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JANUARY 1994 NUMBER 593 - Part I

Solar-Geophysical Data prompt reports

Data for December, November 1993, and Late Data

International Standard Serial Number: 0038-0911
Library of Congress Catalog Number: 79-640375 //r81

NATIONAL GEOPHYSICAL DATA CENTER
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Boulder, Colorado

Subscription information is on the inside back cover.

SOLAR-GEOPHYSICAL DATA

Number 593

(Issued in Two Parts)

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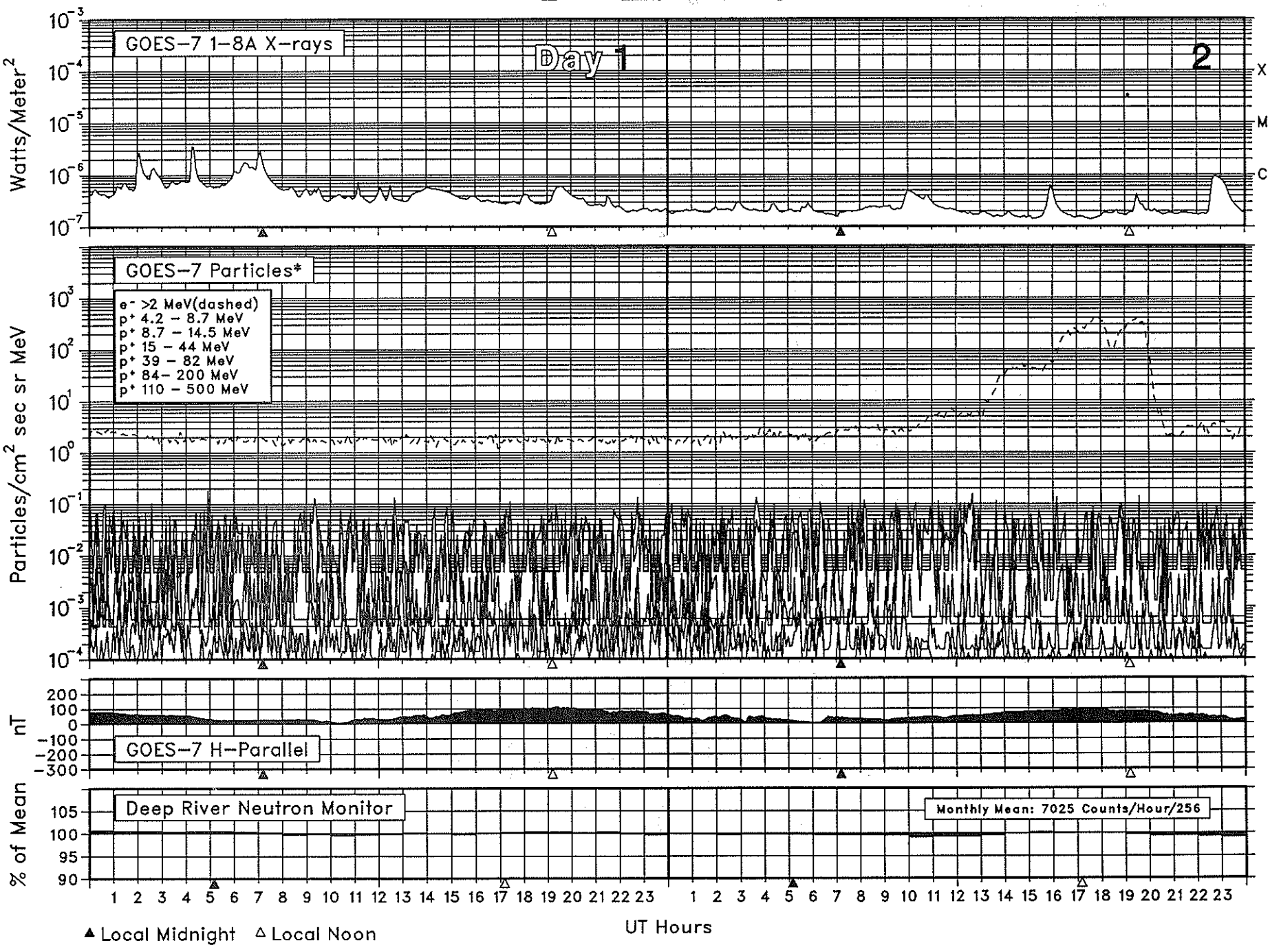

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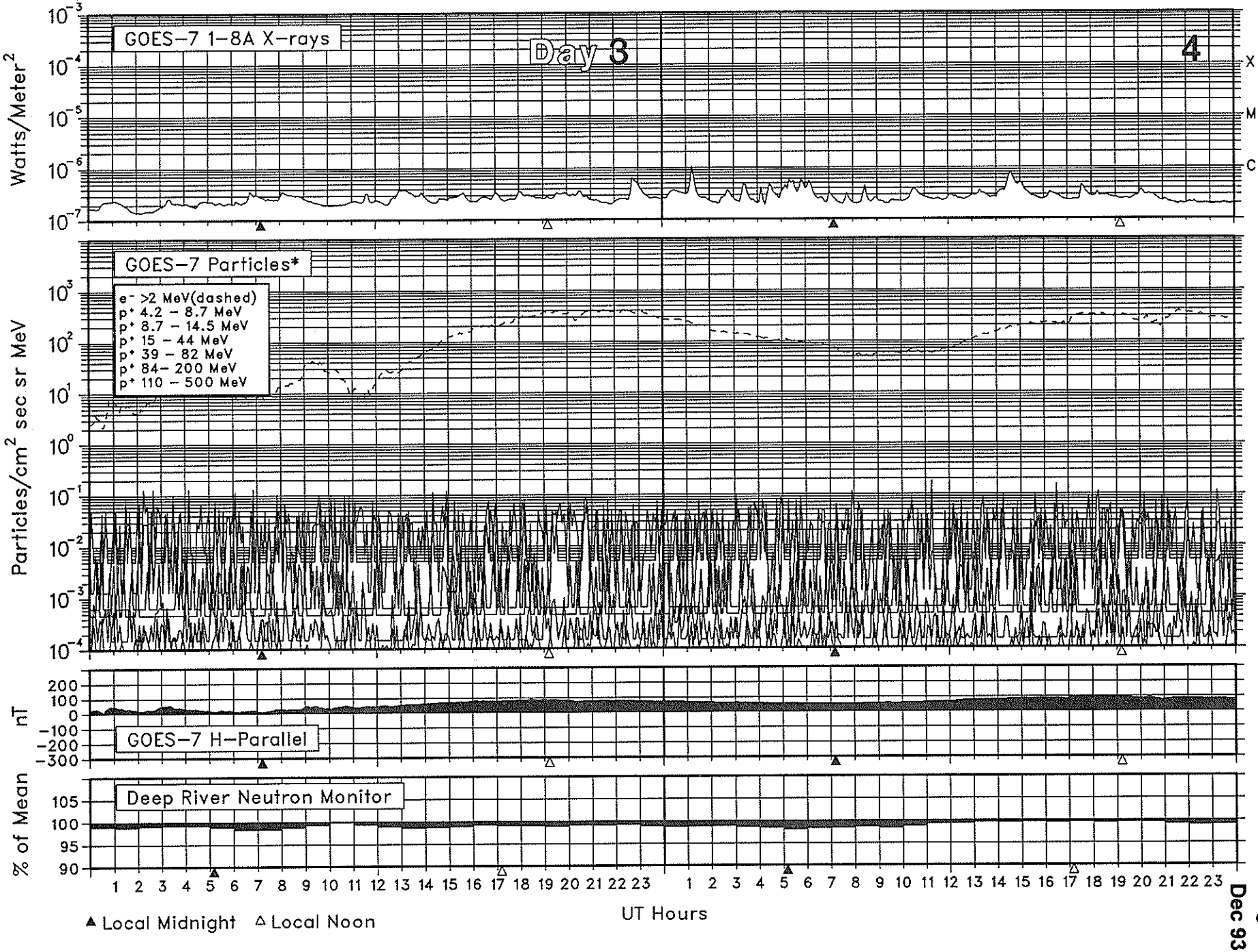

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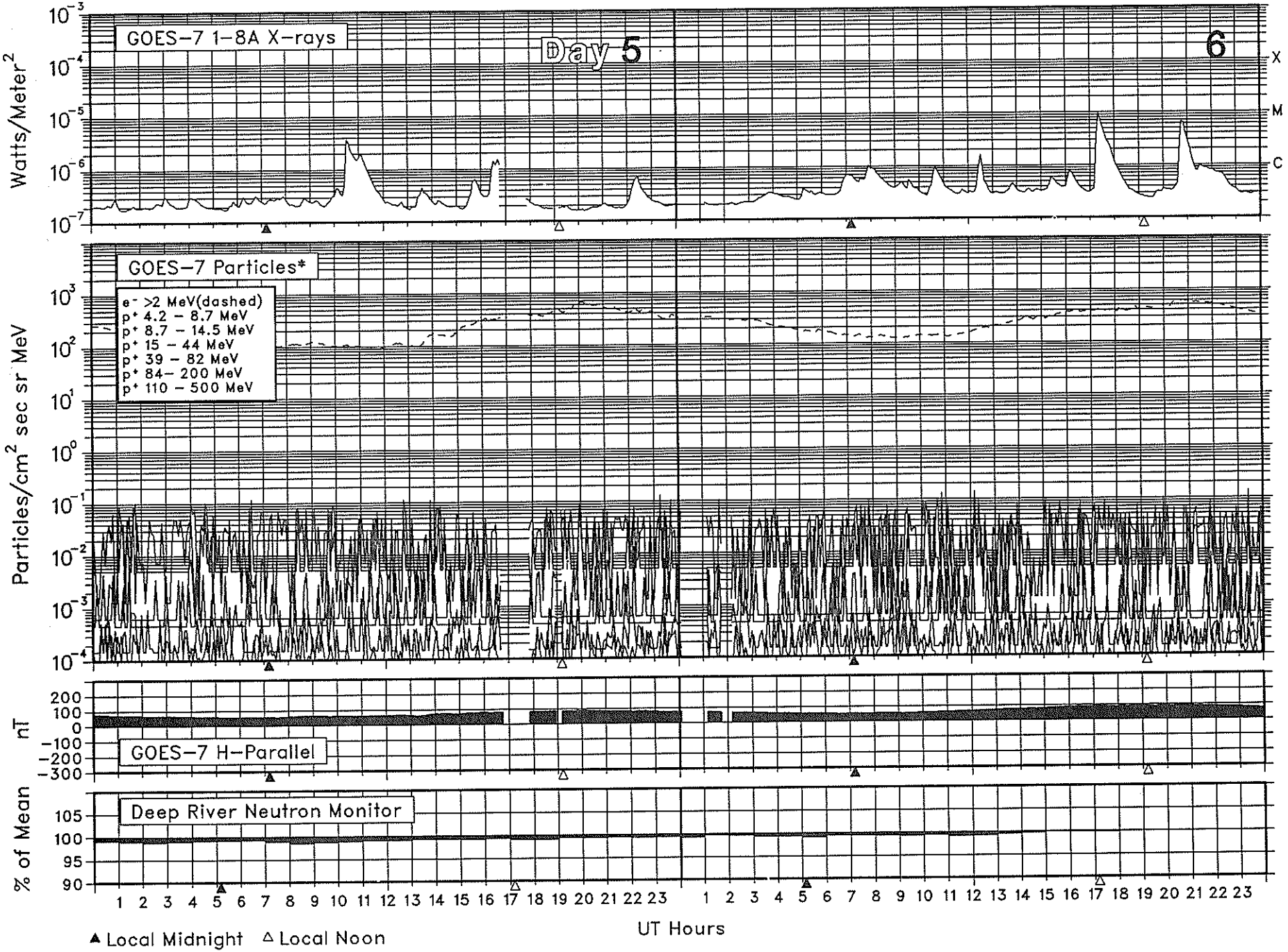

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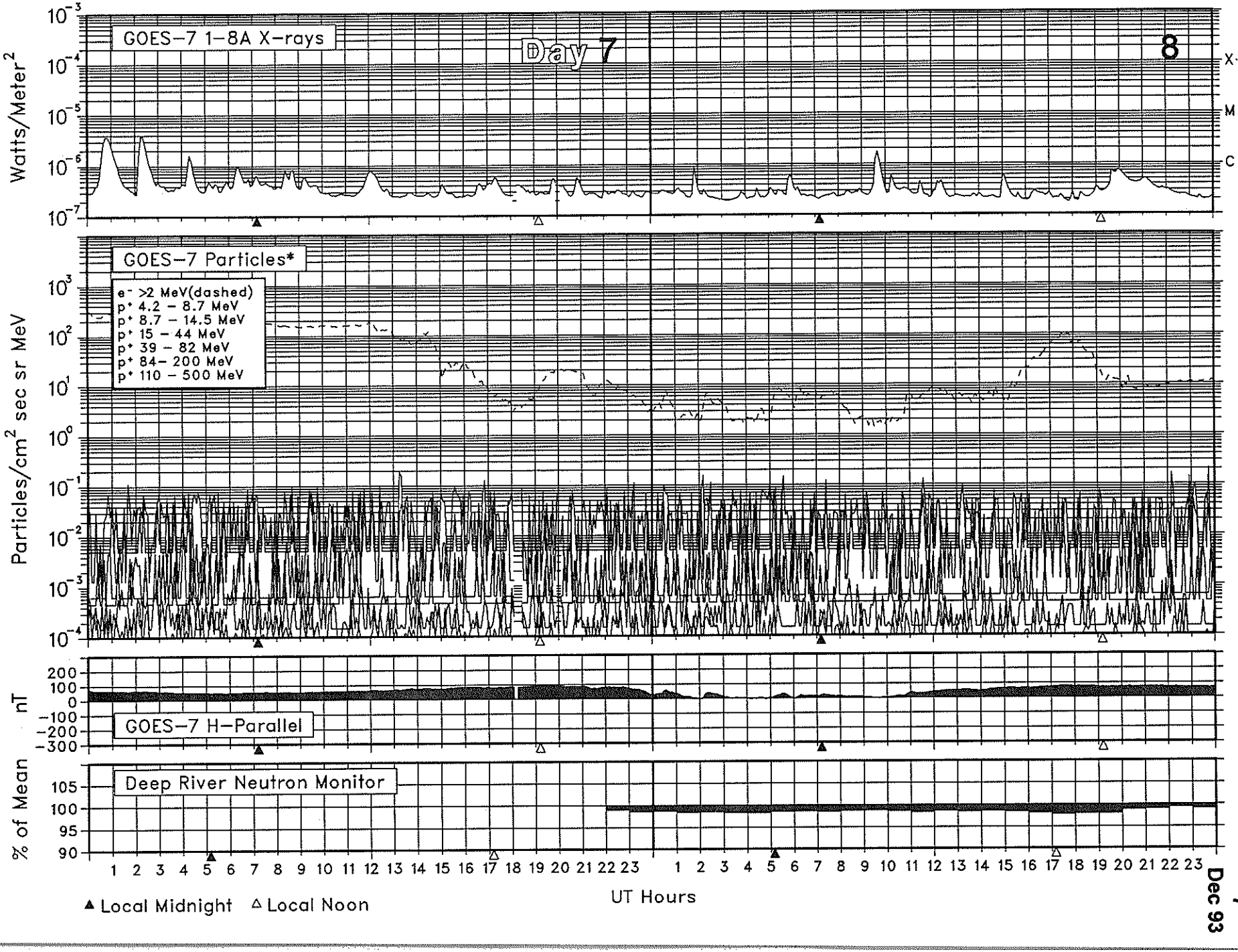

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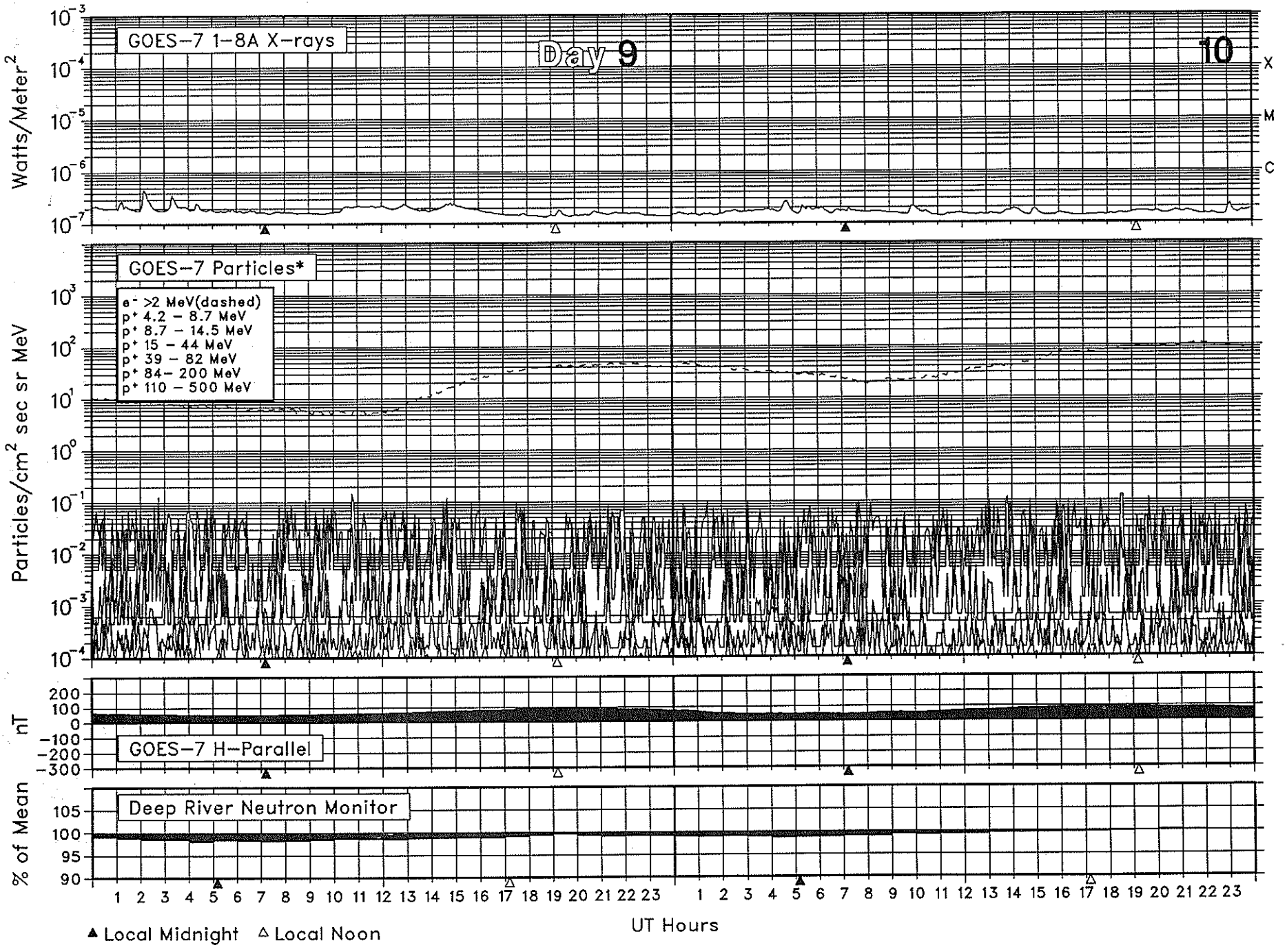

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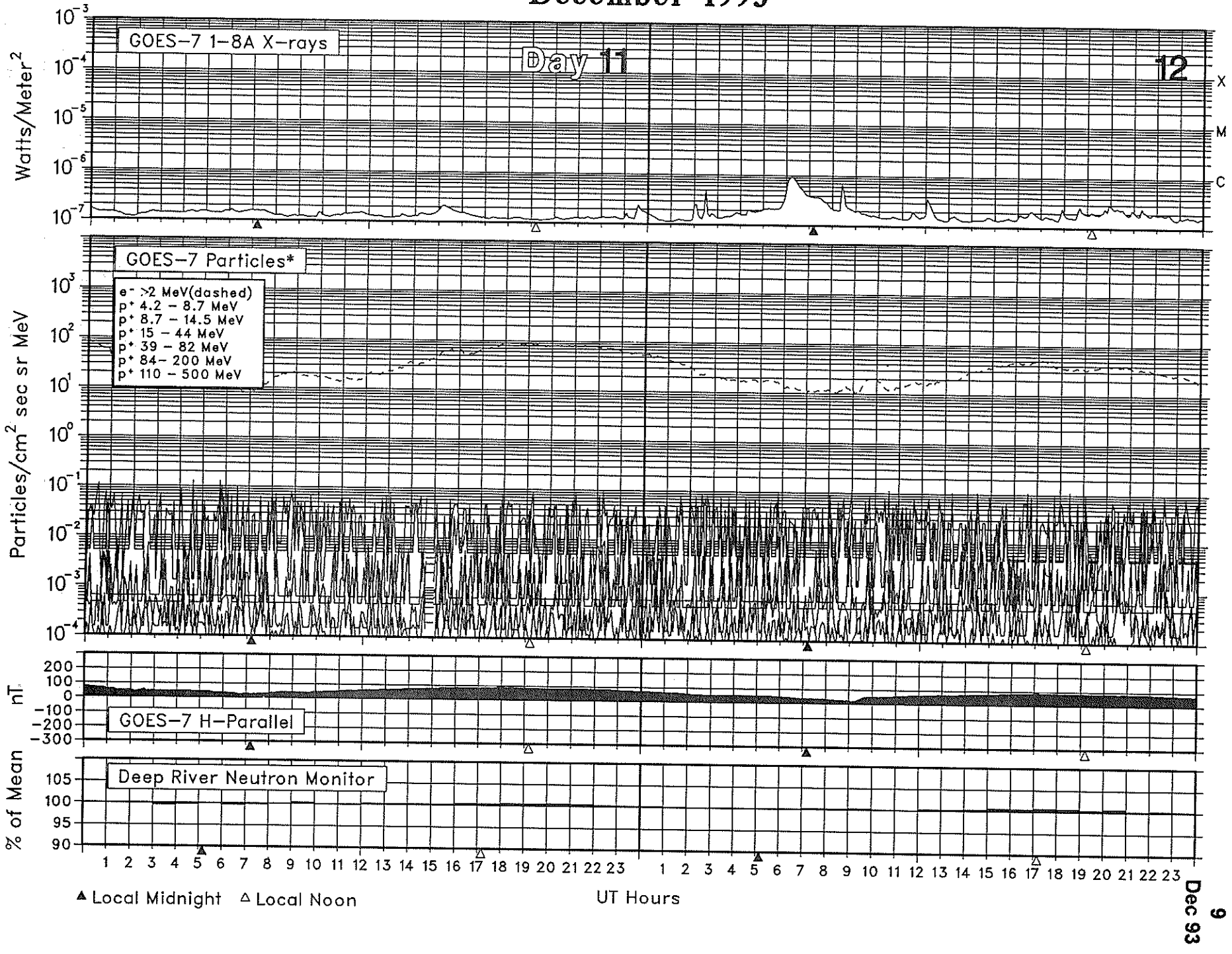

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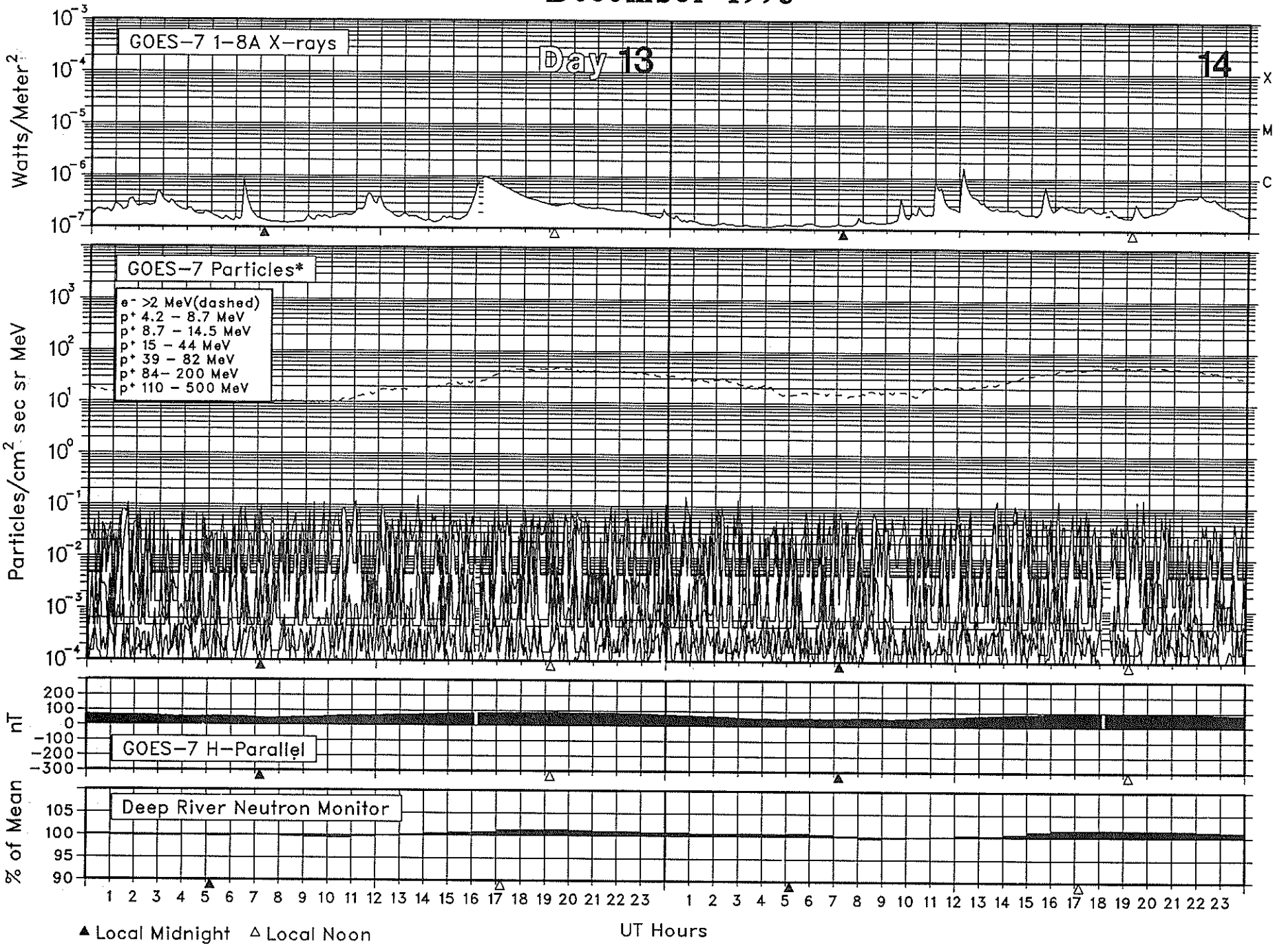

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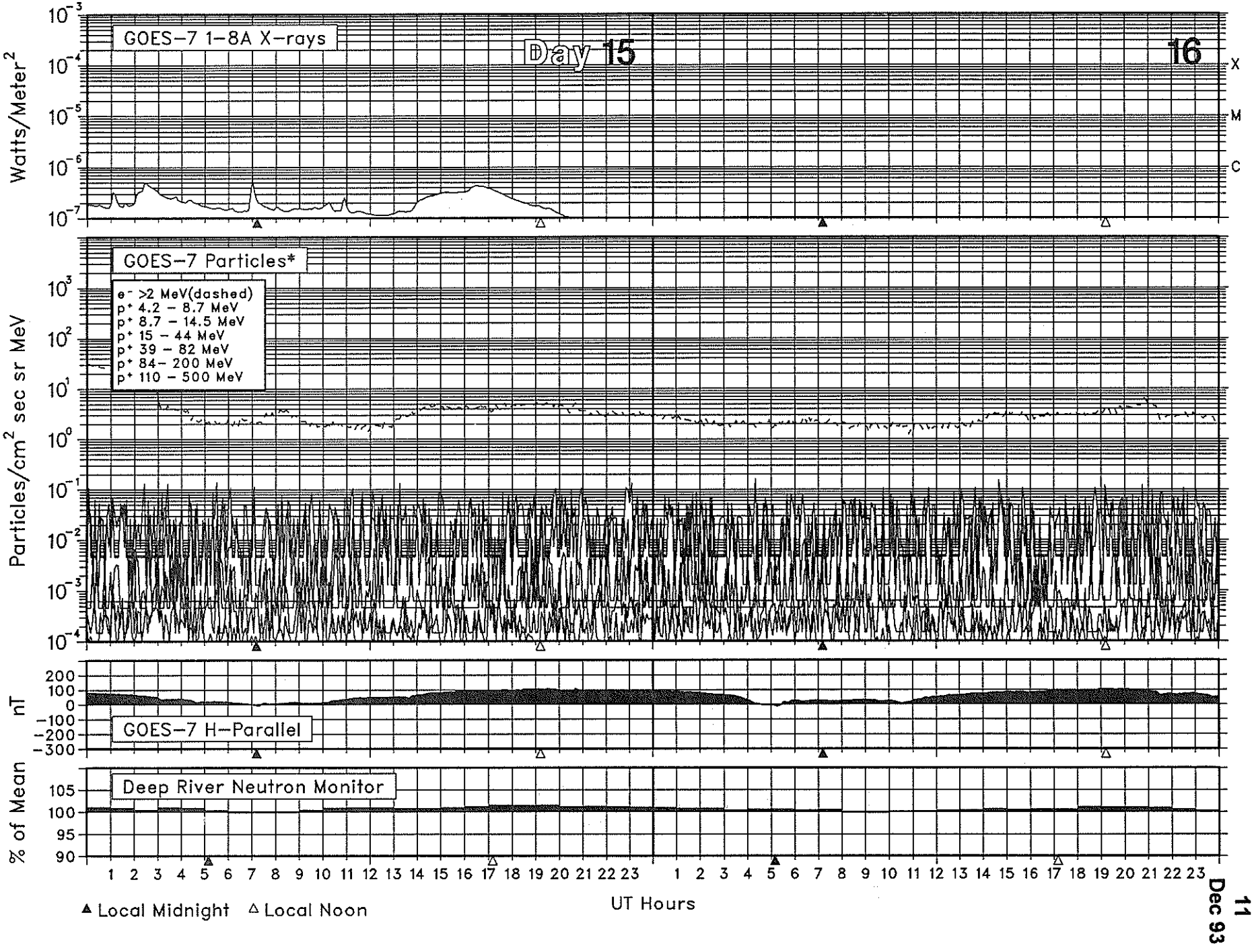

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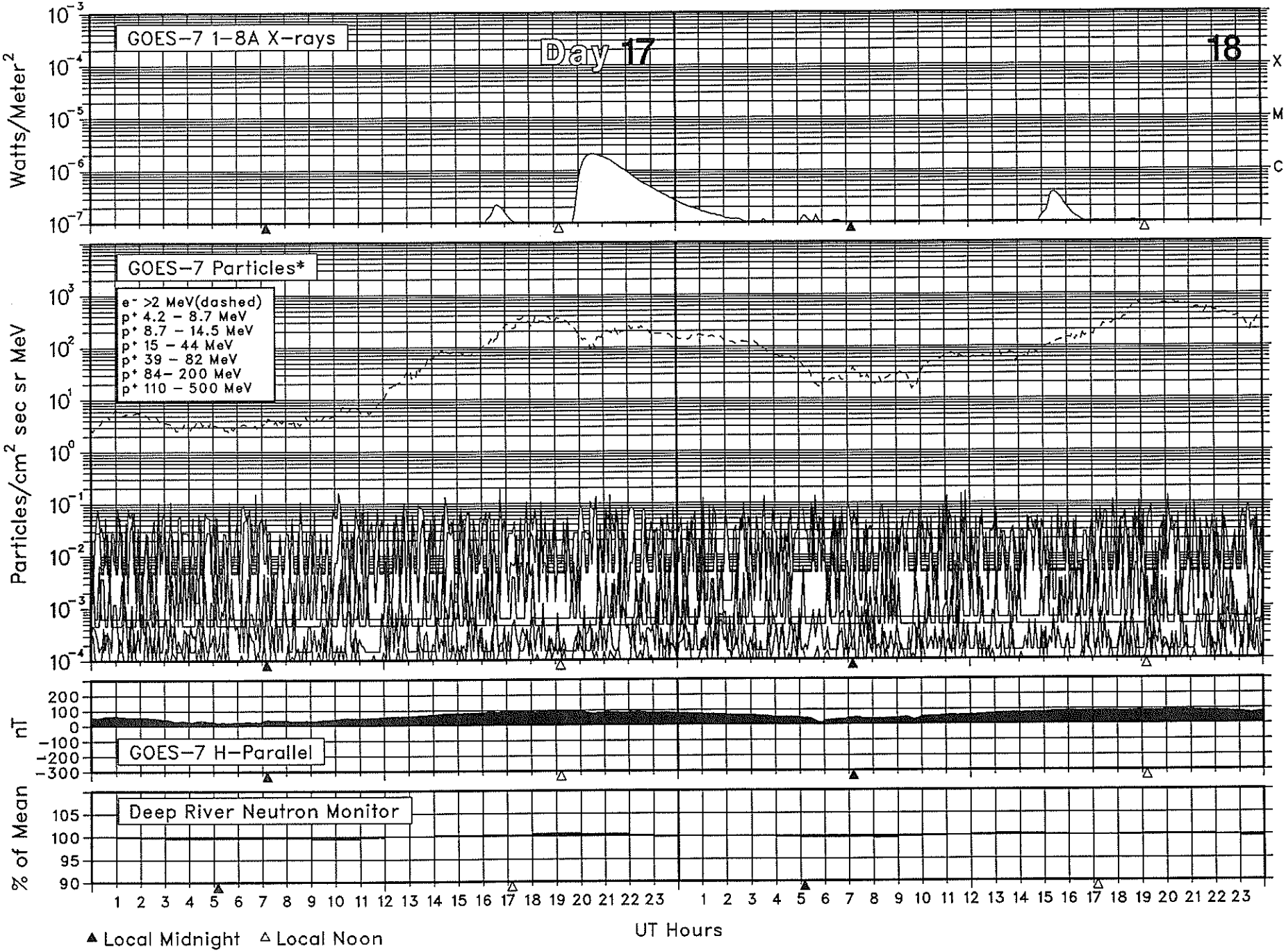

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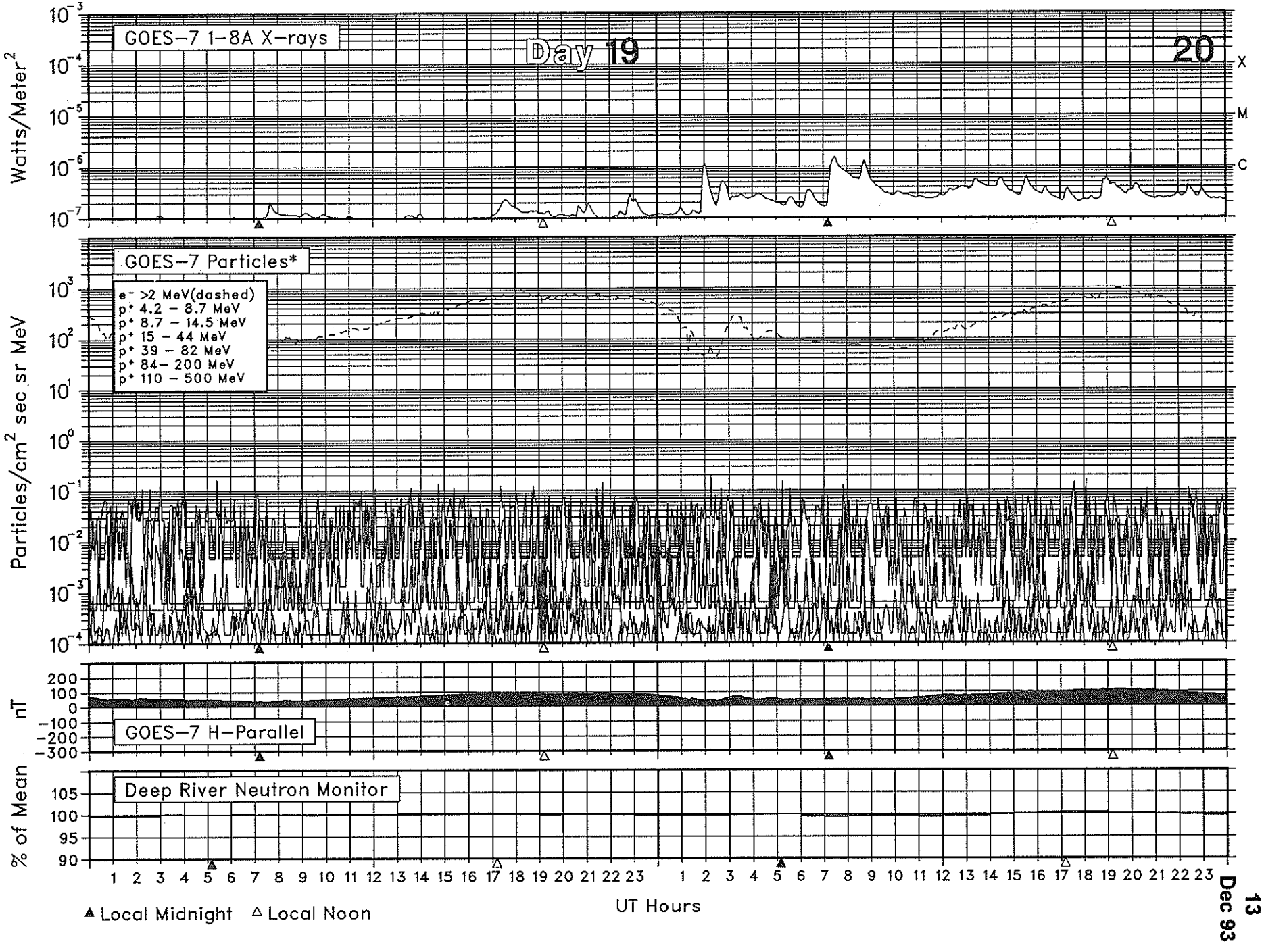

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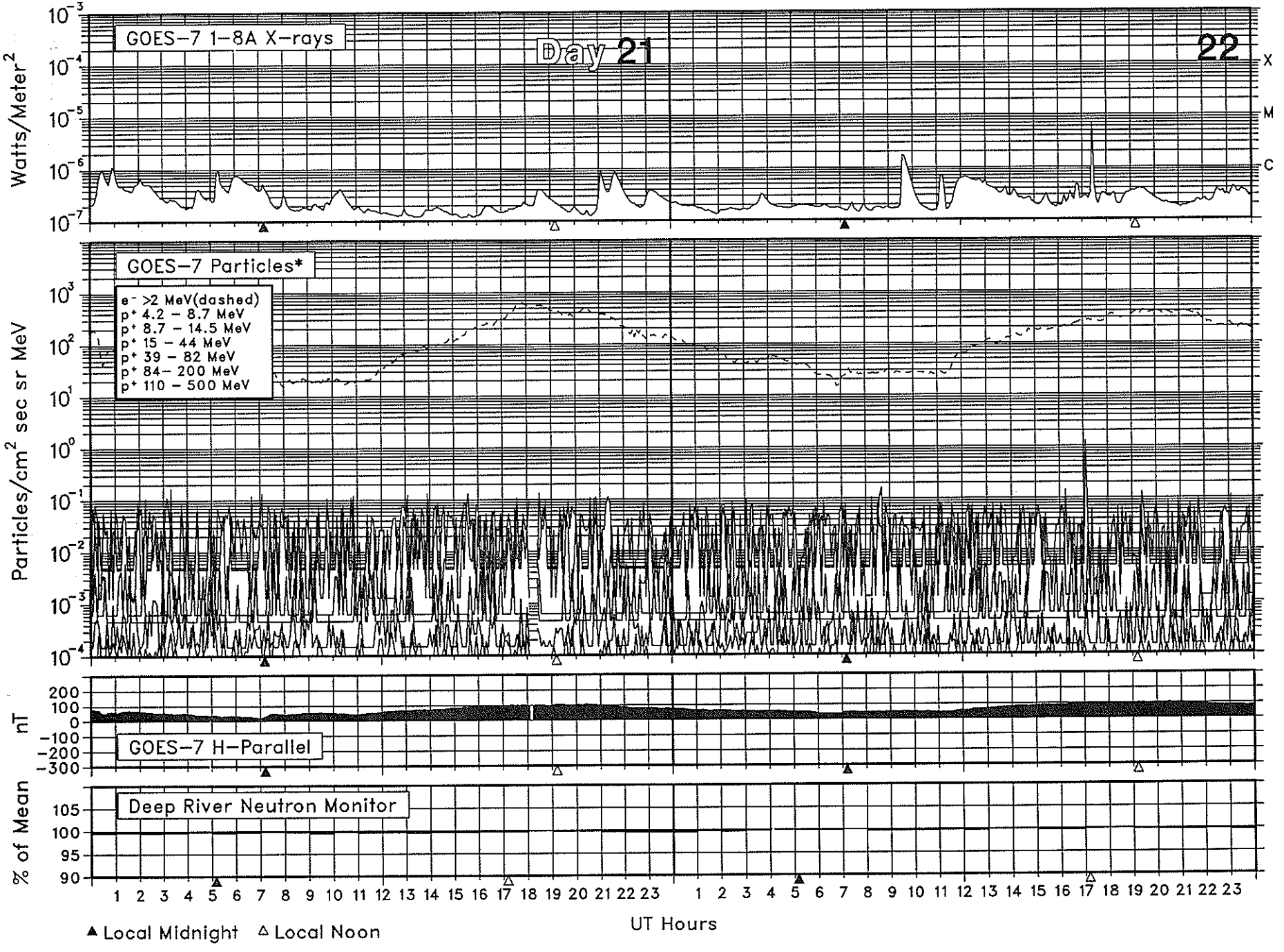

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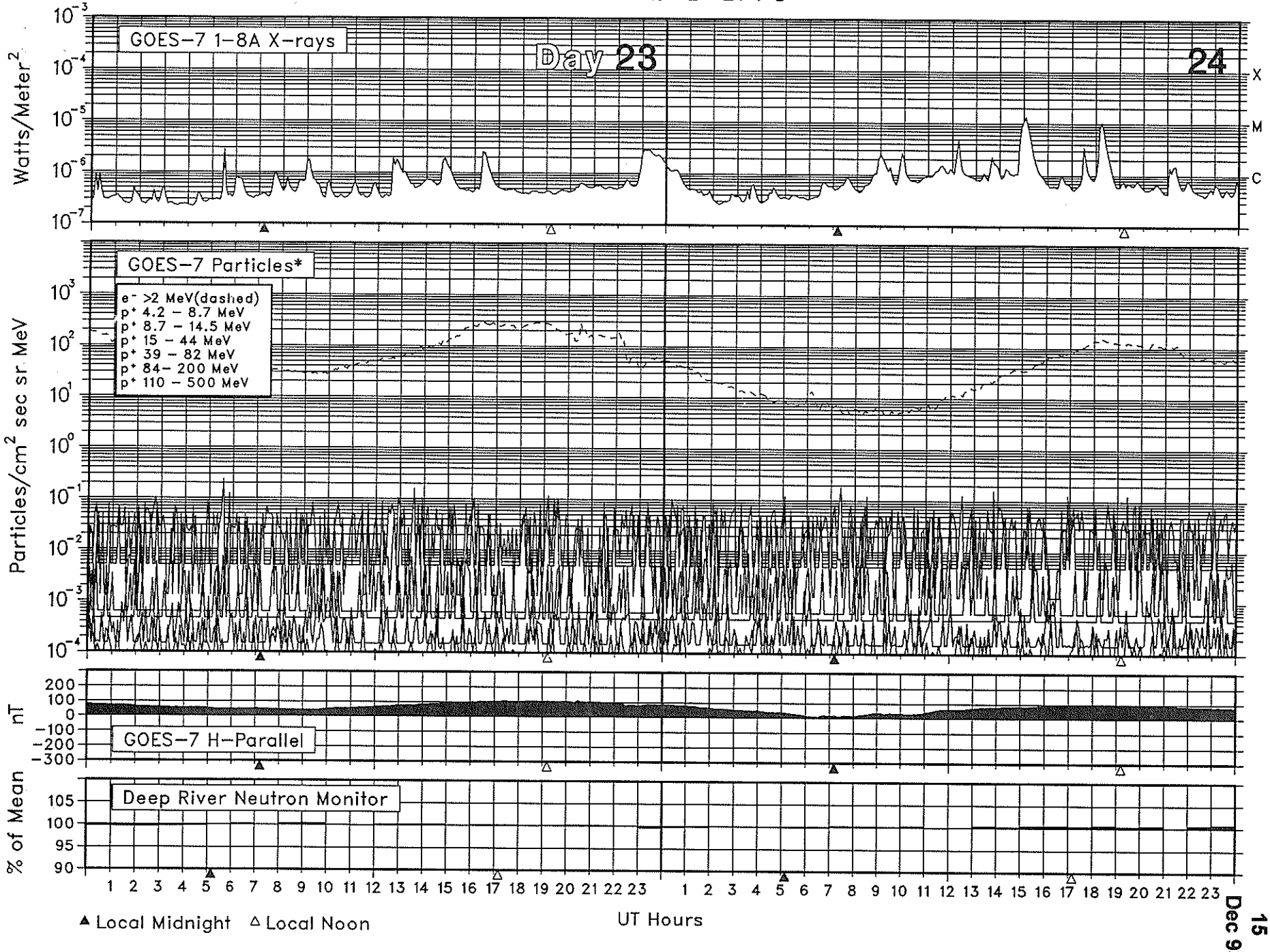

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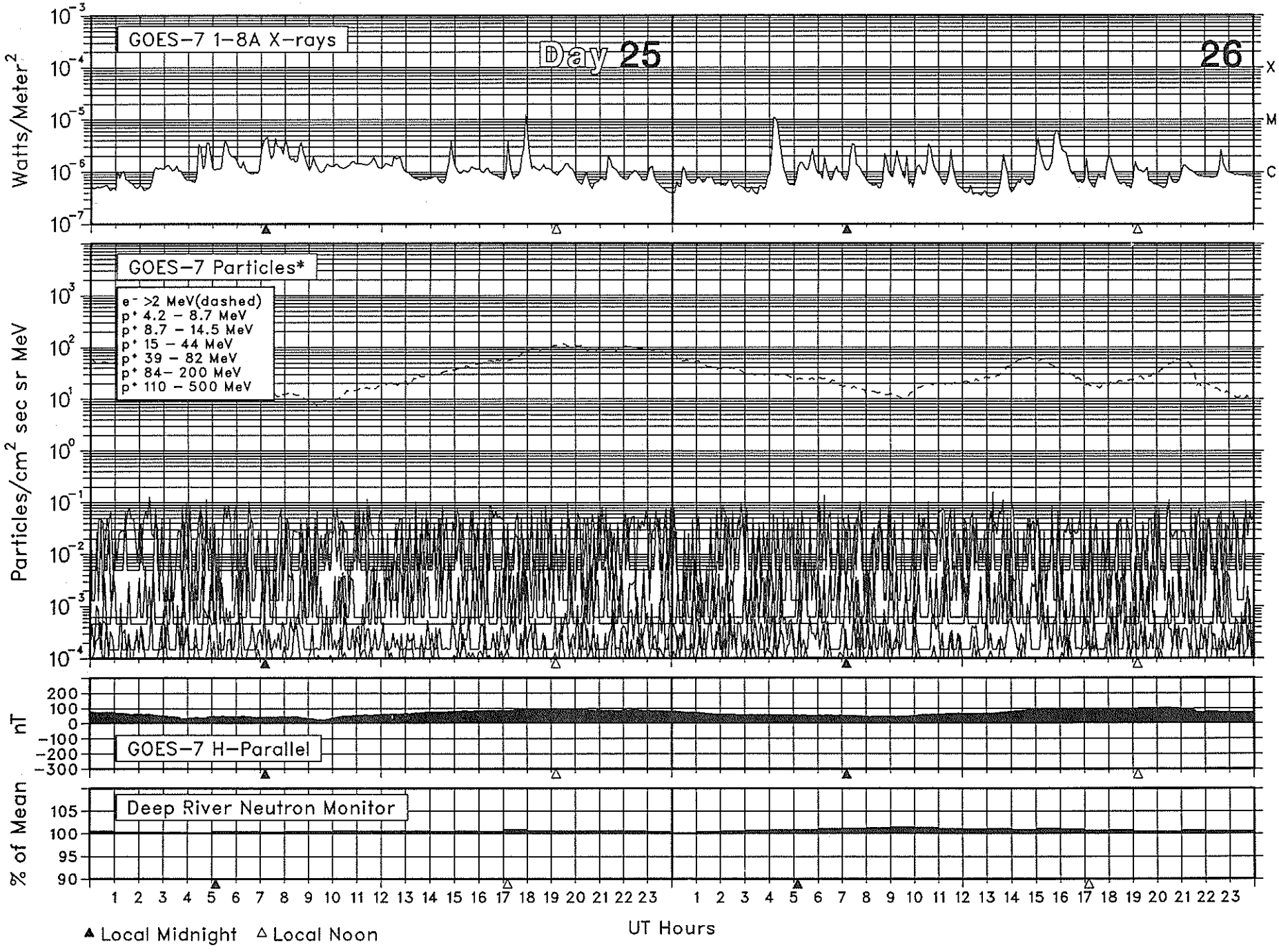

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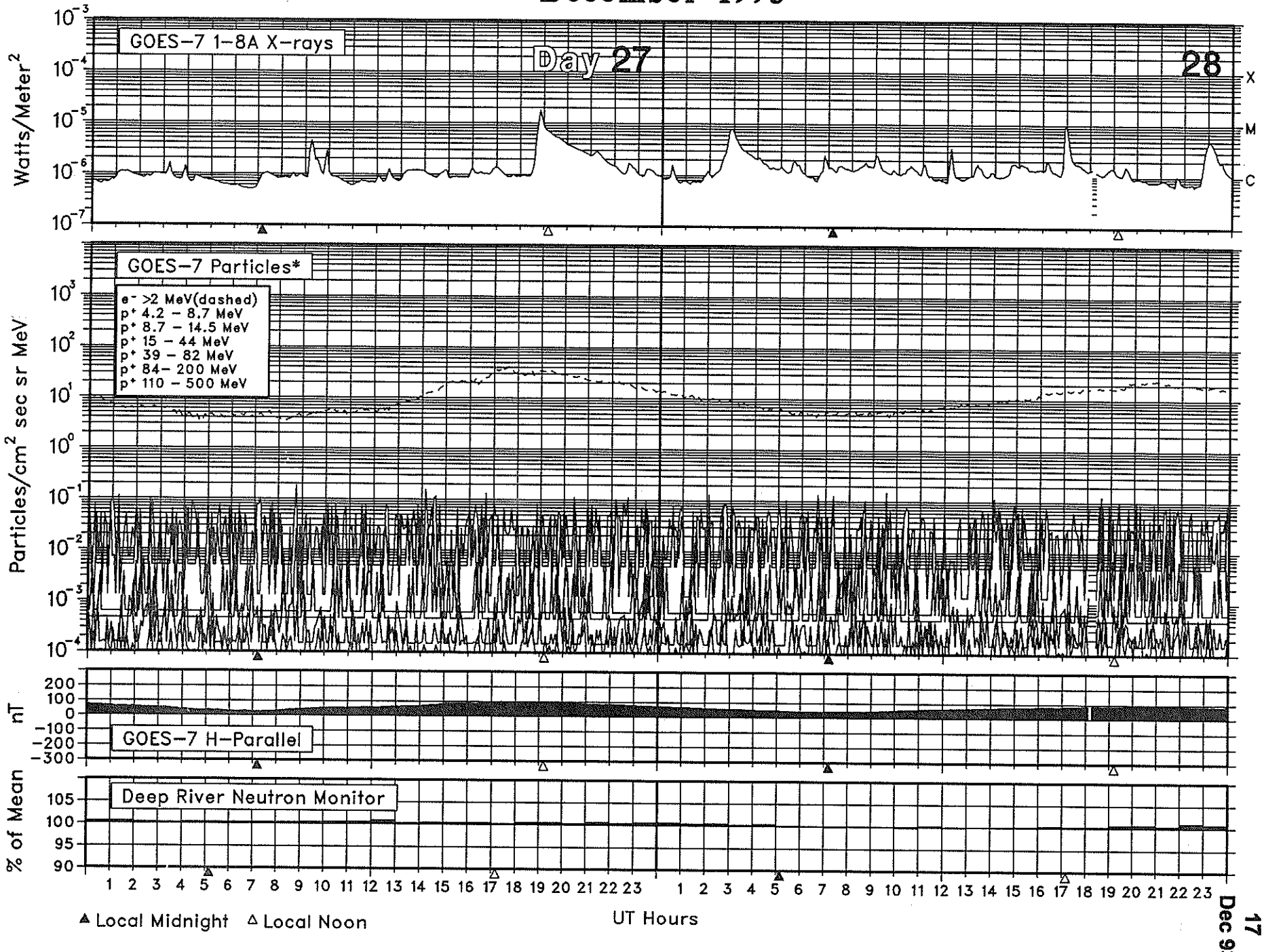

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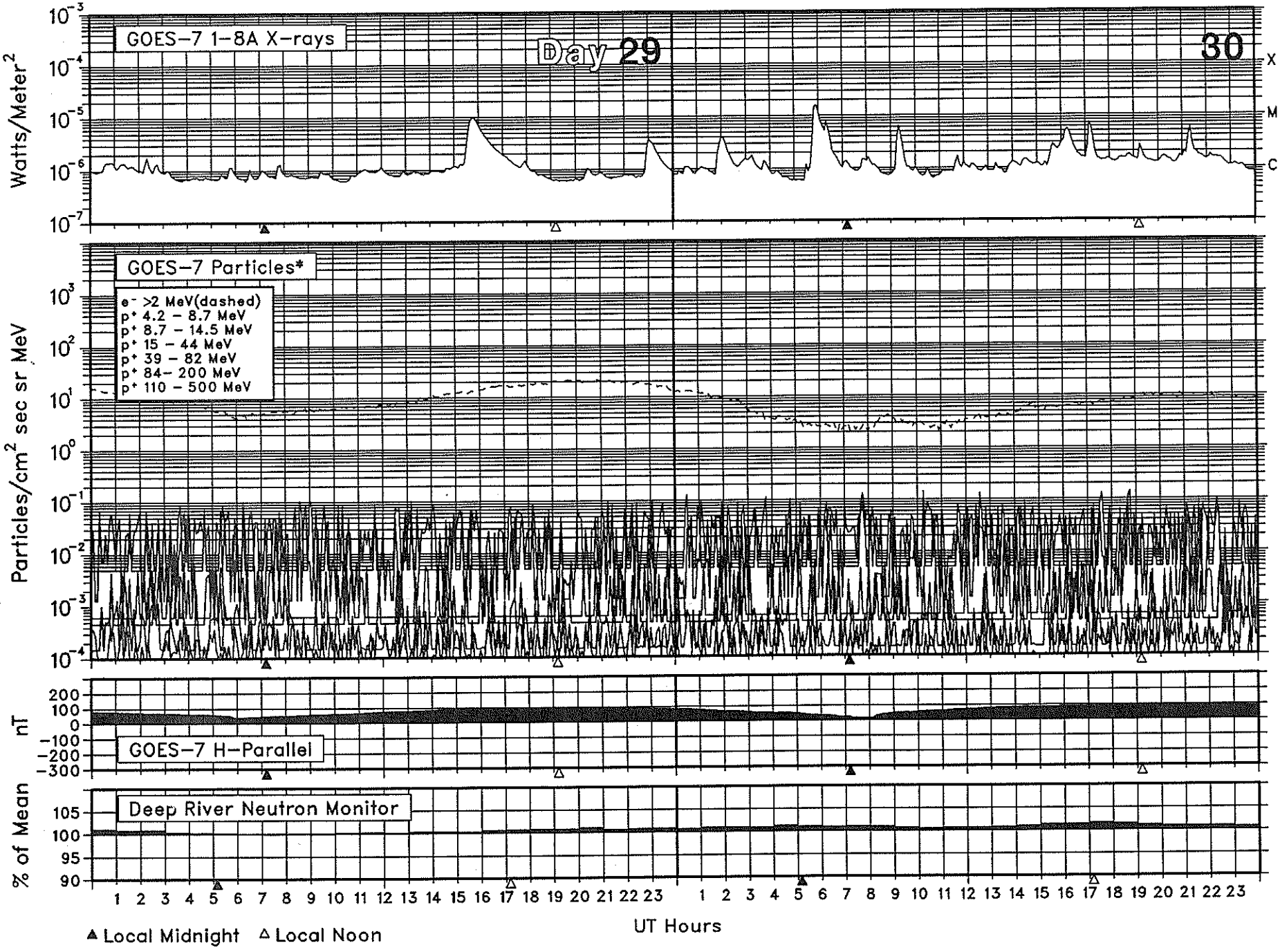

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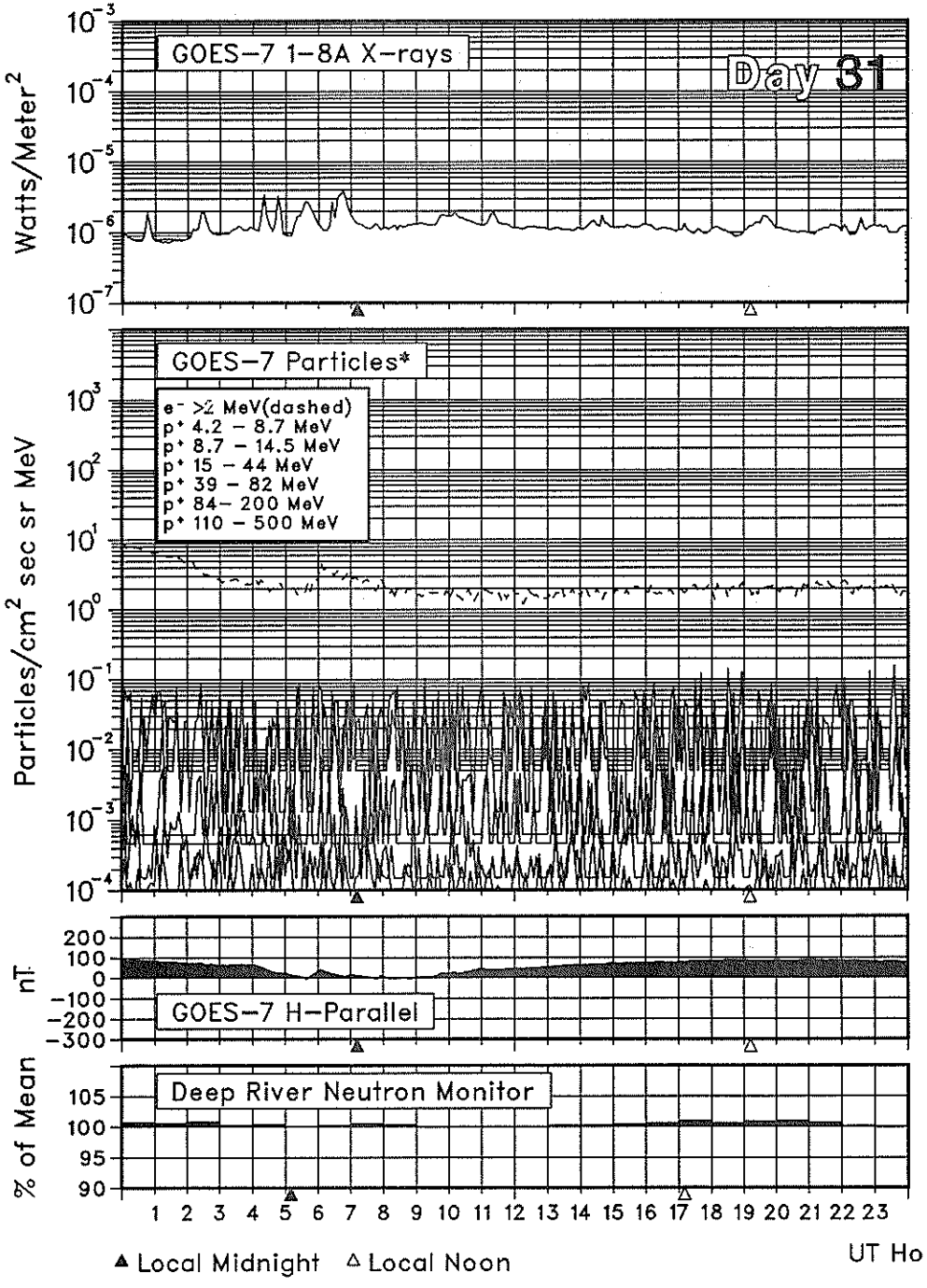


ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages — DECEMBER 1993

Julian Day	Date of Issue	Date of Obser-vation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat	Location °Long	Flares Total	Flares M	Flares X	Date of Forecast	Region Forecast [1]	Geoadvice[1]
335	01	30	101	104	2	N05	W98	0	0	0	01	Q	SOL: Eruptive
						S10	E14	0	0	0	01	Q	MAG: Major
						N03	W14	1	0	0	01	Q	PROTON: Quiet
						S14	W13	0	0	0	01	Q	
						S18	E70	0	0	0	01	E	
						S21	W58	0	0	0	01	Q	
336	02	01	100	109	15	S09	W00	0	0	0	02	Q	SOL: Eruptive
						N04	W28	12	0	0	02	E	MAG: Minor
						S14	W26	0	0	0	02	Q	PROTON: Quiet
						S18	E57	1	0	0	02	E	
						S21	W74	0	0	0	02	Q	
337	03	02	085	104	32	S10	W13	0	0	0	03	Q	SOL: Eruptive
						N04	W42	0	0	0	03	E	MAG: Minor
						S14	W40	0	0	0	03	Q	PROTON: Quiet
						S16	E43	3	0	0	03	E	
338	04	03	097	106	27	S09	W27	0	0	0	04	Q	SOL: Eruptive
						N04	W56	0	0	0	04	E	MAG: Active
						S16	W51	0	0	0	04	Q	PROTON: Quiet
						S18	E31	3	0	0	04	E	
						S22	E55	1	0	0	04	Q	
						S10	E56	0	0	0	04	Q	
339	05	04	099	105	4	S11	W39	0	0	0	05	Q	SOL: Eruptive
						N03	W71	0	0	0	05	Q	MAG: Quiet
						S15	W63	0	0	0	05	Q	PROTON: Quiet
						S18	E15	0	0	0	05	E	
						S22	E42	10	0	0	05	E	
						S10	E41	1	0	0	05	E	
340	06	05	089	101	7	S11	W53	0	0	0	06	Q	SOL: Eruptive
						N03	W88	0	0	0	06	Q	MAG: Quiet
						S19	E03	0	0	0	06	E	PROTON: Quiet
						S23	E30	1	0	0	06	E	
						S10	E28	0	0	0	06	E	
341	07	06	095	103	4	S13	W62	0	0	0	07	Q	SOL: Eruptive
						S18	W10	0	0	0	07	Q	MAG: Quiet
						S22	E16	10	0	0	07	E	PROTON: Quiet
						S09	E15	1	0	0	07	Q	
342	08	07	099	107	16	S15	W76	0	0	0	08	Q	SOL: Eruptive
						S18	W25	1	0	0	08	Q	MAG: Active
						S22	E02	4	0	0	08	E	PROTON: Quiet
						S09	E02	1	0	0	08	Q	
343	09	08	084	105	38	S18	W38	1	0	0	09	Q	SOL: Eruptive
						S21	W13	5	0	0	09	Q	MAG: Active
						S09	W13	1	0	0	09	Q	PROTON: Quiet
344	10	09	079	098	0	S15	W51	0	0	0	10	Q	SOL: Quiet
						S21	W26	1	0	0	10	Q	MAG: Quiet
						S09	W27	0	0	0	10	Q	PROTON: Quiet
						N15	W17	0	0	0	10	Q	
						N07	E72	0	0	0	10	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages — DECEMBER 1993

Julian Day	Date of Issue	Date of Obser-vation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat	Location °Long	Flares Total	Flares M	Flares X	Date of Forecast	Region Forecast [1]	Geoadvice[1]
345	11	10	060	096	5	S21	W40	0	0	0	11	Q	SOL: Quiet
						S09	W42	0	0	0	11	Q	MAG: Quiet
						N06	E58	0	0	0	11	Q	PROTON: Quiet
						S18	W47	0	0	0	11	Q	
346	12	11	059	093	5	S21	W54	0	0	0	12	Q	SOL: Quiet
						S10	W57	0	0	0	12	Q	MAG: Quiet
						N05	E44	0	0	0	12	Q	PROTON: Quiet
						S18	W60	0	0	0	12	Q	
347	13	12	033	091	5	S20	W66	1	0	0	13	Q	SOL: Quiet
						S10	W71	0	0	0	13	Q	MAG: Quiet
						S17	W78	2	0	0	13	Q	PROTON: Quiet
348	14	13	022	088	2	S18	W85	0	0	0	14	Q	SOL: Quiet
						S10	W89	0	0	0	14	Q	MAG: Quiet
						S17	W78	2	0	0	14	Q	PROTON: Quiet
349	15	14	036	088	1	S12	W82	0	0	0	15	Q	SOL: Quiet
						N03	E76	0	0	0	15	Q	MAG: Active
						N14	E15	0	0	0	15	Q	PROTON: Quiet
350	16	15	023	085	7	S11	W94	0	0	0	16	Q	SOL: Quiet
						N02	E63	0	0	0	16	Q	MAG: Active
						N14	E15	0	0	0	16	Q	PROTON: Quiet
351	17	16	029	085	19	N03	E50	0	0	0	17	Q	SOL: Quiet
						N08	W06	0	0	0	17	Q	MAG: Active
						N14	E15	0	0	0	17	Q	PROTON: Quiet
352	18	17	047	084	15	N05	W33	0	0	0	18	Q	SOL: Quiet
						N02	E38	1	0	0	18	Q	MAG: Quiet
						N07	W19	0	0	0	18	Q	PROTON: Quiet
353	19	18	051	085	13	N12	W54	0	0	0	19	Q	SOL: Quiet
						N02	E24	1	0	0	19	Q	MAG: Active
						N07	W34	0	0	0	19	Q	PROTON: Quiet
						N12	W54	0	0	0	19	Q	
						N08	W15	0	0	0	19	Q	
354	20	19	025	087	9	N01	E11	1	0	0	20	Q	SOL: Quiet
						N07	W48	0	0	0	20	Q	MAG: Quiet
						N07	W34	0	0	0	20	Q	PROTON: Quiet
355	21	20	053	091	10	N01	W02	0	0	0	21	Q	SOL: Quiet
						N09	W59	0	0	0	21	Q	MAG: Quiet
						N09	E69	5	0	0	21	E	PROTON: Quiet
						N03	E74	0	0	0	21	Q	
356	22	21	045	093	13	N01	W14	0	0	0	22	Q	SOL: Eruptive
						N09	E58	0	0	0	22	E	MAG: Quiet
						N04	E60	0	0	0	22	Q	PROTON: Quiet
357	23	22	061	100	10	N01	W29	0	0	0	23	Q	SOL: Eruptive
						N08	E47	11	1	0	23	E	MAG: Quiet
						N04	E46	0	0	0	23	Q	PROTON: Quiet
358	24	23	070	105	8	N02	W44	0	0	0	24	Q	SOL: Eruptive
						N10	E34	13	0	0	24	E	MAG: Quiet
						N05	E33	0	0	0	24	Q	PROTON: Quiet

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages **DECEMBER 1993**

Julian Day	Date of Issue	Date of Obser-vation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat	Location °Long	Flares Total	Flares M	Flares X	Date of Forecast	Region Forecast [1]	Geoadvice[1]
359	25	24	129	111	7	N02	W57	1	0	0	25	Q	SOL: Active
						N08	E21	13	2	0	25	A	MAG: Quiet
						N04	E20	0	0	0	25	Q	PROTON: Quiet
						N11	W20	0	0	0	25	Q	
						S16	E69	0	0	0	25	Q	
360	26	25	131	119	6	N09	E09	17	1	0	26	A	SOL: Active
						N04	E06	1	0	0	26	Q	MAG: Quiet
						N11	W34	0	0	0	26	Q	PROTON: Quiet
						S17	E54	0	0	0	26	Q	
361	27	26	092	125	5	N09	W08	19	1	0	27	A	SOL: Active
						N04	W08	0	0	0	27	Q	MAG: Quiet
						S18	E41	0	0	0	27	Q	PROTON: Quiet
362	28	27	107	140	3	N08	W25	7	1	0	28	E	SOL: Active
						N03	W22	0	0	0	28	Q	MAG: Quiet
						S17	E28	0	0	0	28	Q	PROTON: Quiet
						N11	W11	1	0	0	28	Q	
363	29	28	108	134	0	N10	W39	10	1	0	29	A	SOL: Active
						N06	W34	0	0	0	29	Q	MAG: Active
						N12	W26	4	0	0	29	Q	PROTON: Quiet
						N11	E80	0	0	0	29	Q	
						S09	E83	0	0	0	29	Q	
364	30	29	112	129	0	N09	W52	7	0	0	30	A	SOL: Active
						N05	W47	0	0	0	30	Q	MAG: Active
						N10	W39	0	0	0	30	Q	PROTON: Quiet
						N11	E67	1	0	0	30	E	
						S10	E69	5	0	0	30	E	
365	31	30	110	143	2	N08	W66	5	0	0	31	A	SOL: Active
						N05	W61	0	0	0	31	Q	MAG: Active
						N10	W55	3	0	0	31	Q	PROTON: Quiet
						N11	E54	11	1	0	31	E	
						S10	E54	0	0	0	31	E	

[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

12/26/93 03:30:00
GEOALERT WWA360 STRATWARM ALERT/SAT/STRATWARM EXISTS.
INTENSE WARMING EXISTS FROM SOUTHWESTERN SIBERIA ACROSS MONGOLIA AND SOUTHERN SIBERIA TO EASTERN SIBERIA AND THE ALEUTIAN AREA WITH TEMPERATURE INCREASE OF MORE THAN 40 DGS CELSIUS AT 10 HPA SINCE THE LAST WEEK AROUND THE LAKE BAYKAL.
THE COLD CENTRE DISPLACED TO EASTERN GREENLAND.

12/27/93 03:30:00
GEOALERT WWA361 STRATWARM ALERT/SUN/STRATWARM EXISTS.
WARMING OVER SIBERIA INTENSIFIES AND SPREADS NORTHWARDS.
DEVELOPMENT INTO MAJOR WARMING POSSIBLE.

12/28/93 03:30:00
GEOALERT WWA362 STRATWARM ALERT/MON/STRATWARM EXISTS.
INTENSE WARMING FROM SIBERIA TO SOUTHEASTERN EUROPE EXPANDS WESTWARDS.

12/29/93 03:30:00
GEOALERT WWA363 STRATWARM ALERT/TUE/STRATWARM EXISTS.
INTENSE WARMING OVER SIBERIA EXPANDS NORTHWARD.

12/30/93 03:30:00
GEOALERT WWA364 STRATWARM ALERT/WEDNESDAY/STRATWARM EXISTS.
INTENSIFYING OF THE ALEUTIAN HIGH WITH A NEW WARMING OVER EASTERN SIBERIA.

STRATWARM ALERTS – continued

12/31/93 03:30:00
GEOALERT WWA365 STRATWARM ALERT/THURSDAY/STRATWARM EXISTS.
INTENSE WARMING CONTINUES FROM CENTRAL SIBERIA TO ALASKA AND THE ADJACENT ARCTIC, SPREADING NORTH – AND NORTHEASTWARDS.

