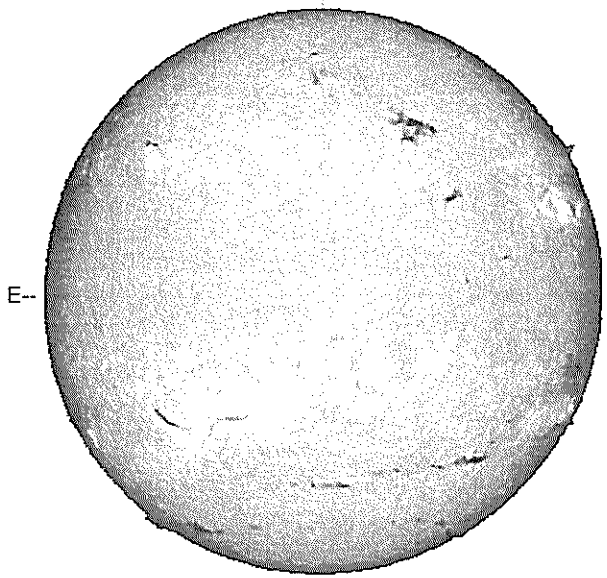
MT. WILSON MAGNETOGRAM



18.63 -
19.60 UT

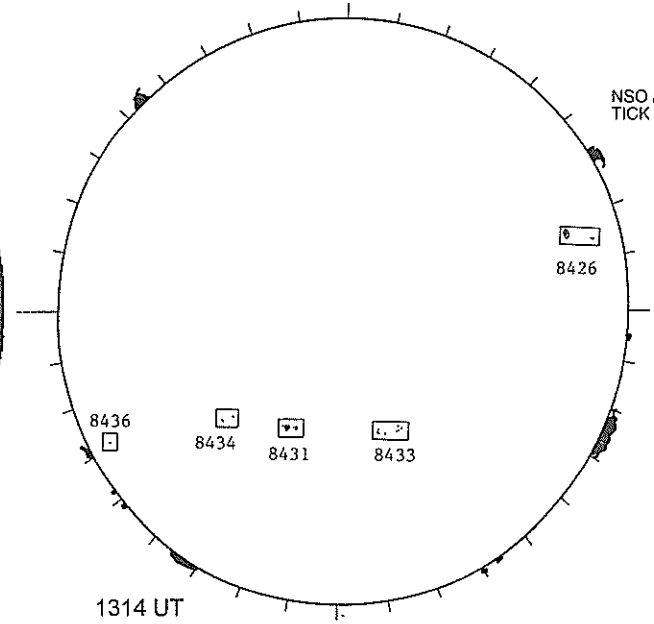
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



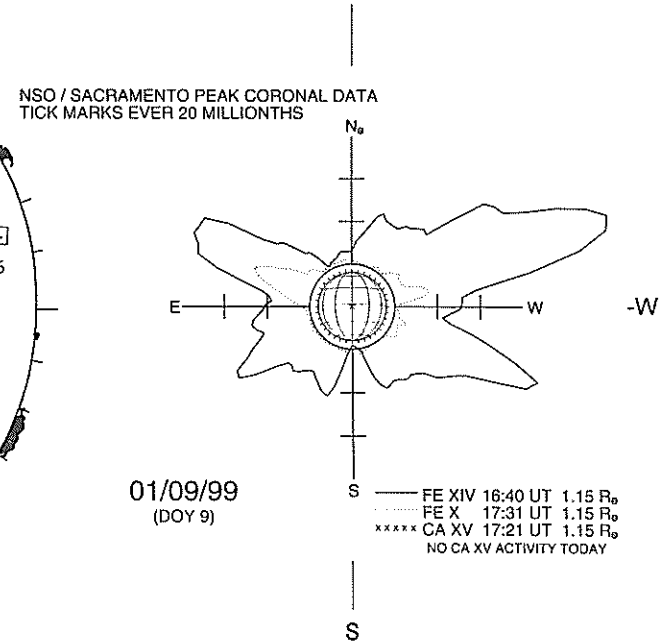
1157 UT

RAMEY SUNSPOT



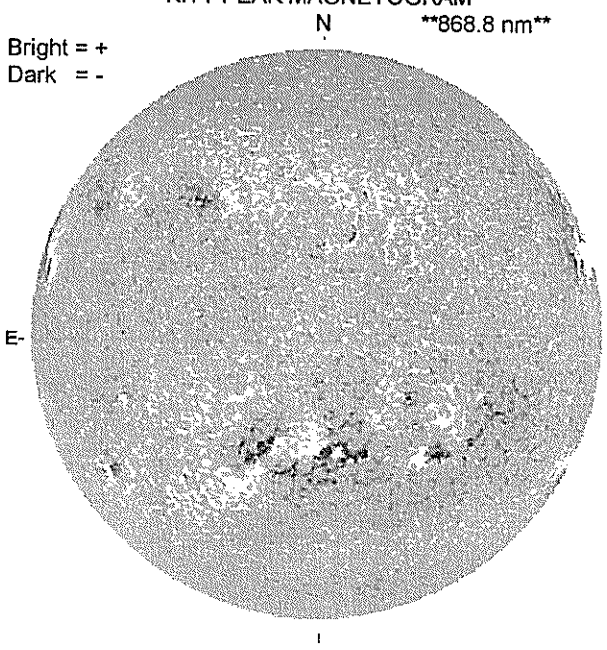
1314 UT
1052 UT LOMN Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



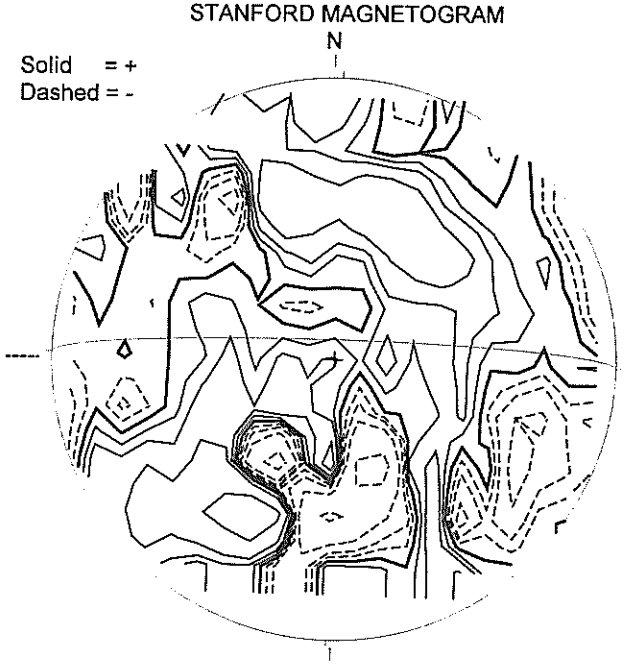
JANUARY 10, 1999 (P= -2.09, Bo = -4.00, Lo = 27.05)

KITT PEAK MAGNETOGRAM



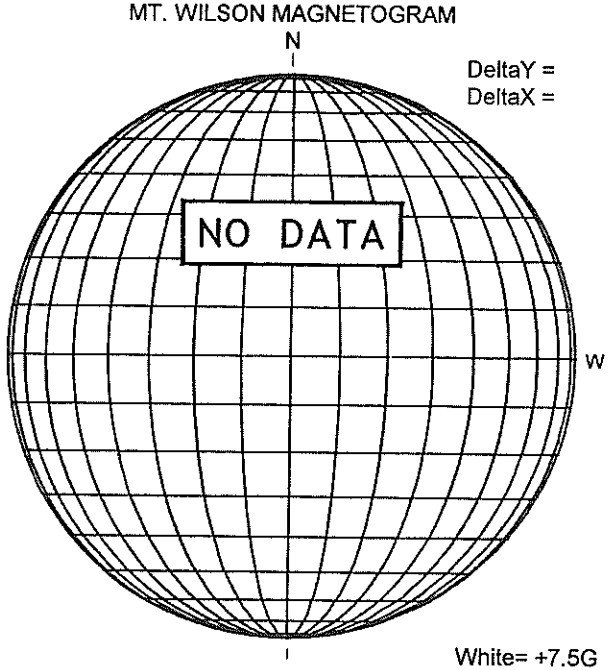
1728 UT

STANFORD MAGNETOGRAM



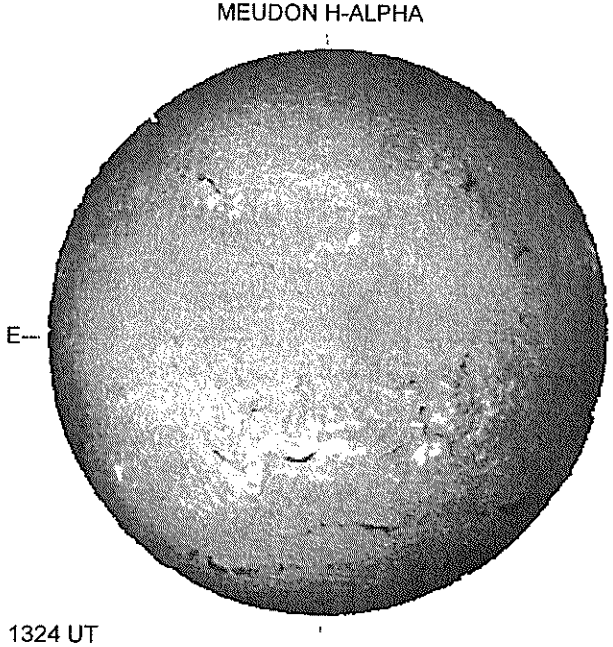
2309 UT

MT. WILSON MAGNETOGRAM



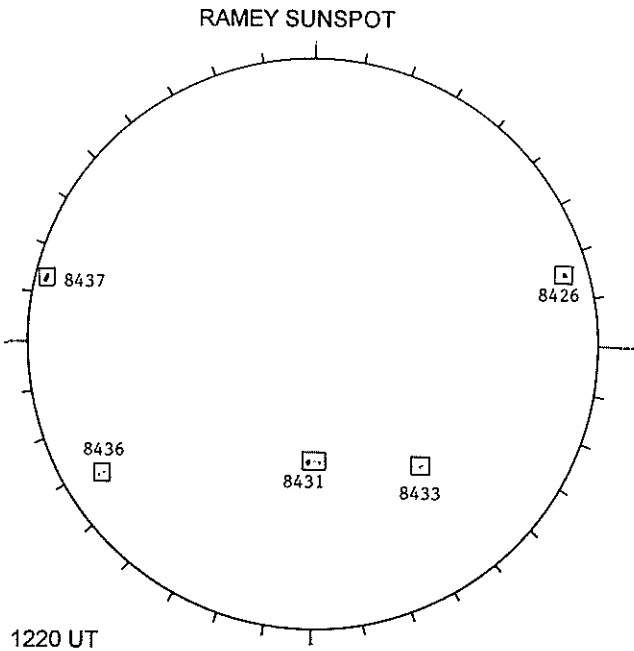
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



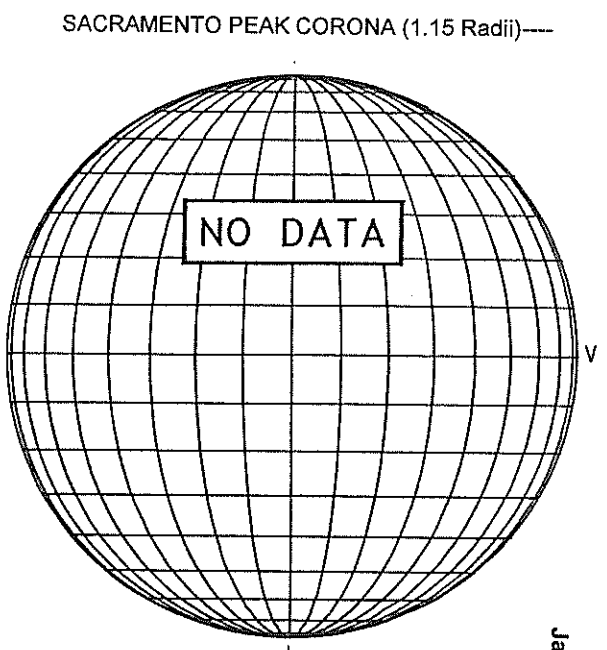
1324 UT

RAMEY SUNSPOT



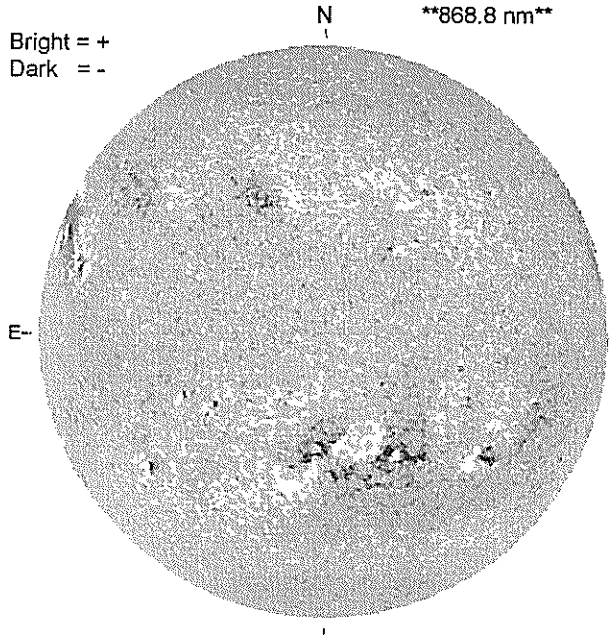
1220 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



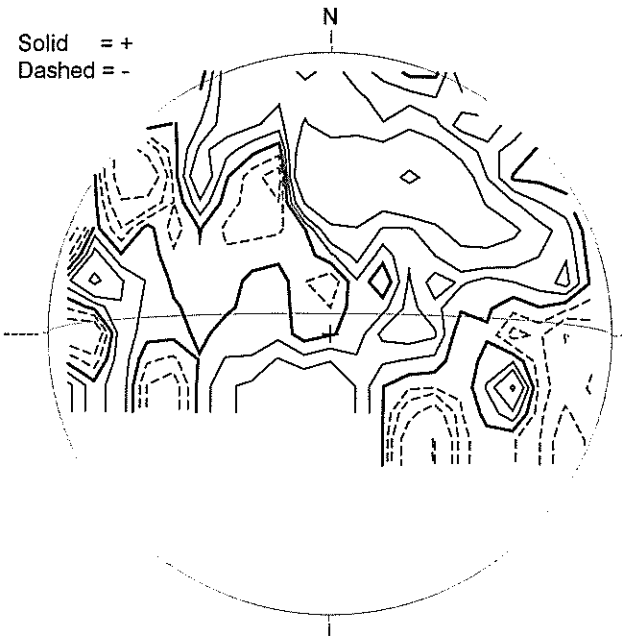
JANUARY 11, 1999 (P= -2.57 Bo = -4.10, Lo = 13.88)

KITT PEAK MAGNETOGRAM



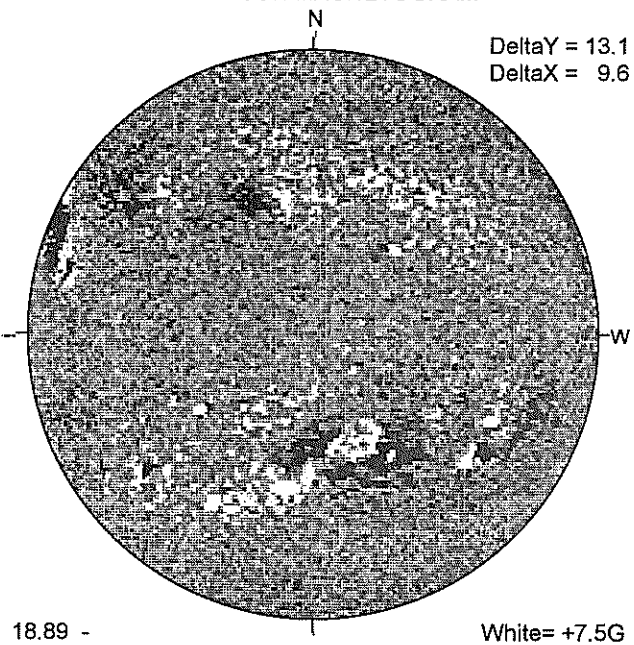
1607 UT

STANFORD MAGNETOGRAM



2207 UT

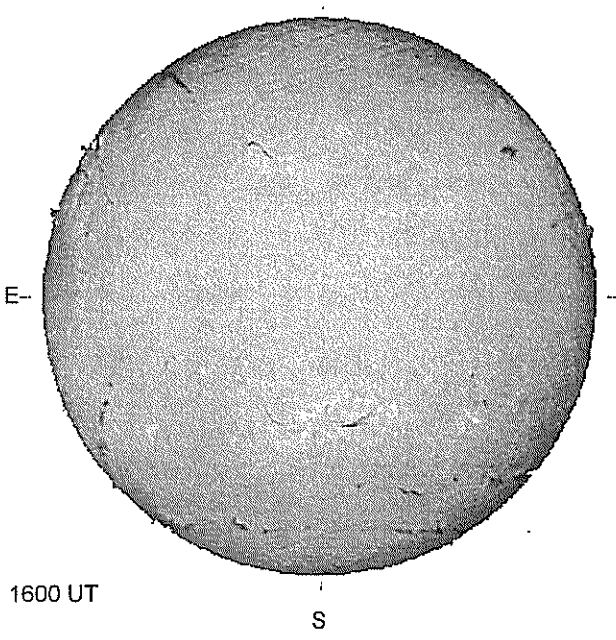
MT. WILSON MAGNETOGRAM



18.89 -
19.87 UT

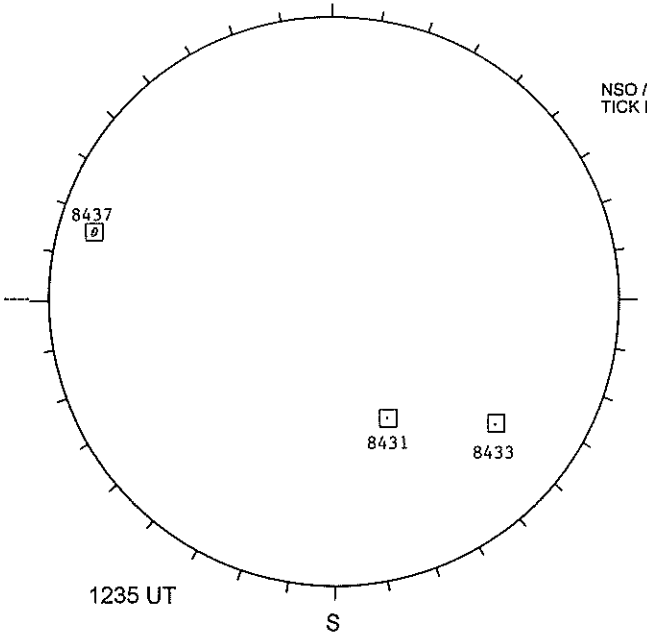
White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



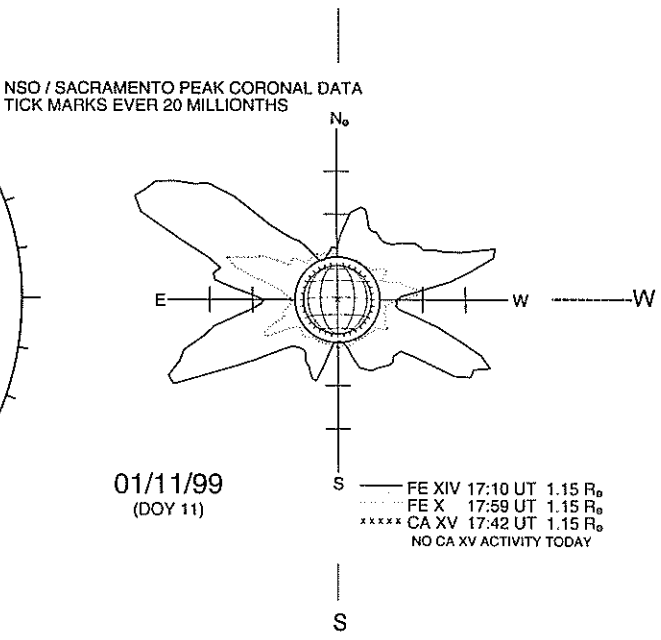
1600 UT

RAMEY SUNSPOT



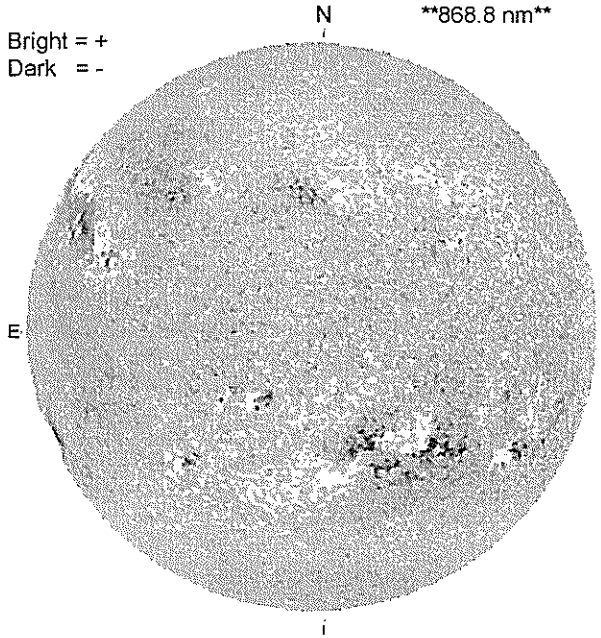
1235 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



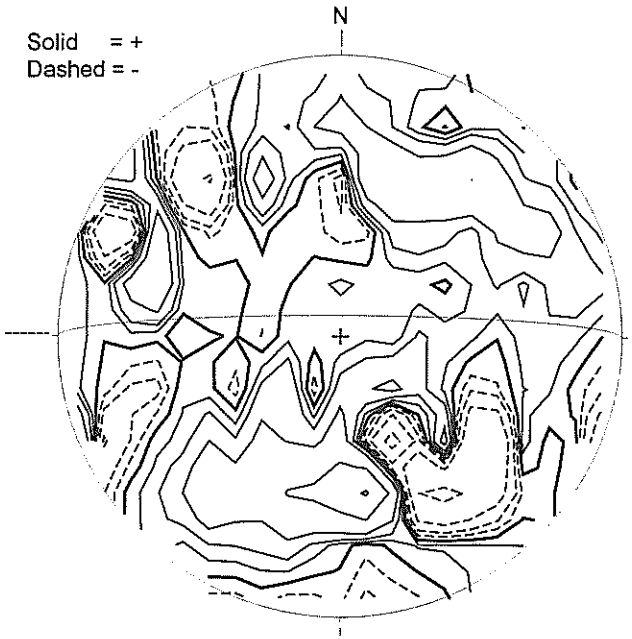
JANUARY 12, 1999 (P= -3.05, Bo = -4.21, Lo = 0.71)

KITT PEAK MAGNETOGRAM



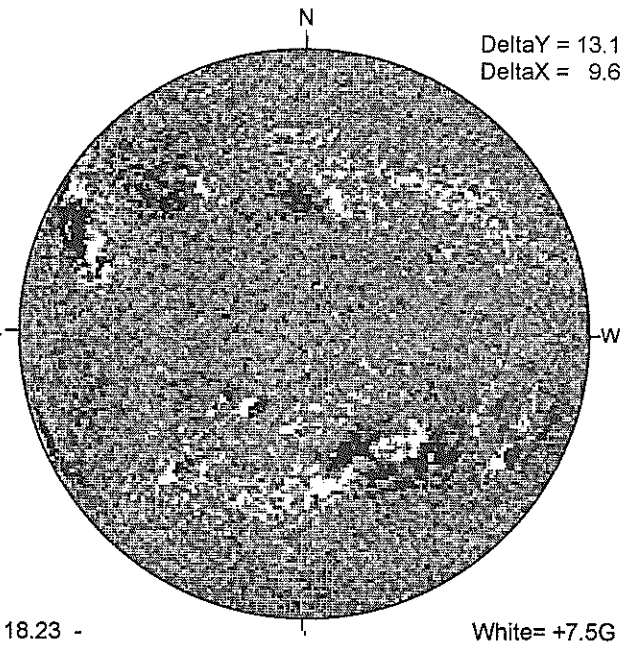
1636 UT

STANFORD MAGNETOGRAM



2122 UT

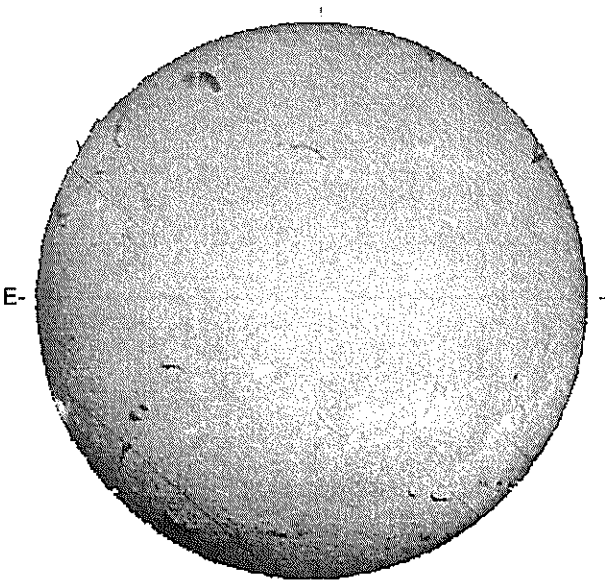
MT. WILSON MAGNETOGRAM



18.23 -
19.21 UT

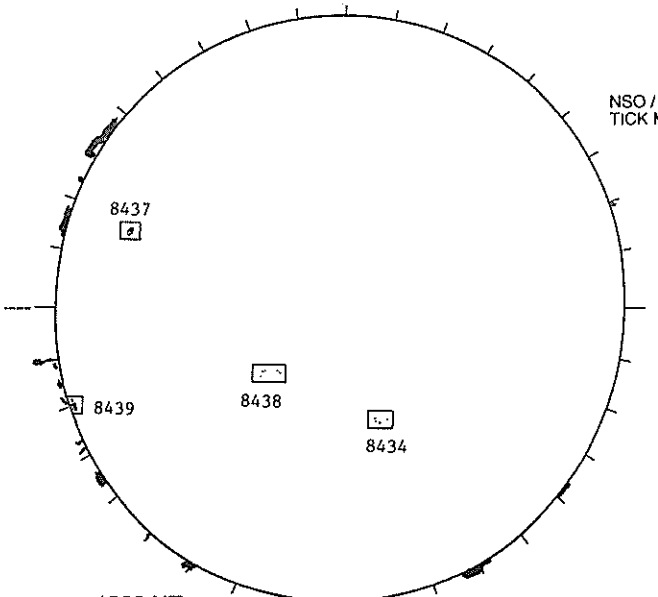
White= +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



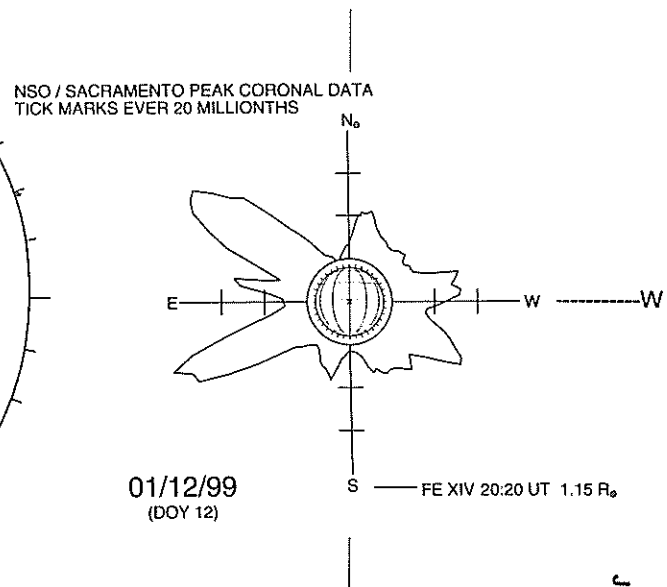
1952 UT

RAMEY SUNSPOT



1226 UT
0730 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



01/12/99
(DOY 12)

S

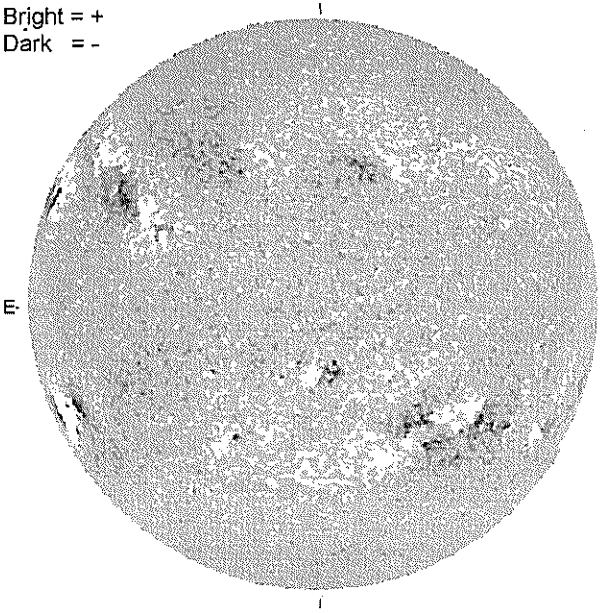
55
Jan 9

JANUARY 13, 1999 (P= -3.52, Bo = -4.31, Lo = 347.54)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



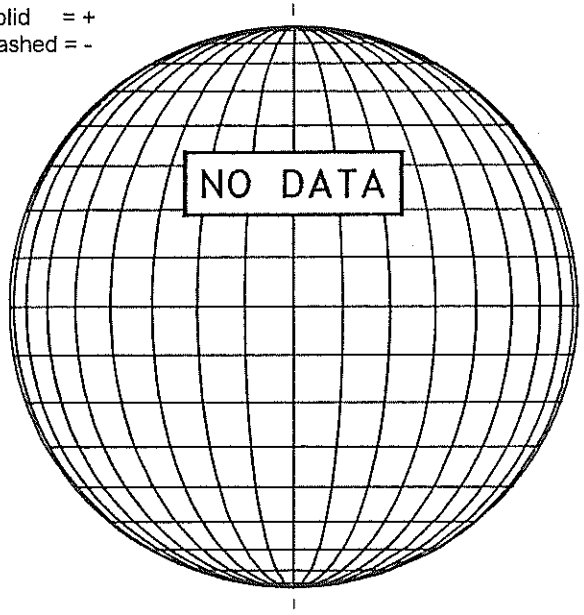
E-

1624 UT

STANFORD MAGNETOGRAM

N

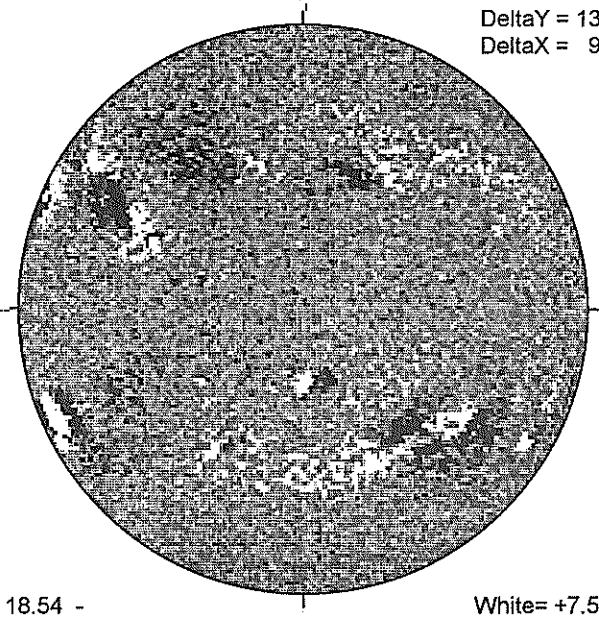
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

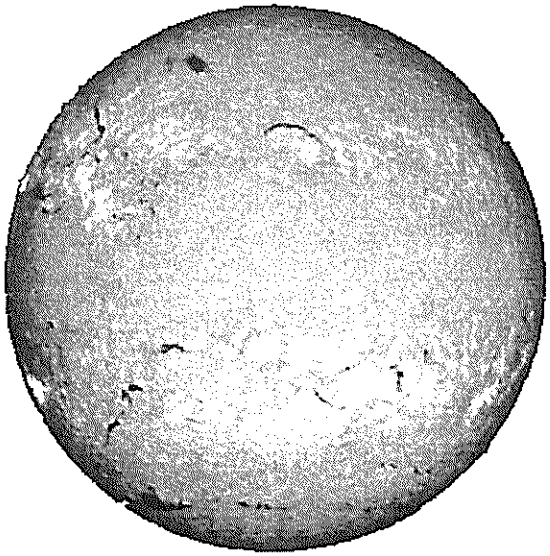


-W

18.54 -
19.52 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

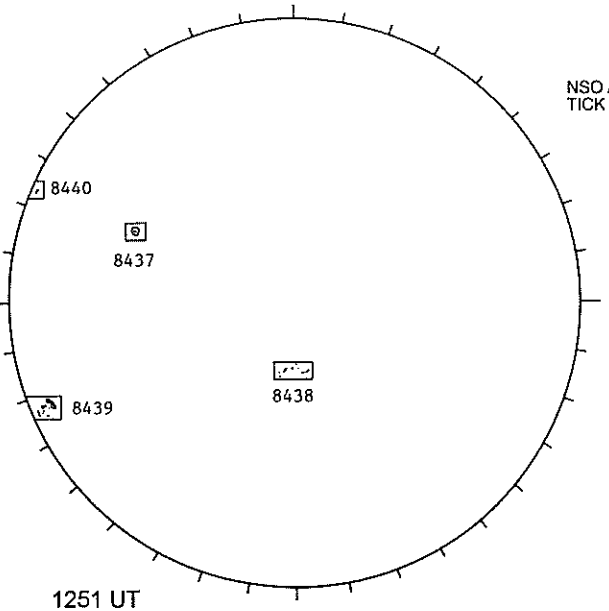


E--

0922 UT

S

RAMEY SUNSPOT

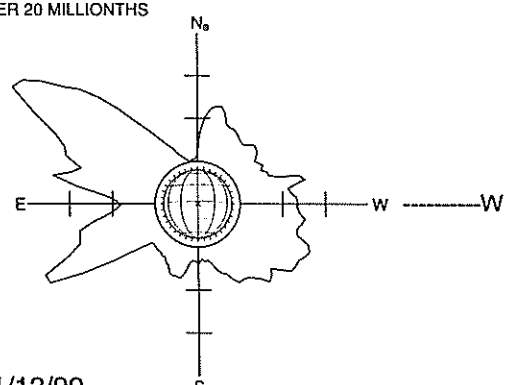


1251 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



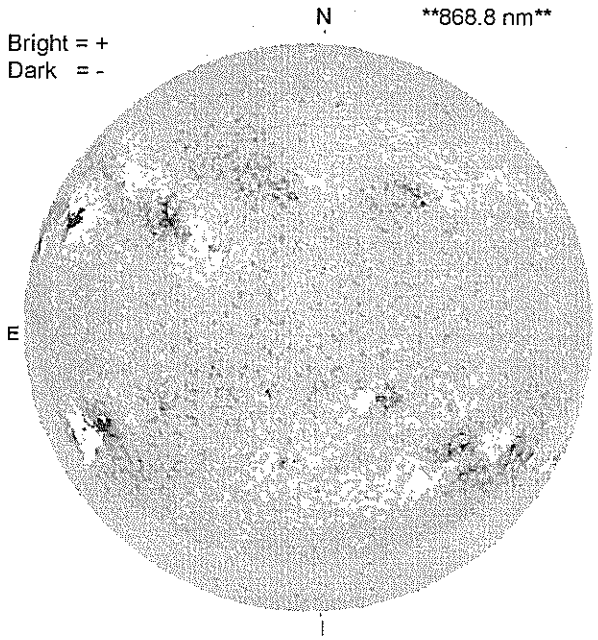
01/13/99
(DOY 13)

FE XIV 15:44 UT 1.15 R_o

S

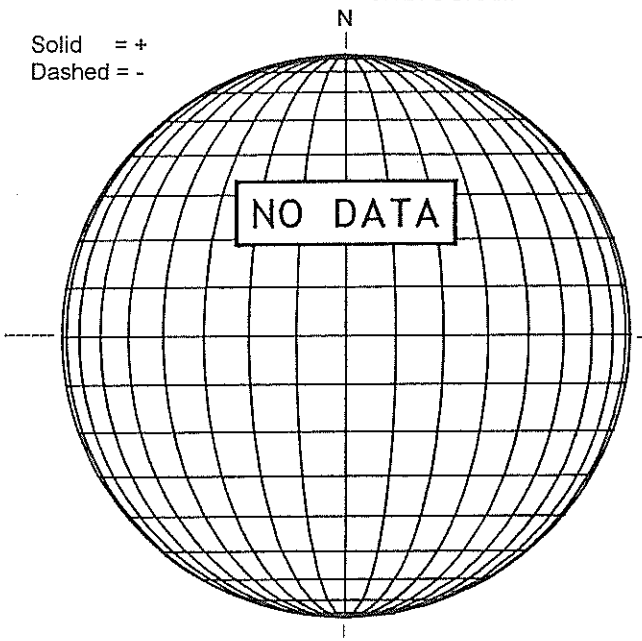
JANUARY 14, 1999 (P= -4.00, Bo = -4.42, Lo = 334.38)

KITT PEAK MAGNETOGRAM

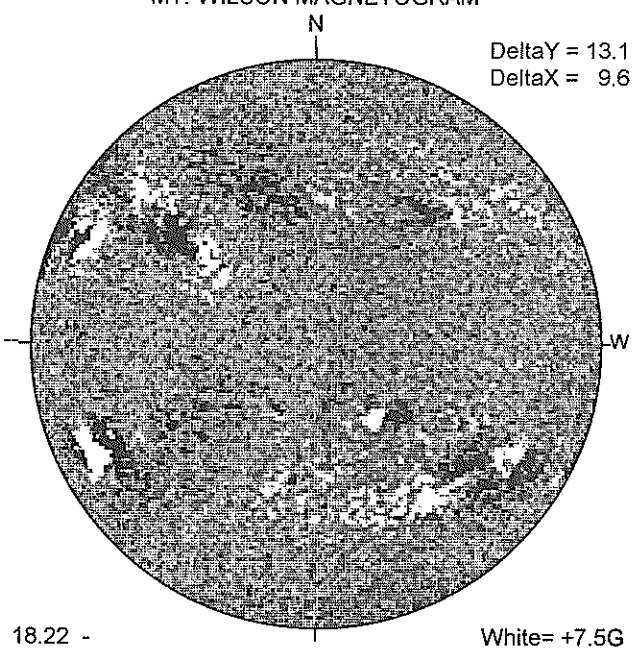


1631 UT

STANFORD MAGNETOGRAM



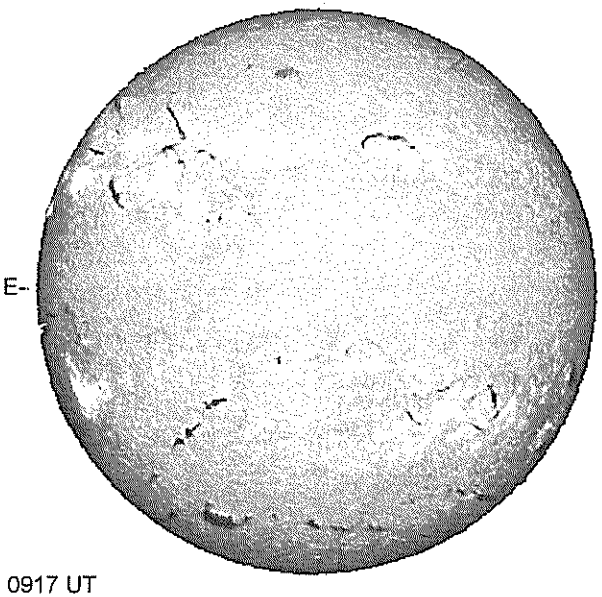
MT. WILSON MAGNETOGRAM



18.22 -
19.20 UT

White= +7.5G
Black = -7.5G

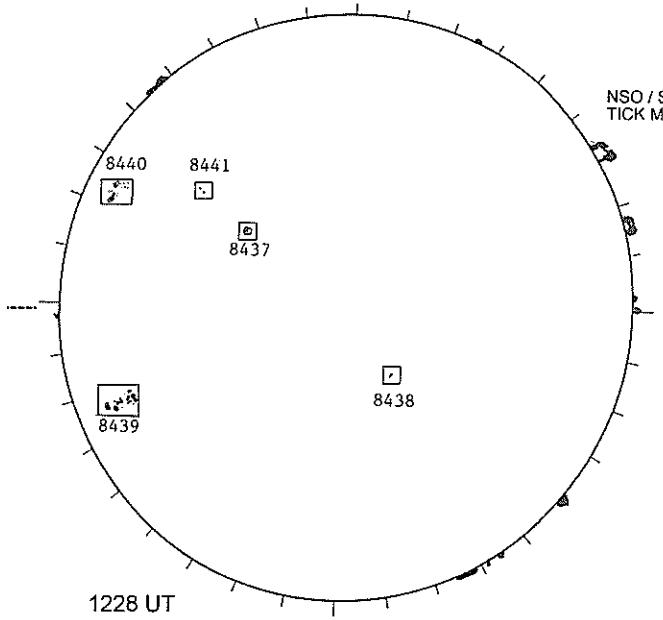
MEUDON H-ALHPA



0917 UT

S

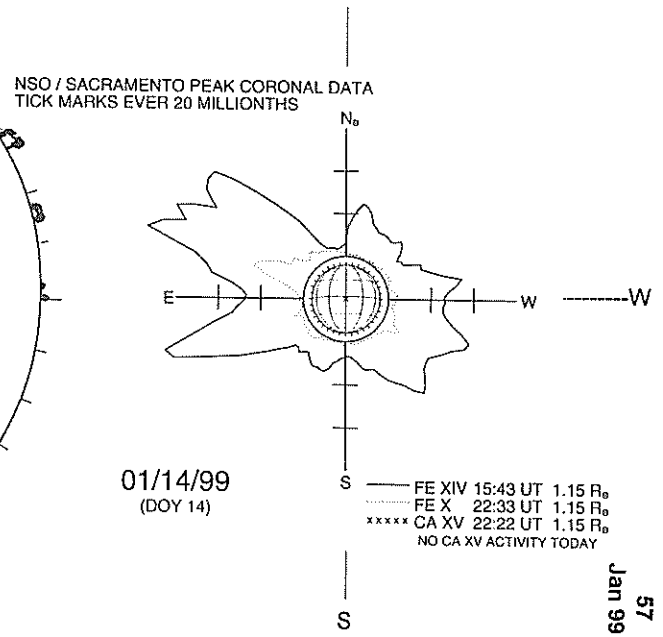
RAMEY SUNSPOT



1228 UT
0745 UT LOMN Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)

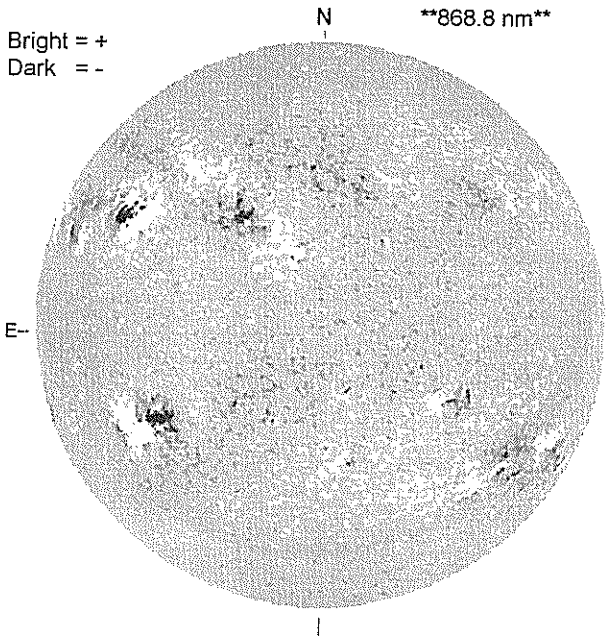


S

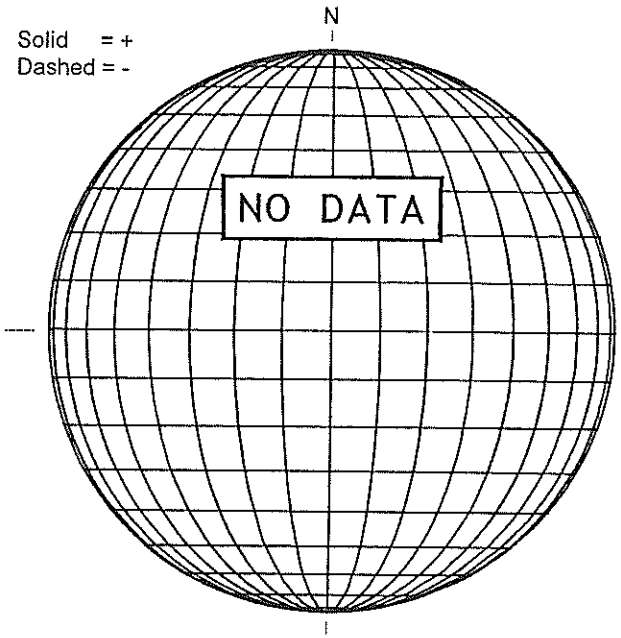
57
Jan 99

JANUARY 15, 1999 (P= -4.47, Bo = -4.52, Lo = 321.21)

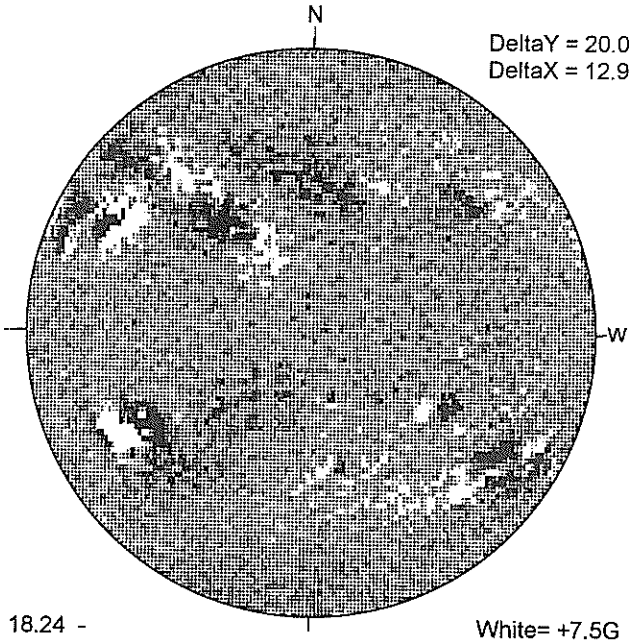
KITT PEAK MAGNETOGRAM



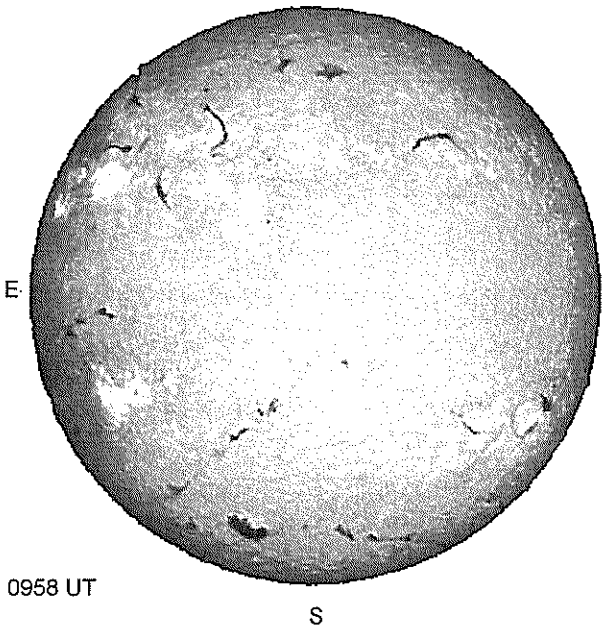
STANFORD MAGNETOGRAM



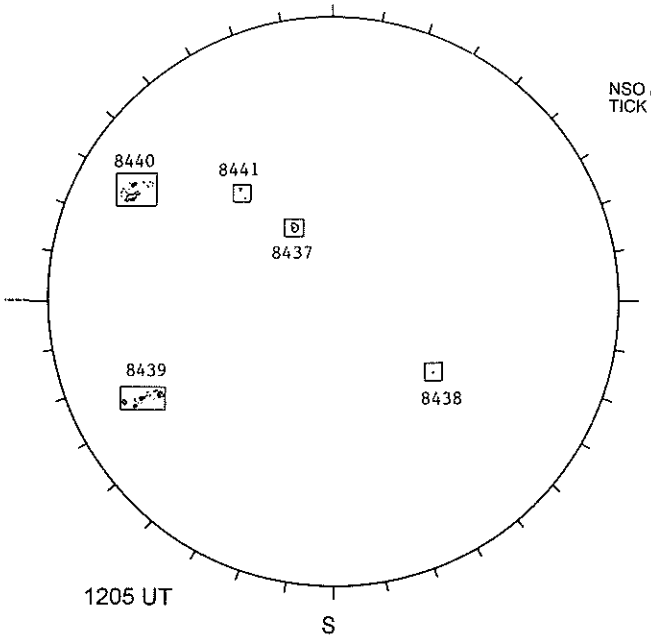
MT. WILSON MAGNETOGRAM



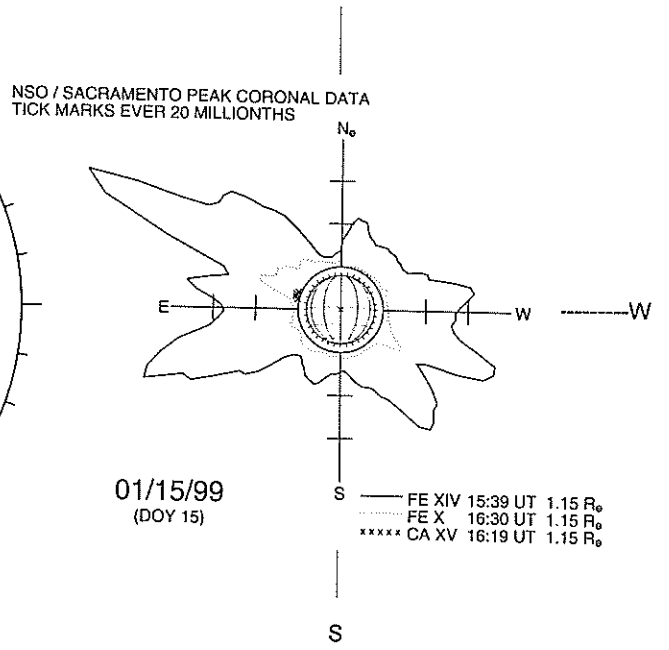
MEUDON H-ALPHA



RAMEY SUNSPOT

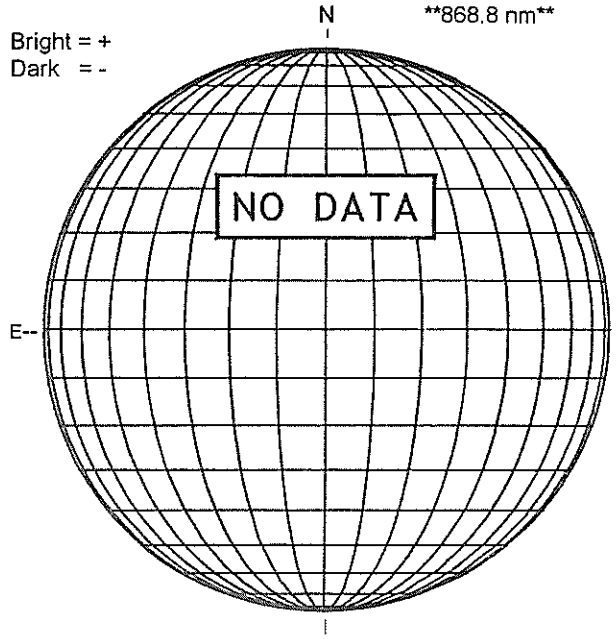


SACRAMENTO PEAK CORONA (1.15 Radii)----

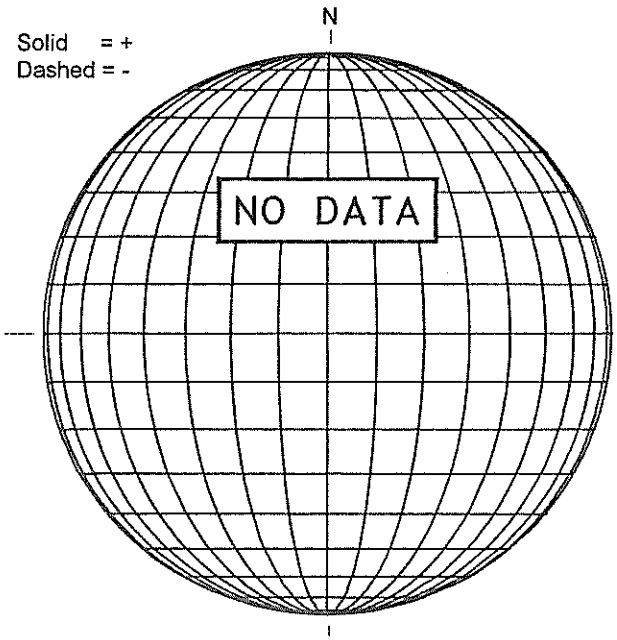


JANUARY 16, 1999 (P= -4.94, Bo = -4.62, Lo = 308.04)

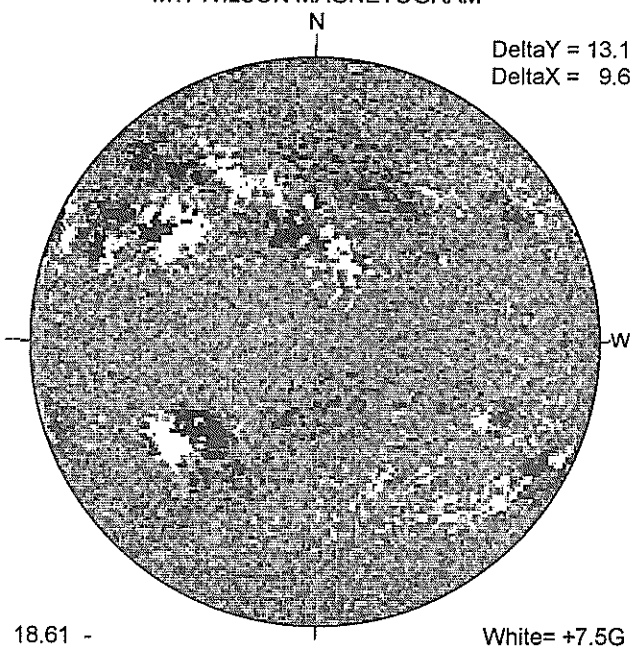
KITT PEAK MAGNETOGRAM



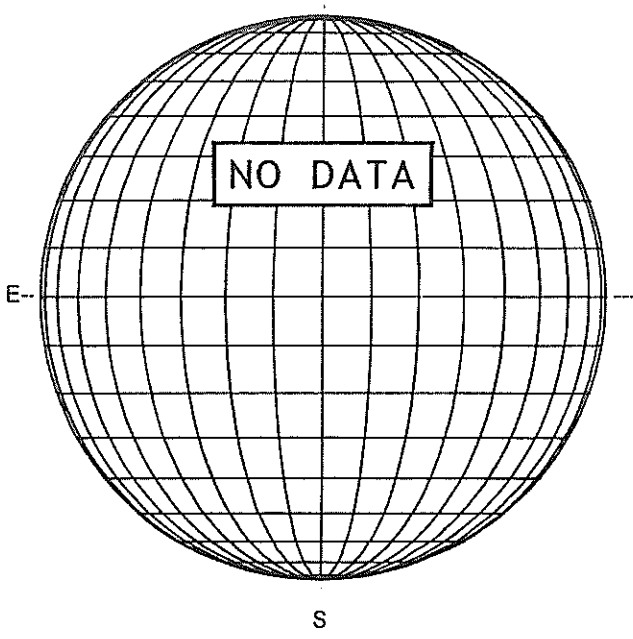
STANFORD MAGNETOGRAM



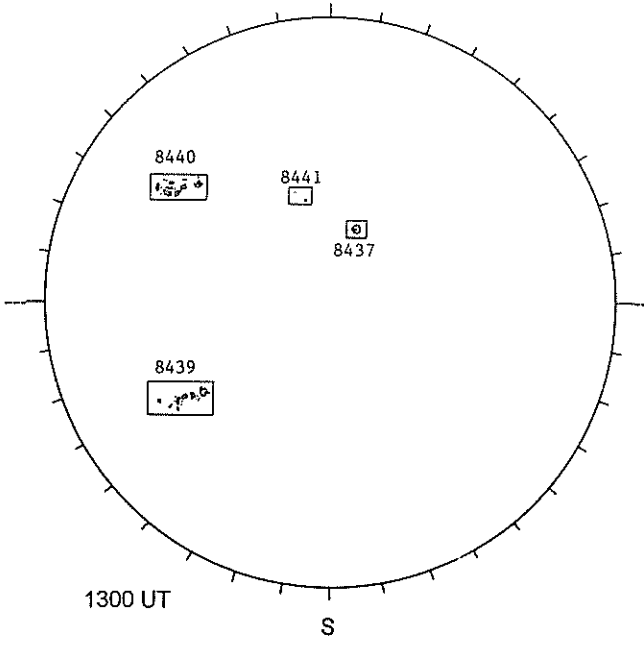
MT. WILSON MAGNETOGRAM



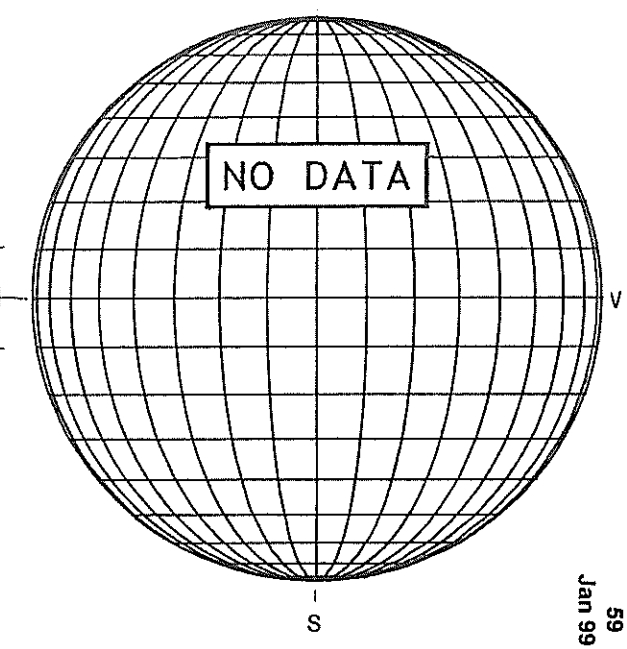
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



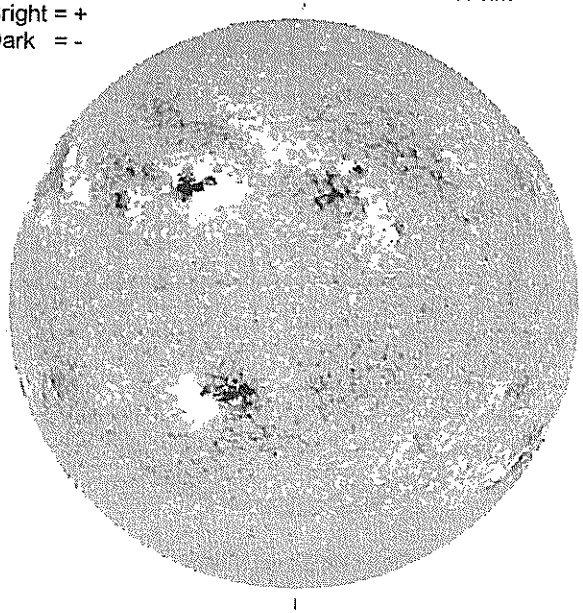
JANUARY 17, 1999 (P= -5.40, Bo = -4.72, Lo = 294.88)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



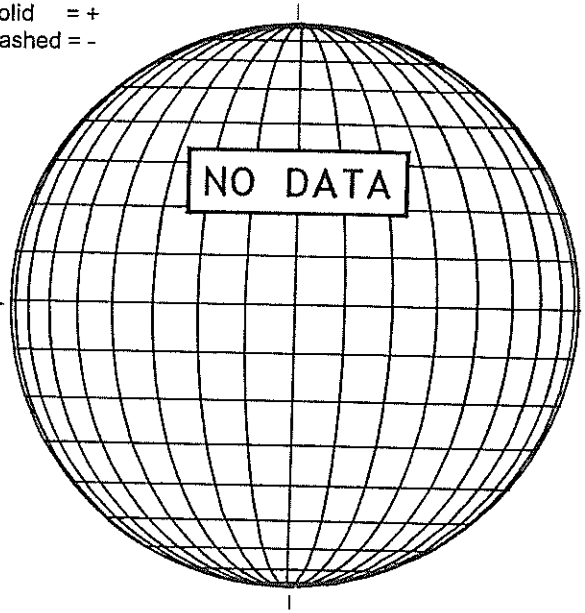
E-

1641 UT

STANFORD MAGNETOGRAM

N

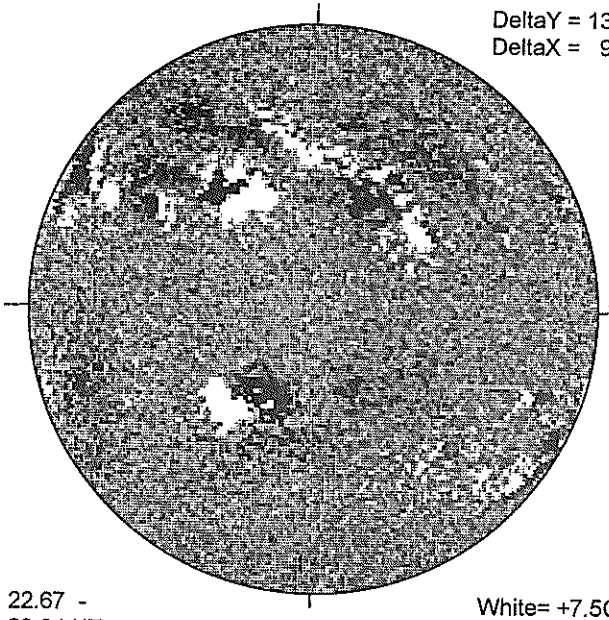
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

