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Number 594

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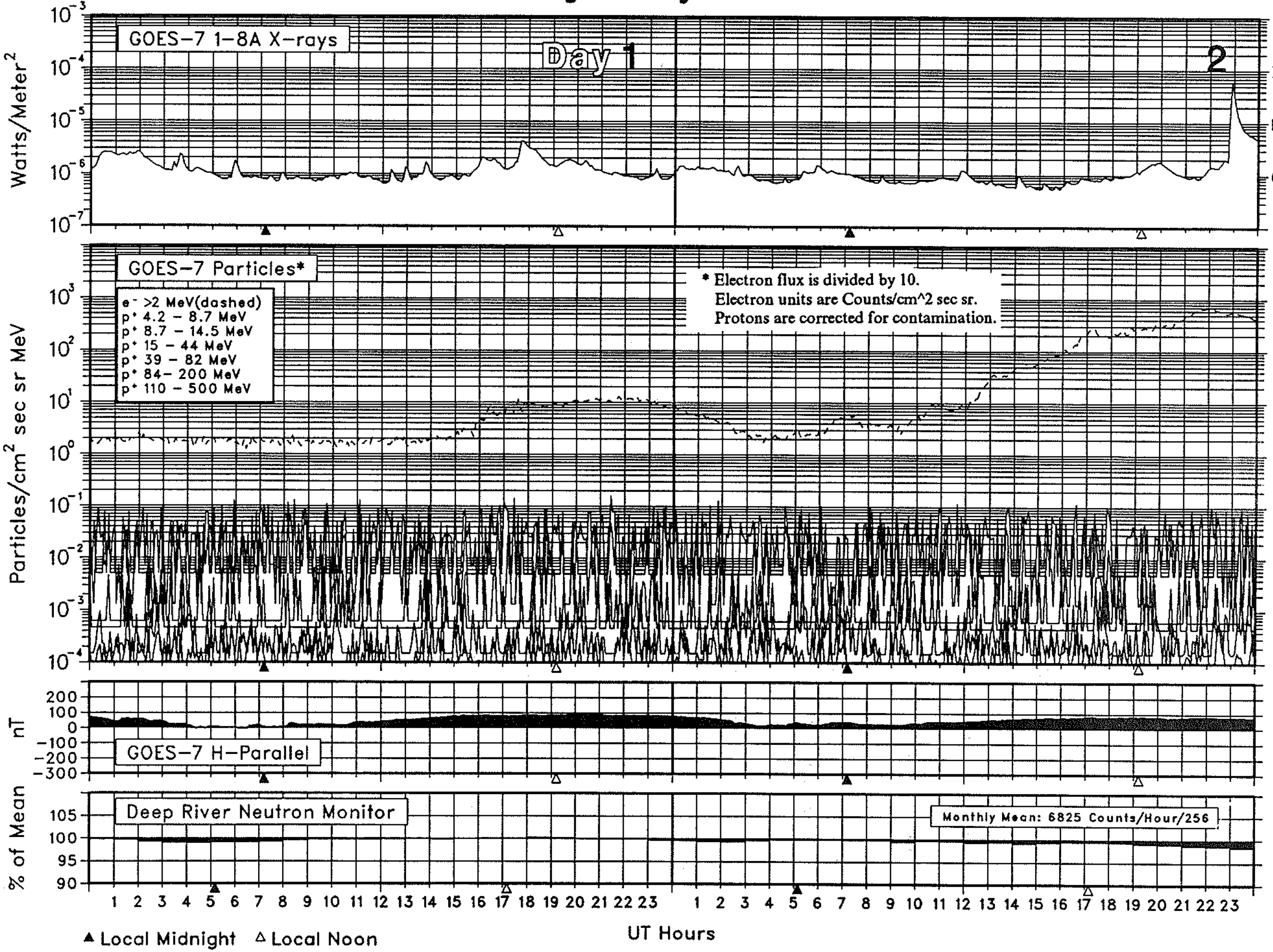

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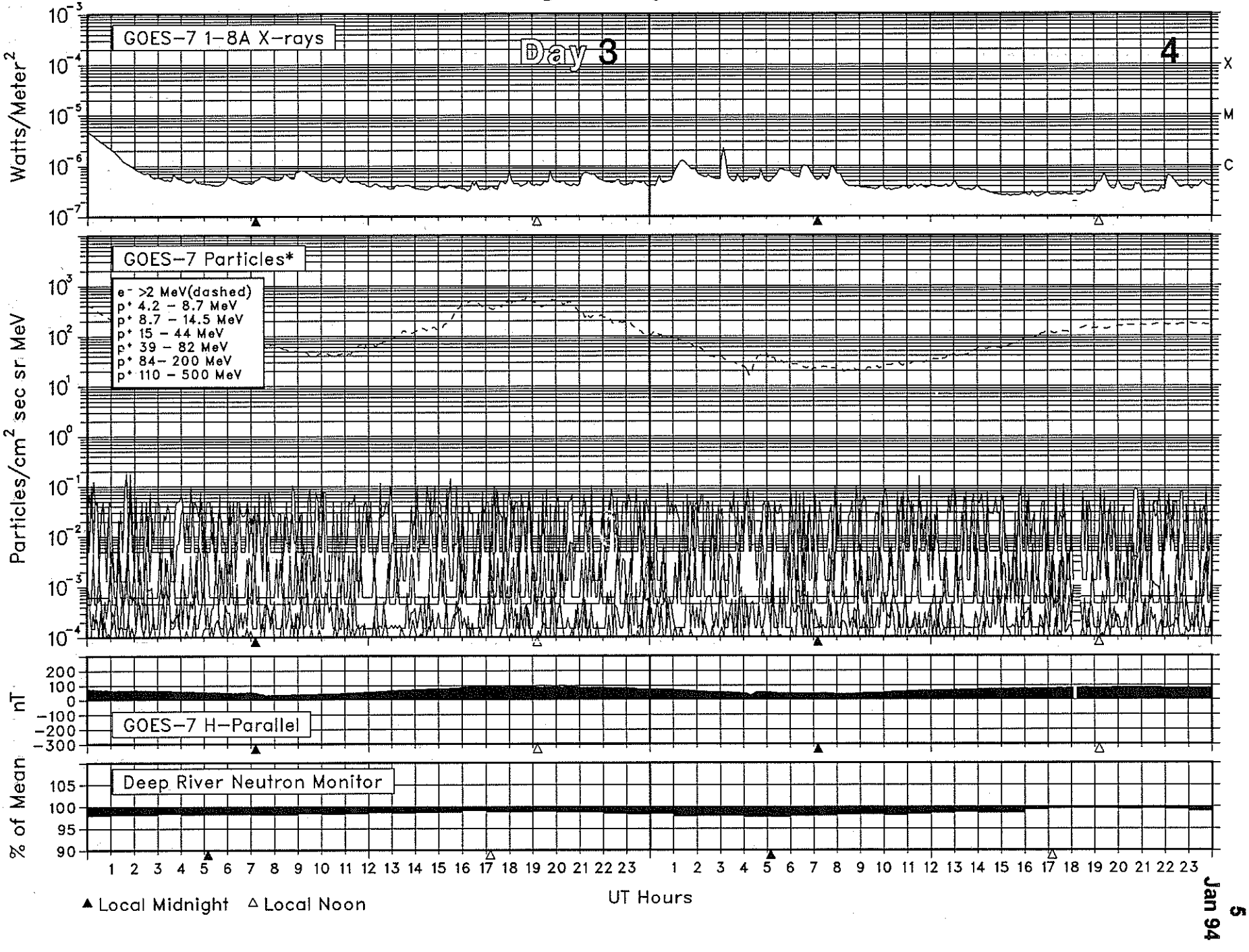

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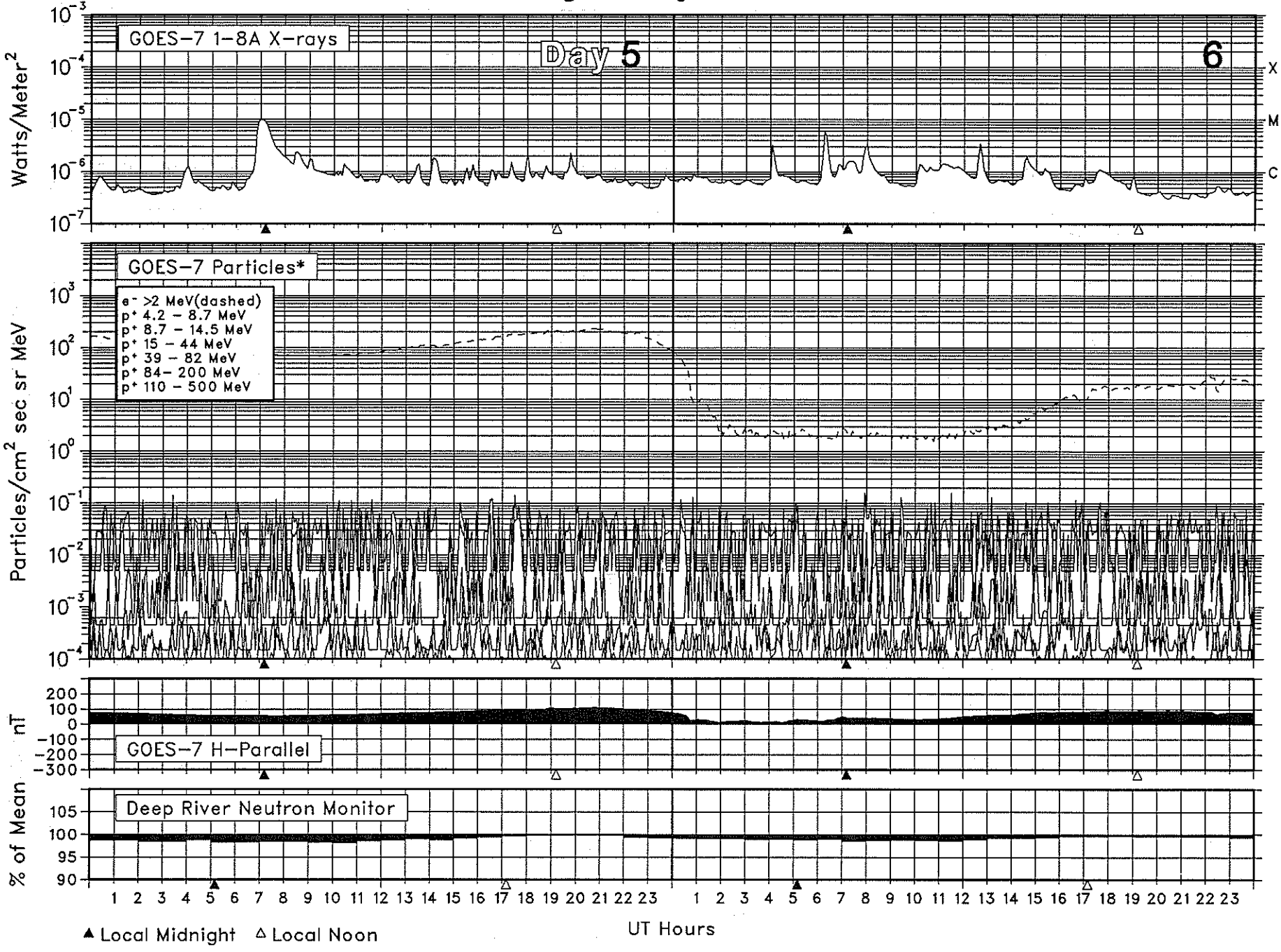
January 1994



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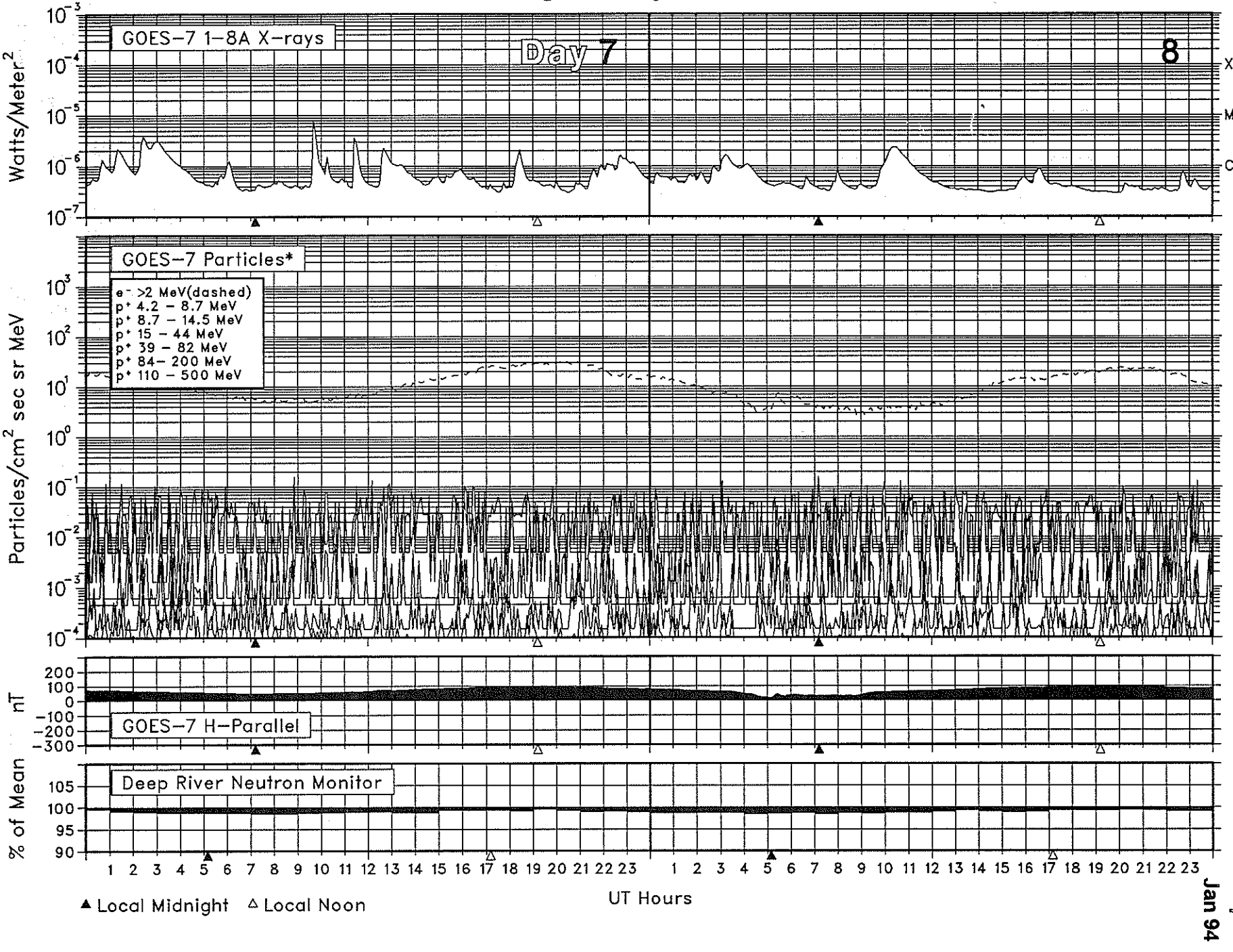

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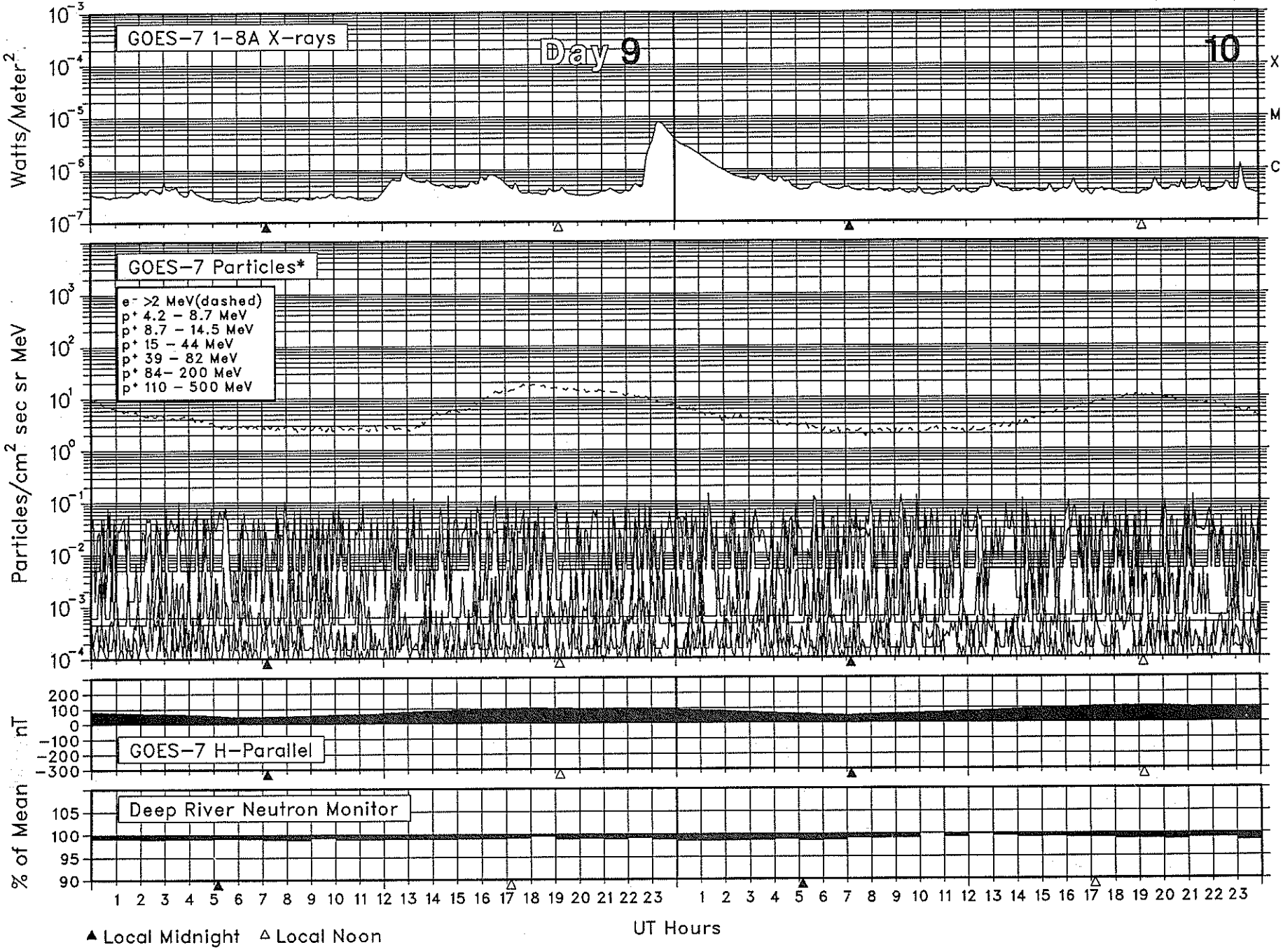

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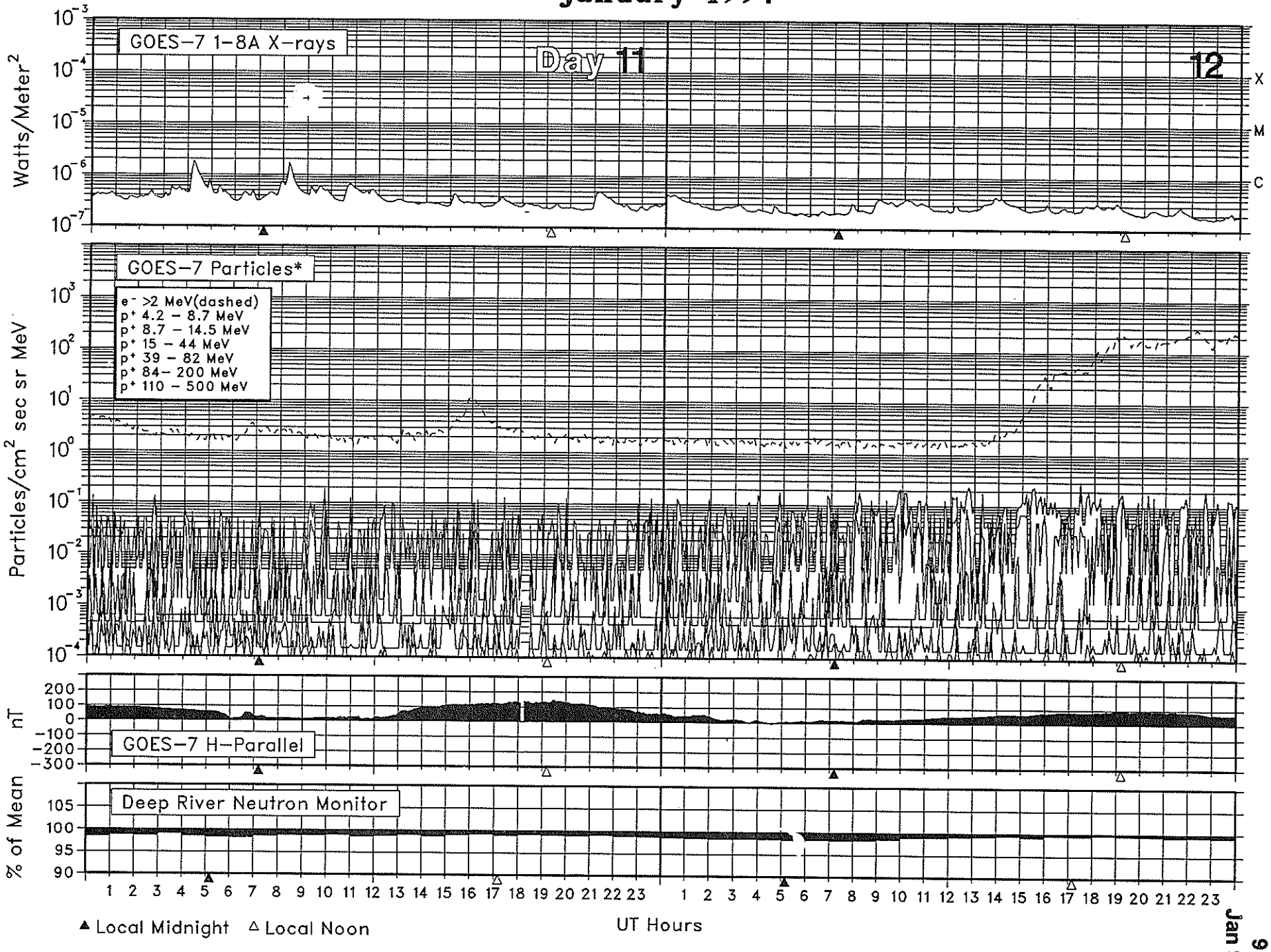
January 1994



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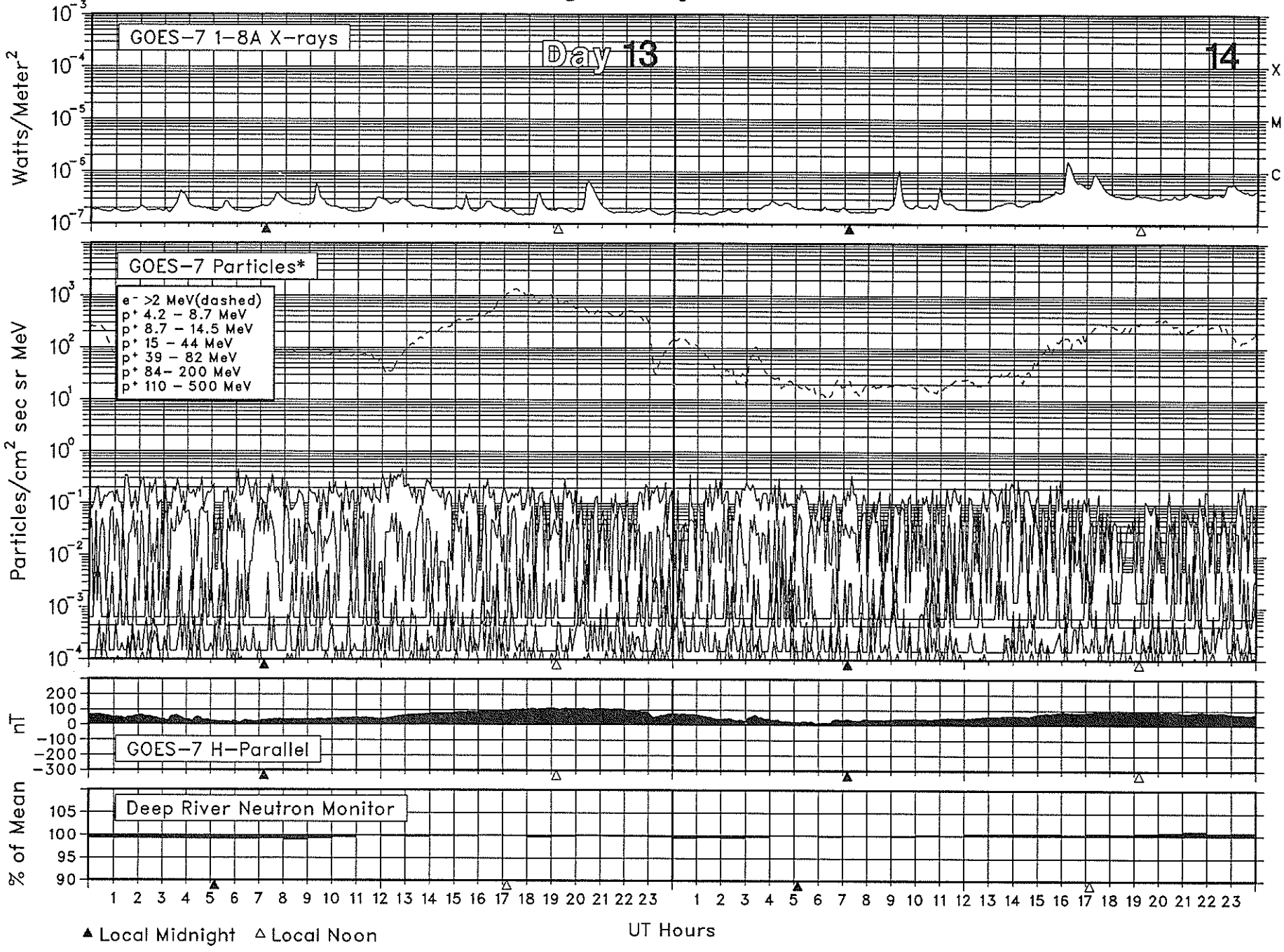

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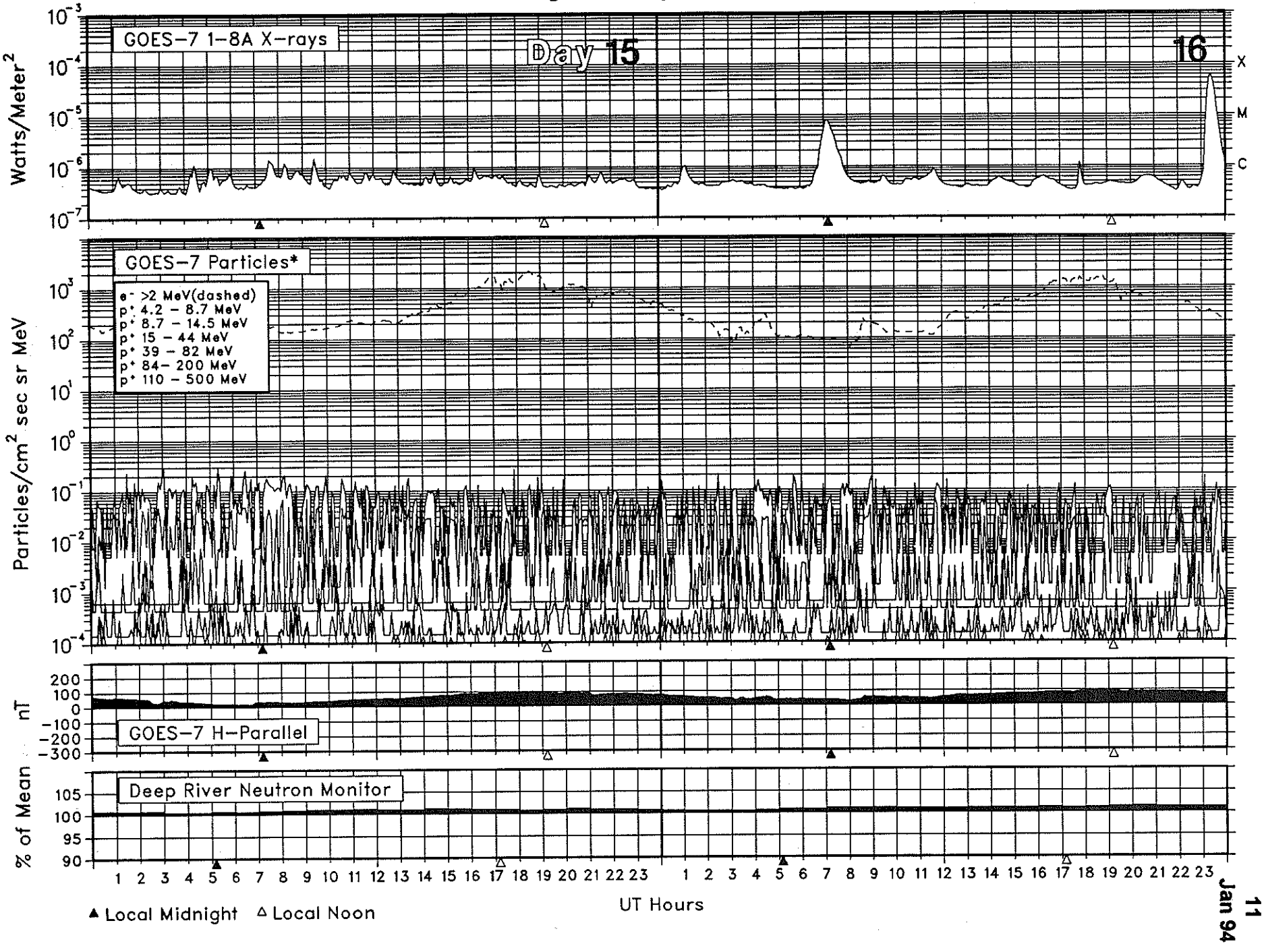

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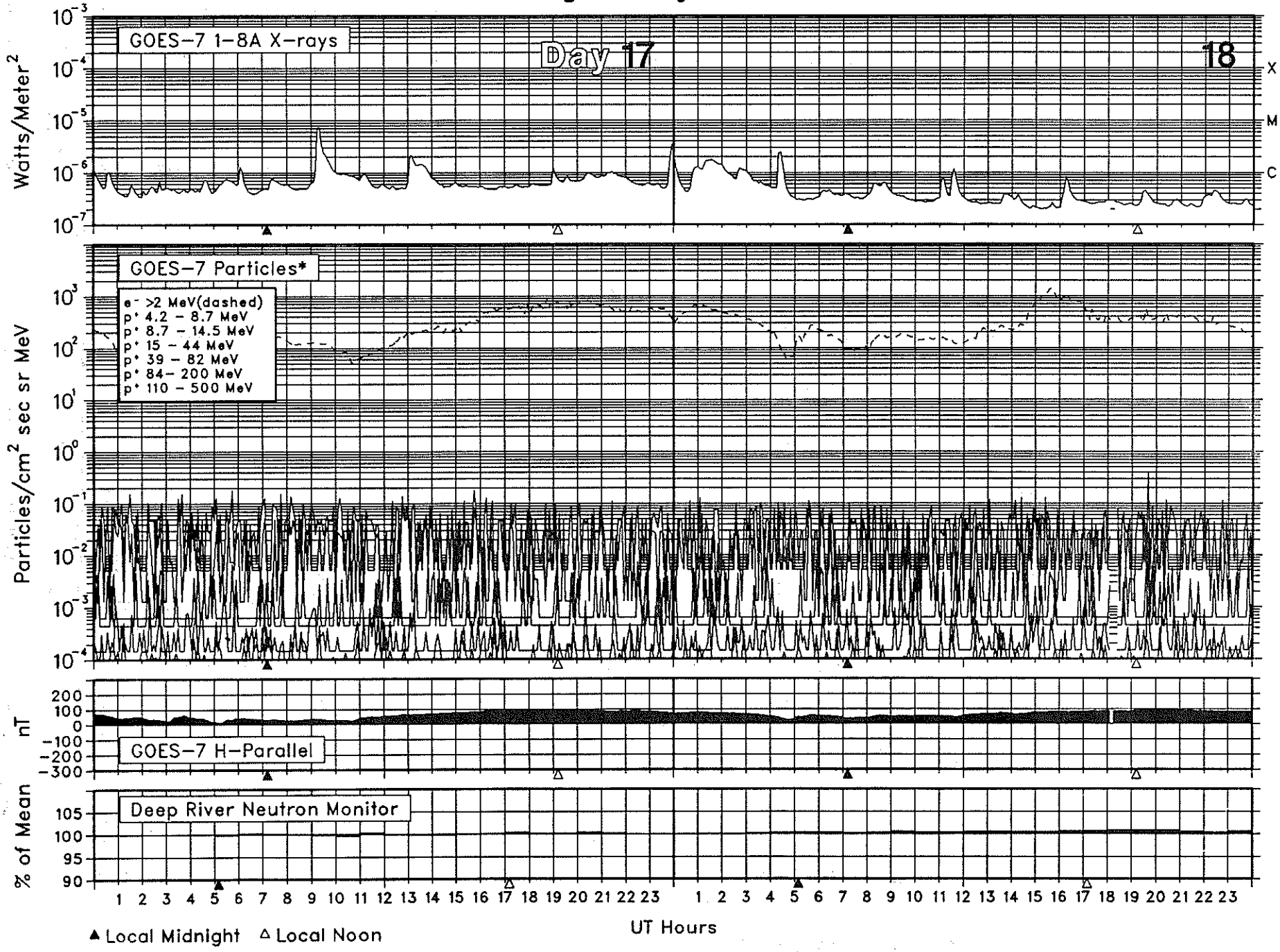

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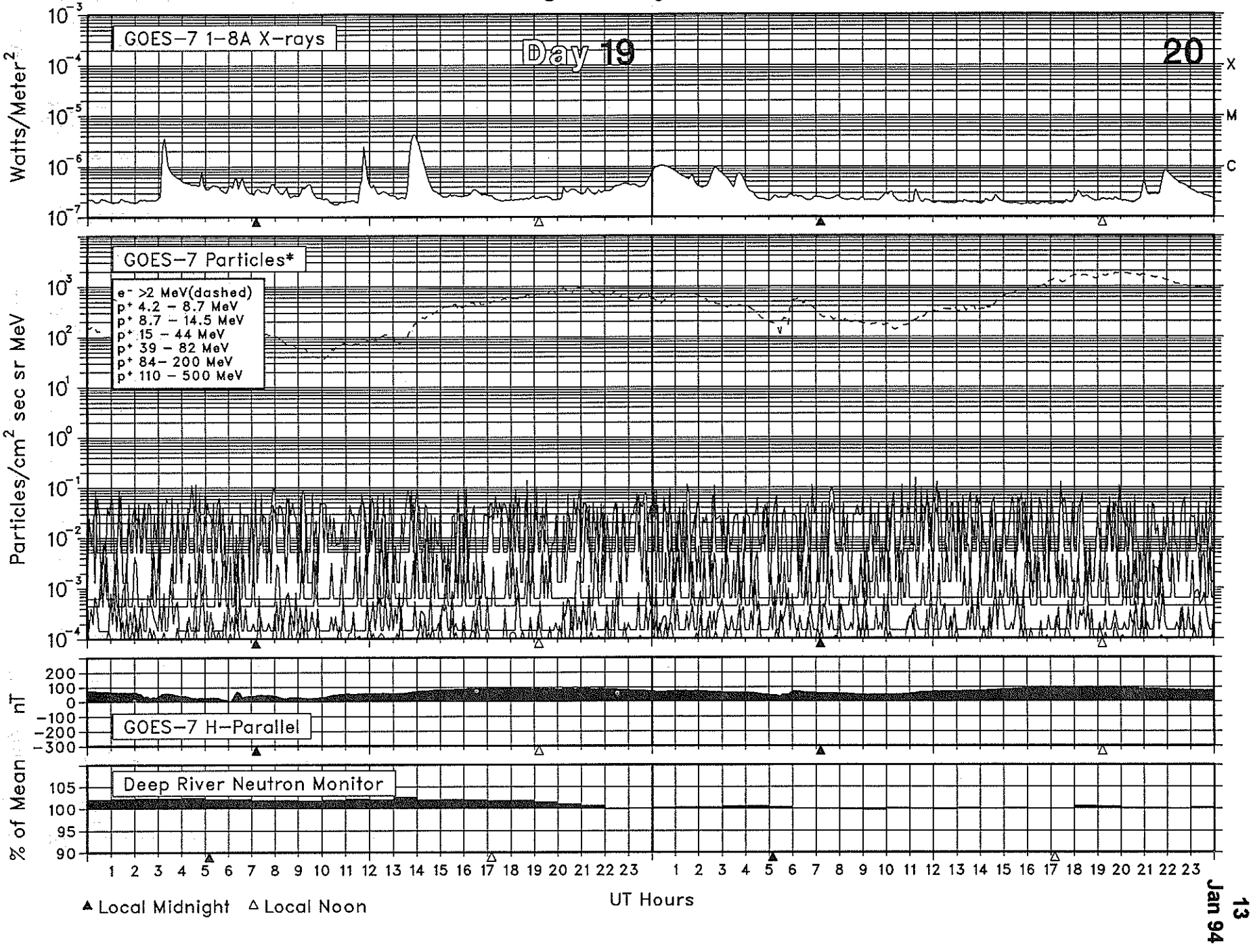

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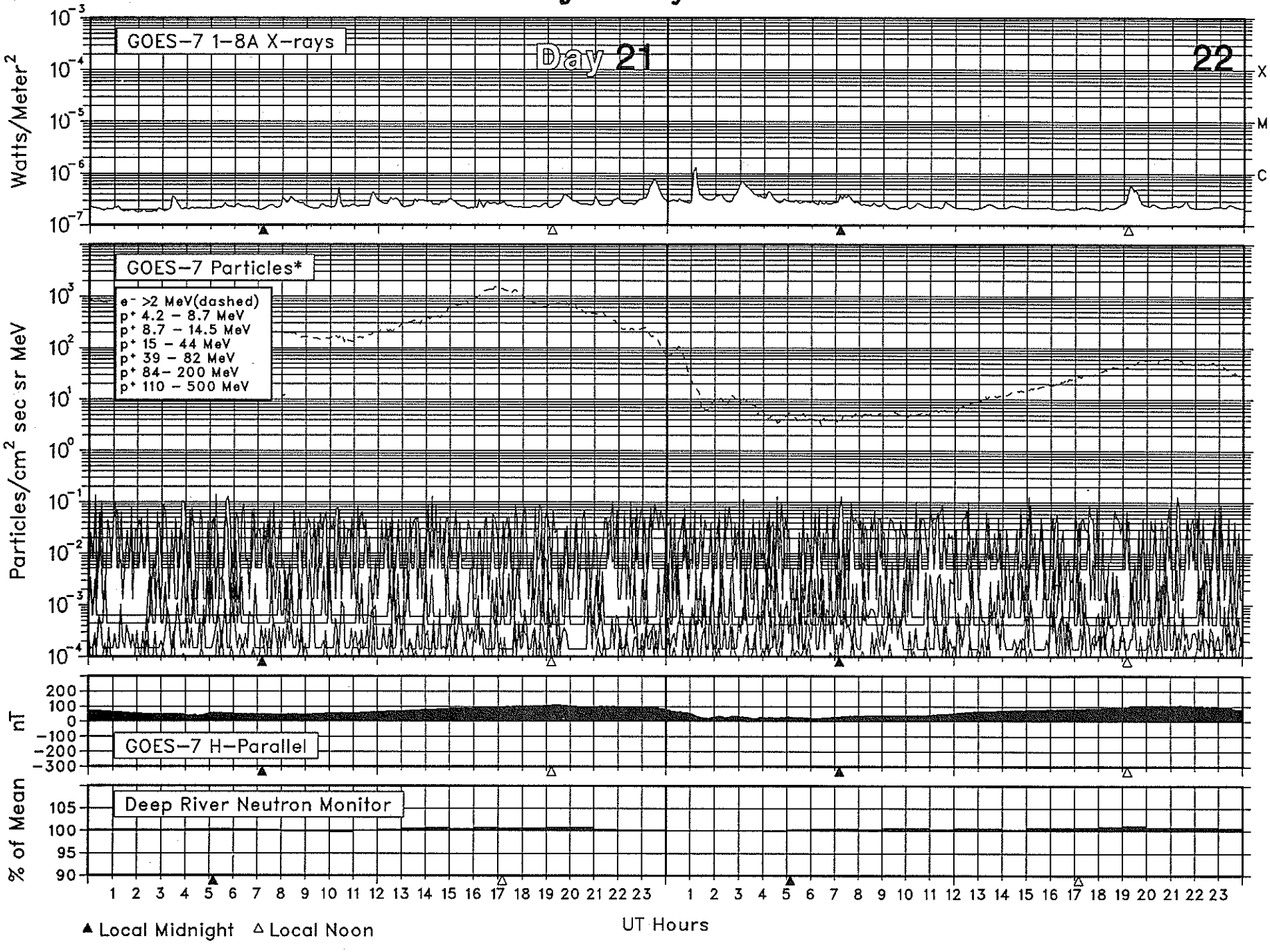

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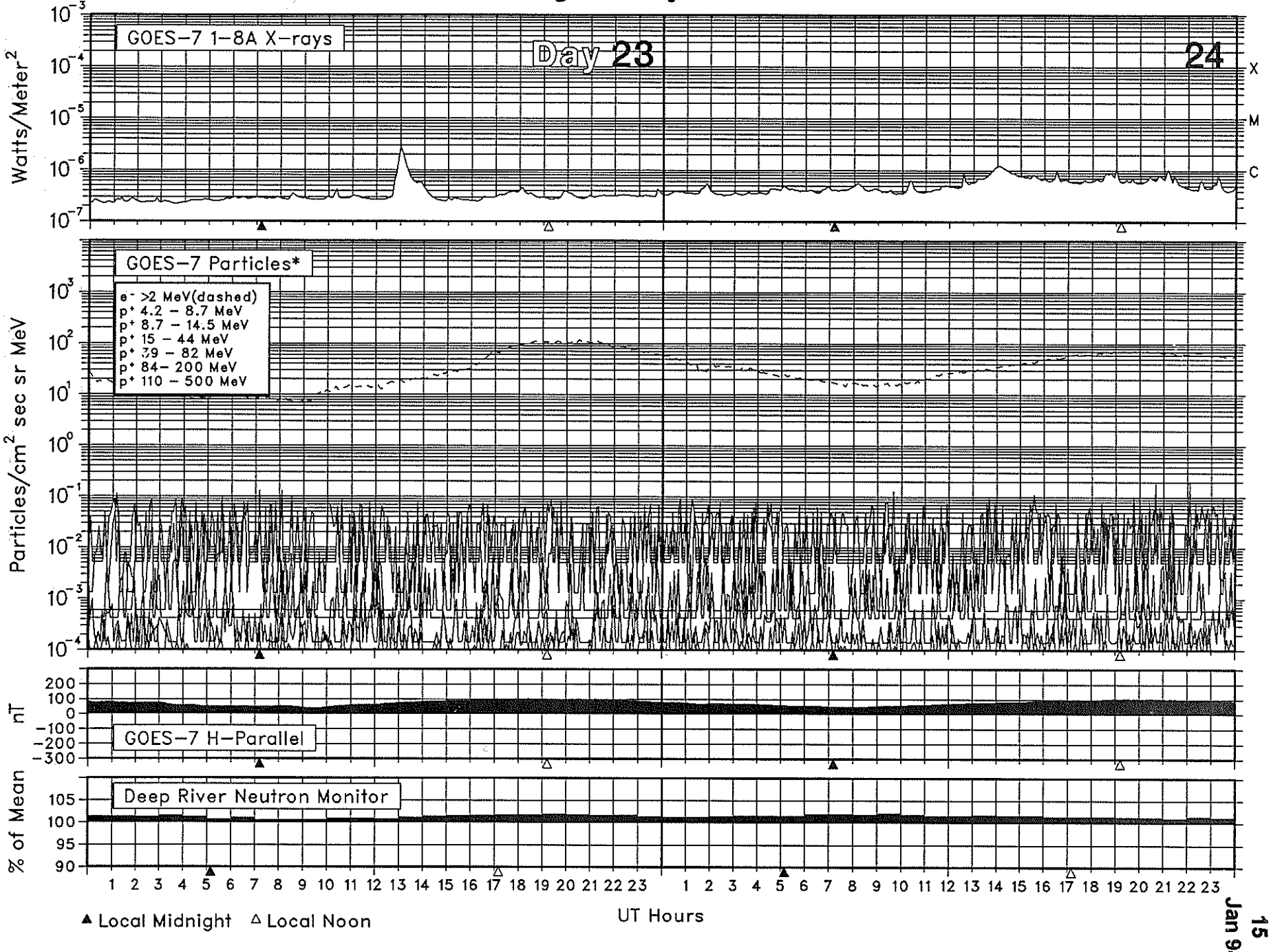

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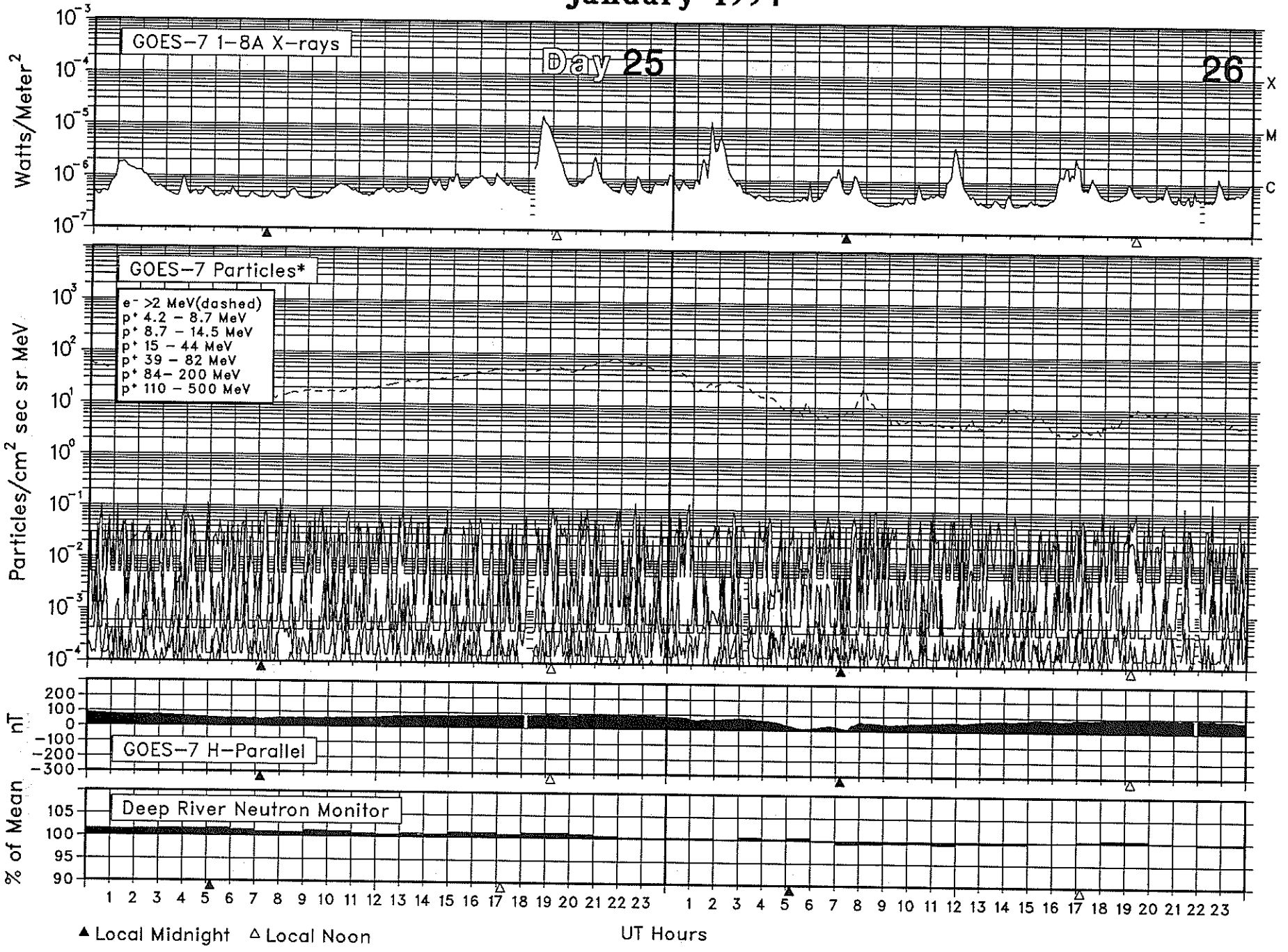

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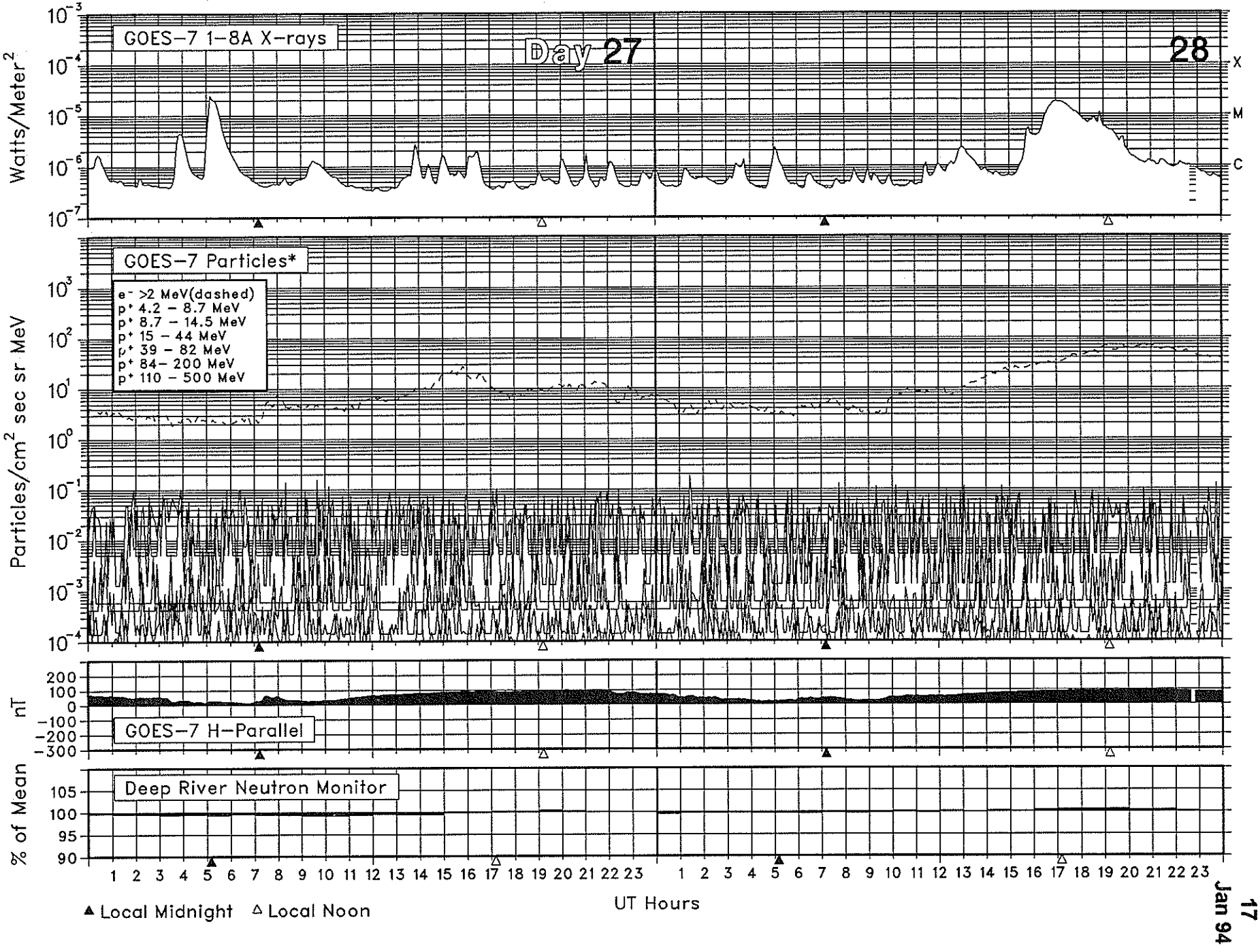

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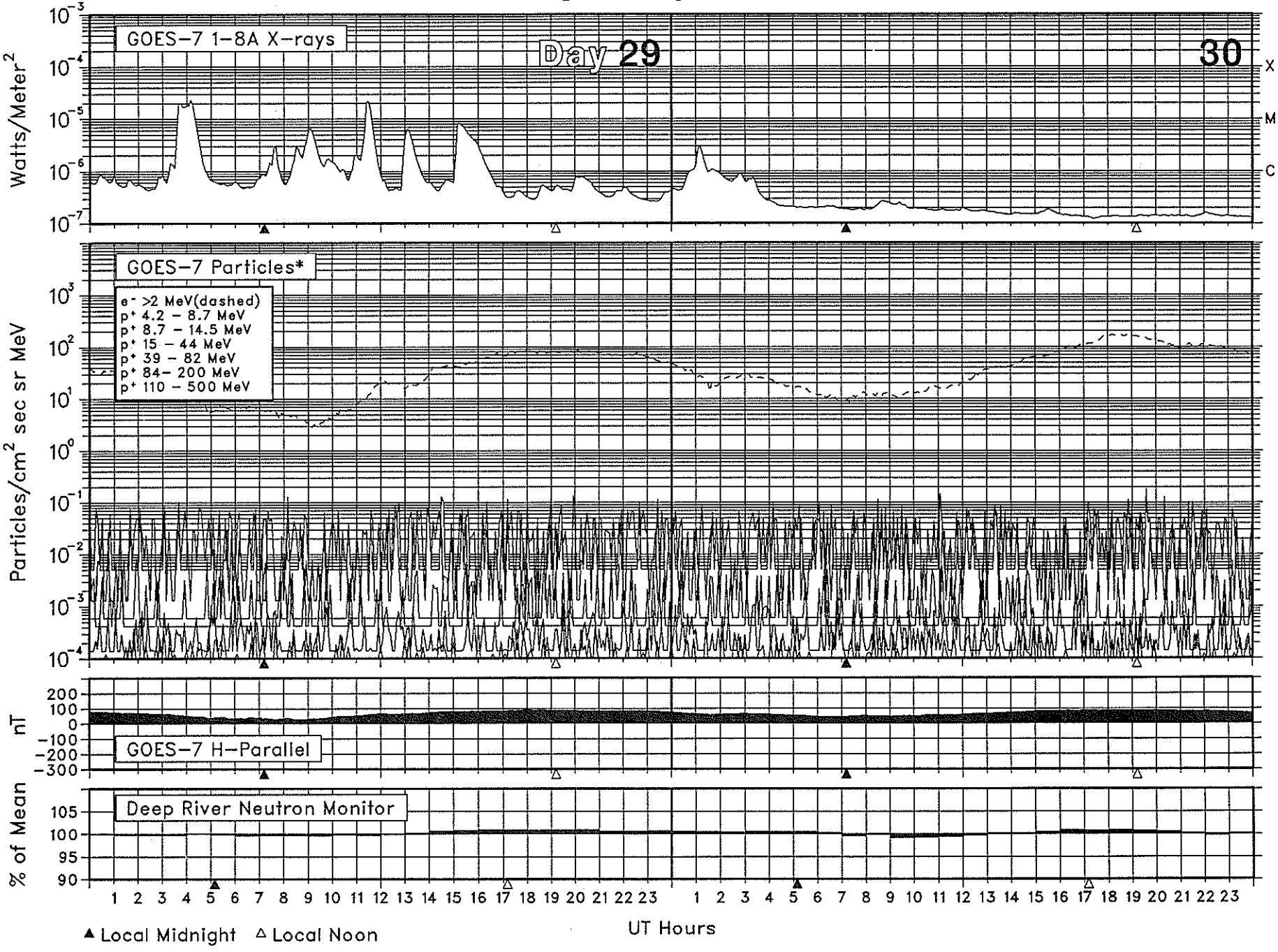

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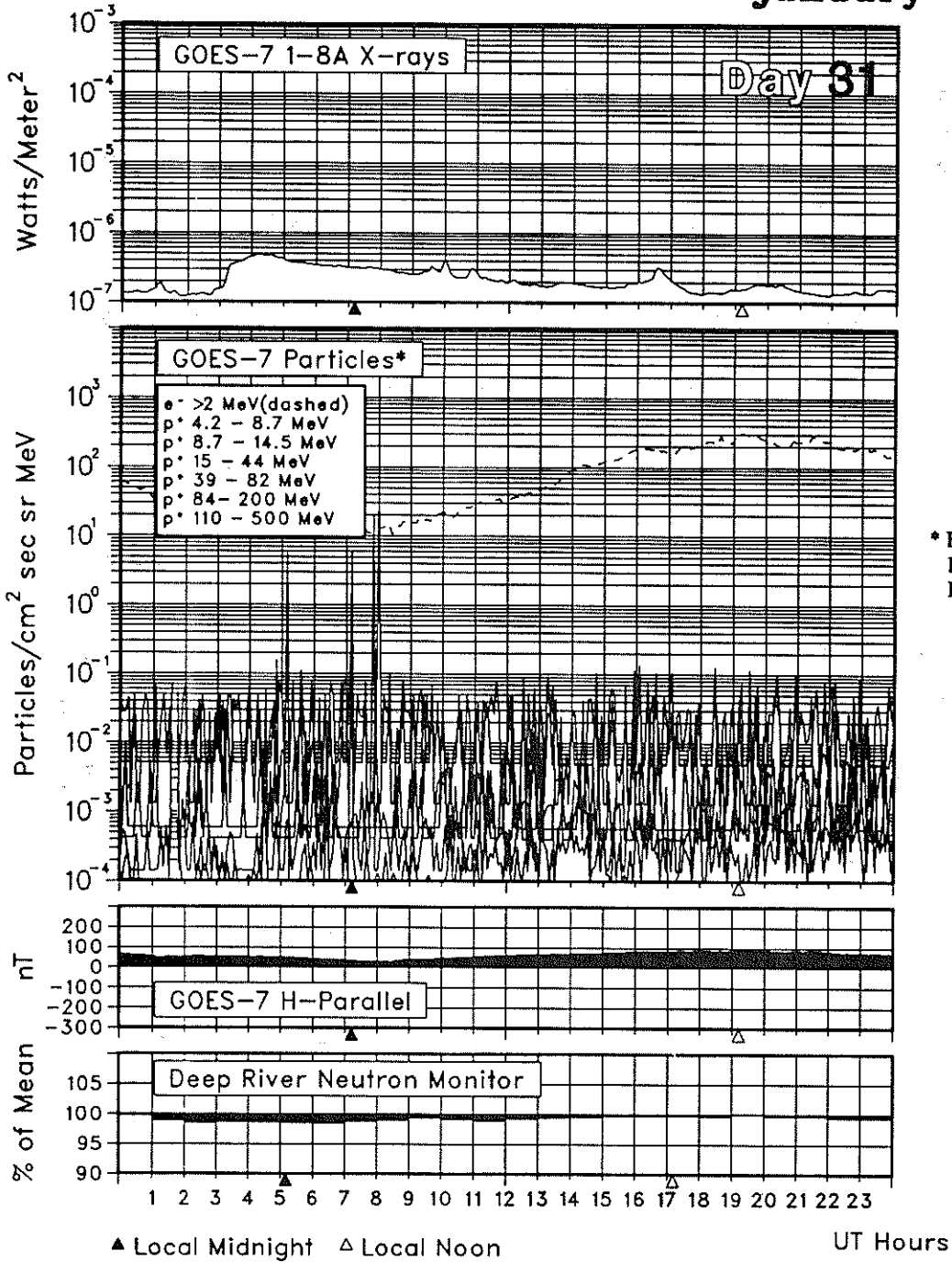
January 1994



* Electron flux is divided by 10.
Electron units are Counts/cm^2 sec sr.
Protons are corrected for contamination.

ERRATA -- GOES electron flux is divided by 10:

Please note that in all **SGD** Solar-Terrestrial Environment plots of the GOES electrons >2 MeV, <u>the electron flux is divided by 10</u>. The asterisk remark alerting users was inadvertently left off plots since mid-1992 when we had a change of staff. We apologize for this oversight. Also, protons from mid-1992 to present are corrected for contamination.

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages — JANUARY 1994

Julian Day	Date of Issue	Date of Obser-vation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat °Long	Flares Total	Flares M	Flares X	Date of Forecast	Region Forecast [1]	Geoadvice[1]
001	01	31	134	141	13	N08 W80	6	0	0	01	E	SOL: Eruptive
						N05 W75	0	0	0	01	Q	MAG: Quiet
						N11 W68	3	0	0	01	Q	PROTON: Quiet
						N11 E43	7	0	0	01	E	
						S09 E42	3	0	0	01	E	
						S15 E35	0	0	0	01	Q	
002	02	01	130	148	12	N10 W93	3	0	0	02	E	SOL: Active
						N06 W88	0	0	0	02	Q	MAG: Quiet
						N12 W83	0	0	0	02	Q	PROTON: Quiet
						N13 E30	2	0	0	02	E	
						S08 E27	2	0	0	02	E	
						S14 E20	1	0	0	02	E	
003	03	02	094	146	14	N12 E18	4	1	0	03	E	SOL: Eruptive
						S09 E14	2	0	0	03	E	MAG: Quiet
						S15 E06	0	0	0	03	E	PROTON: Quiet
004	04	03	134	133	11	N13 E03	0	0	0	04	E	SOL: Eruptive
						S08 E01	1	0	0	04	E	MAG: Quiet
						S14 W06	0	0	0	04	Q	PROTON: Quiet
						N06 E67	8	0	0	04	E	
						S12 E12	0	0	0	04	Q	
005	05	04	131	129	3	N13 W09	6	0	0	05	E	SOL: Eruptive
						S08 W12	0	0	0	05	E	MAG: Quiet
						S15 W21	0	0	0	05	Q	PROTON: Quiet
						N06 E56	8	0	0	05	E	
006	06	05	154	137	2	N12 W22	7	0	0	06	E	SOL: Eruptive
						S08 W26	9	0	0	06	A	MAG: Quiet
						S16 W35	1	1	0	06	Q	PROTON: Quiet
						N06 E42	3	0	0	06	E	
007	07	06	144	132	9	N12 W35	0	0	0	07	E	SOL: Active
						S09 W38	8	0	0	07	A	MAG: Quiet
						S16 W48	0	0	0	07	Q	PROTON: Quiet
						N06 E29	0	0	0	07	E	
						N04 E41	0	0	0	07	Q	
008	08	07	135	126	2	N13 W49	0	0	0	08	E	SOL: Eruptive
						S08 W51	11	1	0	08	E	MAG: Quiet
						S15 W61	1	0	0	08	Q	PROTON: Quiet
						N07 E17	0	0	0	08	E	
						S17 W46	0	0	0	08	Q	
						N05 E28	1	0	0	08	Q	
009	09	08	119	123	4	N13 W64	0	0	0	09	Q	SOL: Eruptive
						S09 W66	3	0	0	09	E	MAG: Quiet
						S15 W73	2	0	0	09	Q	PROTON: Quiet
						N06 E03	0	0	0	09	Q	
						S19 W58	0	0	0	09	Q	
						N05 E14	0	0	0	09	Q	
010	10	09	098	117	0	N13 W80	0	0	0	10	Q	SOL: Eruptive
						S08 W82	2	0	0	10	E	MAG: Quiet
						N07 W10	0	0	0	10	Q	PROTON: Quiet
						S20 W72	0	0	0	10	Q	
						N05 W00	0	0	0	10	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages — JANUARY 1994

Julian Day	Date of Issue	Date of Obser-vation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Region Forecast [1]	Geoadvice[1]
						°Lat	°Long	Total	M	X			
011	11	10	074	110	0	S09	W93	0	0	0	11	E	SOL: Eruptive
						N06	W25	4	0	0	11	Q	MAG: Quiet
						N05	W14	0	0	0	11	E	PROTON: Quiet
012	12	11	056	101	16	N07	W38	1	0	0	12	Q	SOL: Eruptive
						N05	W28	3	0	0	12	Q	MAG: Active
						N05	W14	0	0	0	12	E	PROTON: Quiet
013	13	12	066	098	18	N07	W55	1	0	0	13	Q	SOL: Eruptive
						N05	W42	0	0	0	13	Q	MAG: Active
						S06	W19	0	0	0	13	Q	PROTON: Quiet
014	14	13	061	095	22	N07	W69	1	0	0	14	Q	SOL: Quiet
						N05	W56	2	0	0	14	Q	MAG: Active
						S05	W33	0	0	0	14	Q	PROTON: Quiet
015	15	14	046	090	14	N07	W80	1	0	0	15	Q	SOL: Eruptive
						N05	W68	0	0	0	15	Q	MAG: Active
						S06	W47	0	0	0	15	Q	PROTON: Quiet
016	16	15	045	096	17	N06	W91	0	0	0	16	Q	SOL: Eruptive
						N05	W83	0	0	0	16	Q	MAG: Quiet
						S07	W61	0	0	0	16	Q	PROTON: Quiet
						N05	E72	0	0	0	16	Q	
						S05	W82	0	0	0	16	Q	
017	17	16	049	100	13	N06	W93	0	0	0	17	Q	SOL: Active
						S06	W76	0	0	0	17	Q	MAG: Quiet
						N03	E57	0	0	0	17	Q	PROTON: Quiet
						S04	W95	0	0	0	17	Q	
						N08	E72	1	0	0	17	E	
						S07	W24	0	0	0	17	Q	
018	18	17	034	105	17	N04	E42	0	0	0	18	Q	SOL: Active
						N08	E55	5	0	0	18	A	MAG: Quiet
						N03	E57	0	0	0	18	Q	PROTON: Quiet
019	19	18	043	101	21	N04	E30	0	0	0	19	Q	SOL: Eruptive
						N08	E44	1	0	0	19	E	MAG: Active
						S22	W10	0	0	0	19	Q	PROTON: Quiet
020	20	19	039	103	23	N04	E18	0	0	0	20	Q	SOL: Eruptive
						N08	E32	3	0	0	20	E	MAG: Active
						S22	W10	0	0	0	20	Q	PROTON: Quiet
021	21	20	054	105	10	N04	E04	0	0	0	21	Q	SOL: Eruptive
						N09	E19	1	0	0	21	E	MAG: Active
						S22	W10	0	0	0	21	Q	PROTON: Quiet
022	22	21	078	111	5	N04	W09	0	0	0	22	Q	SOL: Eruptive
						N08	E08	4	0	0	22	E	MAG: Active
						N12	W21	0	0	0	22	Q	PROTON: Quiet
023	23	22	102	113	5	N04	W23	0	0	0	23	Q	SOL: Eruptive
						N09	W08	2	0	0	23	E	MAG: Quiet
						N12	W37	1	0	0	23	Q	PROTON: Quiet
						N12	E14	0	0	0	23	Q	
						S13	E47	0	0	0	23	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages — JANUARY 1994

Julian Day	Date of Issue	Date of Obser-vation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat °Long	Flares Total	Flares M	Flares X	Date of Forecast	Region Forecast [1]	Geoadvice[1]
024	24	23	105	118	3	N05 W36	0	0	0	24	Q	SOL: Eruptive
						N10 W22	1	0	0	24	E	MAG: Quiet
						N13 W50	0	0	0	24	Q	PROTON: Quiet
						N12 E02	0	0	0	24	Q	
						S14 E36	0	0	0	24	Q	
						S08 E70	0	0	0	24	Q	
025	25	24	106	129	2	N04 W50	0	0	0	25	Q	SOL: Quiet
						N09 W35	2	0	0	25	E	MAG: Active
						N10 W63	0	0	0	25	Q	PROTON: Quiet
						N12 W12	1	0	0	25	Q	
						S12 E26	0	0	0	25	Q	
						N08 E38	0	0	0	25	E	
026	26	25	116	132	2	N04 W63	0	0	0	26	Q	SOL: Eruptive
						N08 W49	14	1	0	26	E	MAG: Quiet
						N11 W78	0	0	0	26	Q	PROTON: Quiet
						N12 W25	2	0	0	26	E	
						S13 E11	0	0	0	26	Q	
						S09 E42	0	0	0	26	Q	
						N08 E25	1	0	0	26	Q	
027	27	26	090	128	18	N04 W76	0	0	0	27	Q	SOL: Eruptive
						N09 W63	12	1	0	27	E	MAG: Active
						N12 W38	2	0	0	27	E	PROTON: Quiet
						S12 W00	0	0	0	27	Q	
						N08 E11	0	0	0	27	E	
028	28	27	063	120	18	N04 W93	0	0	0	28	Q	SOL: Eruptive
						N09 W78	6	1	0	28	E	MAG: Active
						N12 W53	0	0	0	28	E	PROTON: Quiet
						N08 W02	0	0	0	28	Q	
029	29	28	060	119	13	N09 W90	1	1	0	29	E	SOL: Eruptive
						N13 W67	0	0	0	29	Q	MAG: Active
						N08 W16	0	0	0	29	Q	PROTON: Quiet
						S16 E36	0	0	0	29	Q	
030	30	29	089	102	6	N13 W78	1	0	0	30	Q	SOL: Eruptive
						S09 W09	0	0	0	30	Q	MAG: Quiet
						N09 W29	0	0	0	30	Q	PROTON: Quiet
						S17 E23	0	0	0	30	Q	
						N12 E19	0	0	0	30	Q	
						S07 E62	0	0	0	30	Q	
						N04 E76	0	0	0	30	Q	
031	31	30	081	099	6	N10 W92	0	0	0	31	Q	SOL: Quiet
						N09 W43	0	0	0	31	Q	MAG: Quiet
						S16 E10	0	0	0	31	Q	PROTON: Quiet
						N12 E06	0	0	0	31	Q	
						S07 E49	0	0	0	31	Q	
						N05 E65	0	0	0	31	Q	

[1] **Region Forecast and Flare Geoadvice**

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, probabiljty >=50%)
P =Proton (Proton flares exptected, probability >=50%)
Warning condition (activity levels expected to increase, but no numeric forecast given)
Nil (end of Alert period)
No forecast

Magnetic Geoadvice

Quiet
Active conditions expected (A>=20 or K=4)
Minor storm expected (A>=30 or K=5)
Major magstorm expected (A>=50 or K>=6)
Severe magstorm expected (A>=100 or K>=7)
Magstorm in progress (A>=30 or K>=4)
Warning condition (activity levels expected to increase, but no numeric forecast given)
Nil (end of Alert period)
No forecast

Proton Geoadvice

Quiet
Proton event expected (10 pfu at >10 MeV)
Major proton event expected (100 pfu at >100 MeV)
Proton event in progress (>10 MeV)
Warning condition (activity levels expected to increase, but no numeric forecast given)
Nil (end of Alert period)
No forecast

STRATWARM ALERTS

01/01/94 03:30:00
GEOALERT WWA001 STRATWARM ALERT/FRIDAY/STRATWARM EXISTS.
INTENSE WARMING OVER CENTRAL AND NORTHEASTERN SIBERIA, ALASKA,
NORTHWESTERN CANADA AND THE SIBERIAN AND CANADIAN ARCTIC CONTINU
SPREADING NORTH AND NORTHEASTWARDS. TEMPERATURE GRADIENT
REVERSED BETWEEN 60N AND THE POLE AT 10 HPA AND UPWARDS IN THE
UPPER STRATOSPHERE.

01/02/94 03:30:00
GEOALERT WWA002 STRATWARM ALERT/SATURDAY/STRATWARM EXISTS.
INTENSE WARMING OVER CENTRAL AND NORTHEASTERN
SIBERIA,ALASKA AND THE SIBERIAN AND CANADIAN
ARCTIC CONTINUES,SLOWLY WEAKENING.
TEMPERATURE GRADIENT REVERSED BETWEEN 60N AND
THE POLE IN THE MIDDLE AND UPPER STRATOSPHERE
FROM 30 HPA UPWARDS.

STRATWARM ALERTS – continued

01/03/94 03:30:00
GEOALERT WWA003 STRATWARM ALERT/SUNDAY/STRATWARM EXISTS.
INTENSE WARMING OVER CENTRAL AND NORTHEASTERN SIBERIA, ALASKA,
NORTHERN CANADA AND THE SIBERIAN AND CANADIAN ARCTIC CONTINUES.
TEMPERATURE GRADIENT REVERSED BETWEEN 60N AND THE POLE FROM 50
HPA UPWARDS INTO THE UPPER STRATOSPHERE.

01/04/94 03:30:00
GEOALERT WWA004 STRATWARM ALERT/MON/STRATWARM EXISTS.
INTENSE WARMING OVER SIBERIA, ALASKA, AND CANADA
CONTINUES. TEMPERATURE GRADIENT BETWEEN 60N AND THE
POLE REVERSED THROUGHOUT THE STRATOSPHERE.

01/05/94 03:30:00
GEOALERT WWA005 STRATWARM ALERT/TUE/STRATWARM EXISTS.
WARM REGION OVER SIBERIA, ALASKA, AND CANADA PERSISTS
BUT TEMPERATURES DECREASE. TEMPERATURE GRADIENT BETWEEN
60N AND THE POLE TODAY STILL REVERSED THROUGHOUT
THE STRATOSPHERE.

01/06/94 03:30:00
GEOALERT WWA006 NO STRATWARM MESSAGE RECEIVED DUE TO COMM PROBLEMS.

01/07/94 03:30:00
GEOALERT WWA007 STRATWARM ALERT/THU/STRATWARM EXISTS.
WARMING OVER ALASKA WEAKENING, BUT WARMING OVER
CENTRAL SIBERIA INTENSIFYING AND MOVING
NORTHEASTWARD. TEMPERATURE GRADIENT NO LONGER
REVERSED BETWEEN 60N AND THE POLE IN THE LOWER AND
MIDDLE STRATOSPHERE. A NEW WARMING DEVELOPING AROUND
MADEIRA, WARM AIR SPREADING NORTHEASTWARD.
FREE UNIVERSITY, BERLIN

01/08/94 03:30:00
GEOALERT WWA008 STRATWARM ALERT/FRI/STRATWARM EXISTS.
WARMING FROM SIBERIA ACROSS ALASKA TO CANADA AND WARMING
OVER SOUTHEASTERN EUROPE SPREADING NORTHEASTWARD TODAY.
FREE UNIVERSITY, BERLIN SENDS

STRATWARM ALERTS – continued

_01/09/94 03:30:00
GEOALERT WWA009 STRATWARM ALERT/SAT/STRATWARM EXISTS.
WARMINGS ARE MOVING SOUTHWARDS OVER SIBERIA,BERING SEA,CANADA AND SOUTHEASTERN EUROPE,TODAY.TEMPERATURE GRADIENT IS REVERSED BETWEEN 60N AND THE POLE ONLY ABOVE 10 HPA IN THE UPPER STRATOSPHERE.

01/10/94 03:30:00
GEOALERT WWA010 STRATWARM ALERT/SUN/STRATWARM EXISTS.
WARMINGS OVER SIBERIA,BERING STRAIT,EASTERN CANADA AND OVER SOUTHERN EUROPE,THE COLD AIR STAYS STILL OVER GREENLAND AND EUROPEAN ARCTIC,TODAY.

01/11/94 03:30:00
GEOALERT WWA011 STRATWARM ALERT/MON/STRATWARM EXISTS.
STRATWARM ALERT/ MONDAY/ STRATWARM EXISTS. MINOR WARMING OVER SIBERIA, ALASKA AND CANADA WEAKENING,
BUT A NEW WARMING OVER THE MEDITERRANEAN AREA INTENSIFYING AND SPREADING NORTHEASTWARDS. POLAR REGION COOLING.

International Relative Sunspot Numbers

Day	Feb 93	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*	Jan 94*
1	22	76	67	33	105	58	38	26	64	10	62	86
2	34	80	67	32	102	61	40	24	95	20	56	84
3	73	84	75	42	101	66	36	22	87	18	60	95
4	85	93	67	69	82	80	35	23	100	21	66	103
5	119	105	75	77	75	73	27	22	90	30	63	104
6	121	96	89	75	83	58	49	14	71	33	55	101
7	128	93	79	74	72	45	43	12	65	31	65	94
8	134	82	81	81	55	40	47	12	64	33	57	81
9	126	85	87	87	46	38	59	16	76	23	53	71
10	114	81	79	120	47	31	65	9	58	25	46	51
11	95	86	56	125	37	35	73	12	65	14	35	38
12	97	77	37	116	18	35	58	9	56	15	21	44
13	92	67	22	85	10	51	60	10	35	21	17	45
14	82	56	15	59	10	63	39	10	29	26	23	36
15	73	60	13	51	10	66	29	10	52	29	8	35
16	88	56	13	37	13	63	22	23	56	32	20	29
17	68	60	34	32	17	67	29	21	38	35	21	25
18	80	69	49	24	16	80	28	19	37	37	28	30
19	88	72	51	14	15	82	28	15	44	40	18	28
20	97	70	89	33	24	71	23	15	63	40	27	35
21	92	78	98	25	26	66	31	14	66	56	37	53
22	100	73	93	19	27	58	42	14	61	52	44	65
23	101	63	96	22	51	68	42	16	61	53	54	60
24	90	42	98	33	50	66	56	23	52	54	63	70
25	88	40	88	53	59	61	53	43	39	40	82	66
26	86	46	53	66	59	55	44	43	55	40	62	67
27	86	51	62	59	67	60	49	49	39	39	69	54
28	88	51	54	74	69	59	48	52	29	53	65	49
29		54	41	91	79	47	49	48	21	55	81	46
30		58	38	97	70	45	37	46	24	69	75	53
31		61		96		46	30		25		99	26
Mean	91.0	69.8	62.2	61.3	49.8	57.9	42.2	22.4	55.4	34.8	49.4	58.8

* = preliminary. The yearly mean sunspot number equals 94.3 for 1992.