International Relative Sunspot Numbers

Day	Jan 93	Feb	Mar	Apr	May	Jun	Jul*	Aug*	Sep*	Oct*	Nov*	Dec*
1	46	22	76	67	33	105	58	38	26	64	10	62
2	41	34	80	67	32	102	57	40	24	95	20	56
3	38	73	84	75	42	101	66	36	20	87	18	60
4	52	85	93	67	69	82	80	35	22	100	21	66
5	71	119	105	75	77	75	68	26	21	90	30	63
6	84	121	96	89	75	83	58	49	14	71	33	55
7	81	128	93	79	74	72	45	43	12	65	31	65
8	89	134	82	81	81	55	40	47	12	64	33	57
9	94	126	85	87	87	46	38	59	16	76	23	53
10	100	114	81	79	120	47	31	65	9	58	25	46
11	91	95	86	56	125	37	35	73	12	65	14	35
12	94	97	77	37	116	18	35	58	9	56	15	21
13	96	92	67	22	85	10	51	60	10	35	21	17
14	69	82	56	15	59	10	63	39	10	29	26	23
15	58	73	60	13	51	10	66	29	9	52	29	8
16	59	88	56	13	37	13	63	21	23	56	32	20
17	62	68	60	34	32	17	67	29	19	38	35	21
18	66	80	69	49	24	16	80	28	19	37	37	28
19	68	88	72	51	14	15	76	28	14	44	40	18
20	52	97	70	89	33	24	69	22	13	63	40	27
21	47	92	78	98	25	26	64	31	14	66	56	37
22	34	100	73	93	19	27	54	42	14	61	52	44
23	30	101	63	96	22	51	68	42	16	61	53	54
24	45	90	42	98	33	50	66	56	23	52	54	63
25	51	88	40	88	53	59	61	53	43	39	40	82
26	37	86	46	53	66	59	55	44	43	55	40	62
27	43	86	51	62	59	67	66	46	43	39	39	69
28	37	88	51	54	74	69	59	48	52	29	53	65
29	35		54	41	91	79	47	49	48	21	55	81
30	36		58	38	97	70	45	37	40	24	69	75
31	32		61		96		46	28		25		99
Mean	59.3	91.0	69.8	62.2	61.3	49.8	57.3	42.0	21.7	55.4	34.8	49.4

* = 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	Jan 93	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	118.3	121.5	129.6	123.5	104.2	140.4	111.8	102.8	87.1	117.1	90.0	105.6
2	117.4	124.7	141.0	120.7	104.7	143.4	113.6	103.7	82.6	126.9	91.8	101.3
3	120.6	133.0	148.6	117.0	108.9	140.4	114.2	100.8	80.9	124.8	92.4	102.6
4	117.1	143.2	163.8	116.4	112.4	133.7	110.1	98.9	80.5	121.5	94.1	101.6
5	120.8	155.6	162.5	118.9	120.0	137.7	103.9	97.0	81.0	123.7	94.8	98.3
6	125.8	178.8	164.0	133.1	122.2	131.3	98.4	97.1	80.2	118.0	94.9	99.9
7	126.3	171.2	150.9	130.0	133.0	115.7	96.5	93.8	79.6	116.6	93.5	103.8
8	128.6	183.4	144.3	143.5	131.2	115.2	96.4	93.4	80.2	113.1	90.2	101.9
9	124.5	180.3	140.6	136.0	131.5	118.9	93.2	99.1	80.1	110.1	88.7	95.4
10	127.7	175.0	146.7	139.2	136.8	116.0	89.0	104.5	80.1	107.1	88.2	93.2
11	127.4	168.8	148.0	119.4	134.7	104.9	85.8	111.2	79.8	102.3	87.0	89.7
12	135.6	144.9	158.7	103.7	129.0	96.2	88.7	103.2	79.5	97.3	88.9	88.1
13	136.6	131.7	139.9	97.7	122.4	89.4	89.5	99.2	81.1	94.5	92.2	85.1
14	128.8	137.9	134.2	92.8	114.6	86.4	95.7	94.6	82.6	90.8	92.3	85.1
15	121.9	131.6	129.7	88.8	106.7	84.6	96.3	92.8	85.6	93.5	99.9	82.8
16	129.1	130.5	120.5	90.0	101.1	85.0	100.3	92.4	89.0	90.3	98.2	81.9
17	121.9	121.4	122.4	96.5	98.4	86.1	102.6	95.1	85.9	89.4	97.7	81.1
18	117.7	123.2	126.2	106.6	93.5	87.4	103.7	94.3	86.0	86.7	100.2	82.4
19	112.7	113.4	133.4	111.9	93.1	88.8	104.1	93.9	85.0	88.1	98.7	84.2
20	106.5	120.6	127.0	119.9	93.4	94.1	105.6	93.8	80.3	93.5	98.0	88.1
21	103.3	120.3	129.7	120.5	93.3	94.0	108.9	97.0	80.6	94.2	94.8	89.9
22	101.0	130.3	126.6	118.4	94.1	99.8	111.2	96.2	79.8	91.3	96.8	96.6
23	102.7	129.6	120.1	122.9	97.3	113.1	113.3	94.8	82.0 +	91.4	97.9	101.6
24	101.6	132.7	114.4	130.3	100.9	125.4	109.8	92.5	90.0 +	90.6	97.5	107.5
25	102.6	125.5	116.0	126.2	102.4	122.6	105.1	90.6	96.5	86.0	94.7	115.2
26	103.3	123.8	116.4	125.0	110.4	126.0	106.8	90.2	106.8	87.4	90.8	120.5
27	107.6	121.6	122.4	119.6	122.7	131.7	106.4	89.4	104.9	86.0	87.3	135.8
28	108.6	121.4	125.8	115.2	129.2	127.8	104.6	90.2	111.7	87.3	90.7	129.2
29	110.7		128.3	108.1	132.5	126.7	103.5	91.7	116.8	90.5	91.2	124.4
30	109.6		128.7	107.4	144.1	120.3	100.8	90.7	120.9	90.0	100.8	138
31	115.6		124.9		142.1		99.1	90.6		90.1		136.2
Mean	117.2	139.1	135.0	116.7	114.9	112.8	102.2	96.0	87.9	99.7	93.8	101.5

+ = suspect values due to software problems.

DAILY SOLAR INDICES

December 1993

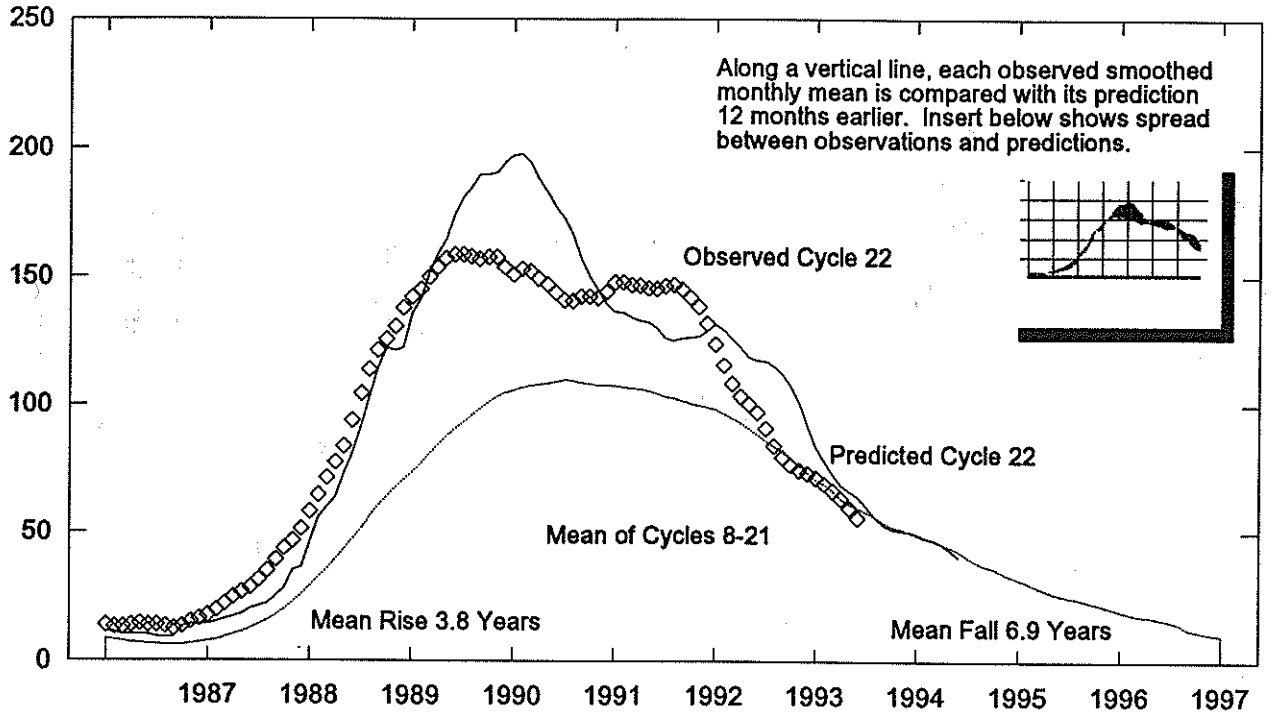
Day	Day of Year	Bartels Cycle Day	Sunspot Numbers Int	Sunspot Numbers Amer	Obs Flux Penticton (2800)	Solar Flux Adjusted to 1 Astronomical Unit — LEAR (15400)	LEAR (8800)	LEAR (4995)	Pentic (2800)	LEAR (2695)	LEAR (1415)	LEAR (610)	LEAR (410)	LEAR (245)
1	335	26	62	70	108.6	512	249	158	105.6	102	72	48	32	15
2	336	27	56	60	104.3	523	214	145	101.3	100	73	49	30	19
3	337	1	60	62	105.6	527	240	146	102.6	100	71	50	29	28
4	338	2	66	71	104.6	528	243	149	101.6	101	72	48	28	14
5	339	3	63	62	101.2	499	235	147	98.3	100	73	49	27	13
6	340	4	55	68	103.0	531	231	146	99.9	99	70	49	26	12
7	341	5	65	66	107.0	539	211	146	103.8	103	74	49	29	11
8	342	6	57	62	105.1	567	238	150	101.9	100	69	46	27	16
9	343	7	53	48	98.4	592	237	146	95.4	100	69	51	29	17
10	344	8	46	40	96.1	556	229	141	93.2	94	66	44	26	13
11	345	9	35	31	92.5	547	207	133	89.7	92	63	48	26	13
12	346	10	21	21	90.9	517	231	137	88.1	88	59	46	26	13
13	347	11	17	19	87.8	548	234	135	85.1	86	58	46	26	8
14	348	12	23	21	87.9	510	234	134	85.1	83	56	45	26	12
15	349	13	8	14	85.4	584	237	135	82.8	82	56	40	22	11
16	350	14	20	22	84.5	520	234	132	81.9	80	55	45	26	13
17	351	15	21	25	83.8	514	231	131	81.1	79	55	45	26	14
18	352	16	28	32	85.1	504	215	128	82.4	81	56	45	26	14
19	353	17	18	19	87.0	576	232	132	84.2	81	58	45	27	15
20	354	18	27	30	91.0	518	232	135	88.1	83	60	47	28	15
21	355	19	37	37	92.9	572	238	139	89.9	87	60	45	27	15
22	356	20	44	45	99.8	526	224	139	96.6	90	61	47	28	15
23	357	21	54	56	105.0	558	239	146	101.6	96	64	49	28	15
24	358	22	63	73	111.2	554	226	146	107.5	99	69	53	33	22
25	359	23	82	90	119.1	542	238	164	115.2	107	70	52	30	16
26	360	24	62	68	124.6	532	246	170	120.5	111	70	50	30	18
27	361	25	69	72	140.4	535	241	173	135.8	120	78	54	36	28
28	362	26	65	75	133.6	585	248	182	129.2	126	80	55	30	16
29	363	27	81	79	128.7	587	263	182	124.4	121	80	55	31	14
30	364	1	75	78	142.8	555	279	193	138.0	128	79	54	31	15
31	365	2	99	97	140.8	558	286	202	136.2	134	81	56	35	16
MEAN			49.4	52.0	104.8	542	236	149	101.5	98	67	48	28	15

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	54	53	51	50	49	47	58
( )							(4)	(7)	(10)	(12)	(14)	(15)	10
1994	46	44	43	42	41	40	38	36	35	33	32	31	38
( )	(16)	(16)	(17)	(18)	(18)	(19)	(20)	(21)	(22)	(22)	(23)	(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)

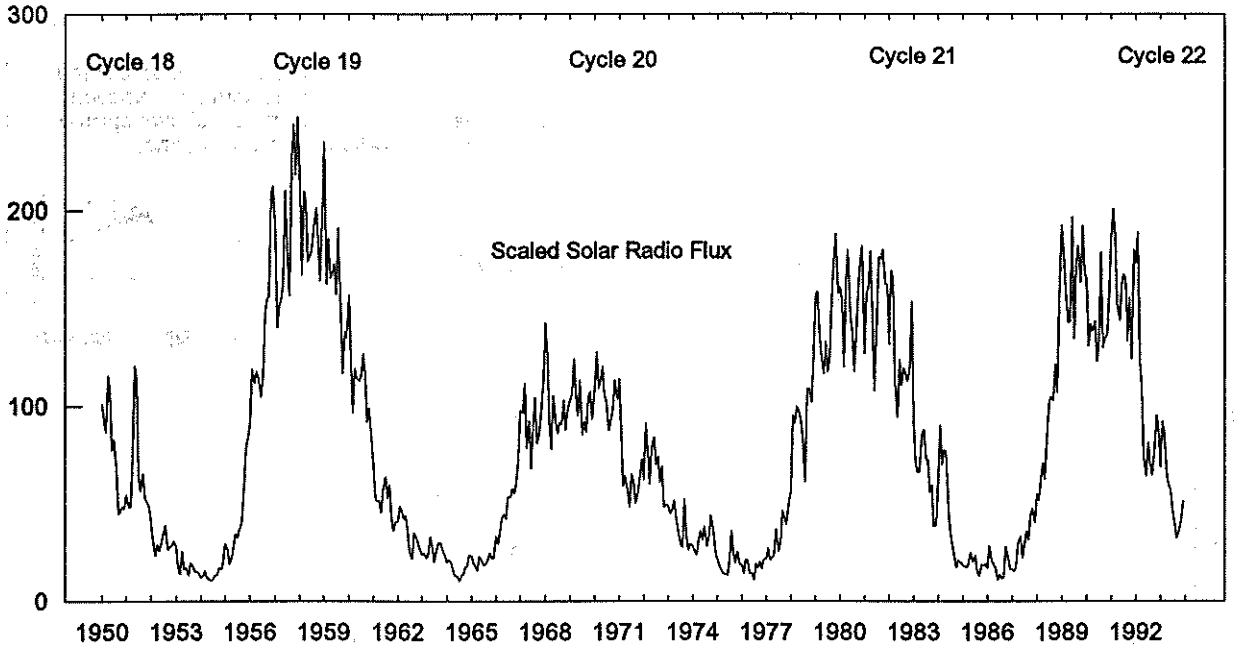
Solar Cycle 22 — Min, Max, and Predictions

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 June 1994 prediction. There exists a 90% chance that in June 1994 the actual smoothed number will fall somewhere between 21 and 59.

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 - Dec 1993



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

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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
LEAR	01	0024	0039	0046	N05	W18	7624	11	29.8	22	SF		3	E		21		F
PALE		0025E	0037U	0046D	N02	W18	7624	11	29.8	21D	SF		3	E		13		
LEAR		0057	0112	0134	N06	W18	7624	11	29.8	37	SF		3	E		25		
PALE		0148E	0150U	0151D	N02	W19	7624	11	29.7	3D	SF		3	E		14		
LEAR		0149	0151	0154	N05	W19	7624	11	29.7	5	SF		3	E		20		
LEAR		0159	0205	0227	N05	W18	7624	11	29.8	28	SF	C 3.2	3	E		80		
PALE		0201E	0209U	0215D	N02	W18	7624	11	29.8	14D	SF		2	E		53		
LEAR		0235	0237	0250	N05	W19	7624	11	29.8	15	SF		3	E		10		
PALE		0238E	0238U	0240D	N02	W18	7624	11	29.9	2D	SF		2	E		10		
LEAR		0415	0419	0431	N05	W21	7624	11	29.7	16	1N	C 5.0	3	E		128		F
LEAR		0439	0443	0449	N04	W16	7624	11	30.0	10	SF		3	E		19		
LEAR		0555	0603	0616	N04	W20	7624	11	29.8	21	SF		3	E		54		F
LEAR		0701	0702	0710	S23	E65	7627	12	6.3	9	SF	C 3.1	3	E		51		F
LEAR		0842	0859	0902	N06	W23	7624	11	29.7	20	SF		3	E		35		F
LEAR		0932	0932	0938	N05	W24	7624	11	29.7	6	SF		3	E		20		F
GOES		1105	1109	1111						6		B 5.4						
SVTO		1121		1124D	N03	W22	7624	11	29.9	3D	SF	C 1.4	3	E		17		H
GOES		1200	1205	1211						11		B 6.1						
RAMY		1229	1230	1234	N04	W24	7624	11	29.8	5	SF	B 8.6	3	E		21		
GOES		2127	2134	2138						11		B 4.1						
GOES	02	0536	0539	0541						5		B 2.8						
RAMY		1553	1557	1605	S16	E55	7627	12	6.8	12	SF	B 6.4	3	E		13		
PALE		1928E	1928U	1941D	S18	E48	7627	12	6.5	13D	SF	B 4.5	3	E		16		
HOLL		2236	2241	2309	S19	E48	7627	12	6.6	33	SF	B 9.2	3	E		51		F
LEAR		2238E	2238U	2254D	S18	E48	7627	12	6.6	16D	SF		3	E		25		F
GOES	03	0641	0645	0656						15		B 3.8						
GOES		1135	1139	1142						7		B 4.4						
RAMY		1348	1353	1418D	S17	E41	7627	12	6.7	30D	SF		3	E		12		
RAMY		1657	1658	1702	S17	E40	7627	12	6.7	5	SF		3	E		13		
HOLL		1657	1658	1703	S19	E39	7627	12	6.7	6	SF		3	E		18		
HOLL		1801	1805	1807	S18	E39	7627	12	6.7	6	SF		3	E		25		
RAMY		1801	1805	1808	S18	E39	7627	12	6.7	7	SF		3	E		25		
HOLL		1932	1938	1945	S22	E57	7629	12	8.2	13	SF		3	E		19		
GOES		2241	2248	2303						22		B 6.8						
LEAR	04	0112	0118	0125	S23	E52	7629	12	8.0	13	SF	C 1.2	3	E		52		F
GOES		0324	0328	0333						9		B 5.5						
LEAR		0410	0411	0416	S22	E53	7629	12	8.2	6	SF	B 5.2	3	E		44		F
GOES		0424	0431	0441						17		B 4.9						
LEAR		0510	0511	0514	S23	E50	7629	12	8.1	4	SF	B 5.2	3	E		17		
LEAR		0518	0518	0526	S23	E50	7629	12	8.1	8	SF	B 6.6	3	E		18		
LEAR		0547	0554	0559	S23	E50	7629	12	8.1	12	SF	B 6.3	3	E		22		
LEAR		0603	0608	0620	S23	E49	7629	12	8.0	17	SF	B 5.7	3	E		15		
GOES		0658	0704	0708						10		B 3.7						
LEAR		0741	0747	0757	S23	E51	7629	12	8.2	16	SF	B 3.4	3	E		35		
GOES		0826	0830	0833						7		B 5.6						
RAMY		1432	1436	1442	S21	E49	7629	12	8.4	10	SF	B 8.3	3	E		13		
RAMY		1736	1738	1747	S22	E44	7629	12	8.1	11	SF	B 5.6	4	E		13		F
LEAR		2252	2253	2256	S23	E42	7629	12	8.2	4	SF		3	E		40		F
LEAR		2252	2254	2256	S11	E43	7630	12	8.2	4	SF		3	E		22		F
GOES	05	0056	0100	0104						8		B 3.2						
GOES		1025	1033	1042						17		C 4.3						
GOES		1059	1104	1111						12		C 2.1						
GOES		1323	1336	1351						28		B 4.7						
RAMY		1541	1542	1548	S22	E35	7629	12	8.3	7	SF	B 6.7	3	E		12		F
RAMY		1626	1645	1652	S22	E33	7629	12	8.2	26	SF	C 1.6	4	E		30		F
HOLL		1643	1645	1647	S22	E33	7629	12	8.2	4	SF		4	E		41		F
GOES		2140	2226	2235						55		B 7.2						
LEAR	06	0638	0638	0642	S09	E26	7630	12	8.2	4	SF		3	E		14		
LEAR		0638	0653	0701	S23	E25	7629	12	8.2	23	SF	B 7.1	3	E		48		F
SVTO		0710E	0715U	0730D	S22	E26	7629	12	8.3	20D	SF		2	E		54		F
LEAR		0736	0744	0746	S22	E24	7629	12	8.2	10	SF		3	E		58		F
GOES		0747	0756	0814						27		C 1.0						
LEAR		0801	0808	0826	S22	E24	7629	12	8.2	25	SF		3	E		67		F

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Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Lo	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	06	0911	0916	0931						20		B 5.1						
GOES		0934	0938	0942						8		B 6.0						
GOES		1034	1041	1048						14		C 1.0						
RAMY		1226	1232	1240	S22	E21	7629	12	8.1	14	SF	C 1.7	3	E		22		FH
GOES		1343	1352	1357						14		B 4.8						
GOES		1515	1528	1538						23		B 6.2						
RAMY		1608	1609	1624	S22	E21	7629	12	8.3	16	SF	B 7.8	3	E		12		F
RAMY		1717	1721	1812	S21	E19	7629	12	8.2	55	SN		3	E		89		FE
HOLL		1717	1721	1817	S22	E19	7629	12	8.2	60	1N	C 9.7	3	E		109		F
PALE		1746E	1746U	1814D	S21	E19	7629	12	8.2	28D	SF		4	E		29		H
HOLL		2040	2045	2106	S23	E16	7629	12	8.1	26	SF	C 7.5	3	E		56		
PALE		2044E	2047U	2058D	S22	E15	7629	12	8.0	14D	SF		2	E		50		FH
LEAR		2227	2254	2256	S21	E14	7629	12	8.0	29	SF		3	E		45		F
LEAR	07	0021	0045	0118	S22	E12	7629	12	7.9	57	SF	C 3.8	3	E		55		F
PALE		0038E	0039U	0103D	S21	E11	7629	12	7.9	25D	SF		2	E		42		
LEAR		0211	0213	0236	S21	E12	7629	12	8.0	25	SF	C 4.2	3	E		32		F
PALE		0211E	0215U	0224D	S21	E11	7629	12	7.9	13D	SF		2	E		40		
LEAR		0414	0419	0437	S21	E10	7629	12	7.9	23	SF	C 1.7	3	E		39		F
GOES		0618	0623	0630						12		C 1.0						
SVTO		0649E	0654U	0657	S17	W23	7627	12	5.5	8D	SF		2	E		51		FH
SVTO		0704	0710	0719	S22	E14	7629	12	8.4	15	SF		2	E		68		F
LEAR		0711	0712	0732	S22	E09	7629	12	8.0	21	SF		3	E		41		F
LEAR		0820	0829	0903	S18	W11	7627	12	6.5	43	SF	B 9.3	3	E		56		FH
SVTO		0822E	0830	0905D	S19	W11	7627	12	6.5	43D	SF		3	E		56		FH
GOES		0837	0845	0849						12		B 9.6						
GOES		1129	1206	1221						52		B 8.0						
GOES		1500	1508	1513						13		B 4.5						
GOES		1715	1720U	1722D						7D		B 6.2						
GOES		1943	1950	1959						16		B 5.7						
HOLL		2050E	2051U	2105D	S11	E02	7630	12	8.0	15D	SF	B 6.2	2	E		18		F
GOES		2159	2203	2210						11		B 3.3						
LEAR	08	0150	0152	0155	S22	E01	7629	12	8.1	5	SF	C 1.0	3	E		13		F
PALE		0150E	0152U	0157D	S21	E01	7629	12	8.1	7D	SF		3	E		47		
GOES		0429	0433	0435						6		B 3.9						
GOES		0548	0558	0604						16		B 6.2						
GOES		0921	0925	0928						7		B 3.4						
LEAR		0933	0939	1012	S22	W04	7629	12	8.1	39	SF	C 1.8	3	E		61		F
SVTO		0945	0954	1005D	S22	W04	7629	12	8.1	20D	SF		3	E		24		
SVTO		1012	1016	1032	S24	W21	7627	12	6.8	20	SF	B 6.9	3	E		25		
GOES		1129	1134	1136						7		B 5.6						
GOES		1215	1218	1220						5		B 6.3						
GOES		1223	1226	1231						8		B 4.8						
RAMY		1501	1502	1515	S22	W08	7629	12	8.0	14	SF	B 7.9	3	E		45		F
PALE		1759E	1800U	1803D	S21	W08	7629	12	8.1	4D	SF	B 3.5	3	E		14		
GOES		1819	1823	1827						8		B 3.0						
PALE		1939E	1940U	1942D	S09	W09	7630	12	8.1	3D	SF		3	E		13		
RAMY		1941	1942	1946	S10	W11	7630	12	8.0	5	SF	B 8.3	3	E		15		F
PALE		2053E	2053U	2056D	S21	W09	7629	12	8.2	3D	SF		3	E		20		
GOES	09	0111	0114	0116						5		B 4.2						
GOES		0206	0214	0220						14		B 4.9						
LEAR		0321	0321	0326	S22	W15	7629	12	8.0	5	SF	B 4.1	3	E		14		
GOES		0420	0424	0426						6		B 3.1						
GOES	10	2258	2305	2310						12		B 2.5						
GOES	11	2331	2336	2344						13		B 2.5						
LEAR	12	0203	0203	0210	S20	W62	7633	12	7.3	7	SF	B 3.9	3	E		13		
LEAR		0229	0231U	0237	S22	W75	7627	12	6.3	8	1F	B 6.5	3	E		142		
LEAR		0423	0424	0429	S20	W64	7633	12	7.3	6	SF	B 2.3	3	E		35		
GOES		0559	0617	0634						35		B 9.4						
SVTO		0824	0826U	0830	S21	W64	7629	12	7.4	6	SF		3	E		14		
LEAR		0826	0826	0834	S21	W55	7629	12	8.1	8	SF	B 7.9	3	E		19		
GOES		1202	1206	1214						12		B 3.8						
GOES		1752	1755	1758						6		B 2.8						

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Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP No	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	12	1835	1839	1844						9		B 3.0						
GOES		1955	1958	2002						7		B 3.4						
GOES		2054	2057	2101						7		B 2.6						
GOES		2118	2122	2126						8		B 2.7						
GOES	13	0243	0252	0259						16		B 5.0						
GOES		0617	0623	0626						9		C 1.1						
GOES		1119	1132	1144						25		B 4.6						
GOES		1153	1159	1204						11		B 4.3						
GOES		1509	1619	1724						135		B 9.6						
GOES		2342	2346	2350						8		B 2.5						
GOES	14	0934	0938	0941						7		B 5.0						
GOES		1057	1102	1106						9		C 1.2						
GOES		1204	1210	1214						10		C 2.1						
GOES		1527	1536	1542						15		B 7.2						
GOES		1916	1921	1930						14		B 3.4						
HOLL		2100	2102	2114	S12	W79	7634	12	8.9	14	SF		3	E		27		H
PALE		2104E	2104U	2116D	S14	W77	7634	12	9.0	12D	SF		3	E		26		
PALE		2123E	2127U	2137D	S14	W77	7634	12	9.1	14D	SF		2	E		27		
HOLL		2233	2234	2238	S11	W80	7634	12	8.9	5	SF		3	E		23		
GOES	15	0102	0106	0114						12		B 3.5						
GOES		0652	0701	0705						13		B 6.5						
GOES		1049	1055	1059						10		B 2.9						
GOES		1351	1632	1736						225		B 4.3						T
HOLL	17	1958	2001	2149	N07	E43	7635	12	21.0	111	SF	C 2.0	3	E		29		FH
PALE		2001E	2001U	2150	N05	E37	7635	12	20.6	109D	SF		3	E		76		H
GOES	18	0544	0547	0549						5		B 1.6						
RAMY		1512E	1516U	1538D	N00	E28	7635	12	20.7	26D	SN	B 3.6	2	E		27		
PALE	19	0304E	0304U	0310D	N02	E24	7635	12	20.9	6D	SF		2	E		14		
GOES		0736	0741	0747						11		B 2.2						
GOES		1717	1736	1748						31		B 2.3						
GOES		2038	2042	2049						11		B 1.9						
GOES		2101	2108	2113						12		B 2.1						
GOES		2245	2253	2257						12		B 3.2						
GOES	20	0152	0200	0209						17		C 1.3						
GOES		0235	0245	0259						24		B 5.2						
GOES		0613	0625	0638						25		B 3.6						
GOES		0713	0731	0751						38		C 1.5						
GOES		0838	0846	0854						16		C 1.3						
RAMY		1425	1426	1431	N08	E80		12	26.6	6	SF	B 6.0	3	E		12		
RAMY		1533	1535	1553	N07	E76		12	26.3	20	SF	B 6.8	3	E		50		
RAMY		1819	1820	1829	N07	E75	7640	12	26.4	10	SF		3	E		20		F
RAMY		1849	1852	1902	N08	E74	7640	12	26.3	13	SF	B 6.4	3	E		32		F
PALE		1858E	1858U	1903D	N07	E72	7640	12	26.2	5D	SF		2	E		26		
RAMY		1916	1917	1927	N07	E72	7640	12	26.2	11	SF		3	E		18		
GOES		2222	2225	2236						14		B 4.7						
GOES	21	0012	0030	0042						30		C 1.0						
GOES		0053	0057	0102						9		C 1.2						
GOES		0424	0429	0438						14		B 4.6						
GOES		0511	0520	0524						13		C 1.2						
GOES		0757	0802	0808						11		B 3.5						
GOES		1259	1302	1304						5		B 2.3						
GOES		2100	2105	2113						13		C 1.0						
GOES		2134	2142	2150						16		B 8.7						
GOES	22	0726	0730	0734						8		B 2.3						
SVTO		0757	0800	0809	N08	E55	7640	12	26.4	12	SF		3	E		10		
LEAR		0936	0937	0943	N09	E56	7640	12	26.6	7	SF	C 2.1	3	E		21		F
SVTO		1111	1115	1121D	N07	E49	7640	12	26.1	10D	SF	C 1.2	3	E		43		
GOES		1115	1119	1121						6		C 1.4						
SVTO		1146	1239	1242	N07	E48	7640	12	26.1	56	SF		3	E		11		

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RAMY	22	1300	1302	1308	N06	E46	7640	12	26.0	8	SF	B 7.0	3	E		26		
GOES		1346	1350	1352						6		B 5.7						
GOES		1527	1530	1534						7		B 3.5						
HOLL		1606E	1616U	1643	N07	E45	7640	12	26.0	37D	SF	B 3.5	2	E		31		
RAMY		1647	1648	1651	N05	E44	7640	12	26.0	4	SF	B 7.6	3	E		12		F
HOLL		1723	1725	1737	N07	E45	7640	12	26.1	14	1B	M 1.4	3	E		133		H
PALE		1731E	1731U	1738D	N06	E46	7640	12	26.2	7D	SF		1	E		27		FH
HOLL		2233	2238	2246	N07	E42	7640	12	26.1	13	SF	B 4.5	3	E		18		
HOLL		2252	2305	2310	N07	E41	7640	12	26.0	18	SF	B 4.7	3	E		30		F
LEAR		2302	2302	2307	N07	E42	7640	12	26.1	5	SF		3	E		13		
HOLL		2311	2315U	2325	N08	E46	7640	12	26.4	14	SF	B 4.3	2	E		28		F
LEAR	23	0011	0012	0016	N07	E42	7640	12	26.1	5	SF	C 1.4	3	E		11		
LEAR		0019	0023	0034	N07	E41	7640	12	26.1	15	SF	C 1.1	3	E		23		
PALE		0021E	0021U	0023D	N07	E42	7640	12	26.2	2D	SF		1	E		21		H
GOES		0143	0149	0151						8		B 6.2						
GOES		0235	0238	0240						5		B 6.0						
LEAR		0253	0257	0307	N07	E39	7640	12	26.0	14	SF	B 5.5	3	E		25		
GOES		0425	0429	0431						6		B 5.0						
LEAR		0530	0532	0538	N07	E38	7640	12	26.1	8	SF	C 4.4	3	E		27		
GOES		0556	0603	0619						23		B 8.8						
GOES		0733	0743	0749						16		C 1.0						
GOES		0805	0813	0816						11		B 9.0						
SVTO		0840	0841	0850	N06	E42	7640	12	26.5	10	SF		3	E		13		
SVTO		0859	0904	0908	N07	E37	7640	12	26.1	9	SF	C 2.9	3	E		33		H
LEAR		0903	0903	0907	N07	E36	7640	12	26.1	4	SF		3	E		35		
LEAR		0953	0954	1000	N07	E35	7640	12	26.0	7	SF		3	E		23		
SVTO		0953	0955	1008	N07	E37	7640	12	26.2	15	SF	C 1.2	3	E		32		
GOES		1136	1139	1143						7		B 4.3						
GOES		1144	1150	1157						13		B 6.9						
RAMY		1235	1236	1302	N06	E33	7640	12	26.0	27	SN	C 1.9	3	E		62		FE
SVTO		1235	1237	1309	N07	E37	7640	12	26.3	34	SF	C 2.9	3	E		73		H
RAMY		1305	1306	1317	N04	E37	7640	12	26.3	12	SF		3	E		19		
RAMY		1441	1447	1458	N05	E34	7640	12	26.1	17	SF	C 2.0	3	E		35		
SVTO		1445E	1445U	1454D	N01	E40	7640	12	26.6	9D	SF		3	E		55		
RAMY		1617	1625	1645	N03	E43	7640	12	26.9	28	SF	C 2.9	3	E		30		F
HOLL		1625E	1630U	1640	N06	E41	7640	12	26.7	15D	SF		1	E		34		
PALE		2031E	2031U	2033	N05	E36	7640	12	26.5	2D	SF		2	E		11		F
LEAR		2300	2321	2325	N06	E31	7640	12	26.3	25	SF	C 3.1	3	E		63		F
GOES	24	0324	0327	0329						5		B 6.0						
LEAR		0335	0335	0346	N07	E27	7640	12	26.2	11	SF	B 7.4	3	E		12		F
LEAR		0842	0858	0939	N07	E22	7640	12	26.0	57	SF	C 2.7	3	E		81		F
GOES		0923	0926	0928						5		C 1.7						
LEAR		0943	0957	1014	N07	E20	7640	12	25.9	31	SN	C 3.8	3	E		77		F
SVTO		0948E	0955U	1006D	N08	E30	7640	12	26.6	18D	1N		2	E		143		FE
SVTO		1144E	1145	1205	N08	E22	7640	12	26.1	21D	1F		3	E		108		
RAMY		1151E	1157	1215	N07	E24	7640	12	26.3	24D	SB		2	E		60		
SVTO		1211	1214	1226	N08	E22	7640	12	26.1	15	SF	C 5.1	3	E		97		F
SVTO		1318	1319	1328D	N04	W49	7635	12	20.9	10D	SF		3	E		38		F
SVTO		1322	1324	1329D	N08	E26	7640	12	26.5	7D	SF		3	E		16		F
RAMY		1324	1325	1328	N06	E34	7640	12	27.1	4	SF		3	E		16		
RAMY		1335	1341	1409	N07	E20	7640	12	26.1	34	SF	C 2.5	3	E		40		F
GOES		1411	1415	1425						14		C 1.4						
RAMY		1451	1503	1537	N08	E29	7640	12	26.8	46	1N	M 1.3	3	E		195		FE
GOES		1631	1635	1640						9		C 1.0						
HOLL		1729	1730	1734	N07	E23	7640	12	26.4	5	SF		3	E		66		
RAMY		1729	1731	1741	N06	E17	7640	12	26.0	12	SN	C 3.9	3	E		67		FE
HOLL		1804	1814	1835	N07	E20	7640	12	26.2	31	1N	M 1.1	3	E		124		
PALE		1810E	1818U	1840D	N06	E20	7640	12	26.2	30D	1B		2	E		165		FE
GOES		1905	1910	1913						8		B 8.9						
HOLL		2106	2106	2110	N07	E16	7640	12	26.1	4	SF	C 1.8	3	E		18		
PALE		2107E	2108U	2126D	N05	E15	7640	12	26.0	19D	SF		2	E		42		FH
RAMY		2116	2118	2121D	N06	E14	7640	12	25.9	5D	SN		2	E		19		
HOLL		2117	2117	2122	N06	E15	7640	12	26.0	5	SF	C 2.1	3	E		25		
GOES		2246	2249	2252						6		B 6.7						
GOES		2259	2303	2312						13		B 7.1						
LEAR		2354	2355		N07	E15	7640	12	26.1	6	SF	B 9.1	3	E		16		

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	See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	25	0103	0108	0111						8		C 1.3						
GOES		0115	0119	0125						10		C 1.2						
LEAR		0132	0134	0137	N06	E13	7640	12	26.0	5	SF		3	E		16		
GOES		0327	0330	0333						6		C 1.5						
LEAR		0426	0429	0441	N07	E12	7640	12	26.1	15	SF	C 6.2	3	E		74		F
LEAR		0442	0455	0507	N03	E15	7640	12	26.3	25	SF	C 4.3	3	E		55		F
LEAR		0518	0530	0640	N07	E11	7640	12	26.0	82	SF	C 4.4	3	E		98		F
GOES		0612	0616	0619						7		C 1.7						
LEAR		0657	0738	0847	N07	E10	7640	12	26.0	110	SF	C 5.8	3	E		89		F
SVTO		0835E	0835U	0848D	N08	E17	7640	12	26.6	13D	SF	C 4.5	2	E		93		F
GOES		0906	0910	0915						9		C 2.1						
SVTO		1139	1245	1253	N08	E10	7640	12	26.2	74	SN		3	E		34		F
RAMY		1213	1244	1254	N07	E08	7640	12	26.1	41	SF		3	E		15		F
GOES		1229	1233	1236						7		C 2.3						
GOES		1241	1244	1248						7		C 2.2						
GOES		1411	1415	1417						6		C 1.0						
RAMY		1444	1452	1500	N07	E07	7640	12	26.1	16	SF	C 6.0	3	E		15		FE
HOLL		1521	1524	1530	N07	E06	7640	12	26.1	9	SF		3	E		12		H
HOLL		1559	1602	1606	N07	E06	7640	12	26.1	7	SF		3	E		21		
HOLL		1615	1615	1623	N07	E06	7640	12	26.1	8	SF		3	E		14		
RAMY		1709	1710	1720	N08	E07	7640	12	26.2	11	SF		3	E		28		F
HOLL		1709	1711	1720	N08	E07	7640	12	26.2	11	SF	C 4.6	3	E		33		F
RAMY		1743	1745	1750	N04	E08	7641	12	26.3	7	SF		3	E		10		F
RAMY		1744	1757	1820	N07	E06	7640	12	26.2	36	SN	M 1.5	3	E		69		FE
HOLL		1744	1759	1815	N07	E05	7640	12	26.1	31	SF		3	E		80		F
RAMY		1826	1834	1903	N07	E04	7640	12	26.1	37	SF		3	E		21		F
HOLL		1828	1841	1859	N07	E04	7640	12	26.1	31	SF		3	E		42		
RAMY		1931	1934	1938	N06	E04	7640	12	26.1	7	SF		3	E		14		F
RAMY		1939	1940	1946	N07	E04	7640	12	26.1	7	SF	C 1.8	3	E		47		F
PALE		1940E		1946	N07	E05	7640	12	26.2	6D	SF		3	E		40		F
GOES		2021	2025	2030						9		C 1.0						
GOES		2117	2123	2128						11		C 2.6						
LEAR		2258	2302	2320D	N06	E01	7640	12	26.0	22D	SF		3	E		33		
HOLL		2258	2309	2322	N08	E08	7640	12	26.5	24	SF		3	E		51		
GOES	26	0008	0013	0015						7		B 7.7						
GOES		0023	0029	0032						9		C 1.6						
LEAR		0347	0349	0356	N06	W01	7640	12	26.1	9	SF	B 6.6	3	E		32		
LEAR		0402	0413	0444	N06	W02	7640	12	26.0	42	1N	M 1.5	3	E		192		FE
LEAR		0511	0517	0558	N05	W04	7640	12	25.9	47	SF	C 1.7	3	E		25		F
GOES		0538	0548	0550						12		C 3.3						
LEAR		0608	0616	0629	N07	W03	7640	12	26.0	21	SF	C 2.5	3	E		48		F
GOES		0640	0645	0648						8		C 1.5						
LEAR		0718	0733	0749	N06	W06	7640	12	25.8	31	1F	C 4.6	3	E		123		F
LEAR		0843	0848	0858	N06	W05	7640	12	26.0	15	SF	C 3.6	3	E		46		F
SVTO		0850E	0853U	0857D	N06	E04	7640	12	26.7	7D	SF		1	E		62		F
LEAR		0913	0914	0932	N06	E00	7640	12	26.4	19	SF	C 2.8	3	E		46		F
LEAR		0940	0941	0946	N05	W09	7640	12	25.7	6	SF	C 2.5	3	E		19		H
GOES		0948	0951	0953						5		B 7.5						
LEAR		1003	1015	1027D	N06	W05	7640	12	26.0	24D	SF	C 1.4	3	E		32		
GOES		1029	1039	1043						14		C 4.0						
GOES		1118	1121	1123						5		B 7.7						
GOES		1126	1131	1135						9		C 3.0						
GOES		1218	1221	1223						5		B 7.3						
RAMY		1331	1340	1357	N10	W01	7640	12	26.5	26	1N	C 2.4	3	E		113		FE
HOLL		1456	1505	1626	N07	W06	7640	12	26.2	90	1F	C 5.7	3	E		173		FE
RAMY		1501	1504	1516	N07	W06	7640	12	26.2	15	1N		3	E		113		FE
RAMY		1542	1558	1621	N07	W11	7640	12	25.8	39	1F	C 6.5	3	E		148		FE
HOLL		1705	1707	1710	N06	W12	7640	12	25.8	5	SF	C 2.2	3	E		15		
RAMY		1706	1707	1711	N06	W11	7640	12	25.9	5	SF		3	E		14		
RAMY		1714	1801	1830	N11	W09	7640	12	26.0	76	SF	C 1.0	3	E		56		F
GOES		1741	1745	1747						6		C 1.0						
HOLL		1757	1758	1816	N11	W10	7640	12	26.0	19	SF	C 2.0	3	E		16		
RAMY		1831	1840	1847	N06	W09	7640	12	26.1	16	SF		3	E		23		
RAMY		1903	1904	1923	N06	W10	7640	12	26.0	20	SF	C 1.6	3	E		47		F
HOLL		1904	1905	1915	N06	W10	7640	12	26.0	11	SF		3	E		48		
RAMY		1924	1936	1939	N05	W14	7640	12	25.8	15	SF	C 1.5	3	E		14		F
GOES		2028	2032	2036						8		C 1.1						

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)	Opt	Imp Xray	See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	26	2101	2110	2127						26		C 1.3						
PALE		2237E	2239U	2255D	N11	E05	7640	12	27.3	18D	SF		2	E		47		F
LEAR		2238	2239	2253	N08	E02	7640	12	27.1	15	SF	C 3.0	3	E		54		F
PALE		2357E	2357U	2409D	N06	W17	7640	12	25.7	12D	SF		1	E		13		
PALE	27	0218E	0219U	0240D	N09	E04	7640	12	27.4	22D	SF		3	E		20		F
LEAR		0313	0317	0325	N04	W18	7640	12	25.8	12	SF	C 1.6	3	E		23		F
LEAR		0350	0357	0405	N05	W19	7640	12	25.7	15	SF	C 1.5	3	E		23		
LEAR		0912	0915	0941	N07	W13	7640	12	26.4	29	SF	C 4.8	3	E		46		FH
SVTO		0916	0918	0930	N10	W03	7640	12	27.2	14	SN		3	E		25		F
LEAR		0953	0954	1001	N06	W25	7640	12	25.5	8	SF	C 4.3	3	E		28		
SVTO		0956E	0958U	1012	N06	W23	7640	12	25.7	16D	SF		3	E		39		FH
GOES		1226	1231	1236						10		C 1.3						
RAMY		1559	1559	1605	N07	W24	7640	12	25.9	6	SF	C 1.4	3	E		15		F
RAMY		1843	1900	1922	N10	W20	7640	12	26.3	39	SF	M 1.9	3	E		28		F
HOLL		2207	2208	2312D	N09	W18	7644	12	26.6	65D	SF		3	E		42		
GOES	28	0022	0027	0031						9		C 1.7						
LEAR		0152	0157	0207	N07	W25	7640	12	26.2	15	SF		3	E		30		F
LEAR		0227	0253	0331	N09	W24	7640	12	26.3	64	SF	C 8.4	3	E		88		F
LEAR		0240	0243	0258	N10	W15	7644	12	27.0	18	SF		3	E		23		F
PALE		0258E	0306U	0306D	N10	W27	7640	12	26.1	8D	SF		2	E		28		
GOES		0530	0534	0537						7		C 2.6						
LEAR		0649	0653	0705	N11	W16	7644	12	27.1	16	SF	C 3.0	3	E		73		F
SVTO		0756	0803	0816	N05	W33	7640	12	25.9	20	SF		3	E		35		F
LEAR		0833	0835	0842	N03	W35	7640	12	25.7	9	SF		3	E		25		
SVTO		0833	0836	0846	N04	W35	7640	12	25.7	13	SF		3	E		35		F
SVTO		0853	0901	0920	N06	W34	7640	12	25.8	27	SF	C 2.7	3	E		64		F
LEAR		0859	0901	0917	N05	W34	7640	12	25.8	18	SF		3	E		62		F
LEAR		1013	1015	1026	N11	W18	7644	12	27.1	13	SF		3	E		19		
GOES		1059	1104	1108						9		C 2.1						
GOES		1205	1210	1214						9		C 4.6						
GOES		1310	1315	1329						19		C 1.7						
RAMY		1530	1534	1538	N08	W36	7640	12	25.9	8	SF		3	E		60		F
RAMY		1602	1604	1611	N13	W19	7644	12	27.2	9	SF	C 2.6	3	E		11		
RAMY		1653	1656	1713	N07	W37	7640	12	25.9	20	1N	M 1.1	3	E		134		FE
RAMY		2002	2005	2018	N08	W35	7640	12	26.2	16	SF		3	E		24		F
GOES		2138	2143	2150						12		C 1.1						
HOLL		2153	2157	2206	N07	W39	7640	12	26.0	13	SF		3	E		11		
HOLL		2157	2157	2204	N06	W31	7641	12	26.6	7	SF		3	E		17		
HOLL		2220	2221	2224	N06	W42	7640	12	25.8	4	SF		3	E		10		
GOES		2244	2307	2322						38		C 5.0						
PALE	29	0143	0146	0154D	S10	E84	7640	01	4.4	11D	SF		4	E		45		F
LEAR		0218	0220	0237	N10	W36	7640	12	26.4	19	SF	C 1.9	3	E		20		F
LEAR		0242	0247	0252	N07	W41	7640	12	26.0	10	SF	C 1.4	3	E		27		F
LEAR		0257	0300	0303	S09	E80	7646	01	4.1	6	SF		3	E		32		
GOES		0544	0549	0556						12		C 1.2						
LEAR		0634	0636	0647	N07	W42	7640	12	26.1	13	SF	C 1.1	3	E		32		F
GOES		0701	0707	0717						16		C 1.0						
LEAR		0746	0748	0752	S13	E75	7646	01	4.0	6	SF	C 1.6	3	E		25		
LEAR		0940	0942	0949	S09	E76	7646	01	4.1	9	SF		3	E		19		
RAMY		1245	1252	1310	S11	E76	7646	01	4.2	25	SF		3	E		23		
RAMY		1439	1444	1447	S11	E77	7646	01	4.4	8	SF		3	E		29		
RAMY		1530	1539	1604	N12	W43	7640	12	26.4	34	SF	C 9.9	3	E		50		F
PALE		1755E	1756U	1759	N14	W45	7640	12	26.3	4D	SF	C 1.5	2	E		34		F
GOES		2016	2032	2041						25		C 1.1						
LEAR		2256	2258	2303	N11	E67	7645	01	4.0	7	SF	C 3.7	3	E		18		F
LEAR	30	0027	0032	0054	N08	W43	7640	12	26.8	27	SF		3	E		28		F
GOES		0149	0203	0214						25		C 4.3						
GOES		0310	0317	0319						9		C 1.8						
GOES		0528	0531	0536						8		C 1.3						
GOES		0547	0555	0610						23		M 1.6						
GOES		0617	0622	0626						9		C 8.0						
GOES		0704	0714	0718						14		C 1.3						
GOES		0747	0806	0812						25		C 1.6						
GOES		0914	0919	0928						14		C 7.1						

Hα S O L A R F L A R E S

DECEMBER 1993

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	Imp See	Obs Type	Area Measurement Time (UT)	Area Measurement Apparent (10-6 Disk)	Area Measurement Corr (Sq Deg)	Remarks
GOES	30	1140	1144	1150						10		C 1.9						
GOES		1159	1202	1205						6		C 1.4						
RAMY		1211	1227	1242	N10	W50	7644	12	26.7	31	SF		3	E		12		
SVTO		1217E	1220	1302D	N10	E59	7645	01	3.9	45D	SF		2	E		33		
SVTO		1217E	1224U	1238D	N10	W47	7644	12	27.0	21D	SF		3	E		25		
RAMY		1220	1227	1305	N09	E61	7645	01	4.1	45	SF		3	E		10		
RAMY		1248	1306	1320	N09	W51	7644	12	26.7	32	SF	C 1.2	3	E		39		
RAMY		1308	1314	1319	N10	E62	7645	01	4.2	11	SF		3	E		43		
RAMY		1321	1322	1344	N09	E62	7645	01	4.2	23	SF	C 1.2	3	E		47		F
RAMY		1357	1400	1418	N10	W50	7644	12	26.8	21	SF		3	E		11		
RAMY		1509	1539	1600	N10	E59	7645	01	4.1	51	SF		3	E		32		F
RAMY		1513	1609	1715	N12	W57	7640	12	26.3	122	1N	C 5.5	3	E		141		FE
RAMY		1705	1710	1742	N10	E58	7645	01	4.1	37	SN	C 7.7	3	E		55		F
HOLL		1705	1710	1742	N10	E58	7645	01	4.1	37	SF	C 7.7	3	E		96		
RAMY		1740	1755	1818	N08	W61	7640	12	26.2	38	SF		3	E		25		F
RAMY		1820	1821	1827	N09	E56	7645	01	4.0	7	SF		3	E		15		F
HOLL		1820	1822	1843	N10	E60	7645	01	4.3	23	SF		3	E		17		
HOLL		1848	1848	1855	N09	E58	7645	01	4.1	7	SF		3	E		10		
RAMY		1848	1848	1904	N10	E56	7645	01	4.0	16	SF		3	E		11		F
RAMY		1914	1917	1936	N09	E58	7645	01	4.1	22	SN	C 3.0	3	E		59		
HOLL		1916	1916U	1930	N09	E58	7645	01	4.1	14	SF		3	E		56		
PALE		1916E	1917U	1927D	N09	E62	7645	01	4.4	11D	SF		3	E		29		F
RAMY		2015	2019	2028	N09	E58	7645	01	4.2	13	SF	C 1.6	3	E		14		F
PALE		2017E	2019U	2030D	N09	W62	7645	12	26.2	13D	SF		3	E		31		F
HOLL		2022	2022	2034	N10	E59	7645	01	4.3	12	SF		3	E		12		
GOES		2104	2108	2112						8		C 2.3						
HOLL		2117	2118	2129	N11	W61	7640	12	26.3	12	SN	C 7.6	3	E		77		
PALE		2117E	2119U	2131D	N16	W49	7644	12	27.2	14D	SF		3	E		63		F
HOLL		2208	2211	2217	N08	W67	7640	12	25.9	9	SF		3	E		21		
LEAR	31	0043	0048	0056	N13	E49	7645	01	3.7	13	SF	C 2.5	3	E		40		
PALE		0045E	0050U	0105D	N12	E55	7645	01	4.2	20D	SF		3	E		55		
LEAR		0145	0149	0152	S09	E55	7646	01	4.2	7	SF		3	E		35		
GOES		0223	0229	0235						12		C 2.1						
GOES		0415	0420	0423						8		C 4.8						
GOES		0427	0446	0456						29		C 4.0						
LEAR		0526	0536	0555	N08	W70	7640	12	26.0	29	SF	C 2.8	3	E		35		F
LEAR		0526	0536	0559	N12	W54	7644	12	27.1	33	SF		3	E		33		F
LEAR		0624	0628	0639	N11	E52	7645	01	4.2	15	SF	C 3.2	3	E		24		F
LEAR		0644	0646	0655	N12	W55	7644	12	27.1	11	SF	C 4.1	3	E		24		F
SVTO		0818	0820	0827	N12	E47	7645	01	3.9	9	SF		3	E		16		
LEAR		0903	0905	0911	S08	E50	7646	01	4.1	8	SF		3	E		42		F
SVTO		1120	1121	1132	N09	W62	7640	12	26.8	12	SF	C 2.1	3	E		33		
SVTO		1138	1139	1146	N12	E44	7645	01	3.8	8	SF		3	E		25		
RAMY		1441	1442	1445	N09	W69	7640	12	26.4	4	SF	C 2.0	3	E		24		F
RAMY		1802	1804	1807	S10	E44	7646	01	4.0	5	SF		3	E		18		
RAMY		1918	1928	1942	N09	W78	7640	12	26.0	24	SF	C 1.7	3	E		50		
LEAR		2233	2235	2240	N13	E38	7645	01	3.8	7	SF		2	E		39		
HOLL		2236E	2238U	2242D	N12	E40	7645	01	3.9	6D	SF	C 1.8	3	E		15		H
HOLL		2311	2311	2313	N10	W81	7644	12	25.9	2	SF		3	E		18		
LEAR		2311	2312	2320	N09	W79	7640	12	26.0	9	SF		2	E		29		
PALE		2312	2313	2325D	N10	W80	7640	12	25.9	13D	SF		3	E		25		

SOLAR RADIO EMISSION
Selected Fixed Frequency Events

DECEMBER 1993

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
06	8800	SGMR	8	S	1717.0	1717.0	U	33.0			QL=4 ST=2 TYP=3
21	2695	LEAR	4	S/F	0545.0	0551.0	8.0	63.0			QL=4 ST=2 TYP=3
	8800	LEAR	4	S/F	0546.0	0551.0	7.0	39.0			QL=4 ST=2 TYP=3
22	2695	SGMR	8	S	1725.0	1725.0	1.0	190.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1725.0	1725.0	U	350.0			QL=2 ST=2 TYP=3
23	2695	LEAR	8	S	0528.0	0528.0	1.0	75.0			QL=4 ST=2 TYP=3
	8800	LEAR	8	S	0528.0	0528.0	2.0	330.0			QL=4 ST=2 TYP=3
	8800	SVTO	4	S/F	0858.0	0859.0	3.0	96.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	0858.0	0859.0	2.0	32.0			QL=4 ST=2 TYP=3
25	8800	PALE	4	S/F	1753.0	1759.0	8.0	34.0			QL=2 ST=2 TYP=3
	8800	SGMR	4	S/F	1754.0	1754.0	7.0	51.0			QL=4 ST=3 TYP=3
26	8800	LEAR	8	S	0408.0	0409.0	1.0	31.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0725.0	0726.0	1.0	65.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	0726.0	0726.0	U	63.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1555.0	1555.0	1.0	47.0			QL=4 ST=2 TYP=3
	2695	SGMR	8	S	1555.0	1555.0	2.0	69.0			QL=4 ST=2 TYP=3
	8800	SGMR	4	S/F	1703.0	1707.0	5.0	23.0			QL=4 ST=2 TYP=3
27	2695	LEAR	8	S	0316.0	0316.0	U	30.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	0316.0	0316.0	U	25.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	0912.0	0913.0	1.0	31.0			QL=4 ST=2 TYP=3
28	2695	LEAR	8	S	0859.0	0859.0	1.0	32.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	0859.0	0859.0	1.0	21.0			QL=4 ST=2 TYP=3
	2695	SVTO	8	S	0859.0	0859.0	1.0	29.0			QL=4 ST=2 TYP=3
	2695	SVTO	4	S/F	1208.0	1209.0	3.0	130.0			QL=4 ST=2 TYP=3
	8800	SVTO	8	S	1208.0	1209.0	2.0	25.0			QL=4 ST=2 TYP=3
	2695	SGMR	4	S/F	1654.0	1654.0	10.0	30.0			QL=4 ST=2 TYP=3
	8800	SGMR	20	GRF	1654.0	1701.0	10.0	31.0			QL=4 ST=2 TYP=2
29	8800	LEAR	8	S	0546.0	0546.0	1.0	55.0			QL=4 ST=2 TYP=3
	8800	SGMR	20	GRF	1528.0	1537.0	57.0	28.0			QL=4 ST=2 TYP=2
	2695	SGMR	20	GRF	1529.0	1549.0	56.0	22.0			QL=4 ST=2 TYP=2
	2695	PALE	8	S	1744.0	1745.0	1.0	47.0			QL=4 ST=2 TYP=3
	2695	SGMR	8	S	1745.0	1745.0	U	38.0			QL=4 ST=2 TYP=3
30	8800	LEAR	8	S	0618.0	0618.0	1.0	33.0			QL=4 ST=2 TYP=3
	2695	LEAR	8	S	0618.0	0619.0	1.0	29.0			QL=4 ST=2 TYP=3
	8800	SGMR	8	S	1708.0	1709.0	2.0	33.0			QL=4 ST=2 TYP=3
	8800	PALE	8	S	2118.0	2118.0	U	30.0			QL=4 ST=2 TYP=3
	2695	PALE	8	S	2118.0	2118.0	1.0	58.0			QL=4 ST=2 TYP=3

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

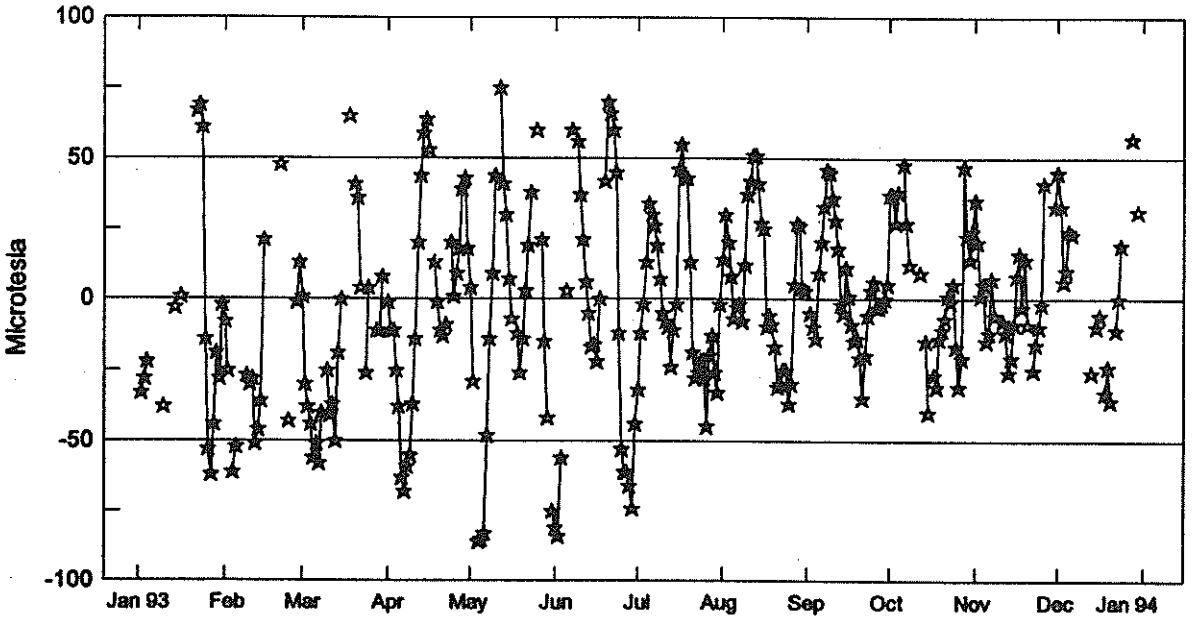
Explanation of Type Code:

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.

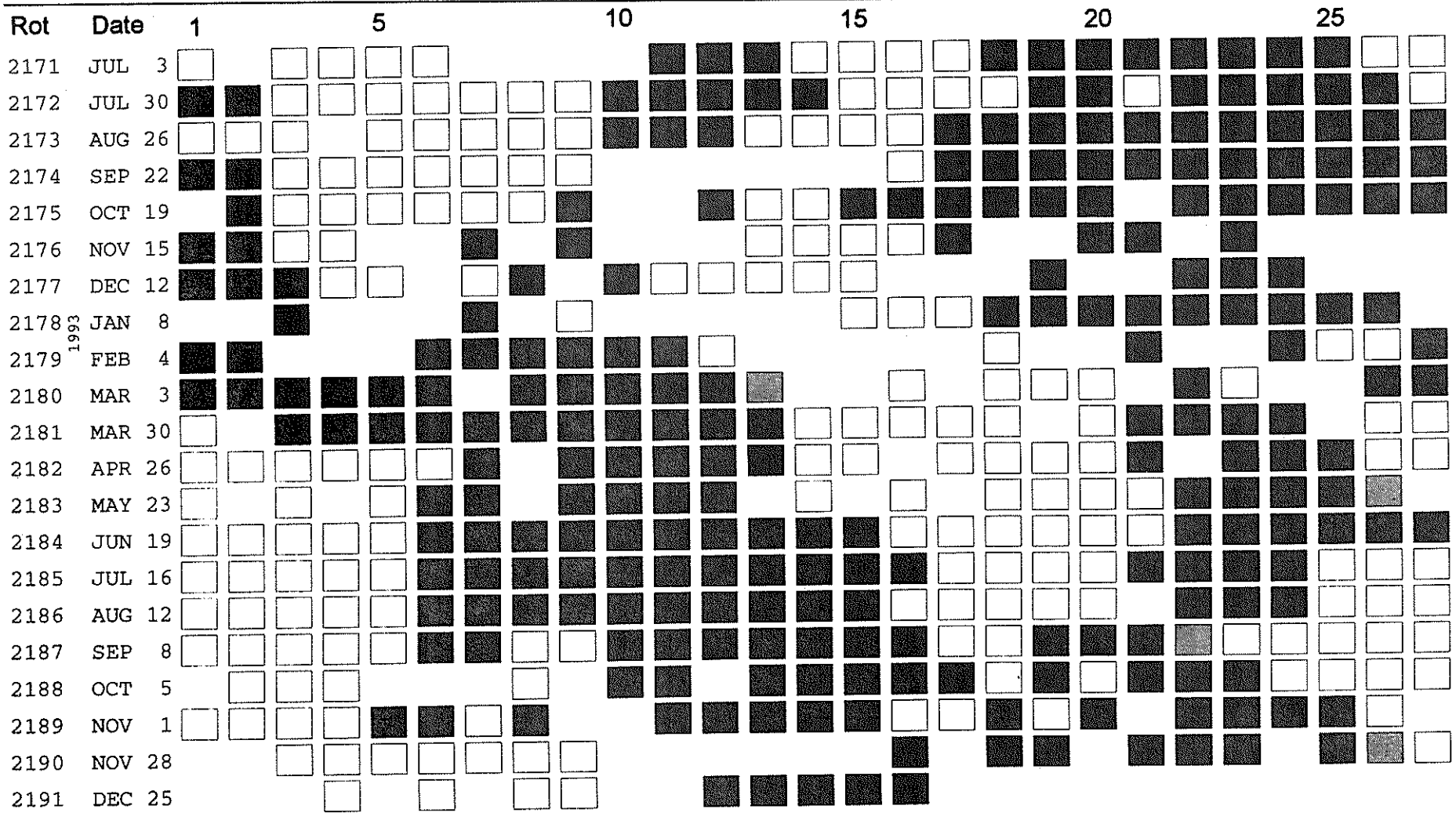
Stanford Mean Solar Magnetic Field (Microtesla)



Day	Jan 93	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	---	-8	1	-1	4	-81	-32	14	---	37	35	45
2	-33	-25	-30	-11	-29	-84	-12	30	-5	37	20	33
3	-28	---	-38	-11	---	-56	-2	20	-10	27	1	6
4	-22	-61	-44	-25	-86	---	13	8	-14	38	5	10
5	---	-52	-56	-38	-85	3	34	-7	9	---	-15	24
6	---	---	-51	-63	-83	---	30	-3	20	48	-12	23
7	---	---	-58	-68	-48	60	26	-2	33	27	7	---
8	---	---	-40	-59	-14	---	19	-8	46	12	-6	---
9	---	-27	---	-55	9	56	7	12	45	---	---	---
10	-38	-30	-25	-37	44	37	-5	37	36	---	---	---
11	---	-28	-41	-14	---	21	-8	42	28	---	-8	---
12	---	-51	-37	20	75	6	-10	51	18	9	-12	---
13	---	-46	-50	44	41	-5	-24	51	-2	---	-26	-26
14	-3	-36	-19	59	30	-17	-11	41	-5	-15	-21	---
15	---	21	0	64	7	-16	-2	27	11	-40	-9	-10
16	1	---	---	53	-7	-22	46	25	1	---	8	-6
17	---	---	---	---	---	0	55	-10	-9	-27	16	---
18	---	---	65	13	-12	---	43	-6	-15	-31	-3	-33
19	---	---	---	-1	-26	42	43	-9	-14	-14	14	-24
20	---	---	41	-11	-14	70	13	-17	-21	-11	-9	-36
21	---	48	36	-13	3	66	-19	-31	-35	-7	---	---
22	67	---	4	-9	19	60	-28	-30	-20	1	-25	-11
23	69	---	---	---	38	45	-26	-25	-6	-1	-16	0
24	61	-43	-26	20	---	-12	-22	-25	3	5	-10	19
25	-14	---	4	1	60	-53	-28	-37	6	-17	-2	---
26	-53	---	---	9	---	-61	-45	-30	-3	-31	41	---
27	-62	-1	---	18	21	-61	-20	5	-3	-21	---	---
28	-44	13	-11	39	-15	-66	-13	27	-2	47	---	57
29	-19		-11	43	-42	-74	-26	26	0	22	---	---
30	-28		8	18	---	-44	-33	4	5	14	33	31
31	-2		---		-75		-2	3		24		---

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.

