



Solar-Geophysical Data prompt reports

Data for December 1999 and January 2000

Explanation of Data Reports Issued as Number 515 (Supplement) July 1987

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NATIONAL ENVIRONMENTAL SATELLITE,
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NATIONAL GEOPHYSICAL
DATA CENTER

BOULDER,
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FEBRUARY 2000 NUMBER 666 - Part I

Solar-Geophysical Data prompt reports

Data for December 1999 and January 2000

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NATIONAL GEOPHYSICAL DATA CENTER

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SOLAR-GEOPHYSICAL DATA

Number 666

(Issued in Two Parts)

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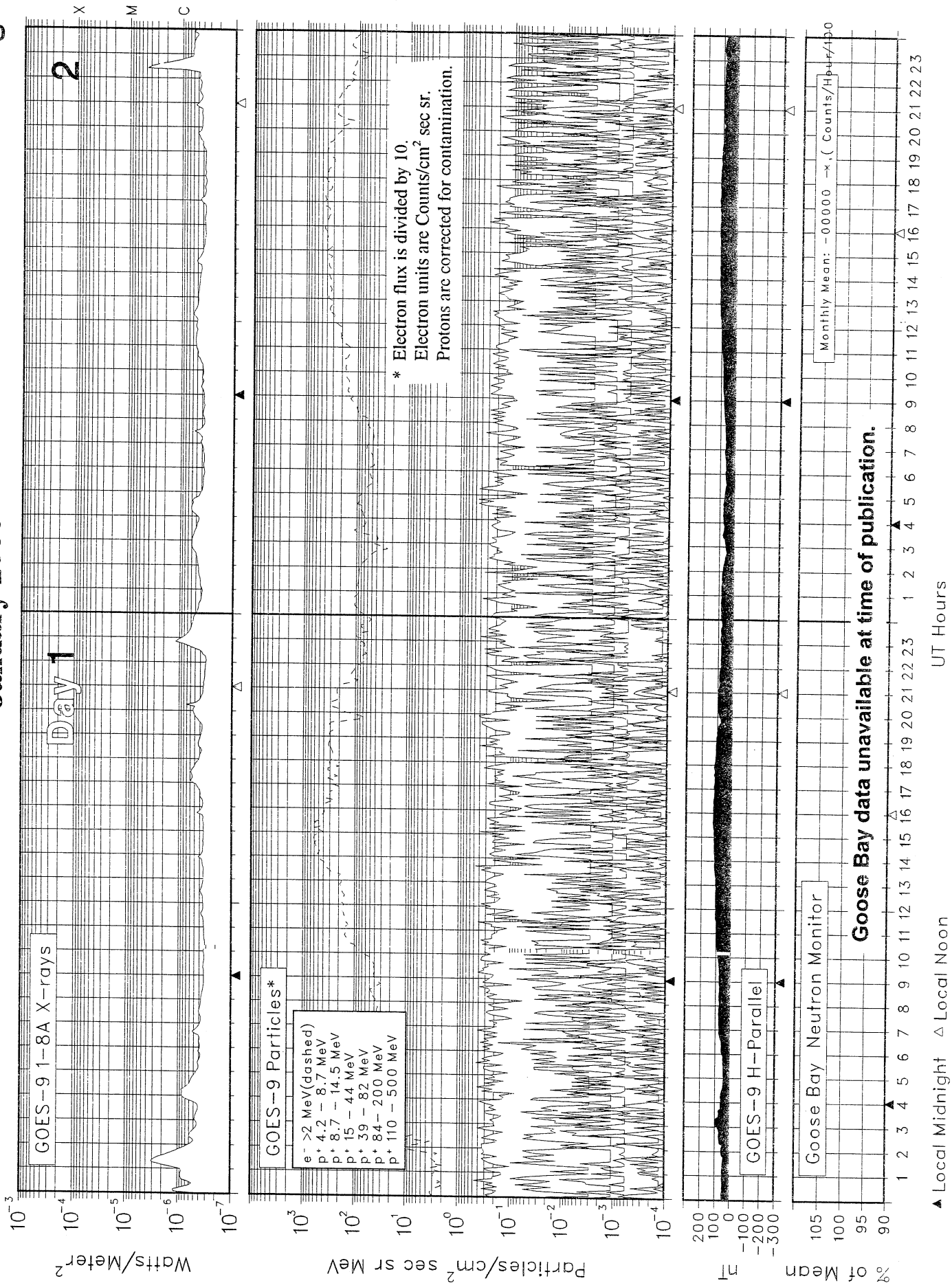
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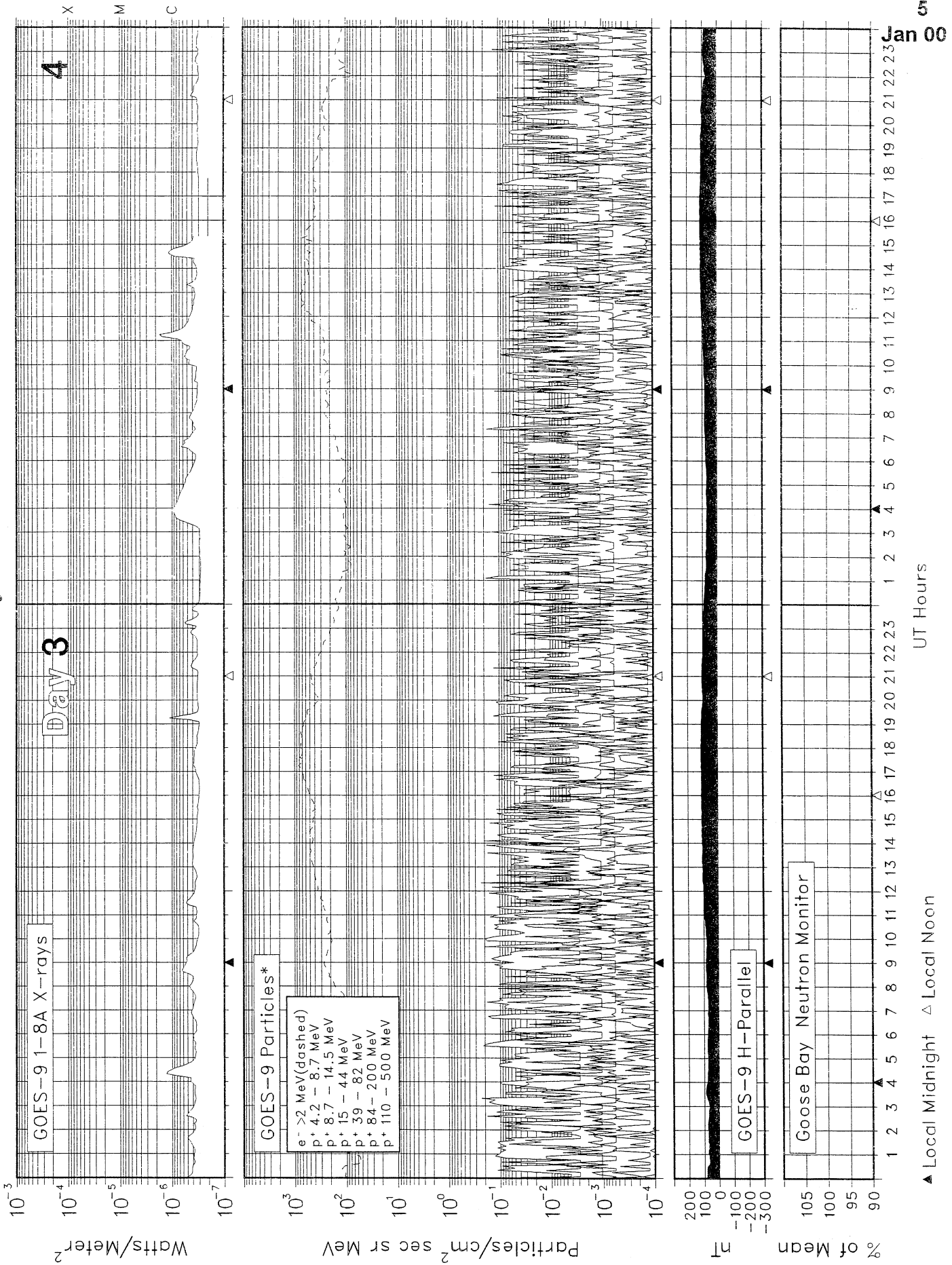
SOLAR-TERRESTRIAL ENVIRONMENT

January 2000



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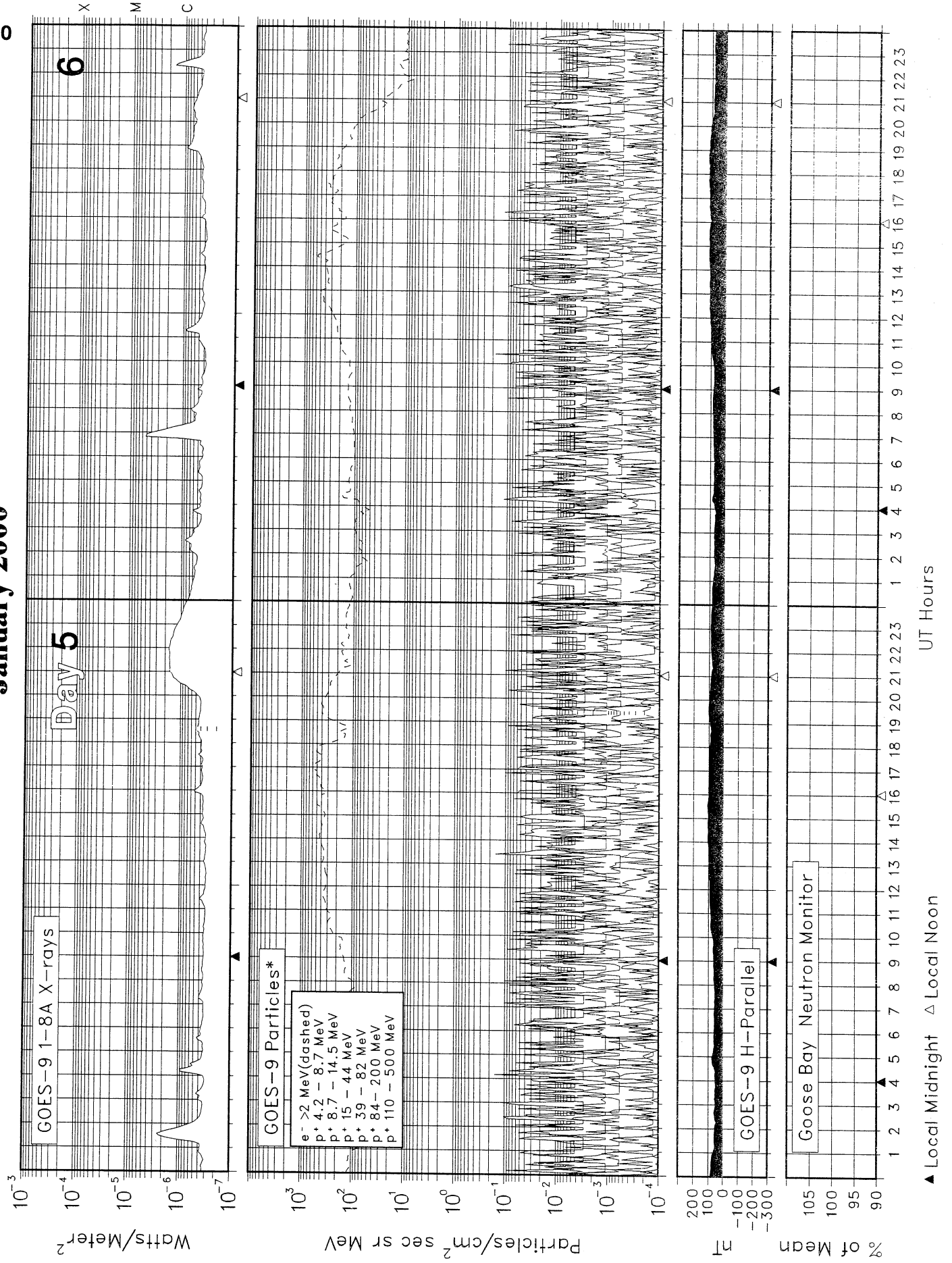
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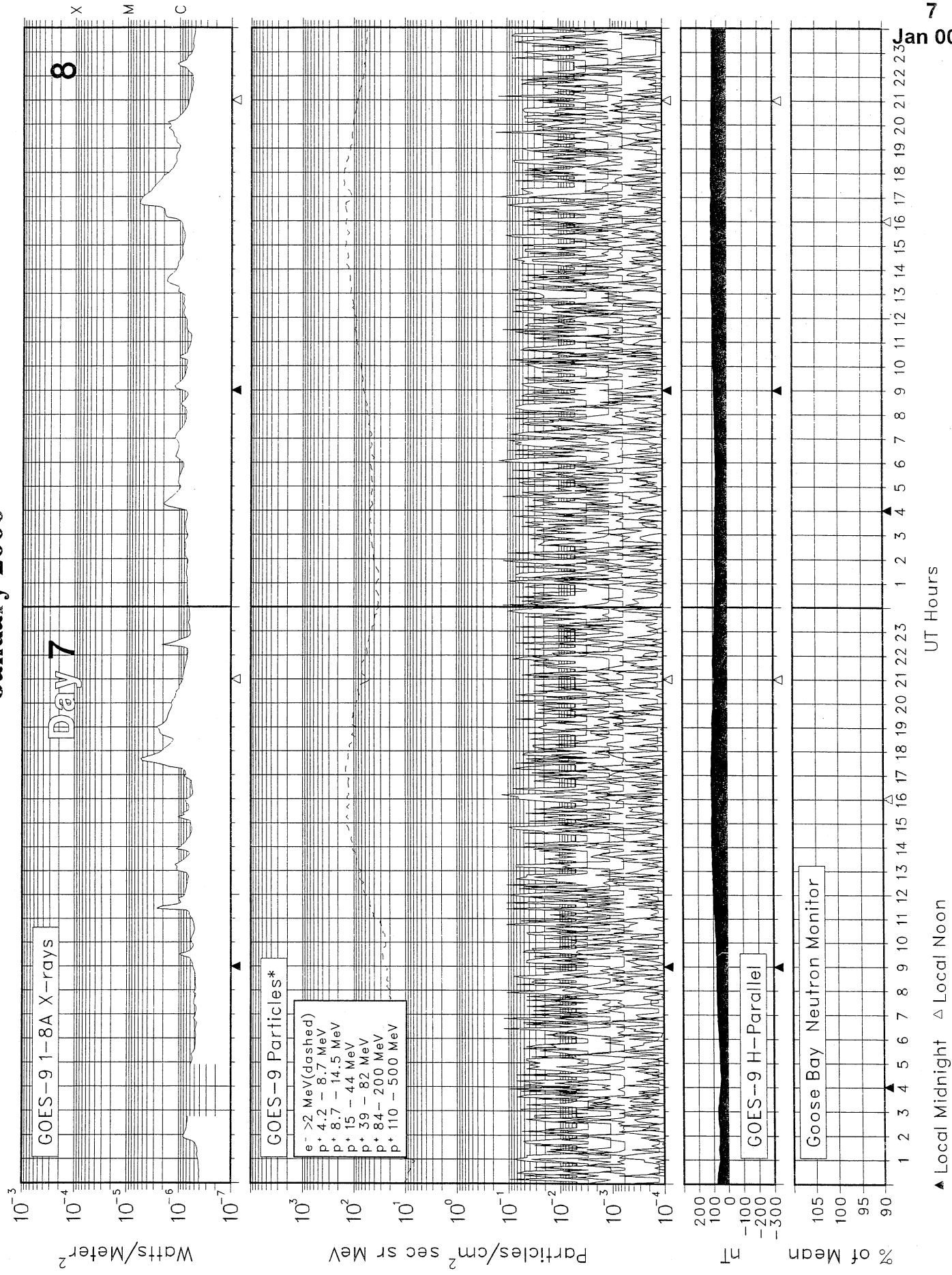
January 2000