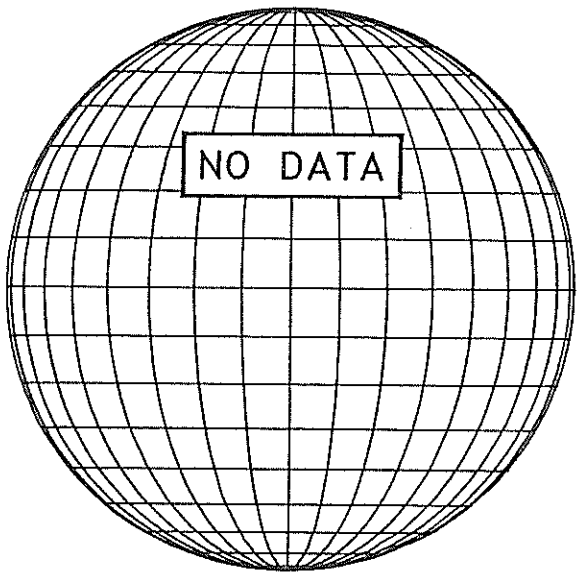


-W

22.67 -
23.64 UT

White= +7.5G
Black = -7.5G

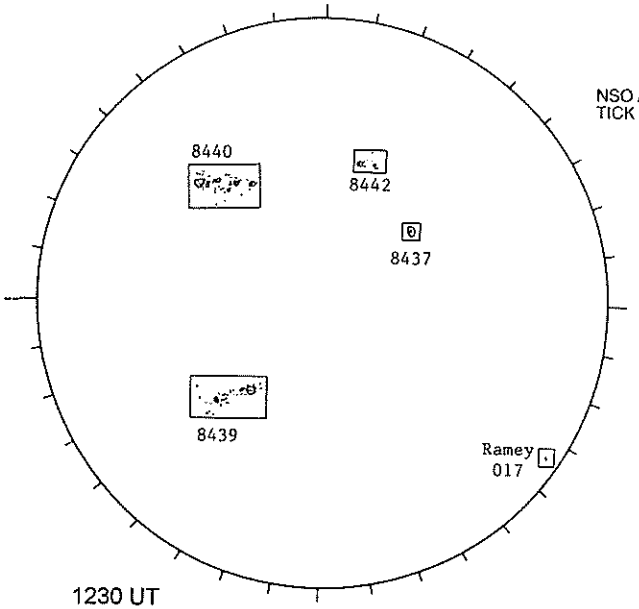
MEUDON H-ALPHA



E-

S

RAMEY SUNSPOT

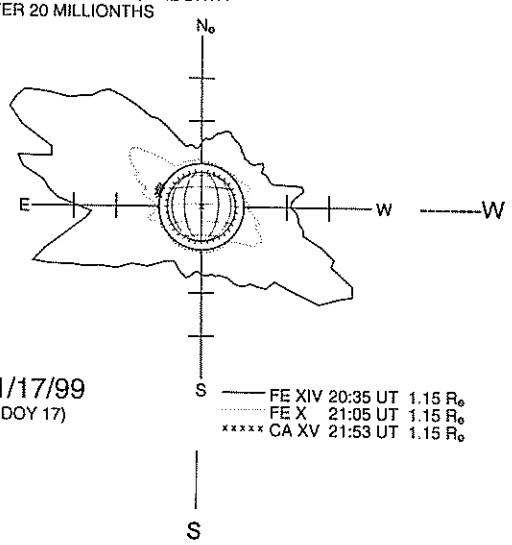


1230 UT

S

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / SACRAMENTO PEAK CORONAL DATA
TICK MARKS EVER 20 MILLIONTHS



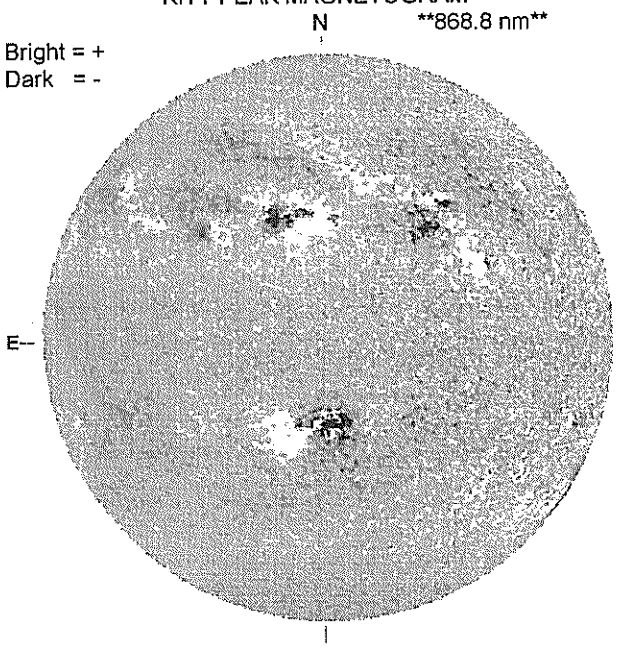
01/17/99
(DOY 17)

FE XIV 20:35 UT 1.15 R_o
FE X 21:05 UT 1.15 R_o
CA XV 21:53 UT 1.15 R_o

S

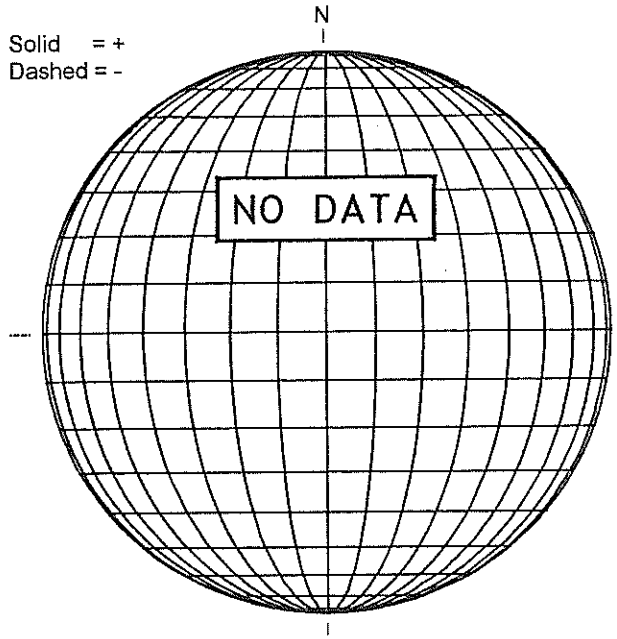
JANUARY 18, 1999 (P= -5.87, Bo = -4.81, Lo = 281.71)

KITT PEAK MAGNETOGRAM

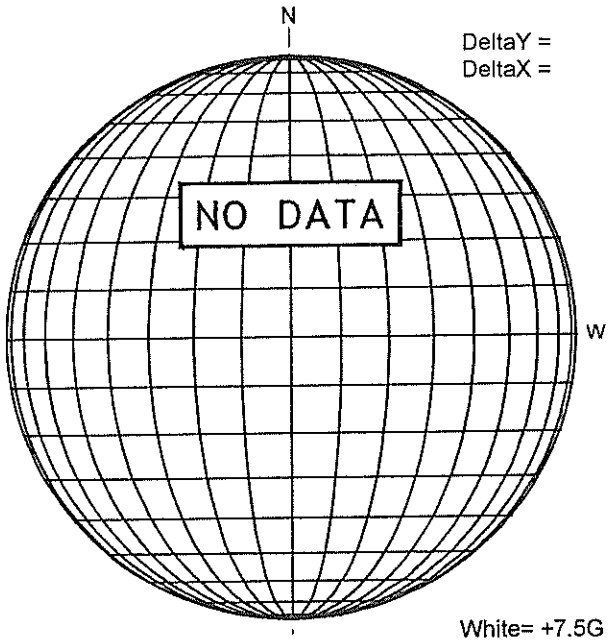


1644 UT

STANFORD MAGNETOGRAM

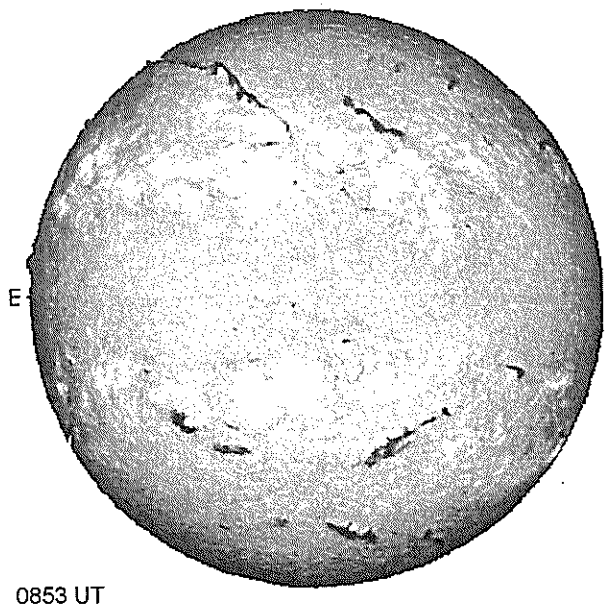


MT. WILSON MAGNETOGRAM



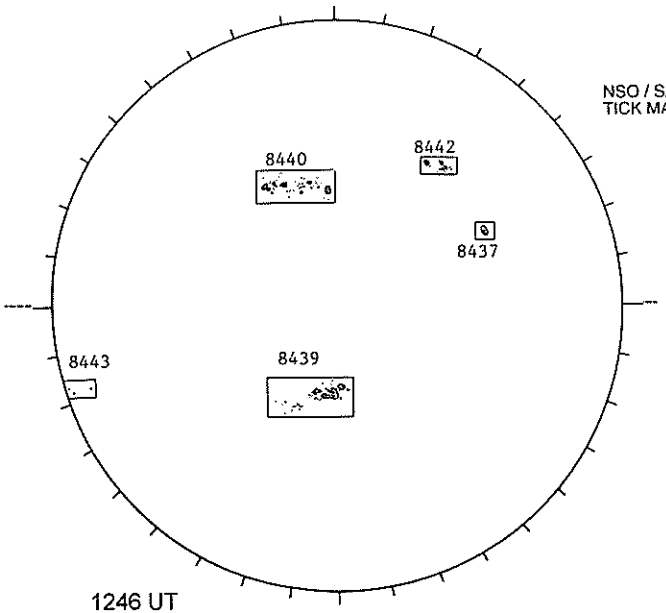
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



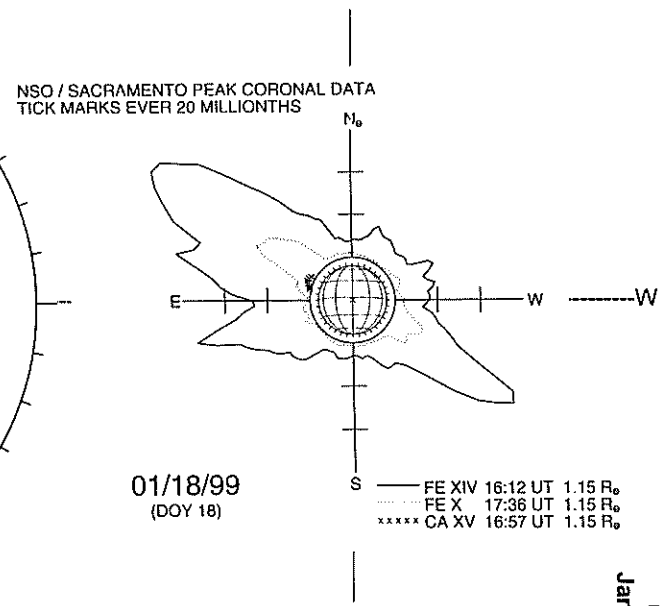
0853 UT

RAMEY SUNSPOT



1246 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



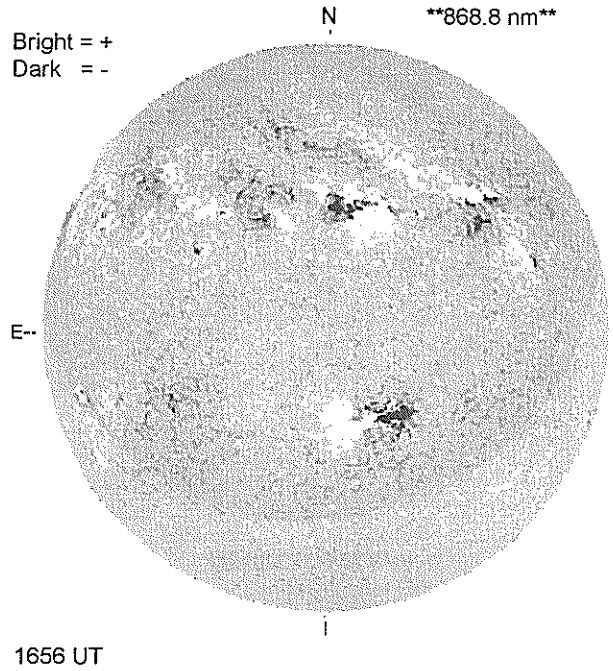
01/18/99
(DOY 18)

S

61
Jan 99

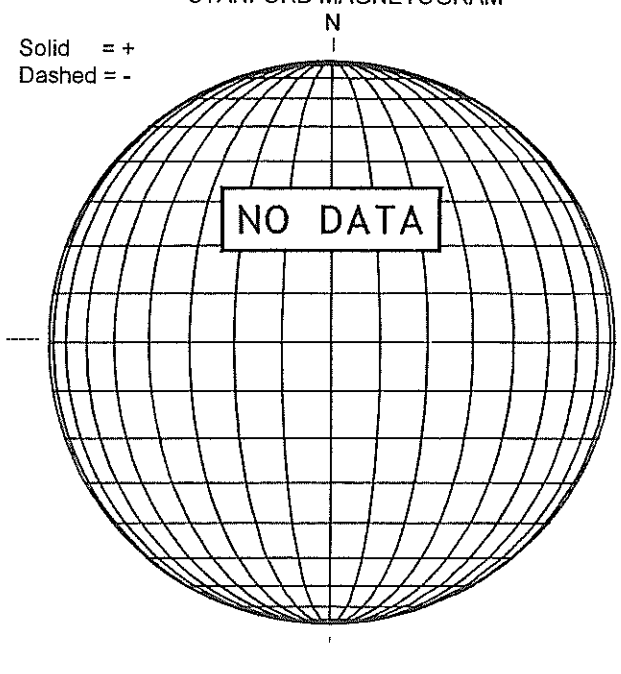
JANUARY 19, 1999 (P= -6.33, Bo = -4.91, Lo = 268.54)

KITT PEAK MAGNETOGRAM

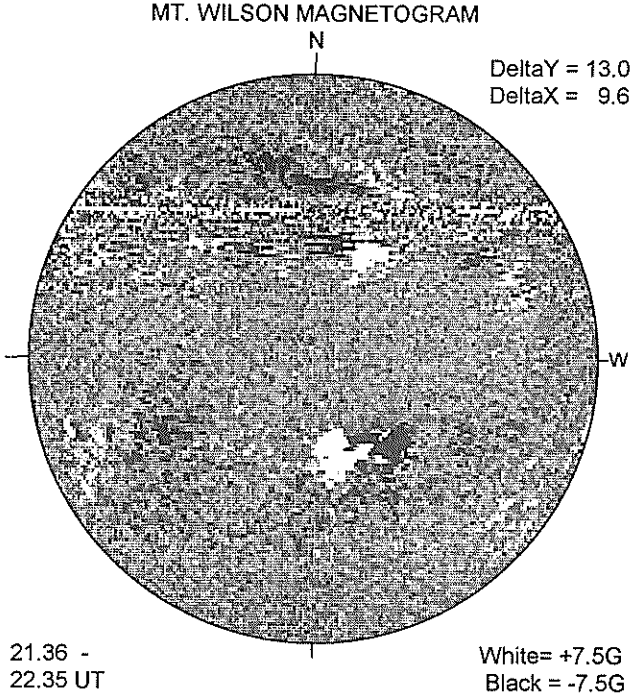


1656 UT

STANFORD MAGNETOGRAM



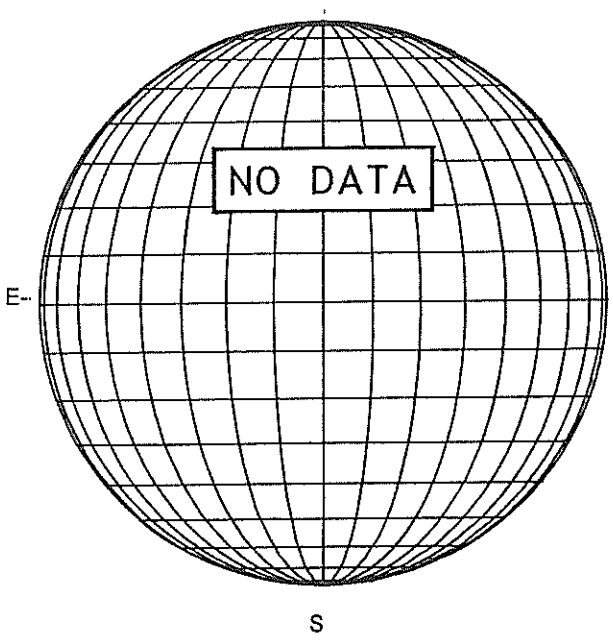
MT. WILSON MAGNETOGRAM



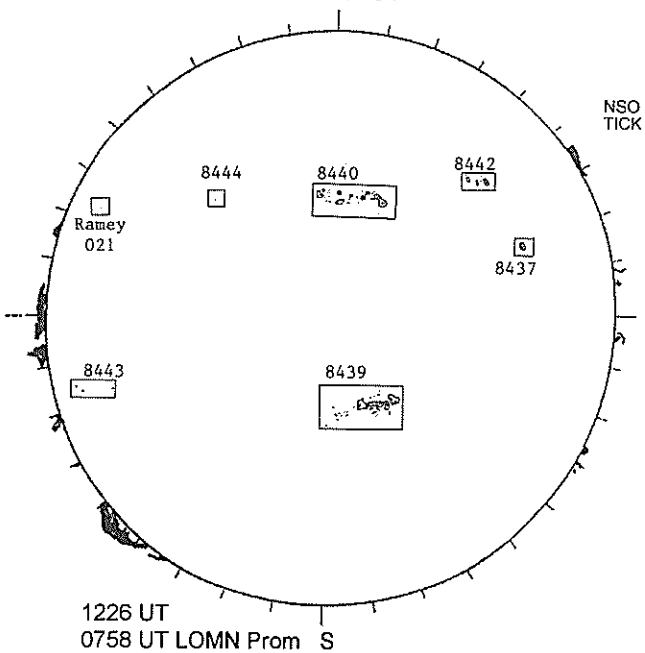
21.36 - 22.35 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

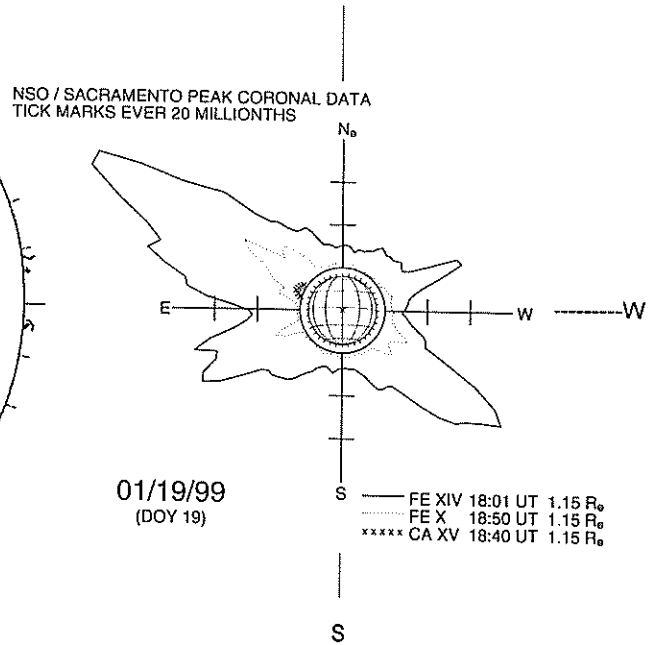


RAMEY SUNSPOT



1226 UT
0758 UT LOMN Prom

SACRAMENTO PEAK CORONA (1.15 Radii)----



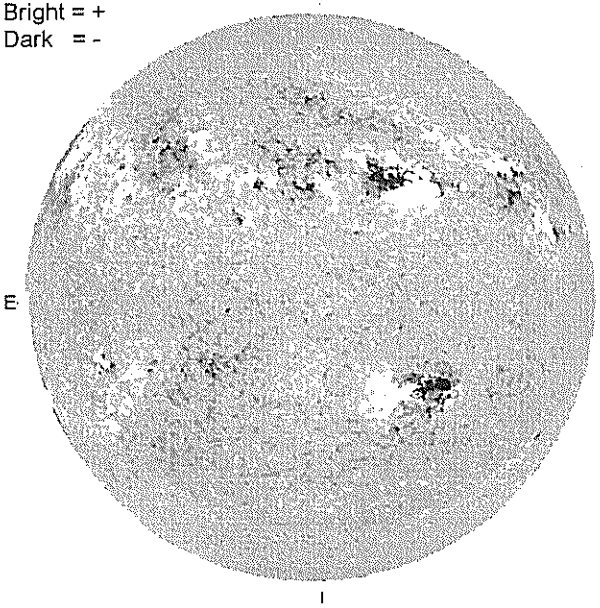
S

JANUARY 20, 1999 (P= -6.79, Bo = -5.00, Lo = 255.37)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



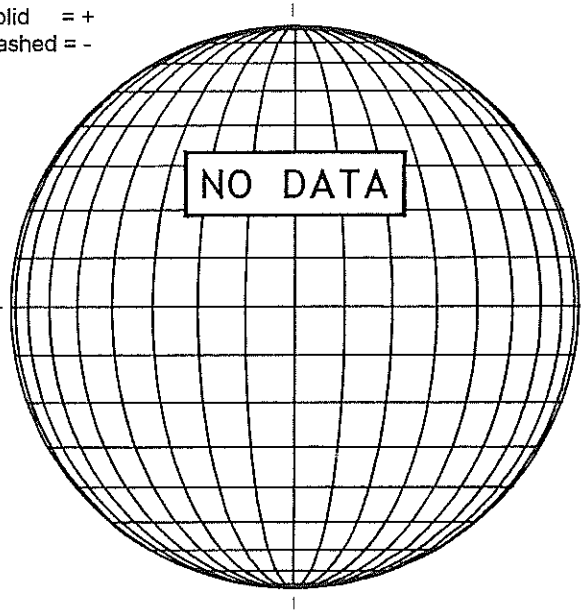
E

1643 UT

STANFORD MAGNETOGRAM

N

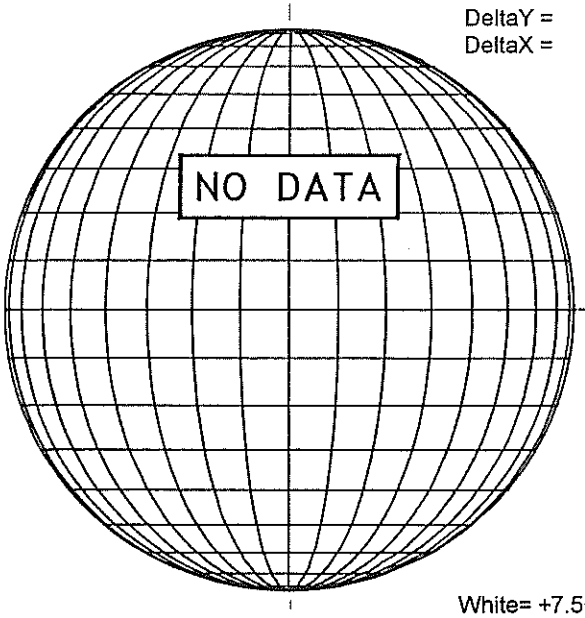
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

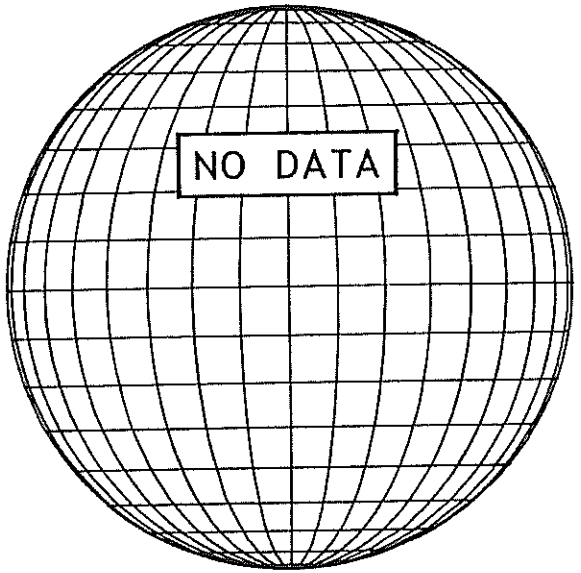
DeltaY =
DeltaX =



W

White= +7.5G
Black = -7.5G

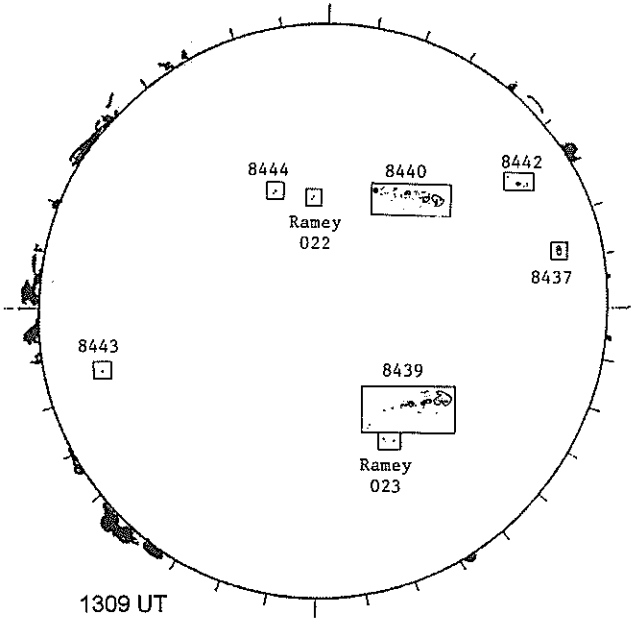
MEUDON H-ALPHA



E

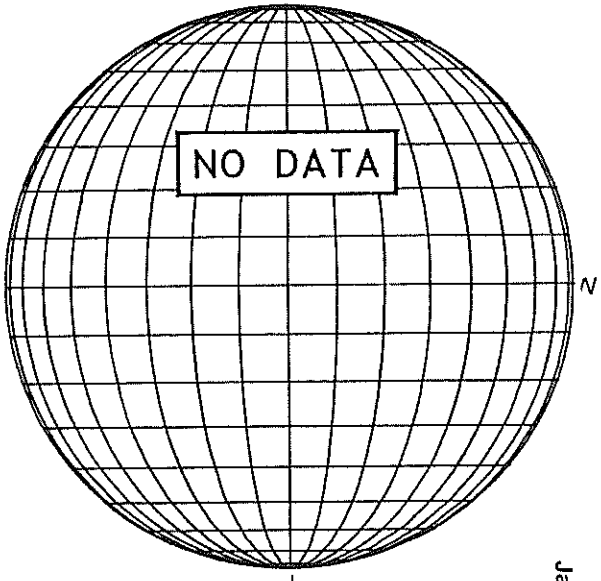
S

RAMEY SUNSPOT



1309 UT
0749 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



N

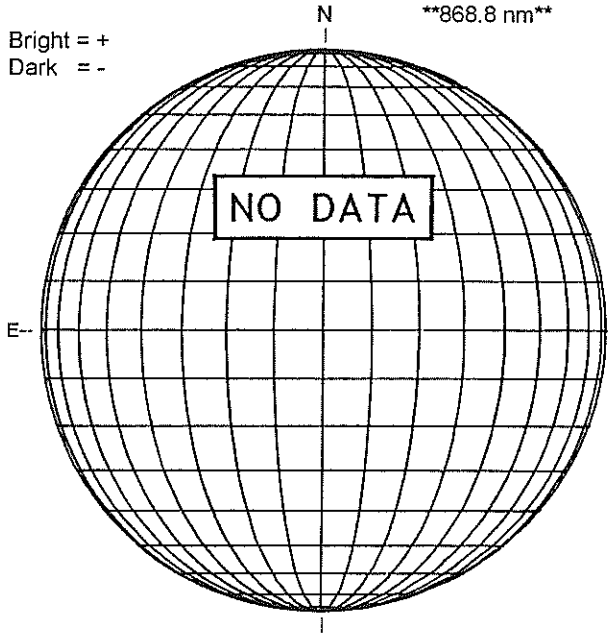
S

JANUARY 21, 1999 (P= -7.24, Bo = -5.10, Lo = 242.21)

KITT PEAK MAGNETOGRAM

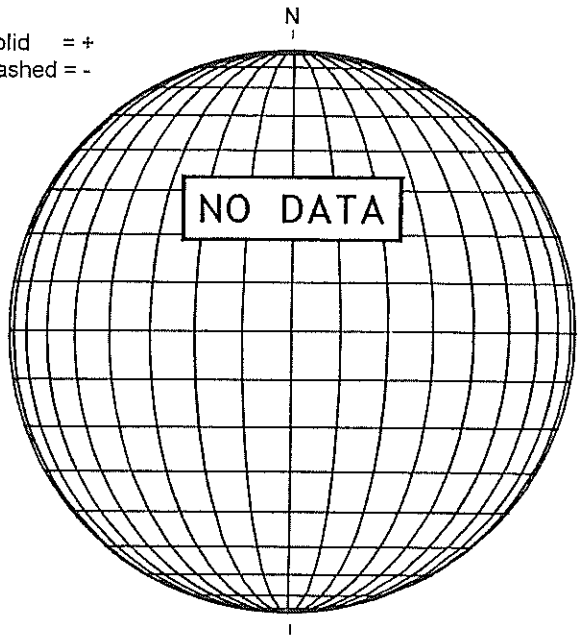
868.8 nm

Bright = +
Dark = -



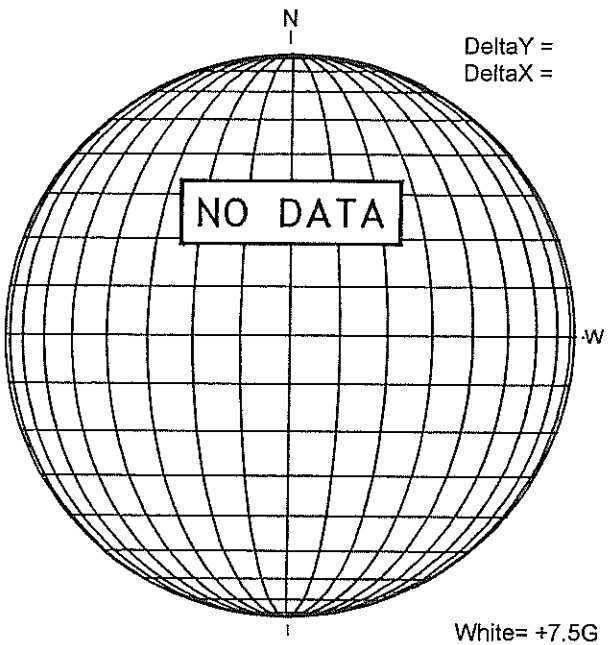
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



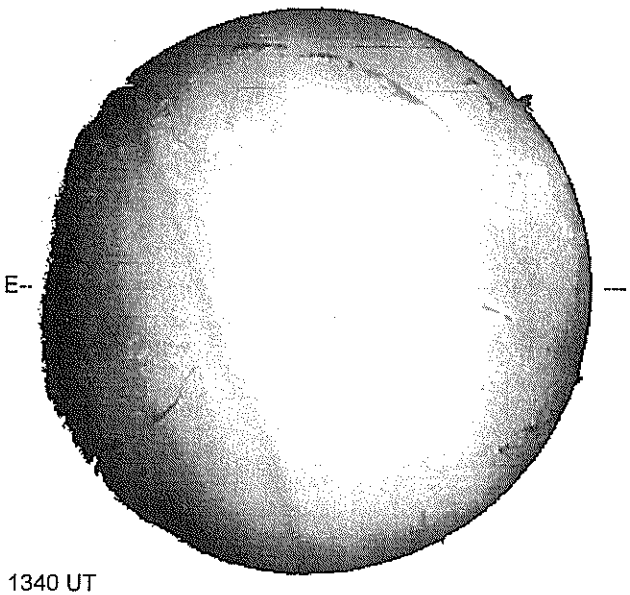
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



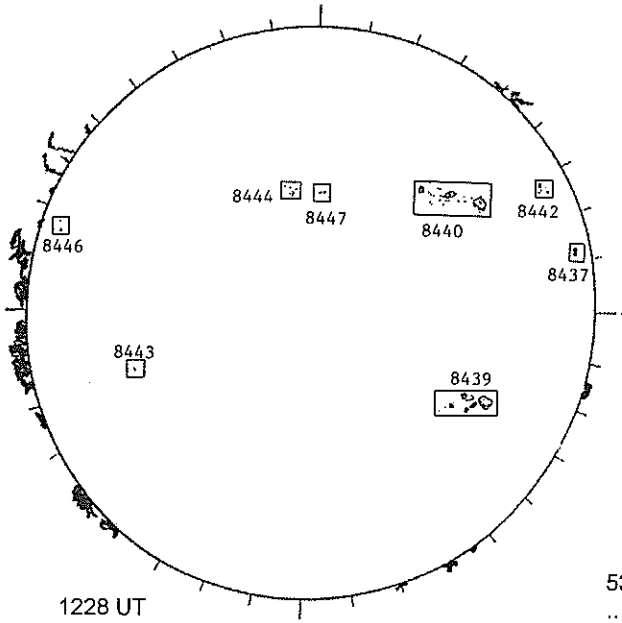
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



1340 UT

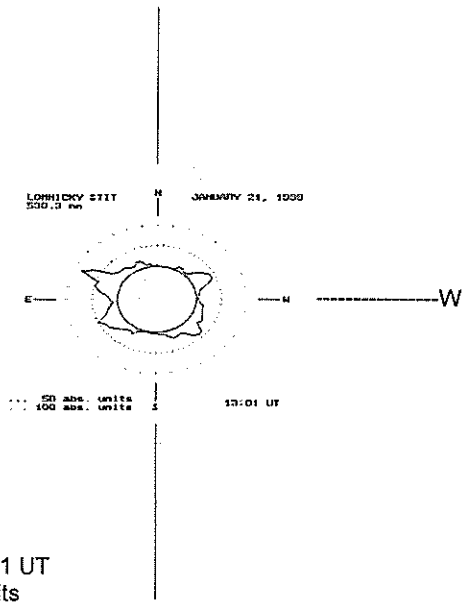
RAMEY SUNSPOT



1228 UT
0803 UT LOMN Prom

S

LOMNICKY PEAK CORONA (1.04 Radii)——



530.3 nm, 1301 UT
.... 50 abs. units
. . 100 abs. units

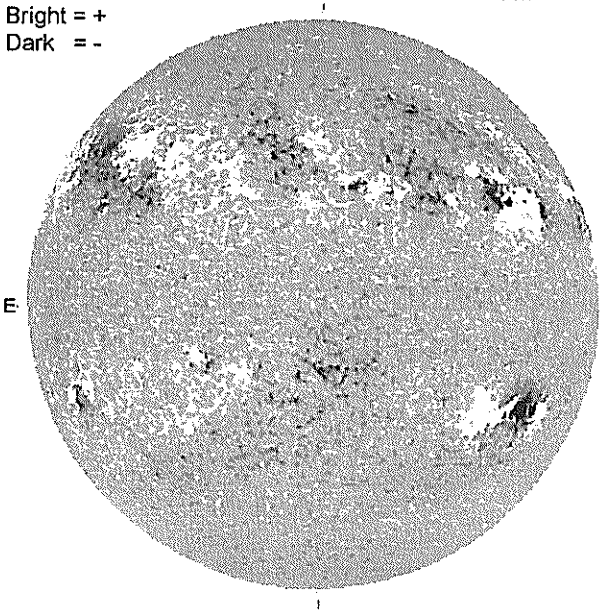
JANUARY 22, 1999 (P= -7.69, Bo = -5.19, Lo = 229.04)

KITT PEAK MAGNETOGRAM

N

868.8 nm

Bright = +
Dark = -



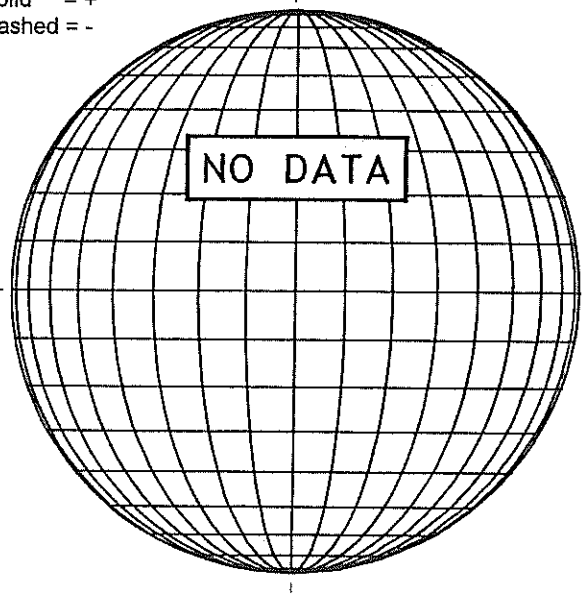
E

1632 UT

STANFORD MAGNETOGRAM

N

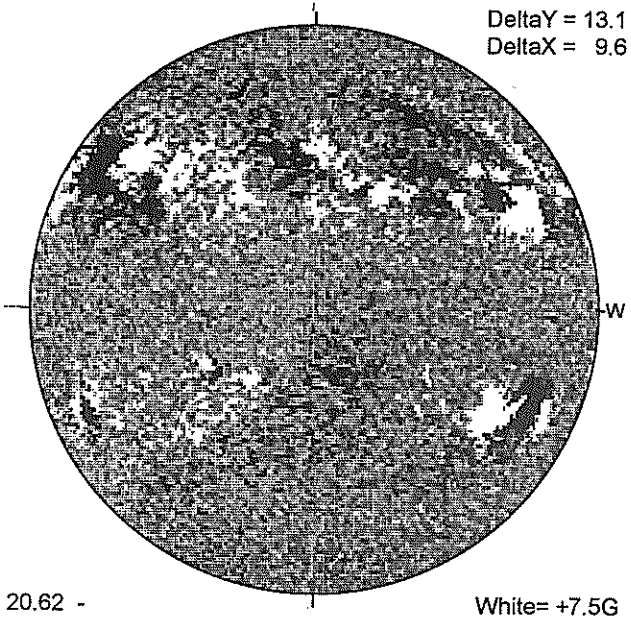
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 13.1
DeltaX = 9.6

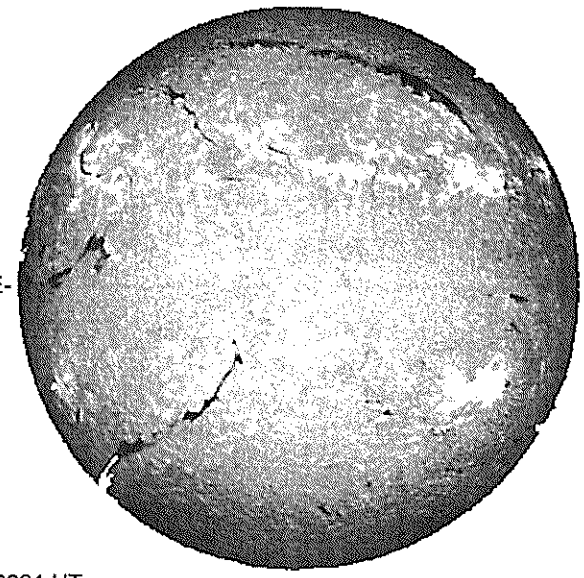


W

20.62 -
21.60 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

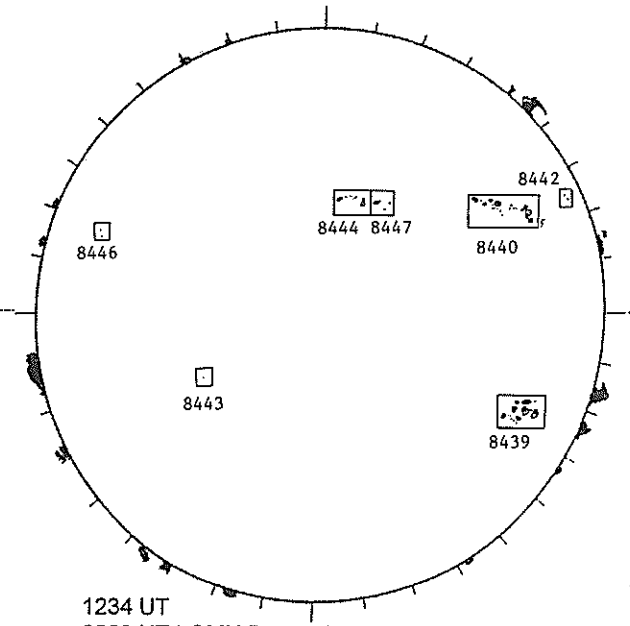


E

0921 UT

S

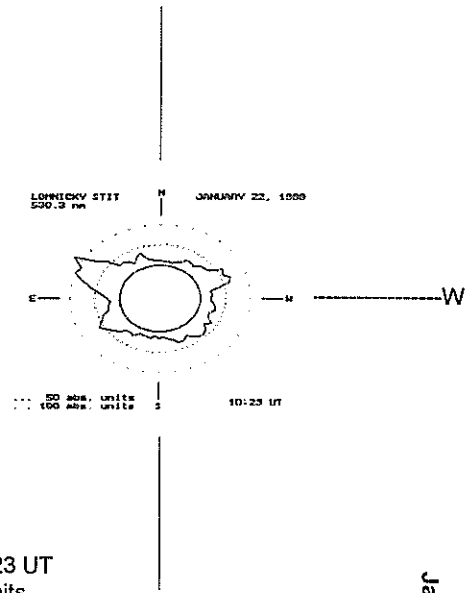
RAMEY SUNSPOT



1234 UT
0808 UT LOMN Prom

S

LOMNICKY PEAK CORONA (1.04 Radii)



W

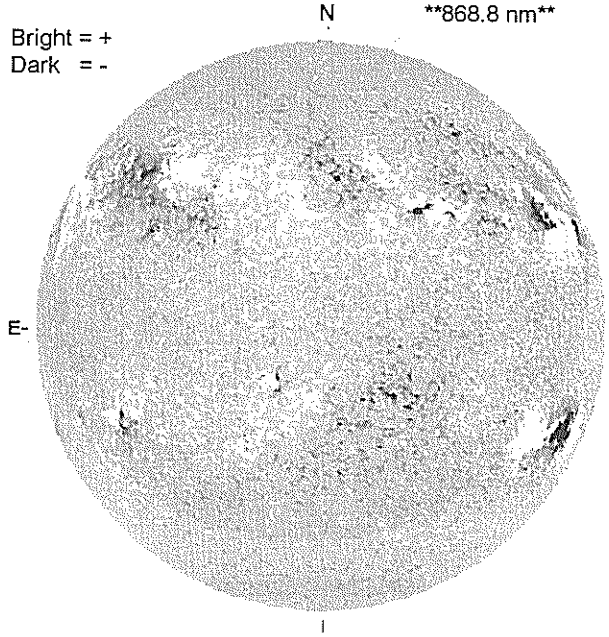
530.0 nm, 1023 UT
. . 50 abs. units
... 100 abs. units

S

65
Jan 99

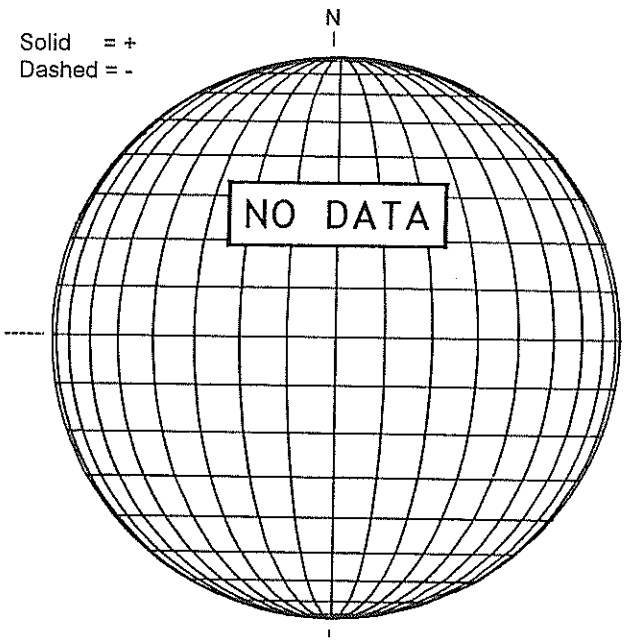
JANUARY 23, 1999 (P= -8.14, Bo = -5.27, Lo = 215.88)

KITT PEAK MAGNETOGRAM

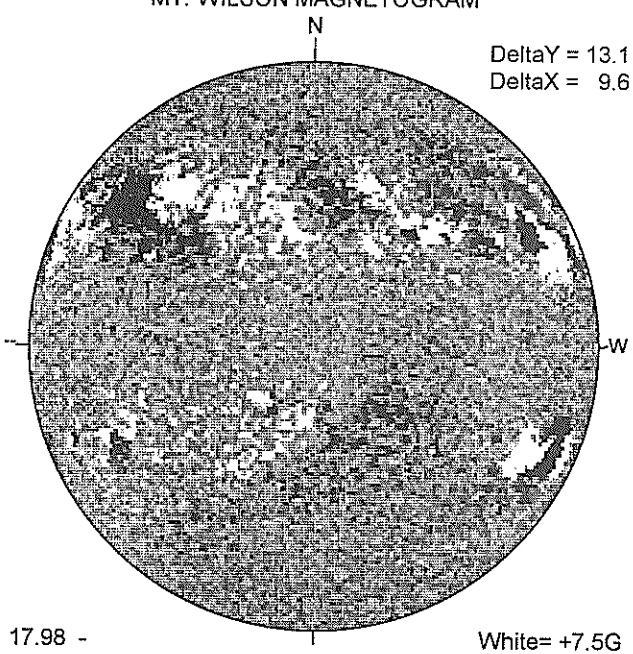


1656 UT

STANFORD MAGNETOGRAM



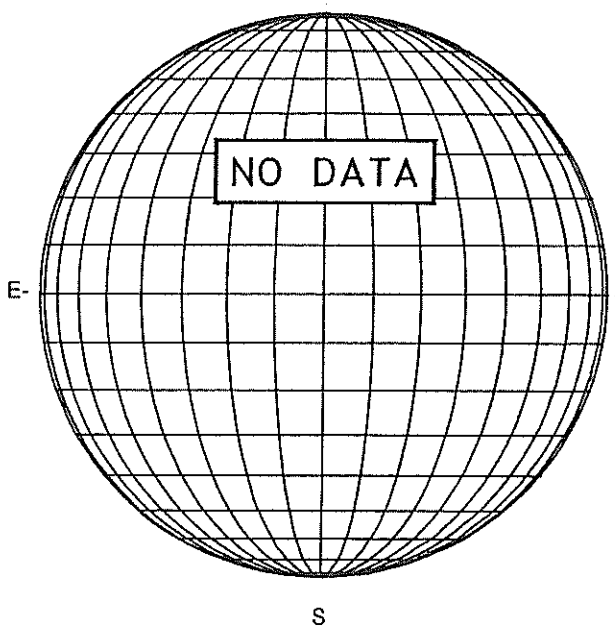
MT. WILSON MAGNETOGRAM



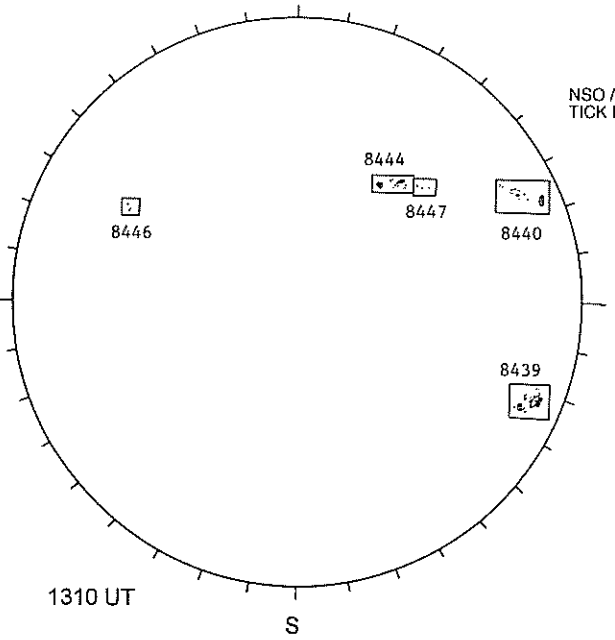
17.98 -
18.95 UT

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

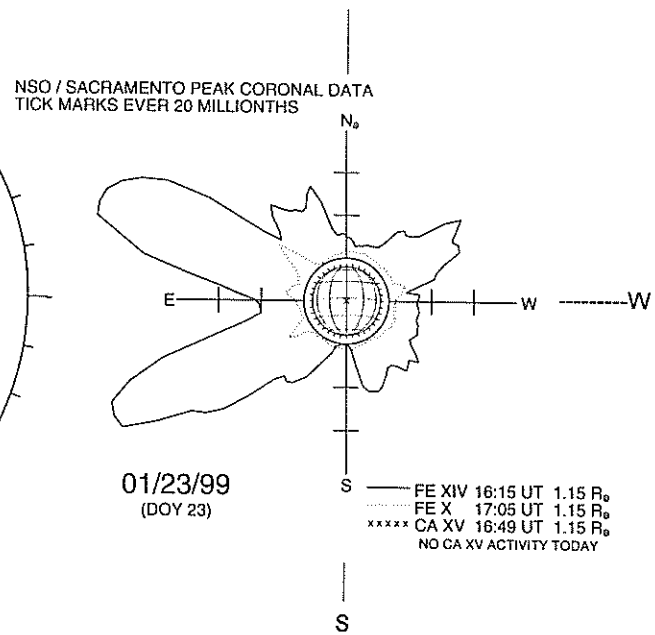


RAMEY SUNSPOT



1310 UT

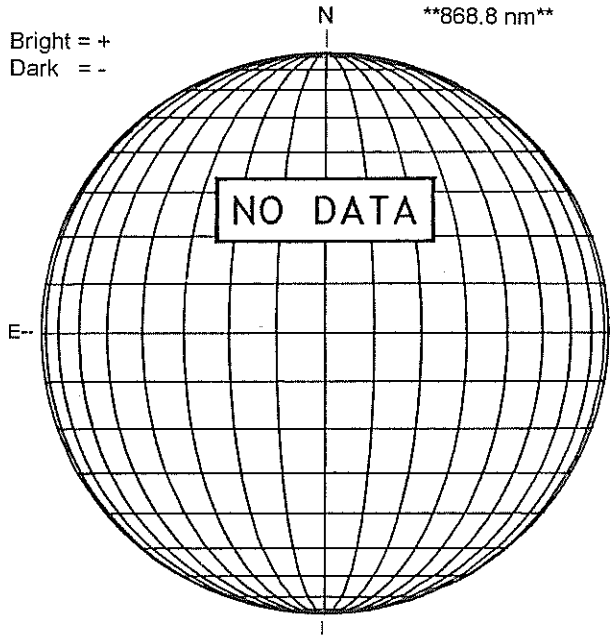
SACRAMENTO PEAK CORONA (1.15 Radii)----



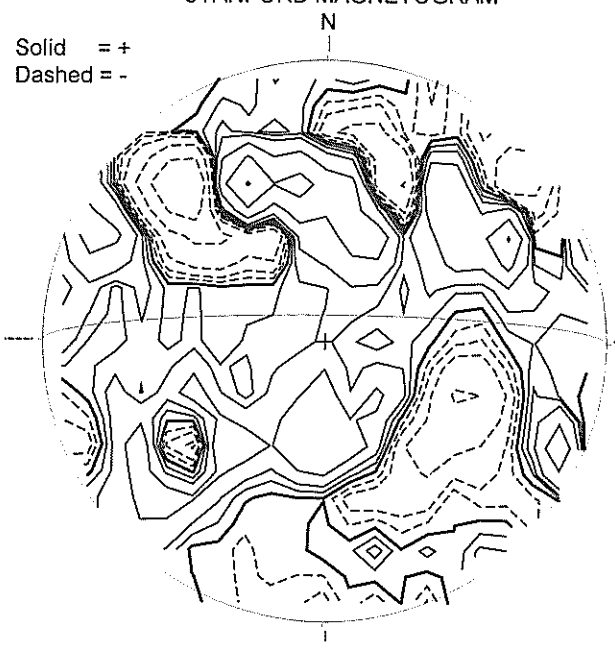
01/23/99
(DOY 23)

JANUARY 24, 1999 (P= -8.58, Bo = -5.36, Lo = 202.71)

KITT PEAK MAGNETOGRAM

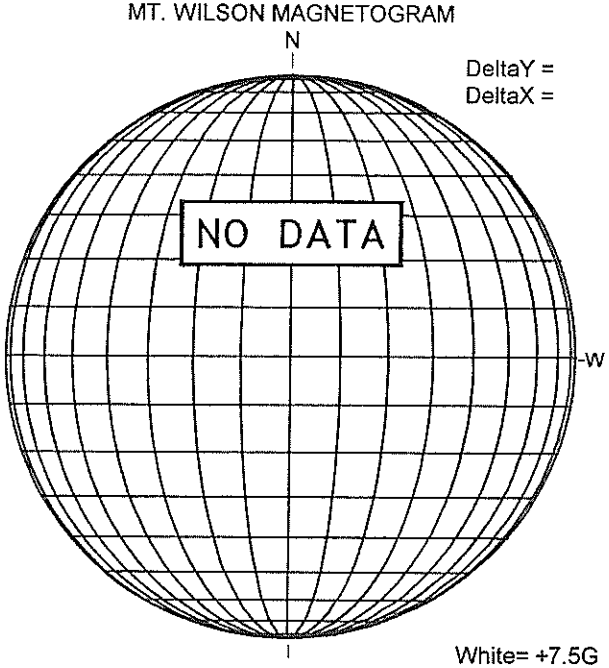


STANFORD MAGNETOGRAM



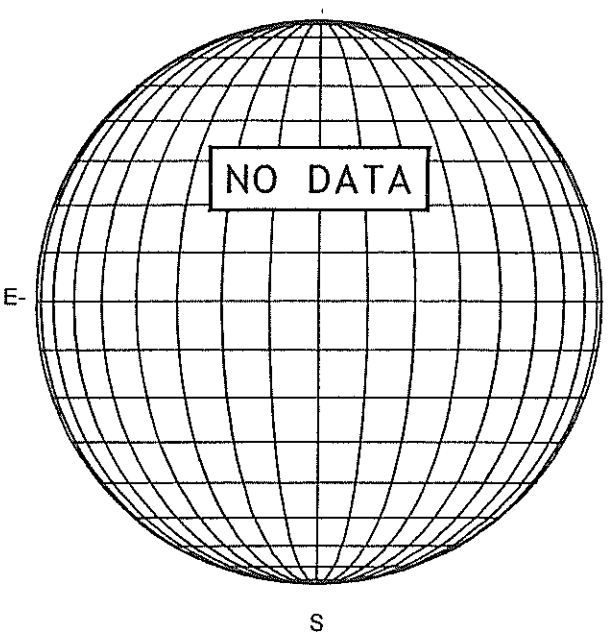
1930 UT

MT. WILSON MAGNETOGRAM

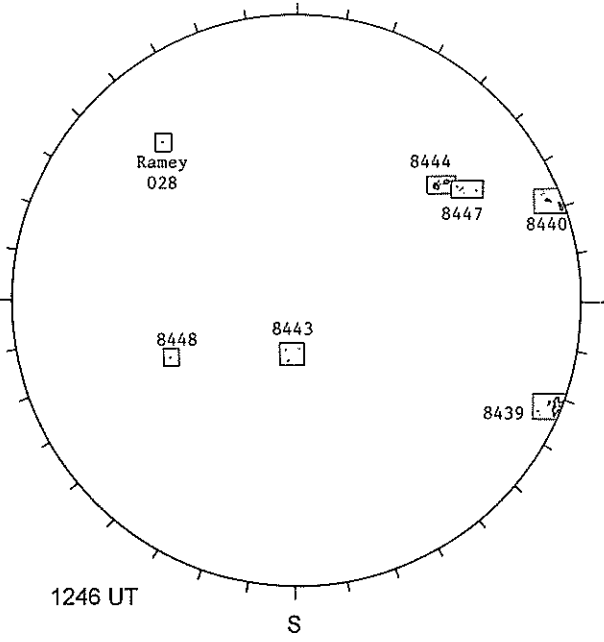


White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

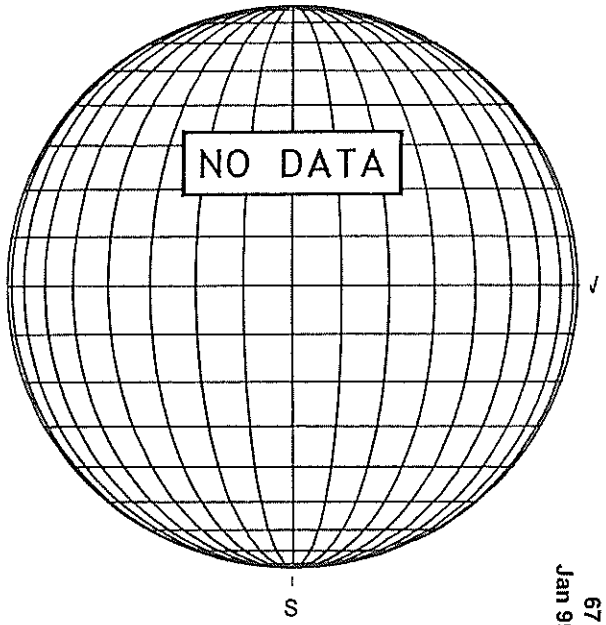


RAMEY SUNSPOT



1246 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



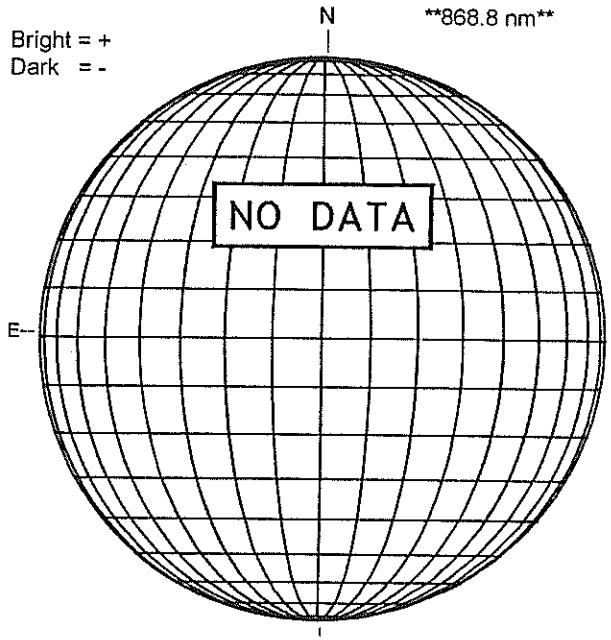
67
Jan 99

JANUARY 25, 1999 (P= -9.02, Bo = -5.45, Lo = 189.54)

KITT PEAK MAGNETOGRAM

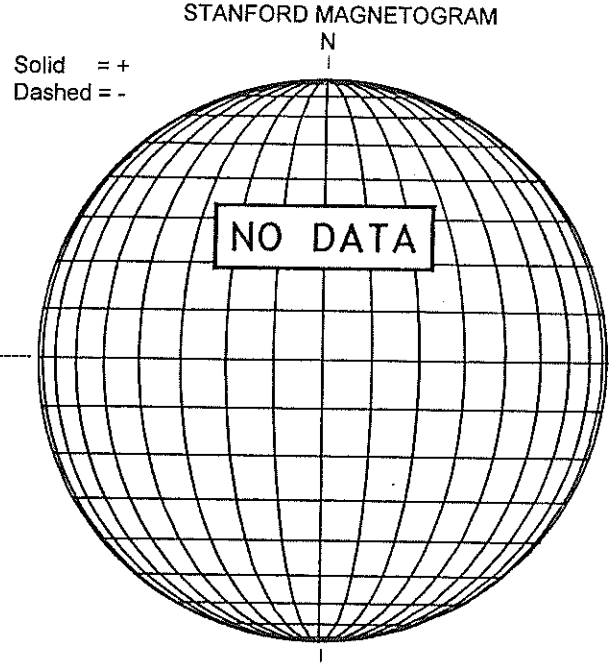
868.8 nm

Bright = +
Dark = -



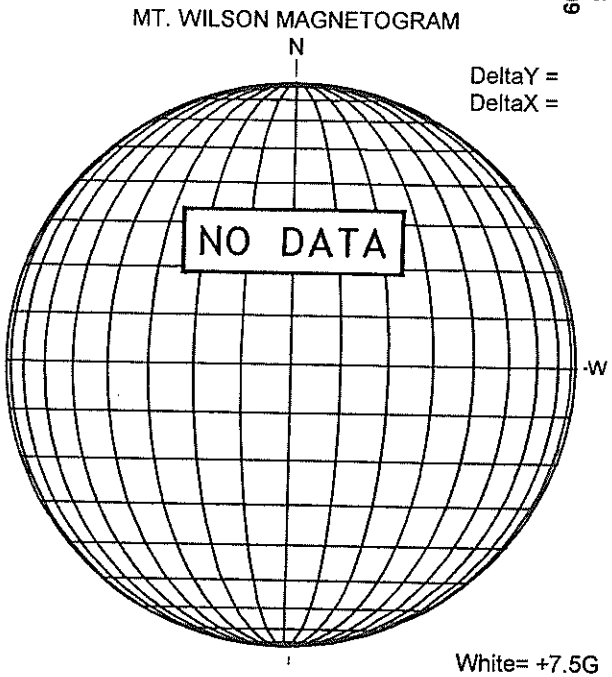
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



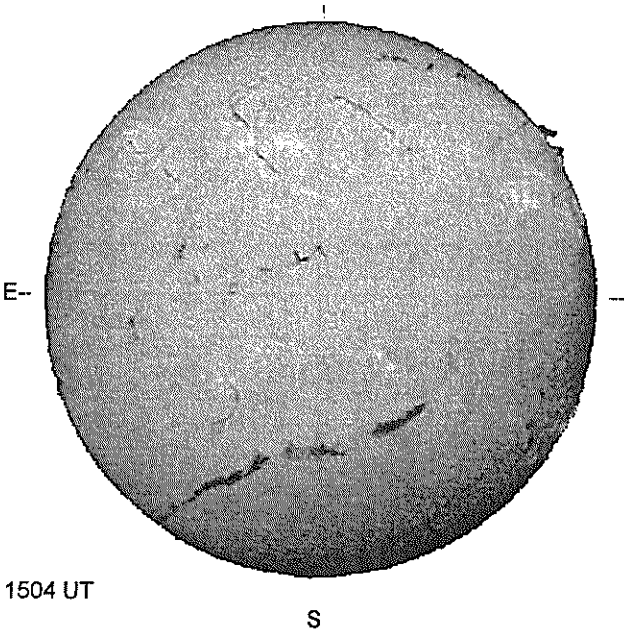
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =

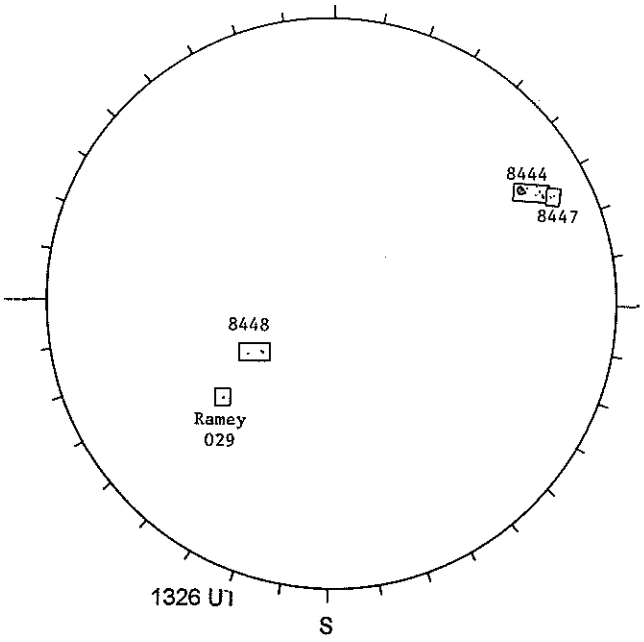


White= +7.5G
Black = -7.5G

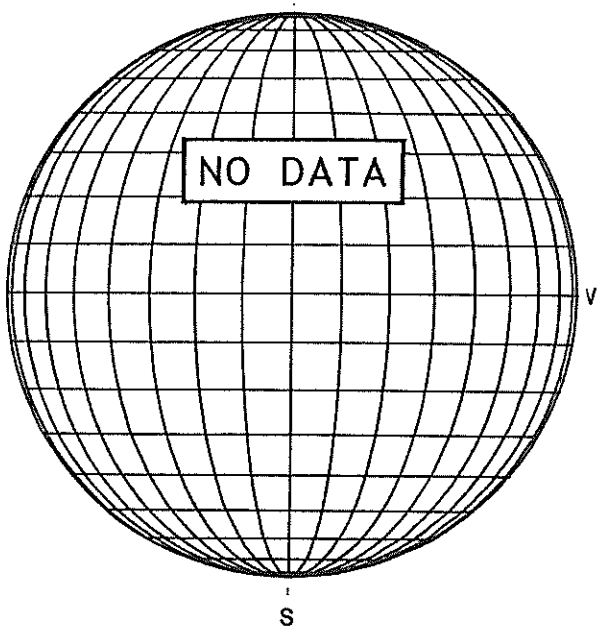
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT

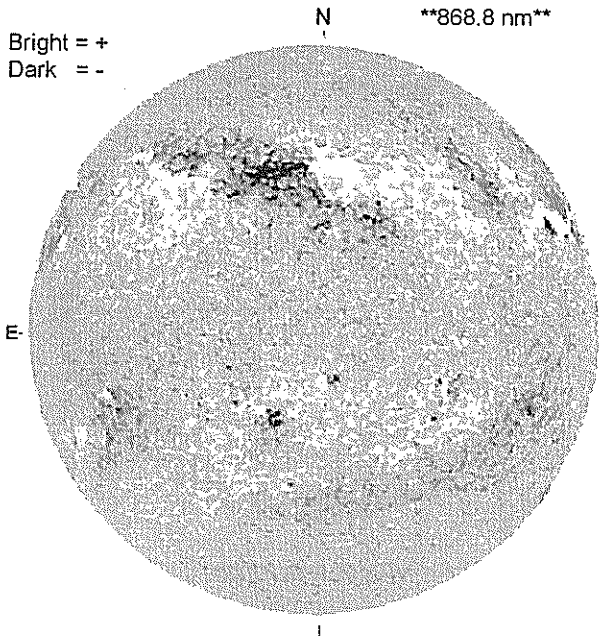


SACRAMENTO PEAK CORONA (1.15 Radii)----

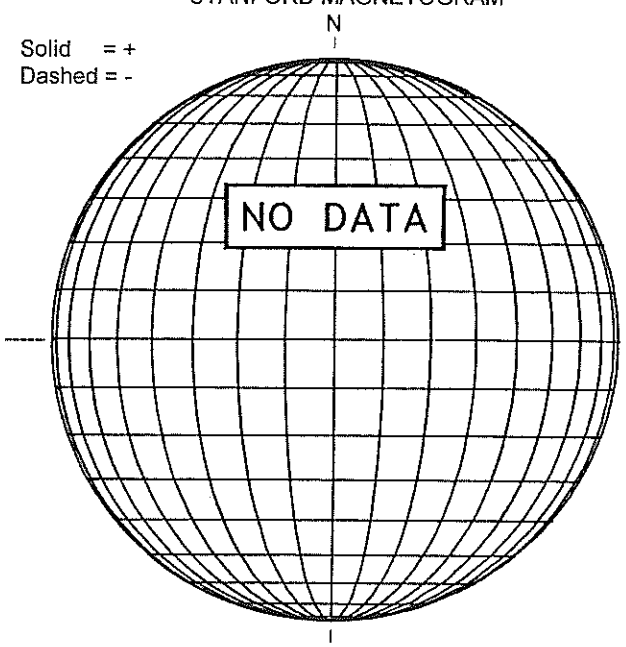


JANUARY 26, 1999 (P= -9.46, Bo = -5.53, Lo = 176.38)

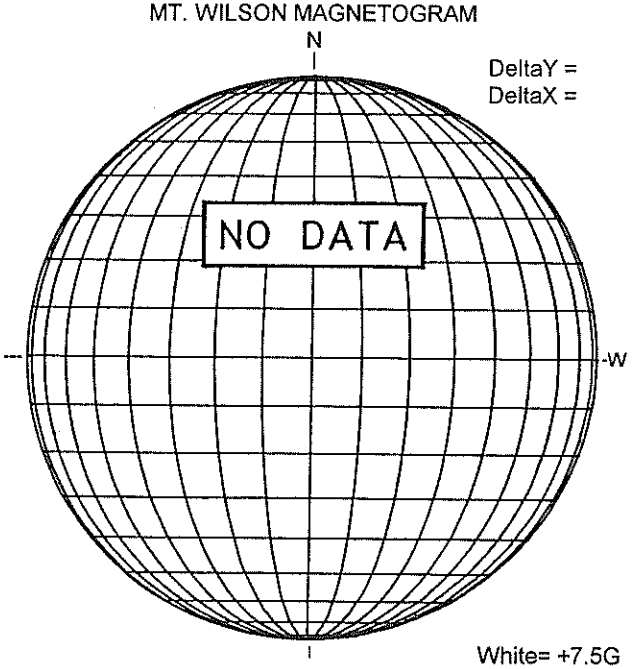
KITT PEAK MAGNETOGRAM



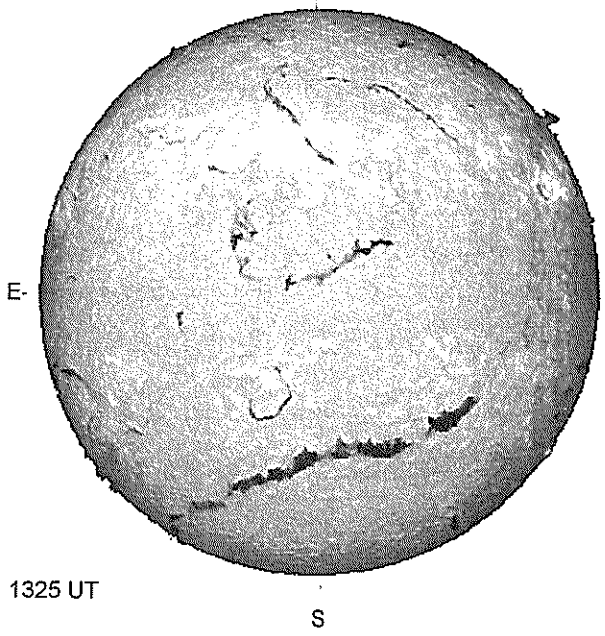
STANFORD MAGNETOGRAM



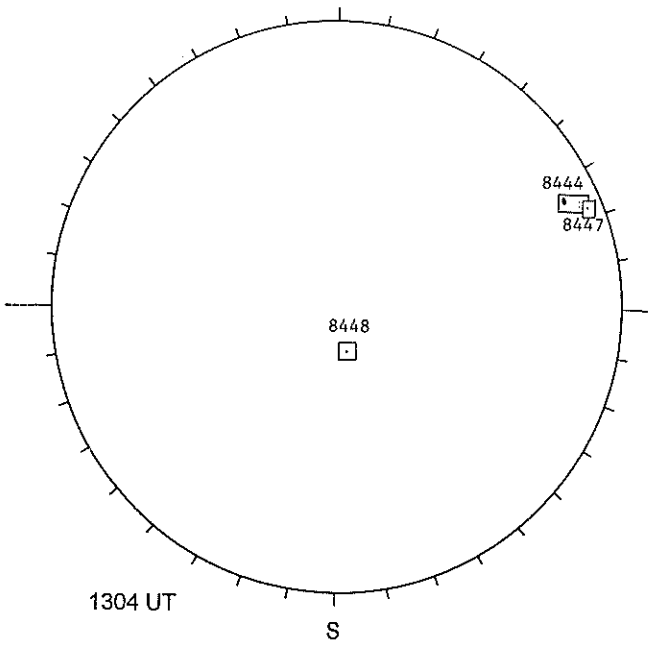
MT. WILSON MAGNETOGRAM



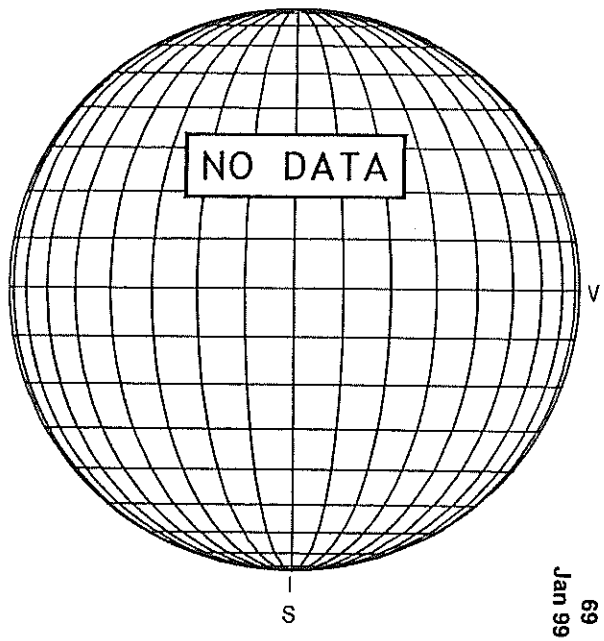
MEUDON H-ALPHA



RAMEY SUNSPOT

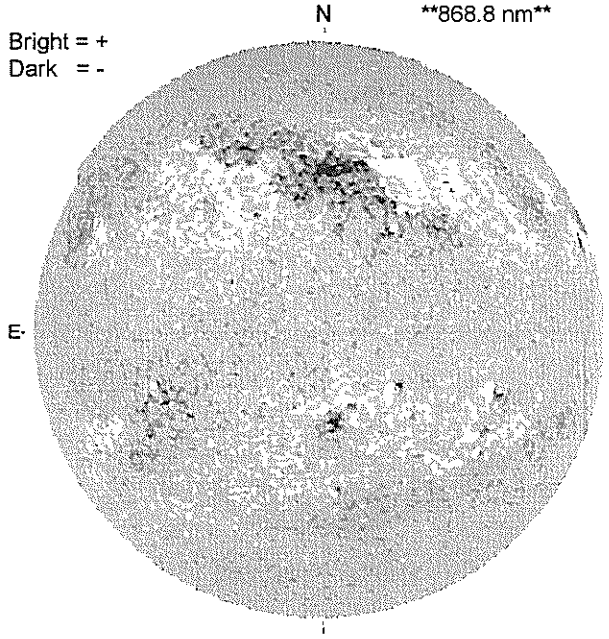


SACRAMENTO PEAK CORONA (1.15 Radii)----



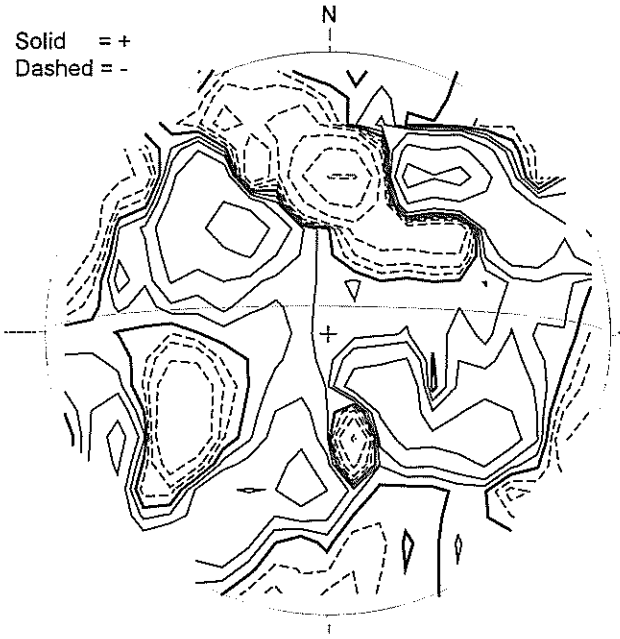
JANUARY 27, 1999 (P= -9.90, Bo = -5.61, Lo = 163.21)

KITT PEAK MAGNETOGRAM



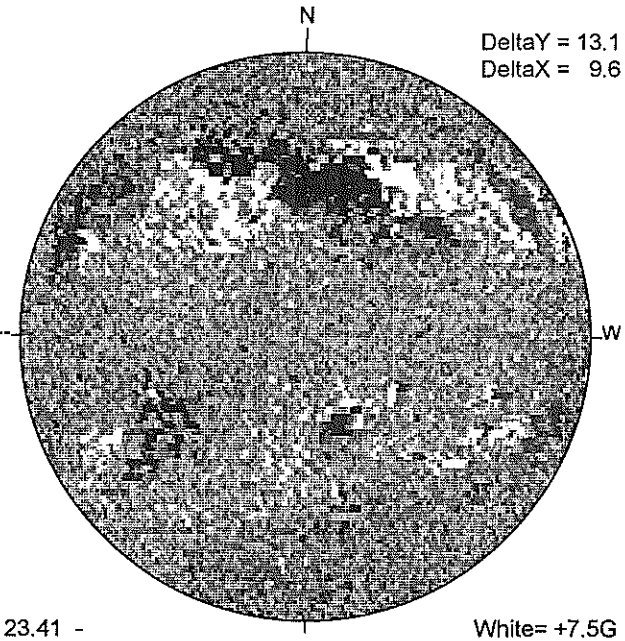
1629 UT

STANFORD MAGNETOGRAM



1935 UT

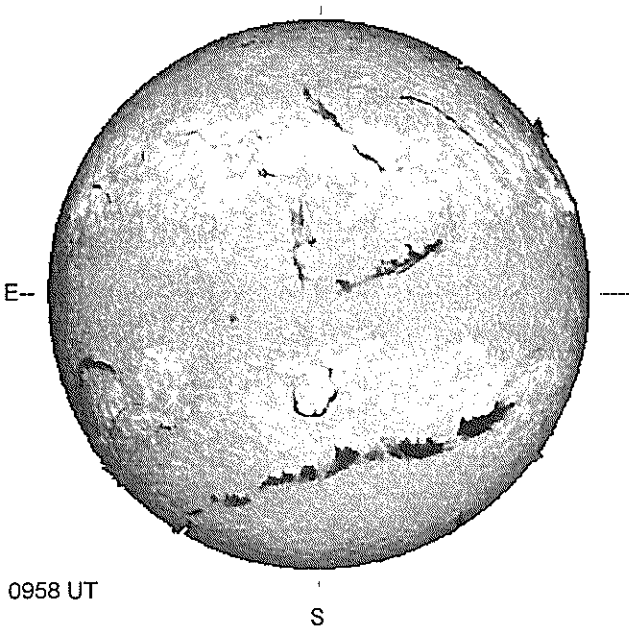
MT. WILSON MAGNETOGRAM



23.41 -
24.39 UT

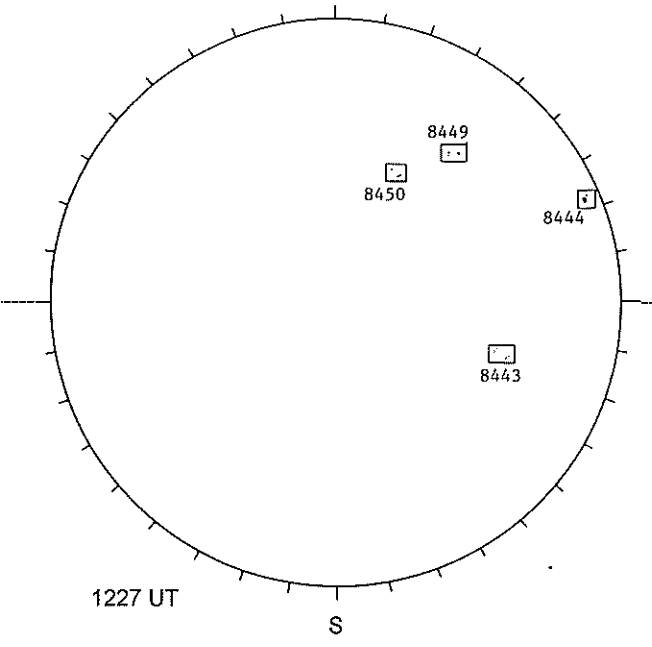
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



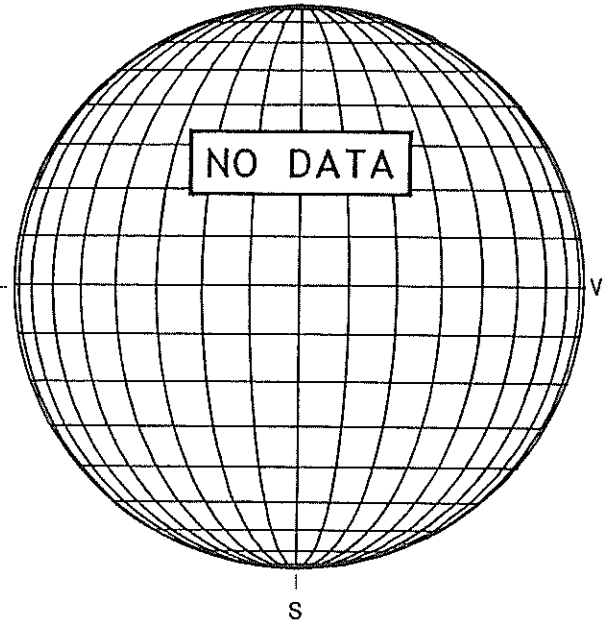
0958 UT

RAMEY SUNSPOT



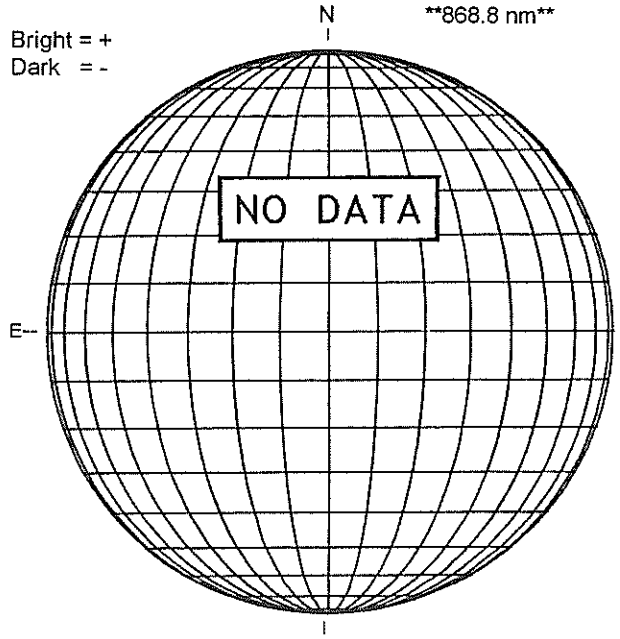
1227 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

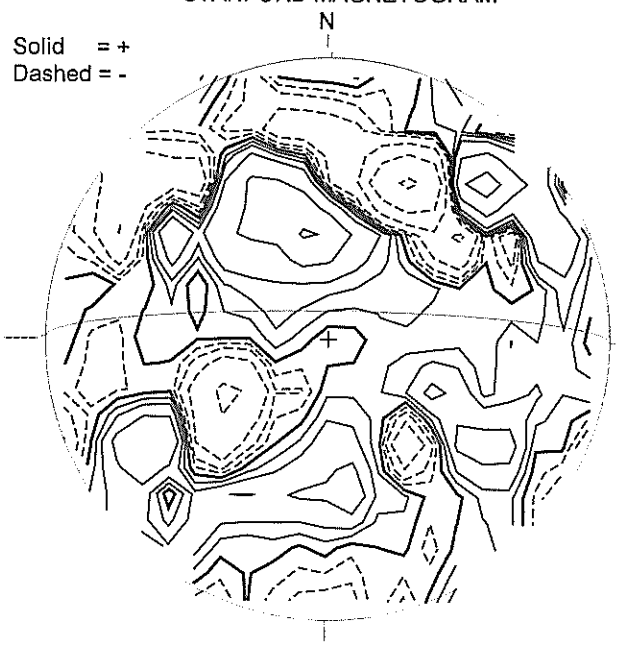


JANUARY 28, 1999 (P= -10.32, Bo = -5.70, Lo = 150.04)

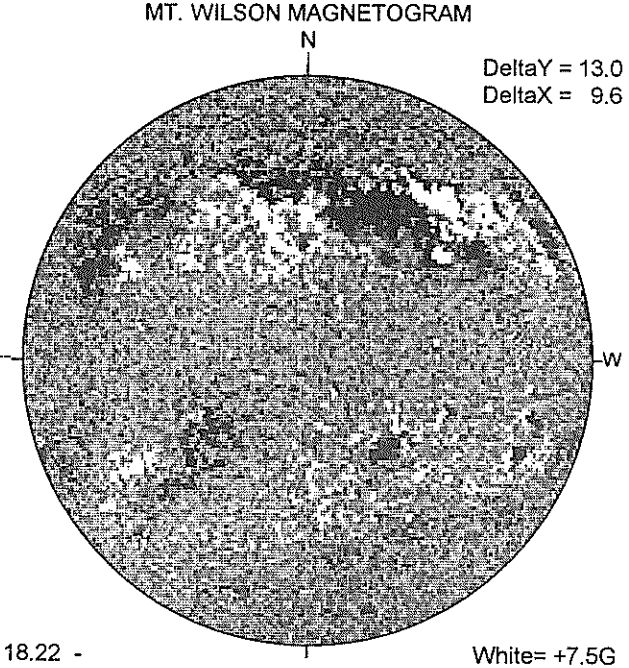
KITT PEAK MAGNETOGRAM



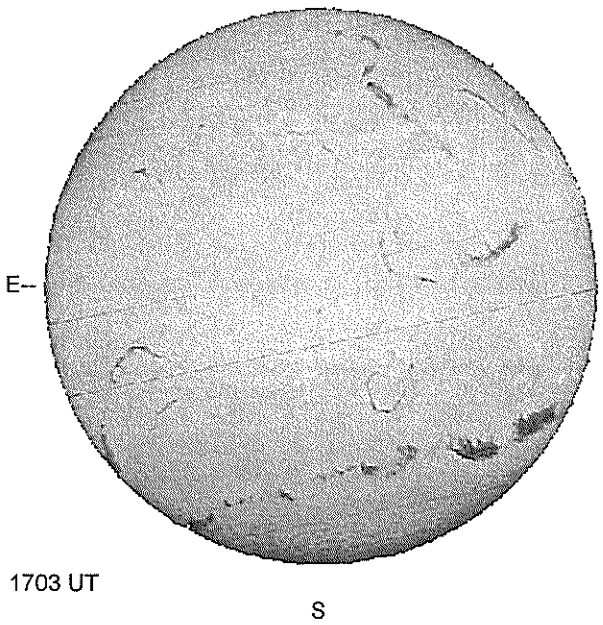
STANFORD MAGNETOGRAM



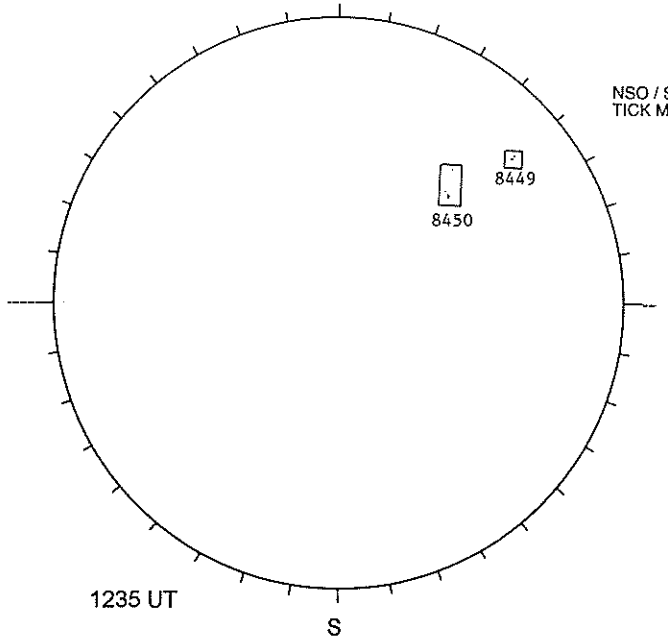
MT. WILSON MAGNETOGRAM



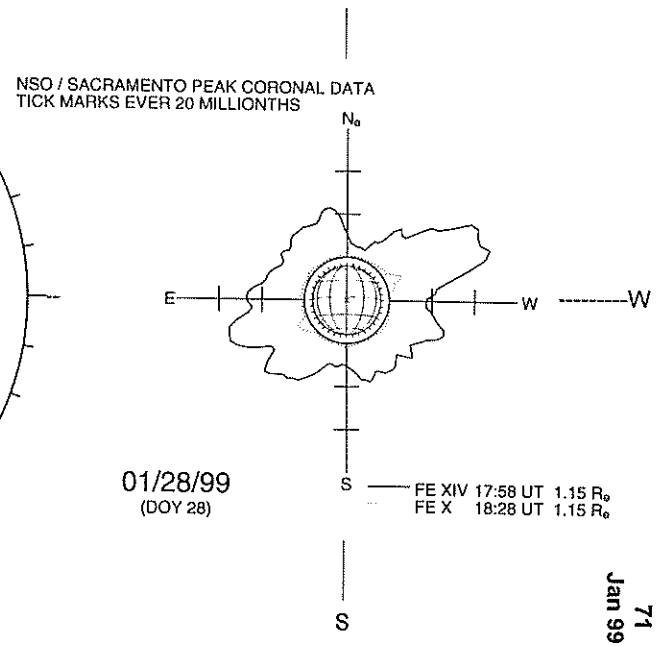
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



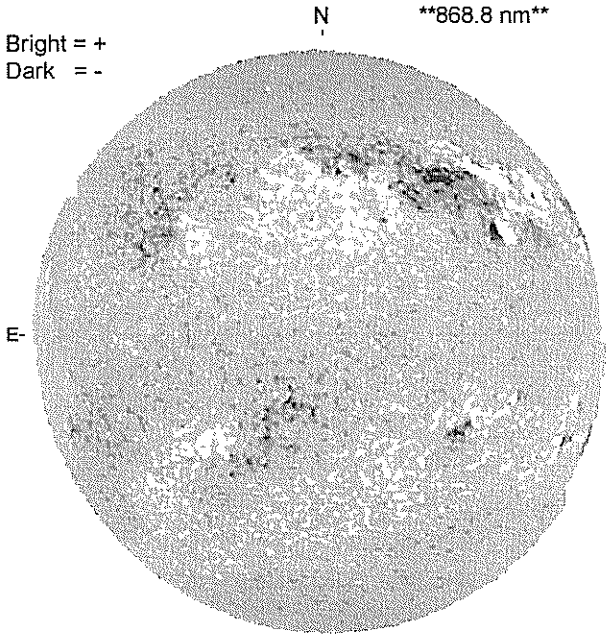
SACRAMENTO PEAK CORONA (1.15 Radii)----



71
Jan 99

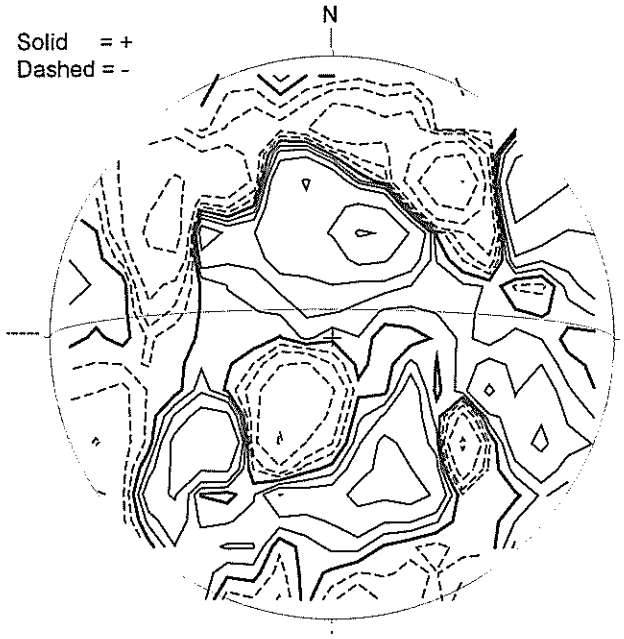
JANUARY 29, 1999 (P= -10.75, Bo = -5.77, Lo = 136.88)

KITT PEAK MAGNETOGRAM



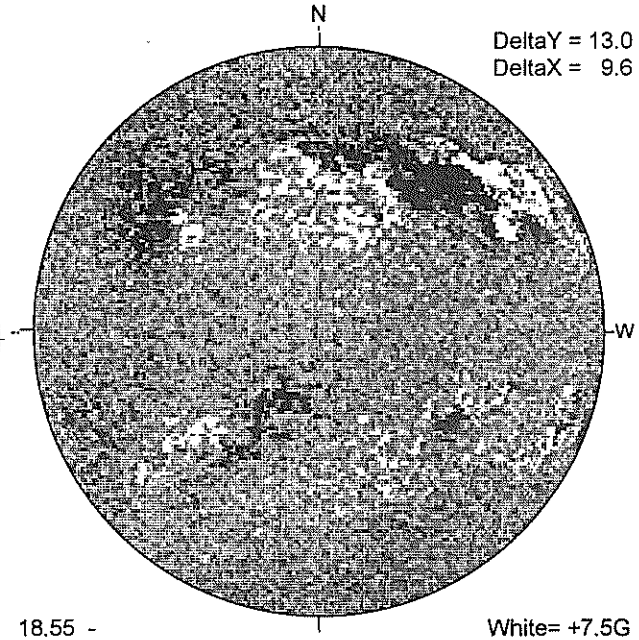
1959 UT

STANFORD MAGNETOGRAM



1953 UT

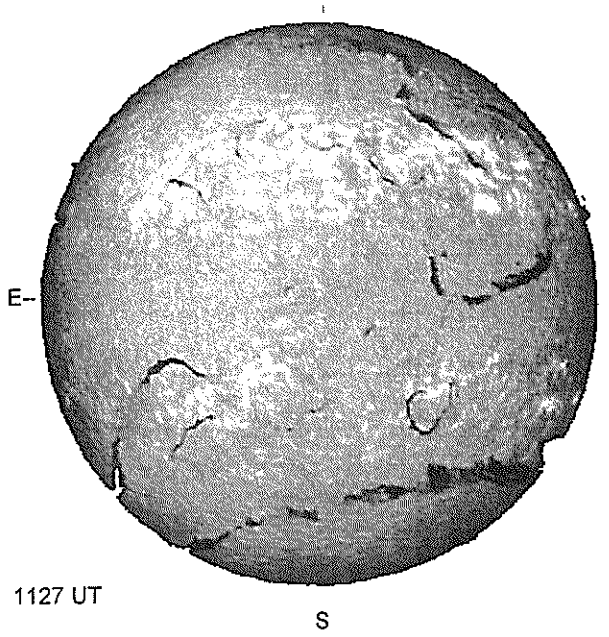
MT. WILSON MAGNETOGRAM



18.55 -
19.52 UT

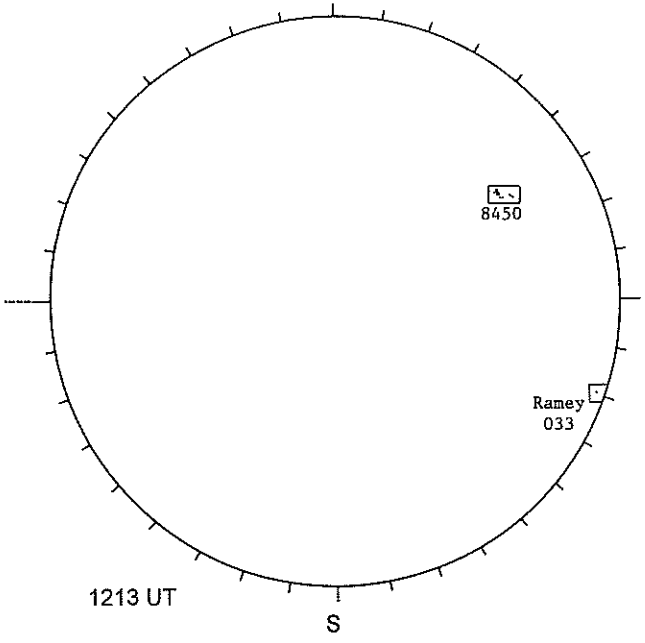
White= +7.5G
Black = -7.5G

MEUDON H-ALPHA



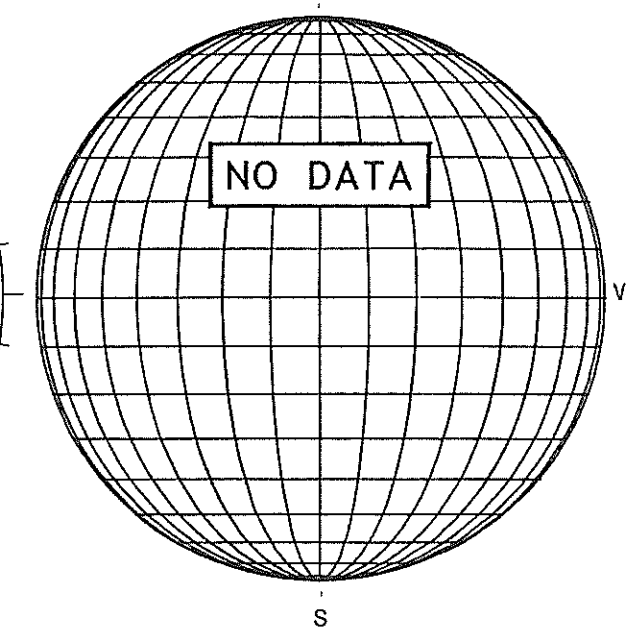
1127 UT

RAMEY SUNSPOT



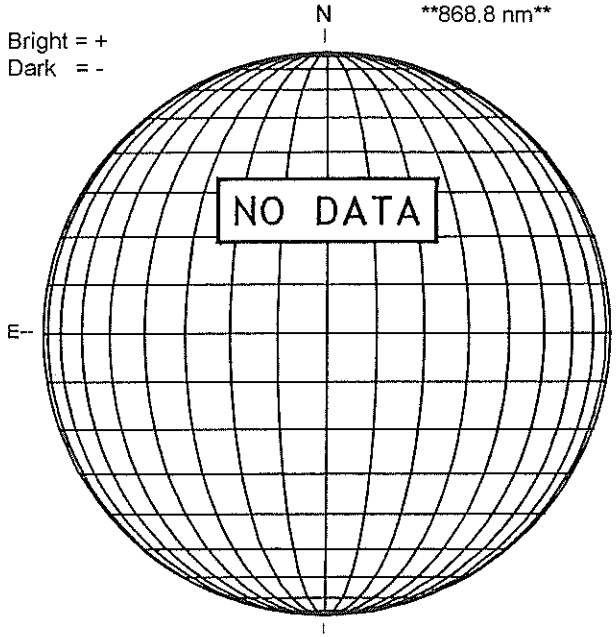
1213 UT

LOMNICKY PEAK CORONA (1.04 Radii)----

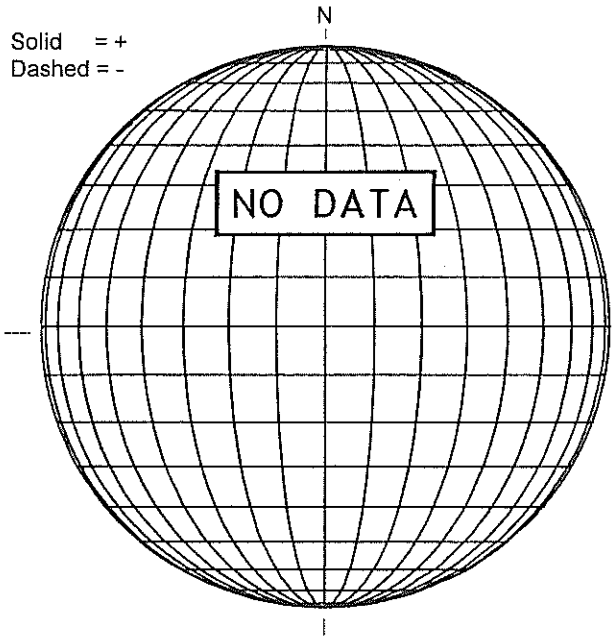


JANUARY 30, 1999 (P= -11.17, Bo = -5.85, Lo = 123.71)

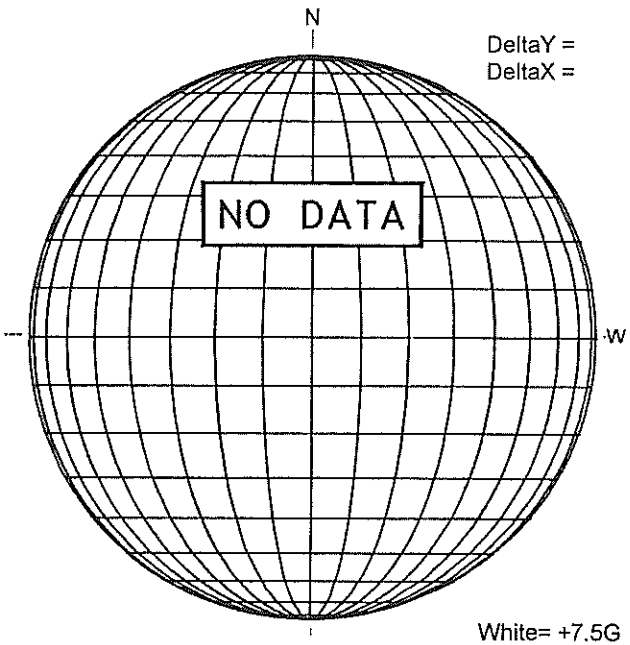
KITT PEAK MAGNETOGRAM



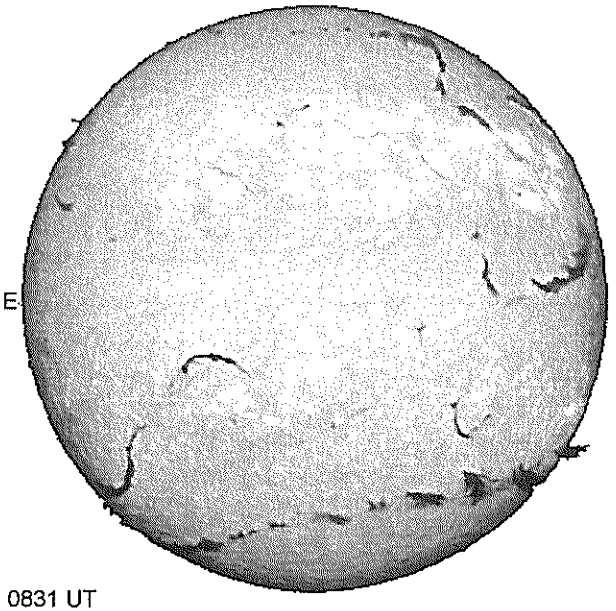
STANFORD MAGNETOGRAM



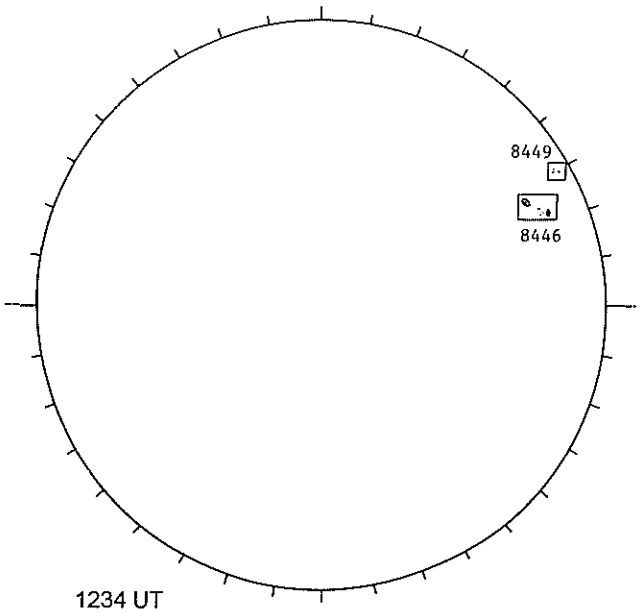
MT. WILSON MAGNETOGRAM



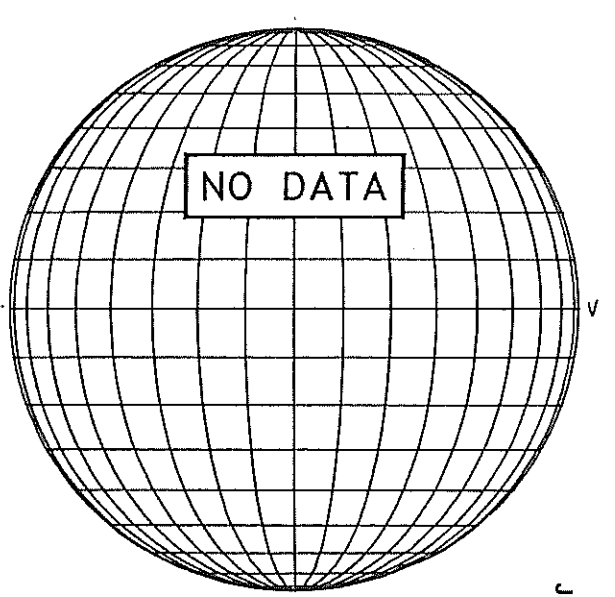
MEUDON H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



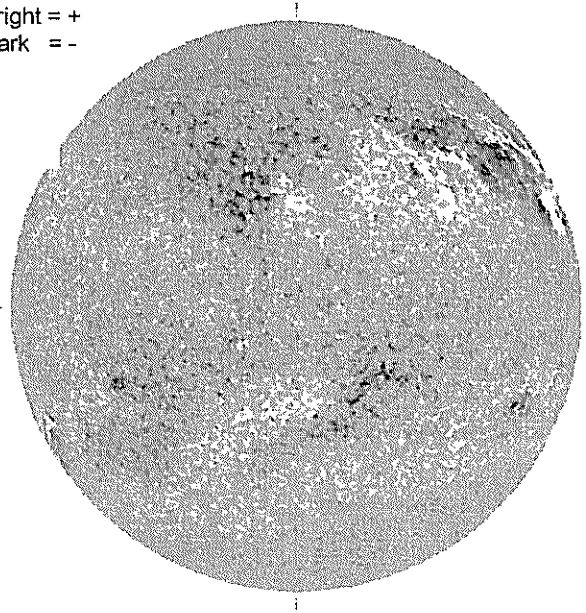
73
Jan 99

JANUARY 31, 1999 (P= -11.59, Bo = -5.93, Lo = 110.54)

KITT PEAK MAGNETOGRAM

N **868.8 nm**

Bright = +
Dark = -



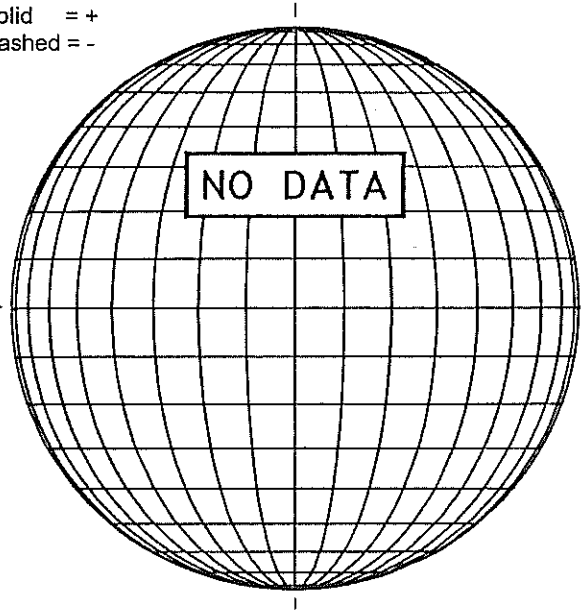
E-

1940 UT

STANFORD MAGNETOGRAM

N

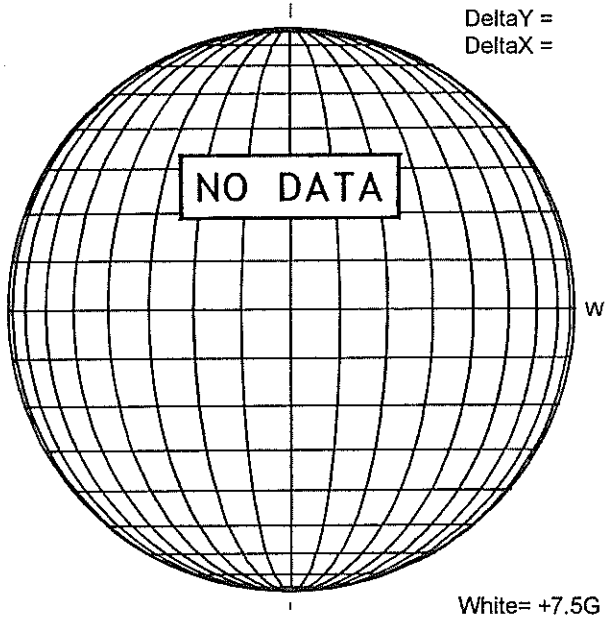
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

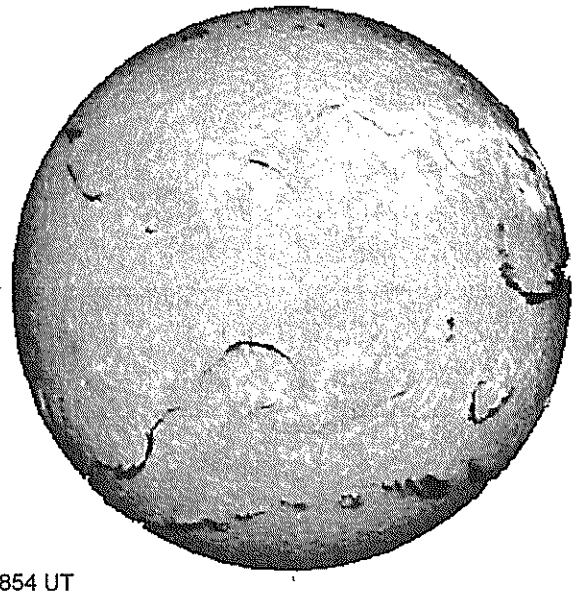
DeltaY =
DeltaX =



W

White= +7.5G
Black = -7.5G

MEUDON H-ALPHA

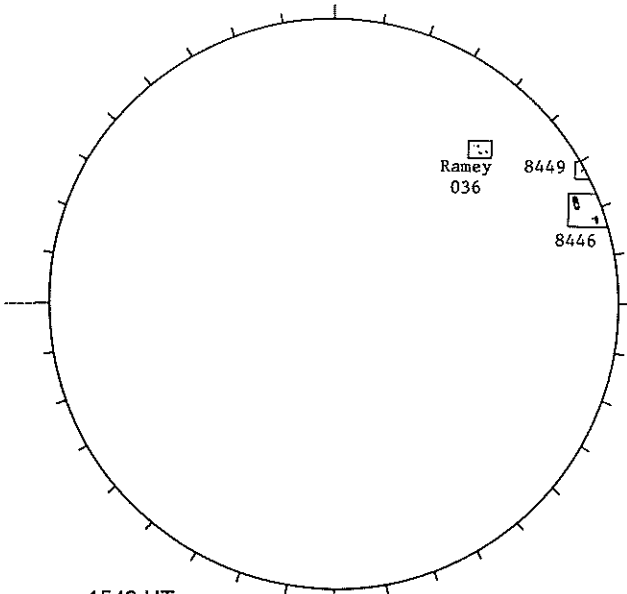


E-

0854 UT

S

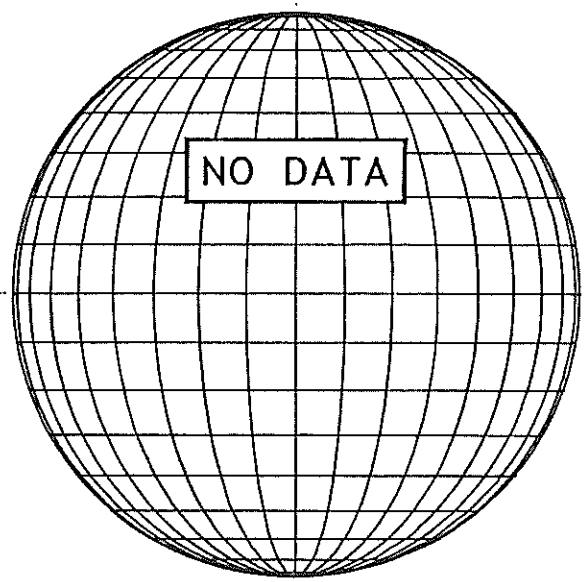
RAMEY SUNSPOT



1543 UT

S

LOMNICKY PEAK CORONA (1.04 Radii)



V

S

DAILY SOFT X-RAY IMAGES FROM YOHKOH

SXT daily images are on-line via ftp at the Hiraiso Communications Research Laboratory in Japan and at the Solar Data Analysis Center at GSFC. The following document explains everything.

Daily YOHKOH/SXT Images by FTP

This document explains the service which provides access to the daily Yohkoh Soft X-ray Telescope (SXT) full-disk images stored at Hiraiso Solar Terrestrial Research Center, C.R.L. Before using this service, please read this document.

1. Purpose and Rules

This service is provided by CRL under the following agreement with the Yohkoh Team (Project Manager: Yoshiaki Ogawara, ISAS; Project Scientist: Yutaka Uchida, Univ. Tokyo). Those who wish to use the data in a way not explicitly permitted below are requested to contact the Yohkoh Team.

i) The main purpose of this data service is to encourage broad scientific use of the Yohkoh data and observing capability through collaboration with the Yohkoh Team. Both observational and theoretical collaborations are welcome. Scientists outside the Yohkoh Team are requested to obtain specific permission when they write scientific papers based upon data from this service.

ii) Solar images from this service may be published or presented for purposes of illustration without special permission. In such cases the following acknowledgment is appropriate:

The solar X-ray image is from the Yohkoh mission of ISAS, Japan. The X-ray telescope was prepared by the Lockheed Palo Alto Research Laboratory, the National As tronomical Observatory of Japan, and the University of Tokyo with the support of NASA and ISAS.

iii) This data service is also intended to contribute to improving solar activity prediction, to assist other solar observers in their choice of targets, and for public education and information. Use of the images for these purposes is unrestricted.

2. Instrument

A full description of the SXT may be found in the book "The YOHKOH (SOLAR-A) Mission" (Z. Svestka and Y. Uchida, eds.), Kluwer Academic Publishers, 1991; or in the paper, "The Soft X-ray Telescope for the Solar-A Mission" (Tsuneta, et al. Solar Physics, vol. 136, pp. 37-67, 1991.

3. Description of Data

The stored SXT images data are taken through an Al/Mg composite filter with a mean wavelength of about 20 A for normal coronal temperatures. The images are composites of a short and a long exposure with a pixel size of 4.9 arcsec. Background has been removed and all images are normalized to an

exposure time of one second. The 8-bit numbers give the logarithm of the signal byte- scaled so that an actual signal of 10^6 equals 255. To recover the actual signal in data numbers, use the relation

data_number = 10^((6*NN)/255)

where NN is the datum in the stored image. Conversion to intensity depends upon temperature but is of the order of 5 x 10^20 ergs, at the Sun, per data_number.

The file format is the usual FITS format. The file names are in the style

sf_fits930515.151807,

where sf means SXT FFI image ,"930515" means 15-May-93, and "151807" means 15:18:07 UT.

4. How to connect and transfer data

Those who wish to access these data are requested to send an application to the manager of this data service via e-mail. At least, the following items should be included in an application;

* Full name
* Institution
* Postal Address
* e-mail address
* your host machine and OS
* software for SXT data processing and display
* expected frequency of data transfer

The format of the application is free. This information is necessary to deliver additional information and service in future, and helpful to update data service for more convenience. The application should be sent to the following address via e-mail;

akioka@planet.crl.go.jp
or akioka@planet.hi.crl.go.jp.

The data server is the usual anonymous ftp server program of UNIX. The IP address is 133.243.32.7. Therefore, a typical example for data access is ...

```
% ftp 133.243.32.7
name: anonymous
password : (your e-mail address)
ftp> cd sxt
ftp> binary
ftp> get <file name>
%
```

When you have logged in with the anonymous ftp account, you will find a directory named sxt. In this directory, you will find available sxt images and some documents which all users should read.

5. Practical Limitations

The domestic network in Japan is very crowded. Therefore, to assure continuation of this service we request potential users to follow the following limitations;

i) Please avoid to access during office hours in Japan (23:30 - 08:00 UT). Our advice is to access between 13:00 UT and 24:00 UT.

ii) Please do not try to transfer more than two images at once. We request the users not to obtain more than a few images per day. If you need more images, please contact the manager for special arrangements.

If the above rules are consistently violated, there is a possibility that we will have to terminate this service or apply more severe limitations, so please cooperate fully until we have more experience with the effect of this service upon the network.

If you have some request or comment, please feel free to send e-mail to one of the following persons:

Yutaka Uchida, Project Scientist, Yohkoh
Department of Astronomy, University of Tokyo
e-mail: uchida@dept.astron.s.u-tokyo.ac.jp

Maki Akioka, Manager, CRL Data Service
Hiraiso Solar Terrestrial Research Center
Communications Research Laboratory
e-mail: akioka@planet.hi.crl.go.jp

Received Aug. 25, 1993 from acton@sxt4.oscs.montana.edu

Submitted by L. Acton for the Yohkoh Team

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Solar DAC Node Name Changes

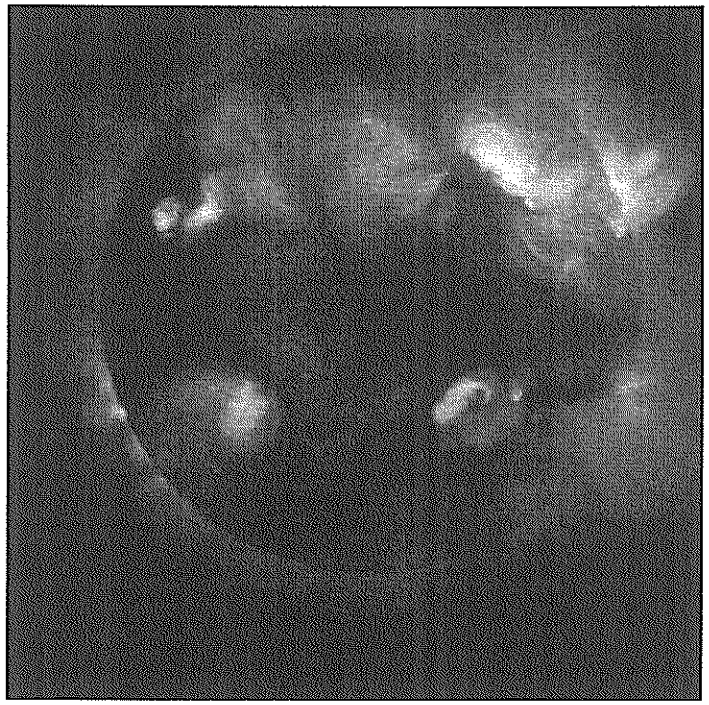
The NASA Goddard Solar Data Analysis Center (SDAC) nodes most familiar to the community will be undergoing some major changes in August and September, 1993. Nodes NEWMAX (newmax.gsfc.nasa.gov) and ISIS (isis.gsfc.nasa.gov) are being retired, and their functions combined on a single server, which will be known as SDAC (sdac.gsfc.nasa.gov). SDAC's IP (Internet) address will be 128.183.57.156, and its NSI/DECnet address will be 15.526.

Users of the BATSE solar flare database and other services of ISIS and NEWMAX should watch for messages warning of the actual changeover dates. (SDAC is a DEC 4000 Model 610 AXP, so users should see noticeable improvements in response.)