CONTENTS

Prompt Reports Number 593 Part I

DATA FOR NOVEMBER 1993

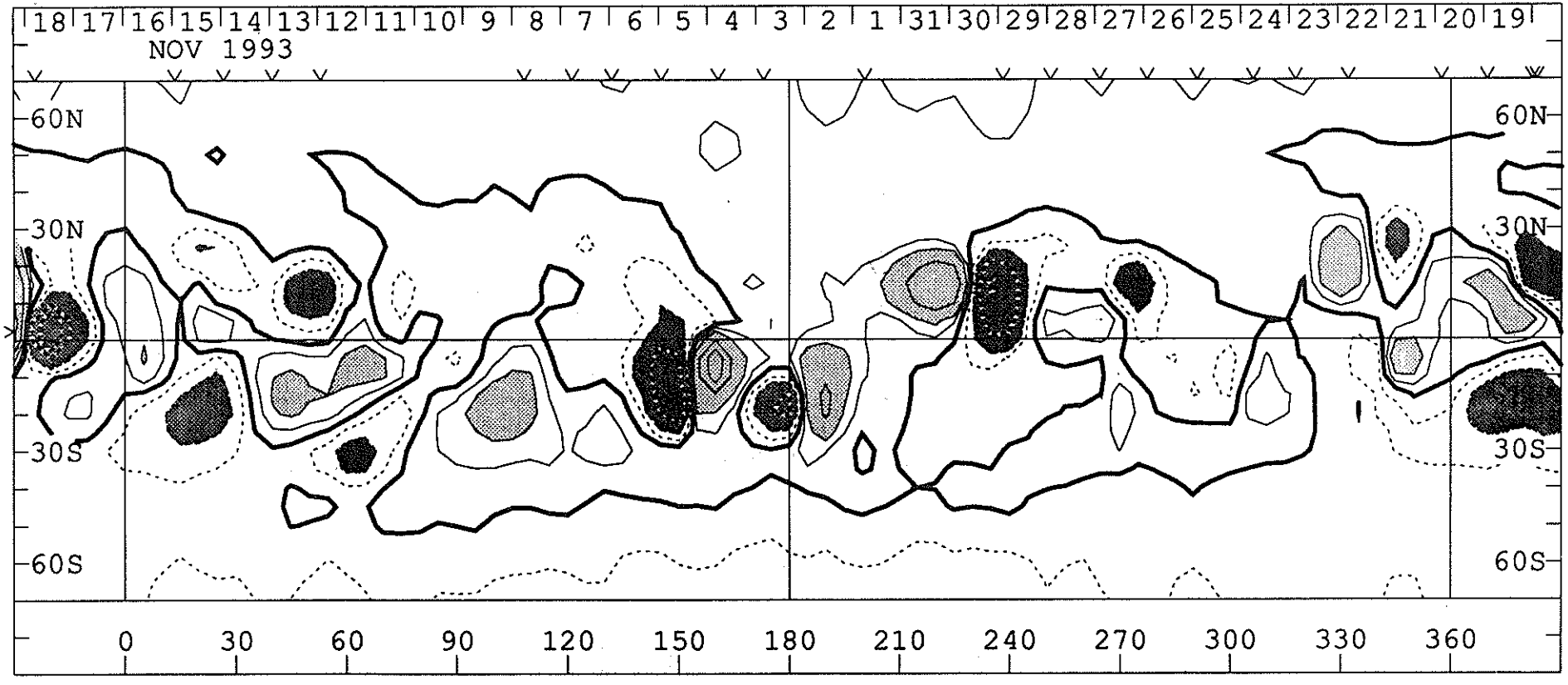
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1875
(20 October to 16 November 1993)

WILCOX SOLAR OBSERVATORY

Mean Field

Photospheric Magnetic Field 0, ±100, 200, 500, 1000, 2000 MicroTesla



Heliographic Longitude

1875

SOLAR MAGNETIC FIELD SYNOPTIC CHART

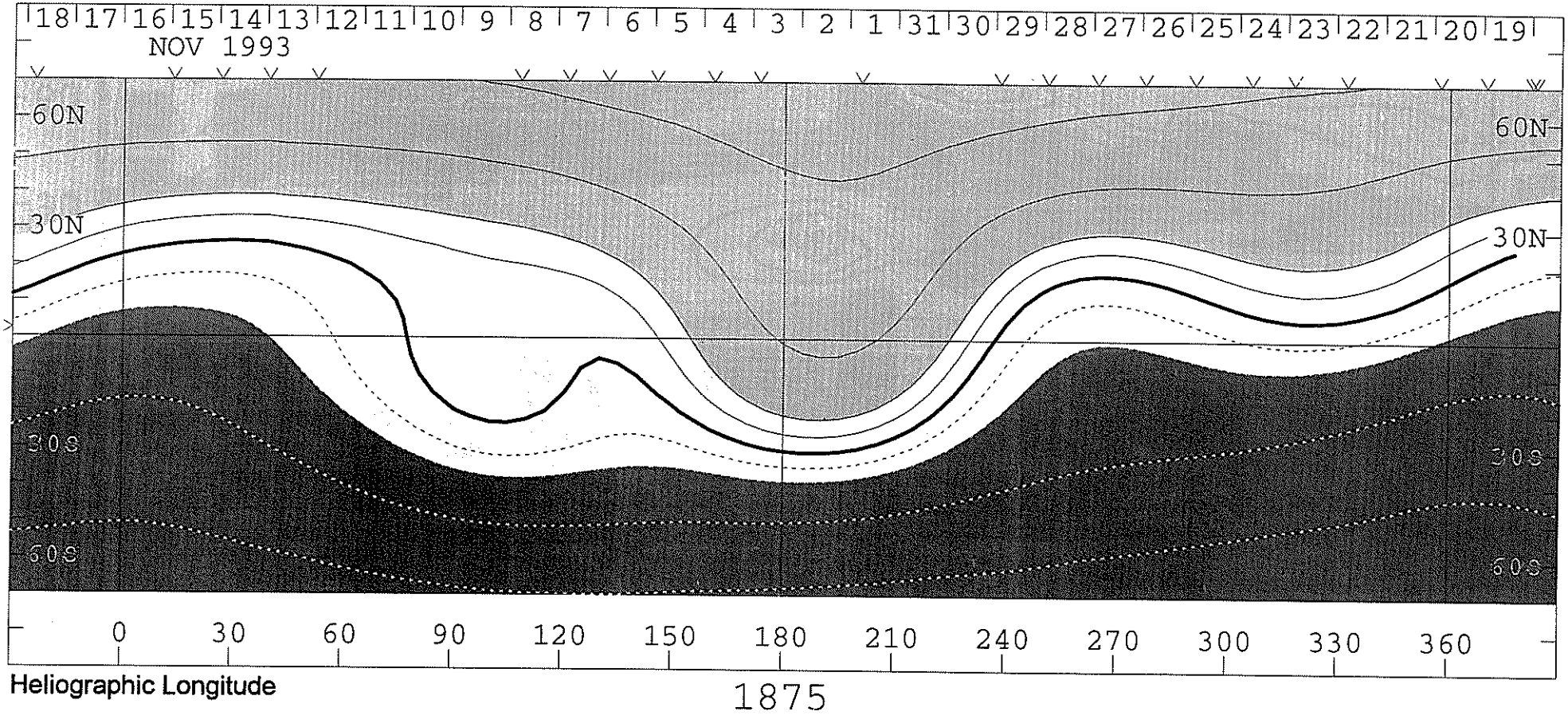
SOURCE SURFACE FIELD

CARRINGTON ROTATION NUMBER 1875

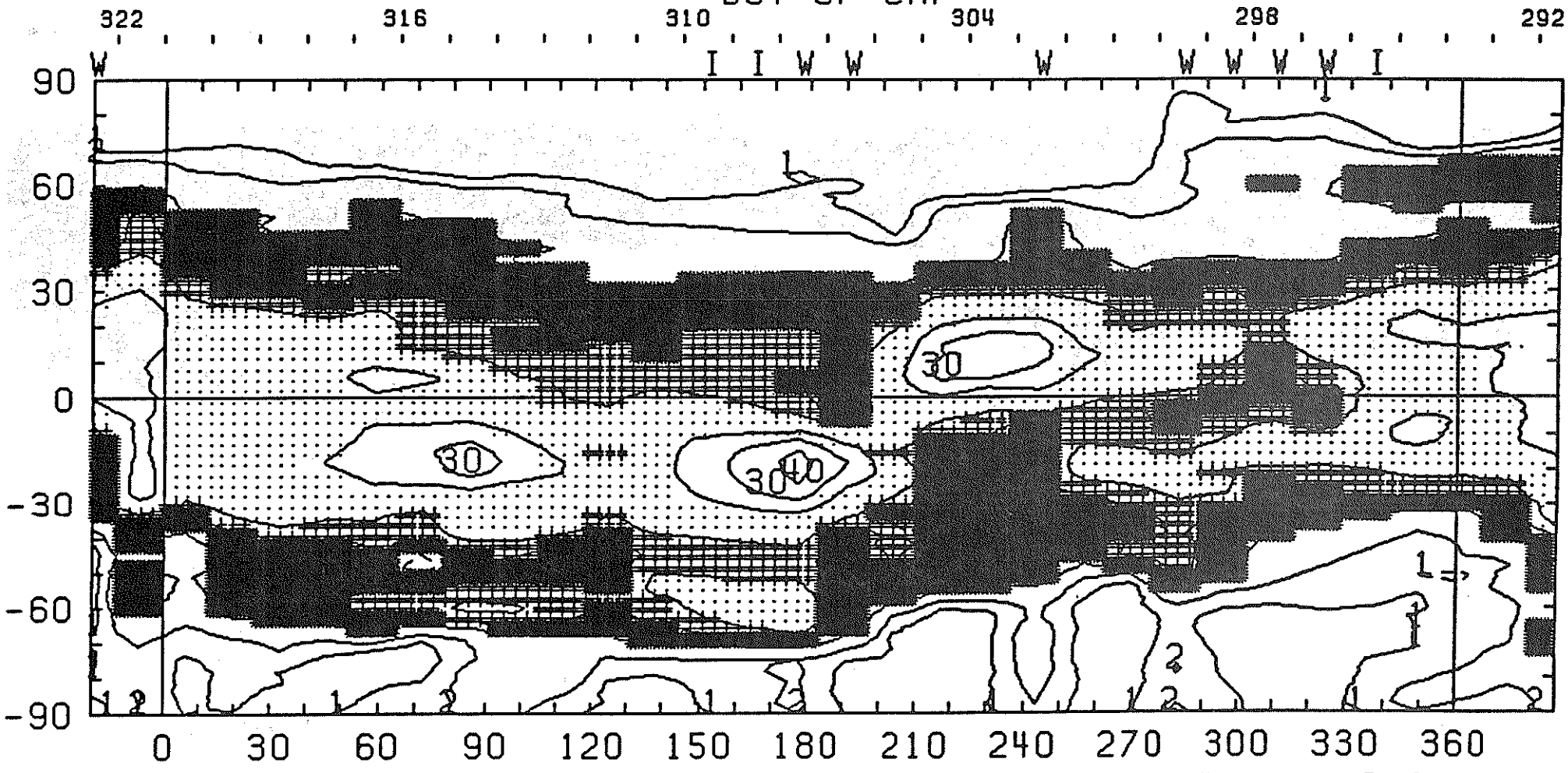
(20 October to 16 November 1993)

Wilcox Solar Observatory

0, ±1, 2, 5, 10, 20 microTesla

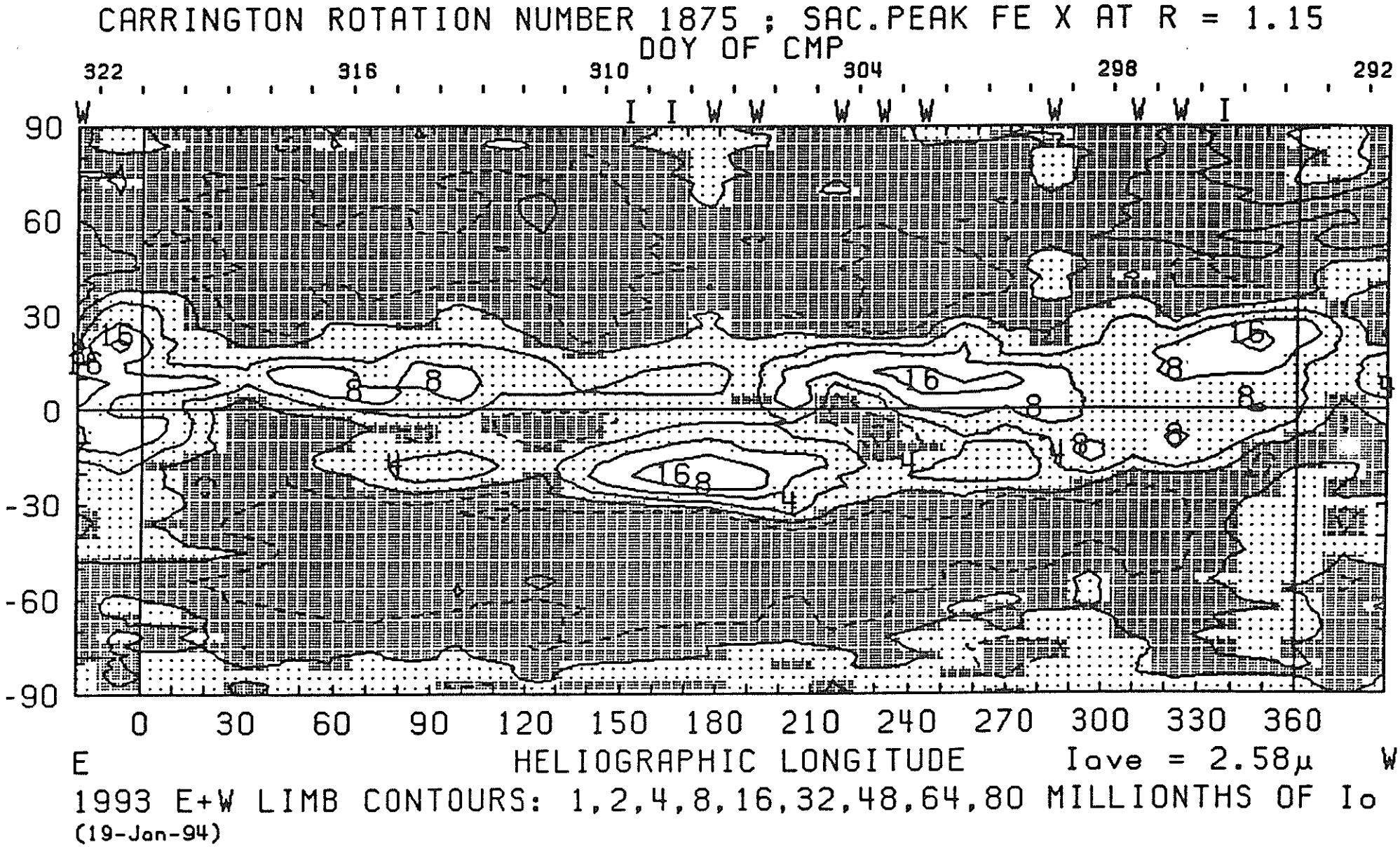


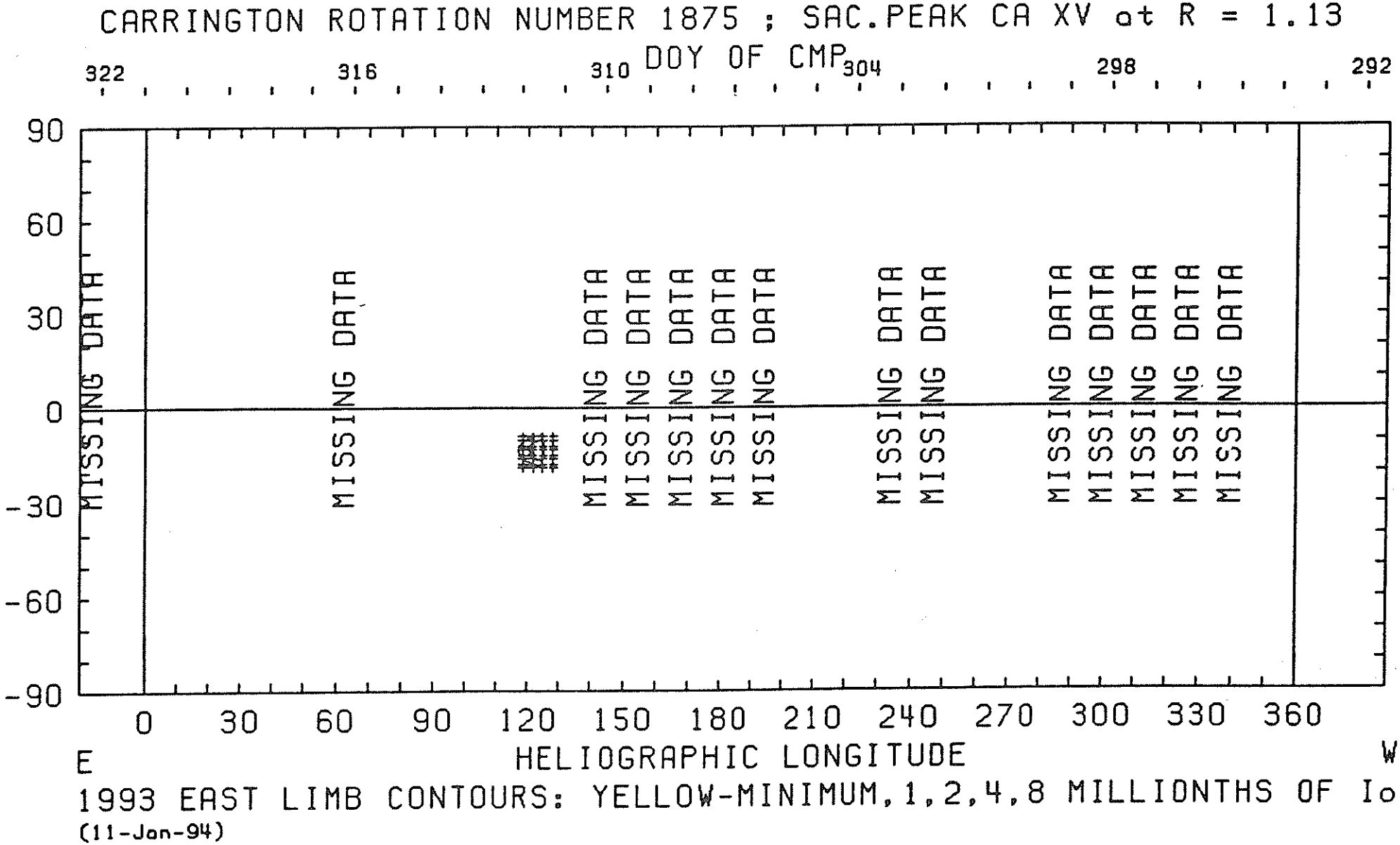
CARRINGTON ROTATION NUMBER 1875 ; SAC.PEAK FE XIV AT R = 1.15

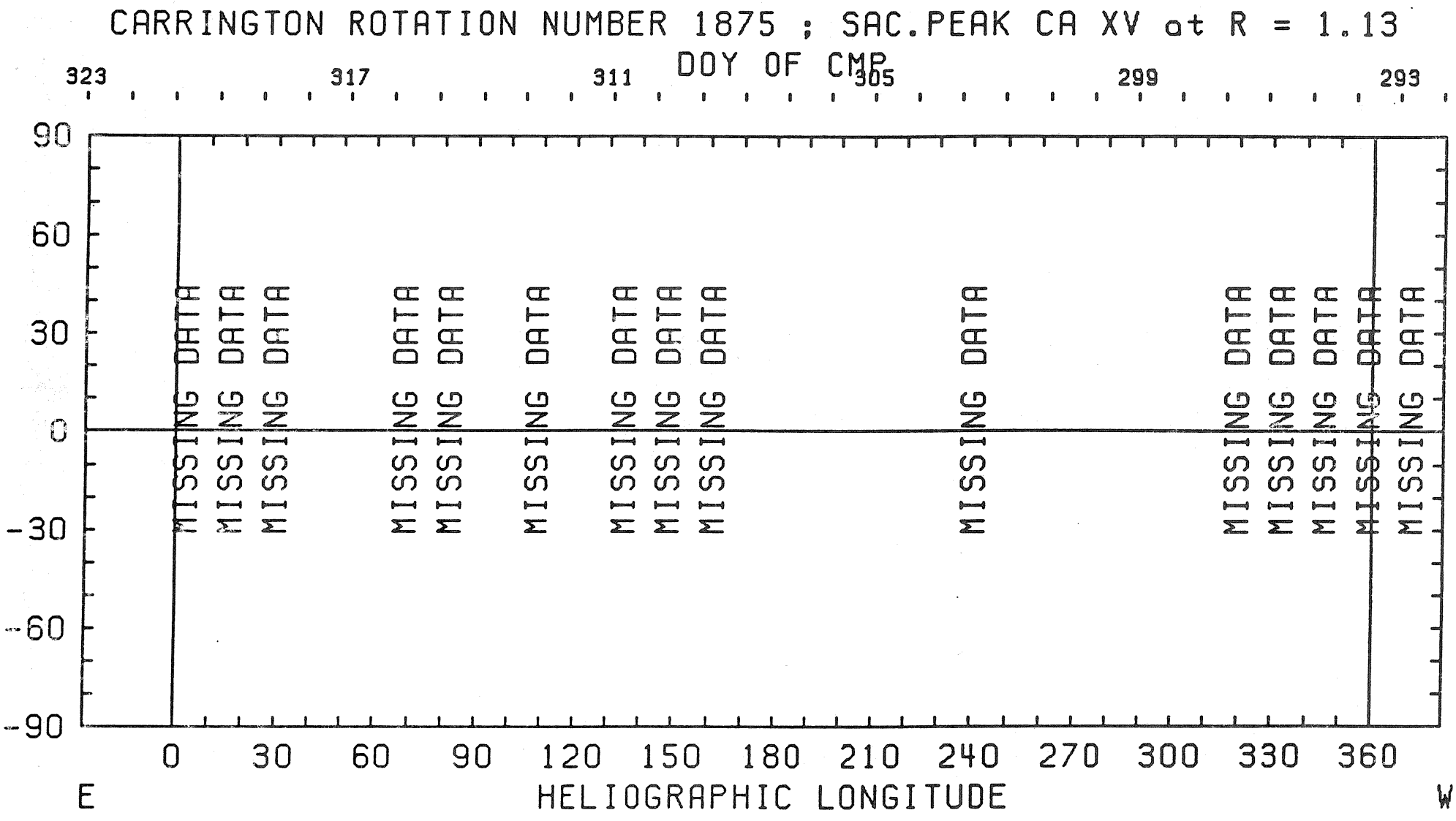


1993 E+W LIMB CONTOURS: 1,2,4,7,10,20,30,40,50 MILLIONTHS OF Io

(19-Jan-94) CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK


CARRINGTON ROTATION NUMBER 1875 ; SAC.PEAK FE X AT R = 1.15
DOY OF CMP
322
316
310
304
298
292
W I I W W W W W W I
90
60
30
0
-30
-60
-90
0 30 60 90 120 150 180 210 240 270 300 330 360
E
HELIOGRAPHIC LONGITUDE
Iave = 2.58μ
W
1993 E+W LIMB CONTOURS: 1,2,4,8,16,32,48,64,80 MILLIONTHS OF Io
(19-Jan-94)


CARRINGTON ROTATION NUMBER 1875 ; SAC.PEAK CA XV at R = 1.13
DOY OF CMP304
322
316
310
298
292
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 EAST LIMB CONTOURS: YELLOW-MINIMUM,1,2,4,8 MILLIONTHS OF Io
(11-Jan-94)


CARRINGTON ROTATION NUMBER 1875 ; SAC.PEAK CA XV at R = 1.13
DOY OF CMP
323
317
311
305
299
293
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
(11-Jan-94)

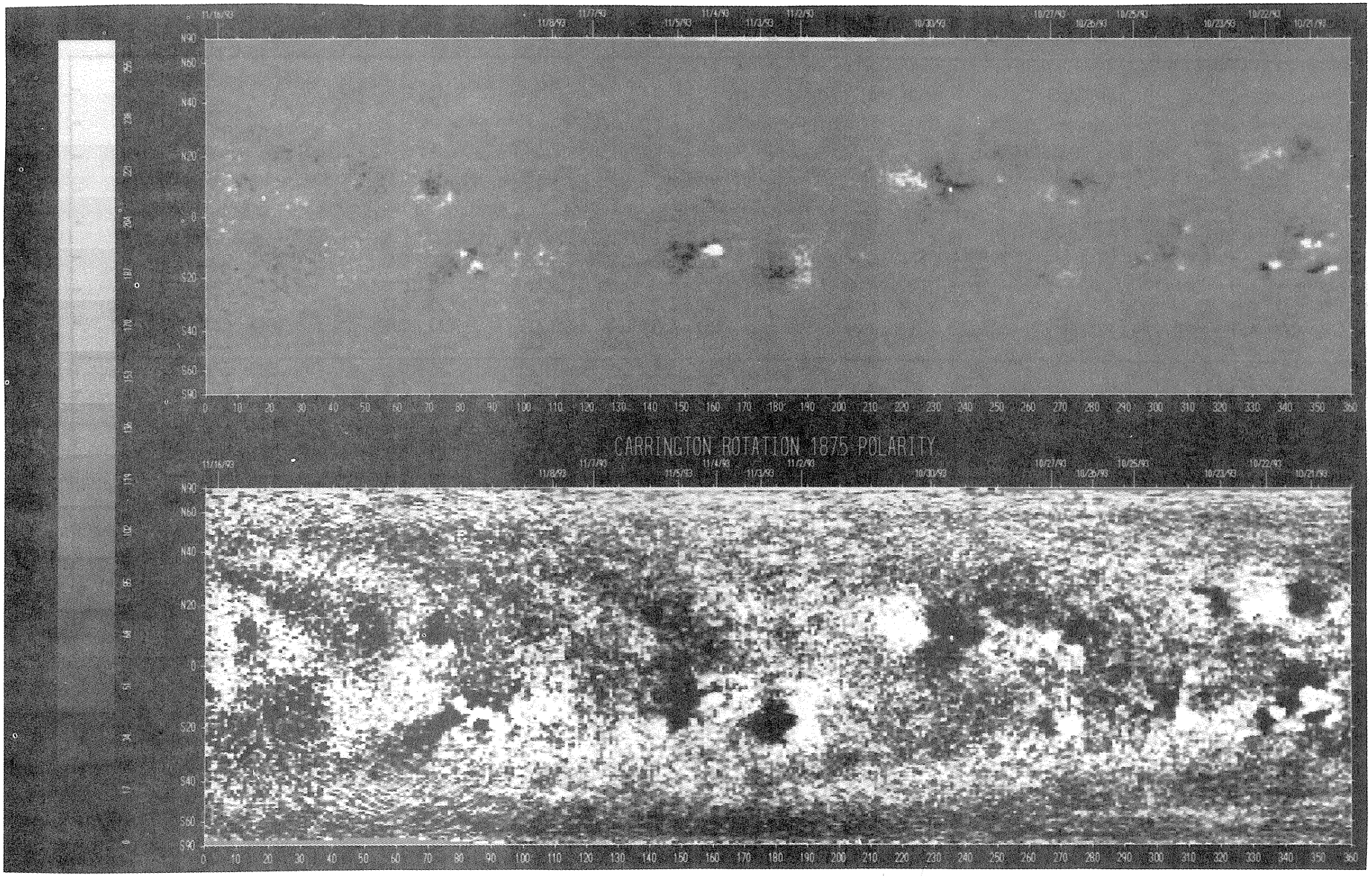
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1875

(20 October to 16 November 1993)

National Solar Observatory/Kitt Peak

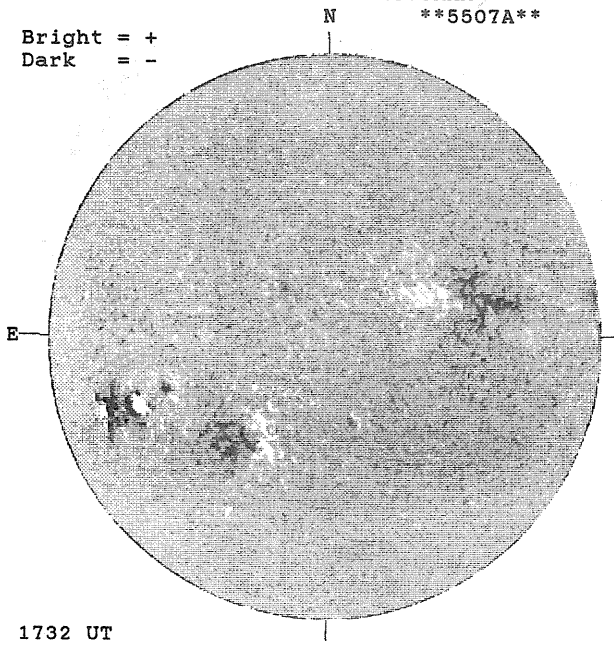
Dates of Observation



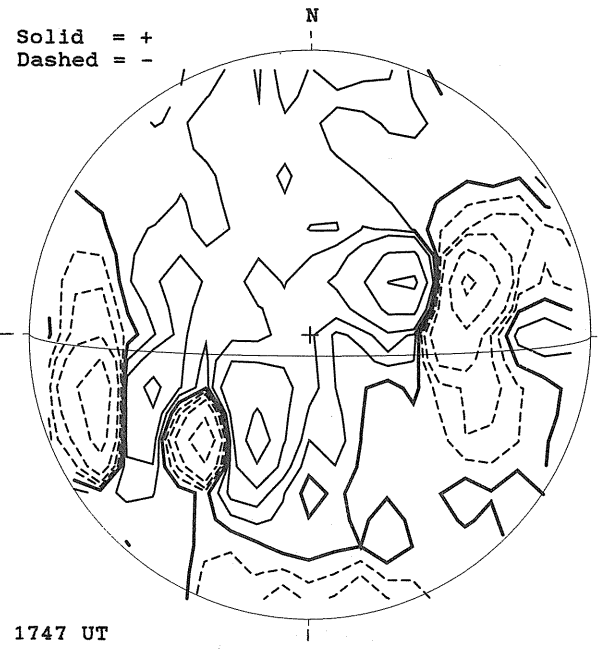
Heliographic Longitude

NOVEMBER 1, 1993 (P= 24.50, B_o = 4.36, L_o = 210.50)

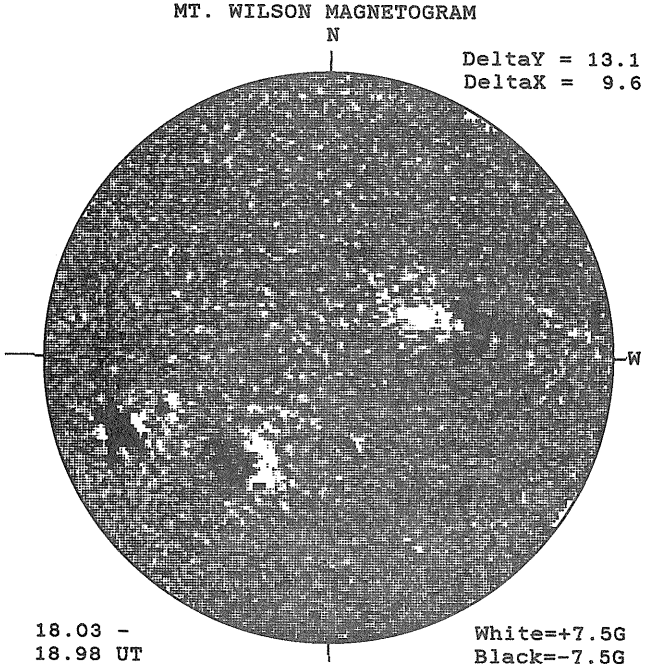
KITT PEAK MAGNETOGRAM



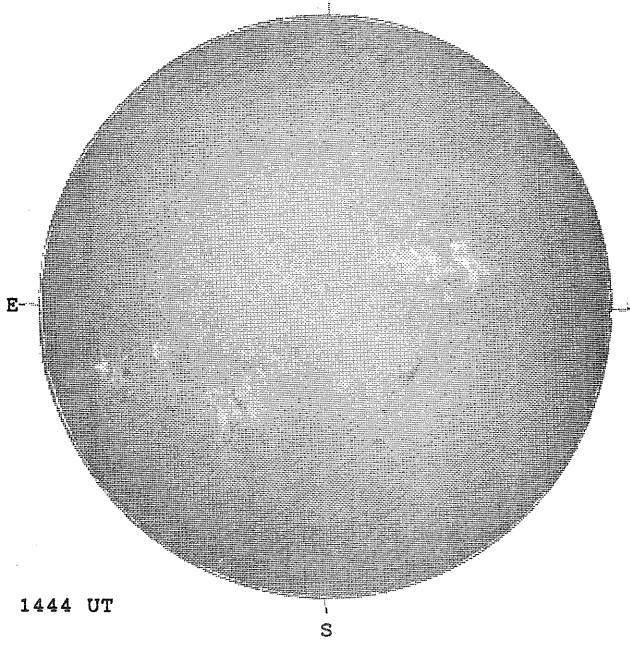
STANFORD MAGNETOGRAM



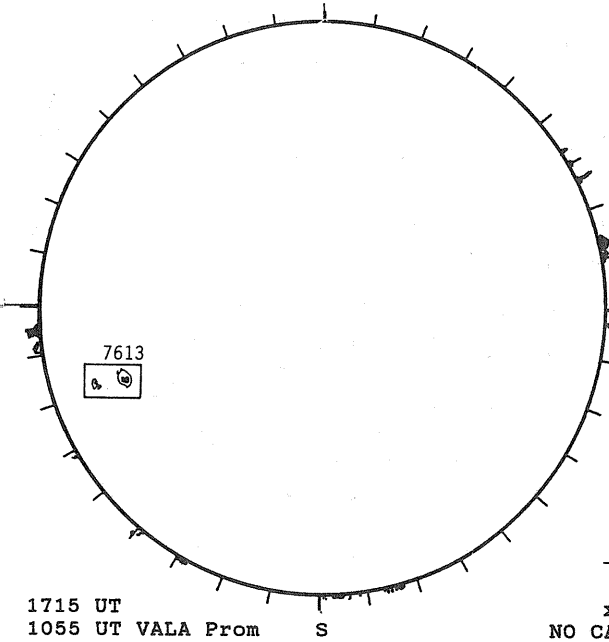
MT. WILSON MAGNETOGRAM



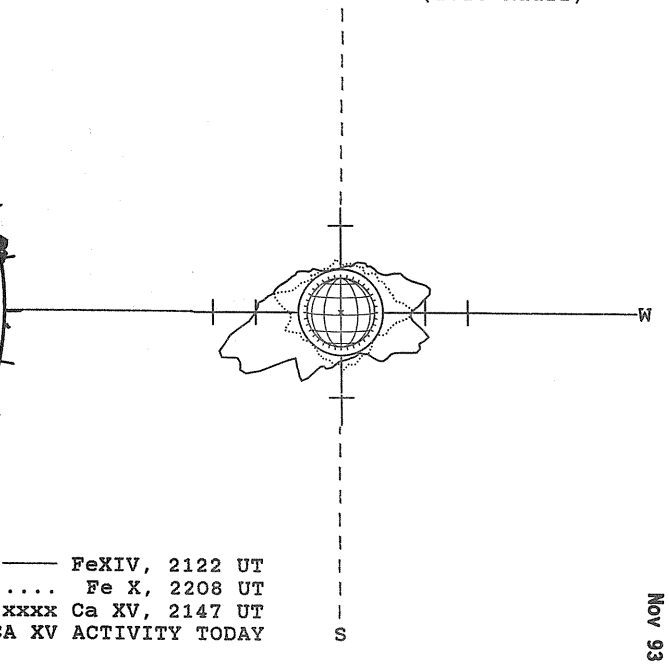
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



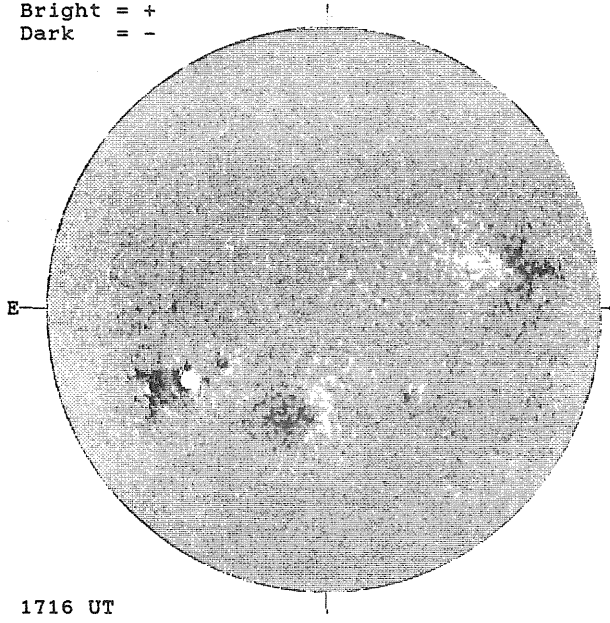
47
Nov 93

NOVEMBER 2, 1993 (P= 24.33, B_o = 4.26, L_o = 197.31)

KITT PEAK MAGNETOGRAM

N **5507A**

Bright = +
Dark = -

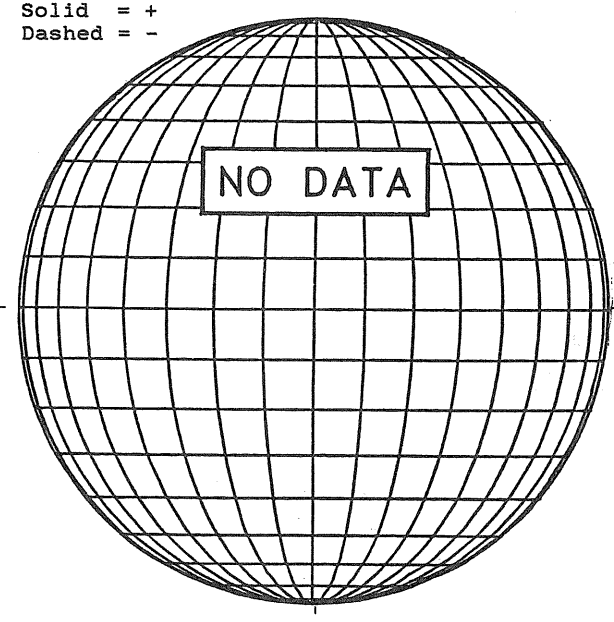


1716 UT

STANFORD MAGNETOGRAM

N

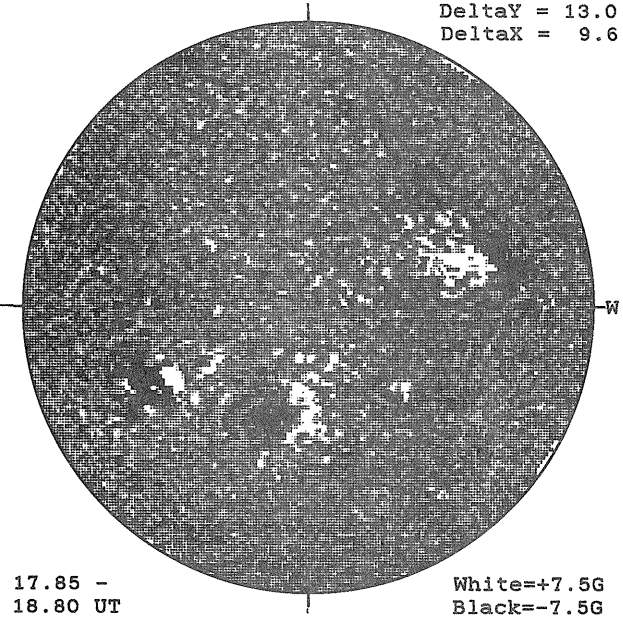
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

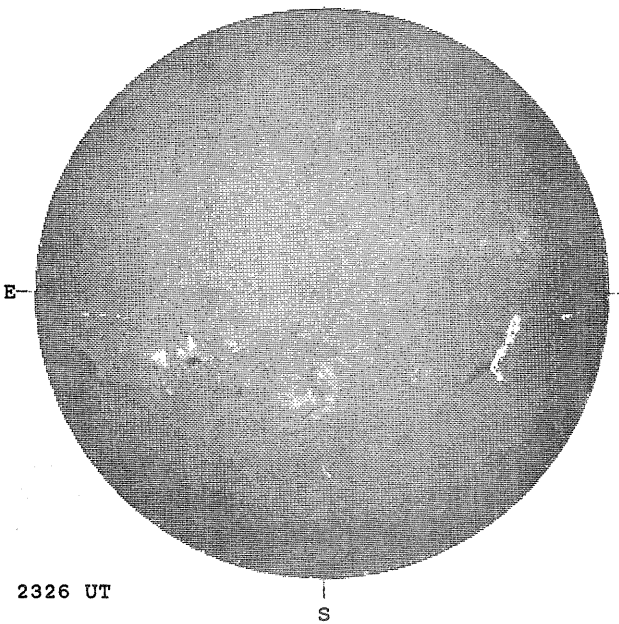
DeltaY = 13.0
DeltaX = 9.6



17.85 -
18.80 UT

White=+7.5G
Black=-7.5G

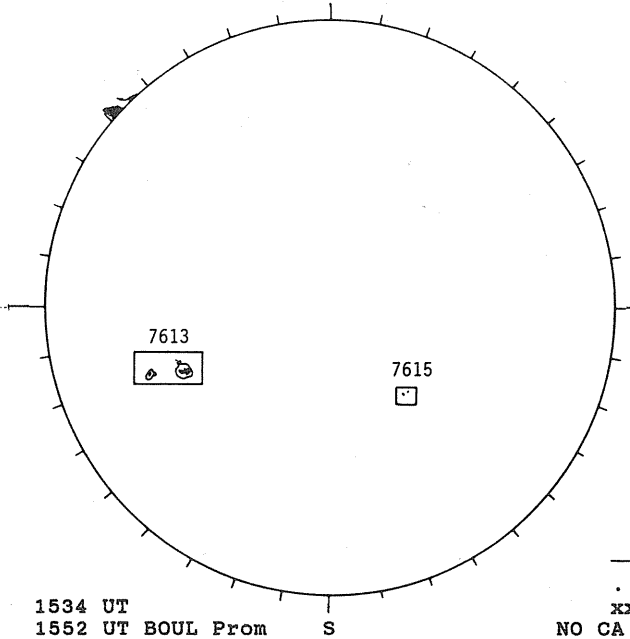
SACRAMENTO PEAK H-ALPHA



2326 UT

S

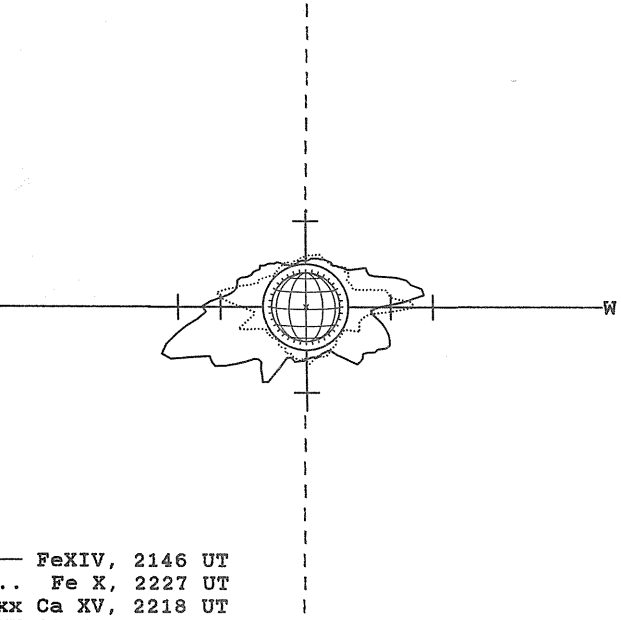
BOULDER SUNSPOT



1534 UT
1552 UT BOUL Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)

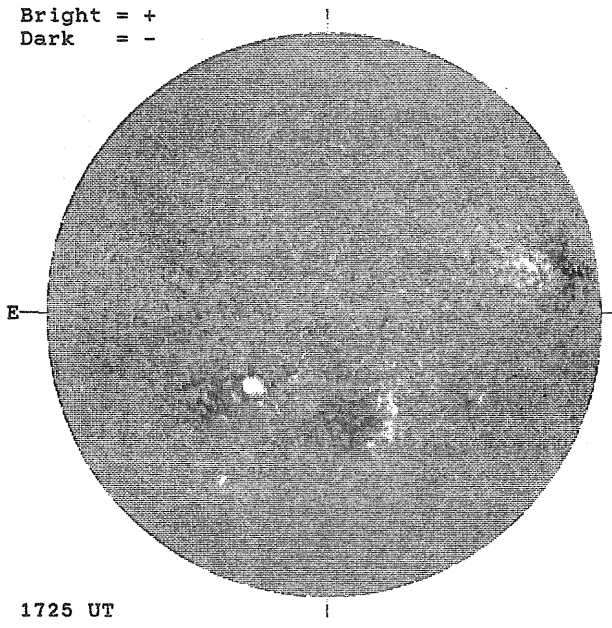


—— FeXIV, 2146 UT
.... Fe X, 2227 UT
xxxx Ca XV, 2218 UT
NO CA XV ACTIVITY TODAY

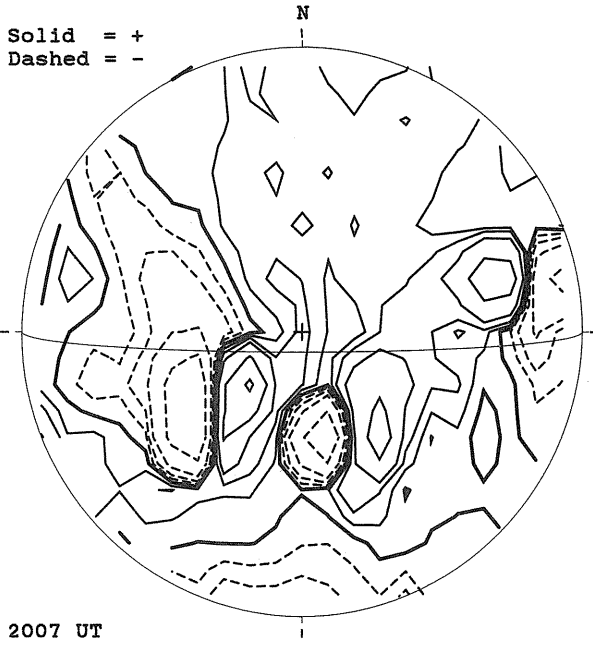
S

NOVEMBER 3, 1993 (P= 24.15, B_o = 4.16, L_o = 184.12)

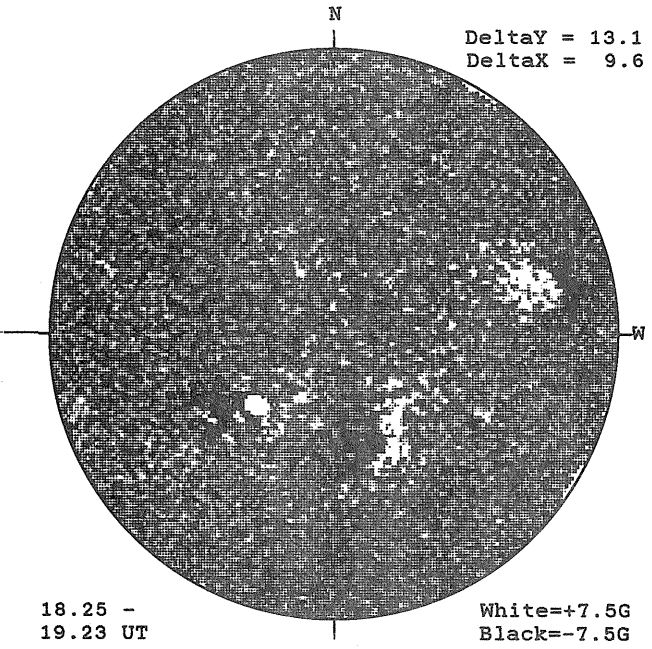
KITT PEAK MAGNETOGRAM



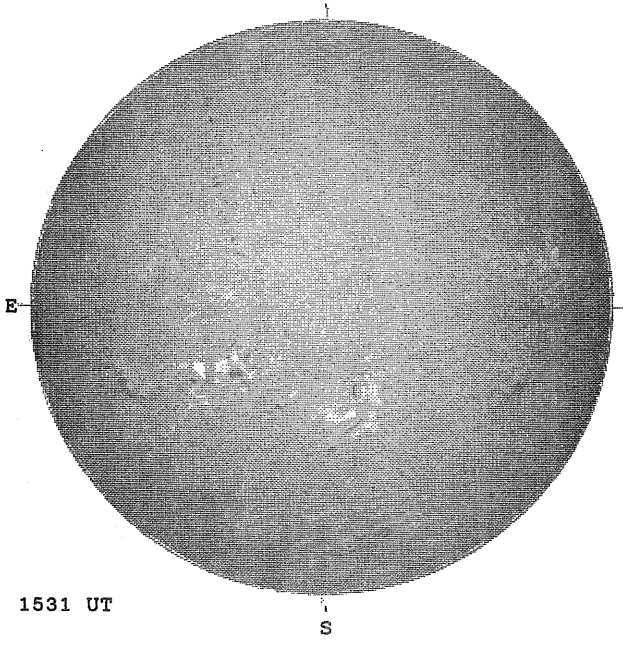
STANFORD MAGNETOGRAM



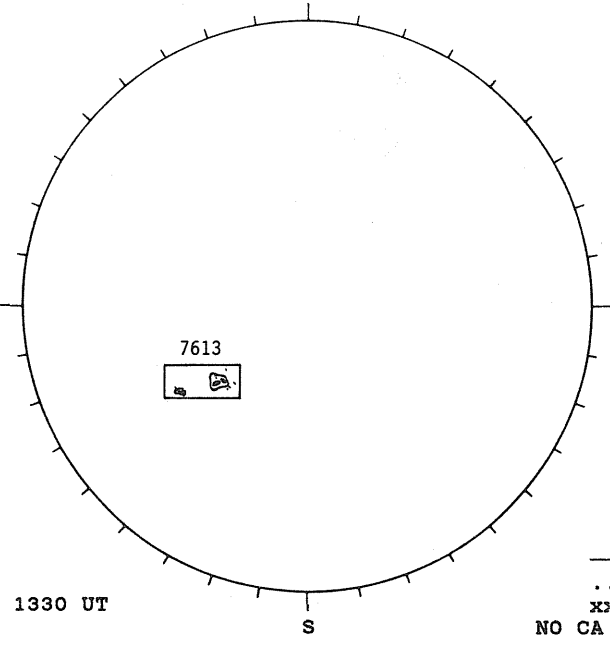
MT. WILSON MAGNETOGRAM



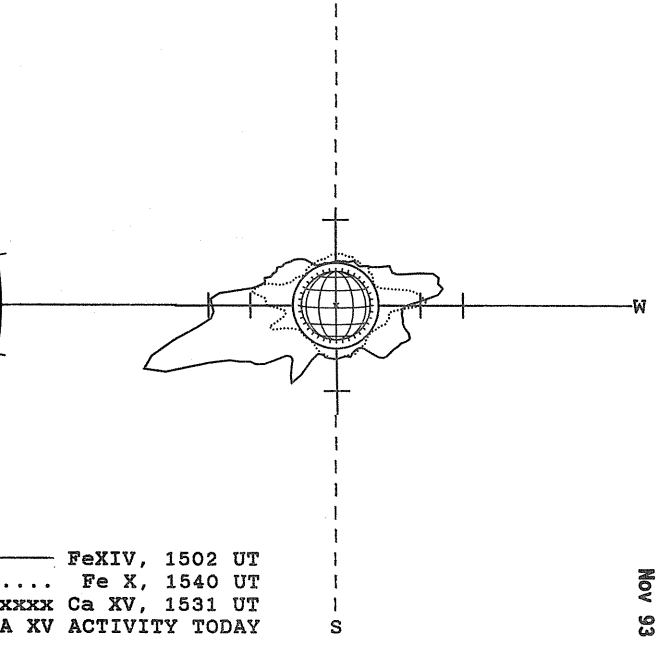
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT

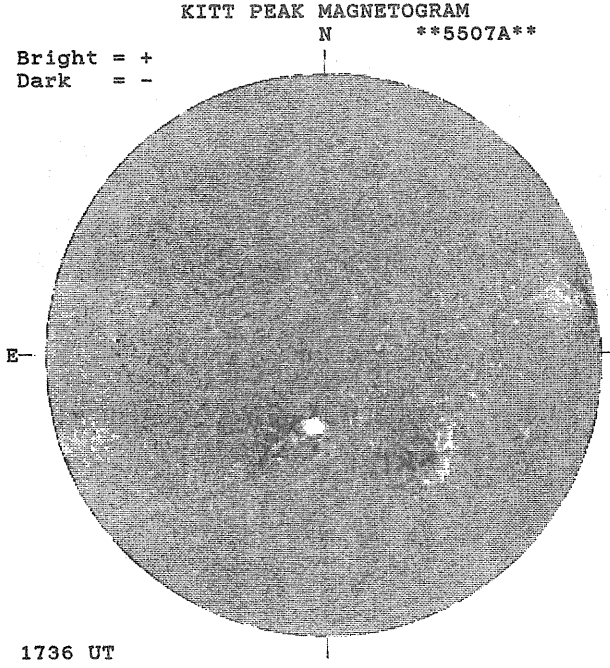


SACRAMENTO PEAK CORONA (1.15 Radii)

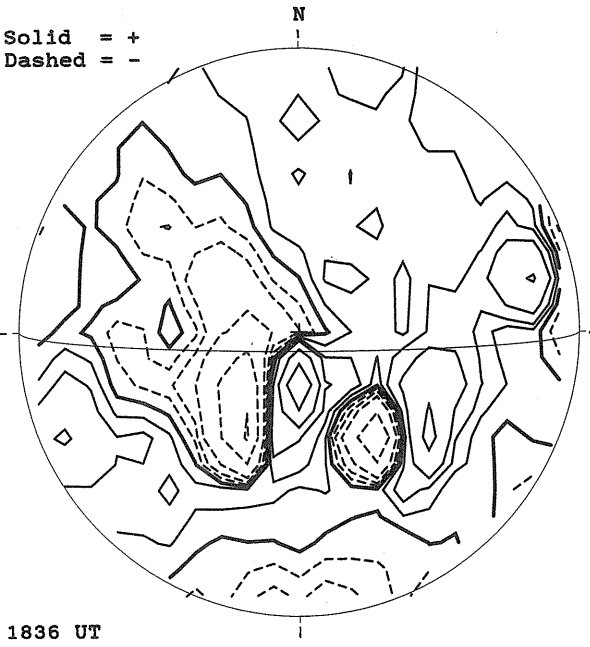


NOVEMBER 4, 1993 (P= 23.97, B_o = 4.05, L_o = 170.94)

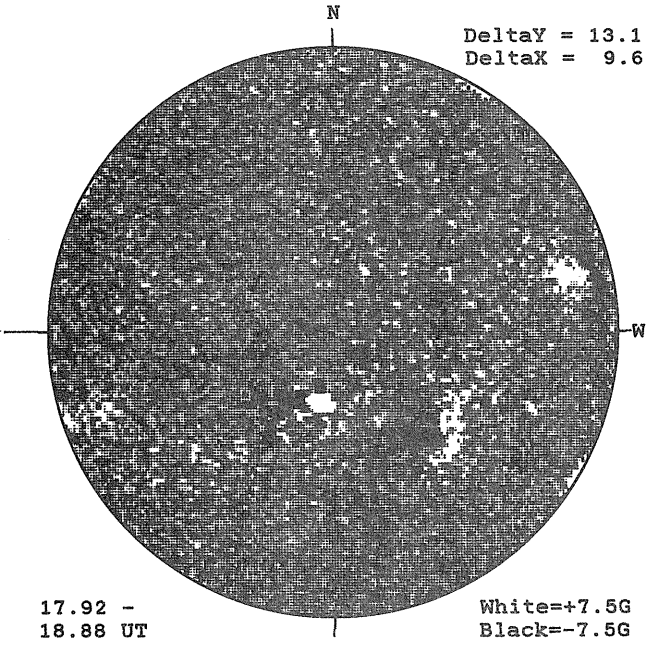
KITT PEAK MAGNETOGRAM



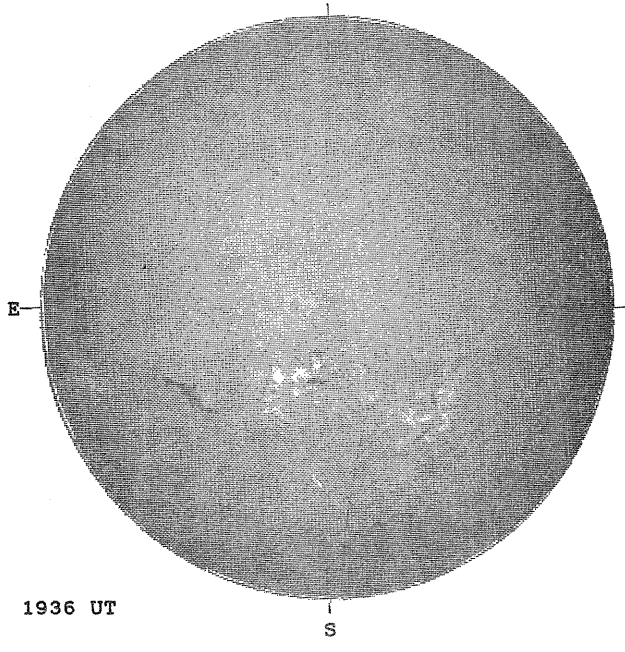
STANFORD MAGNETOGRAM



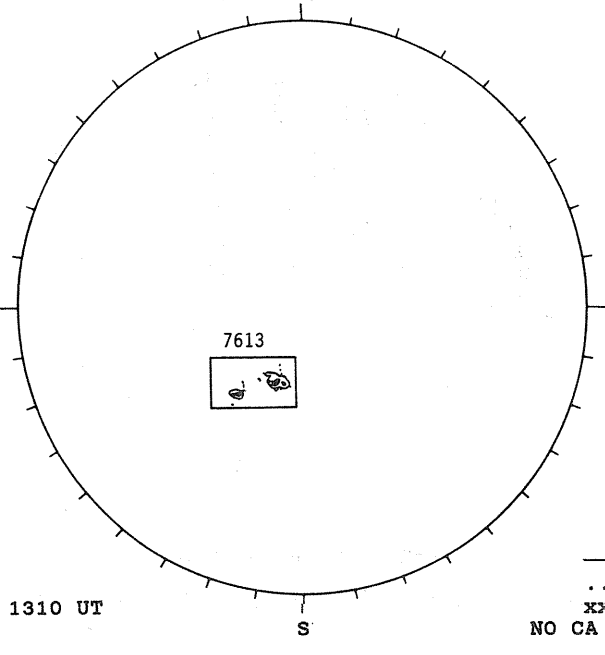
MT. WILSON MAGNETOGRAM



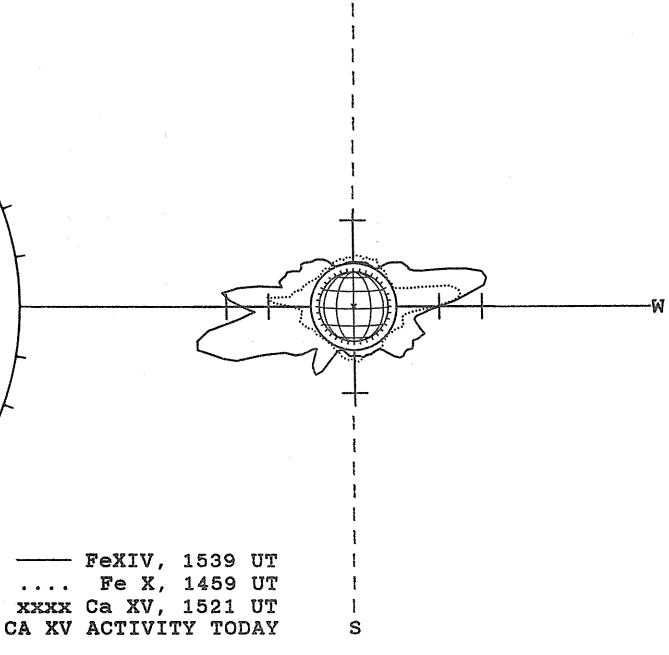
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT

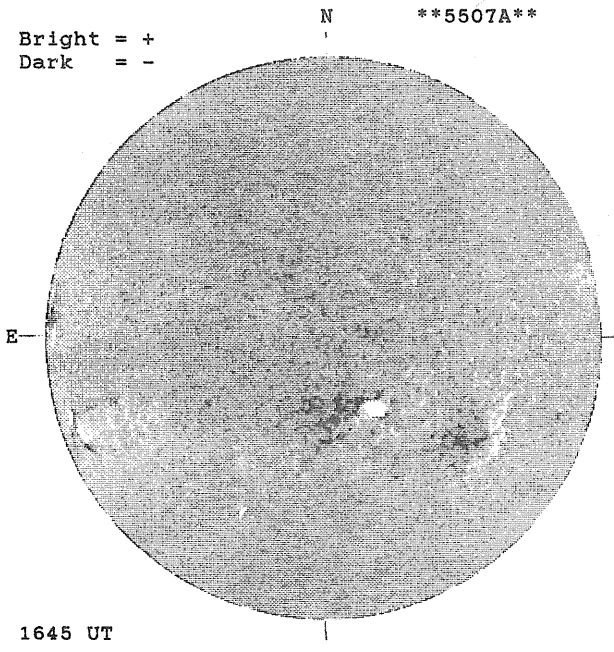


SACRAMENTO PEAK CORONA (1.15 Radii)

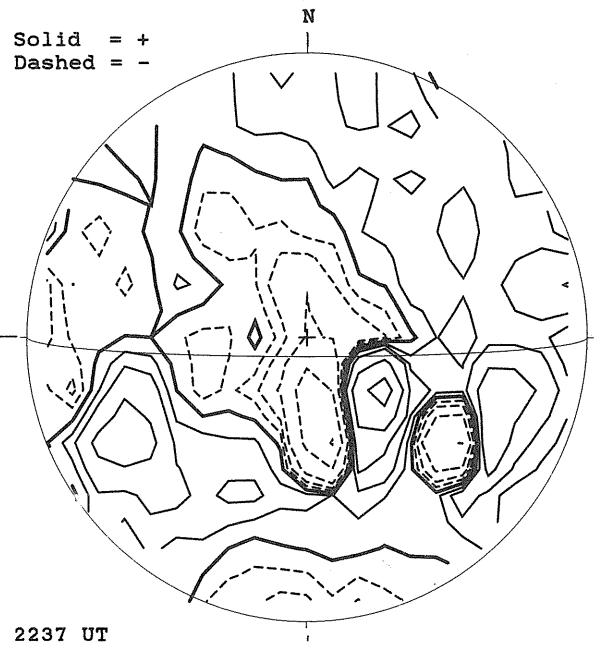


NOVEMBER 5, 1993 (P= 23.77, B_o = 3.95, L_o = 157.75)

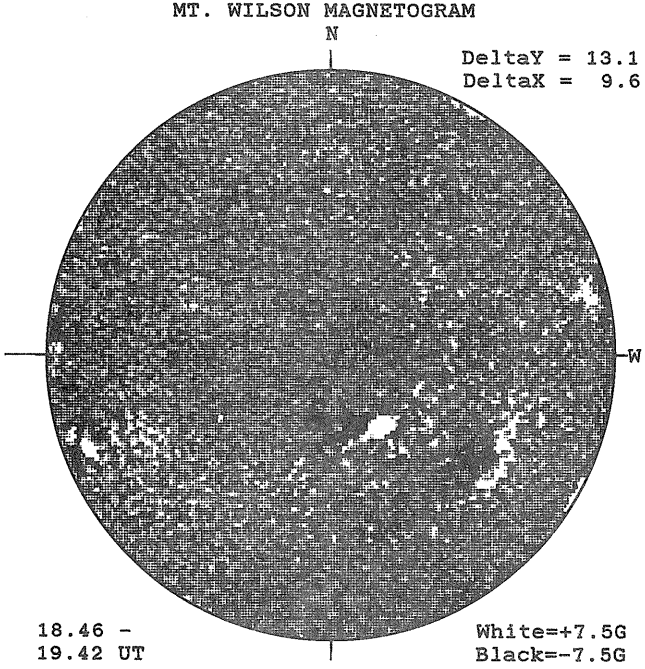
KITT PEAK MAGNETOGRAM



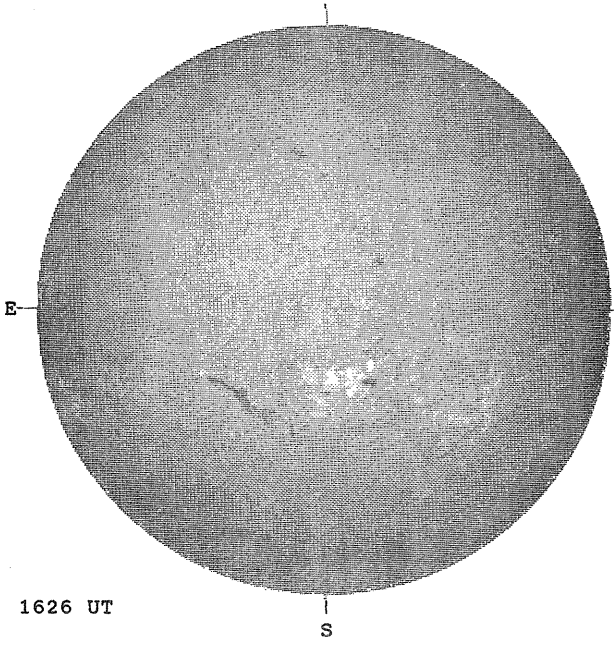
STANFORD MAGNETOGRAM



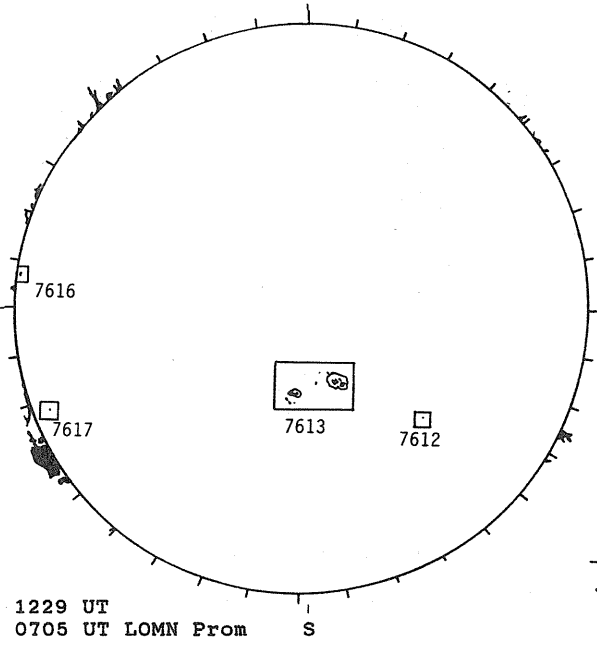
MT. WILSON MAGNETOGRAM



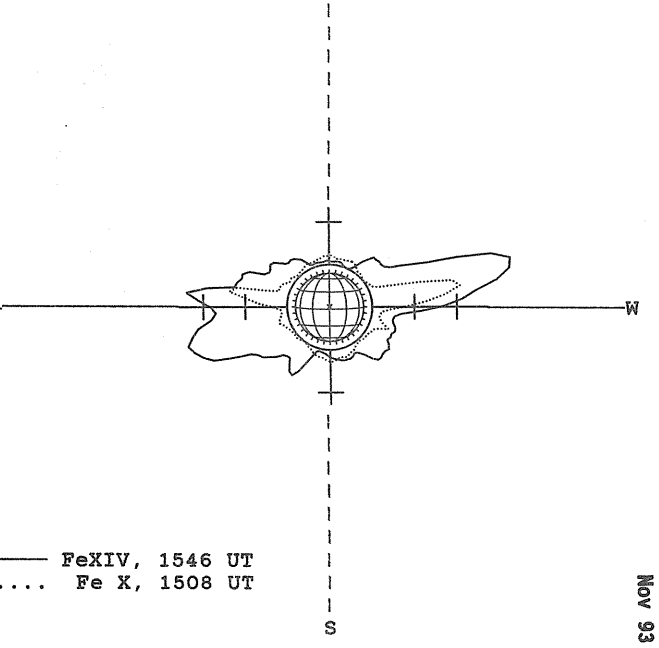
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT

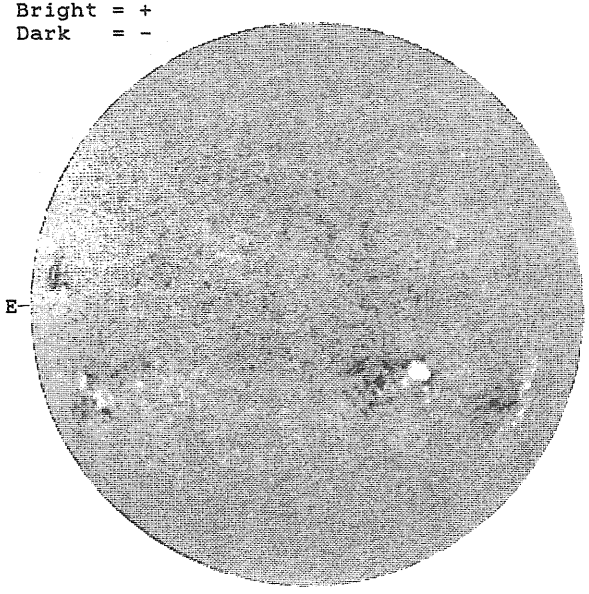


SACRAMENTO PEAK CORONA (1.15 Radii)



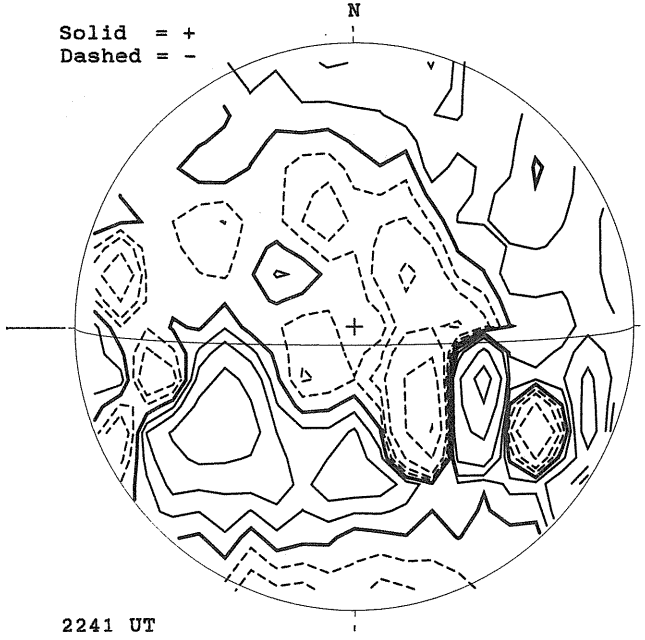
NOVEMBER 6, 1993 (P= 23.57, B_o = 3.84, L_o = 144.57)

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



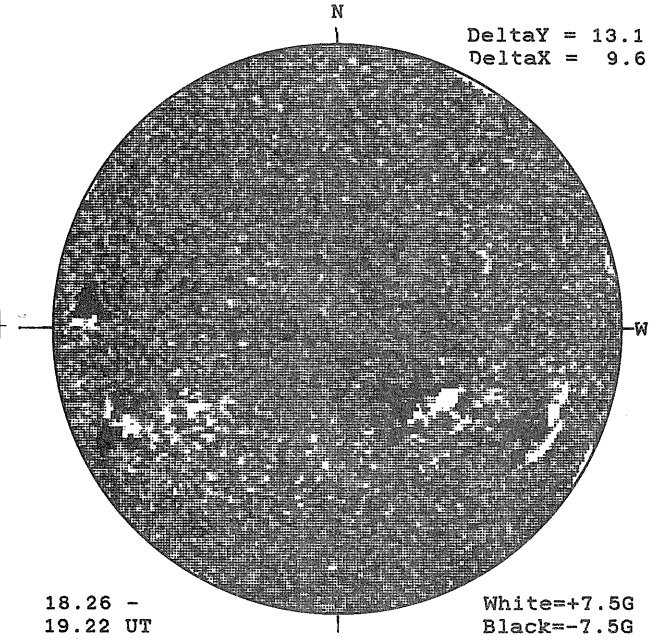
1642 UT

STANFORD MAGNETOGRAM
N
Solid = +
Dashed = -



2241 UT

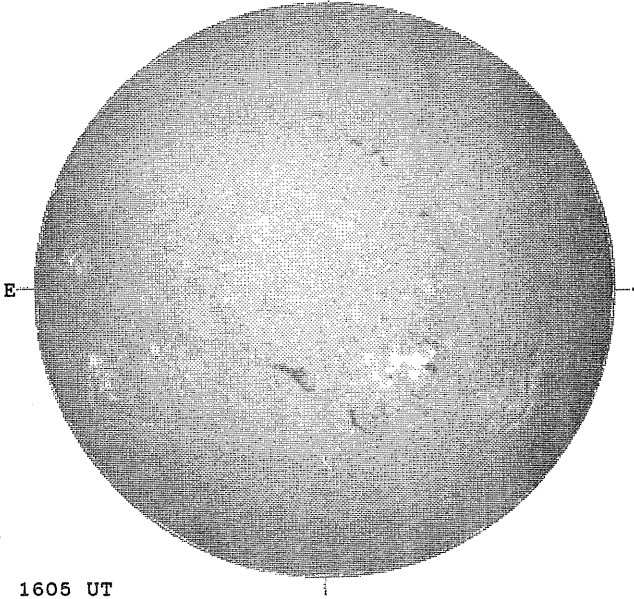
MT. WILSON MAGNETOGRAM
N
DeltaY = 13.1
DeltaX = 9.6



18.26 -
19.22 UT

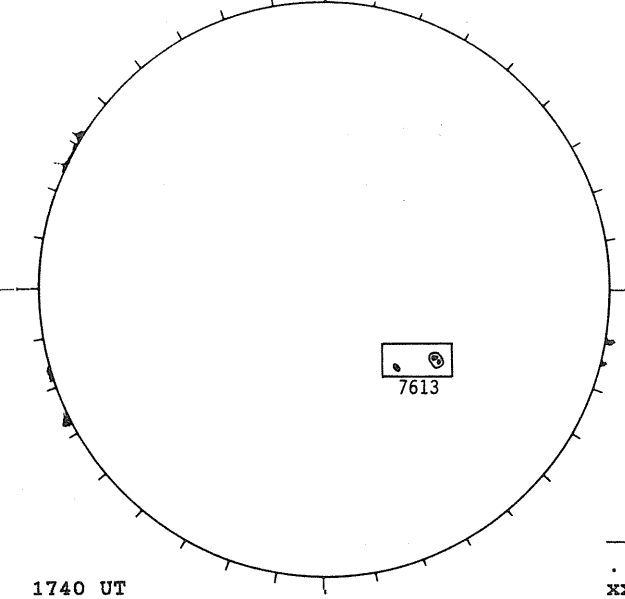
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



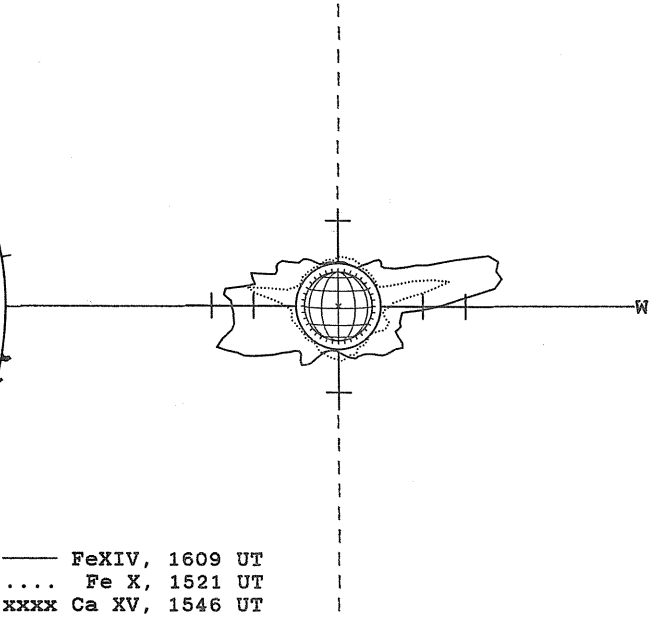
1605 UT

BOULDER SUNSPOT



1740 UT
1730 UT BOUL Prom

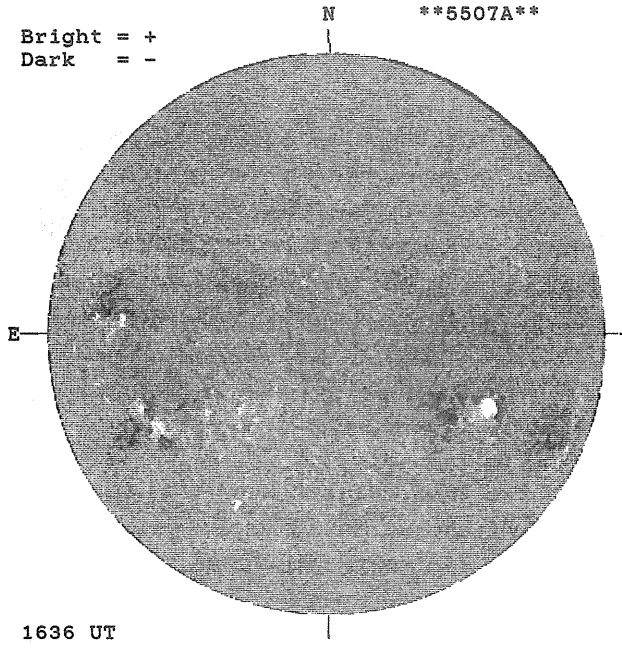
SACRAMENTO PEAK CORONA (1.15 Radii)



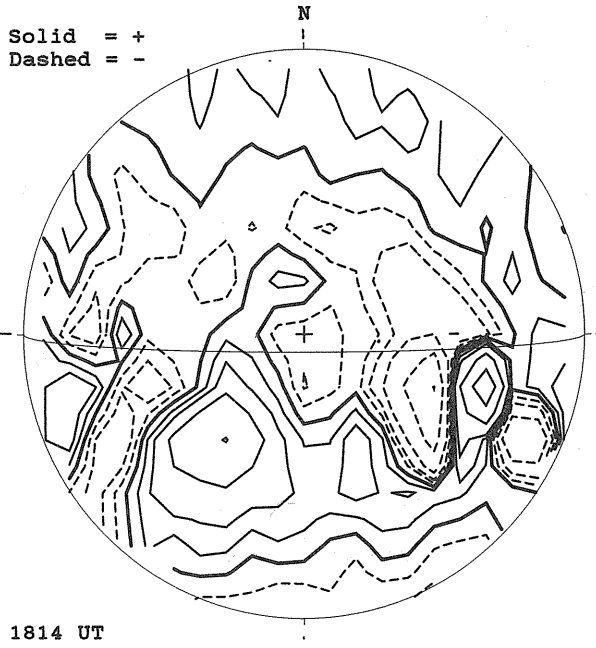
—— FeXIV, 1609 UT
.... Fe X, 1521 UT
xxxx Ca XV, 1546 UT
NO CA XV ACTIVITY TODAY

NOVEMBER 7, 1993 (P= 23.36 B_o = 3.73, L_o = 131.38)

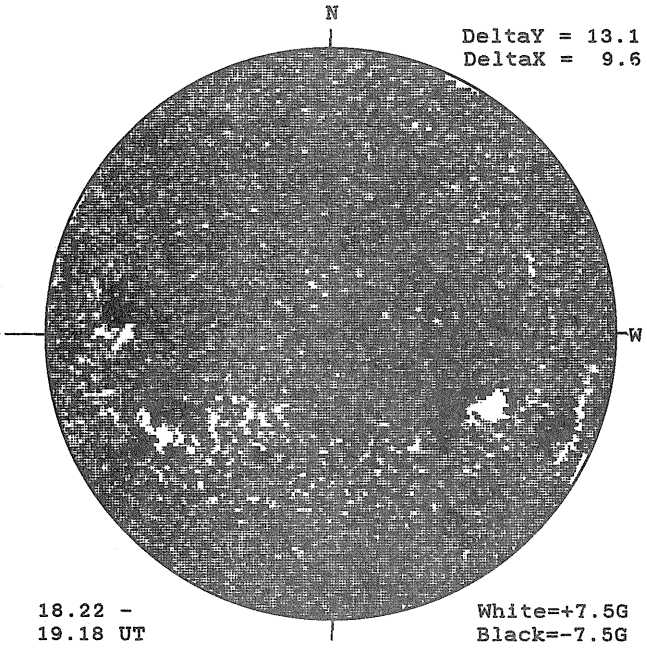
KITT PEAK MAGNETOGRAM



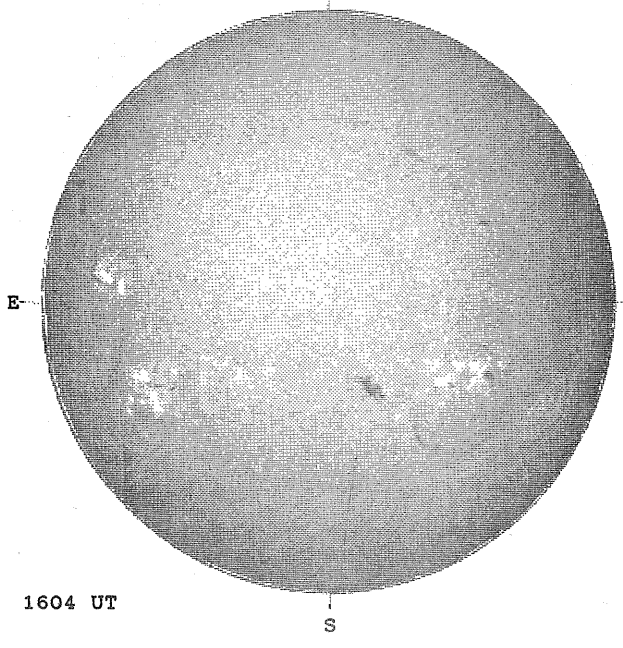
STANFORD MAGNETOGRAM



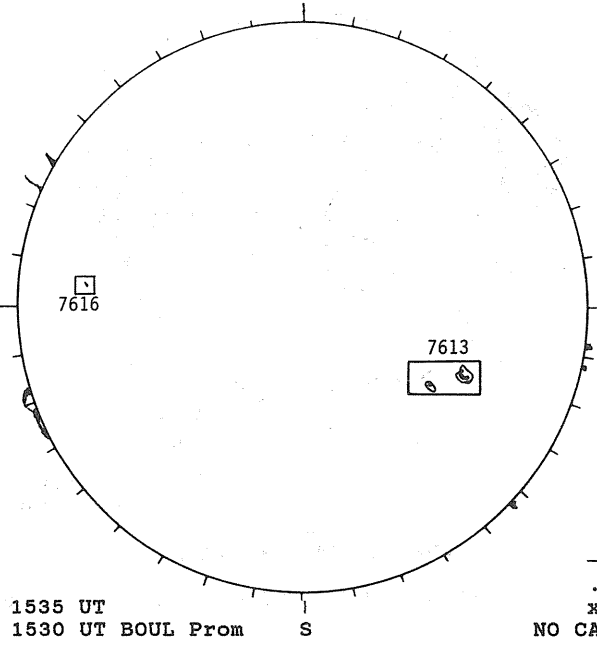
MT. WILSON MAGNETOGRAM



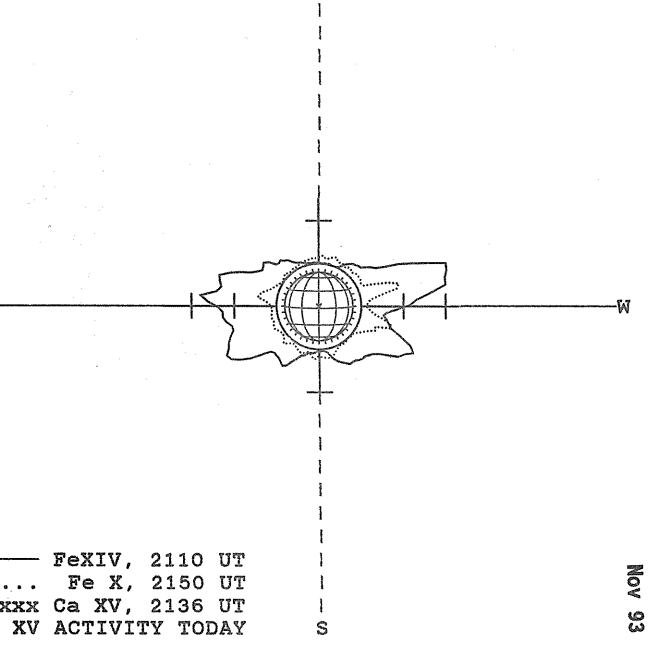
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)