6
Jan 00



SOLAR-TERRESTRIAL ENVIRONMENT

January 2000



8

X

M

C

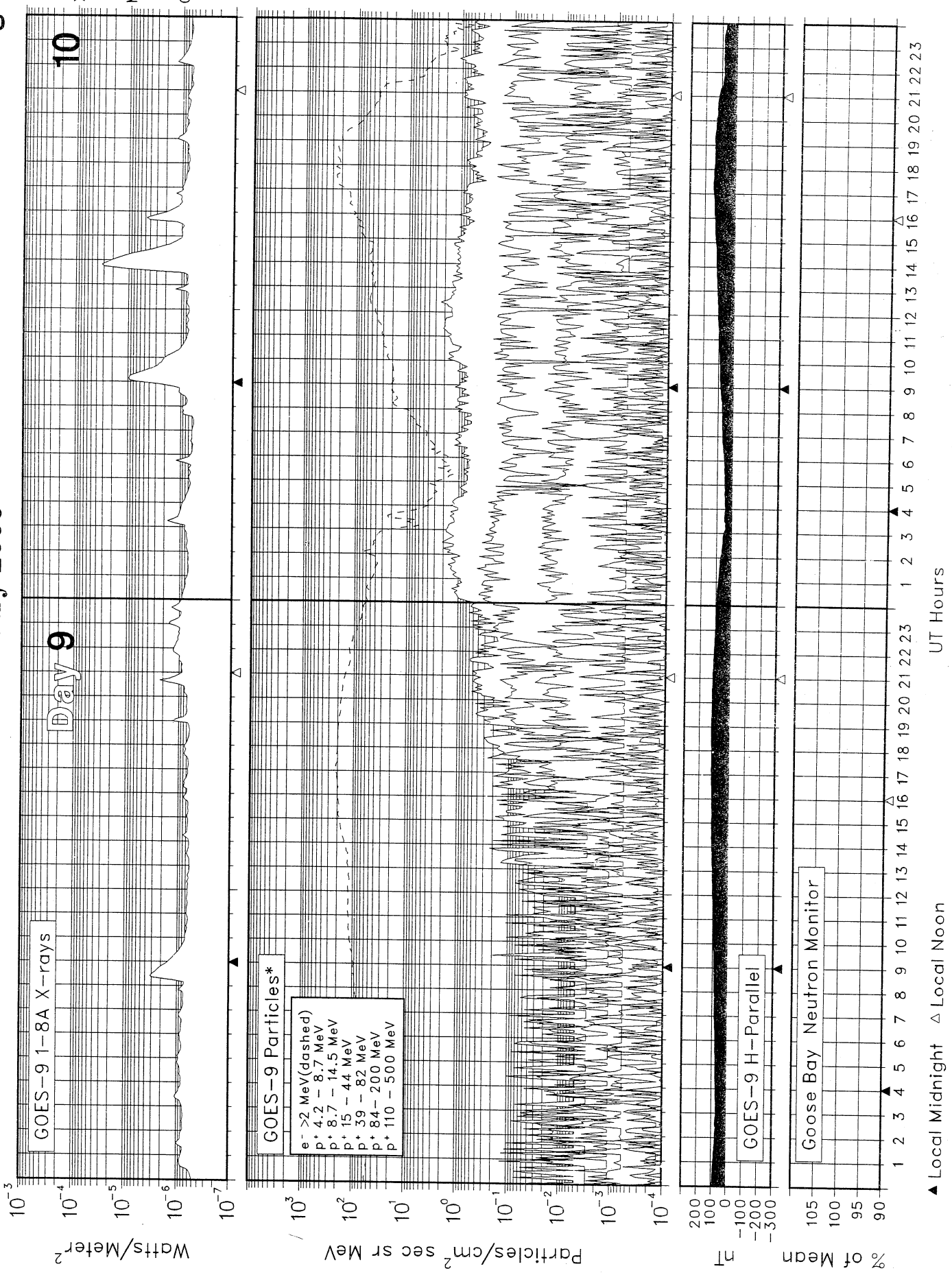
UT Hours

▲ Local Midnight △ Local Noon

SOLAR-TERRESTRIAL ENVIRONMENT

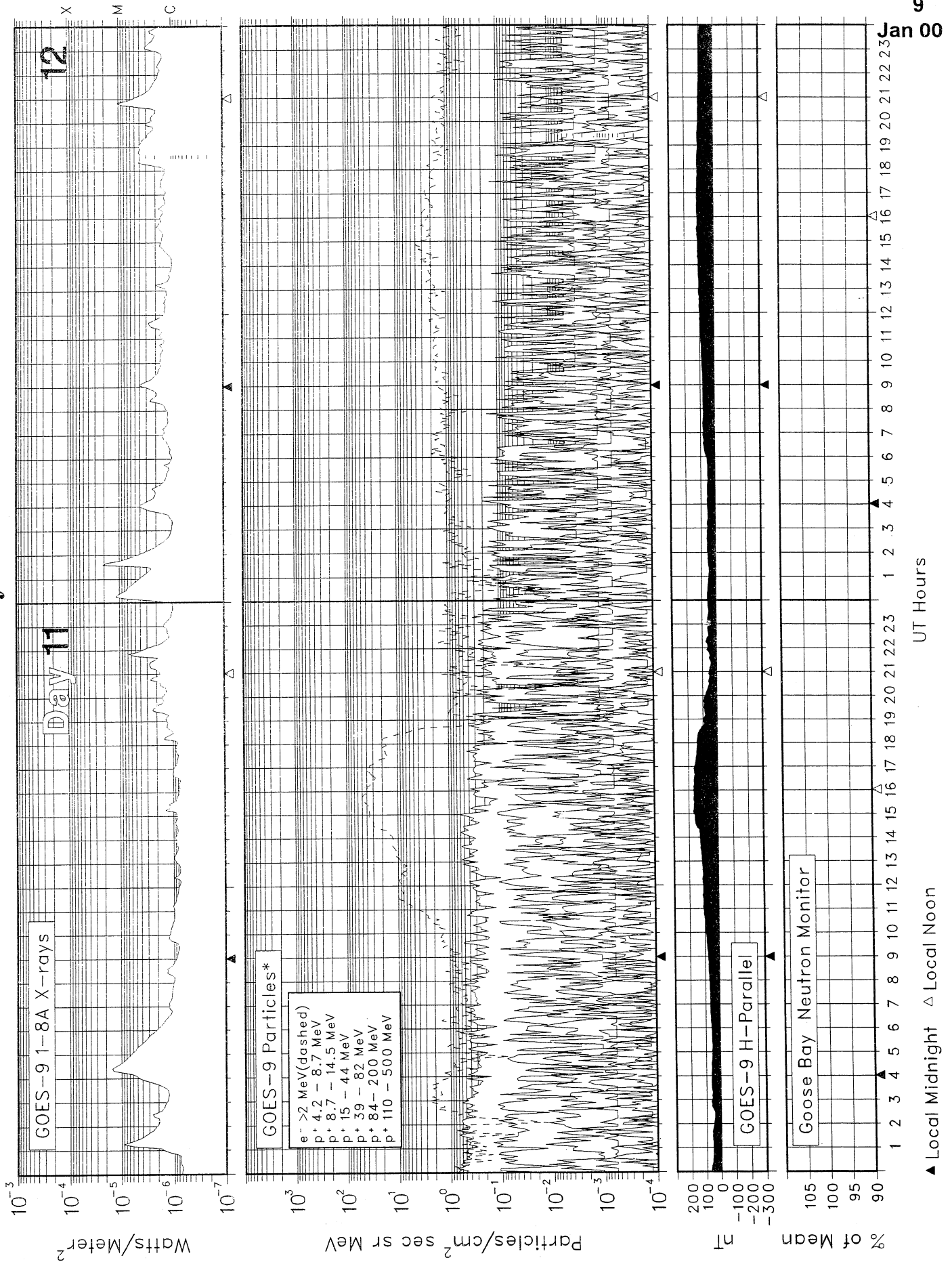
January 2000

8
Jan 00



SOLAR-TERRESTRIAL ENVIRONMENT

January 2000



GOES-9 1-8A X-rays

Watts/Meter²

GOES-9 Particles*

- e⁻ >2 MeV (dashed)
- p⁺ 4.2 - 8.7 MeV
- p⁺ 8.7 - 14.5 MeV
- p⁺ 15 - 44 MeV
- p⁺ 39 - 82 MeV
- p⁺ 84 - 200 MeV
- p⁺ 110 - 500 MeV

Particles/cm² sec sr MeV

GOES-9 H-Parallel

nT

Goose Bay Neutron Monitor

% of Mean

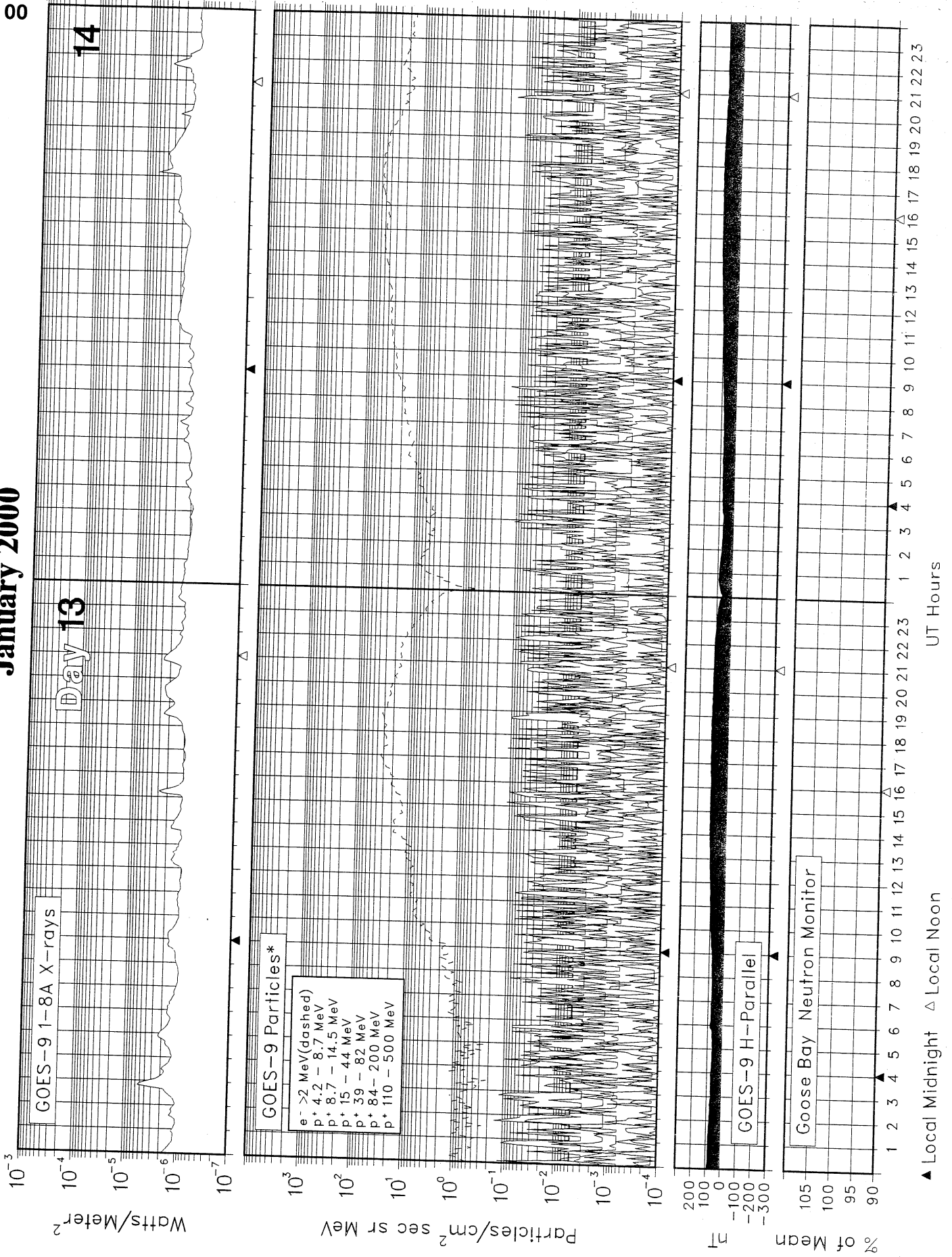
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UT Hours