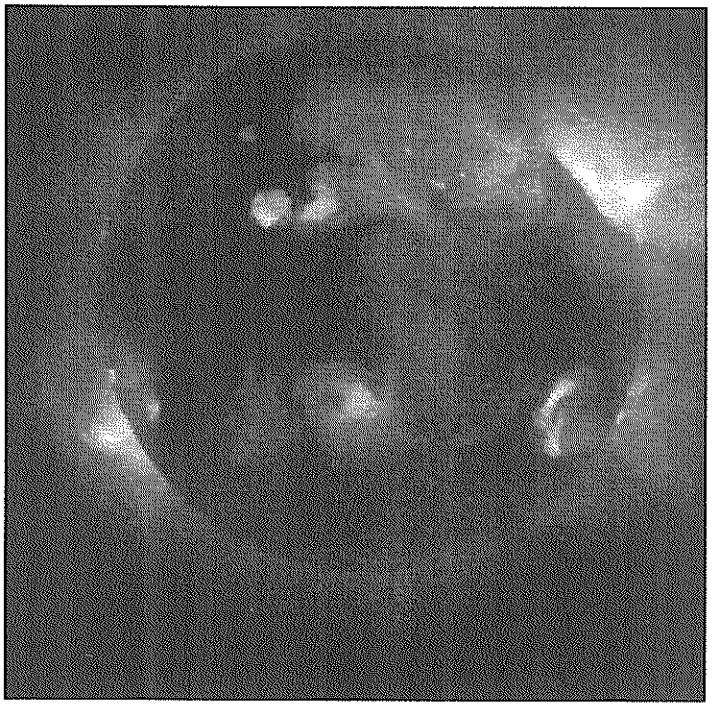
Received Aug. 10, 1993 from gurman@uvsp.gsfc.nasa.gov
--Joe Gurman

YOHKOH SOFT X-RAY TELESCOPE IMAGES

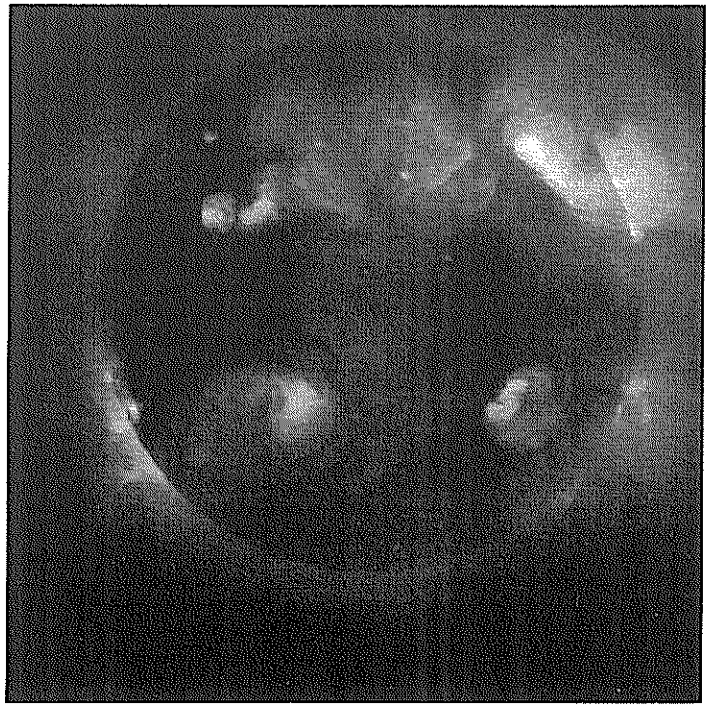
January
1999



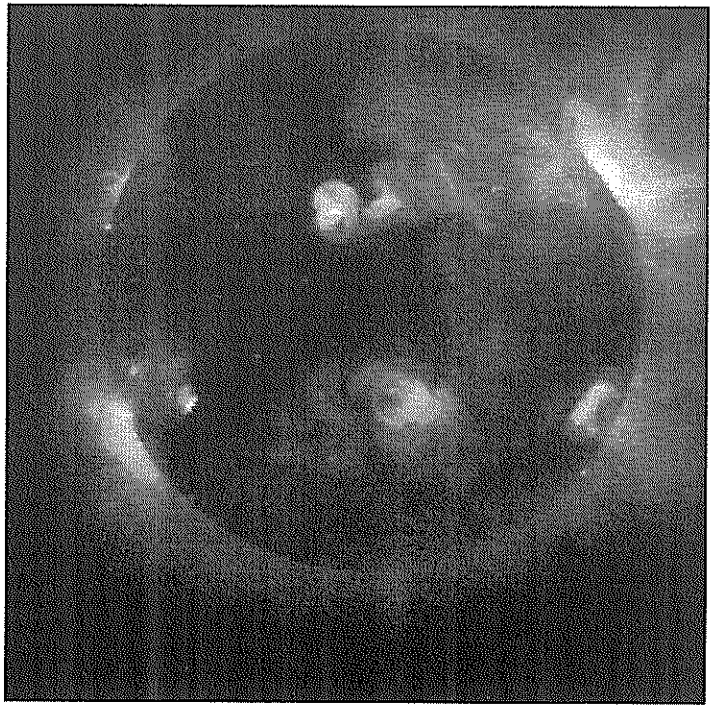
Day 1
11:43:50 UT



Day 3
12:03:32 UT



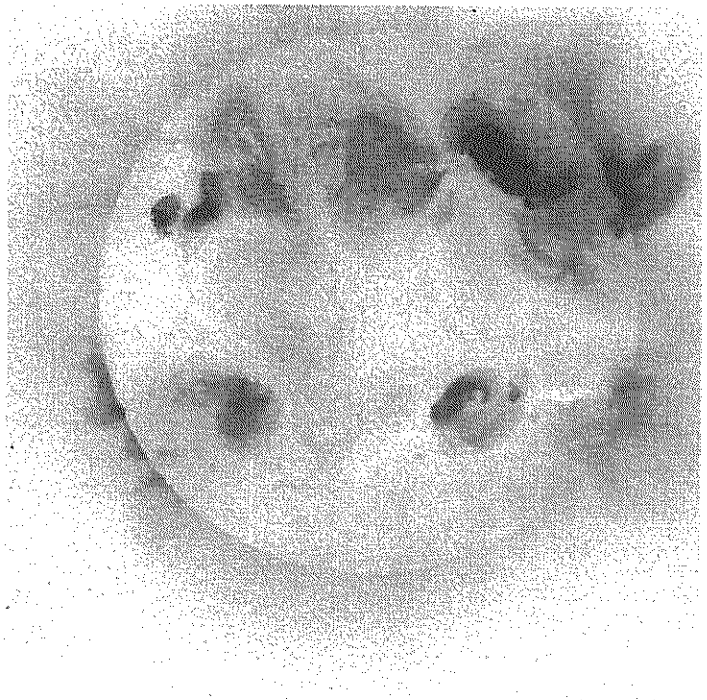
Day 2
11:43:02 UT



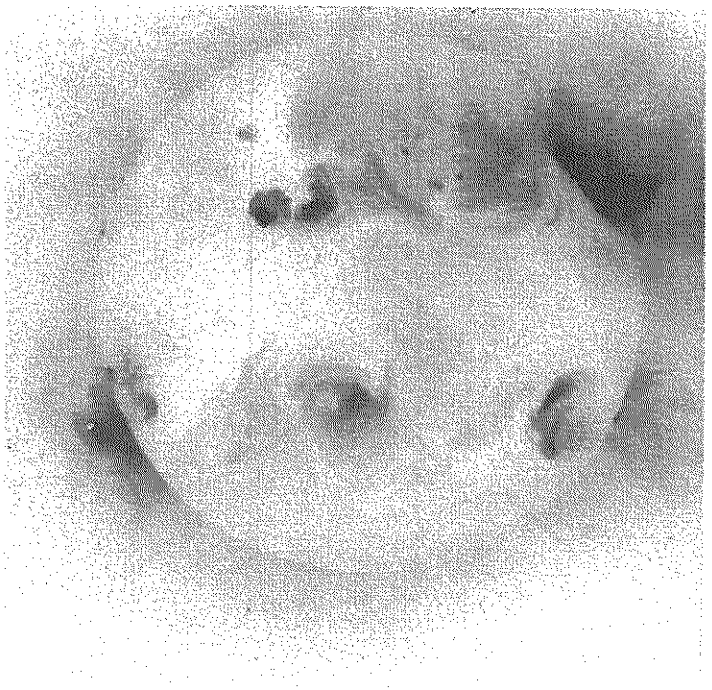
Day 4
11:56:52 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

January 1999

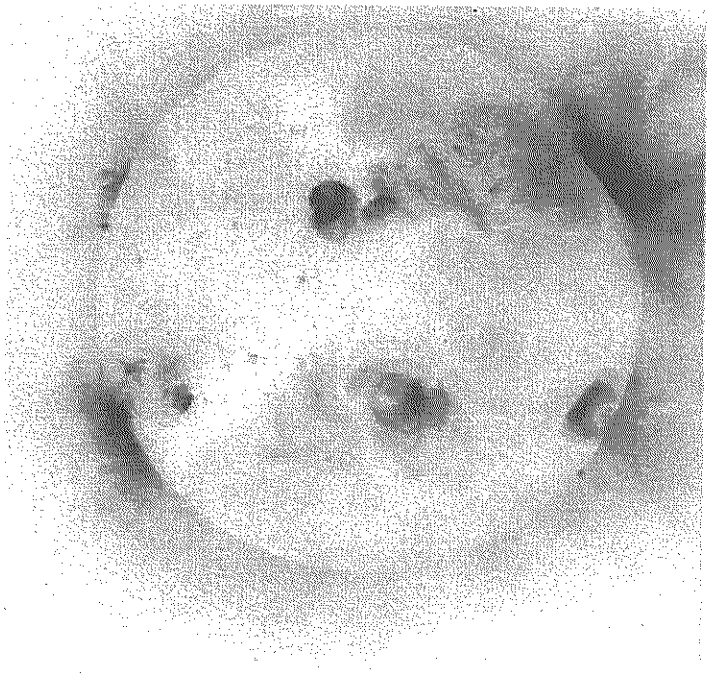


Day 1
11:43:50 UT



Day 3
12:03:32 UT

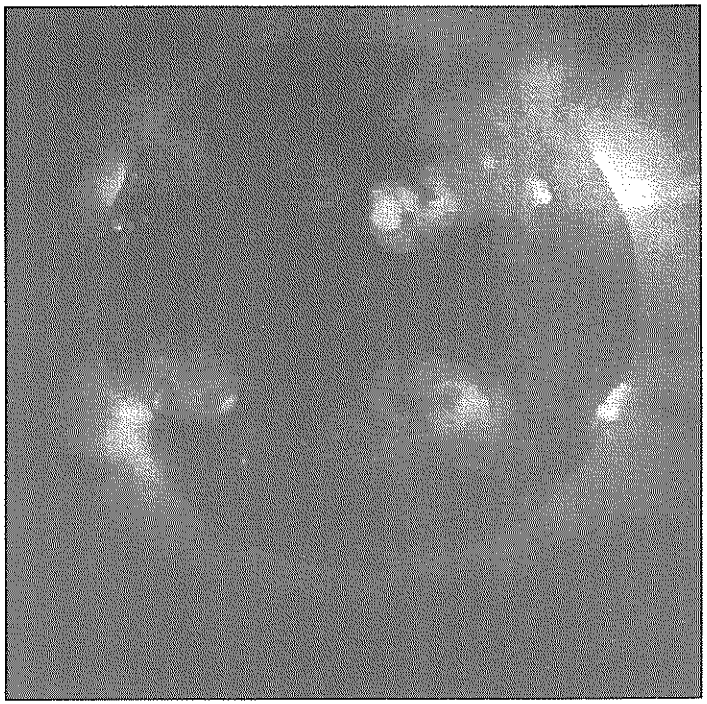
Day 2
11:43:02 UT



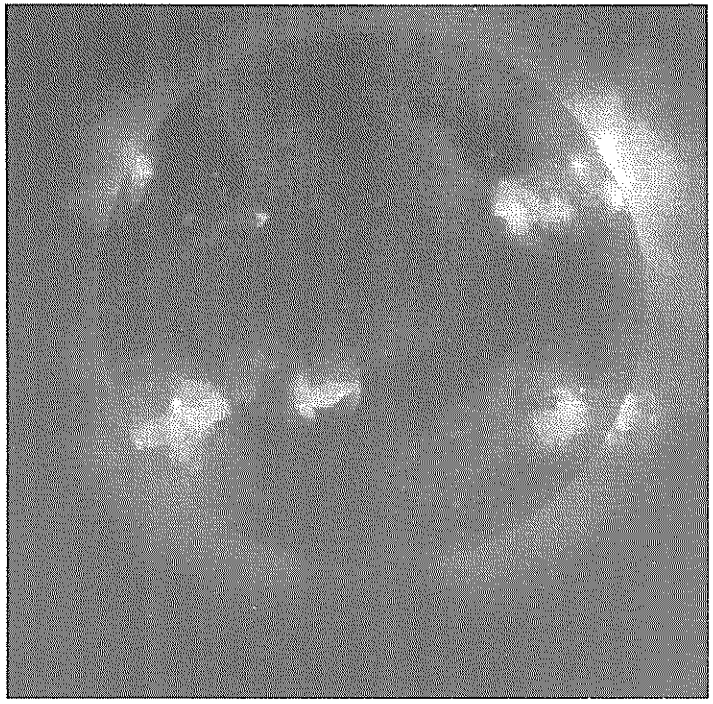
Day 4
11:56:52 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

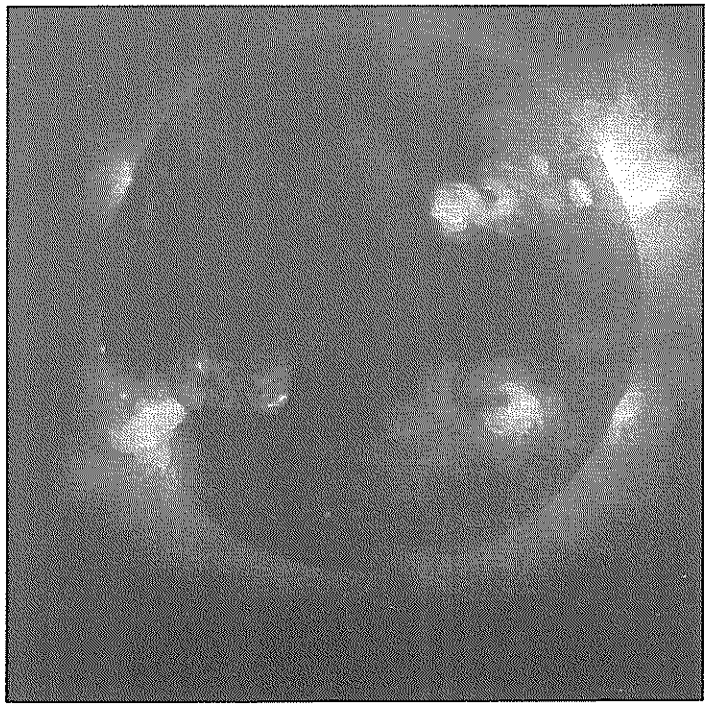
January
1999



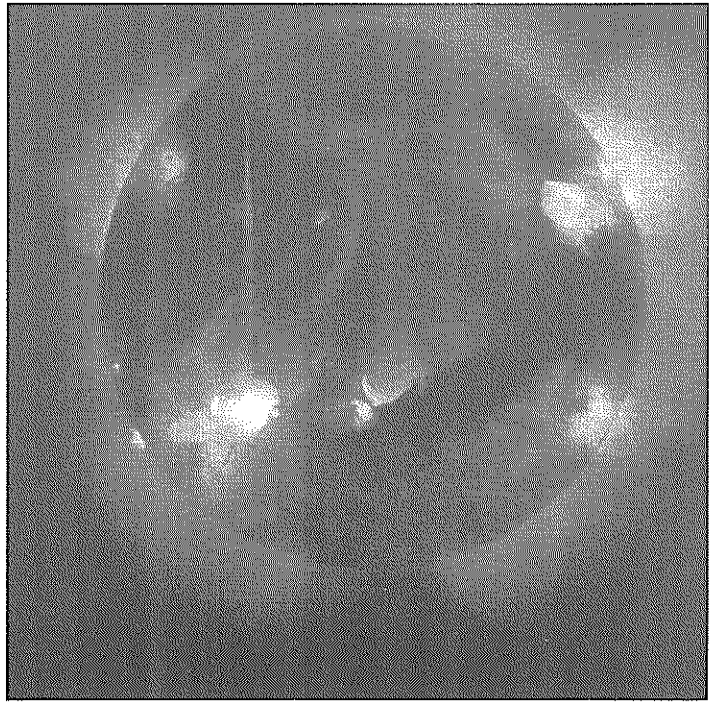
Day 5
12:06:28 UT



Day 7
12:44:52 UT



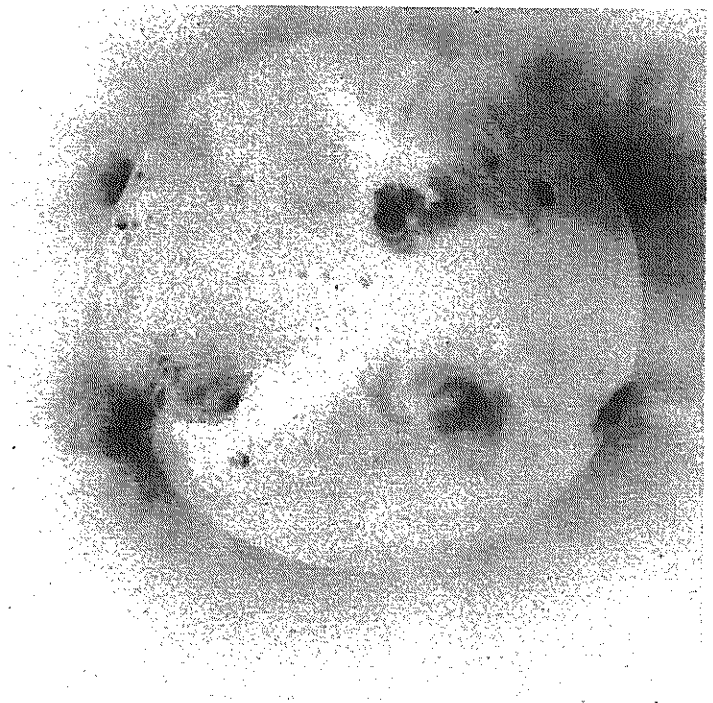
Day 6
11:23:24 UT



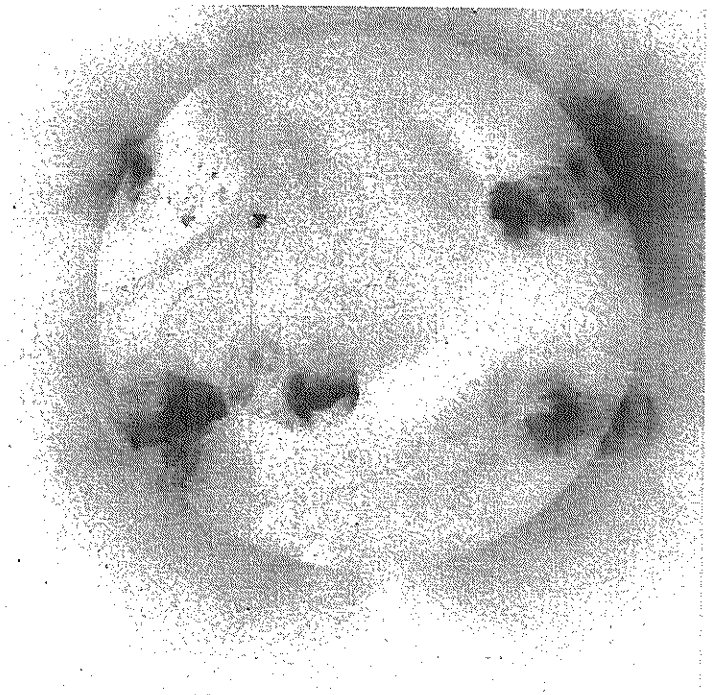
Day 8
11:47:29 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

January
1999

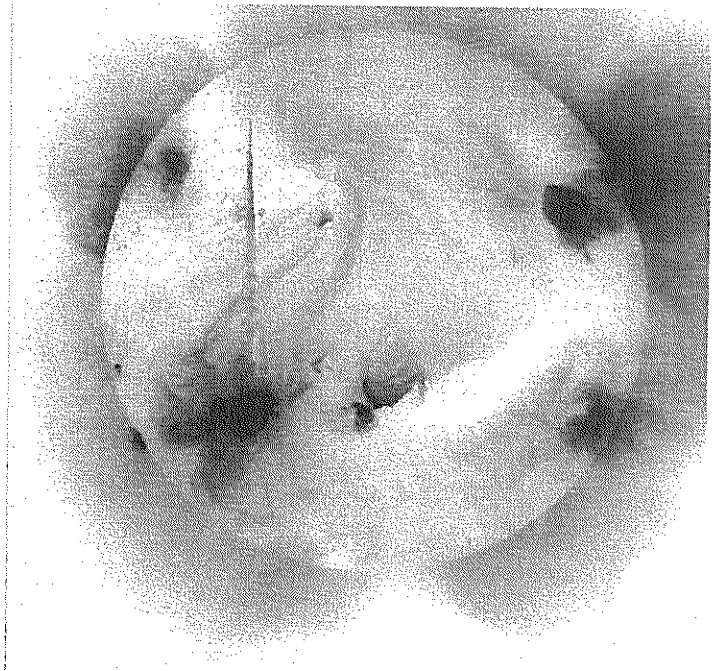


Day 5
12:06:28 UT



Day 7
12:44:52 UT

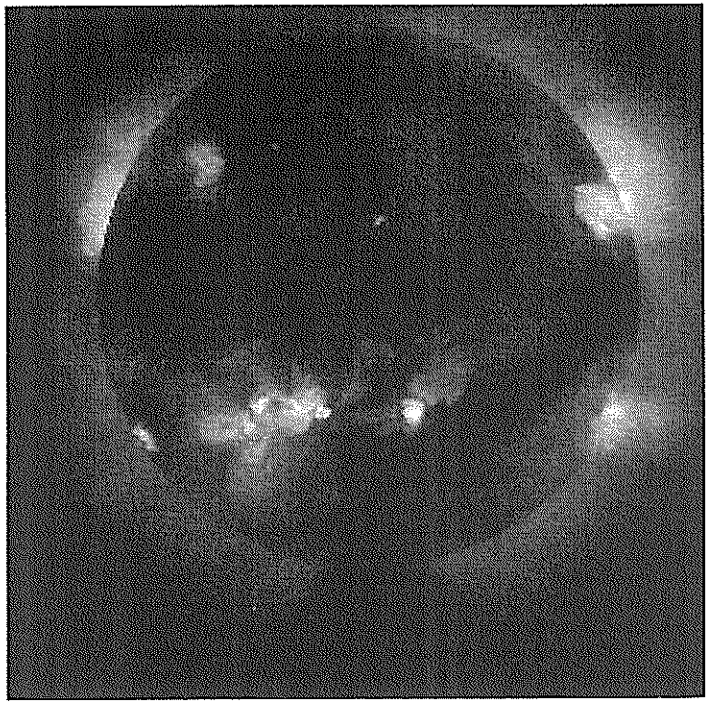
Day 6
11:23:24 UT



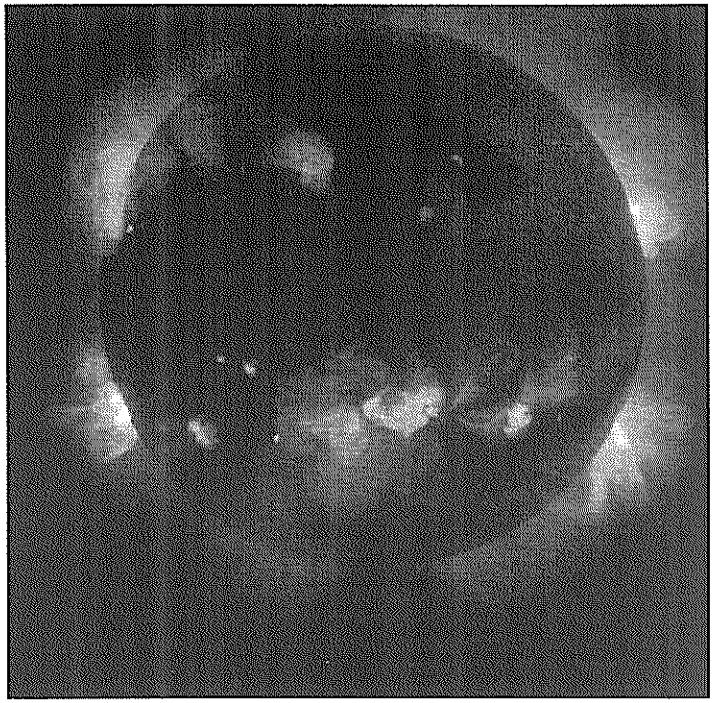
Day 8
11:47:29 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

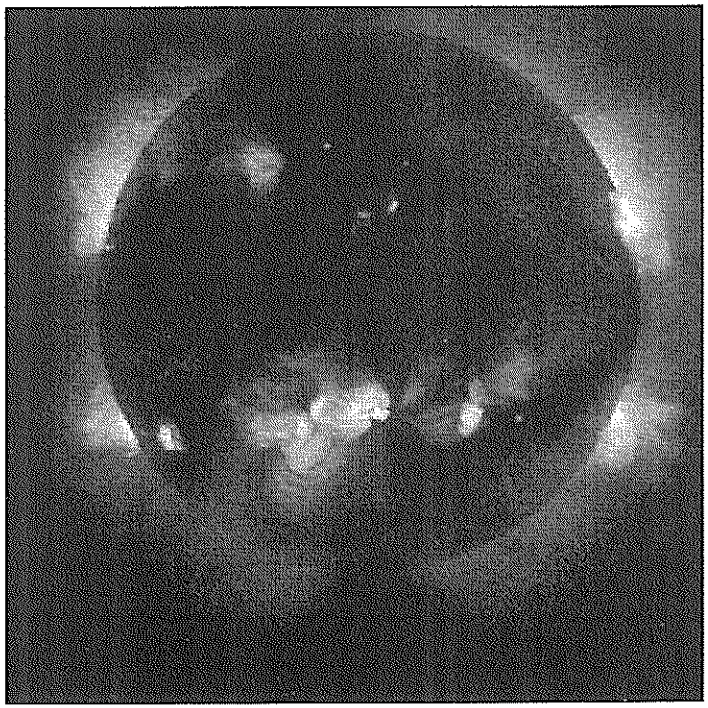
January
1999



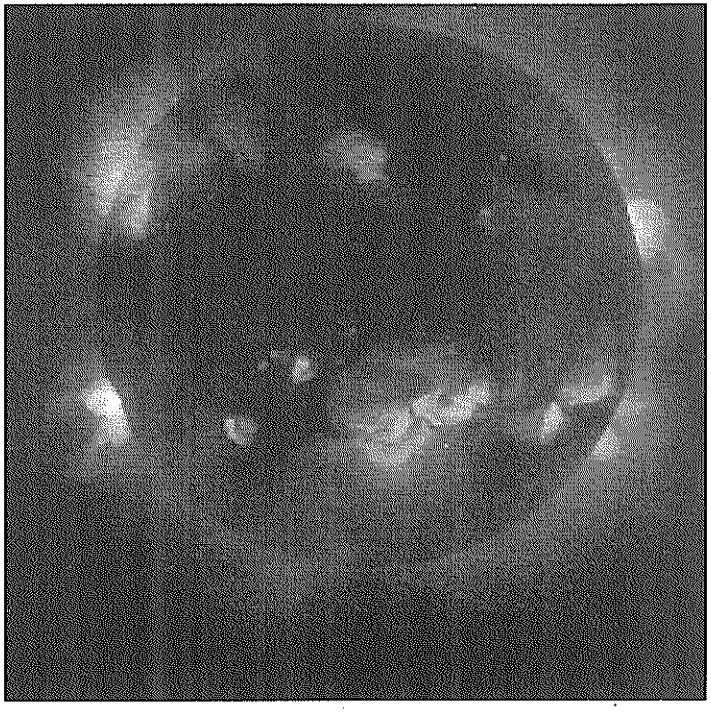
Day 9
11:35:15 UT



Day 11
10:48:13 UT



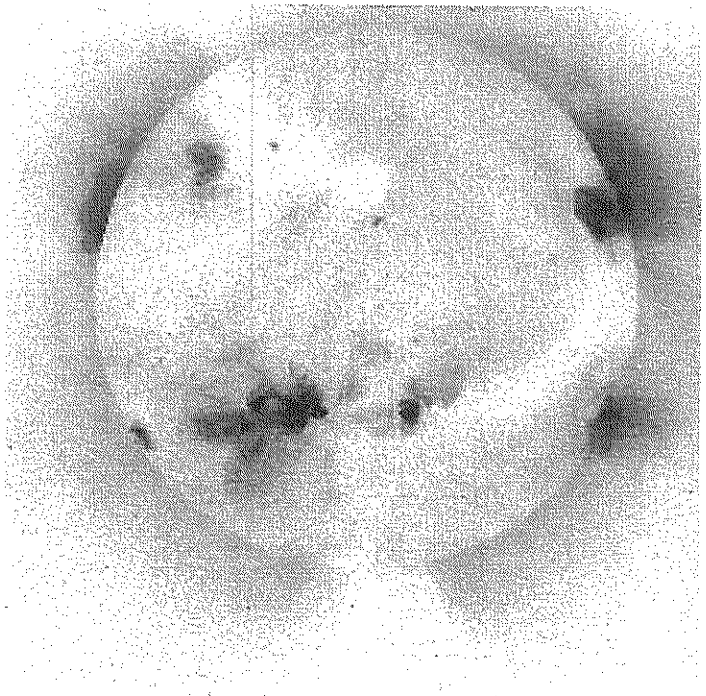
Day 10
13:57:39 UT



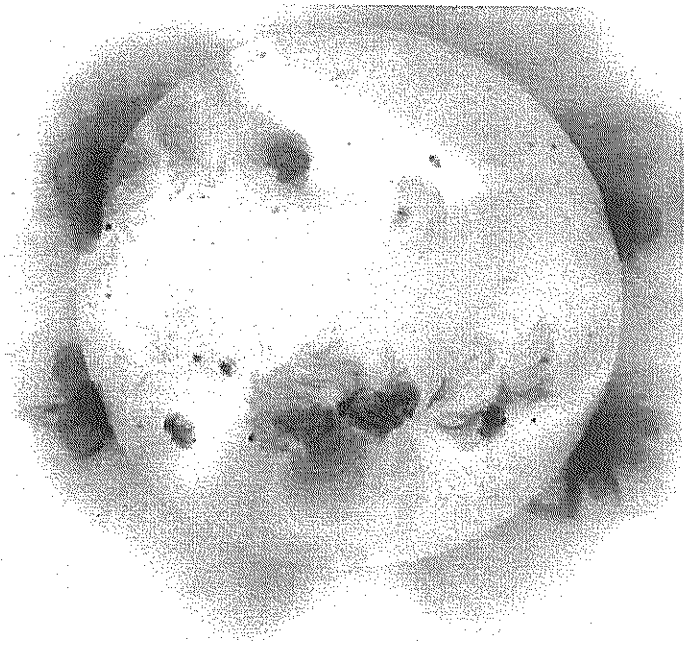
Day 12
10:45:55 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

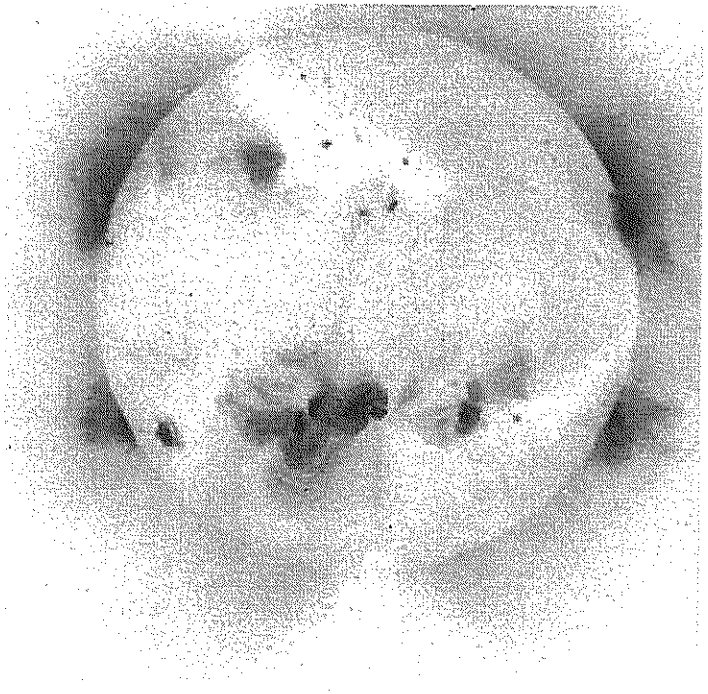
January 1999



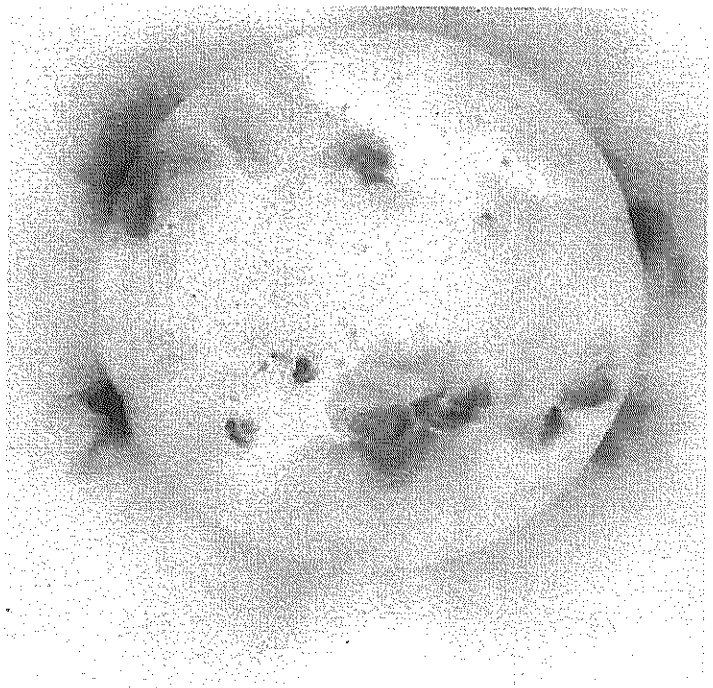
Day 9
11:35:15 UT



Day 11
10:48:13 UT



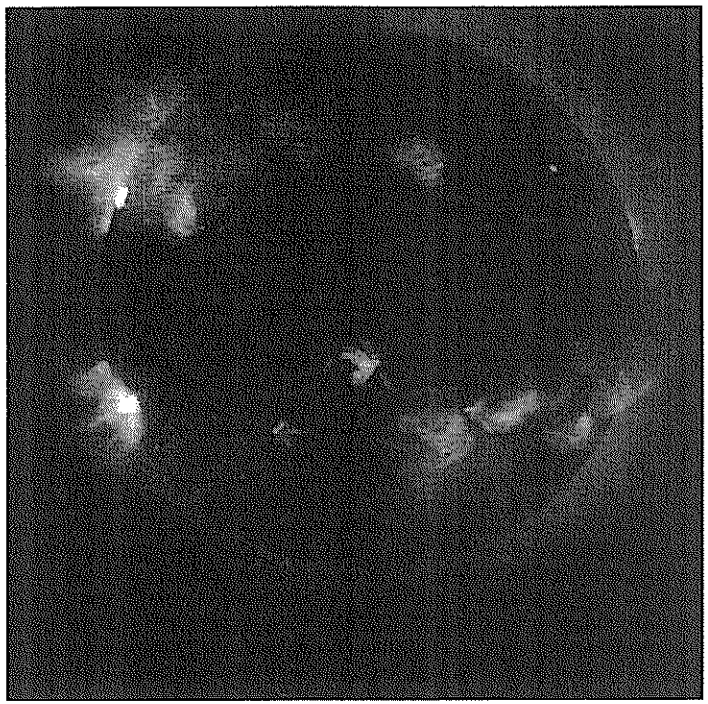
Day 10
13:57:39 UT



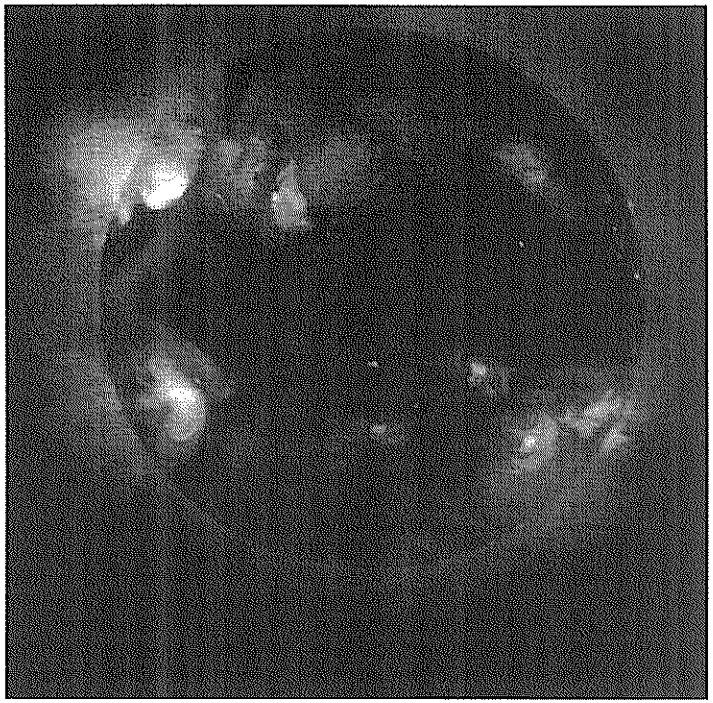
Day 12
10:45:55 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

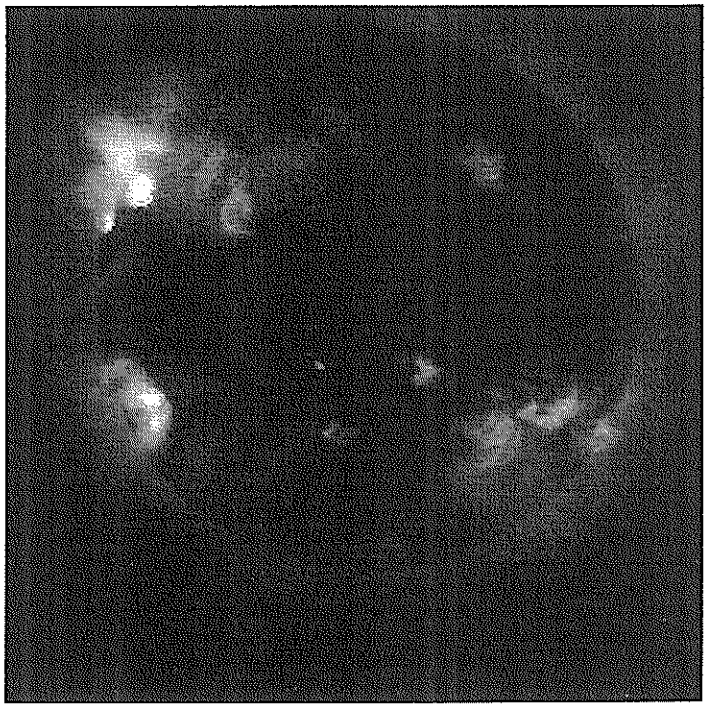
January
1999



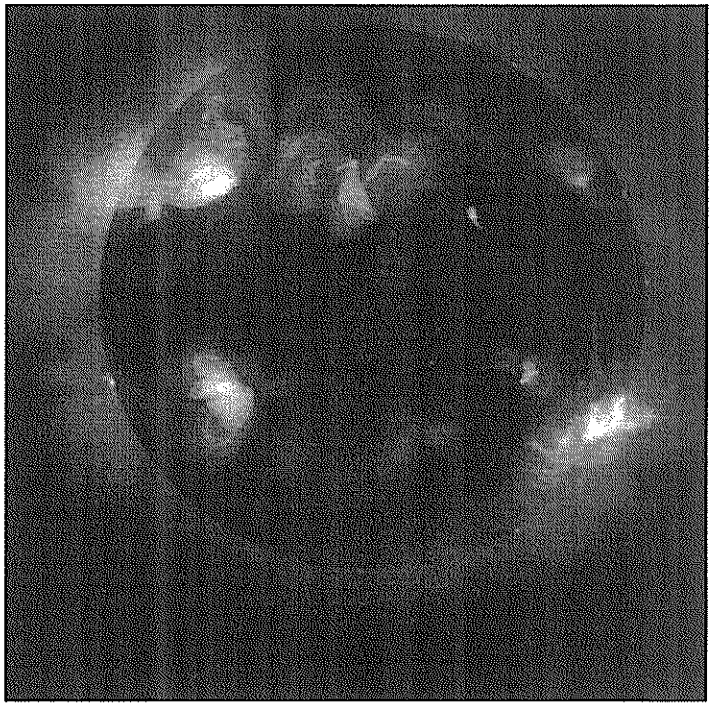
Day 13
11:30:16 UT



Day 15
10:25:10 UT



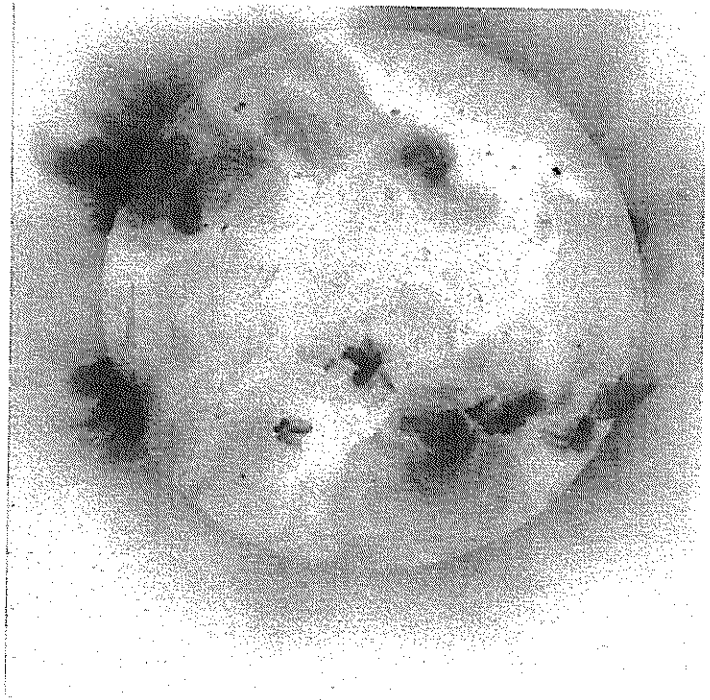
Day 14
13:25:06 UT



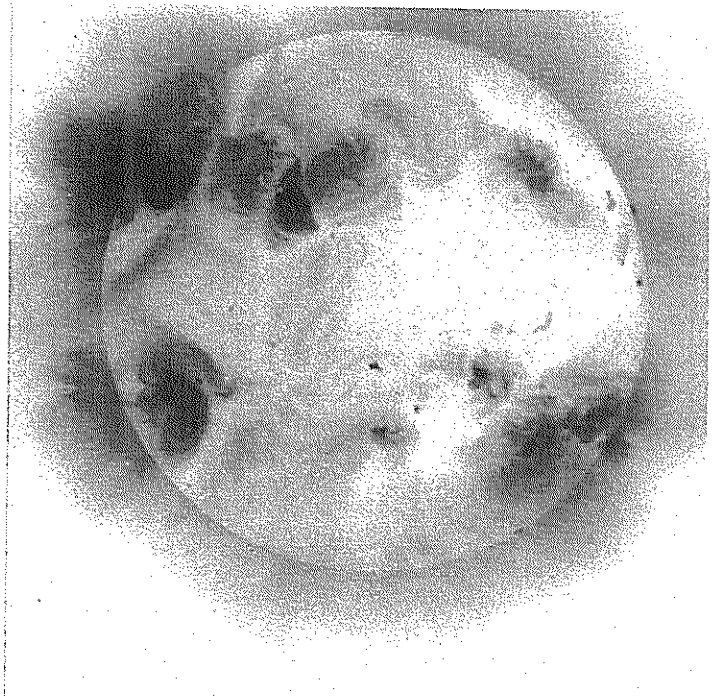
Day 16
10:39:52 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

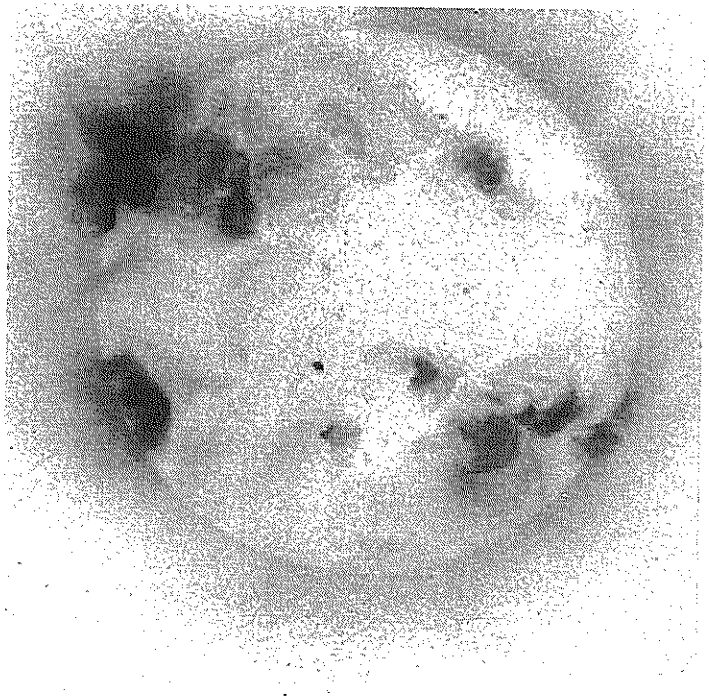
January 1999



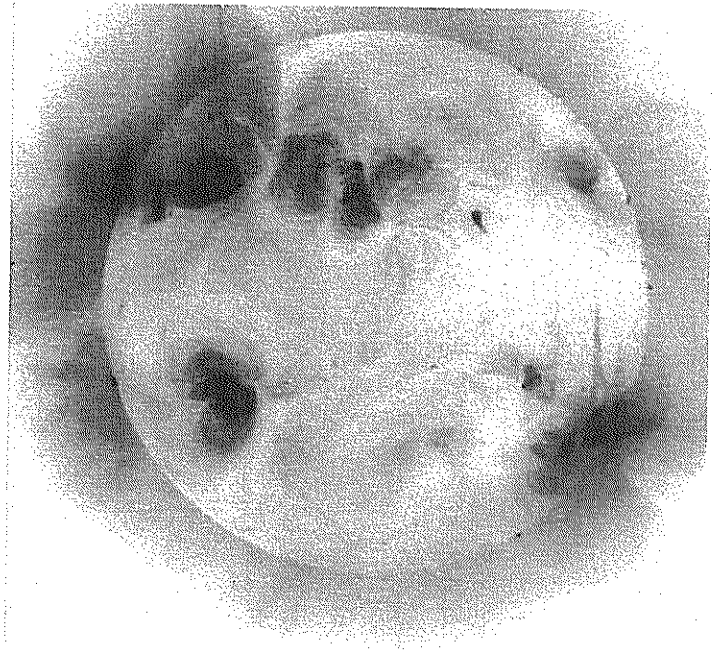
Day 13
11:30:16 UT



Day 15
10:25:10 UT



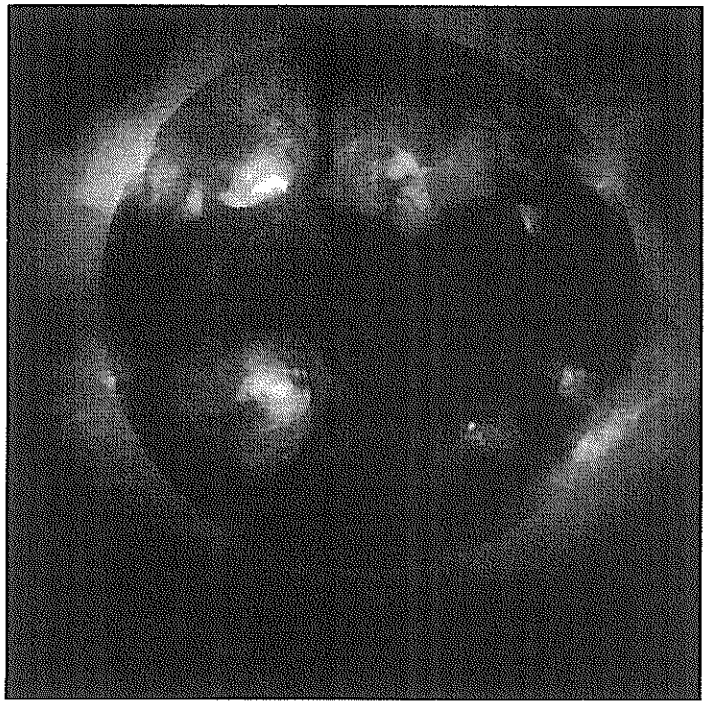
Day 14
13:25:06 UT



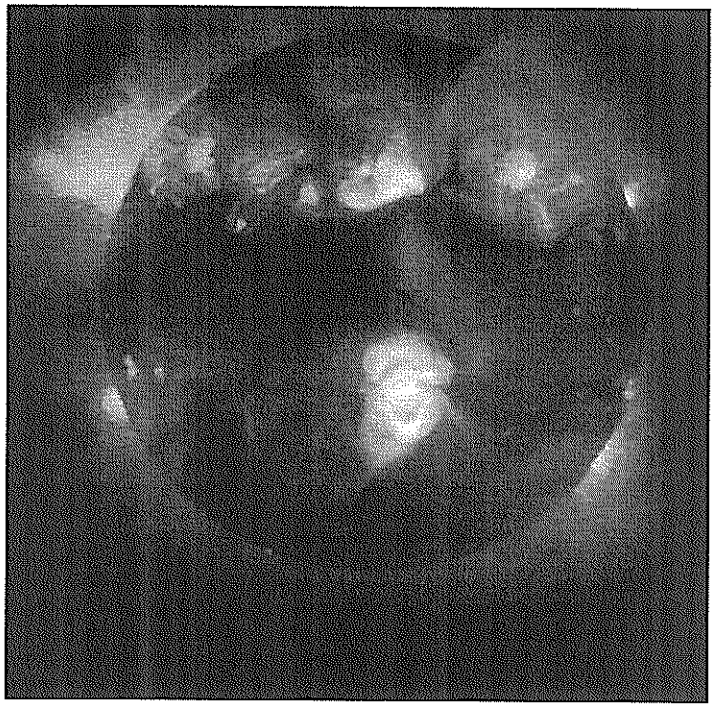
Day 16
10:39:52 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

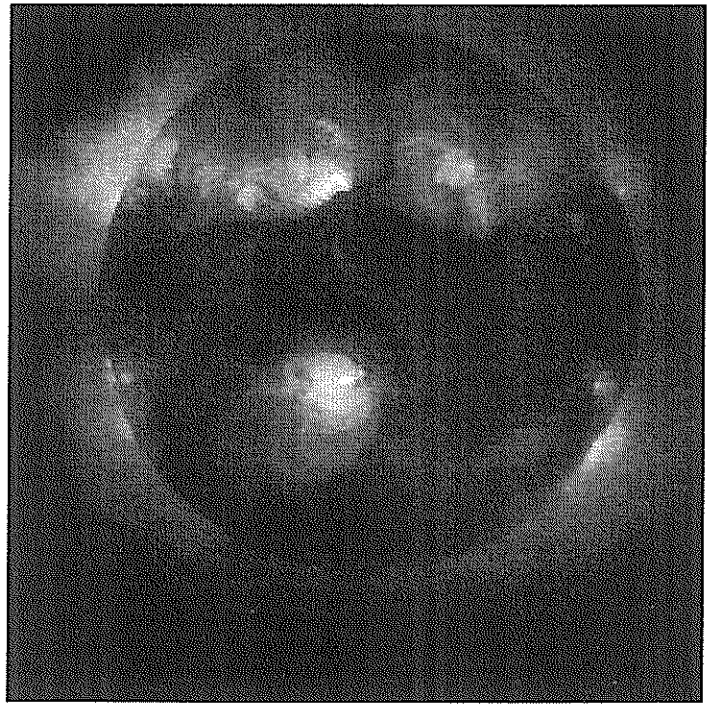
January
1999



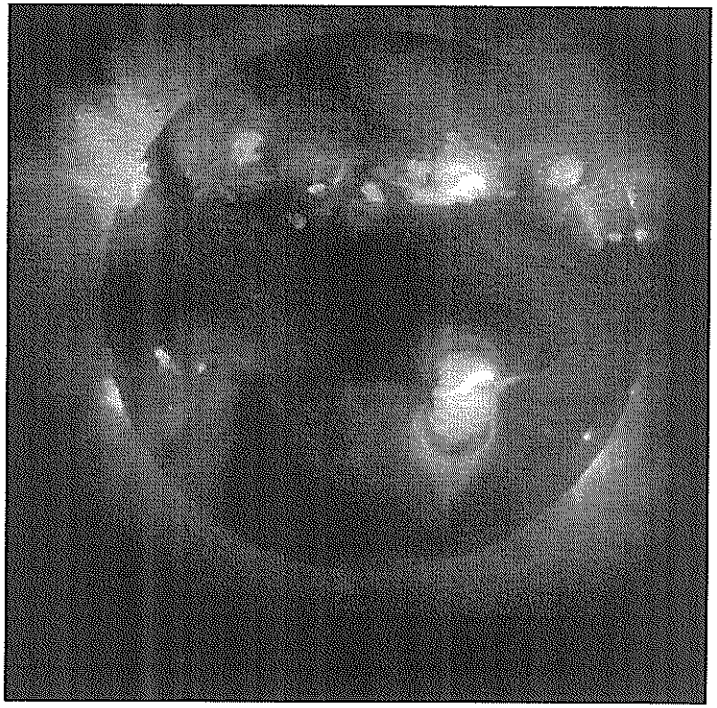
Day 17
10:56:12 UT



Day 19
13:04:25 UT



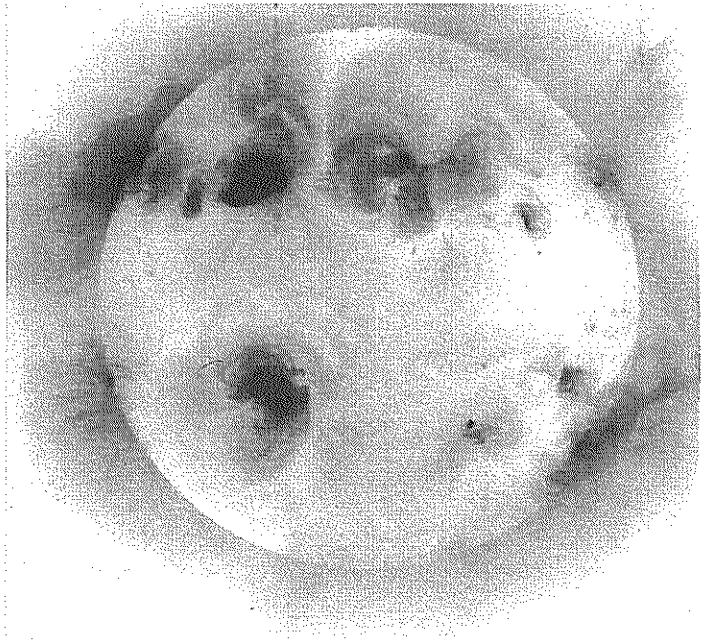
Day 18
11:59:29 UT



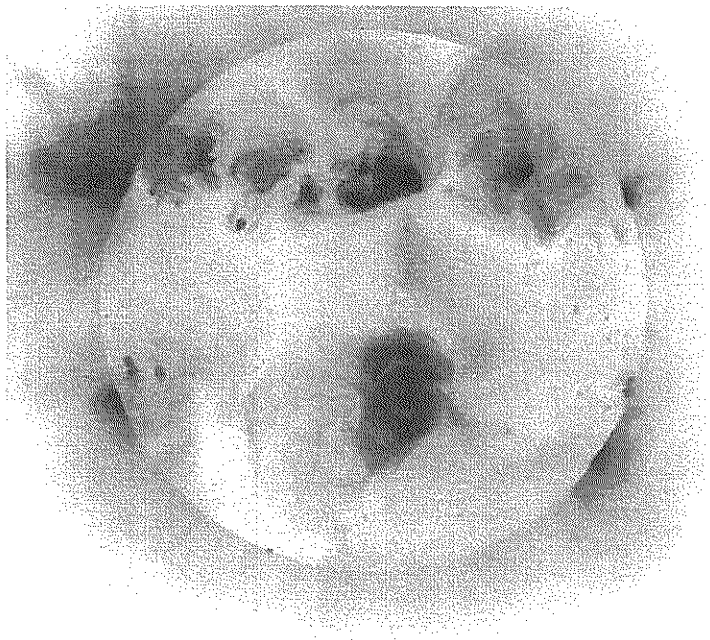
Day 20
13:18:27 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

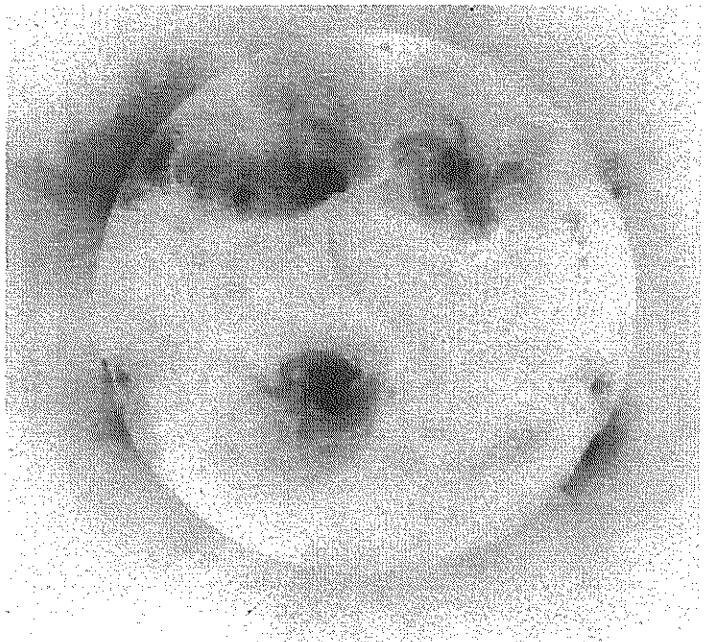
January 1999



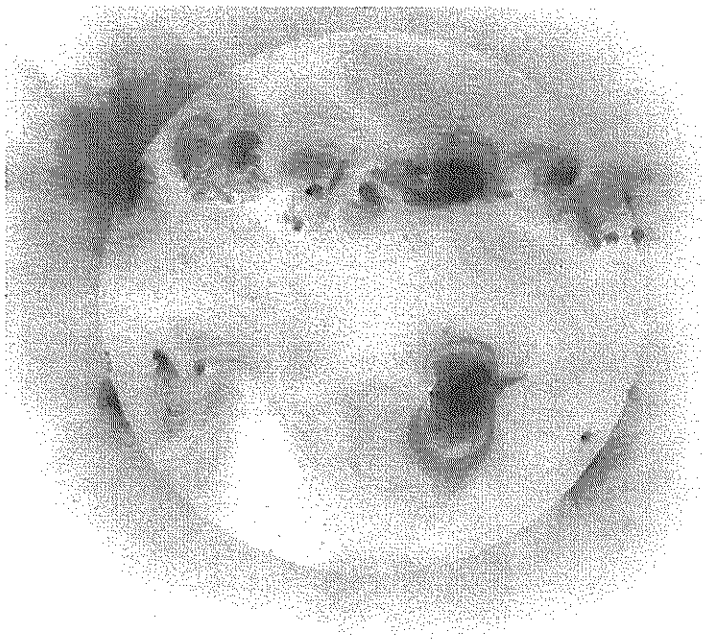
Day 17
10:56:12 UT



Day 19
13:04:25 UT



Day 18
11:59:29 UT

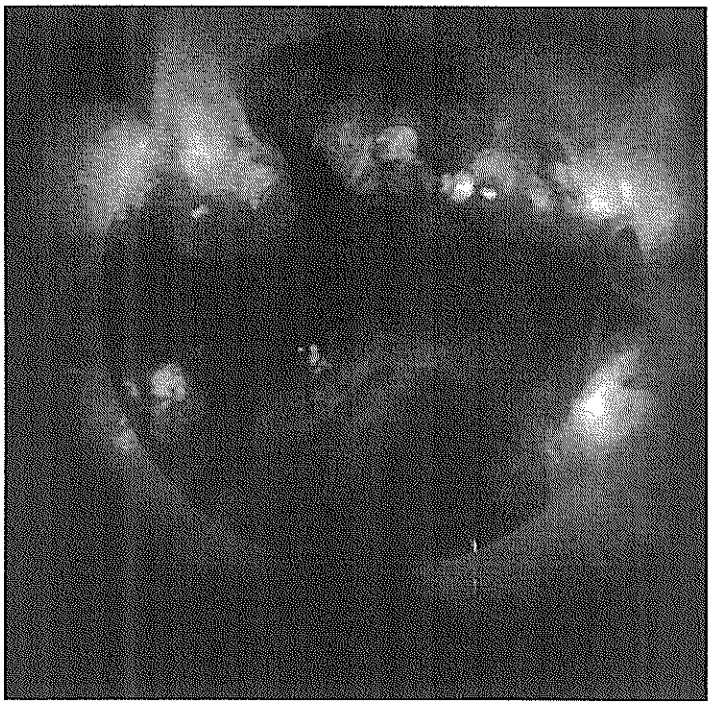


Day 20
13:18:27 UT

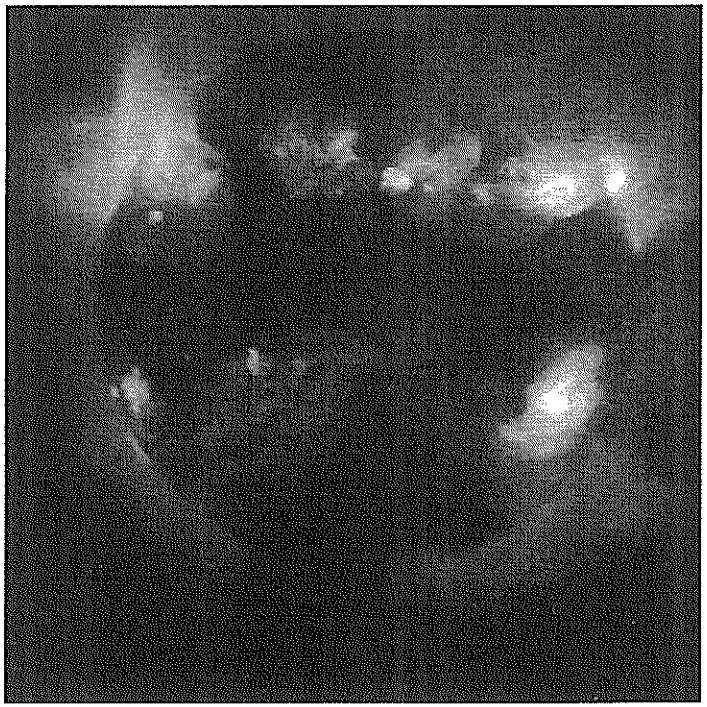
YOHKOH SOFT X-RAY TELESCOPE IMAGES

January
1999

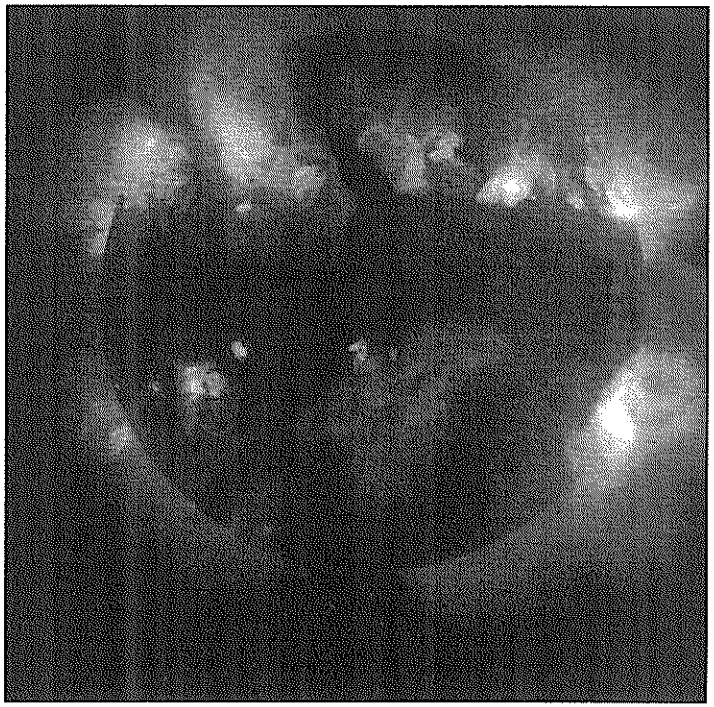
Day 21
11:58:51 UT



Day 23
12:23:44 UT



Day 22
12:06:57 UT

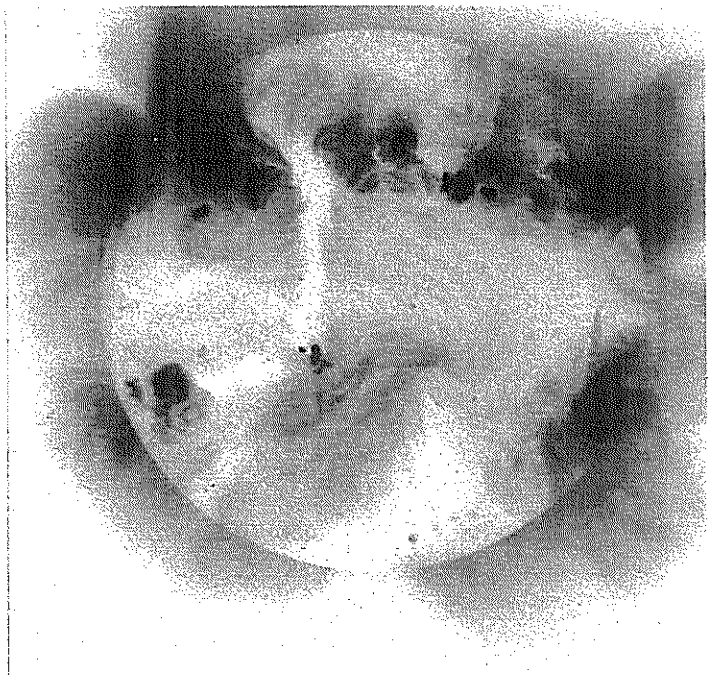


Day 24
07:54:16 UT

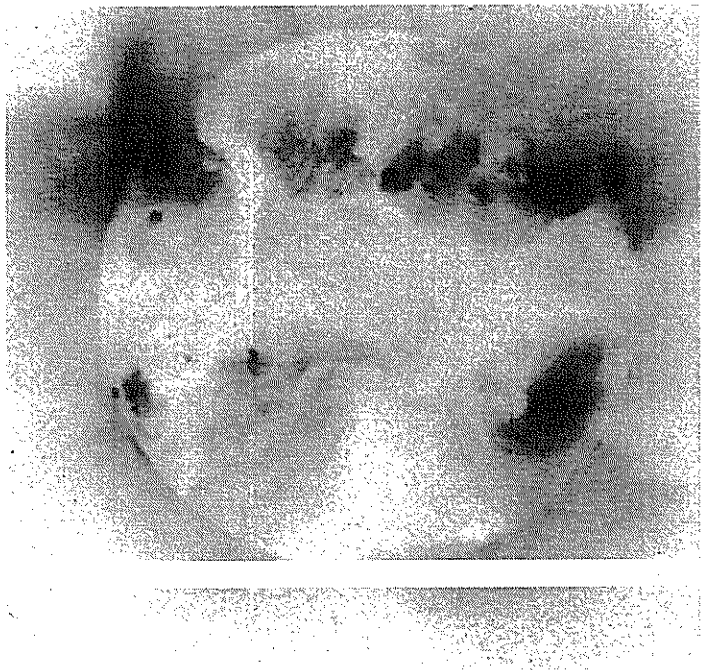
YOHKOH SOFT X-RAY TELESCOPE IMAGES

January
1999

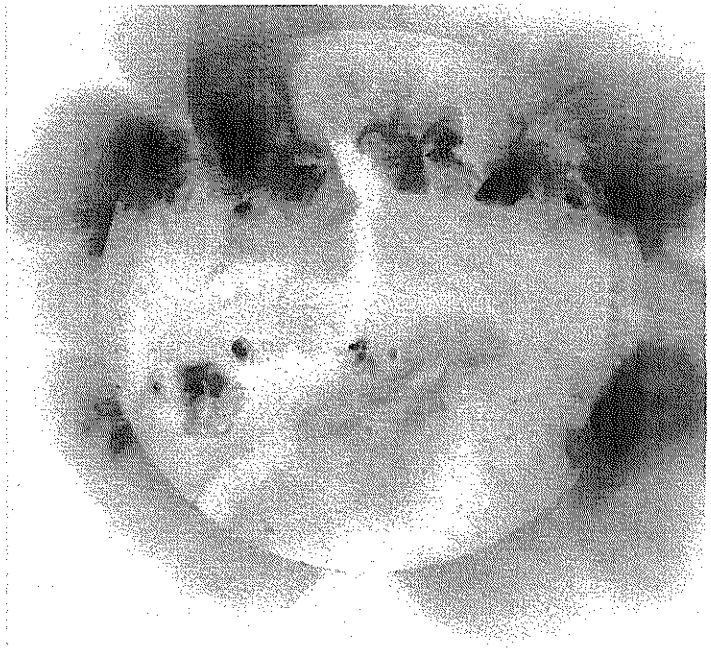
Day 21
11:58:51 UT



Day 23
12:23:44 UT



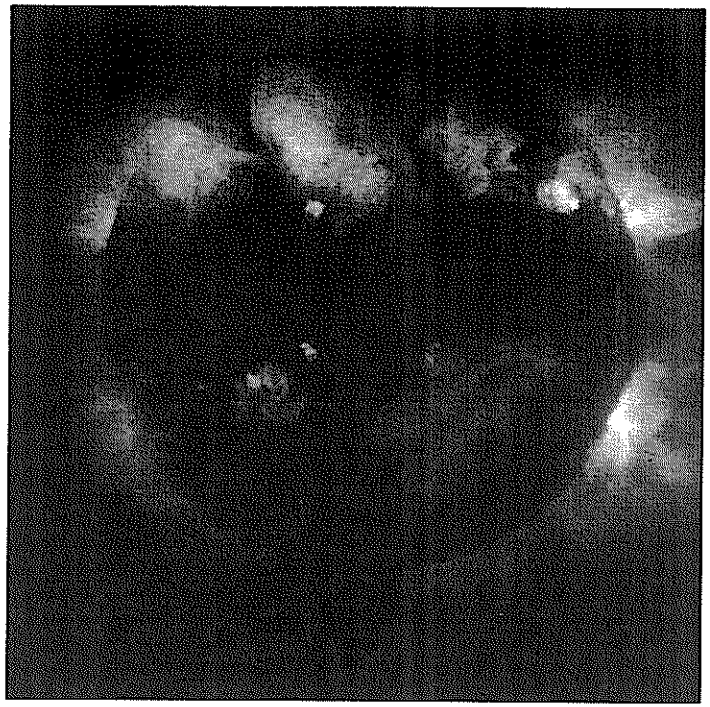
Day 22
12:06:57 UT



Day 24
07:54:16 UT

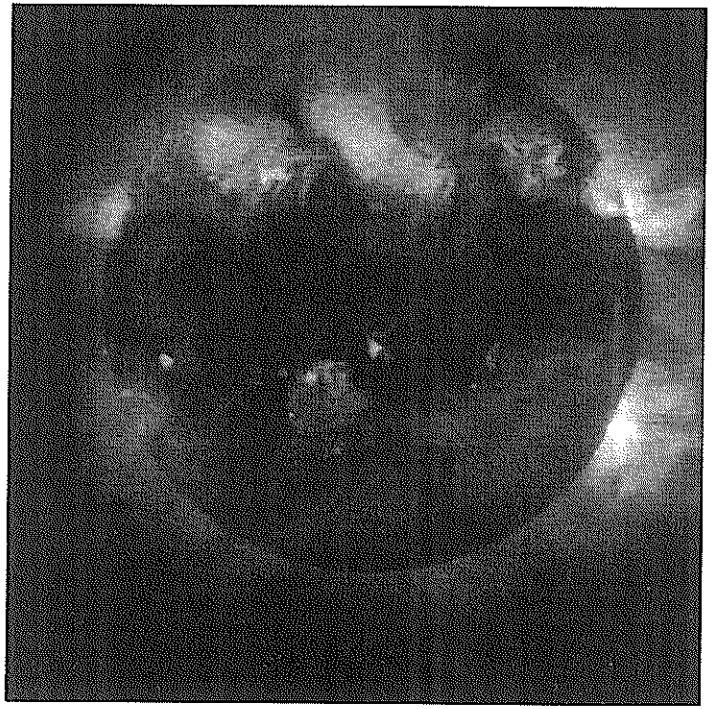
YOHKOH SOFT X-RAY TELESCOPE IMAGES

January
1999

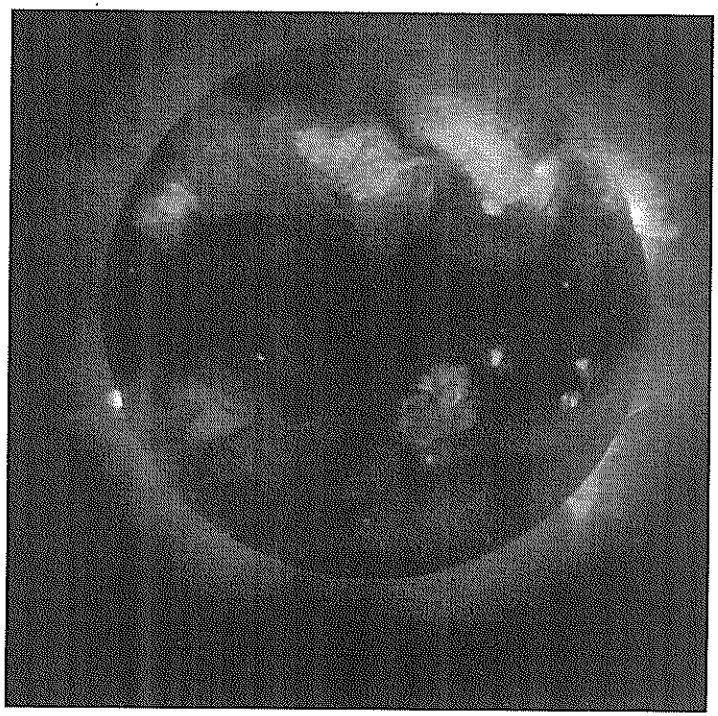


Day 25
12:12:00 UT

Day 27
11:56:34 UT



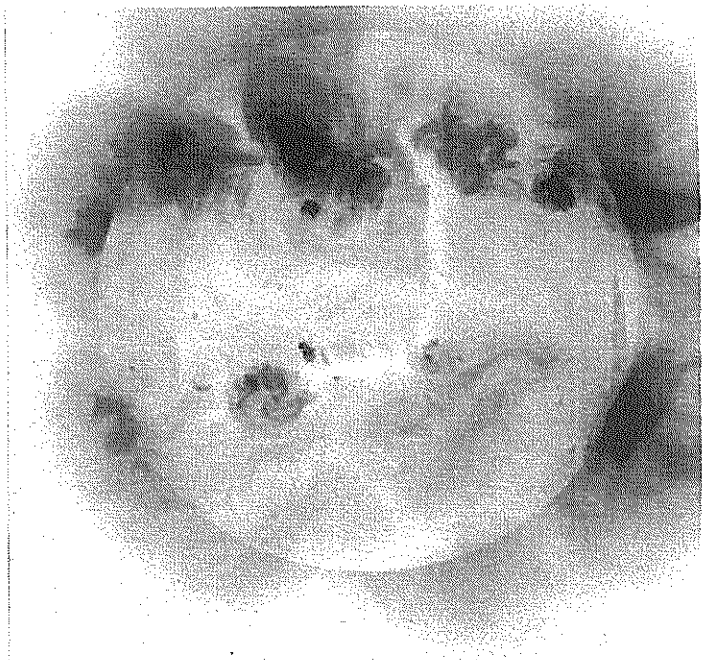
Day 26
13:08:12 UT



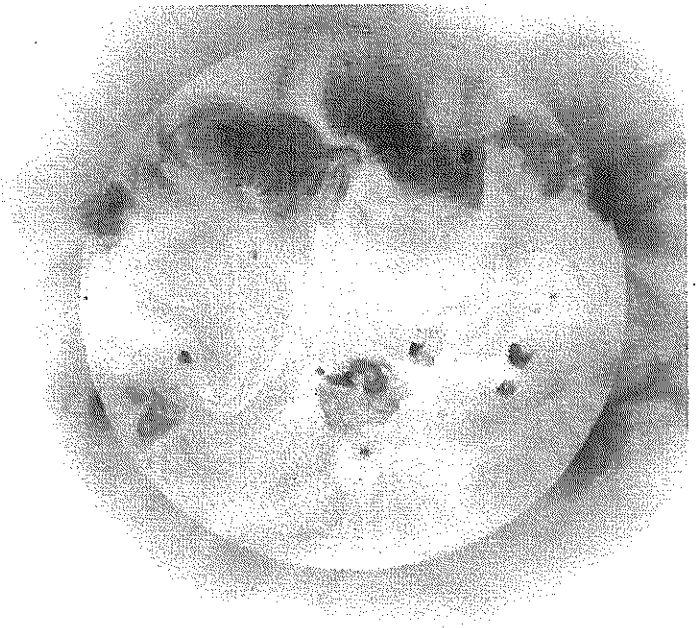
Day 28
12:03:51 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