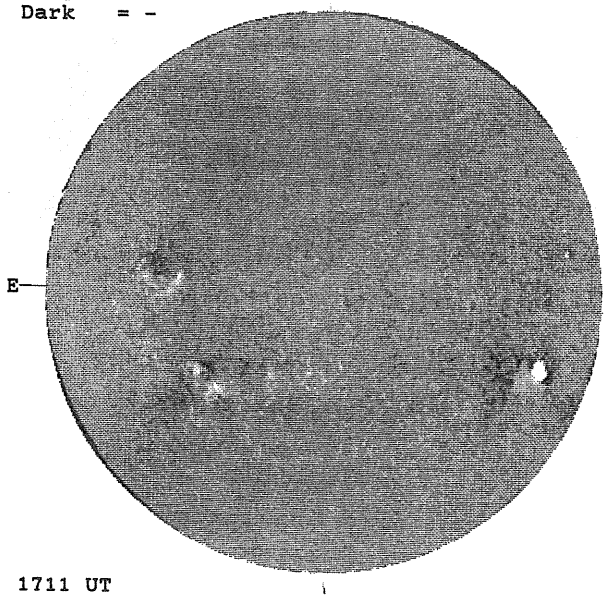


NOVEMBER 8, 1993 (P= 23.14, B_o = 3.62, L_o = 118.20)

KITT PEAK MAGNETOGRAM

N **5507A**

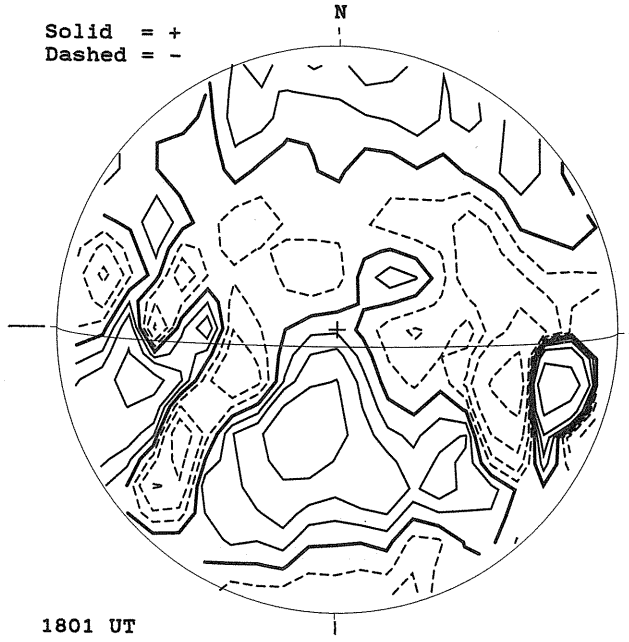
Bright = +
Dark = -



1711 UT

STANFORD MAGNETOGRAM

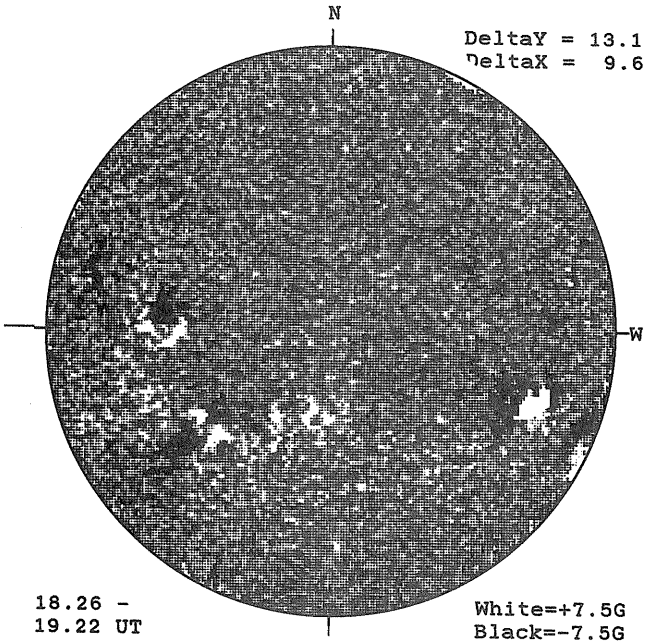
Solid = +
Dashed = -



1801 UT

MT. WILSON MAGNETOGRAM

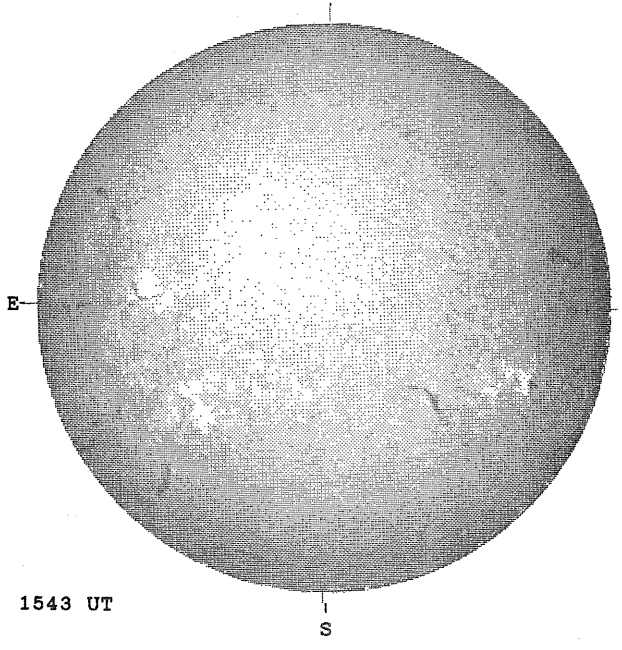
DeltaY = 13.1
DeltaX = 9.6



18.26 -
19.22 UT

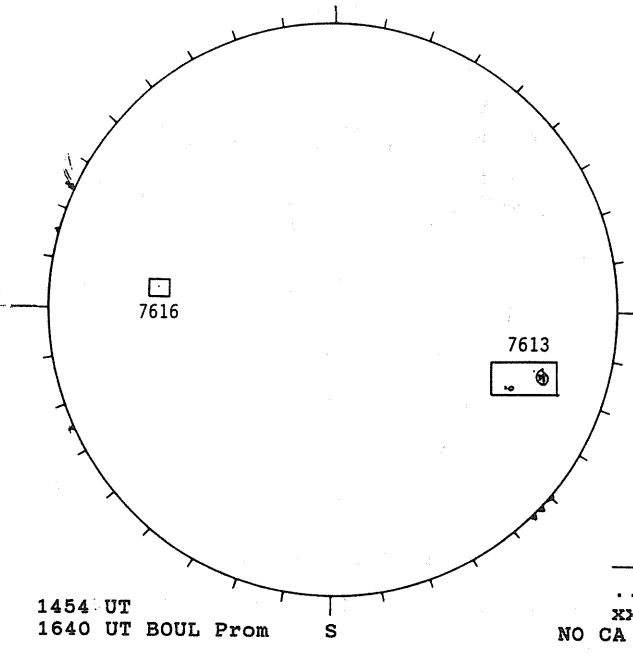
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



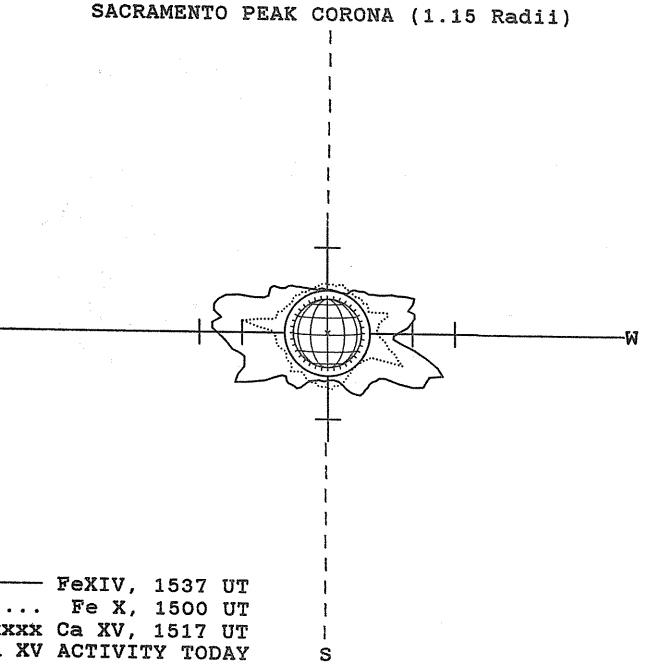
1543 UT

BOULDER SUNSPOT



1454 UT
1640 UT BOUL Prom

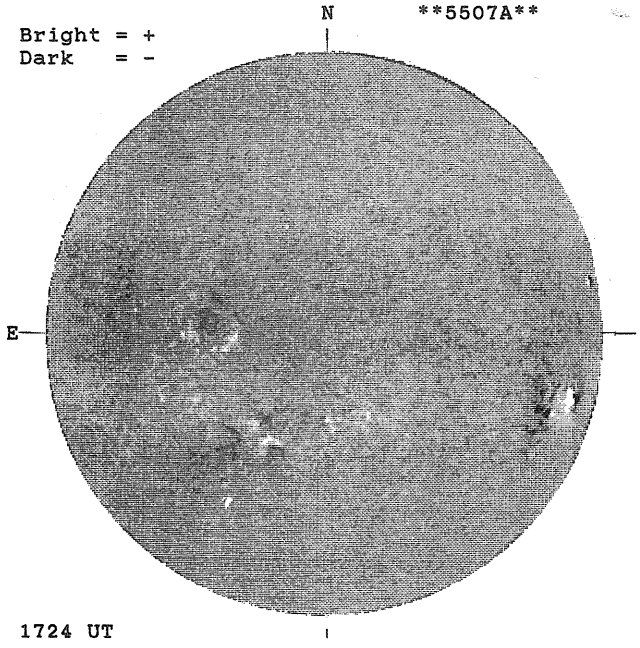
SACRAMENTO PEAK CORONA (1.15 Radii)



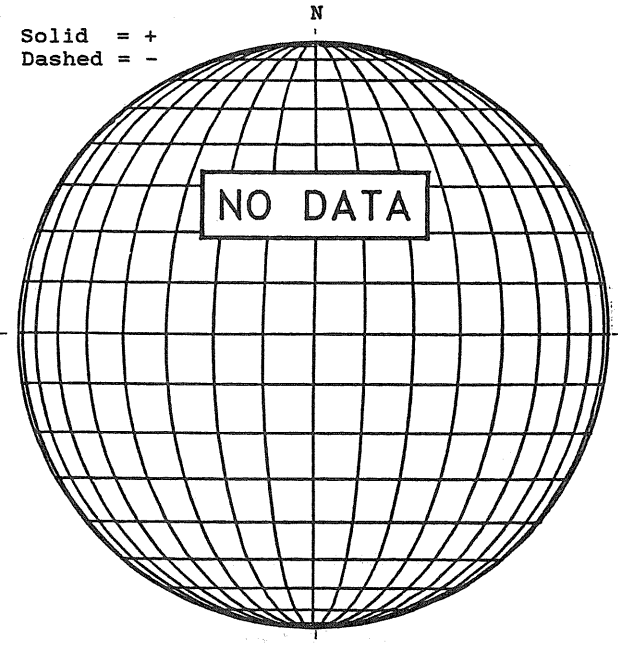
—— FeXIV, 1537 UT
.... Fe X, 1500 UT
xxxx Ca XV, 1517 UT
NO CA XV ACTIVITY TODAY

NOVEMBER 9, 1993 (P= 22.92 B_o = 3.51, L_o = 105.01)

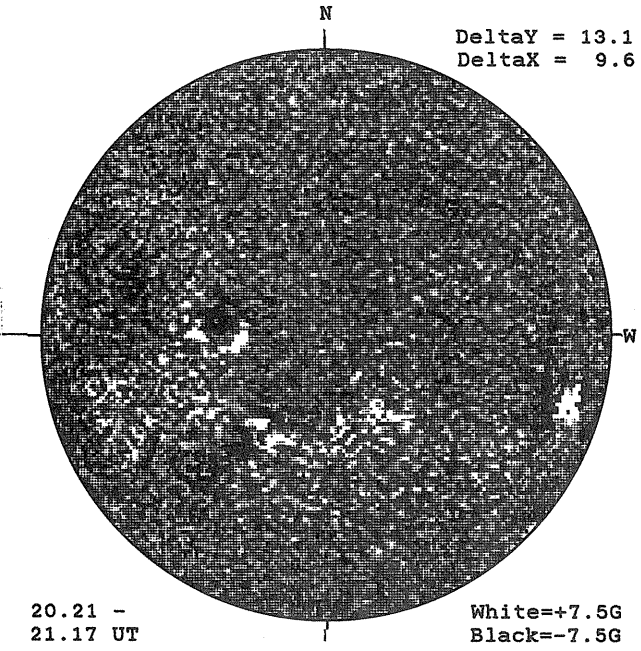
KITT PEAK MAGNETOGRAM



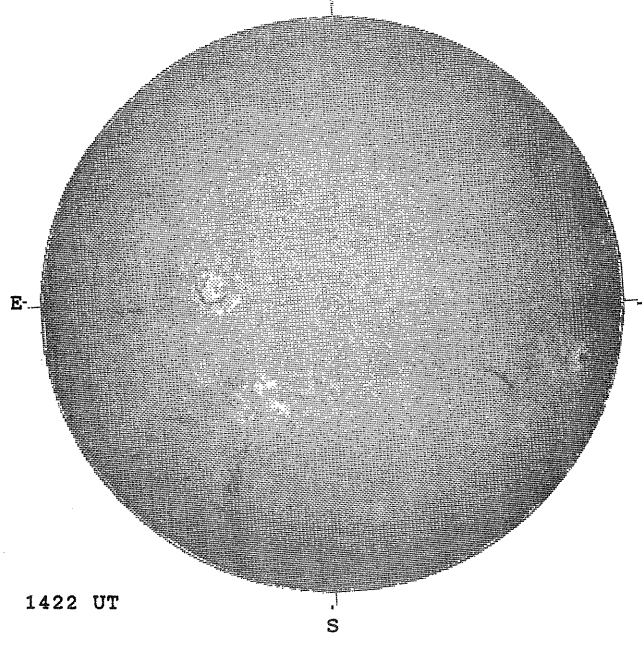
STANFORD MAGNETOGRAM



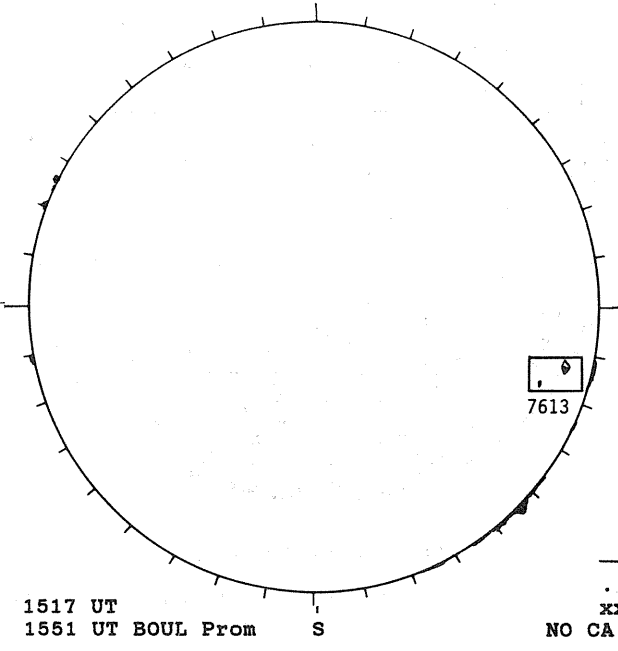
MT. WILSON MAGNETOGRAM



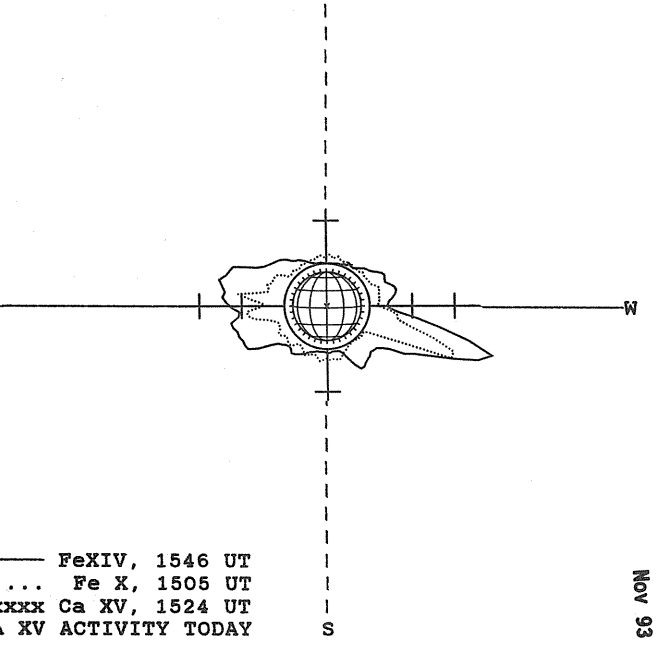
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



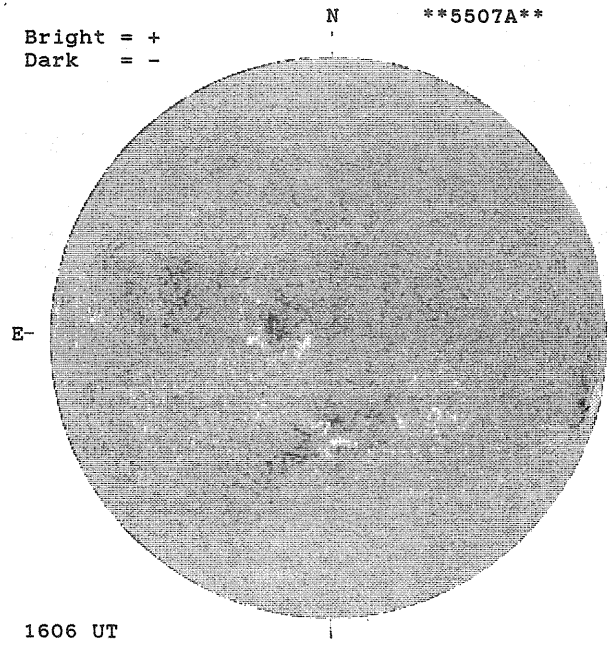
SACRAMENTO PEAK CORONA (1.15 Radii)



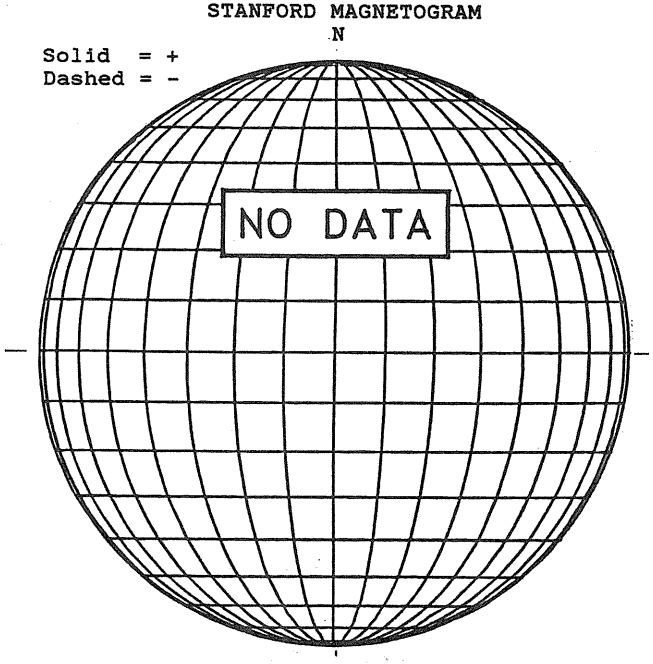
55
Nov 93

NOVEMBER 10, 1993 (P= 22.68, B_o = 3.40, L_o = 91.83)

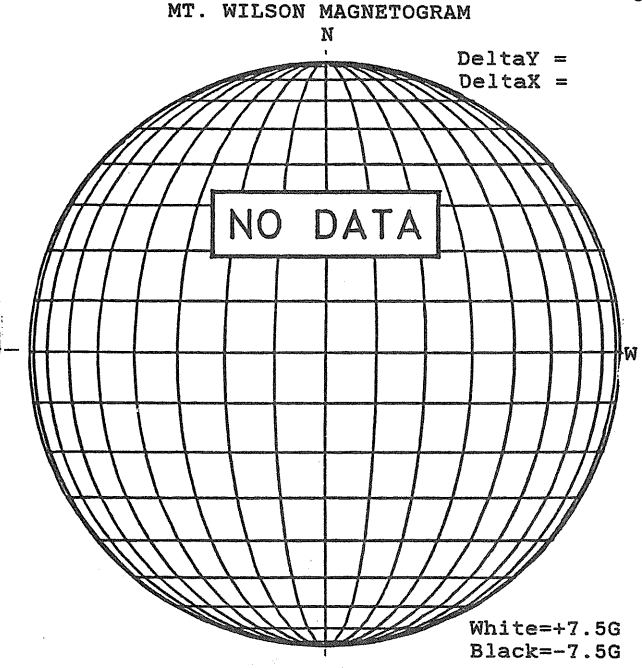
KITT PEAK MAGNETOGRAM



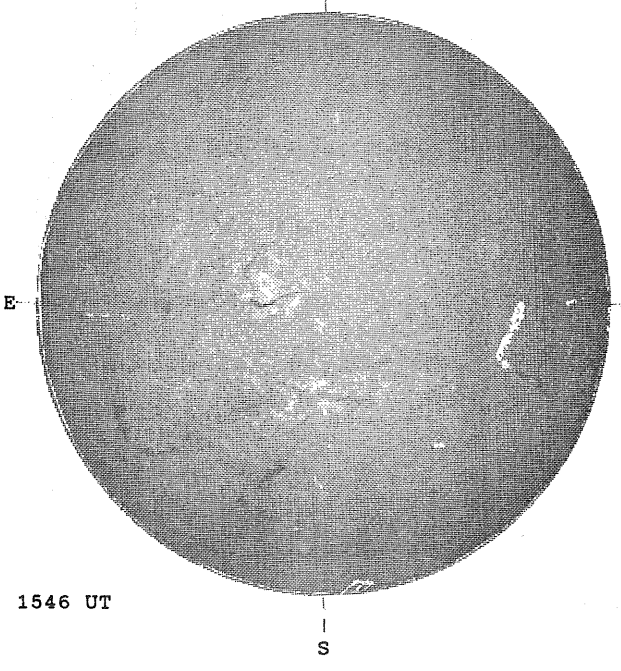
STANFORD MAGNETOGRAM



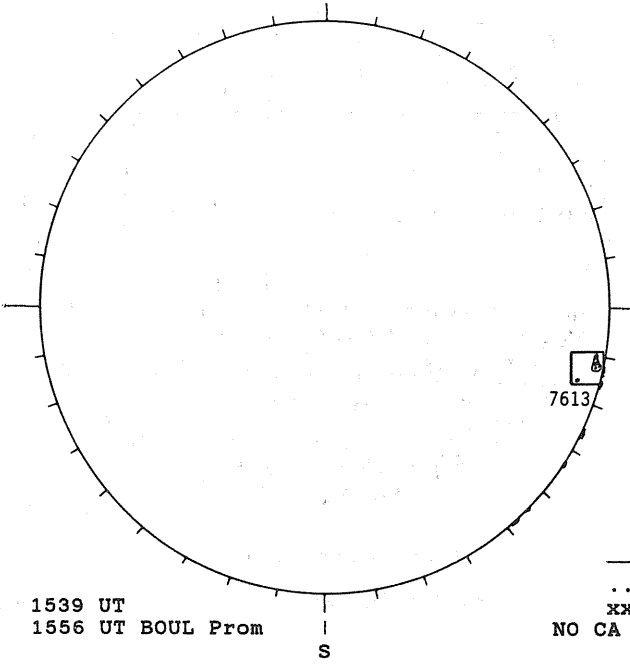
MT. WILSON MAGNETOGRAM



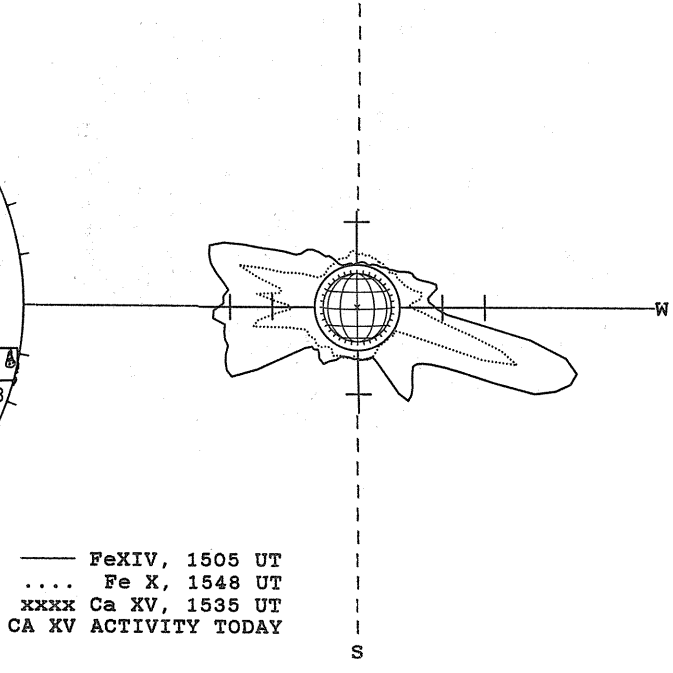
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

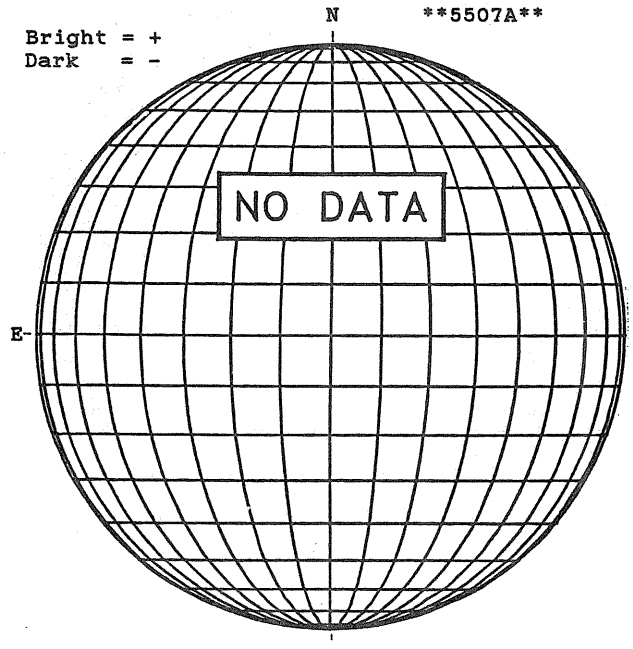


SACRAMENTO PEAK CORONA (1.15 Radii)

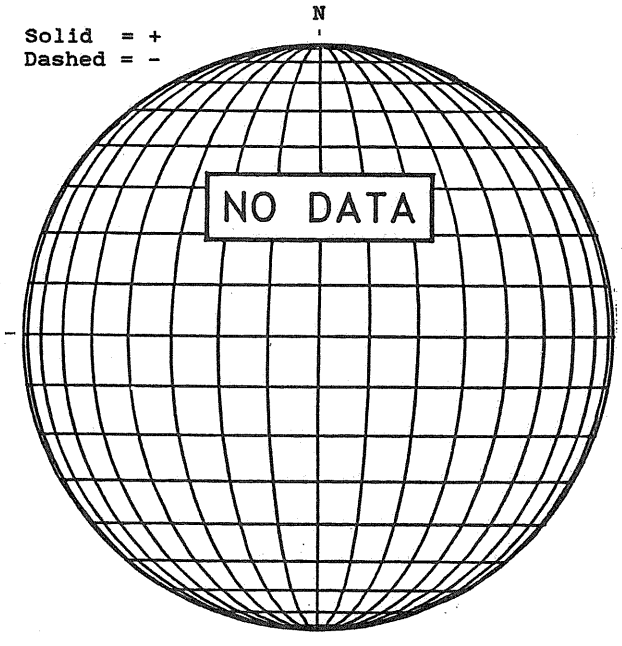


NOVEMBER 11, 1993 (P= 22.44, B_o = 3.29, L_o = 78.65)

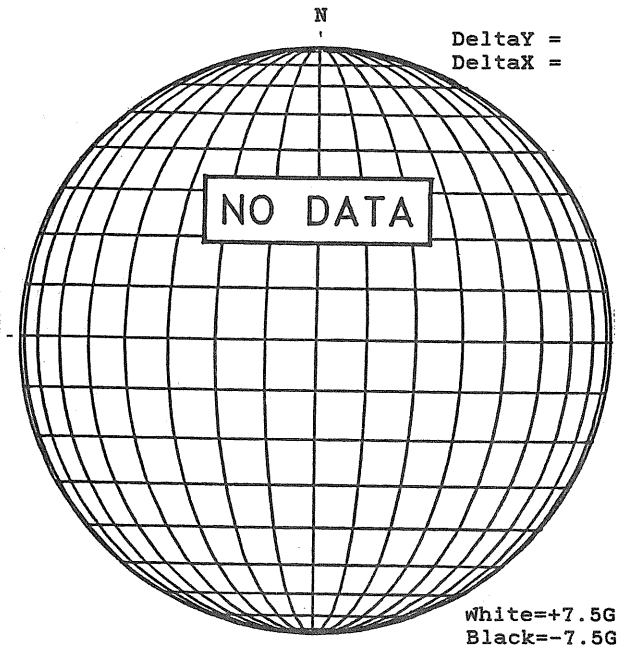
KITT PEAK MAGNETOGRAM



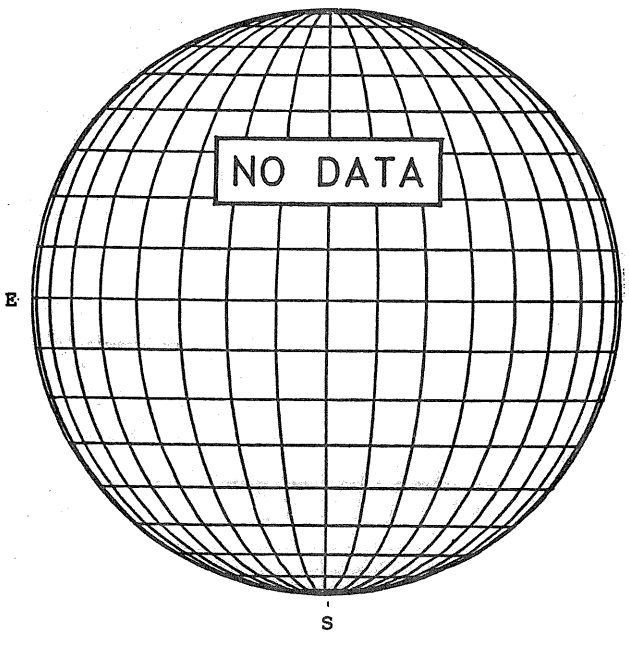
STANFORD MAGNETOGRAM



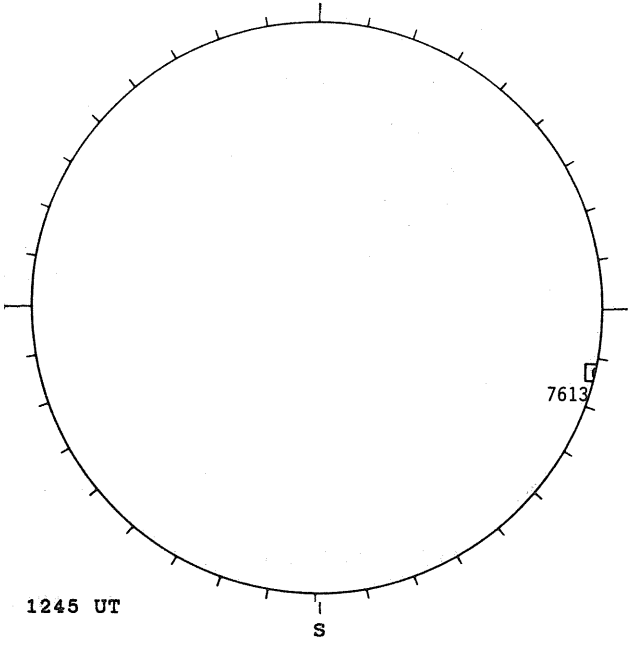
MT. WILSON MAGNETOGRAM



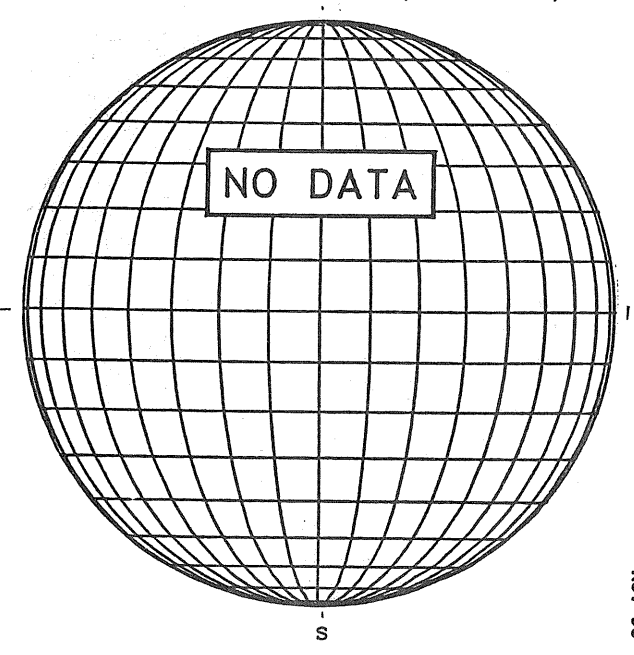
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



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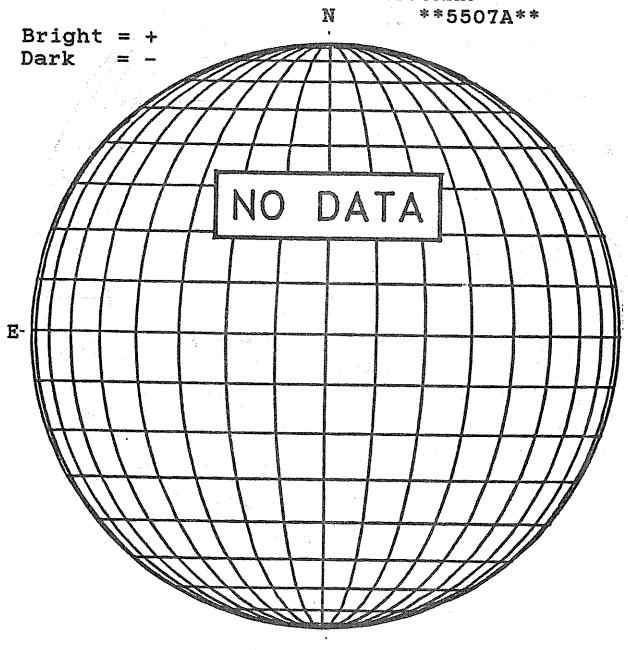
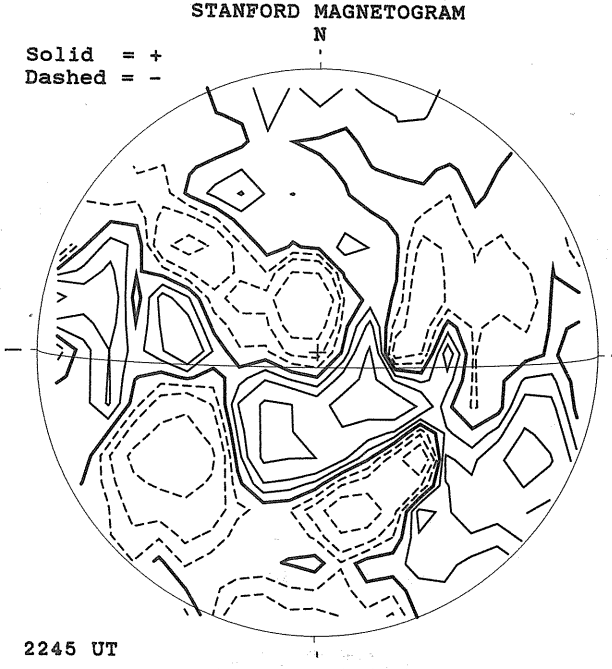
Nov 93

NOVEMBER 12, 1993 (P= 22.19, B_o = 3.17, L_o = 65.46)

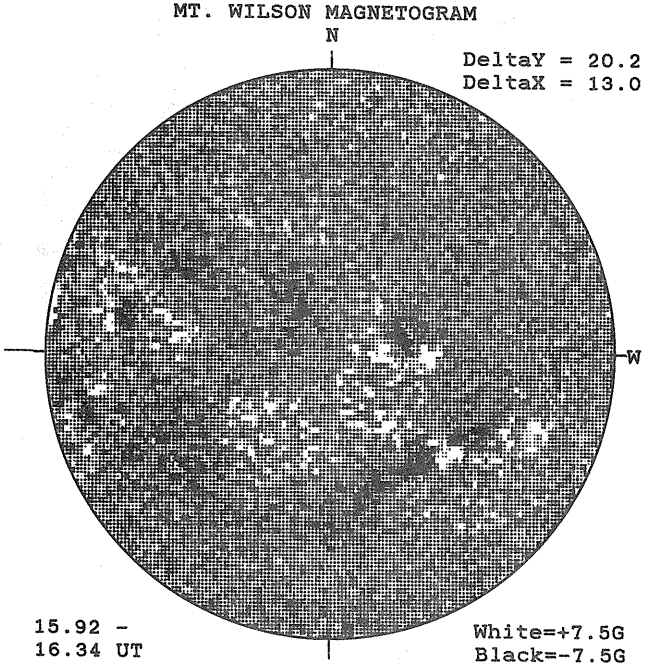
KITT PEAK MAGNETOGRAM



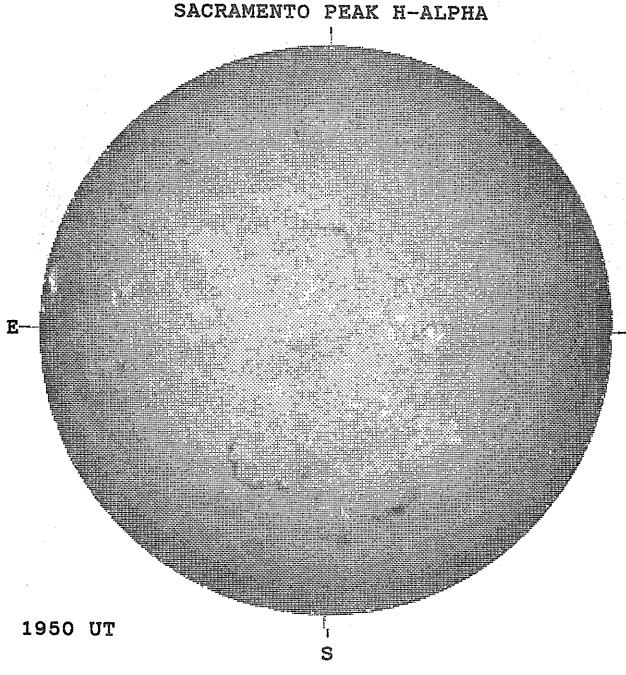
STANFORD MAGNETOGRAM



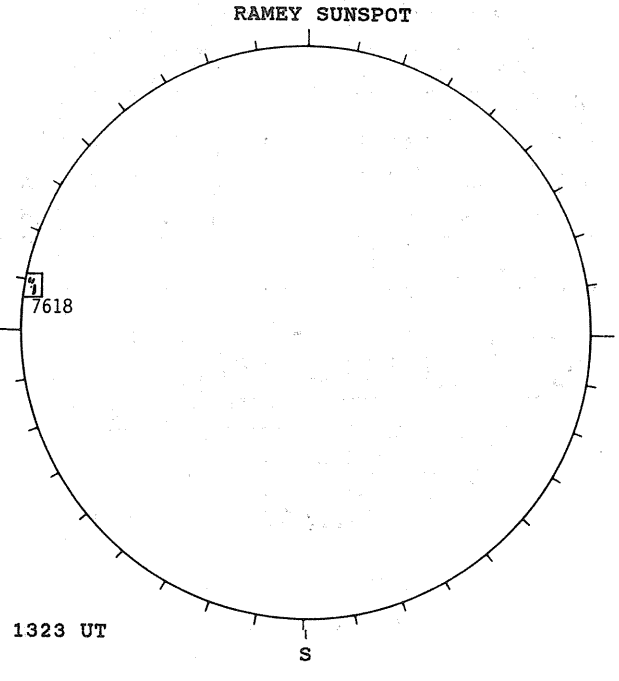
MT. WILSON MAGNETOGRAM



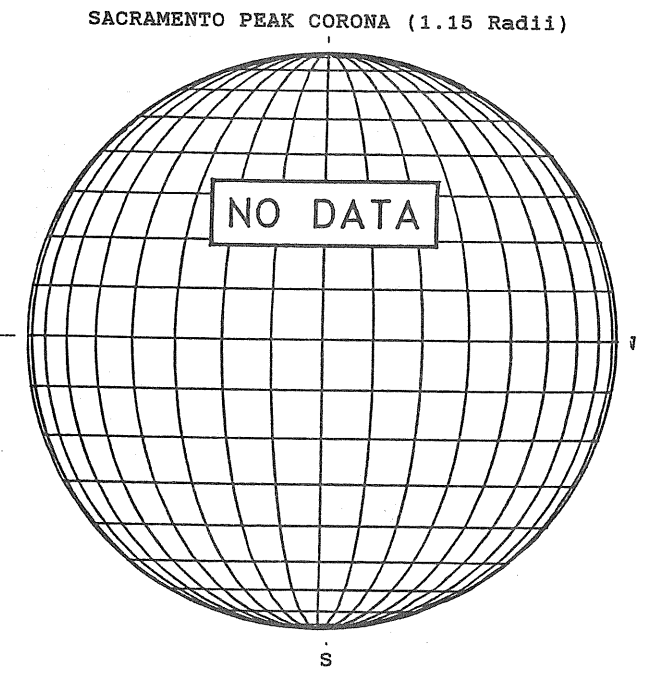
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)

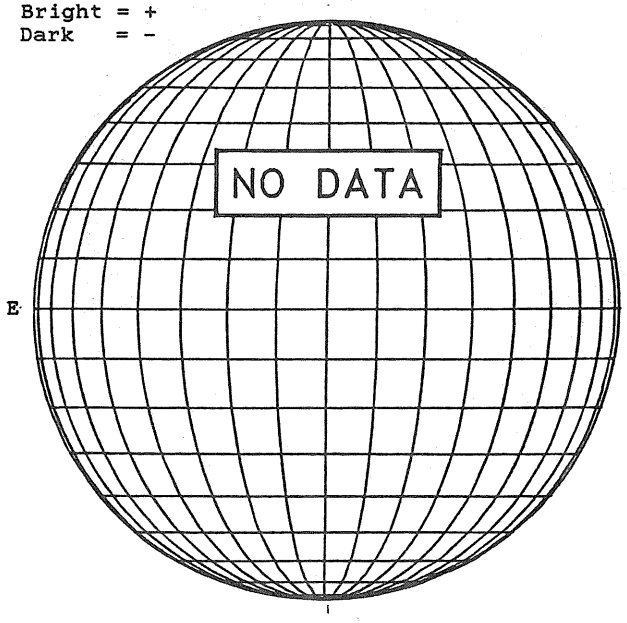


NOVEMBER 13, 1993 (P= 21.94, B_o = 3.06, L_o = 52.28)

KITT PEAK MAGNETOGRAM

N **5507A**

Bright = +
Dark = -



STANFORD MAGNETOGRAM

N

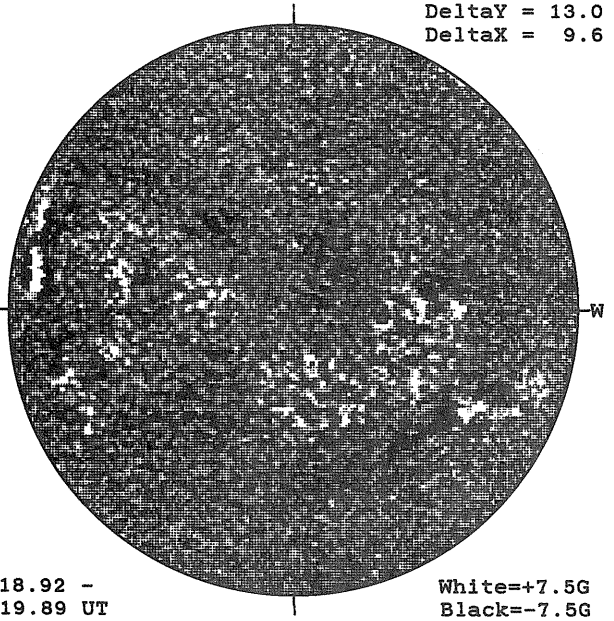
Solid = +
Dashed = -

2239 UT

MT. WILSON MAGNETOGRAM

N

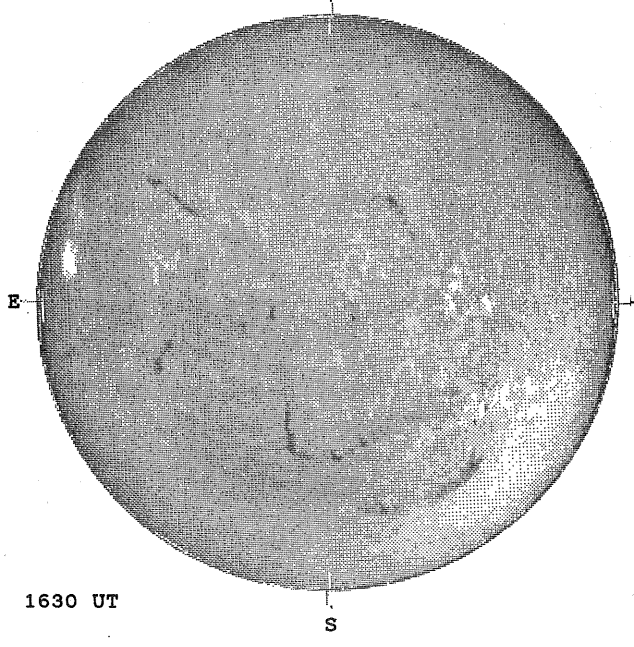
DeltaY = 13.0
DeltaX = 9.6



18.92 -
19.89 UT

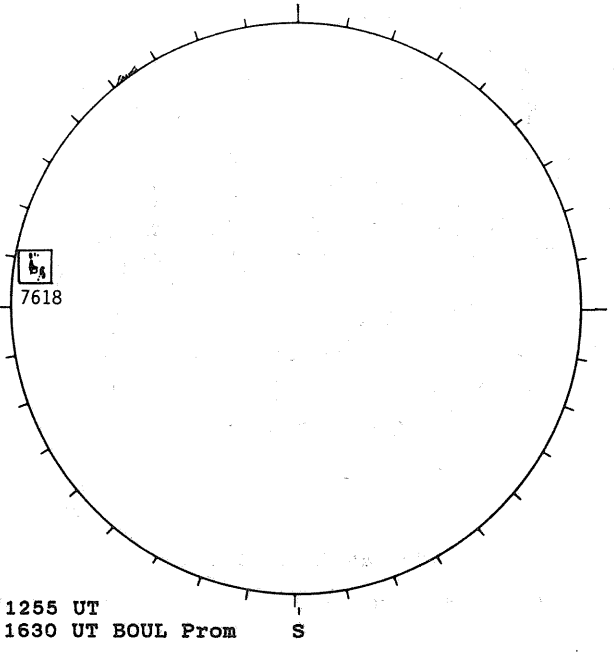
White=+7.5G
Black=-7.5G

BOULDER H-ALPHA



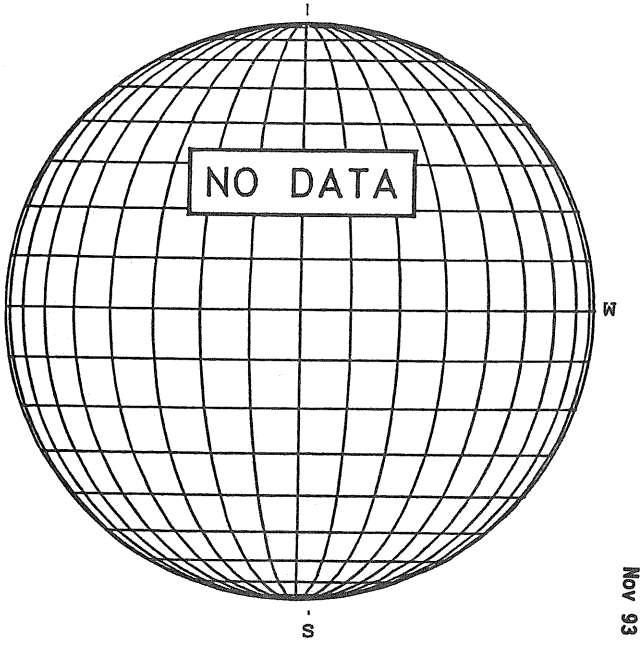
1630 UT

RAMEY SUNSPOT



1255 UT
1630 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



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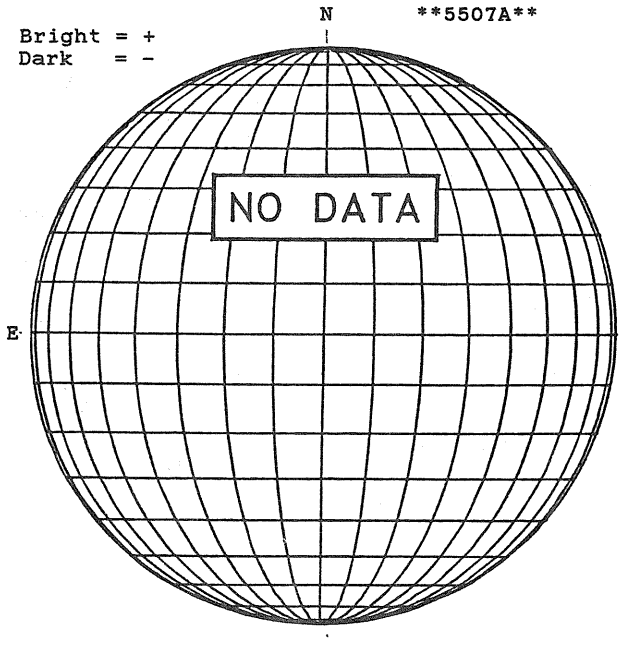
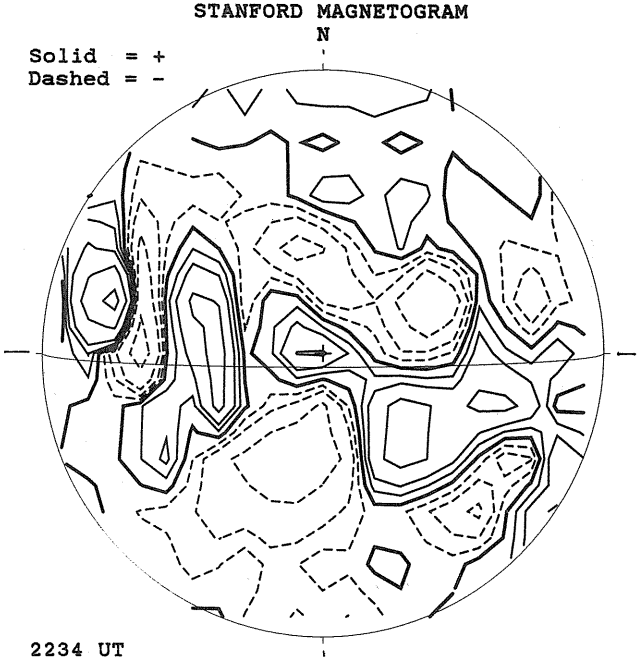
Nov 93

NOVEMBER 14, 1993 (P= 21.67, B_o = 2.94, L_o = 39.10)

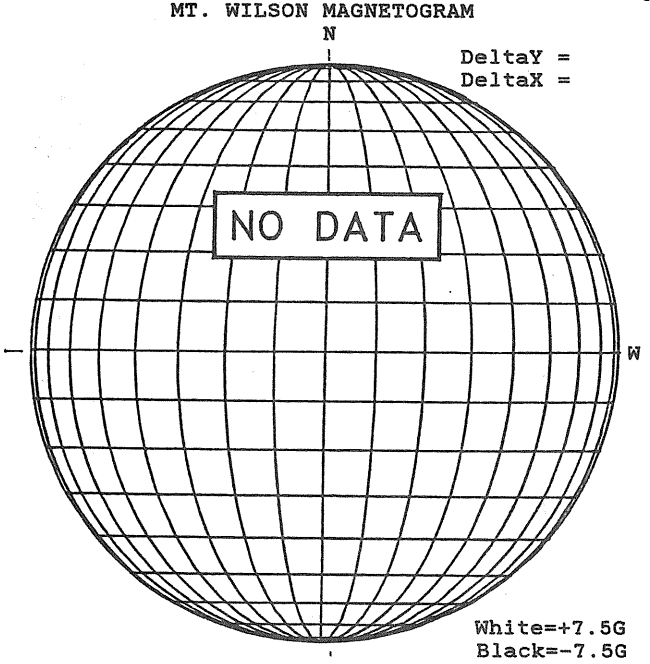
KITT PEAK MAGNETOGRAM



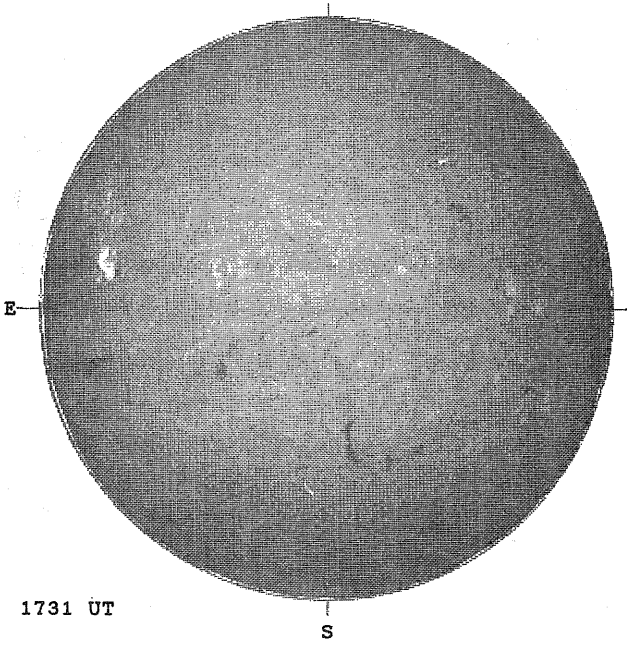
STANFORD MAGNETOGRAM



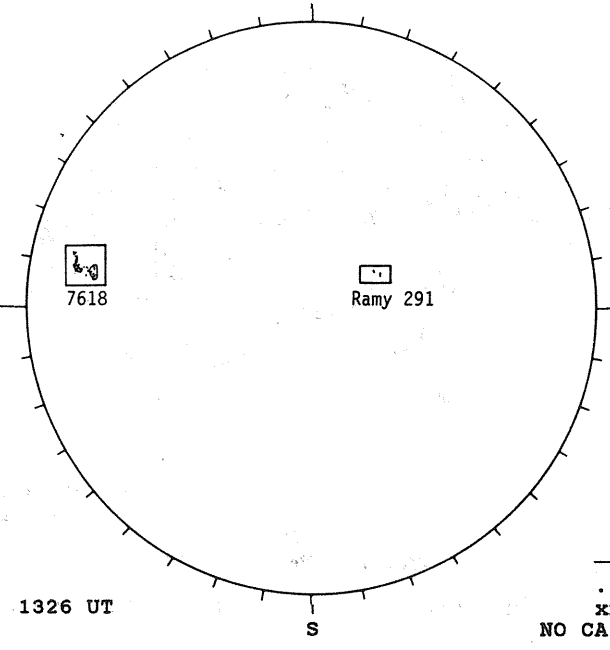
MT. WILSON MAGNETOGRAM



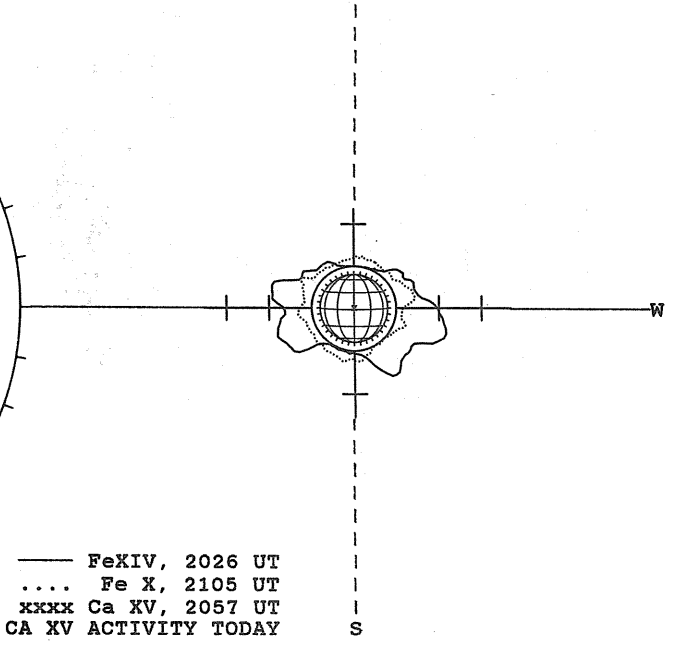
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



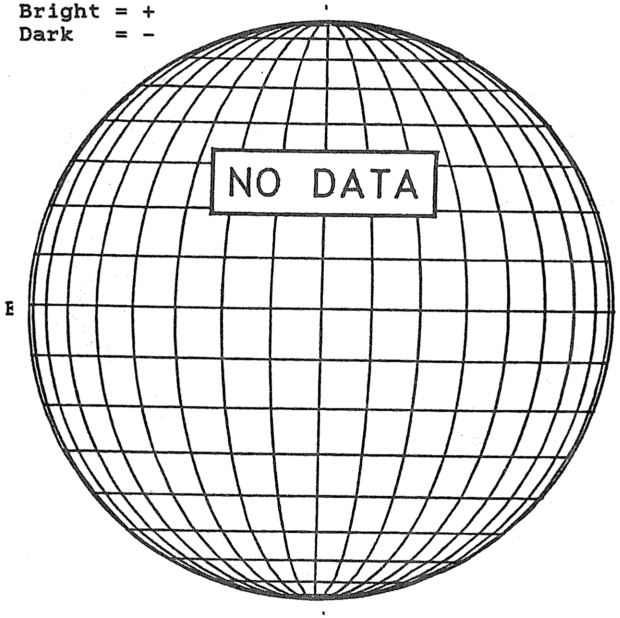
SACRAMENTO PEAK CORONA (1.15 Radii)



NOVEMBER 15, 1993 (P= 21.40, B_o = 2.83 L_o = 25.92)

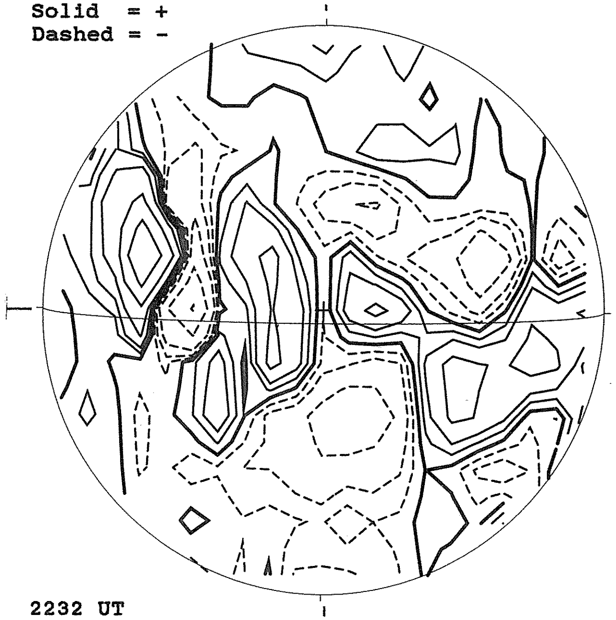
KITT PEAK MAGNETOGRAM **5507A**

Bright = +
Dark = -



STANFORD MAGNETOGRAM

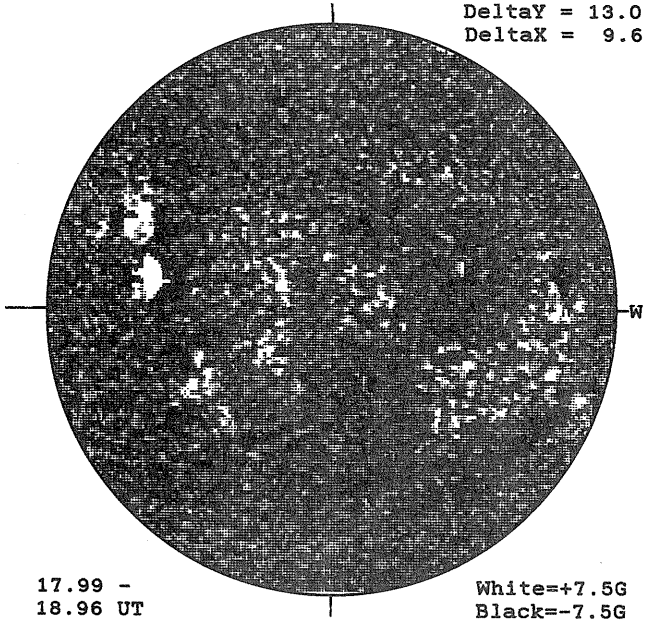
Solid = +
Dashed = -



2232 UT

MT. WILSON MAGNETOGRAM

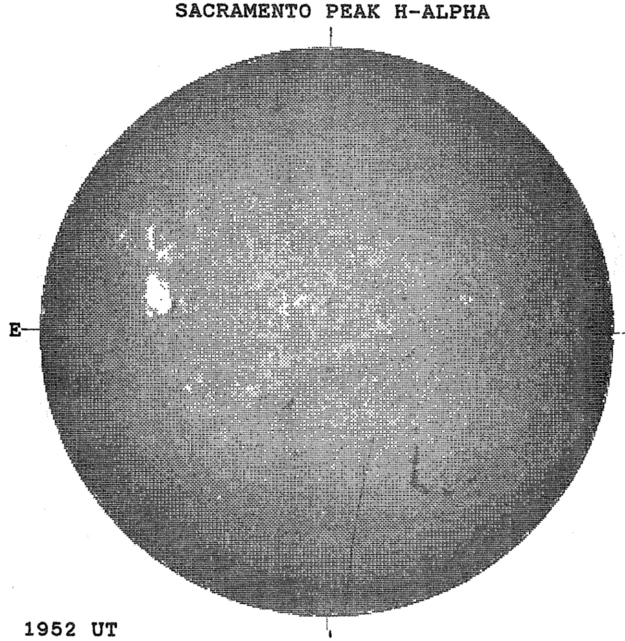
DeltaY = 13.0
DeltaX = 9.6



17.99 -
18.96 UT

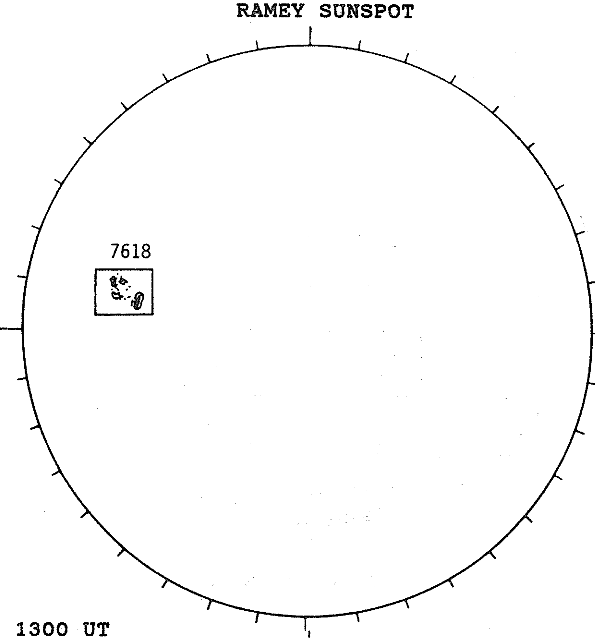
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



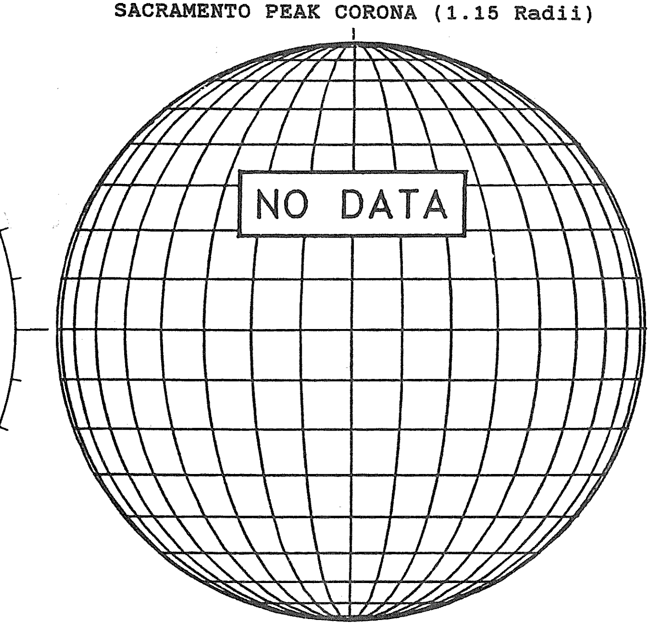
1952 UT

RAMEY SUNSPOT



1300 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

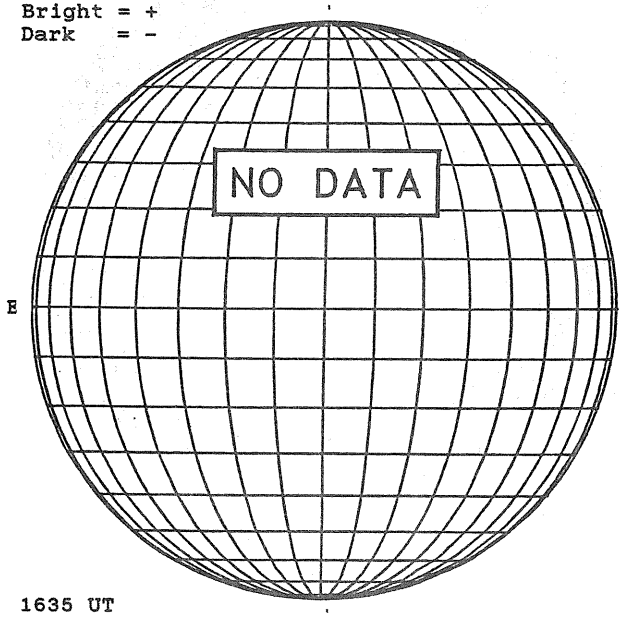


NOVEMBER 16, 1993 (P= 21.12, B_o = 2.71, L_o = 12.73)

KITT PEAK MAGNETOGRAM

N **5507A**

Bright = +
Dark = -

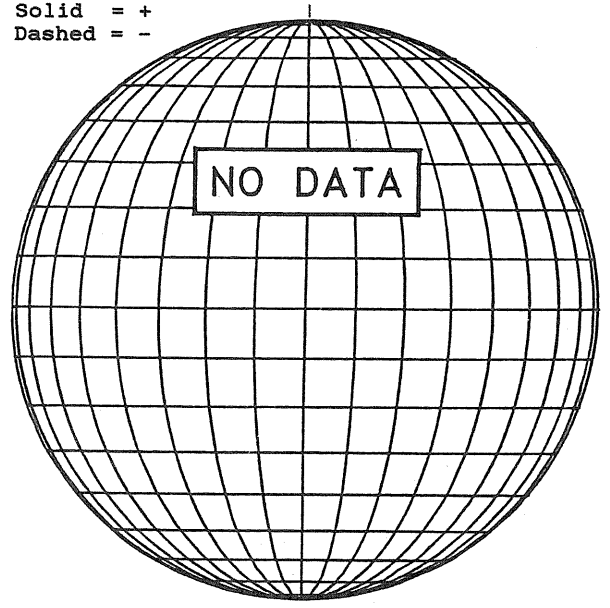


1635 UT

STANFORD MAGNETOGRAM

N

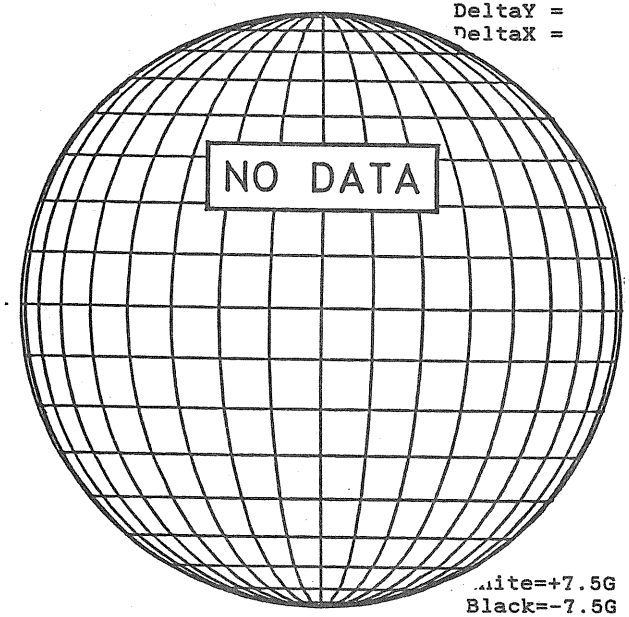
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