SOLAR-TERRESTRIAL ENVIRONMENT

January 2000

Jan 00

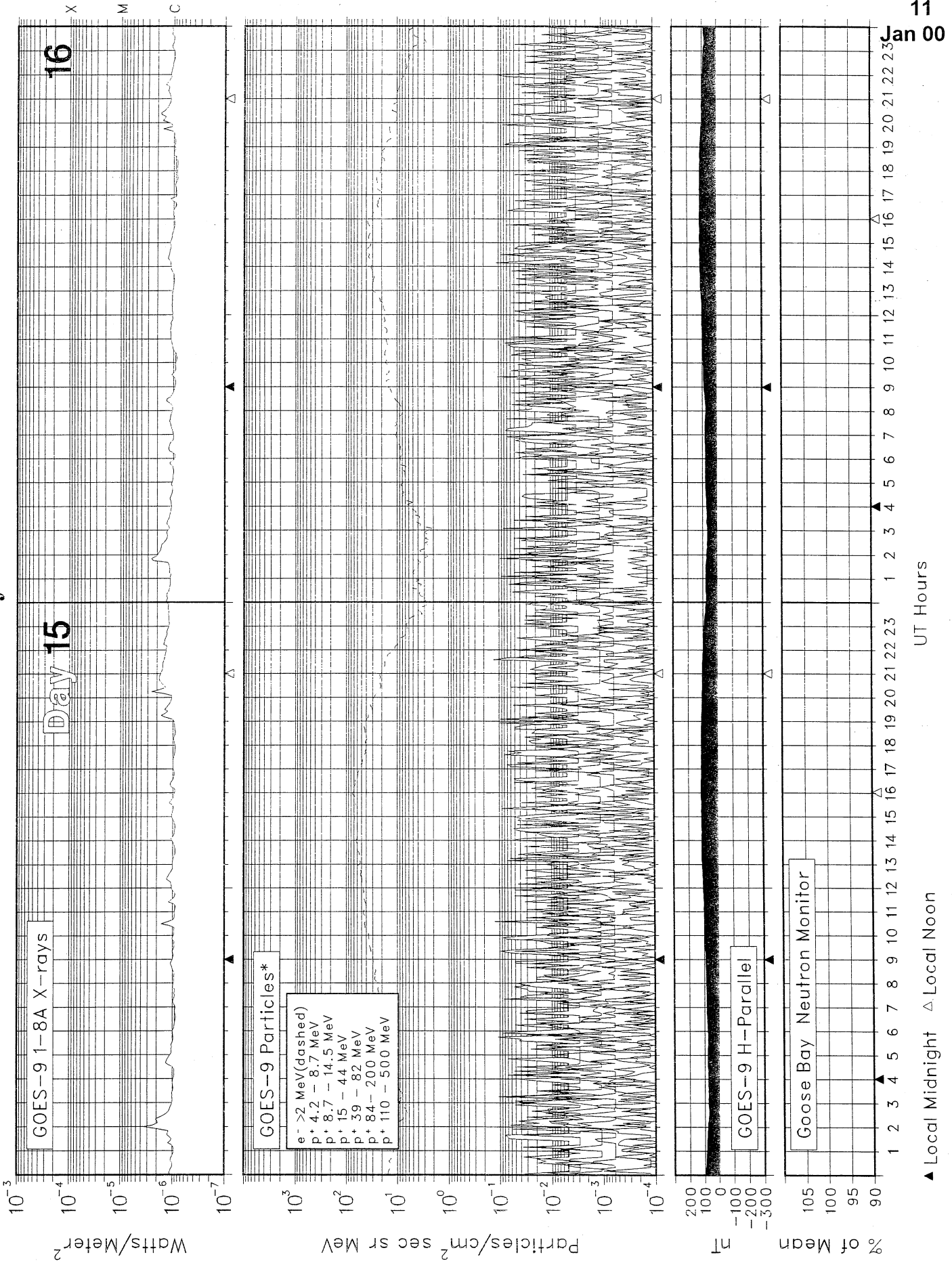


UT Hours

▲ Local Noon ▲ Local Noon

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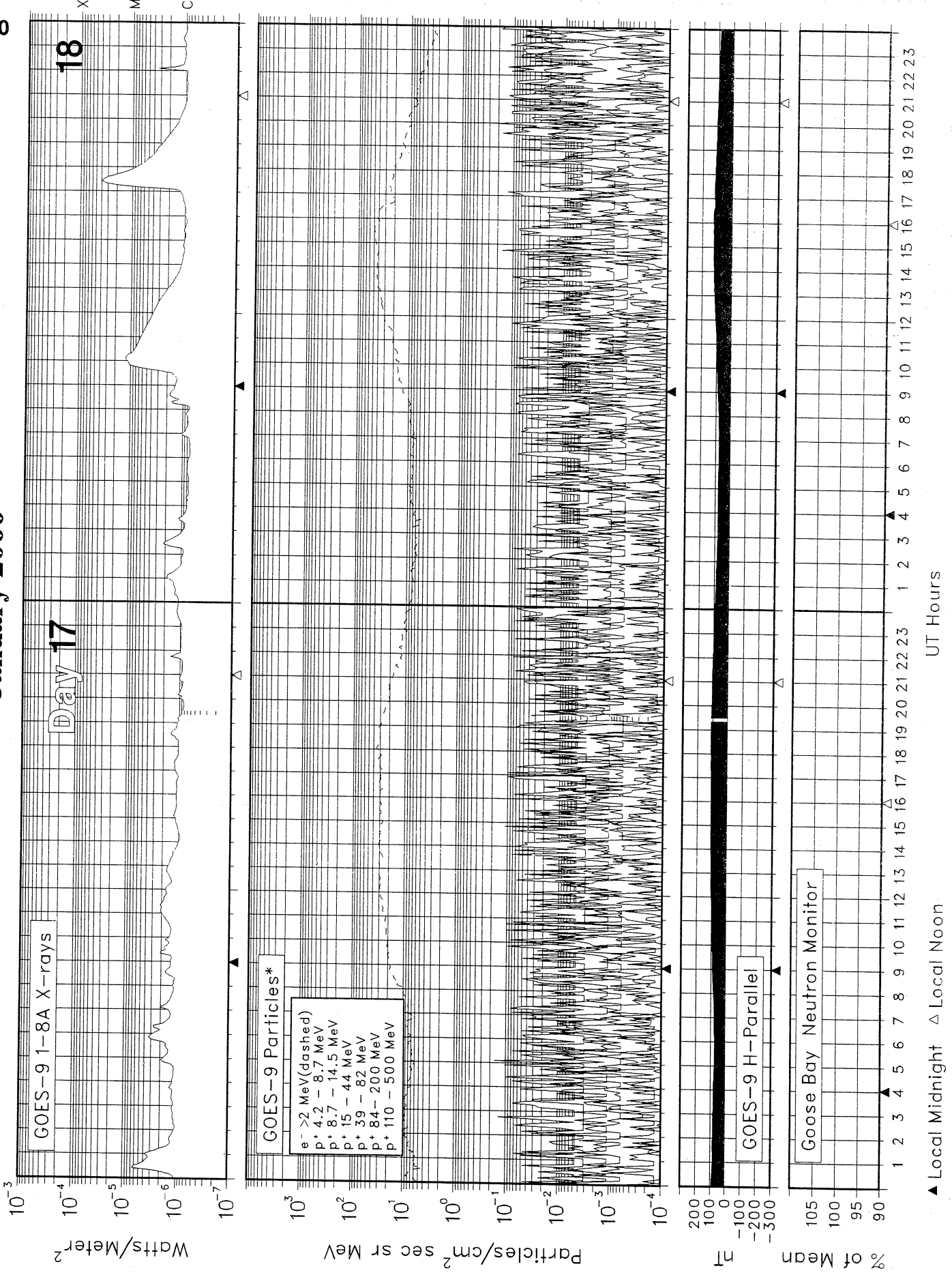
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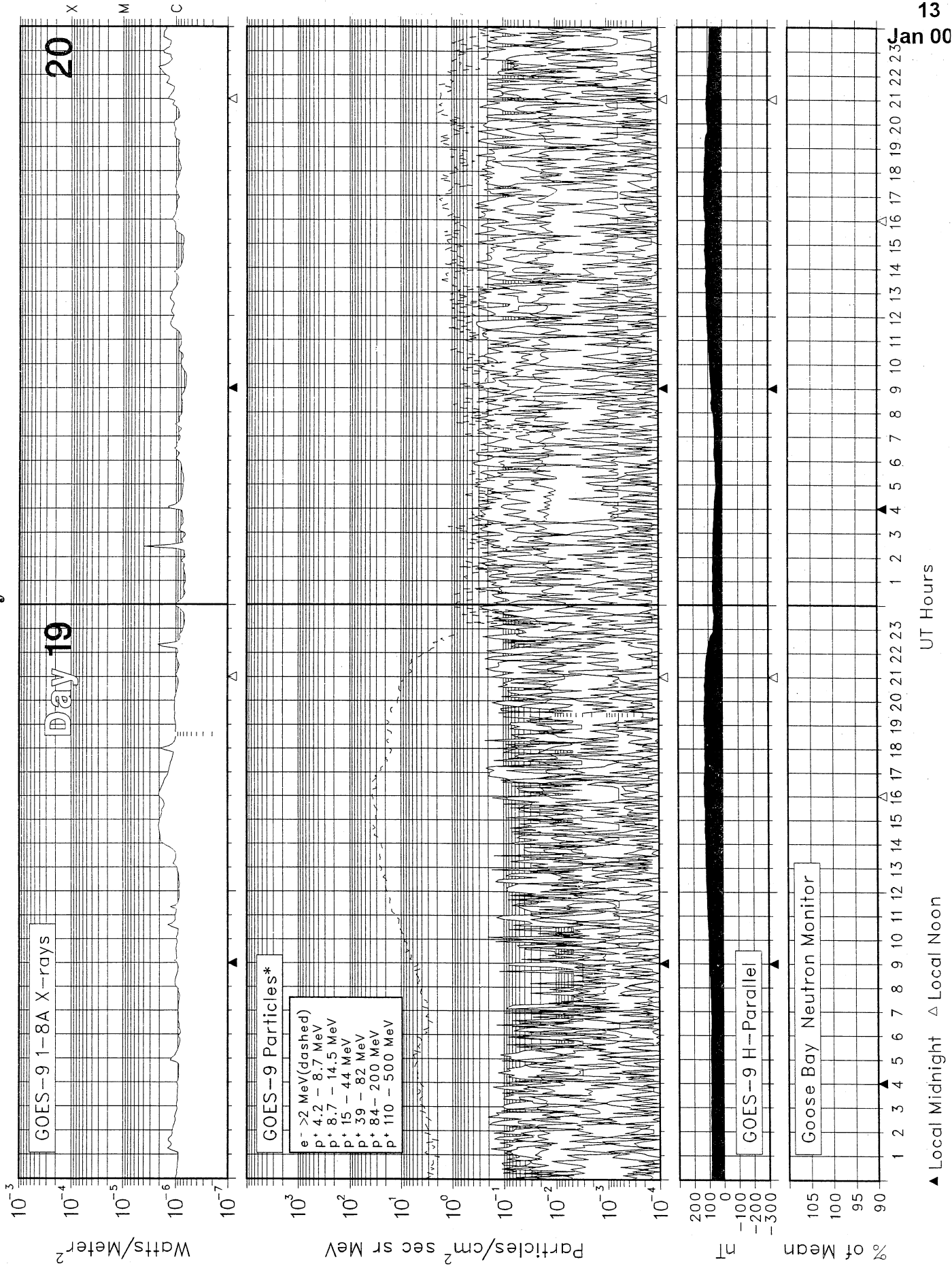
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Jan 00