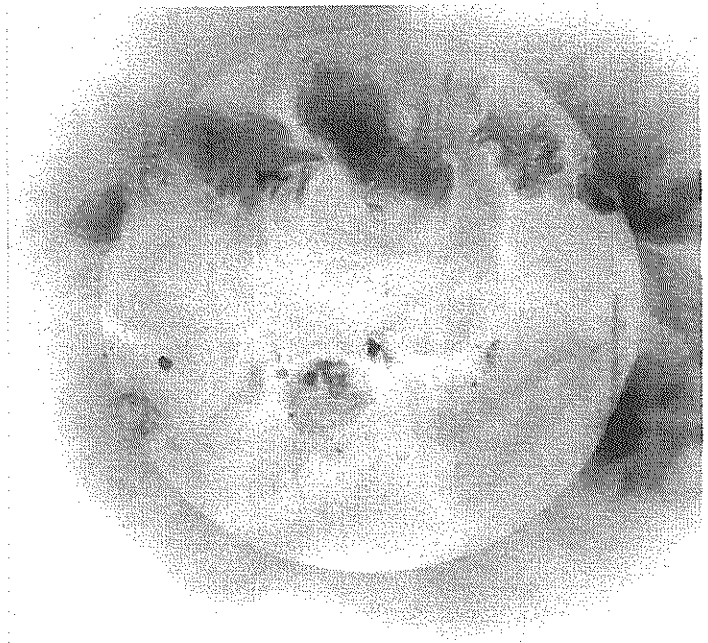
January 1999



Day 25
12:12:00 UT



Day 27
11:56:34 UT

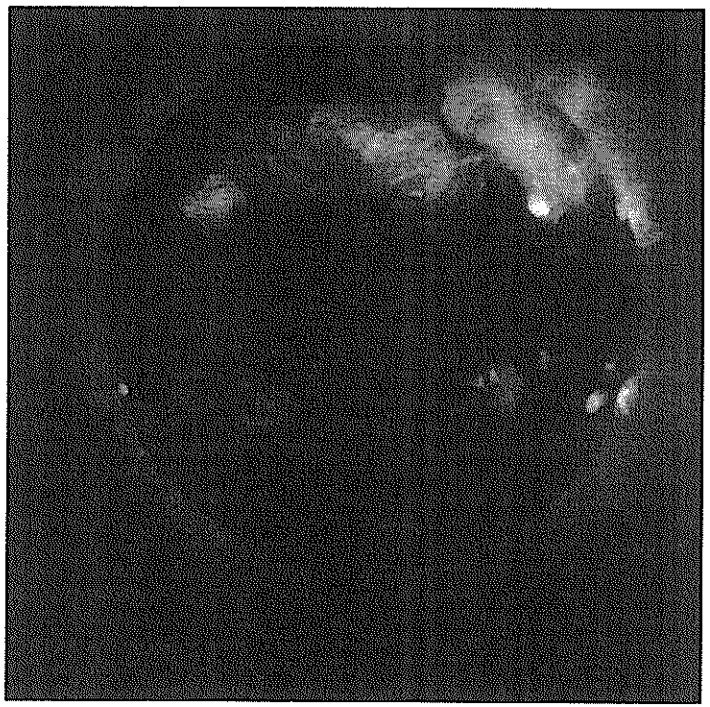


Day 26
13:08:12 UT

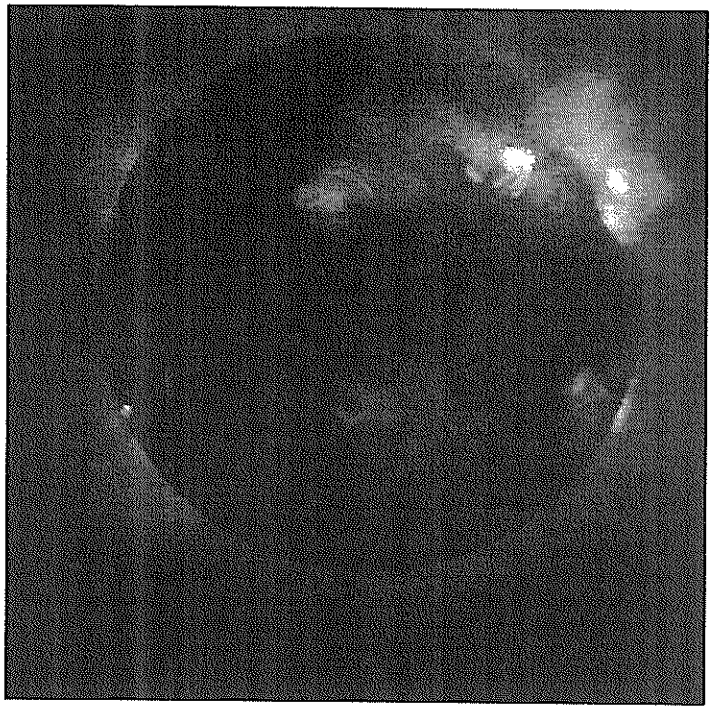
Day 28
12:03:51 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

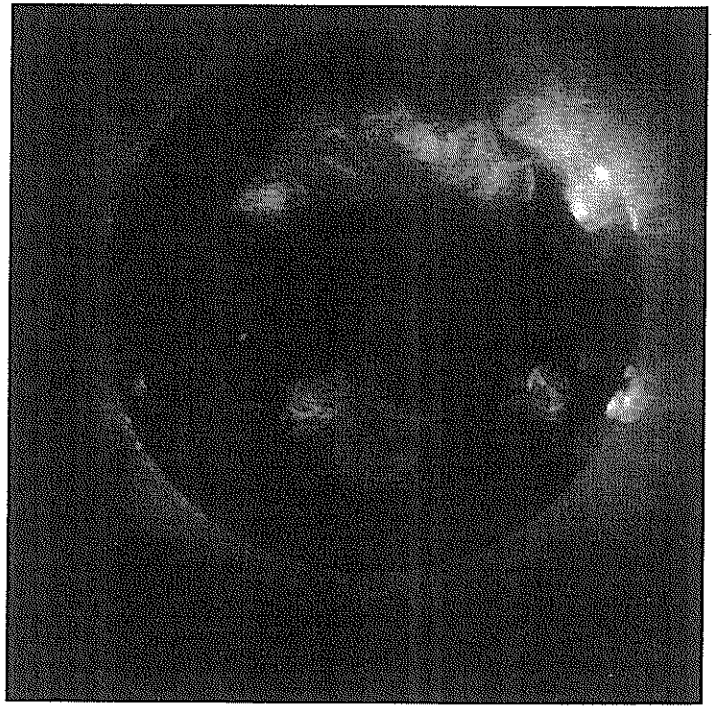
January
1999



Day 29
12:06:23 UT



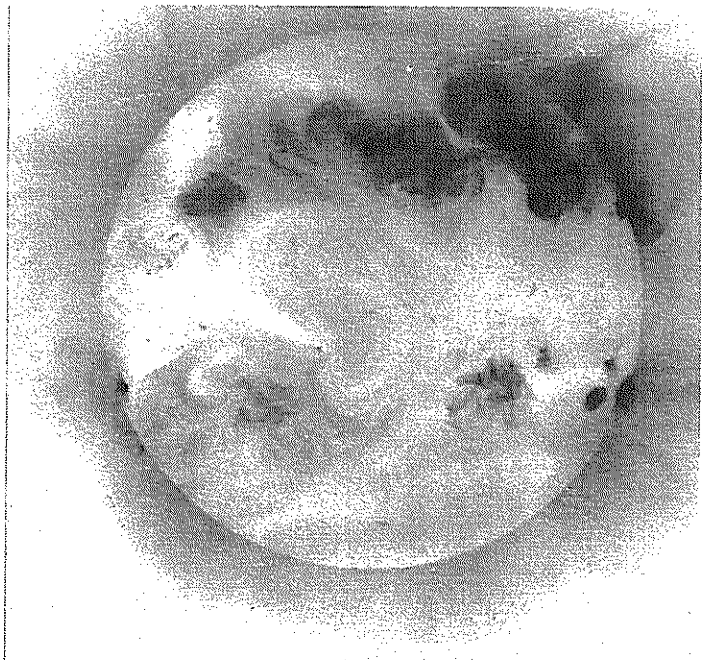
Day 31
12:09:35 UT



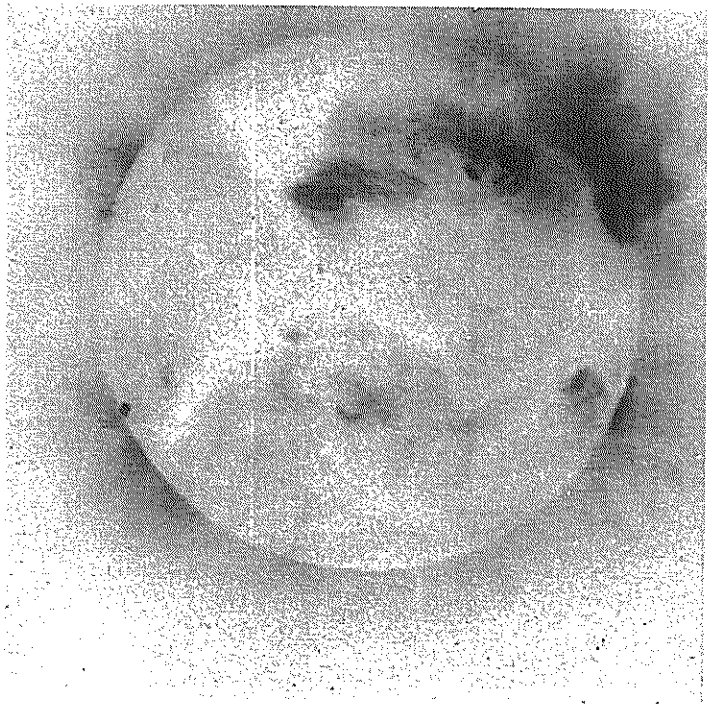
Day 30
11:01:35 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

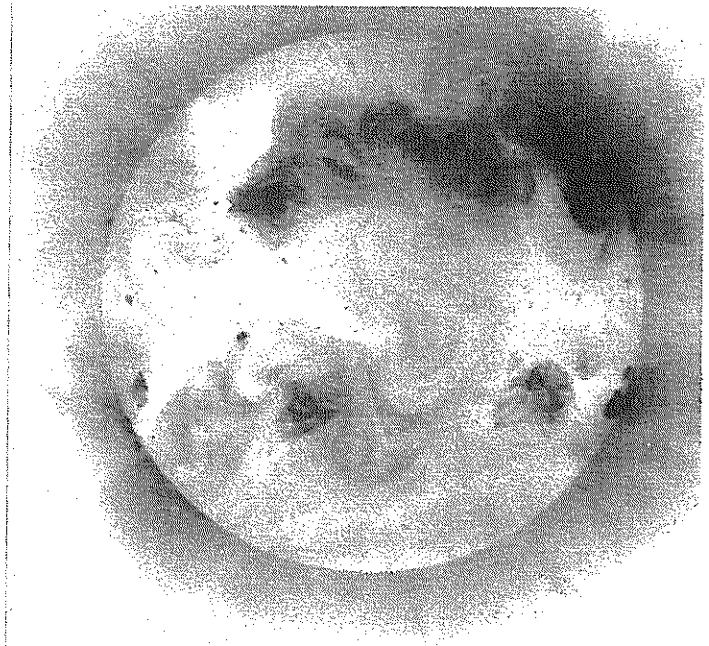
January 1999



Day 29
12:06:23 UT

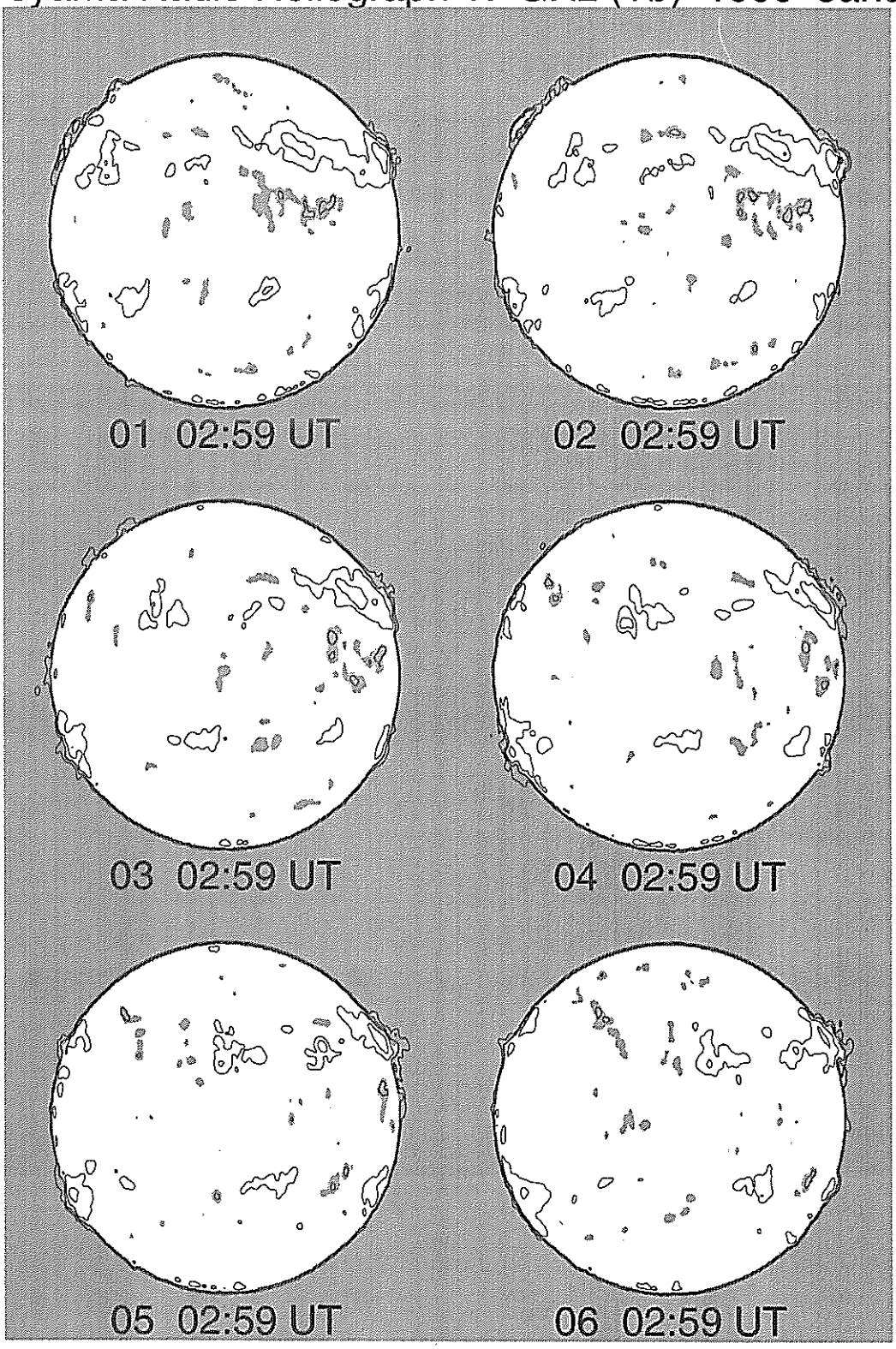


Day 31
12:09:35 UT



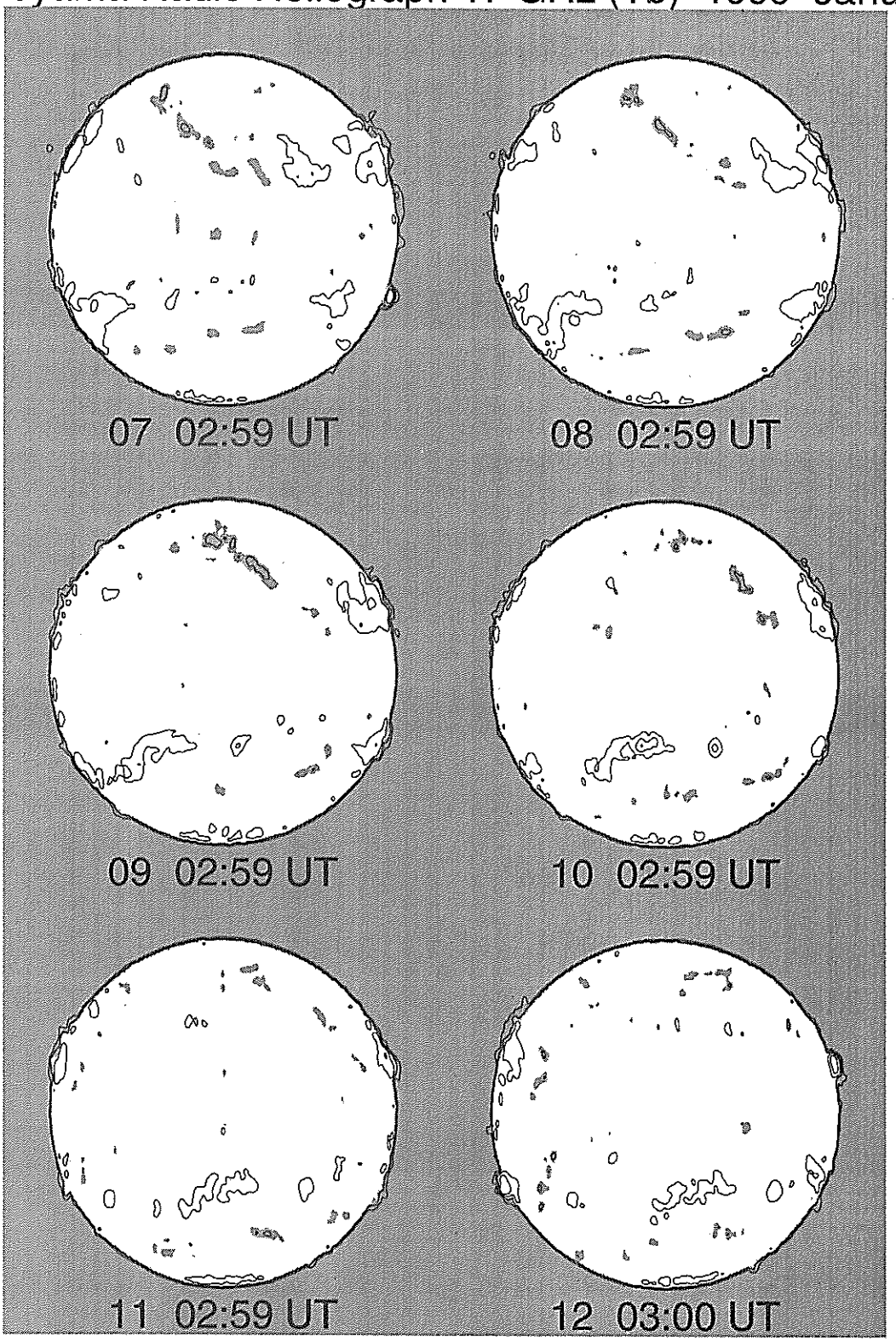
Day 30
11:01:35 UT

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 January



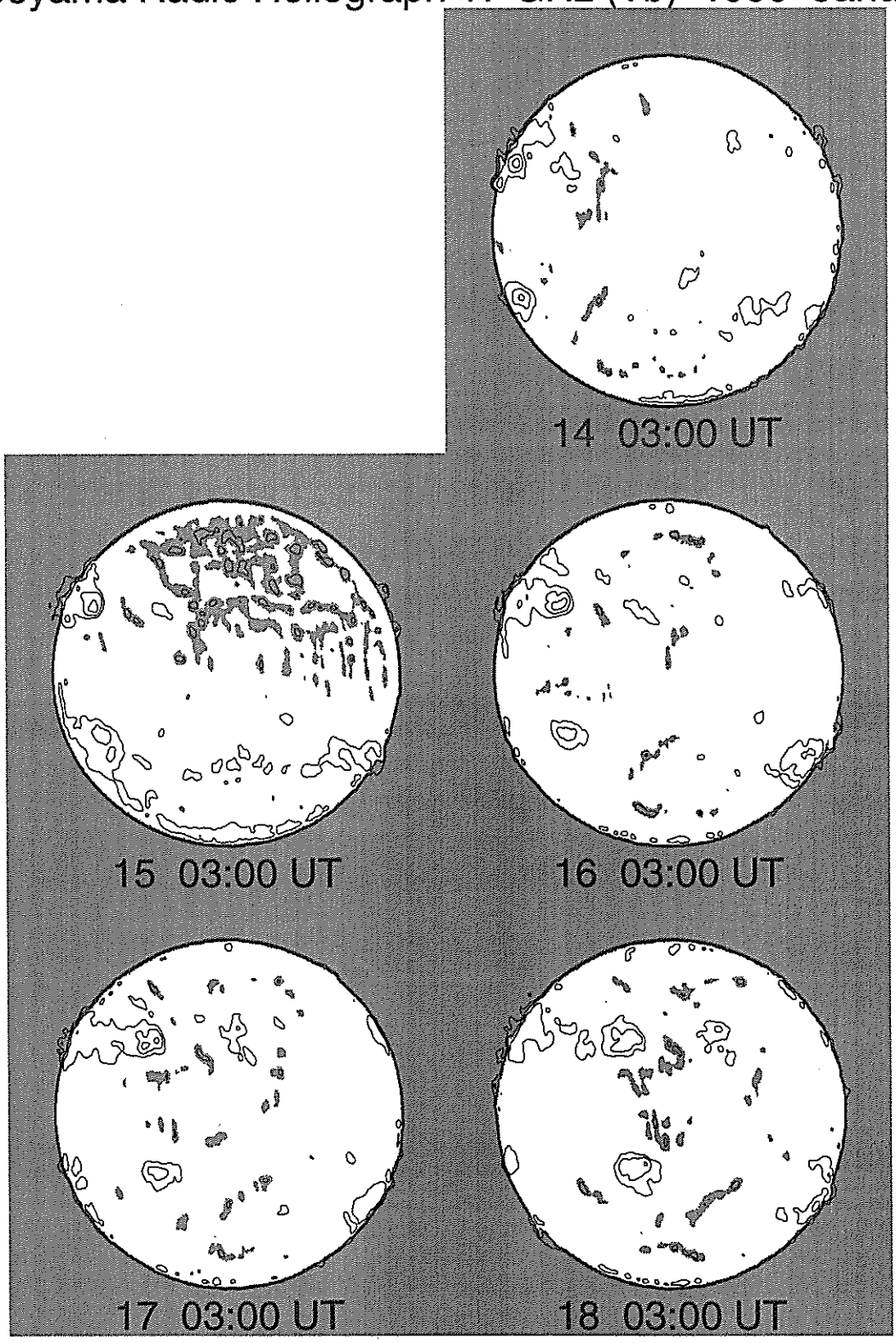
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 January



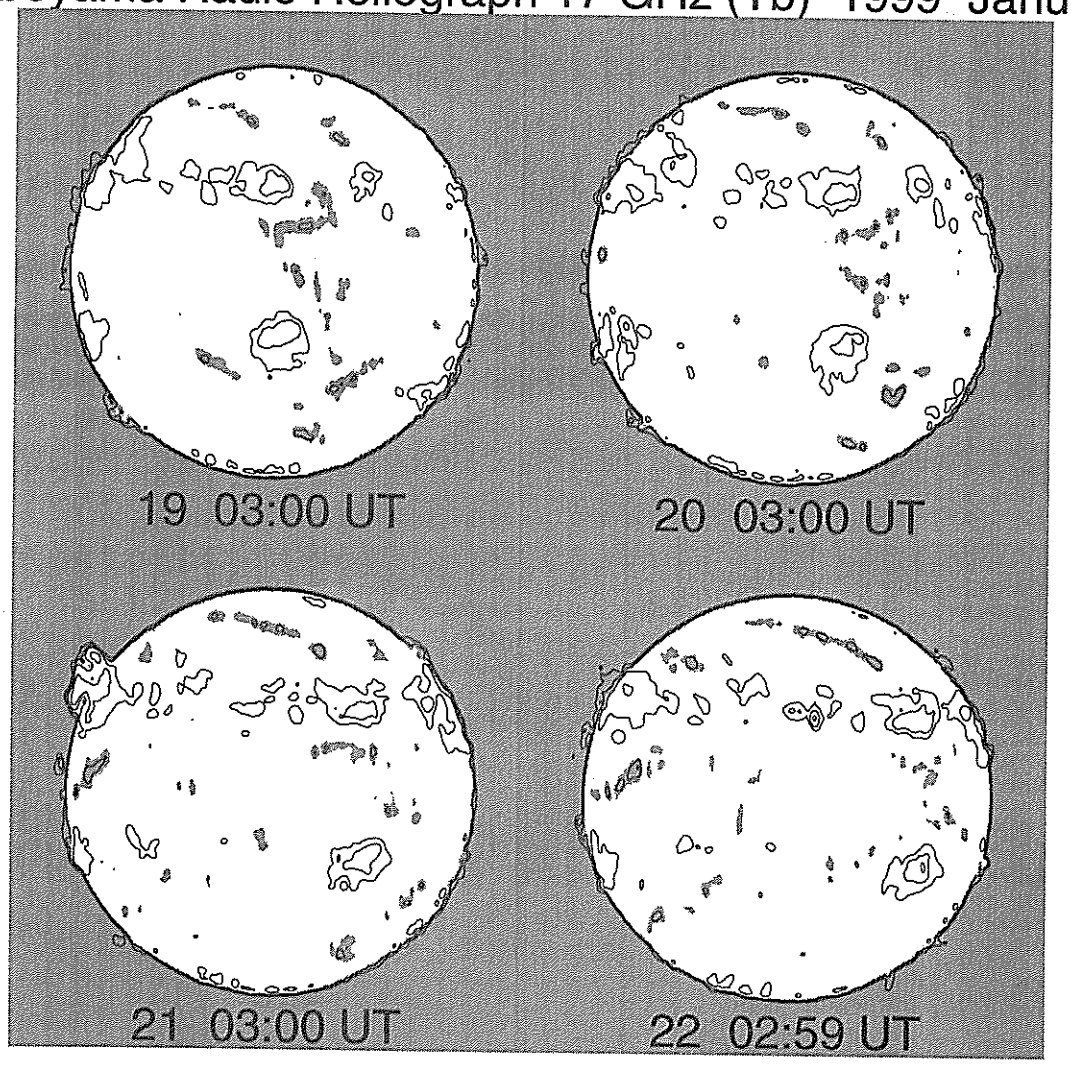
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 January



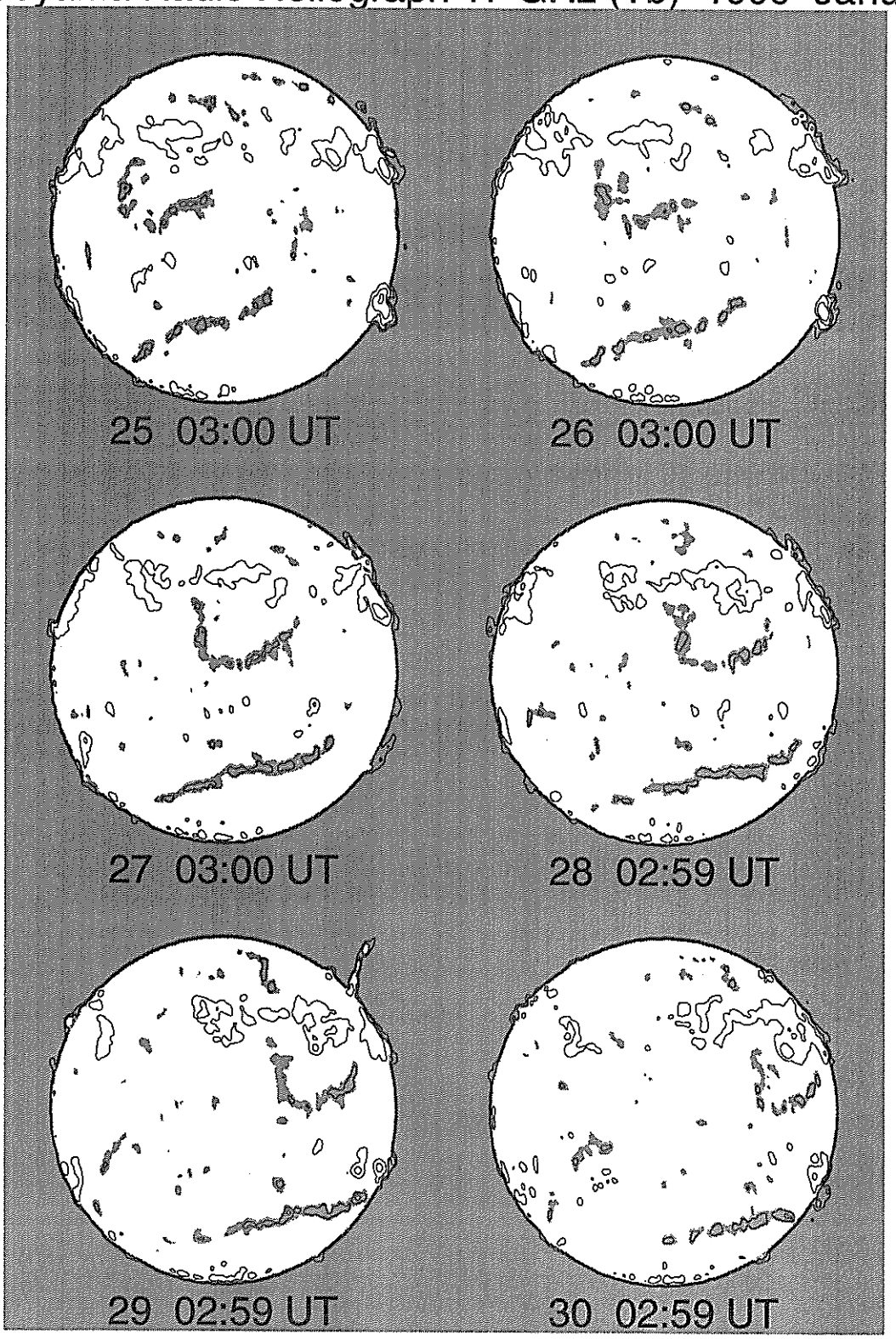
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 January



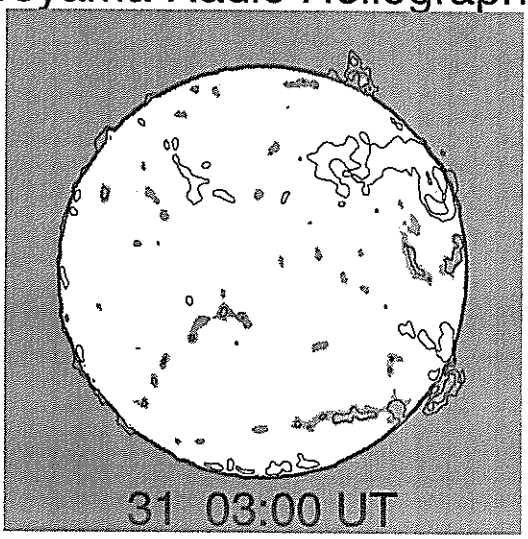
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 January



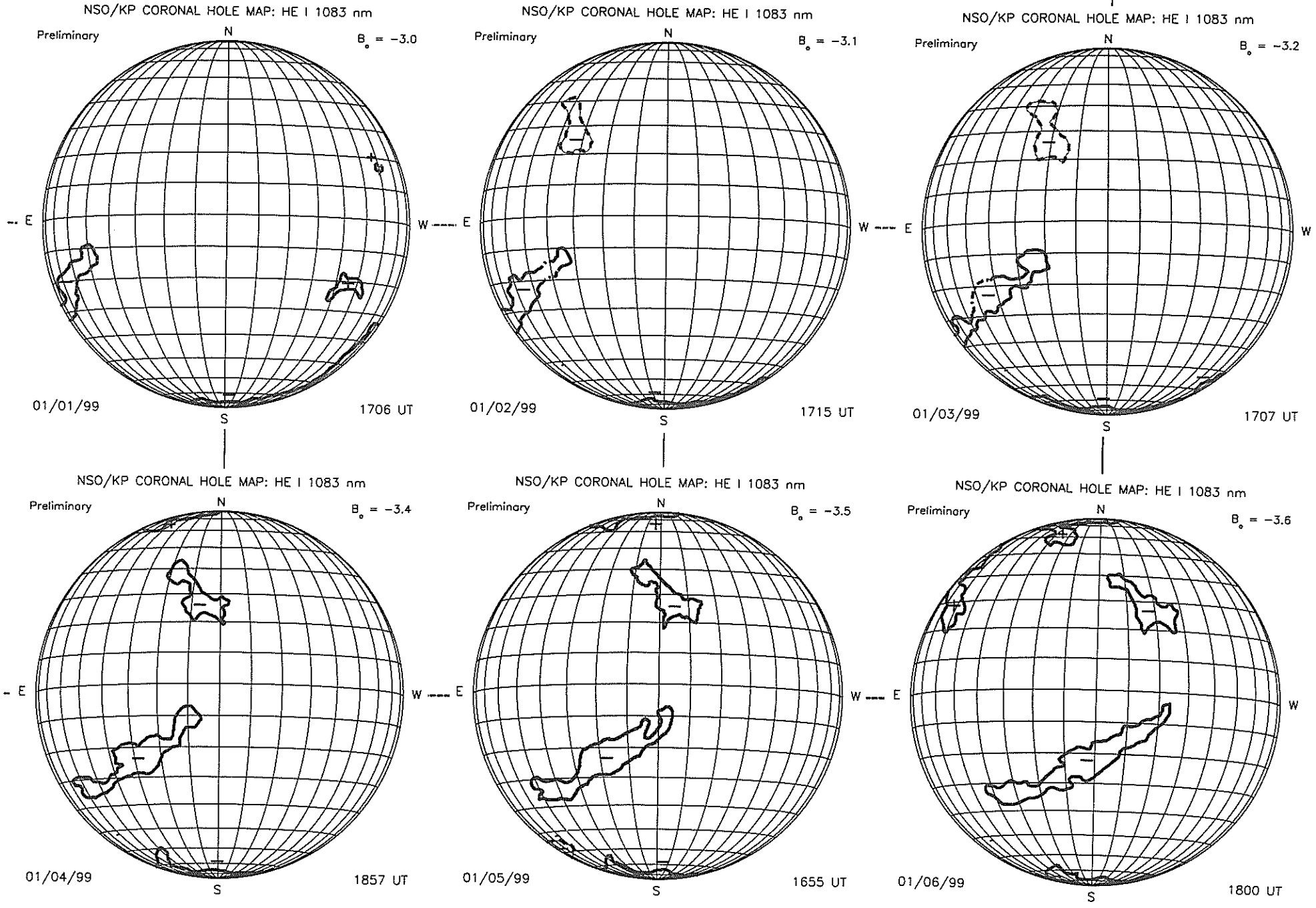
Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 January

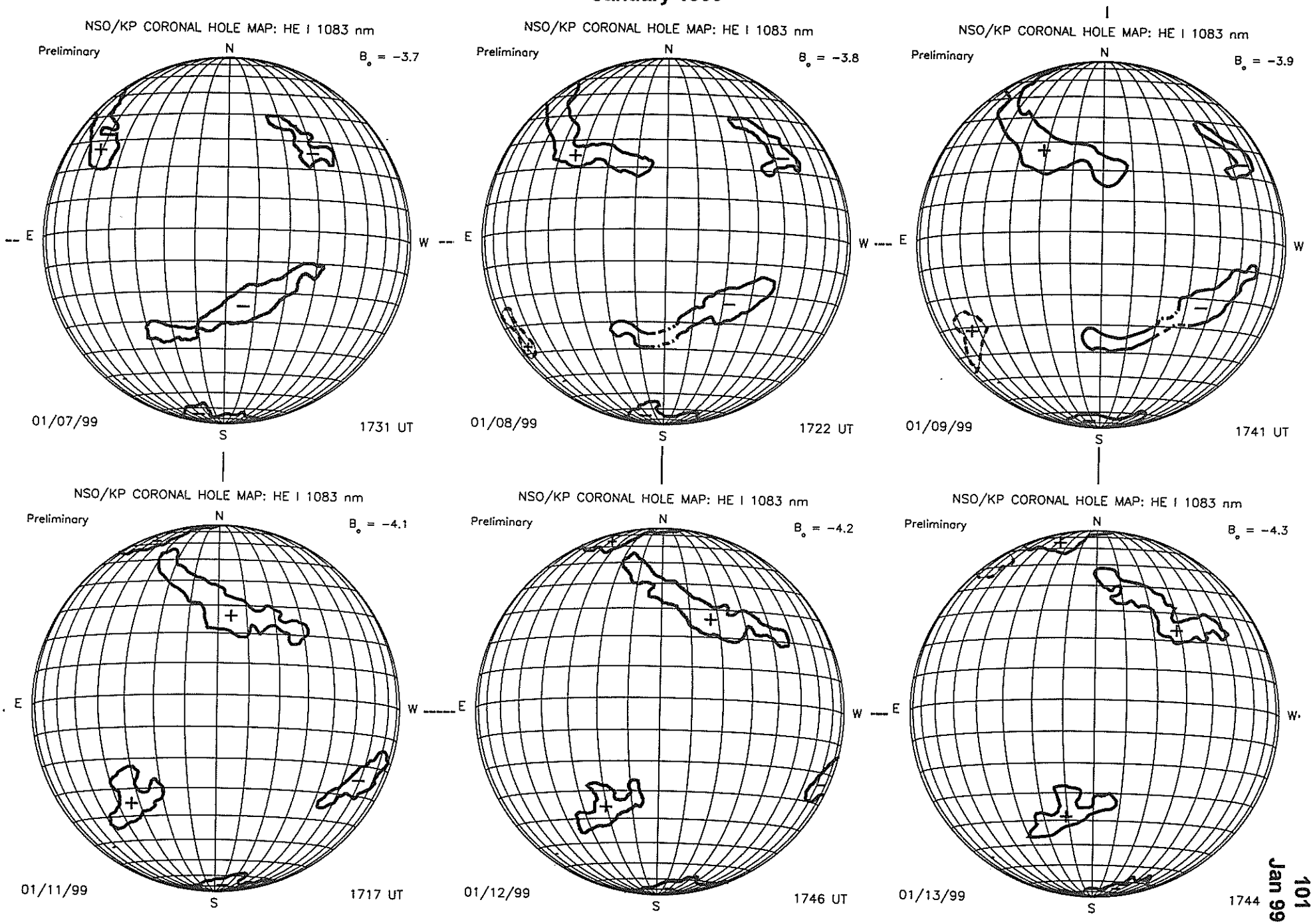


Contour Levels Tb=[5,8,12,20,50,100] x 10^3 K
Grey level Tb <= 9,500 K

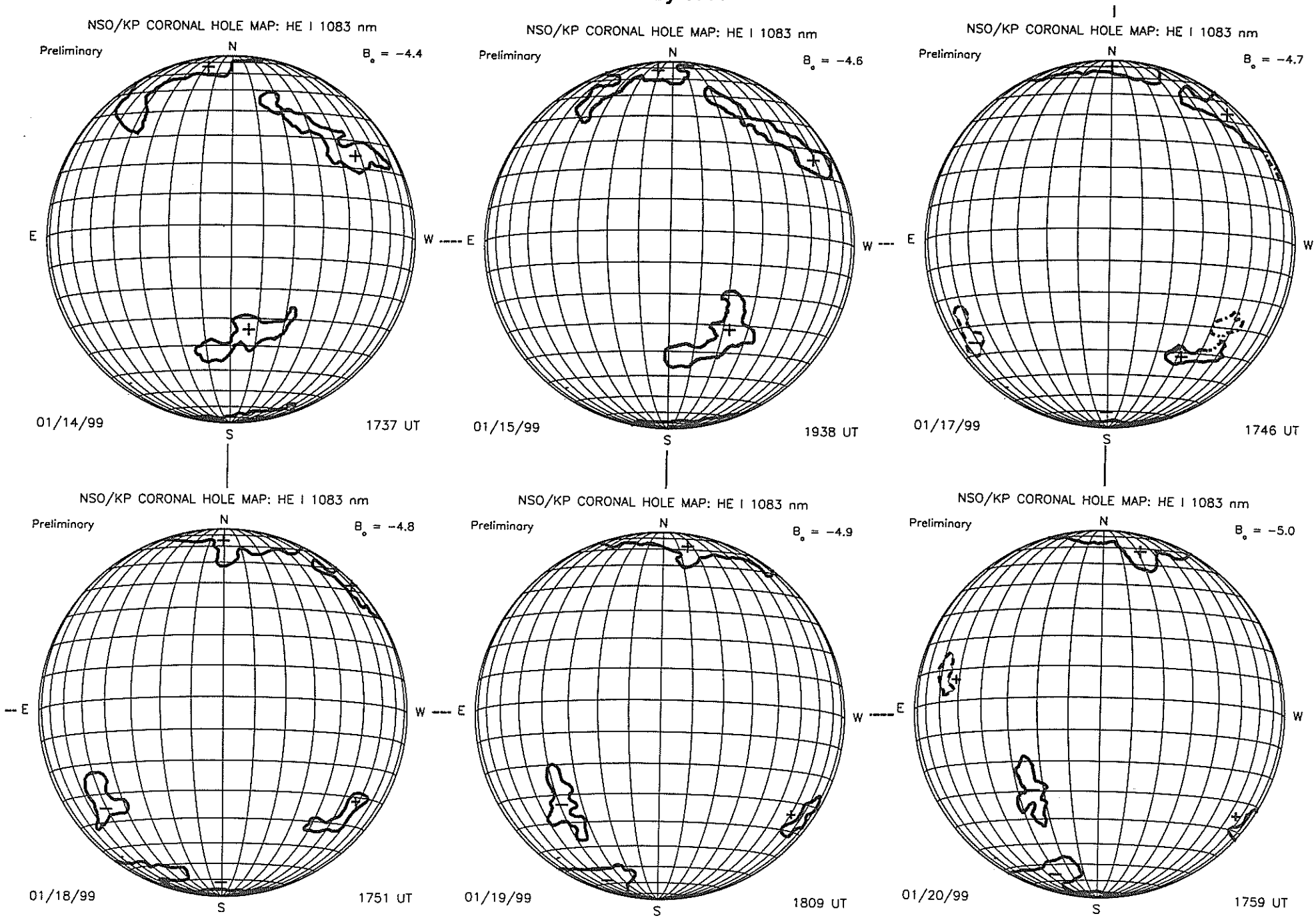
KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
January 1999



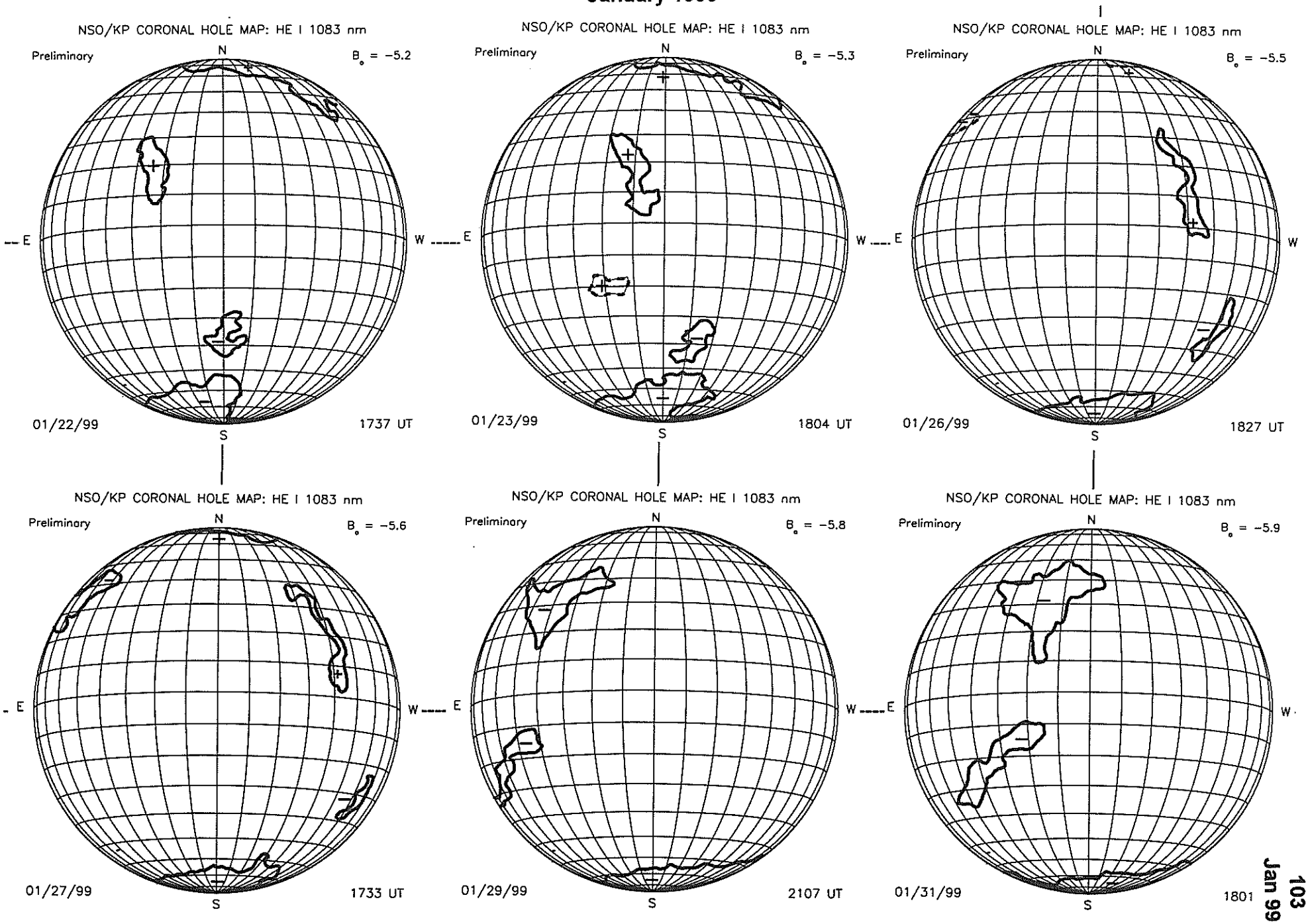
KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
January 1999



KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
January 1999



KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
January 1999



SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

JANUARY 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8428		RAMY	01 02 1240	N23 W09	01 1.8		B	BXO	10	2	3	3
8428	28942	MWIL	01 02 1545	N24 W10	01 1.9	4	(B)					
8428		HOLL	01 02 1615	N24 W11	01 1.8		B	BXO	10	2	3	2
8428		VORO	01 03 0020	N24 W16	01 1.8			BXO	23	2	3	3
8428		LEAR	01 03 0048	N24 W15	01 1.9		B	BXO	10	2	3	3
8428		RAMY	01 03 1340	N23 W21	01 1.9		B	BXO		3	7	3
8428		HOLL	01 03 1635	N24 W22	01 2.0		B	BXO	10	2	4	4
8428		VORO	01 04 0000	N21 W26	01 2.0			AXX	3	1		3
8428		LEAR	01 04 0025	N22 W24	01 2.2		A	AX	10	1	1	3
8428		SVTO	01 04 1400	N22 W30	01 2.3		A	AX		1		2
8428	28944	MWIL	01 04 1600	N22 W31	01 2.3	4	(BP)					
8428		HOLL	01 04 1620	N22 W31	01 2.3		B	BXO	10	3	3	3
8428		VORO	01 05 0024	N21 W37	01 2.2			DAI	118	7	3	3
8428		LEAR	01 05 0030	N22 W36	01 2.2		B	DAO	80	9	4	3
8428		TACH	01 05 0542	N22 W36	01 2.5			CSI	62	6	4	3
8428		SVTO	01 05 0745	N22 W39	01 2.3		B	DSO	40	7	6	3
8428		RAMY	01 05 1215	N21 W42	01 2.3		B	CAO	40	5	6	3
8428	28944	MWIL	01 05 1545	N22 W44	01 2.3	5	(BP)					
8428		HOLL	01 05 1619	N22 W45	01 2.2		B	CSO	50	5	8	3
8428		LEAR	01 06 0020	N22 W48	01 2.3		B	CSO	50	6	6	3
8428		TACH	01 06 0523	N21 W54	01 2.1			AR	26	2	2	2
8428		SVTO	01 06 0740	N20 W52	01 2.3		B	CRO	20	3	5	3
8428		RAMY	01 06 1445	N21 W59	01 2.1		A	AX	10	2	2	3
8428	28944	MWIL	01 06 1545	N21 W60	01 2.0	4	(AP)					
8428		HOLL	01 06 1810	N22 W61	01 2.1		A	AX	10	1		3
8428		LEAR	01 07 0024	N21 W64	01 2.1		B	CRO	30	3	3	4
8428		SVTO	01 07 0749	N21 W68	01 2.1		A	AX	20	1		3
8428		KAND	01 07 0940	N21 W73	01 1.8			AX		1		3
8428		RAMY	01 07 1236	N24 W76	01 1.6		A	AX		1		3
8428	28944	MWIL	01 07 1600	N22 W74	01 2.0	3	(AP)					
8428		HOLL	01 07 1610	N22 W74	01 2.0		A	AX		1		4
8432		VORO	12 28 2350	N25 E63	01 2.9			AXX	7	1		2
8432	28945	MWIL	01 04 1600	N27 W20	01 3.1	4	(AP)					
8432		VORO	01 05 0024	N28 W24	01 3.1			CAO	46	3	2	3
8432		LEAR	01 05 0030	N27 W23	01 3.2		B	BXO	10	2	3	3
8432		TACH	01 05 0542	N28 W24	01 3.4			BXO	20	2	3	3
8432		SVTO	01 05 0745	N27 W27	01 3.2		B	BXO	10	2	4	3
8432		RAMY	01 05 1215	N27 W29	01 3.2		B	BXO	10	2	4	3
8432	28945	MWIL	01 05 1545	N27 W31	01 3.2	4	(B)					
8432		LEAR	01 06 0020	N26 W38	01 3.1		B	BXO	10	2	2	3
8432		TACH	01 06 0523	N25 W41	01 3.0			AXX	20	1	1	2
8432		SVTO	01 06 0740	N25 W41	01 3.1		A	AX	10	2	1	3
8432		RAMY	01 06 1445	N25 W46	01 3.0		A	AX		1		3
8432	28945	MWIL	01 06 1545	N26 W46	01 3.1	4	(AP)					
8432		HOLL	01 06 1810	N27 W48	01 3.0		A	AX		1		3
8432		LEAR	01 07 0024	N26 W52	01 3.0		B	BXO	10	3	6	4
8432		RAMY	01 07 1236	N31 W59	01 2.9		B	BXO		2	3	3
8432	28945	MWIL	01 07 1600	N26 W57	01 3.2	3	(B)					
8432		HOLL	01 07 1610	N27 W59	01 3.1		B	BXO	10	2	4	4
8432		LEAR	01 08 0125	N26 W66	01 2.9		A	AX	10	1		3
8425	28943	MWIL	01 02 1545	S19 E07	01 3.2	4	(AP)					
8425		SVTO	01 07 0749	S22 W52	01 3.3		A	AX	10	1		3
8425	28947	MWIL	01 07 1600	S21 W57	01 3.3	4	(AF)					
8425		HOLL	01 07 1610	S22 W58	01 3.2		A	AX		1		4
8425A	28938	MWIL	01 02 1545	S24 E19	01 4.1	4	(AF)					
8425A		HOLL	01 03 1635	S29 E02	01 3.8		A	AX		1		4
8425A	28938	MWIL	01 04 1600	S24 W10	01 3.9	4	(AF)					
8426		VORO	12 30 0240	N16 E81	01 5.2			HAX	28	1		2
8426		VORO	01 01 0036	N17 E56	01 5.3			AXX	18	1		2
8426		LEAR	01 01 0408	N14 E53	01 5.2		A	AX	10	1		2
8426		KAND	01 01 0840	N16 E49	01 5.1			AX		1	1	2
8426		RAMY	01 01 1248	N15 E47	01 5.1		A	AX	10	1	1	2
8426	28939	MWIL	01 01 1600	N15 E45	01 5.1	3	(AP)					
8426		HOLL	01 01 1843	N14 E42	01 4.9		A	AX	10	1		2
8426		VORO	01 01 2355	N16 E41	01 5.1			HAX	22	1		2

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

JANUARY 1999

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
8426		LEAR	01	02	0128	N14	E38	01	4.9		A	HR	10	1		3
8426		RAMY	01	02	1240	N15	E34	01	5.1		B	BXO	10	7	6	3
8426	28939	MWIL	01	02	1545	N15	E33	01	5.1	4	(BP)					
8426		HOLL	01	02	1615	N15	E32	01	5.1		B	BXO	10	4	6	2
8426		VORO	01	03	0020	N15	E28	01	5.1			BXI	33	8	7	3
8426		LEAR	01	03	0048	N14	E28	01	5.1		B	BXO	10	5	7	3
8426		RAMY	01	03	1340	N15	E21	01	5.1		B	BXO	10	12	8	3
8426	28939	MWIL	01	03	1545	N15	E20	01	5.2	4	(BF)					
8426		HOLL	01	03	1635	N15	E20	01	5.2		B	CRO	40	17	9	4
8426		VORO	01	04	0000	N15	E17	01	5.3			CAI	105	6	5	3
8426		LEAR	01	04	0025	N15	E16	01	5.2		B	CSO	40	12	7	3
8426		TACH	01	04	0559	N14	E13	01	5.2			DAI	185	8	6	2
8426		RAMY	01	04	1225	N15	E09	01	5.2		B	DAO	60	12	7	3
8426		SVTO	01	04	1400	N16	E09	01	5.3		B	DAO	50	12	7	2
8426	28939	MWIL	01	04	1600	N15	E08	01	5.3	5	(BG)					
8426		HOLL	01	04	1620	N15	E07	01	5.2		B	DSO	90	14	8	3
8426		VORO	01	05	0024	N15	E02	01	5.2			DKI	245	12	7	3
8426		LEAR	01	05	0030	N15	E03	01	5.2		B	DAO	90	11	8	3
8426		TACH	01	05	0542	N15	E01	01	5.3			DAI	429	10	7	3
8426		SVTO	01	05	0745	N15	W02	01	5.2		B	DAO	150	13	9	3
8426		RAMY	01	05	1215	N15	W05	01	5.1		B	DAO	170	13	9	3
8426	28939	MWIL	01	05	1545	N15	W06	01	5.2	5	(B)					
8426		HOLL	01	05	1619	N15	W07	01	5.1		B	DSO	190	9	9	3
8426		LEAR	01	06	0020	N14	W12	01	5.1		B	DAO	160	14	9	3
8426		TACH	01	06	0523	N14	W14	01	5.2			DAI	282	8	10	2
8426		SVTO	01	06	0740	N15	W14	01	5.2		BG	EAI	210	14	11	3
8426		RAMY	01	06	1445	N14	W18	01	5.2		B	ESO	130	13	12	3
8426	28939	MWIL	01	06	1545	N14	W19	01	5.2	4	(B)					
8426		HOLL	01	06	1810	N15	W22	01	5.1		B	ESO	150	9	11	3
8426		LEAR	01	07	0024	N14	W25	01	5.1		B	EAO	150	13	11	4
8426		SVTO	01	07	0749	N13	W27	01	5.3		BG	DAI	190	9	10	3
8426		KAND	01	07	0940	N14	W30	01	5.1			EAO		7	13	3
8426		RAMY	01	07	1236	N14	W32	01	5.1		B	EAO	110	6	12	3
8426	28939	MWIL	01	07	1600	N14	W32	01	5.2	5	(B)					
8426		HOLL	01	07	1610	N15	W34	01	5.1		B	ESO	100	4	12	4
8426		LEAR	01	08	0125	N14	W38	01	5.2		B	ESO	80	4	12	3
8426		TACH	01	08	0555	N15	W40	01	5.2			DSO	200	3	10	2
8426		KAND	01	08	0730	N14	W43	01	5.1			ESO		3	12	3
8426		SVTO	01	08	0755	N15	W43	01	5.1		B	ESO	70	3	11	3
8426		RAMY	01	08	1159	N14	W44	01	5.2		B	ESO	100	3	12	3
8426	28939	MWIL	01	08	1700	N16	W46	01	5.2	4	(B)					
8426		HOLL	01	08	2011	N15	W49	01	5.1		B	ESO	90	5	12	3
8426		VORO	01	09	0025	N14	W52	01	5.1			CAO	117	2	11	3
8426		LEAR	01	09	0113	N14	W52	01	5.1		B	ESO	80	2	11	3
8426		TACH	01	09	0644	N16	W54	01	5.2			DAO	105	2	11	2
8426		KAND	01	09	0750	N13	W55	01	5.2			ESO		4	11	3
8426		RAMY	01	09	1314	N13	W58	01	5.2		B	ESO	110	3	12	3
8426		SVTO	01	09	1410	N16	W57	01	5.3		B	ESO	50	2	11	2
8426	28939	MWIL	01	09	1600	N15	W60	01	5.1	5	(B)					
8426		HOLL	01	09	1602	N15	W61	01	5.0		B	ESO	110	3	12	3
8426		LEAR	01	10	0010	N14	W65	01	5.1		B	ESO	50	3	11	4
8426		VORO	01	10	0030	N14	W60	01	5.5			HAX	68	1		3
8426		SVTO	01	10	0830	N15	W70	01	5.0		B	CAO	40	2	16	2
8426		KAND	01	10	0855	N14	W63	01	5.6			AX		2	1	2
8426		RAMY	01	10	1220	N14	W64	01	5.7		A	HS	20	1	1	3
8426		HOLL	01	10	1545	N15	W67	01	5.6		A	HS	70	1	2	3
8426	28939	MWIL	01	10	1800	N15	W73	01	5.2	4	(BF)					
8426		VORO	01	11	0012	N15	W75	01	5.3			HRX	40	1		3
8426		LEAR	01	11	0035	N14	W71	01	5.6		A	HS	30	1	1	2
8426C		RAMY	01	02	1240	N35	E43	01	6.0		A	AX		1		3
8426C		HOLL	01	02	1615	N33	E43	01	6.1		A	AX		1		2
8426B		RAMY	01	02	1240	S25	E69	01	7.9		A	AX		2	1	3
8426B		RAMY	01	03	1340	S24	E55	01	7.8		A	AX		1		3
8426B		HOLL	01	03	1635	S26	E53	01	7.8		A	AX		2	2	4
8426B		LEAR	01	04	0025	S26	E52	01	8.0		B	BXO	10	2	1	3
8430		LEAR	01	07	0024	S28	E22	01	8.7		B	CRO	20	4	3	4