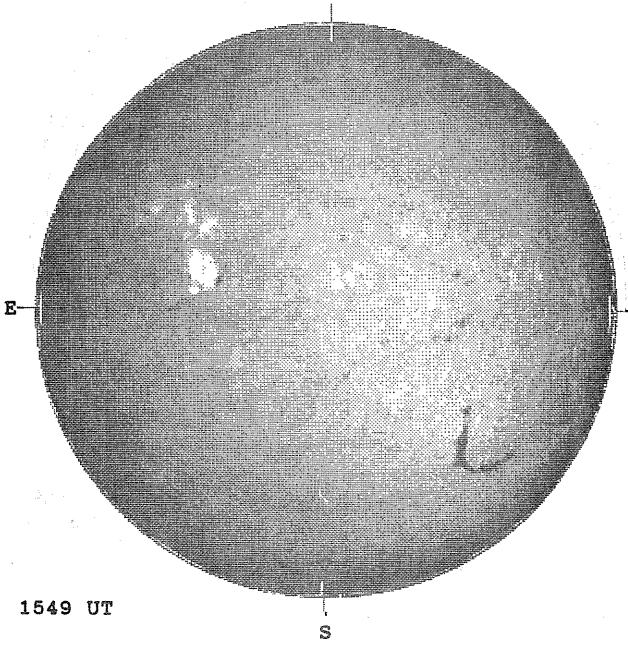
N

DeltaY =
DeltaX =



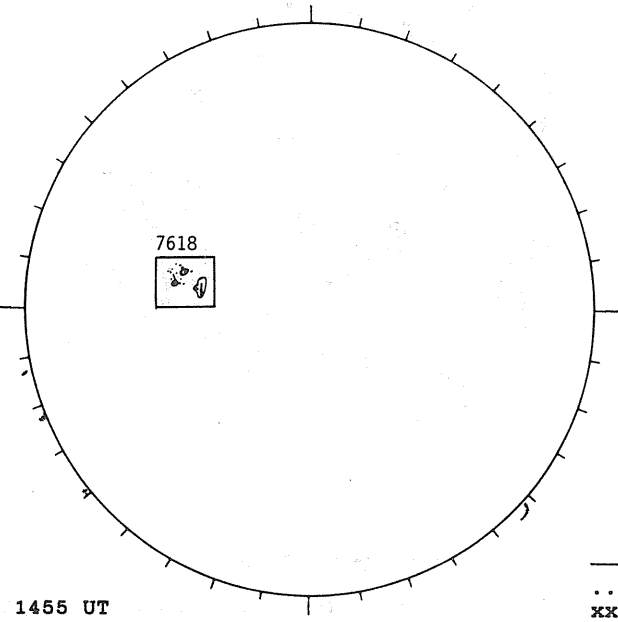
...ite=+7.5G
Black=-7.5G

BOULDER H-ALPHA



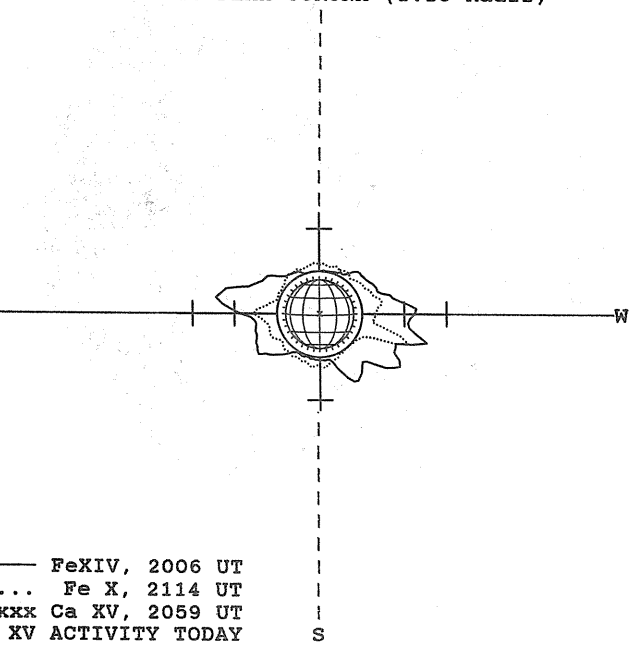
1549 UT

BOULDER SUNSPOT



1455 UT
1549 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



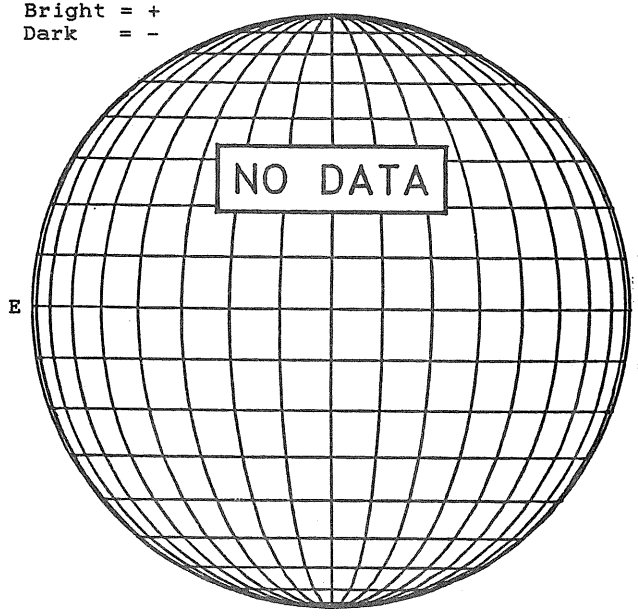
—— FeXIV, 2006 UT
.... Fe X, 2114 UT
xxxx Ca XV, 2059 UT
NO CA XV ACTIVITY TODAY

NOVEMBER 17, 1993 (P= 20.84, B_o = 2.59, L_o = 359.55)

KITT PEAK MAGNETOGRAM

N **5507A**

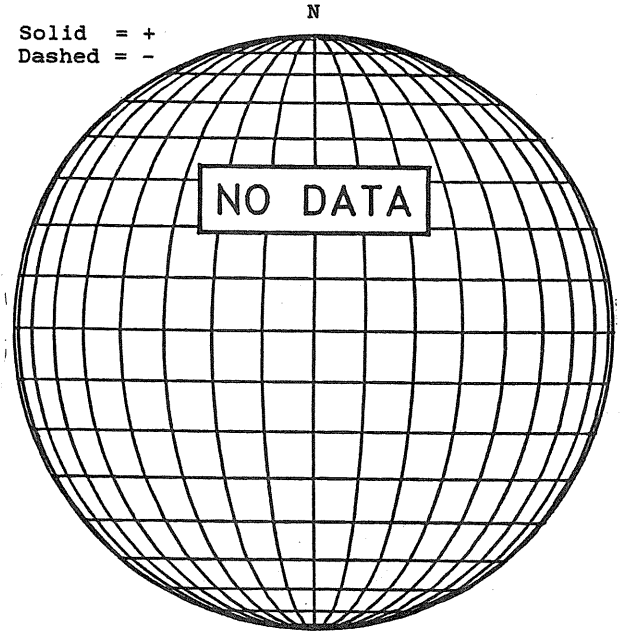
Bright = +
Dark = -



STANFORD MAGNETOGRAM

N

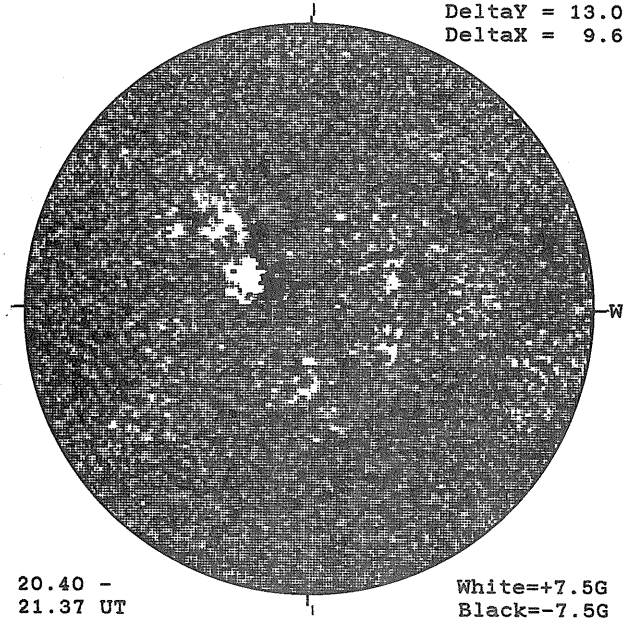
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

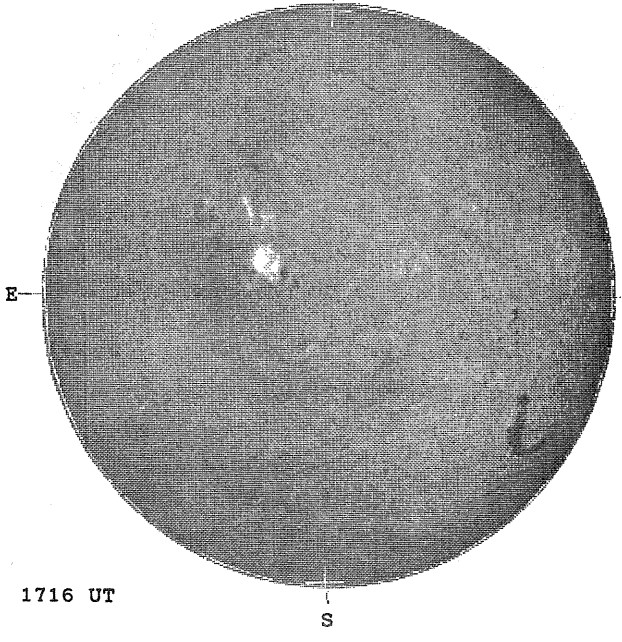
DeltaY = 13.0
DeltaX = 9.6



20.40 -
21.37 UT

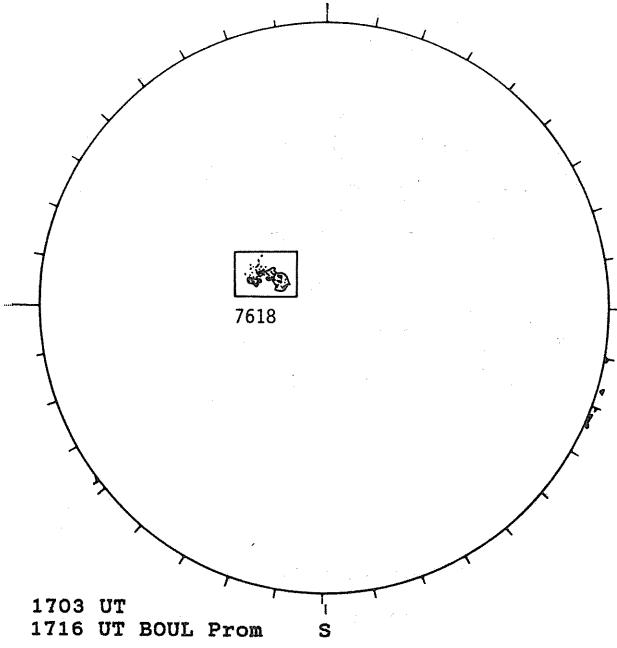
White=+7.5G
Black=-7.5G

BOULDER H-ALPHA



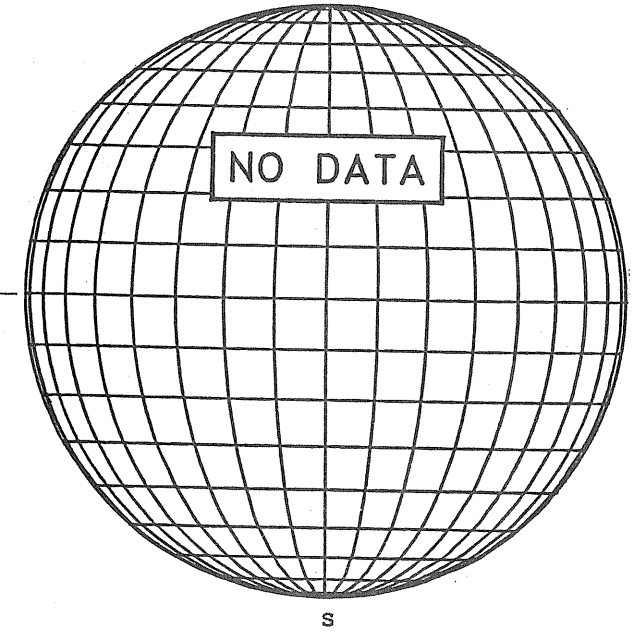
1716 UT

BOULDER SUNSPOT



1703 UT
1716 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



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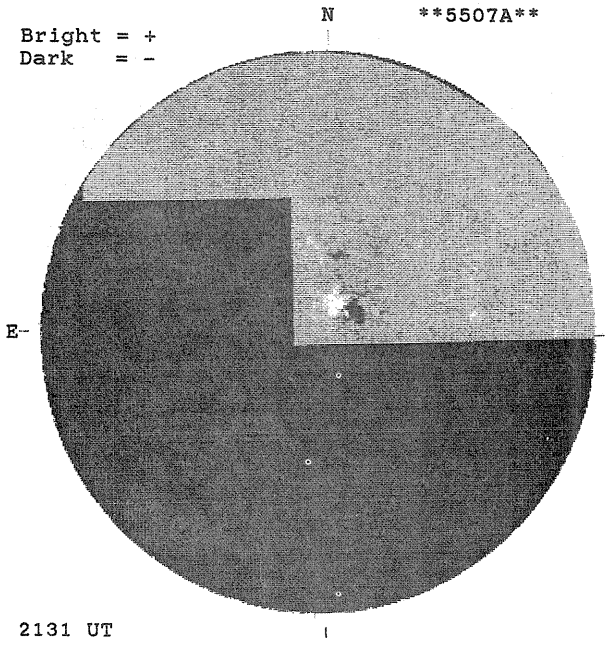
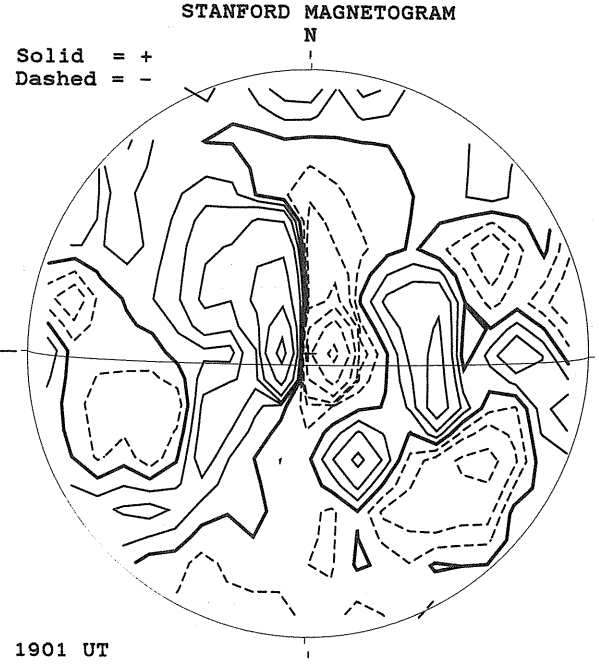
Nov 93

NOVEMBER 18, 1993 (P= 20.54, B_o = 2.47, L_o = 346.37)

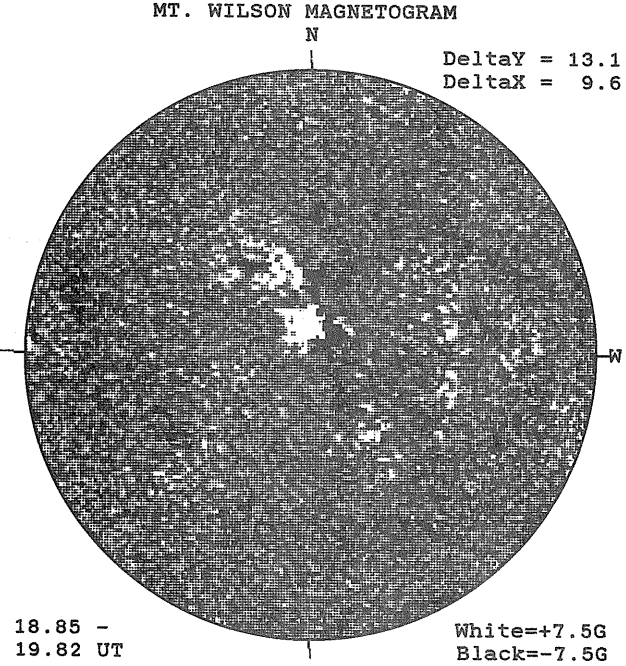
KITT PEAK MAGNETOGRAM



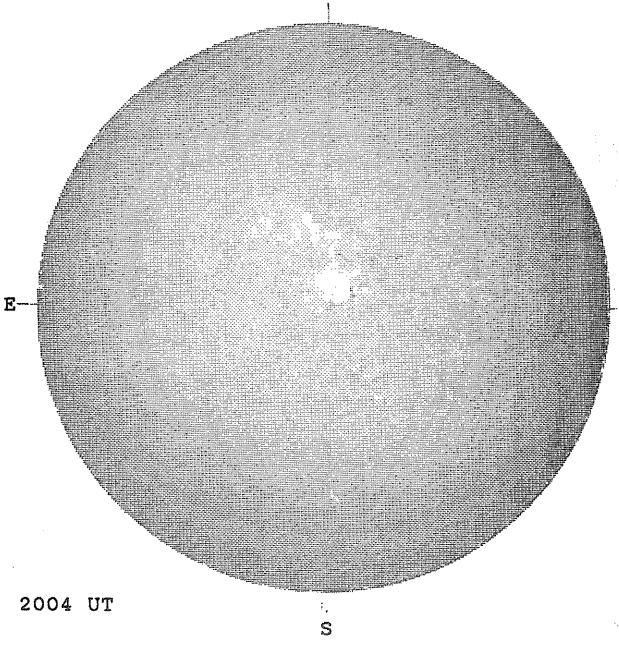
STANFORD MAGNETOGRAM



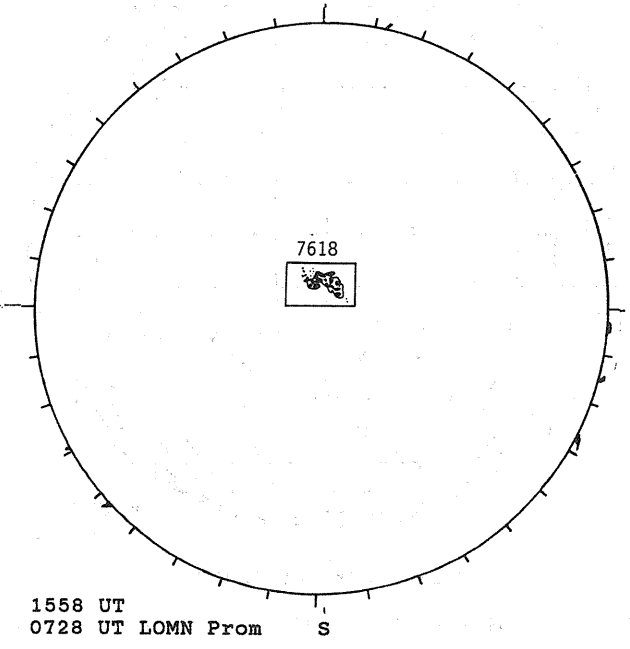
MT. WILSON MAGNETOGRAM



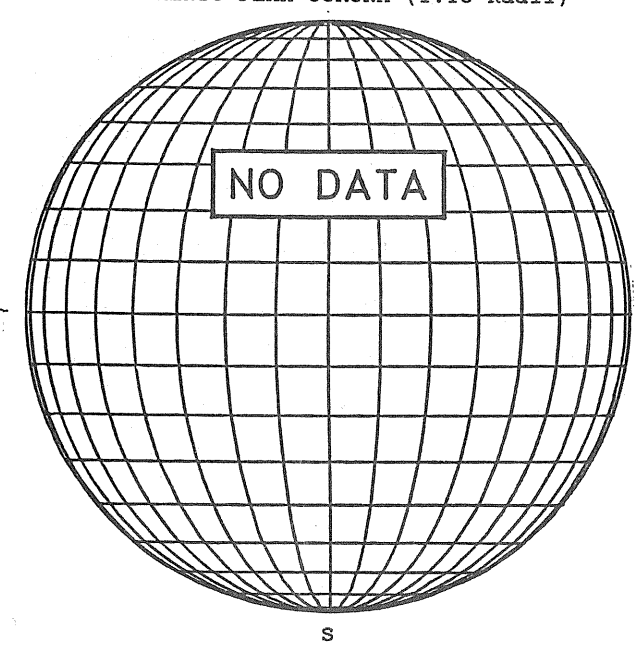
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



NOVEMBER 19, 1993 (P= 20.24, B_o = 2.35, L_o = 333.19)

KITT PEAK MAGNETOGRAM

N **5507A**

Bright = +
Dark = -

E

1732 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

2256 UT

MT. WILSON MAGNETOGRAM

N

DeltaY = 13.0
DeltaX = 9.6

W

20.49 -
21.46 UT

White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA

E

1925 UT

S

BOULDER SUNSPOT

7620

7618

1557 UT
0728 UT LOMN Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)

W

—— FeXIV, 1624 UT
.... Fe X, 1713 UT
xxxx Ca XV, 1704 UT

S

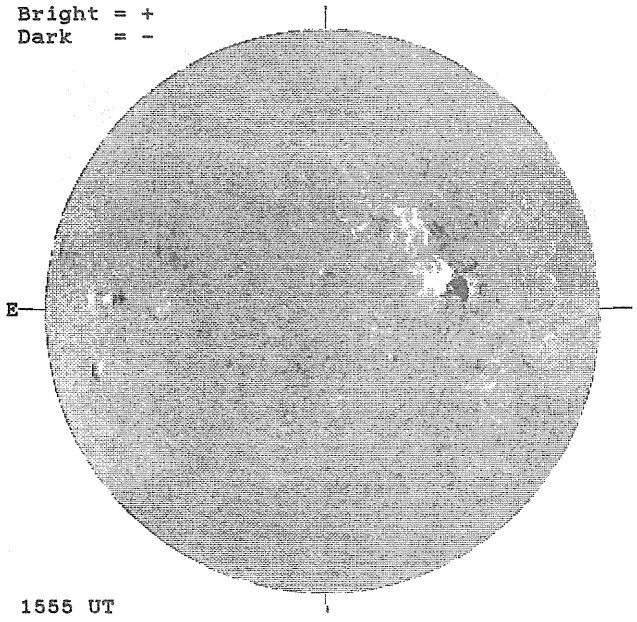
65
Nov 93

NOVEMBER 20, 1993 (P= 19.93, B_o = 2.23, L_o = 320.01)

KITT PEAK MAGNETOGRAM

N **5507A**

Bright = +
Dark = -



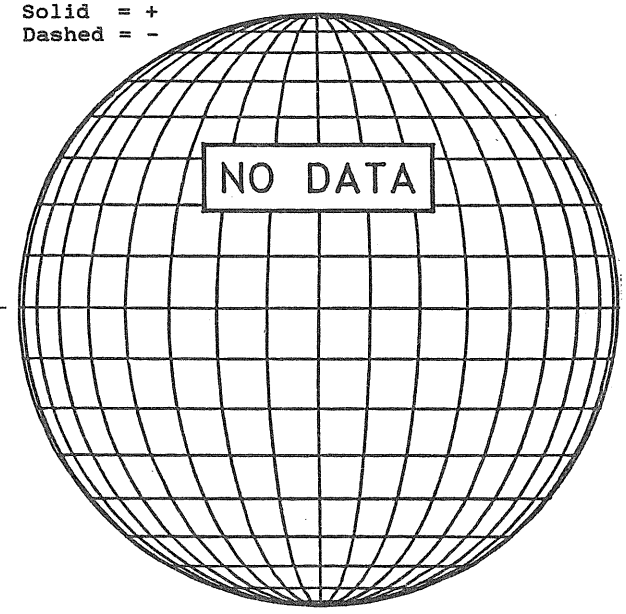
E

1555 UT

STANFORD MAGNETOGRAM

N

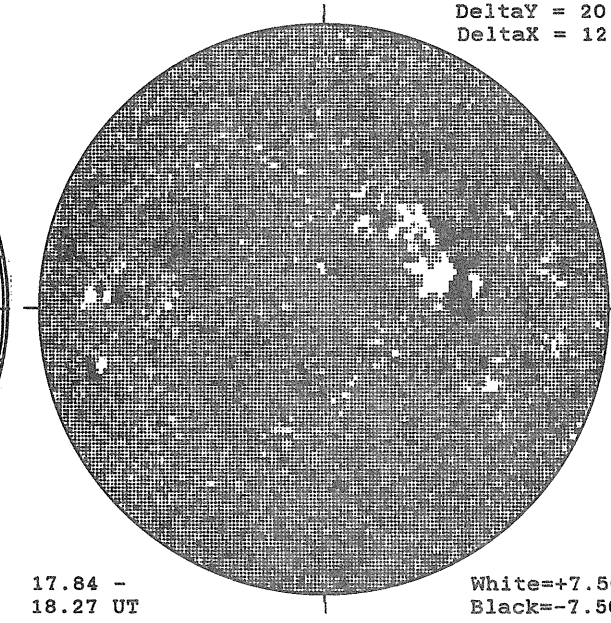
Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

N

DeltaY = 20.2
DeltaX = 12.9

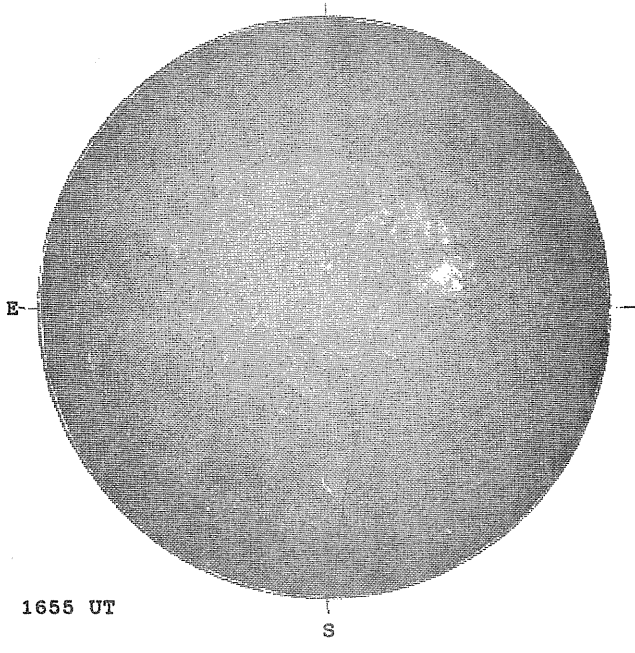


W

17.84 -
18.27 UT

White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA

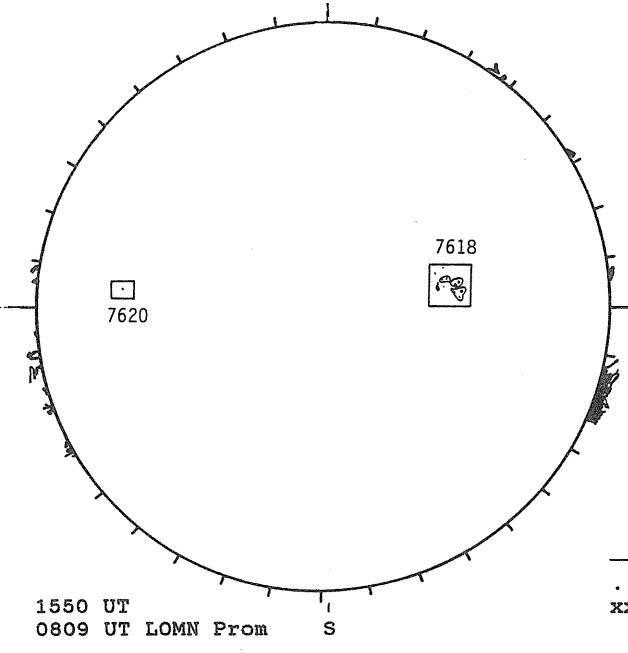


E

1655 UT

S

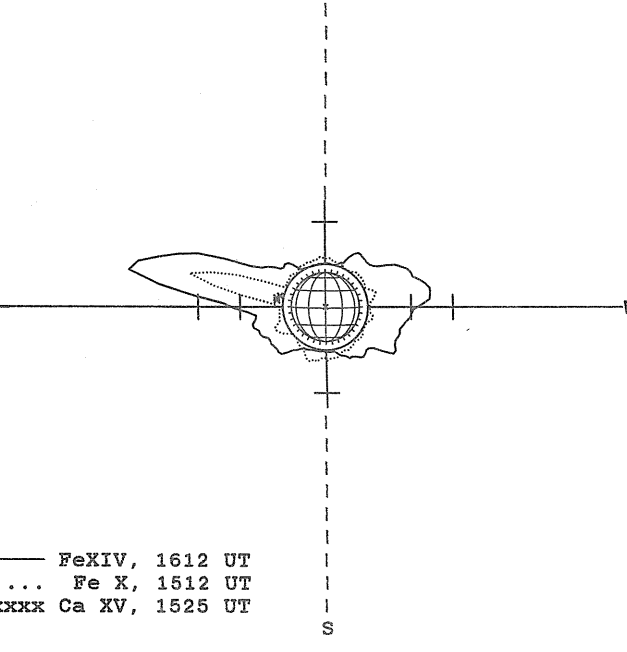
BOULDER SUNSPOT



1550 UT
0809 UT LOMN Prom

S

SACRAMENTO PEAK CORONA (1.15 Radii)



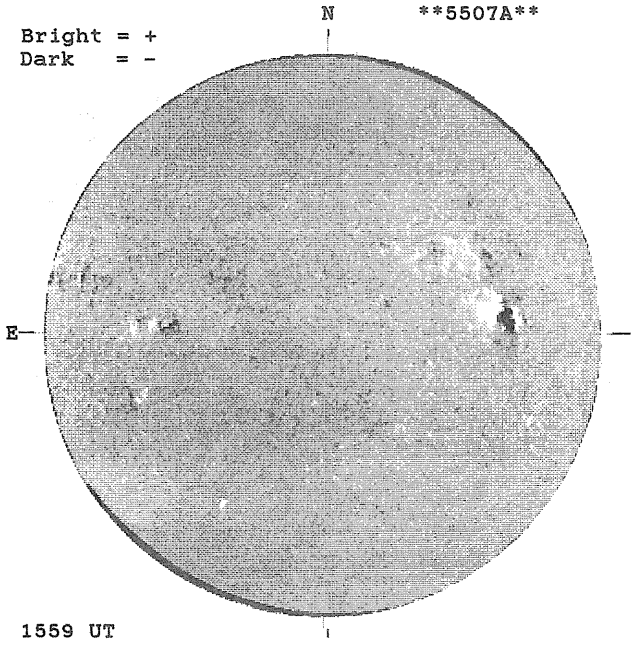
W

—— FeXIV, 1612 UT
.... Fe X, 1512 UT
xxxx Ca XV, 1525 UT

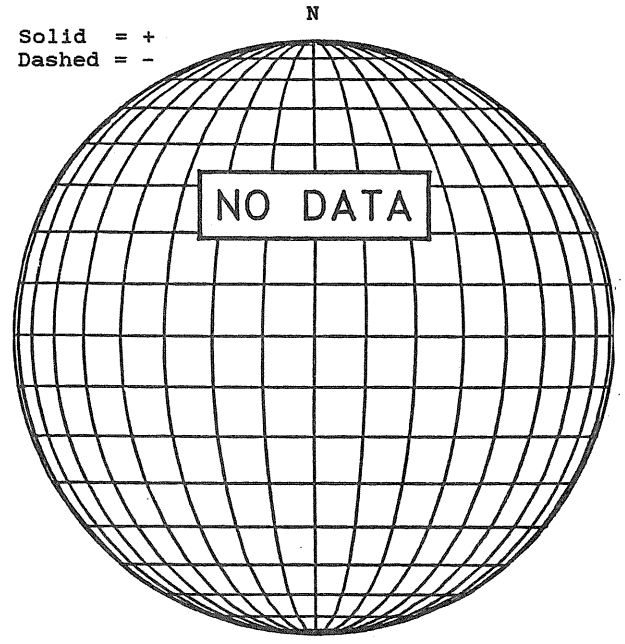
S

NOVEMBER 21, 1993 (P= 19.62, B_o = 2.11 L_o = 306.83)

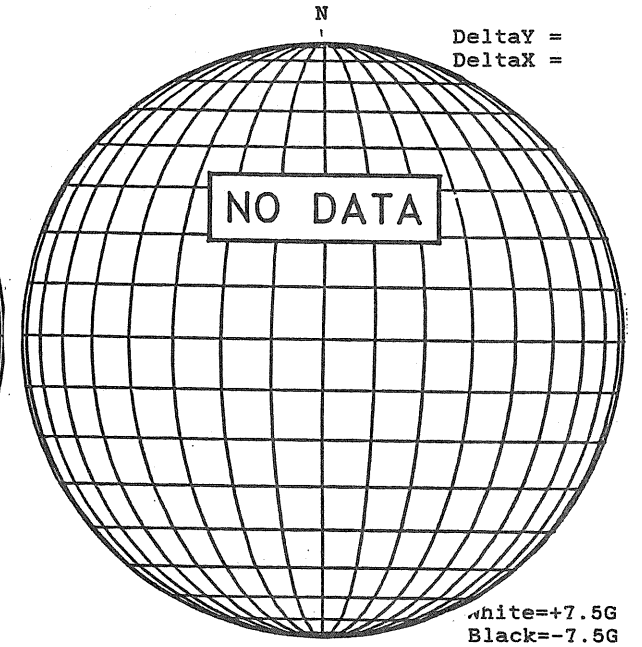
KITT PEAK MAGNETOGRAM



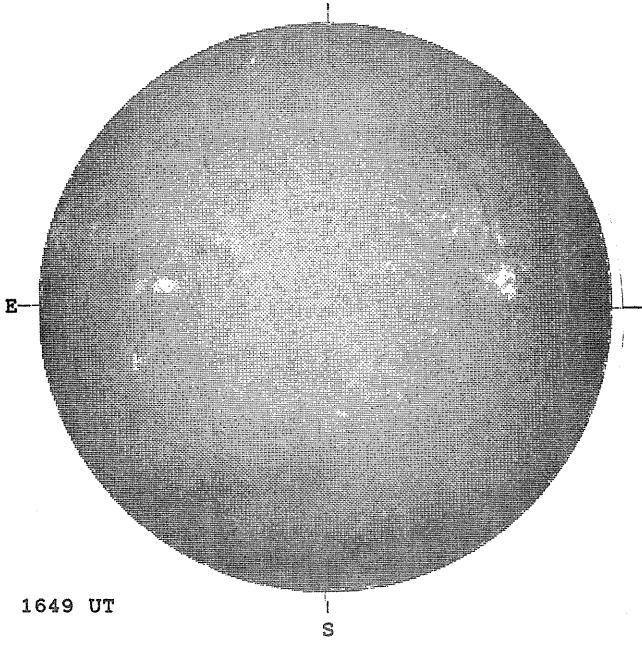
STANFORD MAGNETOGRAM



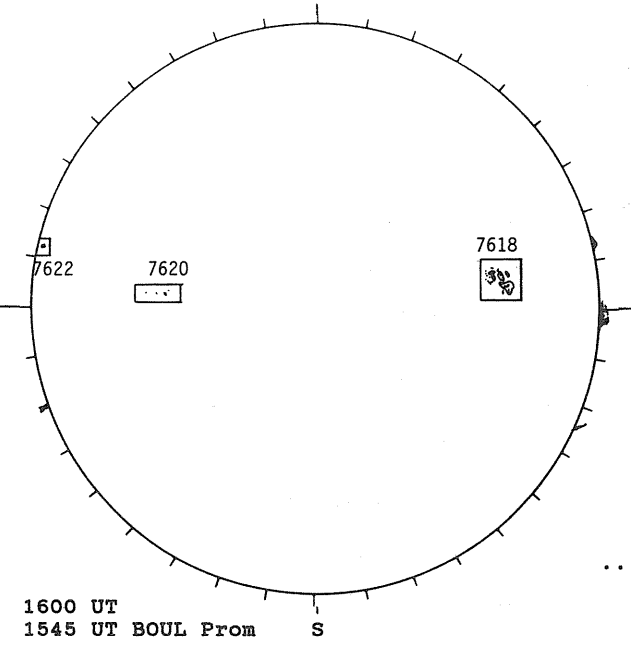
MT. WILSON MAGNETOGRAM



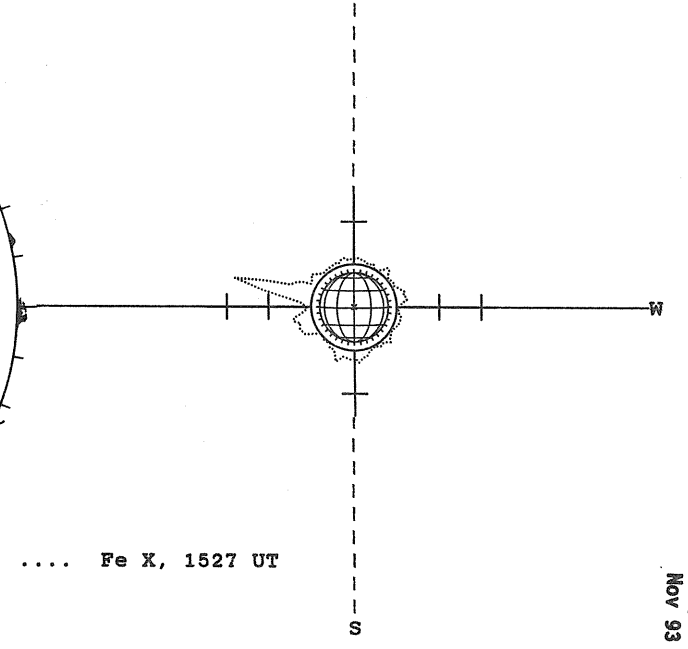
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



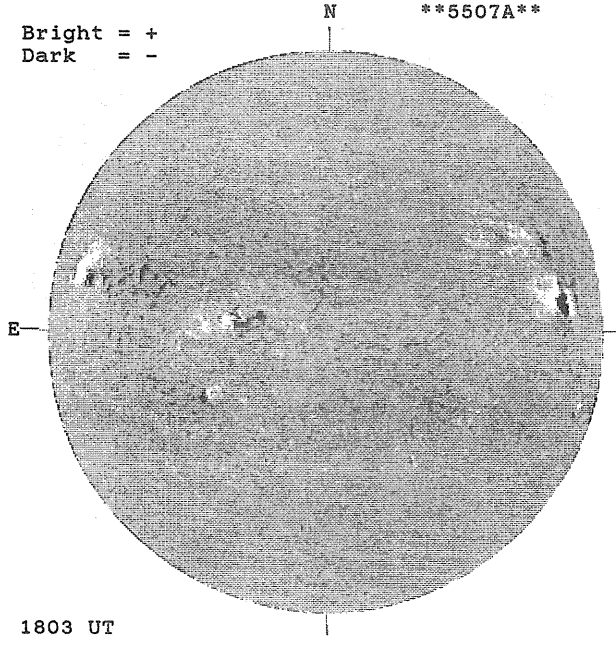
SACRAMENTO PEAK CORONA (1.15 Radii)



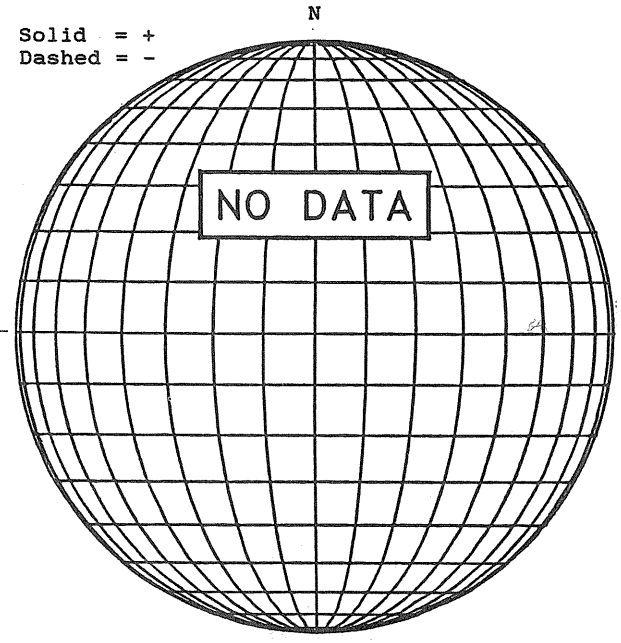
67
Nov 93

NOVEMBER 22, 1993 (P= 19.29, B_o = 1.99, L_o = 293.64)

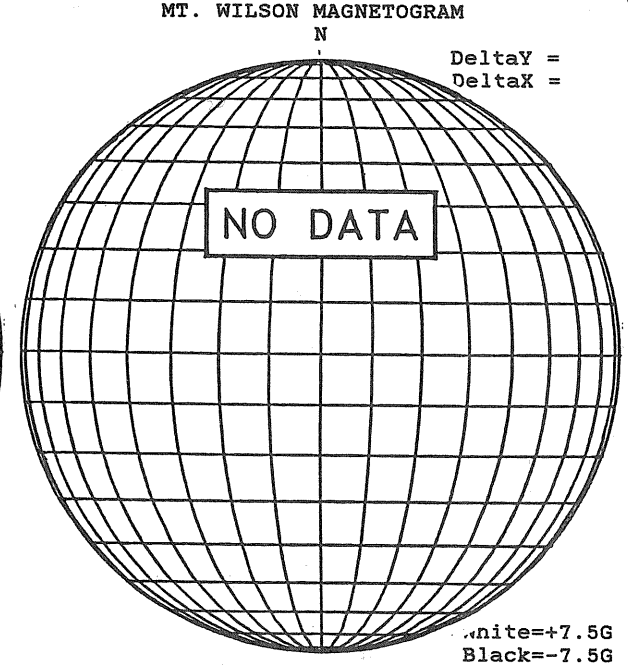
KITT PEAK MAGNETOGRAM



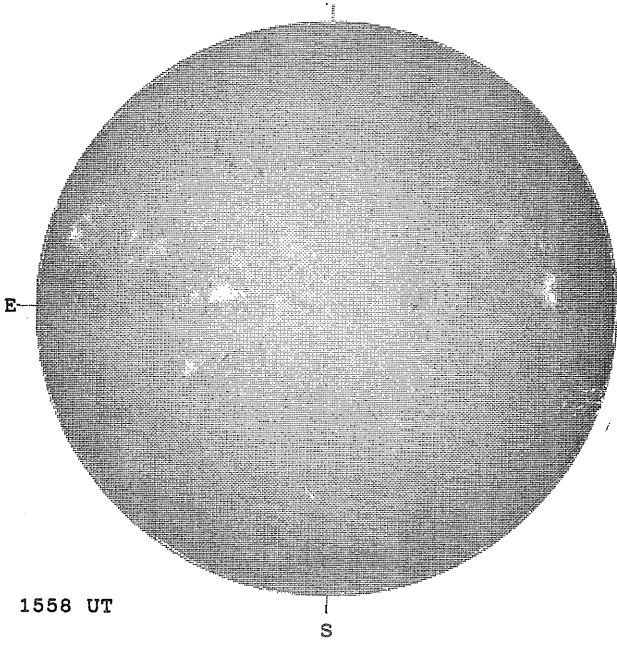
STANFORD MAGNETOGRAM



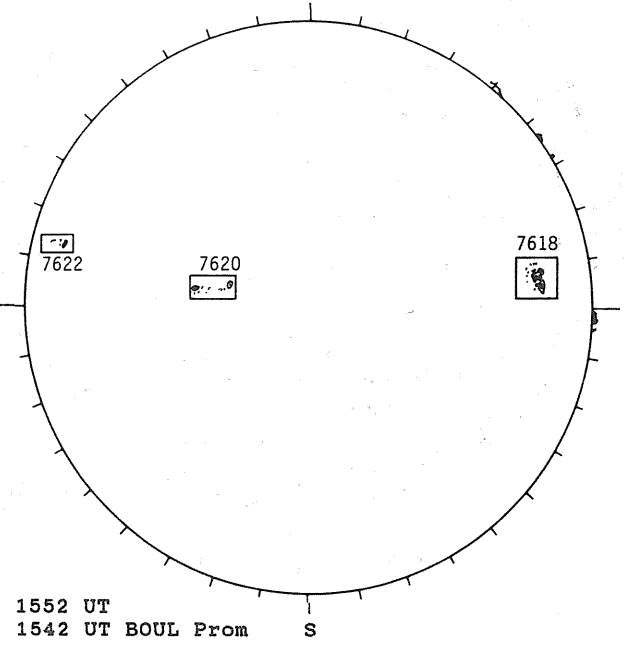
MT. WILSON MAGNETOGRAM



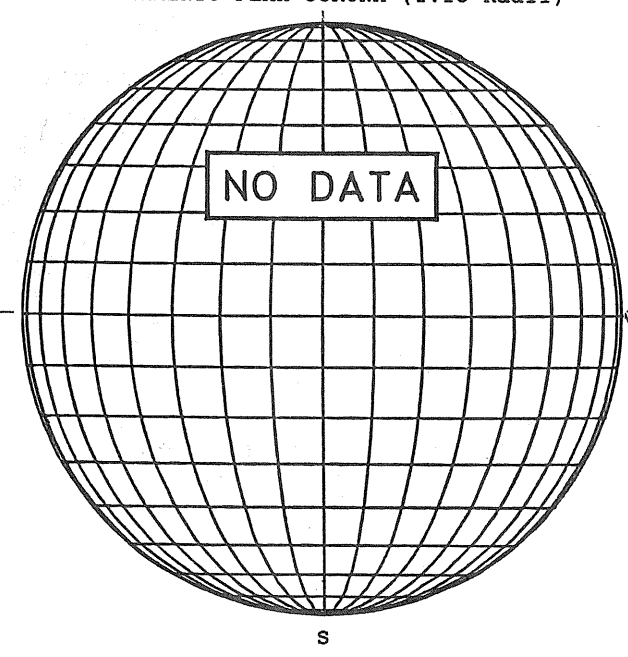
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT

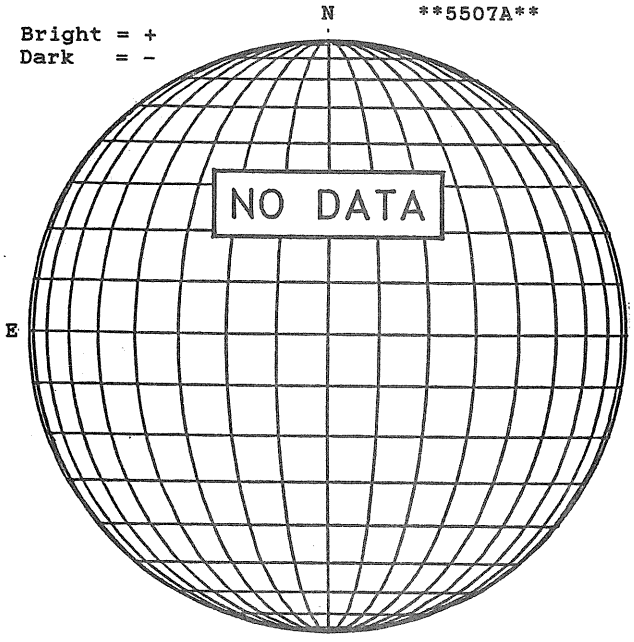


SACRAMENTO PEAK CORONA (1.15 Radii)

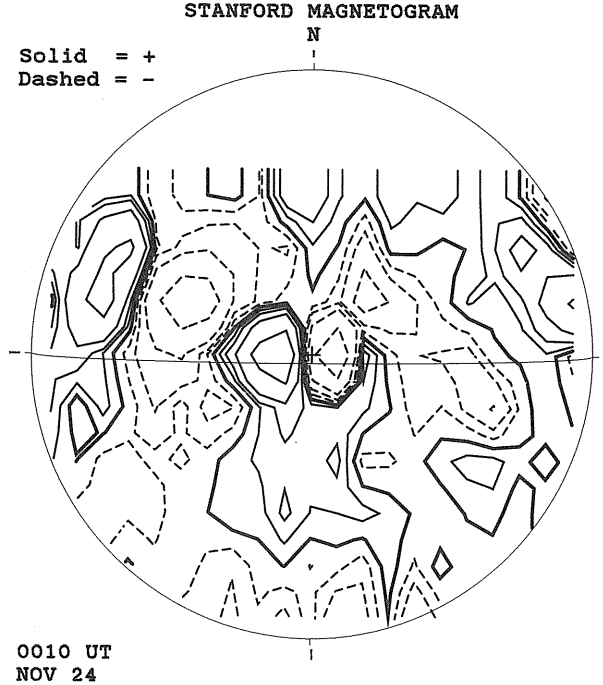


NOVEMBER 23, 1993 (P= 18.96, B_o = 1.87, L_o = 280.46)

KITT PEAK MAGNETOGRAM

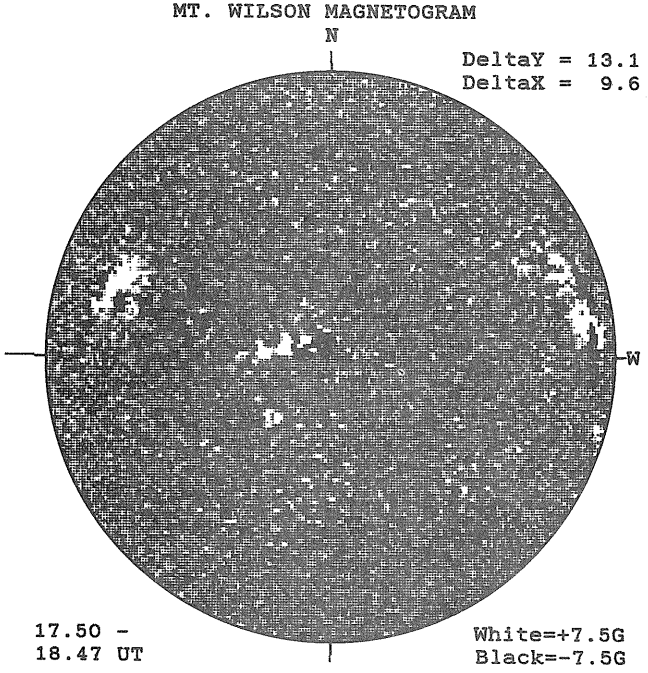


STANFORD MAGNETOGRAM



0010 UT
NOV 24

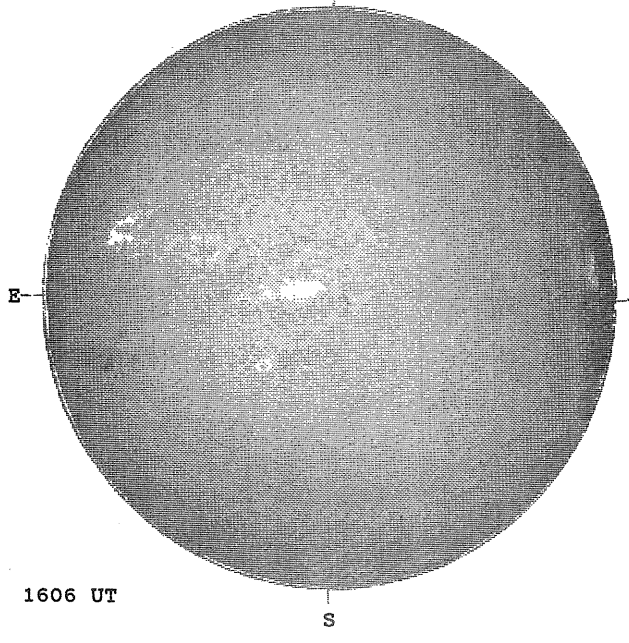
MT. WILSON MAGNETOGRAM



17.50 -
18.47 UT

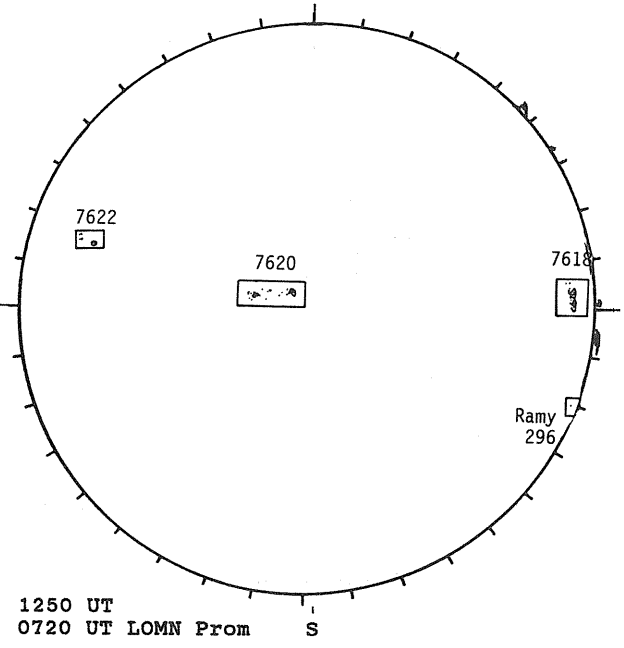
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



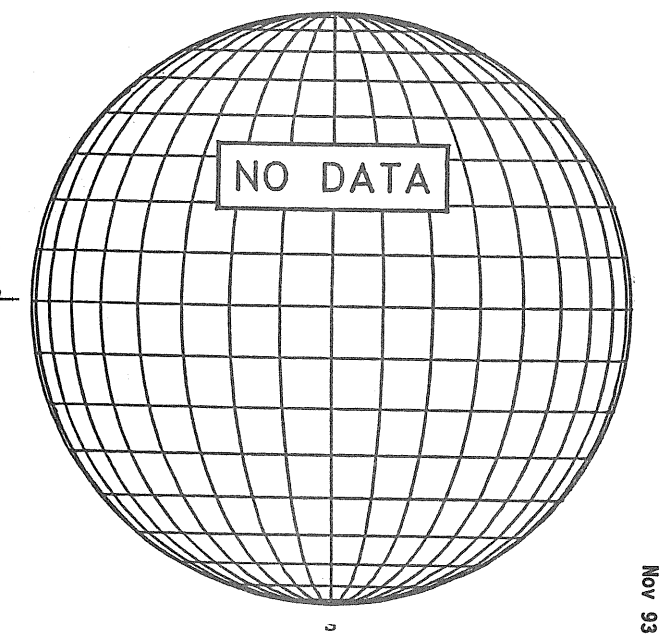
1606 UT

RAMEY SUNSPOT



1250 UT
0720 UT LOMN Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



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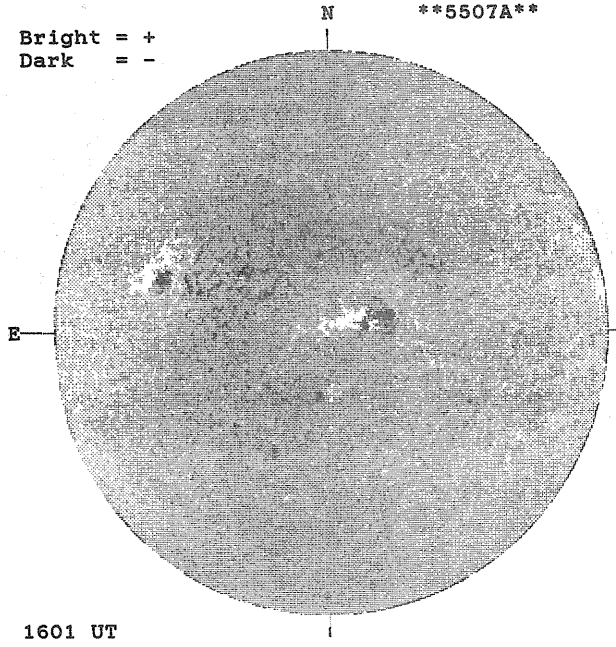
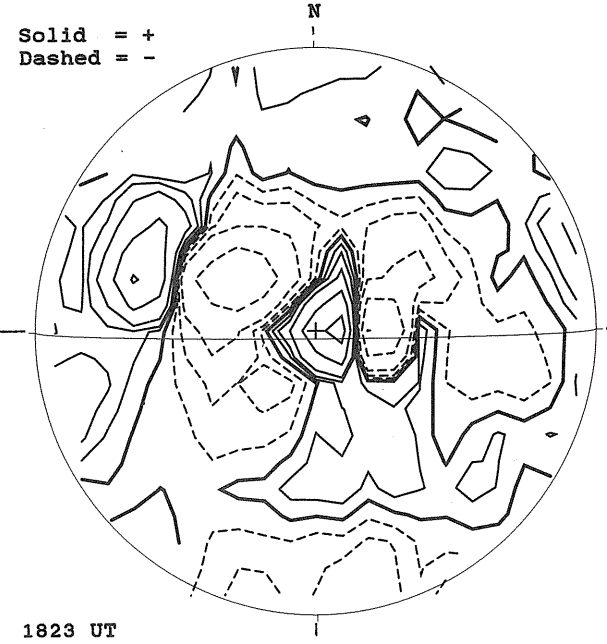
Nov 93

NOVEMBER 24, 1993 (P= 18.63 B_o = 1.74, L_o = 267.28)

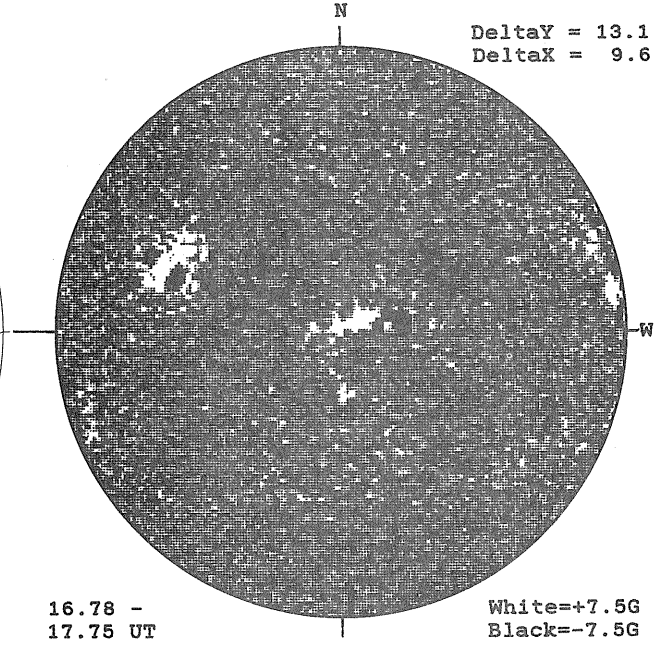
KITT PEAK MAGNETOGRAM



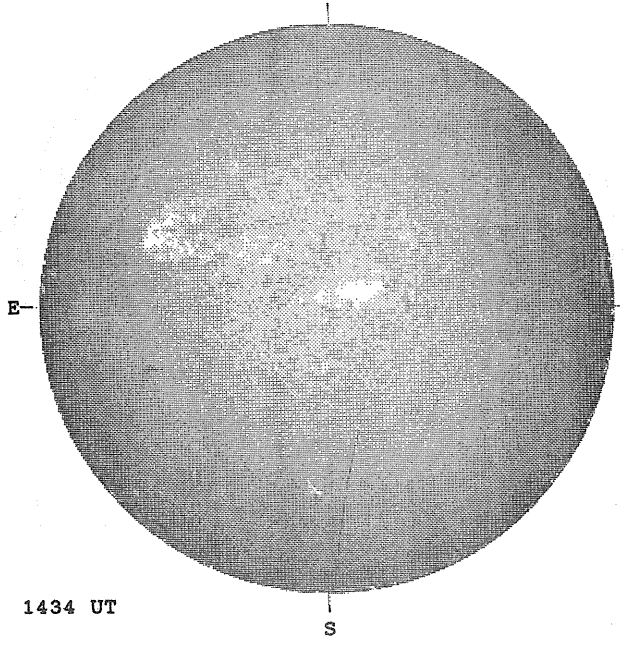
STANFORD MAGNETOGRAM



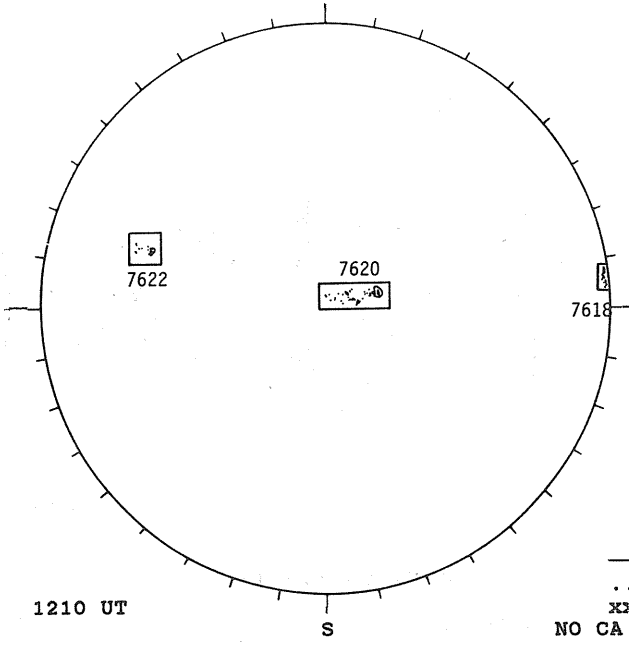
MT. WILSON MAGNETOGRAM



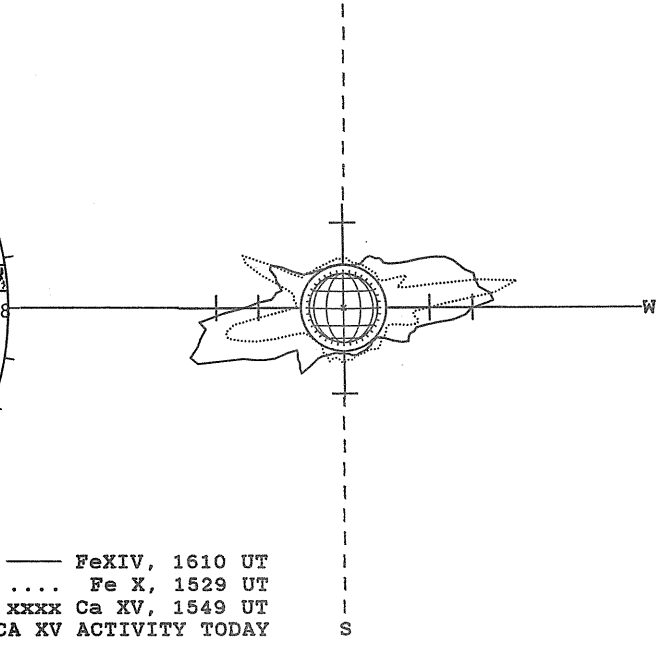
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



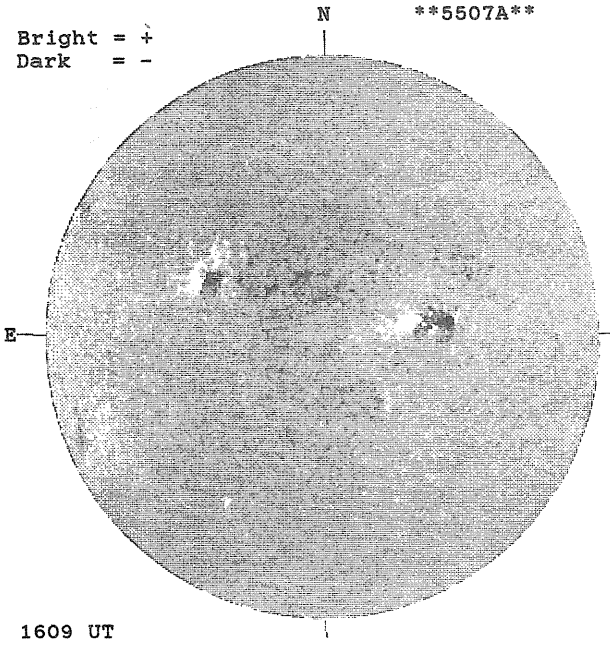
SACRAMENTO PEAK CORONA (1.15 Radii)



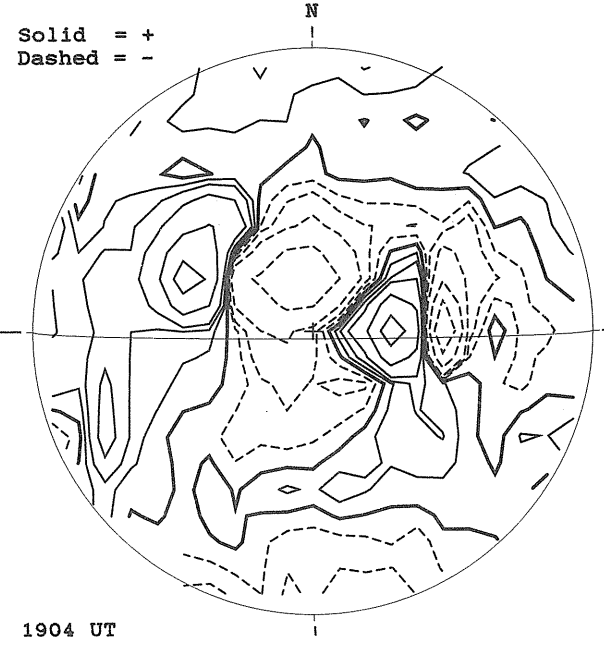
—— FeXIV, 1610 UT
.... Fe X, 1529 UT
xxxx Ca XV, 1549 UT
NO CA XV ACTIVITY TODAY

NOVEMBER 25, 1993 (P= 18.28 B_o = 1.62, L_o = 254.10)

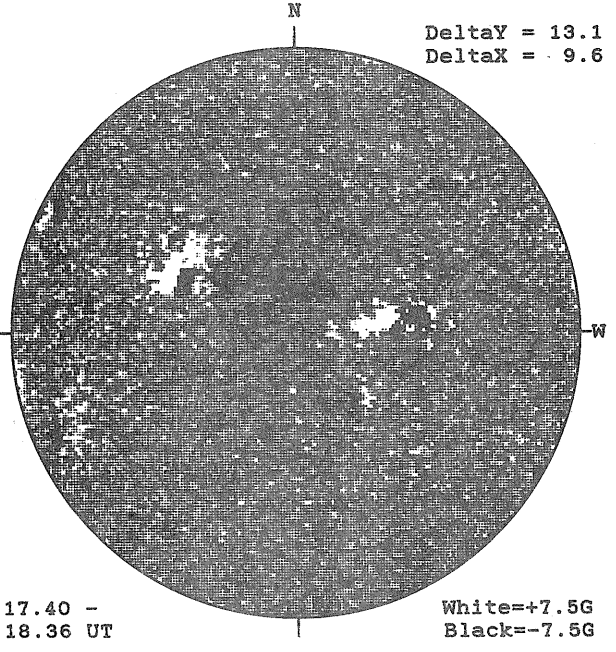
KITT PEAK MAGNETOGRAM



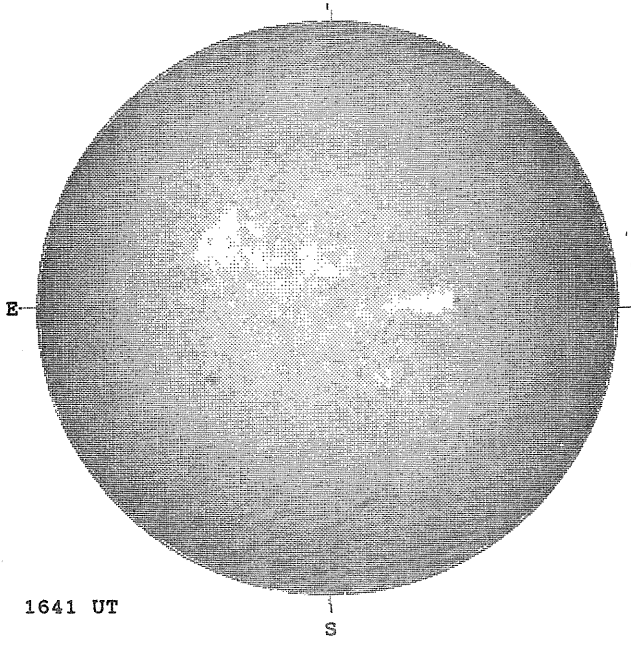
STANFORD MAGNETOGRAM



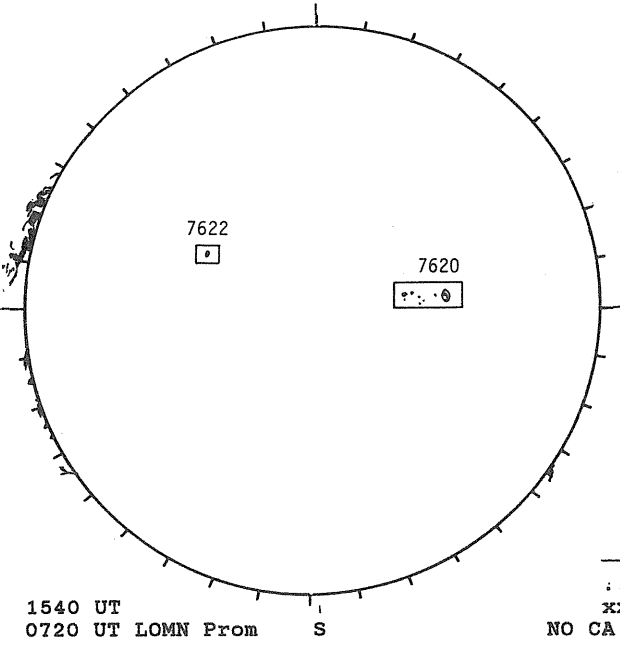
MT. WILSON MAGNETOGRAM



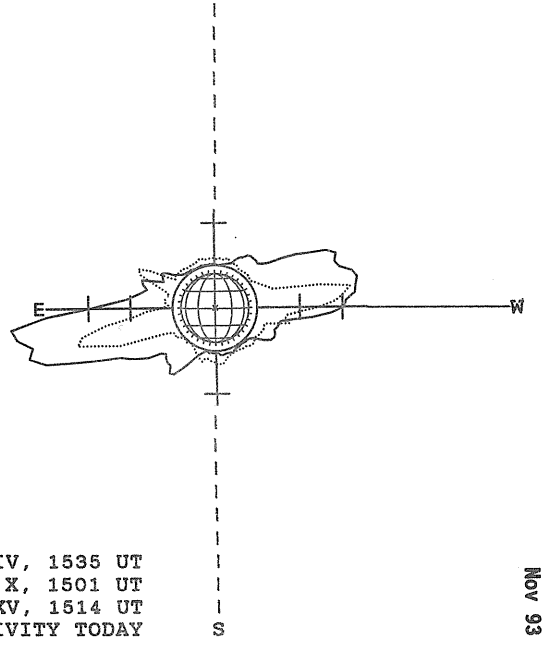
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



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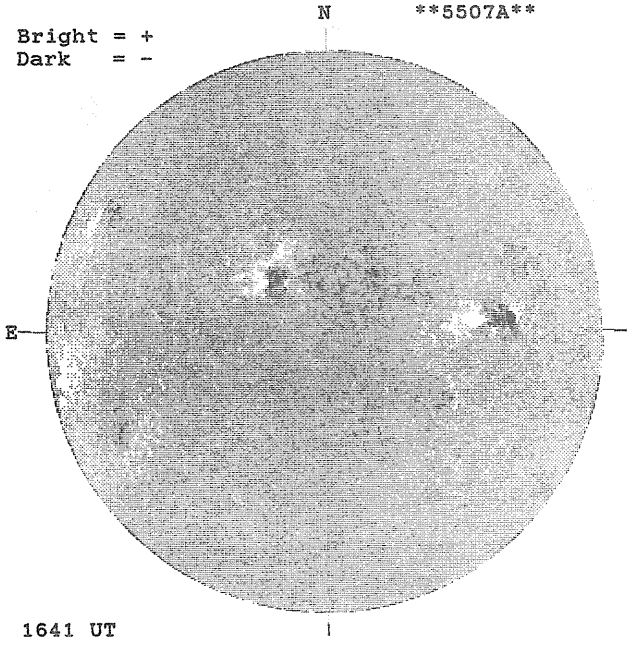
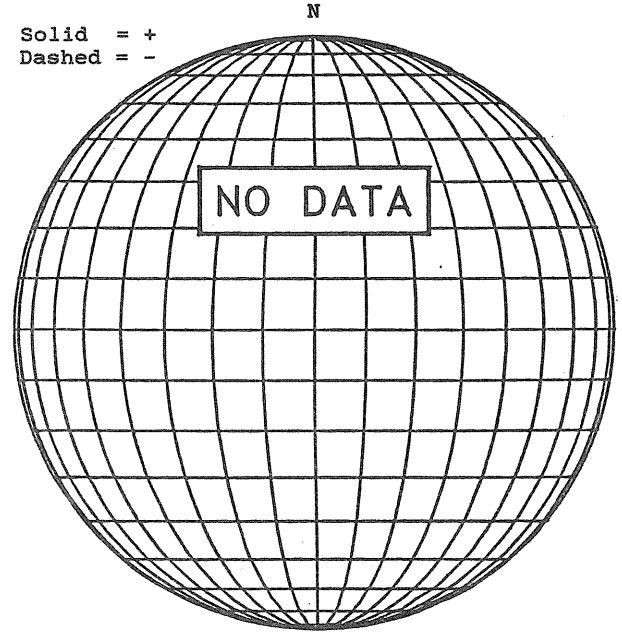
Nov 93

NOVEMBER 26, 1993 (P= 17.93, B_o = 1.50, L_o = 240.92)