Dominion Radio Observatory

Penticton 2800 MHz (10.7cm) Solar Flux

Adjusted to 1 Au

Day	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 94
1	121.5	129.6	123.5	104.2	140.4	111.8	102.8	87.1	117.1	90.0	105.6	143.4
2	124.7	141.0	120.7	104.7	143.4	113.6	103.7	82.6	126.9	91.8	101.3	141.4
3	133.0	148.6	117.0	108.9	140.4	114.2	100.8	80.9	124.8	92.4	102.6	128.7
4	143.2	163.8	116.4	112.4	133.7	110.1	98.9	80.5	121.5	94.1	101.6	124.6
5	155.6	162.5	118.9	120.0	137.7	103.9	97.0	81.0	123.7	94.8	98.3	132.4
6	178.8	164.0	133.1	122.2	131.3	98.4	97.1	80.2	118.0	94.9	99.9	127.7
7	171.2	150.9	130.0	133.0	115.7	96.5	93.8	79.6	116.6	93.5	103.8	122.1
8	183.4	144.3	143.5	131.2	115.2	96.4	93.4	80.2	113.1	90.2	101.9	118.9
9	180.3	140.6	136.0	131.5	118.9	93.2	99.1	80.1	110.1	88.7	95.4	113.1
10	175.0	146.7	139.2	136.8	116.0	89.0	104.5	80.1	107.1	88.2	93.2	106.5
11	168.8	148.0	119.4	134.7	104.9	85.8	111.2	79.8	102.3	87.0	89.7	97.8
12	144.9	158.7	103.7	129.0	96.2	88.7	103.2	79.5	97.3	88.9	88.1	94.6
13	131.7	139.9	97.7	122.4	89.4	89.5	99.2	81.1	94.5	92.2	85.1	91.9
14	137.9	134.2	92.8	114.6	86.4	95.7	94.6	82.6	90.8	92.3	85.1	87.3
15	131.6	129.7	88.8	106.7	84.6	96.3	92.8	85.6	93.5	99.9	82.8	92.6
16	130.5	120.5	90.0	101.1	85.0	100.3	92.4	89.0	90.3	98.2	81.9	97.0
17	121.4	122.4	96.5	98.4	86.1	102.6	95.1	85.9	89.4	97.7	81.1	102.0
18	123.2	126.2	106.6	93.5	87.4	103.7	94.3	86.0	86.7	100.2	82.4	97.5
19	113.4	133.4	111.9	93.1	88.8	104.1	93.9	85.0	88.1	98.7	84.2	99.5
20	120.6	127.0	119.9	93.4	94.1	105.6	93.8	80.3	93.5	98.0	88.1	101.6
21	120.3	129.7	120.5	93.3	94.0	108.9	97.0	80.6	94.2	94.8	89.9	107.3
22	130.3	126.6	118.4	94.1	99.8	111.2	96.2	79.8	91.3	96.8	96.6	109.5
23	129.6	120.1	122.9	97.3	113.1	113.3	94.8	82.0 +	91.4	97.9	101.6	114.6
24	132.7	114.4	130.3	100.9	125.4	109.8	92.5	90.0 +	90.6	97.5	107.5	125.1
25	125.5	116.0	126.2	102.4	122.6	105.1	90.6	96.5	86.0	94.7	115.2	128.1
26	123.8	116.4	125.0	110.4	126.0	106.8	90.2	106.8	87.4	90.8	120.5	123.9
27	121.6	122.4	119.6	122.7	131.7	106.4	89.4	104.9	86.0	87.3	135.8	116.8
28	121.4	125.8	115.2	129.2	127.8	104.6	90.2	111.7	87.3	90.7	129.2	115.7
29		128.3	108.1	132.5	126.7	103.5	91.7	116.8	90.5	91.2	124.4	98.9
30		128.7	107.4	144.1	120.3	100.8	90.7	120.9	90.0	100.8	138	96.1
31		124.9		142.1		99.1	90.6		90.1		136.2	94.7
Mean	139.1	135.0	116.7	114.9	112.8	102.2	96.0	87.9	99.7	93.8	101.5	111.3

+ = suspect values due to software problems.

DAILY SOLAR INDICES

January 1994

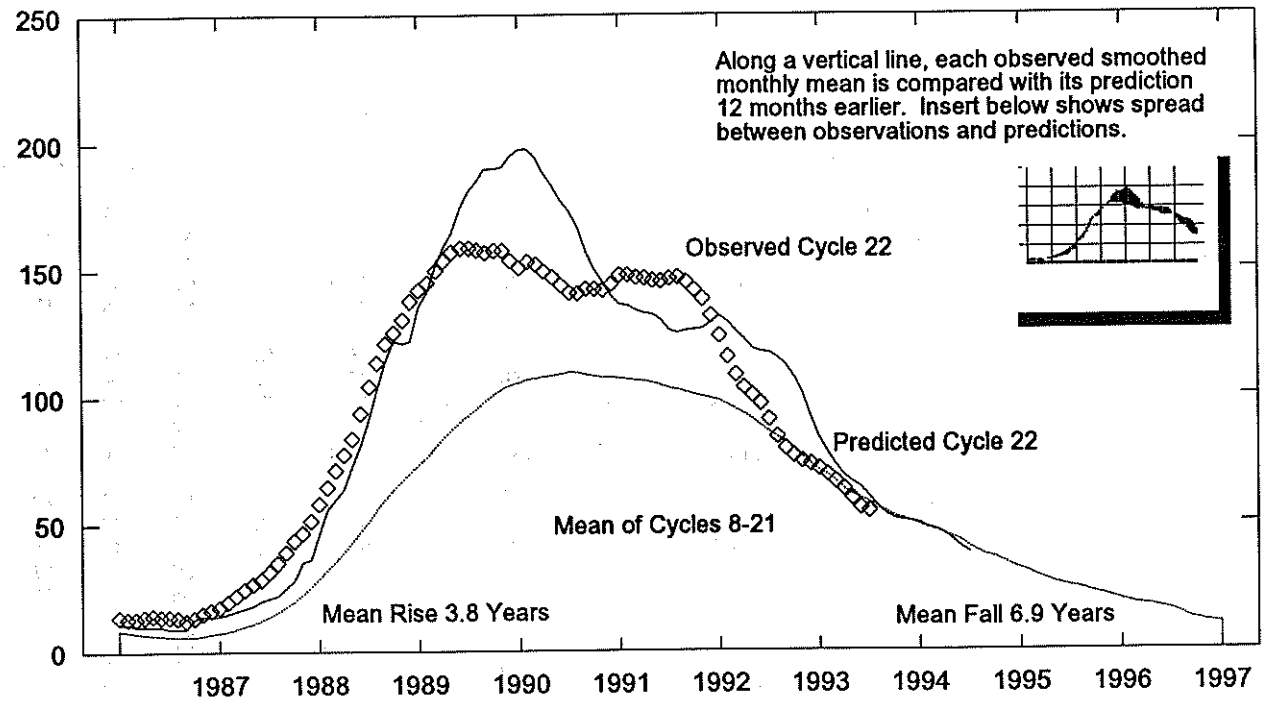
Day	Day of Year	Bartels Cycle Day	Sunspot Numbers Int	Amer	Obs Flux Penticton (2800)	Solar Flux Adjusted to 1 Astronomical Unit — LEAR (15400)	LEAR (8800)	LEAR (4995)	Pentic (2800)	LEAR (2695)	LEAR (1415)	LEAR (610)	LEAR (410)	LEAR (245)
1	1	3	86	89	148.3	550	284	205	143.4	136	82	54	33	19
2	2	4	84	79	146.2	533	278	198	141.4	141	87	54	36	--
3	3	5	95	91	133.1	535	263	187	128.7	131	82	58	36	--
4	4	6	103	101	128.8	569	258	183	124.6	129	81	57	31	18
5	5	7	104	104	136.9	508	248	177	132.4	129	82	50	31	33
6	6	8	101	98	132.1	550	227	179	127.7	133	84	54	31	18
7	7	9	94	94	126.3	545	266	182	122.1	128	80	52	30	21
8	8	10	81	80	122.9	540	251	168	118.9	122	77	50	36	45
9	9	11	71	67	117.0	538	255	160	113.1	111	72	51	34	40
10	10	12	51	51	110.1	541	249	161	106.5	112	72	50	32	--
11	11	13	38	41	101.1	551	252	153	97.8	102	64	47	29	--
12	12	14	44	43	97.8	537	248	146	94.6	95	61	46	30	30
13	13	15	45	45	95.0	525	248	145	91.9	92	58	44	28	23
14	14	16	36	38	90.2	529	246	140	87.3	86	55	43	27	40
15	15	17	35	36	95.7	513	233	137	92.6	87	55	42	26	16
16	16	18	29	32	100.3	542	258	149	97.0	91	57	46	27	13
17	17	19	25	26	105.4	--	246	149	102.0	95	60	46	27	11
18	18	20	30	30	100.7	545	269	155	97.5	96	60	43	23	8
19	19	21	28	31	102.7	538	263	155	99.5	97	61	46	26	9
20	20	22	35	37	104.9	542	262	154	101.6	96	61	48	28	10
21	21	23	53	54	110.8	523	260	160	107.3	100	64	49	27	10
22	22	24	65	66	113.0	543	268	167	109.5	108	70	52	29	--
23	23	25	60	72	118.3	536	246	159	114.6	106	70	51	26	11
24	24	26	70	74	129.1	550	266	172	125.1	115	77	53	28	12
25	25	27	66	74	132.1	551	282	181	128.1	119	78	54	30	16
26	26	1	67	68	127.8	581	278	182	123.9	123	79	54	30	14
27	27	2	54	53	120.5	540	284	193	116.8	125	79	58	34	27
28	28	3	49	49	119.3	561	268	164	115.7	110	75	54	28	12
29	29	4	46	54	101.9	598	278	173	98.9	107	72	55	29	12
30	30	5	53	42	99.0	551	251	145	96.1	95	67	49	27	10
31	31	6	26	33	97.6	539	248	144	94.7	94	66	49	27	11
MEAN			58.8	59.7	115.0	543	259	165	111.3	110	70	50	29	18

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

The observed and the adjusted Penticton fluxes tabulated here are the "Series C" daily values reported by the Dominion Radio Astrophysical Observatory, Penticton, British Columbia, Canada. Numbers in parentheses in the column headings denote frequencies in MHz.

Equipment problems produced any gaps in the Air Weather Service's Learmonth (LEAR) observations.

Cycle 22 Smoothed Sunspot Numbers: Observed and Predicted



Smoothed Sunspot Numbers (Observed and Predicted) for Parts of Solar Cycles 21 and 22

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
1987	18	20	22	24	26	28	31	35	39	44	47	51	32
1988	58	65	71	78	84	94	104	114	121	125	130	138	99
1989	142	145	150	154	157	158	158	158	157	157	158	154	154
1990	151	153	152	149	147	144	141	140	142	142	142	144	146
1991	148	148	147	146	146	145	146	147	145	142	138	132	144
1992	124	115	108	103	100	97	91	84	80	76	74	73	94
1993	71	69	67	63	60	56	55	53	51	50	49	47	58
( )								(4)	(8)	(10)	(12)	(13)	(9)
1994	46	44	43	42	41	40	38	36	35	33	32	31	38
( )	(14)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(22)	(23)	(20)
1995	30	29	28	27	25	24	23	23	22	21	20	19	24
( )	(23)	(23)	(23)	(23)	(22)	(22)	(22)	(21)	(21)	(20)	(19)	(18)	(21)

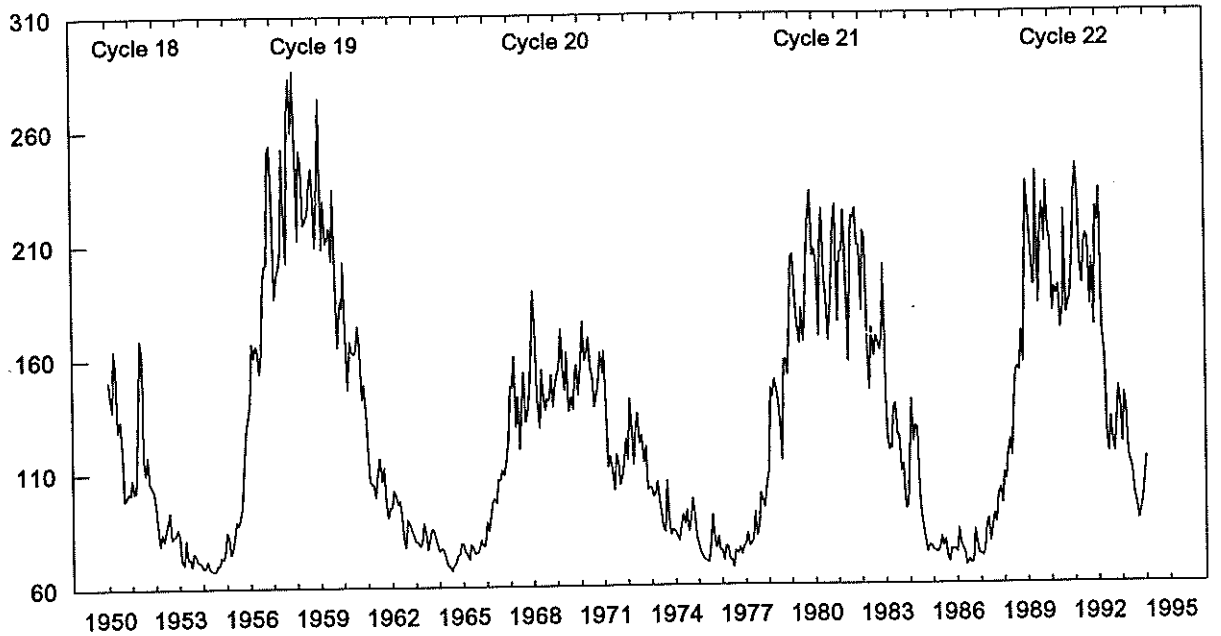
Solar Cycle 22 — Min, Max, and Predictions

September 1986 marks the minimum of Solar Cycle 21 and the onset of Cycle 22, which in turn, reached a maximum in July 1989.

Observed and Predicted Numbers. For the end of Cycle 21, and the rise and decline of Cycle 22, the table above lists observed smoothed sunspot numbers up to the one that includes the most recent monthly mean. We based these smoothed values on final monthly means through Jun 1993 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 July 1994 prediction. There exists a 90% chance that in July 1994, the actual smoothed number will fall somewhere between 19 and 57.

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 14 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 minimum value of 12.3 that occurred in Sep 1986.

Monthly Mean 2800 MHz Solar Flux (Observed) Jan 1950 - Jan 1994



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	150.7	143.3	137.8	164.3	157.1	128.7	134.1	120.9	98.6	99.9	101.9	101.1	128.2
1951	107.9	101.9	102.5	127.1	168.6	161.7	116.3	109.8	117.8	106.0	104.4	102.4	118.9
1952	95.4	86.2	78.5	84.0	80.9	84.8	88.8	93.3	81.5	82.8	83.4	85.7	85.4
1953	83.2	72.8	70.4	81.0	72.5	73.0	69.8	75.5	74.3	71.9	71.4	70.8	73.9
1954	68.7	69.2	71.9	68.7	68.0	67.3	67.7	69.9	70.1	73.2	72.6	75.5	70.2
1955	84.3	82.0	74.8	77.3	82.8	88.8	87.3	90.7	91.1	111.8	130.0	134.6	95.0
1956	141.2	167.2	160.6	165.9	163.4	154.0	162.8	193.8	200.9	201.6	250.4	253.7	184.6
1957	231.2	186.7	197.8	200.0	208.5	252.1	218.0	202.3	267.1	283.1	259.2	286.5	232.7
1958	251.5	212.2	251.5	245.9	218.6	220.5	224.1	237.0	243.5	228.0	209.2	238.2	231.7
1959	274.5	207.9	229.2	210.6	212.7	217.5	203.0	234.2	194.3	165.1	184.8	182.2	209.7
1960	202.6	170.9	146.8	167.6	162.7	161.9	163.9	174.4	164.5	142.3	148.9	138.1	162.0
1961	122.0	106.4	104.8	105.0	99.3	109.9	116.5	106.2	112.7	96.7	90.3	94.8	105.4
1962	94.9	102.2	100.3	96.2	97.9	91.0	80.7	77.3	89.5	87.8	84.9	82.0	90.4
1963	79.5	79.7	77.8	79.5	87.8	83.5	75.9	80.9	85.1	85.1	81.7	78.4	81.2
1964	75.4	76.8	75.9	72.6	69.5	69.0	67.0	69.3	70.2	73.4	73.7	78.8	72.6
1965	78.6	75.2	74.1	72.0	78.2	77.0	74.3	74.8	76.6	80.2	77.7	77.8	76.4
1966	87.9	84.2	90.3	97.2	98.5	96.3	106.7	106.6	110.9	108.6	113.3	124.6	102.1
1967	147.7	147.0	160.6	129.9	143.0	120.2	140.3	153.7	132.1	136.1	145.3	163.0	143.2
1968	189.1	173.2	142.6	129.5	154.9	142.3	137.2	142.2	141.0	152.5	138.5	148.4	149.3
1969	152.7	155.2	172.3	155.5	145.4	162.2	136.6	143.0	137.3	154.0	156.7	143.6	151.2
1970	158.3	175.4	158.4	162.0	168.4	154.9	152.0	138.2	143.2	148.3	162.0	152.8	156.2
1971	162.6	137.8	111.9	116.7	109.9	101.7	117.4	114.1	104.0	107.2	114.0	124.5	118.5
1972	114.8	141.8	128.5	112.9	129.6	135.4	122.0	125.7	113.6	121.1	101.6	102.9	120.8
1973	102.2	98.7	100.4	105.0	97.0	91.2	84.5	82.9	105.6	87.7	81.5	84.2	93.4
1974	83.1	80.9	79.2	86.1	90.6	86.3	92.5	83.0	87.8	97.6	90.3	81.1	86.5
1975	77.5	74.2	72.4	70.7	70.1	69.7	77.2	90.4	79.6	75.7	80.8	74.6	76.1
1976	74.7	70.5	76.7	76.3	70.6	70.6	67.5	74.8	73.1	75.9	72.9	76.7	73.4
1977	77.4	82.3	76.6	77.6	79.6	91.5	81.1	84.3	99.9	96.9	93.7	102.1	86.9
1978	109.6	145.4	141.8	149.4	146.5	142.2	131.1	114.0	157.9	158.2	151.5	175.5	143.6
1979	203.0	204.1	185.8	173.8	165.2	180.3	165.9	172.7	200.2	217.9	231.7	203.5	192.0
1980	206.2	200.0	168.1	207.9	224.0	193.2	184.8	166.2	183.9	204.2	218.1	225.8	198.5
1981	174.6	204.5	205.3	223.2	194.6	156.9	191.9	220.6	219.5	224.3	207.8	207.8	202.6
1982	179.0	214.2	210.5	161.8	144.7	171.9	159.6	167.9	165.3	161.9	167.4	199.4	175.3
1983	142.3	122.6	118.6	118.9	137.1	138.6	125.0	124.4	109.0	112.4	92.5	93.4	119.6
1984	116.1	140.6	122.0	128.7	128.3	100.3	89.3	83.7	78.1	73.5	76.3	75.9	101.1
1985	74.5	73.7	73.3	75.1	80.2	76.1	78.7	71.5	69.5	74.7	74.2	74.8	74.7
1986	73.2	83.6	77.0	75.1	72.6	67.6	70.2	68.4	68.7	83.0	77.1	72.6	74.1
1987	72.5	71.5	74.0	84.9	87.8	77.9	84.2	90.0	86.1	98.1	101.2	94.4	85.3
1988	108.0	105.0	114.9	122.7	115.2	139.4	152.7	154.2	152.5	169.8	156.2	199.8	141.0
1989	235.4	222.4	205.1	189.6	190.1	239.6	181.9	217.1	225.9	208.7	235.1	213.0	213.7
1990	210.1	178.3	188.8	185.3	189.7	170.9	180.7	222.6	177.4	182.0	184.3	204.9	189.6
1991	229.4	243.0	230.0	198.8	190.3	206.8	212.0	210.3	180.6	201.3	172.0	223.9	208.1
1992	217.6	232.1	171.3	158.5	125.4	116.7	132.2	122.1	116.8	130.8	145.2	139.1	150.7
1993	121.0	142.6	136.4	115.9	112.3	109.3	99.0	93.7	87.0	100.3	95.9	104.8	109.7
1994	115.0												115.0

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	Obs See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	01	0016	0158	0208						112		C 2.8						
LEAR		0120	0120	0123	N08	W78	7640	12	26.3	3	SF		3	E		24		
LEAR		0156	0158	0202	N08	W79	7640	12	26.2	6	SF		3	E		25		
LEAR		0157	0158	0216	S09	E39	7646	01	4.0	19	SF		3	E		23		F
LEAR		0327	0327	0334	N13	E35	7645	01	3.8	7	SF	C 1.8	3	E		22		
GOES		0335	0341	0350						15		C 2.4						
LEAR		0554	0554	0558	N06	W77	7640	12	26.6	4	SF	C 2.0	3	E		13		
LEAR		0557	0600	0606	S09	E37	7646	01	4.0	9	SF		3	E		14		F
GOES		0750	0754	0758						8		C 1.2						
SVTO		1223E	1223U	1233	N10	E36	7645	01	4.2	10D	SF	C 1.5	3	E		28		F
GOES		1254	1259	1302						8		C 1.6						
GOES		1341	1348	1353						12		C 1.7						
GOES		1540	1609	1649						69		C 2.0						
HOLL		1735	1741	1806	S15	E27	7647	01	3.8	31	SF	C 4.4	3	E		72		FH
RAMY		1753E	1753U	1826D	S15	E27	7647	01	3.8	33D	1F		2	E		100		F
PALE		1758E	1758U	1816D	S15	E27	7647	01	3.8	18D	1F		2	E		135		F
GOES		2311	2315	2319						8		C 1.3						
LEAR	02	0214	0215	0217	S10	E25	7646	01	4.0	3	SF		3	E		22		F
GOES		0229	0236	0240						11		C 1.5						
GOES		0546	0555	0602						16		C 1.5						
GOES		0826	0832	0836						10		C 1.0						
GOES		1139	1149	1155						16		C 1.1						
GOES		1404	1408	1414						10		C 1.1						
GOES		1508	1511	1513						5		B 9.2						
HOLL		1542	1543	1547	N12	E24	7645	01	4.5	5	SF		3	E		27		
RAMY		1542	1543	1548	N12	E24	7645	01	4.5	6	SF		3	E		20		
RAMY		1848	1848	1851	S10	E17	7646	01	4.1	3	SF		3	E		11		
GOES		1913	1956	2010						57		C 1.8						
HOLL		2159	2159	2208	N12	E17	7645	01	4.2	9	SF		3	E		11		
PALE		2251E	2254U	2317D	N13	E15	7645	01	4.1	26D	SN	M 6.5	3	E		82		FE
LEAR		2317	2318	2325	N12	E17	7645	01	4.2	8	SF		3	E		67		F
LEAR	03	0436	0437	0440	S09	E13	7646	01	4.2	4	SF		3	E		14		F
SVTO		1035E	1058	1109D	N05	E79		01	9.3	34D	SF		3	E		35		
RAMY		1620	1624	1628	N03	E78		01	9.5	8	SF	B 5.0	3	E		13		F
RAMY		1636	1644	1647	N03	E76		01	9.4	11	SF		3	E		12		F
RAMY		1752	1758	1808	N03	E75		01	9.3	16	SF		3	E		51		F
HOLL		1757	1758	1809	N06	E76		01	9.4	12	SF	B 8.8	3	E		39		H
HOLL		1929	1933	1940	N06	E74	7648	01	9.3	11	SF		3	E		36		
RAMY		1931	1932	1937	N03	E75	7648	01	9.4	6	SF		3	E		16		F
RAMY		1945	1948	1951	N03	E76	7648	01	9.5	6	SF	C 1.0	3	E		18		F
HOLL		1946	1948	1952	N06	E75	7648	01	9.4	6	SF		3	E		21		
PALE		1947	1950	1953	N07	E76	7648	01	9.5	6	SF		3	E		25		
HOLL		2311	2311	2315	N06	E71	7648	01	9.3	4	SF		3	E		18		
LEAR		2311	2312	2315	N06	E73	7648	01	9.4	4	SF		3	E		17		
HOLL		2334	2337	2340	N05	E67	7648	01	9.0	6	SF		3	E		46		
GOES	04	0021	0025	0029						8		B 7.5						
PALE		0110E	0115	0150	S10	E14	7649	01	5.1	40D	SF	C 1.2	3	E		45		
LEAR		0118	0143	0201	S18	E08	7649	01	4.7	43	SF		3	E		35		FU
PALE		0302	0312	0325D	N14	E08	7645	01	4.7	23D	SF	C 2.4	3	E		35		F
LEAR		0307	0311	0315	N15	E07	7645	01	4.6	8	SF		3	E		30		F
GOES		0442	0448	0451						9		C 1.0						
LEAR		0448	0450	0453	N15	E09	7645	01	4.9	5	SF		3	E		11		
LEAR		0613	0621	0632	N06	E68	7648	01	9.3	19	SF	C 1.0	3	E		23		
LEAR		0630	0631	0649	N13	W05	7645	01	3.9	19	SF		3	E		31		
LEAR		0633	0633	0643	N06	E65	7648	01	9.1	10	SF		3	E		22		
LEAR		0644	0646	0711	N06	E65	7648	01	9.1	27	SF		3	E		50		F
LEAR		0715	0752	0852	N06	E65	7648	01	9.2	97	SF		3	E		55		
LEAR		0743	0747	0816	N12	W05	7645	01	3.9	33	SF		3	E		25		
LEAR		0927	0931	0946	N07	E65	7648	01	9.3	19	SF		3	E		27		
RAMY		1258	1305	1341	N03	E63	7648	01	9.2	43	SF		3	E		70		F
HOLL		1531	1533	1540	N06	E62	7648	01	9.3	9	SF		3	E		13		
RAMY		1617	1619	1625	N03	E61	7648	01	9.2	8	SF		3	E		15		
HOLL		1923	1924	1935	N15	E00	7645	01	4.8	12	SF		3	E		15		
PALE		1925E	1928U	1938D	N14	E02	7645	01	5.0	13D	SF		2	E		16		
GOES		1957	2000	2005						8		B 6.0						

Hα S O L A R F L A R E S

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Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
HOLL	04	2057	2058	2102	N14	E02	7645	01	5.0	5	SF		3	E		18		
GOES		2203	2212	2228						25		B 6.5						
PALE	05	0027E	0028U	0032D	N15	W04	7645	01	4.7	5D	SF	B 8.3	3	E		19		
PALE		0105E	0115U	0126D	N16	W04	7645	01	4.7	21D	SF		3	E		34		F
GOES		0350	0402	0407						17		C 1.4						
GOES		0549	0553	0557						8		B 7.0						
LEAR		0648	0650	0737	S12	W18	7646	01	3.9	49	1N		3	E		164		UF
LEAR		0648	0650	0739	S13	W23	7647	01	3.5	51	1N	M 1.0	3	E		159		UF
LEAR		0725	0725	0735	N14	W05	7645	01	4.9	10	SF		3	E		26		
LEAR		0743	0743	0746	S09	W15	7646	01	4.2	3	SF		3	E		23		
LEAR		0826	0831	0848	N17	W08	7645	01	4.7	22	SF	C 2.8	3	E		49		
LEAR		0901	0905	0910	S11	W21	7646	01	3.8	9	SF	C 1.9	3	E		20		
GOES		1023	1026	1033						10		C 1.5						
GOES		1155	1158	1216						21		B 9.4						
RAMY		1315	1320	1324	N04	E49	7648	01	9.2	9	SF	C 1.8	3	E		39		
RAMY		1404	1411	1424	N16	W11	7645	01	4.7	20	SF	C 1.9	3	E		30		
RAMY		1450	1453	1458	S09	W27	7646	01	3.6	8	SF		3	E		14		H
SVTO		1505E	1512U	1515D	N13	W14	7645	01	4.6	10D	SF		1	E		37		F
GOES		1524	1531	1534						10		C 1.4						
RAMY		1543	1545	1556	N03	E47	7648	01	9.2	13	SN	C 1.7	3	E		36		
RAMY		1633	1636	1641	S11	W26	7646	01	3.7	8	SF	C 1.8	3	E		23		F
RAMY		1645	1647	1651	S17	W29	7646	01	3.5	6	SF		3	E		17		F
RAMY		1656	1657	1702	N02	E47	7648	01	9.2	6	SF		3	E		11		
RAMY		1702	1704	1711	N14	W09	7645	01	5.0	9	SF		3	E		12		F
RAMY		1721	1722	1726	S11	W24	7646	01	3.9	5	SF	C 1.7	3	E		17		F
RAMY		1757	1802	1805D	S10	W24	7646	01	3.9	8D	1N	C 2.8	3	E		123		F
PALE		1758E	1801U	1806D	S08	W19	7646	01	4.3	8D	SF		3	E		29		F
PALE		1822E	1823U	1826D	S06	W26	7646	01	3.8	4D	SF	C 1.3	3	E		20		
GOES		1840	1845	1849						9		C 1.5						
GOES		1929	1933	1935						6		C 1.1						
PALE		1945E	1947U	1955D	S05	W26	7646	01	3.9	10D	4	C 2.4	3	E		35		FH
GOES		2339	2343	2346						7		B 9.8						
GOES	06	0050	0053	0055						5		C 1.3						
GOES		0402	0407	0409						7		C 4.9						
GOES		0607	0619	0624						17		C 6.2						
GOES		0645	0654	0701						16		C 1.4						
SVTO		0758	0758	0809	S09	W34	7646	01	3.8	11	SN	C 4.6	3	E		47		
SVTO		1008E	1010U	1028	S09	W32	7646	01	4.0	20D	SF	C 1.4	3	E		10		FH
RAMY		1237	1239	1256D	S09	W35	7646	01	3.9	19D	SN	C 4.2	4	E		56		FE
SVTO		1238	1239	1256	S10	W36	7646	01	3.8	18	SN		3	E		63		F
RAMY		1431	1432	1438	S11	W37	7646	01	3.8	7	SF	C 2.2	4	E		12		F
SVTO		1431	1433	1439	S11	W37	7646	01	3.8	8	SF		3	E		27		F
HOLL		1517	1521	1542	S10	W36	7646	01	3.9	25	SF	C 1.4	3	E		75		F
RAMY		1521	1521	1528	S09	W37	7646	01	3.9	7	SF		3	E		11		F
RAMY		1700	1701	1713	S09	W38	7646	01	3.8	13	SF	B 8.5	3	E		47		
HOLL		1701	1702	1709	S10	W38	7646	01	3.8	8	SF		3	E		38		
RAMY		1730	1749	1808	S11	W37	7646	01	3.9	38	SF	C 1.1	3	E		22		F
HOLL		1733	1748	1754	S11	W35	7646	01	4.1	21	SF		3	E		21		
RAMY		1857	1901	1907	S09	W39	7646	01	3.9	10	SF		3	E		75		H
HOLL		1858	1859	1905	S10	W38	7646	01	3.9	7	SF	C 1.1	3	E		58		
GOES	07	0034	0042	0048						14		C 1.5						
PALE		0111	0115	0129D	S09	W37	7646	01	4.3	18D	SF	C 2.3	3	E		30		
LEAR		0214	0220	0301	S11	W40	7646	01	4.1	47	SF	C 3.9	3	E		24		
GOES		0248	0303	0330						42		C 3.1						
LEAR		0556	0605	0616	S09	W43	7646	01	4.0	20	SF	C 1.3	3	E		26		
LEAR		0937	0944	1003	S09	W45	7646	01	4.0	26	1N	M 1.3	3	E		121		H
GOES		1013	1016	1018						5		C 2.1						
SVTO		1127	1128	1146	S11	W49	7646	01	3.8	19	SN	C 8.0	3	E		79		
RAMY		1128E	1129U	1139	S10	W48	7646	01	3.9	11D	SN		1	E		33		F
RAMY		1234	1235	1315	S04	W44	7646	01	4.2	41	SF	C 2.3	4	E		53		ZF
HOLL		1519	1524	1545	N06	E32	7650	01	10.0	26	SF	B 7.3	3	E		56		
HOLL		1533	1556	1608	S16	W55	7647	01	3.5	35	SF		3	E		19		
RAMY		1537	1547	1600	S15	W51	7647	01	3.8	23	SF		3	E		21		F
HOLL		1628	1630	1634	S09	W46	7646	01	4.2	6	SF		3	E		13		
RAMY		1744	1746	1806	S09	W47	7646	01	4.2	22	SF	B 5.3	3	E		13		

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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	07	1815	1825	1850	S10	W49	7646	01	4.1	35	1F	C 2.2	3	E		119		F
PALE		1823E	1823U	1837D	S12	W46	7646	01	4.3	14D	SF		2	E		51		F
HOLL		1825E	1829U	1836D	S13	W44		01	4.4	11D	1F		3	E		109		
GOES		1959	2002	2005						6		B 5.8						
RAMY		2048	2051	2111	S10	W49	7646	01	4.2	23	SF	B 4.8	3	E		20		
HOLL		2127	2137	2208	S10	W55	7646	01	3.8	41	SF	B 9.4	3	E		57		FH
GOES		2238	2245	2255						17		C 1.7						
LEAR	08	0018	0020	0022	S05	W55	7646	01	3.9	4	SF	B 8.1	3	E		18		F
LEAR		0142	0146	0155	S11	W56	7646	01	3.8	13	SF	B 8.4	3	E		20		F
GOES		0238	0245	0258						20		C 1.0						
LEAR		0306	0306	0310	S10	W53	7646	01	4.1	4	SF	C 1.6	3	E		18		
GOES		0636	0642	0649						13		B 6.5						
LEAR		0800	0802	0806	S15	W67	7647	01	3.3	6	SF	B 9.4	3	E		20		
GOES		0920	1031	1059						99		C 2.4						
RAMY		1630	1630	1634	S13	W69	7647	01	3.5	4	SF	B 9.8	3	E		46		
GOES		2236	2246	2254						18		B 7.9						
LEAR	09	0301	0303	0306	S10	W70	7646	01	3.9	5	SF	B 7.3	3	E		19		
GOES		1249	1254	1300						11		C 1.0						
GOES		1531	1542	1548						17		B 6.2						
GOES		1559	1605	1611						12		B 7.6						
GOES		1617	1625	1643						26		B 8.3						
GOES		1725	1728	1731						6		B 6.7						
HOLL		2251	2256	2302	S05	W78	7646	01	4.1	11	SF	C 8.2	3	E		13		
LEAR		2305	2321	2334	S06	W76	7646	01	4.3	29	SF		3	E		38		
HOLL		2308	2316	2326	S05	W77	7646	01	4.2	18	SF		3	E		33		
PALE		2351E	2352U	2358D	S11	W83	7646	01	3.7	7D	SF		2	E		38		
GOES	10	0323	0333	0348						25		B 8.1						
GOES		0412	0420	0427						15		B 7.5						
GOES		0439	0442	0443						4		B 6.3						
GOES		1002	1005	1010						8		B 4.5						
GOES		1126	1129	1134						8		B 4.7						
RAMY		1303	1308	1321	N07	W18	7648	01	9.2	18	SF		3	E		21		F
SVTO		1303	1310	1319	N07	W19	7648	01	9.1	16	SF		3	E		60		F
HOLL		1734	1735	1738	N06	W21	7648	01	9.2	4	SF		3	E		13		
RAMY		1735	1735	1739D	N06	W21	7648	01	9.2	4D	SF		3	E		19		F
GOES		1941	1945	1950						9		B 7.2						
GOES		2048	2052	2055						7		B 6.2						
HOLL		2134	2136	2139	N07	W23	7648	01	9.2	5	SF	B 9.5	3	E		30		
PALE		2314E	2315U	2326D	N05	W28	7648	01	8.9	12D	SF		3	E		42		F
LEAR		2315	2315	2341	N07	W27	7648	01	8.9	26	SF	C 1.3	3	E		33		
HOLL		2316	2316	2317D	N07	W25	7648	01	9.1	1D	SF		3	E		39		
LEAR	11	0320	0321	0327	N04	W18	7650	01	9.8	7	SF	B 6.3	3	E		11		F
LEAR		0411	0412	0437	N07	W29	7648	01	9.0	26	SF	C 1.8	3	E		97		F
LEAR		0456	0500	0503	N04	W19	7650	01	9.8	7	SF	B 9.0	3	E		12		F
GOES		0517	0522	0527						10		B 6.5						
GOES		0750	0817	0825						35		C 1.7						
LEAR		0828	0828	0831	N04	W22	7650	01	9.7	3	SF		3	E		12		
GOES		0908	0912	0916						8		B 6.5						
GOES		1034	1048	1112						38		B 6.7						
GOES		1505	1510	1522						17		B 4.5						
GOES		2059	2114	2141						42		B 4.9						
RAMY	12	1401E	1410	1423	N06	W42	7648	01	9.4	22D	SF		3	E		19		
GOES	13	0336	0341	0348						12		B 4.4						
SVTO		0915E	0919U	0919D	N05	W47	7650	01	9.9	4D	SF		1	E		61		F
LEAR		0916	0916	0926	N07	W50	7650	01	9.6	10	SF	B 6.8	3	E		23		F
SVTO		1048	1058	1103	N04	W50	7650	01	9.7	15	SF		3	E		44		
HOLL		1524	1524	1529	N06	W56	7648	01	9.4	5	SF	B 4.0	3	E		10		
GOES		1815	1825	1834						19		B 4.0						
GOES		2015	2025	2041						26		B 6.8						
LEAR	14	0905	0913	0927	N05	W67	7648	01	9.4	22	SF	C 1.2	3	E		77		F
SVTO		0911E	0915U	0920	N06	W72	7650	01	9.0	9D	SF		2	E		12		F

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GOES	14	1051	1056	1059						8		B 6.2						
GOES		1603	1612	1622						19		C 1.6						
GOES	15	0111	0114	0118						7		B 7.9						
GOES		0346	0349	0353						7		B 5.0						
GOES		0410	0415	0421						11		B 8.6						
GOES		0422	0428	0431						9		C 1.3						
GOES		0458	0510	0514						16		C 1.1						
GOES		0731	0737	0740						9		C 1.5						
GOES		0815	0818	0821						6		C 1.5						
GOES		0925	0930	0933						8		C 1.9						
GOES		1057	1100	1104						7		B 9.5						
GOES		1140	1144	1146						6		C 1.0						
GOES		1156	1159	1204						8		B 8.5						
GOES		1247	1252	1258						11		B 9.2						
GOES		1411	1414	1417						6		B 7.6						
GOES		1431	1435	1438						7		C 1.0						
RAMY		1611	1613	1617	S04	W79		01	9.8	6	SF	C 1.0	3	E		19		
GOES		1805	1809	1816						11		B 5.9						
GOES		1854	1859	1903						9		B 8.5						
GOES		2101	2106	2113						12		B 7.2						
GOES	16	0100	0110	0115						15		C 1.1						
GOES		0647	0709	0725						38		C 8.5						
GOES		1129	1142	1148						19		B 9.0						
GOES		1403	1428	1444						41		B 6.1						
GOES		1545	1618	1649						64		B 6.4						
HOLL		1748	1751	1801	N03	E71	7654	01	22.0	13	SF	C 1.4	3	E		58		FH
RAMY		1748	1752	1801	N03	E71	7654	01	22.0	13	SF		3	E		44		H
GOES		2016	2044	2105						49		B 6.3						
GOES		2236	2239	2241						5		B 4.6						
HOLL		2309	2340U	2402	N05	E71	7654	01	22.3	53	1N	M 6.1	3	E		219		U
GOES	17	0033	0039	0045						12		C 1.1						
GOES		0204	0207	0209						5		B 5.5						
GOES		0221	0224	0228						7		B 6.2						
GOES		0242	0247	0250						8		B 7.7						
GOES		0603	0608	0612						9		C 1.6						
GOES		0718	0724	0745						27		B 7.8						
LEAR		0916	0916	0922	N06	E65	7654	01	22.2	6	1N	C 9.3	3	E		146		
RAMY		1304	1307	1347	N08	E68	7654	01	22.6	43	SF	C 2.3	3	E		23		F
RAMY		1351	1353	1405	N07	E62	7654	01	22.2	14	SF		3	E		25		
HOLL		1901	1901	1905	N07	E60	7654	01	22.3	4	SF		3	E		16		
RAMY		1901	1901	1909	N09	E58	7654	01	22.1	8	SF	C 1.5	3	E		19		F
HOLL		2116	2117	2129	N05	E58	7654	01	22.2	13	SF		3	E		12		
GOES		2347	2357	2403						16		C 3.7						
GOES	18	0044	0124	0208						84		C 1.7						
GOES		0417	0424	0431						14		C 2.8						
GOES		1103	1109	1113						10		C 1.1						
GOES		1128	1135	1142						14		C 1.2						
RAMY		1607	1618	1631	N08	E47	7654	01	22.2	24	SF	B 8.6	3	E		19		F
GOES		1925	1930	1938						13		B 4.7						
LEAR	19	0311	0316	0329	N05	E40	7654	01	22.1	18	SF	C 4.0	3	E		48		F
GOES		0449	0452	0454						5		C 1.0						
GOES		0615	0619	0623						8		B 7.5						
GOES		0629	0636	0641						12		B 6.6						
GOES		0826	0830	0833						7		B 4.7						
GOES		1141	1146	1150						9		C 2.8						
RAMY		1143	1144	1152	N09	E33	7654	01	22.0	9	SF		2	E		36		F
RAMY		1339	1342	1434	N05	E40	7654	01	22.6	55	SF	C 4.2	3	E		39		FE
GOES		2012	2016	2020						8		B 4.5						
GOES		2335	2417	2513						98		C 1.0						
GOES	20	0141	0144	0147						6		B 8.4						
GOES		0214	0244	0307						53		B 9.7						
GOES		0334	0348	0358						24		B 7.4						

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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	20	1113	1117	1123						10		B 3.8						
GOES		2056	2100	2106						10		B 6.2						
HOLL		2210E	2220U	2223D	N07	E24	7654	01	22.7	13D	SF	B 8.3	2	E		26		
GOES	21	0324	0328	0332						8		B 4.5						
GOES		0758	0802	0809						11		B 3.5						
LEAR		0816	0821	0838	N07	E17	7654	01	22.6	22	SF		3	E		19		
GOES		1019	1023	1025						6		B 6.6						
GOES		1140	1146	1155						15		B 4.5						
HOLL		1612	1612	1617	N08	E12	7654	01	22.6	5	SF	B 4.0	3	E		19		F
HOLL		2103	2103	2110	N07	E08	7654	01	22.5	7	SF	B 4.6	3	E		14		
LEAR		2317	2324	2334	N06	E07	7654	01	22.5	17	SF	B 7.8	3	E		26		
LEAR	22	0105	0108	0121	N10	E00	7654	01	22.0	16	SF	C 1.6	3	E		40		
LEAR		0411	0414	0420	N11	W26	7657	01	20.2	9	SF		3	E		26		
GOES		0619	0622	0625						6		B 3.5						
RAMY		1912	1920	1941	N08	W10	7654	01	22.0	29	SF	B 6.2	4	E		28		
HOLL		1912	1921	1931	N09	W09	7654	01	22.1	19	SF		3	E		24		
SVTO	23	1250E	1302U	1323D	N06	W12	7654	01	22.6	33D	1F	C 2.9	2	E		134		F
RAMY		1306E	1306U	1333	N06	W17	7654	01	22.3	27D	1F		3	E		151		H
GOES		2344	2347	2351						7		B 4.7						
GOES	24	0118	0151	0156						38		B 5.9						
GOES		1005	1025	1029						24		B 6.9						
RAMY		1236	1236	1242	N07	W32	7654	01	22.1	6	SF	C 1.1	3	E		19		F
RAMY		1311	1313	1319	N13	W04	7658	01	24.2	8	SF	C 1.2	3	E		33		F
GOES		1629	1633	1635						6		C 1.3						
GOES		1858	1901	1904						6		C 1.2						
GOES		2101	2113	2116						15		C 1.0						
GOES		2124	2127	2131						7		B 8.8						
HOLL		2232	2232	2238	N07	W33	7654	01	22.5	6	SF	B 8.4	3	E		14		
GOES		2313	2317	2321						8		B 8.7						
GOES		2358	2401	2404						6		B 6.2						
LEAR	25	0103	0103	0121	N08	W34	7654	01	22.5	18	SF	C 1.8	3	E		39		F
LEAR		0343	0345	0355	N13	W12	7658	01	24.2	12	SF	C 1.2	3	E		23		F
GOES		0543	0546	0551						8		B 6.7						
SVTO		0813	0814	0817	N11	W37	7654	01	22.5	4	SF	B 6.4	3	E		18		F
SVTO		1246	1305	1313	N07	E29	7661	01	27.7	27	SF		3	E		27		
RAMY		1302	1305	1311	N06	E31	7661	01	27.9	9	SF	B 7.6	4	E		23		
RAMY		1354	1354	1401	N11	W41	7654	01	22.5	7	SF	B 9.9	4	E		12		
SVTO		1419	1422	1429	N09	W47	7654	01	22.1	10	SF		3	E		18		F
GOES		1442	1446	1452						10		C 1.1						
RAMY		1503	1504	1514	N08	W42	7654	01	22.5	11	SF	C 1.2	4	E		12		
HOLL		1602E	1604	1614	N12	W20	7658	01	24.2	12D	SF	C 1.1	2	E		30		F
HOLL		1640	1643	1657	N10	W49	7654	01	22.0	17	SF	C 1.4	3	E		71		
RAMY		1642	1642	1650	N09	W49	7654	01	22.0	8	SF		3	E		29		
RAMY		1651	1652	1657	N09	W47	7654	01	22.2	6	SF		3	E		19		
GOES		1808	1814	1819						11		C 2.7						
HOLL		1812	1833	1928	N09	W48	7654	01	22.1	76	1N	M 1.6	3	E		205		UF
RAMY		1812	1850	1937	N09	W48	7654	01	22.1	85	1N		3	E		138		FE
HOLL		2007	2007	2010	N11	W49	7654	01	22.1	3	SF		3	E		16		
RAMY		2042	2042	2048	N07	W48	7654	01	22.3	6	SF		3	E		11		F
HOLL		2042	2043	2056	N10	W48	7654	01	22.2	14	SF	C 3.1	3	E		20		F
HOLL		2057	2057	2104	N11	W51	7654	01	22.0	7	SF		3	E		10		
HOLL		2156	2158	2206	N10	W49	7654	01	22.2	10	SF	B 9.2	3	E		30		F
HOLL		2228	2236	2246	N06	W49	7654	01	22.3	18	SF	C 1.2	3	E		41		F
HOLL		2311	2315	2320	N11	W53	7654	01	22.0	9	SF		4	E		16		F
GOES		2347	2352	2405						18		C 1.3						
GOES	26	0019	0028	0033						14		C 1.0						
GOES		0054	0058	0103						9		C 1.1						
LEAR		0113	0118	0130	N07	W50	7654	01	22.3	17	SF	C 2.5	3	E		39		F
GOES		0133	0136	0215						42		M 1.5						
LEAR		0140E	0142U	0227D	N07	W50	7654	01	22.3	47D	SF	C 6.5	2	E		80		F
GOES		0244	0247	0249						5		C 1.0						
LEAR		0540	0540	0553	N08	W56	7654	01	22.0	13	SF	C 1.4	3	E		26		F

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LEAR	26	0638	0651	0658	N07	W56	7654	01	22.1	20	SF	C 1.8	3	E		21		F
GOES		0726	0733	0741						15		C 1.3						
GOES		0936	0939	0941						5		B 7.3						
GOES		1005	1011	1016						11		C 1.0						
GOES		1119	1142	1150						31		C 4.6						
RAMY		1352	1353	1410	N10	W33	7658	01	24.1	18	SF		3	E		17		
SVTO		1352	1358	1411	N09	W34	7658	01	24.0	19	SF	B 5.9	3	E		31		
RAMY		1606	1607	1620	N11	W35	7658	01	24.0	14	SF		3	E		13		F
RAMY		1613	1649	1659	N10	W61	7654	01	22.1	46	SF	C 2.5	3	E		53		F
GOES		1630	1633	1636						6		C 1.9						
GOES		1639	1642	1645						6		C 3.7						
HOLL		1648E	1659U	1755D	N12	W65	7654	01	21.8	67D	SF		2	E		38		
RAMY		1720	1722	1726	N08	W60	7654	01	22.2	6	SF	C 1.3	3	E		14		F
HOLL		1852	1852	1906	N09	W62	7654	01	22.1	14	SF	C 1.5	3	E		35		
GOES		2020	2025	2030						10		C 1.0						
RAMY		2057	2057	2107	N08	W62	7654	01	22.2	10	SF	B 7.2	3	E		22		
HOLL		2057	2058	2103	N09	W62	7654	01	22.2	6	SF		3	E		27		
HOLL		2119	2120	2125	N09	W63	7654	01	22.1	6	SF	B 8.7	3	E		28		
GOES		2132	2137	2140						8		B 8.6						
HOLL		2146	2146	2156	N09	W64	7654	01	22.1	10	SF		3	E		12		
HOLL		2237	2240	2243	N10	W68	7654	01	21.8	6	SF	C 1.6	3	E		86		
GOES	27	0019	0028	0033						14		C 1.8						
GOES		0211	0214	0216						5		C 1.0						
GOES		0340	0343	0404						24		C 4.6						
LEAR		0518E	0528U	0549	N11	W65	7654	01	22.3	31D	SN	M 2.7	2	E		90		
GOES		0840	0932	1003						83		C 1.3						
SVTO		1348	1349	1357	N07	W71	7654	01	22.2	9	SF		3	E		36		
RAMY		1348	1349	1403	N07	W72	7654	01	22.2	15	SF	C 2.7	3	E		71		
GOES		1416	1427	1433						17		C 1.1						
GOES		1448	1503	1513						25		C 1.7						
HOLL		1605	1607	1610	N08	W73	7654	01	22.2	5	SF		3	E		35		H
RAMY		1606	1606	1610	N07	W74	7654	01	22.1	4	SF	C 2.1	3	E		14		
HOLL		1624	1625	1639	N11	W71	7654	01	22.3	15	SF		3	E		29		
GOES		1900	1905	1910						10		B 8.2						
RAMY		2000E	2003U	2012	N07	W77	7654	01	22.1	12D	SF	C 1.6	3	E		20		
RAMY		2103E	2105U	2118	N08	W73	7654	01	22.4	15D	SF		3	E		33		F
HOLL		2103	2107	2116	N10	W73	7654	01	22.4	13	SF	C 2.1	3	E		27		
GOES		2140	2144	2148						8		B 7.5						
GOES		2157	2209	2218						21		C 1.3						
HOLL		2339	2342	2345	N08	W80	7654	01	22.0	6	SF	B 7.8	3	E		42		
GOES		2354	2404	2408						14		B 9.5						
GOES	28	0110	0115	0129						19		B 9.3						
GOES		0319	0345	0348						29		C 1.6						
GOES		0446	0506	0515						29		C 2.4						
GOES		0623	0636	0645						22		B 7.5						
GOES		0856	0900	0904						8		C 1.1						
GOES		0912	0918	0928						16		B 7.2						
GOES		1122	1131	1134						12		C 1.4						
GOES		1247	1303	1315						28		C 2.3						
RAMY		1513	1516	1523	S09	E82		02	3.8	10	SF		3	E		23		
RAMY		1625	1626	1631	N08	W85	7654	01	22.3	6	SF	M 1.8	3	E		20		
RAMY		1631	1632	1638	N08	W84	7654	01	22.4	7	SF		3	E		11		
GOES		1847	1852	1856						9		M 1.1						
RAMY		1947	1949	1954	S09	E79		02	3.7	7	SF	C 4.5	3	E		20		
GOES	29	0059	0102	0104						5		C 1.0						
GOES		0247	0302	0306						19		B 9.7						
GOES		0314	0413	0422						68		M 2.4						
GOES		0735	0739	0742						7		C 5.0						
GOES		0819	0833	0842						23		C 3.3						
SVTO		0906	0909	0913	N12	W71	7658	01	24.0	7	SF	C 6.6	3	E		49		
GOES		1050	1059	1110						20		C 2.3						
GOES		1113	1129	1138						25		M 2.4						
GOES		1252	1308	1321						29		C 6.5						
GOES		1503	1514	1545						42		C 8.8						
GOES	30	0102	0110	0118						16		C 3.2						

Hα SOLAR FLARES

JANUARY 1994

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	31	0135	0138	0142						7		B	1.9					
GOES		0311	0417	0507						116		B	4.8					

"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

SOLAR RADIO EMISSION
Selected Fixed Frequency Events

JANUARY 1994

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 -22 W/m 2 Hz)	Mean	Int	Remarks
01	8800	SVTO	8	S	1221.0	1221.0	1.0	51.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	2313.0	2313.0	1.0	160.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	2313.0	2313.0	U	27.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	2313.0	2313.0	1.0	140.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	2313.0	2313.0	1.0	34.0			QL=4 ST=2 TYP=3
02	8800	LEAR	8	S	0235.0	0235.0	U	27.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	0235.0	0235.0	U	32.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	2251.0	2253.0	10.0	470.0			QL=4 ST=2 TYP=3
	2695	PALE	4	S/F	2253.0	2254.0	3.0	100.0			QL=4 ST=2 TYP=3
05	2695	PALE	4	S/F	0151.0	0154.0	3.0	54.0			QL=4 ST=2 TYP=3
	2695	LEAR	4	S/F	0646.0	0650.0	8.0	36.0			QL=4 ST=2 TYP=3
	8800	LEAR	4	S/F	0647.0	0655.0	9.0	27.0			QL=4 ST=2 TYP=3
	2695	SGMR	8	S	1401.0	1402.0	1.0	38.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1401.0	1402.0	1.0	43.0			QL=4 ST=2 TYP=3
06	8800	LEAR	4	S/F	0400.0	0405.0	8.0	200.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0613.0	0614.0	2.0	35.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0757.0	0758.0	1.0	36.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	0757.0	0758.0	7.0	30.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	1237.0	1238.0	3.0	99.0			QL=4 ST=2 TYP=3
07	2695	LEAR	8	S	0941.0	0942.0	1.0	40.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0941.0	0942.0	1.0	150.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	0941.0	0942.0	1.0	45.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	0941.0	0942.0	1.0	170.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1127.0	1127.0	U	39.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	1127.0	1127.0	U	35.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	1233.0	1234.0	4.0	250.0			QL=4 ST=2 TYP=3
09	2695	LEAR	4	S/F	2246.0	2247.0	3.0	44.0			QL=4 ST=2 TYP=3
	2695	PALE	20	GRF	2246.0	2247.0	3.0	43.0			QL=4 ST=2 TYP=2
	8800	PALE	20	GRF	2247.0	2247.0	U	25.0			QL=4 ST=2 TYP=2
16	2695	LEAR	4	S/F	0656.0	0700.0	7.0	54.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0700.0	0700.0	2.0	38.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	0700.0	0700.0	1.0	43.0			QL=2 ST=2 TYP=3
	2695	SVTO	8	S	0700.0	0700.0	2.0	40.0			QL=2 ST=2 TYP=3
	2695	LEAR	4	S/F	2307.0	2317.0	22.0	190.0			QL=4 ST=2 TYP=5
	8800	LEAR	49	GB	2307.0	2317.0	20.0	920.0			QL=4 ST=2 TYP=7
	8800	PALE	49	GB	2307.0	2317.0	27.0	1200.0			QL=4 ST=2 TYP=7
	2695	PALE	4	S/F	2307.0	2317.0	21.0	180.0			QL=4 ST=2 TYP=5
	8800	LEAR	49	GB	2308.0	2318.0	20.0	920.0			QL=/ ST=/ TYP=6
17	8800	LEAR	8	S	0914.0	0915.0	1.0	36.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	0914.0	0915.0	1.0	60.0			QL=2 ST=2 TYP=3
	2695	LEAR	8	S	0916.0	0917.0	1.0	40.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	0916.0	0917.0	1.0	45.0			QL=2 ST=2 TYP=3
	2695	PALE	4	S/F	1859.0	1900.0	4.0	28.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	1900.0	1900.0	1.0	57.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	2320.0	2321.0	1.0	26.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	2321.0	2321.0	U	26.0			QL=4 ST=2 TYP=3
19	8800	LEAR	4	S/F	0310.0	0312.0	3.0	47.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	0312.0	0312.0	1.0	23.0			QL=2 ST=2 TYP=3
	8800	SVTO	4	S/F	0827.0	0828.0	3.0	58.0			QL=2 ST=2 TYP=3
	8800	LEAR	8	S	0828.0	0828.0	U	39.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	1144.0	1145.0	2.0	43.0			QL=2 ST=2 TYP=3
	2695	SVTO	8	S	1144.0	1145.0	2.0	16.0			QL=4 ST=2 TYP=3
24	2695	SGMR	8	S	1245.0	1245.0	2.0	28.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	1245.0	1245.0	U	20.0			QL=4 ST=2 TYP=3
25	8800	SGMR	8	S	1643.0	1643.0	U	27.0			QL=4 ST=3 TYP=3
	8800	PALE	8	S	1811.0	1812.0	1.0	67.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1811.0	1812.0	2.0	66.0			QL=4 ST=2 TYP=3
	8800	SGMR	4	S/F	1820.0	1821.0	6.0	85.0			QL=4 ST=2 TYP=3
	2695	SGMR	4	S/F	1820.0	1821.0	6.0	28.0			QL=4 ST=2 TYP=3

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

JANUARY 1994

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
25	8800	PALE	8	S	1821.0	1821.0	1.0	58.0			QL=4 ST=2 TYP=3
	8800	SGMR	4	S/F	1831.0	1832.0	9.0	63.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	2041.0	2042.0	2.0	210.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	2042.0	2042.0	U	37.0			QL=4 ST=2 TYP=3
26	8800	LEAR	4	S/F	0133.0	0134.0	3.0	130.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0133.0	0134.0	2.0	60.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	0133.0	0134.0	4.0	160.0			QL=4 ST=3 TYP=3
	2695	PALE	8	S	0133.0	0134.0	1.0	49.0			QL=4 ST=3 TYP=3
	8800	LEAR	8	S	0539.0	0540.0	1.0	190.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0728.0	0729.0	1.0	55.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	0728.0	0729.0	2.0	62.0			QL=4 ST=2 TYP=3
27	8800	LEAR	4	S/F	0505.0	0509.0	30.0	150.0			QL=4 ST=2 TYP=3
	2695	LEAR	4	S/F	0506.0	0508.0	4.0	51.0			QL=4 ST=2 TYP=3
29	8800	LEAR	4	S/F	0331.0	0338.0	9.0	110.0			QL=4 ST=2 TYP=3
	8800	PALE	4	S/F	0336.0	0338.0	7.0	95.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1508.0	1509.0	1.0	35.0			QL=4 ST=2 TYP=3

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

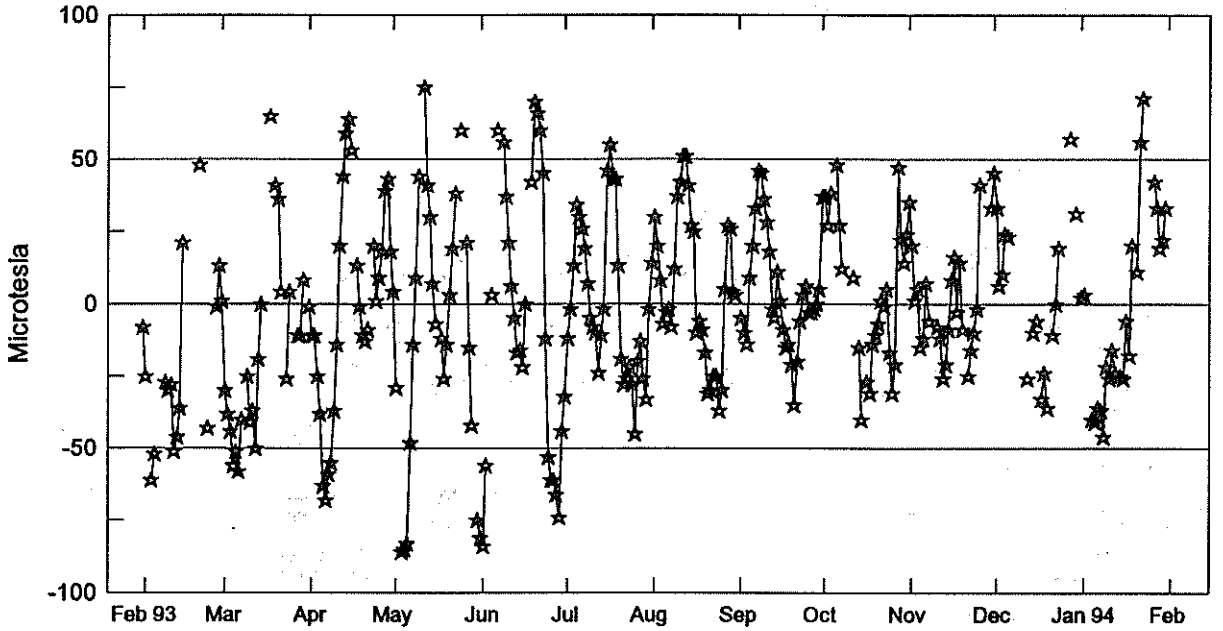
Explanation of Type Code:

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; Hiraiso, Japan 500 and 200 MHz; and Toyokawa, Japan 9400, 3750, 2000 and 1000 MHz.

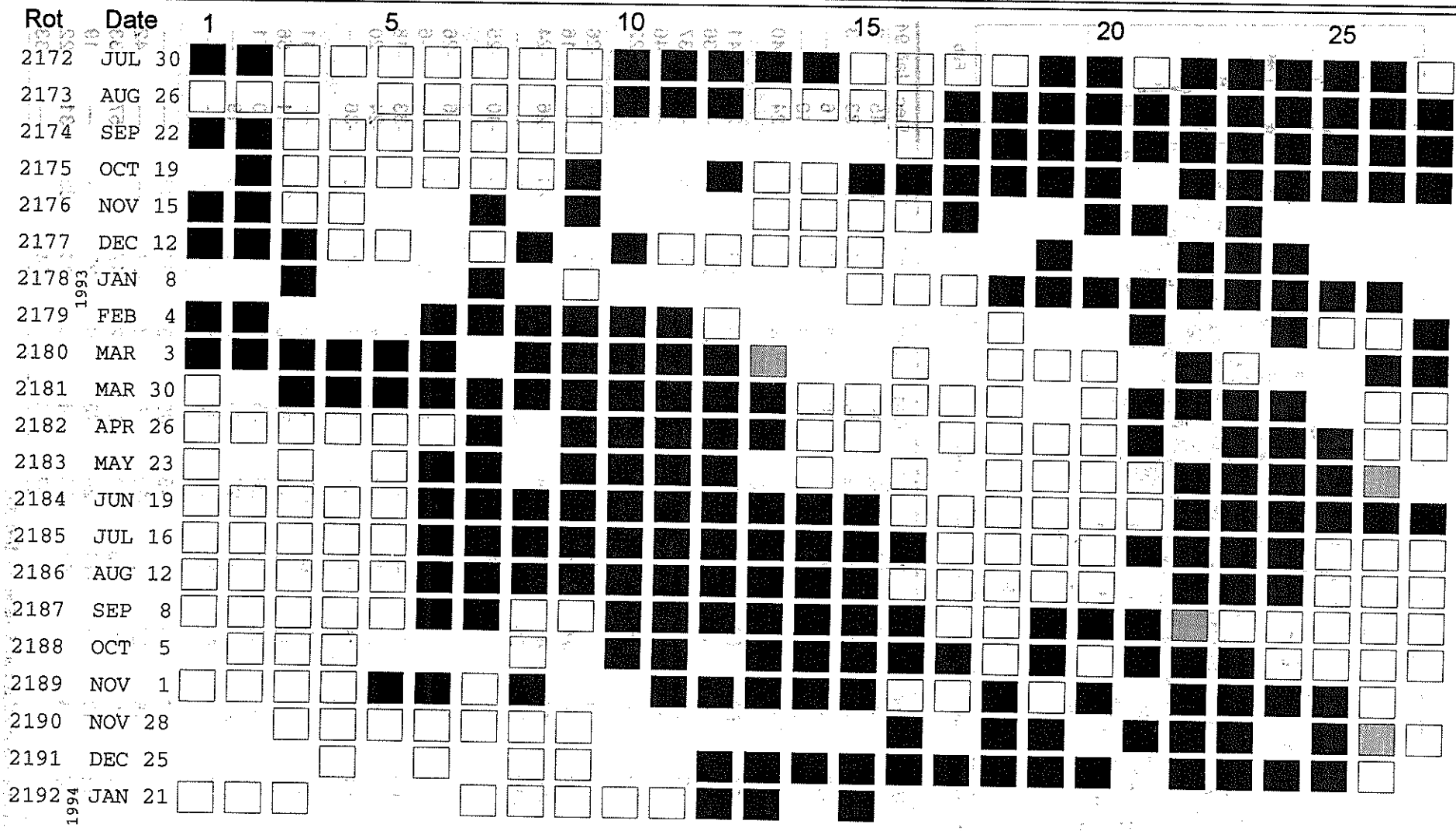
Stanford Mean Solar Magnetic Field (Microtesla)
"Sun-As-A-Star"



Day	Feb 93	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 94
1	-8	1	-1	4	-81	-32	14	---	37	35	45	2
2	-25	-30	-11	-29	-84	-12	30	-5	37	20	33	3
3	---	-38	-11	---	-56	-2	20	-10	27	1	6	---
4	-61	-44	-25	-86	---	13	8	-14	38	5	10	---
5	-52	-56	-38	-85	3	34	-7	9	---	-15	24	-40
6	---	-51	-63	-83	---	30	-3	20	48	-12	23	-41
7	---	-58	-68	-48	60	26	-2	33	27	7	---	-36
8	---	-40	-59	-14	---	19	-8	46	12	-6	---	-37
9	-27	---	-55	9	56	7	12	45	---	---	---	-46
10	-30	-25	-37	44	37	-5	37	36	---	---	---	-22
11	-28	-41	-14	---	21	-8	42	28	---	-8	---	-26
12	-51	-37	20	75	6	-10	51	18	9	-12	---	-16
13	-46	-50	44	41	-5	-24	51	-2	---	-26	-26	-24
14	-36	-19	59	30	-17	-11	41	-5	-15	-21	---	---
15	21	0	64	7	-16	-2	27	11	-40	-9	-10	-25
16	---	---	53	-7	-22	46	25	1	---	8	-6	-26
17	---	---	---	---	0	55	-10	-9	-27	16	---	-6
18	---	65	13	-12	---	43	-6	-15	-31	-3	-33	-18
19	---	---	-1	-26	42	43	-9	-14	-14	14	-24	20
20	---	41	-11	-14	70	13	-17	-21	-11	-9	-36	---
21	48	36	-13	3	66	-19	-31	-35	-7	---	---	11
22	---	4	-9	19	60	-28	-30	-20	1	-25	-11	56
23	---	---	---	38	45	-26	-25	-6	-1	-16	0	71
24	-43	-26	20	---	-12	-22	-25	3	5	-10	19	---
25	---	4	1	60	-53	-28	-37	6	-17	-2	---	---
26	---	---	9	---	-61	-45	-30	-3	-31	41	---	---
27	-1	---	18	21	-61	-20	5	-3	-21	---	---	42
28	13	-11	39	-15	-66	-13	27	-2	47	---	57	33
29		-11	43	-42	-74	-26	26	0	22	---	---	19
30		8	18	---	-44	-33	4	5	14	33	31	22
31		---		-75		-2	3		24		---	33

Note: --- Indicates no data available for the day.

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.