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

JANUARY 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8430		SVTO	01 07 0749	S28 E18	01 8.7		B	DRO	30	7	3	3
8430		KAND	01 07 0940	S27 E17	01 8.7			BXO		5	4	3
8430		RAMY	01 07 1236	S28 E14	01 8.6		B	BXO	10	5	3	3
8430	28948	MWIL	01 07 1600	S28 E13	01 8.7	4	(B)					
8430		HOLL	01 07 1610	S29 E13	01 8.7		B	BXO	20	5	4	4
8430		LEAR	01 08 0125	S28 E08	01 8.7		B	BXO	20	5	5	3
8430		TACH	01 08 0555	S27 E03	01 8.5			BXI	40	4	5	2
8430		KAND	01 08 0730	S28 E04	01 8.6			BXO		5	4	3
8430		SVTO	01 08 0755	S28 E04	01 8.6		B	CAO	40	6	5	3
8430		RAMY	01 08 1159	S28 E03	01 8.7		B	CRO	20	7	5	3
8430	28948	MWIL	01 08 1700	S28 W01	01 8.6	4	(B)					
8430		HOLL	01 08 2011	S28 W02	01 8.7		B	CSO	30	8	5	3
8433		VORO	01 09 0025	S27 W04	01 8.7			CAI	59	4	4	3
8433		LEAR	01 09 0113	S27 W06	01 8.6		B	DSO	20	6	6	3
8433		TACH	01 09 0644	S27 W10	01 8.5			BRO	34	4	3	2
8433		KAND	01 09 0750	S28 W09	01 8.6			BXO		10	5	3
8433		RAMY	01 09 1314	S28 W11	01 8.7		B	BXO	10	8	6	3
8433		SVTO	01 09 1410	S28 W12	01 8.6		B	CRO	20	9	5	2
8433	28948	MWIL	01 09 1600	S28 W15	01 8.5	4	(B)					
8433		HOLL	01 09 1602	S28 W15	01 8.5		B	BXO	10	5	4	3
8433		LEAR	01 10 0010	S28 W16	01 8.7		B	CSO	20	4	5	4
8433		VORO	01 10 0030	S28 W21	01 8.4			HAX	37	1		3
8433		SVTO	01 10 0830	S28 W26	01 8.3		A	HS	20	2	2	2
8433		KAND	01 10 0855	S28 W24	01 8.5			AX		4	2	2
8433		RAMY	01 10 1220	S28 W26	01 8.5		A	AX	10	2	1	3
8433		HOLL	01 10 1545	S28 W29	01 8.4		A	HS	40	1	1	3
8433	28948	MWIL	01 10 1800	S27 W30	01 8.4	4	(AP)					
8433		VORO	01 11 0012	S28 W34	01 8.3			AXX	23	1		3
8433		LEAR	01 11 0035	S28 W34	01 8.4		B	CSO	10	2	1	2
8433		RAMY	01 11 1235	S29 W40	01 8.4		A	AX		1		3
8433		HOLL	01 11 1612	S28 W43	01 8.3		B	BXO	10	1	2	4
8433	28948	MWIL	01 11 1700	S27 W43	01 8.3	4	(AP)					
8435		SVTO	01 07 0749	N13 E26	01 9.3		B	CRO	10	2	3	3
8435		KAND	01 07 0940	N13 E26	01 9.4			BXO		2	2	3
8435		RAMY	01 07 1236	N13 E24	01 9.3		B	BXO		2	2	3
8435	28949	MWIL	01 07 1600	N12 E22	01 9.3	4	(B)					
8435		HOLL	01 07 1610	N12 E23	01 9.4		B	BXO	10	2	3	4
8435		LEAR	01 08 0125	N13 E15	01 9.2		A	AX		1		3
8435		KAND	01 08 0730	N13 E11	01 9.1			AX		1		3
8435		SVTO	01 08 0755	N13 E13	01 9.3		A	AX		1		3
8435		RAMY	01 08 1159	N12 E09	01 9.2		A	AX		1		3
8431A		TACH	01 04 0559	N28 E82	01 10.6			HX	20	1	1	2
8431A	28952	MWIL	01 10 1800	N26 W10	01 10.0	3	(B)					
8431		LEAR	01 04 0025	S28 E77	01 10.0		A	AX	10	1	1	3
8431		RAMY	01 04 1225	S28 E76	01 10.4		A	AX	10	1		3
8431		SVTO	01 04 1400	S29 E77	01 10.6		A	HR	20	1	1	2
8431	28946	MWIL	01 04 1600	S28 E75	01 10.5	3	AF					
8431		HOLL	01 04 1620	S29 E73	01 10.4		A	HS	30	1	1	3
8431		VORO	01 05 0024	S27 E70	01 10.5			HAX	48	1		3
8431		LEAR	01 05 0030	S28 E69	01 10.4		A	HS	10	1	1	3
8431		TACH	01 05 0542	S29 E70	01 10.7			HSX	25	1	1	3
8431		SVTO	01 05 0745	S28 E65	01 10.4		A	HS	50	2	2	3
8431		RAMY	01 05 1215	S28 E63	01 10.4		A	HR	20	1	1	3
8431	28946	MWIL	01 05 1545	S28 E60	01 10.3	4	(AP)					
8431		HOLL	01 05 1619	S28 E58	01 10.2		B	CSO	40	2	6	3
8431		LEAR	01 06 0020	S28 E54	01 10.2		B	CAO	30	2	7	3
8431		TACH	01 06 0523	S29 E52	01 10.3			BXO	30	2	6	2
8431		SVTO	01 06 0740	S27 E50	01 10.2		B	BXO	30	5	6	3
8431		RAMY	01 06 1445	S29 E50	01 10.5		B	CRO	20	3	2	3
8431	28946	MWIL	01 06 1545	S29 E49	01 10.5	4	(AP)					
8431		HOLL	01 06 1810	S30 E47	01 10.4		B	BXO	20	2	3	3
8431		LEAR	01 07 0024	S28 E44	01 10.4		B	CRO	30	2	2	4
8431		SVTO	01 07 0749	S28 E39	01 10.4		B	CRO	50	6	3	3
8431		KAND	01 07 0940	S28 E39	01 10.4			BXO		2	3	3
8431		RAMY	01 07 1236	S28 E36	01 10.3		B	BXO	10	3	2	3

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

JANUARY 1999

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
8431	28946	MWIL	01	07	1600	S29	E36	01	10.5	4	(BG)					
8431		HOLL	01	07	1610	S30	E35	01	10.4		B	BXO	20	4	3	4
8431		LEAR	01	08	0125	S28	E31	01	10.5		B	BXO	10	4	3	3
8431		TACH	01	08	0555	S28	E28	01	10.4			BXO	8	2	3	2
8431		KAND	01	08	0730	S29	E26	01	10.3			BXO		3	3	3
8431		SVTO	01	08	0755	S28	E27	01	10.4		A	HR	10	3	2	3
8431		RAMY	01	08	1159	S29	E24	01	10.4		B	BXO	10	9	6	3
8431	28946	MWIL	01	08	1700	S29	E22	01	10.4	4	(B)					
8431		HOLL	01	08	2011	S29	E21	01	10.5		B	BXO	20	7	4	3
8431		VORO	01	09	0025	S28	E18	01	10.4			HAX	63	2	2	3
8431		LEAR	01	09	0113	S28	E18	01	10.4		B	DSO	20	5	4	3
8431		TACH	01	09	0644	S28	E14	01	10.4			AR	45	4	3	2
8431		KAND	01	09	0750	S29	E14	01	10.4			BXO		8	4	3
8431		RAMY	01	09	1314	S28	E12	01	10.5		B	DSO	40	7	4	3
8431		SVTO	01	09	1410	S29	E10	01	10.4		B	DSO	30	2	3	2
8431	28946	MWIL	01	09	1600	S28	E10	01	10.4	5	(B)					
8431		HOLL	01	09	1602	S29	E09	01	10.4		B	DSO	70	8	4	3
8431		LEAR	01	10	0010	S28	E05	01	10.4		B	DAO	50	7	3	4
8431		VORO	01	10	0030	S28	E05	01	10.4			CAO	73	2	3	3
8431		SVTO	01	10	0830	S28	E00	01	10.3		B	CAO	30	5	4	2
8431		KAND	01	10	0855	S29	E01	01	10.4			BXO		6	4	2
8431		RAMY	01	10	1220	S28	W01	01	10.4		B	CAO	20	5	3	3
8431		HOLL	01	10	1545	S29	W03	01	10.4		B	CSO	40	2	3	3
8431	28946	MWIL	01	10	1800	S28	W04	01	10.4	4	(BF)					
8431		VORO	01	11	0012	S28	W06	01	10.5			HAX	37	1		3
8431		LEAR	01	11	0035	S28	W07	01	10.5		A	HS	30	1	1	2
8431		RAMY	01	11	1235	S28	W12	01	10.6		A	AX		1		3
8431		HOLL	01	11	1612	S28	W15	01	10.5		A	AX	10	3		4
8431	28946	MWIL	01	11	1700	S28	W17	01	10.4	4	(AP)					
8431		LEAR	01	12	0010	S27	W19	01	10.5		A	HA	20	1	1	3
8434		LEAR	01	07	0024	S27	E59	01	11.6		B	AXO	10	2	2	4
8434		SVTO	01	07	0749	S26	E55	01	11.6		B	BXO	50	8	3	3
8434		KAND	01	07	0940	S27	E55	01	11.7			BXO		7	6	3
8434		RAMY	01	07	1236	S28	E49	01	11.3		B	BXO	10	7	4	3
8434	28950	MWIL	01	07	1600	S27	E50	01	11.6	4	(B)					
8434		HOLL	01	07	1610	S28	E50	01	11.6		B	BXO	20	6	3	4
8434		LEAR	01	08	0125	S27	E47	01	11.7		A	AX	10	4	2	3
8434		TACH	01	08	0555	S26	E43	01	11.6			AXX	10	1	1	2
8434		KAND	01	08	0730	S27	E43	01	11.7			BXO		2	2	3
8434		SVTO	01	08	0755	S27	E43	01	11.7		A	HR	10	2	1	3
8434		RAMY	01	08	1159	S27	E41	01	11.7		B	BXO	10	5	3	3
8434	28950	MWIL	01	08	1700	S27	E38	01	11.7	3	(AP)					
8434		HOLL	01	08	2011	S28	E37	01	11.7		A	AX	10	3	1	3
8434		VORO	01	09	0025	S26	E35	01	11.7			AXX	12	1		3
8434		LEAR	01	09	0113	S27	E33	01	11.6		A	HS	10	1	1	3
8434		TACH	01	09	0644	S28	E30	01	11.6			AXX	5	1	1	2
8434		KAND	01	09	0750	S27	E32	01	11.8			BXO		5	3	3
8434		RAMY	01	09	1314	S26	E27	01	11.6		B	BXO		3	3	3
8434		SVTO	01	09	1410	S28	E27	01	11.7		A	AX		2	1	2
8434	28950	MWIL	01	09	1600	S27	E26	01	11.7	4	(AP)					
8434		HOLL	01	09	1602	S28	E26	01	11.7		A	AX	10	2	1	3
8434		LEAR	01	10	0010	S28	E16	01	11.2		A	AX	10	1	1	4
8434		LEAR	01	12	0010	S27	W05	01	11.6		A	AX	10	1	1	3
8434		RAMY	01	12	1226	S27	W11	01	11.7		B	BXO	10	4	3	3
8434	28956	MWIL	01	12	1545	S27	W13	01	11.6	4	(B)					
8434		LEAR	01	13	0045	S26	W15	01	11.9		B	BXO	10	2	2	3
8434A		HOLL	01	15	1609	S34	W49	01	11.8		B	BXO	10	3	3	3
8434A		HOLL	01	16	1718	S33	W62	01	11.8		B	BXO	30	3	4	2
8434A		LEAR	01	17	0020	S33	W65	01	11.8		A	AX	20	3	2	3
8434A		RAMY	01	17	1230	S34	W74	01	11.6		A	AX	10	2	1	3
8438		HOLL	01	11	1612	S18	E27	01	13.7		B	BXO	10	3	7	4
8438	28954	MWIL	01	11	1700	S19	E25	01	13.6	3	(B)					
8438		LEAR	01	12	0010	S17	E18	01	13.4		B	BXO	10	3	2	3
8438		VORO	01	12	0356	S19	E19	01	13.6			AXX	9	1		2
8438		RAMY	01	12	1226	S18	E13	01	13.5		B	BXO	10	5	4	3
8438	28954	MWIL	01	12	1545	S19	E13	01	13.6	4	(B)					

SUNSPOT GROUPS
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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
8438		HOLL	01 12	1934	S19 E10	01 13.6		B	CSO	30	7	5	3
8438		LEAR	01 13	0045	S18 E07	01 13.6		B	DSO	30	6	6	3
8438		VORO	01 13	0356	S19 E07	01 13.7			BXO	60	4	5	2
8438		KAND	01 13	1045	S18 E00	01 13.4			CAO		6	6	3
8438		RAMY	01 13	1251	S18 E01	01 13.6		B	BXO	20	9	5	3
8438	28954	MWIL	01 13	1600	S18 W01	01 13.6	5	(B)					
8438		HOLL	01 13	1622	S18 W03	01 13.4		B	CRO	40	10	7	3
8438		LEAR	01 14	0014	S18 W06	01 13.5		B	CAO	20	6	6	4
8438		VORO	01 14	0200	S19 W06	01 13.6			BXO	19	2	6	2
8438		KAND	01 14	0730	S18 W06	01 13.8			AX		2	1	3
8438		SVTO	01 14	1158	S17 W09	01 13.8		A	HS	20	2	1	3
8438		RAMY	01 14	1228	S18 W08	01 13.9		A	AX	10	2	1	3
8438	28954	MWIL	01 14	1545	S18 W11	01 13.8	4	(AF)					
8438		HOLL	01 14	1612	S18 W12	01 13.8		A	AX	20	3	3	3
8438		VORO	01 15	0005	S20 W16	01 13.8			AXX	17	1		2
8438		LEAR	01 15	0035	S18 W16	01 13.8		B	BXO	10	2	1	3
8438		SVTO	01 15	0756	S19 W20	01 13.8		A	AX	10	2	2	3
8438		RAMY	01 15	1205	S18 W21	01 13.9		A	AX		1		3
8438	28954	MWIL	01 15	1600	S18 W24	01 13.8	4	(AF)					
8438		HOLL	01 15	1609	S18 W24	01 13.8		A	AX		1		3
8438A	28955	MWIL	01 11	1700	S16 E30	01 14.0	3	(AP)					
8437A		LEAR	01 16	0025	N13 W16	01 14.8		A	AX	10	2	1	2
8437A		SVTO	01 16	0752	N13 W22	01 14.7		B	CRO	10	4	3	3
8436		KAND	01 09	0750	S32 E73	01 15.1			AX		1	1	3
8436		RAMY	01 09	1314	S29 E68	01 14.9		A	AX		1		3
8436	28951	MWIL	01 09	1600	S32 E68	01 15.0	4	(AP)					
8436		HOLL	01 09	1602	S32 E68	01 15.0		A	AX	10	1	1	3
8436		LEAR	01 10	0010	S29 E63	01 14.9		A	AX	10	1	1	4
8436		SVTO	01 10	0830	S32 E60	01 15.1		B	BXO	10	2	3	2
8436		KAND	01 10	0855	S31 E63	01 15.3			AX		1		2
8436		RAMY	01 10	1220	S29 E57	01 15.0		B	BXO	10	2	3	3
8436		HOLL	01 10	1545	S32 E56	01 15.1		A	AX		1		3
8436	28951	MWIL	01 10	1800	S32 E53	01 14.9	3	(B)					
8436		LEAR	01 14	0014	S28 E18	01 15.4		B	BXO	10	5	2	4
8436A		VORO	01 14	0200	S18 E18	01 15.4			AXX	16	1		2
8436A		KAND	01 14	0730	S17 E14	01 15.4			AX		1		3
8437		VORO	01 10	0023	N12 E80	01 16.0			HRX	91	1		2
8437		SVTO	01 10	0830	N11 E76	01 16.1		A	HS	90	1	3	2
8437		KAND	01 10	0855	N11 E82	01 16.5			HS		1	2	2
8437		RAMY	01 10	1220	N13 E73	01 16.0		A	HA	60	1	2	3
8437		HOLL	01 10	1545	N10 E73	01 16.1		A	HS	110	1	2	3
8437	28953	MWIL	01 10	1800	N09 E72	01 16.1	4	(AP)					
8437		VORO	01 11	0022	N12 E71	01 16.4			HAX	170	1		2
8437		LEAR	01 11	0035	N11 E68	01 16.1		A	HA	80	1	2	2
8437		RAMY	01 11	1235	N13 E60	01 16.0		A	HS	70	1	2	3
8437		HOLL	01 11	1612	N10 E59	01 16.1		A	HS	110	1	2	4
8437	28953	MWIL	01 11	1700	N10 E60	01 16.2	5	(AP)					
8437		LEAR	01 12	0010	N11 E55	01 16.1		A	HS	100	1	2	3
8437		VORO	01 12	0356	N11 E56	01 16.4			HAX	122	1		2
8437		KAND	01 12	0810	N11 E51	01 16.2			HA		1	2	1
8437		RAMY	01 12	1226	N12 E48	01 16.1		A	HS	80	1	2	3
8437	28953	MWIL	01 12	1545	N10 E46	01 16.1	5	(AP)					
8437		HOLL	01 12	1934	N09 E44	01 16.1		A	HS	70	1	1	3
8437		LEAR	01 13	0045	N11 E41	01 16.1		A	HS	90	1	2	3
8437		VORO	01 13	0356	N10 E41	01 16.2			HAX	187	1		2
8437		KAND	01 13	1045	N10 E35	01 16.1			HS		1	2	3
8437		RAMY	01 13	1251	N12 E35	01 16.2		A	HS	100	1	2	3
8437	28953	MWIL	01 13	1600	N10 E33	01 16.1	5	(AP)					
8437		HOLL	01 13	1622	N10 E33	01 16.2		B	CSO	70	3	4	3
8437		LEAR	01 14	0014	N10 E30	01 16.3		B	CSO	100	3	4	4
8437		VORO	01 14	0200	N10 E29	01 16.3			HAX	160	1		2
8437		KAND	01 14	0730	N10 E25	01 16.2			HA		1	2	3
8437		SVTO	01 14	1158	N11 E22	01 16.1		A	HS	110	1	2	3
8437		RAMY	01 14	1228	N11 E22	01 16.2		A	HS	90	1	2	3

SUNSPOT GROUPS
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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
8437	28953	MWIL	01 14	1545	N11 E20	01 16.2	5	(AP)					
8437		HOLL	01 14	1612	N10 E20	01 16.2		A	HS	100	1	2	3
8437		VORO	01 15	0005	N10 E15	01 16.1			HAX	172	1		2
8437		LEAR	01 15	0035	N09 E15	01 16.1		A	HS	100	1	2	3
8437		SVTO	01 15	0756	N10 E11	01 16.1		A	HS	100	1	2	3
8437		RAMY	01 15	1205	N11 E08	01 16.1		A	HS	90	1	2	3
8437	28953	MWIL	01 15	1600	N11 E06	01 16.1	5	(AP)					
8437		HOLL	01 15	1609	N10 E07	01 16.2		A	HS	100	1	2	3
8437		LEAR	01 16	0025	N11 E03	01 16.2		B	CAO	70	4	4	2
8437		TACH	01 16	0632	N10 W02	01 16.1			HSX	200	1	2	3
8437		KAND	01 16	0650	N10 W02	01 16.1			HS		1	2	3
8437		SVTO	01 16	0752	N10 W03	01 16.1		A	HS	90	1	2	3
8437		RAMY	01 16	1300	N11 W06	01 16.1		A	HS	90	1	2	2
8437	28953	MWIL	01 16	1545	N11 W07	01 16.1	5	(AP)					
8437		HOLL	01 16	1718	N10 W08	01 16.1		A	HS	80	1	2	2
8437		LEAR	01 17	0020	N10 W11	01 16.2		A	HX	50	1	1	3
8437		VORO	01 17	0350	N11 W12	01 16.2			HAX	100	1		2
8437		KAND	01 17	0830	N10 W17	01 16.1			HS		3	2	3
8437		RAMY	01 17	1230	N11 W18	01 16.2		A	HS	90	1	2	3
8437		HOLL	01 17	1547	N10 W20	01 16.1		A	HS	60	1	2	3
8437	28953	MWIL	01 17	1600	N11 W20	01 16.2	5	(AP)					
8437		SVTO	01 18	0932	N10 W30	01 16.1		A	HS	120	1	2	3
8437		RAMY	01 18	1246	N11 W32	01 16.1		A	HS	100	1	2	3
8437	28953	MWIL	01 18	1545	N11 W33	01 16.2	5	(AP)					
8437		HOLL	01 18	1555	N11 W33	01 16.2		A	HS	60	1	2	3
8437		LEAR	01 19	0055	N11 W39	01 16.1		A	HS	80	1	2	3
8437		TACH	01 19	0543	N10 W40	01 16.2			HSX	100	1	2	3
8437		SVTO	01 19	0720	N10 W42	01 16.1		A	HS	60	1	2	4
8437		RAMY	01 19	1226	N11 W45	01 16.1		A	HS	70	1	2	3
8437	28953	MWIL	01 19	1545	N11 W46	01 16.2	5	(AP)					
8437		HOLL	01 19	1711	N11 W46	01 16.2		A	HS	60	1	2	4
8437		LEAR	01 20	0315	N11 W54	01 16.1		A	HS	70	1	2	3
8437		SVTO	01 20	0953	N12 W57	01 16.1		A	HS	70	1	2	3
8437		RAMY	01 20	1309	N11 W58	01 16.2		A	HS	70	1	2	3
8437	28953	MWIL	01 20	1945	N11 W61	01 16.2	5	(AP)					
8437		LEAR	01 21	0147	N10 W64	01 16.3		A	HS	40	1	2	2
8437		SVTO	01 21	0816	N11 W69	01 16.1		A	HA	50	1	2	3
8437		RAMY	01 21	1228	N11 W71	01 16.2		A	HS	70	1	1	3
8437		HOLL	01 21	1621	N11 W73	01 16.2		A	HS	60	1	1	2
8437		LEAR	01 22	0115	N11 W77	01 16.2		A	HS	50	1	2	3
8437		VORO	01 22	2335	N10 W85	01 16.6			HAX	214	1		3
8442		LEAR	01 17	0020	N24 W03	01 16.8		B	CRO	20	7	3	3
8442		VORO	01 17	0350	N22 W04	01 16.8			CSO	78	3	3	2
8442		KAND	01 17	0830	N24 W09	01 16.6			DAO		5	4	3
8442		RAMY	01 17	1230	N25 W11	01 16.7		B	DSO	50	10	4	3
8442		HOLL	01 17	1547	N24 W11	01 16.8		B	DSO	30	7	5	3
8442	28960	MWIL	01 17	1600	N24 W11	01 16.8	5	(B)					
8442		SVTO	01 18	0932	N25 W22	01 16.7		B	DSO	60	13	7	3
8442		RAMY	01 18	1246	N25 W23	01 16.7		B	DAO	70	14	6	3
8442	28960	MWIL	01 18	1545	N24 W23	01 16.9	4	(D)					
8442		HOLL	01 18	1555	N25 W24	01 16.8		B	DAO	100	17	7	3
8442		LEAR	01 19	0055	N24 W30	01 16.7		B	DAO	90	14	5	3
8442		TACH	01 19	0543	N24 W31	01 16.8			BRI	85	10	4	3
8442		SVTO	01 19	0720	N24 W34	01 16.7		B	DAO	50	7	6	4
8442		RAMY	01 19	1226	N25 W35	01 16.8		B	DAI	80	10	6	3
8442	28960	MWIL	01 19	1545	N24 W36	01 16.9	4	(D)					
8442		HOLL	01 19	1711	N25 W37	01 16.8		B	DAO	60	12	7	4
8442		LEAR	01 20	0315	N24 W44	01 16.7		BGD	DAO	60	10	7	3
8442		SVTO	01 20	0953	N25 W48	01 16.7		B	CRO	30	6	6	3
8442		RAMY	01 20	1309	N24 W49	01 16.8		B	CAO	200	6	7	3
8442	28960	MWIL	01 20	1945	N25 W50	01 16.9	4	B					
8442		LEAR	01 21	0147	N24 W55	01 16.8		B	CAO	20	2	1	2
8442		SVTO	01 21	0816	N25 W62	01 16.5		B	CSO	50	3	4	3
8442		RAMY	01 21	1228	N24 W64	01 16.6		B	CSO	40	5	5	3
8442		HOLL	01 21	1621	N23 W65	01 16.7		B	BXO	20	4	4	2
8442	28960	MWIL	01 21	1720	N25 W65	01 16.7	4	(AP)					
8442		LEAR	01 22	0115	N25 W67	01 16.9		B	CSO	40	4	2	3
8442		SVTO	01 22	1021	N25 W74	01 16.7		B	DRO	60	2	2	3

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

JANUARY 1999

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
8442		RAMY	01	22	1234	N24	W75	01	16.7		B	BXO	20	2	3	3
8442		VORO	01	22	2335	N23	W79	01	16.9			HAX	55	1		3
8441	28958	MWIL	01	13	1600	N17	E43	01	16.9	3	(B)					
8441		RAMY	01	14	1228	N19	E33	01	17.0		B	BXO		2	2	3
8441	28958	WIL	01	14	1545	N18	E31	01	17.0	4	(AF)					M
8441		HOLL	01	14	1612	N18	E32	01	17.1		A	AX	10	2	1	3
8441		LEAR	01	15	0035	N17	E27	01	17.1		B	BXO	10	7	2	3
8441		SVTO	01	15	0756	N17	E22	01	17.0		B	BXO	10	5	3	3
8441		RAMY	01	15	1205	N18	E19	01	16.9		B	CRO	20	3	2	3
8441	28958	MWIL	01	15	1600	N18	E18	01	17.0	4	(BF)					
8441		HOLL	01	15	1609	N17	E17	01	17.0		B	BXO	10	2	3	3
8441		LEAR	01	16	0025	N17	E12	01	16.9		B	BXO	10	3	2	2
8441		TACH	01	16	0632	N18	E11	01	17.1			AXX	10	1	1	3
8441		KAND	01	16	0650	N17	E10	01	17.0			BXO		2	4	3
8441		SVTO	01	16	0752	N17	E08	01	16.9		B	CSO	20	3	4	3
8441		RAMY	01	16	1300	N18	E07	01	17.1		B	BXO	10	2	3	2
8441		SVTO	01	19	0720	N18	W27	01	17.2		A	AX		1		4
8440B	28959	MWIL	01	23	1600	N20	W63	01	18.8	5	(BG)					
8439		KAND	01	12	0810	S24	E85	01	18.9			CAO		2	3	1
8439		RAMY	01	12	1226	S23	E80	01	18.7		B	CSO	100	4	9	3
8439	28957	MWIL	01	12	1545	S24	E80	01	18.8	4	(B)					
8439		HOLL	01	12	1934	S24	E77	01	18.8		B	CAO	210	6	7	3
8439		LEAR	01	13	0045	S23	E76	01	18.9		B	CAO	200	8	10	3
8439		VORO	01	13	0356	S23	E74	01	18.9			HAX	294	1		2
8439		KAND	01	13	1045	S24	E71	01	18.9			EAI		11	14	3
8439		RAMY	01	13	1251	S23	E72	01	19.1		B	EAI	300	11	13	3
8439	28957	MWIL	01	13	1600	S23	E69	01	19.0	5	(BG)					
8439		HOLL	01	13	1622	S25	E69	01	19.0		BG	EAC	290	13	13	3
8439		LEAR	01	14	0014	S24	E67	01	19.2		BG	EAC	260	17	15	4
8439		VORO	01	14	0200	S24	E67	01	19.2			DKC	485	9	13	2
8439		KAND	01	14	0730	S23	E61	01	19.0			EAI		18	14	3
8439		SVTO	01	14	1158	S24	E57	01	18.9		BG	EAI	170	19	14	3
8439		RAMY	01	14	1228	S23	E59	01	19.1		B	EAI	310	20	14	3
8439	28957	MWIL	01	14	1545	S23	E56	01	19.0	5	(B)					
8439		HOLL	01	14	1612	S26	E56	01	19.0		B	EAI	360	19	13	3
8439		VORO	01	15	0005	S24	E55	01	19.2			EKC	747	6	12	2
8439		LEAR	01	15	0035	S24	E53	01	19.1		B	EAC	240	26	15	3
8439		SVTO	01	15	0756	S25	E48	01	19.0		B	EAI	220	18	14	3
8439		RAMY	01	15	1205	S23	E47	01	19.1		B	EAO	190	17	14	3
8439	28957	MWIL	01	15	1600	S23	E45	01	19.1	4	(D)					
8439		HOLL	01	15	1609	S25	E45	01	19.1		BG	EAC	410	36	14	3
8439		LEAR	01	16	0025	S24	E40	01	19.1		BG	FAC	290	28	16	2
8439		TACH	01	16	0632	S24	E37	01	19.1			CSI	170	14	12	3
8439		KAND	01	16	0650	S24	E37	01	19.1			EAI		16	15	3
8439		SVTO	01	16	0752	S24	E36	01	19.1		B	EAI	340	31	15	3
8439		RAMY	01	16	1300	S24	E33	01	19.1		B	EAI	250	21	14	2
8439	28957	MWIL	01	16	1545	S23	E32	01	19.1	5	(B)					
8439		HOLL	01	16	1718	S26	E32	01	19.2		BG	FAC	160	42	16	2
8439		LEAR	01	17	0020	S24	E27	01	19.1		BG	FAI	320	41	16	3
8439		VORO	01	17	0350	S23	E27	01	19.2			DAC	506	10	9	2
8439		KAND	01	17	0830	S24	E22	01	19.0			FAI		43	16	3
8439		RAMY	01	17	1230	S25	E21	01	19.1		B	FAO	190	42	16	3
8439		HOLL	01	17	1547	S24	E16	01	18.9		B	EAO	130	33	12	3
8439	28957	MWIL	01	17	1600	S24	E17	01	19.0	4	(BP)					
8439		SVTO	01	18	0932	S24	E06	01	18.9		B	FAI	260	37	16	3
8439		RAMY	01	18	1246	S24	E06	01	19.0		BG	FAI	230	55	16	3
8439	28957	MWIL	01	18	1545	S23	E03	01	18.9	5	(BG)					
8439		HOLL	01	18	1555	S23	E04	01	19.0		BG	EAI	220	45	15	3
8439		LEAR	01	19	0055	S24	W01	01	19.0		BG	FAI	260	53	17	3
8439		TACH	01	19	0543	S23	W07	01	18.7			EAI	840	19	13	3
8439		SVTO	01	19	0720	S23	W03	01	19.1		BG	FAI	170	34	17	4
8439		RAMY	01	19	1226	S23	W08	01	18.9		BG	FAI	360	48	16	3
8439	28957	MWIL	01	19	1545	S23	W12	01	18.7	2	BG					
8439		HOLL	01	19	1711	S23	W11	01	18.9		BG	FSC	290	43	16	4
8439		LEAR	01	20	0315	S23	W17	01	18.8		BG	FAI	280	40	16	3
8439		SVTO	01	20	0953	S23	W23	01	18.6		BG	EKI	260	20	12	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

JANUARY 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8439		RAMY	01 20 1309	S25 W21	01 18.9		BG	FAI	330	42	18	3
8439	28957	MWIL	01 20 1945	S23 W28	01 18.7	5	(D)					
8439		LEAR	01 21 0147	S23 W30	01 18.8		BG	EAC	220	11	13	2
8439		SVTO	01 21 0816	S22 W35	01 18.6		BG	EKI	550	29	15	3
8439		RAMY	01 21 1228	S23 W36	01 18.7		BG	EAC	430	28	15	3
8439		HOLL	01 21 1621	S23 W39	01 18.7		B	EAC	340	20	11	2
8439	28957	MWIL	01 21 1720	S23 W41	01 18.6	5	(BG)					
8439		LEAR	01 22 0115	S22 W43	01 18.7		BG	EAC	450	18	12	3
8439		SVTO	01 22 1021	S23 W50	01 18.6		BG	EKI	810	14	11	3
8439		RAMY	01 22 1234	S23 W50	01 18.7		BG	EAI	330	28	13	3
8439		KAND	01 22 1320	S23 W52	01 18.5			EKC		23	11	2
8439		HOLL	01 22 1750	S23 W55	01 18.5		BGD	EKC	360	20	13	4
8439		VORO	01 22 2335	S25 W56	01 18.6			DAC	925	15	11	3
8439		LEAR	01 23 0045	S23 W57	01 18.6		BG	EAC	460	19	12	3
8439		TACH	01 23 0628	S23 W59	01 18.7			DAI	273	9	8	2
8439		SVTO	01 23 0747	S22 W61	01 18.6		BG	EKC	420	26	13	3
8439		RAMY	01 23 1310	S23 W64	01 18.6		BG	EAI	330	25	12	3
8439	28957	MWIL	01 23 1600	S22 W65	01 18.7	5	(B)					
8439		HOLL	01 23 1638	S23 W68	01 18.4		BG	EHC	310	23	15	2
8439		LEAR	01 24 0040	S23 W70	01 18.6		BG	EKC	300	19	13	3
8439		TACH	01 24 0514	S23 W74	01 18.5			HA	204	9	11	4
8439		SVTO	01 24 0730	S23 W71	01 18.8		BG	ESO	200	11	14	4
8439		RAMY	01 24 1246	S23 W78	01 18.5		B	FKO	300	6	20	3
8439		LEAR	01 25 0140	S23 W82	01 18.7		B	CAO	80	2	2	3
8439A		RAMY	01 20 1309	S32 W17	01 19.2		B	BXO		3	3	3
8440		RAMY	01 13 1251	N23 E79	01 19.6		A	HS	20	1	1	3
8440	28959	MWIL	01 13 1600	N20 E74	01 19.3	3	B					
8440		HOLL	01 13 1622	N19 E71	01 19.1		B	CAO	90	5	4	3
8440		LEAR	01 14 0014	N19 E70	01 19.3		B	DAO	120	3	4	4
8440		VORO	01 14 0200	N21 E71	01 19.5			DKO	321	2	1	2
8440		KAND	01 14 0730	N21 E67	01 19.4			DAO		3	5	3
8440		SVTO	01 14 1158	N19 E59	01 19.0		B	DSO	190	14	9	3
8440		RAMY	01 14 1228	N21 E61	01 19.2		B	DAO	200	18	10	3
8440	28959	MWIL	01 14 1545	N20 E60	01 19.2	5	(B)					
8440		HOLL	01 14 1612	N18 E61	01 19.3		BG	DAO	260	15	6	3
8440		VORO	01 15 0005	N19 E53	01 19.0			DKO	645	7	3	2
8440		LEAR	01 15 0035	N20 E55	01 19.2		BG	DKC	320	23	10	3
8440		SVTO	01 15 0756	N19 E50	01 19.1		B	DAO	210	25	10	3
8440		RAMY	01 15 1205	N21 E47	01 19.1		BG	DAO	220	23	10	3
8440	28959	MWIL	01 15 1600	N20 E47	01 19.3	5	(D)					
8440		HOLL	01 15 1609	N19 E46	01 19.2		BG	DAI	430	33	10	3
8440		LEAR	01 16 0025	N19 E42	01 19.2		BG	DAC	320	23	10	2
8440		TACH	01 16 0632	N19 E38	01 19.2			DAI	212	19	11	3
8440		KAND	01 16 0650	N19 E39	01 19.3			EAI		16	11	3
8440		SVTO	01 16 0752	N18 E35	01 19.0		BG	EAI	460	29	14	3
8440		RAMY	01 16 1300	N20 E34	01 19.1		B	EAI	320	26	12	2
8440	28959	MWIL	01 16 1545	N20 E34	01 19.2	4	(BG)					
8440		HOLL	01 16 1718	N18 E33	01 19.2		BG	ESC	290	45	13	2
8440		LEAR	01 17 0020	N20 E29	01 19.2		BG	EAI	370	37	12	3
8440		VORO	01 17 0350	N21 E28	01 19.3			DKO	1024	14	12	2
8440		KAND	01 17 0830	N20 E24	01 19.2			ESI		38	13	3
8440		RAMY	01 17 1230	N19 E22	01 19.2		BG	EAI	270	52	15	3
8440		HOLL	01 17 1547	N18 E21	01 19.2		BG	ESC	270	38	15	3
8440	28959	MWIL	01 17 1600	N20 E20	01 19.2	5	(BG)					
8440		SVTO	01 18 0932	N19 E10	01 19.2		B	FSO	350	44	16	3
8440		RAMY	01 18 1246	N20 E09	01 19.2		B	EAI	270	62	15	3
8440	28959	MWIL	01 18 1545	N20 E07	01 19.2	5	(BG)					
8440		HOLL	01 18 1555	N19 E06	01 19.1		BG	FSC	310	57	17	3
8440		LEAR	01 19 0055	N19 E02	01 19.2		B	FSI	300	49	16	3
8440		TACH	01 19 0543	N20 W05	01 18.8			DAI	321	26	11	3
8440		SVTO	01 19 0720	N19 W03	01 19.1		BG	ESI	170	30	14	4
8440		RAMY	01 19 1226	N19 W05	01 19.1		B	EAI	320	48	14	3
8440	28959	MWIL	01 19 1545	N20 W06	01 19.2	5	(BG)					
8440		HOLL	01 19 1711	N20 W05	01 19.3		BG	EAC	320	67	15	4
8440		LEAR	01 20 0315	N19 W14	01 19.1		BG	FAI	300	47	16	3
8440		SVTO	01 20 0953	N19 W18	01 19.0		BG	FSI	310	24	16	3
8440		RAMY	01 20 1309	N19 W18	01 19.2		B	EAI	300	46	15	3

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JANUARY 1999

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
8440	28959	MWIL	01	20	1945	N20	W22	01	19.1	2	B2					
8440		LEAR	01	21	0147	N18	W25	01	19.2		BG	EAI	260	18	15	2
8440		SVTO	01	21	0816	N19	W29	01	19.1		BG	FAI	370	25	17	3
8440		RAMY	01	21	1228	N20	W32	01	19.1		B	FKI	360	32	16	3
8440		HOLL	01	21	1621	N19	W34	01	19.1		B	FAC	300	22	16	2
8440	28959	MWIL	01	21	1720	N20	W33	01	19.2	5	(B)					
8440		LEAR	01	22	0115	N19	W38	01	19.1		BG	EKI	360	17	15	3
8440		SVTO	01	22	1021	N19	W45	01	19.0		BG	FKI	470	10	18	3
8440		RAMY	01	22	1234	N19	W45	01	19.1		BG	FAI	320	28	16	3
8440		KAND	01	22	1320	N18	W46	01	19.0			FKI		21	17	2
8440		HOLL	01	22	1750	N19	W45	01	19.3		BG	FHC	310	27	17	4
8440		VORO	01	22	2335	N19	W51	01	19.1			DKO	655	9	15	3
8440		LEAR	01	23	0045	N18	W51	01	19.1		BG	FKI	360	20	17	3
8440		TACH	01	23	0628	N20	W53	01	19.2			DAI	268	6	15	2
8440		SVTO	01	23	0747	N19	W55	01	19.1		BG	FAI	310	15	17	3
8440		RAMY	01	23	1310	N20	W57	01	19.2		BG	FAO	180	15	19	3
8440		HOLL	01	23	1638	N19	W62	01	19.0		BG	FSO	220	18	16	2
8440		LEAR	01	24	0040	N19	W66	01	19.0		BG	EAI	280	8	15	3
8440		TACH	01	24	0514	N19	W71	01	18.8			CAI	161	6	10	4
8440		SVTO	01	24	0730	N18	W70	01	19.0		B	CSO	90	8	16	4
8440		RAMY	01	24	1246	N20	W75	01	18.8		B	FSO	90	5	20	3
8440		LEAR	01	25	0140	N19	W76	01	19.3		B	DAO	60	4	8	3
8440		KAND	01	25	0845	N19	W80	01	19.2			AX		2	2	3
8439B		LEAR	01	22	0115	S22	W23	01	20.3		A	AX	10	1	1	3
8440A		SVTO	01	14	1158	N16	E77	01	20.3		B	BXO		2	4	3
8440A		HOLL	01	14	1612	N13	E76	01	20.4		A	AX	10	2	2	3
8444A		KAND	01	17	0830	N17	E45	01	20.8			AX		1		3
8447		RAMY	01	19	1226	N20	E25	01	21.4		A	AX		1		3
8447		RAMY	01	20	1309	N18	E13	01	21.5		A	AX		2		3
8447		RAMY	01	21	1228	N19	W03	01	21.3		B	BXO	10	3	2	3
8447		HOLL	01	21	1621	N19	W04	01	21.4		A	HR	20	2	2	2
8447		LEAR	01	22	0115	N19	W09	01	21.4		A	AX	10	1	1	3
8447		SVTO	01	22	1021	N19	W13	01	21.4		B	DRO	40	4	3	3
8447		RAMY	01	22	1234	N19	W13	01	21.5		B	CSO	20	6	4	3
8447		KAND	01	22	1320	N19	W16	01	21.3			CRO		2	4	2
8447		HOLL	01	22	1750	N19	W17	01	21.4		B	CSO	20	2	3	4
8447		LEAR	01	23	0045	N18	W22	01	21.3		B	BXO	10	3	3	3
8447		SVTO	01	23	0747	N19	W26	01	21.3		A	AX		2	2	3
8447		RAMY	01	23	1310	N20	W28	01	21.4		B	BXO	10	3	4	3
8447		HOLL	01	23	1638	N19	W31	01	21.3		B	BXO	10	3	3	2
8447		LEAR	01	24	0040	N19	W34	01	21.4		A	HS	40	1	1	3
8447		SVTO	01	24	0730	N20	W38	01	21.4		B	DRO	30	6	6	4
8447		RAMY	01	24	1246	N20	W40	01	21.5		B	BXO	10	7	4	3
8447		LEAR	01	25	0140	N19	W46	01	21.5		B	CAO	40	3	5	3
8447		KAND	01	25	0845	N18	W51	01	21.5			CAI		7	7	3
8447		RAMY	01	25	1326	N20	W56	01	21.3		B	BXO		2	3	3
8447		HOLL	01	25	1600	N19	W55	01	21.5		B	CSO	40	3	5	2
8447		SVTO	01	26	0815	N19	W66	01	21.3		B	BXO	30	3	5	3
8447		KAND	01	26	0825	N18	W64	01	21.5			CAO		3	4	3
8447		RAMY	01	26	1304	N19	W68	01	21.3		A	AX	10	1		3
8447		HOLL	01	26	1623	N19	W65	01	21.7		B	BXO	10	2	4	2
8444	28963	MWIL	01	19	1545	N19	E24	01	21.5	4	(B)					
8444		HOLL	01	19	1711	N18	E23	01	21.5		A	AX	10	2	1	4
8444		LEAR	01	20	0315	N19	E16	01	21.3		A	AX		1	1	3
8444		SVTO	01	20	0953	N19	E12	01	21.3		A	HR	10	2	2	3
8444		RAMY	01	20	1309	N19	E11	01	21.4		A	AX	10	2	1	3
8444	28963	MWIL	01	20	1945	N19	E09	01	21.5	4	(BP)					
8444		LEAR	01	21	0147	N19	E03	01	21.3		A	HA	10	1	1	2
8444		SVTO	01	21	0816	N20	E04	01	21.6		BG	DSO	40	6	9	3
8444		RAMY	01	21	1228	N20	E04	01	21.8		B	BXO	10	7	3	3
8444		HOLL	01	21	1621	N19	E03	01	21.9		B	CSO	20	8	4	2
8444	28963	MWIL	01	21	1720	N20	W01	01	21.6	4	(BG)					
8444		LEAR	01	22	0115	N19	W04	01	21.7		B	DAO	50	9	7	3
8444		SVTO	01	22	1021	N20	W07	01	21.9		B	DAO	60	6	5	3

S U N S P O T G R O U P S
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JANUARY 1999

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
8444		RAMY	01 22	1234	N20 W07	01 22.0		B	DSO	50	10	6	3
8444		KAND	01 22	1320	N20 W10	01 21.8			DAO		7	6	2
8444		HOLL	01 22	1750	N19 W12	01 21.8		B	CAO	60	7	6	4
8444		VORO	01 22	2335	N20 W17	01 21.7			BXO	107	8	10	3
8444		LEAR	01 23	0045	N18 W15	01 21.9		B	DAO	80	9	6	3
8444		TACH	01 23	0628	N20 W18	01 21.9			SAI	58	7	3	2
8444		SVTO	01 23	0747	N20 W18	01 21.9		B	DAO	70	8	7	3
8444		RAMY	01 23	1310	N21 W21	01 21.9		B	DAO	60	11	7	3
8444	28963	MWIL	01 23	1600	N20 W23	01 21.9	5	(BG)					
8444		HOLL	01 23	1638	N19 W24	01 21.9		B	CSO	60	13	8	2
8444		LEAR	01 24	0040	N19 W27	01 22.0		B	DAO	60	11	9	3
8444		TACH	01 24	0514	N19 W33	01 21.7			CAI	95	7	10	4
8444		SVTO	01 24	0730	N19 W29	01 22.1		B	CSO	60	8	4	4
8444		RAMY	01 24	1246	N21 W34	01 21.9		B	DSO	80	5	5	3
8444		LEAR	01 25	0140	N19 W41	01 21.9		B	DSO	90	8	8	3
8444		KAND	01 25	0845	N19 W44	01 22.0			CAO		4	2	3
8444		RAMY	01 25	1326	N21 W48	01 21.9		B	DAO	130	7	7	3
8444		HOLL	01 25	1600	N19 W47	01 22.1		B	CSO	60	4	3	2
8444		VORO	01 26	0035	N18 W57	01 21.7			CSO	243	4	11	3
8444		LEAR	01 26	0111	N18 W56	01 21.8		B	EAO	100	4	11	3
8444		SVTO	01 26	0815	N19 W57	01 22.0		B	CRO	70	3	3	3
8444		KAND	01 26	0825	N19 W55	01 22.1			HS		1	2	3
8444		RAMY	01 26	1304	N19 W60	01 22.0		B	CSO	80	3	8	3
8444		HOLL	01 26	1623	N19 W59	01 22.2		A	HS	30	1	2	2
8444		LEAR	01 27	0001	N19 W65	01 22.0		B	EAO	90	3	12	3
8444		SVTO	01 27	0810	N19 W70	01 22.0		A	HR	30	1	1	2
8444		KAND	01 27	0815	N18 W68	01 22.2			HS		1	2	3
8444		RAMY	01 27	1227	N19 W70	01 22.2		B	CSO	60	2	3	2
8444	28963	MWIL	01 27	2200	N19 W77	01 22.0	4	AF					
8445	28964	MWIL	01 19	1545	N11 E28	01 21.8	4	(B)					
8445		HOLL	01 19	1711	N10 E28	01 21.8		B	BXO	20	2	3	4
8445		LEAR	01 20	0315	N12 E21	01 21.7		B	BXO		2	3	3
8445A		RAMY	01 19	1226	N21 E59	01 24.0		A	AX		1		3
8445A	28972	MWIL	01 29	1545	N19 W74	01 24.0	4	(AP)					
8443		VORO	01 17	0350	S17 E86	01 23.7			HRX	37	1		2
8443		KAND	01 17	0830	S18 E85	01 23.8			AX		1		3
8443	28961	MWIL	01 17	1600	S18 E79	01 23.7	2	AP					
8443		SVTO	01 18	0932	S18 E68	01 23.6		A	AX		1		3
8443		RAMY	01 18	1246	S17 E72	01 24.0		B	BXO	10	3	15	3
8443	28962	MWIL	01 18	1545	S17 E79	01 24.6	4	(B)					
8443	28961	MWIL	01 18	1545	S18 E65	01 23.6	3	(AP)					
8443		HOLL	01 18	1555	S18 E71	01 24.1		B	BXO	10	3	15	3
8443		LEAR	01 19	0055	S17 E64	01 23.9		B	BXO	10	3	13	3
8443		TACH	01 19	0543	S16 E72	01 24.7			AR	11	2	3	3
8443		SVTO	01 19	0720	S17 E59	01 23.8		B	CRO	30	2	3	4
8443		RAMY	01 19	1226	S16 E59	01 24.0		B	BXO	10	3	16	3
8443	28962	MWIL	01 19	1545	S17 E64	01 24.5	4	(BF)					
8443	28961	MWIL	01 19	1545	S18 E50	01 23.5	3	(AP)					
8443		HOLL	01 19	1711	S18 E58	01 24.1		B	BXO	10	3	15	4
8443		LEAR	01 20	0315	S17 E51	01 24.0		B	BXO	10	3	13	3
8443		SVTO	01 20	0953	S16 E55	01 24.6		A	AX		1		3
8443		RAMY	01 20	1309	S17 E53	01 24.6		A	AX	10	1		3
8443	28962	MWIL	01 20	1945	S17 E50	01 24.6	4	(AF)					
8443		LEAR	01 21	0147	S16 E46	01 24.6		A	AX		1		2
8443		SVTO	01 21	0816	S16 E42	01 24.5		A	HS	10	1	1	3
8443		RAMY	01 21	1228	S16 E39	01 24.5		A	AX	10	2		3
8443		HOLL	01 21	1621	S17 E38	01 24.6		A	HR	10	1	1	2
8443	28962	MWIL	01 21	1720	S16 E38	01 24.6	3	(AF)					
8443		LEAR	01 22	0115	S18 E32	01 24.5		A	HR	10	2	1	3
8443		RAMY	01 22	1234	S16 E25	01 24.4		A	AX		1		3
8443		KAND	01 22	1320	S16 E24	01 24.4			AX		1		2
8443		HOLL	01 22	1750	S17 E23	01 24.5		A	AX	10	2	2	4
8443		VORO	01 22	2335	S16 E21	01 24.6			AXX	7	1		3
8443		LEAR	01 23	0045	S18 E19	01 24.5		B	CRO	10	2	2	3
8443		SVTO	01 24	0730	S15 E04	01 24.6		B	BXO		2	3	4
8443		RAMY	01 24	1246	S16 E02	01 24.7		B	BXO		3	3	3

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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
8443		LEAR	01 25	0140	S15 W04	01 24.8		B	BXO	10	2	2	3
8443		LEAR	01 27	0001	S16 W30	01 24.7		B	CSO	20	4	3	3
8443		KAND	01 27	0815	S16 W35	01 24.7			BXO		3	5	3
8443		RAMY	01 27	1227	S15 W37	01 24.7		B	BXO		4	5	2
8443		HOLL	01 28	1820	S23 W53	01 24.7		B	BXO	10	2	3	2
8443		RAMY	01 29	1213	S20 W76	01 23.7		A	AX		1		3
8443	28971	MWIL	01 29	1545	S21 W80	01 23.5	4	(AP)					
8443	28973	MWIL	01 30	1615	S23 W78	01 24.7	4	(AP)					
8449		HOLL	01 22	1750	N28 E33	01 25.3		A	AX	10	2	1	4
8449		LEAR	01 25	0140	N27 E04	01 25.4		A	AX		1	1	3
8449		KAND	01 25	0845	N27 W01	01 25.3			AX		2	1	3
8449		LEAR	01 26	0111	N26 W09	01 25.3		A	AX	10	1		3
8449		SVTO	01 26	0815	N27 W15	01 25.2		A	AX		1		3
8449		LEAR	01 27	0001	N26 W22	01 25.3		B	BXO		2	1	3
8449		SVTO	01 27	0810	N27 W28	01 25.1		A	AX		1		2
8449		KAND	01 27	0815	N26 W27	01 25.2			AX		1		3
8449		RAMY	01 27	1227	N27 W28	01 25.3		B	BXO	10	4	4	2
8449	28968	MWIL	01 27	2200	N27 W36	01 25.1	4	(AP)					
8449		VORO	01 28	0004	N26 W37	01 25.1			AXX	17	1		3
8449		LEAR	01 28	0035	N27 W37	01 25.1		A	AX	10	1	1	3
8449		TACH	01 28	0654	N27 W41	01 25.1			AXX	10	1	1	3
8449		KAND	01 28	0755	N26 W43	01 25.0			AX		2	1	2
8449		RAMY	01 28	1235	N26 W43	01 25.2		A	AX	10	2	1	3
8449		SVTO	01 28	1450	N27 W45	01 25.1		A	AX	20	1		2
8449	28968	MWIL	01 28	1600	N26 W44	01 25.2	3	(AP)					
8449		HOLL	01 28	1820	N27 W47	01 25.1		A	AX	10	1		2
8449		VORO	01 29	0017	N25 W49	01 25.2			AXX	25	2	7	3
8449		LEAR	01 29	0025	N27 W48	01 25.3		B	BXO	10	2	4	3
8449		TACH	01 29	0558	N26 W52	01 25.2			AXX	15	1	1	4
8449	28968	MWIL	01 29	1545	N26 W56	01 25.3	4	(B)					
8449		TACH	01 30	0618	N27 W67	01 25.0			AR	3	2	1	3
8449		SVTO	01 30	0948	N29 W70	01 24.9		B	BXO	10	2	6	2
8449		RAMY	01 30	1234	N26 W68	01 25.2		B	BXO	10	3	4	3
8449	28968	MWIL	01 30	1615	N26 W69	01 25.3	4	(B)					
8449		HOLL	01 30	1838	N27 W71	01 25.2		B	BXO	20	3	3	4
8449		VORO	01 31	0029	N26 W76	01 25.1			HAX	75	1		3
8449		LEAR	01 31	0030	N26 W74	01 25.3		B	BXO	20	5	8	4
8449		RAMY	01 31	1543	N27 W83	01 25.2		A	AX		1		3
8446		SVTO	01 21	0816	N14 E69	01 26.5		A	AX		1		3
8446		RAMY	01 21	1228	N14 E66	01 26.5		B	BXO	10	3	4	3
8446		HOLL	01 21	1621	N14 E64	01 26.5		B	BXO	10	2	3	2
8446	28965	MWIL	01 21	1720	N15 E66	01 26.7	3	(AF)					
8446		LEAR	01 22	0115	N14 E57	01 26.3		B	BXO	10	2	2	3
8446		VORO	01 22	0240	N15 E58	01 26.5			BXO	27	2	1	3
8446		SVTO	01 22	1021	N15 E54	01 26.5		B	BXO	10	2	2	3
8446		RAMY	01 22	1234	N15 E52	01 26.5		B	BXO	10	2	2	3
8446		HOLL	01 22	1750	N15 E49	01 26.4		B	BXO	10	2	1	4
8446		VORO	01 23	0020	N16 E48	01 26.6			BXO	27	2	1	3
8446		LEAR	01 23	0045	N13 E45	01 26.4		B	BXO	10	2	2	3
8446		TACH	01 23	0628	N15 E44	01 26.6			AR	11	2	1	2
8446		SVTO	01 23	0747	N15 E41	01 26.4		B	CRO	10	2	1	3
8446		RAMY	01 23	1310	N15 E38	01 26.4		A	AX	10	3	2	3
8446	28965	MWIL	01 23	1600	N15 E37	01 26.5	4	(AP)					
8446		HOLL	01 23	1638	N14 E37	01 26.5		A	AX	10	2	1	2
8446		LEAR	01 24	0040	N15 E31	01 26.4		A	AX	10	1	1	3
8446		KAND	01 27	0815	N22 W11	01 26.5			AX		1		3
8446	28969	MWIL	01 27	2200	N17 W18	01 26.5	4	(B)					
8446		VORO	01 28	0004	N17 W19	01 26.5			BXI	26	4	3	3
8446		LEAR	01 28	0035	N17 W19	01 26.6		B	BXO	20	3	3	3
8446		TACH	01 28	0654	N19 W22	01 26.6			BRO	32	4	2	3
8446		KAND	01 28	0755	N22 W23	01 26.6			AX		1	1	2
8446		SVTO	01 28	1450	N18 W25	01 26.7		A	AX	10	3	2	2
8446	28969	MWIL	01 28	1600	N17 W25	01 26.8	3	(AP)					
8446		HOLL	01 28	1820	N17 W28	01 26.6		B	BXO	20	7	6	2
8446		VORO	01 29	0017	N17 W31	01 26.6			AXX	10	1		3
8446		LEAR	01 29	0025	N17 W30	01 26.7		A	AX	10	1	1	3
8446		TACH	01 29	0558	N17 W34	01 26.7			BRO	8	3	5	4

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NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8446	28969	MWIL	01 29 1545	N17 W40	01 26.6	4	(B)					
8446		VORO	01 30 0100	N17 W47	01 26.5			CAO	174	3	5	3
8446		TACH	01 30 0618	N17 W48	01 26.6			DAI	172	5	6	3
8446		RAMY	01 30 1234	N16 W53	01 26.5		B	DSO	120	6	9	3
8446	28969	MWIL	01 30 1615	N17 W54	01 26.6	5	(B)					
8446		HOLL	01 30 1838	N16 W57	01 26.4		B	DSO	180	7	10	4
8446		VORO	01 31 0029	N16 W60	01 26.5			DAO	322	2	9	3
8446		LEAR	01 31 0030	N17 W59	01 26.5		B	DAO	150	11	10	4
8446		TACH	01 31 0849	N19 W65	01 26.4			CAO	170	3	12	2
8446		RAMY	01 31 1543	N17 W70	01 26.3		B	ESO	200	5	15	3
8446		HOLL	01 31 1632	N17 W69	01 26.4		B	DSO	170	6	10	4
8446		VORO	02 01 0000	N16 W74	01 26.5			CAO	325	2	12	3
8446		LEAR	02 01 0107	N17 W70	01 26.8		A	HA	60	1	2	3
8446		TACH	02 01 0518	N20 W72	01 26.8			HR	62	2	2	3
8446	28969	MWIL	02 01 1600	N18 W77	01 26.9	4	(BF)					
8446		HOLL	02 01 1927	N18 W80	01 26.8		B	CSO	60	2	4	2
8446		VORO	02 02 0026	N19 W87	01 26.5			HRX	96	1		3
8448		LEAR	01 24 0040	S16 E34	01 26.6		A	AX	10	1	1	3
8448		SVTO	01 24 0730	S17 E30	01 26.6		A	AX		2	1	4
8448		RAMY	01 24 1246	S16 E28	01 26.6		A	AX		1		3
8448		LEAR	01 25 0140	S16 E19	01 26.5		B	BXO	10	2	3	3
8448		KAND	01 25 0845	S15 E14	01 26.4			AX		2	1	3
8448		RAMY	01 25 1326	S16 E16	01 26.8		B	BXO		3	4	3
8448		LEAR	01 26 0111	S17 E08	01 26.6		B	BXO	10	2	1	3
8448		RAMY	01 26 1304	S16 W03	01 26.3		A	AX		1		3
8448		HOLL	01 26 1623	S17 W02	01 26.5		A	AX		1		2
8448		LEAR	01 27 0001	S17 W05	01 26.6		A	AX		1		3
8450		KAND	01 22 1320	N15 E52	01 26.5			CRO		2	2	2
8450		HOLL	01 22 1750	N20 E46	01 26.3		A	AX		1		4
8450		RAMY	01 27 1227	N21 W13	01 26.5		B	BXO		3	3	2
8450	28970	MWIL	01 27 2200	N23 W18	01 26.5	4	(AF)					
8450		VORO	01 28 0004	N23 W20	01 26.5			AXX	11	1		3
8450		LEAR	01 28 0035	N23 W20	01 26.5		A	AX	10	1	1	3
8450		KAND	01 28 0755	N17 W21	01 26.7			BXO		2	2	2
8450		RAMY	01 28 1235	N20 W25	01 26.6		B	BXO	10	4	7	3
8450		SVTO	01 28 1450	N22 W27	01 26.5		A	AX	10	1		2
8450	28970	MWIL	01 28 1600	N23 W27	01 26.6	3	(AF)					
8450		HOLL	01 28 1820	N23 W28	01 26.6		A	AX	10	2	1	2
8450		RAMY	01 29 1213	N19 W38	01 26.6		B	DAO	30	11	6	3
8450		SVTO	01 30 0948	N19 W54	01 26.3		B	DAO	180	6	9	2
8446B	28966	MWIL	01 23 1600	N28 E39	01 26.7	3	(AP)					
8446B		RAMY	01 24 1246	N29 E33	01 27.1		A	AX		1		3
8446B		VORO	02 01 0000	N24 W60	01 27.5			AXX	14	1		3
8446C		RAMY	01 25 1326	S24 E24	01 27.4		A	AX		1		3
8451A		VORO	01 28 0004	N19 E10	01 28.8			AXX	10	1		3
8451A		LEAR	01 28 0035	N19 E08	01 28.6		A	AX	10	2	2	3
8451	28967	MWIL	01 23 1600	N28 E66	01 28.8	3	(AP)					
8451		LEAR	01 29 0025	N29 E00	01 29.0		A	AX	10	1	1	3
8451		RAMY	01 31 1543	N28 W37	01 28.8		B	BXO	10	5	3	3
8451		HOLL	01 31 1632	N28 W35	01 28.9		B	BXO	20	3	2	4
8451		VORO	02 01 0000	N28 W41	01 28.9			BXO	33	3	3	3
8451		LEAR	02 01 0107	N25 W46	01 28.6		A	AX	10	2	1	3
8451		TACH	02 01 0518	N29 W42	01 29.0			BXO	26	3	3	3
8451	28974	MWIL	02 01 1600	N26 W49	01 28.9	4	(AP)					
8451		HOLL	02 01 1927	N27 W52	01 28.8		A	AX	10	2	2	2
8452		LEAR	01 31 0030	N22 W18	01 29.6		A	AX	10	2	2	4
8452		HOLL	01 31 1632	N22 W26	01 29.7		B	BXO	10	2	3	4
8452	28975	MWIL	02 01 1600	N23 W39	01 29.8	4	(AP)					
8452		HOLL	02 01 1927	N24 W42	01 29.7		A	AX	10	2	2	2
8452		RAMY	02 02 1303	N22 W54	01 29.5		A	AX		1	1	3
8452	28975	MWIL	02 02 1545	N21 W56	01 29.5	4	(AP)					
8452		SVTO	02 03 1050	N20 W62	01 29.8		A	AX	10	1		3

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8452		RAMY	02 03 1244	N19 W62	01 29.9		A	AX		1		3
8452	28978	MWIL	02 03 1530	N18 W66	01 29.7	4	(B)					
8452		HOLL	02 03 1612	N19 W68	01 29.6		B	BXO	10	3	6	3
8452A		VORO	02 03 0020	N31 W44	01 30.6			AXX	28	1		3
8452B		KAND	01 25 0845	S26 E71	01 30.9			AX		3	3	3

Stations reporting:

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

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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	1359	1405	1440	2-	3					2	1354	C7.7	8421
03	1450	1510	1601	2+	5					4	1449	C6.2	8422
03	1903	1906	1945	2	3					2	1859	C2.6	8421
03	1945	1950	2022	2-	3					2	1946	C2.8	8426
04	0830	0835	0840	1-	1					1	0830	C3.6	
08	0956	1020	1105	2-	3		1			1	0951	C3.7	8431
12	1147	1156	1228	2-	3					2	1139	C6.9	
12	1153	1210	1250	3	1		1				1139	C6.9	
13	0608	0610	0620	1-	1					1	0552	C1.6	
13	0723	0725	0740	1-	1					1	0721	C1.6	
13	1430	1433	1440	1-	1					1	1428	C2.9	8439
13	1458	1504	1538	2-	5		1			5	1456	C6.9	8439
13	1530	1540	1545	1-	1					1	1534	C2.0	
13	1850	1858	1940	2-	3					2	1851	C5.5	8440
13	2009	2015	2030D	1	1					1	2010	C2.9	8440
14	0905	0909	0925	1-	3					2	0904	C2.8	8439
14	0906	0935	1048	2	1		1				0927		8440
14	1006	1017	1106	2	3		3			3	1007	M3.0	8440
14	1132	1206	1226	1+	3		2				No flare		
14	1236	1308U	1350	1	1		1				No flare		
14	1345	1350	1400	1-	1					1	1345	C1.7	8440
14	1405	1412	1449	1	1		1				1405	C2.4	8440
14	1530	1545	1550	1	1					1	1536	C1.1	
14	1555	1600	1630	2	1					1	1554	C2.3	8439
14	1652	1656	1710	1-	1					1	1651	C1.3	8440
14	1858	1903	1958	2	5					5	1855	M1.4	8440
15	0138	0140	0155	1-	1					1	0136	C2.1	8440
15	0300	0301	0320	1	1					1	0257	C2.9	8440
15	0527	0530	0600	1-	1					1	0525	C2.2	8440
15	0607	0609	0632	1	1					1	0602	C6.4	
15	0635	0651	0801	3	3		1			1	0632	M1.3	8440
15	0844	0900	0931	1	3		2				0841	C1.8	8440
15	0933	1000	1021	2	1		1				1004	C1.1	8440
15	1314	1330	1405	1	3		2				1319	C2.8	
15	1358	1424	1443	1	1		1				No flare		
15	1441	1447	1509	2-	3		2			1	1436	C9.8	8440
15	1900	1905	1955D	2+	1					1	1858	C4.9	8440
15	1916	1920	1928	1	1					1	1858	C4.9	8440
15	1955	2000	2045	2+	1					1	1954	C1.9	
16	0801	0804	0822	1	1					1	0758	C1.5	8440
16	0900	0905	0919	1-	3		1			1	0859	C2.0	8440
16	0922	0926	0941	1-	3					2	0921	C2.2	8440
16	1203	1211	1246	2-	3		3			1	1202	M3.6	8440
16	1255	1305	1325	1+	1					1	1258	C2.6	
16	1438	1442	1457	1-	5					3	1437	C4.0	8440
16	1637	1642	1706	1+	1					1	1637	C2.4	8440
16	1740	1750	1830	2+	1					1	1748	C2.9	8440
16	1904	1909	1929	1+	3					2	1906	C3.0	
16	1949	1956	2032	2-	5					3	1950	M1.2	
16	2010	2013	2050	2	1					1	2023	C1.9	
17	0522	0524	0543	1	1					1	0520	C1.9	8440
17	0858	0920	0953	2-	3		2				0916	C2.3	8440
17	1106	1109	1128	1-	3		1			1	1054	C4.9	
17	1120	1125	1130	1-	1					1	No flare		
17	1152	1201	1211	1	1		1				1147	C4.3	8440

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES

JANUARY 1999

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
17	1613	1616	1636	1	3					2	1614	C2.3	8440
17	1659	1701	1731	1+	3					2	1658	C4.1	8439
17	1829	1834	1905	2-	3					2	1829	C2.5	8440
17	1950	1954	2016	1	3					3	1950	C5.9	8439
18	0733	0735	0746	1-	1					1	No flare		
18	0755	0804	0902	3-	3		2			1	0752	M2.0	8440
18	0930	0940	0945	1-	1					1	0933	C1.6	8439
18	1234	1241	1301	1	3		1			1	1235	C1.7	8440
18	1309	1316	1333	1+	5		2			2	1310	C4.8	8439
18	1409	1423	1438	1	1		1				1412	C1.1	8439
18	1500	1520	1530	1+	1					1	1505	C1.4	
18	1855	1903	1934	2	3					3	1858	C3.0	8440
19	0130	0135	0200	1+	1					1	0128		8439
19	0505	0507	0524	1	1					1	0500	C2.6	8440
19	0805	0807	0830	1	1					1	0802	C3.3	8440
19	0950	1020	1101	1	1		1				1014		8440
19	1106	1126	1150	1	1		1				1118	C3.9	8439
19	1404	1412	1425	1-	5		1			2	1404	C2.9	8439
19	2021	2025	2051	1+	3					2	2022	C2.8	8439
19	2243	2245	2323	2	1					1	2241	C3.5	
20	0732	0746U	0827	1	1		1				0732	C2.2	
20	1244	1302	1341	1	3		1			1	1241	C2.1	8440
20	1446	1453	1530	1	1		1				1419	C2.0	
20	1903	1927	2133	3	3					3	1906	M5.2	
20	1919	1943	2032	2+	1					1	1906	M5.2	
21	0711	0718	0736	1	1		1				No flare		
21	1022	1102U	1124	1	1		1				No flare		
21	1305	1311	1324	1	1		1				1304		8442
22	0537	0540	0600	1	1					1	0536	C3.1	8439
22	0704	0707	0723	1	1					1	0701	C2.7	
22	0820	0829	0851	1	1		1				0821		8440
22	0853	0926	0942	1	1		1				0914	C3.5	
22	1206	1211	1232	1	1		1				No flare		
22	1327	1332	1355	1+	5		1			2	1325	C5.3	
22	1405	1413	1446	1	3		2				1411		8442
22	1716	1721	1805	2-	5					4	1705	M1.4	
23	1346	1356	1415	1	5		1			1	1339	C2.2	
23	1511	1514	1530	1	5		1			3	1509	C5.6	8439
23	1530	1539	1611	2-	3					2	1530	C5.6	8439
23	1910	1915	1931	1	3					3	1912	C2.3	
23	2125	2131	2150	1	1					1	2122	C2.8	
23	2348	2354	2418	1+	1					1	2347	C3.6	8439
24	0456	0500	0530	2	1					1	0455	C4.3	
24	0815	0819	0852	2-	1					1	0812	C5.5	8444
24	1119	1123	1149	1+	3		2				1106		8444
24	1220	1235	1250	1	1					1	1221	C2.0	8439
25	0055	0100	0150	2+	1					1	0052	M2.6	
25	0745	0746	1015	3-	1					1	No flare		
26	1040	1120	1155	2	1					1	1040	C5.4	
26	1839	1844	1920	2-	3					3	1836	C7.9	8447
27	1632	1650	1740	2+	3					2	1633	C3.9	
29	1340	1350U	1414	1	1		1				1334		8446
29	1440	1455	1505	1	1					1	1441	C1.2	
30	1359	1400	1415	1	1		1				*		

* = no flare patrol.