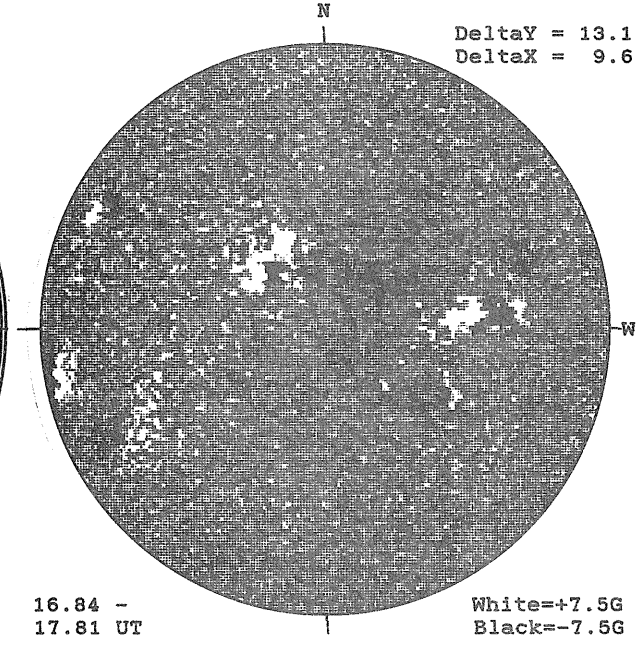
KITT PEAK MAGNETOGRAM



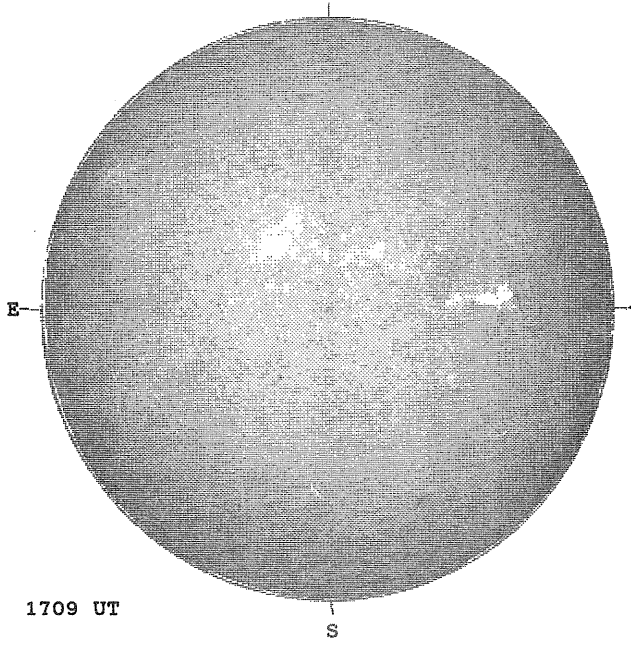
STANFORD MAGNETOGRAM



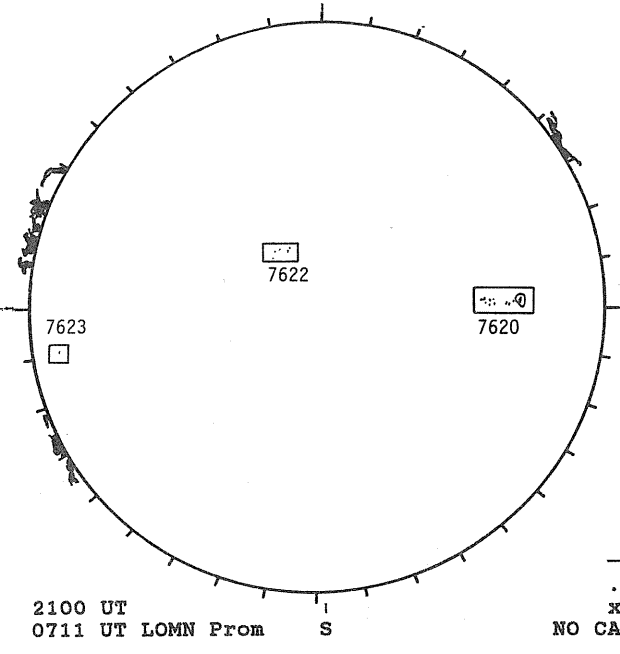
MT. WILSON MAGNETOGRAM



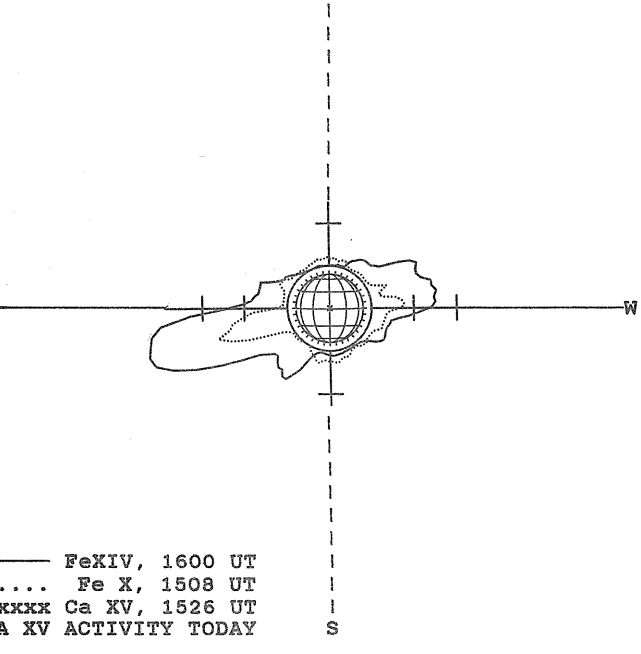
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT

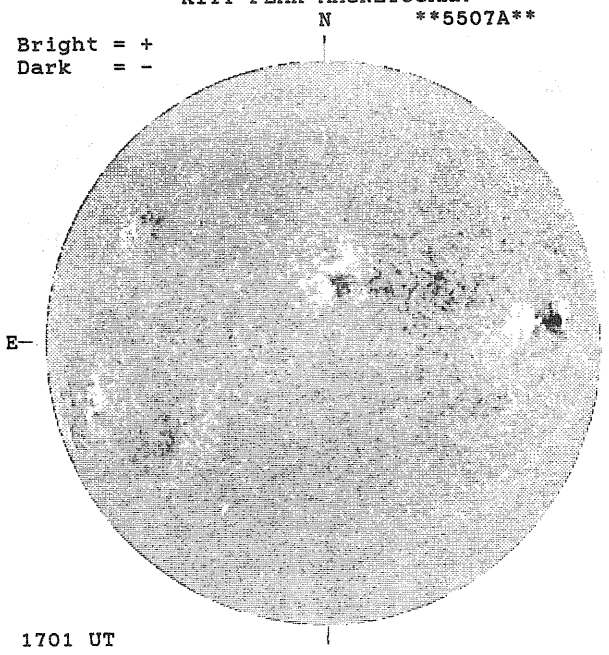


SACRAMENTO PEAK CORONA (1.15 Radii)

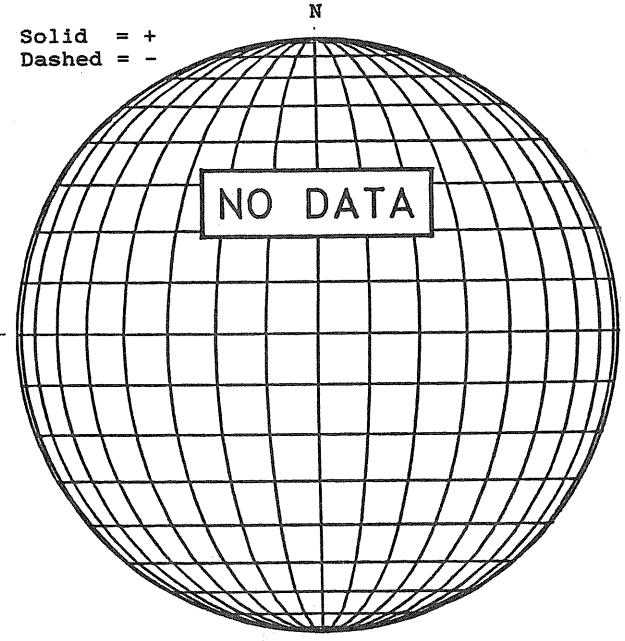


NOVEMBER 27, 1993 (P= 17.58, B_o = 1.37, L_o = 227.74)

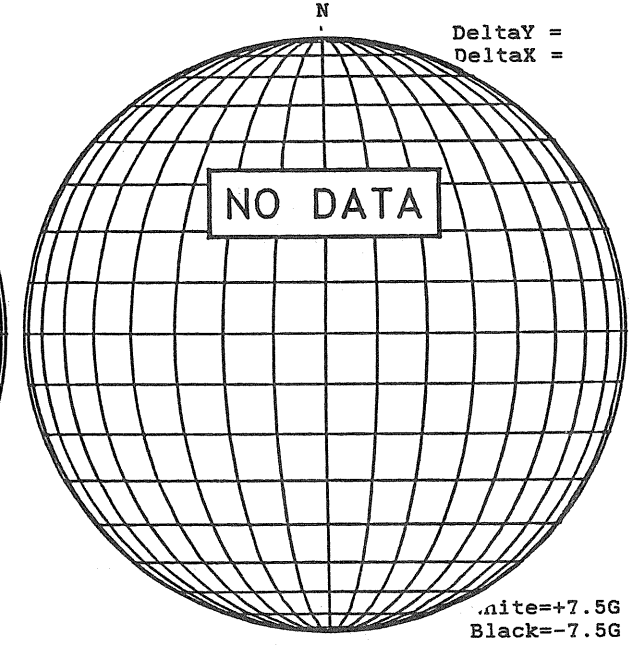
KITT PEAK MAGNETOGRAM



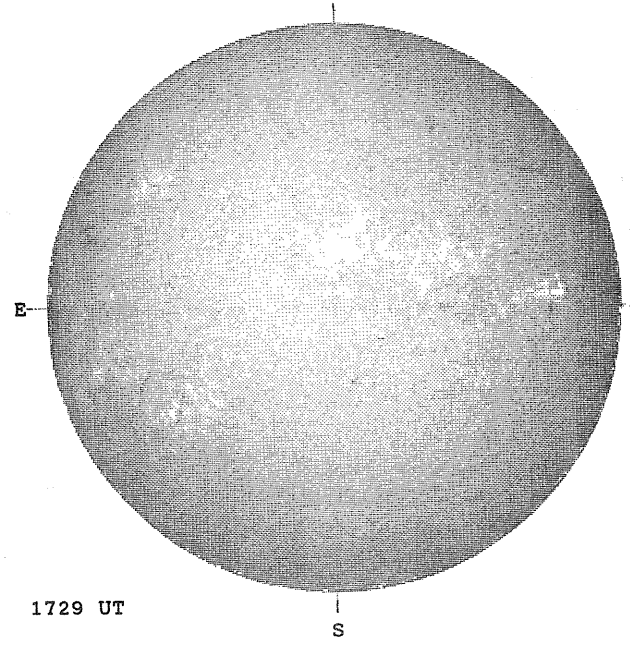
STANFORD MAGNETOGRAM



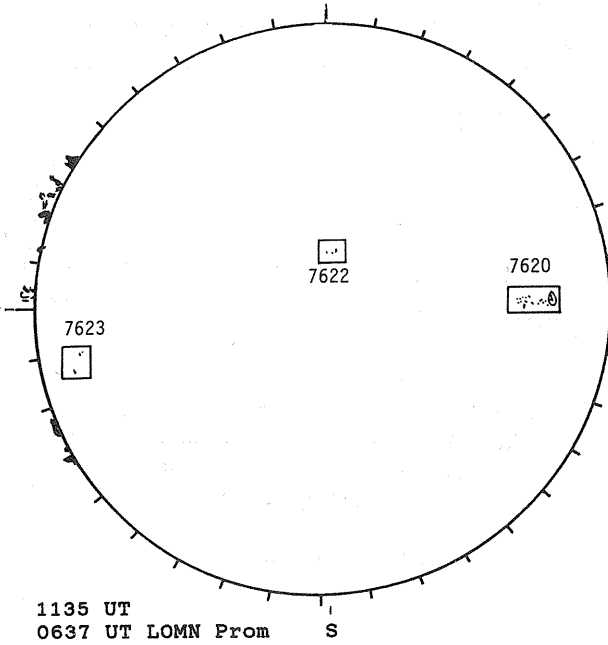
MT. WILSON MAGNETOGRAM



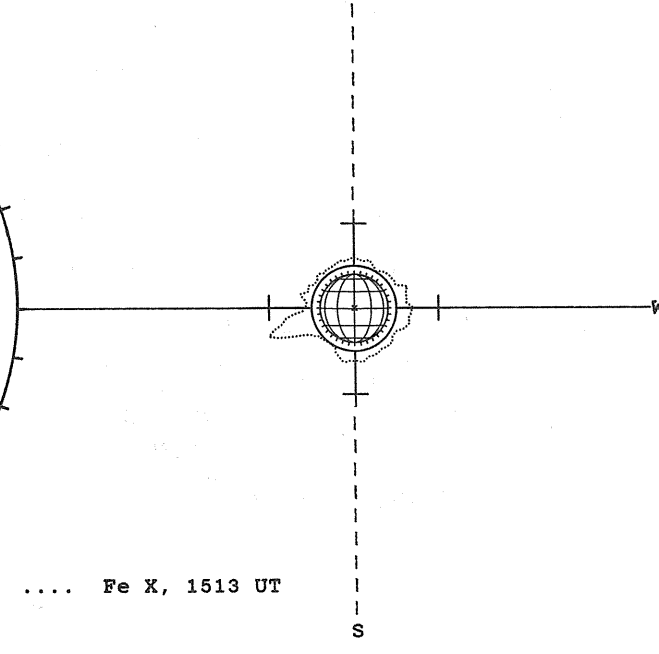
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



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Nov 93

NOVEMBER 28, 1993 (P= 17.22 B_o = 1.25, L_o = 214.56)

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

STANFORD MAGNETOGRAM
N
Solid = +
Dashed = -
NO DATA

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

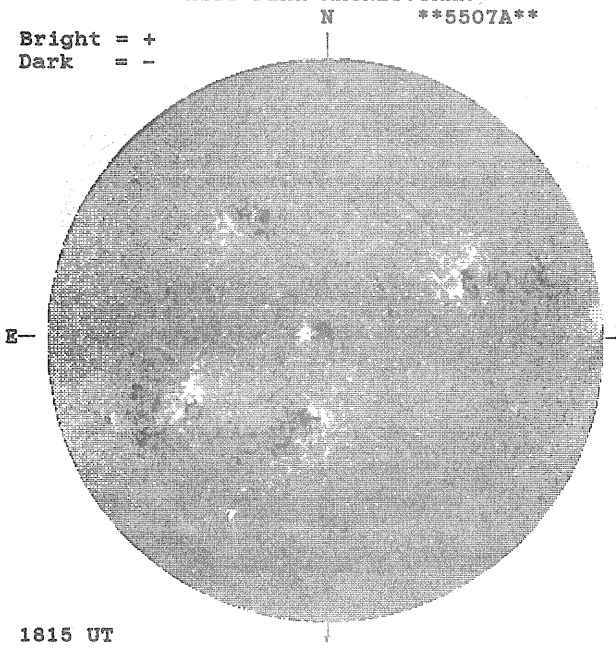
SACRAMENTO PEAK H-ALPHA
E
2234 UT
S

BOULDER SUNSPOT
7624
7623
7625
7620
1540 UT
1530 UT BOUL Prom
S

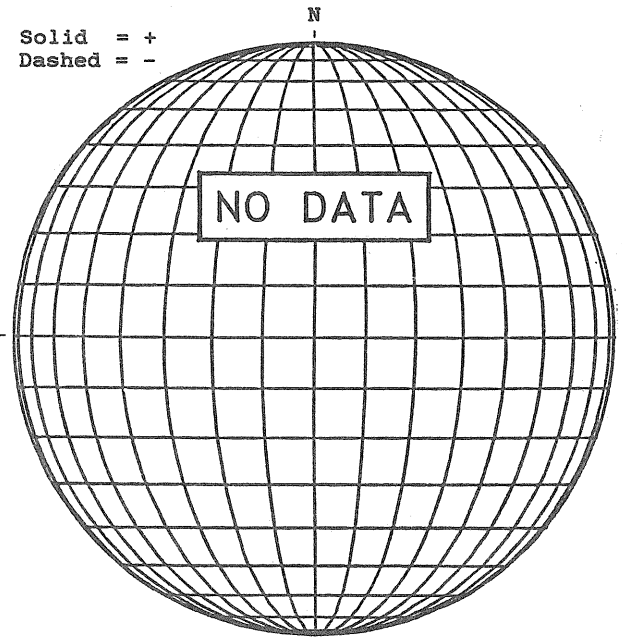
SACRAMENTO PEAK CORONA (1.15 Radii)
W
S
—— FeXIV, 2202 UT
.... Fe X, 2302 UT
xxxx Ca XV, 2242 UT

NOVEMBER 29, 1993 (P= 16.85, B_o = 1.12, L_o = 201.38)

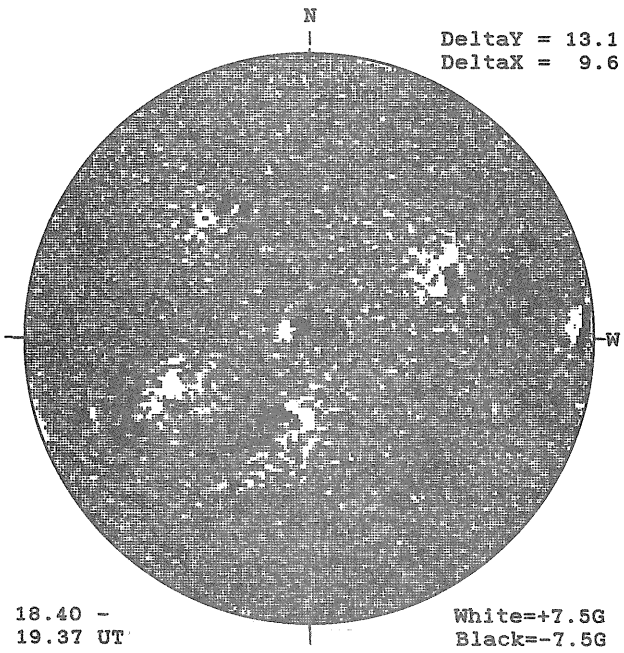
KITT PEAK MAGNETOGRAM



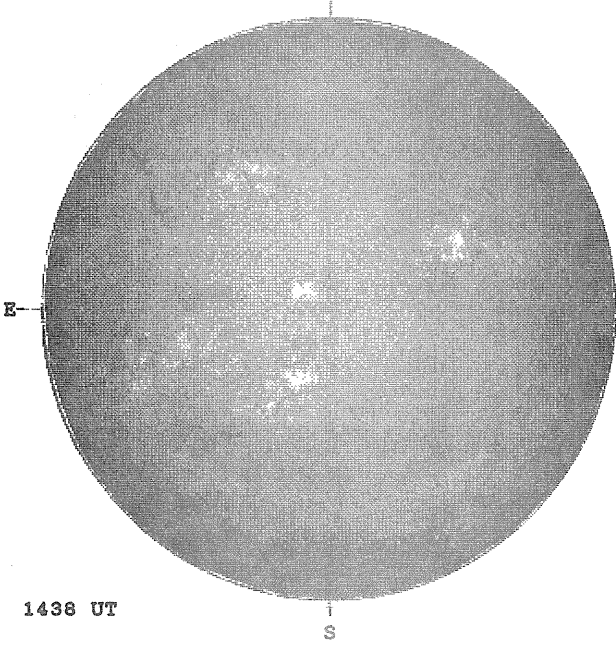
STANFORD MAGNETOGRAM



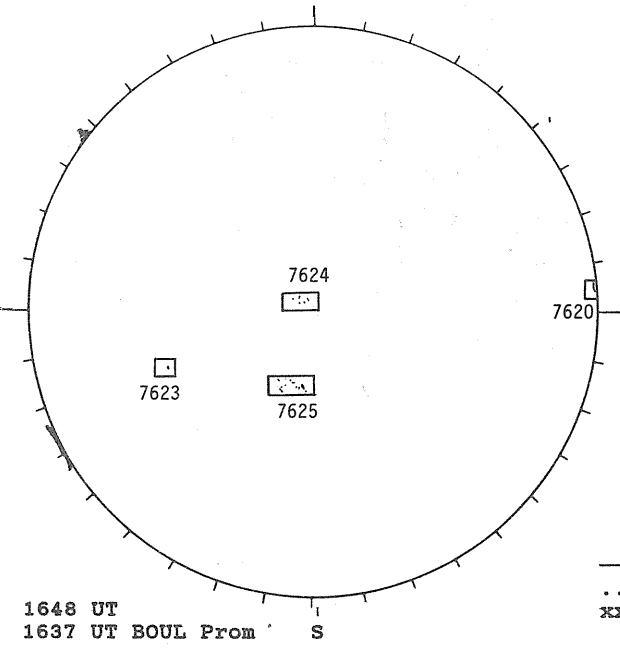
MT. WILSON MAGNETOGRAM



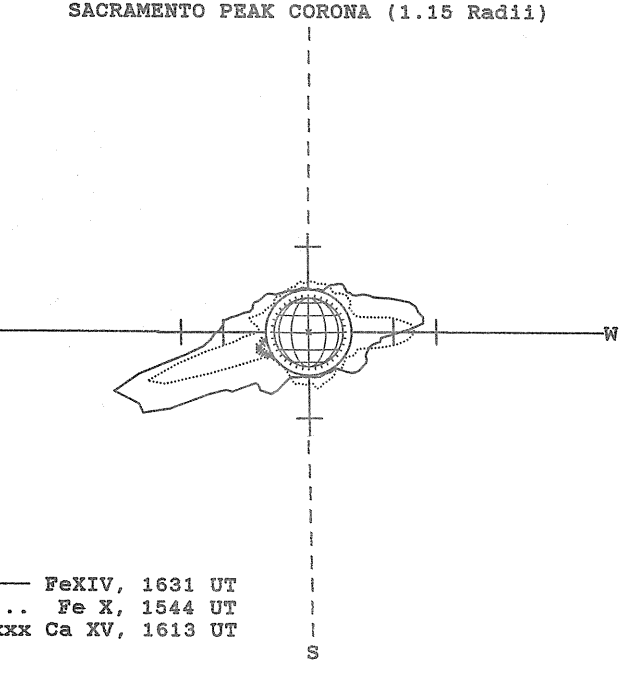
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOT



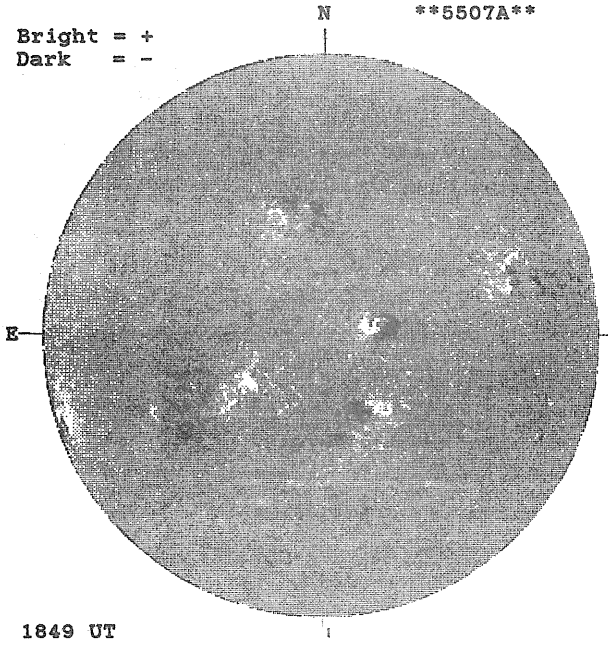
SACRAMENTO PEAK CORONA (1.15 Radii)



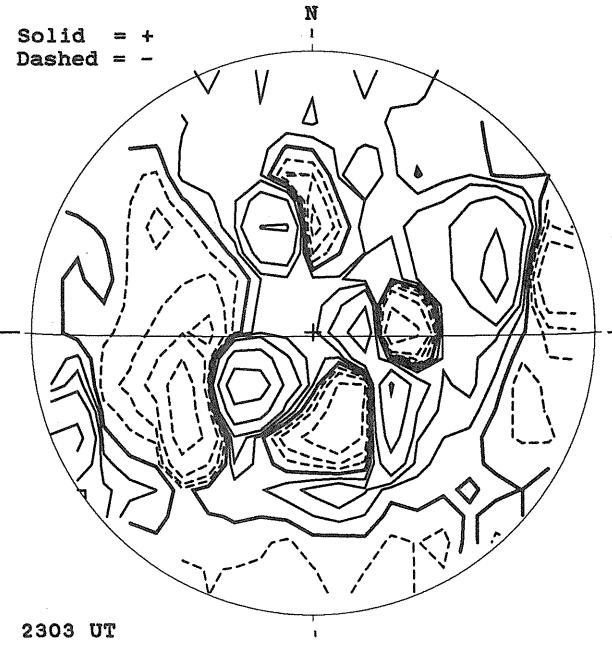
75
Nov 93

NOVEMBER 30, 1993 (P= 16.47, B_o = 0.99, L_o = 188.20)

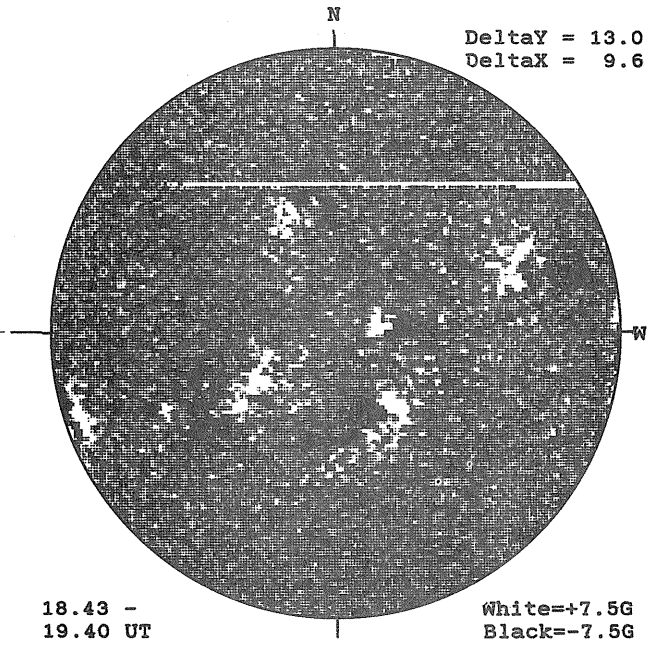
KITT PEAK MAGNETOGRAM



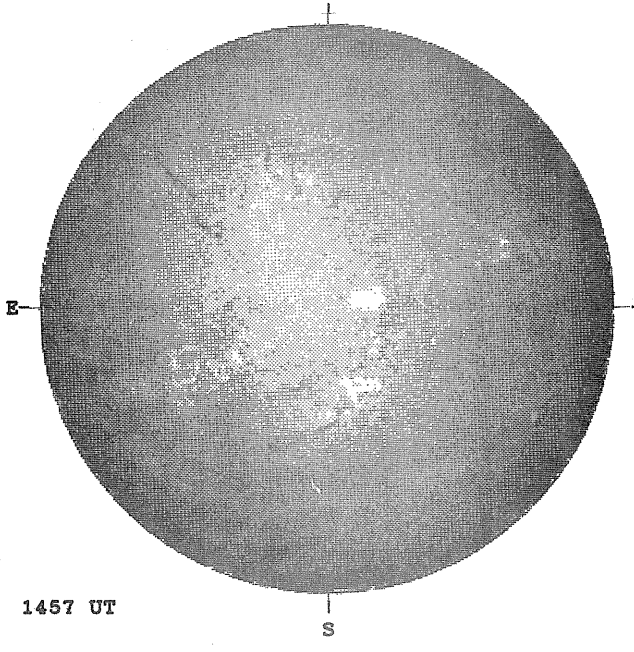
STANFORD MAGNETOGRAM



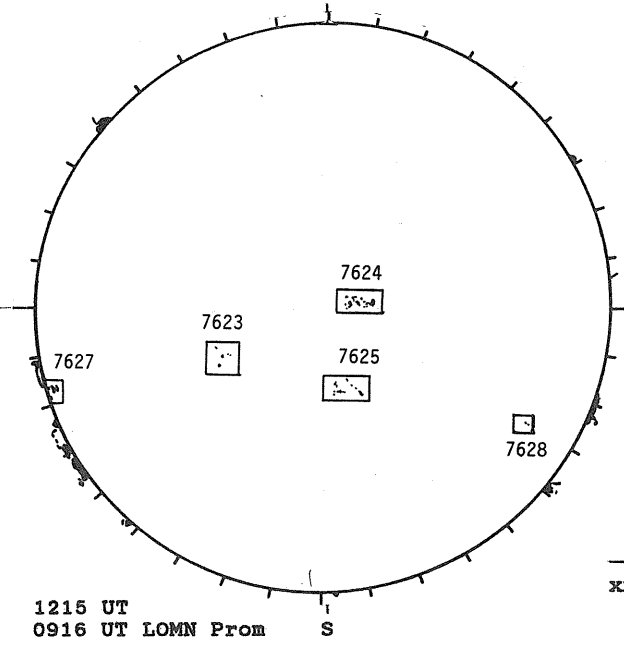
MT. WILSON MAGNETOGRAM



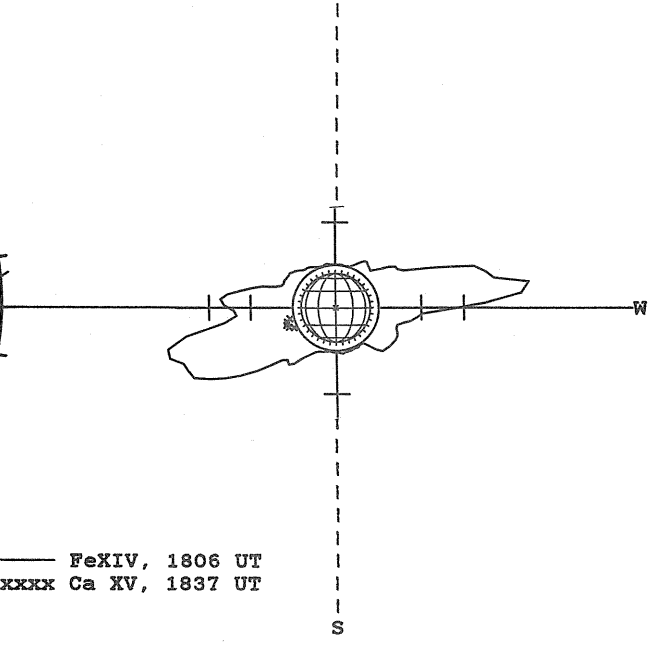
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)



DAILY SOFT X-RAY IMAGES FROM YOHKOH

The YOHKOH ("sunbeam") mission is a Japanese program designed to answer many questions in solar flare and coronal physics that have been raised by the highly successful Hinotori and SMM missions. It includes the United States and the United Kingdom as participating partners. The Japanese Institute for Space and Astronautical Sciences (ISAS) provided overall program management, the launch vehicle, the spacecraft, and two science instruments -- a Hard X-ray Telescope, one of the primary mission instruments, and a Wide Band Spectrometer. The other primary instrument, a Soft X-ray Telescope, was prepared by the Lockheed Palo Alto Research Laboratory, under NASA support, in collaboration with the National Astronomical Observatory of Japan and the University of Tokyo. The U.K., in collaboration with the E. O. Hulburt Center for Space Research, provided a Bragg Crystal Spectrometer. The NASA Deep Space Network cooperates in tracking Yohkoh.

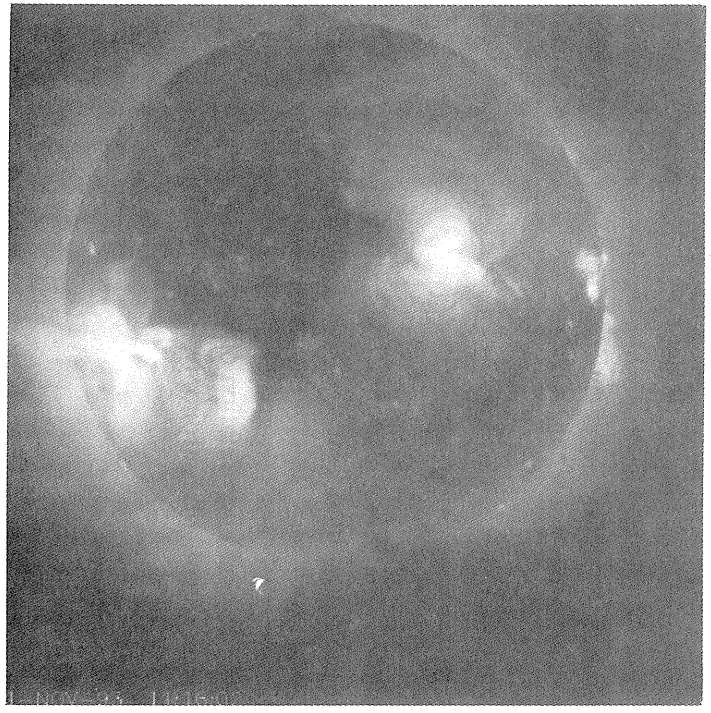
The Soft X-ray Telescope (SXT) uses low-scatter grazing incidence optics to form direct images on a CCD detector. It employs a Nariai-Werner design which differs from the more commonly used Wolter Type 1 in that both mirror segments have been made hyperbolic in order to gain better off-axis performance at the expense of a slight loss of on-axis resolution. The optical system includes an entrance aperture filter, the X-ray mirror, a filter wheel assembly, a rotating shutter, and the CCD camera. A detailed description of the SXT has been published in Tsuneta, et al., **Solar Physics, Vol. 136**, pp. 37-67, 1991.

ISAS bears full responsibility for YOHKOH operations. U.S. and U.K. investigators in residence at ISAS participate in mission operations and scientific analyses. With the approval of Professor Y. Ogawara, Yohkoh Program Manager, and the YOHKOH Science Committee, the Lockheed Palo Alto Research Laboratory is kindly providing daily digital SXT images for publication in SGD. The digital images are 512x512 (5" pixels) or 256x256 (10" pixels) in size. They combine two exposures differing by a factor of 35 in duration and are printed with a logarithmic intensity scale to cope with the great range in intensity of the X-ray corona. The brightest features are typically more than 100,000 times brighter than the faintest. The mean wavelength of the pictures is about 20 angstroms. We display these images of the solar corona in soft X-rays in both positive and negative forms. They are printed on a dye sublimation printer at NGDC.

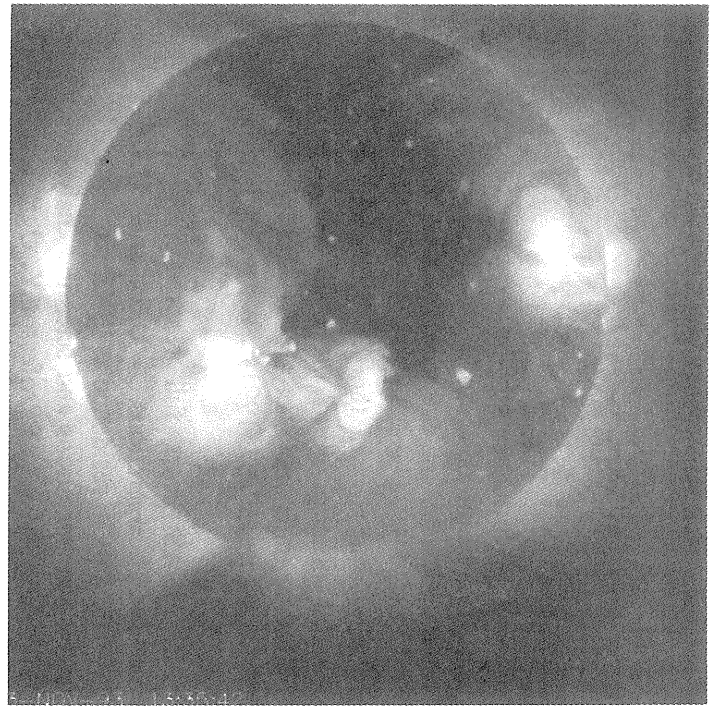
Editor's Note: YOHKOH SXT images for September 1991 through August 1992 are available through the NASA SolarDAC. Contact Joe Gurman for access information [gurman@uvsp.gsfc.nasa.gov, jgurman@solar, or uvsp::gurman. Telephone: (301)286-4767]. The YOHKOH team continues to invite collaborations in their analysis and are willing to assist those who wish to utilize the data in order to ensure the correct interpretation of the experimental results. Contact Y. Uchida, Project Scientist, Yohkoh, Dept. of Astronomy, Univ. of Tokyo [uchida@dept.astron.s.u-tokypo.ac.jp].

YOHKOH SOFT X-RAY TELESCOPE IMAGES

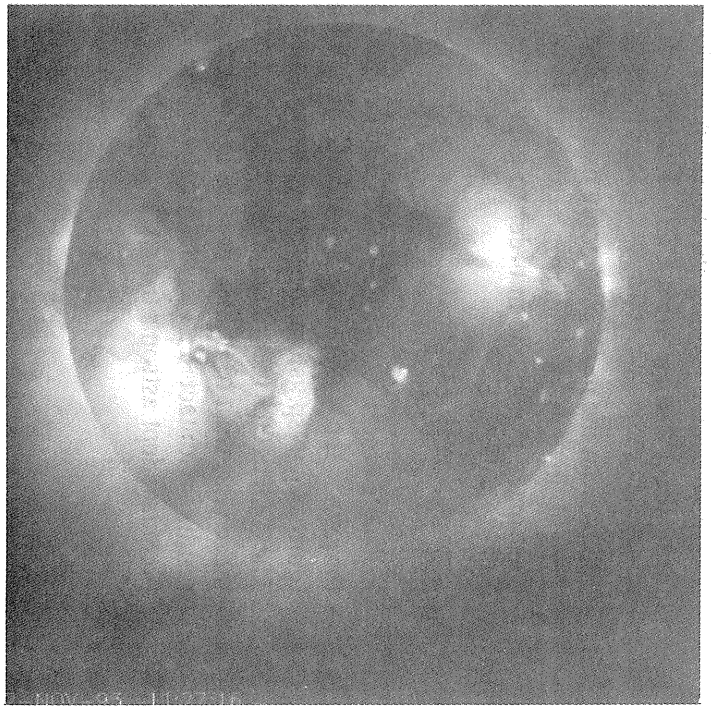
November 1993



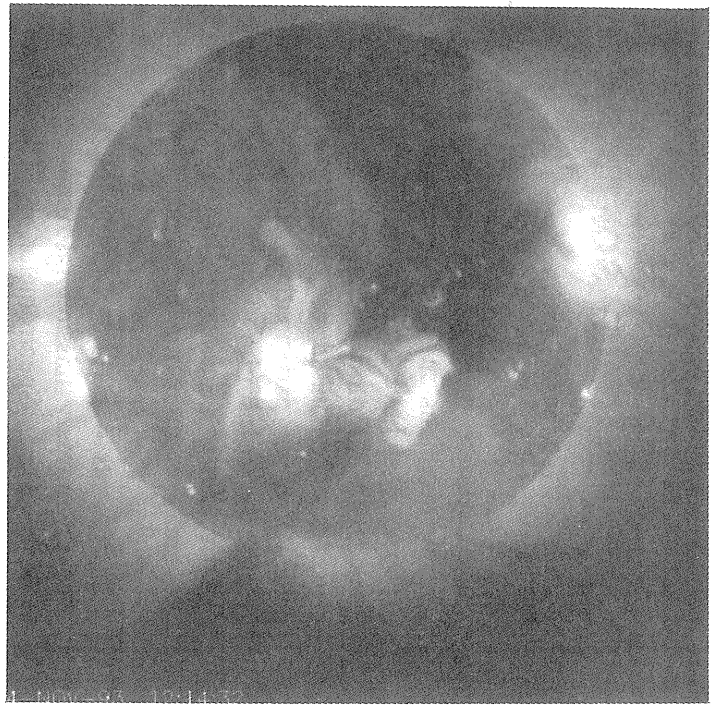
Day 1
11:16:02 UT



Day 3
13:35:42 UT



Day 2
11:27:16 UT

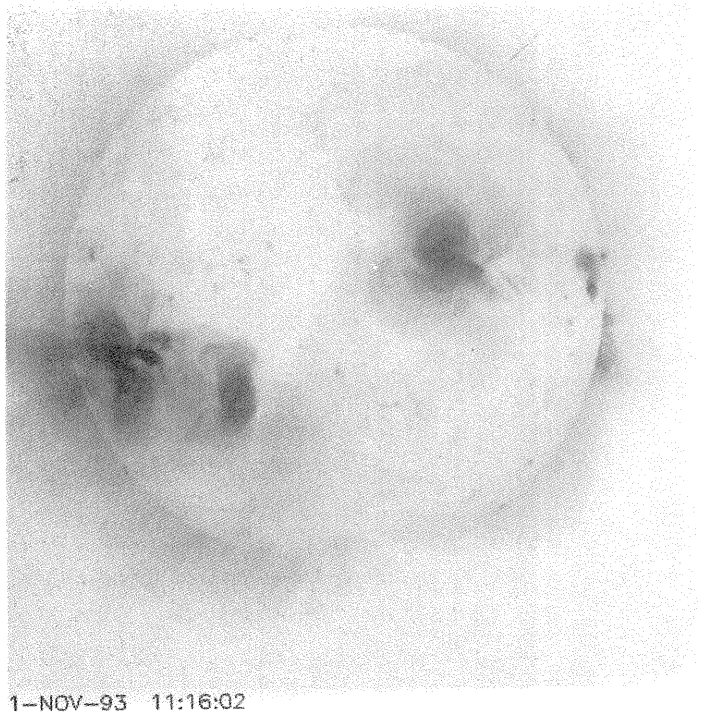


Day 4
12:14:32 UT

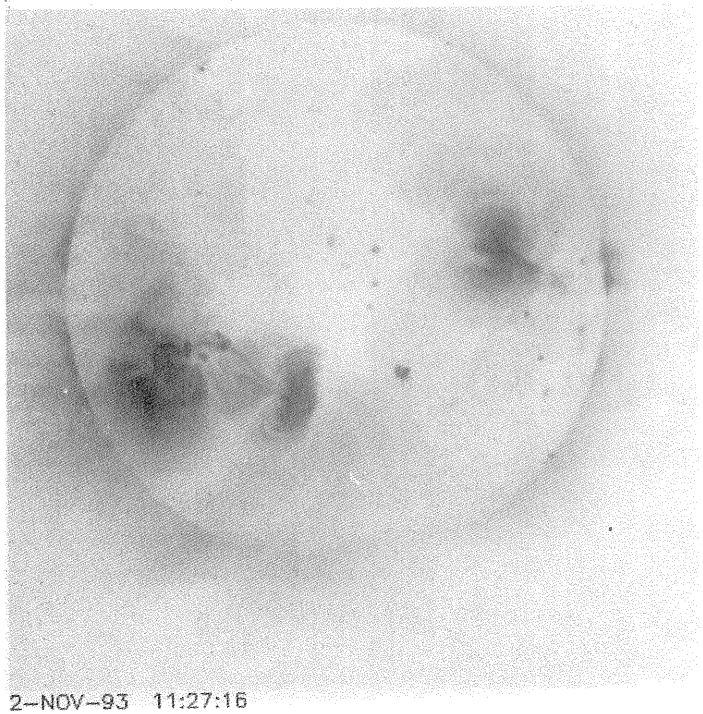
YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993

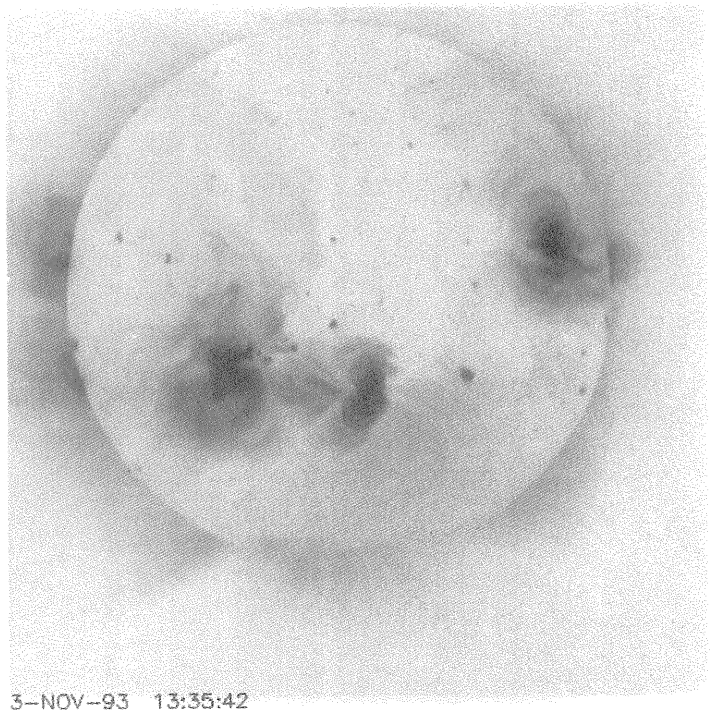
Day 1
11:16:02 UT



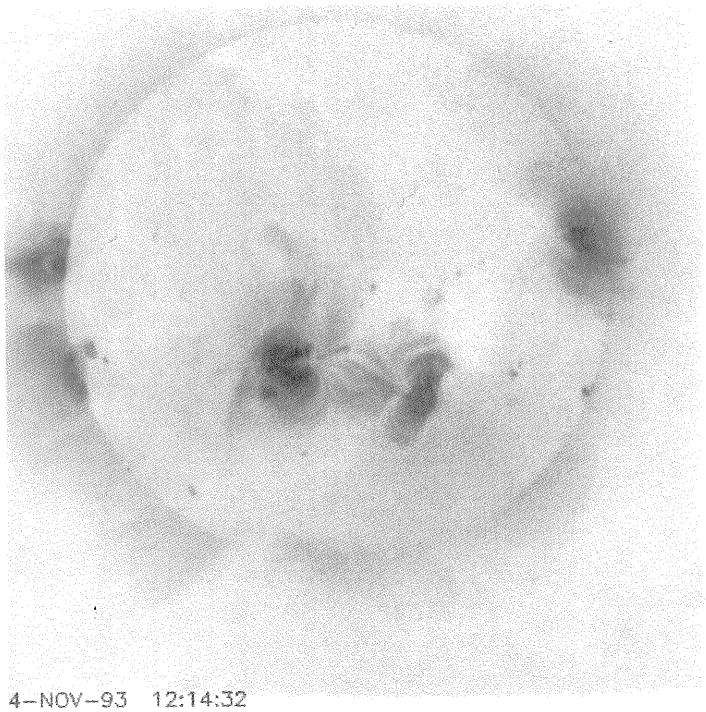
Day 2
11:27:16 UT



Day 3
13:35:42 UT

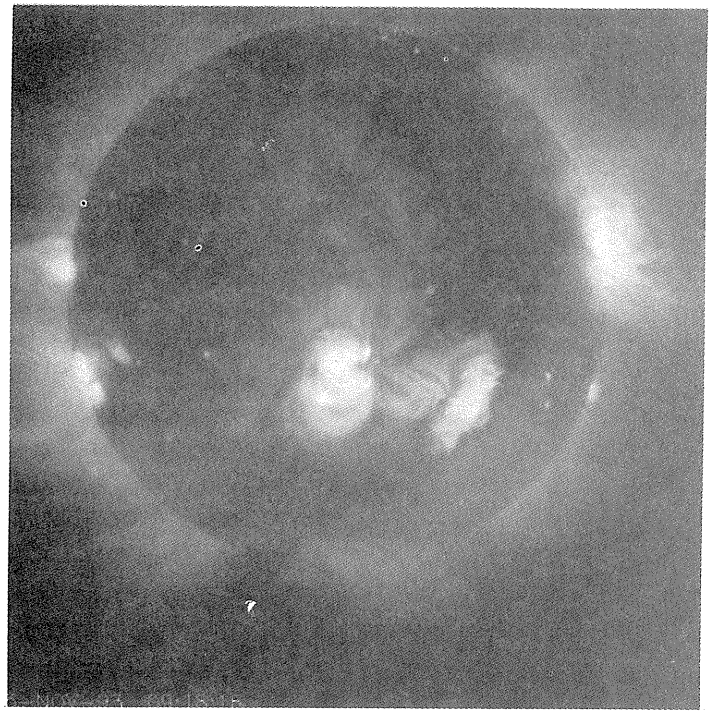


Day 4
12:14:32 UT

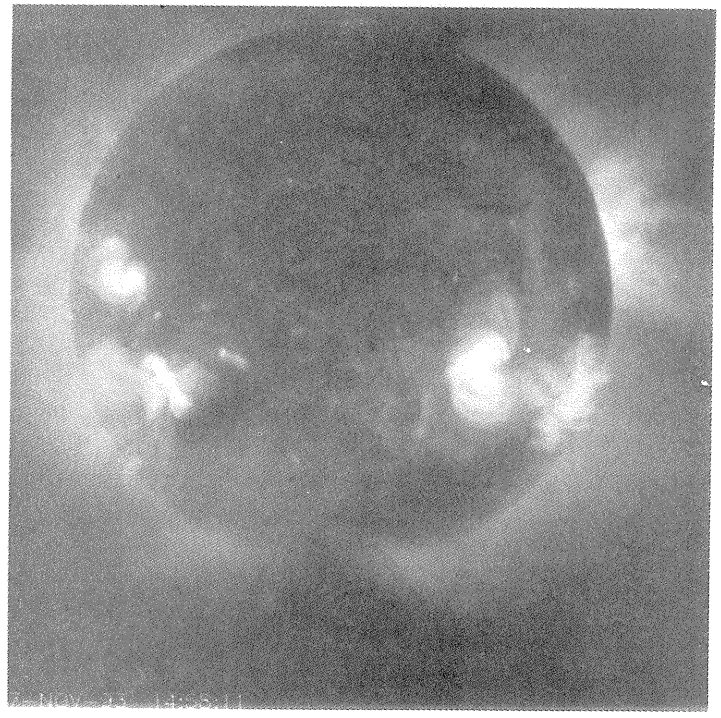


YOHKOH SOFT X-RAY TELESCOPE IMAGES

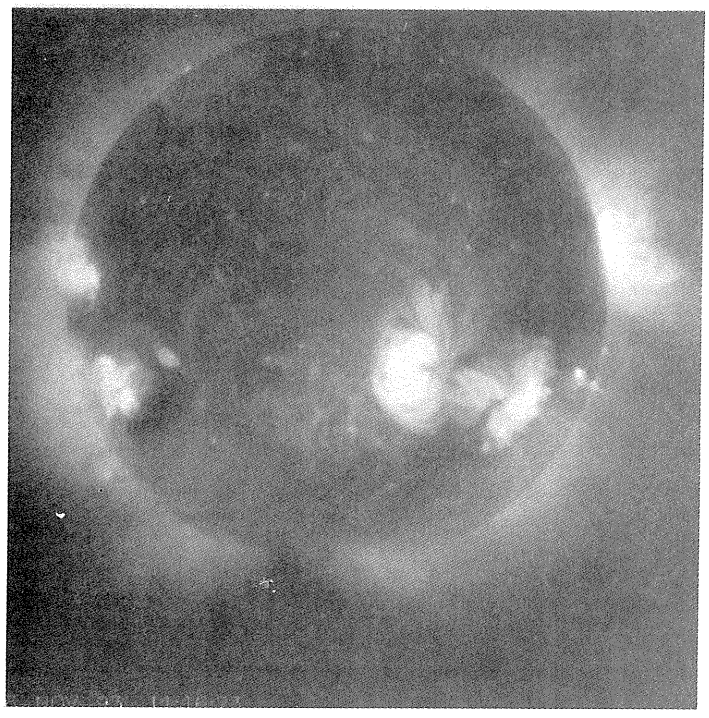
November 1993



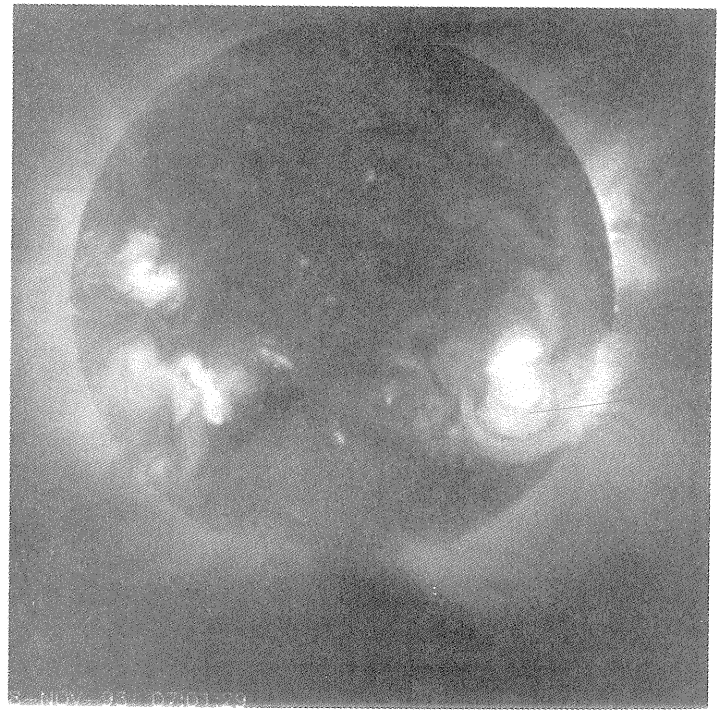
Day 5
09:18:16 UT



Day 7
14:58:11 UT



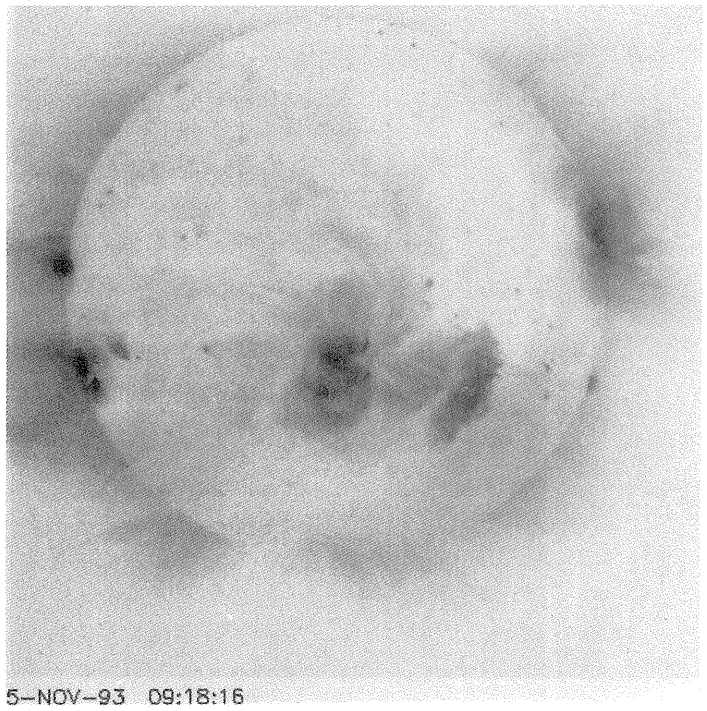
Day 6
11:16:23 UT



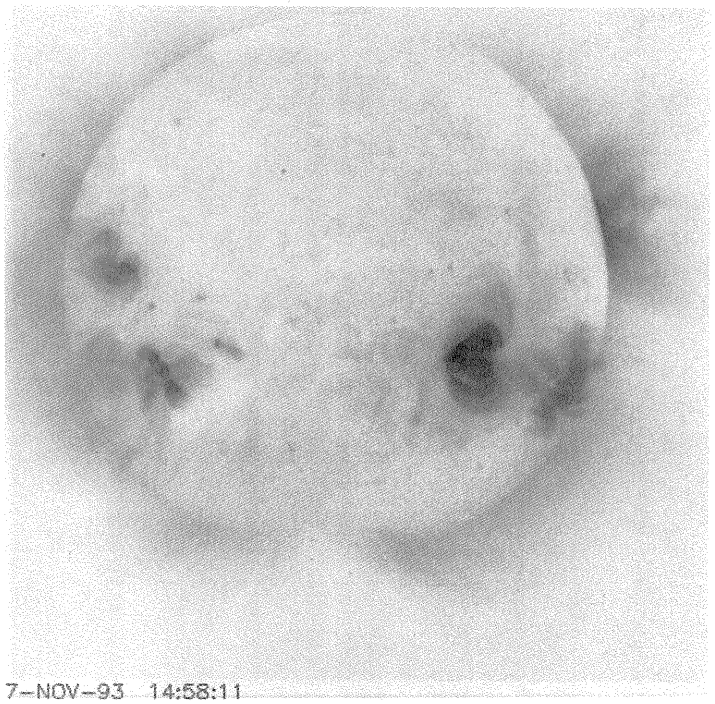
Day 8
07:01:29 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993



Day 5
09:18:16 UT



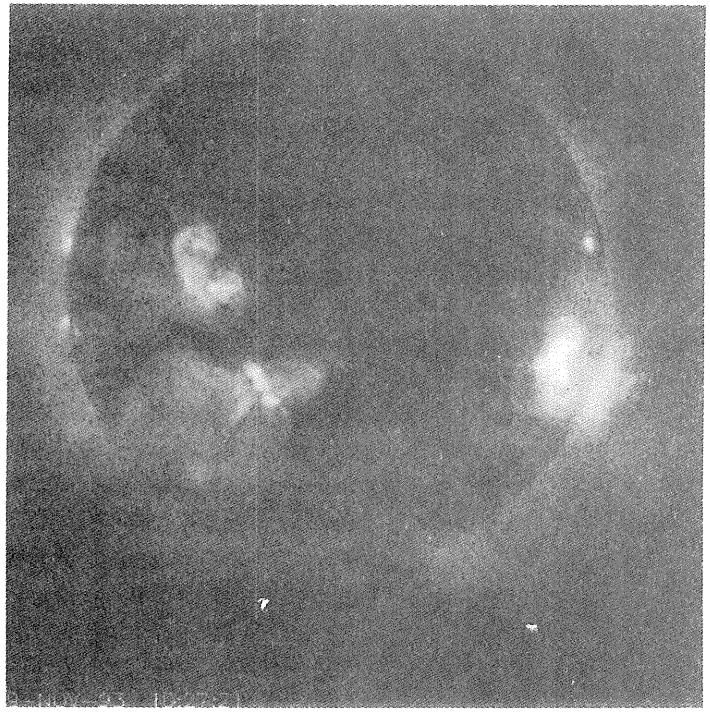
Day 7
14:58:11 UT

Day 6
11:16:23 UT

Day 8
07:01:29 UT

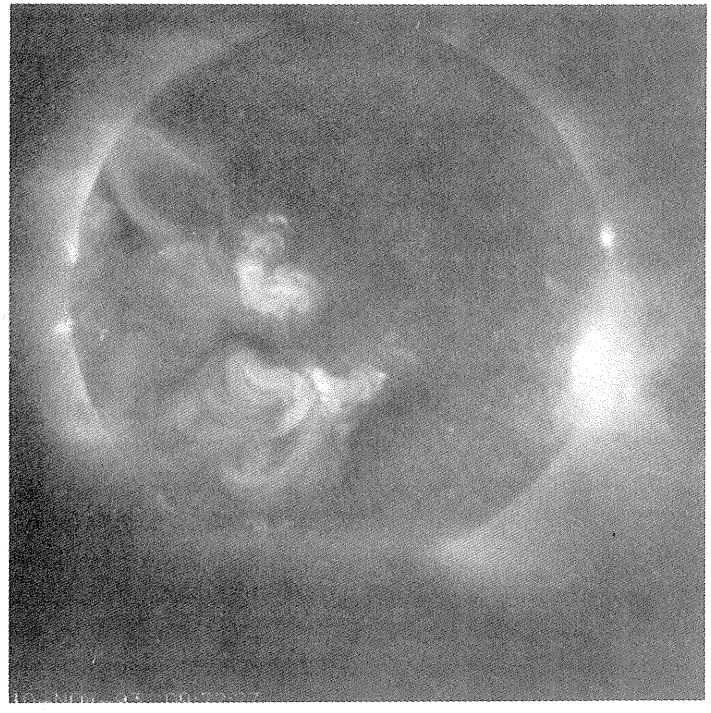
YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993

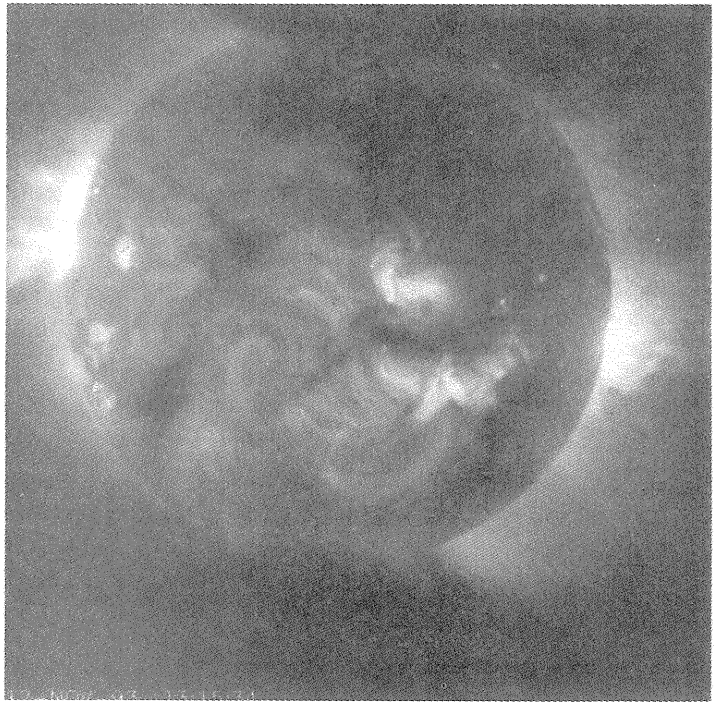


Day 9
10:27:21 UT

Day 11
09:50:33 UT



Day 10
09:22:27 UT

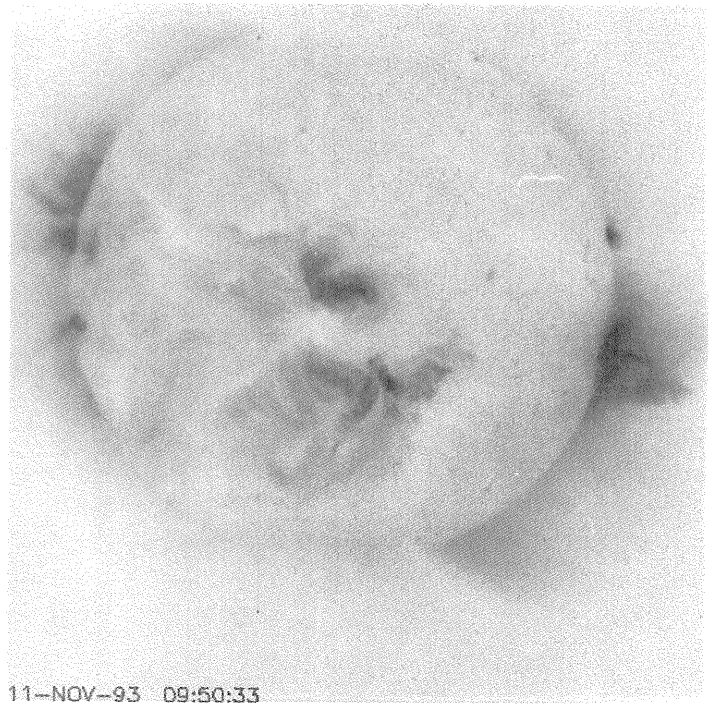


Day 12
13:15:34 UT

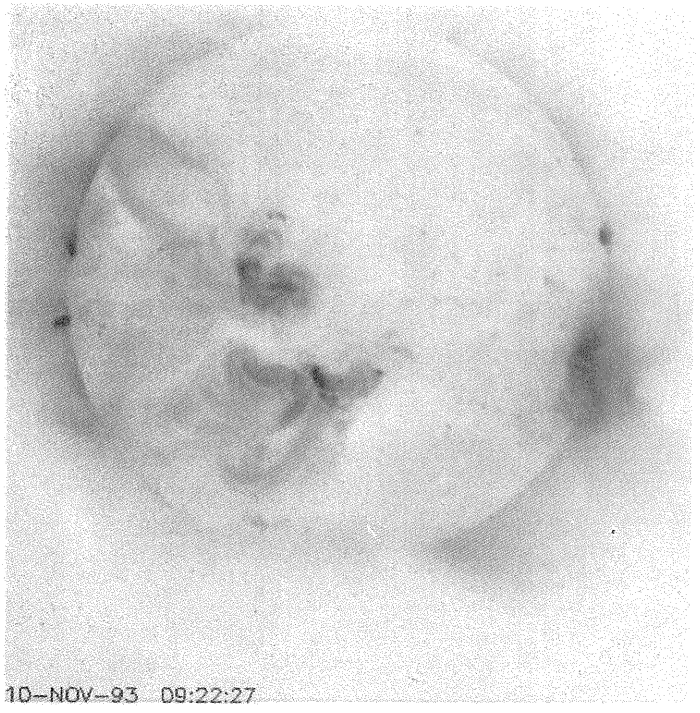
YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993

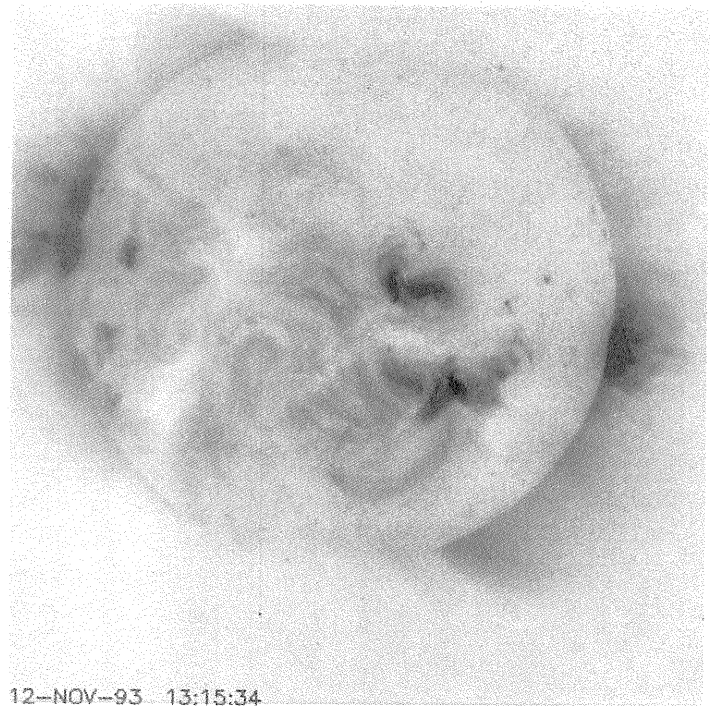
Day 9
10:27:21 UT



Day 11
09:50:33 UT



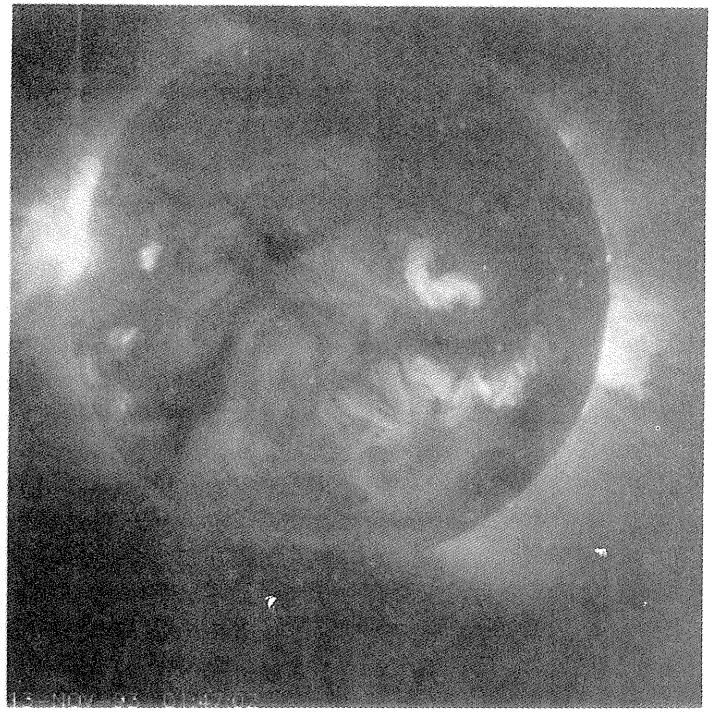
Day 10
09:22:27 UT



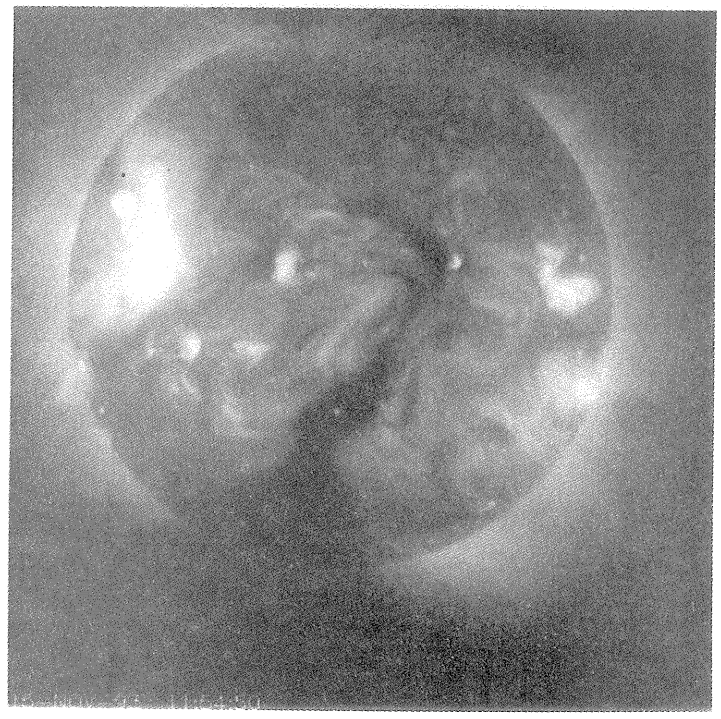
Day 12
13:15:34 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993

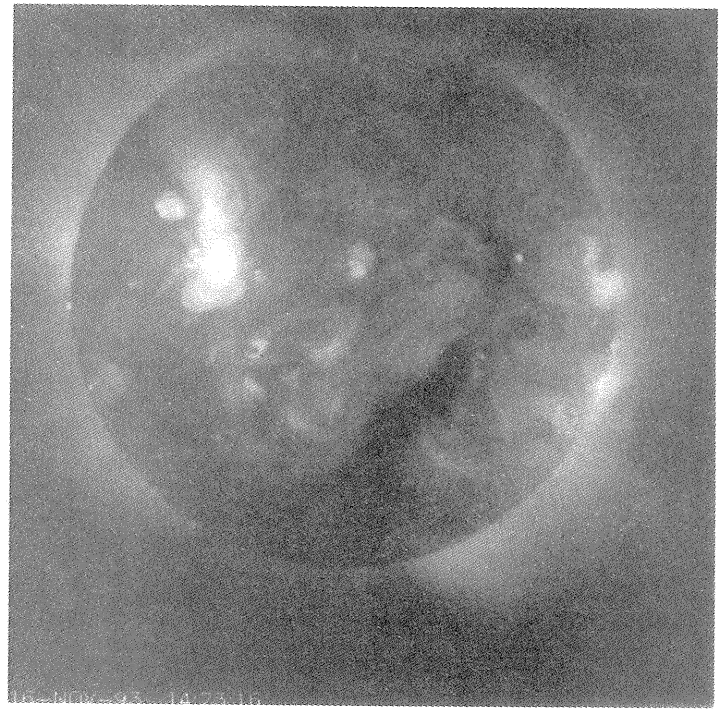


Day 13
01:47:02 UT



Day 15
11:54:50 UT

Day 14
11:57:24 UT

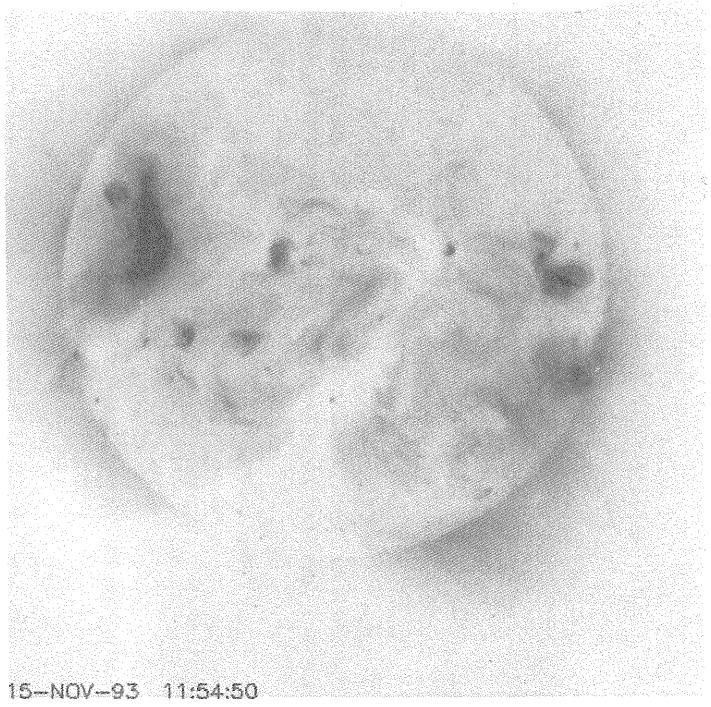


Day 16
14:23:16 UT

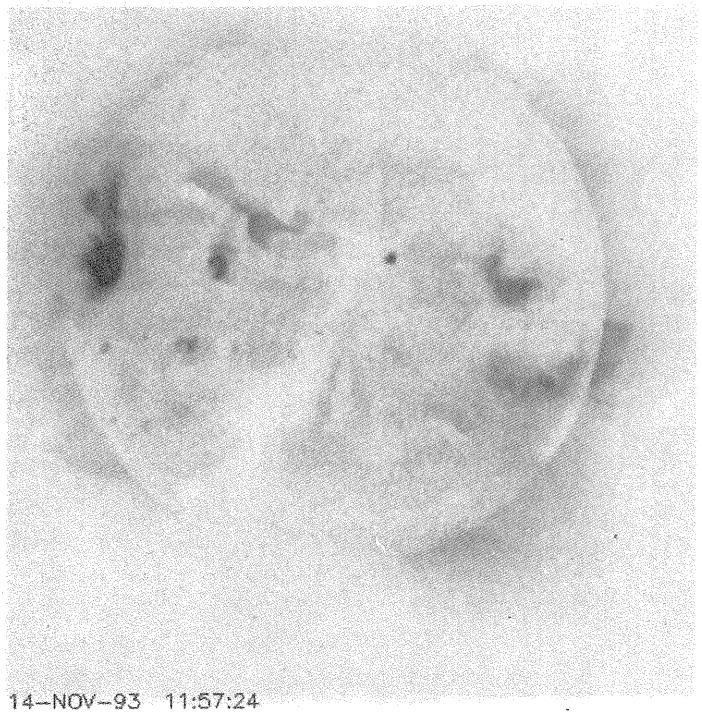
YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993