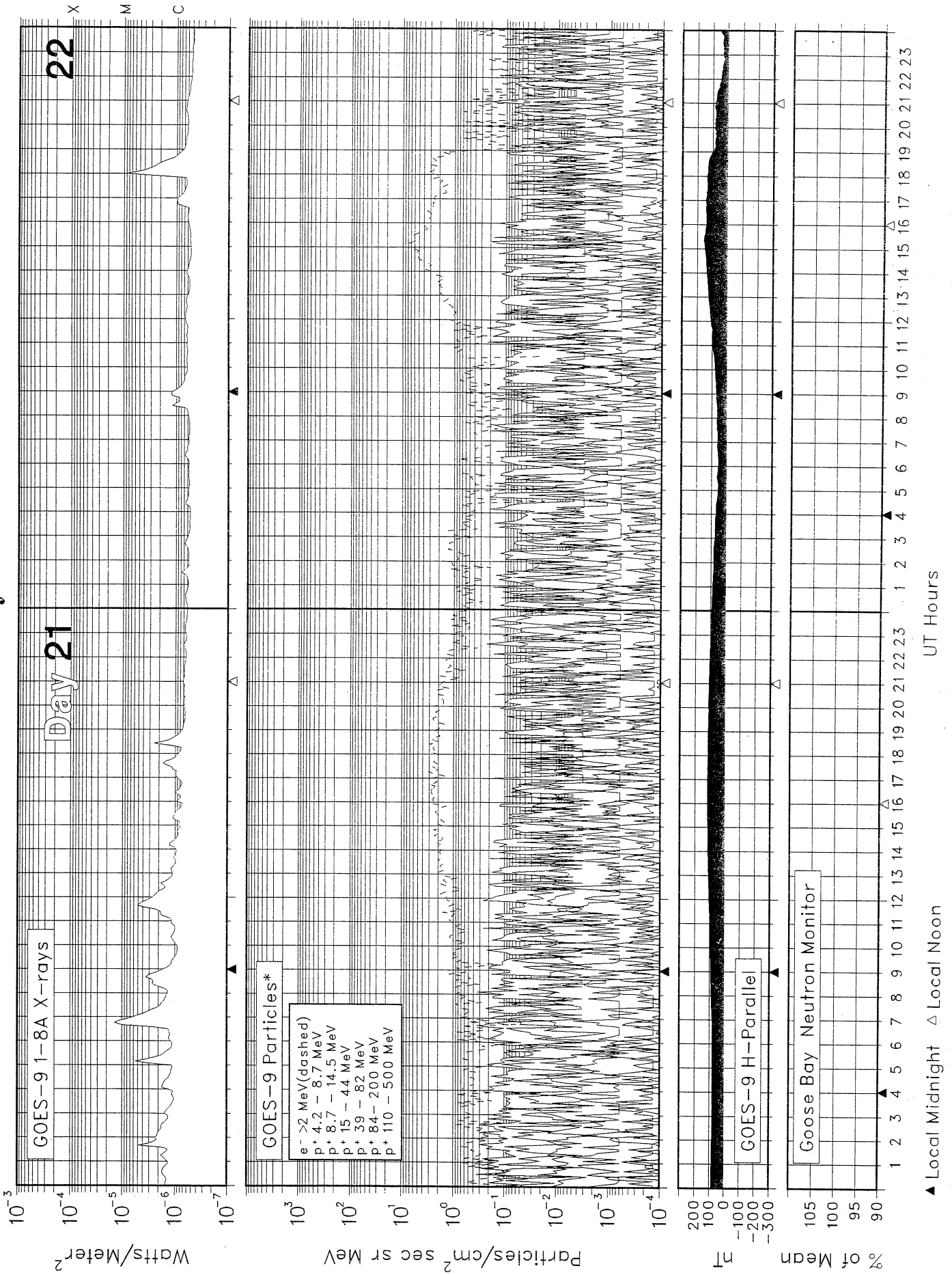
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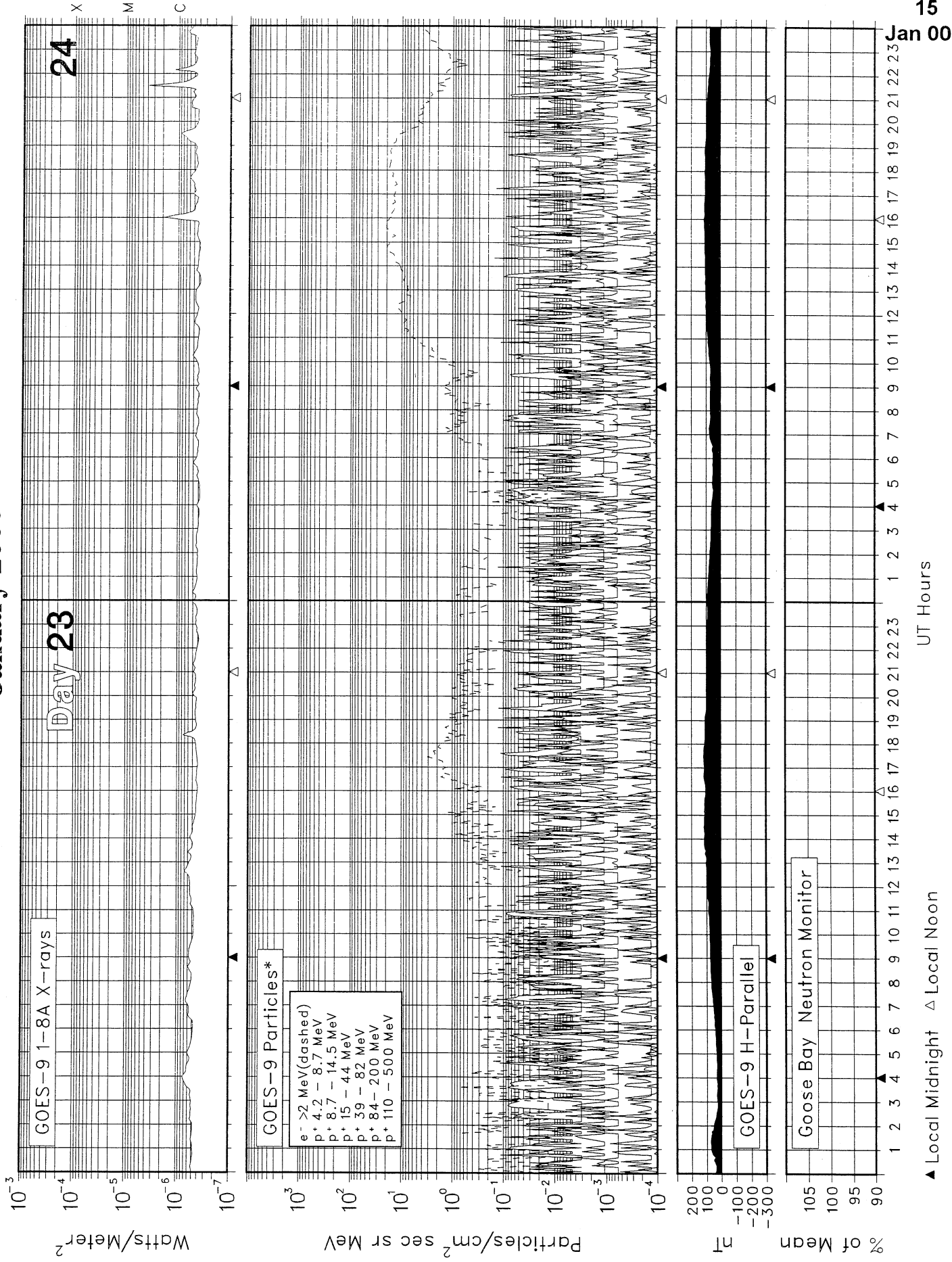
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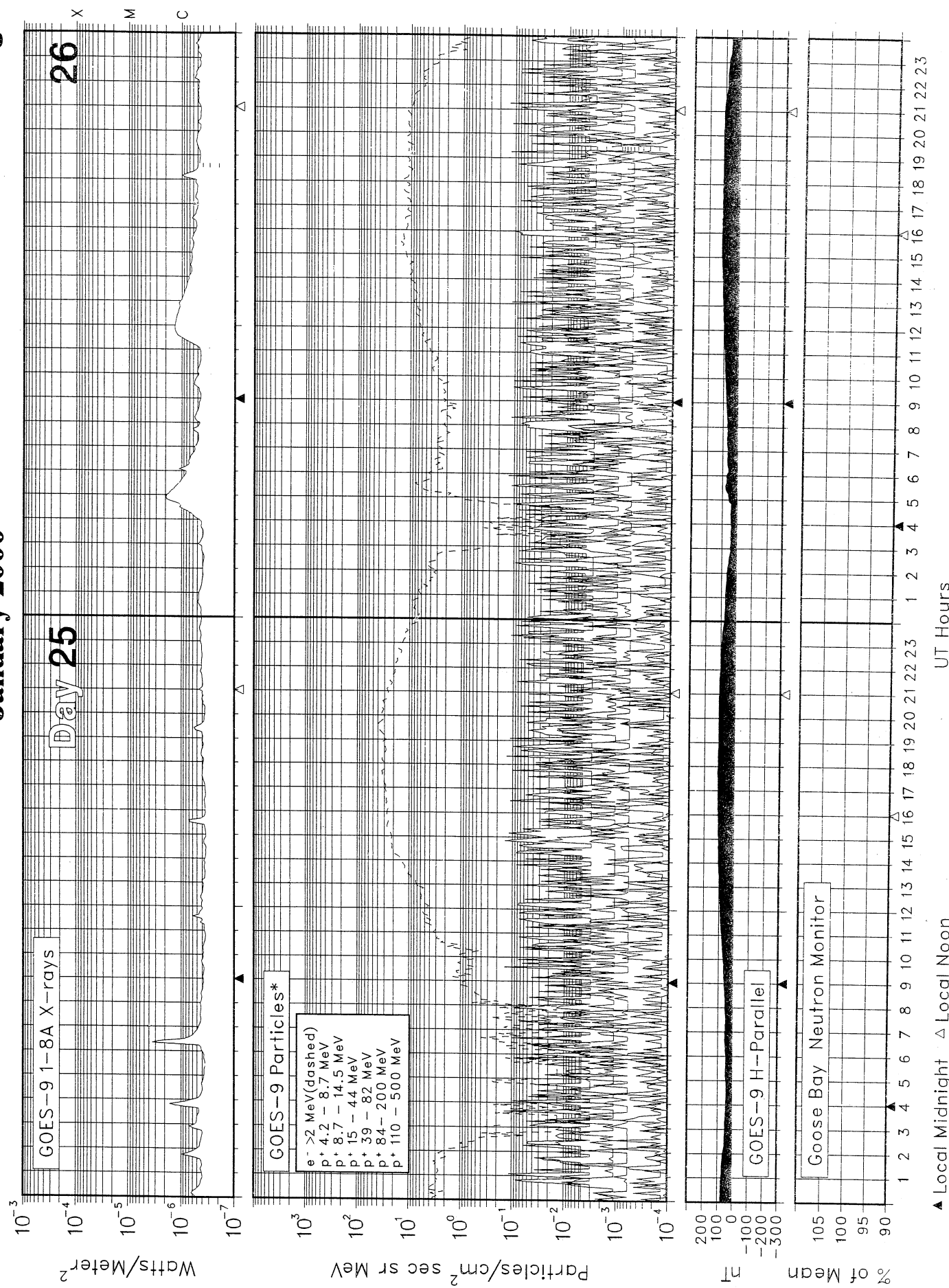
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January 2000



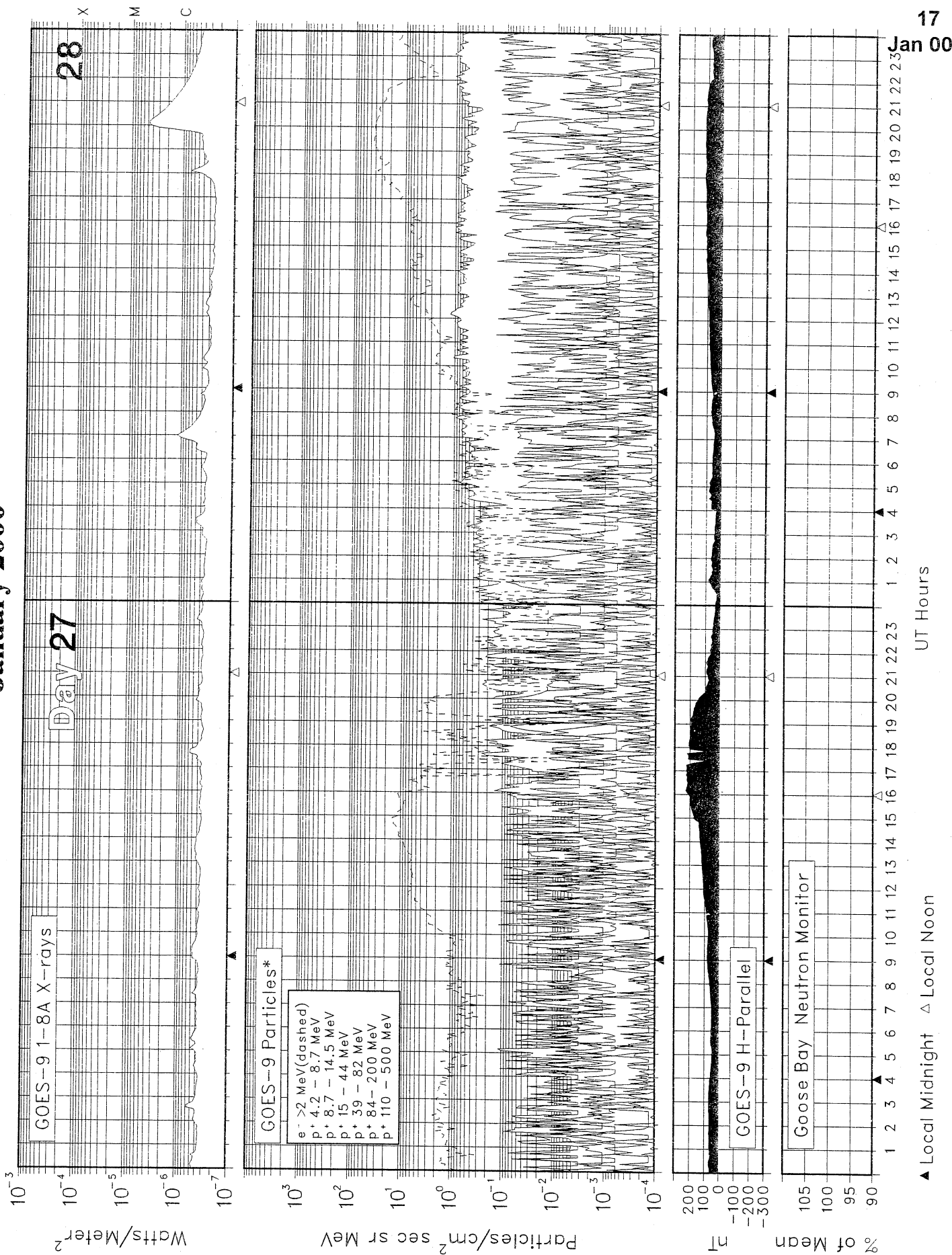
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January 2000