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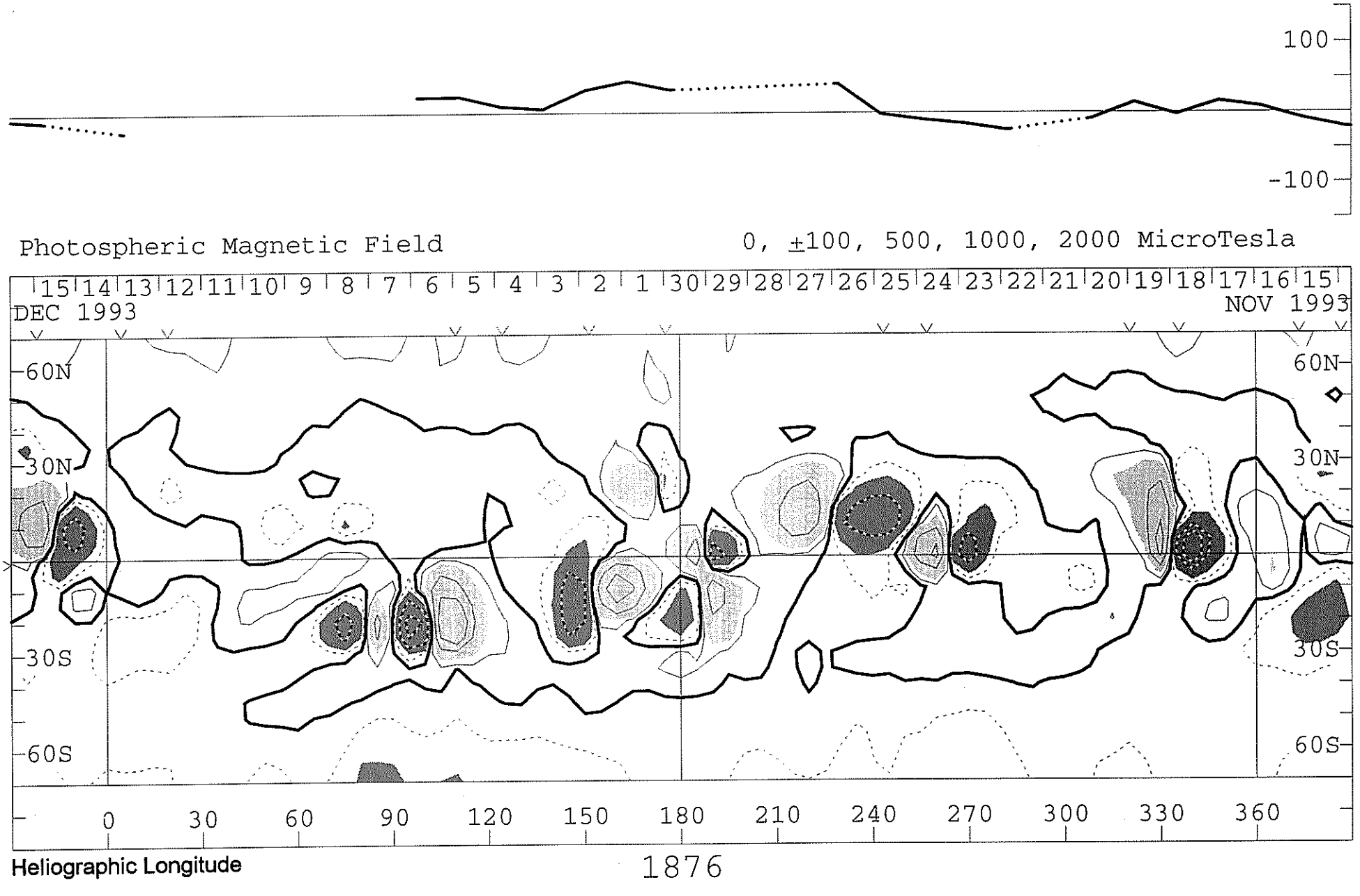
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1876

(16 November to 14 December 1993)

WILCOX SOLAR OBSERVATORY



SOLAR MAGNETIC FIELD SYNOPTIC CHART

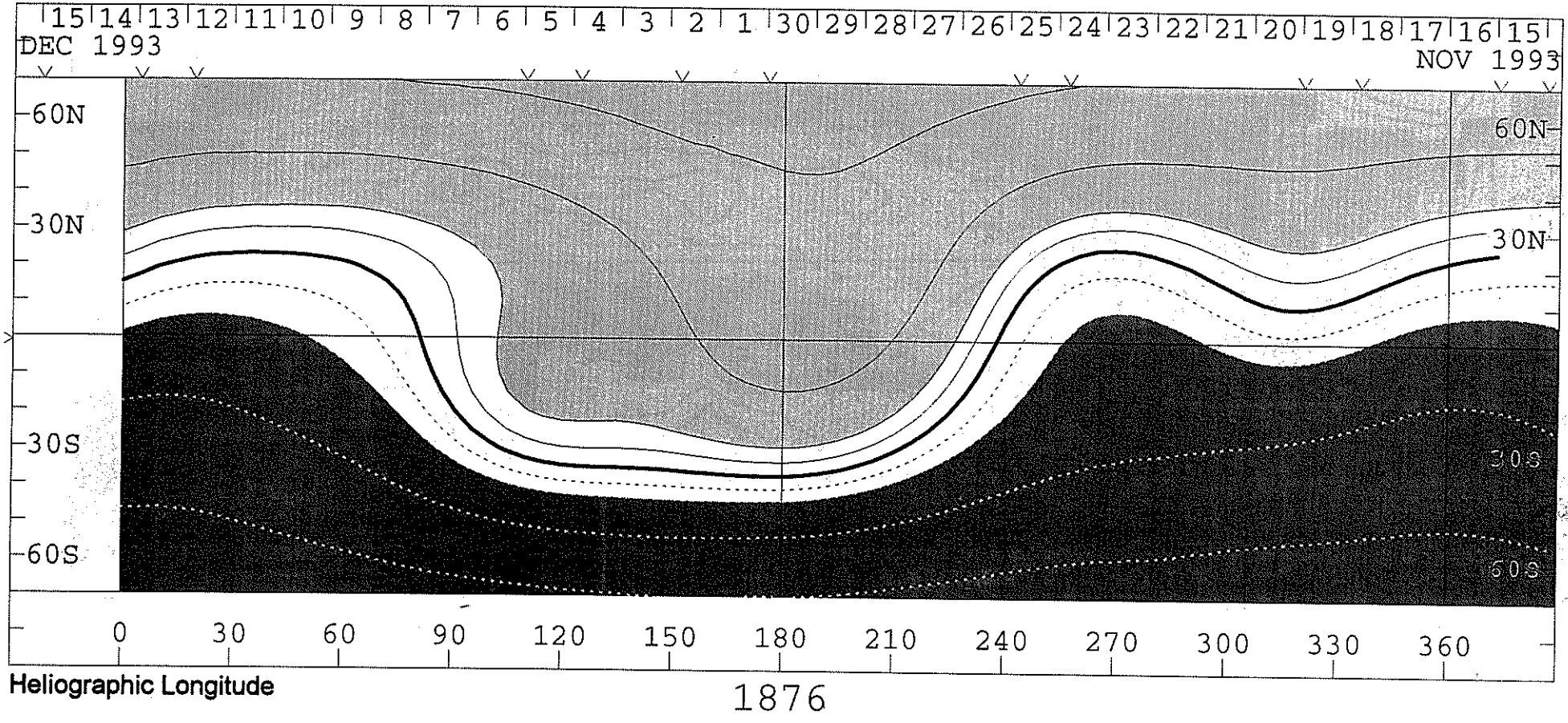
SOURCE SURFACE FIELD

CARRINGTON ROTATION NUMBER 1876

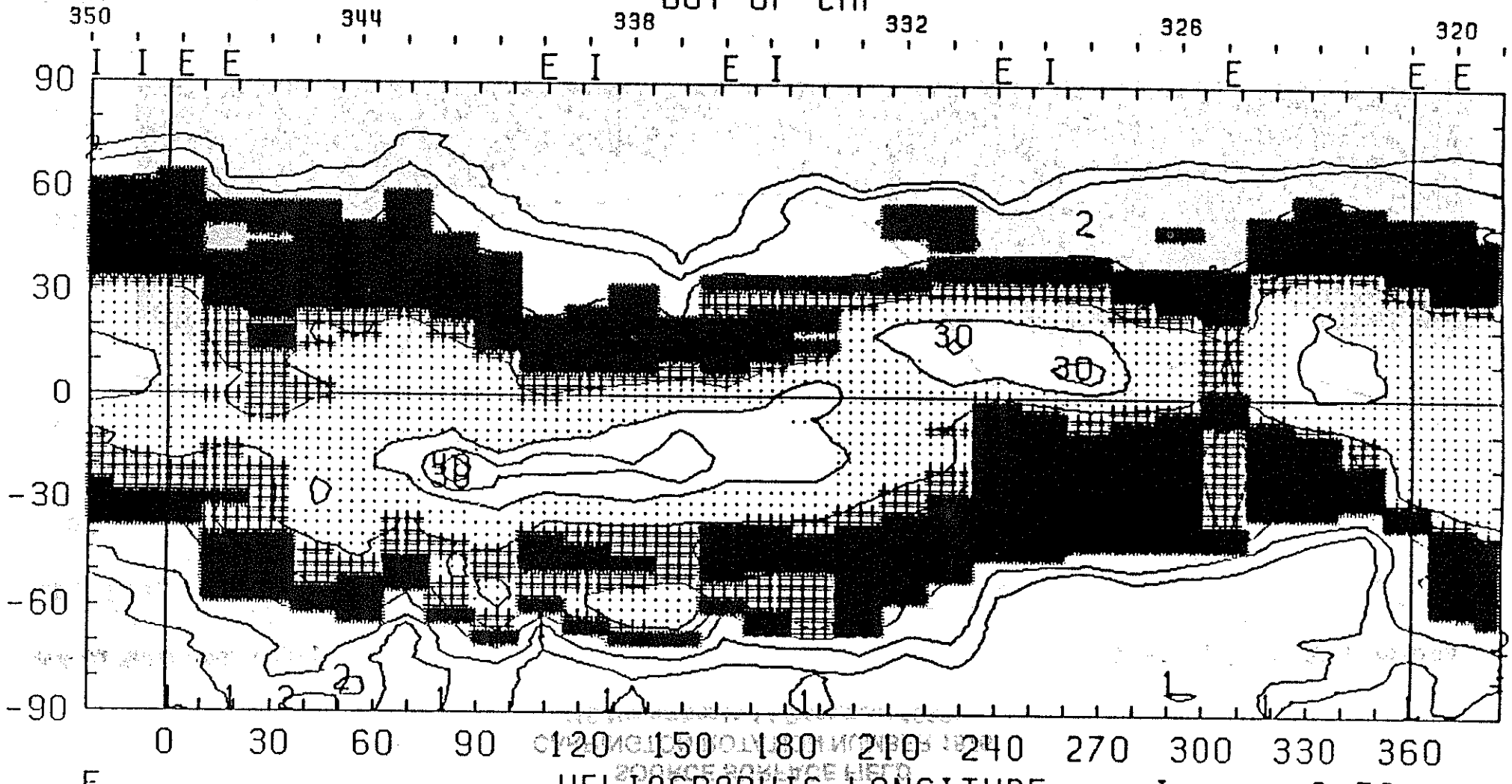
(16 November to 14 December 1993)

Wilcox Solar Observatory

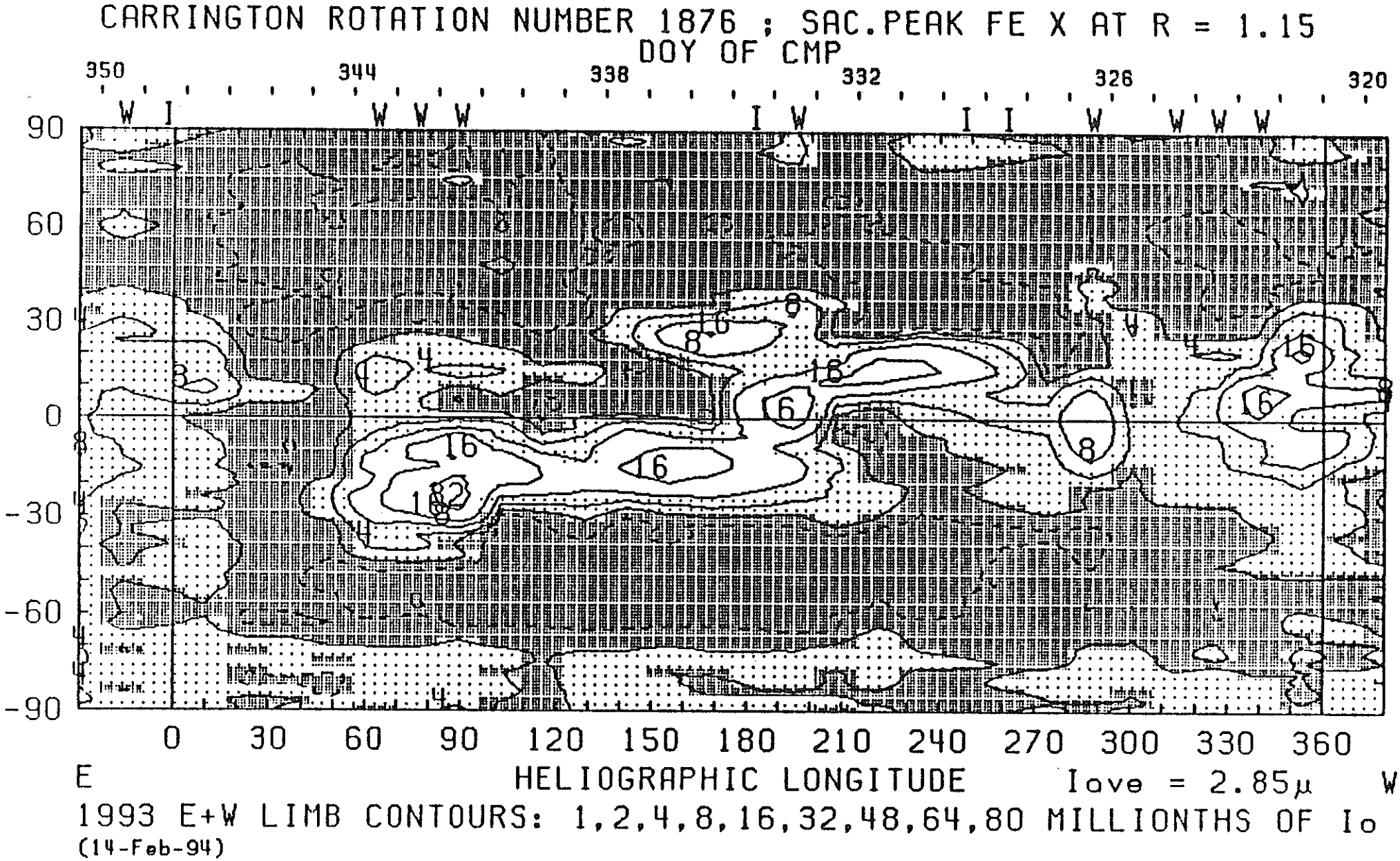
0, ±1, 2, 5, 10, 20 microTesla



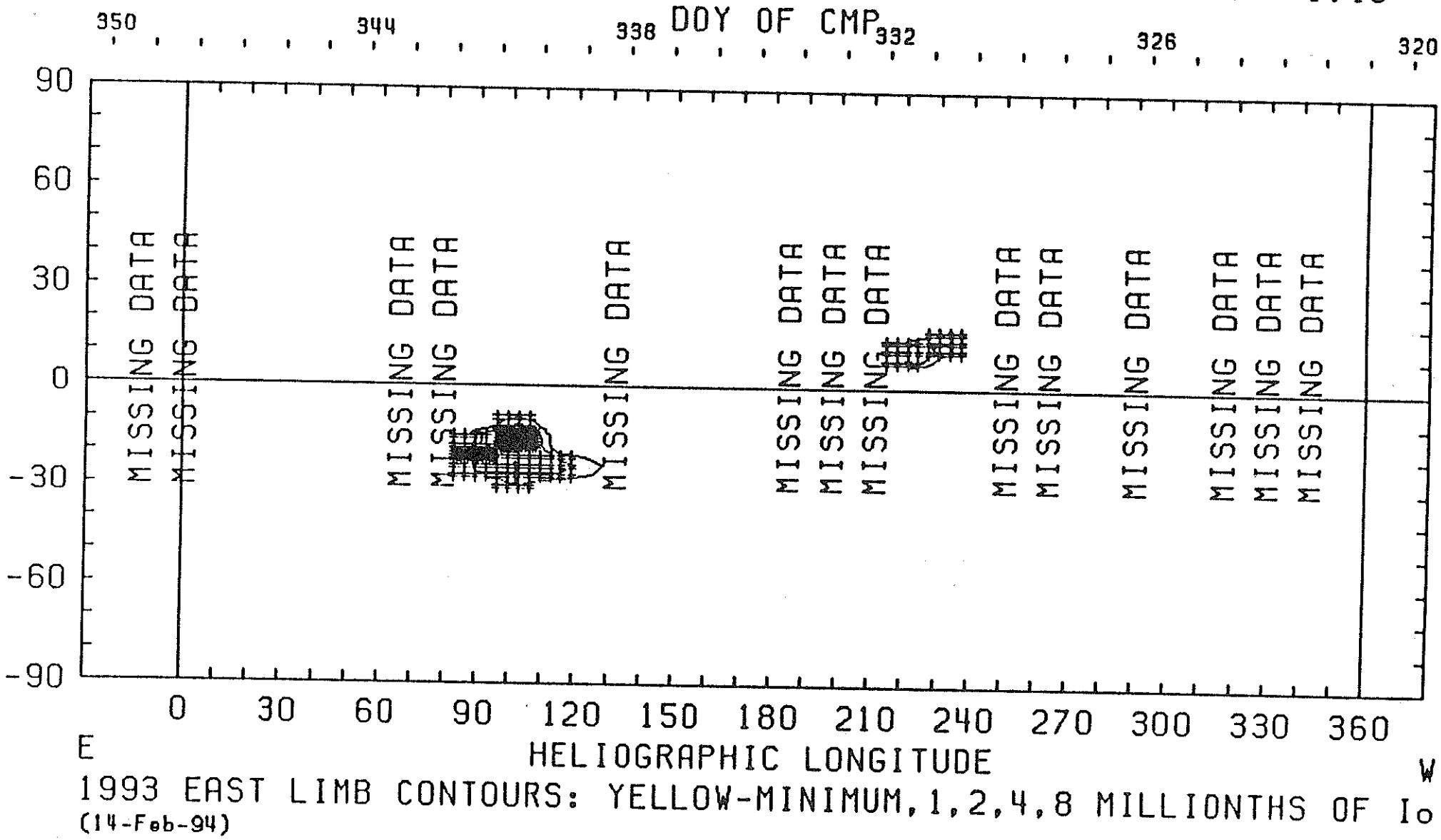
CARRINGTON ROTATION NUMBER 1876 ; SAC.PEAK FE XIV AT R = 1.15



1993 W+E LIMB CONTOURS: 1,2,4,7,10,20,30,40,50 MILLIONTHS OF Io
(14-Feb-94) CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK

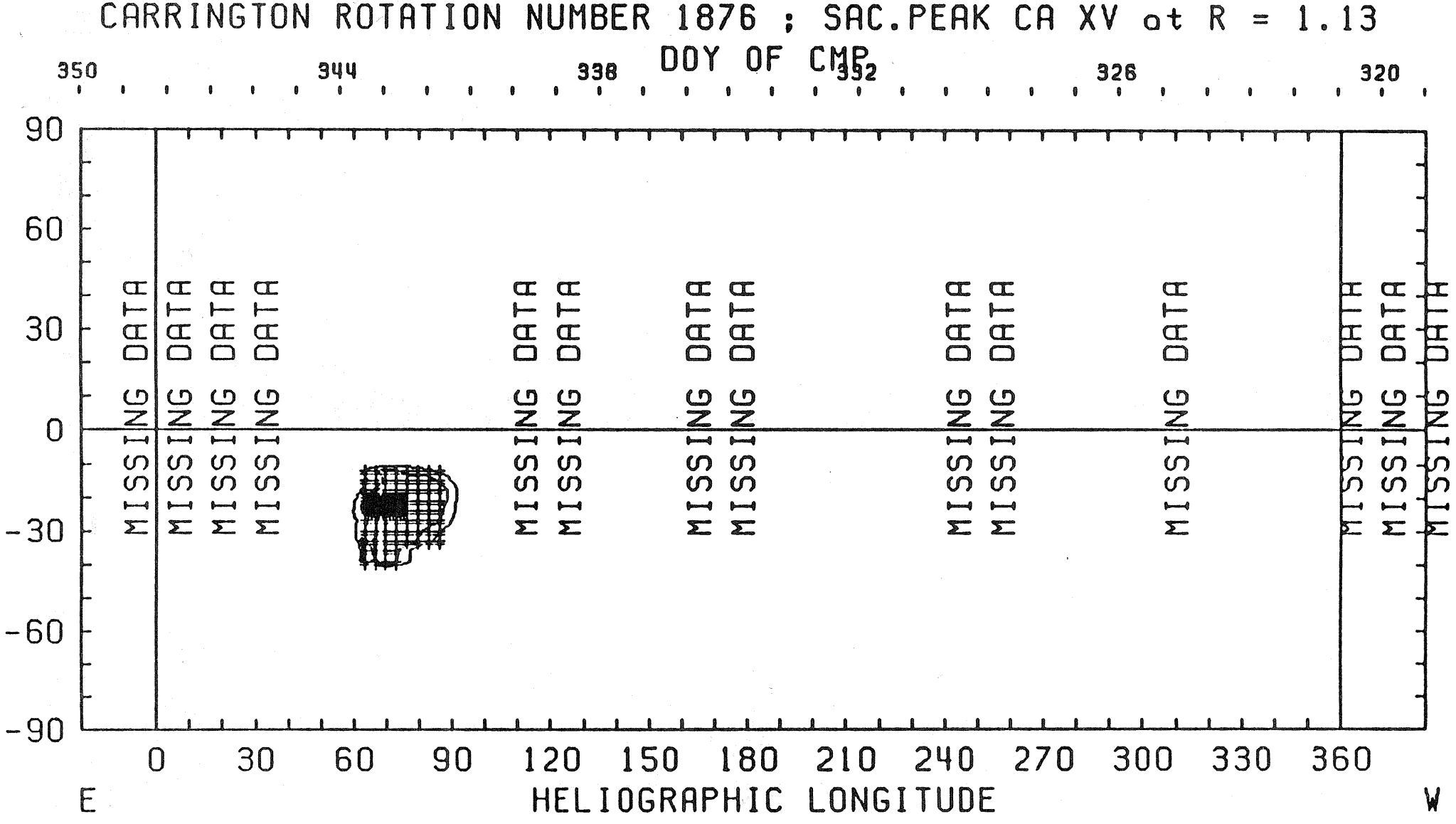

CARRINGTON ROTATION NUMBER 1876 ; SAC.PEAK FE X AT R = 1.15
DOY OF CMP
350
344
338
332
326
320
90
60
30
0
-30
-60
-90
0
30
60
90
120
150
180
210
240
270
300
330
360
E
HELIOGRAPHIC LONGITUDE
Iave = 2.85μ
W
1993 E+W LIMB CONTOURS: 1,2,4,8,16,32,48,64,80 MILLIONTHS OF Io
(14-Feb-94)

CARRINGTON ROTATION NUMBER 1876 ; SAC.PEAK CA XV at R = 1.13



1993 EAST LIMB CONTOURS: YELLOW-MINIMUM, 1, 2, 4, 8 MILLIONTHS OF Io

(14-Feb-94)


CARRINGTON ROTATION NUMBER 1876 ; SAC.PEAK CA XV at R = 1.13
DOY OF CMP
350
344
338
332
326
320
90
60
30
0
-30
-60
-90
MISSING DATA
0
30
60
90
120
150
180
210
240
270
300
330
360
E
HELIOGRAPHIC LONGITUDE
W
1993 WEST LIMB CONTOURS: YELLOW-MINIMUM, 1, 2, 4, 8 MILLIONTHS OF Io
(14-Feb-94)

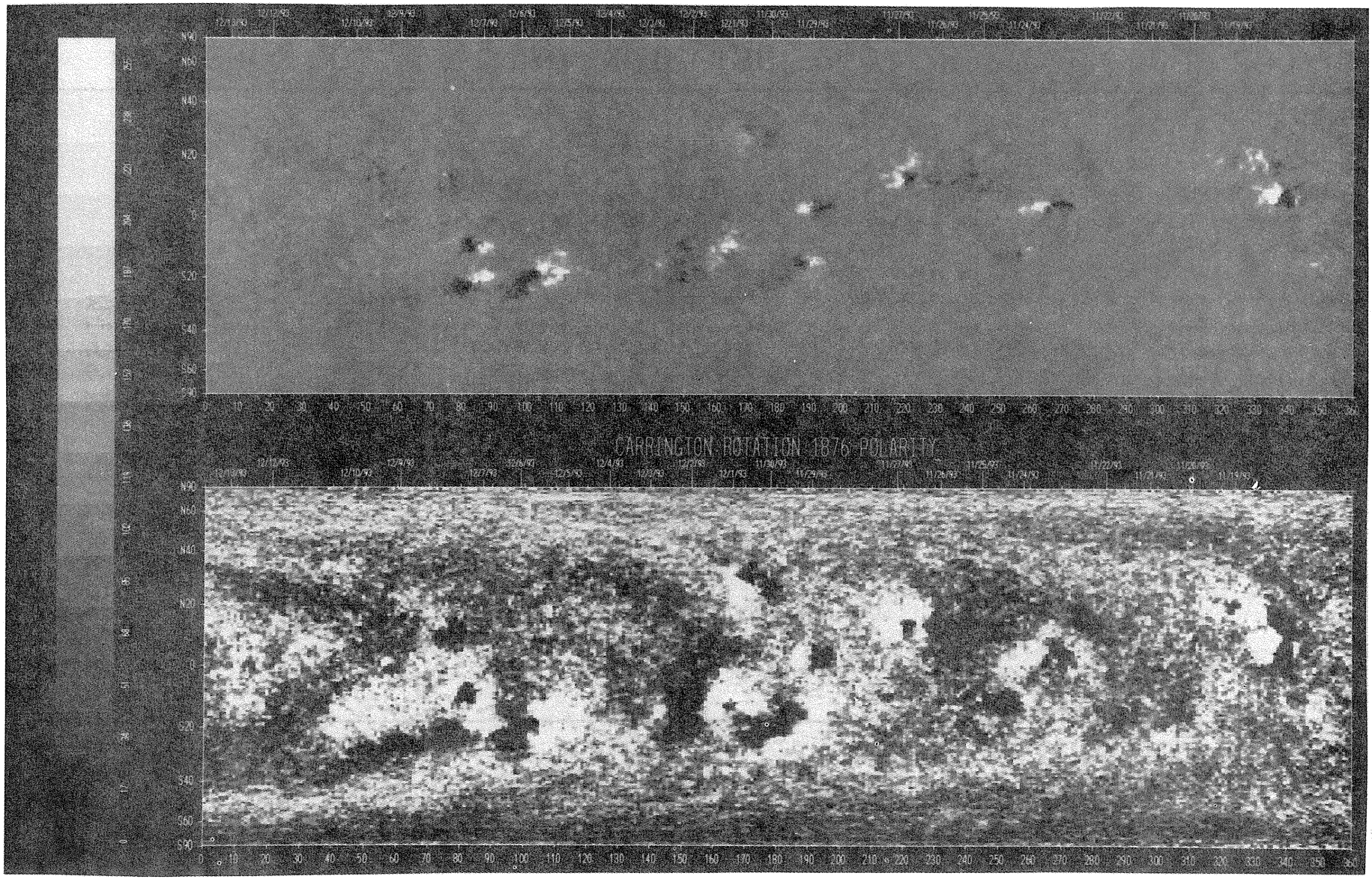
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1876

(16 November to 14 December 1993)

National Solar Observatory/Kitt Peak

Dates of Observation



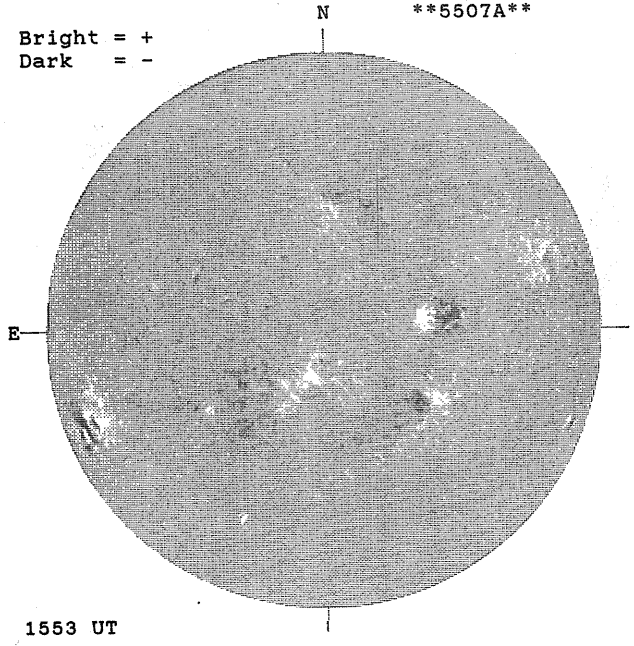
Heliographic Longitude

DECEMBER 1, 1993 (P= 16.09, B_o = 0.87, L_o = 175.02)

KITT PEAK MAGNETOGRAM

5507A

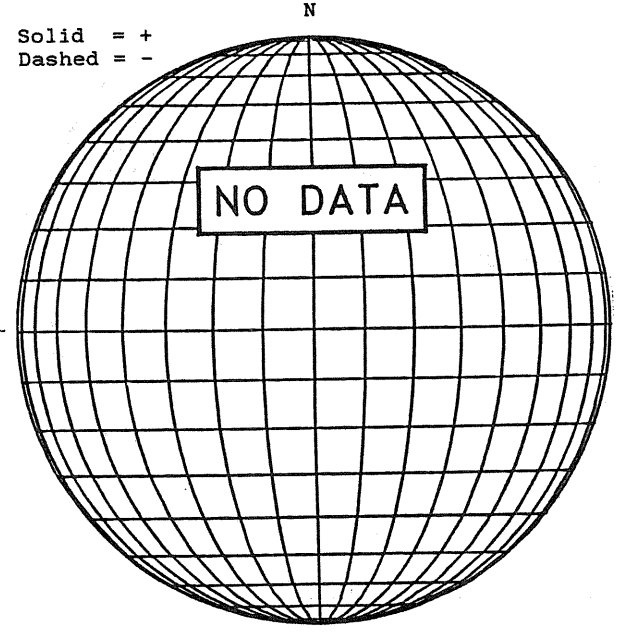
Bright = +
Dark = -



1553 UT

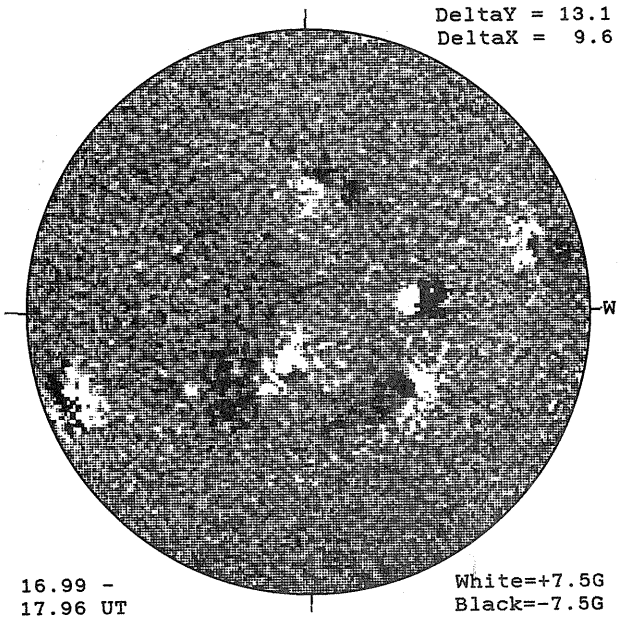
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

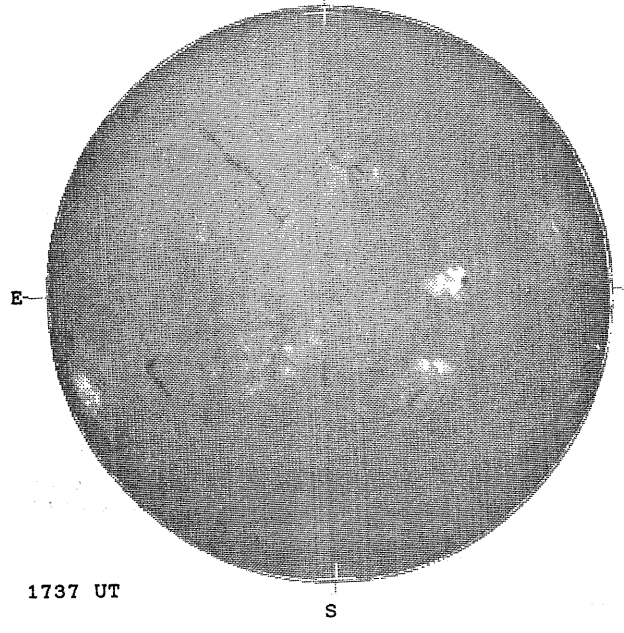
DeltaY = 13.1
DeltaX = 9.6



16.99 -
17.96 UT

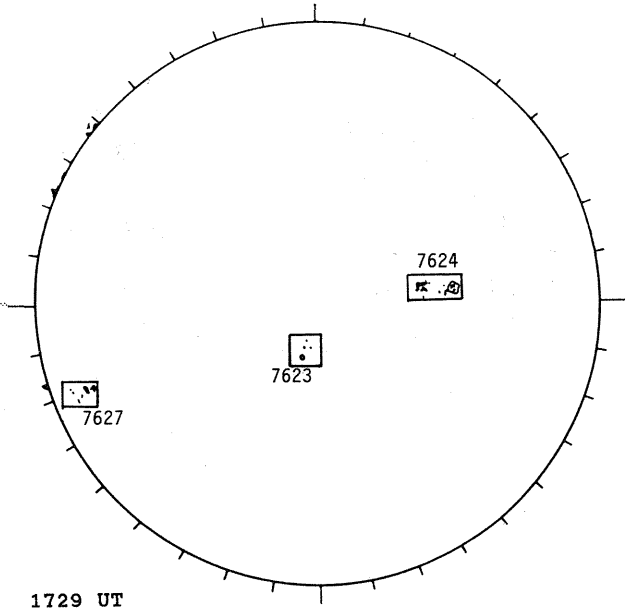
White=+7.5G
Black=-7.5G

BOULDER H-ALPHA



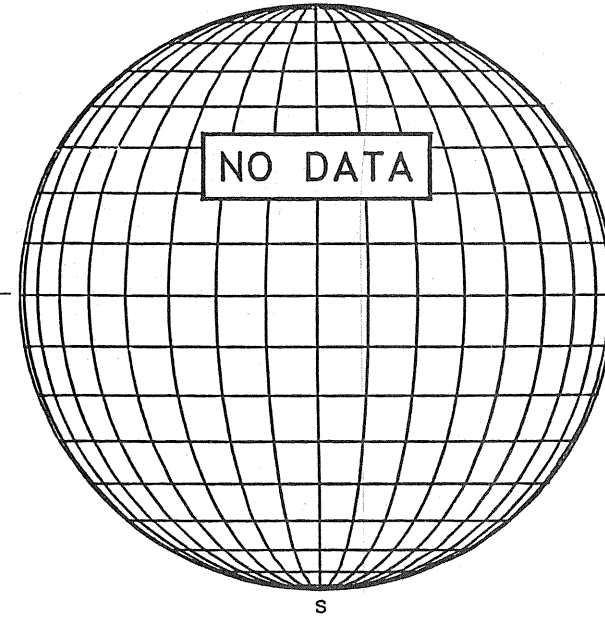
1737 UT

BOULDER SUNSPOT



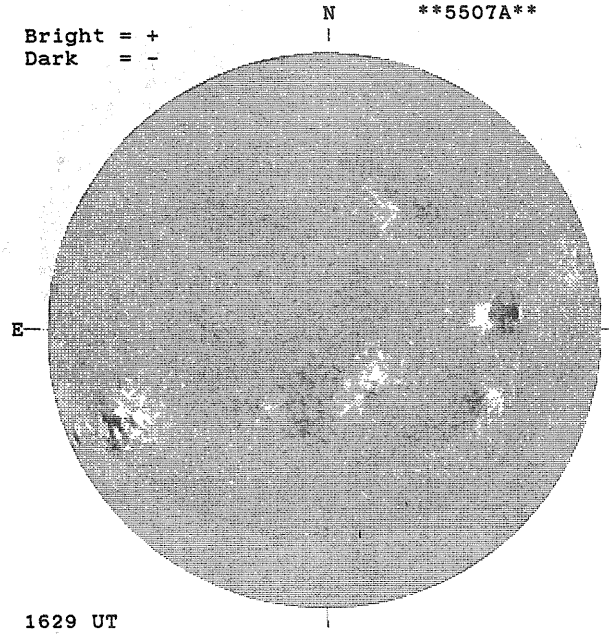
1729 UT
1737 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

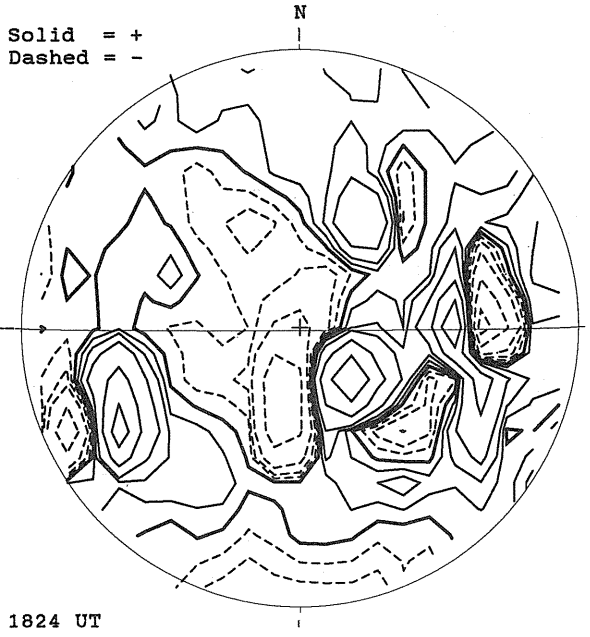


DECEMBER 2, 1993 (P= 15.70, B_o = 0.74, L_o = 161.84)

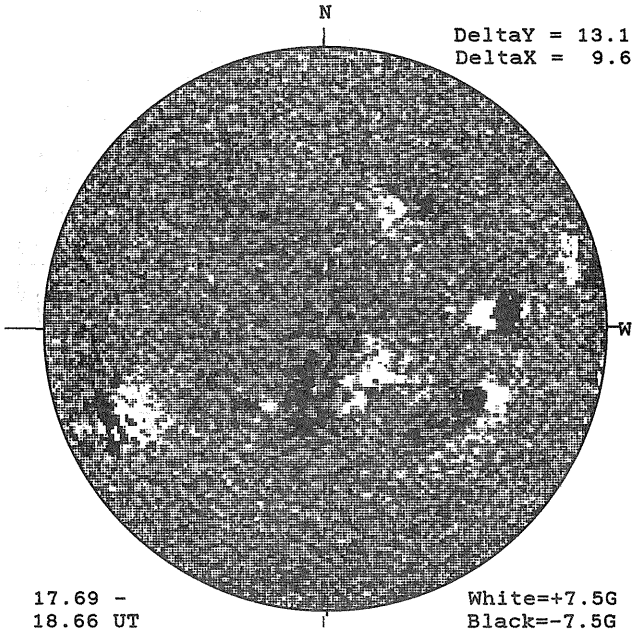
KITT PEAK MAGNETOGRAM



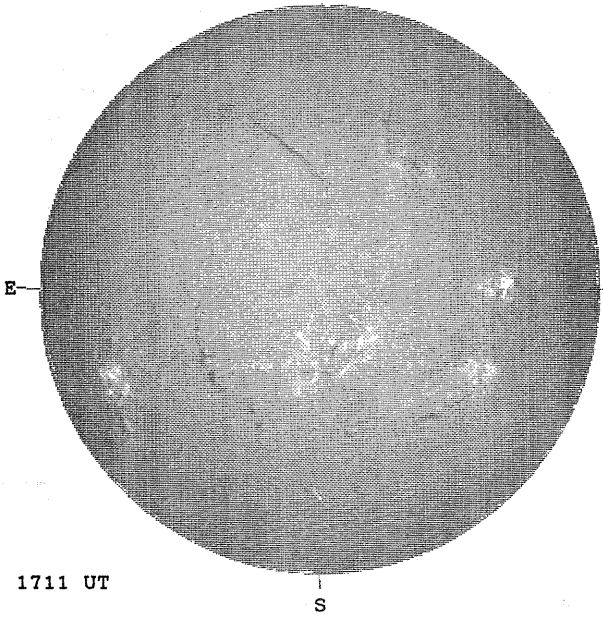
STANFORD MAGNETOGRAM



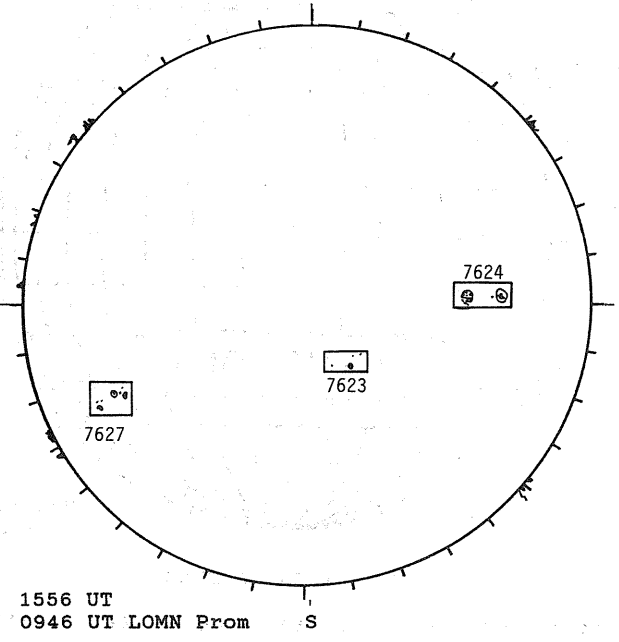
MT. WILSON MAGNETOGRAM



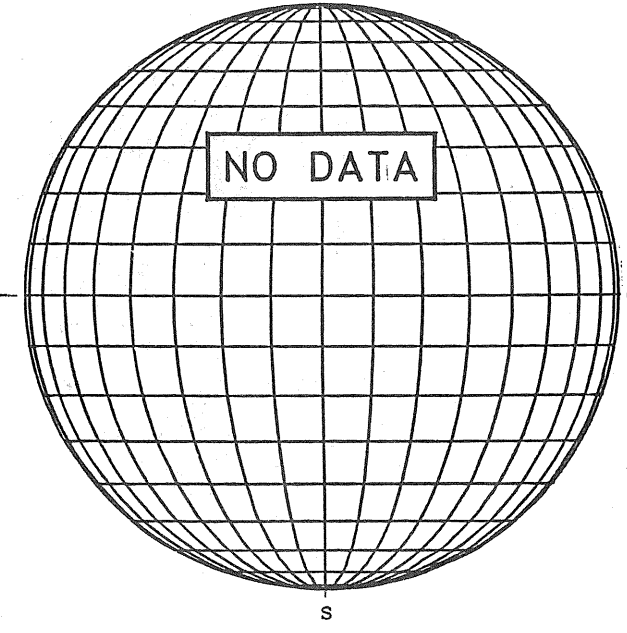
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

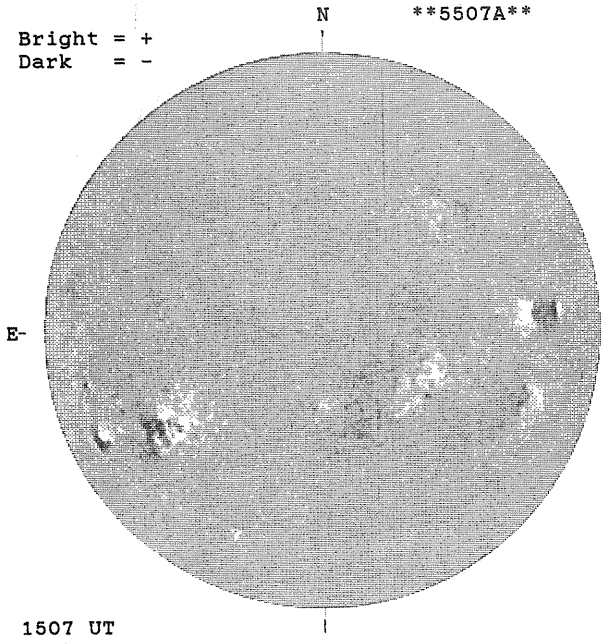


SACRAMENTO PEAK CORONA (1.15 Radii)

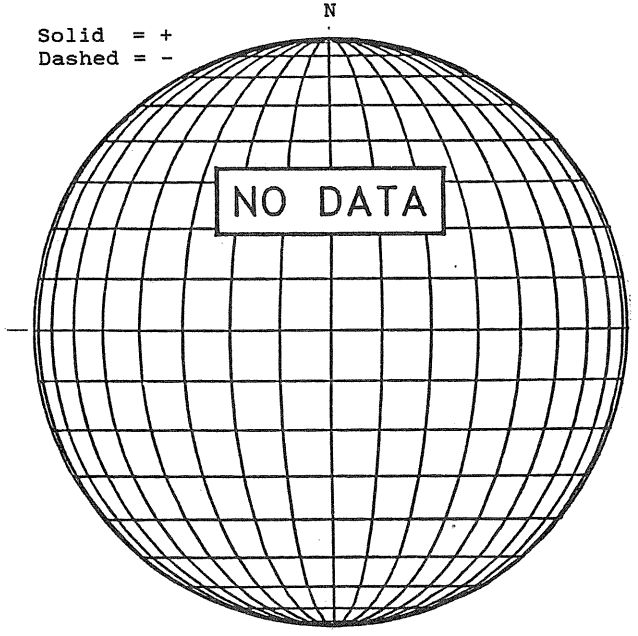


DECEMBER 3, 1993 (P= 15.31, B_o = 0.61, L_o = 148.67)

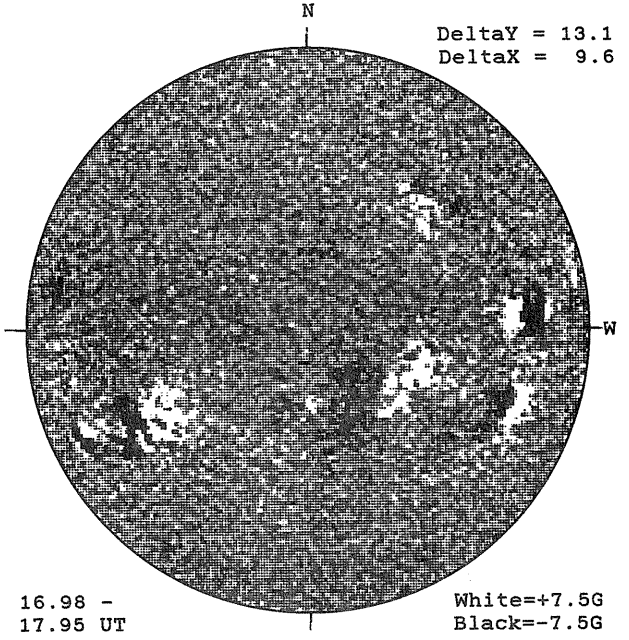
KITT PEAK MAGNETOGRAM



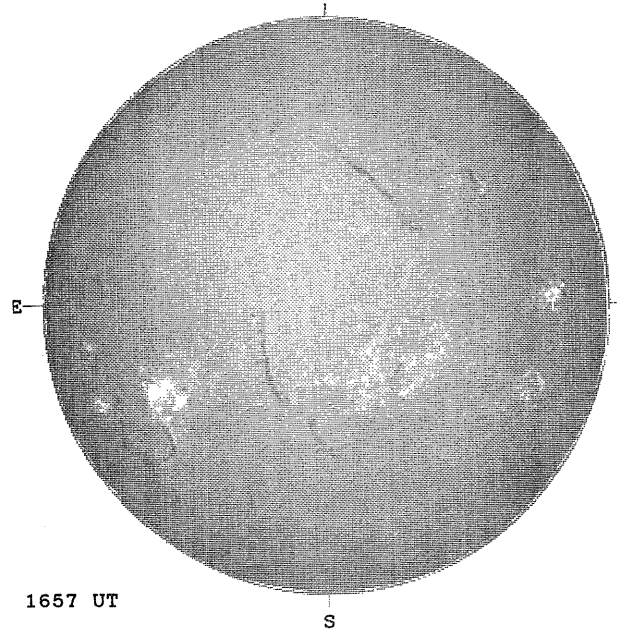
STANFORD MAGNETOGRAM



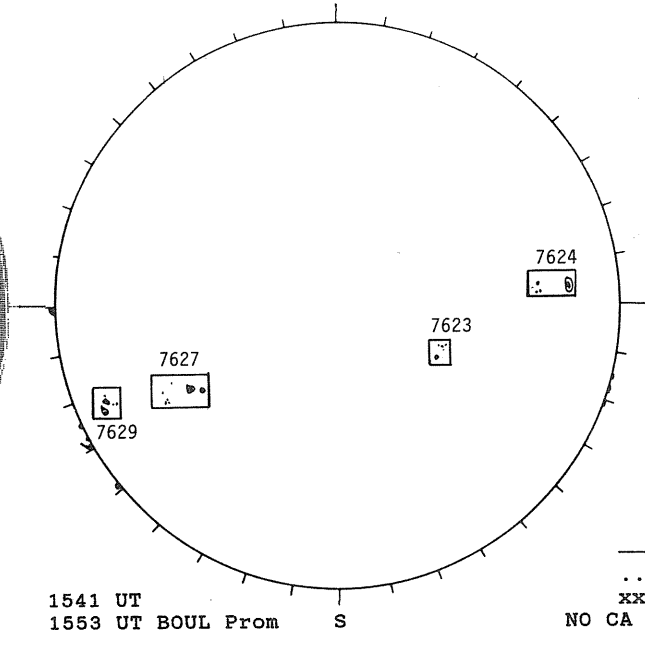
MT. WILSON MAGNETOGRAM



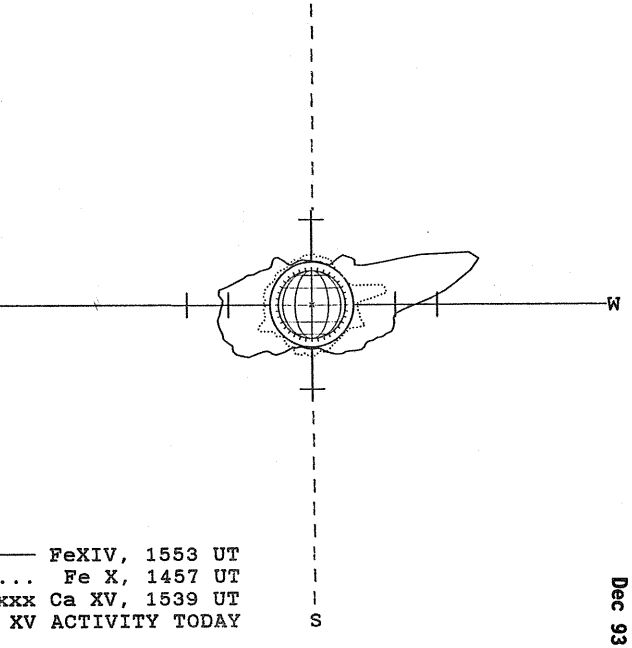
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

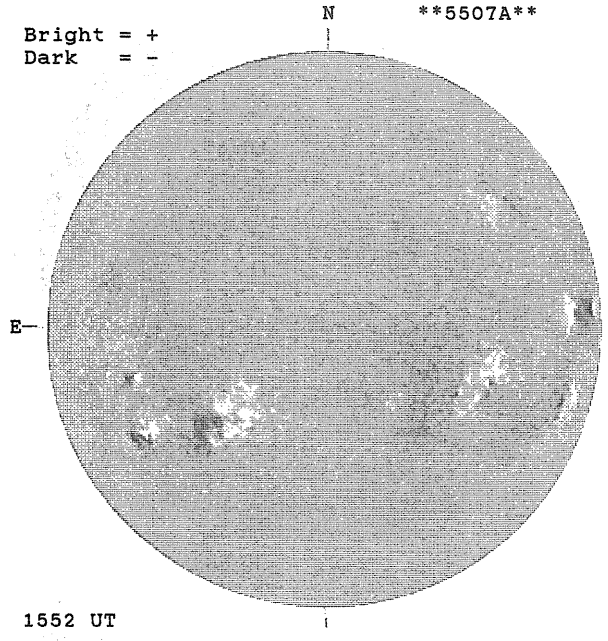


SACRAMENTO PEAK CORONA (1.15 Radii)

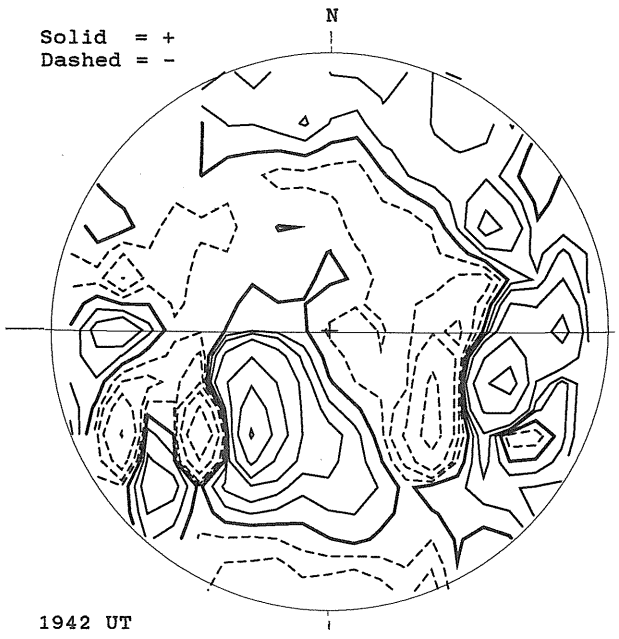


DECEMBER 4, 1993 (P= 14.91, B_o = 0.49, L_o = 135.49)

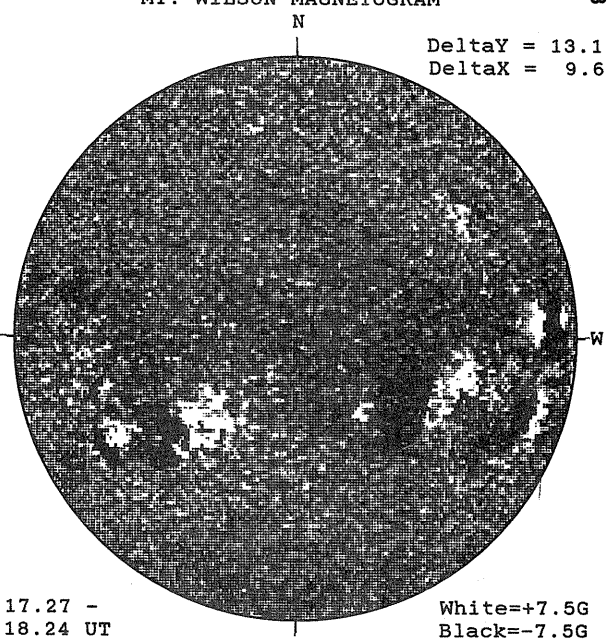
KITT PEAK MAGNETOGRAM



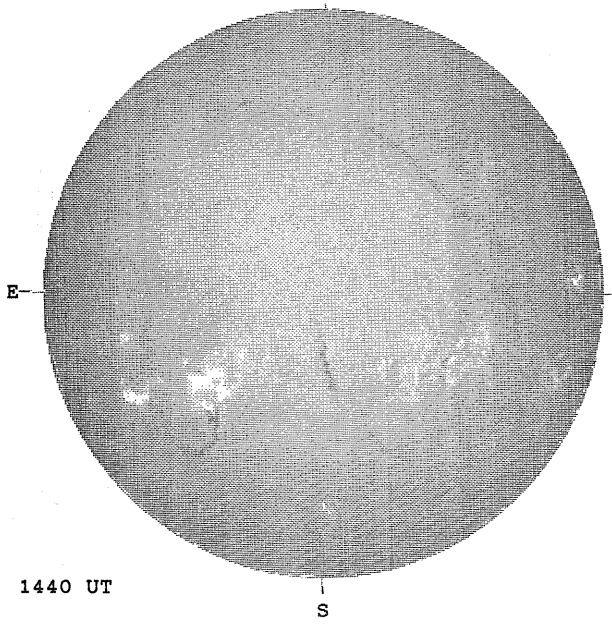
STANFORD MAGNETOGRAM



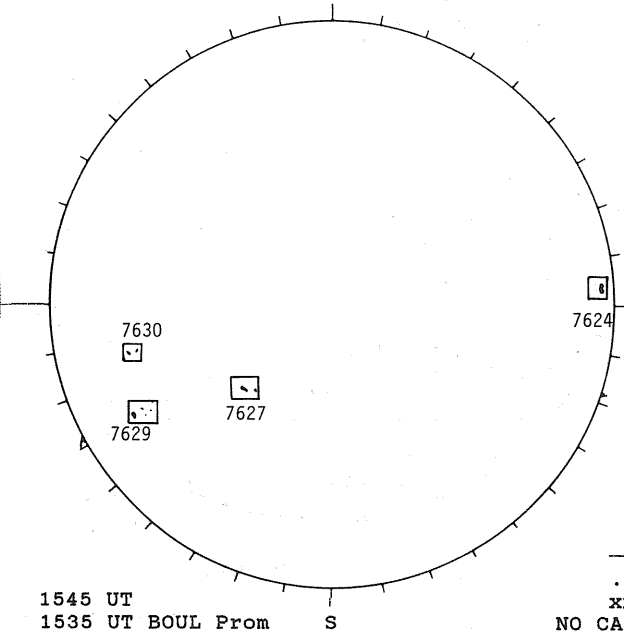
MT. WILSON MAGNETOGRAM



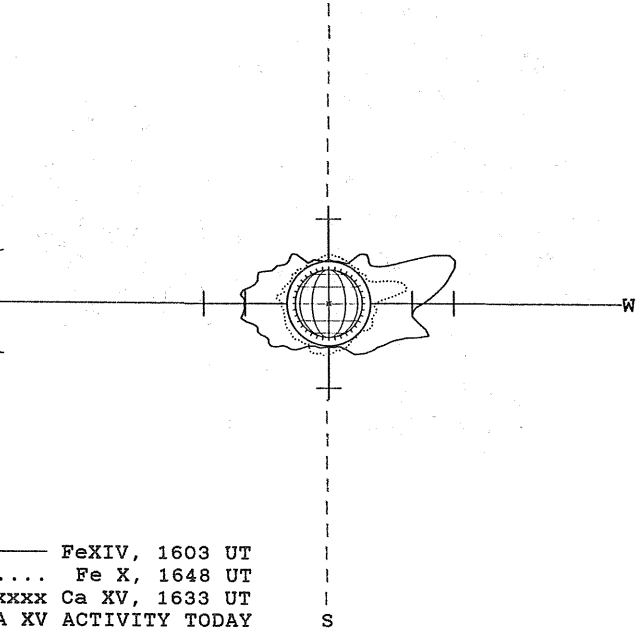
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

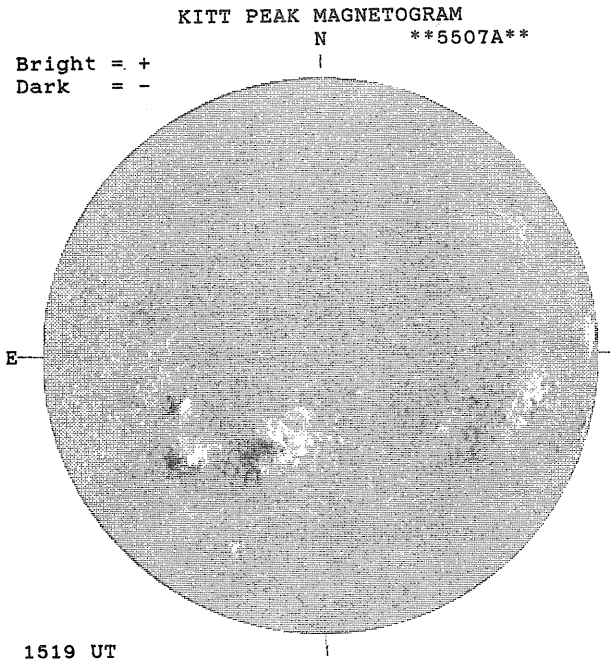


SACRAMENTO PEAK CORONA (1.15 Radii)

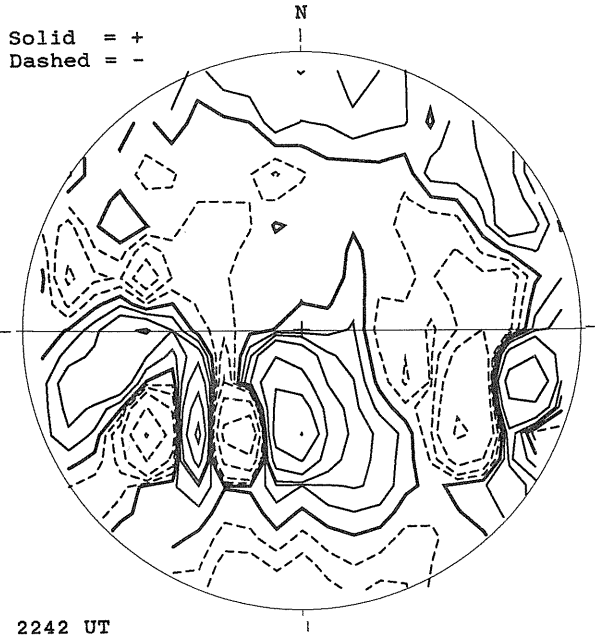


DECEMBER 5, 1993 (P= 14.50, B_o = 0.36, L_o = 122.31)

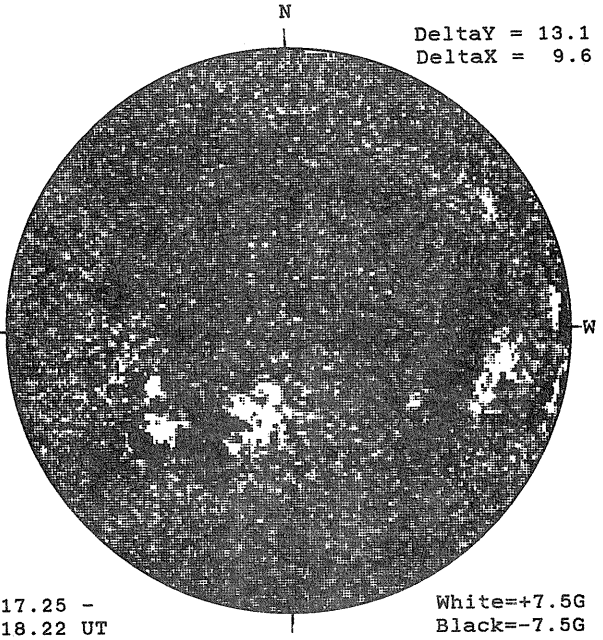
KITT PEAK MAGNETOGRAM



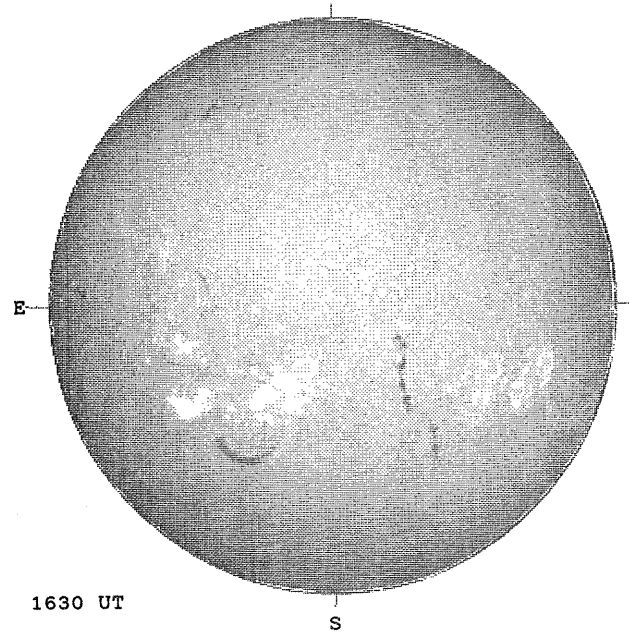
STANFORD MAGNETOGRAM



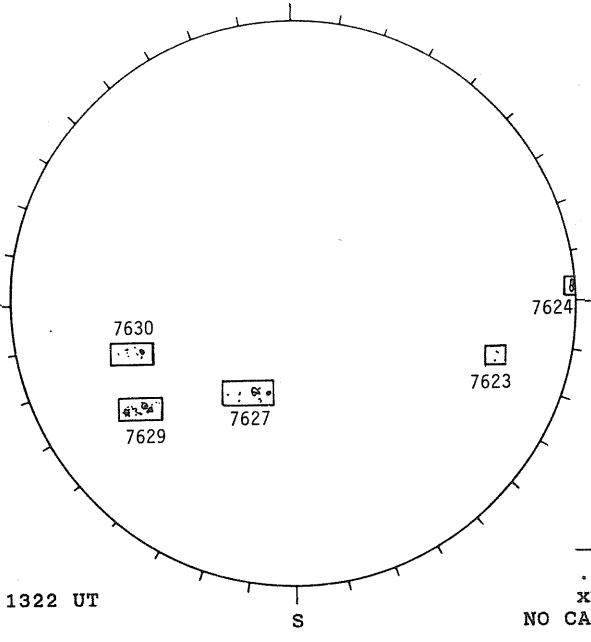
MT. WILSON MAGNETOGRAM



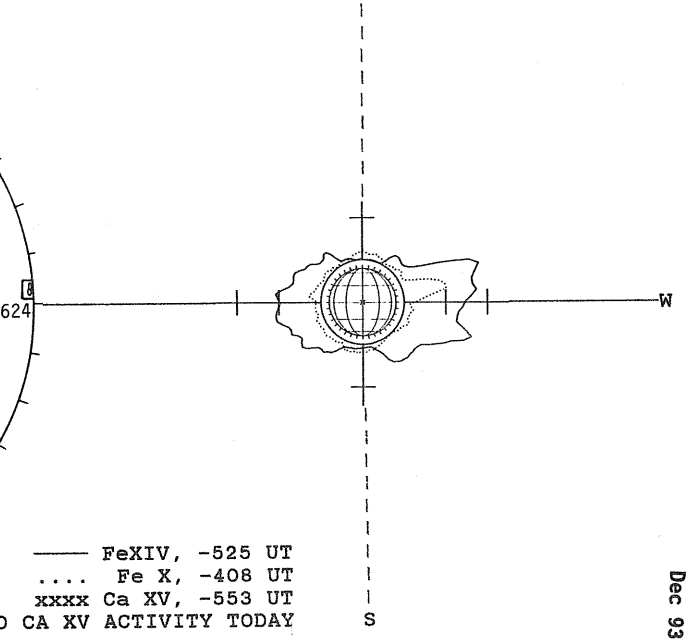
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



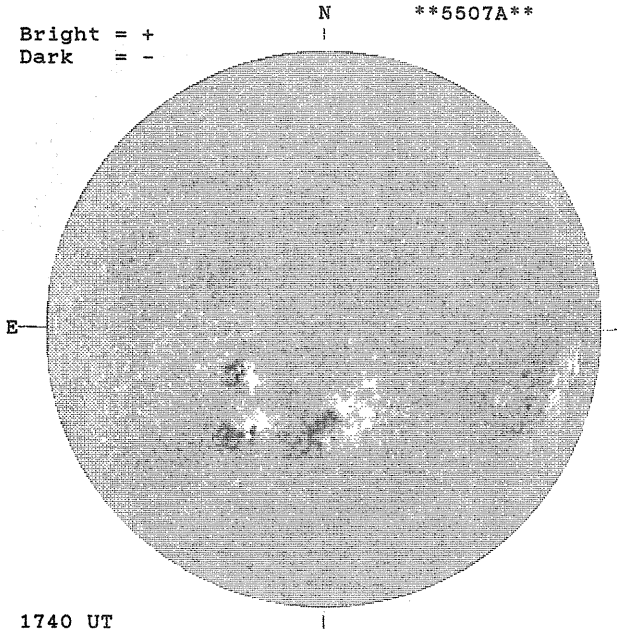
SACRAMENTO PEAK CORONA (1.15 Radii)



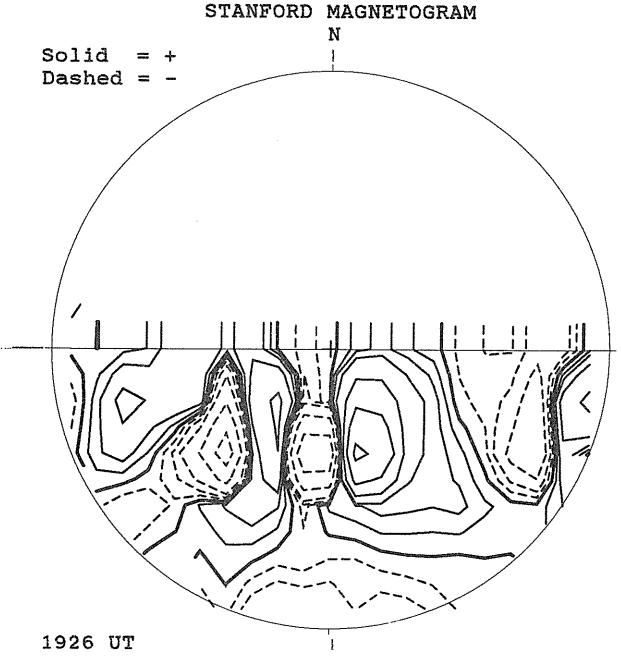
53
Dec 93

DECEMBER 6, 1993 (P= 14.09, B_o = 0.23, L_o = 109.13)

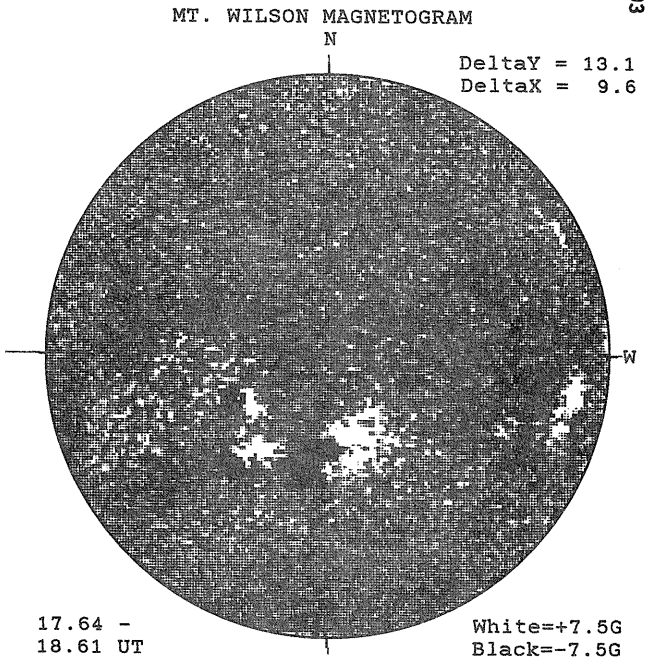
KITT PEAK MAGNETOGRAM



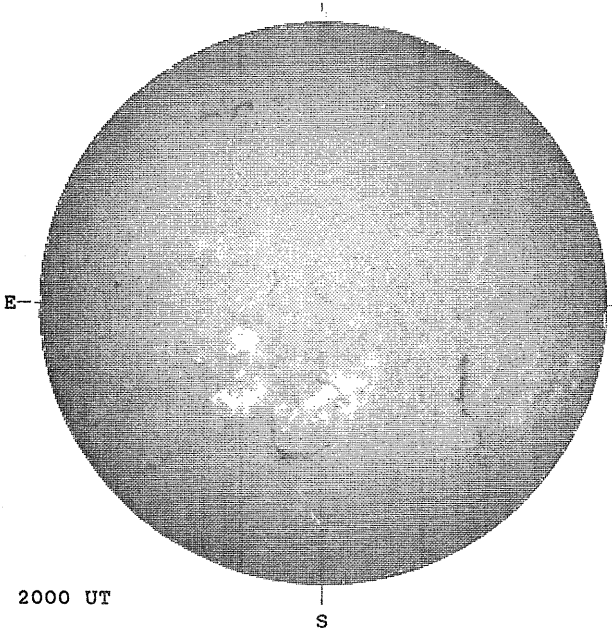
STANFORD MAGNETOGRAM



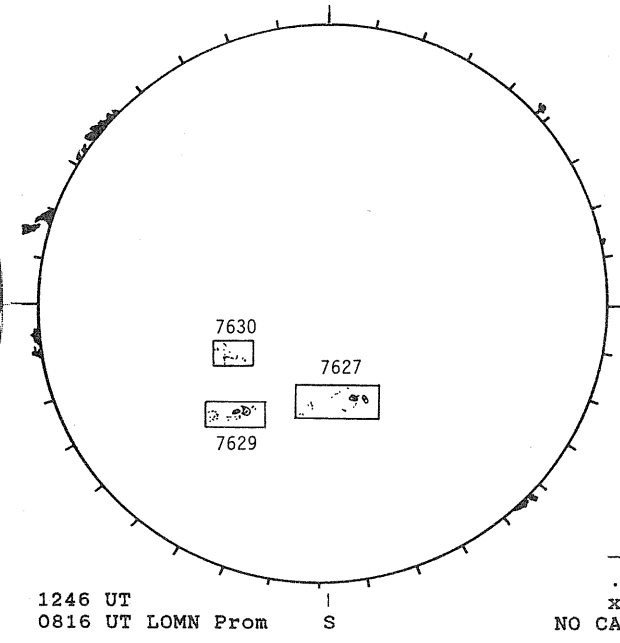
MT. WILSON MAGNETOGRAM



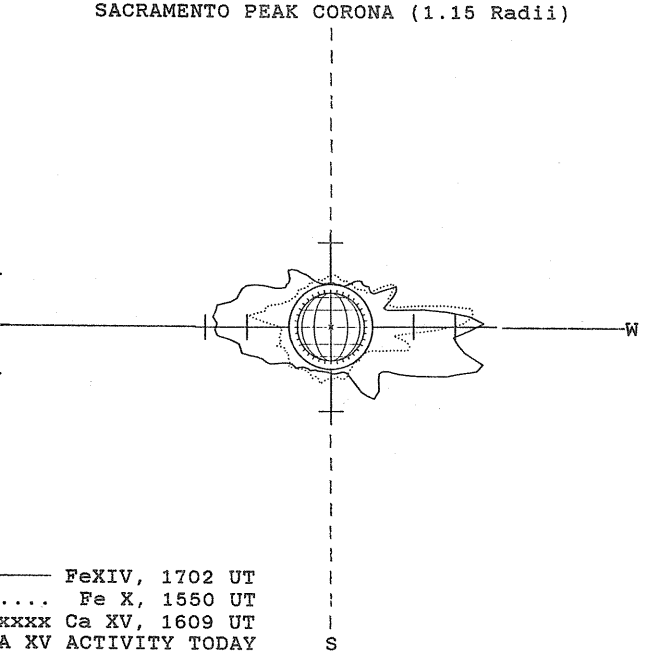
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)

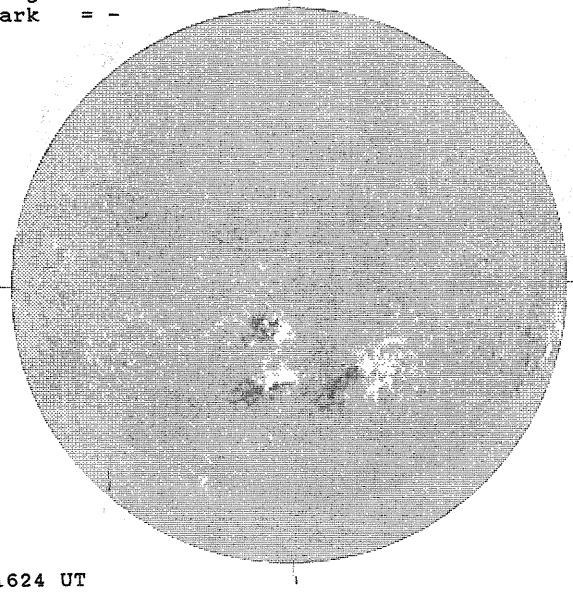


DECEMBER 7, 1993 (P= 13.68 B_o = 0.10, L_o = 95.95)

KITT PEAK MAGNETOGRAM

N **5507A**

Bright = +
Dark = -

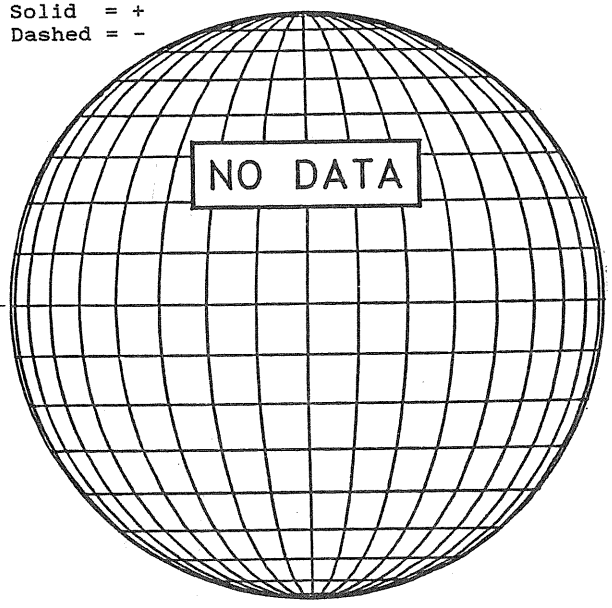


1624 UT

STANFORD MAGNETOGRAM

N

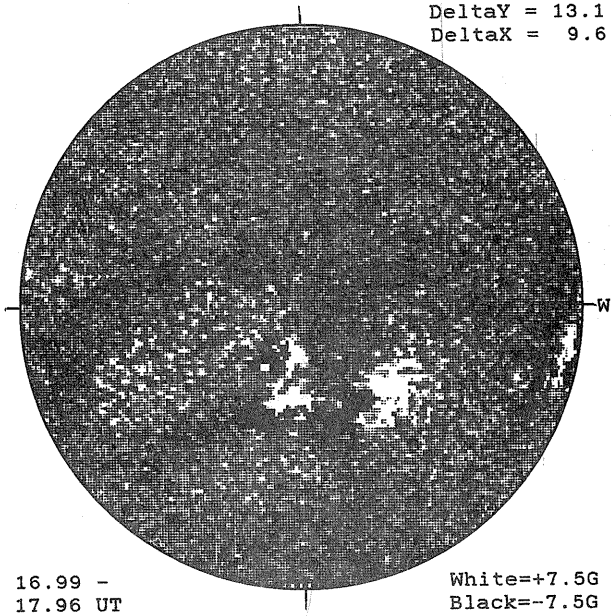
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

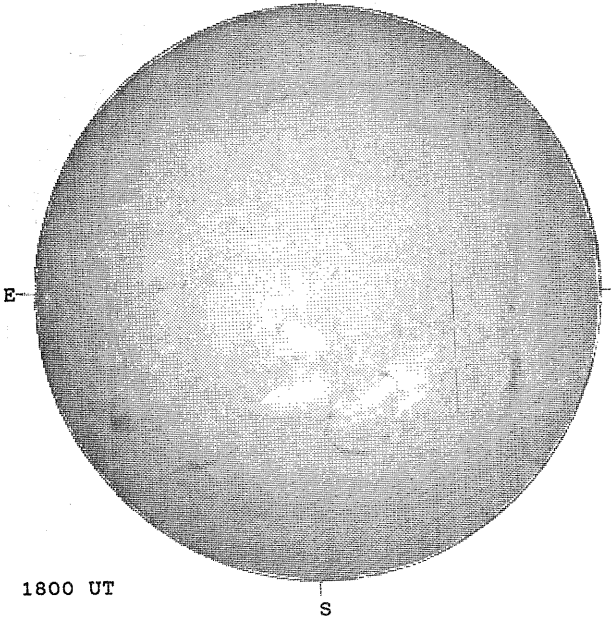
DeltaY = 13.1
DeltaX = 9.6



16.99 -
17.96 UT

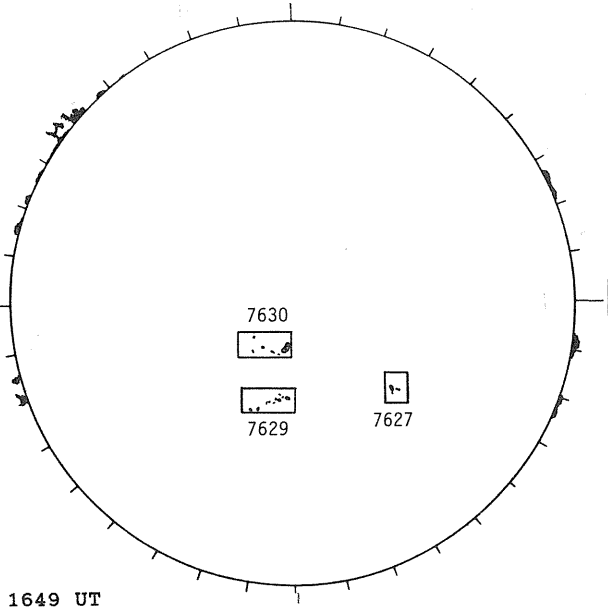
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



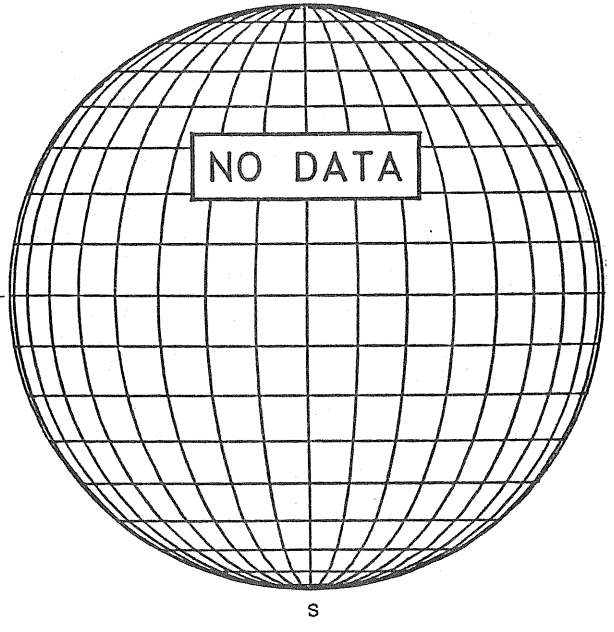
1800 UT

BOULDER SUNSPOT



1649 UT
1640 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

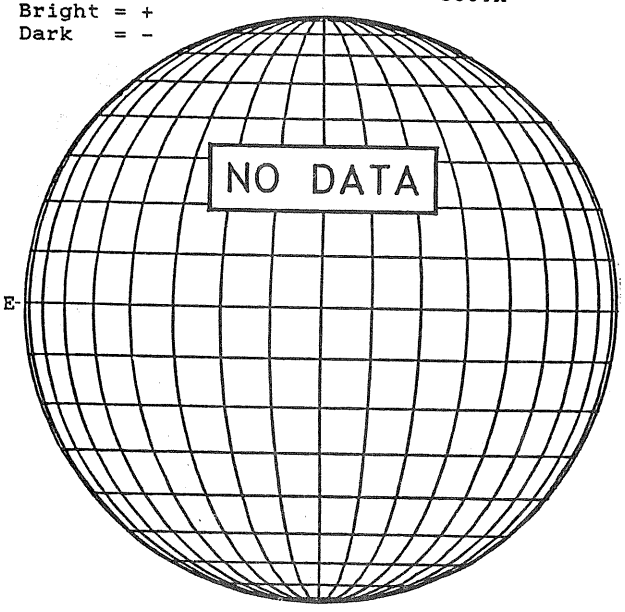


DECEMBER 8, 1993 (P= 13.26, B_o =-0.03, L_o = 82.78)

KITT PEAK MAGNETOGRAM

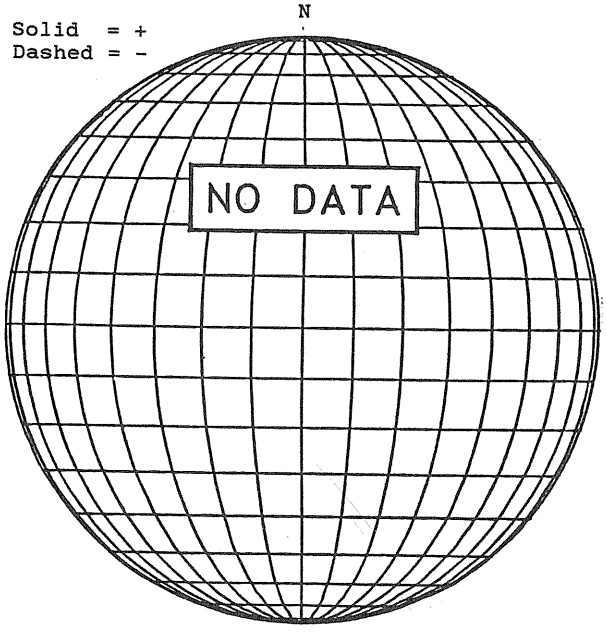
N **5507A**

Bright = +
Dark = -

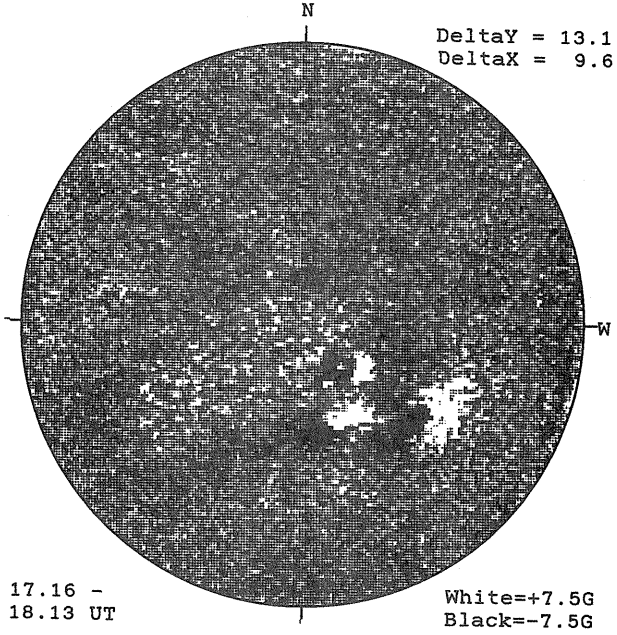


STANFORD MAGNETOGRAM

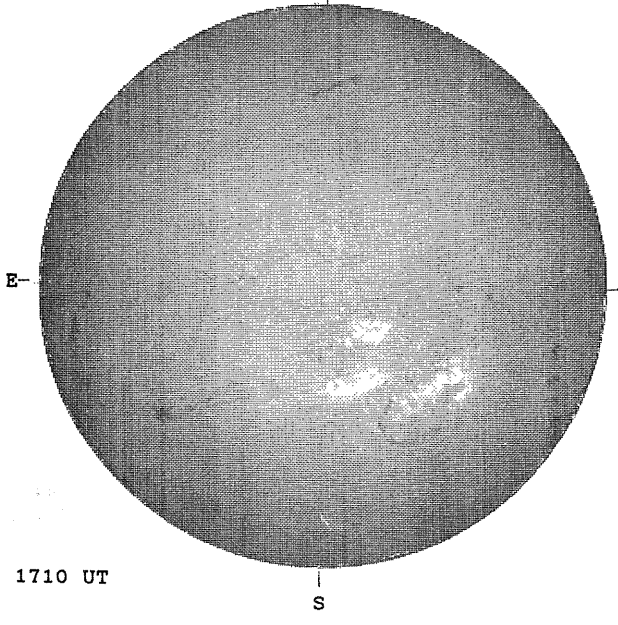
Solid = +
Dashed = -



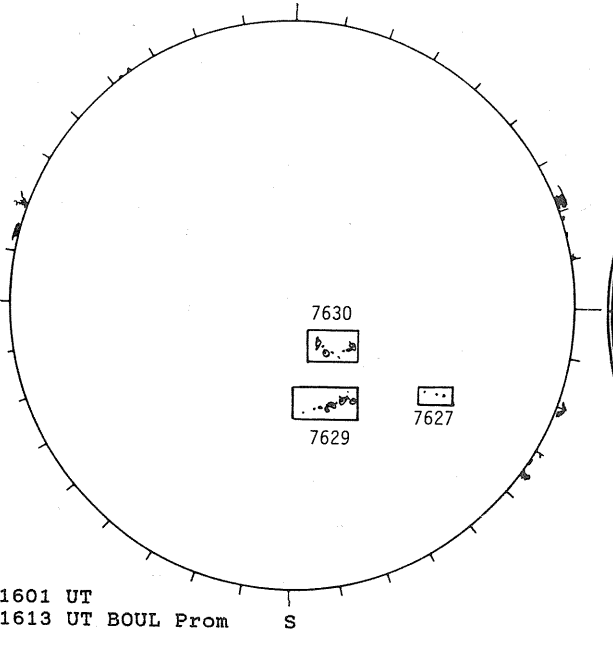
MT. WILSON MAGNETOGRAM



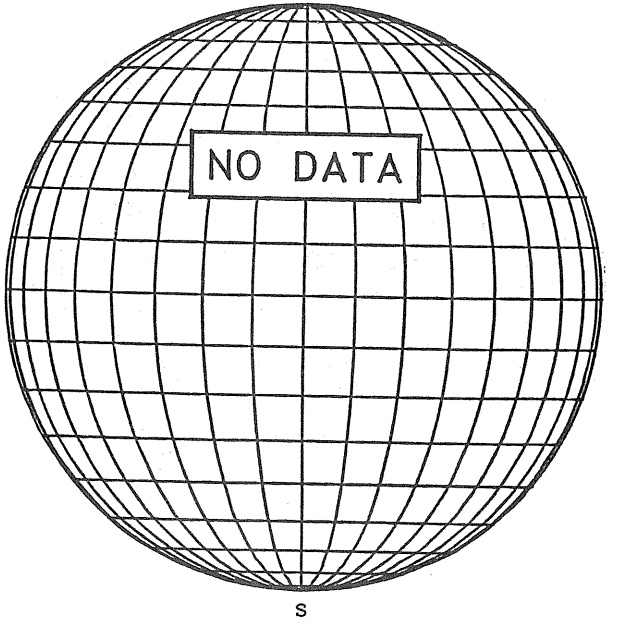
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