Day 13
01:47:02 UT



Day 15
11:54:50 UT

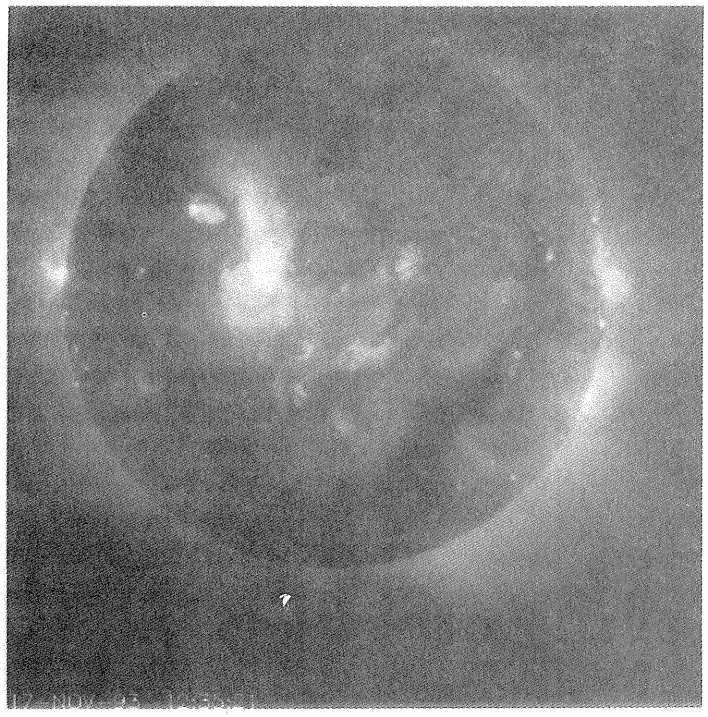


Day 14
11:57:24 UT

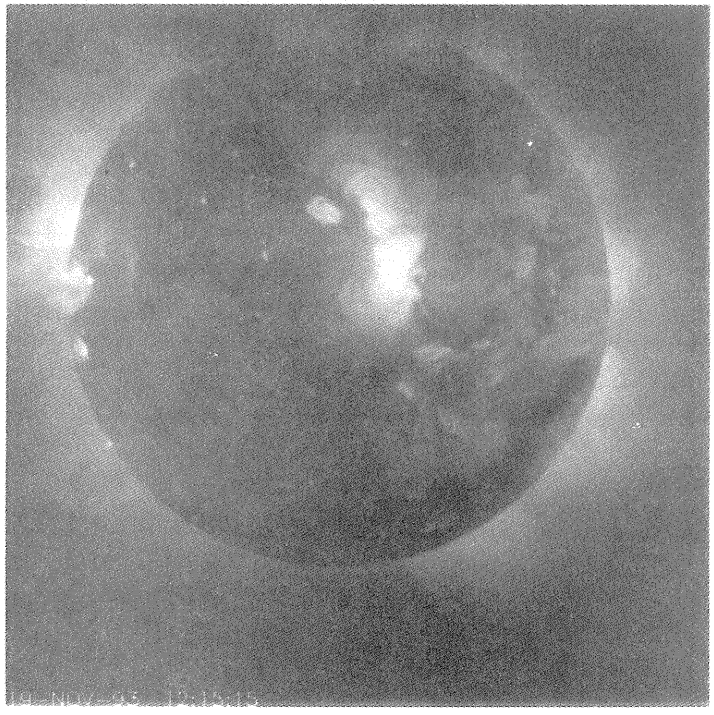
Day 16
14:23:16 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

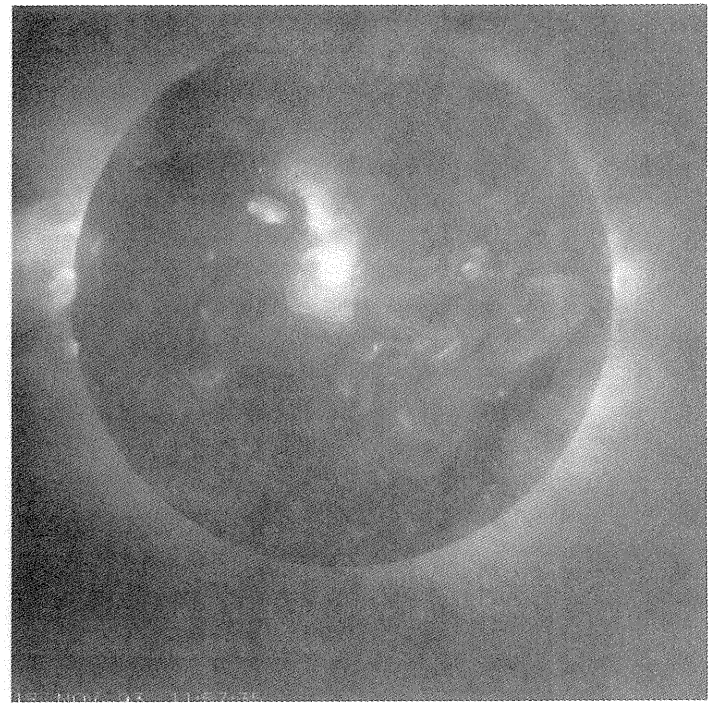
November 1993



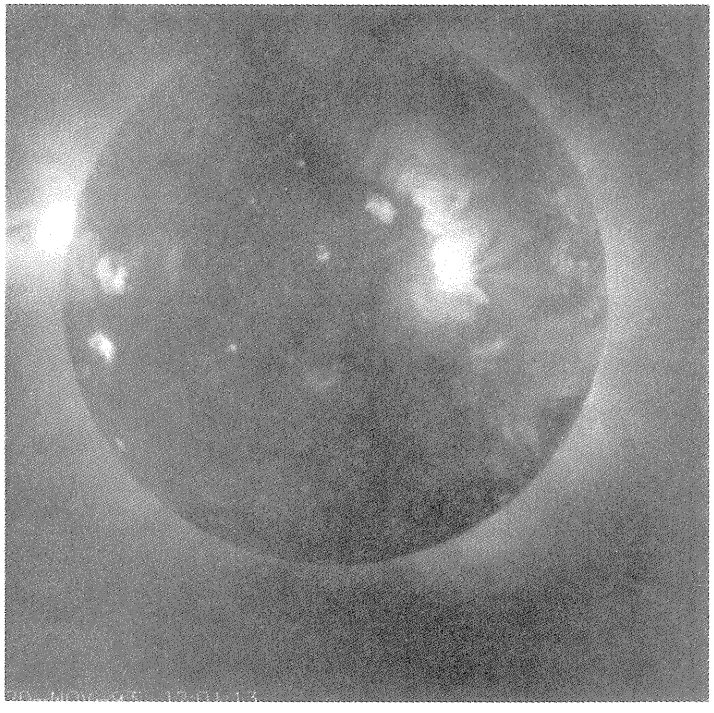
Day 17
12:35:21 UT



Day 19
12:15:15 UT



Day 18
11:57:35 UT



Day 20
12:01:13 UT

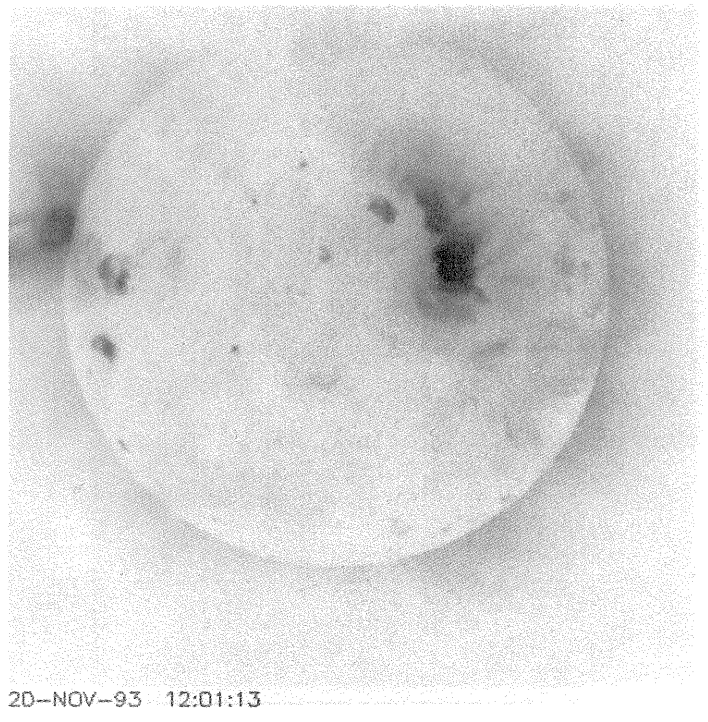
YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993

Day 17
12:35:21 UT

Day 19
12:15:15 UT

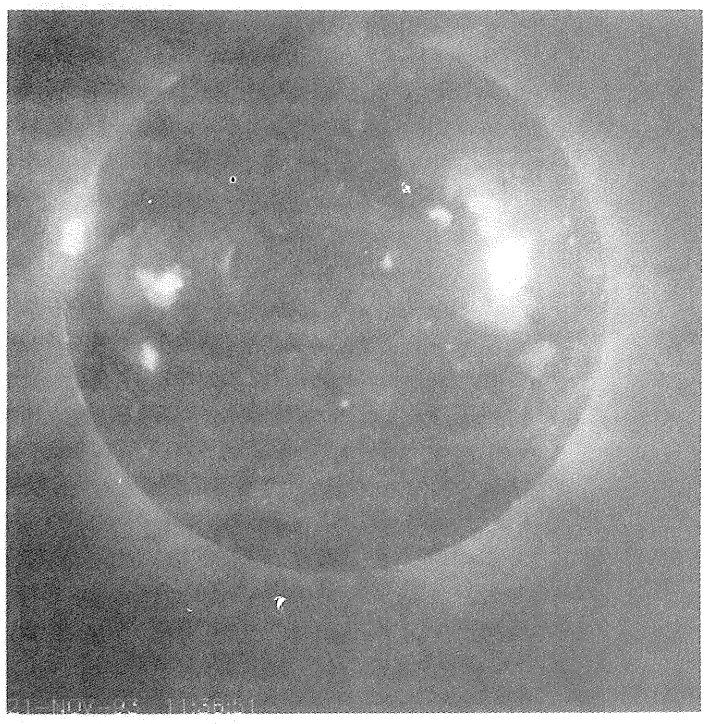
Day 18
11:57:35 UT



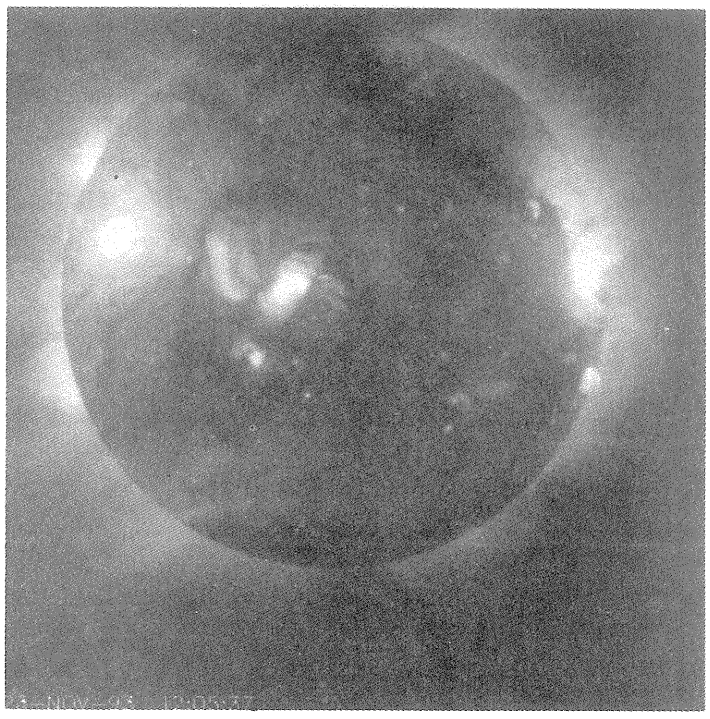
Day 20
12:01:13 UT

YOHKOH SOFT X-RAY TELESCOPE IMAGES

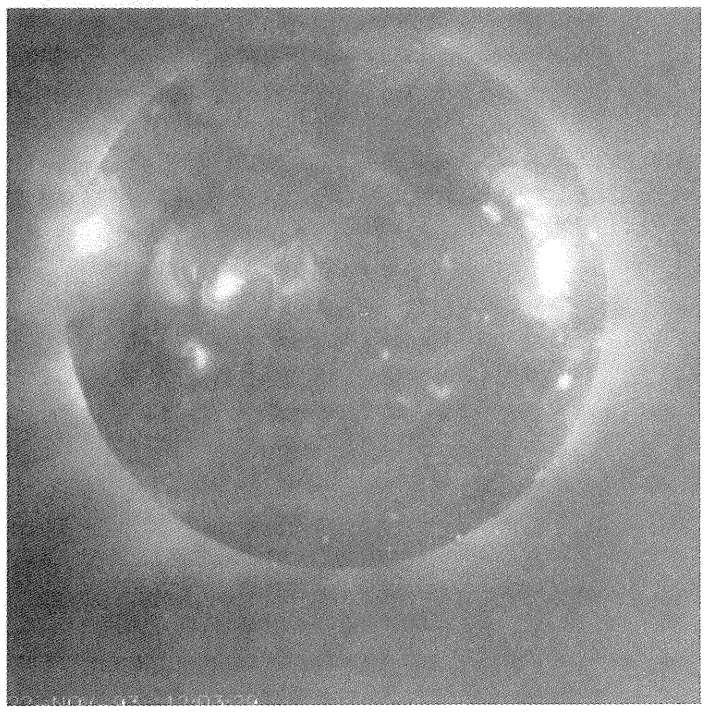
November 1993



Day 21
11:36:51 UT



Day 23
12:05:37 UT



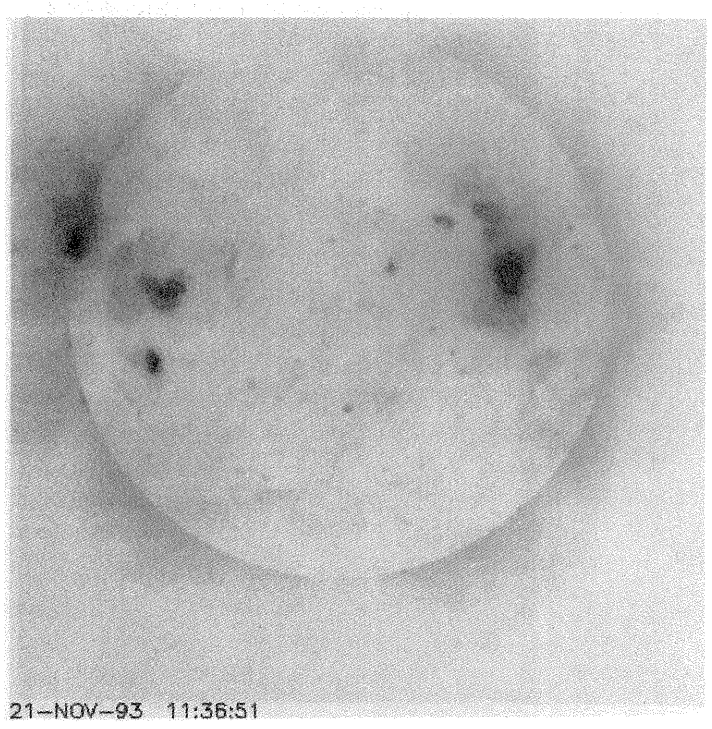
Day 22
12:03:29 UT

Day 24

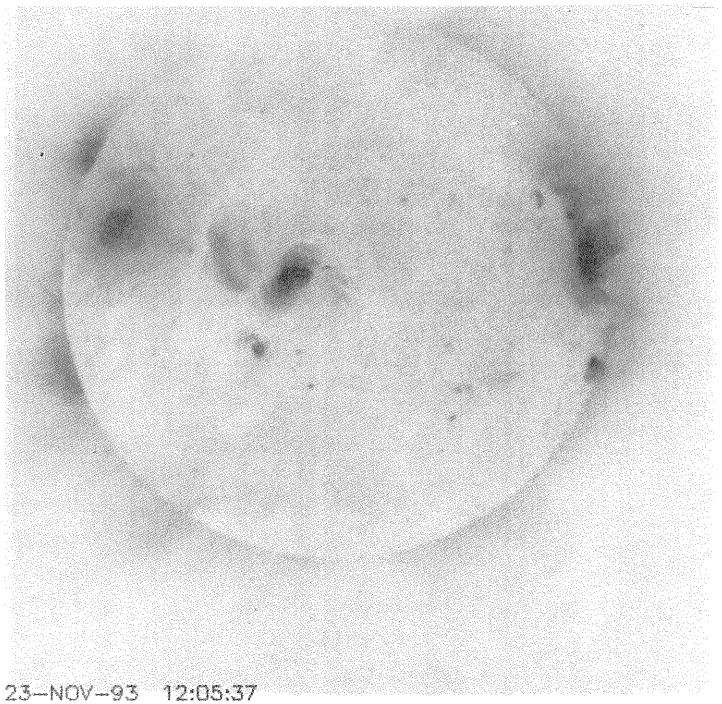
No Data

YOHKOH SOFT X-RAY TELESCOPE IMAGES

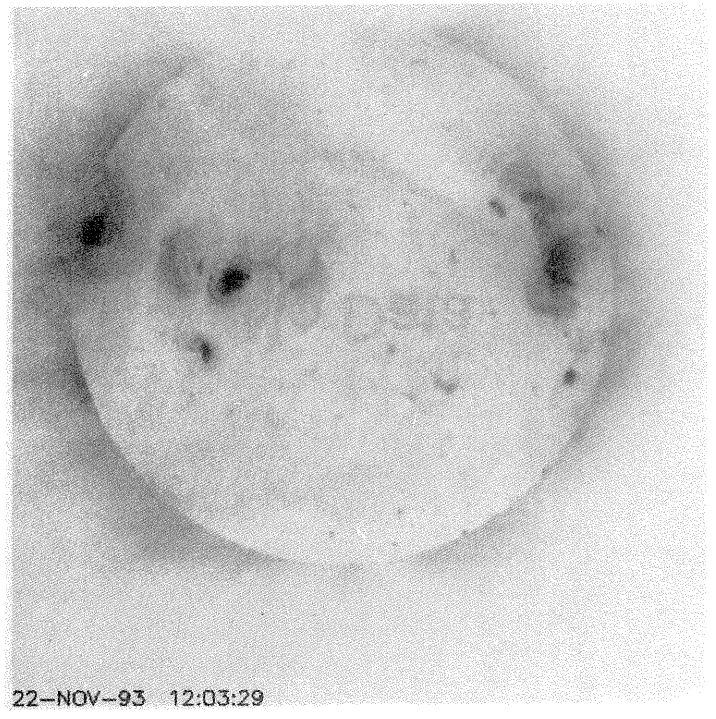
November 1993



Day 21
11:36:51 UT



Day 23
12:05:37 UT



Day 22
12:03:29 UT

Day 24

No Data

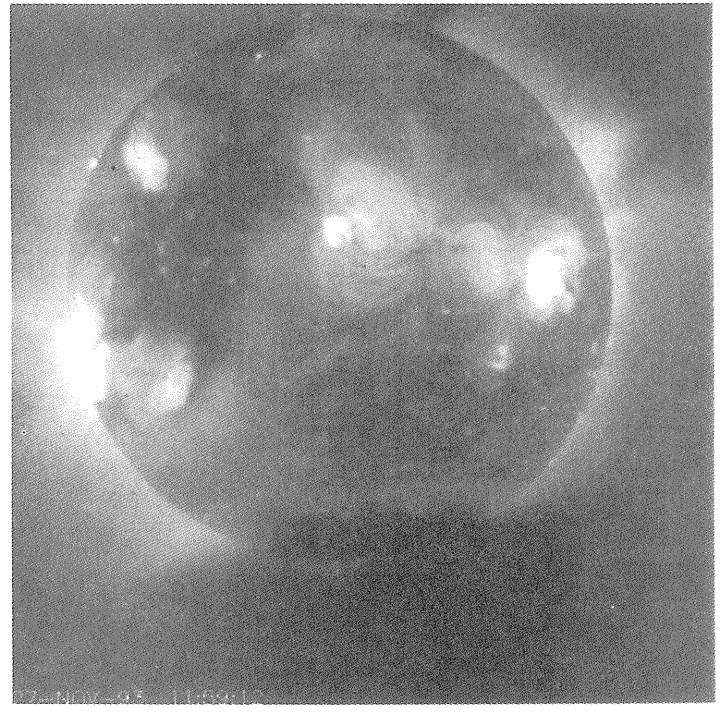
YOHKOH SOFT X-RAY TELESCOPE IMAGES

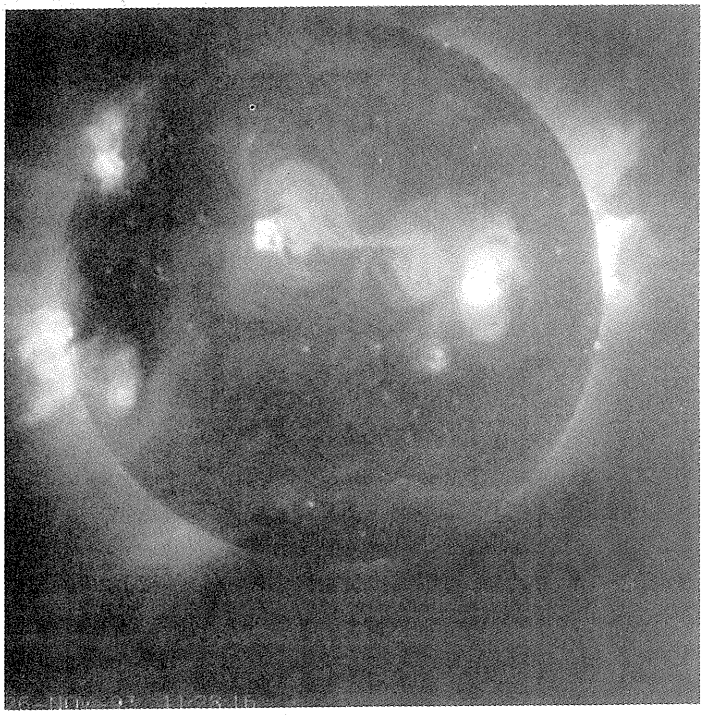
No Data

November 1993

Day 25

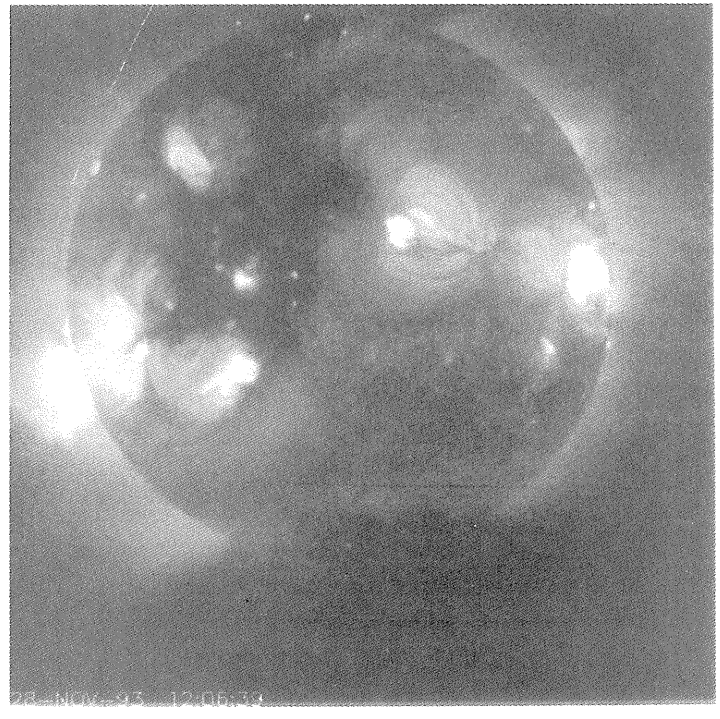
Day 27
11:59:12 UT





Day 26
11:28:16 UT

Day 28
12:06:39 UT



YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993

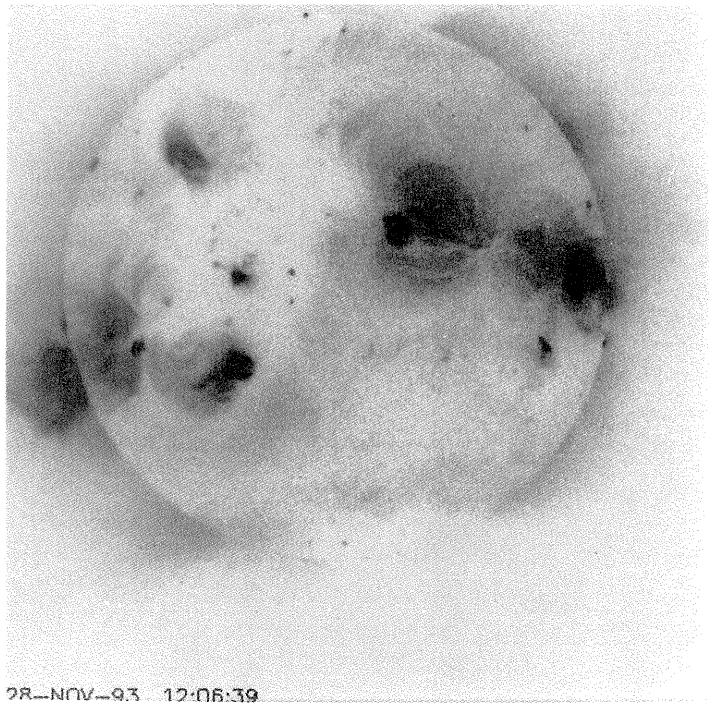
No Data

Day 25

Day 27
11:59:12 UT

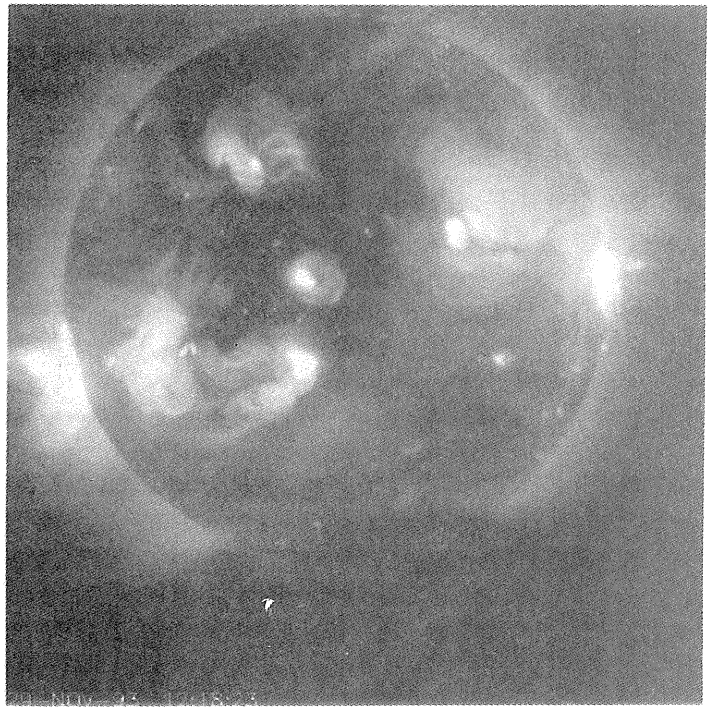
Day 26
11:28:16 UT

Day 28
12:06:39 UT



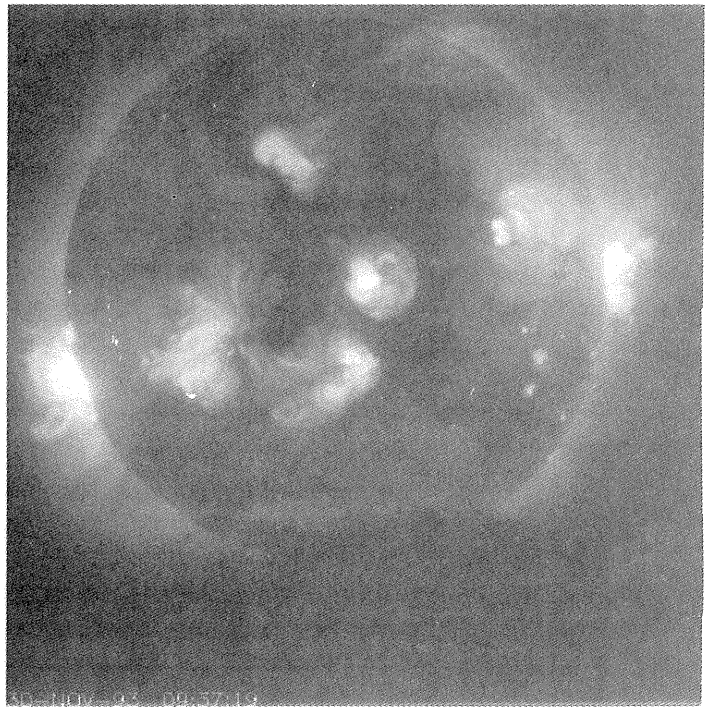
YOHKOH SOFT X-RAY TELESCOPE IMAGES

November 1993



Day 29
12:18:23 UT

Day 29
12:18:23 UT



Day 30
09:37:19 UT

Day 30
09:37:19 UT

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

NOVEMBER 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
7615		BOUL	11	02	1534	S14	W16	11	1.4		B	BXO	10	2	2	1
7612		HOLL	10	27	2134	S17	E76	11	2.7		A	AX		1		2
7612		RAMY	10	28	1243	S16	E67	11	2.6		A	AX	10	1		3
7612		HOLL	10	28	1830	S15	E64	11	2.6		A	AX	10	1		2
7612		LEAR	10	29	0006	S15	E61	11	2.6		A	AX	10	1	1	3
7612		SVTO	10	29	1040	S13	E55	11	2.6		A	AX	10	2	2	3
7612		RAMY	10	29	1214	S16	E53	11	2.5		A	AX		1		3
7612		HOLL	10	29	2053	S15	E48	11	2.5		A	AX		1		2
7612		RAMY	11	03	1226	S13	W15	11	2.4		B	BXO		2	3	3
7612	27998	MWIL	11	05	1515	S15	W38	11	2.7	4	(AP)					
7614		SVTO	10	31	0700	S05	E55	11	4.4		A	AX	10	1		3
7614		RAMY	10	31	1321	S09	E51	11	4.4		A	AX		1		3
7614		HOLL	10	31	1848	S08	E49	11	4.4		A	AX		1		2
7614		LEAR	11	01	0005	S07	E45	11	4.4		A	AX		1		3
7614		SVTO	11	01	0800	S06	E42	11	4.5		A	AX	10	2	1	3
7613	27996	MWIL	10	29	1515	S08	E79	11	4.5	3	X					
7613		HOLL	10	29	2053	S11	E80	11	4.9		A	HH	300	1	3	2
7613		SVTO	10	30	0815	S09	E70	11	4.6		B	CKO	310	5	7	3
7613		RAMY	10	30	1225	S13	E68	11	4.6		B	DHO	340	3	10	3
7613	27996	MWIL	10	30	1515	S11	E72	11	5.0	5	(B)					
7613		HOLL	10	30	1836	S14	E69	11	5.0		B	DKO	300	5	8	3
7613		LEAR	10	31	0005	S12	E72	11	5.4		B	EHO	450	5	11	3
7613		SVTO	10	31	0700	S09	E66	11	5.2		B	DRO	610	4	10	3
7613		RAMY	10	31	1321	S14	E65	11	5.5		B	EHO	820	5	12	3
7613		BOUL	10	31	1540	S12	E60	11	5.2		B	DHO	360	3	10	3
7613	27996	MWIL	10	31	1800	S12	E60	11	5.3	5	B					
7613		HOLL	10	31	1848	S12	E57	11	5.1		B	EHO	440	3	13	2
7613		LEAR	11	01	0005	S12	E58	11	5.4		B	EKO	520	4	12	3
7613		SVTO	11	01	0800	S12	E55	11	5.5		B	EKO	580	3	12	3
7613	27996	MWIL	11	01	1515	S12	E47	11	5.2	6	(B)					
7613		RAMY	11	01	1715	S13	E48	11	5.3		B	EKO	590	5	12	3
7613		HOLL	11	01	1850	S14	E48	11	5.4		B	EHO	480	1	13	2
7613		LEAR	11	02	0030	S12	E44	11	5.3		B	EKO	490	3	12	3
7613	27996	MWIL	11	02	1500	S12	E34	11	5.2	5	(B)					
7613		HOLL	11	02	1515	S12	E36	11	5.3		B	EHO	520	9	12	2
7613		BOUL	11	02	1534	S10	E35	11	5.3		B	EKO	480	5	12	1
7613		LEAR	11	03	0416	S12	E28	11	5.3		BD	EKO	500	5	12	2
7613		RAMY	11	03	1330	S13	E22	11	5.2		B	EKO	490	11	13	3
7613		HOLL	11	03	1446	S12	E21	11	5.2		B	EHO	560	12	15	3
7613	27996	MWIL	11	03	1500	S12	E22	11	5.3	6	(BG)					
7613		SVTO	11	04	0700	S12	E13	11	5.3		BD	EKO	530	0	12	2
7613		RAMY	11	04	1310	S12	E09	11	5.2		B	EKO	720	20	13	4
7613	27996	MWIL	11	04	1515	S12	E08	11	5.2	6	(B)					
7613		HOLL	11	04	1735	S12	E08	11	5.3		B	EKO	560	16	15	3
7613		PALE	11	04	1840	S12	E08	11	5.4		B	EKO	610	16	13	3
7613		LEAR	11	05	0020	S12	E07	11	5.5		B	EKO	620	11	13	3
7613		RAMY	11	05	1229	S12	W03	11	5.3		B	EKO	540	15	13	4
7613	27996	MWIL	11	05	1515	S12	W06	11	5.2	6	(B)					
7613		HOLL	11	05	1704	S12	W07	11	5.2		B	EKO	520	6	13	3
7613		LEAR	11	06	0005	S12	W10	11	5.2		B	EKO	530	11	13	4
7613		PALE	11	06	0130	S11	W10	11	5.3		B	EHO	540	17	12	3
7613		SVTO	11	06	1010	S12	W14	11	5.4		B	EKO	560	6	12	3
7613		RAMY	11	06	1237	S11	W16	11	5.3		B	EKO	510	12	14	3
7613	27996	MWIL	11	06	1515	S12	W18	11	5.3	6	(B)					
7613		HOLL	11	06	1530	S10	W18	11	5.3		B	EKO	530	11	13	3
7613		BOUL	11	06	1740	S11	W19	11	5.3		B	EKO	320	2	11	1
7613		PALE	11	06	1746	S12	W19	11	5.3		B	EHO	590	7	12	4
7613		LEAR	11	07	0015	S12	W22	11	5.3		B	EKO	660	8	13	3
7613		SVTO	11	07	0845	S15	W28	11	5.2		B	EKO	390	7	12	2
7613		RAMY	11	07	1145	S13	W28	11	5.4		B	EKO	520	8	12	4
7613	27996	MWIL	11	07	1530	S12	W32	11	5.2	6	(B)					
7613		BOUL	11	07	1535	S11	W32	11	5.2		B	EKO	420	4	12	2
7613		HOLL	11	07	1639	S11	W34	11	5.1		B	EKO	430	9	14	2
7613		PALE	11	07	1747	S12	W32	11	5.3		B	EHO	460	3	12	2
7613		LEAR	11	08	0030	S13	W33	11	5.5		B	EKO	600	5	13	3
7613		SVTO	11	08	0712	S13	W42	11	5.1		B	EKO	500	7	12	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

NOVEMBER 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
7613		RAMY	11	08	1235	S13	W43	11	5.3		B	EKO	560	9	14	3
7613		BOUL	11	08	1454	S11	W44	11	5.3		B	EKO	400	6	11	2
7613	27996	MWIL	11	08	1515	S12	W46	11	5.2	6	(B)					
7613		HOLL	11	08	1827	S13	W47	11	5.2		B	EHO	400	6	13	3
7613		PALE	11	08	1835	S12	W47	11	5.2		B	EHO	440	8	11	3
7613		LEAR	11	09	0023	S11	W49	11	5.3		B	EKO	350	5	13	3
7613		SVTO	11	09	0900	S12	W55	11	5.2		B	EKO	400	6	13	3
7613		RAMY	11	09	1311	S14	W57	11	5.2		B	EKO	400	6	13	3
7613		BOUL	11	09	1517	S11	W57	11	5.3		B	EKO	290	3	11	2
7613	27996	MWIL	11	09	1530	S11	W58	11	5.3	6	(B)					
7613		HOLL	11	09	1601	S12	W60	11	5.1		B	EHO	460	5	15	3
7613		PALE	11	09	1800	S13	W58	11	5.4		B	EKO	340	6	12	2
7613		LEAR	11	10	0047	S12	W62	11	5.4		B	EKO	320	5	13	3
7613		SVTO	11	10	0800	S13	W67	11	5.3		B	EKO	300	5	13	3
7613		RAMY	11	10	1232	S14	W70	11	5.2		B	EKO	510	3	15	3
7613		HOLL	11	10	1534	S11	W71	11	5.3		B	EKO	420	3	13	3
7613		BOUL	11	10	1539	S12	W73	11	5.1		B	EKO	380	5	14	1
7613		PALE	11	10	1805	S12	W70	11	5.5		B	EKO	240	5	12	3
7613	27996	MWIL	11	10	2215	S12	W77	11	5.1	5	B					
7613		LEAR	11	11	0005	S13	W76	11	5.3		B	CAO	270	3	12	3
7613		SVTO	11	11	0810	S12	W85	11	4.9		B	CKO	120	3	11	3
7613		RAMY	11	11	1245	S12	W89	11	4.8		A	HR	10	1	1	4
7613		PALE	11	11	1930	S14	W85	11	5.4		B	BXO	50	2	6	4
7617		RAMY	11	05	1229	S20	E67	11	10.6		A	AX	10	1	1	4
7617	27999	MWIL	11	05	1515	S20	E65	11	10.6	4	(B)					
7617		HOLL	11	05	1704	S21	E65	11	10.7		A	AX	10	1		3
7617		LEAR	11	06	0005	S16	E63	11	10.8		B	BXO	20	4	8	4
7617		PALE	11	06	0130	S20	E60	11	10.6		A	HS	20	3	2	3
7617		SVTO	11	06	1010	S17	E62	11	11.1		B	BXO	20	4	8	3
7617		RAMY	11	06	1237	S16	E57	11	10.8		B	BXO	20	6	10	3
7617	27999	MWIL	11	06	1515	S20	E52	11	10.6	4	(B)					
7617		HOLL	11	06	1530	S21	E51	11	10.5		A	AX	20	2	1	3
7617		PALE	11	06	1746	S16	E53	11	10.7		B	BXO	70	11	8	4
7617		LEAR	11	07	0015	S18	E47	11	10.6		B	BXO	30	4	6	3
7617		RAMY	11	07	1145	S15	E43	11	10.7		B	BXO	20	6	9	4
7617	27999	MWIL	11	07	1530	S20	E38	11	10.5	4	(B)					
7617		HOLL	11	07	1639	S19	E36	11	10.4		A	AX	10	2	1	2
7617		PALE	11	07	1747	S18	E37	11	10.5		A	AX	10	1	1	2
7617		LEAR	11	08	0030	S20	E36	11	10.8		B	BXO	20	2	6	3
7617		SVTO	11	08	0712	S15	E30	11	10.6		B	CSO	10	3	3	3
7617		RAMY	11	08	1235	S19	E28	11	10.7		A	AX		1		3
7617	27999	MWIL	11	08	1515	S19	E24	11	10.5	4	(B)					
7617		HOLL	11	08	1827	S19	E25	11	10.7		A	AX	10	1		3
7617		PALE	11	08	1835	S15	E25	11	10.7		A	AX	10	2	1	3
7617		SVTO	11	10	0900	S14	E04	11	10.7		A	AX		1	1	3
7617		SVTO	11	11	0810	S15	W09	11	10.6		B	BXO		2	2	3
7617		PALE	11	11	1930	S17	W15	11	10.7		A	AX	10	3	2	4
7616		RAMY	11	05	1229	N07	E79	11	11.4		A	HS	30	1	1	4
7616	28000	MWIL	11	05	1515	N07	E78	11	11.5	4	(AP)					
7616		HOLL	11	05	1704	N06	E78	11	11.5		A	AX	10	1		3
7616		LEAR	11	06	0005	N07	E70	11	11.2		A	AX	20	1	1	4
7616		PALE	11	06	0130	N08	E72	11	11.5		A	HS	30	2	1	3
7616		SVTO	11	06	1010	N08	E68	11	11.5		A	AX	10	1	1	3
7616		RAMY	11	06	1237	N08	E65	11	11.4		A	AX	10	2	1	3
7616	28000	MWIL	11	06	1515	N07	E64	11	11.4	5	(AP)					
7616		HOLL	11	06	1530	N06	E64	11	11.4		A	AX		1	1	3
7616		PALE	11	06	1746	N07	E65	11	11.6		A	AX	20	1	1	4
7616		LEAR	11	07	0015	N09	E58	11	11.4		A	AX	10	2	1	3
7616		SVTO	11	07	0845	N09	E53	11	11.3		A	HS	10	1	1	2
7616		RAMY	11	07	1145	N08	E51	11	11.3		A	AX	10	2	1	4
7616	28000	MWIL	11	07	1530	N07	E51	11	11.5	4	(AP)					
7616		BOUL	11	07	1535	N08	E50	11	11.4		A	AX		1		2
7616		HOLL	11	07	1639	N06	E49	11	11.4		A	AX	20	2	1	2
7616		PALE	11	07	1747	N07	E49	11	11.4		A	AX	20	1	1	2
7616		LEAR	11	08	0030	N08	E47	11	11.5		A	AX		1	1	3
7616		SVTO	11	08	0712	N08	E42	11	11.4		A	HS	10	1	1	3
7616		RAMY	11	08	1235	N07	E37	11	11.3		B	BXO	10	2	6	3

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

NOVEMBER 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
7616		BOUL	11 08 1454	N08 E37	11 11.4		A	AX		1		2
7616	28000	MWIL	11 08 1515	N06 E36	11 11.3	4	(B)					
7616		HOLL	11 08 1827	N08 E36	11 11.5		A	AX	10	1		3
7616		PALE	11 08 1835	N06 E36	11 11.5		A	AX	10	1	1	3
7616		LEAR	11 09 0023	N06 E33	11 11.5		A	AX		1	1	3
7616		SVTO	11 09 0900	N06 E29	11 11.5		A	AX	10	2	2	3
7616		RAMY	11 09 1311	N06 E24	11 11.3		A	AX	10	3	2	3
7616	28000	MWIL	11 09 1530	N05 E26	11 11.6	4	(AP)					
7616		HOLL	11 09 1601	N05 E26	11 11.6		A	AX	10	2	2	3
7616		PALE	11 09 1800	N06 E24	11 11.5		A	AX	10	2	2	2
7616		LEAR	11 10 0047	N05 E21	11 11.6		B	BXO	10	3	3	3
7616		SVTO	11 10 0800	N06 E16	11 11.5		A	AX	10	2	2	3
7616		RAMY	11 10 1232	N06 E13	11 11.5		A	AX	10	6	2	3
7616		PALE	11 10 1805	N07 E12	11 11.6		A	AX	10	4	2	3
7616	28000	MWIL	11 10 2215	N05 E07	11 11.4	4	X					
7616		LEAR	11 11 0005	N05 E07	11 11.5		A	AX		1	1	3
7616		PALE	11 11 1930	N07 W02	11 11.7		A	AX	10	4	2	4
7616		SVTO	11 14 1015	N11 W37	11 11.6		A	AX	10	3	2	3
7619		RAMY	11 14 1326	N10 W13	11 13.6		B	BXO		2	2	3
7619		HOLL	11 14 1526	N11 W15	11 13.5		A	AX		2	2	3
7619		LEAR	11 15 0010	N10 W19	11 13.6		A	AX	10	2	2	3
7619A		RAMY	11 22 1258	S17 W62	11 17.8		A	AX	10	1		3
7619A		RAMY	11 23 1250	S17 W74	11 17.9		A	AX	10	1		4
7618		SVTO	11 12 0818	N08 E81	11 18.4		B	CRO	750	3	9	3
7618		RAMY	11 12 1323	N09 E77	11 18.3		B	DAO	120	4	5	4
7618		PALE	11 12 1745	N08 E80	11 18.7		B	DAI	240	8	6	3
7618		LEAR	11 13 0355	N07 E73	11 18.6		B	EAI	360	8	12	2
7618		RAMY	11 13 1255	N09 E68	11 18.6		B	DAI	370	22	10	3
7618	28002	MWIL	11 13 1530	N07 E66	11 18.6	4	(D)					
7618		PALE	11 13 1805	N09 E64	11 18.5		B	EAI	370	22	11	3
7618		LEAR	11 14 0000	N09 E62	11 18.6		B	DAI	400	20	10	3
7618		SVTO	11 14 1015	N08 E58	11 18.8		B	EKO	400	18	11	3
7618		RAMY	11 14 1326	N09 E55	11 18.7		B	EKI	430	19	11	3
7618		HOLL	11 14 1526	N06 E54	11 18.7		B	EKO	430	12	12	3
7618		PALE	11 14 1745	N06 E52	11 18.6		B	DAO	460	16	10	3
7618		LEAR	11 15 1110	N08 E40	11 18.5		B	EKO	460	23	11	3
7618	28002	MWIL	11 15 1600	N07 E37	11 18.4	5	(B)					
7618		HOLL	11 15 1705	N07 E39	11 18.6		B	EKI	530	33	11	3
7618		PALE	11 15 1730	N09 E39	11 18.6		B	DKI	510	44	9	3
7618		LEAR	11 16 0150	N08 E34	11 18.6		B	DKO	420	23	10	2
7618		SVTO	11 16 0750	N08 E30	11 18.6		B	DKI	700	27	10	3
7618		BOUL	11 16 1455	N09 E26	11 18.6		B	DKI	520	22	9	2
7618		HOLL	11 16 1620	N07 E26	11 18.6		B	DKI	650	54	9	3
7618		PALE	11 16 1835	N08 E27	11 18.8		B	DKI	520	41	9	3
7618		LEAR	11 17 0005	N08 E23	11 18.7		B	DKO	650	45	10	3
7618		SVTO	11 17 0820	N09 E18	11 18.7		B	DKI	490	41	9	2
7618		RAMY	11 17 1135	N09 E15	11 18.6		B	EKC	630	46	11	3
7618	28002	MWIL	11 17 1600	N07 E12	11 18.6	5	(B)					
7618		BOUL	11 17 1703	N09 E11	11 18.5		B	DKI	650	55	9	2
7618		PALE	11 17 1835	N08 E14	11 18.8		B	DKI	520	41	9	3
7618		LEAR	11 18 0001	N08 E08	11 18.6		B	DKI	700	25	9	3
7618		SVTO	11 18 0710	N07 E06	11 18.7		BD	EKI	790	35	11	4
7618		RAMY	11 18 1140	N08 E02	11 18.6		BD	DKC	830	38	9	4
7618	28002	MWIL	11 18 1545	N07 W02	11 18.5	6	(D)					
7618		BOUL	11 18 1558	N08 W01	11 18.6		BD	DKC	780	46	9	1
7618		PALE	11 18 1810	N08 W01	11 18.7		B	DKI	530	41	9	3
7618		HOLL	11 18 2035	N07 W06	11 18.4		BD	DKI	800	26	8	2
7618		LEAR	11 19 0005	N08 W05	11 18.6		B	DKO	710	22	8	3
7618		SVTO	11 19 0725	N06 W12	11 18.4		BD	DKI	850	28	8	2
7618		RAMY	11 19 1356	N07 W13	11 18.6		BD	DAC	850	49	10	3
7618	28002	MWIL	11 19 1545	N07 W15	11 18.5	5	(B)					
7618		BOUL	11 19 1557	N08 W14	11 18.6		B	DKC	700	41	10	1
7618		HOLL	11 19 1643	N07 W14	11 18.6		BD	EKI	870	56	12	3
7618		PALE	11 19 1750	N06 W15	11 18.6		BD	DKI	530	33	8	3
7618		LEAR	11 20 0003	N08 W18	11 18.6		BD	DKI	720	20	8	3
7618		RAMY	11 20 1539	N06 W26	11 18.7		BD	DKI	480	23	8	2

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

NOVEMBER 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
7618	28002	MWIL	11	20	1545	N07	W27	11	18.6	6	(B)					
7618		BOUL	11	20	1550	N07	W26	11	18.7		B	DAI	430	12	7	2
7618		PALE	11	20	1815	N08	W28	11	18.7		BD	DAC	570	36	8	3
7618		HOLL	11	20	2000	N08	W29	11	18.6		BD	DKC	600	3	9	3
7618		LEAR	11	21	0013	N07	W32	11	18.6		BD	DKI	600	28	8	3
7618		RAMY	11	21	1205	N06	W38	11	18.6		BD	DKI	480	30	9	4
7618		SVTO	11	21	1316	N05	W38	11	18.7		BD	DKI	490	25	8	1
7618		BOUL	11	21	1600	N08	W41	11	18.6		B	DAI	420	23	8	3
7618		HOLL	11	21	1740	N08	W42	11	18.6		BD	DKC	480	28	9	3
7618		PALE	11	21	1908	N08	W43	11	18.6		BD	DKC	370	41	7	3
7618		LEAR	11	22	0019	N07	W45	11	18.6		BD	DKI	420	30	7	3
7618		RAMY	11	22	1258	N06	W53	11	18.6		B	DAI	330	25	7	3
7618		BOUL	11	22	1552	N07	W53	11	18.7		B	DAI	370	23	6	3
7618		HOLL	11	22	1611	N07	W56	11	18.5		B	DAI	340	20	6	3
7618		PALE	11	22	2045	N08	W54	11	18.8		B	DAI	290	32	7	3
7618		LEAR	11	23	0305	N07	W60	11	18.6		B	DAI	340	16	10	3
7618		SVTO	11	23	1031	N05	W65	11	18.6		B	DAI	380	7	3	3
7618		RAMY	11	23	1250	N05	W66	11	18.6		B	DAI	380	14	6	4
7618	28002	MWIL	11	23	1545	N07	W68	11	18.6	5	(AP)					
7618		HOLL	11	23	1720	N07	W69	11	18.5		B	DAO	210	7	5	2
7618		PALE	11	23	2130	N05	W73	11	18.4		B	DAI	200	11	7	3
7618		LEAR	11	24	0010	N07	W75	11	18.4		B	DAI	420	13	8	3
7618		SVTO	11	24	1115	N05	W76	11	18.8		B	DAI	240	4	3	1
7618		RAMY	11	24	1210	N06	W78	11	18.7		B	DAO	130	9	5	4
7618	28002	MWIL	11	24	1530	N07	W80	11	18.6	4	(B)					
7618		PALE	11	24	1805	N06	W85	11	18.4		B	DAO	80	5	4	3
7620		RAMY	11	18	1140	N05	E78	11	24.3		A	AX	10	2	1	4
7620		PALE	11	18	1810	N04	E76	11	24.4		A	AX		1		3
7620		HOLL	11	18	2035	N02	E73	11	24.3		A	AX		1	1	2
7620		LEAR	11	19	0005	N03	E72	11	24.4		A	AX	10	1	1	3
7620		SVTO	11	19	0725	N04	E65	11	24.2		A	AX	10	1	1	2
7620		RAMY	11	19	1356	N05	E61	11	24.1		A	HR	20	1	1	3
7620	28003	MWIL	11	19	1545	N03	E61	11	24.2	4	(AP)					
7620		BOUL	11	19	1557	N04	E61	11	24.2		A	AX	10	1	1	1
7620		HOLL	11	19	1643	N02	E61	11	24.2		A	AX		1	1	3
7620		PALE	11	19	1750	N05	E59	11	24.1		A	AX		1		3
7620		LEAR	11	20	0003	N03	E57	11	24.3		A	AX	10	1	1	3
7620		RAMY	11	20	1539	N06	E47	11	24.2		A	AX	10	1	1	2
7620	28003	MWIL	11	20	1545	N03	E46	11	24.1	4	(AP)					
7620		BOUL	11	20	1550	N05	E45	11	24.0		A	AX		1		2
7620		PALE	11	20	1815	N05	E45	11	24.1		A	AX	10	1		3
7620		HOLL	11	20	2000	N03	E45	11	24.2		A	AX	10	1	1	3
7620		LEAR	11	21	0013	N04	E43	11	24.2		B	BXO	20	2	5	3
7620		RAMY	11	21	1205	N06	E37	11	24.3		B	DAO	50	6	6	4
7620		SVTO	11	21	1316	N06	E35	11	24.2		B	DSO	70	4	6	1
7620		BOUL	11	21	1600	N06	E33	11	24.1		B	BXO	10	4	6	3
7620		HOLL	11	21	1740	N04	E32	11	24.1		B	BXO	30	5	7	3
7620		PALE	11	21	1908	N04	E34	11	24.3		B	BXO	30	11	7	3
7620		LEAR	11	22	0019	N04	E28	11	24.1		B	BXO	20	6	6	3
7620		RAMY	11	22	1258	N06	E22	11	24.2		B	DAO	80	16	8	3
7620		BOUL	11	22	1552	N06	E20	11	24.1		B	DAI	80	13	7	3
7620		HOLL	11	22	1611	N03	E20	11	24.2		B	DSO	70	9	7	3
7620		PALE	11	22	2045	N04	E18	11	24.2		B	DSI	110	24	8	3
7620		LEAR	11	23	0305	N04	E13	11	24.1		B	DAO	160	21	9	3
7620		SVTO	11	23	1031	N06	E09	11	24.1		B	DSO	140	21	9	3
7620		RAMY	11	23	1250	N05	E08	11	24.1		B	DAO	90	19	10	4
7620	28003	MWIL	11	23	1545	N05	E04	11	23.9	5	(B)					
7620		HOLL	11	23	1720	N05	E05	11	24.1		B	DSI	100	23	10	2
7620		PALE	11	23	2130	N04	E03	11	24.1		B	ESI	150	22	11	3
7620		LEAR	11	24	0010	N04	E03	11	24.2		B	DSO	180	18	10	3
7620		SVTO	11	24	1115	N06	W05	11	24.1		B	EKO	360	15	11	1
7620		RAMY	11	24	1210	N05	W05	11	24.1		B	EAI	260	36	12	4
7620	28003	MWIL	11	24	1530	N05	W05	11	24.3	4	(BG)					
7620		PALE	11	24	1805	N05	W08	11	24.1		BG	ESI	210	33	12	3
7620		LEAR	11	25	0010	N05	W12	11	24.1		B	ESI	270	21	12	3
7620		SVTO	11	25	1015	N04	W18	11	24.1		B	DSO	220	12	10	1
7620		RAMY	11	25	1320	N05	W21	11	24.0		B	EAI	260	53	13	4
7620	28003	MWIL	11	25	1530	N04	W22	11	24.0	5	(BG)					

S U N S P O T G R O U P S
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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
7620		BOUL	11	25	1540	N05	W22	11	24.0		B	DSI	210	9	10	1
7620		HOLL	11	25	1632	N05	W23	11	24.0		B	CSI	210	28	12	3
7620		PALE	11	25	1820	N04	W22	11	24.1		B	ESI	190	39	12	3
7620		LEAR	11	26	0005	N04	W27	11	24.0		B	ESI	350	20	12	3
7620	28003	MWIL	11	26	1530	N04	W37	11	23.9	5	(BG)					
7620		HOLL	11	26	1617	N04	W36	11	24.0		B	EHI	250	15	12	3
7620		PALE	11	26	1815	N04	W38	11	23.9		B	ESI	220	14	12	2
7620		RAMY	11	26	2100	N02	W39	11	24.0		B	ESI	280	13	12	1
7620		LEAR	11	27	0033	N05	W40	11	24.0		B	CSO	160	19	12	3
7620		RAMY	11	27	1135	N02	W46	11	24.0		B	EAO	220	18	11	4
7620	28003	MWIL	11	27	1630	N04	W51	11	23.9	4	(B)					
7620		HOLL	11	27	1647	N04	W50	11	24.0		B	EAI	210	16	12	3
7620		PALE	11	27	2035	N03	W52	11	24.0		B	ESO	130	14	11	1
7620		LEAR	11	28	0100	N04	W55	11	23.9		B	ESO	300	13	12	2
7620		RAMY	11	28	1249	N02	W60	11	24.0		B	CAO	240	9	11	3
7620		BOUL	11	28	1540	N03	W63	11	23.9		B	CSO	80	3	3	2
7620		HOLL	11	28	2048	N06	W66	11	23.9		B	CAO	120	6	12	3
7620	28003	MWIL	11	28	2200	N05	W68	11	23.8	4	(B)					
7620		LEAR	11	29	0100	N05	W71	11	23.7		A	HA	200	1	2	3
7620		SVTO	11	29	0828	N04	W70	11	24.1		A	HA	60	1	1	2
7620		RAMY	11	29	1222	N03	W79	11	23.6		A	HH	240	2	1	4
7620		HOLL	11	29	1616	N06	W83	11	23.5		A	HS	120	1	2	3
7620	28003	MWIL	11	29	1645	N05	W80	11	23.7	5	(AP)					
7620		BOUL	11	29	1648	N04	W76	11	24.0		A	HS	90	1	2	2
7620		PALE	11	29	1910	N03	W82	11	23.7		A	HS	60	1	2	3
7620		LEAR	11	30	0035	N05	W85	11	23.7		A	HS	60	1	5	3
7621		RAMY	11	20	1539	S08	E54	11	24.7		A	AX	20	1	1	2
7621	28004	MWIL	11	20	1545	S11	E53	11	24.6	4	(AP)					
7621		PALE	11	20	1815	S10	E51	11	24.6		A	AX	10	1		3
7621		HOLL	11	20	2000	S12	E52	11	24.7		A	AX	10	1		3
7621		LEAR	11	21	0013	S10	E47	11	24.5		A	AX	10	1		3
7621		RAMY	11	21	1205	S08	E42	11	24.6		A	AX		1		4
7628		RAMY	11	30	1215	S21	W51	11	26.6		B	BXO	10	2	2	4
7628		PALE	11	30	1830	S22	W57	11	26.4		A	AX	20	1	1	3
7628		SVTO	12	01	1040	S22	W65	11	26.5		A	HA	20	1	3	1
7628		RAMY	12	01	1256	S21	W67	11	26.5		B	BXO	20	3	3	3
7628		PALE	12	01	1900	S21	W74	11	26.2		A	AX	10	1	1	2
7628		PALE	12	02	1827	S21	W88	11	26.1		A	AX	20	1	1	2
7622		LEAR	11	21	0013	N12	E80	11	27.0		A	HS	30	1	1	3
7622		RAMY	11	21	1205	N15	E76	11	27.2		A	HA	30	1	2	4
7622		SVTO	11	21	1316	N13	E78	11	27.4		A	HS	10	1	1	1
7622		BOUL	11	21	1600	N13	E79	11	27.6		A	AX	10	1		3
7622		HOLL	11	21	1740	N11	E74	11	27.3		A	HS	50	1	1	3
7622		PALE	11	21	1908	N13	E76	11	27.5		A	HS	60	1	1	3
7622		LEAR	11	22	0019	N12	E72	11	27.4		A	HA	60	1	1	3
7622		RAMY	11	22	1258	N14	E68	11	27.7		B	DAO	70	5	10	3
7622		BOUL	11	22	1552	N13	E65	11	27.6		B	CAO	80	5	8	3
7622		HOLL	11	22	1611	N12	E63	11	27.4		B	DSO	40	4	8	3
7622		PALE	11	22	2045	N12	E61	11	27.5		B	DSO	70	5	7	3
7622		LEAR	11	23	0305	N12	E58	11	27.5		B	CSO	90	10	8	3
7622		SVTO	11	23	1031	N15	E55	11	27.6		B	DAO	100	7	6	3
7622		RAMY	11	23	1250	N15	E53	11	27.5		B	DAO	70	7	7	4
7622	28005	MWIL	11	23	1545	N12	E51	11	27.5	5	(B)					
7622		HOLL	11	23	1720	N11	E51	11	27.5		B	CSO	60	7	6	2
7622		PALE	11	23	2130	N13	E50	11	27.7		B	DSO	40	4	6	3
7622		LEAR	11	24	0010	N12	E49	11	27.7		B	CAO	100	6	6	3
7622		SVTO	11	24	1115	N13	E41	11	27.6		B	DSO	70	7	5	1
7622		RAMY	11	24	1210	N13	E41	11	27.6		B	CAO	90	17	5	4
7622	28005	MWIL	11	24	1530	N12	E39	11	27.6	4	(B)					
7622		PALE	11	24	1805	N13	E37	11	27.5		B	CSO	60	9	6	3
7622		LEAR	11	25	0010	N13	E34	11	27.6		B	CAO	50	4	6	3
7622		SVTO	11	25	1015	N15	E29	11	27.6		B	CSO	30	6	5	1
7622		RAMY	11	25	1320	N13	E27	11	27.6		B	CSO	40	13	6	4
7622	28005	MWIL	11	25	1530	N13	E25	11	27.5	4	(BP)					
7622		BOUL	11	25	1540	N13	E22	11	27.3		A	HS	30	1	1	1
7622		HOLL	11	25	1632	N13	E25	11	27.6		B	CAO	40	7	5	3

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7622		PALE	11	25	1820	N13	E23	11	27.5		B	CSO	60	6	5	3
7622		LEAR	11	26	0005	N13	E17	11	27.3		B	CSO	60	2	2	3
7622	28005	MWIL	11	26	1530	N13	E12	11	27.5	4	(B)					
7622		HOLL	11	26	1617	N12	E11	11	27.5		B	CSO	30	5	4	3
7622		PALE	11	26	1815	N13	E09	11	27.4		A	AX	10	2	1	2
7622		RAMY	11	26	2100	N13	E08	11	27.5		B	CRO	30	5	4	1
7622		LEAR	11	27	0033	N12	E06	11	27.5		A	AX	10	2	2	3
7622		RAMY	11	27	1135	N12	W01	11	27.4		B	BXO	10	5	3	4
7622	28005	MWIL	11	27	1630	N12	W03	11	27.5	3	(AP)					
7622		HOLL	11	27	1647	N12	W03	11	27.5		A	HS	10	3	2	3
7622		PALE	11	27	2035	N12	W06	11	27.4		A	AX	10	1		1
7622		LEAR	11	28	0100	N12	W08	11	27.4		A	AX	10	1	1	2
7622		RAMY	11	28	1249	N13	W13	11	27.5		B	BXO	10	4	3	3
7622		HOLL	11	28	2048	N15	W18	11	27.5		A	AX	10	4	2	3
7622	28005	MWIL	11	28	2200	N14	W18	11	27.5	3	(B)					
7622		LEAR	11	29	0100	N14	W21	11	27.4		A	AX	10	2	2	3
7624		RAMY	11	28	1249	N03	E19	11	29.9		B	CRO	10	5	3	3
7624		BOUL	11	28	1540	N03	E18	11	30.0		B	BXO	20	3	3	2
7624		HOLL	11	28	2048	N03	E16	11	30.1		B	BXO	20	7	4	3
7624	28007	MWIL	11	28	2200	N03	E14	11	30.0	5	(B)					
7624		LEAR	11	29	0100	N03	E13	11	30.0		B	CSO	30	5	4	3
7624		SVTO	11	29	0828	N03	E09	11	30.0		B	DSO	40	6	6	2
7624		RAMY	11	29	1222	N02	E06	11	30.0		B	CRO	30	10	6	4
7624		HOLL	11	29	1616	N04	E04	11	30.0		B	BXO	20	7	6	3
7624	28007	MWIL	11	29	1645	N03	E02	11	29.8	4	(B)					
7624		BOUL	11	29	1648	N03	E08	11	30.3		B	BXO	10	5	4	2
7624		PALE	11	29	1910	N03	E03	11	30.0		B	CSI	20	17	7	3
7624		LEAR	11	30	0035	N02	W01	11	29.9		B	CRO	50	10	5	3
7624		RAMY	11	30	1215	N03	W07	11	30.0		B	DAO	100	26	6	4
7624	28007	MWIL	11	30	1545	N03	W10	11	29.9	5	(B)					
7624		HOLL	11	30	1557	N03	W11	11	29.8		B	DAI	90	22	7	3
7624		PALE	11	30	1830	N03	W11	11	29.9		BG	CSO	100	30	7	3
7624		LEAR	12	01	0100	N03	W15	11	30.0		B	DAO	180	18	8	3
7624		SVTO	12	01	1040	N02	W22	11	29.9		B	DHO	360	10	10	1
7624		RAMY	12	01	1256	N03	W23	11	29.9		B	DAO	310	36	10	3
7624	28007	MWIL	12	01	1545	N04	W25	11	29.9	5	(B)					
7624		BOUL	12	01	1729	N04	W25	11	29.9		B	DAO	270	17	10	1
7624		PALE	12	01	1900	N04	W25	11	30.0		B	DHO	310	27	10	2
7624		HOLL	12	01	2217	N06	W27	11	30.0		B	DAI	90	30	9	1
7624		LEAR	12	02	0018	N04	W29	11	29.9		B	DAO	210	26	9	3
7624		RAMY	12	02	1251	N03	W37	11	29.9		B	EAO	270	33	12	3
7624		BOUL	12	02	1556	N04	W38	11	29.9		B	EAO	410	12	11	1
7624	28007	MWIL	12	02	1645	N05	W39	11	29.9	5	(B)					
7624		PALE	12	02	1827	N03	W40	11	29.9		B	ESO	220	23	11	2
7624		HOLL	12	02	1955	N05	W40	11	29.9		B	DSO	250	19	10	2
7624		LEAR	12	03	0020	N04	W43	11	29.9		B	CAO	200	10	10	3
7624		RAMY	12	03	1331	N03	W50	11	29.9		B	EAO	220	9	13	3
7624		HOLL	12	03	1530	N04	W51	11	29.9		B	EHO	290	6	12	3
7624		BOUL	12	03	1541	N04	W50	11	30.0		B	EAO	280	5	11	2
7624	28007	MWIL	12	03	1545	N04	W53	11	29.8	5	(BP)					
7624		PALE	12	03	2002	N03	W52	11	30.0		B	CSO	140	4	11	1
7624		LEAR	12	04	0009	N04	W56	11	29.9		B	CSO	190	9	12	3
7624		SVTO	12	04	1110	N03	W64	11	29.8		B	CAO	160	3	12	2
7624		RAMY	12	04	1408	N03	W63	11	30.0		B	EAO	180	4	11	4
7624	28007	MWIL	12	04	1530	N04	W66	11	29.8	5	(BP)					
7624		BOUL	12	04	1545	N04	W63	11	30.0		A	HS	120	1	2	2
7624		PALE	12	04	2343	N03	W71	11	29.8		B	CSO	160	3	12	2
7624		LEAR	12	05	0150	N05	W75	11	29.6		A	HS	180	1	2	3
7624		RAMY	12	05	1322	N03	W76	11	30.0		A	HS	180	1	2	4
7624	28007	MWIL	12	05	1545	N04	W83	11	29.5	5	(AP)					
7624		HOLL	12	05	1945	N06	W78	11	30.0		A	HS	180	1	9	3
7625		RAMY	11	28	1249	S14	E21	11	30.1		B	BXO	20	8	3	3
7625		BOUL	11	28	1540	S14	E18	11	30.0		B	CRO	20	3	4	2
7625		HOLL	11	28	2048	S15	E16	11	30.1		B	CRO	30	8	5	3
7625	28008	MWIL	11	28	2200	S15	E15	11	30.0	4	(B)					
7625		LEAR	11	29	0100	S16	E13	11	30.0		B	DSO	50	11	4	3
7625		SVTO	11	29	0828	S15	E09	11	30.0		B	DSO	60	8	6	2

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

NOVEMBER 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
7625		RAMY	11	29	1222	S14	E08	11	30.1		B	CRO	70	20	7	4
7625		HOLL	11	29	1616	S14	E04	11	30.0		B	BXI	40	13	6	3
7625	28008	MWIL	11	29	1645	S15	E04	11	30.0	4	(B)					
7625		BOUL	11	29	1648	S14	E04	11	30.0		B	BXO	40	12	6	2
7625		PALE	11	29	1910	S15	E04	11	30.1		B	DSI	50	22	6	3
7625		LEAR	11	30	0035	S15	E00	11	30.0		B	DAO	70	13	6	3
7625		RAMY	11	30	1215	S14	W06	11	30.0		B	DAO	70	19	7	4
7625	28008	MWIL	11	30	1545	S15	W08	11	30.0	4	(B)					
7625		HOLL	11	30	1557	S14	W10	11	29.9		B	DAO	50	10	8	3
7625		PALE	11	30	1830	S15	W09	11	30.1		B	BXO	50	16	6	3
7625		LEAR	12	01	0100	S15	W13	11	30.0		B	DAO	80	11	8	3
7625		SVTO	12	01	1040	S15	W18	11	30.1		B	DRO	70	6	6	1
7625		RAMY	12	01	1256	S14	W20	11	30.0		B	BXO	20	9	7	3
7625	28008	MWIL	12	01	1545	S14	W22	11	30.0	4	(B)					
7625		PALE	12	01	1900	S14	W23	11	30.0		B	BXO	30	3	5	2
7625		HOLL	12	01	2217	S12	W25	11	30.0		B	BXO	10	4	6	1
7625		LEAR	12	02	0018	S14	W27	11	30.0		B	BXO	10	2	4	3
7625		RAMY	12	02	1251	S14	W34	11	30.0		B	BXO	10	3	4	3
7625		LEAR	12	03	0020	S16	W38	11	30.1		A	AX	10	2	2	3
7625		RAMY	12	03	1331	S16	W45	11	30.1		A	AX	10	2	2	3
7625		HOLL	12	03	1530	S15	W46	11	30.2		A	AX	10	1	1	3
7625	28008	MWIL	12	03	1545	S15	W46	11	30.2	4	(AF)					
7625		LEAR	12	04	0009	S15	W50	11	30.2		A	AX	10	2	1	3
7626		RAMY	11	29	1222	N29	E18	11	30.9		B	BXO	10	4	4	4
7626		HOLL	11	29	1616	N28	E16	11	30.9		B	BXO	20	3	3	3
7626		PALE	11	29	1910	N26	E14	11	30.9		A	HS	10	2	2	3
7626		LEAR	11	30	0035	N27	E12	11	30.9		A	AX	10	1		3

Stations reporting:

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

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 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	0819	0835	0955	2	3		2				No flare		
01	0827	0916	0940	1	1		1				No flare		
01	1119	1122	1139	1	1						1116	B3.8	7613
01	1237	1237	1245	1-	1					1	1236	B3.0	7613
01	1545	1555	1605	1	1					1	1545	B6.4	
02	0557	0607	0650	1-	1			1			No flare		
02	0741	0745	0827	1	1		1				No flare		
02	0834	0838	0852	1	1		1				No flare		
02	1000	1007	1048	1	1		3				*		
02	1100	1109	1206	1	1		1				No flare		
02	1220	1231U	1242	1	1		1				No flare		
02	1325	1333	1348	1	1		1				No flare		
03	0722	0727	0749	1	1		1				*		
03	1026	1033	1053	1	3		2				*		
03	1233	1248	1301D	1-	1			1			No flare		
03	1301E	1308	1345	1-	1			1			No flare		
04	0217	0233	0233D	1-	1			1			0201	C2.5	
04	0812	0820	0837	1	1		1				*		
04	1056	1105	1130	1	3		2				No flare		
04	1138	1145	1151	1-	5					3	No flare		
04	1227	1229	1242	1-	3					2	1229E		7613
04	1320	1348	1418	1+	1		1				No flare		
04	2123	2125	2146	1	3					2	2124	B6.5	7613
07	1213	1231	1308	1	3		2				No flare		
08	0738	0748	0808	1	3		2				No flare		
08	1104	1115	1150	1	1		1				No flare		
08	2155	2200	2224	1+	3					2	2154	B5.7	7617
10	1535	1540	1555	1	1					1	1536	B2.1	
10	2135	2136	2145	1-	1					1	2134	B1.7	
11	1114	1131	1218	2	5	1	1	1		3	1100	C9.7	
11	1451	1455	1504	1-	1					1	1441	B8.4	
11	1700	1702	1724D	1	1					1	1700	B5.3	
11	1726	1733	1802	1	3					7	1726	C1.7	
11	1915	1916	1930U	1-	1					1	1913	B3.1	
12	0024	0029	0045	1	3					2	0025	B8.8	
12	0218	0233	0508	3-	5			1		1	0221	M2.0	
12	0833	0838	0856	1-	5			1		1	0829	C1.6	
12	0919	0933	1000	1	3		2				*		
12	1601	1610	1655	2-	5					5	*		
12	1756	1800	1819	1-	3					5	1757	C3.5	7618
12	1943	1945	1955	1-	3					2	1942	C1.3	
12	1958	2005	2013	1-	5			1		5	1955	C3.7	7618
12	2041	2043	2057	1-	3					3	2045	C2.1	
12	2200	2204	2214	1-	5			1		1	2201E	C2.2	7618
12	2255	2306	2320D	1-	5			1		1	2256	C3.0	7618
12	2320E	2326	2402	1-	1			1			2318	C1.5	
13	0014	0022	0038	1-	5			1		1	0011	C2.0	
13	0102	0110	0127	1-	5			1		1	0057	C1.5	
13	0158	0204	0222	1-	1			1			0155	C1.2	
13	0236	0245	0314	1+	5			1		1	0234	C3.2	
13	0411	0422	0542	3-	5			1		1	0410	M1.1	
13	0612	0645	0753D	3	5		1	1			0624	M2.1	7618
13	0752E	0758	0900	2	5		1	1		1	0752	C8.3	
13	0933	0939	0959	1-	5			1		1	0928	C3.1	7618
13	1002	1011	1027	1-	1			1		1	1000	C2.3	
13	1033	1034	1107	1+	1					1	1025	C1.7	
13	1527	1531	1602	1+	5					4	1529	C5.8	7618
13	1530	1605	1625	1-	1			1			1529	C5.8	7618

* = no flare patrol.