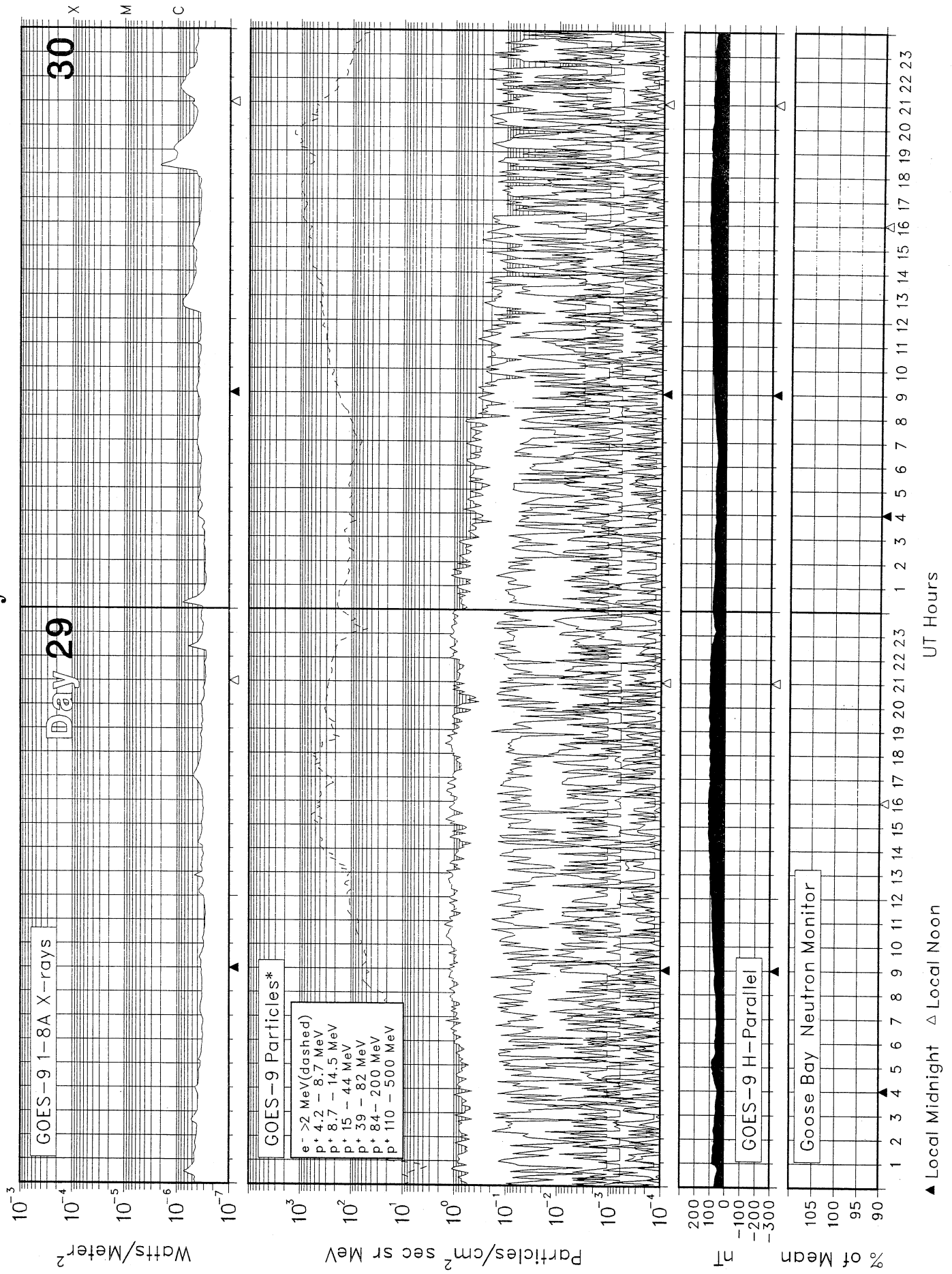


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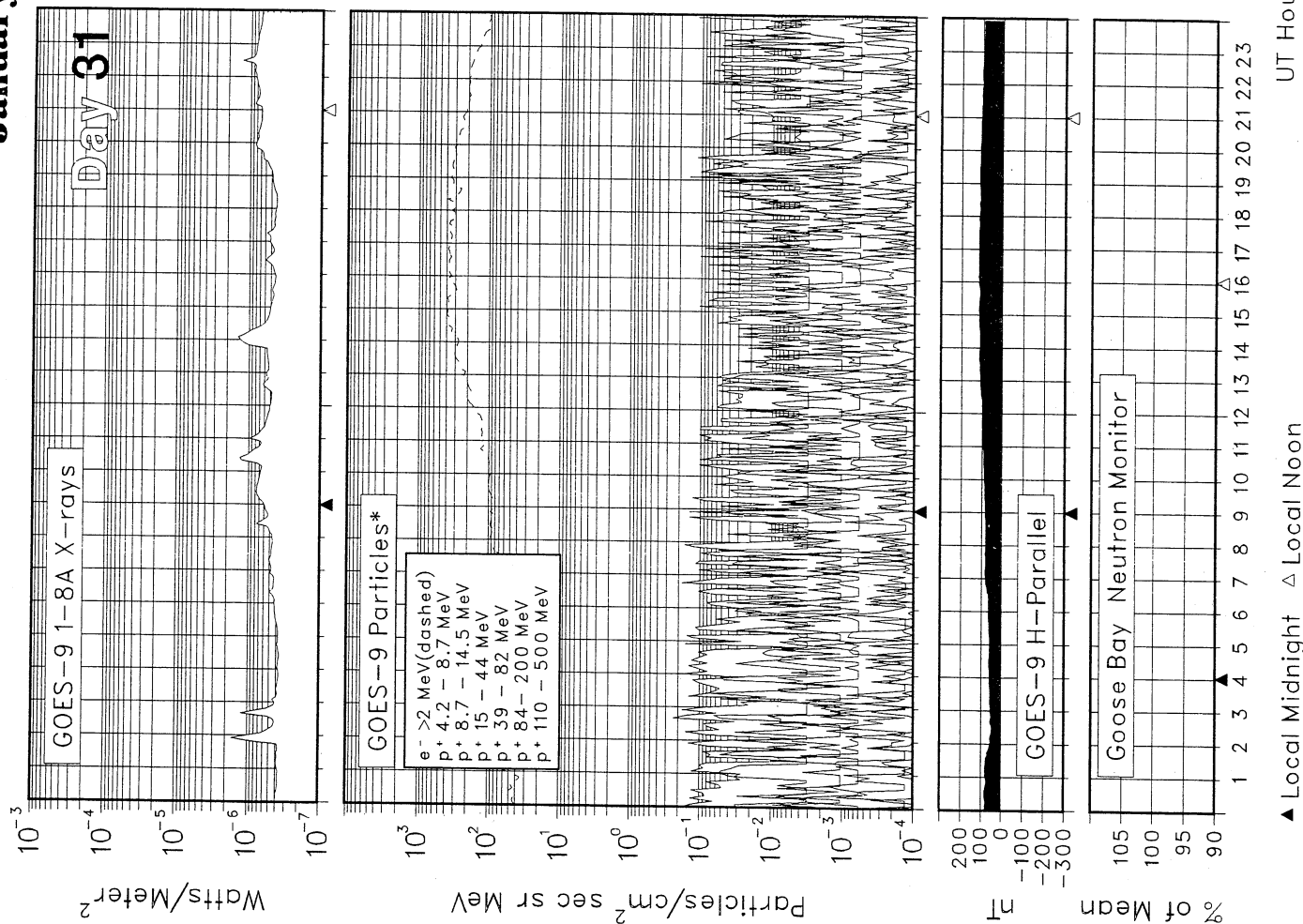


SOLAR-TERRESTRIAL ENVIRONMENT January 2000



SOLAR-TERRESTRIAL ENVIRONMENT

January 2000



* Electron flux is divided by 10.
 Electron units are Counts/cm² sec sr.
 Protons are corrected for contamination.

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Jan 00

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

JANUARY 2000

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Rgn No.	Location		Flares			Date of Fcst	Region Fcst(1)	Geoadvice(1)
							Lat	Lon	Opt	M	X			
001	01	31	91	130	24	8809	N24	W20	0	0	0	01	Q	SOL: Eruptive MAG: Active PRO: Quiet
						8810	N38	W05	0	0	0	01	E	
						8812	S27	W47	0	0	0	01	Q	
						8813	S17	E38	0	0	0	01	Q	
						8814	N10	E47	0	0	0	01	Q	
						8815	N10	E61	0	0	0	01	Q	
002	02	01	69	130	25	8810	N38	W18	0	0	0	02	Q	SOL: Eruptive MAG: Minor PRO: Quiet
						8813	S17	E21	0	0	0	02	Q	
						8814	N10	E34	1	0	0	02	Q	
						8815	N10	E48	0	0	0	02	Q	
003	03	02	69	133	15	8810	N37	W29	0	0	0	03	Q	SOL: Quiet MAG: Active PRO: Quiet
						8813	S16	E08	2	0	0	03	Q	
						8814	N10	E21	0	0	0	03	Q	
						8815	N08	E35	0	0	0	03	Q	
004	04	03	77	133	12	8810	N38	W42	0	0	0	04	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8813	S16	W07	0	0	0	04	Q	
						8814	N11	E08	0	0	0	04	Q	
						8815	N10	E22	1	0	0	04	Q	
005	05	04	102	135	12	8810	N38	W51	2	0	0	05	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8813	S16	W20	0	0	0	05	Q	
						8814	N12	W06	0	0	0	05	Q	
						8815	N10	E11	0	0	0	05	Q	
						8816	N23	W15	0	0	0	05	Q	
						8817	N24	E10	0	0	0	05	Q	
006	06	05	100	137	14	8810	N38	W65	0	0	0	06	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8813	S15	W32	0	0	0	06	Q	
						8814	N11	W19	0	0	0	06	Q	
						8815	N11	W02	0	0	0	06	Q	
						8816	N23	W29	0	0	0	06	Q	
						8817	N25	W03	0	0	0	06	Q	
						8818	S10	W33	0	0	0	06	Q	
007	07	06	145	145	17	8810	N38	W78	0	0	0	07	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8813	S16	W47	0	0	0	07	Q	
						8814	N12	W33	0	0	0	07	Q	
						8815	N10	W17	0	0	0	07	Q	
						8816	N20	W43	2	0	0	07	Q	
						8817	N24	W17	0	0	0	07	Q	
						8818	S11	W46	0	0	0	07	Q	
						8819	N10	W25	0	0	0	07	Q	
						8820	S16	E71	0	0	0	07	Q	
						8821	N25	E80	0	0	0	07	Q	
008	08	07	146	150	11	8810	N38	W83	0	0	0	08	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8813	S16	W62	0	0	0	08	Q	
						8814	N11	W47	0	0	0	08	Q	
						8815	N12	W33	0	0	0	08	Q	
						8816	N20	W57	0	0	0	08	Q	
						8817	N24	W32	0	0	0	08	Q	
						8819	N09	W40	9	0	0	08	E	
						8820	S15	E59	0	0	0	08	Q	
						8821	N26	E62	0	0	0	08	Q	
						8822	N16	E03	0	0	0	08	Q	
009	09	08	106	155	4	8813	S15	W75	0	0	0	09	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8814	N11	W60	0	0	0	09	Q	
						8816	N20	W70	0	0	0	09	Q	
						8819	N10	W52	2	0	0	09	E	
						8820	S15	E46	0	0	0	09	Q	
						8821	N26	E51	1	0	0	09	Q	
						8822	N16	W10	0	0	0	09	Q	
						8823	S31	E63	0	0	0	09	Q	