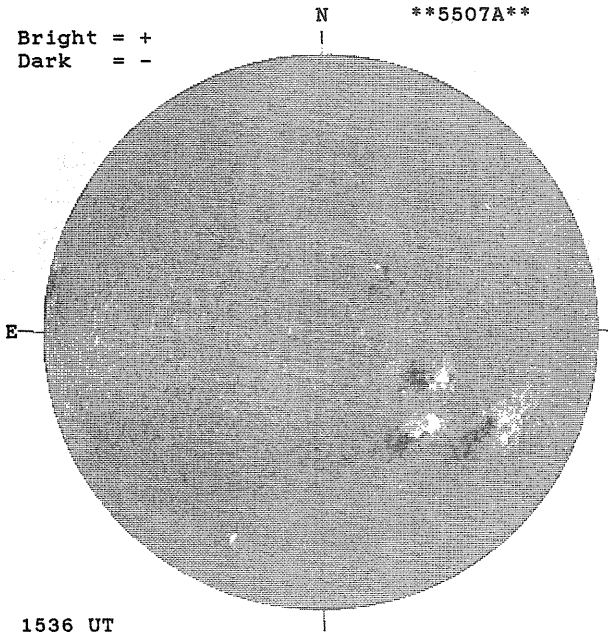


SACRAMENTO PEAK CORONA (1.15 Radii)

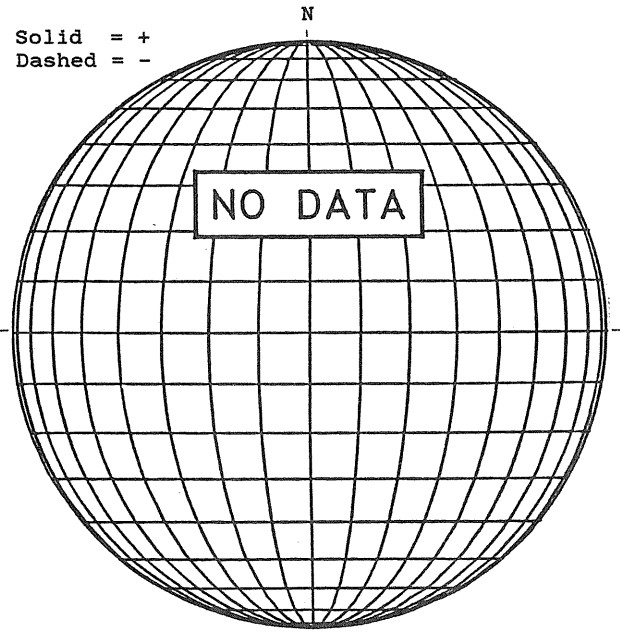


DECEMBER 9, 1993 (P= 12.83 B_o =-0.15, L_o = 69.60)

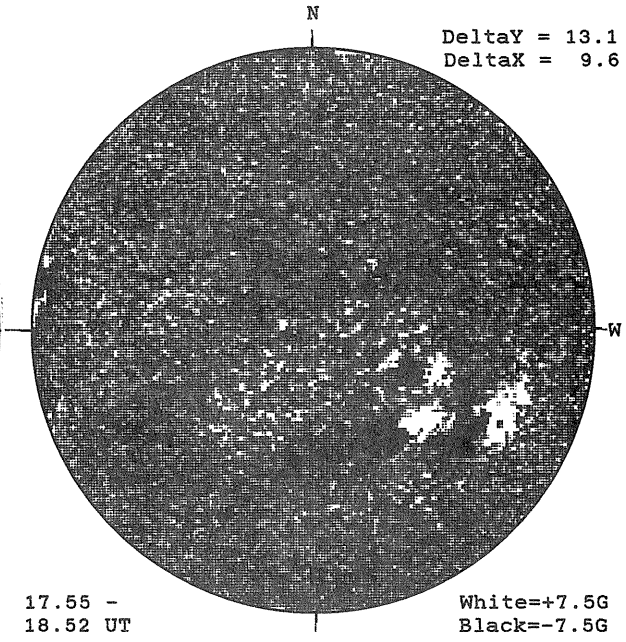
KITT PEAK MAGNETOGRAM



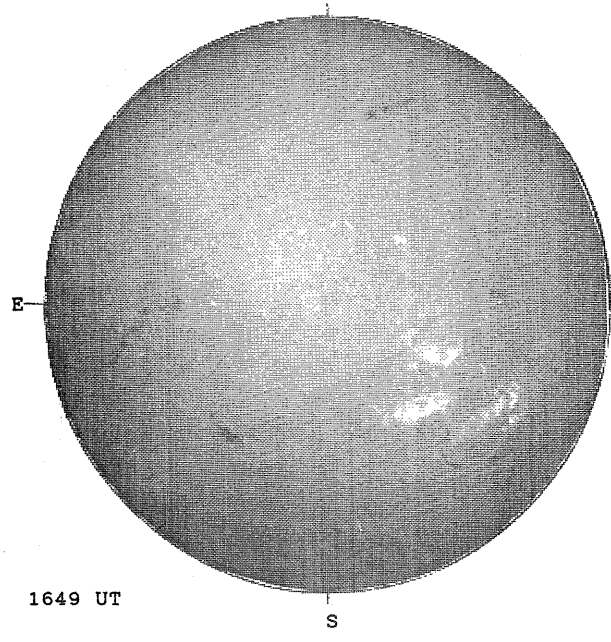
STANFORD MAGNETOGRAM



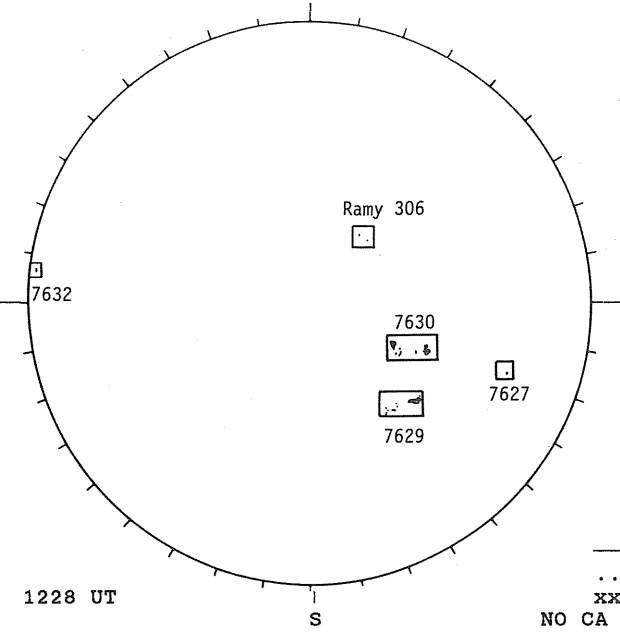
MT. WILSON MAGNETOGRAM



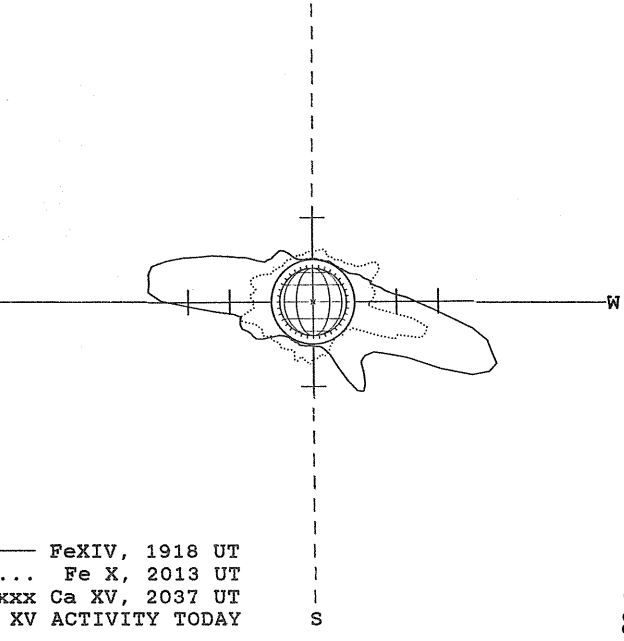
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



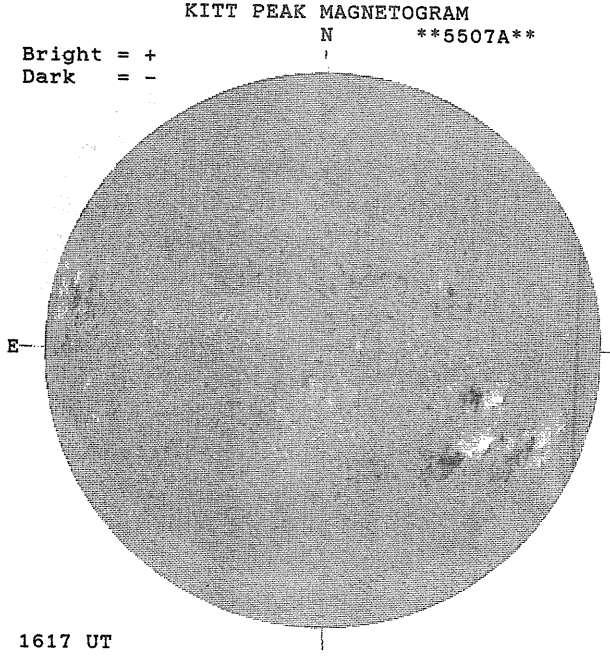
—— FeXIV, 1918 UT
.... Fe X, 2013 UT
xxxx Ca XV, 2037 UT
NO CA XV ACTIVITY TODAY

57
Dec 93

DECEMBER 10, 1993 (P= 12.40, B_o =-0.28, L_o = 56.42)

KITT PEAK MAGNETOGRAM

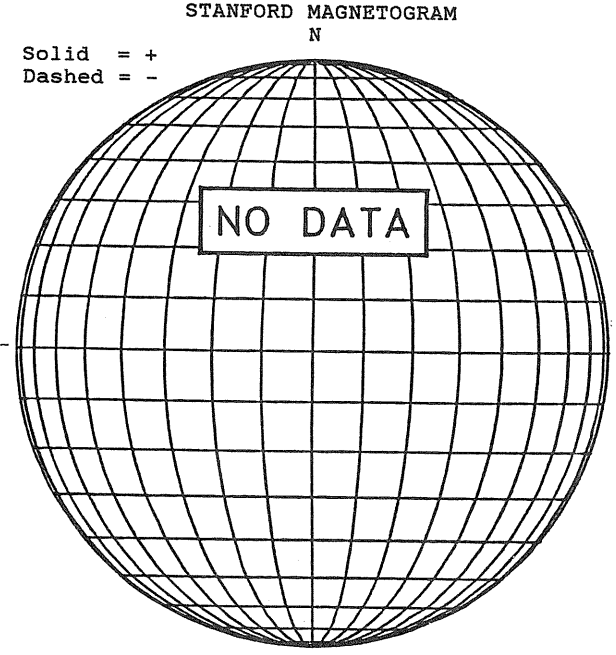
Bright = +
Dark = -



1617 UT

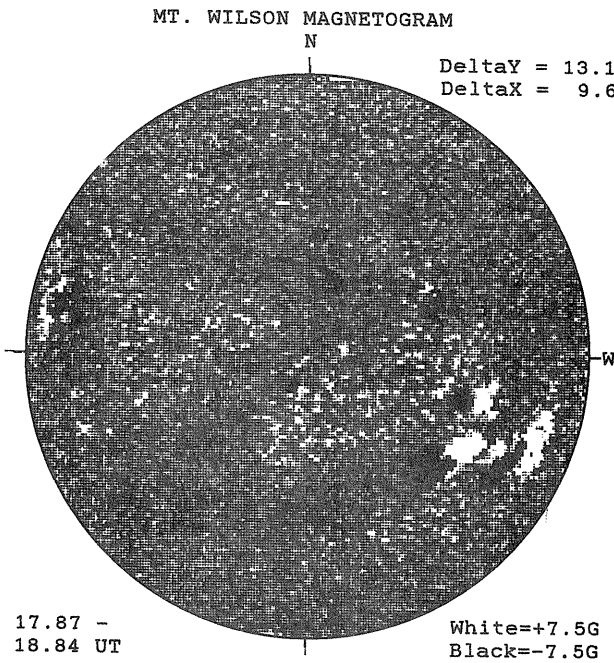
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

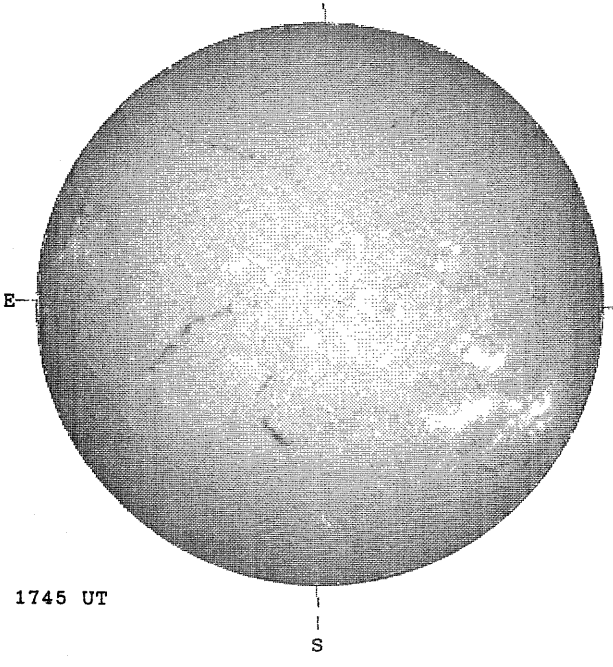
DeltaY = 13.1
DeltaX = 9.6



17.87 -
18.84 UT

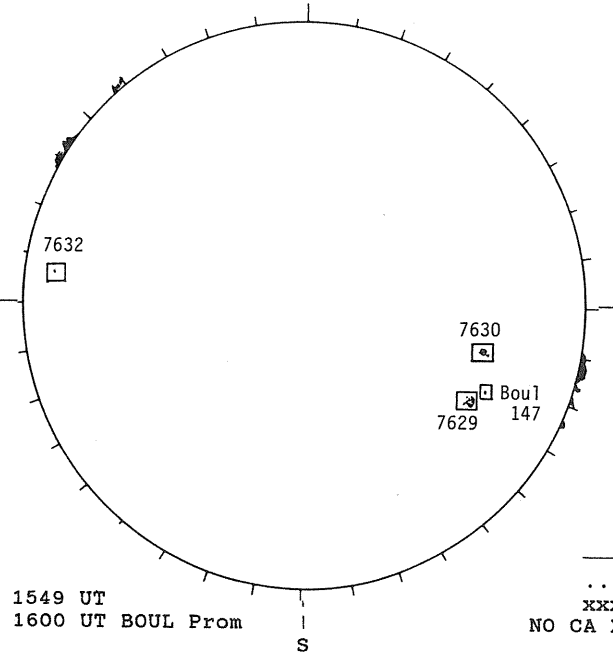
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



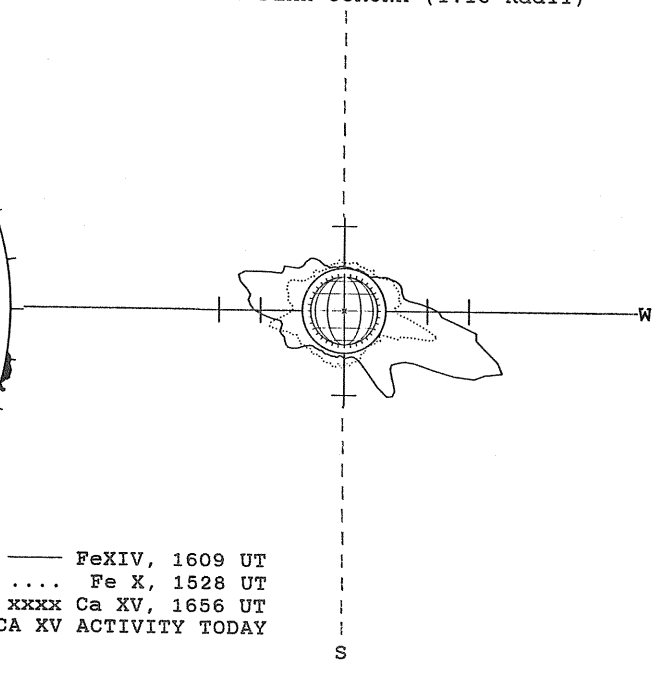
1745 UT

BOULDER SUNSPOT



1549 UT
1600 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



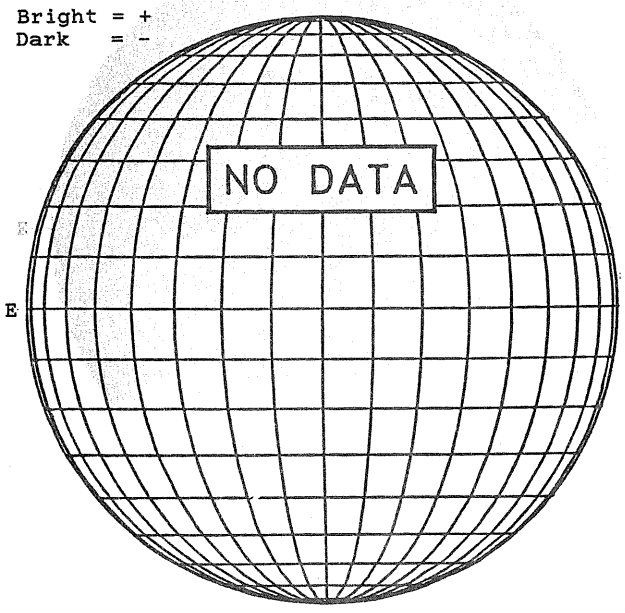
—— FeXIV, 1609 UT
.... Fe X, 1528 UT
xxxx Ca XV, 1656 UT
NO CA XV ACTIVITY TODAY

DECEMBER 11, 1993 (P= 11.97, B_o =-0.41, L_o = 43.25)

KITT PEAK MAGNETOGRAM

N **5507A**

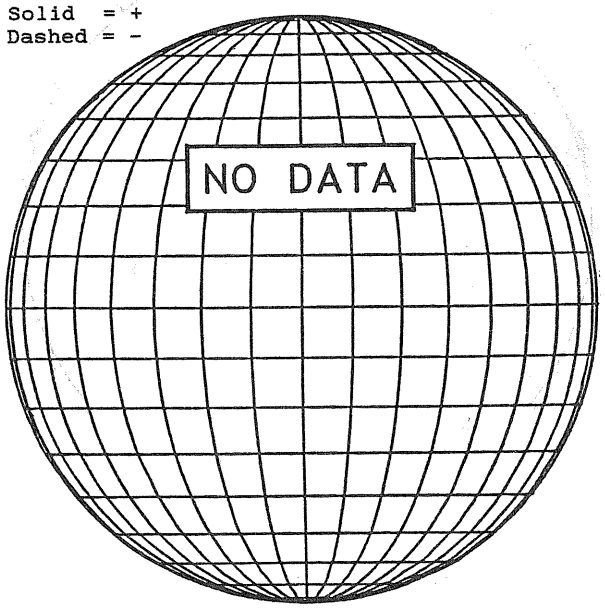
Bright = +
Dark = -



STANFORD MAGNETOGRAM

N

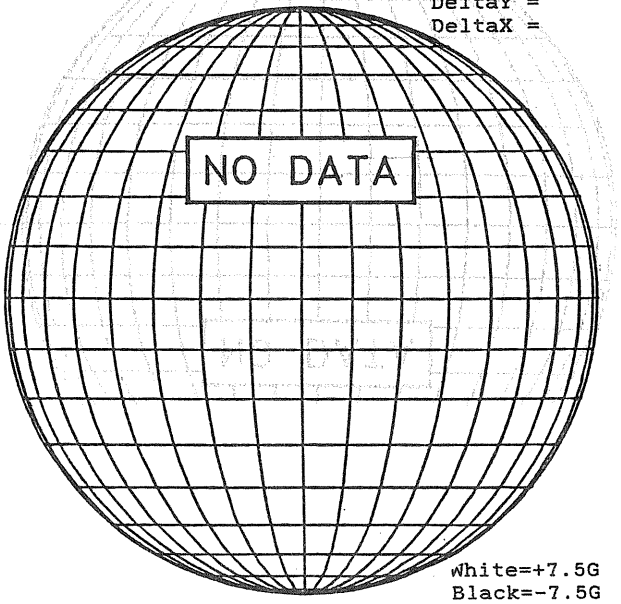
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

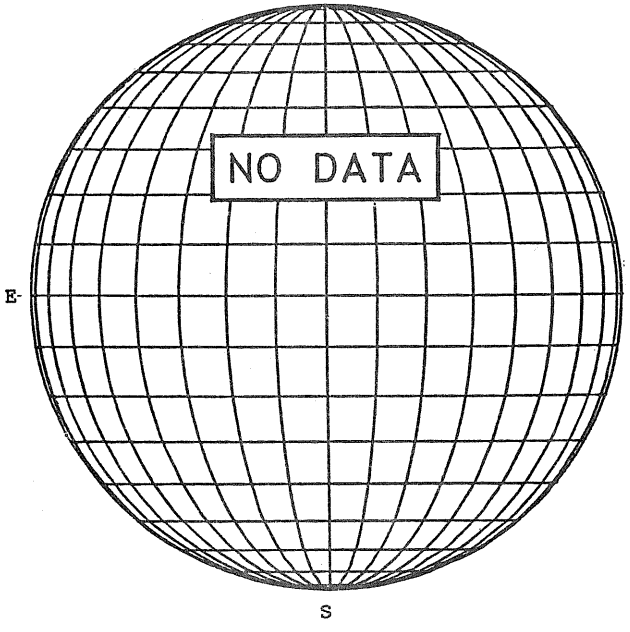
N

DeltaY =
DeltaX =

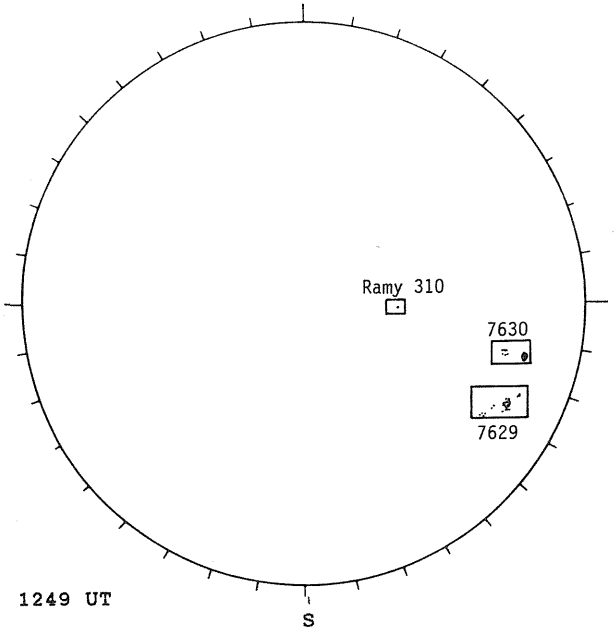


white=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA

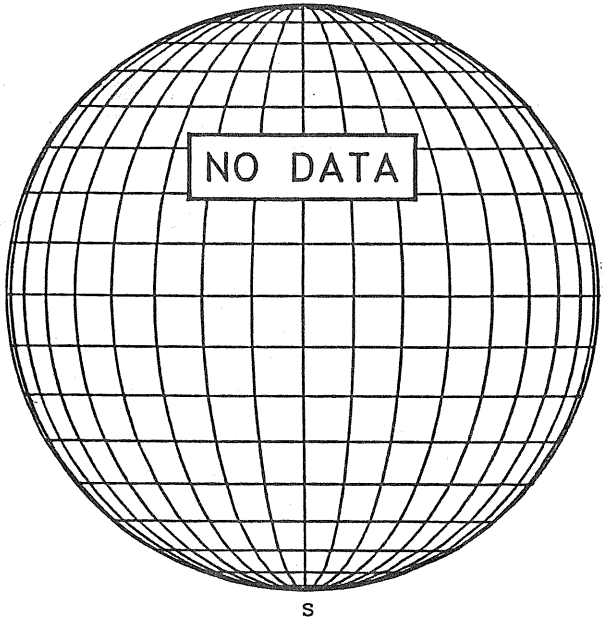


RAMEY SUNSPOT



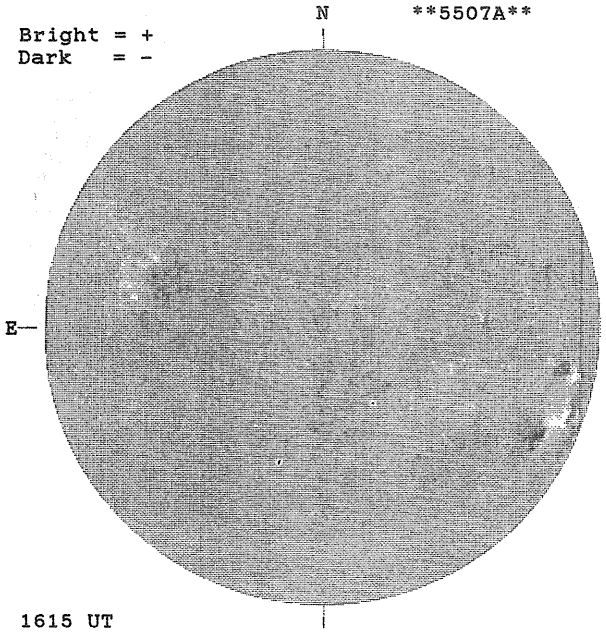
1249 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

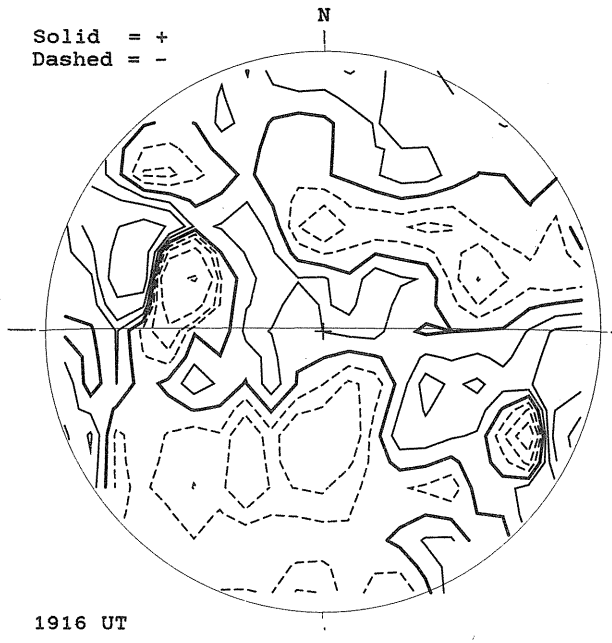


DECEMBER 12, 1993 (P= 11.53, B_o =-0.54, L_o = 30.07)

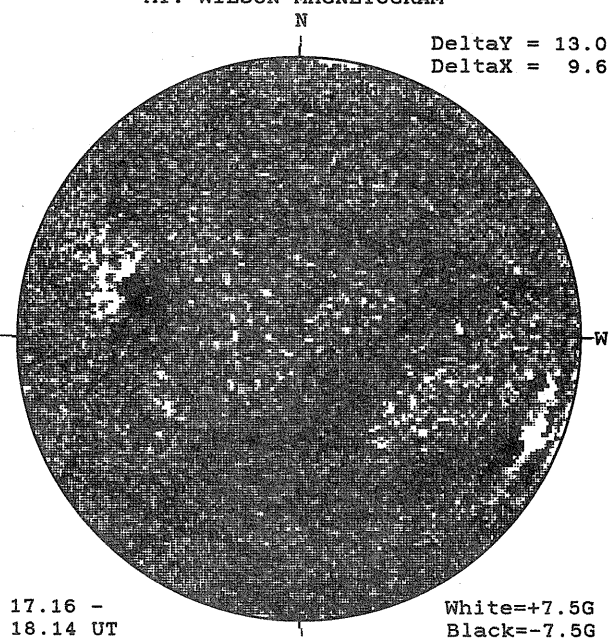
KITT PEAK MAGNETOGRAM



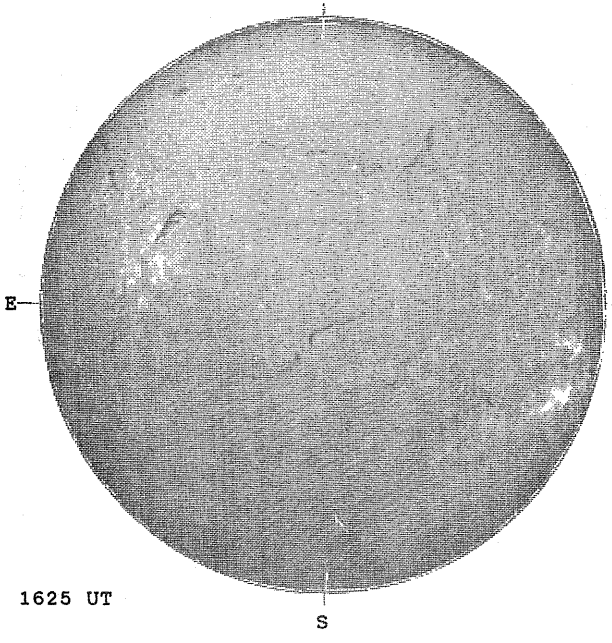
STANFORD MAGNETOGRAM



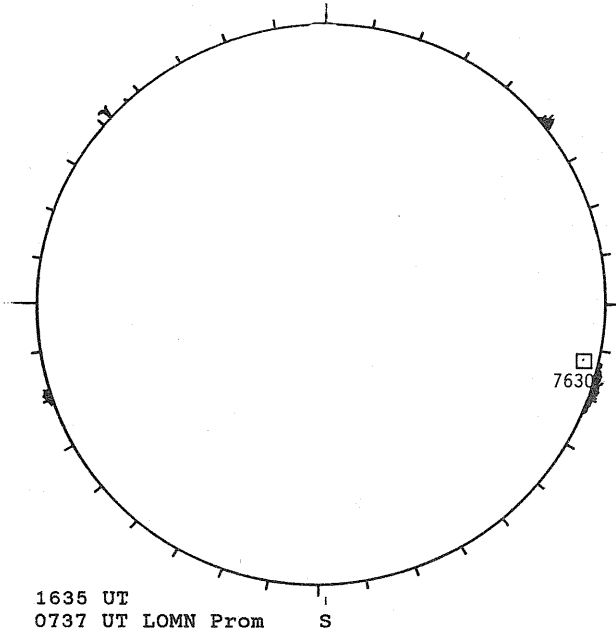
MT. WILSON MAGNETOGRAM



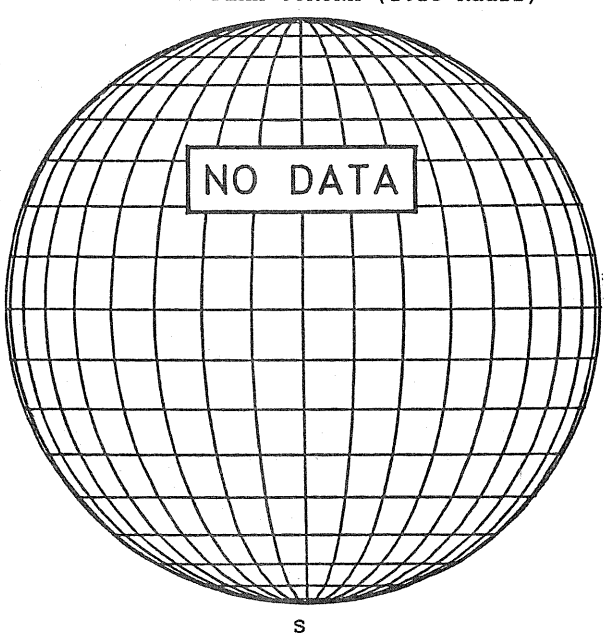
BOULDER H-ALPHA



BOULDER SUNSPOT

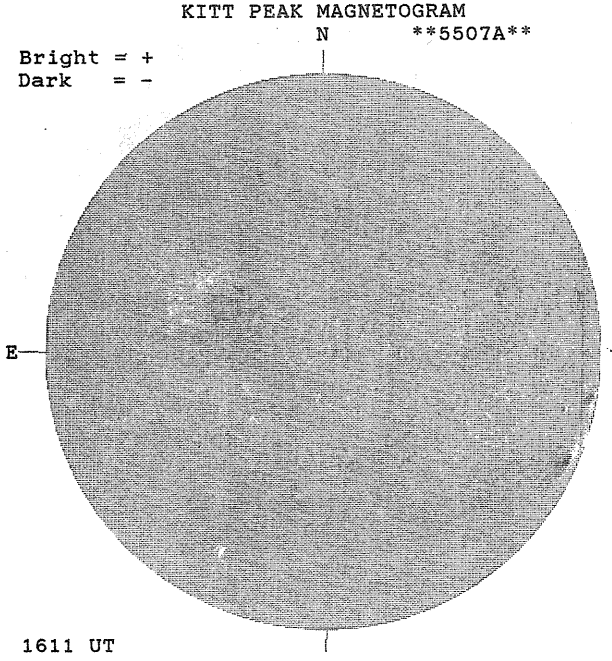


SACRAMENTO PEAK CORONA (1.15 Radii)

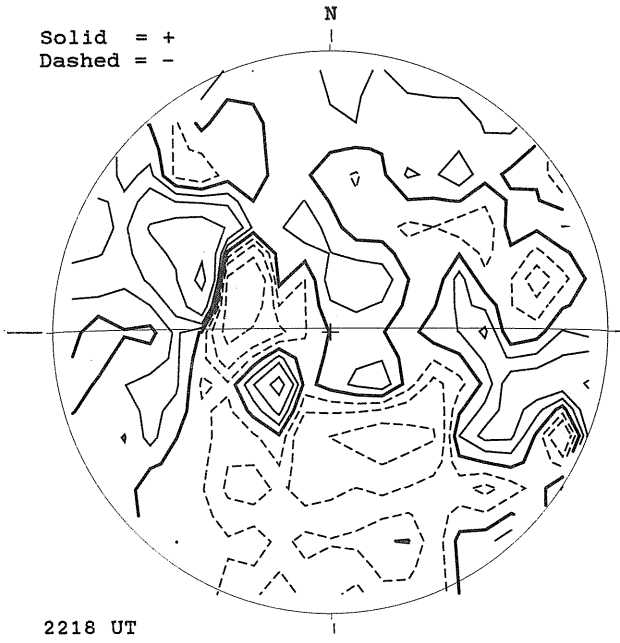


DECEMBER 13, 1993 (P= 11.09, B_o =-0.66, L_o = 16.90)

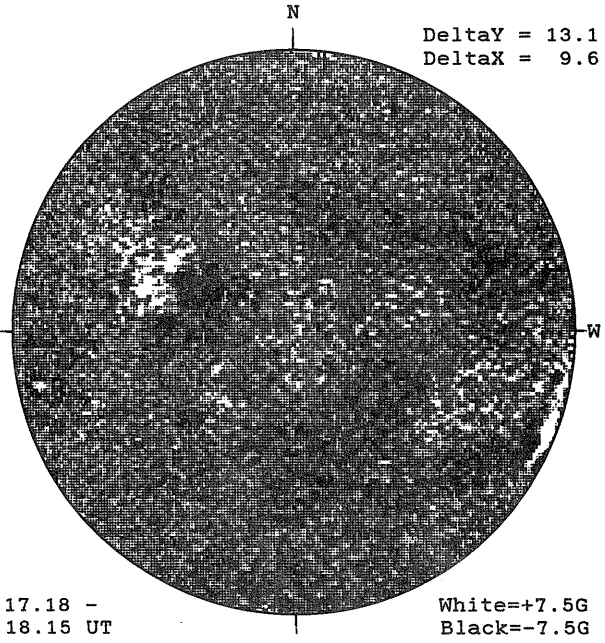
KITT PEAK MAGNETOGRAM



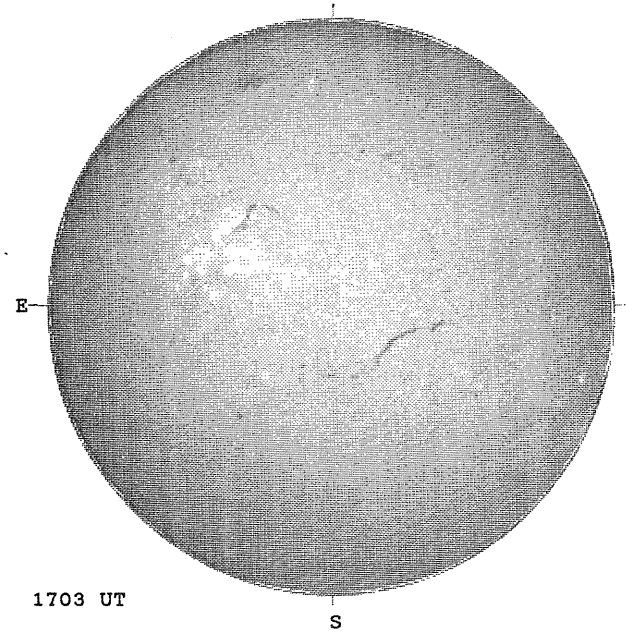
STANFORD MAGNETOGRAM



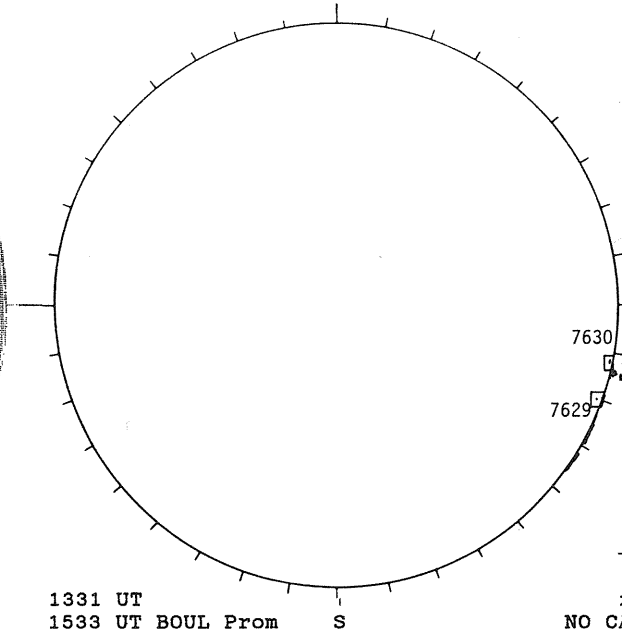
MT. WILSON MAGNETOGRAM



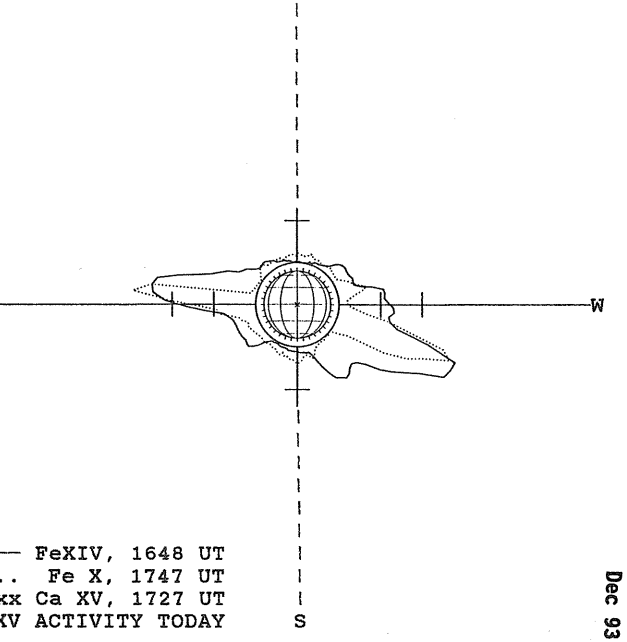
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



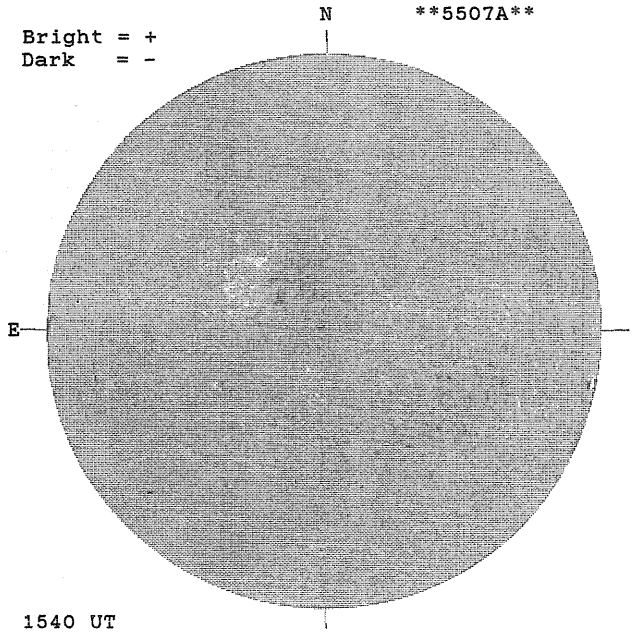
SACRAMENTO PEAK CORONA (1.15 Radii)



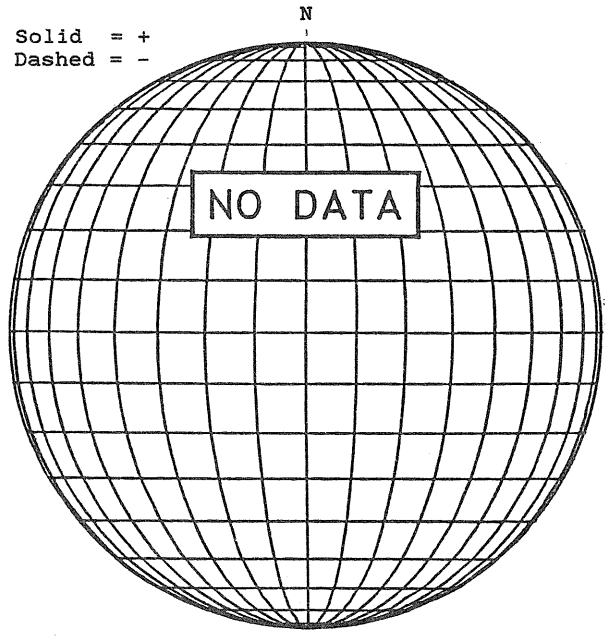
61
Dec 93

DECEMBER 14, 1993 (P= 10.64, B_o =-0.79, L_o = 3.72)

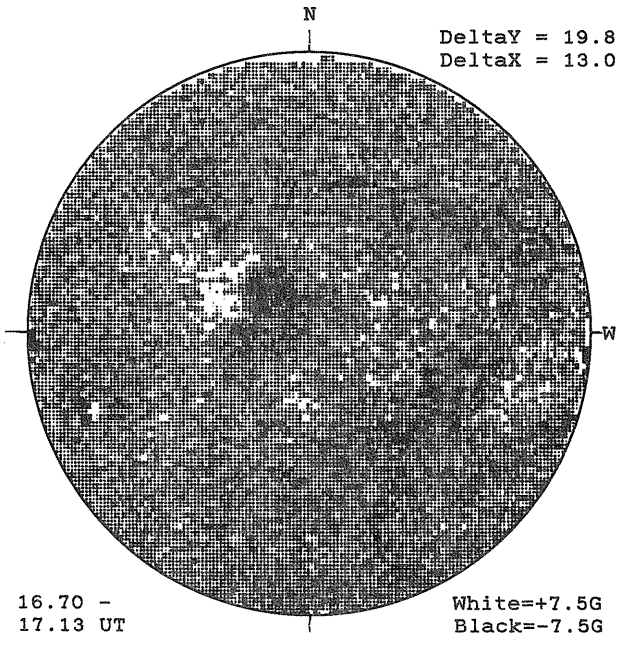
KITT PEAK MAGNETOGRAM



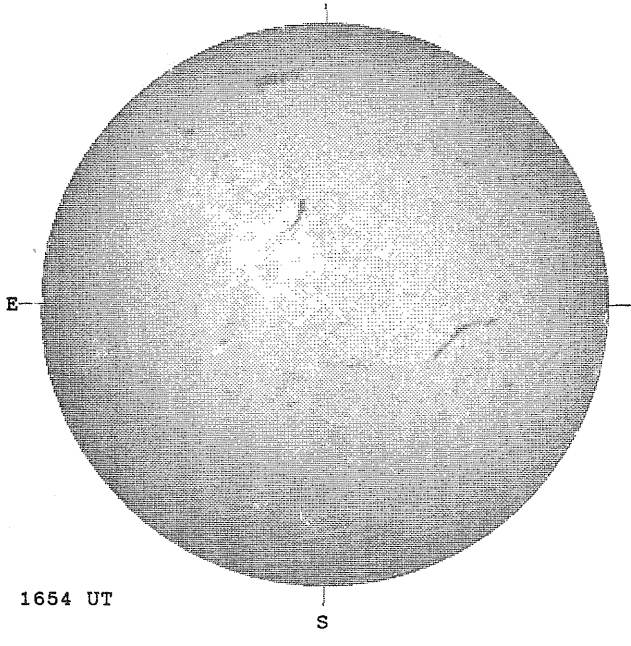
STANFORD MAGNETOGRAM



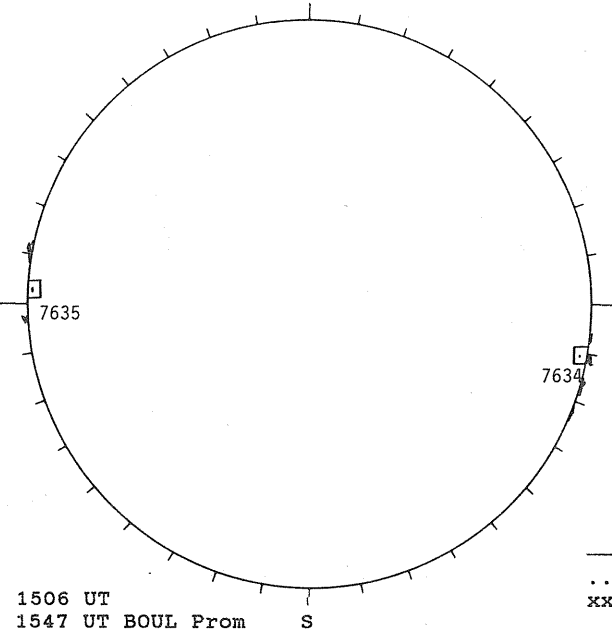
MT. WILSON MAGNETOGRAM



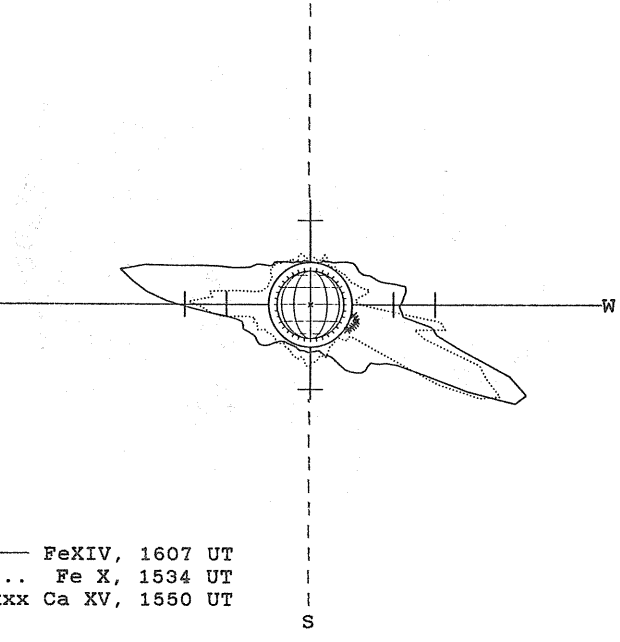
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

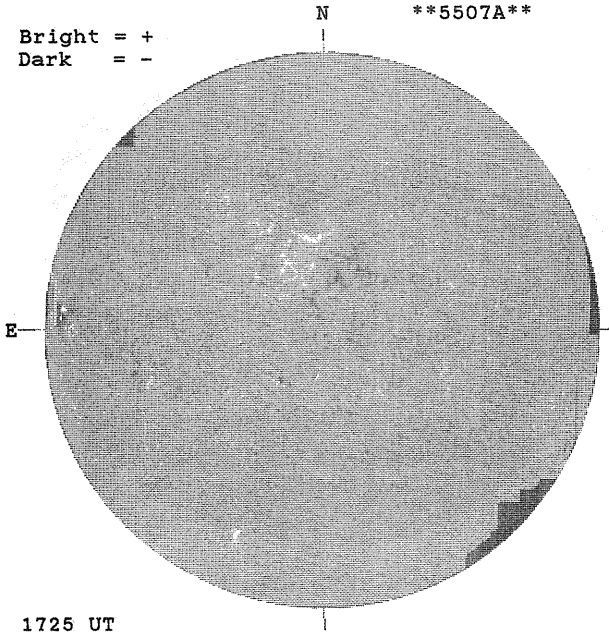


SACRAMENTO PEAK CORONA (1.15 Radii)

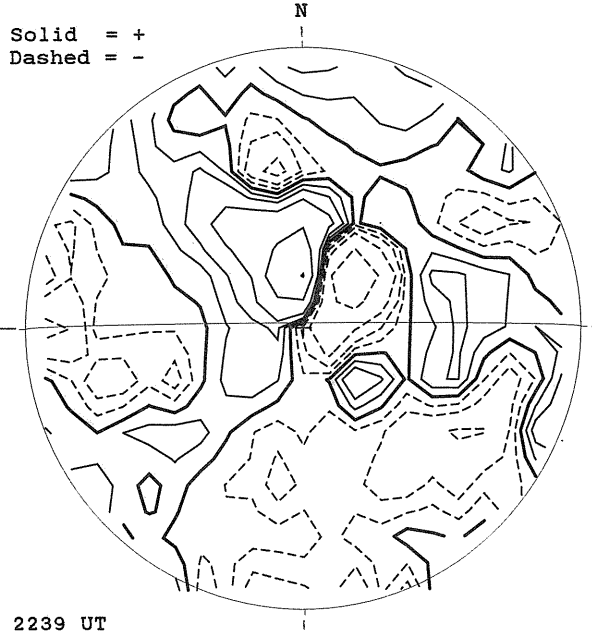


DECEMBER 15, 1993 (P= 10.19, B_o =-0.92 L_o = 350.55)

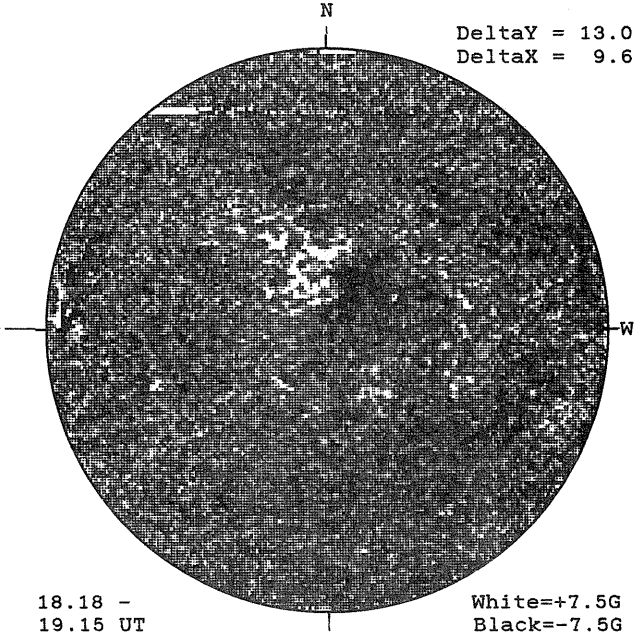
KITT PEAK MAGNETOGRAM



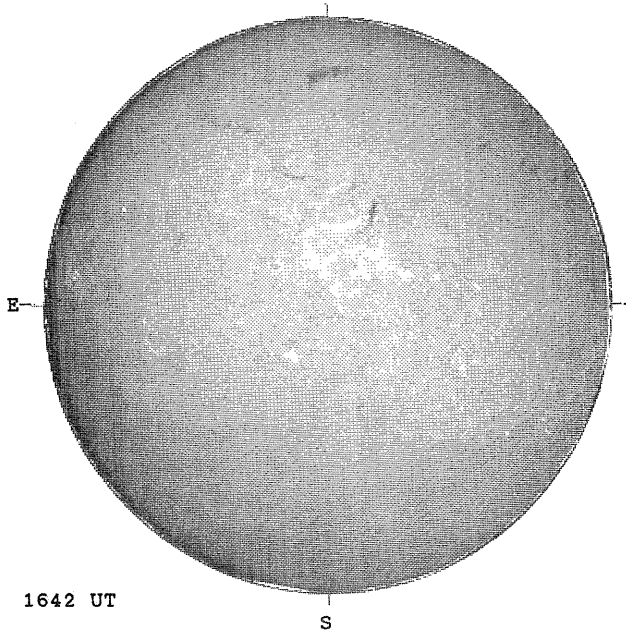
STANFORD MAGNETOGRAM



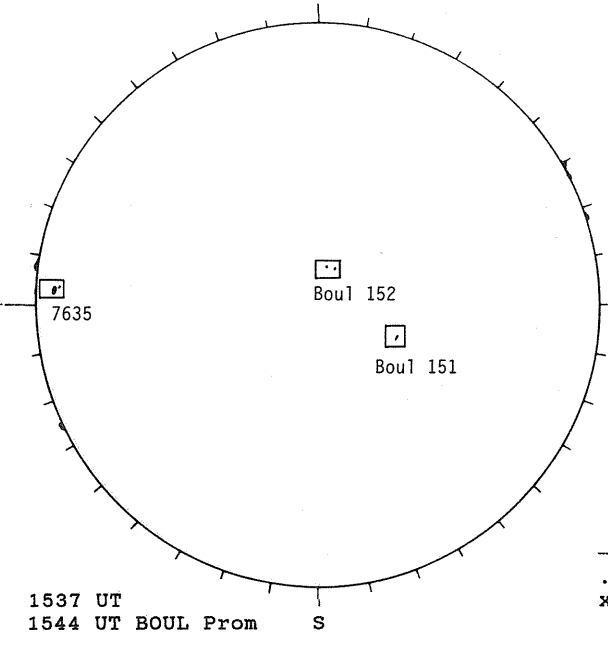
MT. WILSON MAGNETOGRAM



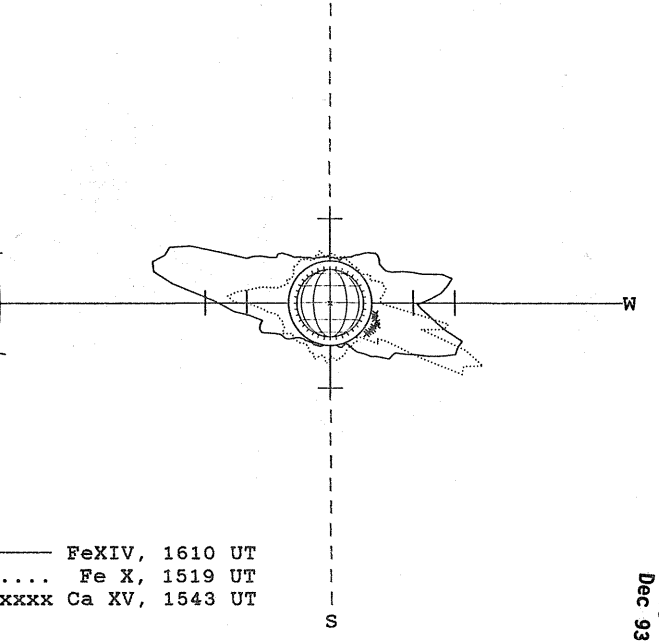
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)

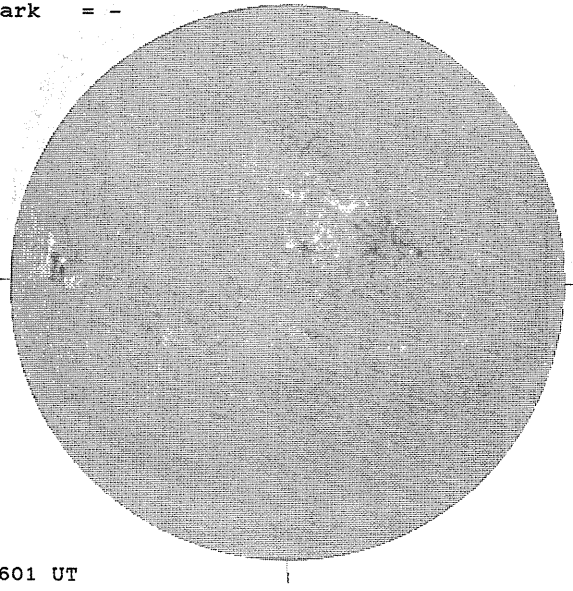


DECEMBER 16, 1993 (P= 9.73, B_o =-1.05, L_o = 337.37)

KITT PEAK MAGNETOGRAM

N **5507A**

Bright = +
Dark = -

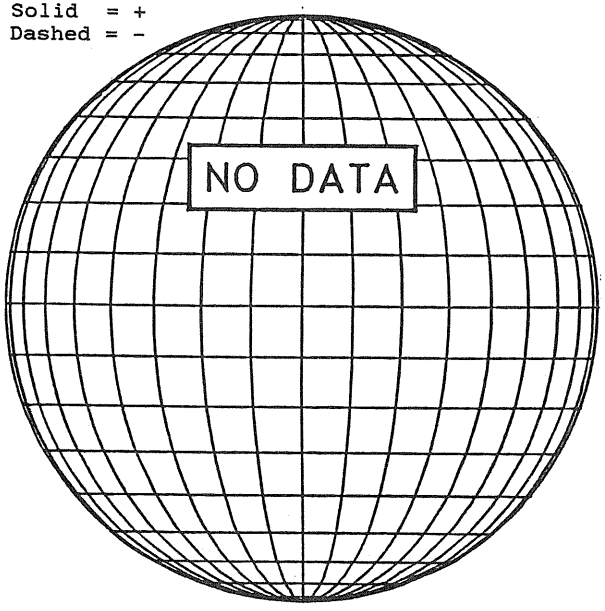


1601 UT

STANFORD MAGNETOGRAM

N

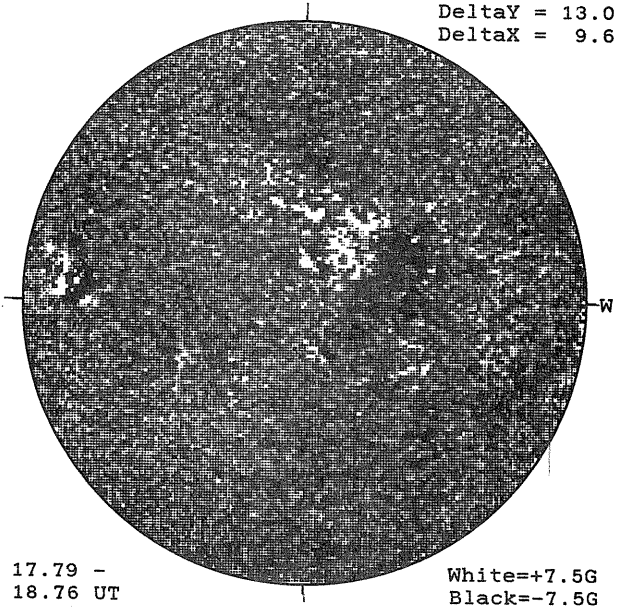
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

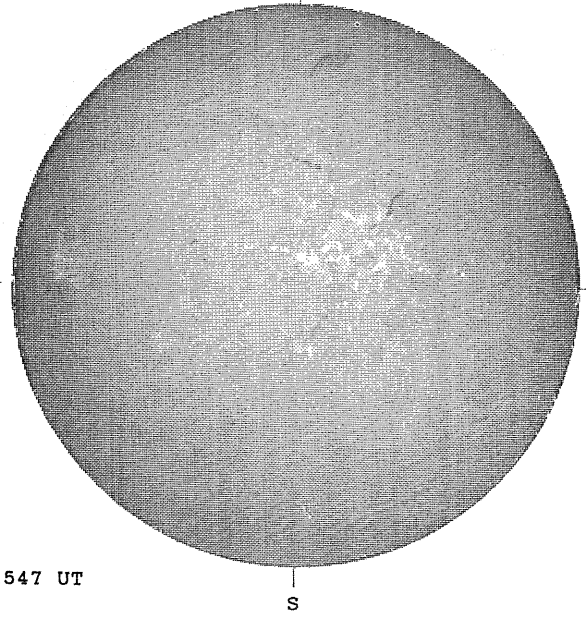
DeltaY = 13.0
DeltaX = 9.6



17.79 -
18.76 UT

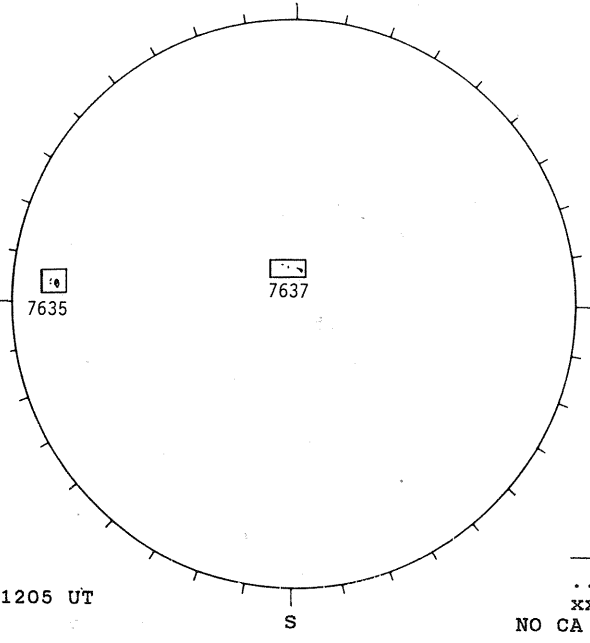
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



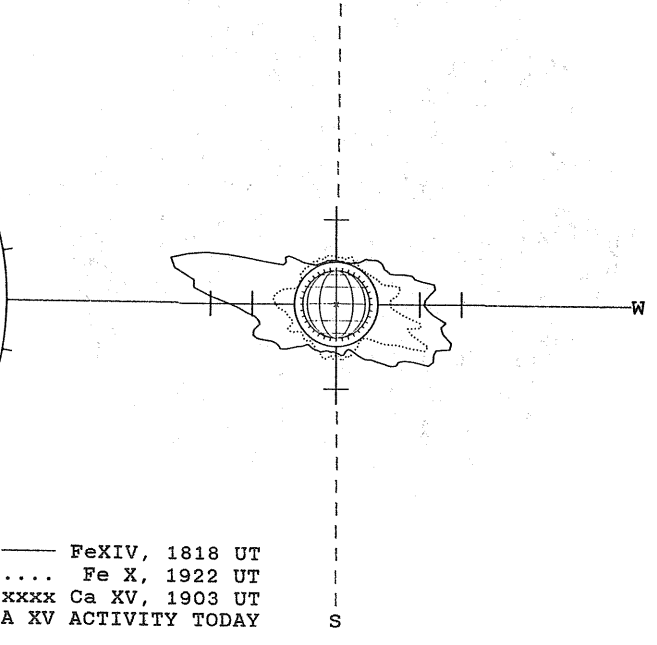
1547 UT

RAMEY SUNSPOT



1205 UT

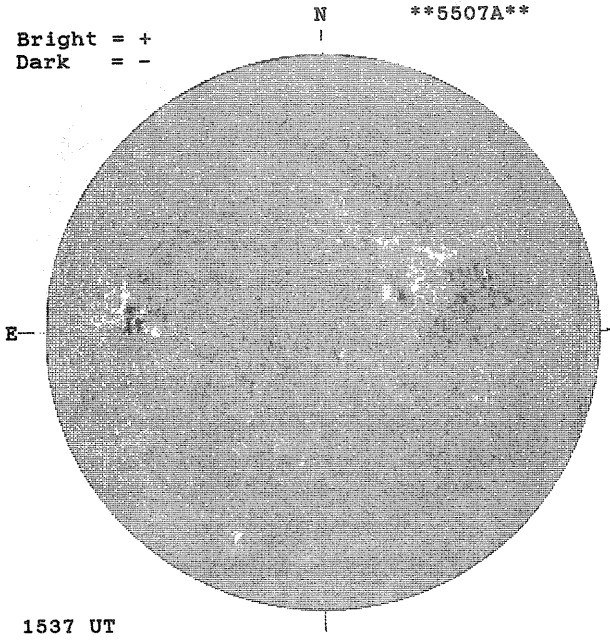
SACRAMENTO PEAK CORONA (1.15 Radii)



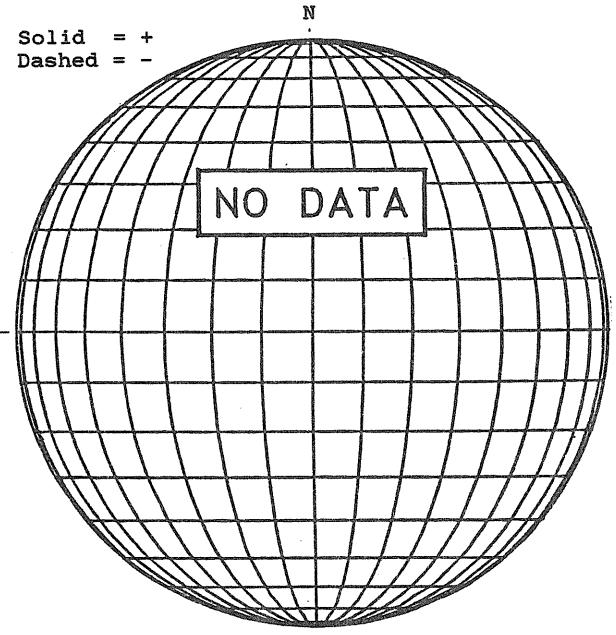
—— FeXIV, 1818 UT
.... Fe X, 1922 UT
xxxx Ca XV, 1903 UT
NO CA XV ACTIVITY TODAY

DECEMBER 17, 1993 (P= 9.28, B_o =-1.17, L_o = 324.20)

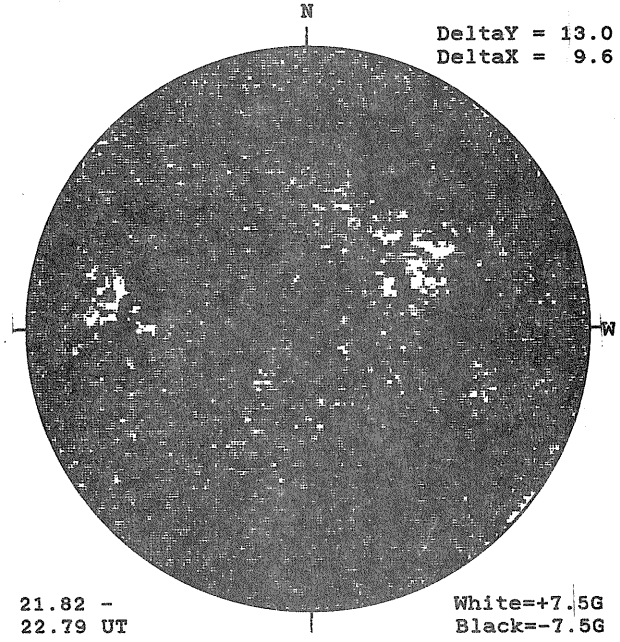
KITT PEAK MAGNETOGRAM



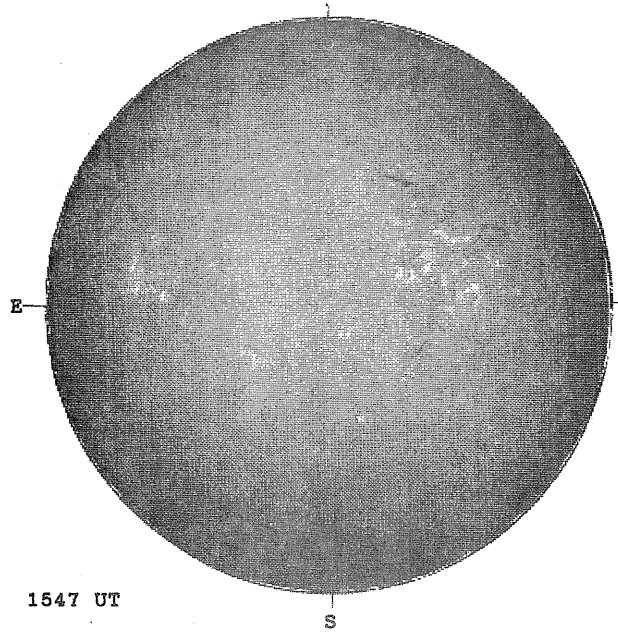
STANFORD MAGNETOGRAM



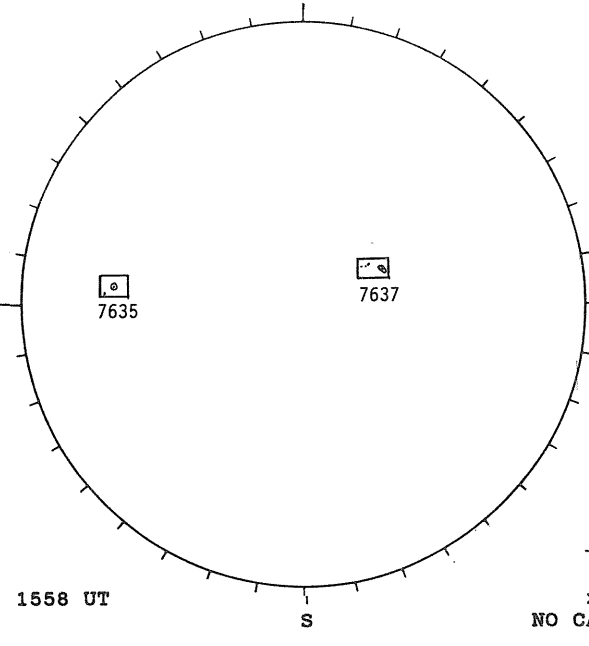
MT. WILSON MAGNETOGRAM



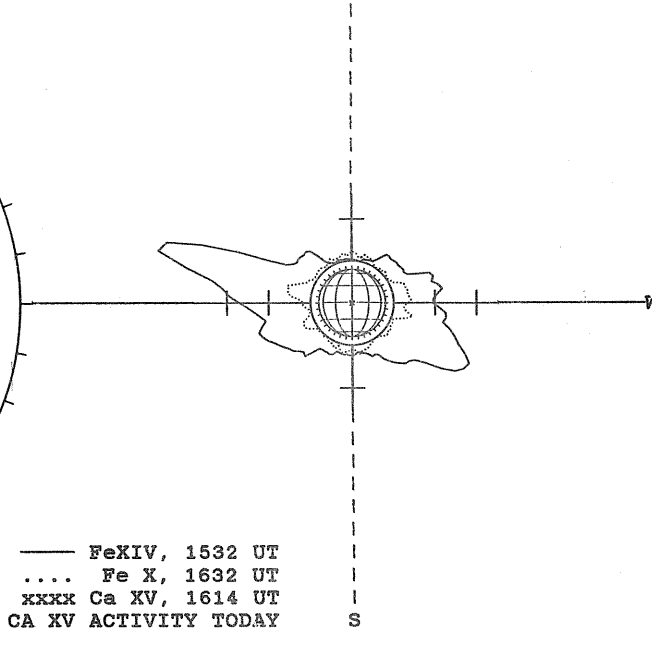
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)

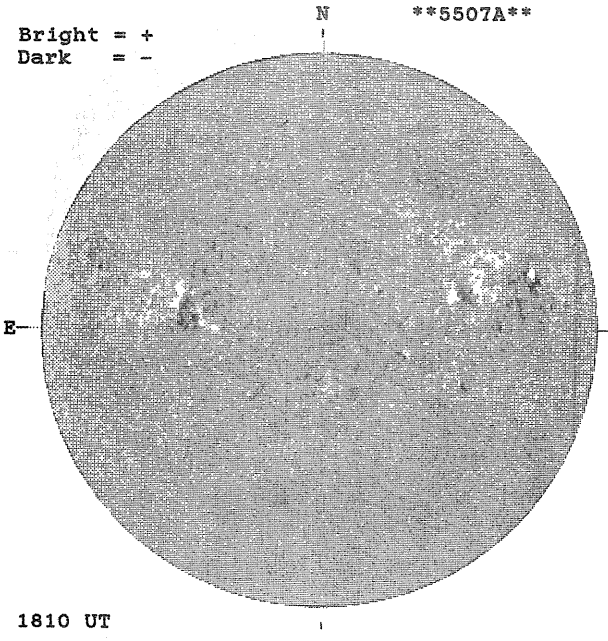


—— FeXIV, 1532 UT
.... Fe X, 1632 UT
xxxx Ca XV, 1614 UT
NO CA XV ACTIVITY TODAY

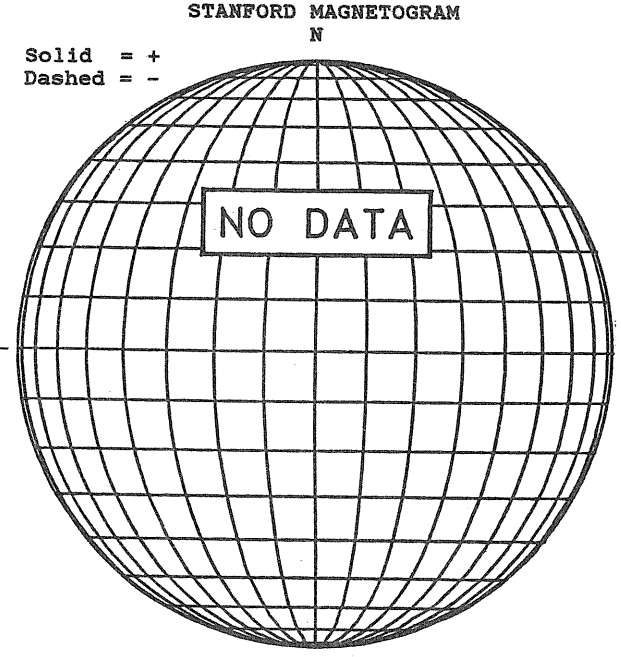
65
Dec 93

DECEMBER 18, 1993 (P= 8.81, B_o =-1.30, L_o = 311.02)

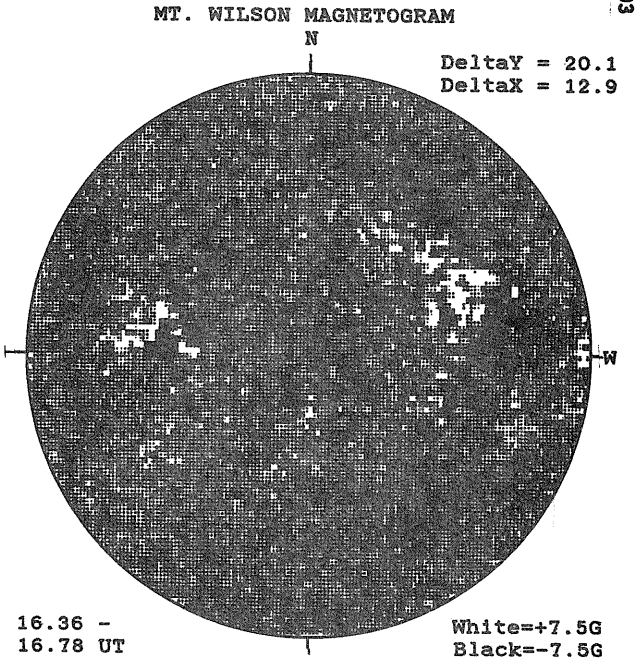
KITT PEAK MAGNETOGRAM



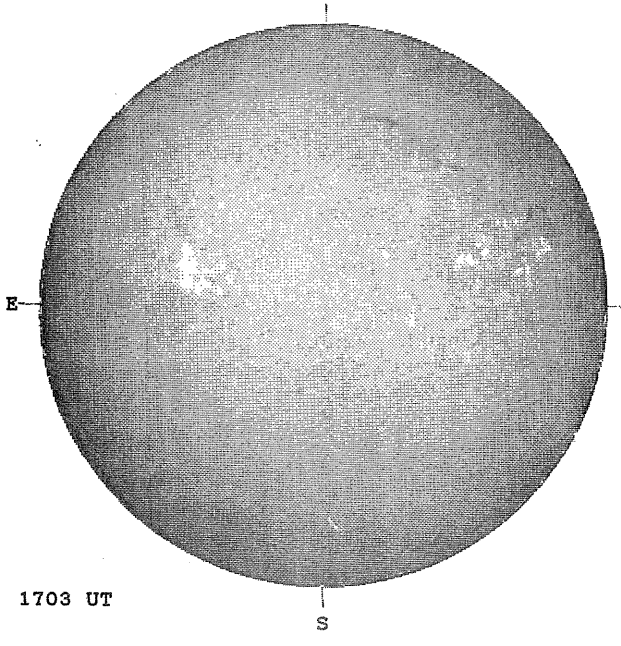
STANFORD MAGNETOGRAM



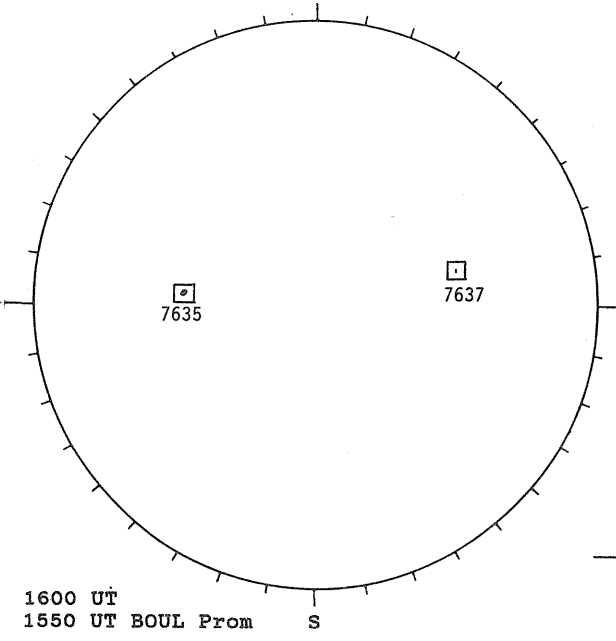
MT. WILSON MAGNETOGRAM



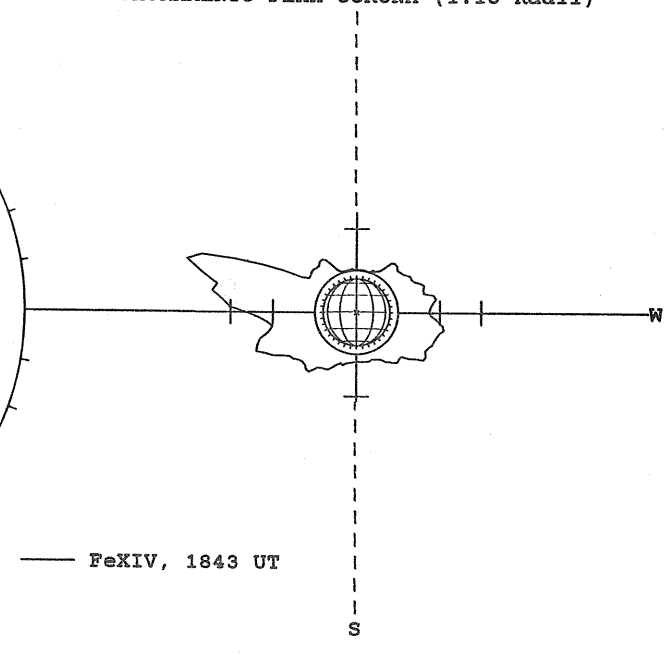
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)