NOVEMBER 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
13	1738	1741	1752	1-	3					7	1738	C1.1	7618
13	2104	2110	2123	1-	1			1			No flare		
14	0036	0102	0153	1-	1			1			0103		7618
14	0408	0429	0500	1-	1			1			0405	B6.7	
14	0939	1003	1041	1	1		1				0934	B2.2	
14	1332	1345	1404	1	1		1				No flare		
14	1532	1542	1555	1	1		1				No flare		
14	1659	1703	1724	1-	1					3	1659	C1.2	7618
14	1824	1825	1839	1-	1					1	1824	B4.1	7618
14	2128	2131	2141	1-	1					1	2128	B1.9	
15	0914	0923	0942	1	3		2				No flare		
15	1702	1709	1729	1+	1					1	1702	B6.9	
15	2328	2330	2348	1	1					1	2325	B3.0	
16	0928	0930	0938	1-	1					1	0929	B4.2	
18	1329	1333	1356	1-	1					1	1329	C1.6	7618
18	1659	1702	1729	1-	3					6	1654	C1.5	
18	1932	1953	2215	3	1					1	1928	C1.4	
19	0659	0710	0805	1	3		2				0710	B8.9	
19	0715	0739	0815U	2+	1					1	0710	B8.9	
19	1018	1034	1111	1	3		2				*		
19	1300	1314	1347	2	1		1				*		
19	1345	1352	1446	1	1		1				No flare		
19	1402	1413	1438	1	1		1				No flare		
19	1900	2000	2058	3	1					1	1845	B9.8	
20	0018	0033	0152	1+	5			1		1	0014	C5.2	
20	0354	0409	0435	1-	1			1			0345	C1.3	7618
20	0825	0840	0944	2-	3		2				No flare		
20	1954	2005	2039	2	1					1	1935	B5.7	
22	0307	0310	0328	1	1					1	0307	B3.9	
22	0953	0955	1005	1-	1					1	0953	B2.9	
22	1206	1242	1316	1+	3		3				*		
22	1447	1450	1500	1-	1					1	1446	B2.5	
22	2323	2326	2400	2	1					1	2321	B3.7	
23	0815	0816	0830	1-	1					1	0816	B3.3	7618
23	1026	1044	1155	1	1		1				No flare		
24	0827	0844	0936	1	1		1				No flare		
24	0940	0945	1003	1	1					1	0940	B5.6	
24	1316	1317	1330	1-	1					1	1313	B6.4	
24	1852	1854	1914	1	3					3	1853	C1.0	7618
24	2344	2345	0007	1	1					1	2346	B8.4	7620
25	0347	0403	0443	1-	1			1			0343	C2.6	
25	0617	0624	0700	1-	1			1			0614	C5.7	
25	0810	0820	0835	1-	1			1			0808	C2.1	7620
25	0908	0916	0938	1-	1			1			0834	C1.9	7620
25	1858	1905	1930	1+	1					1	No flare		
25	2023	2026	2052	1+	1					1	2023	C1.8	7620
26	1117	1122	1145	1+	1					1	1117	B3.8	
26	1200	1210	1215	1-	1					1	1150	B4.3	
26	1417	1420	1445	1	1					1	*		
26	1600	1605	1628	1-	3					6	1602	C2.1	
26	1707	1710	1742	1	3					5	1708	C1.2	7620
29	0323	0333	0409	1-	1			1			0321	C1.1	
29	0725	0729	0740	1-	3					2	0728	B3.8	7623
29	1007	1012	1031	1	3					2	1007	C1.1	

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 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
29	1511	1515	1519	1-	1					1	1511	B6.2	
29	1732	1735	1759	1+	3					2	1732	B4.3	
29	1903	1909	1916	1-	3					3	1903	C1.2	
29	2311	2320	2357	1-	5			1		1	2259	C2.1	
30	0426	0434	0449	1-	1			1			No flare		
30	0603	0611	0712	2-	1			1			0600	C9.2	

* = no flare patrol.

OBSERVATORIES REPORTING FOR NOVEMBER 1993

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

Observations are not necessarily continuous.

SOLAR RADIO EMISSION
Spectral Observations

NOVEMBER 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
01		PALE				0044.0	0045.0	2				III
		LEAR				0131.0	0133.0	2				III
		PALE				0131.0	0131.0	2				III
		LEAR				0308.0	0311.0	3				III
		PALE				0309.0	0309.0	2				III
		LEAR				0321.0	0331.0	2				III
		LEAR				0416.0	0447.0	3				S
		LEAR				0617.0	0617.0	1				III
		SVTO				0617.0	0636.0	1				S
		LEAR				0626.0	0640.0	2				S
0700	1200	IZMI				0700.0E	1200.0D	2				IS,CONT
0700	1433	POTS				0700.0E	1433.0U	2				I,S,C,DC
		LEAR				0704.0	0705.0	2				III
		IZMI				0704.7	0705.1	2				IIIG
		IZMI				0711.3	0712.2	1				IIIG
		IZMI				0717.0	0719.8	2				IIIGG
		POTS				0717.0	0738.2	3				IIIGG
		IZMI				0720.0	0726.5	2				IIIGG
		LEAR				0720.0	0743.0	3				S
		SVTO				0721.0	0735.0	2				S
		IZMI				0722.2	0725.0	3				IIIG,V
0708	1417	ONDR	0722.3	0722.8	1	0710.E	0759.D	1				IN
		IZMI				0729.3	0728.1	2				IIIG,SP
		IZMI				0730.9	0731.9	2				IIIG
		IZMI				0734.8	0735.5	2				IIIG
		IZMI				0738.1	0739.5	1				IIIG
		IZMI				0743.5	0743.7	1				IIIG
		SVTO				0826.0	0851.0	2				S
		IZMI				0829.4	0829.5	2				III
		LEAR				0838.0	0851.0	2				S
		IZMI				0838.8	0839.8	2				IIIG
		POTS				0838.9	0840.0	2				IIIG
		IZMI				0851.0	0851.3	1				IIIG
		POTS				0851.1	0851.3	1				IIIB
0844	1401	ONDR				0852.2	0934.0	1				IN
		IZMI				0900.4	0901.4	2				IIIG
		IZMI				0906.5	0907.0	1				IIIG,Z
		IZMI				0911.5	0912.3	2				IIIG
		POTS				0911.5	0912.5	2				IIIG
		IZMI				0937.3	0940.7	2				IIIGG
		POTS				0939.2	0939.9	2				IIIG
		IZMI				0948.0	0950.1	2				IIIGG
		POTS				0948.1	0948.9	2				IIIGG
		IZMI				1025.7	1026.5	2				IIIG
		POTS				1025.8	1046.2	3				IIIGG
		IZMI				1034.6	1037.3	1				IIIGG
		IZMI				1038.2	1042.2	3				IIIGG
		SVTO				1040.0	1041.0	2				III
0844	1401	ONDR	1040.1	1042.0	2	1026.1	1300.U	2				IN
		IZMI				1044.7	1046.2	2				IIIG
		IZMI				1050.4	1051.2	1				IIIG
		IZMI				1101.5	1101.7	1				IIIG
		IZMI				1110.0	1110.9	1				IIIG
		SVTO				1114.0	1115.0	2				III
		IZMI				1114.2	1116.5	2				IIIGG
		POTS				1114.2	1129.5	2				IIIGG
		IZMI				1119.2	1126.8	2				IIIGG
		IZMI				1130.5	1136.5	1				IIIG,W
		POTS				1325.9	1326.1	2				IIIG
		POTS				1400.5	1400.6	2				IIIB
		POTS				1404.5	1404.8	2				IIIG
		SGMR				1549.0	1552.0	/				V
		SGMR				1626.0	1707.0	/				CONT
		PALE				1958.0	2318.0	1				CONT
		LEAR				2222.0	0543.0	2				CONT
		LEAR				2329.0	2330.0	2				III
		PALE				2338.0	0143.0	1				S
02		LEAR				0311.0	0316.0	3				V

SOLAR RADIO EMISSION
Spectral Observations

NOVEMBER 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
02			PALE				0311.0	0317.0	2				III
			LEAR				0319.0	0321.0	3				III
			LEAR				0528.0	0529.0	3				III
	0700	1200	IZMI				0700.0E	1200.0D	1				IS
			IZMI				0701.6	0702.0	2				IIIG
			IZMI				0702.2	0702.5	1				IIIG
			IZMI				0743.3	0743.4	2				III
			IZMI				0756.4	0757.1	2				IIIG
			LEAR				0757.0	1017.0	2				S
			IZMI				0805.1	0806.0	2				IIIG
			IZMI				0809.3	0809.5	2				IIIG
			IZMI				0811.7	0817.7	3				IIIGG
			IZMI				0828.2	0839.1	2				IIIGG
			IZMI				0840.9	0852.0	2				IIIGG
	0710	1414	ONDR	0842.4	0842.9	2	0756.0	1403.D	2				IN
			IZMI				0908.5	0914.0	2				IIIGG
			IZMI				0921.7	0922.3	2				IIIG
			IZMI				0935.3	0937.7	2				IIIG
			IZMI				0940.2	0940.5	1				IIIG
			IZMI				1045.9	1049.3	1				IIIG
			IZMI				1146.6	1147.9	1				IIIG
	0710	1414	ONDR	1313.7	1415.3	1						IV	P
			SGMR				1526.0	1526.0	/				III
03			LEAR				0012.0	0013.0	2				III
			PALE				0012.0	0013.0	1				III
			LEAR				0035.0	0036.0	3				III
			PALE				0035.0	0036.0	2				III
			LEAR				0054.0	0054.0	2				III
			LEAR				0133.0	0134.0	2				III
			LEAR				0156.0	0157.0	1				III
			LEAR				0227.0	0231.0	2				III
			LEAR				0336.0	0336.0	2				III
			LEAR				0423.0	0423.0	1				III
			LEAR				0607.0	0611.0	3				III
			SVTO				0607.0	0607.0	2				III
			LEAR				0641.0	0641.0	1				III
			LEAR				0651.0	0651.0	1				III
	0650	1415	ONDR				0713.E	1402.D	2				IN
	0700	1200	IZMI				0716.8	0719.0	2				IIIG
			LEAR				0717.0	0719.0	2				III
			IZMI				0910.8	1200.0D	1				IN
			IZMI				1045.9	1200.0D	1				IIIN
			IZMI				1047.5	1049.8	2				IIIG
			IZMI				1122.2	1122.3	2				IIIB
			IZMI				1137.7	1137.8	2				IIIB
			SGMR				1434.0	1434.0	/				III
			PALE				1938.0	1938.0	1				III
			PALE				1944.0	1944.0	1				III
04			LEAR				0212.0	0216.0	2				III
			PALE				0212.0	0240.0	1				S
			LEAR				0223.0	0224.0	2				III
			LEAR				0232.0	0414.0	2				S
			LEAR				0309.0	0313.0	2				III
			LEAR				0449.0	0453.0	2				III
			LEAR				0620.0	0620.0	2				III
			SVTO				0620.0	0620.0	3				III
	0637	1412	ONDR										
			LEAR				0731.0	0732.0	1				III
	0700	1200	IZMI				0751.8	0732.3	1				IIIG
			IZMI				0954.4	0954.6	1				IIIG
			IZMI				1111.8	1200.0	1				IN
			IZMI				1122.4	1122.7	2				IIIG
			IZMI				1126.9	1127.2	2				IIIG
			IZMI				1145.9	1146.4	3				IIIG
			SGMR				1146.0	1146.0	/				III
			SVTO				1146.0	1154.0	2				III
			IZMI				1152.5	1154.3	2				IIIG

SOLAR RADIO EMISSION
Spectral Observations

NOVEMBER 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
04			SGMR				1350.0	1350.0	/				III
05			LEAR				0001.0	0005.0	1				III
			IZMI				0700.0	0801.5	1				CONT
	0700	1200	IZMI				0700.0E	1200.0D	1				IS
	0716	1410	ONDR										
			PALE				2027.0	2035.0	2				III
06	0718	1407	ONDR				0724.E	1000.U	1				IN
07	0720	1406	ONDR				0730.0	1100.U	1				IN
			SGMR				1249.0	1250.0	/				III
			SGMR				1505.0	1505.0	/				III
			LEAR				2334.0	2334.0	2				III
			PALE				2334.0	2334.0	1				III
			LEAR				2339.0	2340.0	2				III
08			LEAR				0225.0	0225.0	1				III
			LEAR				0259.0	0300.0	2				III
	0700	1200	IZMI				0700.0E	0730.0	1				IN
	0722	1405	ONDR										
			IZMI				0901.4	0903.5	2				IIIG
			LEAR				0902.0	0902.0	1				III
			POTS				0945.0E	1412.0U	1				I,S,DC
	0945	1412	POTS				0945.0E	0947.8	2				IIIGG
			IZMI				0945.3	0947.7	3				IIIG
			LEAR				0947.0	0947.0	2				III
			SVTO				0947.0	0947.0	2				III
			POTS				1224.6	1224.7	1				IIIB
			POTS				1252.3	1252.7	1				RS
			POTS				1256.5	1256.6	1				111B
			POTS				1321.8	1322.5	3				IIIG
			POTS				1334.8	1337.9	1				IIIG
			POTS				1345.0	1345.1	1				IIIB
			LEAR				2212.0	2213.0	2				III
09	0700	1433	POTS				0700.0E	1433.0U	1				I,S,C,DC
			POTS				0737.2	0737.3	1				IIIB
	0700	1200	IZMI				0820.0	1200.0	3				IS,C
			POTS				0832.9	0833.0	1				IIIB
			POTS				1003.9	1004.0	1				IIIB
	0758	1401	ONDR	1022.5	1025.5	1							IIIGG
	0758	1401	ONDR	1039.2	1043.9	1							IIIGG
			POTS	1043.1	1043.2	1							DCIM
			POTS				1043.4	1043.5	2				IIIB
10	0700	1200	IZMI				0700.0E	1200.0D	2				IS,C
	0727	1359	ONDR										
			PALE				2036.0	2036.0	1				III
11	0700	1200	IZMI				0700.0E	1200.0D	1				IS
	0721	1424	POTS				0721.0E	1424.0U	1				I,S
	0729	1359	ONDR										
			SVTO				1045.0	1045.0	3				III
			POTS				1103.41	1035.0	1				IIIB
			POTS	1117.4	1117.5	1							DCIM
			POTS				1318.8	1318.9	1				IIIB
			SVTO				1450.0	1451.0	3				III
			LEAR				2237.0	2238.0	2				III
			PALE				2237.0	2238.0	2				III
12			LEAR				0120.0	0124.0	1				III
			LEAR				0226.0	0236.0	1				II 1600km/s
	0721	1424	POTS				0726.9	0727.0	2				IIIG
	0731	1357	ONDR	0834.0	0835.0	1							IIIG
			POTS				1026.5	1026.6	1				IIIB
			POTS				1142.0	1424.0U	1				I,S
			PALE				1724.0	1724.0	1				III
			SGMR				1724.0	1724.0	2				III

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

NOVEMBER 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
12			PALE				1803.0	1804.0	1				III
			SGMR				1803.0	1804.0	2				III
			PALE				1815.0	1815.0	1				III
			PALE				1943.0	1944.0	1				III
			PALE				2037.0	2048.0	1				III
			SGMR				2037.0	2037.0	1				III
			PALE				2103.0	2104.0	1				III
			PALE				2131.0	2132.0	2				V
			PALE				2147.0	2153.0	1				III
			LEAR				2159.0	2200.0	2				III
			PALE				2201.0	2203.0	3				V
			LEAR				2305.0	2314.0	2				III
			PALE				2306.0	2314.0	1				III
			LEAR				2340.0	2346.0	2				III
13			LEAR				0013.0	0018.0	3				III
			LEAR				0106.0	0107.0	1				III
	0700	1200	IZMI				0700.0E	1100.0	1				IS
	0736	1356	ONDR	0827.7	0828.2	1							IIIG
	0733	1353	ONDR	0848.5	0849.1	2	0848.5	0849.1	2				IIIG
	0736	1356	ONDR	0932.5	0932.9	2	0932.5	0932.9	2				IIIG
			IZMI				1029.4	1031.1	1				IIIG
			IZMI				1038.0	1041.1	2				IIIG
	0736	1356	ONDR	1038.9	1039.2	1	1038.9	1039.2	1				IIIGG
14	0735	1352	ONDR										
15	0700	1200	IZMI				0700.0E	1200.0D	1				IN
	0721	1424	POTS				0721.0E	1424.0U	1				I,S,DC
	0737	1351	ONDR				0916.0	1030.U	1				IN
16	0740	1347	ONDR										
	0721	1424	POTS				0820.0	0946.0U	1				I,S,DC
			POTS				1234.0U	1424.0U	1				I,S,DC
17	0721	1424	POTS				0721.0E	1424.0U	1				I,S,DC
	0742	1348	ONDR				0751.0	0935.0	2				IN
	0700	1200	IZMI				0756.1	0756.3	2				IIIG
			POTS				0756.1	0756.3	1				IIIG
			IZMI				0800.0	1200.0D	1				IN
			POTS				1051.6	1051.7	1				IIIB
			POTS				1121.5	1121.7	1				IIIG,RS
			POTS				1124.5	1124.8	1				IIIG
			POTS				1128.8	1129.0	1				IIIG
	0744	1349	ONDR				1147.0	1150.0	2				IN
			POTS				1203.1	1203.2	1				IIIG
			POTS				1209.1	1211.2	1				IIIG
			POTS				1326.6	1329.6	1				IIIGG
			LEAR				2206.0	2208.0	3				III
			PALE				2206.0	2209.0	3				V
18	0700	1200	IZMI				0700.0E	1200.0D	1				IN
	0721	1425	POTS				0721.0E	1425.0U	1				I,S
	0744	1345	ONDR				0751.0	1347.D	1				IN
			POTS				0807.8	0811.1	1				IIIG
			POTS				0824.4	0824.5	1				111B
			POTS				1424.2	1424.5	1				IIIG
19	0721	1425	POTS				0721.0E	1425.0U	1				I,S
	0700	1200	IZMI				0739.1	0739.6	1				IIIG
			POTS				0739.1	0739.8	1				IIIG
	0746	1342	ONDR				0748.E	1345.D	1				IN
			IZMI				1038.3	1038.7	1				IIIG
			POTS				1038.3	1040.6	1				IIIG
			POTS				1332.6	1332.7	1				IIIB
			POTS				1403.8	1404.2	1				IIIG
20	0748	1343	ONDR				0750.E	1344.D	1				IN

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

NOVEMBER 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
21	0750	1340	ONDR										
22			LEAR				0309.0	0310.0	2				III
	0736	1409	POTS				0759.1	0801.5	1				I,S
			POTS				0820.0	1409.0U	1				I,S,DC
	0752	1339	ONDR				1038.0	1205.U	1				IN
23	0736	1409	POTS				0736.0E	1409.0U	1				I,S,DC
	0754	1338	ONDR										
24			LEAR				0108.0	0109.0	1				III
			LEAR				0203.0	0204.0	1				III
			PALE				0329.0	0330.0	2				III
	0756	1335	ONDR										
	0736	1409	POTS				1310.8	1315.2	1				IIIG
			POTS				1336.4	1340.4	1				IIIG
25	0700	1200	IZMI				0700.0E	1200.0D	2				IS,C,DC
	0736	1409	POTS				0736.0E	1409.0U	1				I,S,C,DC
	0815	1334	ONDR	0906.E	1300.D	2	0906.E	1300.D	2				IN
			POTS				1231.0	1231.3	1				IIIG
			POTS				1237.9	1239.7	1				IIIG
			POTS				1330.1	1330.3	1				IIIG
			POTS				1335.6	1335.7	1				IIIB
26	0700	1200	IZMI				0700.0E	1200.0D	1				IS
	0736	1409	POTS				0739.3	0739.4	1				IIIG
	0800	1334	ONDR										
			POTS				0815.0U	1409.0U	2				I,S,C,DC
			POTS				0856.2	0856.8	1				IIIG
			POTS				1149.5	1149.6	1				IIIB
			POTS				1221.7	1251.0U	2				IIIGG
27			LEAR				0103.0	0103.0	1				III
	0700	1200	IZMI				0700.0E	1200.0D	1				IN
	0802	1333	ONDR				0804.E	1334.D	1				IN
28	0804	1329	ONDR										
29	0806	1328	ONDR										
	0736	1409	POTS				1040.6	1040.7	2				UNCLF
			POTS				1226.7	1227.4	2				IIIG
			LEAR				2358.0	2358.0	1				III
30	0736	1409	POTS				0808.0U	0814.0U	1				I,S
	0820	1328	ONDR										
			POTS				1003.0	1020.0U	1				I,S
			POTS				1036.0U	1409.0U	1				I,S

The symbols used under the column heading SPECTRAL TYPE have the following definitions:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of burst
C = Underlying continuum (particularly with Type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
SP = SPIKES
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity
DCIM = Fast drift

Stations Reporting:

IZMI = IZMIRAN LEAR = Learmonth ONDR = Ondrejov PALE = Palehua POTS = Potsdam
SGMR = Sagamore Hill SVTO = San Vito

SOLAR RADIO NOISE STORM AT 164 MHZ
FROM NANCAY RADIOHELIOGRAPH

NOVEMBER 1993

DAY	HELIOGRAPHIC POSITIONS MEAN VALUES* E-W	S-N	IMP**	OBSERVING TIME*** START (UT)	END (UT)
02/11/93	-0.53	-0.45	1	0900 E	1440 D
03/11/93	-0.44	-0.31	1	0845 E	1420 D
04/11/93	+0.16	-0.31	1	0850 E	1420 D
08/11/93	+0.85	-0.01	1	0900 E	1340 D
09/11/93	+1.33	-0.14	3	0835 E	1230 D
10/11/93	+1.19	+0.10	1	0840 E	1435 D
10/11/93	+1.53	-0.06	2	0840 E	1435 D
11/11/93	+1.52	-0.10	1	0840 E	1420 D
11/11/93	+1.70	-0.06	1	0840 E	1420 D
13/11/93	-1.42	+0.26	2	0840 E	1045
14/11/93	-0.90	+0.17	1	0830 E	1440 D
15/11/93	-0.94	+0.14	1	0840 E	1420 D
17/11/93	-0.12	+0.07	2	0840 E	1440 D
18/11/93	+0.16	+0.07	2	0840 E	1420 D
19/11/93	+0.45	-0.01	1	0840 E	1425 D
22/11/93	-0.44	+0.11	1	0840 E	1130
26/11/93°	+0.84	-0.01	2	0840 E	1440 D
27/11/93	+0.97	-0.12	1	0850 E	1420 D
30/11/93	+0.22	+0.10	1	0850 E	1420 D

1, 5, 6, 7, 23, 25, 28 : NO DATA

° 26/11/93 FLUX IMPORTANCE 5 AFTER 1230

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)
NOVEMBER 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	4423	7040.3		4077.0	2005.8	3546.7	3518.6
2	4419	7023.6		4074.2	2003.4	3542.5	3514.9
3	4423	7031.1		4070.0	1996.7	3546.3	3512.4
4	4357	6922.4		4077.3	1997.9	3545.3	3504.3
5	4350	6899.1		4029.4	1978.6	3520.5	3492.7
6	4349	6920.6		4016.3	1983.7	3513.3	3490.4
7	4375	6941.2		4036.2	1988.7	3521.3	3497.3
8	4401	6957.9		4043.9	1991.0	3536.3	3502.4
9	4429	6997.7		4060.8	1992.9	3544.7	3505.0
10	4448	7042.3		4082.1	1997.0	3555.3	3521.6
11	4473	7072.1		4111.4	1992.5	3561.5	3529.5
12	4474	7095.1		4136.5	1999.3	3553.5	3536.1
13	4463	7054.0		4131.2	1996.8	3547.0	3542.0
14	4455	7035.6		4127.3	2003.2	3544.3	3542.2
15	4470	7048.2		4122.2	1997.1	3544.7	3540.5
16	4465	7063.3		4123.2	2009.0	3566.8	3553.7
17	4486	7058.6		4105.2	2019.3	3562.0	3543.4
18	4498	7122.9		4148.2	2022.8	3564.2	3553.1
19	4437	7041.7		4108.0	2006.7	3559.3	3538.7
20	4450	7089.8		4100.2	2026.5	3558.1	3528.1
21	4445	7067.2		4094.4	2024.3	3550.6	3527.5
22	4452	7047.2		4092.8	2029.7	3562.4	3521.9
23	4441	7031.8		4088.1	2022.0	3553.3	3511.3
24	4424	7021.8		4086.1	2005.4	3559.8	3503.9
25	4436	7038.7		4088.0	2002.2	3553.9	3502.7
26	4435	7013.2		4084.8	2003.7	3547.5	3510.9
27	4432	7016.3		4082.8	2008.7	3560.6	3525.0
28	4457	7035.6		4073.5	2010.8	3566.7	3529.7
29	4472	7080.8		4091.2	2009.9	3578.9	3538.2
30	4469	7085.9		4099.8	2009.9	3566.1	3538.5
Mean	4436.9	7029.9		4088.7	2004.5	3551.1	3522.6

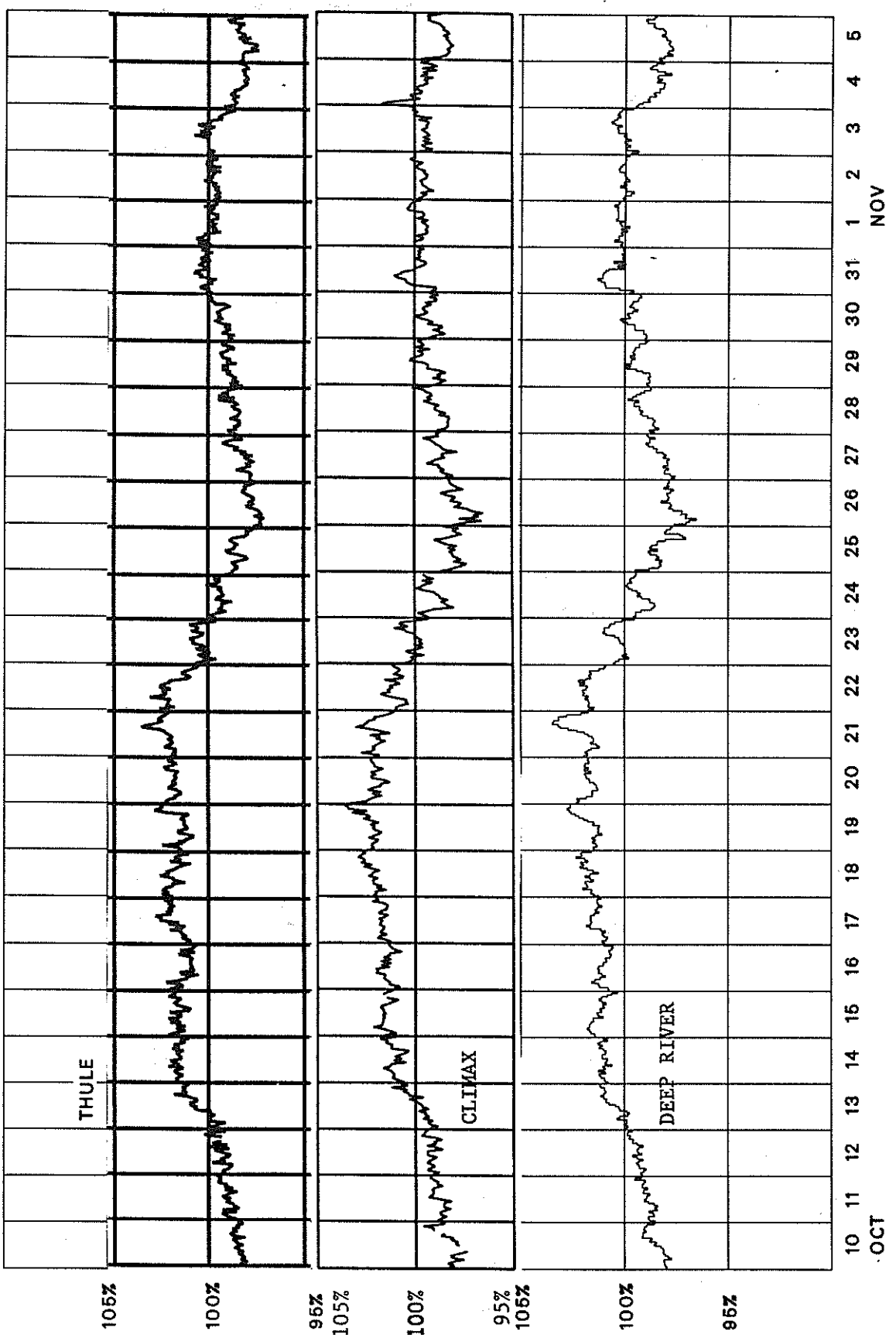
For less than 24-hour coverage, parentheses enclose the number of hours for which data are available. For Climax and Haleakala, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours.

* = 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.

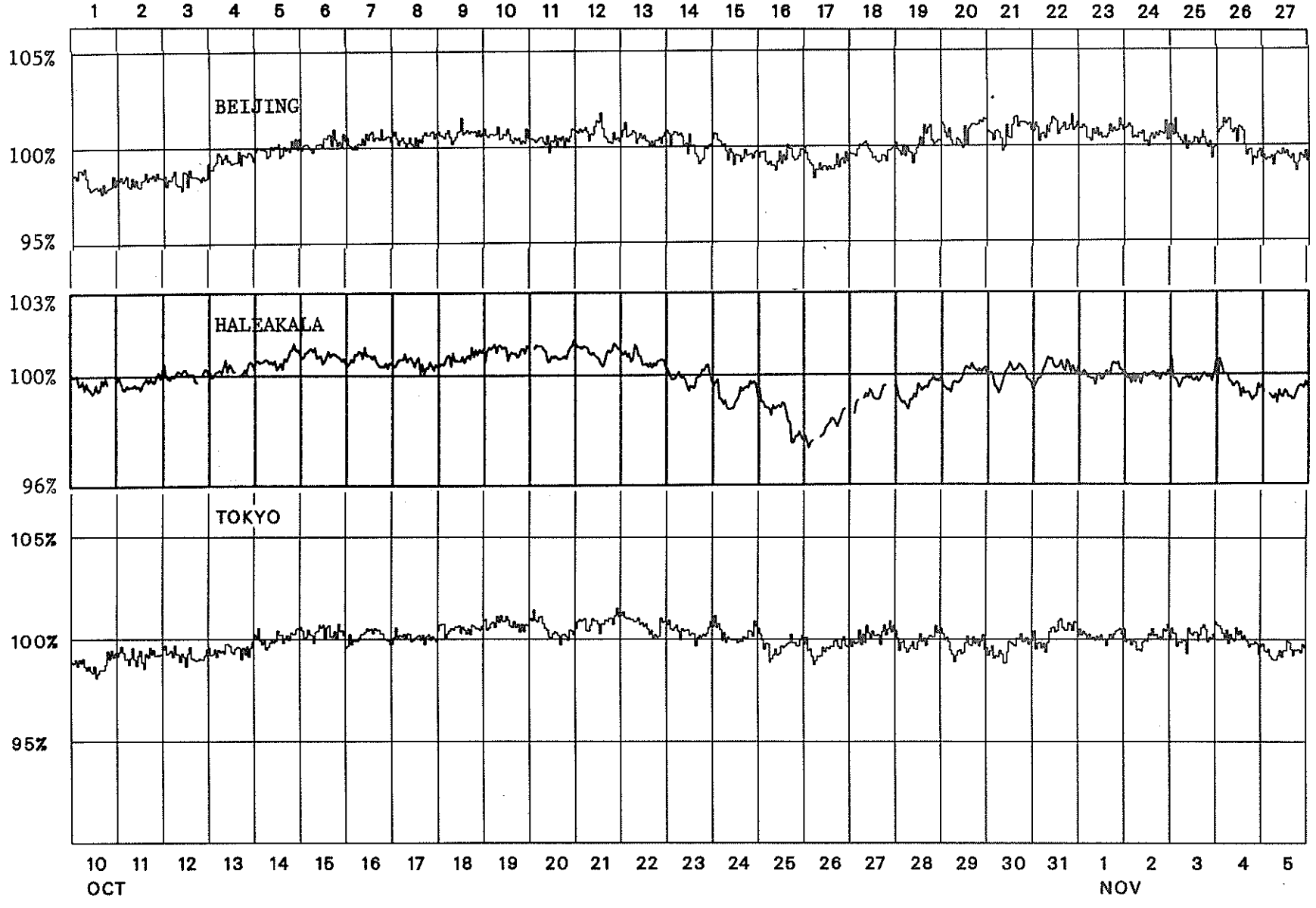
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2188 (October 1993-November 1993)



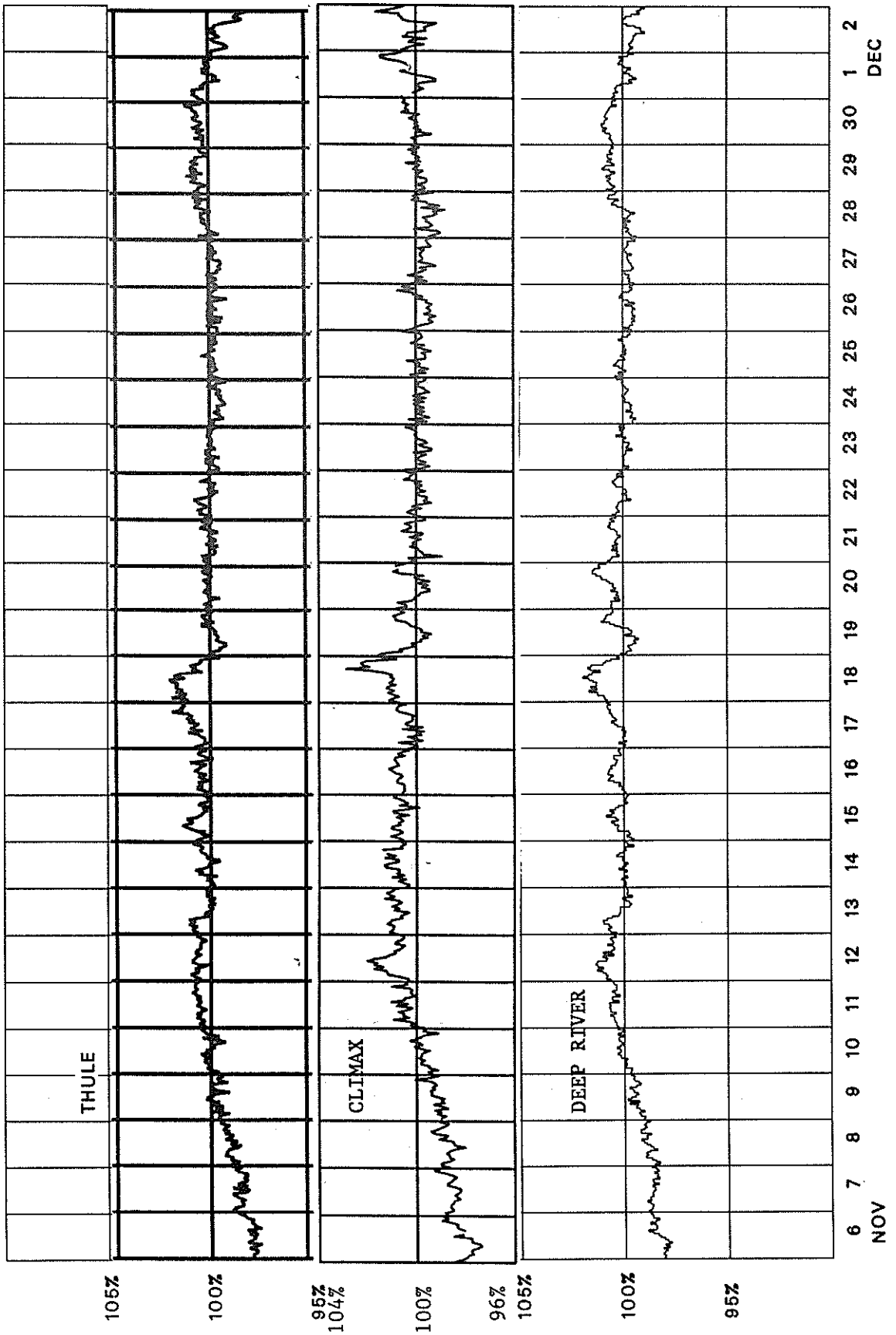
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2188 (October 1993-November 1993)



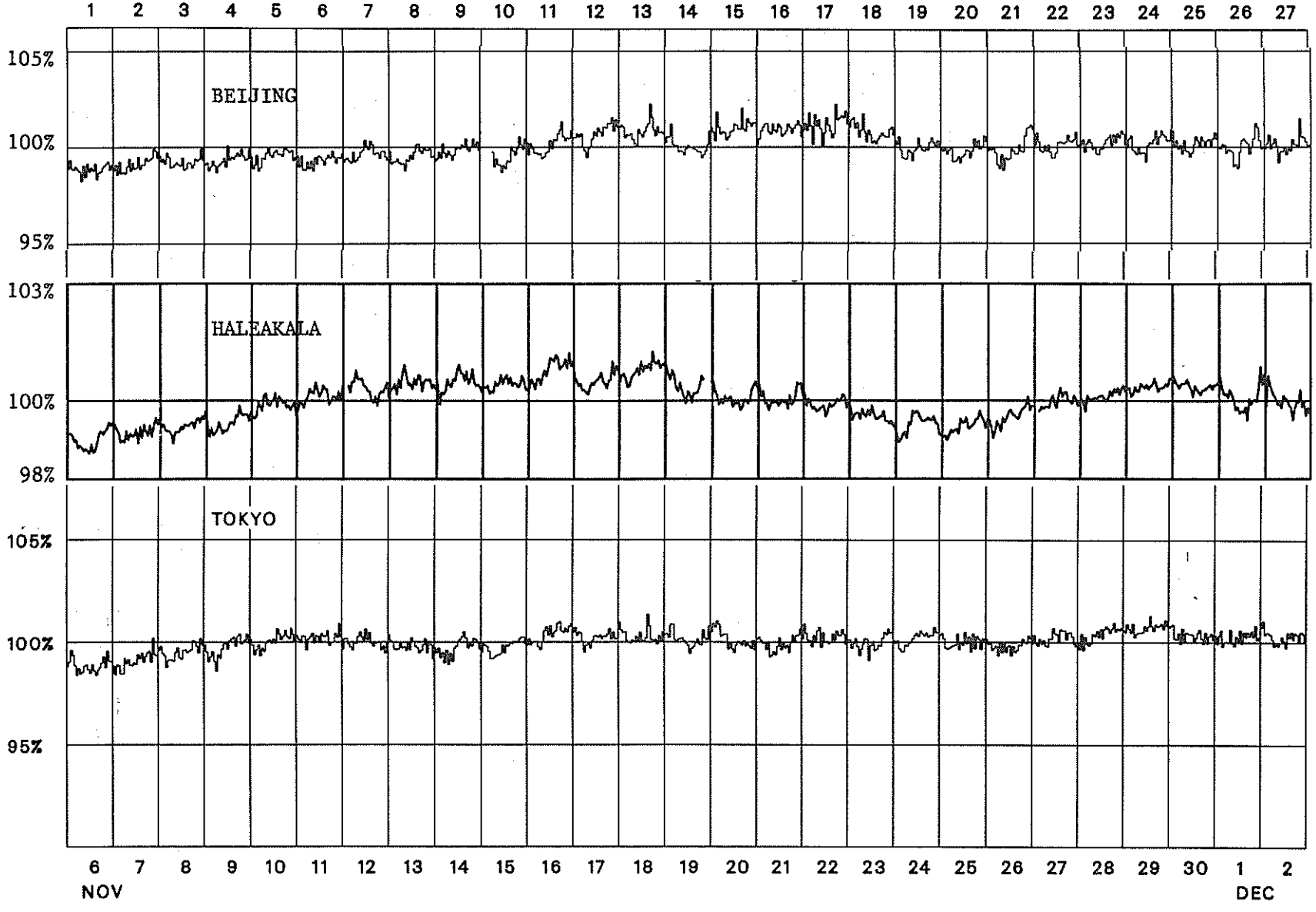
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2189 (November 1993-December 1993)

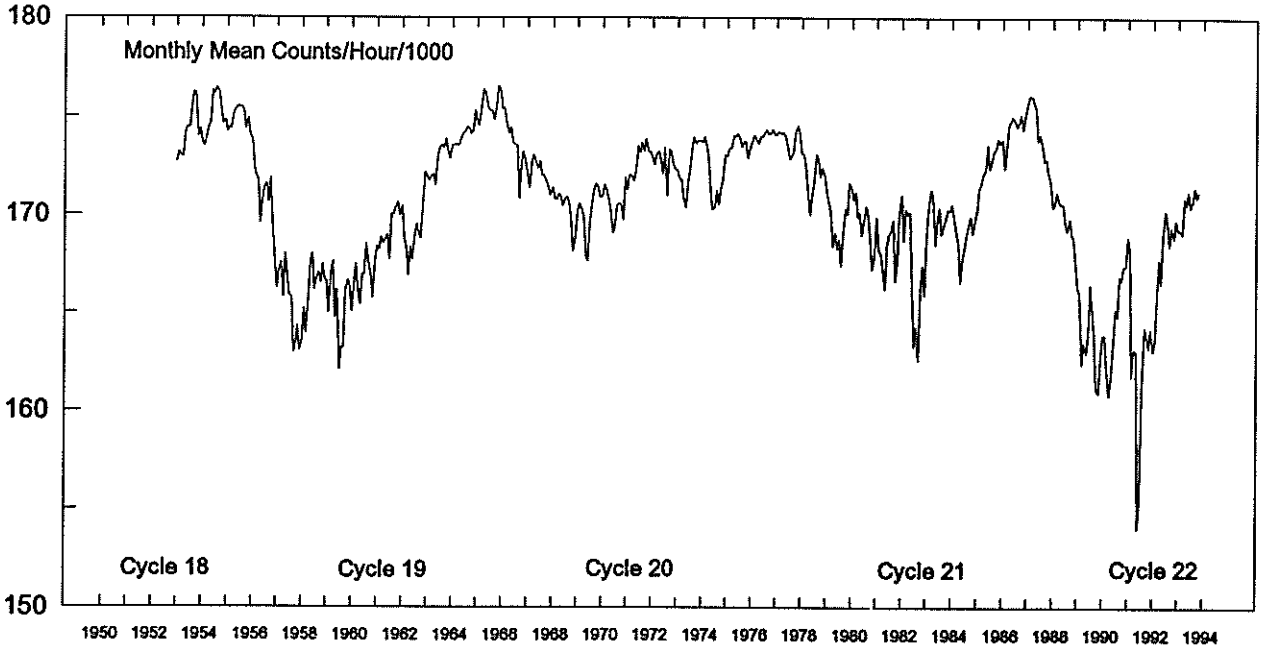


COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2189 (November 1993-December 1993)



Huancayo* Neutron Monitor Pressure-Corrected/Adjusted Values Jan 1953 - Nov 1993



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

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

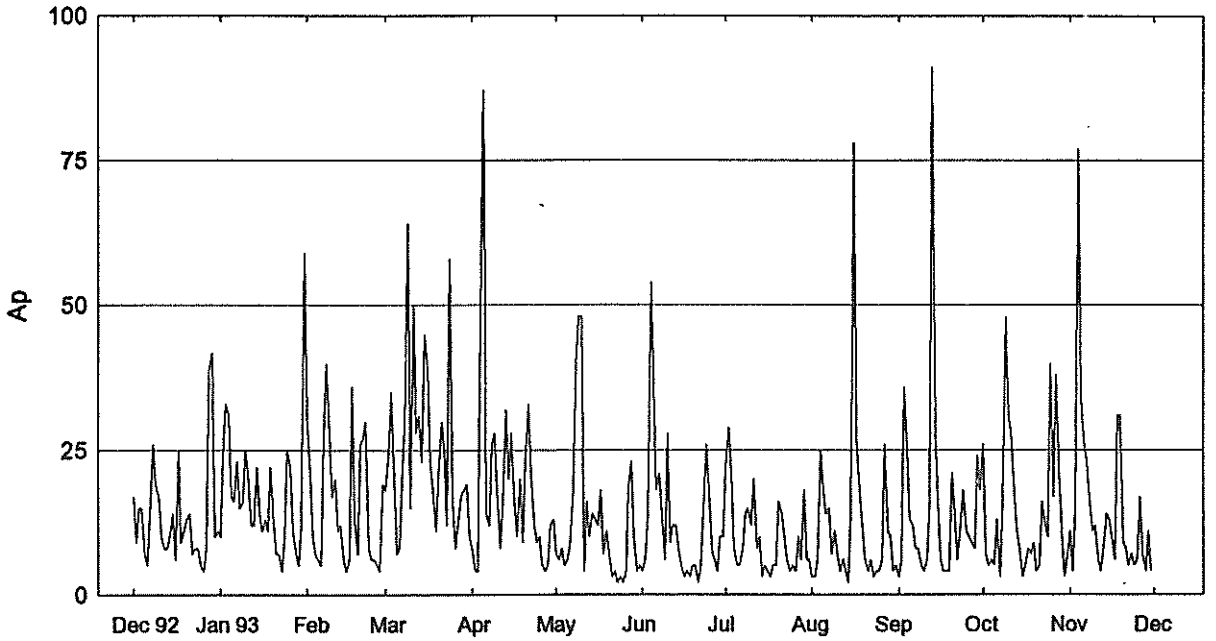
GEOMAGNETIC ACTIVITY INDICES

November 1993

Day		Kp Three-Hourly Indices 1	2	3	4	5	6	7	8	Sum	Ap	Cp	Km Three-Hourly Indices 1	2	3	4	5	6	7	8	aa Provisional Am	N	S	M	
1		3	2+	2-	2+	3	3	3	2	20+	11	0.7	2+	2+	2o	2o	3o	3-	3-	2o	20	28	15	19	24	
2	Q3	2+	2	1	1-	1-	1-	1-	0+	8+	4	0.1	2o	2-	2-	1-	1o	1o	1o	0+	8	9	10	13	6	CK
3		0+	0	1-	1-	1+	2+	3+	6	15-	15	0.8	0+	0+	1o	1+	1+	3o	3o	5+	25	32	22	5	49	
4	D1	7-	6+	5+	6	6	6-	6	5	47	77	1.8	5o	5o	5-	6-	5+	5o	5+	4+	99	107	81	98	91	
5	D2	4	3+	5+	5-	4+	4+	4+	4+	35-	34	1.3	3+	3o	4+	4+	4o	4-	4-	4o	49	66	47	52	61	
6	D5	4-	3-	4+	4+	4	4-	4	4+	31	26	1.2	3+	3-	4-	4o	4-	3+	4-	4o	42	52	46	44	54	
7		4-	3-	3+	4-	4-	4+	4-	4+	29+	23	1.1	3+	2o	3o	3+	3+	4-	3+	4o	36	38	28	24	41	
8		4-	3-	2+	3	3-	3+	4+	3+	25+	17	0.9	3+	2+	2o	3o	2+	3o	4o	3-	28	43	21	25	39	
9		3	3+	2+	3-	2	2-	2+	3	20+	11	0.7	2+	3-	2o	2+	2+	2-	2o	3-	18	25	14	22	17	
10		3	3	3	2	3-	3-	3-	1	20	12	0.7	3-	2o	3-	3-	3-	2+	3-	1+	19	26	17	21	21	
11	Q7K	1+	3+	2-	2-	2-	1	1-	1-	12	6	0.3	1o	2+	1+	2o	2o	1o	0+	1-	10	11	11	13	9	CK
12	Q1	1	2-	1	1-	1-	1-	1-	0+	7-	4	0.1	1-	1o	1o	1o	1o	1-	1o	1-	6	8	6	7	7	CC
13		1-	2-	2	1+	3-	3-	2+	2-	15	8	0.4	1-	2-	2o	2-	3o	3-	3-	2o	17	20	15	9	26	
14		2-	2+	2	3-	3	4+	3+	3	22+	14	0.8	1+	2-	2-	3-	3+	4o	3+	3o	26	28	29	14	44	
15		3	3+	1+	2-	1+	2-	3	4+	20-	13	0.7	3-	3-	2-	2-	2-	2+	3+	4o	24	28	24	16	36	
16		3	2+	2+	2	2+	3-	2+	3-	20-	10	0.6	3-	2-	2+	2o	2+	2+	2+	2+	18	23	17	15	25	
17	Q8K	3-	0+	0+	0+	0	0+	3+	3-	10	6	0.3	2-	0+	0+	1-	0+	1-	3o	3-	11	20	8	10	19	
18	D4	2+	1+	1	1	5	6	6-	4+	27-	31	1.3	2+	1+	2-	1+	5+	6o	5+	4o	58	58	52	11	100	
19	D3	5-	6	2+	3-	4-	4-	4	5-	32-	31	1.3	4o	5-	2-	2o	3+	3+	4-	4-	42	69	39	48	60	
20		3+	3+	2+	2	1+	1+	2-	2-	17	9	0.5	3o	3o	2o	2-	1+	1+	2-	2o	16	15	16	20	11	
21		3	2+	2+	2	1+	1	1+	2	15+	8	0.4	2+	2o	2o	2-	1+	1o	1+	2o	13	17	11	17	11	C
22	Q6	3-	1	1	1-	1+	1-	2-	2-	11-	5	0.2	2+	1-	2-	1o	1+	1-	2o	2o	11	10	8	10	8	CC
23		2+	2+	2-	1+	2	2+	2-	1	15-	7	0.3	2o	2-	2-	1+	2-	2o	2+	1+	13	15	9	12	12	CC
24	Q5	2-	2+	1-	1-	1-	1	1+	2-	10	5	0.2	1+	2-	1o	1o	1-	2-	2-	1+	9	10	10	10	10	CC
25	Q9	1+	2-	1	1	1+	2+	2-	3-	13	6	0.3	1+	2-	1+	1o	1+	2+	2o	3-	14	13	15	11	17	
26		4-	2+	2+	2	2+	4	5-	3	24+	17	0.9	3-	2+	2+	2+	2+	4-	4o	3o	29	41	29	21	49	
27	Q10A	3-	2+	1-	1-	0+	2-	2-	3-	13-	7	0.3	2+	2o	1o	1-	0+	2o	2o	2+	12	16	11	13	14	
28	Q4	0+	0+	1	1-	2-	2-	1+	2	9	4	0.2	1-	1-	1o	1o	2o	2-	1+	2o	9	10	7	5	12	C
29		4	2+	2	2	2+	2+	3-	2+	20	11	0.6	4-	2+	2+	2+	3-	3-	3-	2o	23	30	20	23	27	
30	Q2	2+	0+	1	1-	1-	1-	1-	1	7+	4	0.1	2o	0+	1-	1o	1-	1o	1o	1+	7	10	7	10	8	C
Mean											15	0.64									23.7	29.3	21.7		25.5	

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+	2o	2-	2o	3-	3o	3-	2-	19	2+	3-	2+	2o	3+	2+	3-	2o	22	90.0	10	21	35	
2	2-	2-	1+	1-	1o	1-	1-	0+	7	2o	2-	2-	1-	1+	1+	1+	0+	9	91.8	20	19	37	
3	1-	0+	1-	1+	2-	3o	3o	5+	26	0o	0+	1o	1+	1+	3+	3o	5o	24	92.4	18	18	38	
4	5+	5o	5-	5+	5+	5o	6-	4+	103	5-	5-	5-	6o	5+	5o	5o	4+	96	94.1	21	20	40	
5	3+	3-	4+	4+	5-	4-	4-	4o	52	3+	3o	4o	4+	4-	4-	4-	4-	47	94.8	30	32	40	
6	4-	2+	4-	4+	4-	4-	4o	4o	47	3o	3-	3+	4-	3+	3o	3+	4o	37	94.9	33	34	40	
7	3o	2+	3+	3+	3+	4o	4-	4-	38	3+	2o	3o	3o	3+	3o	3o	4o	34	93.5	31	31	39	
8	3+	2+	2-	3+	3-	3+	4o	3-	30	3+	3-	2o	3-	2o	3-	4-	3-	26	90.2	33	27	35	
9	2+	3-	2o	2+	2+	2-	2o	3-	19	2+	2+	2-	2+	2+	2-	2o	2+	17	88.7	23	22	34	
10	3-	2o	3-	2+	3-	3-	3-	1o	20	3-	2o	2+	3-	2+	2-	2+	1+	17	88.2	25	24	33	
11	1-	2+	1+	2o	2+	1+	1-	0+	10	1+	2+	1+	2o	2o	1o	0+	1-	10	87.0	14	19	32	
12	1o	1o	1o	1o	1o	1o	1-	1-	6	1-	1+	1+	1o	1-	1-	1+	1-	6	88.9	15	15	34	
13	1-	1+	2o	2-	3-	3o	3-	2-	16	1o	2-	2o	2o	3o	3-	2+	2o	17	92.2	21	22	38	
14	1o	2-	2o	3-	3+	4+	3+	3o	28	1+	1+	2-	3-	3+	3+	3o	3o	24	92.3	26	27	38	
15	3-	2+	1+	2-	2-	2o	3o	4o	22	3o	3-	2o	2o	1+	3-	4-	4-	26	99.9	29	27	46	
16	3-	2-	2+	2+	3-	3-	3-	2+	20	2+	2-	2+	2o	2+	2o	2+	2+	17	98.2	32	33	44	
17	2o	0+	0+	0o	0o	1o	3+	3-	10	2-	0+	1-	1o	1-	1-	3-	3o	10	97.7	35	36	44	
18	2o	1o	1+	1+	5+	6o	5+	4-	58	3-	2o	2-	1+	5o	6-	5o	4+	58	100.2	37	35	46	
19	3+	5o	2o	2+	4-	4-	4o	4-	44	5-	5-	2-	2o	3o	3+	3+	4-	40	98.7	40	40	45	
20	3o	3o	2o	2o	1+	1+	2-	1+	16	3o	3-	2o	1+	1o	1+	1+	2+	15	98.0	40	43	44	
21	2o	2-	2-	2o	2-	1+	1+	2-	12	2+	2o	2+	2-	1o	1-	2-	2+	13	94.8	56	55	40	
22	2+	1-	1+	1o	1+	1-	2o	2-	9	2+	1o	2o	1+	1+	1-	2+	2+	12	96.8	52	54	43	
23	1+	2o	1+	1+	2-	2+	2o	1o	12	2+	2-	2o	2-	2o	2-	2+	1+	14	97.9	53	54	44	
24	1+	1+	1-	1o	1-	2-	2-	1+	8	2-	2o	1o	1+	1o	2-	2-	2-	10	97.5	54	53	43	
25	1+	1+	1o	1o	1+	3-	2o	2+	12	2-	2o	2-	1+	1+	2o	2+	3o	15	94.7	40	40	40	
26	3o	2o	2o	2o	2+	4-	4+	3-	29	3-	3-	3-	2+	2+	4o	4-	3o	29	90.8	40	42	36	
27	2+	2-	1-	0+	0+	2+	2-	2+	11	3-	2o	1+	1o	0o	2o	2o	2+	13	87.3	39	43	32	
28	1-	0o	1o	1o	2o	2-	1+	2-	9	1o	1o	1+	1-	2-	2-	1+	2+	10	90.7	53	54	36	
29	4-	2+	2-	2+	3-	3-	3-	2+	22	4-	2+	3-	3-	3o	3-	3-	2-	24	91.2	55	57	36	
30	2o	0+	1-	1-	1-	1+	1-	1o	6	2-	1-	1-	1o	1o	1o	1+	2-	8	100.8	69	71	47	
Mean									24.0									23.3	93.8	34.8	35.6	39.3	

Daily Average Indices Ap

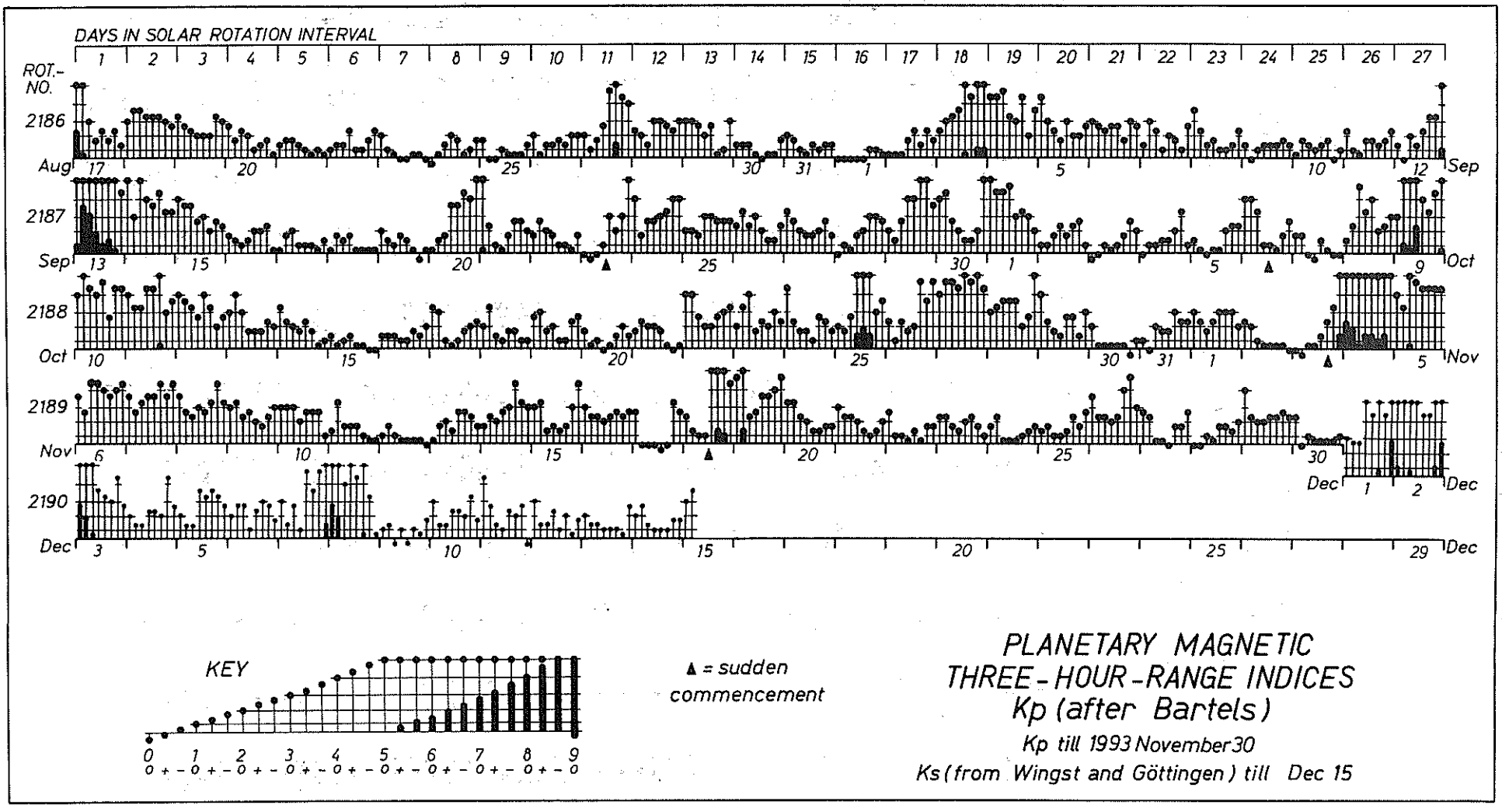


Day	Dec 92	Jan 93	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1	17	10	31	18	8	7	4	22	3	3	26	11
2	9	24	21	24	4	6	6	29	3	6	7	4
3	15	33	10	35	4	8	14	21	6	36	5	15
4	15	31	7	23	58	5	54	8	25	25	6	77
5	7	17	6	7	87	6	36	5	18	13	5	34
6	5	16	5	8	14	9	18	5	14	12	13	26
7	16	23	27	22	12	18	21	8	15	8	3	23
8	26	15	40	29	26	40	14	14	7	8	16	17
9	19	16	28	64	28	48	6	15	11	5	48	11
10	17	25	17	15	18	48	28	12	7	4	31	12
11	10	21	20	50	8	4	9	20	4	6	28	6
12	8	12	11	28	16	16	12	8	6	16	18	4
13	8	12	12	31	32	10	12	10	4	91	11	8
14	10	22	6	23	20	14	8	3	2	28	8	14
15	14	14	4	45	28	13	5	5	14	16	3	13
16	6	11	6	39	16	12	3	4	78	6	5	10
17	25	13	36	23	10	18	4	3	27	4	8	6
18	9	11	13	18	20	7	3	5	18	4	7	31
19	11	22	7	11	9	11	5	5	12	4	9	31
20	13	14	26	21	23	7	5	16	6	21	4	9
21	14	7	27	30	33	3	2	14	4	14	5	8
22	7	7	30	25	21	4	5	10	6	6	16	5
23	8	4	8	12	12	2	17	6	3	12	12	7
24	8	10	6	58	9	3	26	4	4	18	10	5
25	5	25	6	16	10	2	18	5	4	11	40	6
26	4	22	5	8	5	4	7	4	6	10	17	17
27	8	11	4	12	4	18	6	10	26	9	38	7
28	39	7	19	17	5	23	4	6	11	8	21	4
29	42	5		18	12	10	10	18	10	24	11	11
30	10	12		19	13	4	10	6	4	18	3	4
31	11	59		10		5		6	5		7	
Mean	13	17	16	24	19	12	12	10	12	15	14	15

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

University of Gottingen

Kp through November 30, 1993



With Best Wishes for a Happy New Year

Institut für Geophysik Göttingen

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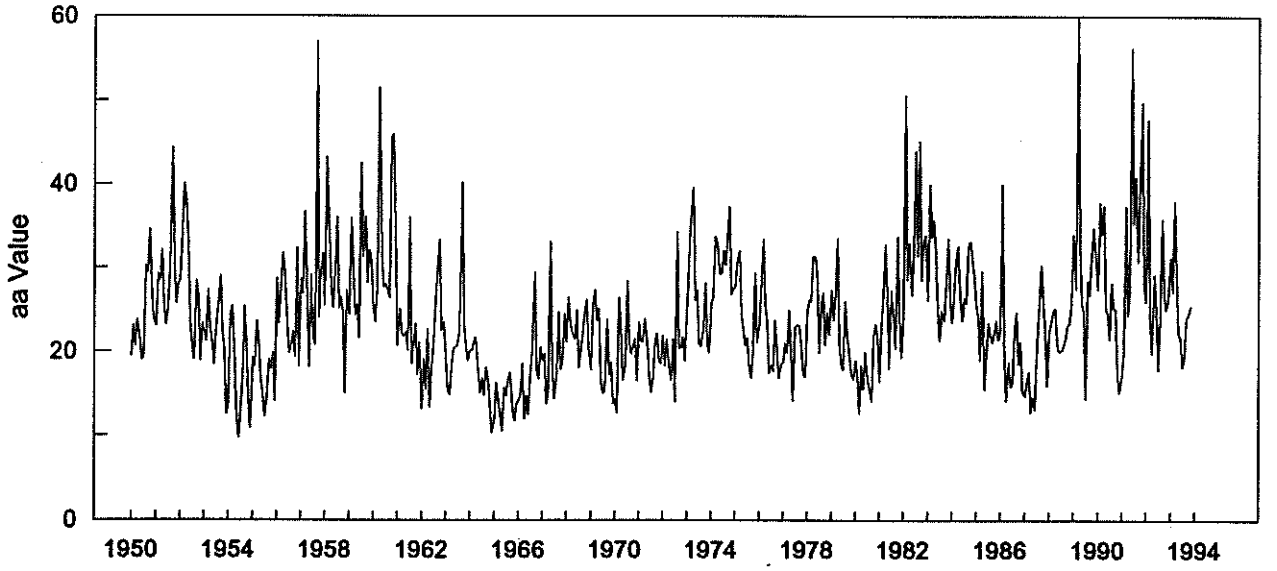
Nov 93

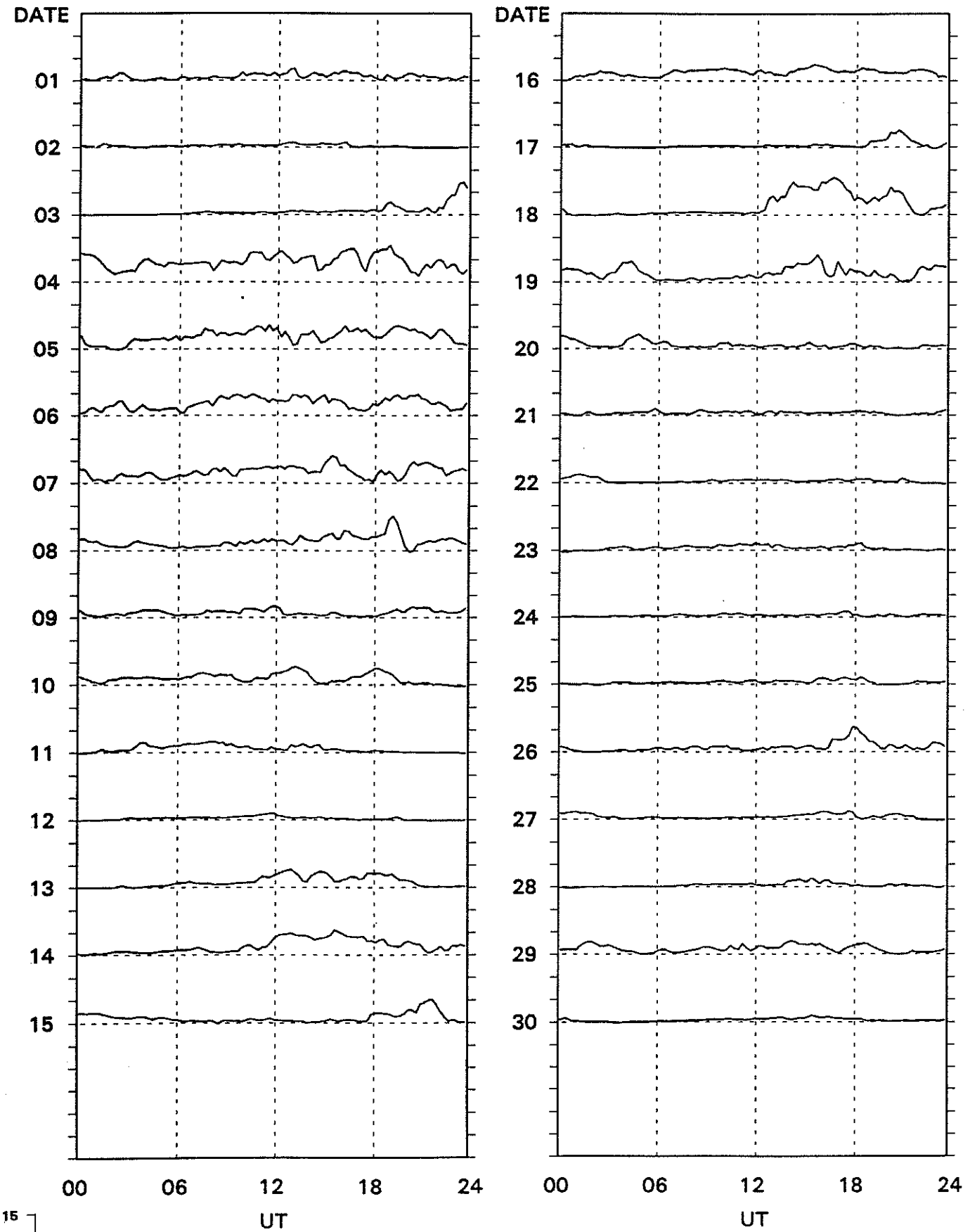
Monthly Mean aa Index Jan 1950 - Nov 1993



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		

PC-INDEX

Thule **November, 1993**



Preliminary Values. 15-min. Values. Div. Geophys. D M I

PRINCIPAL MAGNETIC STORMS

NOVEMBER 1993

Sta	Geomag Lat	Commencement Day	Commencement Time (UT)	Type	SC Amplitudes D (Min)	SC Amplitudes H (Gamma)	SC Amplitudes Z (Gamma)	Maximum 3-Hour K Index Day(3-Hour Periods)	K	Ranges D (Min)	Ranges H (Gamma)	Ranges Z (Gamma)	End Day	End Hour (UT)
FRD	49.4N	03	1755	SC*	2.5	19	- 3	03(8) 04(2,3 5)	6	35	140	78	08	05
BJI	28.8N	03	1757	SC	0.5	24	2	04(5)	6	14	193	36	05	24
KRC	16.4N	03	2300	SC	- 1.6	21	18	04(4,5)	6	75	199	74	05	23
UJJ	13.6N	03	1700	..	..	..	..		-	6	179	18	06	01
ABG	09.4N	03	1700	..	..	..	..	04(1,4,5,7)	5	6	188	26	06	01
HYB	07.6N	03	1755	SC	- 0.3	15	- 1	04(5)	6	6	203	25	06	22
GUA	04.3N	03	22--	..	..	..	..	04(1)	6	--	200	10	05	13
ETT	00.7S	03	1756	SC	- 0.4	13	14		-	6	201	71	05	23
TRD	01.1S	03	1700	..	..	..	..		-	4	193	101	06	01
PNG	18.3S	03	22--	..	..	..	..	04(5)	6	10	180	70	06	15
HER	33.6S	03	17--	..	..	..	..	04(4)	6	27	205	113	06	00
CAN	43.6S	03	1755	SC*	0.9*	22 *	3	04(4)	6	26	157	74	05	00
AMS	46.8S	03	1756	SC	3	24	- 12	04(5,7)	6	17	86	57	09	03
CZT	51.5S	03	17--	..	..	..	..	04(5,7)	6	43	270	140	07	05
PAF	57.2S	03	1755	SC*	4 *	19 *	7 *	4(5)	8	108	800	421	09	01
DRV	75.2S	03	1755	SC*	20 *	28 *	- 64 *	04(1) 5(1)	6	647	752	842	09	13
GUA	04.3N	06	07--	..	..	..	..	06(4)	5	--	50	10	06	18
HYB	07.6N	14	0600	..	..	..	..	14(5,6,7,8)15(7)16(6)	4	3	81	12	16	20
GUA	04.3N	14	21--	..	..	..	..	15(1)	5	--	80	20	15	12
FRD	49.4N	18	1200	..	..	..	..	18(5,6) 19(2)	5	25	124	49	20	05
BJI	28.8N	18	1212	SC	0.9	34	2	18(5)	6	12	170	16	19	21
KRC	16.4N	18	1212	..	..	..	..	18(5,6,7)	6	94	203	78	19	05
UJJ	13.6N	18	1210	SC	- 0.4	30	- 7		-	5	174	17	19	22
ABG	09.4N	18	1210	SC	- 0.4	26	- 6	18(5,6,7)	6	5	185	27	19	22
HYB	07.6N	18	1212	SC	- 0.3	28	- 2	18(5,6,7)	6	4	189	15	20	20
GUA	04.3N	18	1212	..	..	..	..	18(5)	6	10	120	20	19	06
ETT	00.7S	18	1212	SC	- 0.6	25	22		-	4	184	86	19	23
TRD	01.1S	18	1210	SC	- 0.1	24	- 35		-	3	182	124	19	22
PNG	18.3S	18	1212	SC	0.1	29	26	18(6)	6	11	130	80	20	00
HER	33.6S	18	1212	SC	4 *	25	26	18(5,6)	6	32	173	182	19	06
CAN	43.6S	18	1213	SC	0	36	9	18(5,6)	5	27	175	90	19	06
AMS	46.8S	18	1213	SC*	2 *	24 *	- 13 *	18(5,6,7) 19(2,8)	5	25	129	87	20	12
CZT	51.5S	18	1215	SC	6	20	5	18(6,7)	6	59	140	160	20	17
PAF	57.2S	18	1212	SC*	5 *	35 *	10 *	18(6,7)	8	169	1154	294	21	15
DRV	75.2S	18	1212	SC*	20 *	48 *	- 76 *	18(8) 19(1) 20(2)	6	740	530	738	21	10
AMS	46.8S	24	22--	..	..	..	..	26(6,7)	5	13	95	51	27	11
DRV	75.2S	25	1607	SC	16	12	- 24	26(1,2)	6	607	503	614	27	07
CZT	51.5S	26	09--	..	..	..	..	26(7)	5	20	80	60	28	11

Stations:

ABG = ALIBAG
AMS = MARTIN DE VIVIES
ANN = ANNAMALAINAGAR
BJI = BEIJING
CAN = CANBERRA
CHO = 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

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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."