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

JANUARY 2000

Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Rgn No.	Location		Flares			Date of Fcst	Region Fcst(1)	Geoadvice(1)
							Lat	Lon	Opt	M	X			
010	10	09	119	161	1	8813	S15	W87	0	0	0	10	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8814	N11	W72	0	0	0	10	Q	
						8816	N20	W83	0	0	0	10	Q	
						8819	N10	W65	1	0	0	10	E	
						8820	S16	E33	0	0	0	10	Q	
						8821	N26	E40	1	0	0	10	Q	
						8822	N16	W24	0	0	0	10	Q	
						8823	S32	E51	0	0	0	10	Q	
						8824	S13	E75	1	0	0	10	Q	
011	11	10	88	163	5	8820	S15	E19	0	0	0	11	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8821	N27	E30	1	0	0	11	E	
						8822	N16	W41	0	0	0	11	Q	
						8823	S33	E39	0	0	0	11	Q	
						8824	S13	E62	5	1	0	11	E	
						8825	N11	E58	0	0	0	11	Q	
012	12	11	148	178	15	8820	S13	E05	0	0	0	12	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8821	N28	E15	0	0	0	12	Q	
						8823	S33	E26	0	0	0	12	Q	
						8824	S13	E47	9	0	0	12	E	
						8825	N11	E45	0	0	0	12	Q	
						8826	N18	W21	0	0	0	12	Q	
						8827	S11	W20	0	0	0	12	Q	
						8828	S19	E58	0	0	0	12	Q	
						8829	N16	E78	1	0	0	12	Q	
013	13	12	204	196	8	8820	S14	W08	0	0	0	13	Q	SOL: Active MAG: Quiet PRO: Quiet
						8821	N28	E05	0	0	0	13	Q	
						8823	S32	E14	0	0	0	13	Q	
						8824	S13	E32	7	1	0	13	E	
						8825	N11	E32	0	0	0	13	Q	
						8826	N18	W35	1	0	0	13	Q	
						8827	S12	W33	2	0	0	13	Q	
						8828	S20	E44	1	0	0	13	Q	
						8829	N16	E66	5	2	0	13	E	
						8830	S09	E11	0	0	0	13	Q	
						8831	S15	E78	0	0	0	13	Q	
014	14	13	218	202	12	8820	S15	W20	0	0	0	14	Q	SOL: Active MAG: Quiet PRO: Quiet
						8821	N28	W10	0	0	0	14	Q	
						8823	S32	W01	0	0	0	14	Q	
						8824	S12	E20	1	0	0	14	E	
						8826	N18	W48	0	0	0	14	Q	
						8827	S12	W46	1	0	0	14	Q	
						8828	S21	E31	0	0	0	14	Q	
						8829	N15	E52	1	0	0	14	E	
						8830	S10	W02	0	0	0	14	Q	
						8831	S17	E66	0	0	0	14	Q	
						8832	S16	W03	0	0	0	14	Q	
						8833	N19	E78	0	0	0	14	Q	
015	15	14	228	201	7	8821	N28	W24	0	0	0	15	Q	SOL: Eruptive MAG: Quiet PRO: Quiet
						8823	S32	W14	0	0	0	15	Q	
						8824	S13	E08	1	0	0	15	E	
						8825	N10	E06	0	0	0	15	Q	
						8826	N18	W59	0	0	0	15	Q	
						8827	S12	W58	1	0	0	15	E	
						8828	S21	E18	0	0	0	15	Q	
						8829	N17	E40	0	0	0	15	E	
						8830	S10	W16	0	0	0	15	Q	
						8831	S17	E53	0	0	0	15	Q	
						8832	S17	W16	0	0	0	15	Q	
						8833	N18	E66	0	0	0	15	Q	
016	16	15	268	211	3	8821	N28	W35	0	0	0	16	Q	SOL: Eruptive

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Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Rgn No.	Location		Flares			Date of Fcst	Region Fcst(1)	Geoadvice(1)
							Lat	Lon	Opt	M	X			
						8824	S14	W03	2	0	0	16	E	MAG: Quiet
						8826	N18	W71	0	0	0	16	Q	PRO: Quiet
						8827	S12	W70	4	0	0	16	Q	
						8828	S22	E06	0	0	0	16	Q	
						8829	N15	E24	1	0	0	16	Q	
						8831	S18	E40	0	0	0	16	Q	
						8832	S16	W28	0	0	0	16	Q	
						8833	N18	E54	0	0	0	16	Q	
						8834	S16	W60	0	0	0	16	Q	
						8835	N08	E57	0	0	0	16	Q	
017	17	16	262	208	3	8821	N27	W48	0	0	0	17	Q	SOL: Eruptive
						8824	S13	W17	2	0	0	17	E	MAG: Quiet
						8825	N11	W16	0	0	0	17	Q	PRO: Quiet
						8826	N18	W84	0	0	0	17	Q	
						8827	S11	W84	1	0	0	17	Q	
						8828	S22	W09	0	0	0	17	Q	
						8829	N16	E10	2	0	0	17	Q	
						8831	S17	E27	1	0	0	17	Q	
						8832	S16	W39	1	0	0	17	Q	
						8833	N19	E39	0	0	0	17	Q	
						8834	S16	W73	0	0	0	17	Q	
						8835	N09	E42	0	0	0	17	Q	
						8836	S12	E49	0	0	0	17	Q	
018	18	17	227	196	2	8821	N27	W60	0	0	0	18	Q	SOL: Eruptive
						8824	S13	W30	1	0	0	18	E	MAG: Quiet
						8825	N11	W30	0	0	0	18	Q	PRO: Quiet
						8828	S23	W21	0	0	0	18	Q	
						8829	N15	W04	1	0	0	18	Q	
						8830	S14	W49	1	0	0	18	Q	
						8831	S18	E14	1	0	0	18	Q	
						8832	S18	W54	1	0	0	18	Q	
						8833	N17	E26	0	0	0	18	Q	
						8834	S15	W87	0	0	0	18	Q	
						8835	N09	E30	0	0	0	18	Q	
						8836	S12	E37	0	0	0	18	Q	
019	19	18	185	195	2	8821	N27	W75	0	0	0	19	Q	SOL: Eruptive
						8824	S12	W43	2	1	0	19	E	MAG: Quiet
						8828	S23	W34	0	0	0	19	Q	PRO: Quiet
						8829	N15	W19	0	0	0	19	Q	
						8830	S15	W64	1	0	0	19	Q	
						8831	S18	E01	3	1	0	19	E	
						8832	S14	W63	0	0	0	19	Q	
						8833	N17	E14	0	0	0	19	Q	
						8836	S12	E24	1	0	0	19	Q	
						8837	S08	W27	4	0	0	19	Q	
						8838	N12	E66	0	0	0	19	Q	
020	20	19	196	179	3	8821	N26	W88	0	0	0	20	Q	SOL: Eruptive
						8824	S13	W57	1	0	0	20	Q	MAG: Quiet
						8828	S23	W47	0	0	0	20	Q	PRO: Quiet
						8829	N16	W32	1	0	0	20	Q	
						8830	S15	W73	0	0	0	20	Q	
						8831	S18	W12	0	0	0	20	E	
						8832	S15	W81	0	0	0	20	Q	
						8833	N17	E02	1	0	0	20	Q	
						8835	N08	E02	0	0	0	20	Q	
						8836	S13	E12	0	0	0	20	Q	
						8837	S09	W42	0	0	0	20	E	
						8838	N12	E53	0	0	0	20	Q	
021	21	20	119	171	13	8824	S13	W72	0	0	0	21	Q	SOL: Eruptive
						8829	N17	W45	0	0	0	21	Q	MAG: Quiet
						8831	S18	W25	0	0	0	21	E	PRO: Quiet
						8833	N17	W11	0	0	0	21	Q	

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Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Rgn No.	Location		Flares			Date of Fcst	Region Fcst(1)	Geoadvice(1)
							Lat	Lon	Opt	M	X			
						8837	S08	W55	5	0	0	21	E	
						8838	N12	E40	0	0	0	21	Q	
						8839	N11	E06	0	0	0	21	Q	
022	22	21	144	159	2	8829	N16	W59	0	0	0	22	Q	SOL: Eruptive
						8831	S18	W38	0	0	0	22	E	MAG: Active
						8833	N18	W24	0	0	0	22	Q	PRO: Quiet
						8836	S13	W15	0	0	0	22	Q	
						8837	S07	W69	2	0	0	22	E	
						8838	N13	E27	0	0	0	22	Q	
						8839	N12	W07	0	0	0	22	Q	
						8840	S24	E22	0	0	0	22	Q	
						8841	S28	E70	0	0	0	22	Q	
023	23	22	126	151	18	8829	N16	W72	0	0	0	23	Q	SOL: Eruptive
						8831	S17	W53	1	1	0	23	E	MAG: Active
						8833	N18	W38	0	0	0	23	Q	PRO: Quiet
						8835	N11	W38	0	0	0	23	Q	
						8837	S07	W82	0	0	0	23	E	
						8838	N12	E14	0	0	0	23	Q	
						8839	N12	W20	0	0	0	23	Q	
						8840	S24	E09	0	0	0	23	Q	
						8841	S30	E57	0	0	0	23	Q	
024	24	23	135	141	18	8829	N17	W86	0	0	0	24	Q	SOL: Eruptive
						8831	S17	W67	0	0	0	24	Q	MAG: Quiet
						8833	N18	W51	0	0	0	24	Q	PRO: Quiet
						8837	S08	W91	0	0	0	24	Q	
						8838	N12	E00	0	0	0	24	Q	
						8839	N11	W34	0	0	0	24	Q	
						8840	S24	W06	0	0	0	24	Q	
						8841	S29	E43	0	0	0	24	Q	
						8842	S17	W10	0	0	0	24	Q	
						8843	N14	E14	0	0	0	24	Q	
025	25	24	133	141	17	8831	S17	W81	0	0	0	25	Q	SOL: Eruptive
						8833	N19	W64	0	0	0	25	Q	MAG: Quiet
						8838	N12	W15	0	0	0	25	Q	PRO: Quiet
						8839	N12	W47	0	0	0	25	Q	
						8840	S24	W21	0	0	0	25	Q	
						8841	S29	E30	1	0	0	25	Q	
						8842	S16	W23	2	0	0	25	Q	
						8843	N15	E02	0	0	0	25	Q	
						8844	N07	W20	0	0	0	25	Q	
026	26	25	141	137	7	8831	S16	W93	0	0	0	26	Q	SOL: Eruptive
						8833	N19	W76	0	0	0	26	Q	MAG: Quiet
						8839	N11	W64	0	0	0	26	Q	PRO: Quiet
						8840	S24	W34	0	0	0	26	Q	
						8841	S29	E18	3	0	0	26	Q	
						8842	S17	W37	1	0	0	26	Q	
						8843	N14	W11	0	0	0	26	Q	
						8844	N05	W32	4	0	0	26	Q	
						8845	S14	E24	0	0	0	26	Q	
027	27	26	151	141	9	8833	N20	W88	0	0	0	27	Q	SOL: Eruptive
						8839	N14	W78	0	0	0	27	Q	MAG: Quiet
						8840	S25	W50	0	0	0	27	Q	PRO: Quiet
						8841	S30	E05	0	0	0	27	Q	
						8842	S17	W52	0	0	0	27	Q	
						8843	N14	W27	0	0	0	27	Q	
						8844	N04	W47	1	0	0	27	Q	
						8845	S15	E09	2	0	0	27	Q	
						8846	N37	E51	0	0	0	27	Q	
						8847	S26	W28	0	0	0	27	Q	
						8848	S07	E78	0	0	0	27	Q	

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Julian Day	Date of Issue	Date of Obs	Wolf No.	10-cm Solar Flux	A-index	Rgn No.	Location		Flares			Date of Fcst	Region Fcst(1)	Geoadvice(1)	
							Lat	Lon	Opt	M	X				
028	28	27	110	132	13	8840	S24	W63	0	0	0	28	Q	SOL: Eruptive MAG: Active PRO: Quiet	
							8841	S30	W09	0	0		0		Q
							8842	S16	W66	0	0		0		Q
							8844	N05	W60	1	0		0		E
							8845	S16	W06	0	0		0		Q
							8846	N38	E39	0	0		0		Q
8848	S08	E66	2	0	0	Q									
029	29	28	96	126	33	8841	S30	W22	2	0	0	29	Q	SOL: Eruptive MAG: Minor PRO: Quiet	
							8844	N05	W73	1	0		0		E
							8845	S16	W20	0	0		0		Q
							8846	N37	E25	0	0		0		Q
							8848	S09	E54	3	0		0		E
							8849	S16	E19	0	0		0		Q
030	30	29	81	128	22	8841	S30	W33	0	0	0	30	Q	SOL: Eruptive MAG: Active PRO: Quiet	
							8844	N05	W83	0	0		0		Q
							8845	S17	W33	1	0		0		Q
							8847	S26	W71	0	0		0		Q
							8848	S09	E41	0	0		0		Q
							8849	S17	E07	0	0		0		Q
031	31	30	90	133	12	8841	S30	W47	0	0	0	31	Q	SOL: Eruptive MAG: Active PRO: Quiet	
							8845	S16	W48	0	0		0		Q
							8847	S25	W84	0	0		0		Q
							8848	S09	E27	1	0		0		E
							8849	S17	W06	0	0		0		Q
							8850	S18	E25	0	0		0		Q
8851	N27	E42	0	0	0	Q									