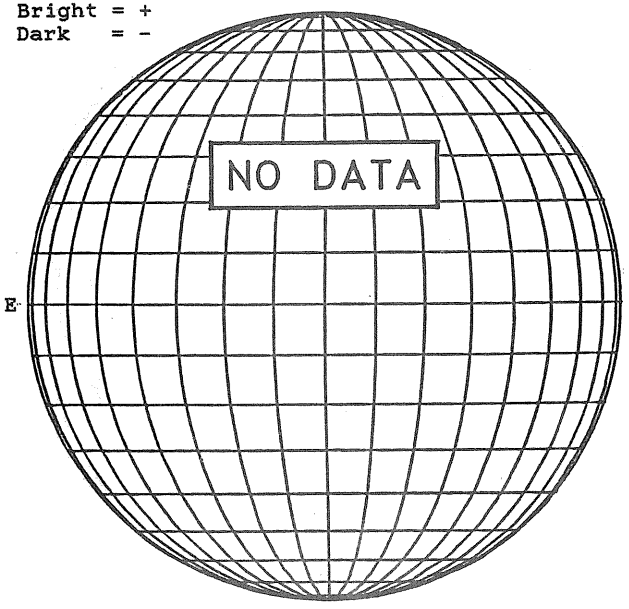


DECEMBER 19, 1993 (P= 8.35, B_o =-1.43, L_o = 297.85)

KITT PEAK MAGNETOGRAM

N **5507A**

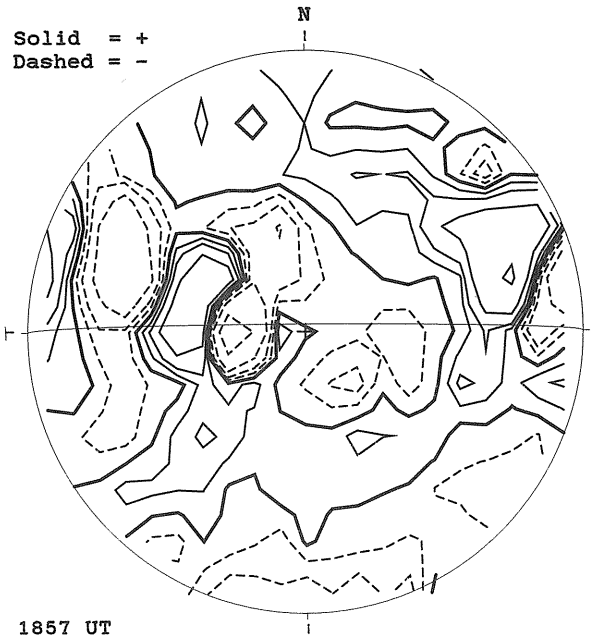
Bright = +
Dark = -



STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

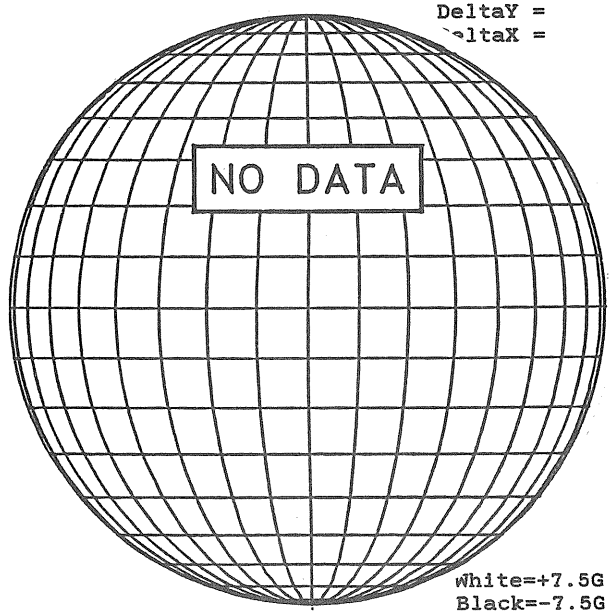


1857 UT

MT. WILSON MAGNETOGRAM

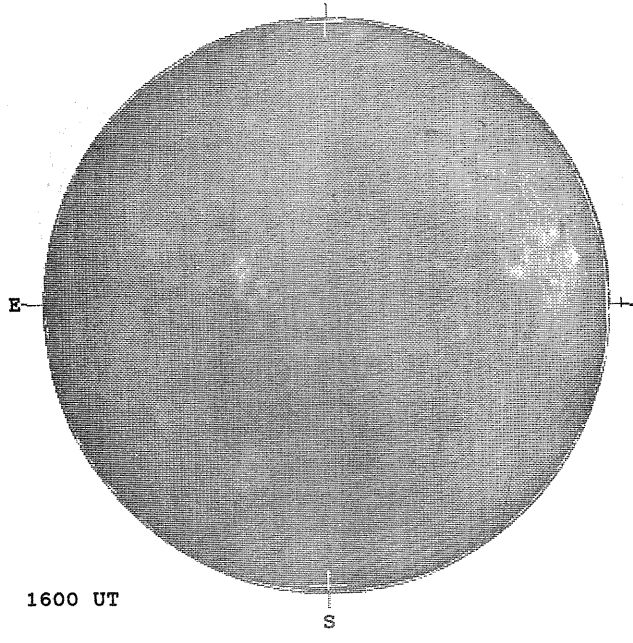
N

DeltaY =
DeltaX =



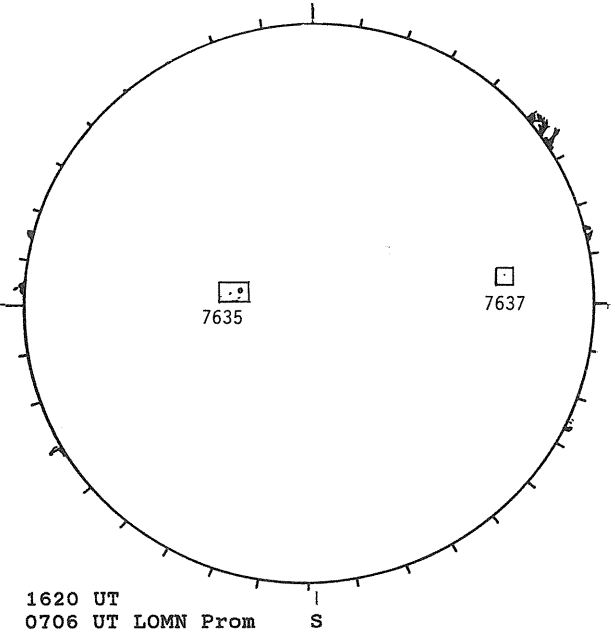
White=+7.5G
Black=-7.5G

BOULDER H-ALPHA



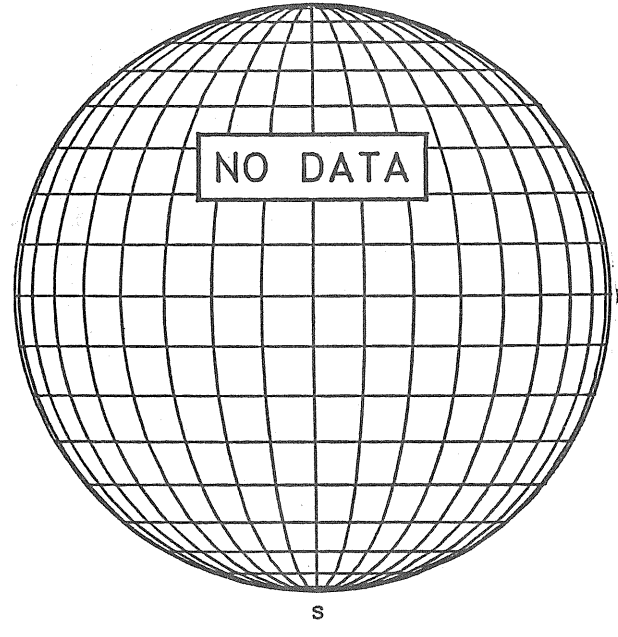
1600 UT

BOULDER SUNSPOT



1620 UT
0706 UT LOMN Prom

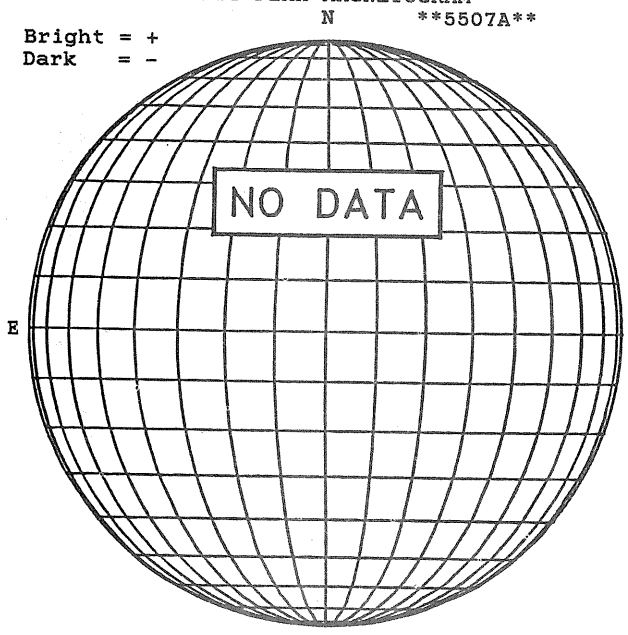
SACRAMENTO PEAK CORONA (1.15 Radii)



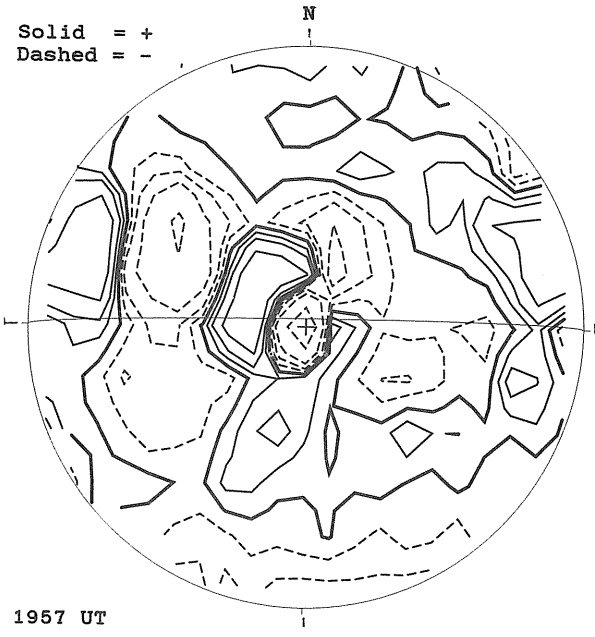
67
Dec 93

DECEMBER 20, 1993 (P= 7.88, B_o =-1.55, L_o = 284.68)

KITT PEAK MAGNETOGRAM

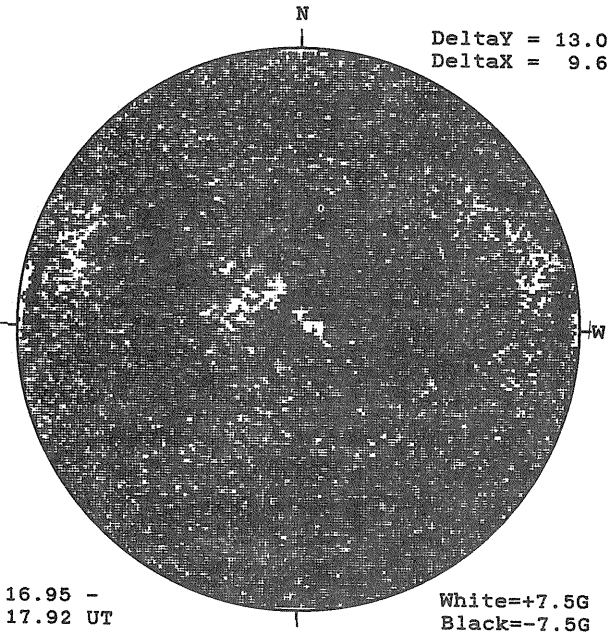


STANFORD MAGNETOGRAM



1957 UT

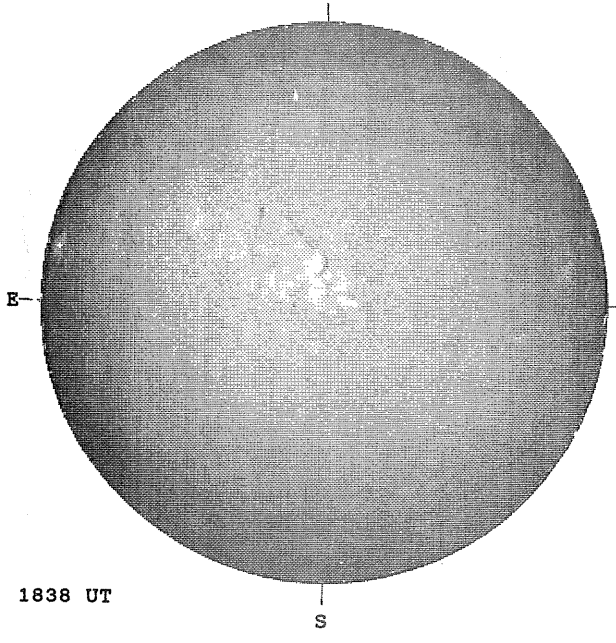
MT. WILSON MAGNETOGRAM



16.95 -
17.92 UT

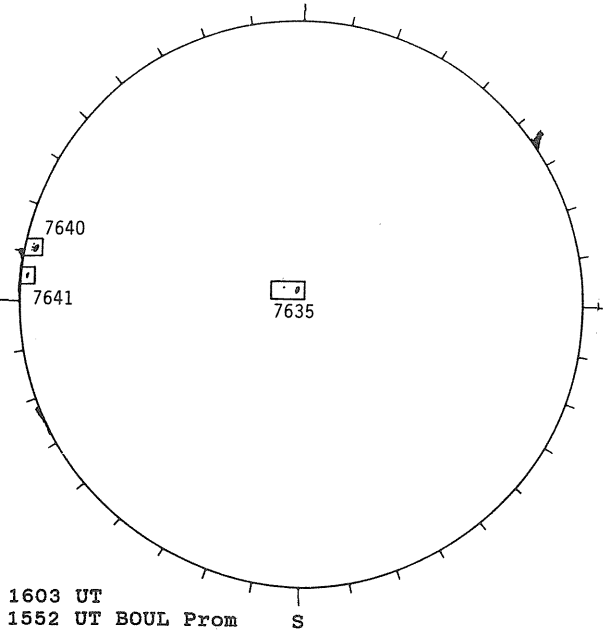
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



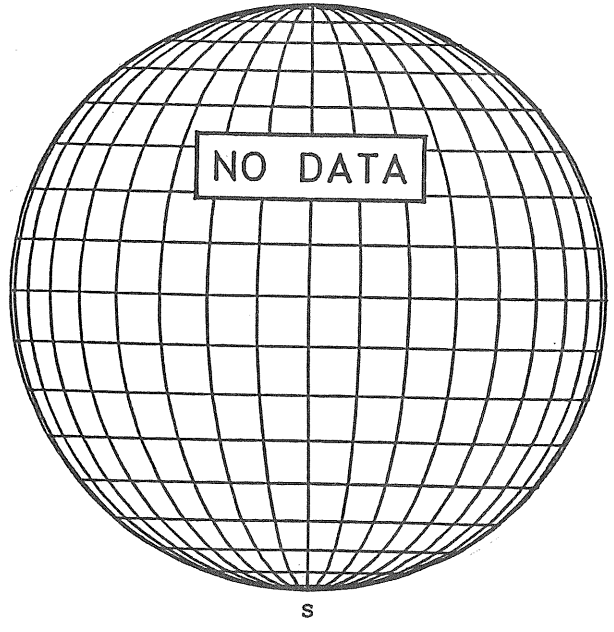
1838 UT

BOULDER SUNSPOT



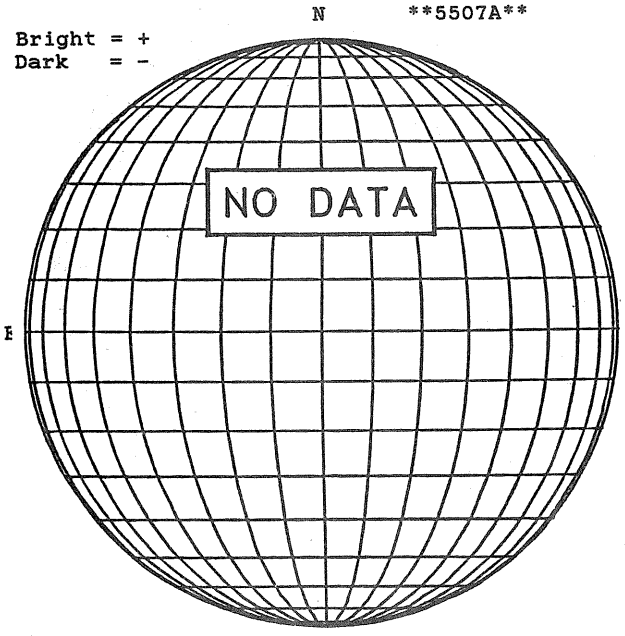
1603 UT
1552 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

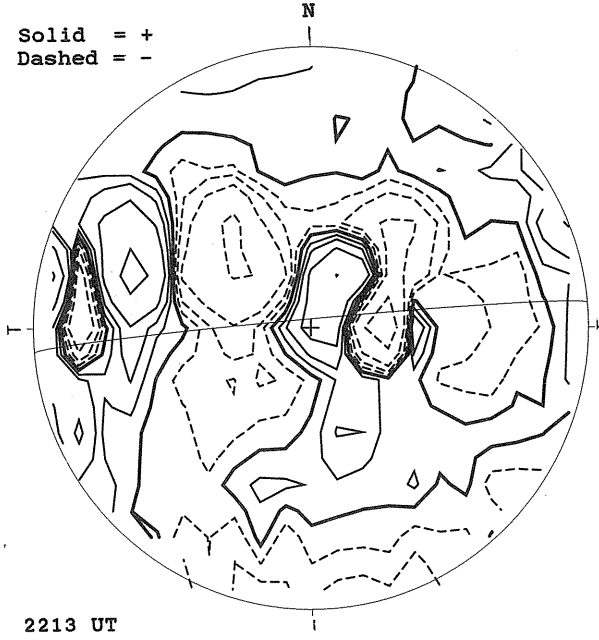


DECEMBER 21, 1993 (P= 7.41, B_o =-1.68 L_o = 271.50)

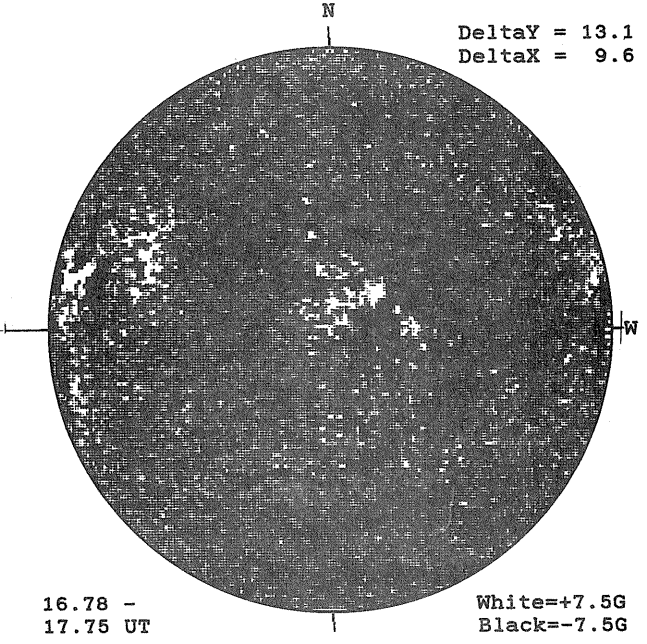
KITT PEAK MAGNETOGRAM



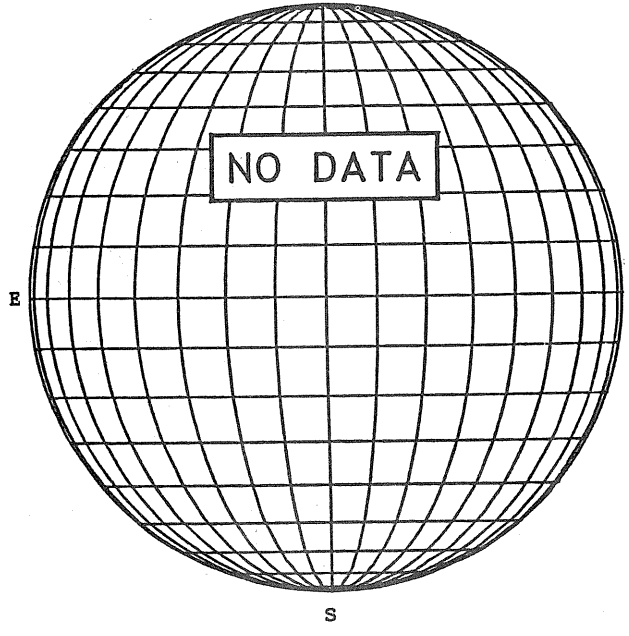
STANFORD MAGNETOGRAM



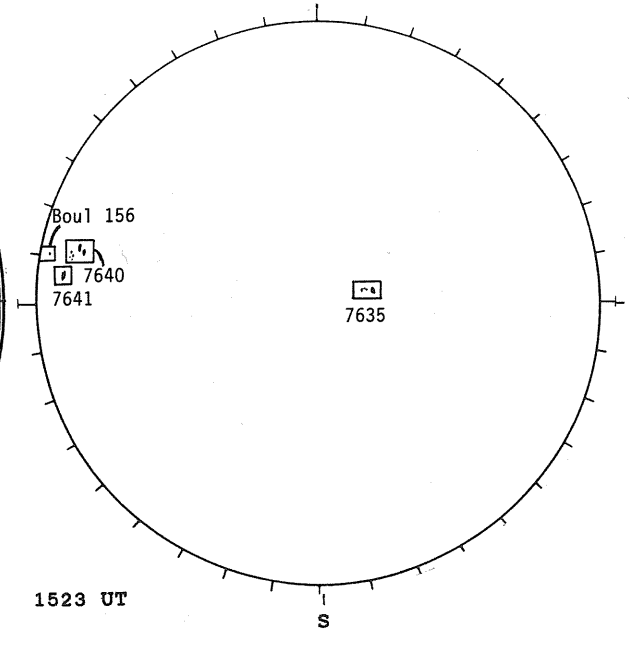
MT. WILSON MAGNETOGRAM



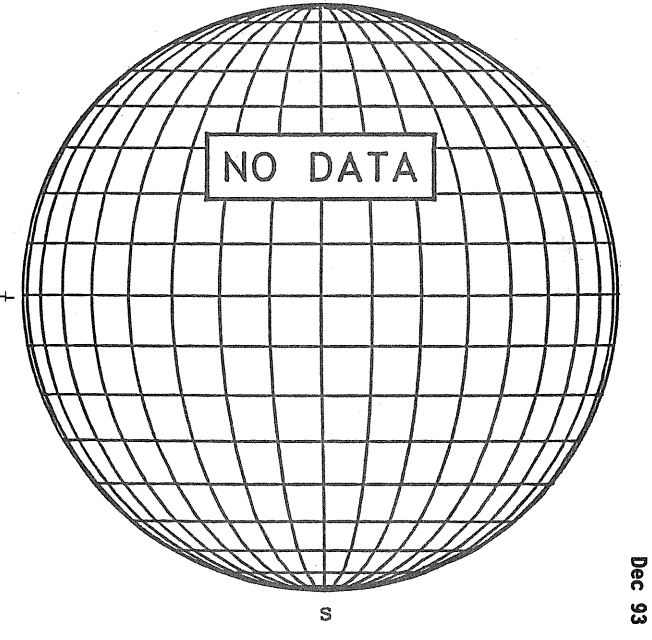
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 22, 1993 (P= 6.94, B_o =-1.80, L_o = 258.33)

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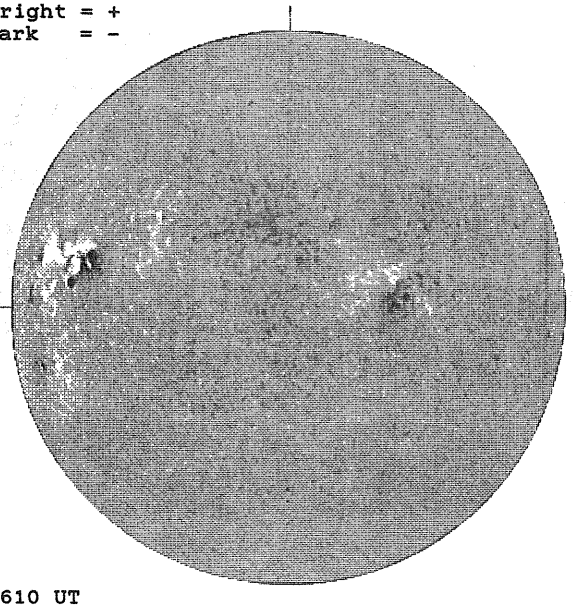
Dec 93

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -

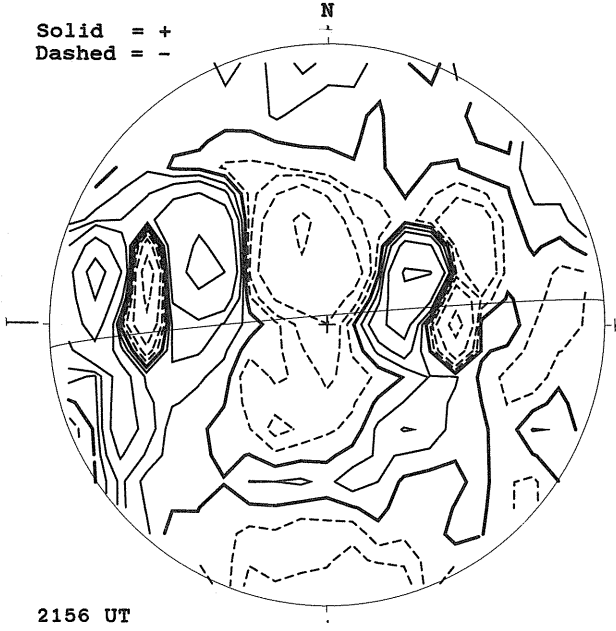
N **5507A**



1610 UT

STANFORD MAGNETOGRAM

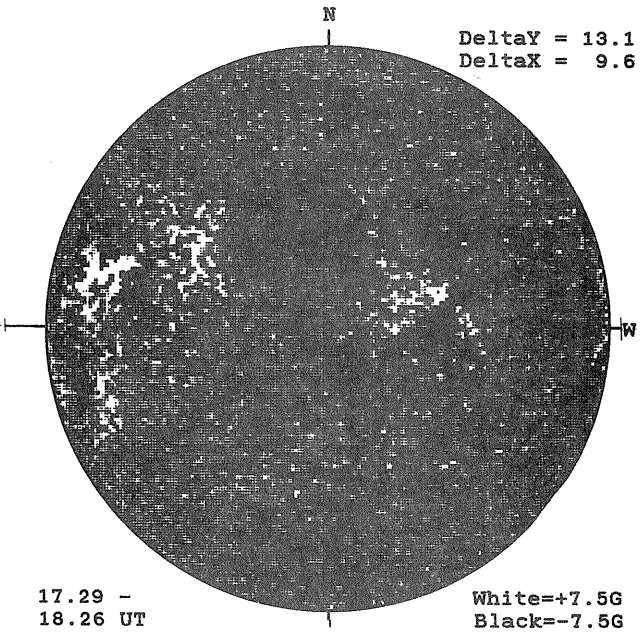
Solid = +
Dashed = -



2156 UT

MT. WILSON MAGNETOGRAM

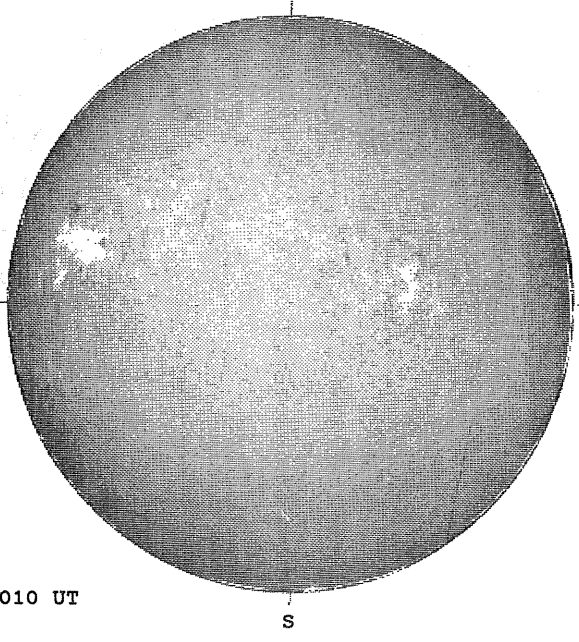
DeltaY = 13.1
DeltaX = 9.6



17.29 -
18.26 UT

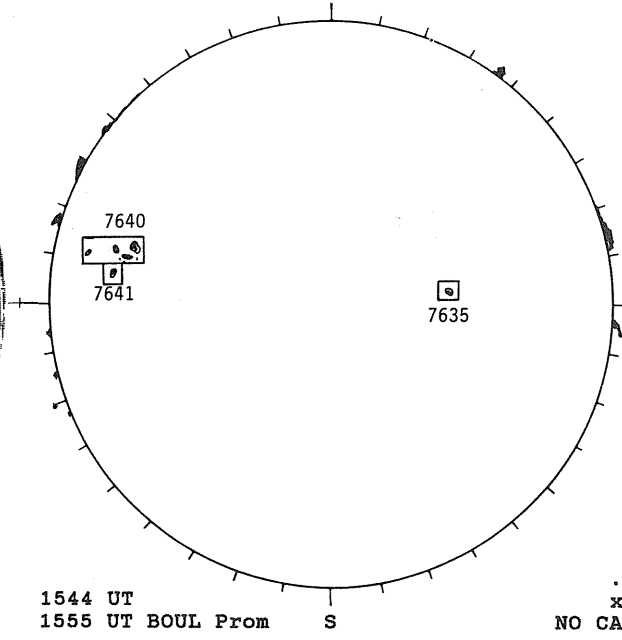
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



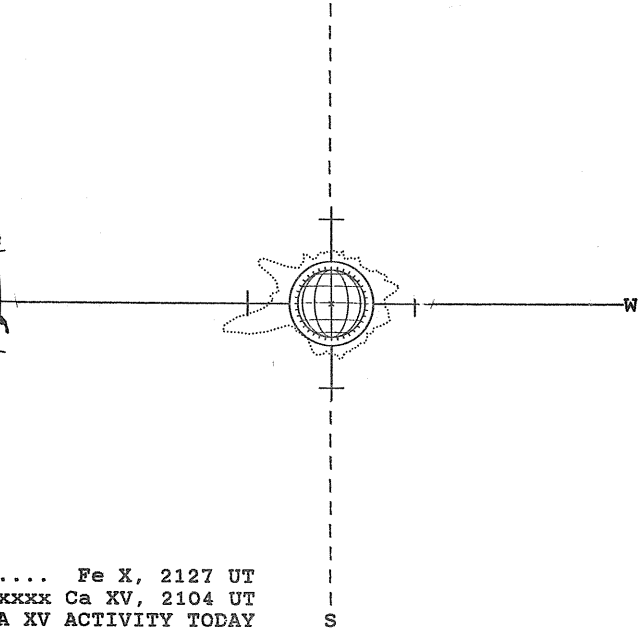
2010 UT

BOULDER SUNSPOT



1544 UT
1555 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



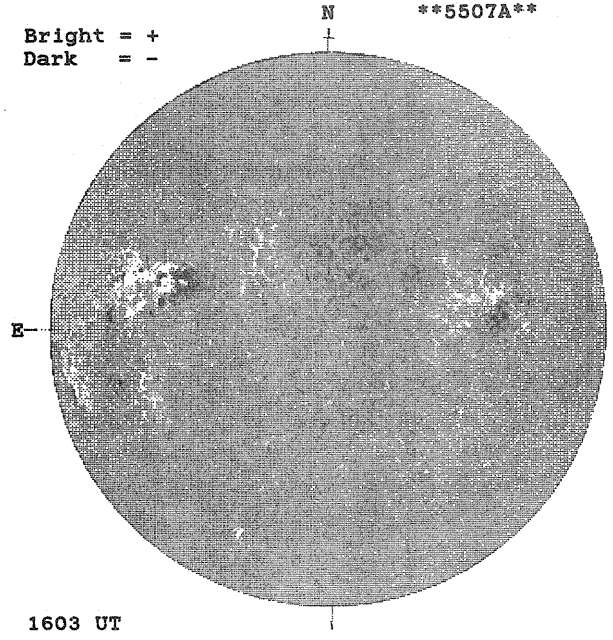
.... Fe X, 2127 UT
xxxx Ca XV, 2104 UT
NO CA XV ACTIVITY TODAY

DECEMBER 23, 1993 (P= 6.47, B_o =-1.92, L_o = 245.16)

KITT PEAK MAGNETOGRAM

5507A

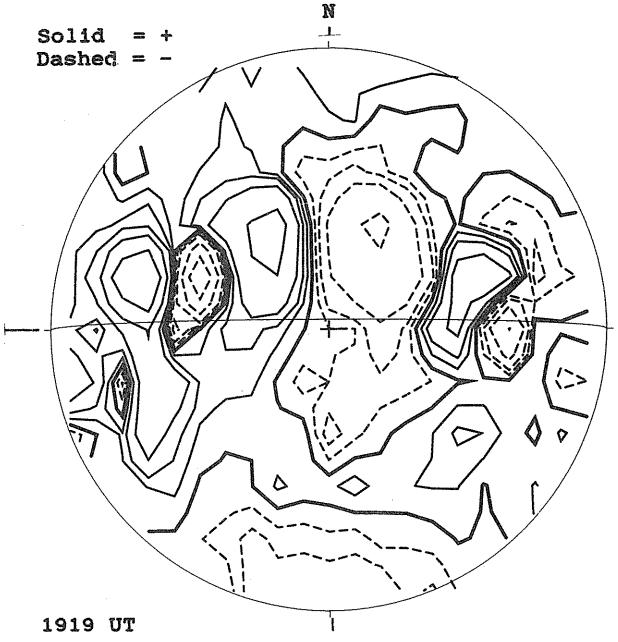
Bright = +
Dark = -



1603 UT

STANFORD MAGNETOGRAM

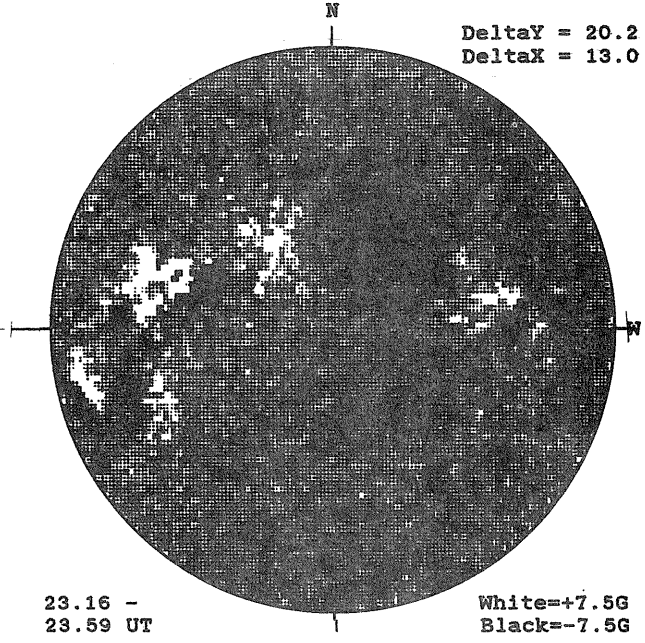
Solid = +
Dashed = -



1919 UT

MT. WILSON MAGNETOGRAM

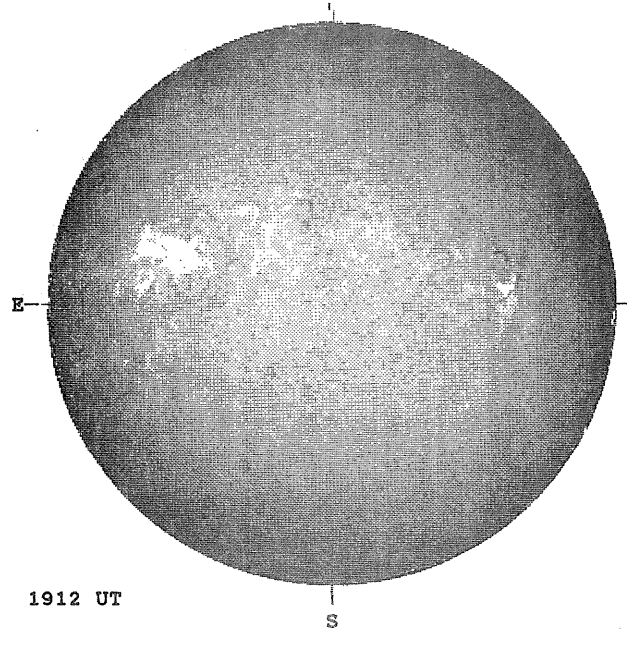
DeltaY = 20.2
DeltaX = 13.0



23.16 -
23.59 UT

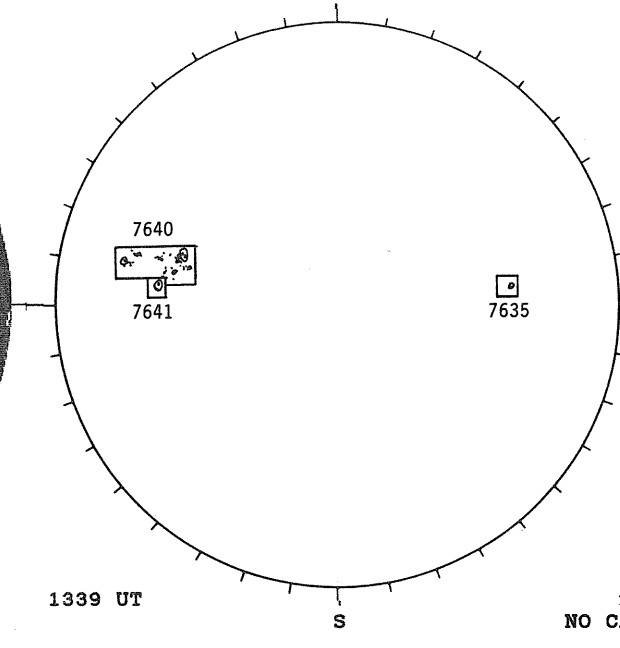
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



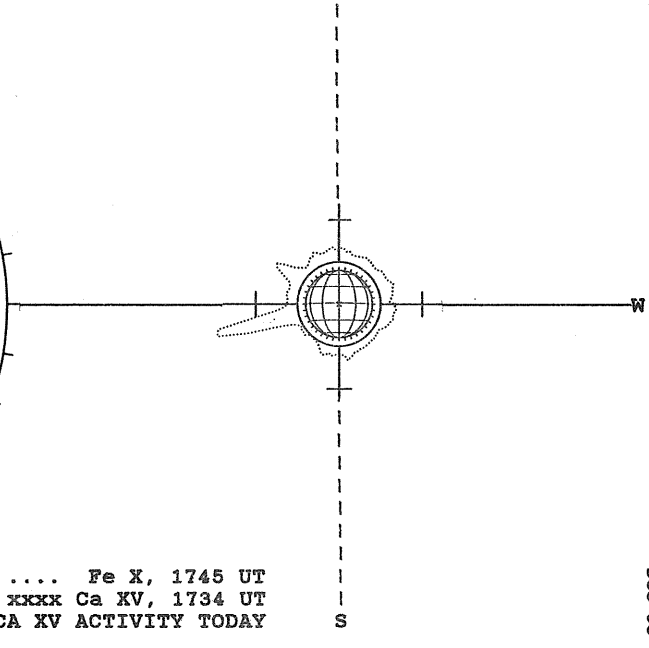
1912 UT

RAMEY SUNSPOT



1339 UT

SACRAMENTO PEAK CORONA (1.15 Radii)



.... Fe X, 1745 UT
xxxx Ca XV, 1734 UT
NO CA XV ACTIVITY TODAY

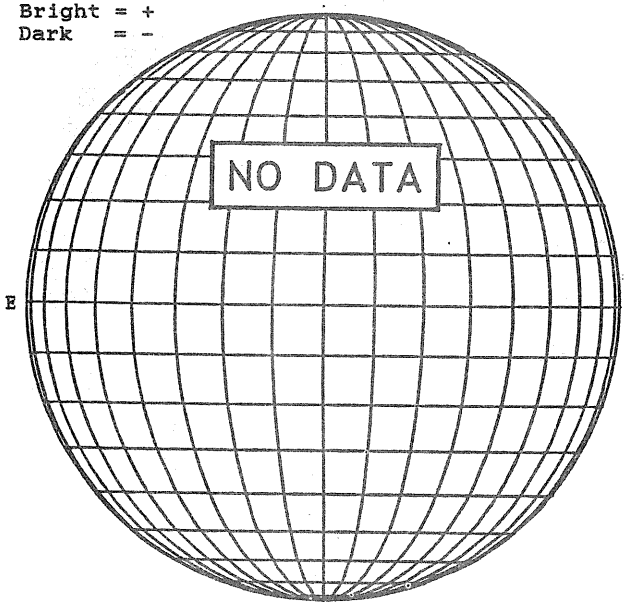
71
Dec 93

DECEMBER 24, 1993 (P= 5.99 B_o =-2.05, L_o = 231.98)

KITT PEAK MAGNETOGRAM

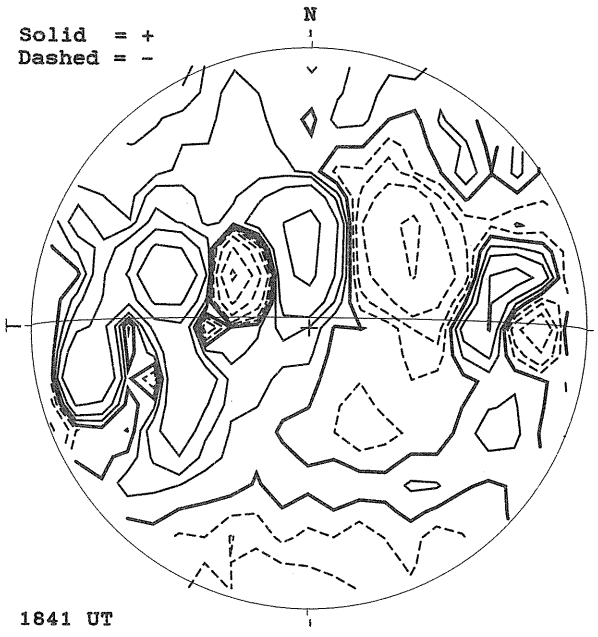
N **5507A**

Bright = +
Dark = -



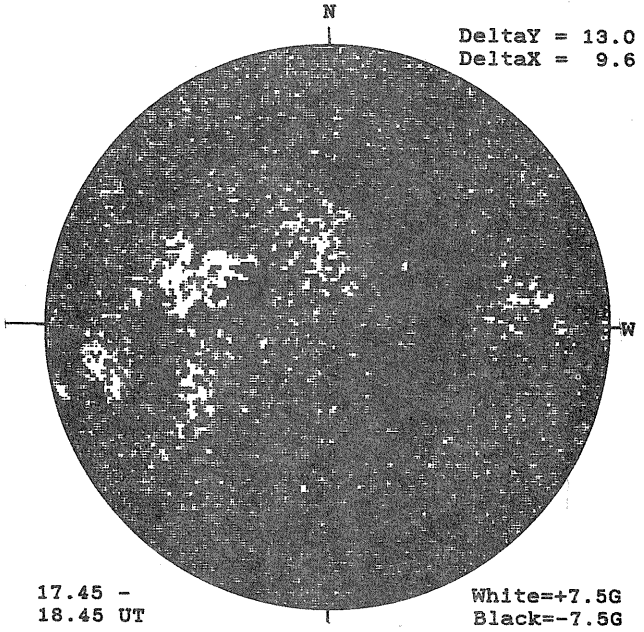
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



1841 UT

MT. WILSON MAGNETOGRAM

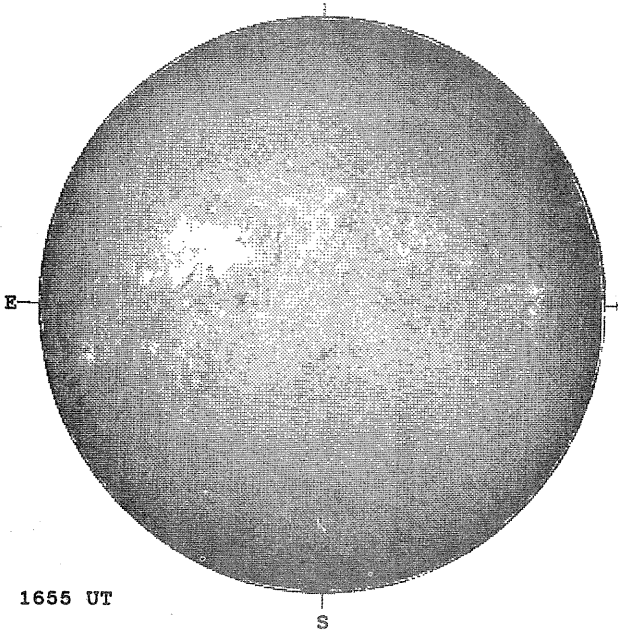


DeltaY = 13.0
DeltaX = 9.6

17.45 -
18.45 UT

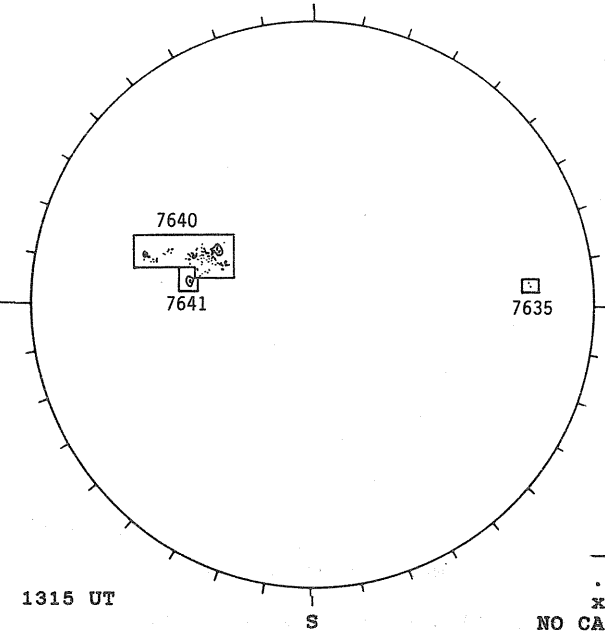
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



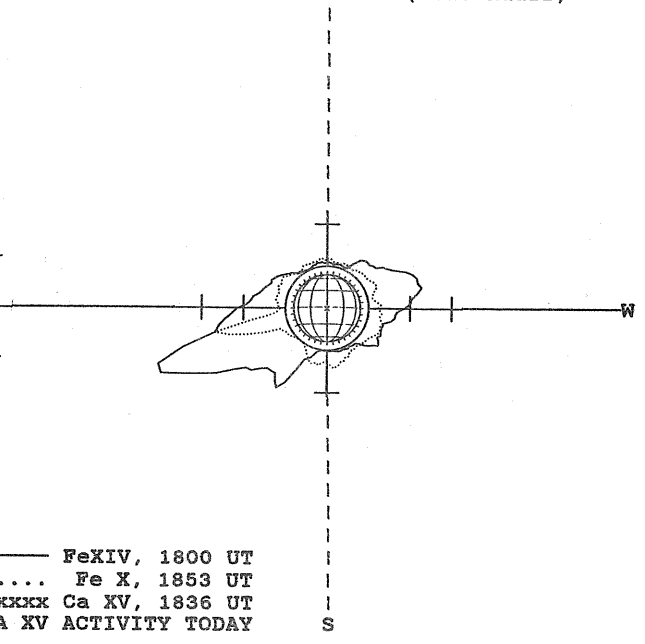
1655 UT

RAMEY SUNSPOT



1315 UT

SACRAMENTO PEAK CORONA (1.15 Radii)



—— FeXIV, 1800 UT
.... Fe X, 1853 UT
xxxx Ca XV, 1836 UT
NO CA XV ACTIVITY TODAY

DECEMBER 25, 1993 (P= 5.51 B_o =-2.17, L_o = 218.81)

KITT PEAK MAGNETOGRAM
N **5507A**
Bright = +
Dark = -
E
NO DATA

STANFORD MAGNETOGRAM
N
Solid = +
Dashed = -
NO DATA

MT. WILSON MAGNETOGRAM
N
DeltaY =
'taX =
NO DATA
White=+7.5G
Black=-7.5G

BOULDER H-ALPHA
E
1600 UT
S

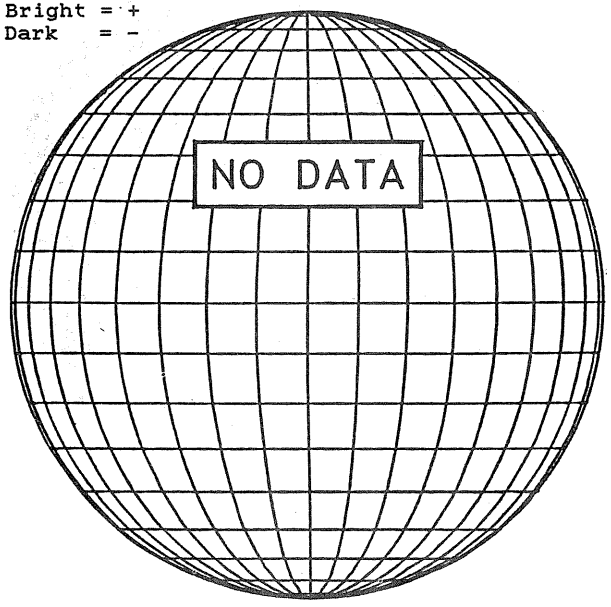
BOULDER SUNSPOT
7640
7641
1600 UT
1600 UT BOUL Prom
S

SACRAMENTO PEAK CORONA (1.15 Radii)
NO DATA
S

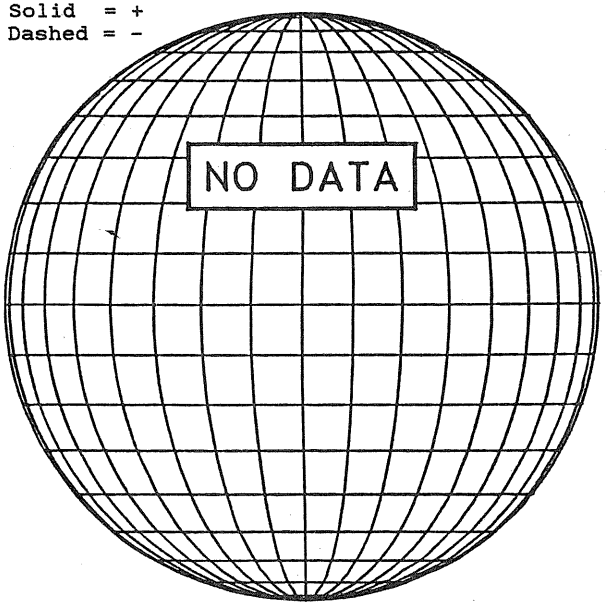
73
Dec 93

DECEMBER 26, 1993 (P= 5.03, B_o =-2.29, L_o = 205.64)

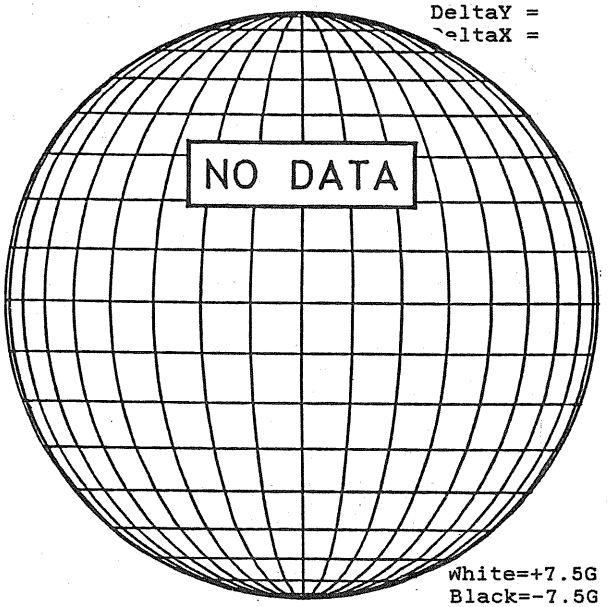
KITT PEAK MAGNETOGRAM
N **5507A**
Bright = +
Dark = -



STANFORD MAGNETOGRAM
N
Solid = +
Dashed = -

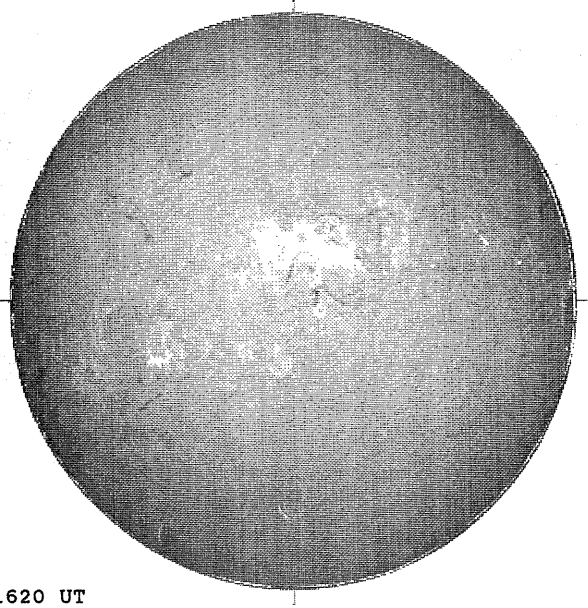


MT. WILSON MAGNETOGRAM
N
DeltaY =
DeltaX =



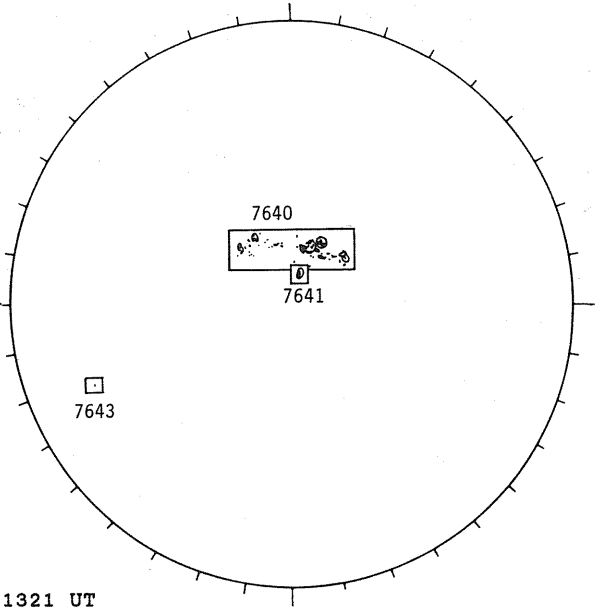
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



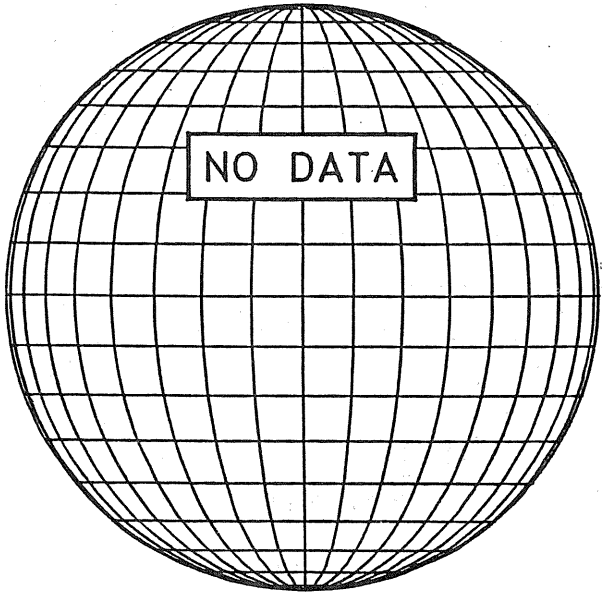
1620 UT
S

RAMEY SUNSPOT



1321 UT
S

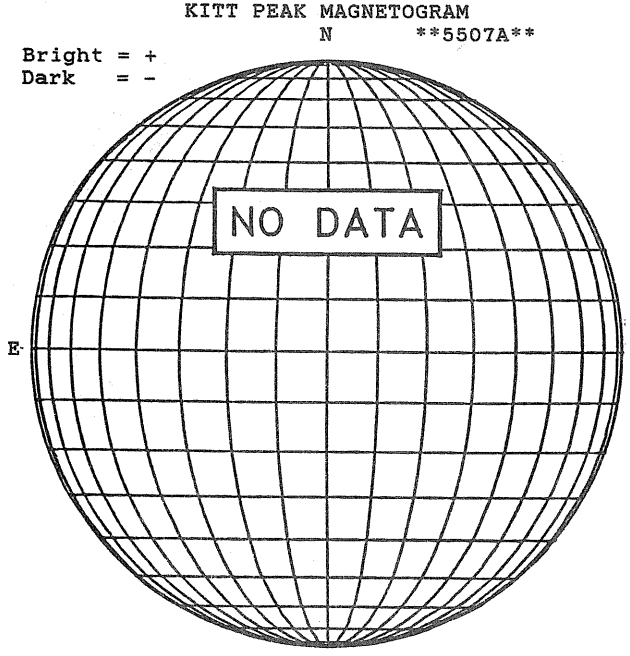
SACRAMENTO PEAK CORONA (1.15 Radii)



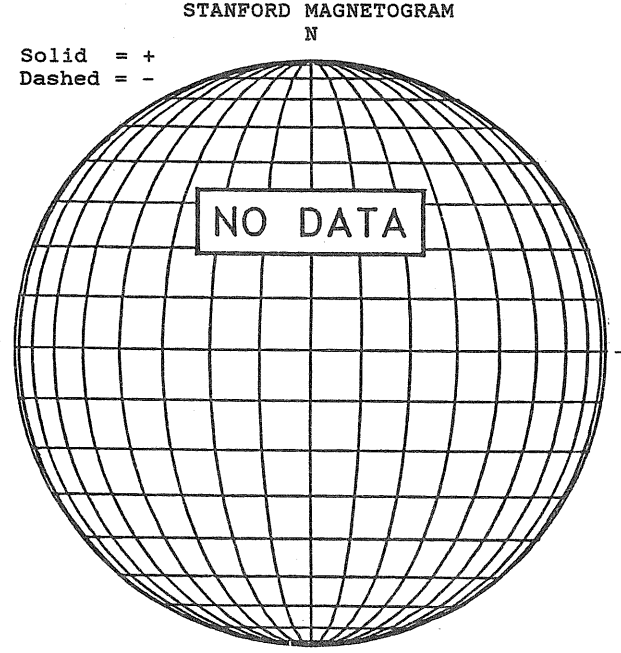
S

DECEMBER 27, 1993 (P= 4.55, B_o =-2.41, L_o = 192.47)

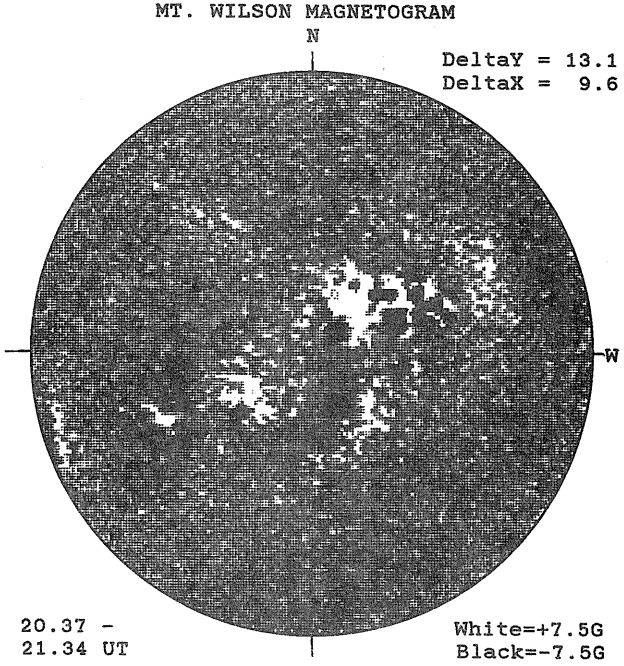
KITT PEAK MAGNETOGRAM



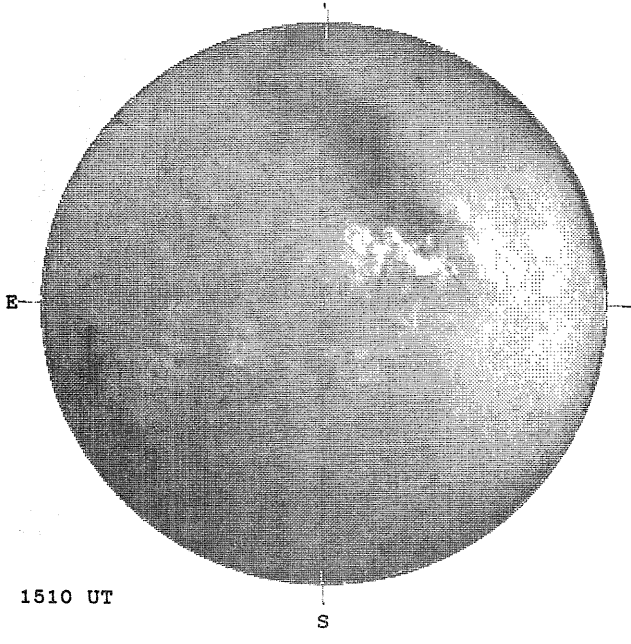
STANFORD MAGNETOGRAM



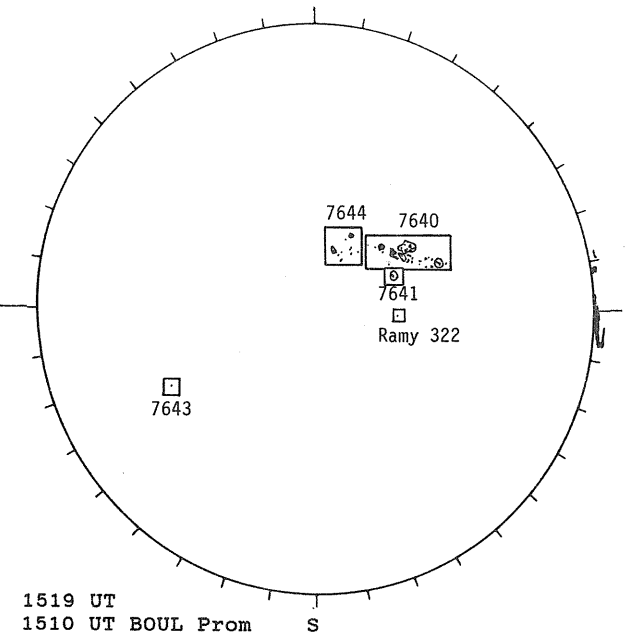
MT. WILSON MAGNETOGRAM



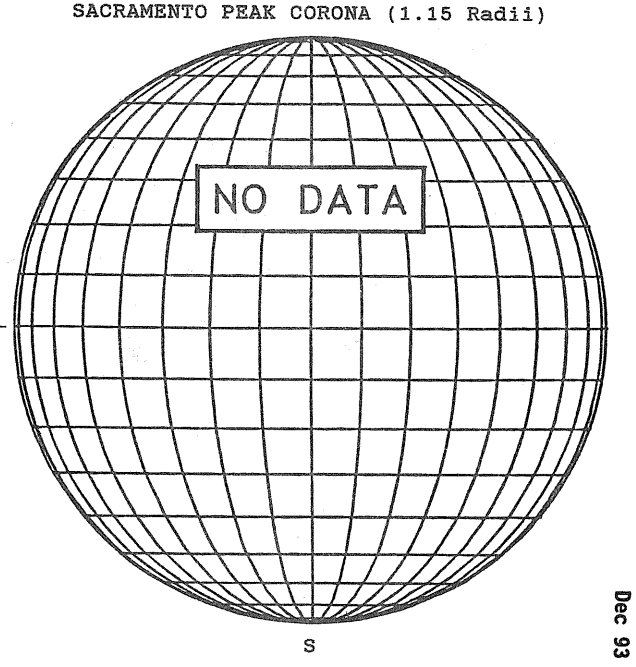
BOULDER H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



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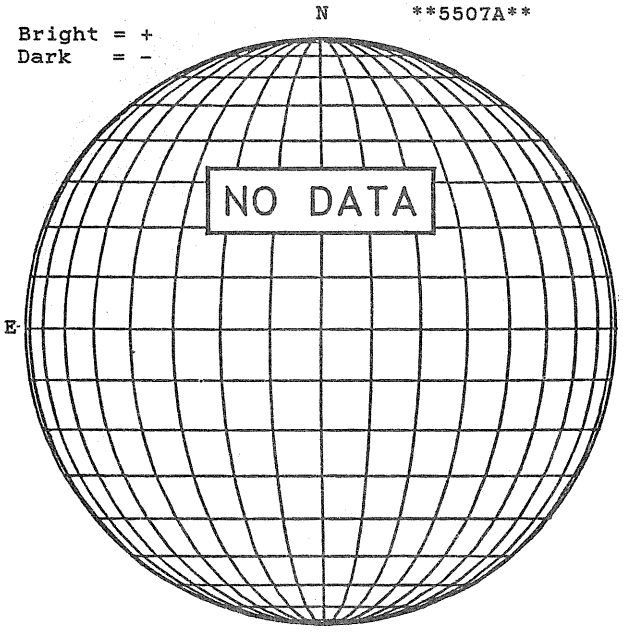
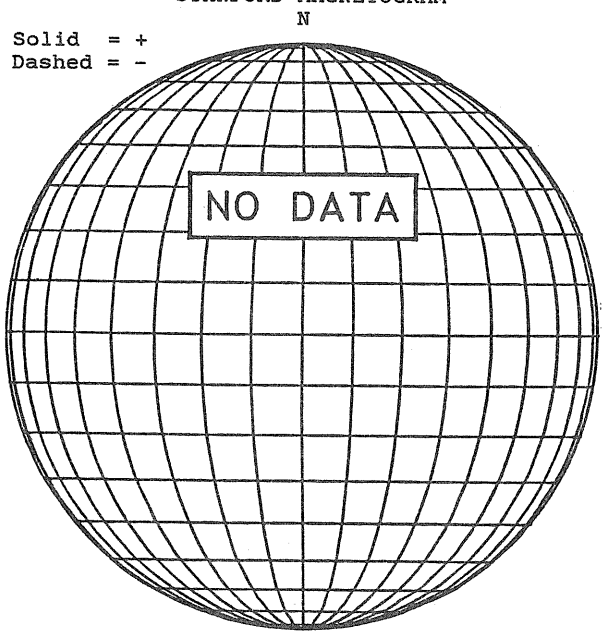
DECEMBER 28, 1993 (P= 4.07 B_o =-2.53, L_o = 179.30)

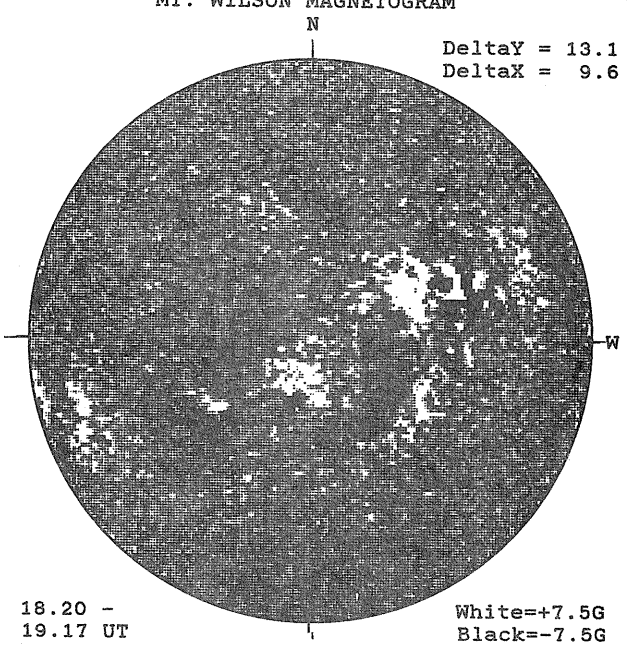
KITT PEAK MAGNETOGRAM



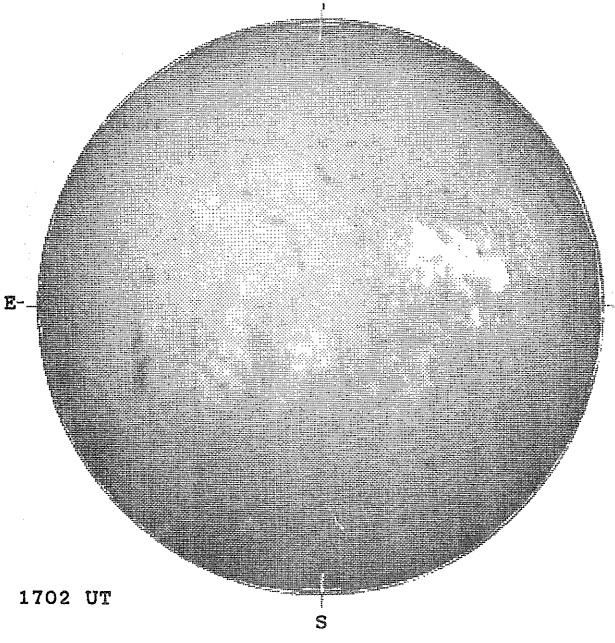
STANFORD MAGNETOGRAM



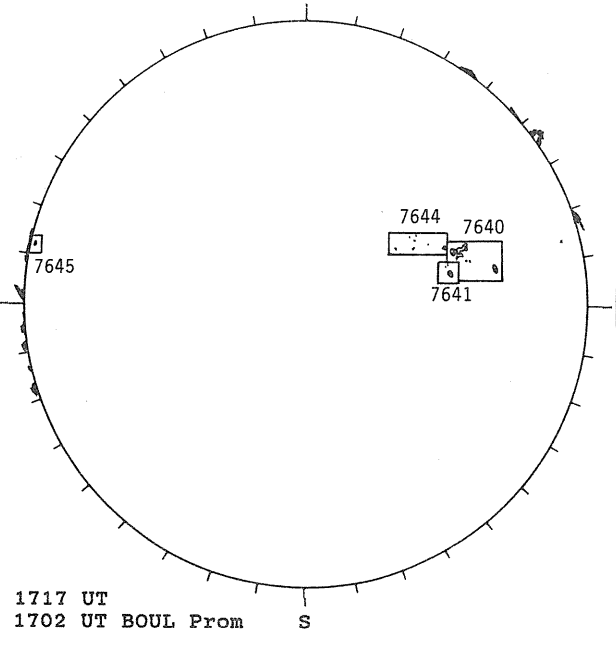
MT. WILSON MAGNETOGRAM



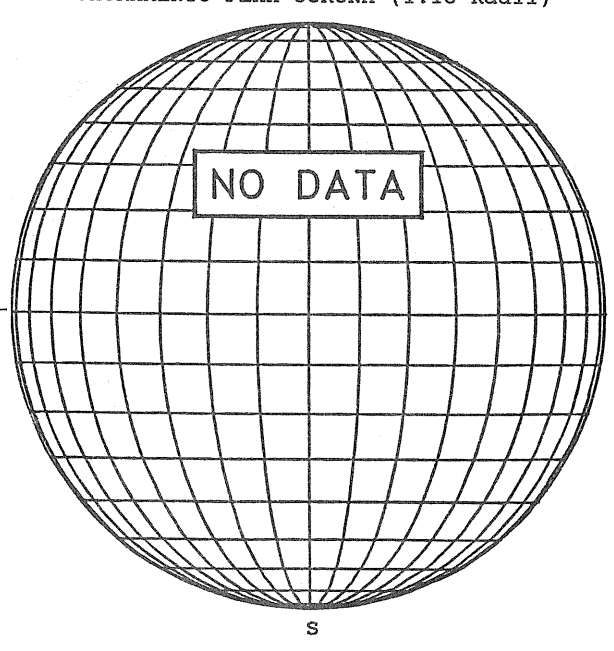
BOULDER H-ALPHA



BOULDER SUNSPOT

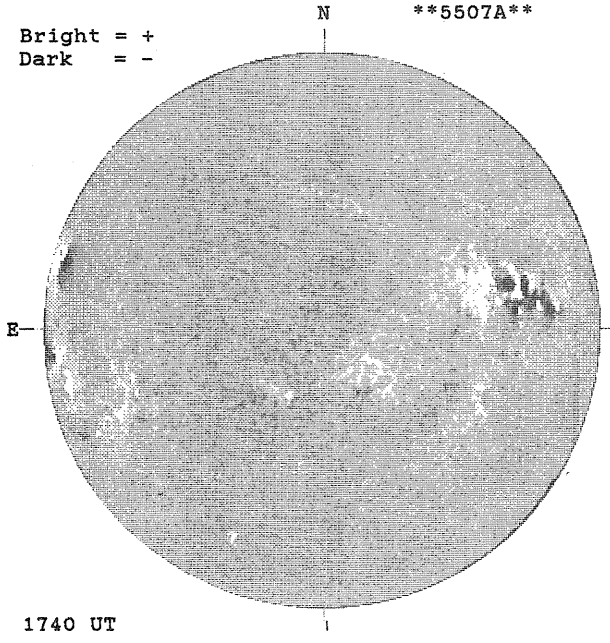


SACRAMENTO PEAK CORONA (1.15 Radii)

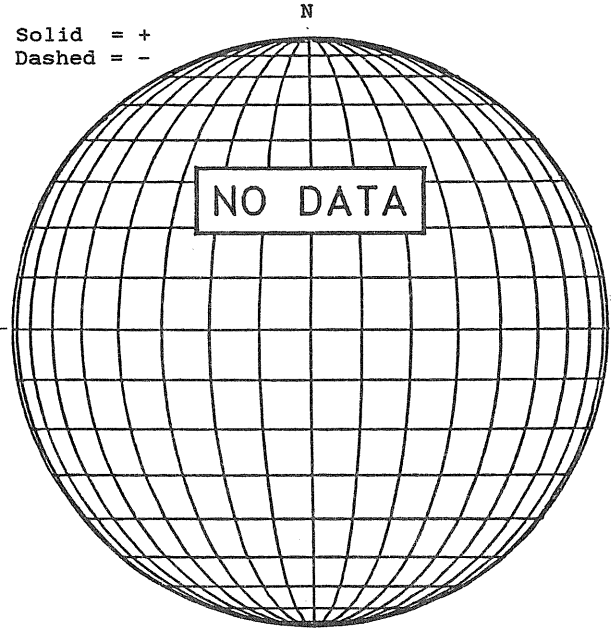


DECEMBER 29, 1993 (P= 3.59, B_o =-2.65, L_o = 166.12)