JANUARY 1999

OBSERVATORIES REPORTING FOR JANUARY 1999

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

Observations are not necessarily continuous.

SOLAR RADIO EMISSION
Spectral Observations

JANUARY 1999

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
01	0000	0739	HIRA								
	0000	0805	CULG								
	0640	1200	IZMI	0649.8	0650.9	III	G	1	105	270X	
			IZMI	0758.6	0758.7	III	GG	1	205	270X	
	0803	1355	POTS	0851.6	0852.9	III	G	2	140	170U	
			POTS	0852	1355	I	S	1	110U	350	
	0836	1331	ONDR	1009.3	1010.0	DCIM		1	2000X	4245	
			POTS	1139.0	1141.7	III	GG	2	55	250U	
			SVTO	1139.0	1140.0	III		1	60	75	
			IZMI	1139.1	1141.5	III	GG	2	95X	270X	
			POTS	1139.4	1142.5	DCIM		2	200U	350	
			ONDR	1205.0	1215.2	DCIM	GG	2	800X	1475	
			POTS	1240.2	1240.4	III	B	2	225	400	
			POTS	1324.5	1325.3	DCIM		2	160	375	
			SVTO	1400.0	1507.0	CONT		2	36	58	
			SGMR	1403.0	1408.0	III		1	30	80	
			SVTO	1407.0	1408.0	III		2	60U	85U	
	2035	2400	CULG								
	2143	2400	HIRA								
02	0000	0740	HIRA								
	0000	0805	CULG	0041.0	0042.0	III	G	1	300	600	
	0803	1355	POTS								
	0836	1333	ONDR								
	2035	2400	CULG								
	2143	2400	HIRA								
03	0000	0741	HIRA								
	0000	0805	CULG								
	0803	1355	POTS	0817	1355 U	I	S,C	2	70	350	
	0703	1200	IZMI	0839.0	1200.0D	I	N	1	95X	270X	
	0835	1333	ONDR	0850.0	0851.0	DCIM	G	1	800X	1705	
			SVTO	0946.0	1056.0	CONT		1	40	85	
			POTS	1009.0	1009.2	III	B	2	40X	80	
			IZMI	1038.4	1039.3	III	G	2	190	270	
			ONDR	1038.5	1039.1	DCIM		1	3115	4365X	
			POTS	1038.8	1039.3	DCIM		2	150	320	
			POTS	1133.2	1138.4	III	GG	2	40X	170U	
			IZMI	1133.5	1133.9	III	G	1	120	180	
			POTS	1329.7	1329.8	III	G	2	130	160	
			POTS	1353.3	1353.4	III	B	2	40X	50	
			SGMR	1456.0	1511.0	III	N	1	30	70	
			SGMR	1521.0	1525.0	II		1	30	50	ESS 1200
	2143	2400	HIRA								
	2035	2400	CULG	2204.0	2204.0	III	B	1	40	75	
			CULG	2236.0	2236.0	III	B	1	20	80	
			CULG	2300.0	2300.0	III	B	1	20	80	
04	0000	0741	HIRA								
			LEAR	0117.0	0117.0	III		1	30	51	
			LEAR	0148.0	1053.0	CONT		1	30	55	
	0000	0805	CULG	0215.0	0222.0	III	G	1	20	50	
			CULG	0353.0	0405.0	III	G	1	25	90	
			CULG	0511.0	0531.0	III	N	1	23	150	
			CULG	0611.0	0616.0	III	G	1	23	80	
			CULG	0631.0	0805.0D	III	S	1	20	160	
	0701	1200	IZMI	0700.0E	1200.0D	I	S	1	95U	270U	
	0802	1355	POTS	0802 E	1355 U	I	S,C,DC	2	110U	400	
	0836	1336	ONDR								
			SVTO	0836.0	1048.0	CONT		2	39	75	
			POTS	0932	1321	III	N	1	40X	90U	
			SVTO	1259.0	1510.0	CONT		2	43	54	
			SGMR	1916.0	1916.0	III		1	30	52	
			PALE	1917.0	1918.0	III		1	25	40	
	2035	2400	CULG	2035.0E	2400.0D	III	S	1	20	150	
			PALE	2138.0	2200.0	III	N	1	25	45	
	2143	2400	HIRA								
			CULG	2238.0	2239.0	III	G	1	80	250	
			LEAR	2243.0	2243.0	III		1	30	47	

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

JANUARY 1999

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
04			PALE	2243.0	2254.0	III	N	2	25	40	
			LEAR	2308.0	2308.0	III		1	30	45	
			LEAR	2317.0	0934.0	CONT		1	30	65	
			LEAR	2332.0	2333.0	III		2	30	80	
			PALE	2332.0	2333.0	III		1	32	47	
05	0000	0742	HIRA								
	0000	0805	CULG	0000.0E	0805.0D	III	S	1	25	150	
			LEAR	0252.0	0255.0	III		2	30	80	
	0645	1200	IZMI	0645.0E	1145.0U	I	N	1	95X	150	
			POTS	0759 E	1355 U	III	N	1	110U	170U	
	0759	1355	POTS	0759 E	1355 U	I	S	2	110U	300	
			POTS	0759.6	0759.7	III	B	2	40X	130	
	0834	1335	ONDR								
			POTS	0846	1128	III	N	1	40X	90U	
			SVTO	0919.0	1128.0	CONT		2	35	80	
			POTS	0922.0	0922.1	III	B	2	40X	120	
			IZMI	0926.0U	0946.0U	III	N	1	95X	140	
			POTS	0933.9	0939.5	III	G	2	40X	120	
			POTS	0945.9	0946.2	III	G	2	110U	150	
			POTS	0952.6	0952.7	III	B	2	40X	90U	
			POTS	1005.7	1006.3	III	G	2	40X	150	
			POTS	1143.6	1144.6	III	G	2	40X	170U	
			POTS	1223.2	1223.5	III	B	2	40X	70	
			SVTO	1355.0	1439.0	CONT		2	35	52	
			PALE	1922.0	1922.0	III		1	29	42	
			PALE	2013.0	2013.0	III		1	28	43	
	2035	2400	CULG	2059.0	2337.0	III	N	1	25	90	
	2143	2400	HIRA								
			CULG	2319.0	2324.0	III	G	1	18	180	
06	0000	0805	CULG	0000.0	0002.0	III	G	1	20	120	
			LEAR	0001.0	0001.0	III		1	40	65	
			CULG	0005.0	0040.0	III	N	1	20	90	
			LEAR	0034.0	0745.0	CONT		2	30	80	
			LEAR	0035.0	0035.0	III		2	58	70	
			CULG	0044.0	0315.0	III	S	1	20	160	
			PALE	0050.0	0148.0	III	N	1	29	75	
			PALE	0050.0	0331.0	CONT		1	25	40	
			CULG	0146.0	0148.0	III	G	2	18	270	
	0000	0743	HIRA	0147.0	0147.8	III	G	2	25X	220	
			CULG	0431.0	0805.0D	III	N	1	25	75	
	0735	1200	IZMI								
			LEAR	0808.0	0809.0	III		1	30	60	
	0803	1355	POTS	0811	1355 U	I	S	2	110U	300	
			LEAR	0832.0	0832.0	III		1	30	60	
	0834	1339	ONDR								
			SVTO	0855.0	1010.0	CONT		1	36	54	
			LEAR	0920.0	0920.0	III		1	37	55	
			POTS	0921.0	0921.1	III	B	2	40X	90U	
			POTS	1032.5	1035.8	II	F,H	1	110U	170U	
			POTS	1032.5	1035.8	II	SH,H	1	230	370	
			POTS	1102.8	1102.9	III	B	2	110U	145	
	2035	2400	CULG								
	2143	2400	HIRA								
07			LEAR	0000.0	0027.0	III	N	2	30	80	
			PALE	0000.0	0028.0	CONT		2	25	55	
	0000	0744	HIRA	0000.0	0002.6	III	G	1	25X	120	
	0000	0805	CULG	0000.0	0004.0	III	G	2	18X	180	
			CULG	0003.0	0020.0	II	FN	2	23	160	
			HIRA	0003.6	0018.0	II		2	60	180	ESS 700
			CULG	0006.0	0006.0	III	B	2	60	180	
			CULG	0006.0	0024.0	II	SH	3	26	200	FLA ESS 700
			LEAR	0008.0	0014.0	II		2	41	80	ESS 0500
			CULG	0023.0	0027.0	III	G	2	18	60	
			LEAR	0224.0	0225.0	III		1	30	80	
			HIRA	0224.8	0225.0	III	B	1	50	210	
			CULG	0225.0	0227.0	III	G	1	30	180	

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

JANUARY 1999

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	0803	1355	POTS	0803 E	1351 U	I	S,C,DC	1	110U	170U	
			POTS	0941.6	0941.7	III	B	2	110U	150	
	0700	1200	IZMI	0941.6	0941.7	III	B	1	95	150	
			POTS	1105.8	1108.2	III	G	2	40X	170U	
	0833	1340	ONDR	1327.5	1329.1	DCIM	G	1	2050	4385X	
	2143	2400	HIRA								
	2035	2400	CULG	2155.0	2155.0	III	B	1	35	180	
			CULG	2301.0	2302.0	III	G	1	35	200	
			LEAR	2301.0	2301.0	III		1	35	75	
08			LEAR	0007.0	0007.0	III		1	40	65	
	0000	0810	CULG	0007.0	0007.0	III	B	1	35	180	
			CULG	0304.0	0311.0	II	FN	2	50	100	ESS 400
	0000	0745	HIRA	0304.6	0308.4	II		1	60	100	ESS 400
			LEAR	0305.0	0305.0	III		1	53	80	
			LEAR	0305.0	0310.0	II		1	60	80	ESS 0600
			CULG	0306.0	0308.0	II	SH	1	80	140	
			LEAR	0336.0	0337.0	III		1	30	55	
			CULG	0337.0	0337.0	III	B	1	30	100	
			LEAR	0430.0	0436.0	III		2	30	80	
			CULG	0431.0	0431.0	III	G	1	20	90	
	0702	1200	IZMI								
			LEAR	0913.0	0913.0	III		1	30	80	
			SVTO	0913.0	0913.0	III		1	37	69	
			ONDR	1000.1	1012.1	DCIM	G	2	800X	2000X	
	0832	1342	ONDR	1005.2	1005.3	DCIM	G	2	2000X	2370	
	2143	2400	HIRA								
	2040	2400	CULG	2248.0	2248.0	III	B	1	23	90	
09			LEAR	0724.0	0725.0	III		3	30	80	
	0000	0746	HIRA	0724.8	0725.0	III	B	1	50	210	
			IZMI	0724.9	0725.4	V	G	2	95X	165	
	0650	1200	IZMI	0724.9	0725.2	III	G	2	95X	230	
			SVTO	0725.0	0725.0	III		2	35	85	
	0000	0810	CULG	0725.0	0725.0	III	B	2	20	180	
			SVTO	0821.0	0822.0	III		1	57U	75U	
	0831	1342	ONDR								
	2040	2400	CULG								
	2143	2400	HIRA								
10	0000	0747	HIRA								
	0700	1200	IZMI	0712.0U	1200.0D	I	N	1	105	240	
	0000	0810	CULG	0743.0	0743.0	III	B	1	20	90	
			IZMI	0752.2	0758.6	III	G	2	95X	220	
			CULG	0757.0	0759.0	III	G	1	20	180	
			SVTO	0813.0	1516.0	CONT		1	36	58	
	0830	1345	ONDR								
			IZMI	1037.6	1038.2	III	G, HARM	2	110	160	
	2040	2400	CULG	2136.0	2136.0	III	B	1	25	90	
	2143	2400	HIRA								
11	0000	0748	HIRA								
			LEAR	0026.0	0031.0	III		2	30	50	
			PALE	0026.0	0031.0	III		2	30	45	
	0000	0810	CULG	0026.0	0032.0	III	G	1	20	80	
	0700	1200	IZMI								
	0829	1345	ONDR								
	0833	1404	POTS	1058	1403 U	I	S,W	1	110U	400	
			POTS	1100.0	1102.5	III	GG	2	40X	170U	
			POTS	1104.4	1104.7	III	G	2	110U	150	
			POTS	1244.2	1245.1	DCIM		2	200U	450	
			POTS	1255.1	1256.1	DCIM		1	250	400	
	2040	2400	CULG								
	2143	2400	HIRA								
12	0000	0749	HIRA								
	0000	0810	CULG								
	0705	1200	IZMI								
	0800	1405	POTS	0811	0820	I	S,W	1	220	300	

SOLAR RADIO EMISSION
Spectral Observations

JANUARY 1999

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
12 0828	1349	ONDR								
		POTS	0905.7	0906.3	III	G	2	110U	140	
		POTS	1001.6	1002.3	DCIM		1	300U	380	
		POTS	1008.7	1008.8	DCIM		2	260	400	
		POTS	1054.5	1055.0	III	G	2	40X	170U	
		POTS	1108.1	1114.2	III	G,U	2	110U	170U	
		POTS	1114.2	1115.3	DCIM		2	250	400	
		POTS	1116.0	1116.5	DCIM		1	350U	400	
		POTS	1205.5	1205.7	III	B	2	110U	160	
2040	2400	CULG								
2143	2400	HIRA								
13 0000	0810	CULG	0617.0	0617.0	III	B	1	23	75	
0800	1409	POTS	0810	1348	I	S,W	1	110U	350	
0827	1351	ONDR								
		SVTO	1143.0	1143.0	III		1	66	69	
		POTS	1143.3	1143.8	III	B	2	40X	65	
		POTS	1218.4	1218.5	III	B	1	110U	170U	
		POTS	1250.9	1251.8	III	G	2	55	170U	
		POTS	1341.9	1342.0	III	B	1	135	170U	
		PALE	2012.0	2012.0	III		2	25	50	
		SGMR	2012.0	2012.0	III		1	30	55	
2040	2400	CULG								
2142	2400	HIRA								
14 0000	0750	HIRA								
0000	0810	CULG	0520.0	0521.0	III	G	1	20	170	
0826	1352	ONDR	1010.4	1019.2	DCIM		1	2000X	4365X	
0800	1412	POTS	1011.5	1011.6	DCIM		1	350	425	
		POTS	1012.2	1020.3	III	GG,RS	2	110U	300	
		POTS	1012.5	1012.6	DCIM		1	450	470	
		ONDR	1013.1	1021.5	DCIM	G	1	800X	2000X	
0700	1200	IZMI	1014.0	1014.8	III	GG	2	95	270X	
		POTS	1021	1402	I	S,W	1	110U	170U	
		POTS	1047.8	1048.0	III	G	2	110U	170U	
		POTS	1054.1	1054.2	III	B	1	110U	150	
		POTS	1257.5	1257.6	III	B	1	40X	70U	
		SGMR	1556.0	1559.0	V		2	30	80	
		PALE	2004.0	2004.0	III		2	27	50	
2040	2400	CULG	2104.0	2104.0	III	B	2	20	120	
		CULG	2114.0	2114.0	III	B	1	30	90	
		PALE	2123.0	2129.0	V		2	25	70	
		CULG	2127.0	2130.0	III	G	2	18X	260	
2142	2400	HIRA								
		CULG	2220.0	2223.0	III	G	1	20	75	
		CULG	2246.0	2248.0	III	G	1	25	80	
		CULG	2305.0	2306.0	III	G	1	25	75	
		LEAR	2305.0	2305.0	III		1	35	50	
		CULG	2335.0	2335.0	III	B	1	28	75	
		CULG	2342.0	2342.0	III	B	1	28	75	
		CULG	2358.0	2358.0	III	B	1	25	90	
15 0000	0810	CULG	0007.0	0012.0	III	G	1	25	90	
		CULG	0015.0	0018.0	III	G	2	23	170	
		PALE	0015.0	0016.0	III		2	25	70	
0000	0751	HIRA	0015.6	0016.4	III	G	2	25X	170	
		CULG	0046.0	0047.0	III	G	2	18	180	
		PALE	0046.0	0047.0	III		2	25	55	
		HIRA	0046.2	0046.4	III	B	1	25X	170	
		LEAR	0229.0	0233.0	III		2	30	65	
		CULG	0307.0	0307.0	III	B	1	30	180	
		LEAR	0307.0	0307.0	III		3	30	65	
		LEAR	0336.0	0336.0	III		1	30	47	
		LEAR	0359.0	0400.0	III		2	30	80	
		CULG	0400.0	0400.0	III	B	2	20	120	
		CULG	0425.0	0427.0	III	G	2	20	180	
		HIRA	0425.4	0425.6	III	B	2	40	190	
		CULG	0431.0	0431.0	III	G	1	35	150	
		CULG	0437.0	0442.0	III	G	1	20	90	

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JANUARY 1999

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
15			LEAR	0514.0	0518.0	III		1	30	71	
			CULG	0515.0	0518.0	III	G	1	30	170	
			SVTO	0730.0	1054.0	CONT		2	36	60	
	0706	1143	IZMI	0853.5	0853.7	III	G, U	2	95	165	
	0800	1412	POTS	0853.5	0854.7	III	G,U	2	40X	170U	
			IZMI	0854.2	0854.6	III	G	1	95	150	
			POTS	1121.8	1122.2	III	G	2	40X	130	
	0825	1356	ONDR	1220.3	1224.1	DCIM	G	1	2880	4365X	
			POTS	1220.9	1221.0	UNCLF		1	140	170U	
			SVTO	1229.0	1230.0	III		2	37	83	
			POTS	1229.9	1230.2	III	G,U	2	40X	400	
			POTS	1344.7	1344.9	III	G	2	110U	160	
	2142	2400	HIRA	2336.0	2336.2	III	B	1	90	160	
			HIRA	2341.6	2342.2	III	G	1	90	170	
16	0000	0752	HIRA	0121.4	0121.6	III	B	1	90	240	
	0700	1200	IZMI	0711.7	0714.3	III	GG	2	95	180	
			IZMI	0715.4	0715.5	III	B	1	105	140	
			IZMI	0827.8	0828.0	III	G	1	105	175	
	0800	1412	POTS	0827.8	0828.1	III	G,U	2	110U	250	
			POTS	0828	1412 U	I	S	2	110U	450	
			IZMI	1015.1	1022.8	I	N	1	110	215	
			POTS	1017.8	1019.6	UNCLF		2	110U	220	
			IZMI	1058.6	1058.8	III	G, HARM	1	105	130	
			POTS	1115.6	1116.3	III	G	2	40X	50	
			IZMI	1140.7	1152.0	I	S	1	230	270X	
	0823	1357	ONDR	1205.5	1206.5	DCIM		1	2000X	4365X	
			SVTO	1222.0	1523.0	CONT		2	37	60	
			POTS	1237.3	1237.5	III	B	2	110U	160	
			POTS	1319.9	1320.0	III	B	2	110U	160	
			PALE	2146.0	2211.0	III	N	3	25	75	
	2142	2400	HIRA	2207.2	2209.6	III	G	2	25X	140	
			HIRA	2251.2	2251.4	III	B	1	100	330	
			HIRA	2252.6	2253.0	III	B	1	90	160	
			HIRA	2341.6	2343.0	III	G	1	100	300	
17			LEAR	0006.0	0007.0	III		1	30	57	
	0000	0753	HIRA	0058.8	0106.4	III	G	1	90	260	
			LEAR	0210.0	0211.0	III		1	31	61	
			LEAR	0423.0	0427.0	III		3	30	80	
			HIRA	0425.4	0426.4	III	G	3	30	430	
			LEAR	0606.0	0606.0	III		1	30	80	
	0650	1200	IZMI								
	0800	1412	POTS	0800 E	1412 U	I	S,W	1	110U	250	
	0822	1359	ONDR								
			LEAR	0837.0	0837.0	III		1	36	53	
			POTS	1151.2	1151.3	III	B	1	110U	170U	
			POTS	1213.1	1213.2	III	B	2	200U	325	
			POTS	1306.6	1306.8	UNCLF		2	120	170U	
			POTS	1308.8	1310.0	III	G	2	75	250	
			POTS	1318.2	1318.7	III	G	2	110U	170U	
			POTS	1332.3	1332.6	III	G	2	110U	170U	
			SGMR	1612.0	1618.0	III		1	30	80	
			SGMR	1701.0	1702.0	III		1	30	80	
			PALE	1920.0	1920.0	III		1	30	40	
			PALE	1952.0	1953.0	III		3	30	75	
			SGMR	1952.0	1953.0	III		2	30	80	
			PALE	1955.0	1956.0	III		3	30	75	
			PALE	1958.0	2006.0	II		2	25	75	ESS 0800
			SGMR	1959.0	2003.0	II		2	30	80	ESS 0800
			PALE	2020.0	2111.0	III	N	3	25	75	
			SGMR	2020.0	2021.0	III		1	30	55	
	2035	2400	CULG	2036.0	2112.0	III	N	3	25	180X	
			SGMR	2037.0	2038.0	III		1	30	80	
			CULG	2044.0	2130.0	III	N	1	20	180	
			SGMR	2055.0	2102.0	III		2	30	80	
			CULG	2149.0	2151.0	III	G	2	30	180	
			PALE	2149.0	2149.0	III		1	25	75	
			CULG	2211.0	2352.0	III	N	1	18X	180X	

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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
17			PALE	2211.0	2211.0	III		1	28	43	
			PALE	2215.0	2220.0	III		1	28	44	
	2142	2400	HIRA	2224.4	2224.6	III	B	1	100	500	
			LEAR	2235.0	2241.0	III		1	30	55	
			PALE	2235.0	2330.0	III	N	1	28	52	
			HIRA	2241.4	2241.6	III	B	1	25X	120	
			LEAR	2313.0	2317.0	III		1	30	55	
			HIRA	2323.4	2323.6	III	B	1	70	240	
			LEAR	2339.0	2340.0	III		1	47	80	
			HIRA	2339.2	2340.0	III	G	2	50	300	
18	0000	0754	HIRA	0010.8	0011.4	III	G	2	80	500X	
	0000	0810	CULG	0011.0	0014.0	III	G	2	60	180X	
			HIRA	0013.4	0013.6	III	B	1	100	500X	
			CULG	0033.0	0033.0	III	B	1	20	90	
			LEAR	0033.0	0033.0	III		1	30	80	
			CULG	0046.0	0050.0	III	G	1	35	180X	
			LEAR	0046.0	0049.0	III		1	50	80	
			HIRA	0049.0	0049.4	III	B	2	50	300	
			LEAR	0131.0	0139.0	III		2	30	80	
			CULG	0132.0	0141.0	III	G	1	18X	180X	
			HIRA	0139.2	0139.4	III	B	1	25X	130	
			LEAR	0140.0	0141.0	III		1	30	80	
			PALE	0140.0	0141.0	III		1	29	42	
			LEAR	0217.0	0217.0	III		1	30	50	
			HIRA	0343.4	0343.6	III	B	2	50	400	
			CULG	0344.0	0345.0	III	G	2	50	180X	
			LEAR	0356.0	0357.0	III		1	30	60	
			CULG	0357.0	0420.0	III	N	1	20	130	
			LEAR	0415.0	0415.0	III		1	30	72	
			LEAR	0559.0	0600.0	III		1	30	50	
			CULG	0600.0	0601.0	III	G	1	20	90	
			CULG	0617.0	0623.0	III	G	1	100	180X	
	0700	1200	IZMI	0700.0U	1200.0U	I	N	1	135	245	
			IZMI	0705.9	0713.7	III	N	2	95U	270	
			IZMI	0738.5	0738.6	III	B	1	105	145	
	0800	1412	POTS	0800 E	1412 U	I	S	2	110U	400	
	0821	1401	ONDR								
			POTS	0821.5	0821.7	III	G,U	2	135	225	
			POTS	0823.0	0835.0	III	GG	2	40X	450	
			IZMI	0823.1	0823.8	III	G	1	115	245	
			LEAR	0831.0	0832.0	III		1	58	72	
			IZMI	0831.7	0831.8	III	B	1	95U	135	
			IZMI	0833.1	0834.9	III	G	1	95U	165	
			IZMI	0834.5	0834.6	III	B, HARM	2	95U	270X	
			POTS	0856.2	0905.5	III	G	2	110U	500	
			IZMI	0951.3	0951.3	III	B	1	110	145	
			POTS	0951.3	0954.9	III	G	3	40X	300	
			LEAR	0952.0	0952.0	III		1	48	63	
			SVTO	0952.0	0952.0	III		1	48	66	
			IZMI	0952.4	0953.4	III	GG	2	95U	175	
			IZMI	0954.7	0954.8	III	B	1	105	175	
			POTS	1029.3	1030.5	III	G,U	2	120	170U	
			IZMI	1029.6	1030.4	III	G,U,HARM	2	110	245	
			IZMI	1046.8	1047.3	III	G	1	45	95	
			POTS	1047.5	1048.2	III	G	2	40X	450	
			IZMI	1047.7	1048.1	III	G	2	45X	132	
			SVTO	1048.0	1048.0	III		1	37	82	
			IZMI	1057.3	1058.0	III	G	1	45X	95	
			POTS	1057.9	1058.1	III	G	2	40X	140	
			IZMI	1128.2	1128.4	III	G	2	120	245	
			POTS	1128.2	1128.5	III	G,U	3	110U	275	
			POTS	1137.3	1138.1	DCIM		2	250	500	
			POTS	1230.8	1231.0	III	G	2	110U	170U	
			POTS	1329.6	1329.9	III	G	2	120	225	
			POTS	1342.6	1342.7	DCIM		2	280	350	
			POTS	1353.3	1400.5	III	GG,RS	2	110U	170U	
			POTS	1353.5	1353.8	DCIM		1	480	550	
			PALE	1921.0	1922.0	III		1	25	45	

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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
18			SGMR	1921.0	1921.0	III		1	30	45	
	2035	2400	CULG	2036.0	2042.0	III	G	1	20	90	
	2142	2400	HIRA								
			CULG	2317.0	2317.0	III	B	1	20	60	
19	0000	0755	HIRA								
	0000	0810	CULG	0025.0	0025.0	III	B	1	20	65	
			LEAR	0051.0	0052.0	III		1	36	49	
			CULG	0052.0	0052.0	III	B	1	20	65	
			CULG	0206.0	0206.0	III	B	1	18X	90	
			LEAR	0206.0	0206.0	III		2	30	80	
			LEAR	0216.0	0216.0	III		1	30	61	
			LEAR	0232.0	0602.0	CONT		1	30	50	
			CULG	0255.0	0325.0	III	N	1	20	90	
			CULG	0557.0	0810.0D	III	N	1	30	80	
	0702	1200	IZMI	0702.0U	1200.0D	I	S	1	95	145	
			LEAR	0748.0	0951.0	CONT		1	30	60	
			SVTO	0752.0	1526.0	CONT		2	35	85	
	0800	1412	POTS	0800 E	1412 U	I	S	2	110U	350	
			POTS	0803.5	0803.7	DCIM		1	380	450	
			POTS	0805	1412 U	III	N	1	110U	170U	
			POTS	0805.2	0805.5	UNCLF		2	110U	170U	
			POTS	0808.8	0809.3	UNCLF		1	40X	55	
	0819	1403	ONDR								
			IZMI	0849.8	0849.9	III	B	2	215	270X	
			POTS	0849.8	0850.0	UNCLF		2	220	320	
			POTS	0940.0	0942.5	DCIM		2	200U	320	
			IZMI	0940.2	0943.7	III	S	2	120	270X	
			POTS	0940.5	0942.5	III	G	2	125	200U	
			IZMI	0953.5	0953.5	III	B	1	200	230	
	2035	2400	CULG	2035.0E	2400.0D	I	S	1	70	170	
	2141	2400	HIRA								
20	0000	0756	HIRA								
	0000	0810	CULG	0000.0E	0415.0	I	S	1	100	170	
			CULG	0010.0	0010.0	III	B	1	20	150	
			LEAR	0010.0	0010.0	III		1	30	65	
	0700	1200	IZMI	0700.0E	1200.0D	I	S	1	105	245	
			CULG	0732.0	0733.0	III	B	2	18X	160	
			LEAR	0732.0	0732.0	III		2	30	80	
			SVTO	0732.0	0732.0	III		2	37	76	
			IZMI	0732.1	0732.4	III	G	2	95X	160	
	0800	1412	POTS	0800 E	1412 U	I	S	2	110U	300	
	0818	1405	ONDR								
			LEAR	0819.0	0821.0	III		2	30	64	
			SVTO	0819.0	0821.0	III		2	35U	66U	
			POTS	0819.2	0821.4	III	G	2	40X	170U	
			IZMI	0821.0	0821.3	III	G	1	95	160	
			POTS	1038.1	1039.0	DCIM		1	220U	325	
			POTS	1355.8	1356.8	III	G,C	3	40X	325	
			PALE	1914.0	1923.0	II		1	25	55	ESS 0800
			SGMR	1914.0	1923.0	II		1	30	55	ESS 0800
			PALE	1926.0	1944.0	IV		2	25	45	
			SGMR	1926.0	1935.0	V		1	30	55	
	2035	2400	CULG								
	2140	2400	HIRA								
21	0000	0757	HIRA								
			LEAR	0314.0	0314.0	III		1	30	70	
	0000	0810	CULG	0315.0	0315.0	III	B	1	20	90	
			LEAR	0414.0	0415.0	III		2	30	80	
			LEAR	0457.0	1055.0	CONT		2	30	80	
			CULG	0501.0	0810.0D	III	S	2	20	170	
	0650	1200	IZMI	0650.0E	1200.0D	I	N	1	95U	270X	
			SVTO	0722.0	1304.0	CONT		2	38	85	
			IZMI	0726.0	0726.2	III	G	2	105	160	
	0750	1428	POTS	0750 E	1428 U	I	S	2	40X	350	
	0816	1406	ONDR								
			IZMI	0901.0	0901.1	III	B	1	140	170	

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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
21			IZMI	0903.2	0903.3	III	B	1	95	140	
			POTS	0903.2	0903.4	III	B	2	110U	170U	
			POTS	0910.6	0914.2	III	G	2	110U	250	
			IZMI	0934.5	0936.6	III	G	1	95	165	
			POTS	0935.3	0938.7	III	G	2	110U	170U	
			POTS	1002.9	1003.0	III	B	2	110U	160	
			POTS	1028.8	1029.0	III	B	2	110U	165	
			POTS	1320.9	1321.0	III	B	1	110U	155	
			POTS	1403.0	1403.1	III	B	1	110U	140	
			POTS	1420.4	1421.0	DCIM		1	200U	400	
			POTS	1420.7	1421.0	III	G	1	110U	170U	
			PALE	1836.0	1837.0	III		1	25	60	
			SGMR	1836.0	1837.0	III		1	30	80	
	2040	2400	CULG	2047.0	2047.0	III	B	1	100	180	
			CULG	2055.0	2131.0	III	N	2	18X	180X	
			PALE	2114.0	2115.0	III		2	25	50	
			SGMR	2114.0	2115.0	III		1	30	50	
			PALE	2126.0	2130.0	III		2	25	50	
			CULG	2202.0	2230.0	III	N	3	18X	180X	
			PALE	2202.0	2229.0	III	N	3	25	75	
	2140	2400	HIRA	2202.8	2206.4	III	G	3	30	300	
			HIRA	2211.0	2227.0	III	GG	3	30	340	
			LEAR	2214.0	2228.0	III	N	2	30	71	
			CULG	2240.0	2246.0	III	G	1	18X	100	
			CULG	2308.0	2400.0D	III	S	1	18X	180X	
			PALE	2334.0	0004.0	III	N	2	25	50	
			LEAR	2335.0	1055.0	CONT		3	30	80	
22	0000	0758	HIRA								
	0000	0815	CULG	0000.0E	0535.0	III	S	2	18X	180X	
			PALE	0010.0	0320.0	CONT		2	25	75	
			CULG	0600.0	0815.0D	III	S	1	25	90	
	0702	1200	IZMI	0702. E	1200.0D	I	S	1	95X	270X	
			IZMI	0702.2	0702.3	III	B	1	120	165	
			IZMI	0703.6	0703.8	III	G	1	130	215	
	0750	1428	POTS	0750 E	1428 U	I	S	2	40X	300	
			SVTO	0807.0	1355.0	CONT		1	35U	85U	
	0815	1409	ONDR								
			POTS	0831.2	0831.3	III	B	1	40X	300	
			POTS	0908.4	0908.5	III	B	2	130	170U	
			POTS	0908.8	0908.9	DCIM		1	250	380	
			SVTO	0913.0	0914.0	V		2	35	85	
			POTS	0913.1	0921.2	III	GG	3	40X	400	
			IZMI	0913.3	0914.5	III	GG	2	45X	270X	
			IZMI	0915.1U	1200.0D	III	N	1	45X	180U	
			IZMI	0920.2	0920.4	III	G	2	45X	180	
			IZMI	0920.8	0921.1	III	G	2	45X	270	
			SVTO	0934.0	0936.0	V		/	35	85	
			SVTO	0934.0	0936.0	V		3	35	85	
			IZMI	0934.7	0936.4	III	G	2	45X	270	
			POTS	0934.7	0937.1	III	GG	2	40X	300	
			POTS	0942.1	0944.3	III	G	2	40X	170U	
			IZMI	0943.9	0944.5	III	G	1	45	130	
			POTS	0955.6	0956.0	III	G	2	40X	160	
			POTS	1013.0	1013.2	III	G	2	125	170U	
			POTS	1019.3	1019.5	DCIM		1	200U	300	
			POTS	1024.7	1028.6	II	UE	3	110U	160	
			IZMI	1025.1	1032.7U	II	HARM	2	50U	165	
			POTS	1038.7	1045.5	III	G	2	60	170U	
			POTS	1053.1	1057.3	III	G	2	110U	170U	
			POTS	1104.2	1105.8	III	G	2	55	170U	
			POTS	1112.1	1112.3	III	G	2	40X	300	
			IZMI	1112.2	1112.3	III	B	2	45X	270X	
			POTS	1122.9	1123.1	III	G	2	110U	145	
			POTS	1125.5	1126.6	DCIM		2	200U	800X	
			IZMI	1138.2	1139.1	III	GG	2	45X	270X	
			POTS	1138.3	1140.4	III	GG	3	40X	500	
			IZMI	1140.3	1140.3	III	B	2	190	270X	
			POTS	1212.4	1212.5	III	B	1	110U	160	

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

JANUARY 1999

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
22			POTS	1244.1	1244.3	III	B	2	40X	120	
			POTS	1251.3	1251.4	III	B	1	110U	170U	
			POTS	1327.5	1327.7	III	B	2	110U	170U	
			POTS	1412.9	1416.6	III	GG	2	40X	300	
			PALE	2130.0	2131.0	III		1	25	35	
	2139	2400	HIRA								
	2040	2400	CULG	2225.0	2225.0	III	B	1	20	100	
23	0000	0800	HIRA								
			LEAR	0011.0	0011.0	III		1	30	66	
	0000	0815	CULG	0011.0	0011.0	III	B	1	23	90	
			LEAR	0202.0	0203.0	III		1	30	58	
	0700	1200	IZMI	0700.0E	1200.0D	I	S	1	85	270	
	0750	1428	POTS	0750 E	1428 U	I	S,C,DC	2	110U	300	
	0813	1412	ONDR								
			POTS	1327.2	1328.1	III	G	2	150	320	
			POTS	1340.6	1341.5	DCIM		2	200U	300	
			PALE	2039.0	0358.0	CONT		1	25	50	
	2040	2400	CULG	2040.0E	2157.0	III	S	1	18X	85	
	2139	2400	HIRA								
24	0000	0815	CULG	0019.0	0019.0	III	B	1	18	100	
			CULG	0115.0	0115.0	III	B	1	20	120	
			LEAR	0115.0	0115.0	III		1	30	70	
			CULG	0151.0	0215.0	III	N	1	20	90	
			LEAR	0200.0	0201.0	III		2	30	65	
			LEAR	0214.0	0215.0	III		2	30	60	
			LEAR	0305.0	0848.0	CONT		1	30	70	
			CULG	0521.0	0524.0	III	G	1	18X	160	
			LEAR	0521.0	0523.0	III		2	30	80	
			CULG	0631.0	0655.0	III	N	1	20	90	
	0650	1200	IZMI	0650.0E	1200.0D	I	S	1	95	270	
			SVTO	0716.0	1113.0	CONT		1	35	85	
			CULG	0733.0	0734.0	III	G	1	20	50	
	0750	1428	POTS	0832.9	0833.1	DCIM		1	250	360	
			POTS	0834.9	0835.9	III	G	2	110U	140	
			LEAR	0842.0	0848.0	III		2	30	80	
			POTS	0842.1	0842.4	UNCLF		2	40X	75	
			SVTO	0848.0	0848.0	III		2	35	44	
			POTS	0848.2	0848.4	III	B	2	40X	90U	
			POTS	1021.5	1023.6	III	G,U	2	40X	170U	
			IZMI	1021.6	1021.7	III	G, HARM	2	45X	125	
			IZMI	1022.7	1023.7	III	GG	2	45X	150	
			IZMI	1044.6	1044.8	III	G	2	55	100	
			POTS	1044.6	1046.4	III	G	2	40X	170U	
			IZMI	1046.2	1046.4	III	G	2	45X	135	
			ONDR	1120.5	1122.0	DCIM		1	1240	2000X	
	0811	1414	ONDR	1120.5	1121.5	DCIM		1	2000X	4365X	
			POTS	1137.3	1143.1	III	G	2	40X	260	
			IZMI	1138.7	1139.4	III	G	2	50	100	
			SVTO	1142.0	1149.0	III		2	35	85	
			IZMI	1142.6	1143.1	III	G	2	45	95	
			IZMI	1148.5	1149.5	III	GG	2	45	175	
			POTS	1148.5	1149.6	III	G	3	40X	220	
			POTS	1221.5	1221.7	III	B	2	110U	145	
			POTS	1227.8	1230.2	III	G	3	40X	250	
			SVTO	1228.0	1228.0	III		1	55	68	
			POTS	1231.3	1231.4	III	B	2	120	170U	
			POTS	1308.7	1308.8	DCIM		2	270	400	
			POTS	1314.3	1314.7	III	G	3	40X	300	
			POTS	1334.0	1336.9	III	G	2	70	160	
			SVTO	1341.0	1533.0	CONT		2	35	85	
			POTS	1349.7	1349.9	III	B	1	60	90U	
			SGMR	1408.0	1412.0	III		1	30	50	
			POTS	1412.3	1412.9	III	G	2	40X	170U	
			SGMR	1449.0	1450.0	V		1	30	80	
			SGMR	1617.0	1620.0	III		1	30	65	
			PALE	1939.0	1939.0	III		1	25	45	
			PALE	2025.0	2029.0	V		3	25	75	

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

JANUARY 1999

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
24			SGMR	2026.0	2027.0	III		2	30	80	
	2040	2400	CULG	2056.0	2204.0	III	N	1	18	90	
	2138	2400	HIRA								
			PALE	2158.0	2200.0	III		2	25	50	
			CULG	2227.0	2230.0	III	G	2	18X	180	
			PALE	2227.0	2241.0	III	N	2	25	50	
	0000	0801	HIRA	2229.2	2229.4	III	B	1	25X	170	
			CULG	2232.0	2242.0	III	G	1	18X	90	
			CULG	2304.0	2304.0	III	B	1	18	90	
			LEAR	2342.0	2343.0	III		1	35	50	
			CULG	2343.0	2345.0	III	G	1	18	160	
			CULG	2359.0	2359.0	III	B	1	20	40	
25	0000	0815	CULG	0011.0	0021.0	II	UE	2	60	180X	FLA
	0000	0802	HIRA	0012.0	0020.0	II		2	50	220	ESS 450
			PALE	0015.0	0057.0	III	N	3	25	75	
			LEAR	0016.0	0053.0	CONT		2	30	80	
			CULG	0018.0	0022.0	III	G	1	20	80	
			CULG	0025.0	0028.0	III	G	1	25	170	
			HIRA	0042.6	0042.8	III	B	1	25X	100	
			CULG	0043.0	0043.0	III	B	2	18X	100	
			CULG	0049.0	0049.0	III	B	1	20	130	
			CULG	0055.0	0055.0	III	B	3	18X	180X	
			CULG	0055.0	0058.0	V		2	18X	130	
			HIRA	0055.0	0055.2	III	B	3	25X	800	
			LEAR	0055.0	0057.0	III		3	30	80	
			CULG	0413.0	0414.0	III	G	1	20	70	
			LEAR	0413.0	0414.0	III		1	30	56	
			SVTO	0701.0	1033.0	CONT		2	37	55	
	0700	1200	IZMI	0706.0U	1200.0D	I	N	1	110	270	
	0750	1428	POTS	0750 E	1428 U	I	S	1	110U	370	
			POTS	0925.4	0925.6	III	G	2	135	170U	
			POTS	1049.6	1049.8	III	B	2	40X	150	
			POTS	1140.1	1141.5	III	G	2	40X	170U	
			SVTO	1151.0	1534.0	CONT		2	37	57	
			POTS	1210.6	1210.8	III	B	2	110U	170U	
			POTS	1233.7	1233.9	DCIM		2	400	550	
			POTS	1249.4	1249.6	III	B	1	110U	160	
			POTS	1341.2	1341.8	DCIM		1	200U	325	
			POTS	1404.0	1408.5	DCIM		2	240	650	
	0810	1416	ONDR	1405.3	1406.0	DCIM		1	2000	4355	
			SGMR	1618.0	1619.0	III		1	30	80	
	2040	2400	CULG								
	2138	2400	HIRA								
26	0000	0815	CULG	0002.0	0002.0	III	B	1	20	70	
			LEAR	0007.0	0008.0	III		1	30	68	
			CULG	0008.0	0008.0	III	B	1	20	70	
			LEAR	0048.0	0051.0	III		1	30	55	
			CULG	0049.0	0051.0	III	G	1	18	70	
			CULG	0120.0	0121.0	III	G	1	30	150	
			LEAR	0120.0	0128.0	III		1	30	80	
	0000	0803	HIRA	0120.6	0121.0	III	B	1	50	130	
			CULG	0128.0	0128.0	III	B	1	20	70	
			LEAR	0231.0	0231.0	III		1	32	62	
			LEAR	0346.0	0346.0	III		1	60	80	
			LEAR	0359.0	0400.0	III		1	30	55	
			SVTO	0651.0	1149.0	CONT		1	36	68	
	0700	1200	IZMI	0741.7U	0912.0U	I	N	1	200	270X	
	0750	1428	POTS	0750 E	1428 U	I	S,W	1	110U	450	
	0808	1417	ONDR								
			POTS	0814.7	0814.9	III	G	2	110U	170U	
			LEAR	0823.0	0824.0	III		1	30	67	
			POTS	0823.8	0825.2	III	G	2	40X	170U	
			IZMI	0824.6	0824.9	III	G	1	95	150	
			PALE	2109.0	2109.0	III		1	27	45	
	2040	2400	CULG	2110.0	2110.0	III	B	1	18X	70	
	2137	2400	HIRA								

SOLAR RADIO EMISSION
Spectral Observations

JANUARY 1999

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
27	0000	0804	HIRA								
			LEAR	0226.0	0227.0	III		1	30	60	
	0000	0815	CULG	0226.0	0226.0	III	B	1	23	90	
			LEAR	0327.0	0327.0	III		1	30	57	
			CULG	0328.0	0328.0	III	B	1	20	80	
			LEAR	0731.0	0734.0	III		1	30	55	
			CULG	0732.0	0733.0	III	G	1	20	50	
	0750	1428	POTS	0750 E	1428 U	I	S,W	1	110U	300	
	0806	1418	ONDR								
	0655	1200	IZMI	1057.2	1058.0	I	GG	2	130	150	
			PALE	2044.0	2045.0	III		1	25	45	
	2136	2400	HIRA								
	2040	2400	CULG	2145.0	2145.0	III	G	1	20	90	
28	0000	0805	HIRA								
	0000	0815	CULG								
	0646	1200	IZMI								
	0750	0820	POTS								
	0804	1423	ONDR								
	0942	1428	POTS	1133	1428 U	I	S,W	1	110U	170U	
			POTS	1212.1	1212.4	III	B	2	40X	130	
			POTS	1235.1	1235.7	UNCLF		2	110U	170U	
	2040	2400	CULG								
	2136	2400	HIRA								
29	0000	0806	HIRA								
	0000	0815	CULG								
	0645	1200	IZMI								
	0750	1428	POTS								
			SVTO	0800.0	1023.0	CONT		1	35	50	
	0803	1425	ONDR								
			SVTO	1119.0	1429.0	CONT		1	35	50	
	2040	2400	CULG								
	2135	2400	HIRA								
30	0000	0807	HIRA								
	0000	0815	CULG								
			SVTO	0649.0	1540.0	CONT		2	36	54	
	0700	1200	IZMI								
	0750	1428	POTS								
	0801	1426	ONDR								
	2040	2400	CULG								
	2134	2400	HIRA								
31	0000	0808	HIRA								
			LEAR	0033.0	0033.0	III		1	30	60	
			PALE	0033.0	0033.0	III		1	30	45	
	0000	0815	CULG	0033.0	0033.0	III	B	1	20	80	
			LEAR	0656.0	0656.0	III		2	30	68	
	0702	1000	IZMI								
	0759	1429	ONDR								
	0750	1428	POTS	1042.4	1045.8	III	G	2	40X	170U	
			SVTO	1044.0	1044.0	III		1	55	68	
			POTS	1044.8	1044.9	UNCLF		1	250	320	
			POTS	1156.2	1201.3	III	G,RS	2	40X	300	
			POTS	1222.8	1230.4	III	G,RS	2	40X	170U	
			SVTO	1223.0	1226.0	III		2	36	73	
			SGMR	1225.0	1226.0	III		1	30	45	
			SGMR	1423.0	1423.0	III		1	30	45	
			SVTO	1423.0	1437.0	III	N	2	35	80	
			SVTO	1423.0	1437.0	III	N	2	36	47	
			SGMR	1437.0	1437.0	III		1	30	50	
			SGMR	1639.0	1639.0	III		1	30	80	
	2040	2400	CULG								
	2133	2400	HIRA								

SOLAR RADIO NOISE STORM AT 164 MHZ FROM NANCAY RADIOHELIOGRAPH

JANUARY 1999

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
01/01/99	+0.87	+0.56	I	12H40	15H23 D
04/01/99	-0.20	-0.06	III	8H26 E	15H25 D
05/01/99	+0.12	-0.02	I	8H26 E	13H30
06/01/99	+0.25	+0.37	II	8H26 E	15H25 D
07/01/99	+0.48	+0.28	I	8H27 E	15H26 D
08/01/99	-0.03	-0.31	I	8H26 E	15H25 D
17/01/99	-0.20	+0.48	I	8H31 E	15H30 D
18/01/99	+0.09	+0.19	I	8H31 E	15H30 D
19/01/99	+0.37	+0.37	I	8H31 E	15H30 D
19/01/99	+0.45	-0.42	III	12H37	15H30 D
20/01/99	+0.09	+0.78	II	8H32 E	15H31 D
20/01/99	+0.33	+0.17	II	8H32 E	15H31 D
20/01/99	+0.81	-0.54	II	8H32 E	15H31 D
20/01/99	+0.54	-0.79	I	12H10	15H31 D
21/01/99	+0.62	+0.42	I	8H32 E	15H31 D
21/01/99	+0.98	-0.71	I	8H32 E	15H31 D
22/01/99	+0.78	+0.50	I	8H38 E	15H32 D
22/01/99	+0.99	+0.85	I	8H38 E	15H32 D
23/01/99	+0.93	-0.95	III	8H32 E	15H31 D
24/01/99	+1.36	-0.34	III	8H33 E	15H32 D
24/01/99	+1.02	-0.34	II	13H37	15H32 D
25/01/99	+1.30	-0.47	II	8H33 E	15H32 D
26/01/99	+0.88	-0.99	I	8H33 E	15H32 D
26/01/99	+1.49	-0.09	I	11H30	15H32 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 NAN,AY OBSERVATIONS
D NOISE STORM IN PROGRESS AT THE END OF THE NANCAY OBSERVATIONS

SOLAR RADIO NOISE STORM AT 327 MHZ
FROM NANCAY RADIOHELIOGRAPH

JANUARY 1999

	HELIOGRAPHICS POSITIONS MEAN VALUES[1]		IMP[2]	OBSERVING TIME[3]	
DAY	E-W	S-N		START(UT)	END(UT)
01/01/99	+0.85	+0.31	I	12H11	15H23 D
04/01/99	-0.16	+0.31	I	8H26 E	13H00
04/01/99	+0.05	+0.19	I	8H26 E	13H00
04/01/99	+1.36	+0.59	I	8H26 E	14H00
06/01/99	+0.33	+0.53	I	8H26 E	15H25 D
08/01/99	+0.05	-0.28	I	8H26 E	15H25 D
16/01/99	-0.64	+0.59	I	8H30 E	15H29 D
18/01/99	+0.19	-0.29	I	8H31 E	15H30 D
19/01/99	+0.39	-0.39	II	8H31 E	15H30 D
20/01/99	+0.14	+0.64	I	8H32 E	15H31 D
20/01/99	+0.64	-0.45	I	8H32 E	15H31 D
2101/99	+0.81	+0.53	I	8H32 E	15H31 D
21/01/99	+0.84	-0.14	I	8H32 E	14H00
21/01/99	+0.85	-0.62	I	8H32 E	14H50
21/01/99	+1.04	-0.31	I	8H32 E	15H31 D
22/01/99	+1.04	+0.57	II	8H38 E	15H32 D
22/01/99	+1.09	-0.20	I	8H38 E	15H32 D
23/01/99	+1.16	+0.53	I	8H38 E	11H50
23/01/99	+1.18	-0.60	I	8H38 E	15H32 D
23/01/99	+1.22	-0.20	I	8H38 E	15H32 D
24/01/99	+1.41	-0.39	III	8H33 E	15H32 D
24/01/99	+1.26	+0.57	II	12H40	15H32 D
25/01/99	+1.33	-0.11	II	8H33 E	15H32 D
25/01/99	+1.35	-0.54	II	8H33 E	15H32 D
26/01/99	+1.30	-0.47	I	8H33 E	10H40

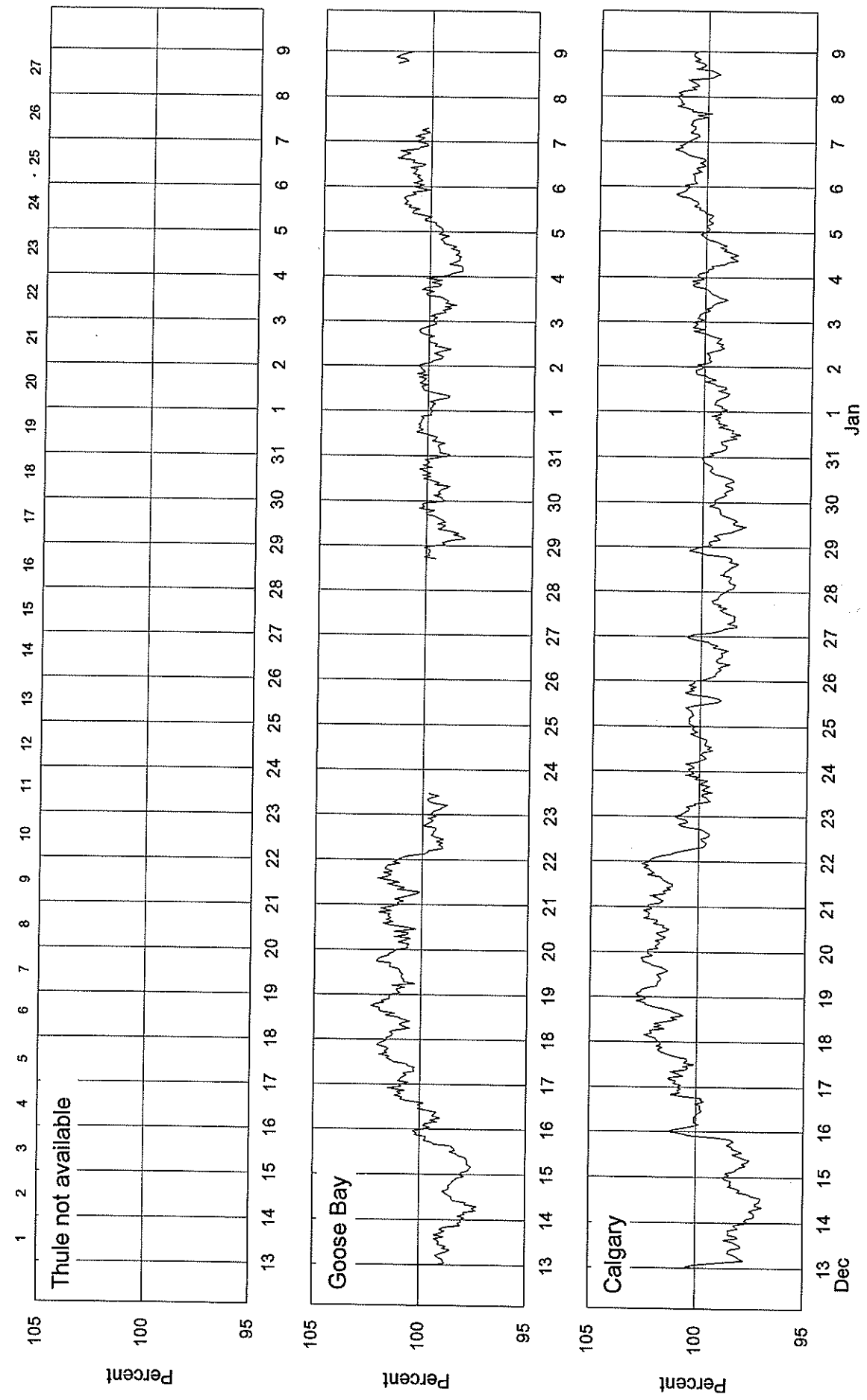
NO DATA: 09, 10 JANUARY 1999
OTHERS DAYS: NO DETECTABLE NOISE STORM

COSMIC RAY INDICES
(Neutron Monitor)
JANUARY 1999

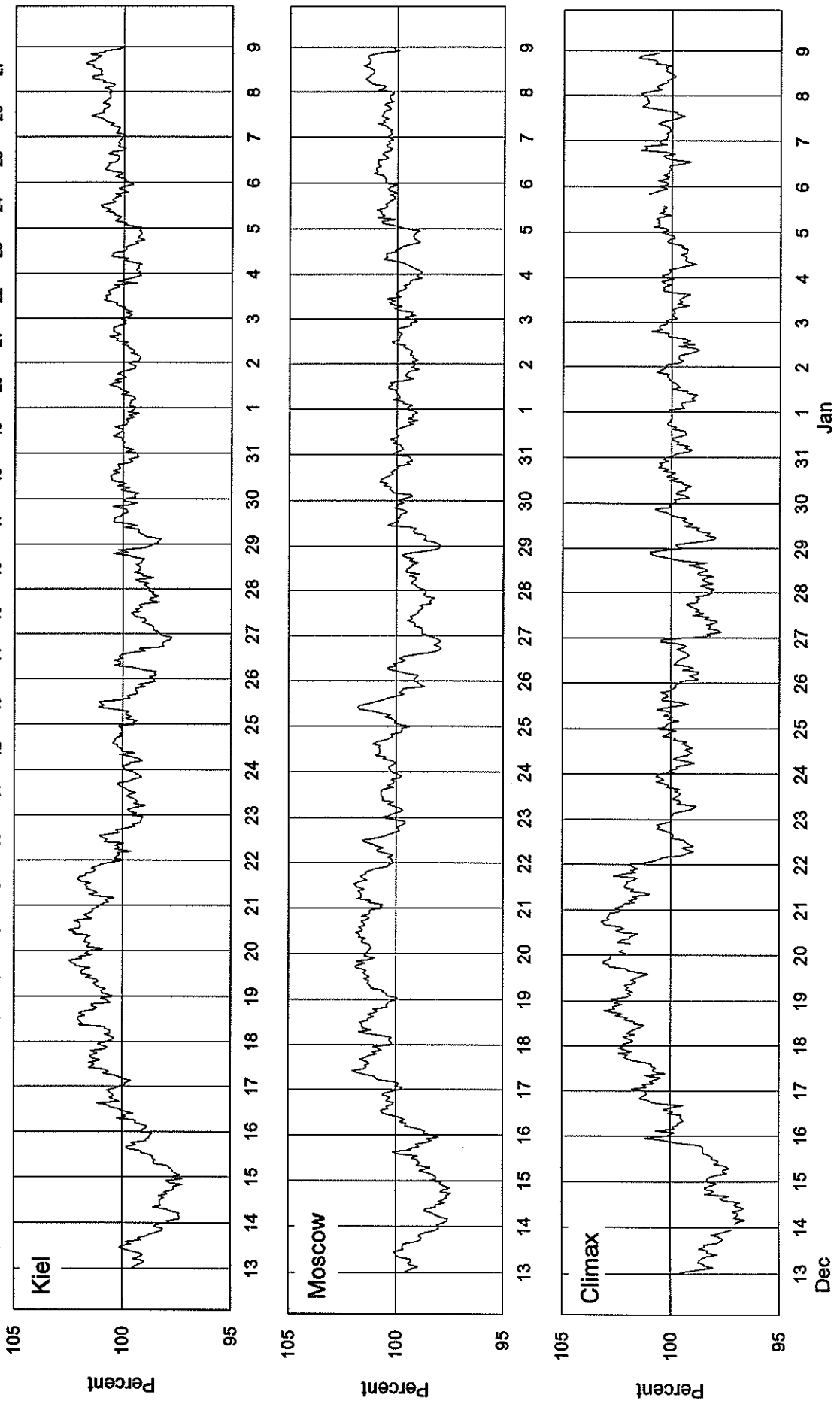
Day	THULE Average (cts/h)/100	GOOSE BAY Average (cts/h)/100	CALGARY Average (cts/h)/300	KIEL Average (cts/h)/100	MOSCOW Average (cts/h)/64	CLIMAX Average (cts/h)/100	BEIJING Average (cts/h)/256	HALEAKALA Average (cts/h)/1000
1	No data	7129.7	3858.2	6104.0	8993.2	4115.0	1955.8	3507.7
2	at time of	7121.9	3870.5	6105.4	8979.3	4116.5	1957.3	3519.5
3	publication	7105.0	3876.2	6120.1	8990.6	4122.1	1956.3	3523.1
4		7057.1	3858.3	6085.2	8977.8	4114.6	1955.8	3523.6
5		7164.2	3891.5	6125.3	9052.5	4148.2	1969.3	3536.2
6		7186.5	3904.3	6129.2	9074.8	4138.5	1966.6	3535.9
7		7165.4 (8)	3907.0	6152.5	9060.2	4144.0	1977.8	3534.3
8		7236.3 (6)	3897.5	6176.0	9111.1	4150.5	1987.3	3523.9
9		7160.3	3884.7	6168.5	9119.8	4137.0	1988.4	3514.0
10		7125.4	3884.7	6141.0	9082.1	4129.2	1986.8	3521.2
11		7132.4	3870.8	6124.9	9037.6	4117.5	1990.0	3528.4
12		7129.0	3875.0	6090.2	9020.2	4119.2	1986.7	3532.1
13		7115.9	3860.2	6099.5	9007.2	4134.4	1997.5	3546.1
14		7037.4	3801.2	6067.5	8930.8	4076.9	1991.0	3528.7
15		7041.8	3819.7	6073.8	8897.3	4086.0	1982.2	3524.7
16		6991.3	3825.0	6050.1	8880.8	4075.8	1976.7	3519.8
17		7024.8	3834.5	6054.8	8852.7	4081.8	1969.5	3518.9
18		7019.4	3836.3	6064.5	8871.5	4069.0	1970.0	3524.6
19		7033.0	3847.0	6059.8	8909.9	4079.3	1980.2	3532.9
20		7068.5	3853.7	6062.6	8923.6	4095.2	1976.3	3532.2
21		7055.3	3853.8	6059.5	8909.5	4102.4	1967.2	3518.5 (57)
22		7069.1	3866.5	6069.6	8928.4	4108.5	1967.6	3522.4
23		6743.8	3686.5	5808.1	8585.6	3895.8	1910.3	3422.3
24		6650.6	3636.2	5770.0	8512.7	3840.8	1895.5	3402.9
25		6661.4	3640.2	5775.6	8519.5	3851.5	1901.8	3425.9
26		6749.8	3669.8	5845.4	8570.2	3886.8	1906.0	3443.5
27		6800.6	3706.8	5894.0	8659.4	3925.1	1923.8	3465.6
28		6843.9	3713.2	5914.4	8679.2	3933.6	1921.2	3471.8
29		6881.8	3725.3	5940.6	8701.2	3955.1	1939.9	3477.8
30		6923.9	3749.0	5954.2	8738.0	3970.3	1943.5	3486.2
31		6961.5	3786.7	5975.6	8804.7	4011.3	1951.8	3491.1
Mean		7012.5	3815.8	6034.3	8883.3	4055.7	1959.7	3504.9

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.