(1) Region Forecast and Flare (SOL) Advice

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

Magnetic (MAG) Geoadvice

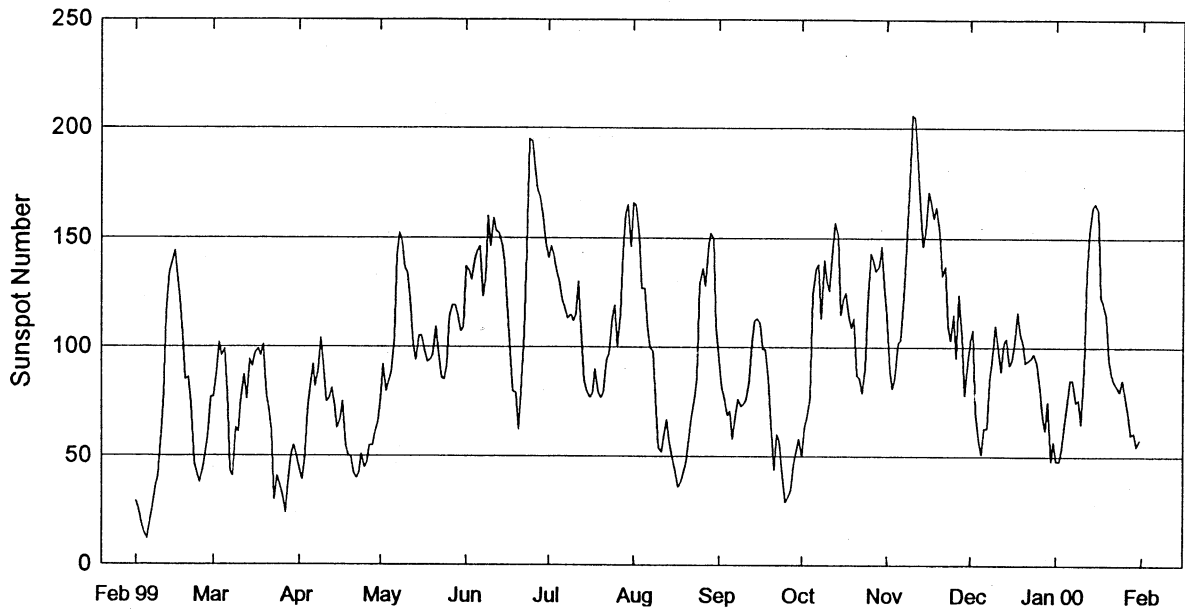
'Quiet'
 'Active' conditions expected (A>=20 or K=4)
 'Minor' storm expected (A>=30 or K=5)
 'Major' storm expected (A>=50 or K>=6)
 'Severe' storm expected (A>=100 or K>=7)
 'IP' magstorm in progress (A>=30 or K>=4)
 'Warning' (activity levels are expected to increase, but no numerical forecast given)
 '/' no forecast available

Proton (PRO) Geoadvice

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

STRATWARM ALERTS - NONE

International Relative Sunspot Numbers Feb 1999 - Jan 2000

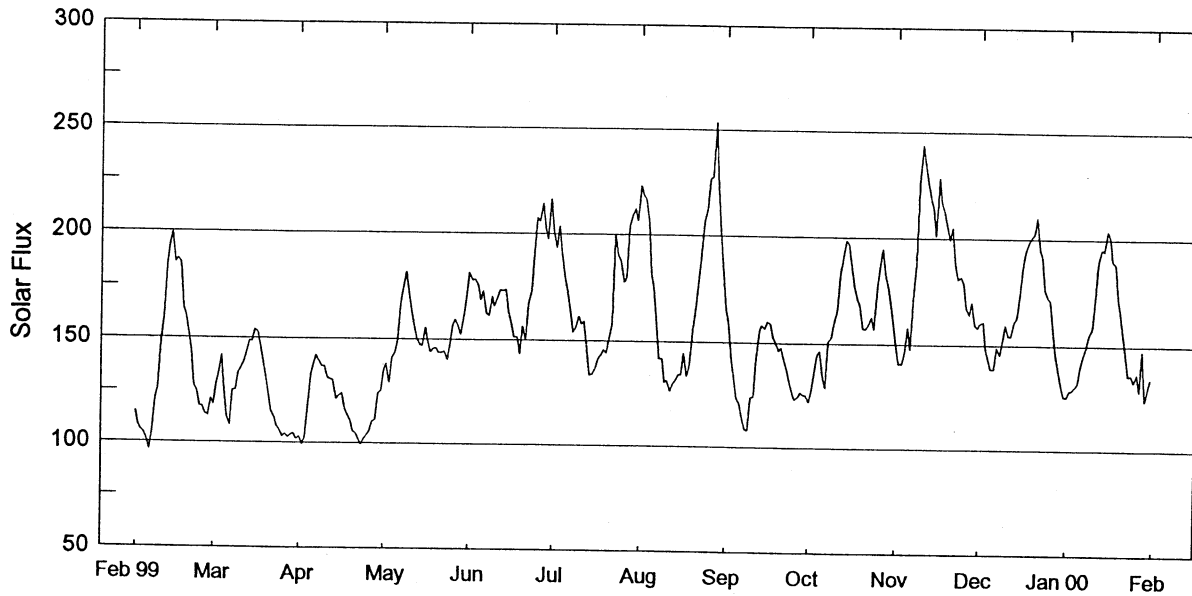


Day	Feb 99	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*	Jan 00*
1	29	77	44	76	137	141	166	94	50	115	103	48
2	25	88	39	92	135	146	165	82	64	90	108	48
3	19	102	48	80	131	142	151	77	68	81	70	54
4	15	96	71	84	140	134	127	69	77	86	57	64
5	12	99	81	88	144	130	127	71	124	102	51	73
6	19	79	92	104	146	122	110	58	136	103	63	85
7	28	43	82	142	123	117	100	69	138	123	63	85
8	36	41	89	152	131	113	98	76	113	146	84	75
9	41	63	104	149	160	115	76	73	140	169	94	76
10	60	61	90	136	146	112	54	74	130	206	110	65
11	78	76	75	134	159	115	52	76	126	205	101	90
12	115	87	76	122	153	130	60	85	145	188	89	134
13	134	76	81	101	152	103	67	102	157	164	102	153
14	138	94	74	94	147	84	57	112	151	146	104	164
15	144	91	63	105	139	80	49	113	115	153	92	166
16	133	97	67	105	120	77	44	111	122	171	94	163
17	122	99	75	99	97	79	36	99	125	166	102	123
18	105	96	55	93	80	90	38	99	114	159	116	120
19	85	101	50	94	79	79	42	86	109	164	106	114
20	86	78	50	96	62	77	48	65	113	152	102	95
21	74	71	42	109	79	79	58	44	87	133	93	88
22	47	61	40	98	106	94	68	60	86	137	94	84
23	42	30	42	86	144	97	76	57	79	110	95	82
24	38	41	51	85	195	113	86	41	90	103	97	80
25	44	37	45	92	194	119	129	29	120	115	93	85
26	51	31	47	114	182	100	136	31	143	95	84	77
27	59	24	55	119	172	115	128	35	140	124	69	70
28	77	37	55	119	169	144	147	46	135	105	62	60
29		51	61	115	160	161	152	52	137	78	75	61
30		55	66	107	148	165	150	58	146	93	48	55
31		51		109		146	109		129		57	58
Mean	66.3	68.8	63.7	106.4	137.7	113.5	93.7	71.5	116.4	132.7	86.4	90.2

* = Provisional.

Penticton 2800 MHz (10.7cm) Solar Flux Feb 1999 - Jan 2000

Adjusted to 1 AU



Day	Feb 99	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 00
1	114.5	118.0	102.9	134.9*	181.2	202.0	222.9	165.8	121.9	148.4	160.4	125.6
2	107.7	127.6	99.4	137.9	178.1	193.4	218.8	159.3	126.6	140.6	160.9	128.5
3	105.8	134.6	102.7	129.2	178.5	203.5	216.9	141.7	134.7	140.8	147.5	128.7
4	104.3	141.6	116.0	141.1	175.9	191.9	206.0	133.5	144.4	145.1	143.3	130.3
5	100.9	125.4	132.7	143.3	168.8	180.0	182.1	123.8	146.2	157.8	138.6	132.0
6	96.6	112.6	137.6	149.5	172.9	173.5	175.3	120.4	133.5	147.4	138.6	140.0
7	106.5	108.3	141.7	166.4	162.4	163.7	157.6	114.1	129.2	170.8	148.8	144.8
8	121.1	125.0	139.5	175.1	161.3	154.1	141.7	108.4	150.9	188.4	145.6	149.6
9	125.9	125.3	136.7	181.7	170.3	155.9	141.9	108.0	152.8	225.5	151.5	155.3
10	148.4	133.6	136.9	172.8	166.0	161.5	130.8	123.7	160.0	243.6	159.5	157.8
11	159.3	135.3	131.3	162.6	169.8	157.8	131.4	124.1	166.0	235.0	154.3	171.8
12	183.6	138.5	130.7	156.3	173.2	159.2	126.4	142.6	182.9	227.1	154.4	189.3
13	193.4	142.7	130.3	150.5	173.0	148.3	129.8	156.5	190.1	219.1	161.0	195.4
14	199.6	148.7	121.0	147.3	173.5	133.9	131.5	158.2	198.7	214.2	163.1	194.7
15	185.5	148.4	122.7	146.8	163.5	133.8	134.5	156.6	197.1	201.1	173.1	203.9
16	187.3	154.1	123.8	155.6	157.6	136.4	134.4	159.9	187.8	228.2	187.9	201.0
17	185.3	152.9	116.6	148.6	151.3	141.3	144.5	159.1	176.8	216.3	194.4	190.1
18	164.2	146.7	113.8	143.8	151.2	142.8	133.9	153.0	171.4	212.9	198.9	188.4
19	160.5	138.1	110.9	145.8	143.3	145.8	138.0	150.6	168.2	205.1	200.3	172.9
20	153.6	131.6	105.8	145.9	156.5	144.1	155.2	146.2	157.4	199.5	202.4	165.3
21	144.0	123.1	104.4	143.7	150.3	152.1	165.0	147.9	157.0	205.0	210.1	154.3
22	127.0	115.0	101.4	143.7	166.9	157.8	176.7	141.5	158.8	187.2	195.1	145.8
23	124.3	112.2	99.3	144.2	173.0	199.9	191.7	137.8	162.8	180.9	191.9	136.1
24	117.3	107.6	102.0	140.4	191.1	190.1	206.4	132.4	157.1	181.9	176.5	136.3
25	117.1	106.4	103.8	146.8	207.5	188.0	212.9	126.1	177.2	179.0	172.5	133.1
26	113.4	103.1	105.8	156.6	206.1	177.8	226.9	123.3	187.1	167.7	171.2	136.4
27	112.9	104.1	110.0	159.3	214.3	179.9	227.7	124.4	194.8	164.5	156.4	128.4
28	120.7	102.7	111.3	156.2	203.2	203.9	253.4	126.5	181.5	170.1	145.4	147.4
29		103.8	123.9	152.7	197.7	208.6	222.5	125.3	177.2	159.5	139.0	123.9
30		104.4	125.3	161.1	216.5	212.2	201.9	125.1	167.0	158.3	131.2	128.7
31		101.7		170.1		206.7	186.1		158.1		125.8	134.5
Mean	138.6	124.9	118.0	151.9	175.2	171.0	175.0	137.2	163.7	187.4	164.5	153.9

NOTE: * 2300UT reading - hail on antenna at 2000UT.

DAILY SOLAR INDICES
January 2000

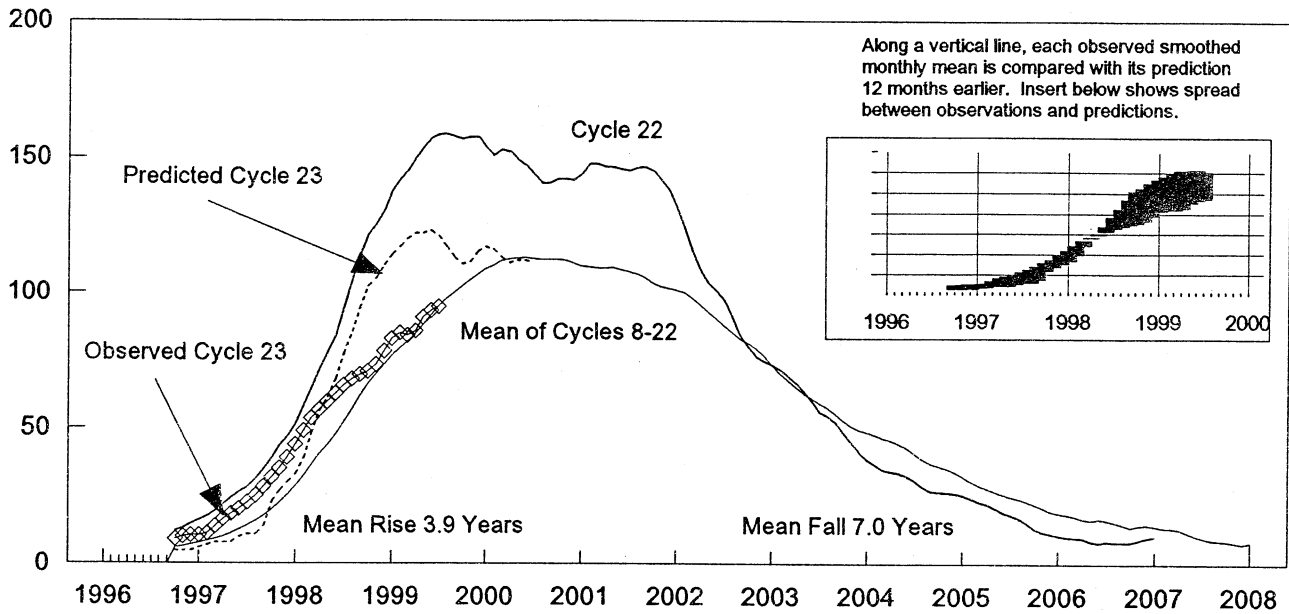
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Jan 00