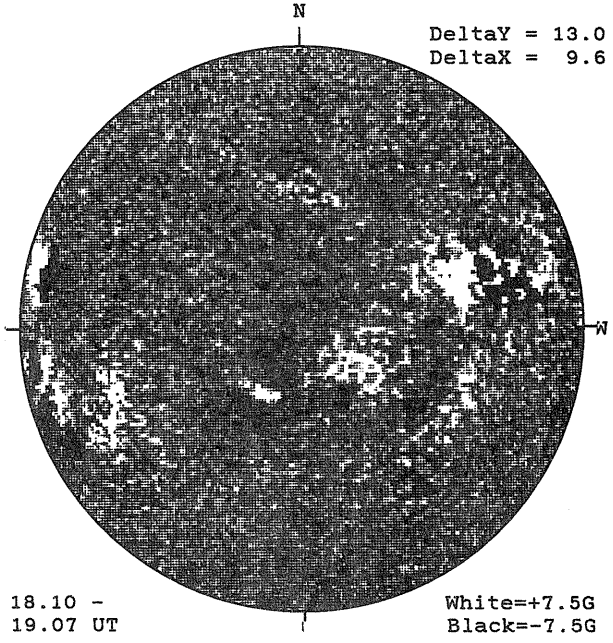
KITT PEAK MAGNETOGRAM



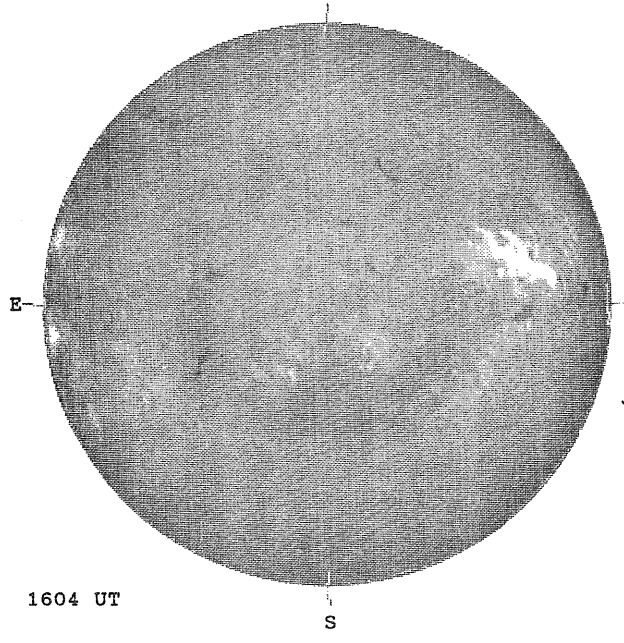
STANFORD MAGNETOGRAM



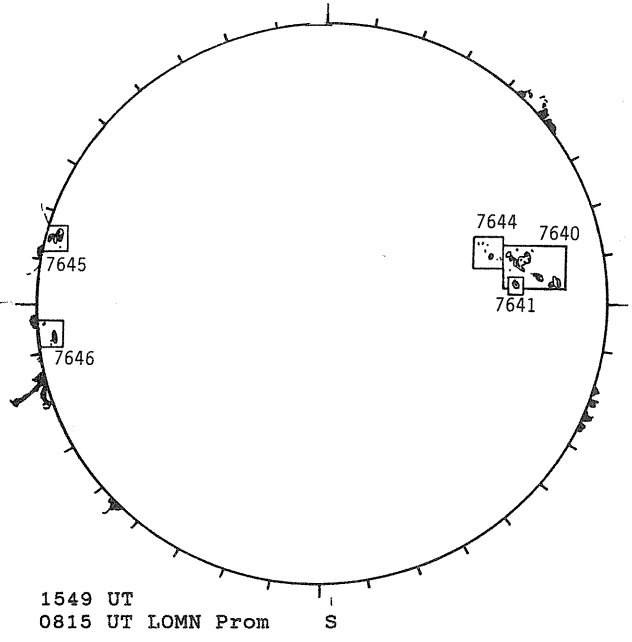
MT. WILSON MAGNETOGRAM



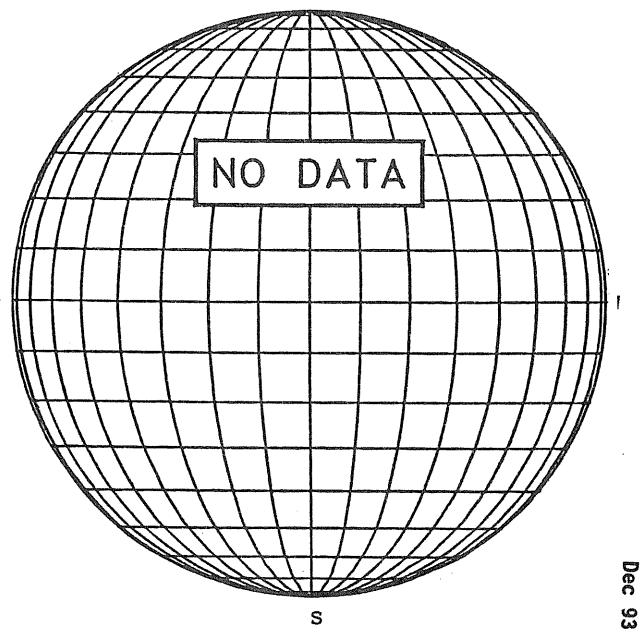
BOULDER H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



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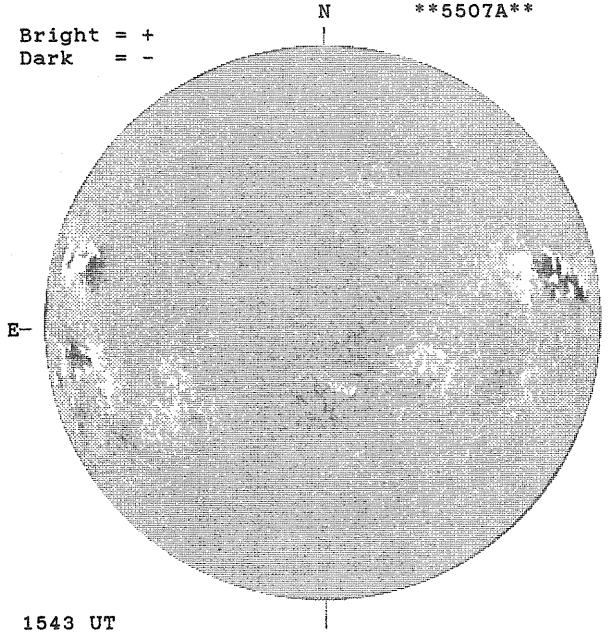
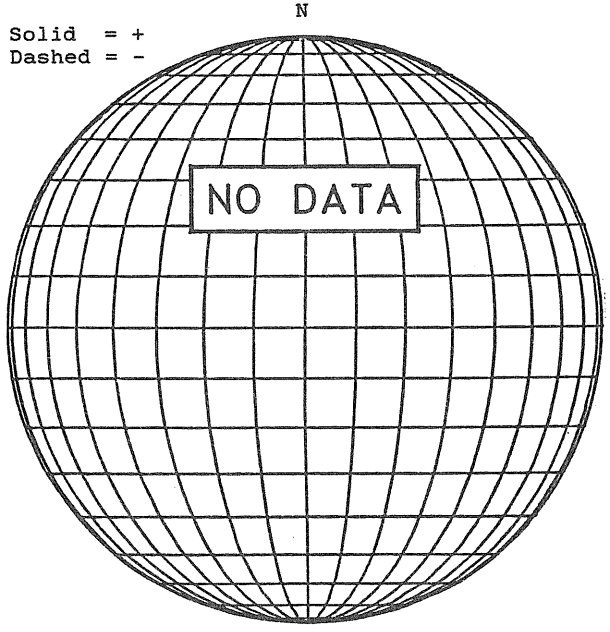
DECEMBER 30, 1993 (P= 3.10, B_o =-2.77, L_o = 152.95)

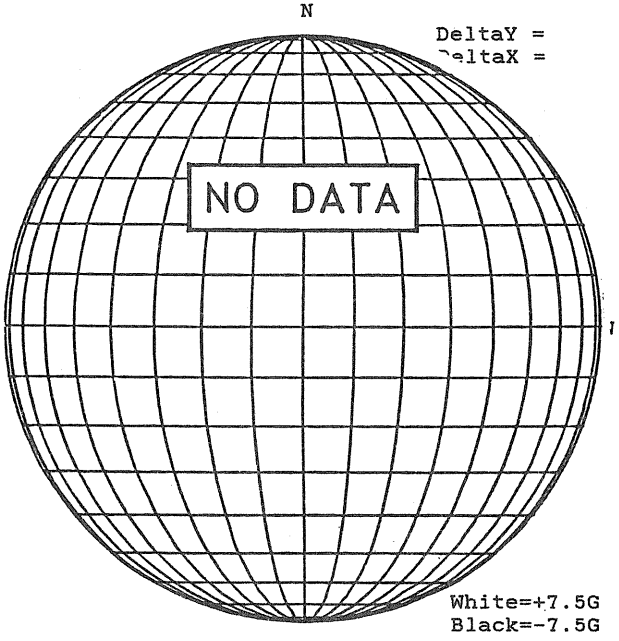
KITT PEAK MAGNETOGRAM



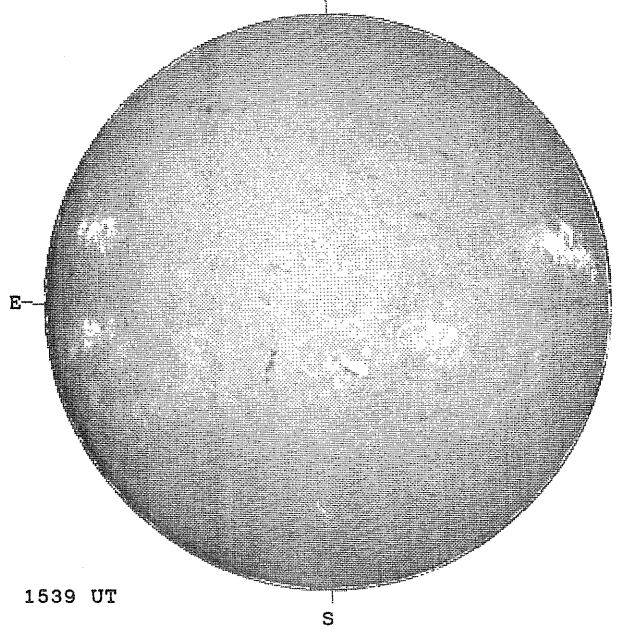
STANFORD MAGNETOGRAM



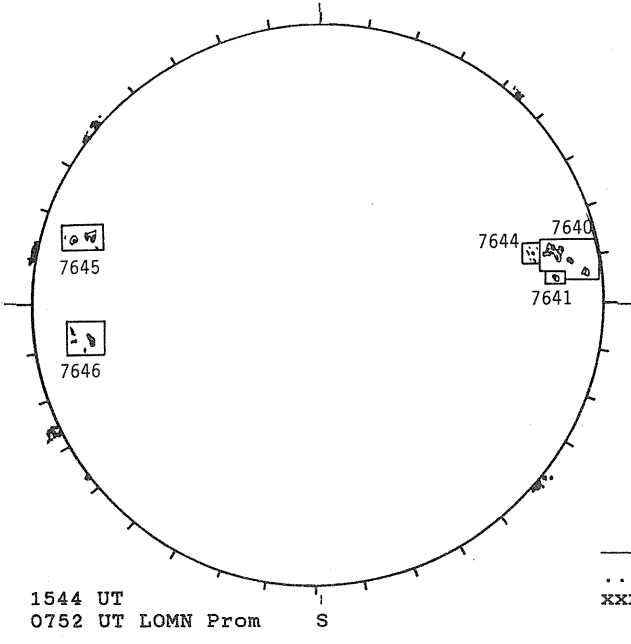
MT. WILSON MAGNETOGRAM



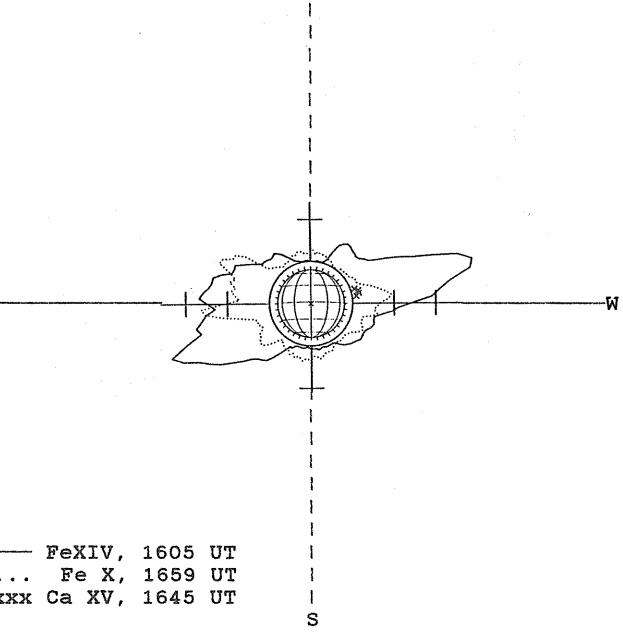
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

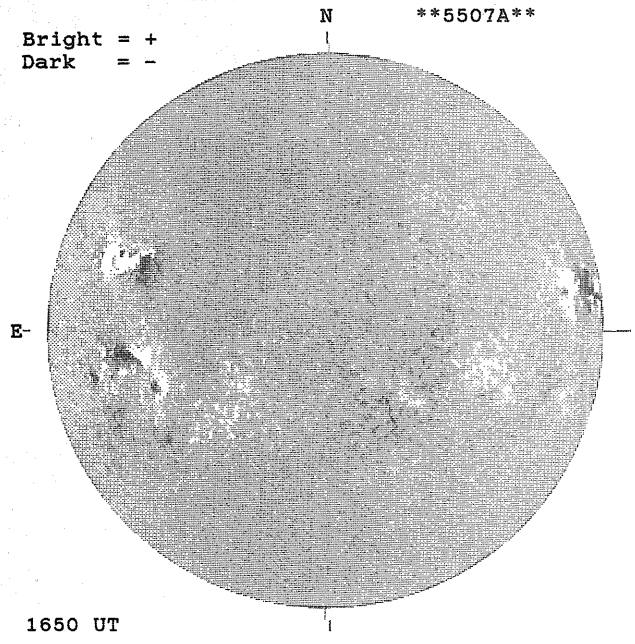


SACRAMENTO PEAK CORONA (1.15 Radii)

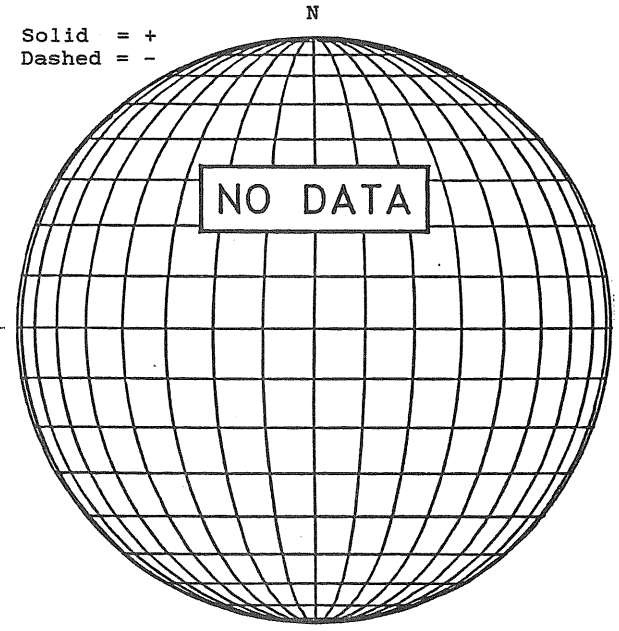


DECEMBER 31, 1993 (P= 2.62, B_o =-2.89 L_o = 139.78)

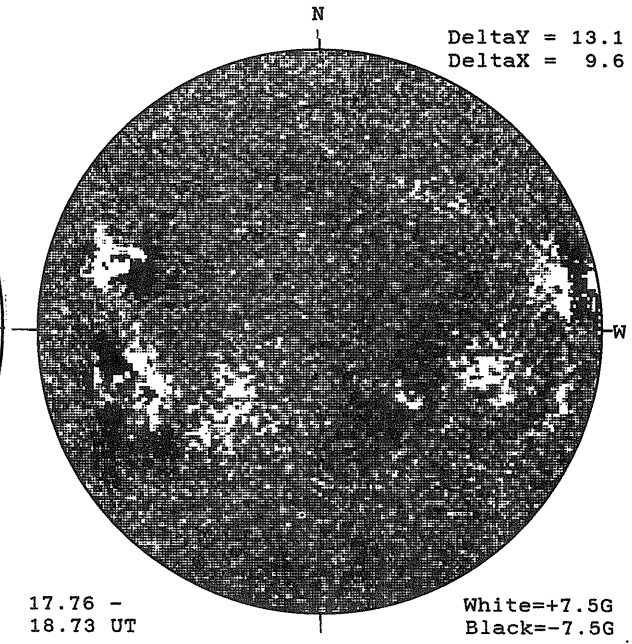
KITT PEAK MAGNETOGRAM



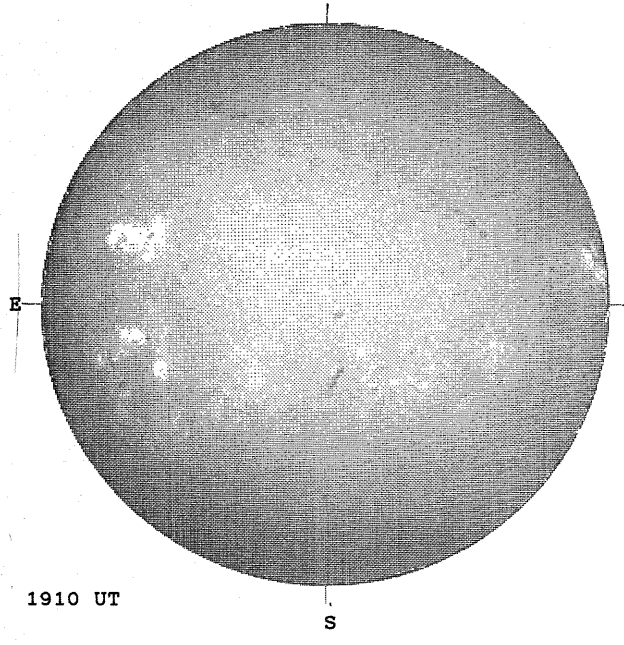
STANFORD MAGNETOGRAM



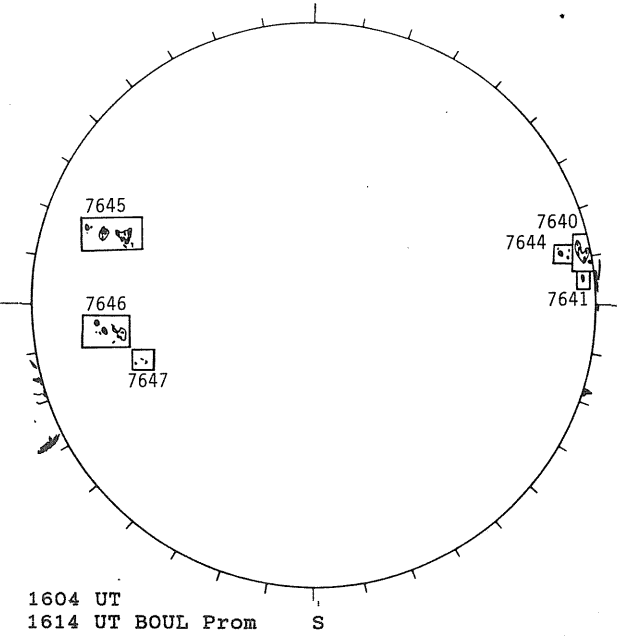
MT. WILSON MAGNETOGRAM



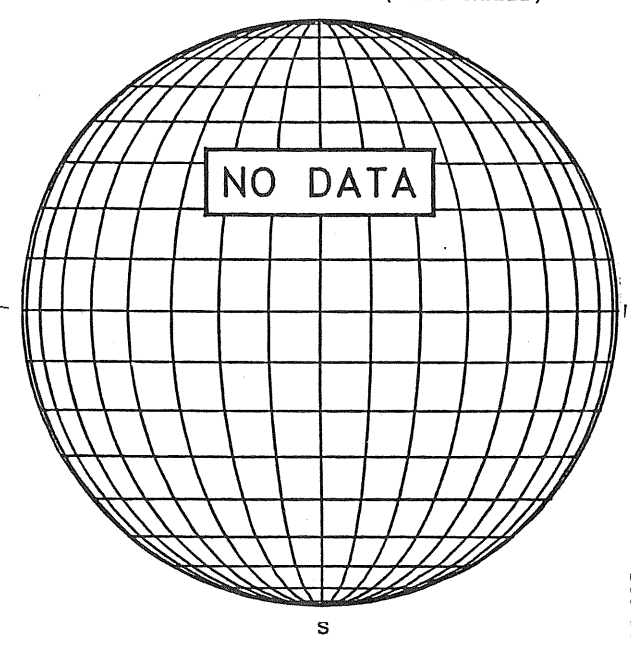
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



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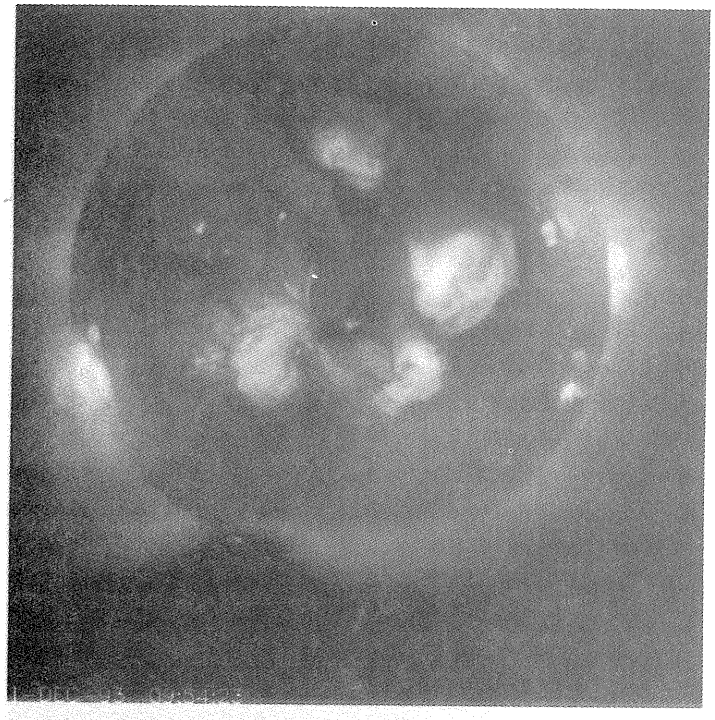
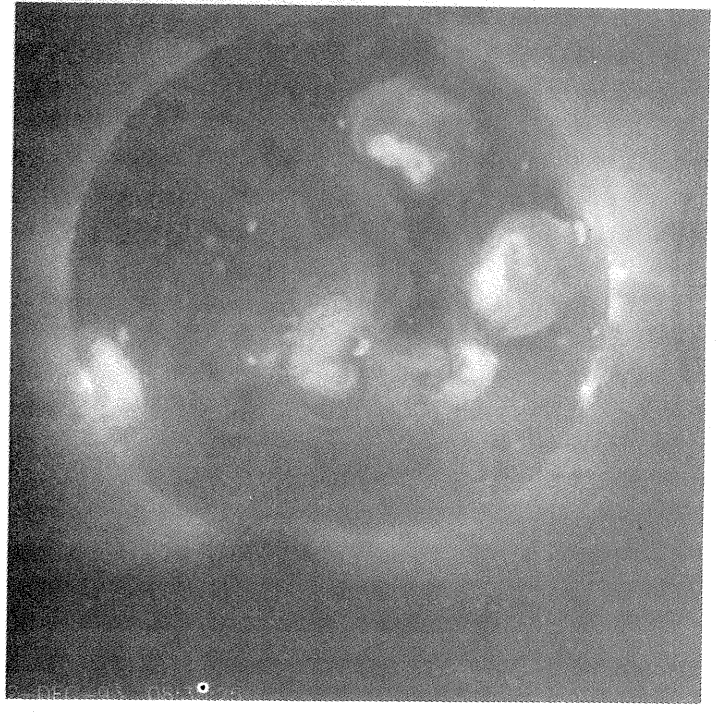
YOHKOH SOFT X-RAY TELESCOPE IMAGES

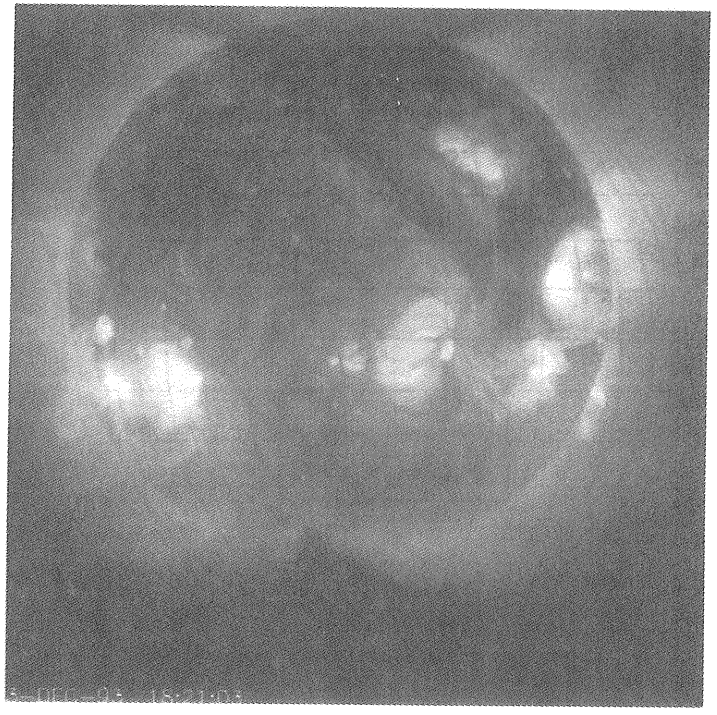
December 1993



Day 1
09:54:23 UT



Day 2
08:35:25 UT



Day 3
18:21:03 UT

Day 4

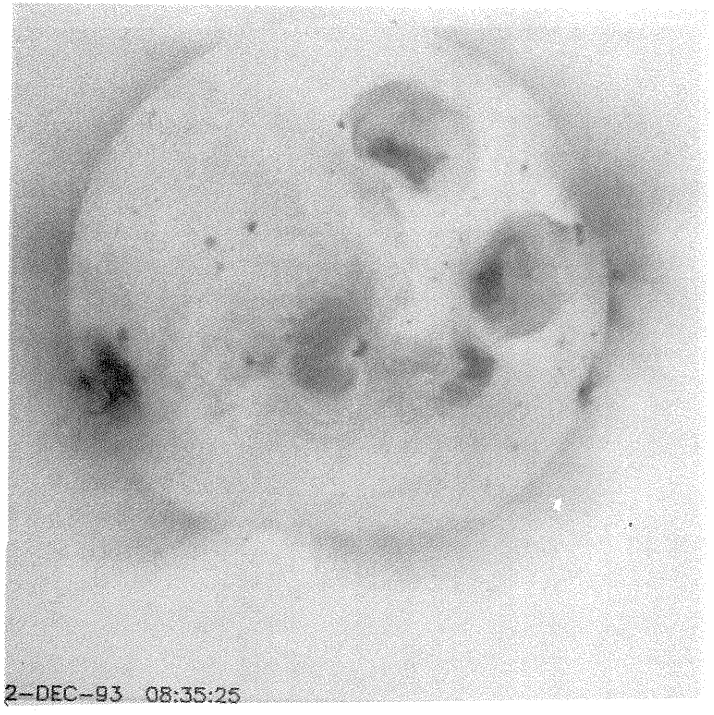
No Data

YOHKOH SOFT X-RAY TELESCOPE IMAGES

December 1993

Day 1
09:54:23 UT

Day 3
18:21:03 UT



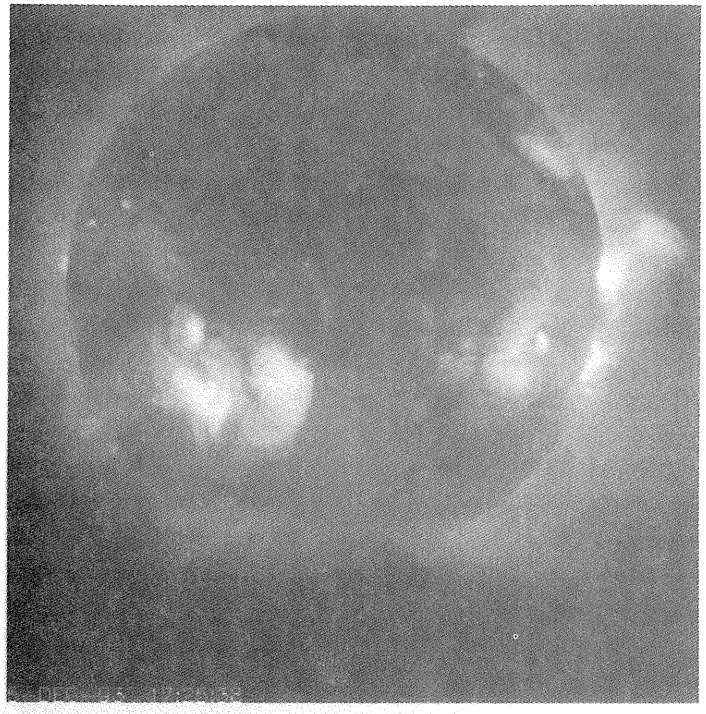
Day 2
08:35:25 UT

Day 4

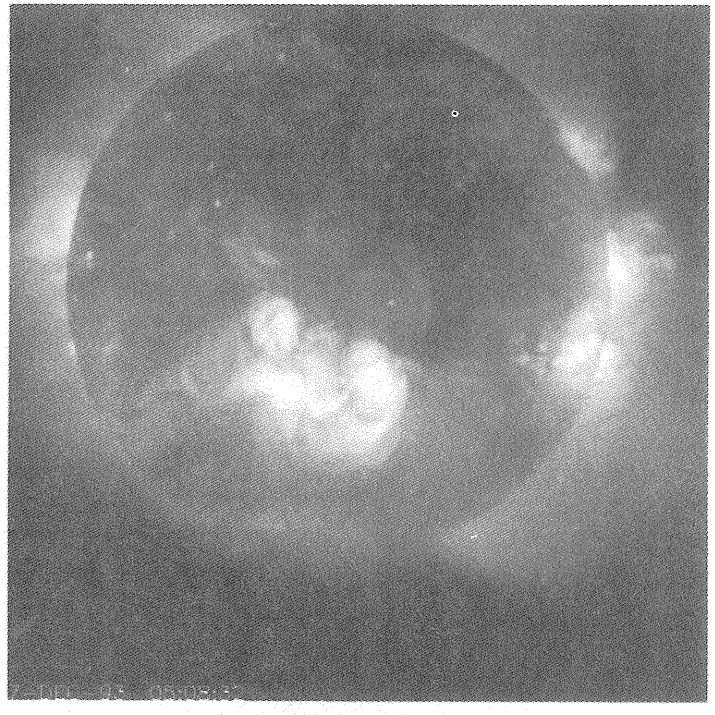
No Data

YOHKOH SOFT X-RAY TELESCOPE IMAGES

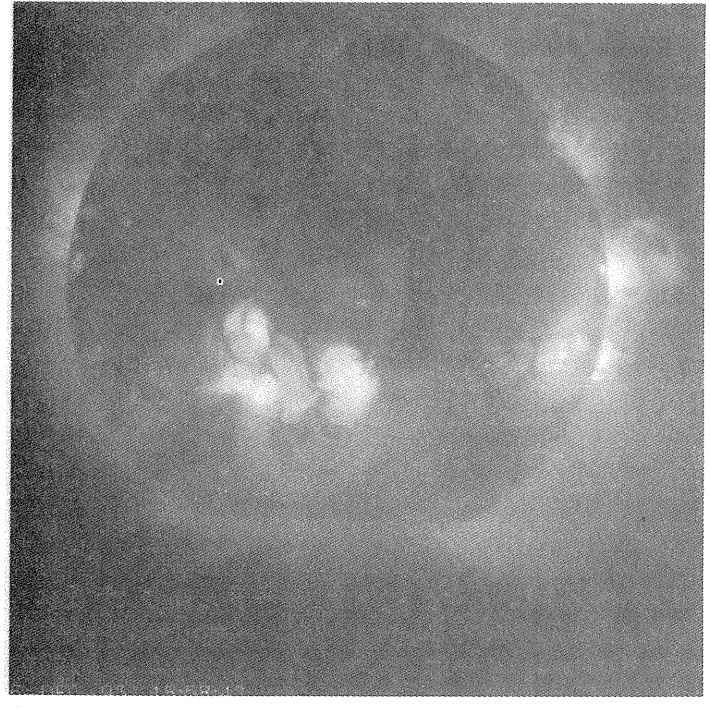
December 1993



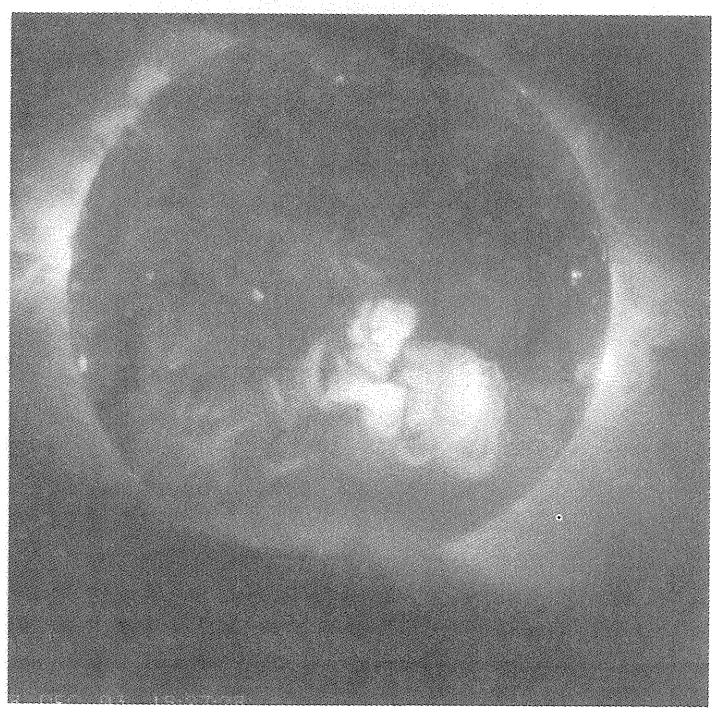
Day 5
17:25:38 UT



Day 7
05:08:32 UT



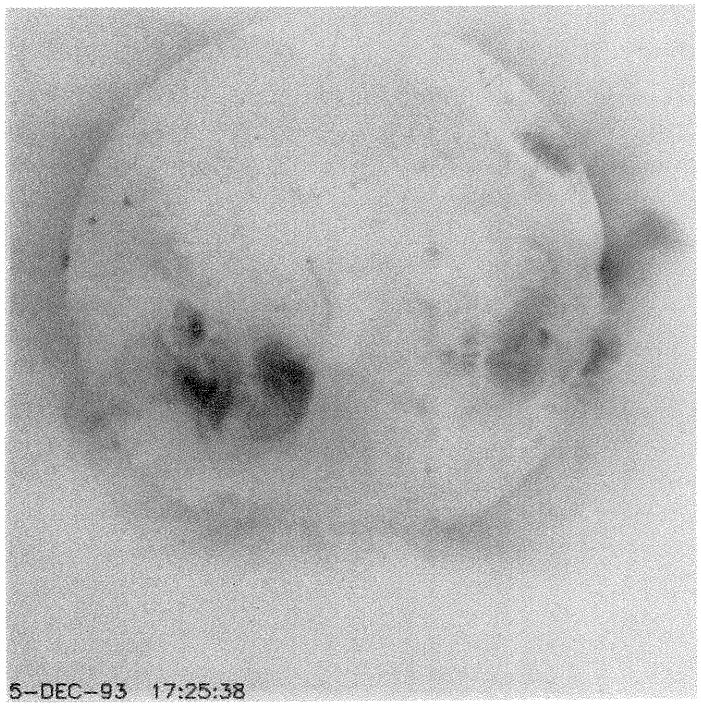
Day 6
18:58:42 UT



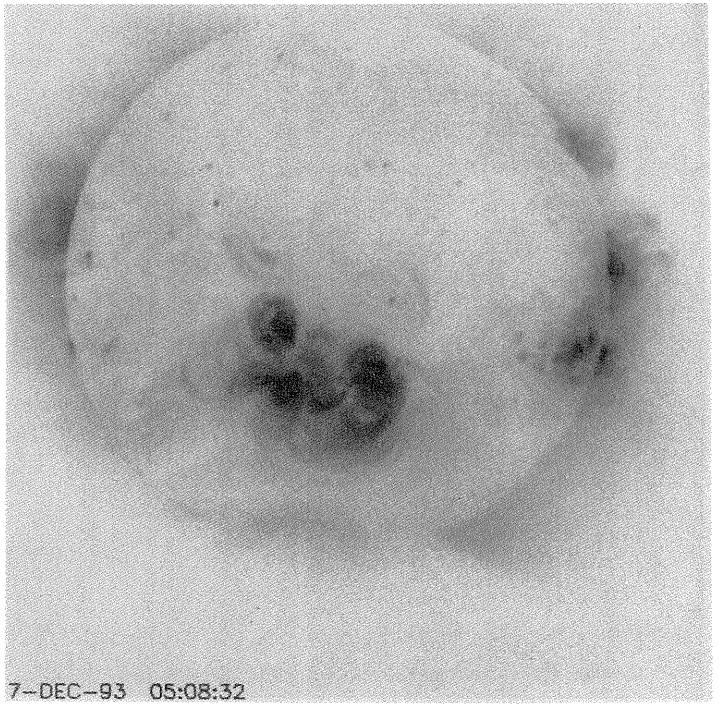
Day 8
18:27:28 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

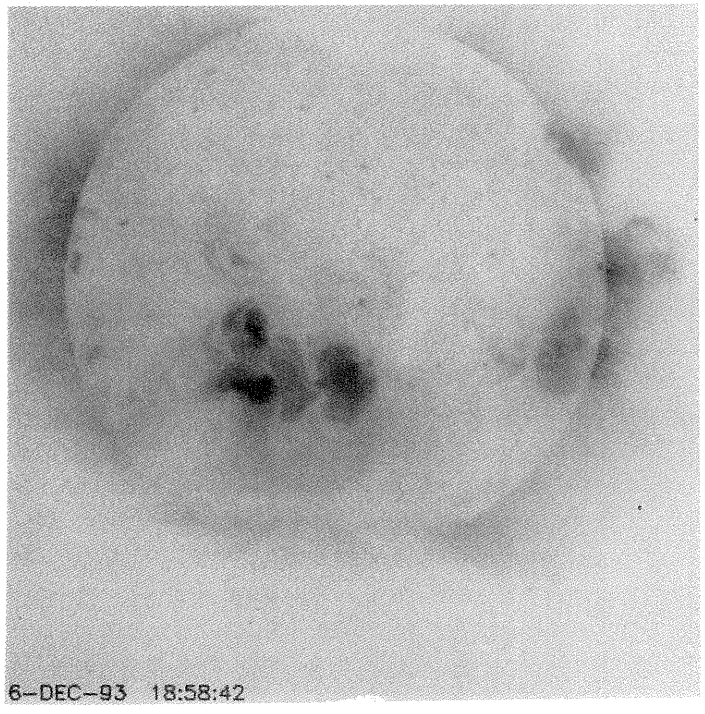
December 1993



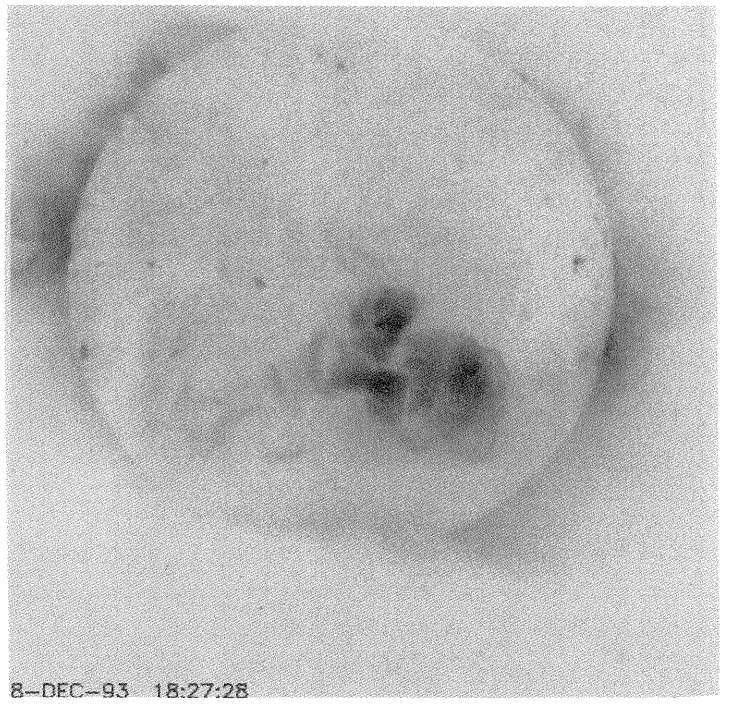
Day 5
17:25:38 UT



Day 7
05:08:32 UT



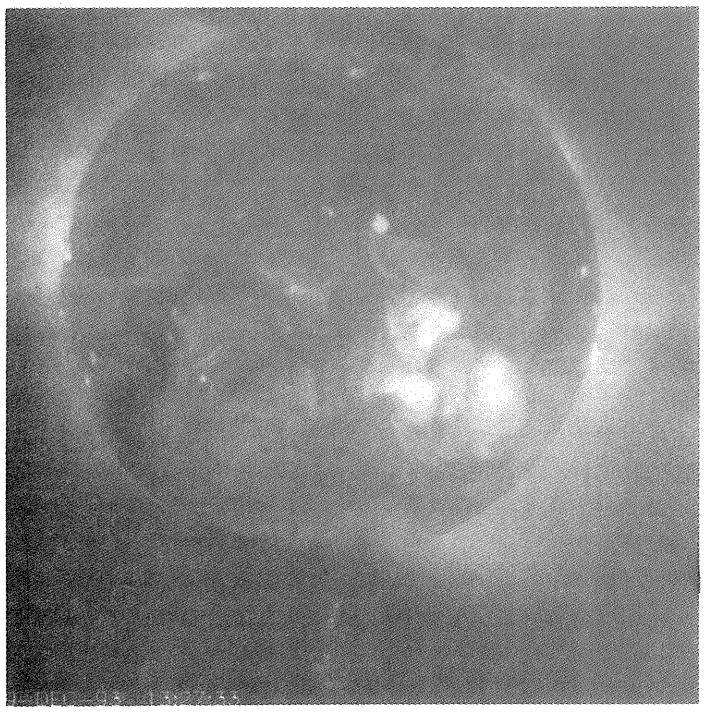
Day 6
18:58:42 UT



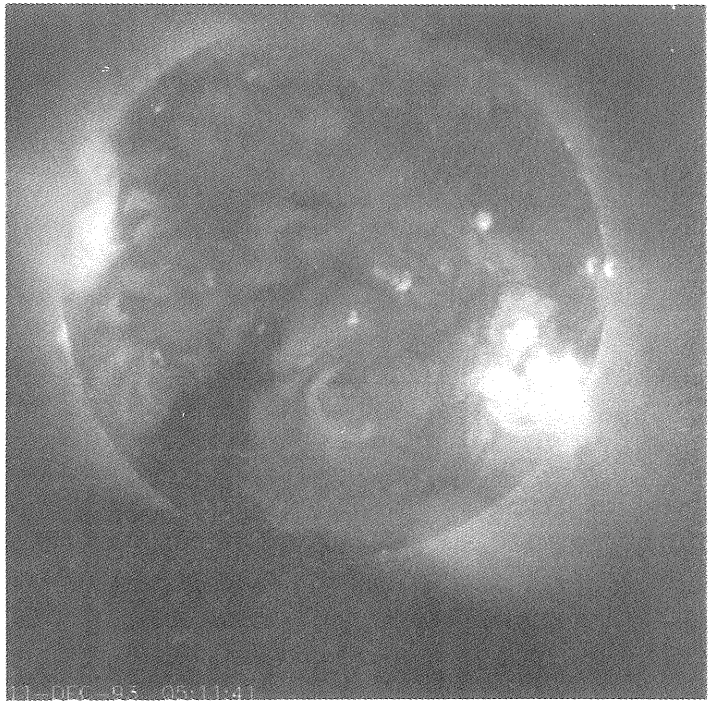
Day 8
18:27:28 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

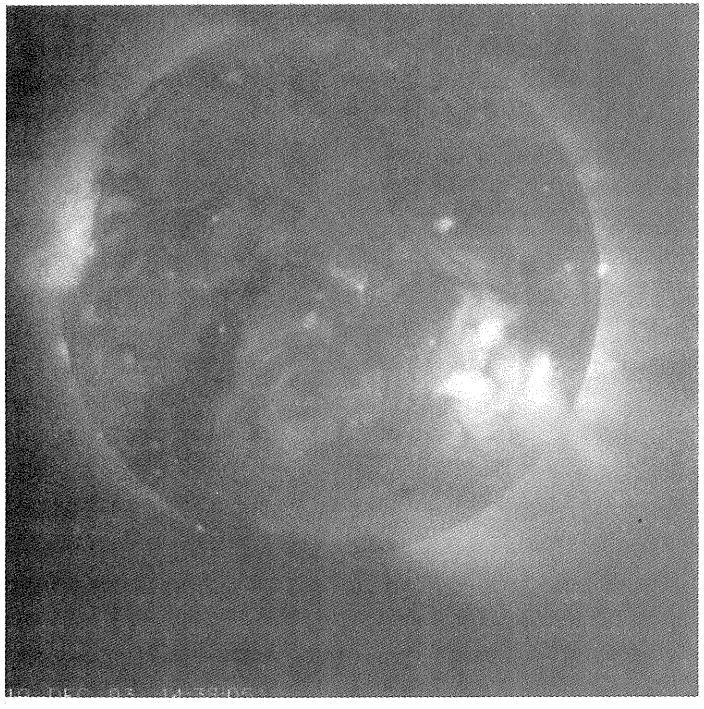
December 1993



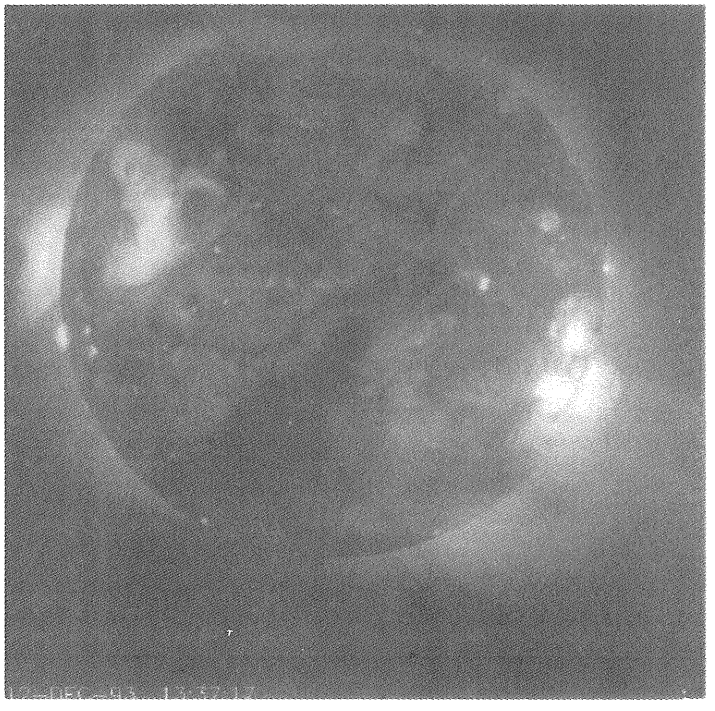
Day 9
13:27:33 UT



Day 11
05:11:41 UT



Day 10
14:38:05 UT



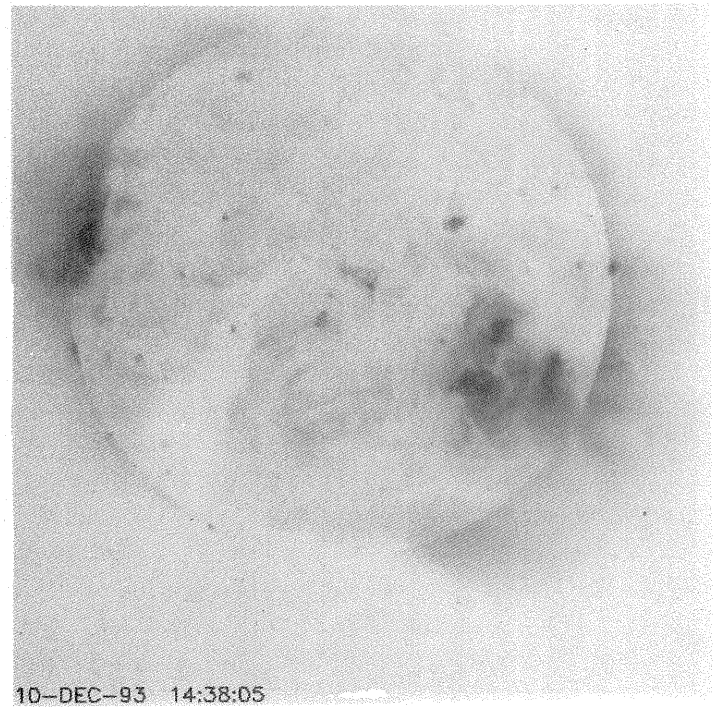
Day 12
13:37:17 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

December 1993

Day 9
13:27:33 UT

Day 11
05:11:41 UT



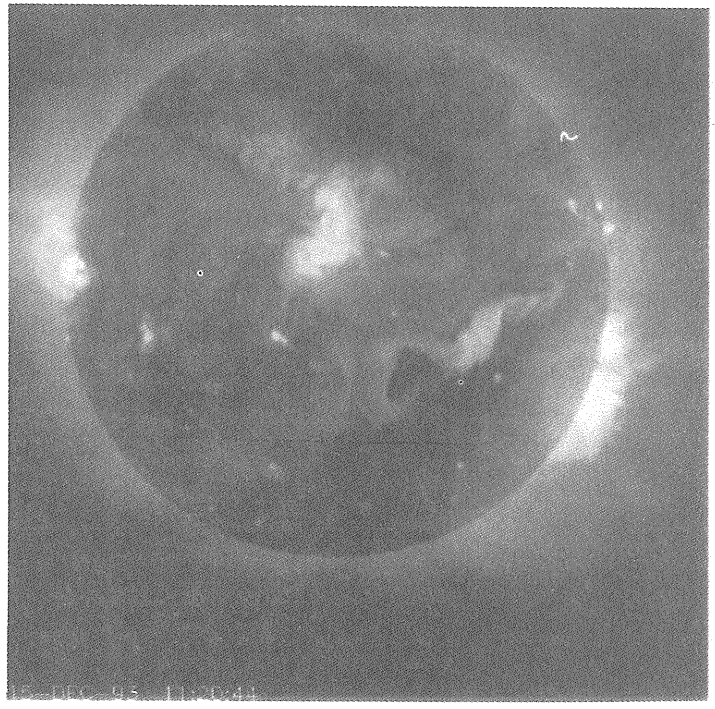
Day 10
14:38:05 UT

Day 12
13:37:17 UT

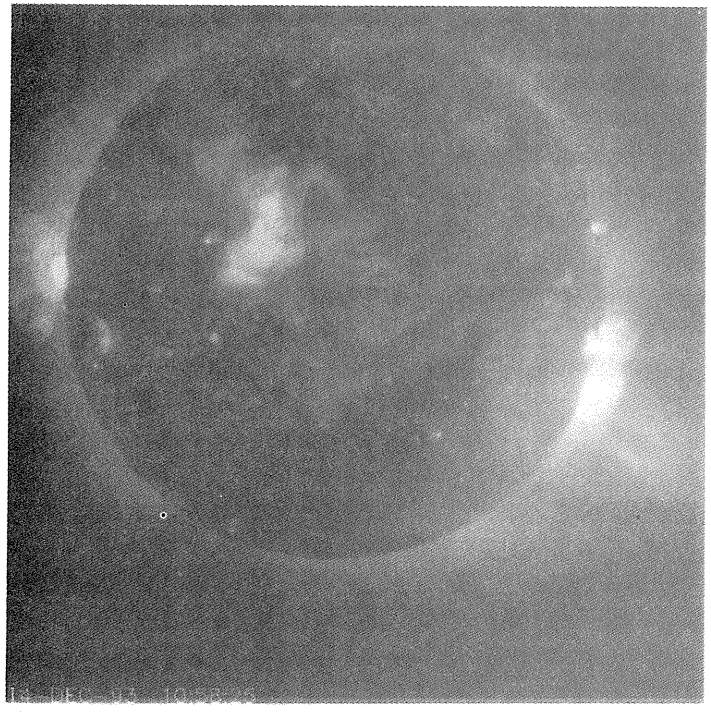
YOHKOH SOFT X-RAY TELESCOPE IMAGES

December 1993

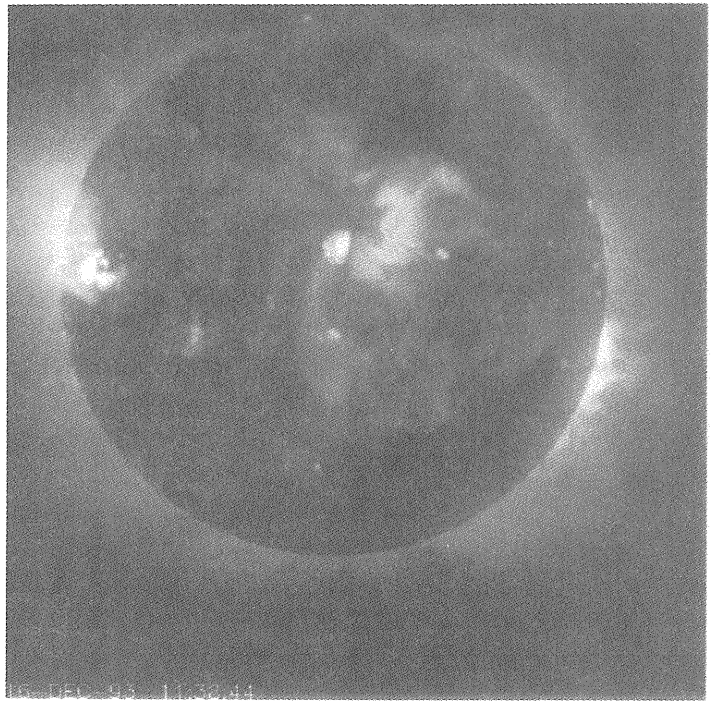
Day 13
12:08:45 UT



Day 15
11:20:44 UT



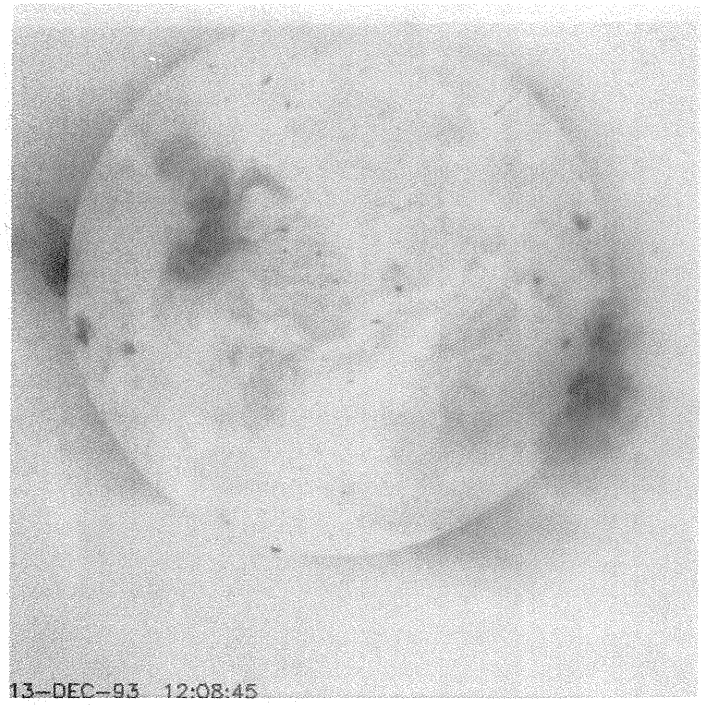
Day 14
10:58:25 UT



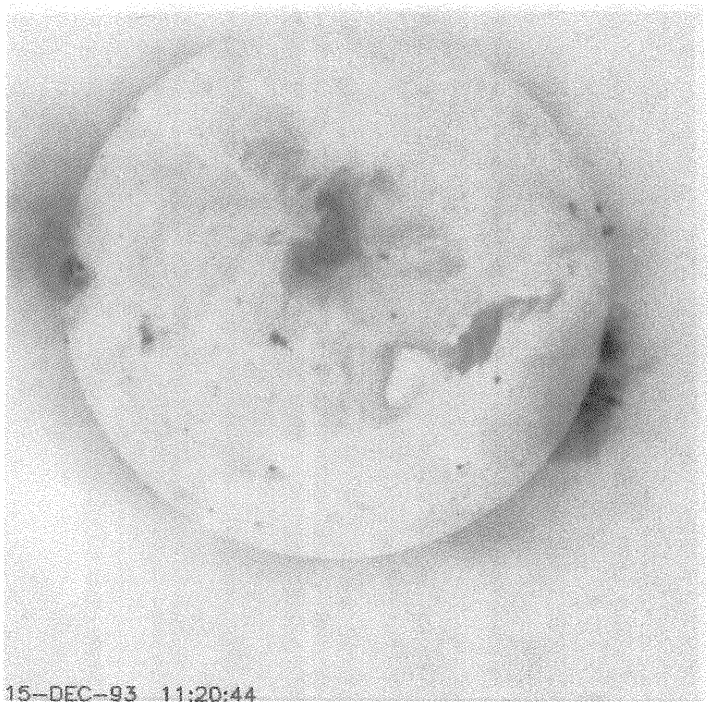
Day 16
11:38:44 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

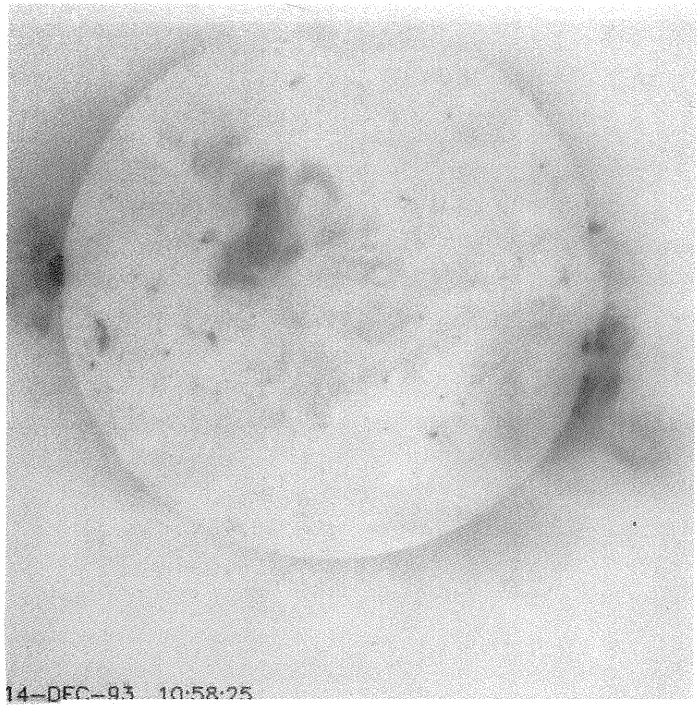
December 1993



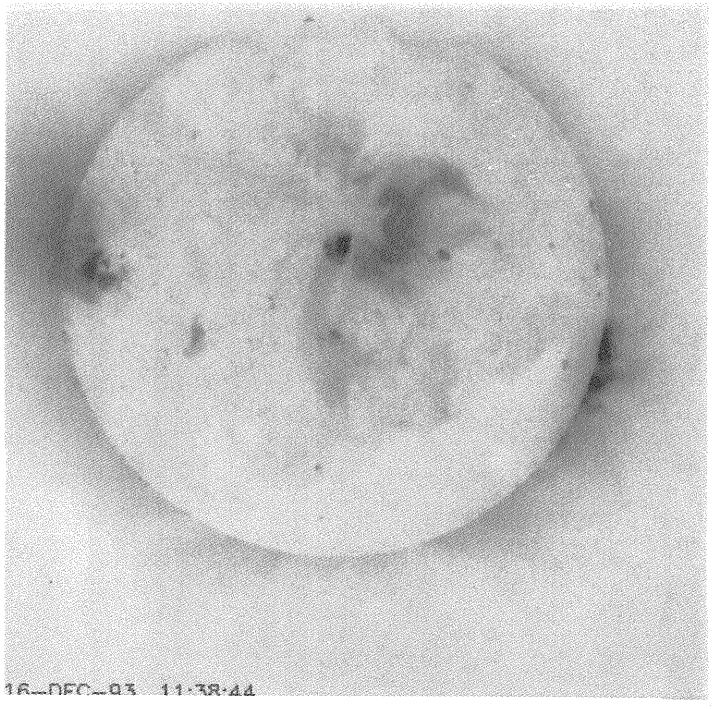
Day 13
12:08:45 UT



Day 15
11:20:44 UT



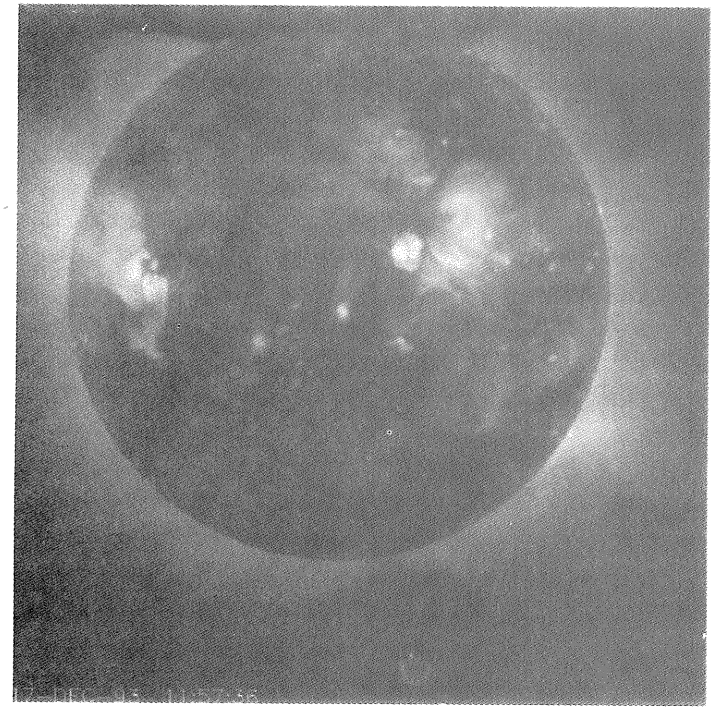
Day 14
10:58:25 UT



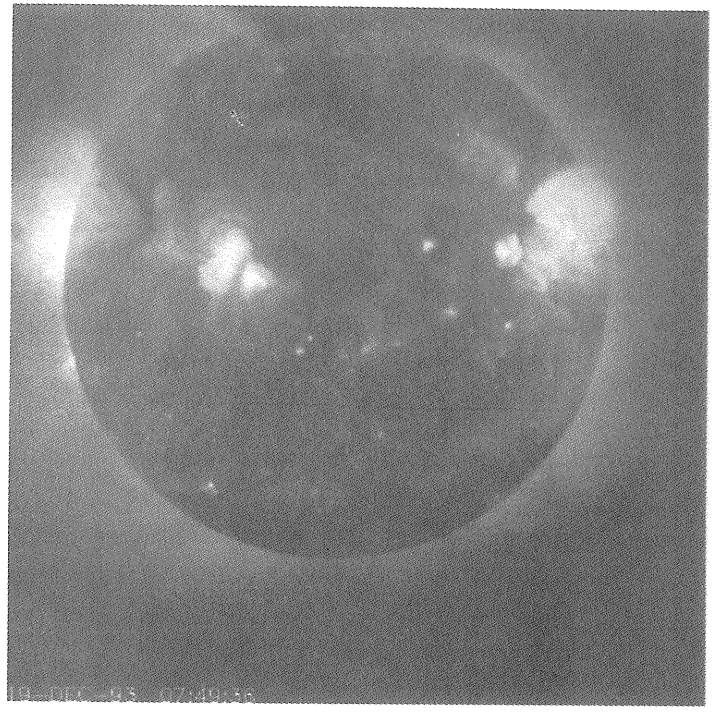
Day 16
11:38:44 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

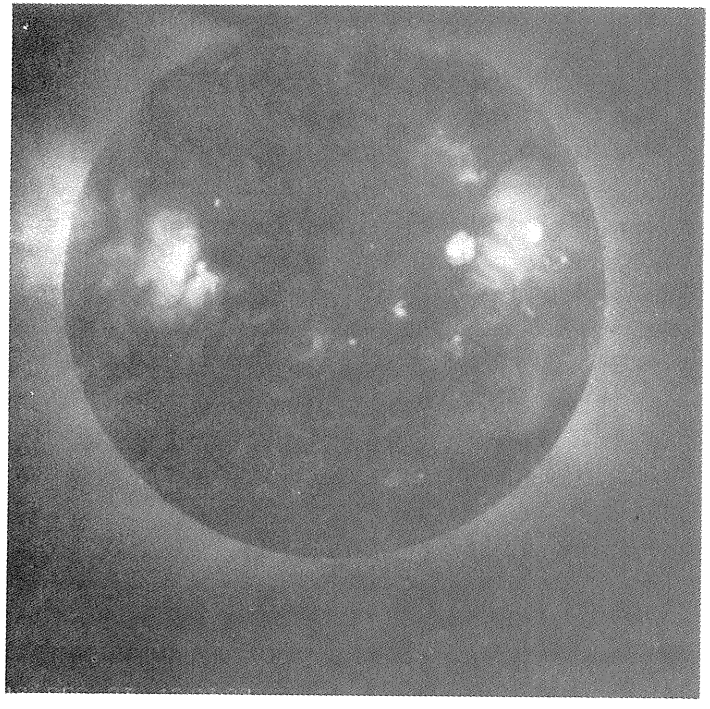
December 1993



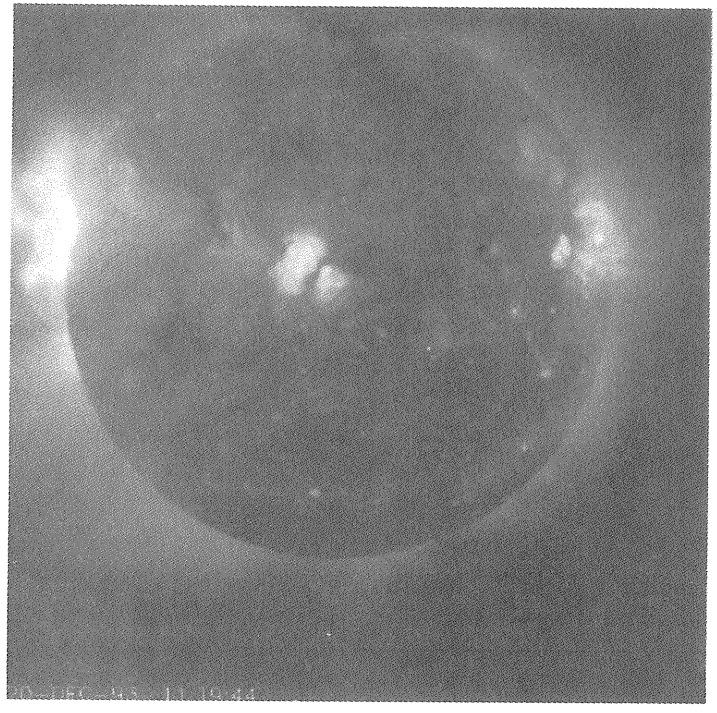
Day 17
11:57:36 UT



Day 19
07:49:36 UT



Day 18
12:03:28 UT

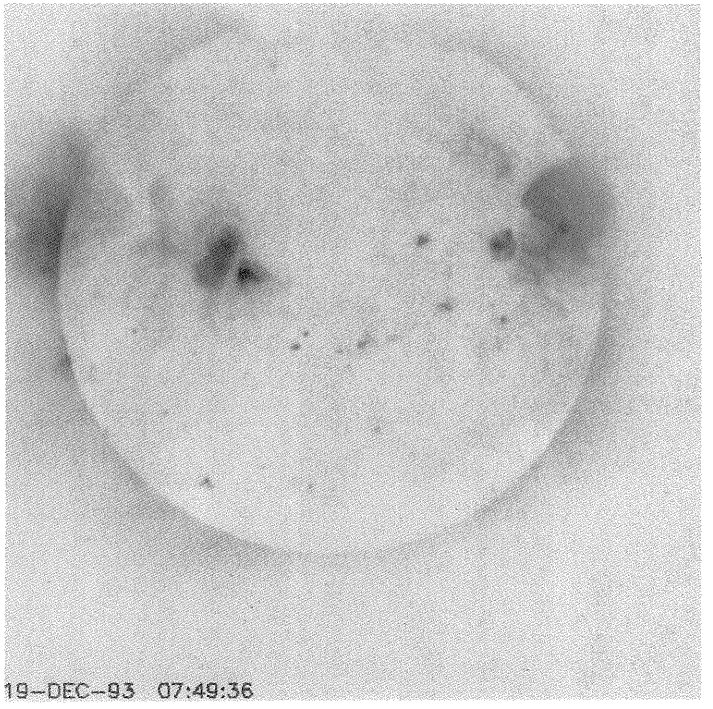


Day 20
11:19:44 UT

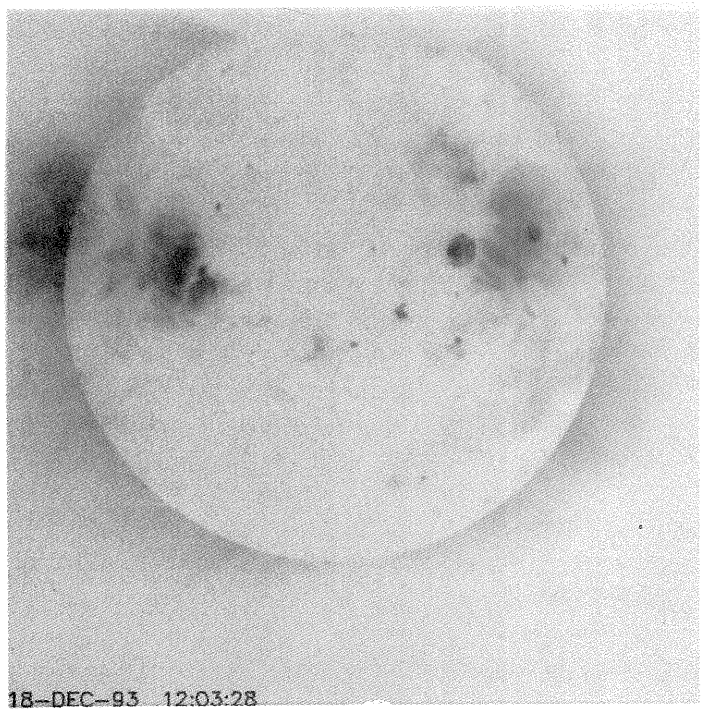
YOHKOH SOFT X-RAY TELESCOPE IMAGES

December 1993

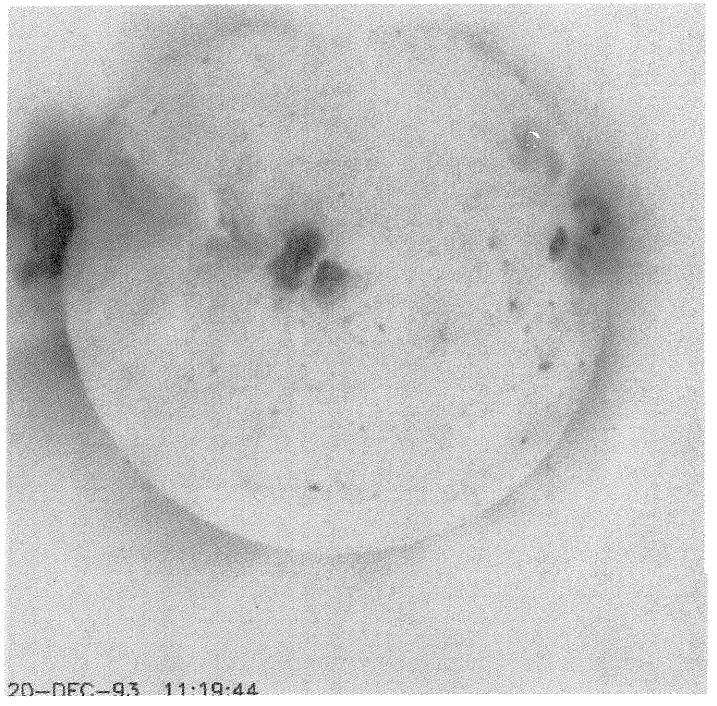
Day 17
11:57:36 UT



Day 19
07:49:36 UT



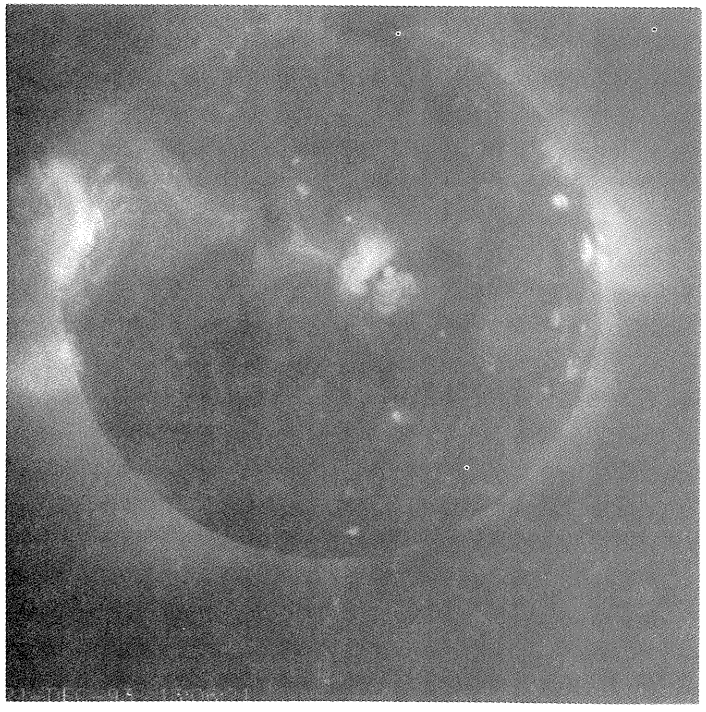
Day 18
12:03:28 UT



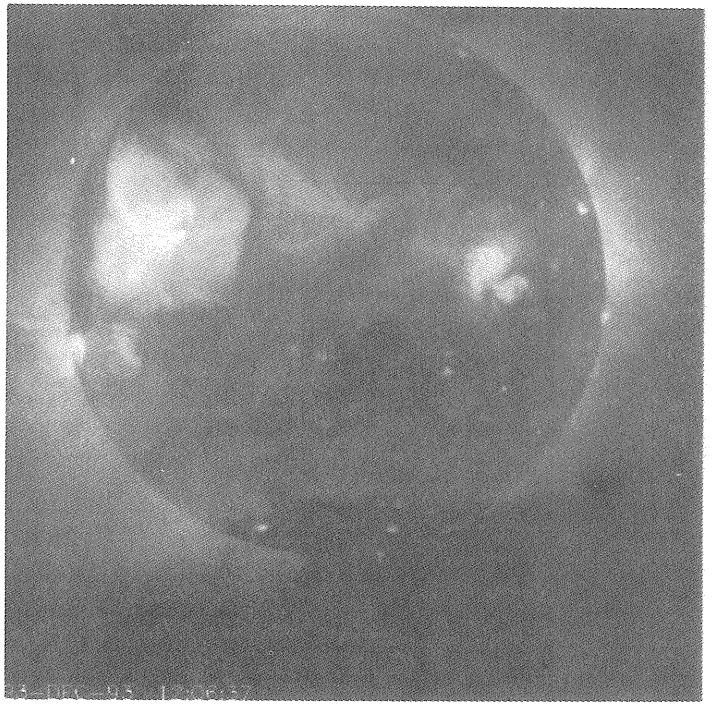
Day 20
11:19:44 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