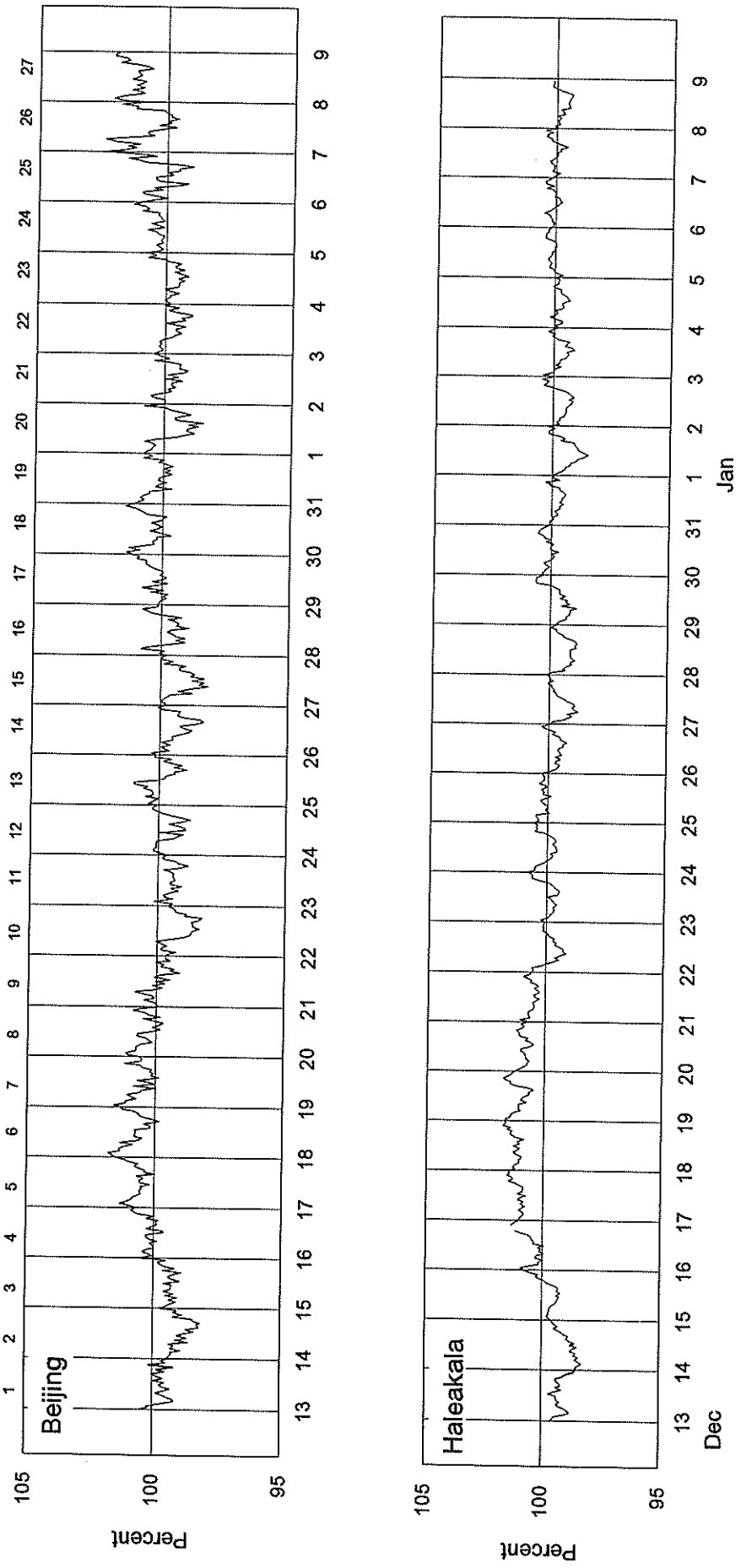
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2258 - Beginning 13 Dec 98



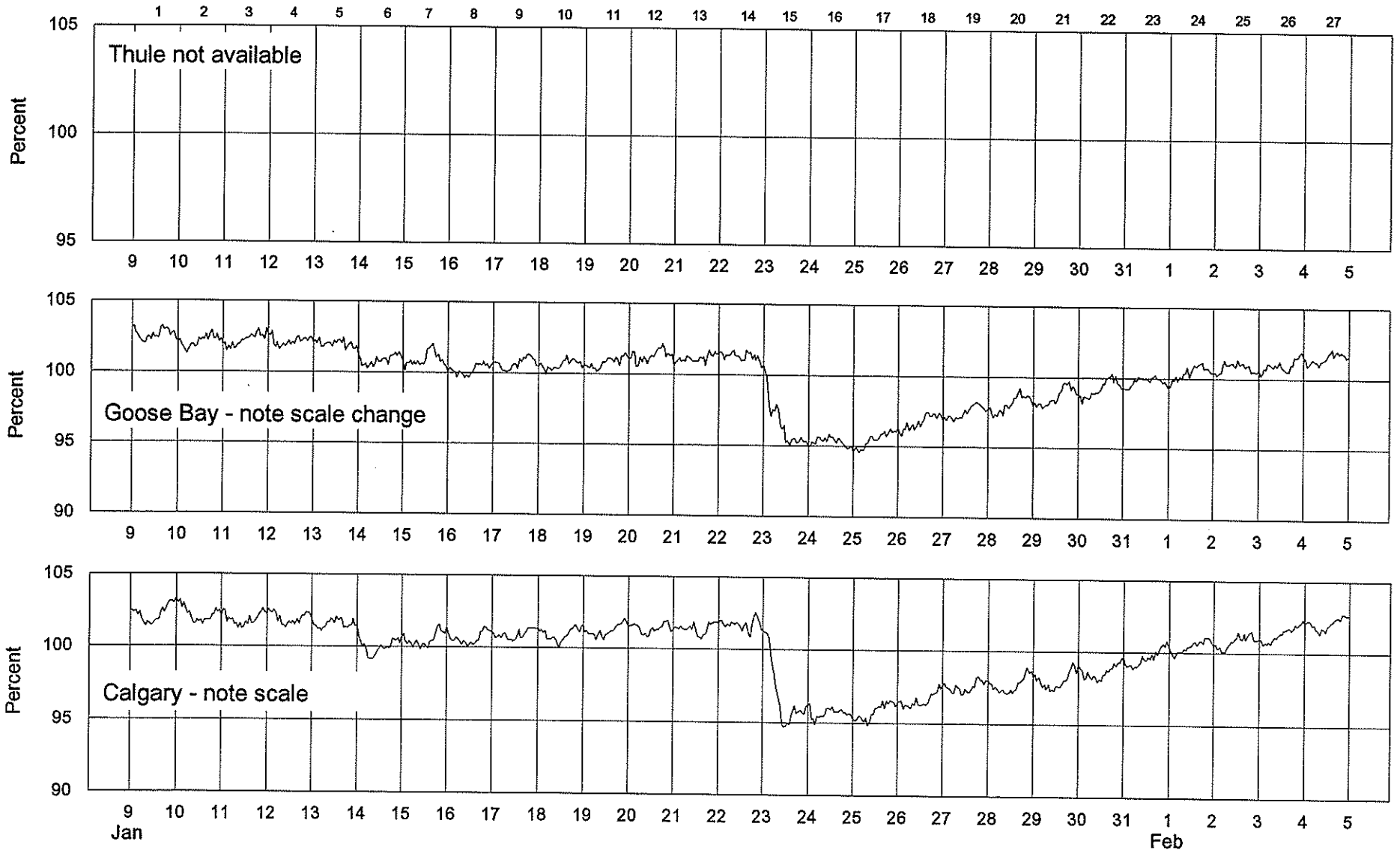
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2258 - Beginning 13 Dec 98



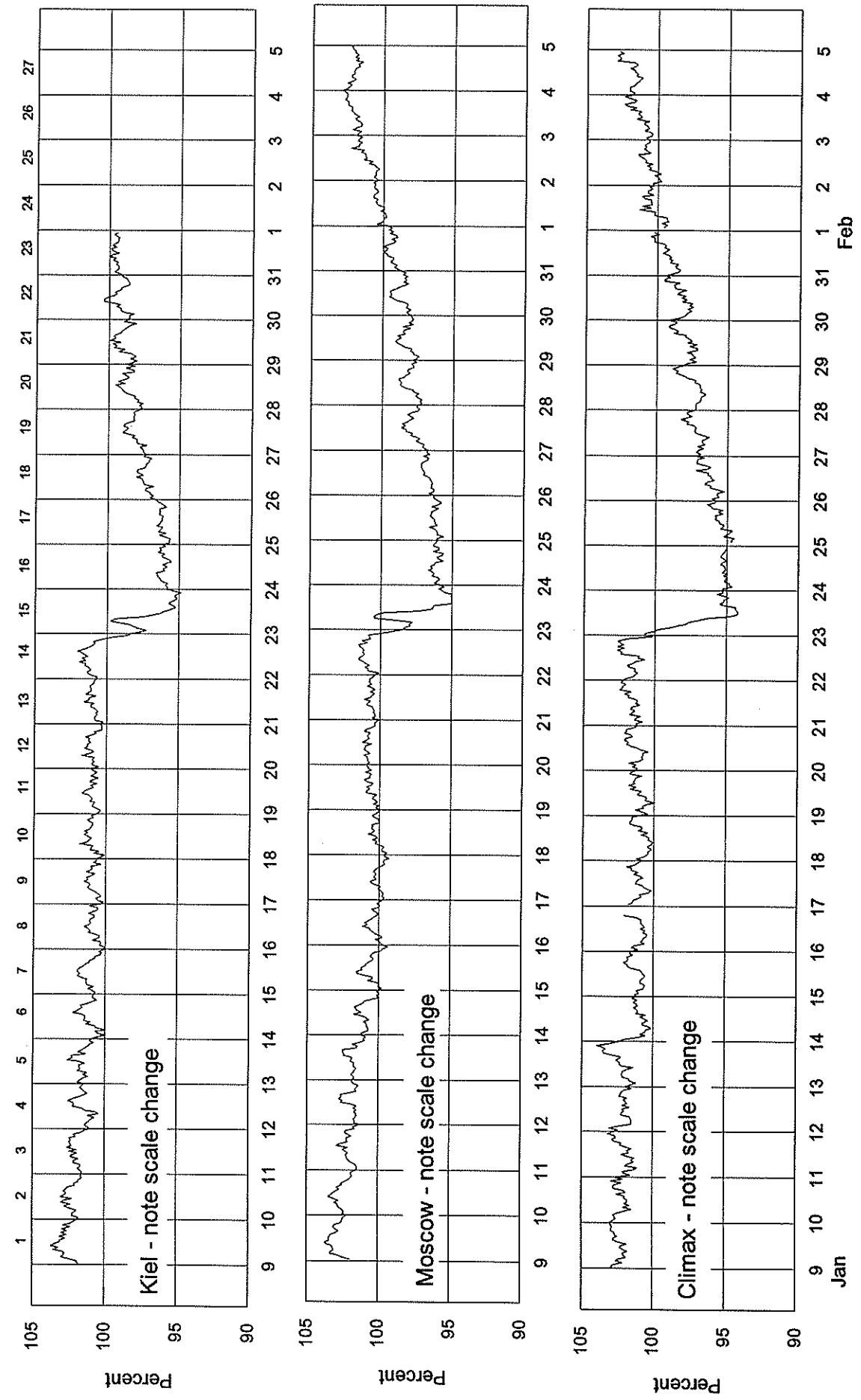
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2258 - Beginning 13 Dec 98



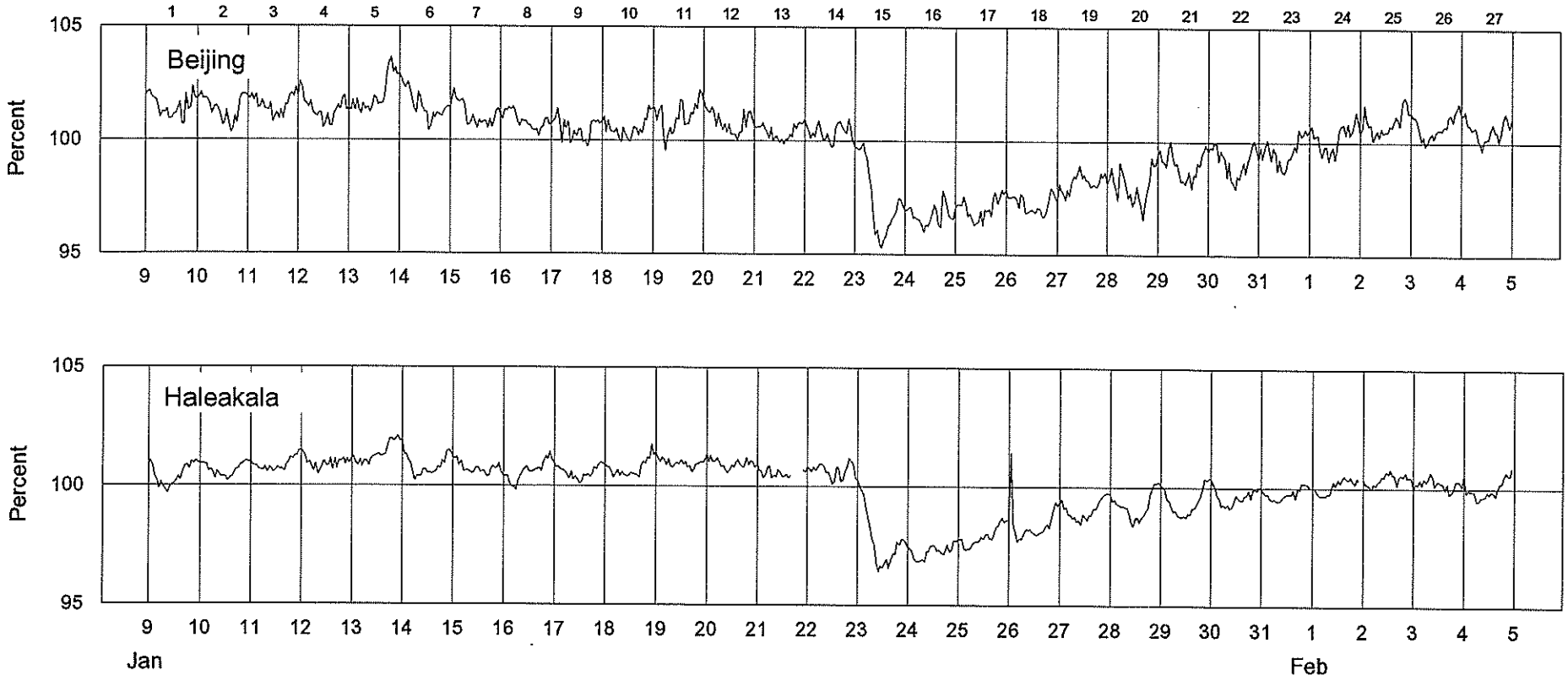
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2259 - Beginning 9 Jan 99



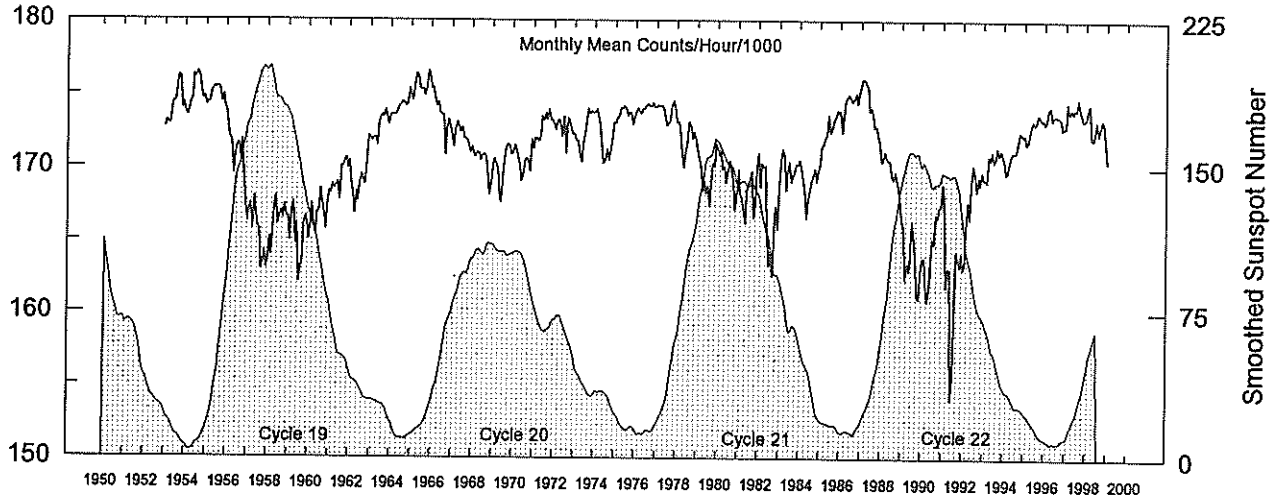
COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2259 - Beginning 9 Jan 99



COSMIC RAY INDICES
(Neutron Monitor)
Bartels Rotation 2259 - Beginning 9 Jan 99



Huancayo* Neutron Monitor Pressure-Corrected/Adjusted Values
Jan 1953 - Jan 1999



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1953	1727	1732	1730	1729	1742	1744	1744	1756	1762	1761	1740	1744	1743
1954	1737	1735	1738	1744	1747	1763	1761	1764	1762	1754	1746	1748	1750
1955	1742	1744	1744	1751	1754	1755	1754	1755	1753	1744	1749	1741	1749
1956	1738	1724	1719	1718	1696	1707	1715	1716	1706	1719	1697	1675	1711
1957	1663	1671	1675	1658	1680	1670	1659	1658	1630	1633	1643	1630	1656
1958	1635	1652	1639	1657	1677	1680	1661	1667	1670	1665	1675	1666	1662
1959	1666	1649	1671	1676	1647	1661	1621	1632	1632	1661	1666	1663	1654
1960	1650	1663	1675	1660	1654	1669	1669	1685	1674	1670	1657	1677	1667
1961	1684	1682	1688	1685	1688	1690	1677	1701	1700	1704	1706	1699	1692
1962	1704	1687	1683	1668	1683	1677	1690	1695	1690	1688	1703	1721	1691
1963	1720	1718	1720	1720	1715	1729	1734	1736	1734	1739	1732	1729	1727
1964	1735	1736	1736	1736	1739	1741	1742	1744	1744	1741	1743	1753	1741
1965	1748	1745	1756	1764	1762	1754	1753	1753	1748	1754	1765	1764	1755
1966	1754	1754	1747	1741	1744	1737	1736	1736	1708	1725	1732	1727	1737
1967	1721	1714	1726	1731	1727	1724	1727	1720	1720	1718	1713	1710	1721
1968	1714	1708	1708	1710	1710	1705	1708	1709	1706	1698	1681	1689	1704
1969	1702	1706	1702	1698	1678	1676	1695	1708	1714	1716	1714	1709	1701
1970	1709	1715	1712	1707	1701	1691	1695	1705	1706	1705	1697	1719	1705
1971	1712	1720	1720	1718	1722	1735	1732	1737	1732	1739	1732	1732	1728
1972	1730	1726	1731	1732	1728	1721	1734	1710	1733	1733	1726	1723	1727
1973	1723	1719	1718	1709	1704	1716	1723	1733	1740	1737	1738	1738	1725
1974	1737	1740	1736	1729	1713	1703	1704	1712	1705	1713	1718	1731	1720
1975	1730	1733	1734	1740	1740	1742	1740	1735	1737	1738	1729	1733	1736
1976	1738	1741	1739	1737	1740	1740	1742	1743	1742	1742	1744	1741	1741
1977	1741	1743	1742	1742	1740	1735	1729	1730	1732	1742	1745	1741	1739
1978	1731	1731	1726	1710	1700	1710	1717	1731	1729	1719	1724	1720	1721
1979	1711	1707	1702	1684	1691	1682	1688	1674	1689	1703	1700	1717	1696
1980	1713	1708	1712	1699	1701	1690	1698	1705	1699	1688	1672	1680	1697
1981	1699	1682	1680	1671	1662	1685	1690	1693	1697	1666	1675	1700	1683
1982	1710	1687	1703	1700	1702	1662	1632	1643	1625	1662	1674	1658	1671
1983	1688	1703	1713	1709	1685	1697	1704	1690	1694	1697	1703	1702	1699
1984	1705	1699	1693	1685	1665	1677	1684	1691	1695	1699	1691	1698	1690
1985	1703	1714	1716	1721	1723	1736	1724	1727	1732	1734	1739	1737	1725
1986	1739	1724	1734	1746	1748	1750	1748	1745	1747	1751	1744	1752	1744
1987	1757	1760	1760	1757	1754	1738	1741	1735	1728	1728	1721	1718	1741
1988	1704	1706	1711	1706	1705	1705	1696	1692	1698	1690	1688	1674	1698
1989	1663	1660	1624	1635	1629	1638	1664	1650	1640	1611	1609	1627	1637
1990	1638	1638	1623	1608	1616	1630	1651	1648	1668	1666	1673	1673	1644
1991	1689	1682	1617	1631	1630	1540	1555	1611	1642	1638	1632	1641	1626
1992	1630	1635	1659	1677	1665	1689	1702	1696	1684	1693	1688	1697	1676
1993	1692	1692	1690	1708	1705	1711	1704	1707	1714	1709	1712	1709	1705
1994	1705	1696	1697	1703	1708	1711	1711	1711	1718	1724	1723	1722	1711
1995	1723	1717	1718	1726	1730	1732	1730	1733	1736	1735	1732	1734	1729
1996	1730	1734	1740	1742	1733	1735	1736	1736	1735	1733	1727	1727	1734
1997	1728	1744	1738	1740	1737	1741	1739	1747	1741	1737	1733	1733	1738
1998	1734	1741	1744	1721	1720	1723	1732	1723	1728	1733	1731	1719	1729
1999	1703												1703

Multiply table entries by 100 to obtain hourly counting rate for Huancayo, Peru: S12 W75, Alt=3400m, Cutoff Rigidity=12.92GV (1980). NOTE: Secular changes in the Earth's magnetic field resulted in a slow lowering of the geomagnetic cutoff rigidity at Huancayo over the 40 year period. This dataset was adjusted by applying a linear time-correction based on the calculated change in response to the change in the vertical cutoff. * Data from Jan 92 on are from the 18-NM64 at Haleakala, Hawaii: N20 W156, Alt=3030m, Cutoff Rigitity=12.91GV (1980). Multiply table entries by 2057.6 to obtain equivalent Haleakala counting rate.

NOTE: Monthly means for January 1995 through March 1998 are corrected values.

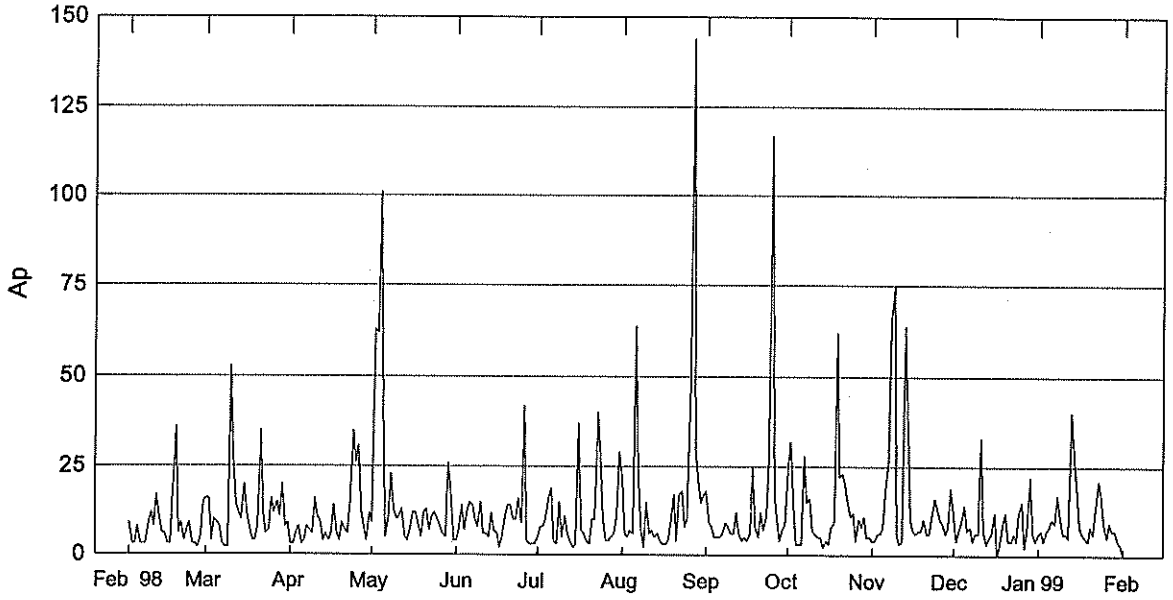
Geomagnetic Activity Indices

January 1999

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	aa Provisional Am	N	S	M	
1		0+	3-	1	1+	2-	1+	2+	2	13-	6	0.3	1o	2+	1o	2o	2o	2-	2+	2o	13	16	10	10	16 CK
2		2	2+	1	2+	2+	2+	1+	1-	14+	7	0.3	2-	2o	2-	3-	3o	3-	2-	1+	16	15	19	17	17
3	Q4	2+	2-	1-	0	1	1-	1-	1+	8+	4	0.1	2-	1+	1o	0+	1+	1+	1-	1+	8	8	9	9	9 CC
4		1	2	2-	2-	2-	2	1+	3-	14	7	0.3	1-	1+	2-	2o	2o	2o	1+	3-	13	13	14	9	18 K
5		3+	3+	2	2-	1+	1+	0+	2	15+	8	0.5	3-	2+	2-	2o	2-	1+	1o	2o	14	12	12	15	9 C
6		2+	1+	3-	1	3+	2+	3	2+	18+	10	0.6	2o	1o	2+	1+	3+	3-	3o	3o	21	21	25	14	32
7		1	1	2	2	3-	3	3-	2+	17-	9	0.5	1+	1o	2o	2o	3-	3-	3-	3-	17	19	22	13	28
8	D5*	3+	3-	2+	4-	3	3	4	3+	25+	17	0.9	3-	2+	2+	3+	3o	3o	4-	3o	30	39	30	27	42
9		4-	3+	3	2-	1	1+	2	3-	19-	11	0.6	3+	2+	3-	2-	2-	2-	2+	3-	20	24	27	32	19
10		2+	1+	2	3	1-	0	1+	1	12-	6	0.3	2+	1o	2-	3-	1-	1-	1o	1+	11	12	14	18	9 K
11	Q8	2	2-	1+	2-	1	1	2	1+	12	6	0.2	2o	1+	2-	2o	1+	2-	2+	1+	12	10	17	14	13 CC
12	Q6	1+	0+	1	1	2	1-	2	2+	11-	5	0.2	1+	1-	1+	2o	3-	1+	2o	2+	13	15	15	12	18
13	D1	2+	2	1+	3+	4	5+	6-	7	31	40	1.5	2o	1+	2-	3+	4o	5o	5-	6o	56	86	51	21	117
14	D2	3-	3-	5	5+	4+	4	3	4+	31+	29	1.3	2+	2o	4+	4+	4o	4-	3+	4o	44	50	46	37	60
15	D4	4-	5-	3	3+	3+	4-	3	2	27-	20	1.0	3+	4-	3-	3+	3+	3+	3o	2+	33	43	28	35	37
16		2+	3+	2+	2+	1+	1+	1	1+	15+	8	0.4	2o	2+	2o	2+	1+	1+	1+	2-	13	15	13	20	8
17	Q9	3-	2	2	1	1	1	1-	1+	12-	6	0.3	3-	1+	2-	1+	1+	1+	1o	1+	11	10	12	14	8 CC
18	Q7K	0	0	0+	0+	1-	2	3	2+	9-	5	0.2	0o	0o	1-	1o	1+	2+	3o	2+	11	16	13	5	24 K
19	Q2	2	1	1+	2-	0+	0+	0+	1-	8-	4	0.1	2-	1o	1o	2-	1-	0+	1o	1+	7	10	8	11	7 CK
20		1+	1-	0+	1	2-	3+	3	2	13+	8	0.4	1+	1+	1-	2-	2+	3o	3+	3-	18	15	21	11	26
21	Q10K	1	2+	1+	3	2-	1-	1-	0+	11	6	0.3	2-	2o	1+	3+	2+	1+	1o	1o	14	11	13	16	8 K
22		1+	1	1+	1+	3+	4	4-	4-	20-	14	0.8	1+	1+	1+	1+	3+	4-	4o	3+	26	30	34	11	52
23	D3	2+	3	3	3+	2	4+	4	5	27	21	1.1	2+	3o	3o	3o	2+	4o	4+	5-	39	44	38	28	55
24		4+	4-	3+	2+	3-	3	4-	2-	25-	17	0.9	3+	3+	3o	3-	2+	3o	3+	2o	28	34	30	35	29
25		4-	3-	2+	2+	1+	1+	2-	1+	17-	9	0.5	3o	3-	2o	3-	1+	2-	2-	1+	16	17	15	21	11
26	Q5	2+	1-	1	2	1-	0	1-	2+	10-	5	0.2	2o	1-	1o	2+	1+	0+	1o	2o	10	11	13	13	11 K
27		2	3	2-	2	3-	3-	2+	1+	18-	9	0.5	2-	2+	2-	3o	3o	3-	3-	2-	20	22	21	19	23
28		0+	1-	2+	2	3-	3-	2-	2	14+	7	0.4	1o	1+	2+	2+	3-	2+	2-	2-	16	15	19	13	22
29		1+	2	2	2	2+	2+	2-	2	16-	7	0.4	1+	1+	2+	2o	2+	3-	2-	2-	14	14	20	15	19
30	Q3	2	1	1+	2-	0+	1	0+	0+	8	4	0.1	2-	1-	2-	2-	1o	1+	1o	1o	8	7	9	10	6 CC
31	Q1	1-	2-	1	1-	1	1	0+	0	6+	3	0.1	1-	1+	1o	1o	1+	1+	1-	0o	6	6	7	8	6 CC
Mean											10	0.49									18.6	21.3	20.3	20.8	

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	0+	2+	1o	2o	2+	2-	2+	2o	13	1+	2o	1+	2o	2o	1+	2+	2-	13	161.6	57	64	113	
2	2-	2o	2-	3o	3o	3-	2-	1o	18	2-	2o	2-	2+	2+	2+	2-	2-	15	154.8	68	61	105	
3	2-	1+	1-	0o	2-	1+	0+	1o	7	2o	1+	1+	1-	1+	1+	1+	1+	9	149.4	58	58	99	
4	1-	1+	2-	2o	2o	2-	2-	3-	13	1o	2-	2-	2-	2-	2o	1+	3-	14	142.0	60	67	91	
5	3-	3-	2-	2+	2+	1o	1-	1+	14	3-	2o	2-	1+	1+	2-	1+	3-	14	132.0	64	59	81	
6	1+	1o	2+	1+	3+	2+	3o	3-	19	3-	1o	2o	2-	3+	3o	3o	3+	23	121.6	48	47	69	
7	1o	1-	2-	2-	3-	3-	3-	2+	15	2o	1+	2o	2o	3o	3o	2+	3-	19	111.3	64	54	58	
8	2+	2o	3-	3+	3o	3o	4o	3+	29	3o	3-	2+	4-	3+	3o	3+	3o	31	111.7	51	55	59	
9	3o	2+	3-	1+	2-	1+	2-	2+	17	4-	3-	3-	2o	2o	2-	3-	3o	23	111.0	47	48	58	
10	2o	1o	2-	3-	0+	0o	1o	1o	10	3-	1+	2o	3-	1o	1o	1o	2-	13	106.7	46	45	53	
11	2-	1+	1+	2-	1+	2-	2+	1+	11	2o	1+	2o	2o	1o	2-	2+	2-	13	108.2	32	26	55	
12	1+	0o	1o	2-	2+	1+	2+	2+	11	2-	1o	1+	2+	3-	1+	2-	3-	14	109.1	38	31	56	
13	2-	1+	2-	3+	4o	5o	5o	6o	57	2+	1+	2-	3o	4o	5-	5-	6o	56	114.7	41	48	62	
14	2+	2o	5-	5-	4+	4o	3o	4-	48	3-	2+	4-	4-	4o	3+	3+	4o	40	132.4	65	68	81	
15	3+	4o	3-	3+	4-	3+	3o	2-	34	3o	4-	3-	3o	3o	3+	3o	3-	31	138.0	83	79	87	
16	2-	2+	2+	2+	1+	1+	1-	1o	12	2+	2+	2-	2o	1+	1+	2-	2+	14	153.4	90	86	104	
17	2+	2-	2-	1+	1+	1+	1-	1+	10	3-	1+	2o	1+	1+	1+	1+	1o	11	156.2	93	101	107	
18	0o	0o	0o	0+	1+	2o	3o	2+	10	0o	0+	1+	1+	2-	2+	3o	2+	13	165.4	111	98	117	
19	1+	1-	1o	2-	1o	0o	1-	1-	6	2-	1+	1+	2-	0+	1-	1+	1+	8	170.3	121	118	122	
20	1+	1-	0+	1+	3-	3o	3o	2-	15	2-	2-	1+	2o	2+	3o	4-	3o	21	231.3	120	118	188	
21	1+	2-	1o	3+	2o	1o	0+	0o	11	2o	2+	1+	3+	2+	1+	1+	2-	16	169.7	114	108	121	
22	1-	1+	1o	1o	3o	4-	4-	3+	22	2o	1+	1+	2o	4-	4-	4+	3o	29	172.3	108	94	124	
23	2+	3-	3o	3o	3-	5-	4+	4+	42	2o	3+	3o	3o	2-	3+	4o	5-	36	160.8	87	79	112	
24	4-	3+	3o	2+	2+	3+	3+	2-	29	3o	3+	3o	3-	2o	3o	3+	2+	28	156.8	68	57	107	
25	3+	3-	2-	3-	2-	2-	1+	1+	17	3-	3-	2o	3-	1+	1+	2-	2-	16	133.9	31	26	83	
26	2-	0+	1o	3-	1+	0+	0+	2+	10	2+	1+	1+	2o	1+	0+	1+	2o	11	129.1	30	22	77	
27	2-	3-	2-	3o	3o	3o	3-	1+	22	2-	2o	1+	3-	3-	3-	3-	2+	18	121.6	35	31	69	
28	0+	1o	2+	2o	3-	3-	2-	2-	14	1+	2-	3-	3-	3o	2+	2o	2o	17	115.2	28	27	62	
29	1o	2-	2+	2o	2o	3-	2-	2-	14	2-	1+	2o	2-	3-	2+	2-	2-	14	114.2	24	21	61	
30	2-	0+	2-	2-	1+	1o	1-	0o	7	2-	1+	2-	2o	0+	1+	1+	1+	10	114.5	22	26	62	
31	0+	1+	1o	1o	1o	1+	0+	0o	5	1+	1+	1o	1o	1+	1+	1o	0+	7	111.5	30	27	58	
Mean									18.1									19.3	138.1	62.4	59.6	87.1	

Daily Average Indices Ap
Feb 1998 - Jan 1999

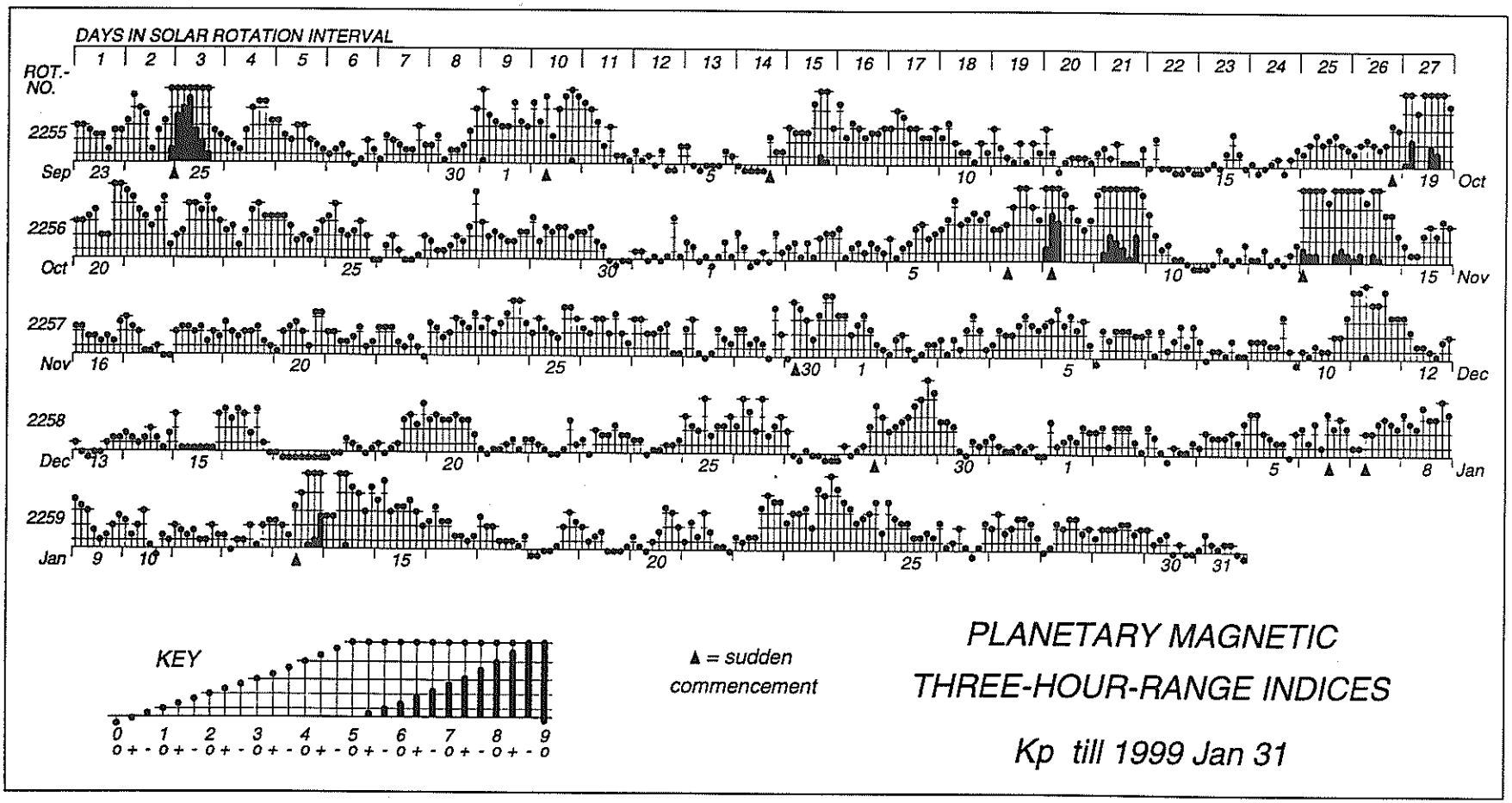


Day	Feb 98	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99
1	9	16	3	9	4	5	21	18	24	4	11	6
2	3	16	3	63	7	8	6	9	32	4	4	7
3	3	4	6	62	14	8	5	8	14	6	7	4
4	8	10	8	101	7	10	7	5	3	6	10	7
5	3	9	3	42	12	16	6	5	3	8	14	8
6	3	8	4	5	15	19	64	5	3	20	7	10
7	3	3	8	10	14	4	24	6	28	26	8	9
8	8	2	7	23	10	3	7	9	15	66	4	17
9	12	2	6	13	8	15	2	8	16	75	6	11
10	8	53	16	10	15	5	15	6	7	6	6	6
11	17	28	11	11	6	11	6	6	6	3	33	6
12	10	14	9	13	6	6	7	12	5	4	7	5
13	6	12	4	5	5	4	5	6	5	64	3	40
14	6	10	6	4	12	2	6	4	2	41	5	29
15	3	20	4	7	7	3	4	5	4	10	6	20
16	3	12	6	12	6	37	3	4	3	7	12	8
17	18	8	14	12	2	7	3	6	8	6	0	6
18	36	4	6	9	5	6	4	25	9	7	3	5
19	6	4	4	5	11	4	9	8	62	7	9	4
20	9	8	9	12	14	3	17	5	22	10	12	8
21	4	35	7	13	14	10	4	12	23	6	4	6
22	7	12	6	7	10	10	17	7	20	6	4	14
23	9	6	15	11	10	40	18	11	15	11	6	21
24	3	7	35	12	16	28	8	28	11	16	4	17
25	3	16	26	10	9	11	10	117	12	13	12	9
26	2	12	31	8	42	4	49	17	4	10	15	5
27	5	15	12	6	4	4	144	10	10	9	2	9
28	15	11	8	5	3	5	30	4	8	6	7	7
29		20	4	26	3	6	20	7	11	8	22	7
30		8	12	18	3	11	15	9	5	19	6	4
31		9		4	4	29	17		5		4	3
Mean	8	13	10	18	10	11	18	13	13	16	8	10

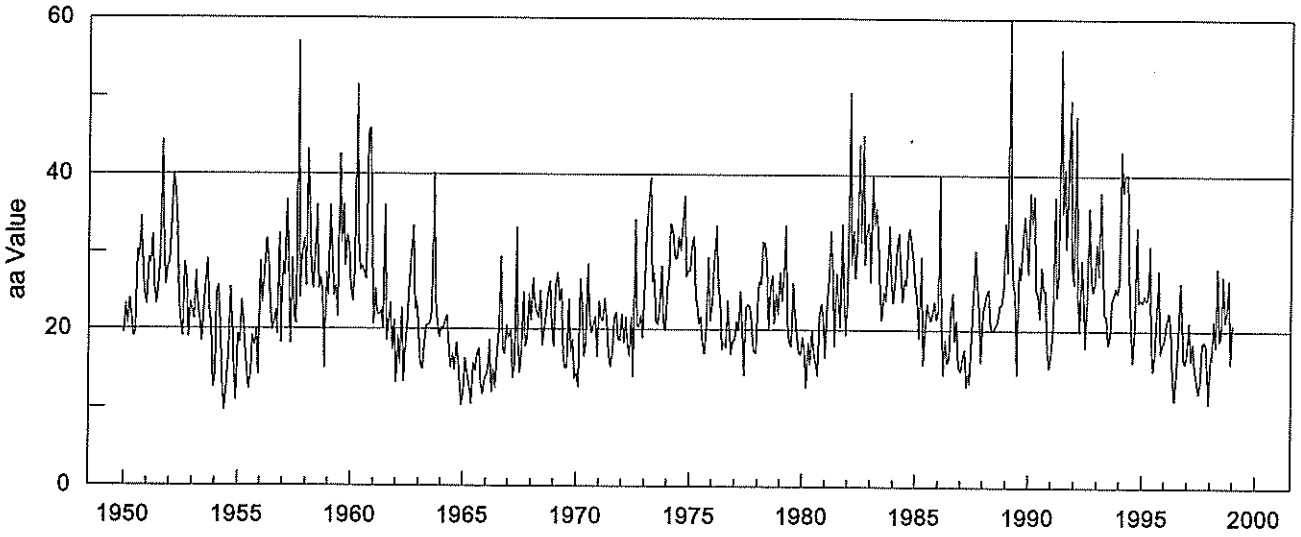
PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

GeoForschungsZentraum Potsdam

Kp through January 31, 1999



Monthly Mean aa Index Jan 1950 - Jan 1999



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	26.5	15.9	21.0
1999	20.8												

PLANETARY GEOMAGNETIC ACTIVITY

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

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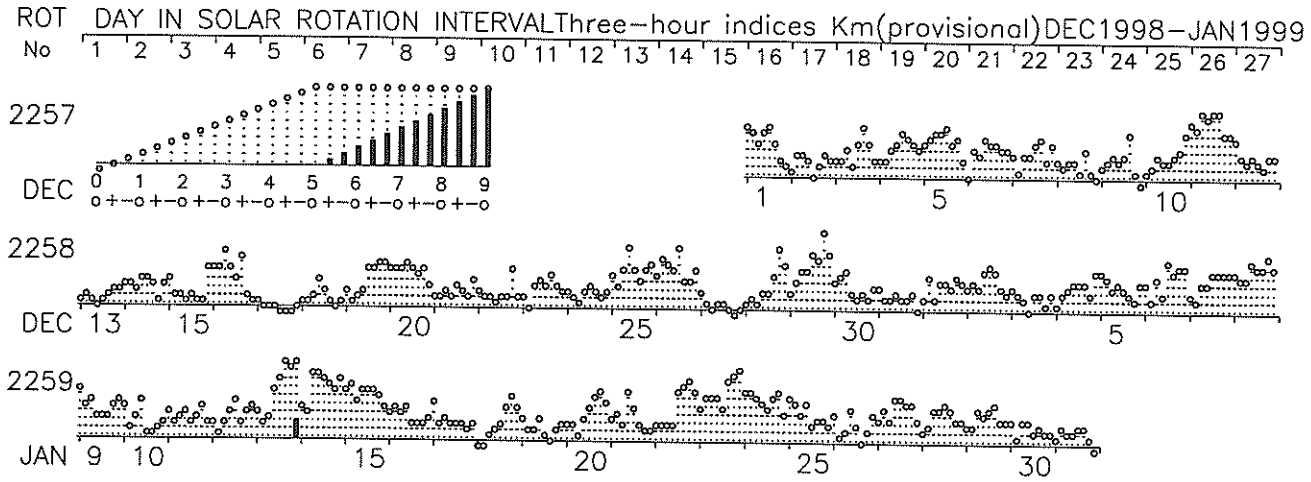
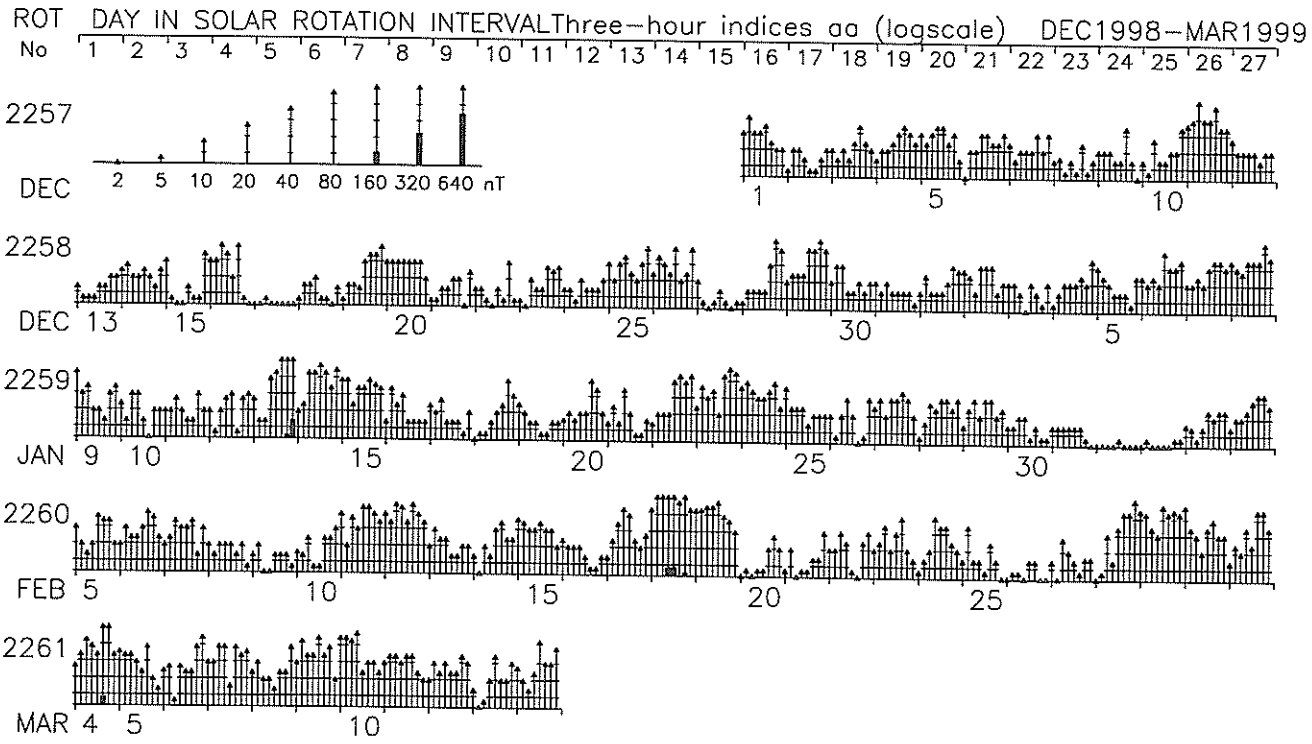


Indices Derivation at Universite Paris Sud; Graph Prepared at ISGI Publication Office.



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

WDC-C2 FOR GEOMAGNETISM, KYOTO UNIVERSITY

HOURLY EQUATORIAL DST VALUES(PROVISIONAL)

JANUARY 1999

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	-2	-1	-2	-6	-7	-2	0	3	7	4	-1	-8	-8	-2	0	0	-1	-2	-4	-6	-2	0	1	-2
2	0	1	0	-1	-4	-6	-3	-4	-5	-9	-8	-7	-8	-11	-15	-8	-8	-11	-13	-12	-8	-7	-5	-6
3	-4	-7	-8	-9	-10	-6	-4	-3	-2	-2	0	2	-1	-4	-4	-3	1	1	2	1	2	2	-1	-2
4	-1	1	0	-3	-5	-10	-15	-21	-26	-27	-23	-21	-18	-17	-15	-19	-21	-23	-22	-21	-20	-19	-19	-21
5	-23	-25	-27	-30	-33	-35	-34	-32	-27	-27	-25	-23	-24	-18	-11	-11	-11	-12	-8	-4	-6	-7	-6	-2
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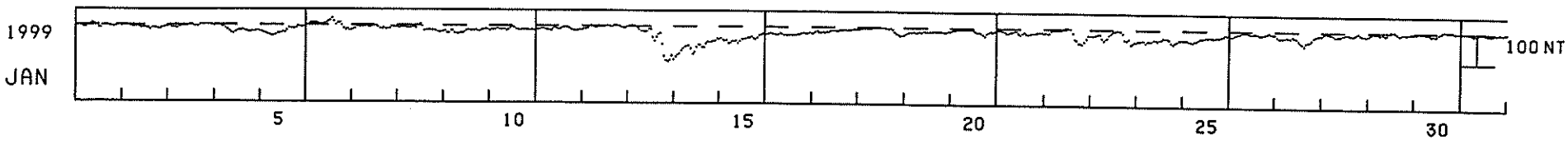
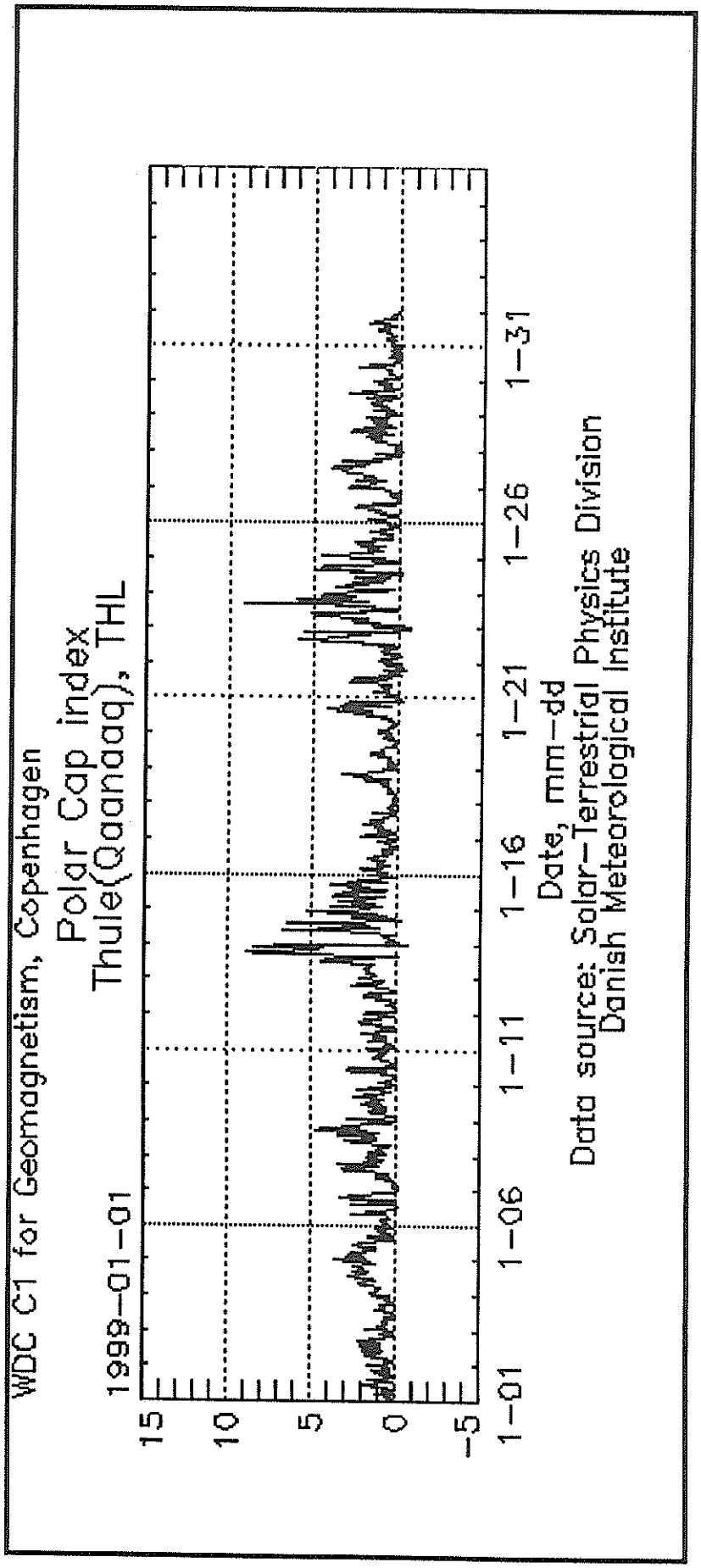
25	-32	-33	-35	-38	-39	-35	-34	-31	-28	-28	-25	-22	-24	-23	-24	-25	-24	-23	-24	-21	-19	-14	-15	-14
26	-19	-19	-14	-12	-11	-8	-6	-5	-6	-8	-9	-10	-9	-9	-11	-14	-14	-12	-10	-8	-6	-8	-10	-11
27	-17	-22	-22	-23	-21	-19	-21	-22	-18	-20	-23	-29	-36	-40	-45	-38	-34	-33	-27	-19	-16	-14	-12	-13
28	-7	-4	-6	-7	-9	-11	-16	-16	-16	-14	-10	-8	-7	-9	-11	-12	-11	-7	-4	-8	-12	-13	-14	-13
29	-8	-6	-4	-4	-6	-8	-6	-7	-10	-8	-1	4	2	1	-3	-8	-9	-6	-6	-7	-5	-4	-4	-4
30	-3	0	0	-2	-1	-3	-3	-7	-10	-10	-10	-9	-4	0	4	5	4	3	3	3	0	0	0	0
31	0	0	-1	-1	-2	-5	-8	-6	-3	-2	-1	-1	-3	-5	-5	-7	-6	-3	-3	-2	-2	-3	-1	0




WDC C1 for Geomagnetism, Copenhagen
Polar Cap index
Thule(Qaanaaq), THL
1999-01-01
15
10
5
0
-5
1-01
1-06
1-11
1-16
1-21
1-26
1-31
Date, mm-dd
Data source: Solar-Terrestrial Physics Division
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

JANUARY 1999

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	06	0408	..	..	..	..	06(5)	5	7	77	32	07	08
UJJ	13.6N	06	0700	..	..	..	..		-	4	68	25	08	23
NGP	11.3N	06	0700	..	..	..	..		-	3	87	24	08	23
ABG	09.4N	06	0700	..	..	..	..	06(5)	5	3	65	27	08	23
HYB	07.6N	06	0600	..	..	..	..	06(5)	5	5	83	26	08	22
PND	02.0N	06	0700	..	..	..	..		-	--	--	--	08	23
ETT	00.7S	06	0600	..	..	..	..		-	--	124	40	07	23
TRD	01.1S	06	0700	..	..	..	..		-	3	115	64	08	23
PAF	57.2S	06	1420	SC	- 6.5	- 53.7	- 20.5	06(5,6,7,8)	3	1	60	70	07	05
ETT	00.7S	08	0300	..	..	..	..		-	--	109	31	09	23
BJI	28.8N	13	1054	SC	21	19	1	14(4)	6	14	154	27	15	21
KRC	16.4N	13	1056	SC	- 1	21	10	13(6,8)	6	7	148	78	15	07
UJJ	13.6N	13	1053	SC	- 0.2	15	- 3		-	4	148	28	15	21
NGP	11.3N	13	1053	SC	..	..	..		-	--	--	--	15	21
ABG	09.4N	13	1053	SC	- 0.1	13	- 4	13(6,8)	6	3	167	30	15	21
HYB	07.6N	13	1054	SC	- 0.1	17	- 1	13(6,7,8)	6	3	148	18	15	22
PND	02.0N	13	1053	SC	--	--	--		-	--	--	--	15	21
TRD	01.1S	13	1053	SC	0.2	22	- 22		-	3	187	118	15	21
HER	33.6S	13	1054	SC	2	16	15	13(6,8)	6	33	162	171	15	00
AMS	46.8S	13	1054	SC*	3.4*	20.7*	- 15.3*	13(6,8)	5	31	134	67	15	21
CZT	51.5S	13	1054	SC	--	--	- 3.5	13(8)	7	23	243	112	15	20
PAF	57.2S	13	1054	SC*	5.7*	43.6*	8.3*	13(8)	8	100	821	431	15	20
KRC	16.4N	22	0234	..	..	..	..	22(5)	5	4	87	38	23	05
UJJ	13.6N	22	0700	..	..	..	..		-	3	90	22	24	20
NGP	11.3N	22	0700	..	..	..	..		-	3	125	17	24	20
ABG	09.4N	22	0700	..	..	..	..	23(6,7,8)	5	3	112	35	24	20
HYB	07.6N	22	0600	..	..	..	..	22(5,6) 23(7,8)	5	3	119	21	24	21
HYB	07.6N	22	2022	SC	- 0.3	17	- 1	23(7,8)	5	3	119	21	24	21
PND	02.0N	22	0700	..	..	..	..		-	--	--	--	24	20
ETT	00.7S	22	0100	..	..	..	..		-	--	179	53	24	21
ETT	00.7S	22	2022	SC	0.2	24	14		-	--	--	--	24	21
TRD	01.1S	22	0700	..	..	..	..		-	4	180	89	24	20
AMS	46.8S	22	16--	..	..	..	..	23(8)	5	20	72	51	25	15
CZT	51.5S	22	16--	..	..	..	..	23(7)	5	20	86	57	25	15
PAF	57.2S	22	13--	..	..	..	..	23(8)	6	40	290	295	25	15
DRV	75.2S	22	19--	..	..	..	..	23(1)	7	710	760	1060	25	15
KRC	16.4N	23	0907	..	..	..	..	23(6)	6	5	88	55	25	01

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

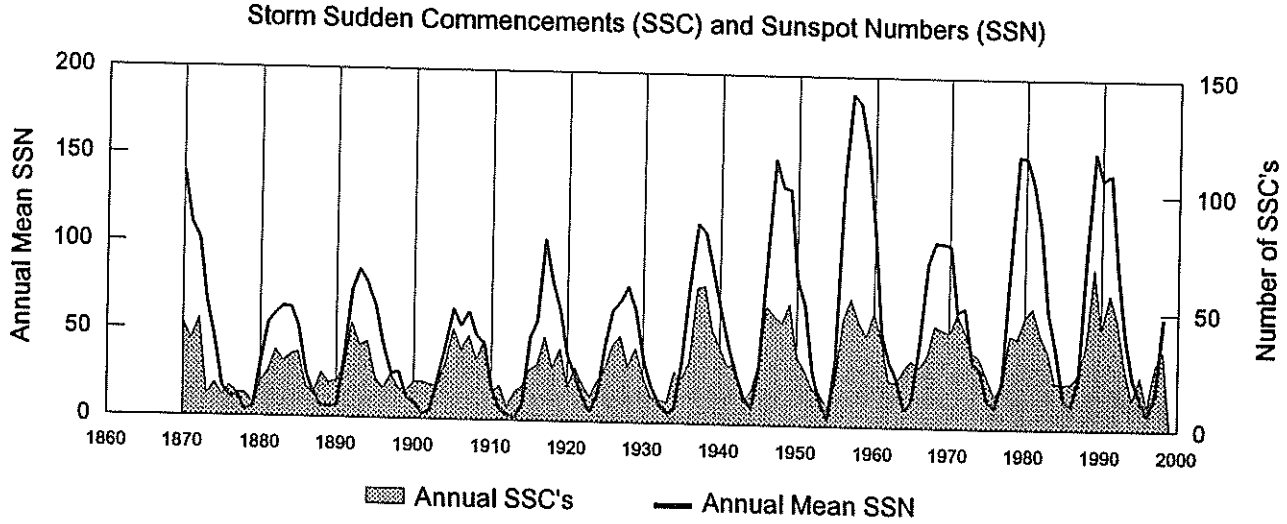
MAGNETIC STORM SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS (PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS)

JANUARY 1999

Storm Sudden Commencements (SSC)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
06	1420	A: COI* B: DOU C: WNG NGK GCK PAF* si: SPT QUE	16	1205-1213	BDV+
13	1054	A: NUR* WNG CLF* HRB NAG* B: SOD* DOU* BDV* HTY QUE GNA* HER C: NGK* GCK* EBR* COI SPT* HYB CNB AMS* CZT PAF*			

REPORTING OBSERVATORIES (up to the 4th of March 1999):
SOD NUR WNG NGK DOU BDV CLF HRB NAG GCK EBR COI SPT HTY QUE HYB ETT GNA HER CNB AMS CZT PAF DRV

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 (+).



☆U.S. GOVERNMENT PRINTING OFFICE:1999-773-002/29024

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."