December 1993

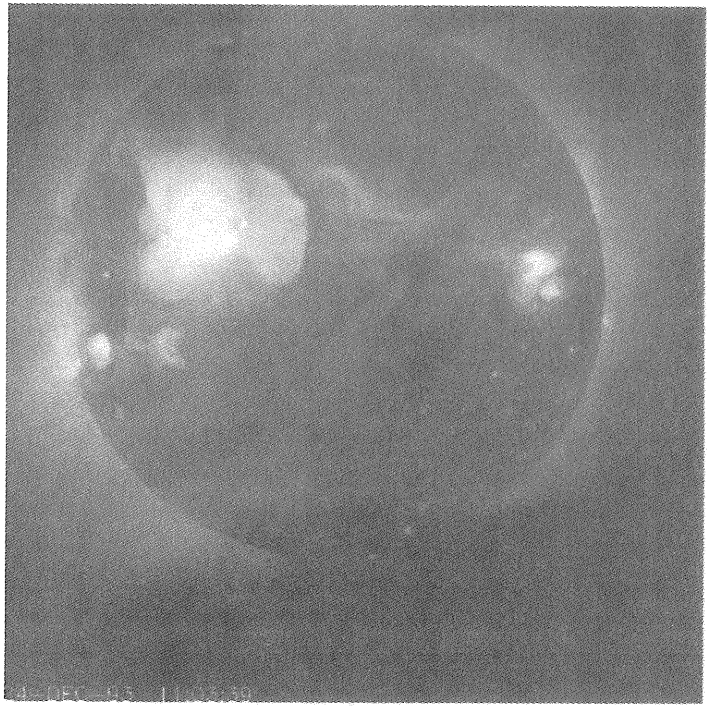


Day 21
13:06:21 UT



Day 23
12:06:37 UT

Day 22
13:24:29 UT



Day 24
11:03:39 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

December 1993

Day 21
13:06:21 UT

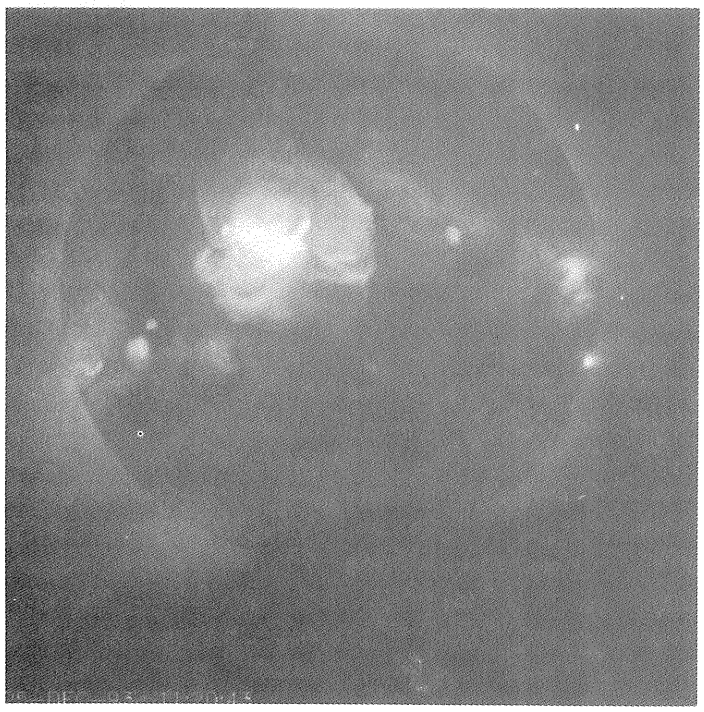
Day 23
12:06:37 UT

Day 22
13:24:29 UT

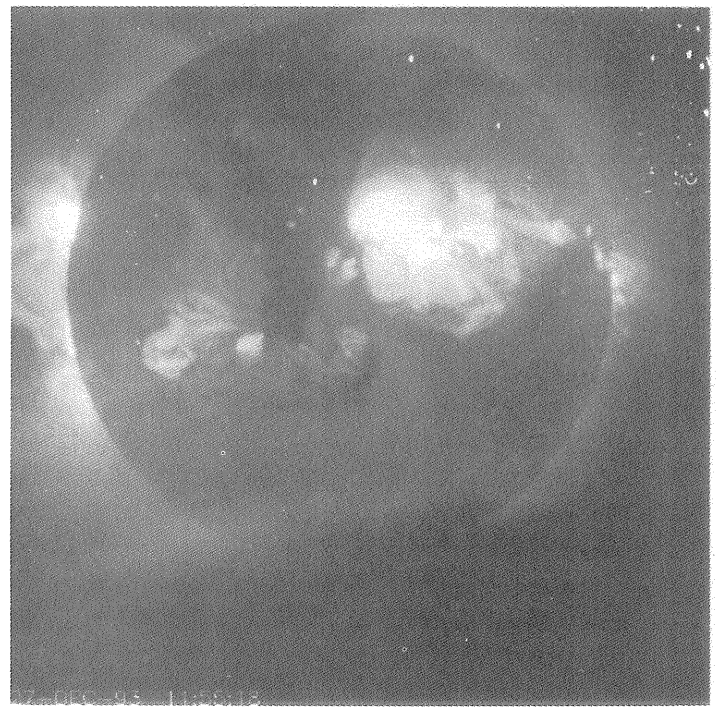
Day 24
11:03:39 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

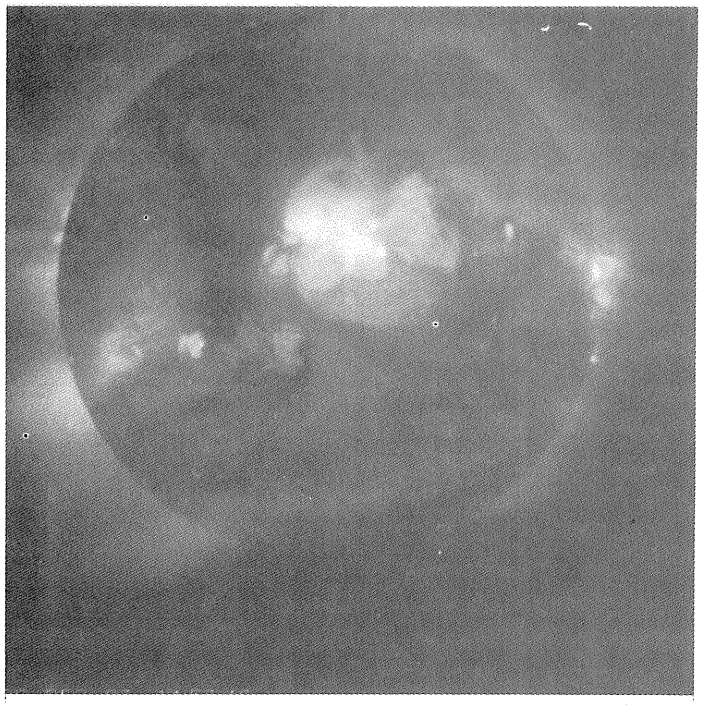
December 1993



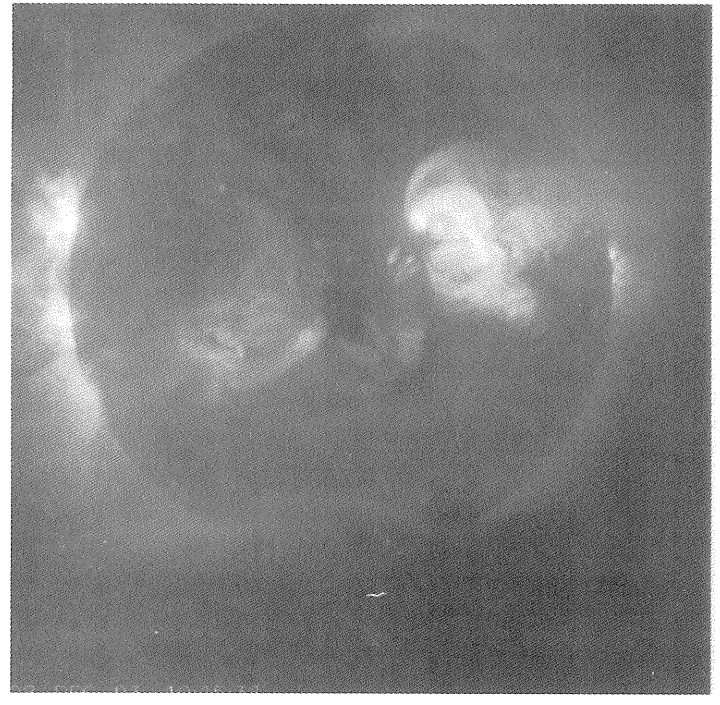
Day 25
11:20:43 UT



Day 27
11:55:18 UT



Day 26
14:53:46 UT



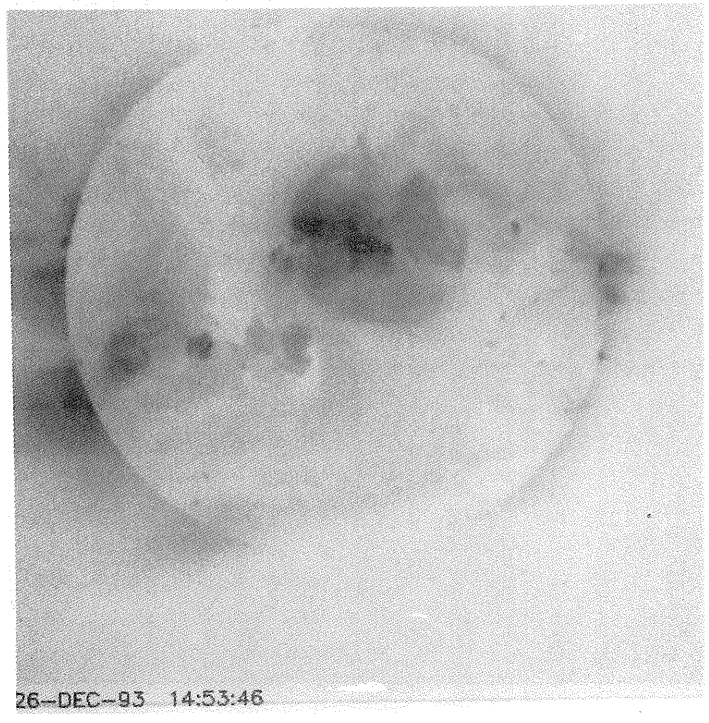
Day 28
10:15:38 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

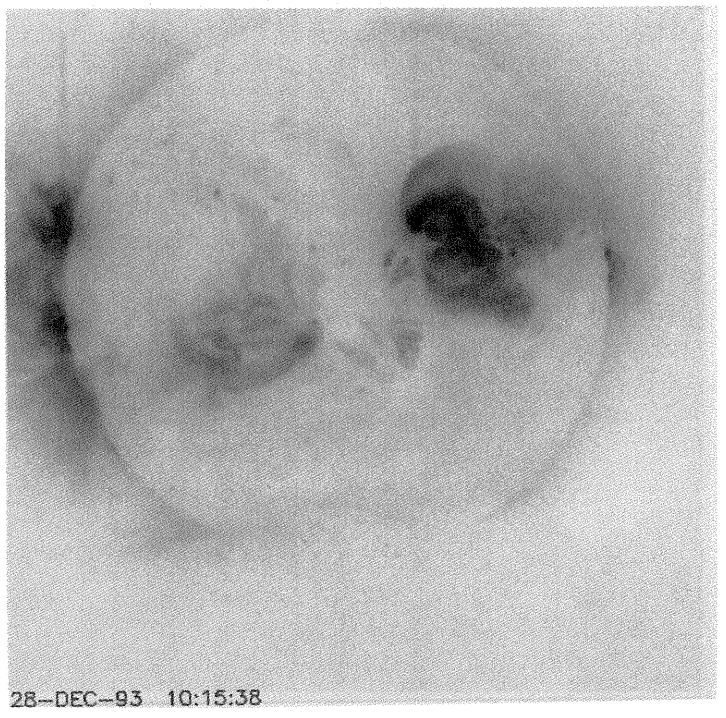
December 1993

Day 25
11:20:43 UT

Day 27
11:55:18 UT



Day 26
14:53:46 UT

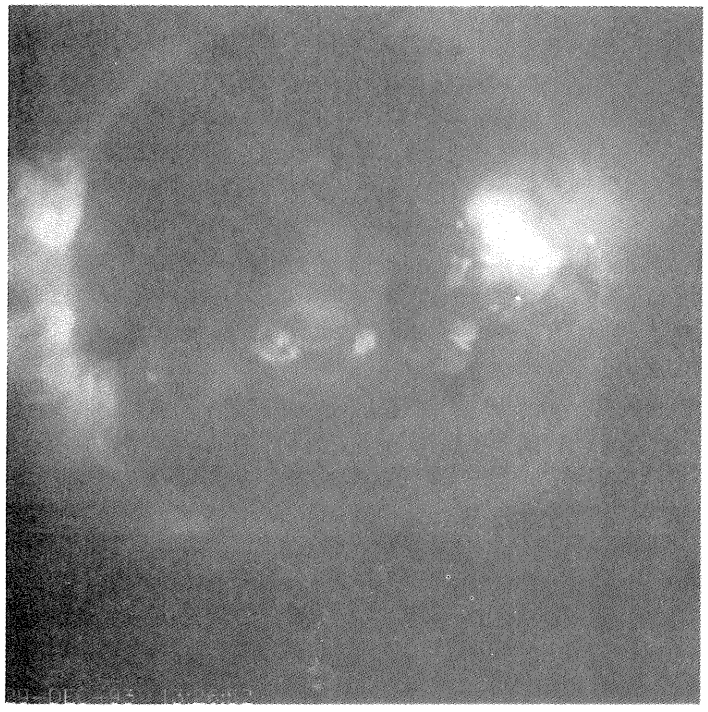


Day 28
10:15:38 UT

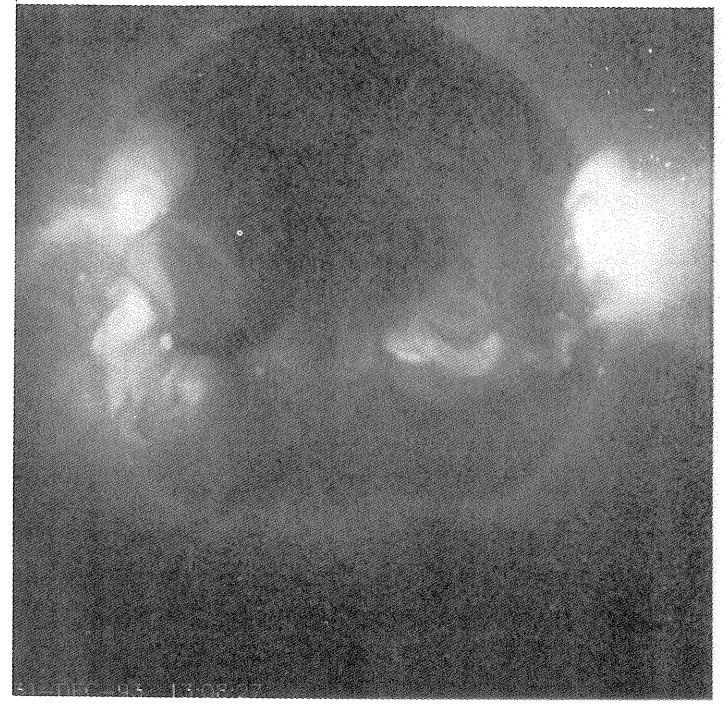
93
Dec 93

YOHKOH SOFT X-RAY TELESCOPE IMAGES

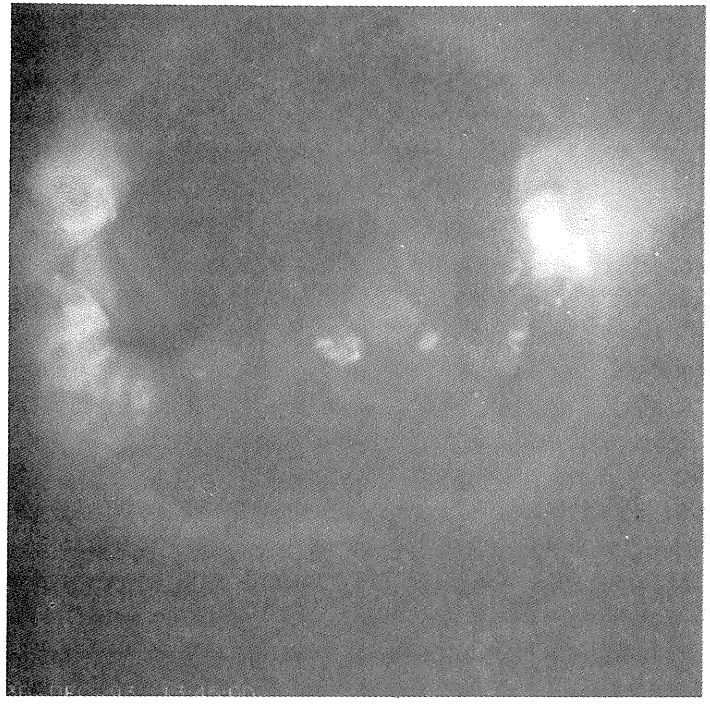
December 1993



Day 29
13:26:52 UT



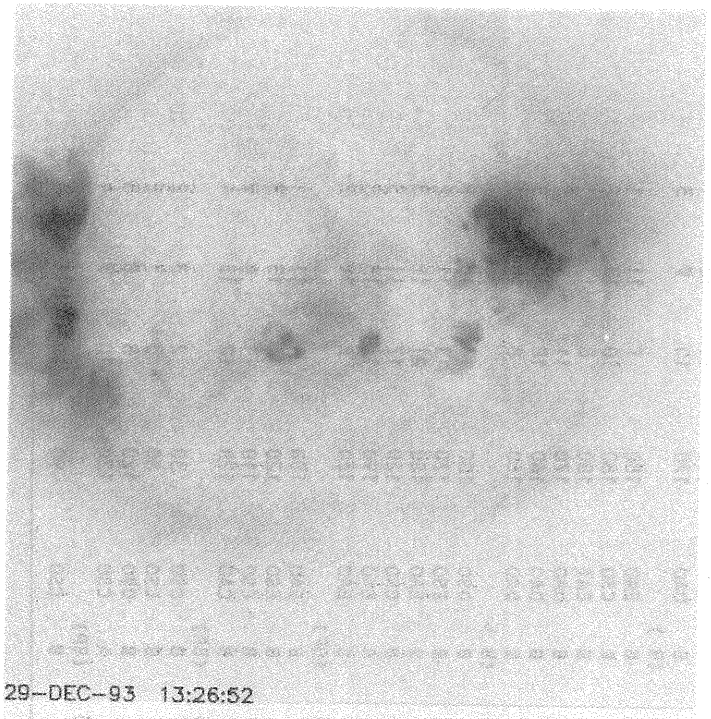
Day 31
13:08:27 UT



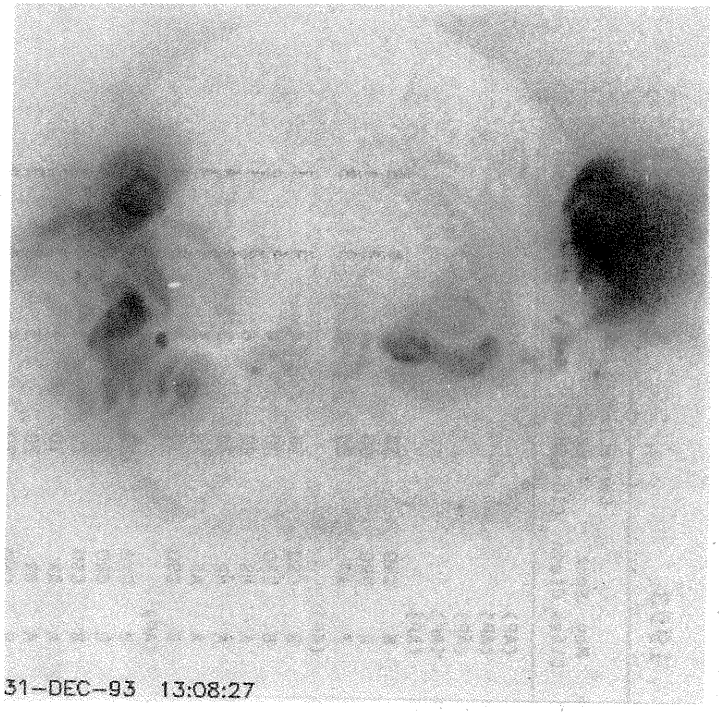
Day 30
13:45:00 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

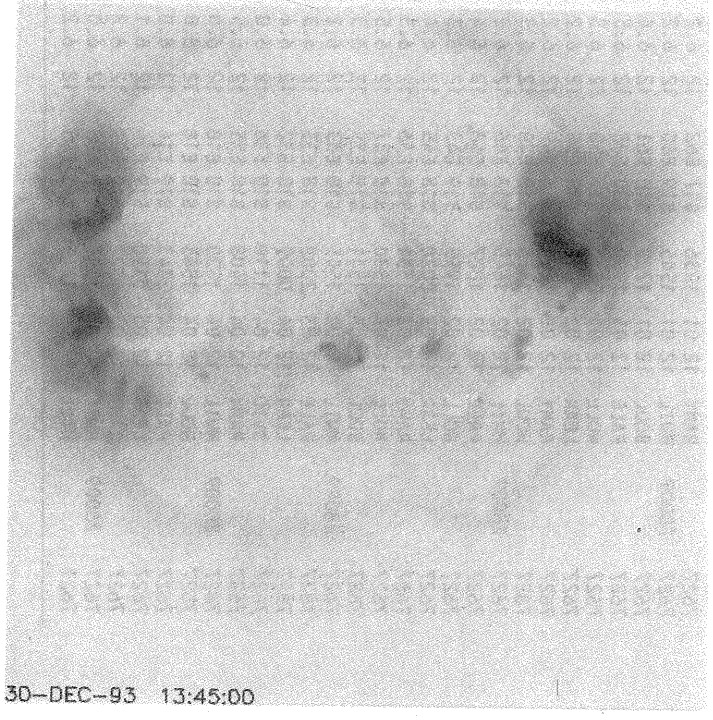
December 1993



Day 29
13:26:52 UT



Day 31
13:08:27 UT



Day 30
13:45:00 UT

95
Dec 93

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1993

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Mo	Day	Time (UT)	Lat	CMD	CMP Mo	CMP Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
7623	28006	MWIL	11	26	1530	S11	E70	12	1.9	3	(AP)					
7623	28006	MWIL	11	27	1630	S11	E58	12	2.0	3	(AP)					
7623	28006	MWIL	11	28	2200	S11	E42	12	2.1	4	(AP)					
7623	28006	MWIL	11	29	1645	S11	E31	12	2.0	4	(AP)					
7623	28006	MWIL	11	30	1545	S11	E18	12	2.0	4	(AP)					
7623		LEAR	12	01	0100	S10	E13	12	2.0		B	CRO	30	5	4	3
7623		SVTO	12	01	1040	S09	E07	12	2.0		B	DRO	60	4	3	1
7623		RAMY	12	01	1256	S09	E06	12	2.0		A	AX	20	6	3	3
7623	28006	MWIL	12	01	1545	S11	E04	12	1.9	4	(AP)					
7623		BOUL	12	01	1729	S08	E02	12	1.9		B	CSO	20	4	3	1
7623		PALE	12	01	1900	S10	E03	12	2.0		B	CAO	30	4	3	2
7623		HOLL	12	01	2217	S07	E01	12	2.0		A	HS	20	6	2	1
7623		LEAR	12	02	0018	S09	W02	12	1.9		A	HR	20	3	3	3
7623		RAMY	12	02	1251	S09	W07	12	2.0		A	AX	10	3	3	3
7623		BOUL	12	02	1556	S09	W07	12	2.1		B	CSO	30	4	6	1
7623	28006	MWIL	12	02	1645	S10	W09	12	2.0	3	(AP)					
7623		PALE	12	02	1827	S11	W08	12	2.2		B	BXO	20	6	7	2
7623		HOLL	12	02	1955	S10	W09	12	2.1		B	CRO	30	6	6	2
7623		LEAR	12	03	0020	S09	W14	12	2.0		B	CSO	20	4	4	3
7623		RAMY	12	03	1331	S09	W22	12	1.9		A	AX	10	4	3	3
7623		HOLL	12	03	1530	S10	W22	12	2.0		A	HR	20	3	5	3
7623		BOUL	12	03	1541	S09	W22	12	2.0		B	CSO	20	5	2	2
7623	28006	MWIL	12	03	1545	S10	W22	12	2.0	4	(AP)					
7623		PALE	12	03	2002	S10	W23	12	2.1		A	AX	10	2	2	1
7623		LEAR	12	04	0009	S11	W26	12	2.0		B	CRO	20	3	5	3
7623		SVTO	12	04	1110	S11	W33	12	2.0		B	CSO	30	4	4	2
7623		RAMY	12	04	1408	S11	W34	12	2.0		A	AX	70	3	4	4
7623	28006	MWIL	12	04	1530	S11	W35	12	2.0	4	(B)					
7623		PALE	12	04	2343	S13	W39	12	2.0		A	AX		1		2
7623		LEAR	12	05	0150	S12	W37	12	2.3		B	BXO	20	3	8	3
7623		RAMY	12	05	1322	S11	W47	12	2.0		A	AX	10	2	2	4
7623	28006	MWIL	12	05	1545	S10	W48	12	2.0	4	(AP)					
7623		HOLL	12	06	2110	S13	W60	12	2.3		A	AX	10	1		3
7623		RAMY	12	07	1214	S16	W68	12	2.3		B	BXO	30	6	4	4
7623	28013	MWIL	12	07	1530	S14	W71	12	2.3	3	(AP)					
7623		HOLL	12	07	1850	S13	W78	12	1.9		A	AX		1	1	2
7623B	28011	MWIL	12	04	1530	S12	W27	12	2.6	3	(B)					
7627	28009	MWIL	11	30	1545	S18	E72	12	6.1	5	(B)					
7627		LEAR	12	01	0100	S18	E69	12	6.3		B	DAO	230	8	9	3
7627		SVTO	12	01	1040	S17	E65	12	6.4		B	EKO	430	11	12	1
7627		RAMY	12	01	1256	S17	E62	12	6.2		B	DAO	170	10	9	3
7627	28009	MWIL	12	01	1545	S19	E60	12	6.2	5	(B)					
7627		BOUL	12	01	1729	S18	E61	12	6.4		B	EAO	180	7	11	1
7627		PALE	12	01	1900	S20	E62	12	6.5		B	CSO	180	10	13	2
7627		HOLL	12	01	2217	S17	E58	12	6.3		B	EAI	180	8	11	1
7627		LEAR	12	02	0018	S18	E55	12	6.2		B	DAO	170	11	9	3
7627		RAMY	12	02	1251	S17	E49	12	6.2		B	DAO	160	18	10	3
7627		BOUL	12	02	1556	S18	E48	12	6.3		B	DAO	160	8	10	1
7627	28009	MWIL	12	02	1645	S18	E46	12	6.2	4	(B)					
7627		PALE	12	02	1827	S18	E48	12	6.4		B	DSO	100	14	10	2
7627		HOLL	12	02	1955	S19	E45	12	6.3		B	ESO	170	13	11	2
7627		LEAR	12	03	0020	S18	E45	12	6.4		B	EAO	180	21	12	3
7627		RAMY	12	03	1331	S16	E36	12	6.3		B	CAO	120	17	11	3
7627		HOLL	12	03	1530	S18	E37	12	6.5		B	EAO	190	14	13	3
7627		BOUL	12	03	1541	S18	E35	12	6.3		B	EAO	130	8	12	2
7627	28009	MWIL	12	03	1545	S18	E33	12	6.2	5	(BP)					
7627		PALE	12	03	2002	S18	E33	12	6.3		B	EAO	100	4	11	1
7627		LEAR	12	04	0009	S18	E32	12	6.4		B	ESO	120	14	13	3
7627		SVTO	12	04	1110	S18	E20	12	6.0		B	CSO	110	11	4	2
7627		RAMY	12	04	1408	S18	E25	12	6.5		B	CAO	120	12	13	4
7627	28009	MWIL	12	04	1530	S18	E18	12	6.0	5	(BP)					
7627		BOUL	12	04	1545	S18	E18	12	6.0		B	CSO	30	2	3	2
7627		PALE	12	04	2343	S19	E14	12	6.0		B	CSO	80	3	5	2
7627		LEAR	12	05	0150	S19	E14	12	6.1		B	DSO	120	8	8	3
7627		RAMY	12	05	1322	S19	E09	12	6.2		A	CSO	120	10	9	4
7627	28009	MWIL	12	05	1545	S18	E05	12	6.0	5	(BP)					
7627		HOLL	12	05	1945	S18	E05	12	6.2		B	CSO	90	10	11	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1993

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
7627		PALE	12 05 2255	S19 E03	12 6.2		B	DSO	80	7	4	1
7627		LEAR	12 06 0015	S18 E01	12 6.1		B	DSO	100	7	4	3
7627		SVTO	12 06 1025	S18 W07	12 5.9		B	DAO	70	10	4	3
7627		RAMY	12 06 1246	S19 W01	12 6.4		B	CSO	120	22	14	4
7627	28009	MWIL	12 06 1600	S18 W07	12 6.1	5	(BP)					
7627		PALE	12 06 1800	S18 W10	12 6.0		B	DSO	70	2	3	1
7627		HOLL	12 06 2110	S16 W12	12 6.0		B	CSO	70	5	4	3
7627		LEAR	12 07 0030	S18 W12	12 6.1		B	CSO	70	7	5	3
7627		SVTO	12 07 0812	S19 W17	12 6.0		B	DAO	40	7	4	4
7627		RAMY	12 07 1214	S18 W17	12 6.2		B	CAO	40	6	7	4
7627	28009	MWIL	12 07 1530	S18 W18	12 6.3	4	(B)					
7627		BOUL	12 07 1649	S18 W23	12 5.9		B	CSO	70	4	3	1
7627		HOLL	12 07 1850	S17 W23	12 6.0		B	CSO	30	5	7	2
7627		PALE	12 07 2230	S19 W26	12 5.9		B	CSO	20	2	3	1
7627		LEAR	12 08 0150	S18 W26	12 6.1		B	CAO	30	4	3	3
7627		RAMY	12 08 1320	S18 W32	12 6.1		B	CAO	10	3	6	3
7627	28009	MWIL	12 08 1530	S18 W33	12 6.1	4	(AP)					
7627		BOUL	12 08 1601	S18 W32	12 6.2		B	CSO	20	3	6	1
7627		HOLL	12 08 1829	S18 W36	12 6.0		B	CRO	20	2	3	1
7627		PALE	12 08 1830	S18 W37	12 5.9		B	BXO	10	2	3	3
7627		SVTO	12 09 0830	S18 W44	12 6.0		A	AX	10	1		1
7627		RAMY	12 09 1228	S14 W45	12 6.1		A	AX		1		3
7627	28009	MWIL	12 09 1530	S18 W47	12 6.1	3	(AP)					
7627		SVTO	12 10 0830	S18 W57	12 6.0		A	AX		1		2
7627		RAMY	12 10 1308	S19 W58	12 6.1		A	AX		1		3
7633		LEAR	12 10 0012	S17 W34	12 7.4		A	AX	10	1	1	3
7633		SVTO	12 10 0830	S17 W39	12 7.4		B	BXO	10	2	1	2
7633		RAMY	12 10 1308	S19 W41	12 7.4		A	AX		1		3
7633	28015	MWIL	12 10 1530	S17 W43	12 7.4	4	(AF)					
7633		BOUL	12 10 1549	S17 W43	12 7.4		A	AX	10	1	1	2
7633		PALE	12 10 2000	S19 W44	12 7.5		A	AX		1		2
7633		LEAR	12 11 0110	S18 W47	12 7.5		A	AX	10	1	1	3
7633		SVTO	12 11 0825	S17 W52	12 7.4		A	AX		1		2
7633		LEAR	12 12 0005	S17 W60	12 7.4		A	AX	20	1	1	3
7630		RAMY	12 03 1331	S09 E61	12 8.1		A	AX	10	2	1	3
7630		HOLL	12 03 1530	S11 E61	12 8.2		A	AX	20	2	1	3
7630		PALE	12 03 2002	S08 E60	12 8.3		A	AX	10	1	1	1
7630		LEAR	12 04 0009	S10 E55	12 8.1		A	AX	20	4	3	3
7630		SVTO	12 04 1110	S10 E48	12 8.1		B	CSO	30	6	3	2
7630		RAMY	12 04 1408	S09 E47	12 8.1		B	CAO	30	5	3	4
7630	28012	MWIL	12 04 1530	S10 E46	12 8.1	5	(B)					
7630		BOUL	12 04 1545	S10 E45	12 8.0		A	AX	20	2	3	2
7630		PALE	12 04 2343	S10 E43	12 8.2		B	DSO	110	4	5	2
7630		LEAR	12 05 0150	S10 E40	12 8.1		B	DAO	80	8	5	3
7630		RAMY	12 05 1322	S10 E34	12 8.1		A	CSO	40	9	5	4
7630	28012	MWIL	12 05 1545	S10 E32	12 8.1	5	(B)					
7630		HOLL	12 05 1945	S11 E29	12 8.0		B	BXI	40	12	5	3
7630		PALE	12 05 2255	S10 E28	12 8.0		B	DAO	50	6	5	1
7630		LEAR	12 06 0015	S10 E26	12 8.0		B	DAO	50	5	5	3
7630		SVTO	12 06 1025	S10 E22	12 8.1		B	DRI	70	12	6	3
7630		RAMY	12 06 1346	S09 E21	12 8.1		B	BXI	60	21	6	4
7630	28012	MWIL	12 06 1600	S09 E18	12 8.0	5	(B)					
7630		PALE	12 06 1800	S09 E17	12 8.0		B	DSO	170	6	7	1
7630		HOLL	12 06 2110	S11 E15	12 8.0		B	BXI	70	12	7	3
7630		LEAR	12 07 0030	S10 E15	12 8.1		B	DSO	100	16	9	3
7630		SVTO	12 07 0812	S08 E12	12 8.2		B	DAO	80	22	7	4
7630		RAMY	12 07 1214	S09 E09	12 8.2		B	DAO	120	25	9	4
7630	28012	MWIL	12 07 1530	S10 E05	12 8.0	5	(BG)					
7630		BOUL	12 07 1649	S09 E04	12 8.0		B	CAI	90	8	7	1
7630		HOLL	12 07 1850	S09 E02	12 7.9		B	DAI	110	28	8	2
7630		PALE	12 07 2230	S10 E01	12 8.0		B	DAO	140	20	8	1
7630		LEAR	12 08 0150	S09 W01	12 8.0		B	DAI	170	29	10	3
7630		RAMY	12 08 1320	S08 W07	12 8.0		B	DAO	100	28	9	3
7630	28012	MWIL	12 08 1530	S09 W10	12 7.9	5	(BG)					
7630		BOUL	12 08 1601	S08 W08	12 8.1		B	DAO	160	12	8	1
7630		HOLL	12 08 1829	S09 W10	12 8.0		B	DAO	100	10	7	1
7630		PALE	12 08 1830	S09 W11	12 7.9		B	DAO	70	27	8	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1993

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
7630		SVTO	12	09	0830	S09	W18	12	8.0		B	CAO	140	9	9	1
7630		RAMY	12	09	1228	S09	W22	12	7.9		B	DAO	100	16	9	3
7630	28012	MWIL	12	09	1530	S09	W23	12	7.9	5	(B)					
7630		HOLL	12	09	1626	S09	W23	12	7.9		B	CAO	50	9	8	3
7630		LEAR	12	10	0012	S09	W27	12	8.0		B	CAO	60	7	8	3
7630		SVTO	12	10	0830	S08	W32	12	7.9		B	DSO	70	4	9	2
7630		RAMY	12	10	1308	S10	W35	12	7.9		B	CAO	40	6	9	3
7630	28012	MWIL	12	10	1530	S09	W36	12	7.9	5	(BP)					
7630		BOUL	12	10	1549	S09	W40	12	7.6		B	CAO	60	4	3	2
7630		HOLL	12	10	1755	S09	W42	12	7.6		B	CSO	30	3	3	3
7630		PALE	12	10	2000	S08	W37	12	8.0		B	DAO	30	8	5	2
7630		LEAR	12	11	0110	S09	W46	12	7.6		B	CAO	60	3	7	3
7630		SVTO	12	11	0825	S09	W50	12	7.6		A	HS	20	1	1	2
7630		RAMY	12	11	1249	S11	W49	12	7.8		B	CSO	70	7	9	3
7630	28012	MWIL	12	11	1540	S10	W51	12	7.8	4	B					
7630		LEAR	12	12	0005	S08	W55	12	7.9		B	CSO	50	3	7	3
7630		SVTO	12	12	0910	S11	W65	12	7.5		A	HS	30	1	1	2
7630	28012	MWIL	12	12	1515	S10	W67	12	7.6	4	(AP)					
7630		BOUL	12	12	1635	S10	W72	12	7.3		A	AX	10	1		3
7630		HOLL	12	12	1908	S09	W70	12	7.5		A	HS	30	1	1	2
7630		PALE	12	12	1934	S11	W65	12	7.9		A	AX	10	1	1	2
7630		RAMY	12	12	1939	S12	W69	12	7.6		A	AX	10	1	1	2
7630		SVTO	12	13	0745	S10	W78	12	7.5		A	HS	40	1	2	3
7630		RAMY	12	13	1331	S12	W83	12	7.3		A	AX	20	1	1	3
7630	28012	MWIL	12	13	1545	S11	W83	12	7.4	3	(AP)					
7630		HOLL	12	13	1644	S08	W86	12	7.2		A	AX		1		3
7629		LEAR	12	03	0020	S21	E68	12	8.2		A	AX	30	3	2	3
7629		RAMY	12	03	1331	S21	E60	12	8.2		B	CSO	70	9	4	3
7629		HOLL	12	03	1530	S23	E60	12	8.3		B	DAI	150	6	9	3
7629		BOUL	12	03	1541	S21	E60	12	8.2		B	DAO	170	7	7	2
7629	28010	MWIL	12	03	1545	S22	E59	12	8.2	4	(B)					
7629		PALE	12	03	2002	S21	E59	12	8.3		B	DAO	190	4	7	1
7629		LEAR	12	04	0009	S23	E57	12	8.4		B	CAO	130	9	6	3
7629		SVTO	12	04	1110	S22	E49	12	8.2		B	DAO	100	10	7	2
7629		RAMY	12	04	1408	S22	E47	12	8.2		B	DAO	150	20	8	4
7629	28010	MWIL	12	04	1530	S23	E47	12	8.3	5	(B)					
7629		BOUL	12	04	1545	S23	E46	12	8.2		B	CSO	40	4	6	2
7629		PALE	12	04	2343	S23	E43	12	8.3		B	DSO	150	10	10	2
7629		LEAR	12	05	0150	S23	E43	12	8.4		B	DAO	210	11	10	3
7629		RAMY	12	05	1322	S22	E35	12	8.2		BG	EAI	170	22	11	4
7629	28010	MWIL	12	05	1545	S22	E34	12	8.3	5	(B)					
7629		HOLL	12	05	1945	S23	E32	12	8.3		B	CSI	80	16	9	3
7629		PALE	12	05	2255	S23	E31	12	8.3		B	ESO	90	8	12	1
7629		LEAR	12	06	0015	S22	E29	12	8.2		B	DSO	110	11	10	3
7629		SVTO	12	06	1025	S23	E24	12	8.3		B	EAO	190	19	11	3
7629		RAMY	12	06	1246	S22	E22	12	8.2		B	EAO	210	32	13	4
7629	28010	MWIL	12	06	1600	S22	E19	12	8.1	5	(D)					
7629		PALE	12	06	1800	S21	E18	12	8.1		B	DSO	250	9	10	1
7629		HOLL	12	06	2110	S22	E15	12	8.0		BG	CSI	140	23	11	3
7629		LEAR	12	07	0030	S22	E15	12	8.2		BD	EAI	200	26	12	3
7629		SVTO	12	07	0812	S22	E10	12	8.1		BD	DRO	110	20	10	4
7629		RAMY	12	07	1214	S21	E09	12	8.2		B	DAO	120	34	12	4
7629	28010	MWIL	12	07	1530	S21	E05	12	8.0	5	(BG)					
7629		BOUL	12	07	1649	S21	E05	12	8.1		B	CSI	110	8	9	1
7629		HOLL	12	07	1850	S21	E03	12	8.0		BG	DAI	70	30	10	2
7629		PALE	12	07	2230	S22	E01	12	8.0		B	DAI	80	26	10	1
7629		LEAR	12	08	0150	S22	E00	12	8.1		BG	EAI	210	35	11	3
7629		RAMY	12	08	1320	S21	W07	12	8.0		B	EAI	100	27	11	3
7629	28010	MWIL	12	08	1530	S20	W10	12	7.9	5	(BG)					
7629		BOUL	12	08	1601	S21	W08	12	8.0		B	DAO	170	16	10	1
7629		HOLL	12	08	1829	S21	W11	12	7.9		B	DAO	70	11	9	1
7629		PALE	12	08	1830	S20	W12	12	7.8		B	DAO	60	24	8	3
7629		SVTO	12	09	0830	S21	W18	12	8.0		B	CAO	90	9	9	1
7629		RAMY	12	09	1228	S22	W20	12	8.0		B	CAO	80	13	9	3
7629	28010	MWIL	12	09	1530	S20	W23	12	7.9	5	(BP)					
7629		HOLL	12	09	1626	S20	W22	12	8.0		B	CAO	90	17	8	3
7629		LEAR	12	10	0012	S21	W26	12	8.0		B	CAO	80	12	8	3
7629		SVTO	12	10	0830	S20	W33	12	7.8		B	DSO	80	8	8	2

S U N S P O T G R O U P S
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DECEMBER 1993

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
7629		RAMY	12	10	1308	S22	W33	12	8.0		B	CAO	80	22	9	3
7629	28010	MWIL	12	10	1530	S20	W36	12	7.9	5	(B)					
7629		BOUL	12	10	1549	S19	W37	12	7.8		B	DAO	140	8	5	2
7629		HOLL	12	10	1755	S19	W40	12	7.7		B	CAO	50	9	12	3
7629		PALE	12	10	2000	S20	W37	12	8.0		B	DAO	60	2	7	2
7629		LEAR	12	11	0110	S20	W40	12	8.0		B	DAO	100	12	8	3
7629		SVTO	12	11	0825	S20	W45	12	7.9		B	CSO	70	6	8	2
7629		RAMY	12	11	1249	S22	W48	12	7.8		B	CAO	110	15	12	3
7629	28010	MWIL	12	11	1540	S20	W52	12	7.7	4	X					
7629		LEAR	12	12	0005	S20	W59	12	7.5		B	CAO	60	7	6	3
7629		SVTO	12	12	0910	S21	W61	12	7.7		B	CSO	40	3	3	2
7629	28010	MWIL	12	12	1515	S20	W65	12	7.7	3	(AP)					
7629		HOLL	12	12	1908	S19	W68	12	7.6		A	HS	20	1	1	2
7629		RAMY	12	12	1939	S22	W67	12	7.7		A	AX	10	1		2
7629		SVTO	12	13	0745	S17	W75	12	7.6		A	HA	60	1	2	3
7629		RAMY	12	13	1331	S19	W80	12	7.4		A	AX	10	1		3
7629	28010	MWIL	12	13	1545	S19	W78	12	7.7	3	(AP)					
7629		HOLL	12	13	1644	S17	W80	12	7.6		A	AX		1		3
7631		RAMY	12	09	1228	N14	W12	12	8.6		B	BXO		2	2	3
7631		HOLL	12	09	1626	N15	W12	12	8.8		A	AX		1	1	3
7631		RAMY	12	10	1308	N13	W27	12	8.5		A	AX		1		3
7634		RAMY	12	10	1308	S12	W22	12	8.9		A	AX		1		3
7634		RAMY	12	14	1335	S13	W75	12	8.9		B	CAO	40	3	4	3
7634		HOLL	12	14	1635	S11	W77	12	8.9		B	BXO	40	3	6	3
7634		PALE	12	14	1800	S12	W80	12	8.7		A	AX	30	4	2	3
7634		LEAR	12	15	0035	S11	W81	12	8.9		A	AX	10	1		3
7631A	28016	MWIL	12	13	1545	S13	W59	12	9.2	3	(AF)					
7631A	28016	MWIL	12	14	1545	S11	W75	12	9.0	4	X					
7634A		RAMY	12	11	1249	S01	W19	12	10.1		A	AX		1		3
7634B		LEAR	12	10	0012	S07	E13	12	11.0		A	AX		1		3
7634C		BOUL	12	15	1537	S07	W16	12	14.4		A	AX		1		2
7638	28020	MWIL	12	17	1730	N12	W37	12	14.9	3	(AF)					
7638		PALE	12	17	2045	N12	W37	12	15.1		A	AX	10	2	2	3
7638		SVTO	12	18	0900	N12	W46	12	14.9		B	BXO	10	3	1	3
7638	28020	MWIL	12	18	1530	N12	W49	12	14.9	3	(B)					
7638		HOLL	12	18	1714	N13	W49	12	15.0		A	AX		2	2	1
7638		PALE	12	18	1801	N12	W51	12	14.9		B	BXO	30	6	4	3
7638		RAMY	12	18	2115	N10	W52	12	15.0		B	BXO	10	4	3	2
7632		RAMY	12	09	1228	N07	E76	12	15.2		A	AX	10	1	1	3
7632	28014	MWIL	12	09	1530	N05	E76	12	15.3	3	(AP)					
7632		HOLL	12	09	1626	N06	E77	12	15.4		A	AX	20	1	1	3
7632		LEAR	12	10	0012	N06	E71	12	15.3		A	AX	30	1	1	3
7632		SVTO	12	10	0830	N06	E67	12	15.4		A	HS	30	1	2	2
7632		RAMY	12	10	1308	N08	E63	12	15.3		A	HR	20	2	1	3
7632	28014	MWIL	12	10	1530	N06	E63	12	15.4	4	(AP)					
7632		BOUL	12	10	1549	N06	E63	12	15.4		A	AX	20	1	1	2
7632		HOLL	12	10	1755	N05	E61	12	15.3		A	AX	10	1		3
7632		PALE	12	10	2000	N05	E62	12	15.5		A	AX		1		2
7632		LEAR	12	11	0110	N05	E57	12	15.3		A	AX	10	1	1	3
7632		BOUL	12	15	1537	N06	W03	12	15.4		B	BXO	10	2	2	2
7632		PALE	12	17	2045	N05	W31	12	15.5		A	AX	10	4	2	3
7632		HOLL	12	17	2045	N07	W38	12	15.0		A	AX	10	3	2	3
7632		LEAR	12	18	0009	N07	W41	12	14.9		A	AX	10	1	1	3
7632A		RAMY	12	14	1335	N11	E27	12	16.6		A	AX		1		3
7632A	28017	MWIL	12	14	1545	N14	E19	12	16.1	4	(AF)					
7632A		HOLL	12	14	1635	N14	E19	12	16.1		A	AX	10	1	1	3
7632A		PALE	12	14	1800	N14	E18	12	16.1		A	AX	10	2	2	3
7632B		RAMY	12	19	1329	S16	W42	12	16.4		A	AX		1	1	3

S U N S P O T G R O U P S
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DECEMBER 1993

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
7632C		PALE	12	17	2045	S07	W17	12	16.6		A	AX		3	2	3
7637		LEAR	12	16	0007	N08	E07	12	16.5		B	BXO	20	3	3	4
7637		SVTO	12	16	0800	N06	E04	12	16.6		B	DSO	20	4	4	2
7637		RAMY	12	16	1205	N07	E01	12	16.6		B	CRO	70	4	5	4
7637	28019	MWIL	12	16	1645	N06	W02	12	16.5	5	(B)					
7637		PALE	12	16	1845	N08	W02	12	16.6		B	DAI	40	16	5	3
7637		LEAR	12	17	0005	N08	W06	12	16.5		B	CAO	80	12	5	3
7637		SVTO	12	17	1020	N07	W12	12	16.5		B	DSO	40	4	5	2
7637		RAMY	12	17	1558	N06	W14	12	16.6		B	CAO	50	5	5	2
7637	28019	MWIL	12	17	1730	N07	W16	12	16.5	4	(B)					
7637		HOLL	12	17	2045	N07	W17	12	16.6		B	CAO	40	4	4	3
7637		PALE	12	17	2045	N10	W15	12	16.7		B	DSI	30	9	5	3
7637		LEAR	12	18	0009	N08	W20	12	16.5		B	CAO	40	3	4	3
7637		SVTO	12	18	0900	N07	W26	12	16.4		A	AX	10	2	1	3
7637	28019	MWIL	12	18	1530	N07	W30	12	16.4	4	(AP)					
7637		BOUL	12	18	1600	N07	W30	12	16.4		A	AX		1		3
7637		HOLL	12	18	1714	N08	W30	12	16.5		A	AX		2	1	1
7637		PALE	12	18	1801	N07	W32	12	16.3		A	AX	20	1	1	3
7637		RAMY	12	18	2115	N07	W32	12	16.5		A	AX		1	1	2
7637		LEAR	12	19	0009	N07	W35	12	16.4		A	AX	10	1	1	2
7637		SVTO	12	19	0845	N07	W39	12	16.4		A	AX	10	1		3
7637		RAMY	12	19	1329	N08	W43	12	16.3		A	AX	10	1	1	3
7637		BOUL	12	19	1620	N05	W44	12	16.4		A	AX		1		2
7637	28019	MWIL	12	19	1645	N06	W42	12	16.5	4	(B)					
7637		PALE	12	19	1818	N06	W44	12	16.5		A	AX	10	1	1	2
7637		RAMY	12	20	1315	N09	W53	12	16.6		B	BXO	10	3	3	4
7637A		PALE	12	18	1801	N08	W12	12	17.8		A	AXO	20	3	2	3
7637A		RAMY	12	18	2115	N08	W13	12	17.9		B	BXO	10	4	2	2
7635		RAMY	12	14	1335	N04	E82	12	20.7		A	HS	80	1	2	3
7635		BOUL	12	14	1506	N03	E79	12	20.5		A	HS	60	1	2	2
7635	28018	MWIL	12	14	1545	N02	E81	12	20.7	4	(AP)					
7635		HOLL	12	14	1635	N02	E80	12	20.7		A	HS	60	1	2	3
7635		PALE	12	14	1800	N02	E80	12	20.7		A	HS	50	1	1	3
7635		LEAR	12	15	0035	N02	E75	12	20.6		A	HR	40	3	3	3
7635		RAMY	12	15	1312	N04	E68	12	20.6		A	HS	50	1	2	3
7635		BOUL	12	15	1537	N03	E67	12	20.6		B	CAO	80	2	5	2
7635		HOLL	12	15	1614	N01	E68	12	20.7		A	HS	50	1	2	2
7635	28018	MWIL	12	15	1645	N02	E67	12	20.7	4	(AP)					
7635		PALE	12	15	1830	N01	E69	12	20.9		A	HS	70	2	2	3
7635		LEAR	12	16	0007	N03	E65	12	20.9		A	HS	90	2	3	4
7635		SVTO	12	16	0800	N02	E60	12	20.8		B	CSO	90	3	3	2
7635		RAMY	12	16	1205	N03	E58	12	20.8		B	CSO	20	3	3	4
7635	28018	MWIL	12	16	1645	N02	E55	12	20.8	5	(AP)					
7635		PALE	12	16	1845	N02	E55	12	20.9		A	HS	40	2	2	3
7635		LEAR	12	17	0005	N02	E50	12	20.7		B	CAO	40	4	4	3
7635		SVTO	12	17	1020	N02	E45	12	20.8		A	HS	50	1	1	2
7635		RAMY	12	17	1458	N02	E43	12	20.8		B	CAO	80	3	4	2
7635	28018	MWIL	12	17	1730	N02	E41	12	20.8	5	(AP)					
7635		HOLL	12	17	2045	N01	E38	12	20.7		B	CSO	40	3	3	3
7635		PALE	12	17	2045	N04	E42	12	21.0		A	HS	50	2	1	3
7635		LEAR	12	18	0009	N05	E39	12	20.9		B	CSO	50	5	6	3
7635		SVTO	12	18	0900	N02	E32	12	20.8		B	CSO	70	4	3	3
7635	28018	MWIL	12	18	1530	N01	E28	12	20.7	5	(BF)					
7635		BOUL	12	18	1600	N02	E28	12	20.7		A	HS	30	1	1	3
7635		HOLL	12	18	1714	N02	E28	12	20.8		A	HS	20	1	2	1
7635		PALE	12	18	1801	N02	E27	12	20.8		A	HS	70	3	3	3
7635		RAMY	12	18	2115	N02	E25	12	20.7		A	HS	40	3	3	2
7635		LEAR	12	19	0009	N02	E23	12	20.7		A	HA	40	4	2	2
7635		SVTO	12	19	0845	N02	E19	12	20.8		A	HSO	70	5	4	3
7635		RAMY	12	19	1329	N01	E15	12	20.7		B	CSO	60	7	6	3
7635		BOUL	12	19	1620	N00	E15	12	20.8		B	CSO	10	3	2	2
7635	28018	MWIL	12	19	1645	N01	E14	12	20.7	5	(BF)					
7635		PALE	12	19	1818	N01	E15	12	20.9		B	CSO	50	2	5	2
7635		LEAR	12	20	0010	N02	E10	12	20.7		A	HS	40	1	1	3
7635		SVTO	12	20	0845	N00	E07	12	20.9		B	CSO	40	2	3	2
7635		RAMY	12	20	1315	N00	E04	12	20.8		B	CSO	50	5	4	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
7635	28018	MWIL	12	20	1545	N01	E02	12	20.8	5	(AP)					
7635		BOUL	12	20	1603	N01	E02	12	20.8		B	CSO	30	2	3	1
7635		HOLL	12	20	1755	N02	W02	12	20.6		B	CSO	40	4	3	1
7635		PALE	12	20	1940	N01	E02	12	21.0		B	CSO	50	6	4	3
7635		LEAR	12	21	0020	N02	W02	12	20.9		B	CSO	40	4	4	2
7635		SVTO	12	21	1045	N01	W07	12	20.9		B	CSO	40	4	4	4
7635		RAMY	12	21	1229	N01	W08	12	20.9		A	HS	90	5	5	3
7635		BOUL	12	21	1523	N01	W10	12	20.9		B	CSO	40	2	3	1
7635	28018	MWIL	12	21	1530	N01	W12	12	20.7	5	(AP)					
7635		LEAR	12	22	0043	N00	W16	12	20.8		B	CXO	30	3	4	3
7635		SVTO	12	22	0803	N03	W19	12	20.9		B	CSO	30	6	4	3
7635		RAMY	12	22	1301	N02	W22	12	20.9		A	HR	10	3	3	3
7635	28018	MWIL	12	22	1530	N01	W25	12	20.8	4	(AP)					
7635		BOUL	12	22	1544	N01	W24	12	20.9		A	HS	40	1	1	1
7635		HOLL	12	22	1751	N02	W27	12	20.7		A	HS	20	1	2	2
7635		PALE	12	22	1800	N02	W25	12	20.9		B	CAO	30	2	5	3
7635		LEAR	12	23	0025	N01	W28	12	20.9		B	CAO	20	3	4	4
7635		SVTO	12	23	0815	N05	W39	12	20.4		A	HS	10	1	1	3
7635		RAMY	12	23	1339	N02	W37	12	20.8		A	HR	20	2	1	3
7635	28018	MWIL	12	23	1900	N01	W41	12	20.7	3	(AP)					
7635		PALE	12	23	2020	N00	W42	12	20.7		A	HR	30	1	1	2
7635		LEAR	12	24	0020	N01	W43	12	20.8		A	AX	10	1	1	3
7635		SVTO	12	24	1205	N01	W51	12	20.7		A	HR	20	2	1	4
7635		RAMY	12	24	1315	N03	W50	12	20.8		A	HR	10	1	1	3
7635	28018	MWIL	12	24	1530	N01	W51	12	20.8	3	(AP)					
7635		PALE	12	24	1910	N01	W55	12	20.7		A	AX	10	1	1	2
7642	28023	MWIL	12	24	1530	N12	W15	12	23.5	3	(B)					
7642		PALE	12	24	1910	N10	W17	12	23.5		B	BXO	20	2	3	2
7642		RAMY	12	25	1245	N12	W26	12	23.6		A	AX		1	1	3
7641		SVTO	12	20	0845	N04	E85	12	26.7		A	HS	60	1	5	2
7641		RAMY	12	20	1315	N02	E78	12	26.4		A	HS	80	1	2	4
7641	28022	MWIL	12	20	1545	N04	E76	12	26.3	5	(AP)					
7641		BOUL	12	20	1603	N05	E78	12	26.5		A	HS	80	1	2	1
7641		HOLL	12	20	1755	N03	E74	12	26.3		B	CSO	80	5	4	1
7641		PALE	12	20	1940	N04	E76	12	26.5		A	HS	60	1	2	3
7641		LEAR	12	21	0020	N04	E70	12	26.2		A	HS	90	1	2	2
7641		SVTO	12	21	1045	N05	E68	12	26.5		A	HS	100	1	2	4
7641		RAMY	12	21	1229	N02	E67	12	26.5		A	HS	100	1	2	3
7641		BOUL	12	21	1523	N05	E64	12	26.4		A	HS	90	1	2	1
7641	28022	MWIL	12	21	1530	N05	E64	12	26.4	4	(AP)					
7641		LEAR	12	22	0043	N05	E59	12	26.4		A	HS	120	1	2	3
7641		SVTO	12	22	0803	N02	E55	12	26.4		A	HS	100	1	2	3
7641		RAMY	12	22	1301	N03	E52	12	26.4		A	HS	100	1	2	3
7641	28022	MWIL	12	22	1530	N04	E50	12	26.4	5	(AP)					
7641		BOUL	12	22	1544	N05	E51	12	26.5		A	HA	100	2	1	1
7641		HOLL	12	22	1751	N03	E48	12	26.3		A	HA	120	1	2	2
7641		PALE	12	22	1800	N05	E50	12	26.5		A	HS	150	1	3	3
7641		LEAR	12	23	0025	N05	E46	12	26.4		A	HS	110	1	2	4
7641		SVTO	12	23	0815	N01	E42	12	26.5		A	HS	50	1	1	3
7641		RAMY	12	23	1339	N03	E39	12	26.5		A	HS	100	1	2	3
7641	28022	MWIL	12	23	1900	N04	E36	12	26.5	5	(AP)					
7641		PALE	12	23	2020	N04	E35	12	26.5		A	HS	100	1	3	2
7641		LEAR	12	24	0020	N04	E32	12	26.4		A	HS	100	1	2	3
7641		SVTO	12	24	1205	N04	E27	12	26.5		B	CSO	90	4	3	4
7641		RAMY	12	24	1315	N03	E25	12	26.4		A	HS	110	1	2	3
7641	28022	MWIL	12	24	1530	N04	E24	12	26.4	5	(AP)					
7641		PALE	12	24	1910	N04	E23	12	26.5		A	HS	140	1	3	2
7641		LEAR	12	25	0020	N04	E19	12	26.4		A	HS	70	3	2	2
7641		RAMY	12	25	1245	N03	E12	12	26.4		A	HS	120	4	3	3
7641	28022	MWIL	12	25	1530	N04	E11	12	26.5	5	(BF)					
7641		BOUL	12	25	1600	N05	E10	12	26.4		A	HA	40	2	1	2
7641		PALE	12	25	2130	N03	E12	12	26.8		B	BXO	90	5	4	3
7641		LEAR	12	26	0906	N04	E01	12	26.4		A	HS	90	1	2	2
7641		SVTO	12	26	1140	N06	W02	12	26.3		B	CSO	40	3	2	1
7641		RAMY	12	26	1321	N04	W02	12	26.4		A	HS	80	1	2	3
7641		HOLL	12	26	1547	N04	W03	12	26.4		A	HS	800	4	2	3
7641		PALE	12	26	2145	N05	W05	12	26.5		B	BXO	70	3	3	3

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7641		LEAR	12 27 0050	N03 W09	12 26.4		A	HS	20	2	2	3
7641		SVTO	12 27 1014	N03 W14	12 26.4		B	CSO	100	1	2	1
7641		RAMY	12 27 1519	N04 W16	12 26.4		A	HS	80	1	2	3
7641	28022	MWIL	12 27 1545	N04 W16	12 26.5	5	(AP)					
7641		LEAR	12 28 0008	N05 W19	12 26.6		B	CSO	100	7	7	4
7641		PALE	12 28 0220	N05 W22	12 26.4		B	CSO	90	5	3	2
7641		SVTO	12 28 0810	N06 W26	12 26.4		A	HS	110	1	2	3
7641	28022	MWIL	12 28 1530	N04 W29	12 26.5	5	(AP)					
7641		BOUL	12 28 1717	N05 W30	12 26.5		A	HS	50	3	2	2
7641		HOLL	12 28 2055	N05 W33	12 26.4		A	HS	100	1	2	2
7641		PALE	12 28 2200	N04 W35	12 26.3		A	HS	70	3	2	1
7641		LEAR	12 29 0014	N06 W35	12 26.4		A	HS	100	2	3	4
7641		RAMY	12 29 1249	N05 W40	12 26.5		A	HS	100	1	2	3
7641	28022	MWIL	12 29 1530	N04 W43	12 26.4	5	(AP)					
7641		BOUL	12 29 1549	N04 W43	12 26.4		A	HA	70	1	2	2
7641		PALE	12 29 1932	N03 W46	12 26.4		A	HS	80	1	2	3
7641		LEAR	12 30 0022	N04 W47	12 26.5		A	HS	80	1	2	3
7641		RAMY	12 30 1335	N07 W55	12 26.4		A	HS	100	1	2	4
7641	28022	MWIL	12 30 1530	N04 W57	12 26.4	5	(AP)					
7641		BOUL	12 30 1544	N04 W56	12 26.5		A	HA	70	1	2	1
7641		HOLL	12 30 1812	N05 W59	12 26.3		A	HS	70	2	2	3
7641		PALE	12 30 1824	N05 W59	12 26.3		A	HS	100	1	2	3
7641		LEAR	12 31 0035	N04 W61	12 26.5		A	HS	80	1	2	3
7641		SVTO	12 31 1000	N05 W67	12 26.4		A	AX	20	1	1	3
7641		RAMY	12 31 1322	N07 W68	12 26.5		A	HS	100	1	2	3
7641	28022	MWIL	12 31 1545	N04 W69	12 26.5	5	(AP)					
7641		BOUL	12 31 1604	N04 W72	12 26.3		A	HS	120	1	2	2
7641		HOLL	12 31 1840	N05 W73	12 26.3		A	HA	60	2	2	3
7641		PALE	12 31 1930	N05 W71	12 26.5		A	HS	80	1	1	4
7641		LEAR	01 01 0025	N06 W75	12 26.5		A	HS	80	1	2	3
7641		RAMY	01 01 1356	N05 W86	12 26.2		A	HS	40	1	2	2
7641	28022	MWIL	01 01 1600	N05 W82	12 26.6	5	(AP)					
7641		HOLL	01 01 1646	N07 W84	12 26.5		A	HA	30	1	2	3
7641A		PALE	12 26 2145	S05 W07	12 26.4		A	AX		2	2	3
7641A		LEAR	12 27 0050	S05 W08	12 26.4		A	AX		1	1	3
7641A		RAMY	12 27 1519	S03 W17	12 26.4		A	AX		1		3
7641A	28026	MWIL	12 27 1545	S05 W17	12 26.4	3	(AF)					
7641A	28026	MWIL	12 28 1530	S05 W28	12 26.5	3	(AP)					
7640		LEAR	12 20 0010	N09 E88	12 26.6		A	HR	30	1	1	3
7640		SVTO	12 20 0845	N09 E79	12 26.3		B	ESO	50	5	11	2
7640		RAMY	12 20 1315	N07 E76	12 26.2		B	DSO	110	5	8	4
7640	28021	MWIL	12 20 1545	N09 E72	12 26.1	5	(B)					
7640		BOUL	12 20 1603	N11 E74	12 26.2		B	CSO	120	3	6	1
7640		HOLL	12 20 1755	N07 E74	12 26.3		A	HS	120	1	4	1
7640		PALE	12 20 1940	N09 E73	12 26.3		B	DAO	140	5	9	3
7640		LEAR	12 21 0020	N09 E75	12 26.6		B	DSO	200	6	9	2
7640		SVTO	12 21 1045	N10 E66	12 26.4		B	FSO	250	12	18	4
7640		RAMY	12 21 1229	N07 E65	12 26.4		B	FAO	340	12	17	3
7640		BOUL	12 21 1523	N10 E60	12 26.1		B	DSO	110	4	5	1
7640	28021	MWIL	12 21 1530	N10 E64	12 26.4	4	(B)					
7640		LEAR	12 22 0043	N08 E58	12 26.4		B	FAO	320	22	17	3
7640		SVTO	12 22 0803	N07 E56	12 26.5		B	EKO	370	20	14	3
7640		RAMY	12 22 1301	N07 E53	12 26.5		B	FAO	380	38	17	3
7640	28021	MWIL	12 22 1530	N09 E50	12 26.4	5	(BG)					
7640		BOUL	12 22 1544	N09 E47	12 26.2		B	FAO	340	12	19	1
7640		HOLL	12 22 1751	N07 E51	12 26.6		BG	FAI	300	24	18	2
7640		PALE	12 22 1800	N09 E50	12 26.5		BD	EKI	330	39	17	3
7640		LEAR	12 23 0025	N10 E48	12 26.6		BG	FAI	400	38	18	4
7640		SVTO	12 23 0815	N07 E42	12 26.5		B	EKO	490	32	13	3
7640		RAMY	12 23 1339	N08 E40	12 26.6		B	FKO	560	46	19	3
7640	28021	MWIL	12 23 1900	N09 E36	12 26.5	4	(B)					
7640		PALE	12 23 2020	N08 E35	12 26.5		BG	F I	310	43	21	2
7640		LEAR	12 24 0020	N08 E34	12 26.6		BG	FAI	380	47	20	3
7640		SVTO	12 24 1205	N07 E27	12 26.5		B	FSC	500	77	22	4
7640		RAMY	12 24 1315	N08 E25	12 26.4		BG	FKI	470	78	20	3
7640	28021	MWIL	12 24 1530	N09 E23	12 26.4	5	(BG)					
7640		PALE	12 24 1910	N09 E25	12 26.7		BG	FKI	560	49	22	2

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7640		LEAR	12 25	0020	N10 E24	12 26.8		BG	FKI	510	58	21	2
7640		RAMY	12 25	1245	N08 E13	12 26.5		BG	FKI	550	91	20	3
7640	28021	MWIL	12 25	1530	N08 E07	12 26.2	5	(BG)					
7640		BOUL	12 25	1600	N10 E08	12 26.3		B	FAO	230	24	22	2
7640		PALE	12 25	2130	N08 E09	12 26.6		BG	FKI	520	95	23	3
7640		LEAR	12 26	0906	N09 E02	12 26.5		BG	FKI	800	39	22	2
7640		SVTO	12 26	1140	N07 E01	12 26.6		B	FAI	380	43	23	1
7640		RAMY	12 26	1321	N09 E00	12 26.5		G	FKC	680	79	23	3
7640		HOLL	12 26	1547	N09 W04	12 26.3		G	FKI	650	59	23	3
7640		PALE	12 26	2145	N11 W03	12 26.7		BG	FKI	540	81	23	3
7640		LEAR	12 27	0050	N10 W08	12 26.4		BG	FKI	700	60	24	3
7640		SVTO	12 27	1014	N09 W12	12 26.5		B	FKI	890	29	25	1
7640		RAMY	12 27	1519	N09 W15	12 26.5		BG	FKC	560	64	24	3
7640	28021	MWIL	12 27	1545	N08 W19	12 26.2	5	(BG)					
7640		LEAR	12 28	0008	N09 W26	12 26.0		BG	FAI	500	64	16	4
7640		SVTO	12 28	0810	N11 W29	12 26.1		BG	FSI	730	34	16	3
7640	28021	MWIL	12 28	1530	N08 W33	12 26.2	5	(D)					
7640		BOUL	12 28	1717	N08 W37	12 25.9		B	EKO	320	9	11	2
7640		HOLL	12 28	2055	N13 W39	12 25.9		BG	FKI	620	34	18	2
7640		PALE	12 28	2200	N08 W40	12 25.9		BG	EAO	500	22	13	1
7640		LEAR	12 29	0014	N10 W40	12 26.0		BG	FKI	660	28	18	4
7640		RAMY	12 29	1249	N10 W43	12 26.3		BG	FKI	900	49	16	3
7640	28021	MWIL	12 29	1530	N07 W47	12 26.1	5	(D)					
7640		BOUL	12 29	1549	N07 W48	12 26.1		BG	FKI	710	31	17	2
7640		PALE	12 29	1932	N08 W53	12 25.8		BG	FKI	700	38	17	3
7640		LEAR	12 30	0022	N08 W53	12 26.0		BGD	FKI	750	30	23	3
7640		RAMY	12 30	1335	N10 W59	12 26.1		BG	FKI	1130	27	18	4
7640	28021	MWIL	12 30	1530	N08 W61	12 26.1	5	(D)					
7640		BOUL	12 30	1544	N08 W61	12 26.1		BGD	FKI	600	10	18	1
7640		HOLL	12 30	1812	N08 W67	12 25.7		BG	FAI	540	12	17	3
7640		PALE	12 30	1824	N07 W66	12 25.8		BG	F I	950	20	18	3
7640		LEAR	12 31	0035	N08 W66	12 26.1		BGD	FKI	870	27	27	3
7640		SVTO	12 31	1000	N11 W68	12 26.3		BGD	DKC	1560	9	10	3
7640		RAMY	12 31	1322	N10 W72	12 26.1		BG	FKI	920	21	17	3
7640	28021	MWIL	12 31	1545	N08 W75	12 26.0	5	(D)					
7640		BOUL	12 31	1604	N08 W78	12 25.8		B	EKI	800	8	15	2
7640		HOLL	12 31	1840	N07 W80	12 25.8		B	ESO	90	3	11	3
7640		PALE	12 31	1930	N07 W81	12 25.7		BG	FKI	810	20	15	4
7640		LEAR	01 01	0025	N11 W83	12 25.9		BG	EKI	420	12	15	3
7640		RAMY	01 01	1356	N09 W84	12 26.4		B	CKO	370	3	12	2
7640	28021	MWIL	01 01	1600	N09 W80	12 26.8	5	X					
7640		LEAR	01 02	0015	N09 W88	12 26.5		A	HS	30	1	1	3
7640A		LEAR	12 21	0020	S09 E78	12 26.9		A	AX	30	2	1	2
7644	28024	MWIL	12 24	1530	N10 E33	12 27.1	4	(B)					
7644	28024	MWIL	12 25	1530	N10 E18	12 27.0	4	(BG)					
7644		RAMY	12 27	1519	N11 W06	12 27.2		B	DAO	70	10	6	3
7644	28024	MWIL	12 27	1545	N10 W05	12 27.3	4	(BF)					
7644		LEAR	12 28	0008	N11 W13	12 27.0		B	DSO	60	12	10	4
7644		PALE	12 28	0220	N09 W13	12 27.1		B	DAI	50	15	8	2
7644		SVTO	12 28	0810	N13 W15	12 27.2		B	BXO	70	7	8	3
7644	28024	MWIL	12 28	1530	N10 W19	12 27.2	5	(B)					
7644		BOUL	12 28	1717	N10 W25	12 26.8		B	CSO	50	5	7	2
7644		HOLL	12 28	2055	N10 W26	12 26.9		B	BXO	20	12	9	2
7644		PALE	12 28	2200	N09 W27	12 26.9		B	BXO	20	9	10	1
7644		LEAR	12 29	0014	N11 W25	12 27.1		B	CRO	40	5	6	4
7644		RAMY	12 29	1249	N09 W32	12 27.1		A	HR	40	15	8	3
7644	28024	MWIL	12 29	1530	N10 W35	12 27.0	4	(BF)					
7644		BOUL	12 29	1549	N10 W37	12 26.9		B	CAO	40	8	6	2
7644		PALE	12 29	1932	N09 W39	12 26.9		B	DAO	40	12	7	3
7644		RAMY	12 30	1335	N11 W49	12 26.9		B	CRO	90	13	3	4
7644	28024	MWIL	12 30	1530	N10 W50	12 26.9	4	(AF)					
7644		BOUL	12 30	1544	N09 W49	12 27.0		B	DSO	70	6	3	1
7644		HOLL	12 30	1812	N11 W56	12 26.5		B	DKO	280	13	9	3
7644		PALE	12 30	1824	N08 W52	12 26.9		B	DSO	100	8	4	3
7644		SVTO	12 31	1000	N13 W58	12 27.0		B	CSO	1140	5	2	3
7644		RAMY	12 31	1322	N10 W61	12 27.0		B	DAO	80	9	4	3
7644	28024	MWIL	12 31	1545	N09 W63	12 26.9	5	(B)					

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(Ordered by Central Meridian Passage Date)

DECEMBER 1993

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
7644		BOUL	12	31	1604	N09	W64	12	26.9		B	DSO	80	4	7	2
7644		HOLL	12	31	1840	N12	W68	12	26.6		BG	FKI	660	13	16	3
7644		PALE	12	31	1930	N10	W64	12	27.0		B	DAO	90	13	5	4
7644		RAMY	01	01	1356	N11	W77	12	26.9		B	CRO	40	2	3	2
7644	28024	MWIL	01	01	1600	N10	W79	12	26.8	4	(B)					
7644		HOLL	01	01	1646	N13	W79	12	26.8		B	DSO	90	3	10	3
7643		SVTO	12	24	1205	S16	E76	12	30.3		A	AX	30	2	1	4
7643		PALE	12	24	1910	S16	E71	12	30.2		A	AX	10	1	1	2
7643		RAMY	12	25	1245	S18	E59	12	30.0		A	AX		1	1	3
7643	28025	MWIL	12	25	1530	S17	E59	12	30.1	4	(AP)					
7643		PALE	12	25	2130	S16	E59	12	30.4		A	AX		1		3
7643		RAMY	12	26	1321	S18	E47	12	30.1		A	AX		1		3
7643		PALE	12	26	2145	S16	E45	12	30.3		A	AX		1		3
7643		RAMY	12	27	1519	S17	E33	12	30.1		A	AX		1		3
7643		PALE	12	28	0220	S18	E28	12	30.2		A	AX		1		2

Stations reporting:

BOUL = Boulder
CULG = Culgoora
HOLL = Holloman
LEAR = Learmonth
MWIL = Mt. Wilson
PALE = Palehua
RAMY = Ramey
SVTO = San Vito

DECEMBER 1993

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	0200	0209	0235D	1-	1			1			0159	C3.2	7624
01	0235E	0246	0246D	1-	1			1			0235		7624
01	0415	0423	0522	1-	1			1			0415	C5.0	7624
01	0701	0710	0727	1-	1			1			0701	C3.1	7627
01	1200	1204	1215	1-	1					1	1200	B6.1	
01	1229	1230	1236	1-	1					1	1229	B8.6	7624
01	1416	1431	1458	1-	1			1			No flare		
01	2128	2131	2144	1-	1					1	2127	B4.1	
02	0827	0845	0900	1	3		2				No flare		
02	1553	1559	1606	1-	1					1	1553	B6.4	7627
02	2236	2243	2310	2-	3					3	2236	B9.2	7627
03	1138	1140	1155	1-	1					1	1135	B4.4	
03	2243	2246	2305	1	3					2	2241	B6.8	
04	0120	0126	0130	1-	5			1		1	0112	C1.2	7629
04	0325	0327	0335	1-	1					1	0324	B5.5	
04	1430	1433	1444	1-	1					1	1432	B8.3	7629
04	1738	1739	1747	1-	1					1	1736	B5.6	7629
05	1031	1041	1121	1-	5			1		1	1025	C4.3	
05	1510	1520	1520D	1	1					1	No flare		
05	1607	1645	1712	1	3					2	1626	C1.6	7629
05	2153	2210	2235	2	1					1	2140	B7.2	
06	1034	1037	1050	1-	1					1	1034	C1.0	
06	1226	1233	1246	1-	5					2	1226	C1.7	7629
06	1716	1720	1806	2-	3					10	1717	C9.7	7629
06	2040	2050	2122	2	5	1		1		4	2040	C7.5	7629
06	2229	2245	2301	1+	1					1	2227		7629
07	0017	0024	0034D	1-	1			1			0021	C3.8	7629
07	0033E	0053	0148	1	3	1		1			0038E		7629
07	0211	0224	0324	2	5	1		1		1	0211	C4.2	7629
07	0417	0428	0512	1-	1			1			0414	C1.7	7629
07	0815	0823	0845	2-	1					1	0820	B9.3	7627
07	1200E	1202	1220	1	1					1	1129	B8.0	
07	1717	1720	1732	1-	3					2	1715	B6.2	
07	1943	1951	2000	1-	1					1	1943	B5.7	
08	0147	0156	0217	1-	1			1			0150	C1.0	7629
08	1215	1218	1226	1-	1					1	1215	B6.3	
08	1940	1941	1950	1-	1					1	1941	B8.3	7630
09	1316	1340	1410	2	3		2				No flare		
10	2258	2303	2314	1-	3					2	2258	B2.5	
12	0927	0955	1046U	2	1		1				No flare		
12	1834	1836	1846	1-	1					1	1835	B3.0	
13	0839	0859U	0934	2	1		1				No flare		
13	0936	1025	1106	2	1		1				No flare		
13	1122	1126	1145	1	1					1	1119	B4.6	
13	1130	1142	1322	1	1		1				1119	B4.6	
13	1153	1158	1208	1-	5					2	1153	B4.3	
13	1520	1544	1630	2	1		1				1509	B9.6	
13	1718	1725	1749	1	1		1				No flare		
14	1057	1100	1108	1-	1					1	1057	C1.2	
14	1204	1208	1218	1-	5					2	1204	C2.1	
14	1527	1532	1544	1-	3					2	1527	B7.2	
14	1916	1918	1930	1-	1					1	1916	B3.4	
15	0652	0655	0702U	1-	1					1	0652	B6.5	
15	1400	1420	1448	2-	3		2				1351	B4.3	

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1993

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	2023	2026	2043	1	1					1	2001E	C2.0	7635
18	1228	1232U	1259	1	1		1				No flare		
19	0736	0737	0750	1-	1					1	0736	B2.2	
19	2245	2251	2300	1-	1					1	2245	B3.2	
20	0155	0205	0227	1-	1			1			0152	C1.3	
20	0713	0721	0749U	2	1					1	0713	C1.5	
20	0838	0843	0900	1	1					1	0838	C1.3	
21	0022	0034	0054D	1-	5			1		1	0012	C1.0	
21	0054E	0058	0110	1-	1			1			0053	C1.2	
21	0520	0524	0529	1-	1			1			0511	C1.2	
21	0758	0801	0815	1-	1					1	0757	B3.5	
21	1300	1301	1311	1-	1					1	1259	B2.3	
22	0700	0708	0820U	1	1		1				No flare		
22	0909	0912	0922	1	1		1				No flare		
22	0935	0939	1000	1-	5		1	1		1	0936	C2.1	7640
22	1111	1114	1136	1	1					1	1111	C1.2	7640
22	1614	1616	1632	1-	1					1	1606E	B3.5	7640
22	1646	1648	1655	1-	1					3	1647	B7.6	7640
22	1722	1725	1759	1+	3					9	1723	M1.4	7640
23	0011	0025	0051	1-	5			1		2	0011	C1.4	7640
23	0529	0534	0625	1-	1			1			0530	C4.4	7640
23	0902	0908	0927	1-	5			1		2	0859	C2.9	7640
23	1144	1145	1201	1-	1					1	1144	B6.9	
23	1234	1244	1303	1	3					2	1235	C2.9	7640
23	1440	1447	1515	1	5					4	1441	C2.0	7640
23	1617	1625	1654	1	3					7	1617	C2.9	7640
23	2028	2030	2038	1-	1					1	2031E		7640
23	2254	2312	2413	1-	5			1		2	2300	C3.1	7640
24	0812	0820	0842	1	1		1				No flare		
24	0855	0904	0924	1-	1			1			0842	C2.7	7640
24	0946	1009	1039	1-	5			1		2	0943	C3.8	7640
24	1214	1222	1251	1-	5		1	1		2	1211	C5.1	7640
24	1347	1351	1413	1-	5		2	1		4	1335	C2.5	7640
24	1404	1426	1445	1-	5		1			3	1411	C1.4	
24	1453	1514	1623	1	5		1	1		8	1451	M1.3	7640
24	1630	1633	1644	1-	3					2	1631	C1.0	
24	1728	1732	1748	1	3					8	1729	C3.9	7640
24	1803	1812	1853	2-	3					9	1804	M1.1	7640
24	1806	1841	1912	1+	3					2	1804	M1.1	7640
24	2112	2114	2152	1-	1					2	2116	C2.1	7640
25	0106	0111	0151	1-	5			1		2	0103	C1.3	
25	0329	0337	0357	1-	5			1		1	0327	C1.5	
25	0424	0432	0525D	1	3	1		1			0426	C6.2	7640
25	0444E	0454	0515	1-	3	1		1			0442	C4.3	7640
25	0525E	0535	0635	1-	1			1			0518	C4.4	7640
25	0702	0718	0737D	1-	3	1		1			0657	C5.8	7640
25	0737E	0743	0836D	1+	1			1			0657	C5.8	7640
25	0836E	0842	0904	2-	5		1	1		1	0835E	C4.5	7640
25	0905	0911	0916	1-	3					2	0906	C2.1	
25	1135	1147	1206	1-	1			1			1139		7640
25	1233	1236	1253	1-	3					3	1229	C2.3	
25	1340	1350	1415	1	1					1	No flare		
25	1411	1414	1420	1-	1					1	1411	C1.0	
25	1450	1458	1536	1-	5			1		7	1444	C6.0	7640
25	1707	1711	1723	1	3					7	1709	C4.6	7640
25	1747	1752	1830	2-	3					11	1744	M1.5	7640
25	2119	2126	2200	1-	1					2	2117	C2.6	
25	2245	2250	2345	1	1					1	2258		7640
25	2309	2314	2345	1-	1			1			2258		7640

* = no flare patrol.

DECEMBER 1993

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Flare (UT)	X-ray Class	NOAA Region
26	0027	0033	0100	1-	1			1			0023	C1.6	
26	0152	0200	0210	1-	1					1	*		
26	0402	0420	0540D	3-	3	1		1			0402	M1.5	7640
26	0540E	0549	0611D	1-	1			1			0538	C3.3	
26	0611E	0622	0642D	1-	1			1			0608	C2.5	7640
26	0642E	0651	0718D	1-	1			1			0640	C1.5	
26	0718E	0732	0845D	1-	1			1			0718	C4.6	7640
26	0845E	0851	0905	1-	5			1		1	0843	C3.6	7640
26	0912	0917	0939D	1-	1			1			0913	C2.8	7640
26	0940E	0952	1009	1-	1			1			0940	C2.5	7640
26	1036	1045	1108	1-	5			1		2	1029	C4.0	
26	1127	1140	1208	1-	5			1		3	1126	C3.0	
26	1316	1325	1325D	1	1					1	No flare		
26	1335	1343	1405	1	3					4	1331	C2.4	7640
26	1508	1520	1532	1-	5			1		9	1501	C5.7	7640
26	1551	1556	1606	1-	5			1		7	1542	C6.5	7640
26	1704	1707	1718	1-	3					8	1705	C2.2	7640
26	1756	1806	1833	1	3					2	1757	C2.0	7640
26	1904	1908	1934	1	3					2	1903	C1.6	7640
26	1929E	1935	1940	1-	1					1	1924	C1.5	7640
26	2239	2243	2309	1-	1			1			2238	C3.0	7640
27	0315	0318	0342	1-	1			1			0313	C1.6	7640
27	0353	0358	0418	1-	1			1			0350	C1.5	7640
27	0911	0918	0952D	1-	5		2	1			0912	C4.8	7640
27	0953	1000	1033	1-	5			1		1	0953	C4.3	7640
27	1555	1605	1615	1	1					1	1559	C1.4	7640
27	1655	1700	1730	1	1					1	*		
27	1836	1847	1935	2-	3					9	1843	M1.9	7640
27	2258	2300	2415	1	1					1	No flare		
28	0231	0257	0440	2+	3	1		1			0227	C8.4	7640
28	0533	0539	0606	1-	1			1			0530	C2.6	
28	0651	0655	0713	1-	5			1		1	0649	C3.0	7644
28	0900	0914	0928	1-	5		1	1		1	0853	C2.7	7640
28	0911	0922	0950	1	3		2				No flare		
28	0946	1018	1044	1	1		1				No flare		
28	1210	1220	1249	1-	5			1		3	1205	C4.6	
28	1314	1315	1328	1-	1					1	1310	C1.7	
28	1610	1616	1616	1	3					2	1602	C2.6	7644
28	1654	1702	1726	1-	5			1		8	1653	M1.1	7640
28	2246	2306	2426	1	5			1		1	2244	C5.0	
29	0216	0224	0302	1-	1			1			0218	C1.9	7640
29	0545	0550	0621	1-	1			1			0544	C1.2	
29	0745	0748	0755	1-	3					2	0746	C1.6	7646
29	0936	0949	1030	1	1		1				0940		7646
29	1135	1202	1228	1	1		1				No flare		
29	1328	1345	1416	1+	1		1				No flare		
29	1455	1510	1510D	1	1					1	No flare		
29	1535	1547	1642	1-	5			1		11	1530	C9.9	7640
29	2256	2312	2410	1-	3			1		1	2256	C3.7	7645
30	0150	0207	0310D	2+	3	1		1			0149	C4.3	
30	0313E	0321	0346D	1-	1			1			0310	C1.8	
30	0346E	0349	0402	1-	1			1			*		
30	0528	0532	0542D	1-	1			1			0528	C1.3	
30	0542E	0556	0702	3	3	1		1			0547	M1.6	
30	0915	0924	1017	2+	5		1	1		2	0914	C7.1	
30	1159	1200	1207	1-	1					1	1159	C1.4	
30	1319	1323	1330	1-	1					1	1321	C1.2	7645
30	1355	1404	1425	1	1					1	1357		7644
30	1530	1540	1554	1+	5					5	1513	C5.5	7640
30	1548	1605	1653	2	5					3	1513	C5.5	7640
30	1612	1616	1630	1-	5			1		6	No flare		
30	1711	1715	1736	1-	5			1		12	1705	C7.7	7645
30	1912	1918	1933	1-	3					5	1914	C3.0	7645
30	2118	2127	2155	1-	5			1		4	2117	C7.6	7640

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1993

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
31	0046	0051	0111	1-	1			1			0043	C2.5	7645
31	0223	0234	0249	1-	1			1			0223	C2.1	
31	0417	0423	0442D	1-	1			1			0415	C4.8	
31	0442E	0450	0450D	1-	1			1			0427	C4.0	
31	0538E	0538	0602	1-	1			1			0526	C2.8	7640
31	0623	0639	0716	1-	1			1			0624	C3.2	7645
31	1441	1443	1448	1-	1					1	1441	C2.0	7640

* = no flare patrol.

OBSERVATORIES REPORTING FOR DECEMBER 1993

Boksburg, Rep of S. Africa	SES	Manahawkin, New Jersey, USA	SES
Brazilian Antarctic Station	SPA, SES	Maui, Hawaii, USA	SWF
Cambridge, England, UK	SES	McDonough, Georgia, USA	SES
Cranford, New Jersey, USA	SES	Nampa, Idaho, USA	SES
Darmstadt, Germany**	SWF	Nerja, Spain	SES
Durham, New Hampshire, USA	SES	Panska Ves, Czechoslovakia	SES, SEA, SWF
Gettysburg, Pennsylvania, USA	SES	Rimavska Sobota, Slovakia	SEA
Hiraiso, Japan	SWF	Rochester, New Hampshire, USA	SES
Houston, Texas, USA	SES	Tucson, Arizona, USA	SES
Hudson, Ohio, USA	SES	Upice, Slovakia	SEA
Inubo, Japan	SPA	Wellington, Ohio, USA	SES
Itapetinga, Brazil	SPA, SES	Windsor Locks, Connecticut, USA	SES
LaCrescenta, California, USA	SES	Ziar nad Hronom, Slovakia	SEA
Madison, Wisconsin, USA	SES	Zilina, Slovakia	SEA

Observations are not necessarily continuous.

** = Final report. Station closing. We appreciate the many years that Darmstadt monitored SWFs and shared their data with the scientific community.

SOLAR RADIO EMISSION
Spectral Observations

DECEMBER 1993

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0700	1200	IZMI				0700.0E	1200.0D	1				IN
			LEAR				0745.0	0746.0	1				III
	0800	1414	POTS				0800.0E	1414.0U	2				I,S,C,DC
			POTS	1108.3	1108.8								DCIM
			POTS				1112.8	1113.0	2				IIIG
			POTS				1234.9	1235.0	1				IIIB
			POTS				1255.3	1255.5	1				IIIB
			POTS				1322.6	1322.8	1				RSG
	3107	2013	ONDR										
02			PALE				0132.0	0133.0	1				III
			LEAR				0331.0	0332.0	2				III
	0700	1200	IZMI										
	0800	1414	POTS				0800.0E	0837.0	1				I,S
			LEAR				0809.0	0811.0	3				V
			SVTO				0809.0	0813.0	2				V
			POTS				0809.3	0810.6	2				IIIB
	0812	1326	ONDR										
			POTS				1045.0E	1414.0U	1				I,S
03			LEAR				0444.0	0444.0	1				III
			LEAR				0632.0	0633.0	2				III
			LEAR				0636.0	0643.0	3				II 1400km/s
			SVTO				0639.0	0641.0	1				II 1600km/s
			LEAR				0652.0	0655.0	2				III
	0700	1200	IZMI				0700.0E	1200.0D	1				IN
			SVTO				0721.0	0721.0	2				III
	0800	1414	POTS				0800.0E	1414.0U	1				I,S,DC
	0813	1324	ONDR				0952.0	1000.0	1				III G
			POTS				1335.8	1337.1	1				IIIG
04	0700	1200	IZMI										
	0815	1325	ONDR										
05	0700	1200	IZMI										
	0817	1325	ONDR										
	0837	1325	ONDR				0837.0	1325.0	1				I N
06	0700	1200	IZMI										
	0800	1414	POTS										
	0818	1323	ONDR										
			PALE				1837.0	1838.0	1				III
07			LEAR				0135.0	0136.0	3				III
			PALE				0136.0	0136.0	1				III
	0800	1414	POTS				0800.0E	1046.0	1				I,S
	0820	1321	ONDR										
	0700	1200	IZMI				0913.0	1000.0	1				IN
08	0700	1200	IZMI										
	0821	1323	ONDR										
09	0823	1321	ONDR										
	0700	1200	IZMI				1002.0	1002.8	1				CONT
			IZMI				1105.0	1200.0D	1				IN
10	0700	1200	IZMI										
	0824	1319	ONDR										
	0800	1414	POTS				1316.4	1346.0	1				I,S
11	0700	1200	IZMI										
	0826	1320	ONDR										
			SVTO				1330.0	1330.0	2				III
12	0700	1200	IZMI										
	0827	1318	ONDR										
13	0700	1200	IZMI										
	0831	1321	ONDR										

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

DECEMBER 1993

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
13	0800	1353	POTS				1108.4	1108.6	2				UNCLF
14	0700	1200	IZMI										
	0800	1353	POTS				0823.3	0823.4	2				UNCLF
	0829	1318	ONDR										
			SGMR				1351.0	1351.0	1				III
			SVTO				1351.0	1351.0	1				III
			POTS				1351.3	1352.5	3				IIIG,V
15			LEAR				0828.0	0829.0	1				III
	0800	1353	POTS				0828.3	0829.1	2				IIIG
	0700	1200	IZMI				0828.7	0829.0	2				III,Y
	0830	1320	ONDR										
			POTS				0910.1	0910.3	1				IIIG
			IZMI				0929.9	0930.6	1				IIIG,CONT
			IZMI				1110.9	1111.4	1				IIIG
			POTS				1110.9	1112.5	1				IIIG
			PALE				2111.0	2112.0	1				III
16	0700	1200	IZMI										
	0826	1320	ONDR										
	0800	1353	POTS				1308.5	1308.6	2				IIIB
			LEAR				2324.0	2325.0	1				III
			LEAR				2328.0	2331.0	2				III
			PALE				2328.0	2331.0	2				V
17			LEAR				0454.0	0502.0	2				III
			LEAR				0600.0	0604.0	3				III
	0832	1320	ONDR										
	0800	1353	POTS				0933.9	0934.0	1				IIIB
	0700	1200	IZMI				0957.5	0958.5	1				IIIG
			POTS				0957.5	1004.8	1				IIIGG
			IZMI				1004.0	1004.7	1				IIIG
			POTS				1319.1	1319.2	1				IIIB
			POTS				1335.3	1325.4	1				IIIB
			PALE				1827.0	1828.0	1				III
			PALE				1902.0	2007.0	1				S
			PALE				2212.0	2216.0	1				III
18	0700	1200	IZMI				0825.3	0825.8	1				IIIG
	0833	1320	ONDR										
			IZMI				0836.0	0837.0	1				IIIG
			IZMI				0842.0	0846.0	1				INI
			IZMI				1051.5	1051.9	1				IIIG
			IZMI				1135.0	1137.4	1				IIIGG
			SVTO				1135.0	1137.0	1				III
			IZMI				1140.1	1141.6	1				IIIG
			LEAR				2302.0	2302.0	2				III
19			LEAR				0504.0	0504.0	1				III
			LEAR				0602.0	0603.0	1				III
			LEAR				0615.0	0617.0	1				III
	0700	1200	IZMI										
	0834	1320	ONDR										
20			LEAR				0156.0	0158.0	2				III
	0834	1320	ONDR										
	0700	1200	IZMI				1004.1	1004.1	1				III
	0800	1353	POTS				1004.1	1004.5	1				IIIG
			POTS				1005.5	1005.6	1				IIIG
			IZMI				1011.4	1011.7	1				IIIG
			POTS				1059.9	1100.8	1				IIIG
			IZMI				1100.6	1103.3	1				IIIGG
			POTS				1101.6	1101.7	1				IIIB
			POTS				1103.0	1103.2	1				IIIB
			IZMI				1111.0	1125.0	1				IN
			IZMI				1133.5	1133.6	1				III
			POTS				1133.5	1133.7	1				UNCLF
			POTS				1212.7	1214.7	1				IIIGG

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

DECEMBER 1993

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
20			SVTO				1213.0	1214.0	1				III
			POTS				1215.0	1215.7	1				IIIG
			POTS				1333.1	1333.7	1				IIIG
			SGMR				1444.0	1445.0	1				V
			PALE				1849.0	1850.0	1				III
			SGMR				1849.0	1850.0	1				V
21			LEAR				0056.0	0057.0	1				III
			LEAR				0549.0	0550.0	2				III
	0700	1200	IZMI				0711.9	1113.3	1				IIIGG
	0835	1320	ONDR										
	0800	1353	POTS				1314.9	1315.4	1				IIIG
22			LEAR				0347.0	0347.0	1				III
	0700	1200	IZMI				0708.3	0708.4	1				III
	0800	1353	POTS				0800.0E	1353.0U	1				I,S,DC
			IZMI				0904.7	0904.8	1				III
			POTS				1035.0	1035.1	1				IIIB
			POTS				1105.1	1121.2	2				U,IIIGG,RSG
			IZMI				1108.8	1109.0	1				IIIG
	0837	1320	ONDR	1109.6	1110.4	3	1109.6	1110.4	3				III G
			IZMI				1109.9	1111.0	2				IIIG
			IZMI				1116.4	1117.5	2				IIIG
			IZMI				1118.0	1119.4	2				IIIG,V
			IZMI				1120.0	1122.3	1				IIIG,G
			POTS				1246.3	1246.5	1				IIIG
			POTS				1247.1	1247.2	1				IIIB
			POTS				1250.0	1250.1	1				IIIB
			POTS				1259.0	1302.7	2				IIIGG,V,RS
			SVTO				1300.0	1302.0	2				III
			SGMR				1301.0	1301.0	1				III
			POTS				1311.3	1311.4	1				IIIB
			POTS				1341.9	1342.5	2				IIIG
			POTS				1346.3	1349.8	2				IIIGG
			SGMR				1349.0	1349.0	1				III
			SVTO				1349.0	1349.0	1				III
			PALE				1725.0	1732.0	2				V
			PALE				1902.0	1903.0	2				III
			PALE				2029.0	2030.0	2				III
			SGMR				2029.0	2030.0	1				III
			PALE				2110.0	2111.0	2				III
			PALE				2151.0	2152.0	2				III
23			LEAR				0019.0	0020.0	3				III
			PALE				0019.0	0020.0	2				III
			LEAR				0528.0	0529.0	3				III
			LEAR				0534.0	0534.0	3				III
	0650	1200	IZMI				0652.3	0652.9	2				IIIG
			IZMI				0732.8	0732.9	1				III
			IZMI				0750.1	0750.4	1				I
	0800	1353	POTS				0800.0E	1353.0U	1				I,S
	0837	1320	ONDR										
			POTS	0854.9	0859.5	1							DCIM,P,IIIB
			IZMI				0859.4	0859.5	1				III
			POTS	0904.2	0904.5	1							DCIM
			POTS				0928.5	0937.6	2				IIIG,RSG
			IZMI				0936.8	0945.6	1				IN
			POTS	1002.1	1002.2	2							DCIM
			IZMI				1017.0	1200.0D	1				IN
			POTS				1235.1	1236.2	1				IIIG
			PALE				1901.0	1902.0	1				III
			SGMR				1901.0	1902.0	1				III
			PALE				2022.0	2023.0	1				III
			SGMR				2022.0	2023.0	2				III
			PALE				2026.0	2027.0	1				III
			SGMR				2026.0	2027.0	1				III
			PALE				2057.0	0020.0	1				CONT
			LEAR				2217.0	0800.0	1				CONT

SOLAR RADIO EMISSION
Spectral Observations

DECEMBER 1993

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
24	0650	1200	IZMI				0650.0E	1200.0D	2				IS
	0800	1353	POTS				0800.0E	1353.0U					I,S,DC
	0838	1320	ONDR				0838.0	1324.0	1				I N
			ONDR	0951.1	0951.3	2							III G
			POTS	0951.2	0951.3	2							DCIM
			SVTO				1100.0	1308.0	1				CONT
			POTS				1147.4	1147.5	1				IIIB
			SVTO				1218.0	1218.0	2				III
25			SVTO				0652.0	0653.0	2				III
	0655	1200	IZMI				0655.0E	1200.0D	1				IN
			IZMI				0847.3	0847.5	1				IIIG
			IZMI				1006.9	1007.5	2				IIIG
			ONDR				1007.0	1007.8	2				III GG
			IZMI				1115.9	1116.4	1				IIIG
			IZMI				1121.7	1125.1	1				IIIG
			SGMR				1522.0	1522.0	1				III
			PALE				1929.0	1929.0	1				III
			PALE				2021.0	2024.0	2				III
26	0700	1200	IZMI				0700.0E	1200.0D	1				IS
			LEAR				0726.0	0727.0	3				III
			SVTO				0726.0	0726.0	2				III
			IZMI				0726.2	0727.2	2				IIIG, V
			IZMI				0727.7	0728.3	1				IIIG
			IZMI				0728.5	0737.0	2				II
			IZMI				0731.5	0731.6	2				IIIG
			LEAR				0825.0	0826.0	1				III
			IZMI				0825.5	0826.8	1				IIIG
			SVTO				0931.0	0932.0	2				III
	0837	1320	ONDR	0939.0	0941.0	3	0939.0	0941.0	3				III GGU
			IZMI				0939.1	0940.9	2				IIIG
			ONDR				1053.2	1053.9	3				III GGU
			ONDR	1053.6	1053.8	3							III G
			ONDR	1120.0	1120.4	2	1120.0	1120.4	2				V
			ONDR	1130.5	1130.6	3							III G
			ONDR	1251.9	1255.0	3	1251.9	1255.0	3				III GGU
			PALE				2024.0	2041.0	1				S
27	0655	1200	IZMI				0655.0E	1200.0D	1				IN
	0800	1353	POTS				0800.0E	1353.0U	1				I,S
			POTS				0901.6	0901.7	1				IIIB
			POTS	0909.7	0909.8	1							DCIM
			POTS				0911.6	0918.1	2				IIIG,II,HARM
	0837	1320	ONDR	0915.0	0918.0	3	0915.0	0918.0	3				II
			IZMI				0915.1	0919.3	2				II
			POTS	0924.1	0925.1	1							IIIG,RS,DCIM
			IZMI				0928.4	0928.6	2				IIIG
			ONDR	0928.4	0928.6	3	0928.4	0928.0	3				III G
			POTS				0928.4	0929.0	1				IIIG
			POTS				0951.0	0954.2	2				IIIG
			IZMI				0952.9	0954.8	2				IIIGG
			ONDR	0953.0	0954.2	2	0953.0	0954.2	2				III GG
			POTS				1018.1	1018.8	1				IIIG,RS
			POTS				1131.8	1131.9	1				IIIB
			POTS				1316.2	1316.6	1				IIIG
			POTS				1326.3	1326.6	2				RS,IIIG
28	0800	1353	POTS				0831.5	0834.9	1				IIIG,I,S
			POTS	0859.3	0900.4	2							RSG,IIIG,DCIM
			POTS				0935.1	0935.6	1				I,S
			POTS				1040.2	1041.4	1				I,S
			POTS				1044.1	1044.2	1				RS
			POTS	1059.5	1100.2	1							DCIM
			POTS				1101.5	1102.0	1				I,S,IIIG
			POTS				1113.0	1240.0	1				I,S
	0700	1200	IZMI				1126.3	1137.0	1				IN
			POTS				1208.1	1218.5	2				II IIIG,H,HARM
	0837	1320	ONDR				1212.0	1213.2	1				II

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

DECEMBER 1993

Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
Day 28												
		SVTO				1214.0	1215.0	1				III
		POTS				1350.6	1351.0	1				IIIB
Day 29												
		LEAR				0745.0	0747.0	3				III
0700	1200	IZMI				0745.5	0747.0	2				IIIG,V
0837	1320	ONDR										
0800	1353	POTS				0927.4	0931.3	1				IIIGG
		POTS				1345.8	1346.5	1				IIIG
		POTS				1351.4	1351.6	1				UNCLF
Day 30												
		LEAR				0447.0	0448.0	2				III
		LEAR				0542.0	0543.0	2				III
0700	1200	IZMI				0655.0	0703.0	1				IN
		IZMI				0748.3	0748.8	1				IIIG
0800	1353	POTS				0800.0E	1353.0U	1				I,S
		POTS	0820.8	0821.1	2							RS,DCIM
		POTS				0823.7	0824.6	1				IIIG
0837	1320	ONDR										
		POTS				0842.2	0842.3	1				IIIG
		POTS				0849.3	0849.4	1				IIIB
		POTS				0911.5	0912.8	2				IIIG
		LEAR				0920.0	0921.0	2				III
		SVTO				0920.0	0921.0	2				III
		IZMI				0920.4	0921.3	2				IIIG,V
		POTS				0920.4	0921.3	2				IIIG
		LEAR				0959.0	1000.0	2				III
		POTS				0959.0	1010.6	2				IIIGG
		SVTO				0959.0	1006.0	2				III
		IZMI				0959.3	1000.0	2				IIIGG
		IZMI				1003.8	1005.5	2				IIIGG
		LEAR				1004.0	1006.0	2				III
		POTS				1017.6	1017.8	1				UNCLF
		IZMI				1017.7	1017.9	1				IIIG
		POTS				1029.1	1029.2	1				IIIB
		POTS	1033.0	1033.2	1							DCIM
		POTS				1036.3	1036.8	1				IIIG
		IZMI				1050.0	1050.5	1				IIIG
		POTS				1050.1	1053.9	1				IIIG
		IZMI				1053.7	1053.8	2				III
		POTS				1131.5	1131.6	1				IIIB
		POTS				1159.2	1211.9	1				RS,IIIGG
		SVTO				1202.0	1203.0	1				III
		SVTO				1224.0	1225.0	2				III
		POTS				1232.9	1233.1	1				IIIB
		POTS				1253.1	1255.0	2				IIIGG,V,RS,U,C
		SVTO				1254.0	1255.0	2				III
		POTS				1334.5	1335.2	1				IIIG
		POTS				1339.6	1339.7	1				IIIB
		PALE				2103.0	2107.0	2				III
Day 31												
		LEAR				0250.0	0251.0	1				III
		LEAR				0333.0	0333.0	2				III
		LEAR				0614.0	0615.0	2				III
0700	1200	IZMI				0651.0E	1200.0D	2				IS
		IZMI				0731.4	0731.5	1				III
0800	1353	POTS				0800.0E	1353.0U	1				I,S
		POTS				1009.8	1017.3	1				IIIG
		IZMI				1017.0	1017.3	1				IIIG
		SVTO				1107.0	1156.0	1				CONT

SOLAR RADIO NOISE STORM AT 164 MHZ
FROM NANCAY RADIOHELIOGRAPH

DECEMBER 1993

DAY	HELIOGRAPHIC POSITIONS MEAN VALUES* E-W	S-N	IMP**	OBSERVING TIME*** START (UT)	END (UT)
02/12/93	+0.50	+0.07	1	1015	1440 D
03/12/93	+1.10	-0.13	2	0900 E	1405 D
04/12/93	+1.13	-0.05	1	0935 E	1435 D
06/12/93	-0.51	-0.34	1	0845 E	1130
07/12/93	-0.15	-0.12	1	0855 E	1435 D
09/12/93	+0.32	-0.06	1	0900	1435 D
10/12/93	+0.73	+0.14	1	0840 E	1145
23/12/93	-0.75	+0.26	1	0840 E	1245 D
24/12/93	-0.69	+0.31	2	0900 E	1435 D
24/12/93	-0.48	+0.30	2	0900 E	1435 D
25/12/93	-0.58	+0.47	1	0825 E	1435 D
25/12/93	-0.12	+0.28	1	0825 E	1435 D
26/12/93	-0.32	+0.22	1	0845 E	1435 D
27/12/93	-0.06	+0.01	1	0845 E	1400
30/12/93	-0.99	+0.22	1	0915	1445 D
31/12/93	-0.73	+0.49	1	0845 E	1445 D
31/12/93	+1.44	+0.20	2	0845 E	1445 D

8,17,18,20: NO DATA
OTHER DAYS : NO DETECTABLE NOISE STORMS

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* POSITIVE E-W AND S-N COORDINATES CORRESPOND TO THE N-W SOLAR QUADRANT

** IMP 1: FLUX<5 SFU IMP 2: 5<FLUX<20 IMP 3: 20<FLUX<100 SFU
IMP 4: 100FLUX<300 SFU IMP 5: FLUX>300 SFU

*** E NOISE STORM IN PROGRESS AT THE BEGINNING OF THE NANCAY OBSERVATIONS
D NOISE STORM IN PROGRESS AT THE END OF THE NANCAY OBSERVATIONS

COSMIC RAY INDICES
(Neutron Monitor)
DECEMBER 1993

Day	THULE Average (cts/h)/100	DEEP RIVER Average (cts/h)/300	KIEL Average (cts/h)/100	CLIMAX Average (cts/h)/100	BEIJING Average (cts/h) 256	TOKYO Average (cts/h)/256	HALEAKALA Average (cts/h)/100
1	4451	7035.5		4104.5	2005.9	3562.7	3527.8
2	4411	7002.3		4105.3	2008.6	3563.3	3525.5
3	4375	6956.0		4077.4	1997.7	3524.5	3503.0
4	4408	6957.0		4041.8	1995.1	3527.7	3479.0
5	4394	6963.8		4051.9	2004.2	3537.5	3476.9
6	4417	6992.0		4062.5	1997.8	3552.0	3476.7
7	4413	6940.0		4067.1	2006.9	3559.6	3490.4
8	4344	6921.2		4027.4	1995.6	3561.9	3488.2
9	4383	6939.3		4014.2	1993.6	3535.8	3492.2
10	4400	6983.8		4039.9	1996.9	3532.5	3503.4
11	4414	7034.6		4057.0	1998.2	3551.9	3512.1
12	4428	7048.2		4104.6	2016.5	3552.0	3523.8
13	4454	7048.3		4099.0	2021.5	3549.8	3522.9
14	4468	7082.5		4112.6	2024.0	3560.9	3533.9
15	4487	7086.0		4136.3	2027.7	3584.4	3536.1
16	4450	7065.8		4122.6	2029.6	3566.0	3524.2
17	4449	7026.0		4080.6	2022.3	3560.2	3511.3
18	4422	7024.2		4067.5	2014.0	3560.8	3510.0
19	4424	7025.0		4074.9	2018.3	3566.3	3500.7
20	4409	7016.1		4060.8	2018.2	3556.0	3509.0
21	4408	7002.8		4057.6	2014.2	3550.3	3510.0
22	4410	7014.0		4054.5	2004.9	3574.6	3522.7
23	4416	7027.7		4062.2	2004.2	3569.3	3529.4
24	4416	7041.7		4047.7	2004.5	3566.2	3537.6
25	4427	7065.1		4059.0	2009.4	3572.1	3543.2
26	4429	7090.7		4061.0	2013.7	3556.7	3538.5
27	4420	7055.5		4074.0	2008.7	3568.0	3530.6
28	4428	7045.9		4076.5	2006.0	3562.6	3529.1
29	4427	7057.0		4067.3	2007.0	3566.9	3534.6
30	4438	7095.6		4083.5	2020.5	3574.8	3539.8
31	4429	7053.5		4107.4	2018.6	3571.7	3532.2
Mean	4420.9	7022.5		4072.9	2009.8	3558.0	3516.0

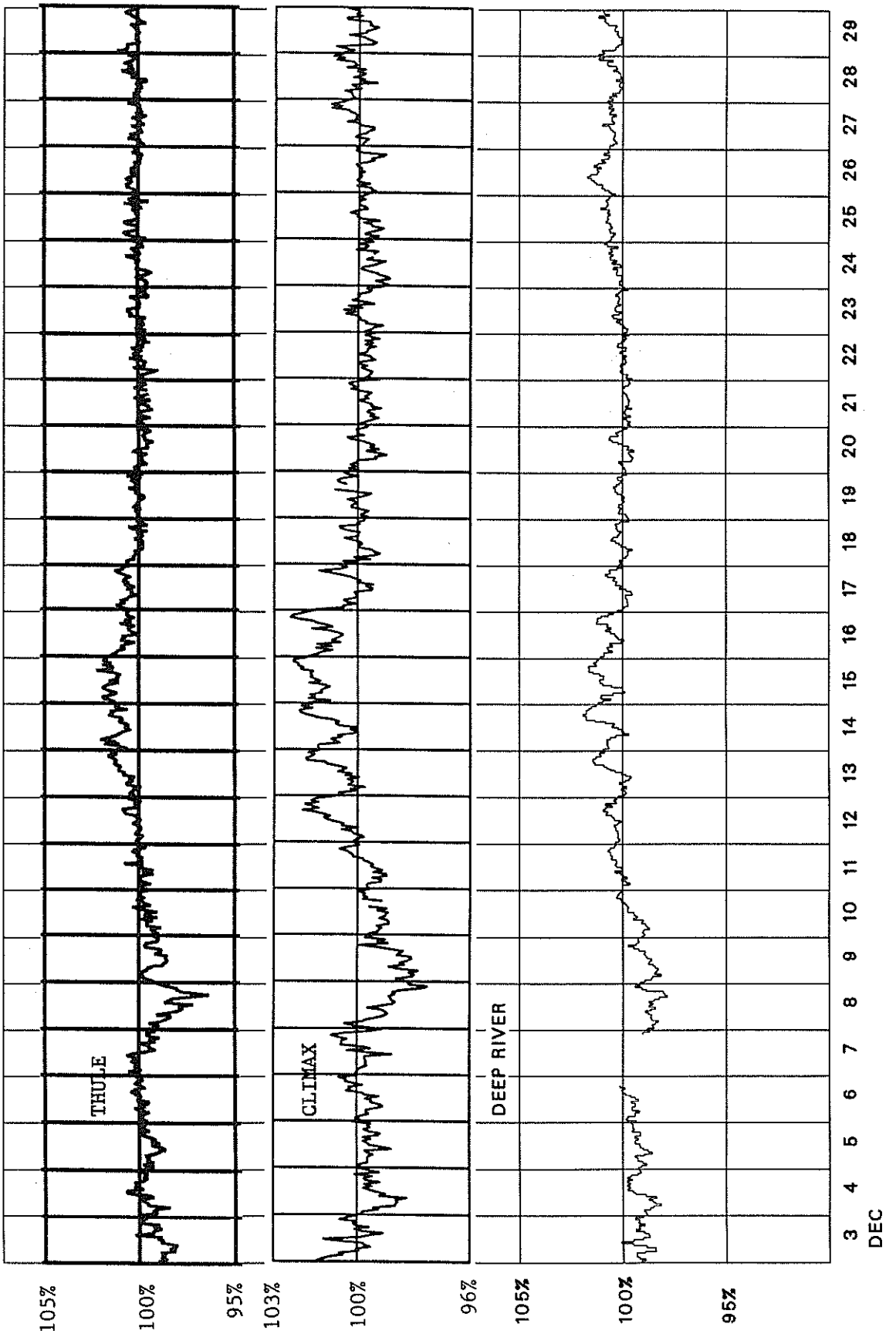
For less than 24-hour coverage, parentheses enclose the number of hours for which data are available. For Climax and Haleakala, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours.

* = A&B includes only hours when both A&B sections are available.

The Haleakala super neutron monitor data replace the Huancayo IGY neutron monitor data.

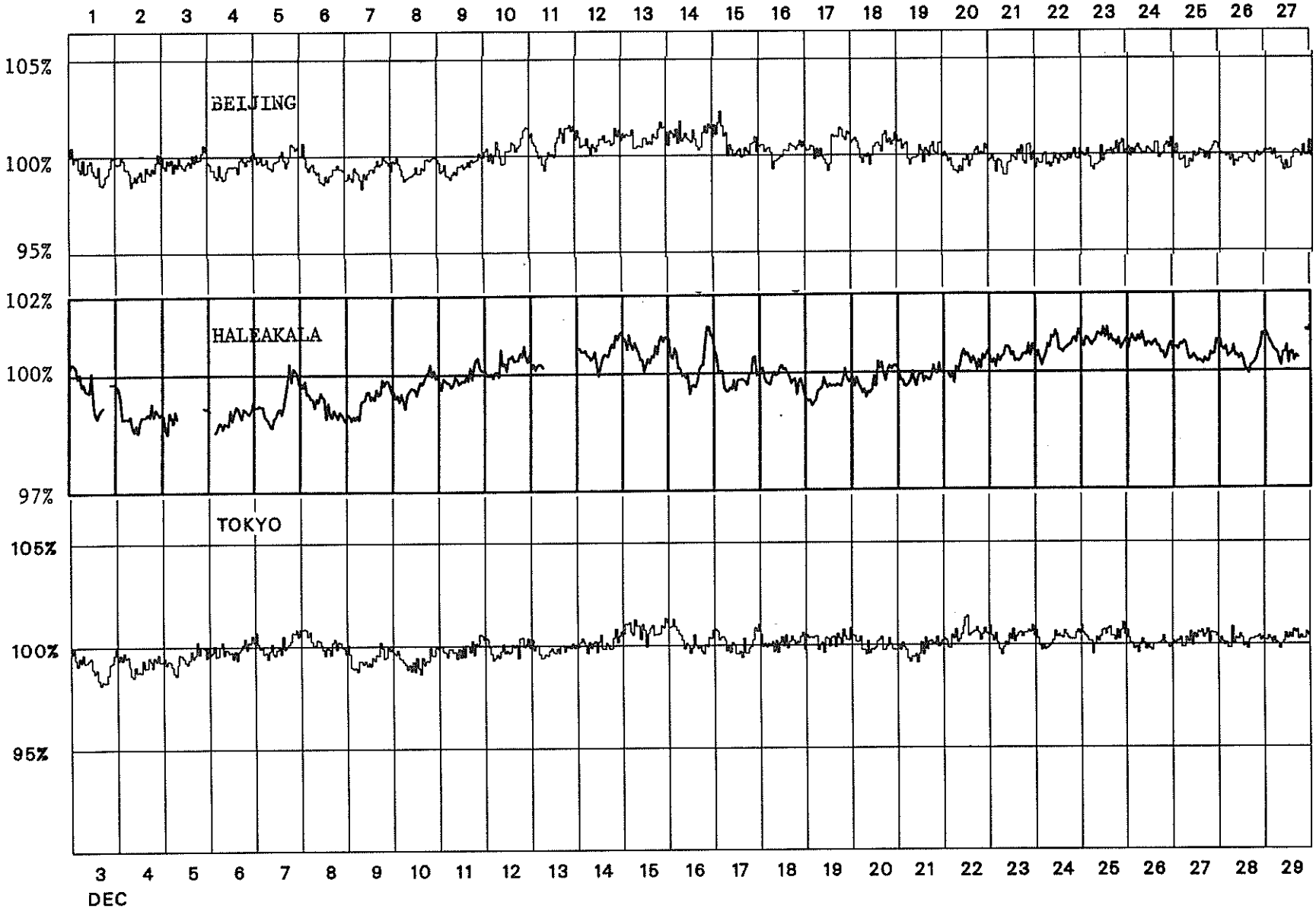
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2190 (December 1993)

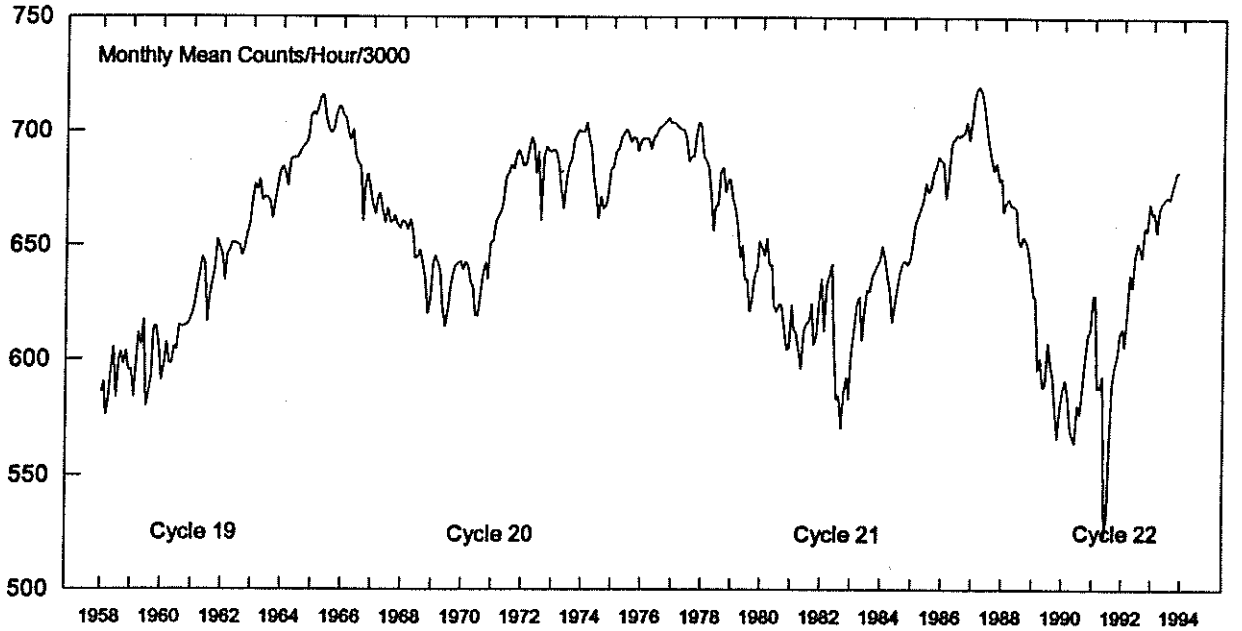


COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2190 (December 1993)



Deep River Neutron Monitor Normalized Values Jan 1958 - Dec 1993



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1958	5860	5906	5759	5822	5959	6053	5834	5994	6033	5978	6039	5952	5932
1959	5955	5839	5960	6116	6062	6173	5796	5860	5930	6135	6143	6066	6003
1960	5910	5971	6075	5983	5984	6058	6044	6151	6142	6144	6151	6165	6065
1961	6199	6234	6303	6376	6447	6424	6163	6283	6333	6390	6527	6492	6348
1962	6462	6346	6459	6478	6512	6509	6507	6497	6456	6483	6554	6591	6488
1963	6702	6768	6745	6789	6696	6711	6709	6692	6617	6677	6750	6818	6723
1964	6842	6820	6760	6873	6886	6883	6885	6911	6930	6945	6962	7071	6897
1965	7082	7071	7105	7151	7156	7062	7008	6992	7005	7056	7103	7106	7075
1966	7066	7055	6985	6963	7006	6892	6856	6846	6608	6761	6812	6751	6883
1967	6676	6639	6714	6728	6651	6599	6663	6603	6605	6629	6591	6576	6640
1968	6608	6600	6569	6612	6559	6443	6449	6480	6421	6355	6200	6260	6463
1969	6422	6456	6424	6389	6215	6143	6210	6317	6380	6410	6423	6430	6352
1970	6394	6429	6409	6332	6324	6192	6192	6288	6384	6426	6353	6515	6353
1971	6517	6603	6627	6651	6688	6798	6816	6851	6836	6896	6915	6889	6757
1972	6846	6856	6920	6974	6939	6814	6909	6609	6882	6933	6912	6911	6875
1973	6919	6908	6858	6740	6660	6784	6847	6877	6966	6981	7005	6998	6879
1974	6997	7040	6965	6919	6801	6726	6615	6713	6660	6674	6719	6829	6805
1975	6845	6909	6918	6975	6985	7007	6990	6953	6974	6965	6909	6957	6949
1976	6966	6969	6964	6922	6976	6979	7011	7020	7032	7044	7059	7037	6998
1977	7040	7032	7017	7009	7006	6968	6868	6890	6891	6974	7041	7028	6980
1978	6894	6874	6843	6724	6567	6673	6677	6828	6840	6732	6788	6790	6769
1979	6704	6669	6586	6448	6504	6354	6355	6212	6261	6378	6393	6520	6449
1980	6496	6457	6533	6413	6417	6236	6213	6242	6240	6143	6048	6058	6291
1981	6243	6132	6118	6041	5965	6129	6160	6170	6248	6067	6099	6250	6135
1982	6356	6127	6326	6373	6422	6112	5831	5850	5706	5867	5930	5836	6061
1983	6034	6130	6252	6276	6088	6196	6307	6297	6365	6392	6419	6442	6267
1984	6500	6450	6371	6303	6163	6249	6308	6379	6426	6435	6415	6441	6370
1985	6513	6592	6624	6660	6695	6776	6736	6757	6826	6837	6891	6877	6732
1986	6866	6707	6800	6953	6969	6986	6980	6988	6993	7045	6963	7053	6942
1987	7142	7193	7199	7167	7102	7004	6937	6883	6830	6863	6785	6798	6992
1988	6651	6687	6705	6678	6674	6662	6532	6502	6544	6519	6480	6381	6585
1989	6279	6277	5958	6011	5883	5899	6078	5985	5925	5792	5665	5790	5962
1990	5869	5916	5852	5701	5666	5646	5807	5768	5883	6006	6106	6133	5863
1991	6282	6285	5881	5881	5935	5227	5333	5622	5894	5974	6014	6118	5871
1992	6139	6060	6197	6378	6317	6455	6517	6499	6452	6585	6570	6692	6405
1993	6642	6649	6563	6663	6695	6706	6720	6707	6755	6789	6825	6830	6712

Multiply table entries by 300 to obtain hourly counting rate. Deep River, Canada: N46 W77, Alt=145m, Cutoff Rigidity=1.02 GV.

Data are preliminary from Jan 92 on.

Deep River Normalization

The Deep River monitor station was set up by Atomic Energy of Canada Ltd in 1957 and operated by them until Hugh Carmichael and John Steljes retired in 1972, at which time the National Research Council assumed responsibility. The original monitor was an eight counter "IGY type" which operated from June to December of 1957 but drifts in the high voltage sets meant that the results were of little value. This suggests the 1957 data must be treated with extreme caution! A 16-counter monitor of the same type, but with reliable electronics, was brought into operation in January 1958 and continued until the first of the NM-64 monitors was installed in April, 1962. The counting rate of this monitor was about 60,000 counts per hour (scaled by a factor of 30).

The first of the super monitors, a 24-NM-64, was in operation from April 1962, until February 1965, when the present 48-NM-64 was installed. The 24-counter monitor had a counting rate of over 600,000 counts per hour (scaled by a factor of 100) compared with over 2 million counts per hour for the present monitor. Normalization factors are essential in order to provide a consistent dataset which allows long-term comparisons of the data. Pre-February 1965 values take into account changes in the physical characteristics of the various monitors, differences in counting rates and scaling factors. The later values include compensation for the drift of the servo-barometer since 1965 and a factor allowing for the differences in shielding over various parts of the monitor.

The following is a list of the normalization factors used to produce these data. Since the numbers are not yet available for 1992 and 1993 we have to use the 1991 data for these years. Also there is an additional factor of 0.9867 which has been applied to the data from July 1992 to take account of the change from the old data acquisition system to the present system, and has been incorporated into the factors.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1958	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1959	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1960	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1961	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1962	1.0000	1.0000	1.0000	2.2247	1.1083	1.1056	1.0996	1.0984	1.1009	1.1063	1.1086	1.1159
1963	1.1188	1.1193	1.1162	1.1169	1.1156	1.1064	1.1047	1.1059	1.1046	1.1048	1.1111	1.1168
1964	1.1098	1.1023	1.1037	1.1023	1.0991	1.0983	1.0993	1.1009	1.1046	1.1035	1.1063	2.8535
1965	2.8672	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1966	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1967	1.0007	1.0008	1.0000	0.9984	0.9990	1.0003	0.9997	1.0000	1.0002	0.9984	1.0017	1.0018
1968	1.0005	1.0012	1.0013	1.0005	1.0005	1.0019	1.0011	1.0012	1.0015	1.0024	1.0040	1.0054
1969	1.0044	1.0041	1.0041	1.0027	1.0028	1.0035	1.0018	1.0028	1.0026	1.0030	1.0034	1.0048
1970	0.9980	0.9962	0.9972	0.9966	0.9947	0.9961	0.9963	0.9956	0.9954	0.9951	0.9963	0.9967
1971	0.9974	0.9959	0.9959	0.9946	0.9922	0.9917	0.9913	0.9908	0.9911	0.9914	0.9923	0.9934
1972	0.9936	0.9939	0.9928	0.9915	0.9904	0.9915	0.9908	0.9917	0.9920	0.9922	0.9924	0.9926
1973	0.9926	0.9929	0.9923	0.9915	0.9911	0.9892	0.9883	0.9885	0.9883	0.9886	0.9888	0.9942
1974	0.9953	0.9954	0.9960	0.9948	0.9942	0.9939	0.9938	0.9931	0.9928	0.9926	0.9926	0.9933
1975	0.9936	0.9939	0.9937	0.9933	0.9924	0.9920	0.9911	0.9908	0.9916	0.9918	0.9918	0.9921
1976	0.9927	0.9927	0.9927	0.9915	0.9911	0.9905	0.9906	0.9903	0.9908	0.9921	0.9937	0.9926
1977	0.9943	0.9943	0.9926	0.9912	0.9909	0.9908	0.9913	0.9915	0.9917	0.9930	0.9936	0.9941
1978	0.9931	0.9937	0.9933	0.9923	0.9909	0.9897	0.9900	0.9884	0.9891	0.9905	0.9914	0.9923
1979	0.9937	0.9940	0.9927	0.9903	0.9889	0.9894	0.9902	0.9924	0.9924	0.9912	0.9910	0.9918
1980	0.9946	0.9936	0.9938	0.9925	0.9911	0.9901	0.9911	0.9912	0.9908	0.9917	0.9932	0.9939
1981	0.9927	0.9935	0.9924	0.9921	0.9921	0.9906	0.9907	0.9936	0.9938	0.9944	0.9941	0.9939
1982	0.9949	0.9957	0.9950	0.9933	0.9907	0.9914	0.9913	0.9915	0.9922	0.9934	0.9932	0.9943
1983	0.9954	0.9937	0.9932	0.9925	0.9916	0.9909	0.9899	0.9902	0.9908	0.9914	0.9920	0.9938
1984	0.9935	0.9922	0.9931	0.9912	0.9917	0.9905	0.9912	0.9894	0.9900	0.9900	0.9907	0.9913
1985	0.9933	0.9924	0.9921	0.9911	0.9900	0.9896	0.9892	0.9895	0.9894	0.9909	0.9922	0.9916
1986	0.9900	0.9910	0.9893	0.9881	0.9886	0.9880	0.9872	0.9872	0.9868	0.9862	0.9881	0.9888
1987	0.9887	0.9875	0.9877	0.9845	0.9827	0.9835	0.9825	0.9821	0.9832	0.9845	0.9836	0.9854
1988	0.9862	0.9854	0.9848	0.9836	0.9822	0.9826	0.9821	0.9818	0.9834	0.9843	0.9841	0.9853
1989	0.9883	0.9874	0.9882	0.9870	0.9862	0.9863	0.9842	0.9848	0.9842	0.9847	0.9859	0.9875
1990	0.9877	0.9875	0.9877	0.9859	0.9850	0.9844	0.9839	0.9838	0.9838	0.9848	0.9848	0.9860
1991	0.9863	0.9864	0.9858	0.9845	0.9836	0.9841	0.9828	0.9821	0.9817	0.9829	0.9839	0.9857
1992	0.9863	0.9864	0.9858	0.9845	0.9836	0.9710	0.9697	0.9690	0.9686	0.9698	0.9708	0.9726
1993	0.9731	0.9732	0.9727	0.9714	0.9705	0.9710	0.9697	0.9690	0.9686	0.9698	0.9708	0.9726

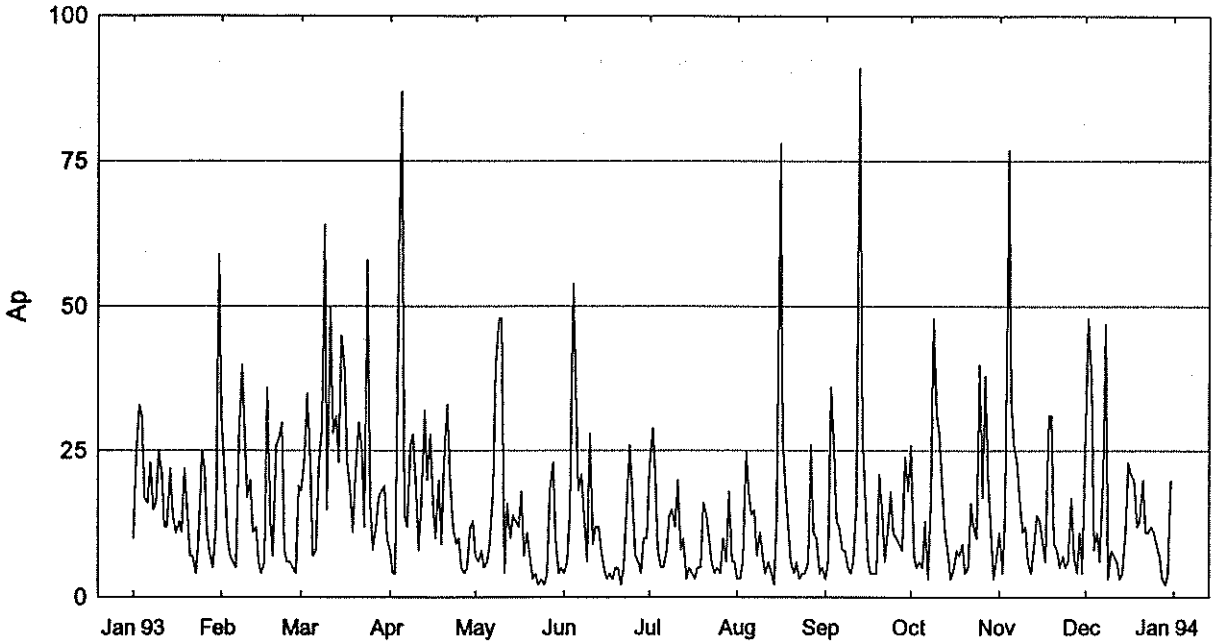
GEOMAGNETIC ACTIVITY INDICES

December 1993

Day		Kp Three-Hourly Indices 1	2	3	4	5	6	7	8	Sum	Ap	Cp	Ka Three-Hourly Indices 1	2	3	4	5	6	7	8	aa Provisional Am	N	S	N	
1	D4	3-	2-	2-	4+	4+	5-	4	6	29+	29	1.3	2+	2o	2o	4o	5o	4+	4-	5+	54	56	51	25	82	
2	D1	5-	5-	5-	4+	4	4+	6-	7-	39	48	1.6	4o	4-	4o	4o	4o	5-	5+	6-	72	69	58	42	86	
3	D3	6+	5+	5	4	4-	2+	4-	3	33+	37	1.4	5o	4o	5-	4-	3+	2+	4-	2+	48	52	43	58	37	
4		2-	1	1+	2	2-	2-	3+	2+	15	8	0.4	2-	1o	1+	2-	2-	3-	3+	2o	16	20	12	11	21	
5		1+	1	1	2+	3	4-	3+	2+	18	11	0.6	1-	1o	1+	2+	3+	3o	3o	2+	19	23	18	10	31	
6	Q8	2	1+	2-	1+	2	2-	2	2	14	6	0.3	2-	1+	1+	2-	2-	2-	2o	2-	12	12	8	9	11	C
7		3-	1	2-	1	4+	4	4	5	24-	20	1.0	3-	2o	2-	2+	4+	4-	4o	4+	36	44	86	68	62	
8	D2	6+	6+	5	5	4+	5-	3+	1+	36+	47	1.5	5+	4+	4o	5-	4o	4o	3+	2-	59	68	6	44	29	
9	Q1	1	1-	0+	0+	0	1-	0+	2-	5	3	0.0	1+	1-	1-	0+	1-	1+	1-	2o	7	5	6	4	7	CK
10		2+	2	2-	2	2+	2-	3-	2	17-	8	0.4	2o	1+	2-	2+	3-	2o	3-	2o	17	18	15	11	22	
11	Q10A	3+	2+	2	1+	2-	1+	2-	1-	14+	7	0.4	2+	2-	2+	2-	2o	2-	2o	1o	14	14	12	15	11	C
12	Q7	2-	1	1+	3-	2-	2	1-	1+	12+	6	0.3	1+	1o	2-	3o	2+	2+	1-	1+	13	13	10	10	12	CC
13	Q4	1+	1	0+	1	0+	0+	0+	2-	6+	3	0.1	1+	1o	1-	1+	1-	0+	1-	2-	7	9	4	5	8	CC
14	Q5	2-	2	1-	1	0+	1-	1-	1-	8-	4	0.1	1+	1+	1o	2-	1+	1+	1-	1-	8	8	7	9	6	CK
15		2+	3-	4-	3	3	2-	2-	1	19	11	0.6	2-	2+	3+	3-	3o	2-	2+	2o	21	17	29	27	20	
16	D5	2	4-	4-	4-	4+	4-	4	4+	29+	23	1.1	2+	3+	3+	4-	4-	3+	4o	4-	40	48	44	35	58	
17		3+	4	3	3	3+	4-	4+	4-	28+	21	1.1	3o	3o	3-	3o	3o	3o	4o	3+	33	38	26	25	39	
18		3-	3	3+	3	3	4	4	4	27	20	1.0	2+	2+	3-	3o	3o	3+	3+	3+	28	36	28	24	40	
19		4	3	3-	2	2	2+	3-	2	21-	12	0.7	3o	2o	3-	2o	2-	2+	2+	2o	19	23	13	20	16	
20		4	3+	2	2	2+	3-	3-	3	22	13	0.8	3+	3o	2-	2+	2+	2+	3o	3-	24	27	26	27	26	
21		3+	3-	3	3+	3+	4	3+	4+	27+	20	1.0	3-	2+	3-	3+	3o	4-	3-	3+	30	38	32	26	43	
22		3	2+	2+	4-	3	1	2-	2+	19+	11	0.6	2+	2-	2o	4-	3-	1+	2o	3-	20	22	21	25	18	
23		2+	3-	1+	2+	2-	2+	2+	4+	19+	11	0.7	2-	2o	1+	3-	2+	3-	2+	4-	21	29	17	15	32	
24		3-	2	2+	3-	3	3-	3-	3	21	12	0.7	2o	2o	2+	3-	3o	3o	3-	3-	22	22	26	20	28	
25		2	3+	2	3-	3	1+	2+	3	20-	11	0.6	2+	3-	2o	3-	3-	1+	3-	3-	19	25	17	22	20	
26		2+	1	2-	1+	2+	2+	2+	4-	17	9	0.5	2-	1-	1+	1+	3-	2+	2o	3o	16	22	14	12	24	
27	Q9A	2	2+	2-	1	2	3-	1+	1-	14-	7	0.3	1+	2-	2-	1o	2+	3-	2-	1o	13	13	15	11	17	
28	Q3	0+	0	0+	1-	1	1	1+	1+	6	3	0.1	1-	0+	1o	1-	1o	1+	1+	2-	7	8	6	5	9	CC
29	Q2	1	2-	1	0+	0+	0	0	0+	5-	2	0.0	1o	1+	1+	1-	1-	0+	1-	1o	6	8	6	7	7	CC
30	Q6	2	2-	1+	1+	2-	0+	0	0+	9-	4	0.1	2-	1+	2-	2-	2-	1-	0+	1-	8	8	9	11	6	C
31		2	3+	5	4+	2+	3	2	4-	26-	20	1.0	2+	3o	5-	4o	3o	3-	3-	3+	37	36	36	41	31	
Mean											14	0.65									24.1	26.9	22.7		24.8	

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	2-	1+	2-	4o	5o	4+	3+	5+	49	3-	2+	2o	4o	5+	5-	4-	6-	60	105.6	62	70	52	
2	4-	4-	4o	4-	4+	5-	5+	6-	73	4+	4-	4-	4o	4o	4+	5+	6-	70	101.3	56	60	47	
3	5-	4o	5-	4-	4-	2+	4o	2+	50	5o	4o	4+	4-	3o	2+	3+	2o	46	102.6	60	62	49	
4	2-	1-	1o	1+	2-	2+	3+	2o	14	1+	1+	2-	2o	2o	3-	3+	2+	17	101.6	66	71	48	
5	1-	1-	1+	2+	3+	3+	3+	2o	20	1o	1+	1+	3-	3o	2+	3-	2+	17	98.3	63	62	44	
6	1+	1o	1+	1+	2o	2-	2o	1+	11	2o	1+	1+	2-	2-	1+	2+	2o	12	99.9	55	68	46	
7	2o	1o	1+	1+	4o	4-	4+	5-	36	3o	3-	2+	3o	4+	4-	4-	4-	36	103.8	65	66	50	
8	6-	5o	5-	5o	5-	5-	4-	2-	74	5o	4o	4-	4o	3o	3o	3-	2-	44	101.9	57	62	48	
9	1o	0+	0+	0o	1-	1-	1-	1+	5	2-	1+	1o	1o	1o	2-	1o	2+	9	95.4	53	48	41	
10	1+	1+	1o	2+	3-	2o	3o	2-	15	2+	1+	2+	3-	3-	2o	3-	2o	18	93.2	46	40	39	
11	2+	1+	3-	2o	2o	2o	2o	1-	14	3-	2o	2o	1+	2o	1+	2+	1+	14	89.7	35	31	35	
12	1+	1-	2-	3+	2+	2+	1-	1+	14	2-	1+	2-	2+	2-	2+	1-	1+	12	88.1	21	21	33	
13	1-	1-	0+	1+	1-	0o	1-	2-	5	2-	1+	1+	1o	1-	0+	1o	2-	8	85.1	17	19	30	
14	1o	1+	1-	1+	1-	1-	1-	0+	6	2o	1+	1+	2o	1+	2-	1-	1o	10	85.1	23	21	30	
15	2-	2-	3o	3-	3-	2-	2o	1+	17	2-	3-	3+	3o	3+	2-	3-	3-	24	82.8	8	14	27	
16	2o	3o	3o	4-	4o	3+	4o	4o	40	3-	3+	4-	4o	4-	3+	4-	4-	41	81.9	20	22	26	
17	3o	4-	3-	3+	3o	3+	4o	3o	37	3-	3-	3-	3-	3o	3o	4o	3+	30	81.1	21	25	26	
18	2+	2+	3-	3o	3o	3+	4-	3+	30	2+	3-	3-	3o	3-	3o	3o	3+	27	82.4	28	32	27	
19	3+	2o	3-	2-	2o	2+	3-	2-	19	3o	2-	3-	2o	2-	2+	2+	2+	18	84.2	18	19	29	
20	4-	3-	2-	3-	2+	3-	3-	2+	22	3+	3+	2-	2+	3-	2+	3o	3o	26	88.1	27	30	33	
21	3-	2o	3-	4-	3+	4-	3o	4-	33	2+	2+	3-	3o	3-	4-	3-	3o	26	89.9	37	37	35	
22	2o	2-	2o	4-	3-	1+	2-	2+	19	2+	2-	2o	3+	3-	2-	2+	3-	20	96.6	44	45	42	
23	2o	2o	1+	3-	2+	3o	2+	4o	23	2-	2-	1+	3-	2+	3-	2+	4-	20	101.6	54	56	48	
24	2o	2-	2o	3o	3+	3+	2+	3-	22	2o	2o	3-	3-	3-	3-	3-	3-	21	107.5	63	73	54	
25	2-	3-	2o	3-	3-	1+	2+	2+	19	2+	3-	2o	3-	3-	1o	3-	3-	20	115.2	82	90	62	
26	2-	1-	1+	1+	2+	2+	2+	3+	16	2-	1o	1+	2-	3o	2o	2o	3-	16	120.5	62	68	68	
27	2-	1+	2-	1o	2+	3-	1+	1-	12	1+	2-	2-	1o	2+	3o	2-	1o	13	135.8	69	72	85	
28	0+	0+	1-	1-	1+	2-	2-	1+	7	1-	1-	1+	1-	1-	1+	1+	2o	8	129.2	65	75	78	
29	1-	1+	1+	1-	0+	0+	1-	1-	5	1o	1+	1+	1-	1o	0+	1-	1+	6	124.4	81	79	72	
30	2-	1+	1+	1+	1+	1-	0o	0o	7	2-	1+	2o	2-	2-	1-	0+	1+	10	138.0	75	78	87	
31	2-	3o	5-	4o	3o	3-	2+	3+	35	3-	3o	5-	4o	3o	3-	3o	3o	38	136.2	99	97	85	
Mean									24.2									23.8	101.5	49.4	52.0	47.6	

Daily Average Indices Ap

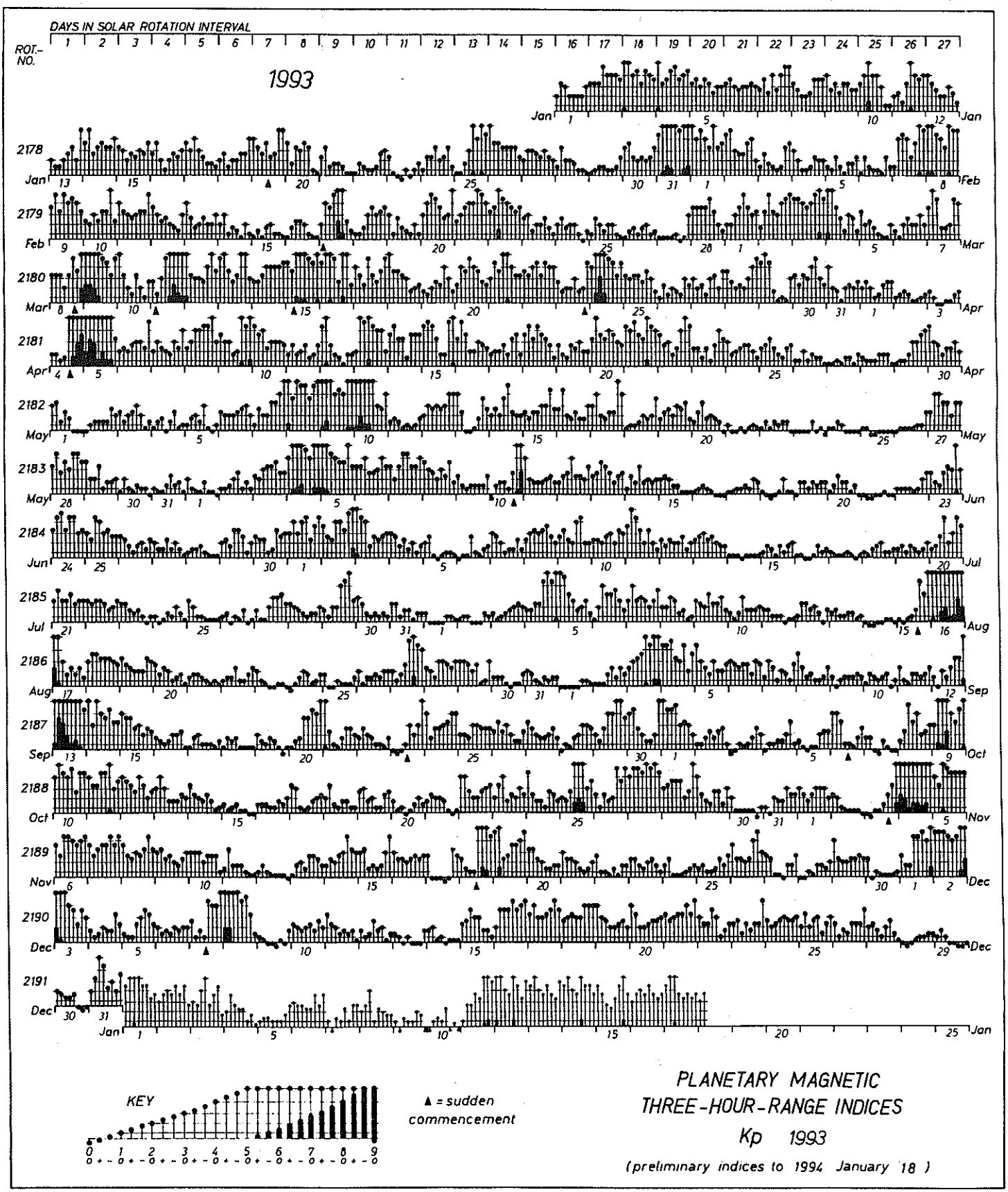


Day	Jan 93	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	10	31	18	8	7	4	22	3	3	26	11	29
2	24	21	24	4	6	6	29	3	6	7	4	48
3	33	10	35	4	8	14	21	6	36	5	15	37
4	31	7	23	58	5	54	8	25	25	6	77	8
5	17	6	7	87	6	36	5	18	13	5	34	11
6	16	5	8	14	9	18	5	14	12	13	26	6
7	23	27	22	12	18	21	8	15	8	3	23	20
8	15	40	29	26	40	14	14	7	8	16	17	47
9	16	28	64	28	48	6	15	11	5	48	11	3
10	25	17	15	18	48	28	12	7	4	31	12	8
11	21	20	50	8	4	9	20	4	6	28	6	7
12	12	11	28	16	16	12	8	6	16	18	4	6
13	12	12	31	32	10	12	10	4	91	11	8	3
14	22	6	23	20	14	8	3	2	28	8	14	4
15	14	4	45	28	13	5	5	14	16	3	13	11
16	11	6	39	16	12	3	4	78	6	5	10	23
17	13	36	23	10	18	4	3	27	4	8	6	21
18	11	13	18	20	7	3	5	18	4	7	31	20
19	22	7	11	9	11	5	5	12	4	9	31	12
20	14	26	21	23	7	5	16	6	21	4	9	13
21	7	27	30	33	3	2	14	4	14	5	8	20
22	7	30	25	21	4	5	10	6	6	16	5	11
23	4	8	12	12	2	17	6	3	12	12	7	11
24	10	6	58	9	3	26	4	4	18	10	5	12
25	25	6	16	10	2	18	5	4	11	40	6	11
26	22	5	8	5	4	7	4	6	10	17	17	9
27	11	4	12	4	18	6	10	26	9	38	7	7
28	7	19	17	5	23	4	6	11	8	21	4	3
29	5		18	12	10	10	18	10	24	11	11	2
30	12		19	13	4	10	6	4	18	3	4	4
31	59		10		5		6	5		7		20
Mean	17	16	24	19	12	12	10	12	15	14	15	14

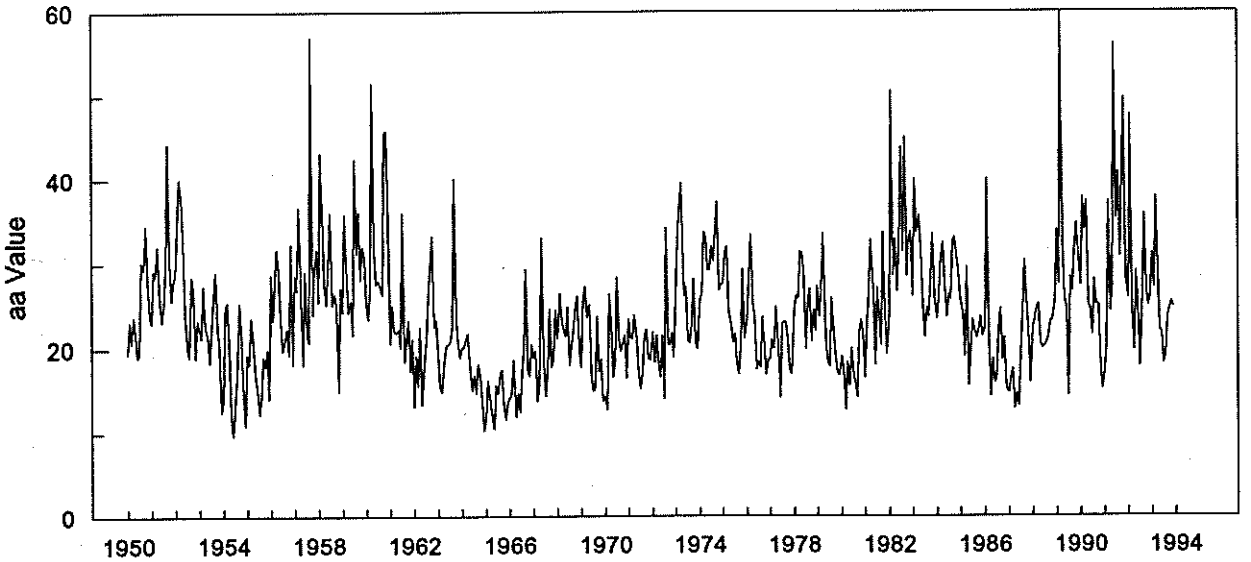
PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

University of Gottingen

Kp through December 31, 1993



Monthly Mean aa Index Jan 1950 - Dec 1993

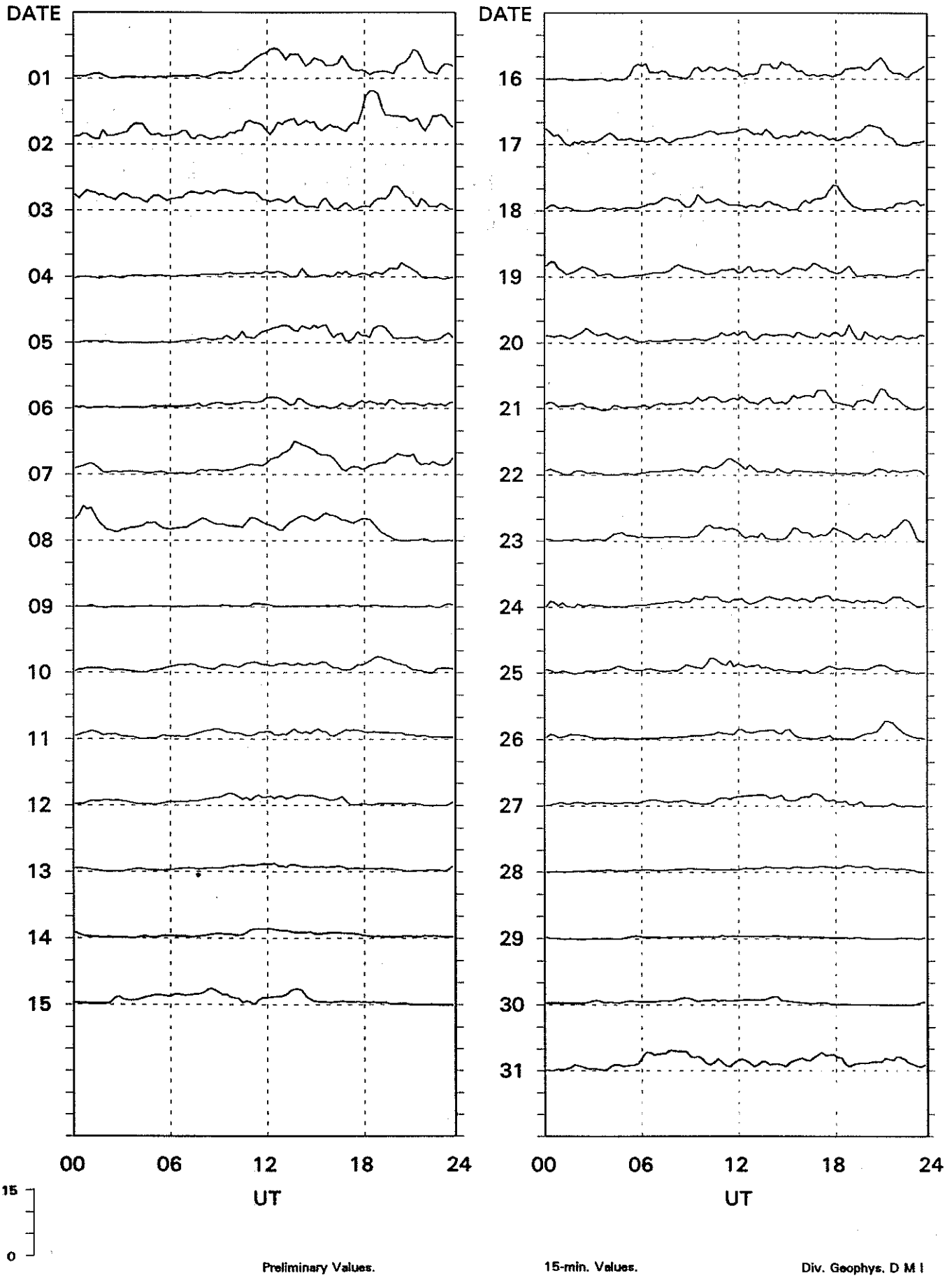


Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	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

PC-INDEX

Thule

December, 1993



Preliminary Values.

15-min. Values.

Div. Geophys. D M I

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

DECEMBER 1993

Sta	Geomag Lat	Commencement Time Day	(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)
FRD	49.4N	01	----	..	..	..	..	03(1)	6	31	182	79	03	21
BJI	28.8N	01	04--	..	..	..	..	01(4)	6	12	162	28	03	18
KRC	16.4N	01	0842	..	..	..	..	01(4,5,8)	6	45	164	76	02	00
UJJ	13.6N	01	0600	..	..	..	..		-	5	177	29	03	22
ABG	09.4N	01	0600	..	..	..	..	02(7)	6	5	196	38	03	22
HYD	07.6N	01	0000	..	..	..	..	01(5) 02(7)	6	5	206	26	03	22
GUA	04.3N	01	06--	..	..	..	..	01(5)	5	--	140	10	05	03
ANN	01.5N	01	0600	..	..	..	..		-	5	222	72	03	22
ETT	00.7S	01	0400	..	..	..	..		-	6	229	91	04	21
TRD	01.1S	01	0600	..	..	..	..		-	4	225	124	03	22
HER	33.6S	01	11--	..	..	..	..	01(8) 02(8)	6	43	113	128	03	21
CAN	43.6S	01	06--	..	..	..	..	01(5,6) 02(7) 03(3)	5	22	200	54	03	10
AMS	46.8S	01	00--	..	..	..	..	01(5) 02(8)	6	28	168	135	03	21
CZT	51.5S	01	03--	..	..	..	..	02(8)	6	55	256	162	05	03
PAF	57.2S	01	06--	..	..	..	..	02(8)	9	178	119	561	04	22
DRV	75.2S	01	0639	SC	32	36	54	02(1)	6	--	749	1075	04	10
KRC	16.4N	02	1148	..	..	..	..	02(6,7,8)	6	72	114	73	03	03
GUA	04.3N	02	17--	..	..	..	..	02(7)	5	10	120	20	06	18
FRD	49.4N	07	12--	..	..	..	..	08(1,2,3,4)	5	24	119	45	08	19
BJI	28.8N	07	1201	SC	0.8	15	1	08(1)	6	17	152	21	08	23
KRC	16.4N	07	1612	..	..	..	..	08(1)	7	99	172	82	08	17
UJJ	13.6N	07	1200	SC	- 0.3	15	- 3		-	7	169	26	08	21
ABG	09.4N	07	1200	SC	- 0.1	12	- 1	07(5) 08(1)	6	7	170	42	08	21
HYD	07.6N	07	1201	SC	0.2	12	- 2	08(1)	6	8	179	14	08	23
ANN	01.5N	07	1200	SC	--	--	--		-	--	--		08	21
ETT	00.7S	07	1200	SC	- 0.2	11	12		-	6	138	78	08	20
TRD	01.1S	07	1200	SC	0.1	13	- 19		-	6	149	96	08	21
HER	33.6S	07	1202	SC	5	15	20	08(1)	6	26	160	104	08	20
CAN	43.6S	07	1201	SC	0.6	30	0	08(4)	6	26	145	71	08	19
AMS	46.8S	07	1201	SC	2.7	19	- 13	07(8) 08(1,4,6)	5	21	191	136	08	21
CZT	51.5S	07	1205	SC	6	20	- 8	08(1,6)	6	31	196	136	08	22
PAF	57.2S	07	1202	SC	7	39	11	08(1,4,6)	7	62	539	385	08	21
DRV	75.2S	07	1201	SC	16	20	- 34	07(8) 8(2)	6	622	921	646	09	06
GUA	04.3N	08	0024	SC	..	6.1	- 2.1	08(1)	6	--	160	30	15	12
DRV	75.2S	14	2140	SC	- 36	- 42	- 12	17(1)	7	748	557	1063	27	08
HYD	07.6N	15	0400	..	..	..	..	16(5)	5	4	113	14	18	19
ETT	00.7S	15	0400	..	..	..	..		-	5	133	42	19	19
AMS	46.8S	15	09--	..	..	..	..	16(4)	5	19	96	37	19	03
CZT	51.5S	16	06--	..	..	..	..	17(7)	5	21	80	44	19	03
PAF	57.2S	16	01--	..	..	..	..	17(7)	6	27	230	220	19	01
AMS	46.8S	20	15--	..	..	..	..	21(6)	4	10	79	44	22	14
ETT	00.7S	21	0100	..	..	..	..		-	3	76	41	22	13
HYD	07.6N	31	0000	..	..	..	..	31(3)	6	6	137	19	01	23
GUA	04.3N	31	03--	..	..	..	..	31(3)	6	--	130	10	19	06
ETT	00.7S	31	0400	..	..	..	..		-	6	228	55	31	23
CZT	51.5S	31	02--	..	..	..	..	31(3)	5	19	114	36	03	23

Stations:

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

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."