Day	Day of Year	Bartels Cycle Day	Sunspot Numbers		Obs Flux Penticton (2800)	Solar Flux Adjusted to 1 Astronomical Unit								
			Int	Amer		SGMR (15400)	SGMR (8800)	SGMR (4995)	Pentic (2800)	SGMR (2695)	SGMR (1415)	SGMR (610)	SGMR (410)	SGMR (245)
1	1	7	48		129.9	489	266	167	125.6	123	101	58	40	14
2	2	8	48		132.9	454	259	164	128.5	119	103	55	43	14
3	3	9	54		133.1	464	--	156	128.7	124	104	62	43	13
4	4	10	64		134.7	435	266	166	130.3	123	104	52	41	12
5	5	11	73		136.5	497	274	167	132.0	124	105	64	43	11
6	6	12	85		144.8	503	285	175	140.0	131	109	66	45	14
7	7	13	85		149.8	499	286	180	144.8	137	112	68	45	15
8	8	14	75		154.7	517	289	189	149.6	144	119	72	49	21
9	9	15	76		160.6	504	282	192	155.3	146	123	72	50	17
10	10	16	65		163.2	481	280	193	157.8	150	125	73	49	17
11	11	17	90		177.6	505	291	209	171.8	162	130	75	48	17
12	12	18	134		195.7	524	305	221	189.3	183	141	78	51	17
13	13	19	153		202.0	481	307	228	195.4	190	146	77	49	16
14	14	20	164		201.3	579	325	240	194.7	194	159	79	52	17
15	15	21	166		210.7	578	316	238	203.9	193	152	78	50	18
16	16	22	163		207.7	539	297	223	201.0	192	148	76	50	--
17	17	23	123		196.4	575	313	218	190.1	181	149	75	50	19
18	18	24	120		194.6	--	--	--	188.4	--	--	--	--	--
19	19	25	114		178.6	566	305	203	172.9	167	138	73	52	26
20	20	26	95		170.7	568	307	202	165.3	157	127	69	57	26
21	21	27	88		159.3	559	309	198	154.3	152	122	67	53	25
22	22	1	84		150.6	574	303	193	145.8	146	117	64	48	24
23	23	2	82		140.5	547	288	179	136.1	133	109	62	44	17
24	24	3	80		140.7	548	276	177	136.3	127	107	63	--	22
25	25	4	85		137.4	417	272	177	133.1	130	102	56	49	19
26	26	5	77		140.7	512	276	167	136.4	138	102	53	51	25
27	27	6	70		132.4	526	276	167	128.4	130	97	61	46	21
28	28	7	60		152.0	534	273	159	147.4	119	96	57	43	16
29	29	8	61		127.7	554	261	157	123.9	118	98	61	43	17
30	30	9	55		132.7	550	262	161	128.7	118	101	60	42	15
31	31	10	58		138.6	523	275	168	134.5	126	104	63	45	15
MEAN			90.2		159.0	520	287	187	153.9	145	118	66	47	17

The International numbers shown above are preliminary values; the American numbers are not available.

NOTE: Radio flux values are from Sagamore Hill, Massachusetts, USA.

Cycle 23 Smoothed Sunspot Numbers: Observed and Predicted



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

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
1992	124	115	108	103	100	97	91	84	80	76	74	73	94
1993	71	69	67	64	60	56	55	52	48	45	41	38	56
1994	37	35	34	34	33	31	29	27	27	27	26	26	31
1995	24	23	22	21	19	18	17	15	13	12	11	11	17
1996	10	10	10	9	8*	9	8	8	8	9**	10	10	8
1997	11	11	14	17	18	20	23	25	28	32	35	39	23
1998	44	49	53	57	59	63	65	68	69	71	73	78	62
1999	83	85	84	85	90	93	94	97	99	102	104	106	94
								(5)	(10)	(13)	(15)	(18)	(5)
2000	107	108	109	110	110	110	111	111	111	110	110	110	110
	(20)	(23)	(24)	(26)	(27)	(28)	(28)	(29)	(31)	(32)	(34)	(35)	(28)

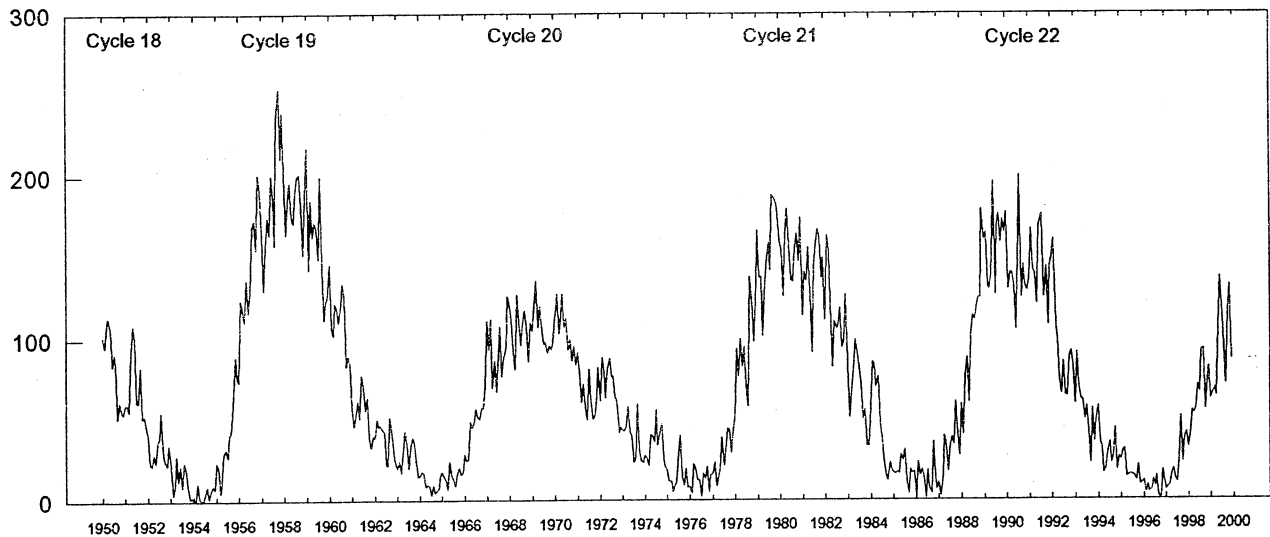
Solar Cycle 22
 Solar Cycle 23
 Min, Max, and Predictions
 * May 1996 marks Cycle 22's mathematical minimum. ** October 1996 marks the consensus minimum NGDC is now using.

Observed and Predicted Numbers. For the end of Cycle 22, and the rise and decline of Cycle 23, the table above lists observed smoothed sunspot numbers up to the one that includes the most recent monthly mean. We based these smoothed values on final monthly means through Jun 1999 and on provisional numbers thereafter. Table entries with numbers in parentheses below them denote predictions by the McNish-Lincoln method. (See page 9 in the Jul 1987 supplement to *Solar-Geophysical Data*.) Adding the number in parentheses to the predicted value generates the upper limit of the 90% confidence interval. Subtracting the number from the predicted value generates the lower limit. Consider, for example, the July 2000 prediction. There exists a 90% chance that in July 2000, the actual smoothed number will fall somewhere between 83 and 139.

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

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

Mean Monthly Sunspot Numbers Jan 1950 - Jan 2000



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	101.6	94.8	109.7	113.4	106.2	83.6	91.0	85.2	51.3	61.4	54.8	54.1	83.9
1951	59.9	59.9	55.9	92.9	108.5	100.6	61.5	61.0	83.1	51.6	52.4	45.8	69.4
1952	40.7	22.7	22.0	29.1	23.4	36.4	39.3	54.9	28.2	23.8	22.1	34.3	31.5
1953	26.5	3.9	10.0	27.8	12.5	21.8	8.6	23.5	19.3	8.2	1.6	2.5	13.9
1954	0.2	0.5	10.9	1.8	0.8	0.2	4.8	8.4	1.5	7.0	9.2	7.6	4.4 m
1955	23.1	20.8	4.9	11.3	28.9	31.7	26.7	40.7	42.7	58.5	89.2	76.9	38.0
1956	73.6	124.0	118.4	110.7	136.6	116.6	129.1	169.6	173.2	155.3	201.3	192.1	141.7
1957	165.0	130.2	157.4	175.2	164.6	200.7	187.2	158.0	235.8	253.8	210.9	239.4	190.2 M
1958	202.5	164.9	190.7	196.0	175.3	171.5	191.4	200.2	201.2	181.5	152.3	187.6	184.8
1959	217.4	143.1	185.7	163.3	172.0	168.7	149.6	199.6	145.2	111.4	124.0	125.0	159.0
1960	146.3	106.0	102.2	122.0	119.6	110.2	121.7	134.1	127.2	82.8	89.6	85.6	122.3
1961	57.9	46.1	53.0	61.4	51.0	77.4	70.2	55.8	63.6	37.7	32.6	39.9	53.9
1962	38.7	50.3	45.6	46.4	43.7	42.0	21.8	21.8	51.3	39.5	26.9	23.2	37.6
1963	19.8	24.4	17.1	29.3	43.0	35.9	19.6	33.2	38.8	35.3	23.4	14.9	27.9
1964	15.3	17.7	16.5	8.6	9.5	9.1	3.1	9.3	4.7	6.1	7.4	15.1	10.2 m
1965	17.5	14.2	11.7	6.8	24.1	15.9	11.9	8.9	16.8	20.1	15.8	17.0	15.1
1966	28.2	24.4	25.3	48.7	45.3	47.7	56.7	51.2	50.2	57.2	57.2	70.4	47.0
1967	110.9	93.6	111.8	69.5	86.5	67.3	91.5	107.2	76.8	88.2	94.3	126.4	93.8
1968	121.8	111.9	92.2	81.2	127.2	110.3	96.1	109.3	117.2	107.7	86.0	109.8	105.9 M
1969	104.4	120.5	135.8	106.8	120.0	106.0	96.8	98.0	91.3	95.7	93.5	97.9	105.5
1970	111.5	127.8	102.9	109.5	127.5	106.8	112.5	93.0	99.5	86.6	95.2	83.5	104.5
1971	91.3	79.0	60.7	71.8	57.5	49.8	81.0	61.4	50.2	51.7	63.2	82.2	66.6
1972	61.5	88.4	80.1	63.2	80.5	88.0	76.5	76.8	64.0	61.3	41.6	45.3	58.9
1973	43.4	42.9	46.0	57.7	42.4	39.5	23.1	25.6	59.3	30.7	23.9	23.3	38.0
1974	27.6	26.0	21.3	40.3	39.5	36.0	55.8	33.6	40.2	47.1	25.0	20.5	34.5
1975	18.9	11.5	11.5	5.1	9.0	11.4	28.2	39.7	13.9	9.1	19.4	7.8	15.5
1976	8.1	4.3	21.9	18.8	12.4	12.2	1.9	16.4	13.5	20.6	5.2	15.3	12.6 m
1977	16.4	23.1	8.7	12.9	18.6	38.5	21.4	30.1	44.0	43.8	29.1	43.2	27.5
1978	51.9	93.6	76.5	99.7	82.7	95.1	70.4	58.1	138.2	125.1	97.9	122.7	92.5
1979	166.6	137.5	138.0	101.5	134.4	149.5	159.4	142.2	188.4	186.2	183.3	176.3	155.4 M
1980	159.6	155.0	126.2	164.1	179.9	157.3	136.3	135.4	155.0	164.7	147.9	174.4	154.6
1981	114.0	141.3	135.5	156.4	127.5	90.9	143.8	158.7	167.3	162.4	137.5	150.1	140.4
1982	111.2	163.6	153.8	122.0	82.2	110.4	106.1	107.6	118.8	94.7	98.1	127.0	115.9
1983	84.3	51.0	66.5	80.7	99.2	91.1	82.2	71.8	50.3	55.8	33.3	33.4	66.6
1984	57.0	85.4	83.5	69.7	76.4	46.1	37.4	25.5	15.7	12.0	22.8	18.7	45.9
1985	16.5	15.9	17.2	16.2	27.5	24.2	30.7	11.1	3.9	18.6	16.2	17.3	17.9
1986	2.5	23.2	15.1	18.5	13.7	1.1	18.1	7.4	3.8	35.4	15.2	6.8	13.4 m
1987	10.4	2.4	14.7	39.6	33.0	17.4	33.0	38.7	33.9	60.6	39.9	27.1	29.4
1988	59.0	40.0	76.2	88.0	60.1	101.8	113.8	111.6	120.1	125.1	125.1	179.2	100.2
1989	161.3	165.1	131.4	130.6	138.5	196.2	126.9	168.9	176.7	159.4	173.0	165.5	157.6 M
1990	177.3	130.5	140.3	140.3	132.2	105.4	149.4	200.3	125.2	145.5	131.4	129.7	142.6
1991	136.9	167.5	141.9	140.0	121.3	169.7	173.7	176.3	125.3	144.1	108.2	144.4	145.7
1992	150.0	161.1	106.7	99.8	73.8	65.2	85.7	64.5	63.9	88.7	91.8	82.6	94.3
1993	59.3	91.0	69.8	62.2	61.3	49.8	57.9	42.2	22.4	56.4	35.6	48.9	54.6
1994	57.8	35.5	31.7	16.1	17.8	28.0	35.1	22.5	25.7	44.0	18.0	26.2	29.9
1995	24.2	29.9	31.1	14.0	14.5	15.6	14.5	14.3	11.8	21.1	9.0	10.0	17.5
1996	11.5	4.4	9.2	4.8	5.5	11.8	8.2	14.4	1.6	0.9	17.9	13.3	8.6 m
1997	5.7	7.6	8.7	15.5	18.5	12.7	10.4	24.4	51.3	22.8	39.0	41.2	21.5
1998	31.9	40.3	54.8	53.4	56.3	70.7	66.6	92.2	92.9	55.5	74.0	81.9	64.3
1999	62.0	66.3	68.8	63.7	106.4	137.7	113.5	93.7	71.5	116.4	132.7	86.4	93.3
2000	90.2												90.2

Values are preliminary after Sep 99. For the yearly means, each 'M' marks a sunspot cycle maximum and each 'm' a minimum.

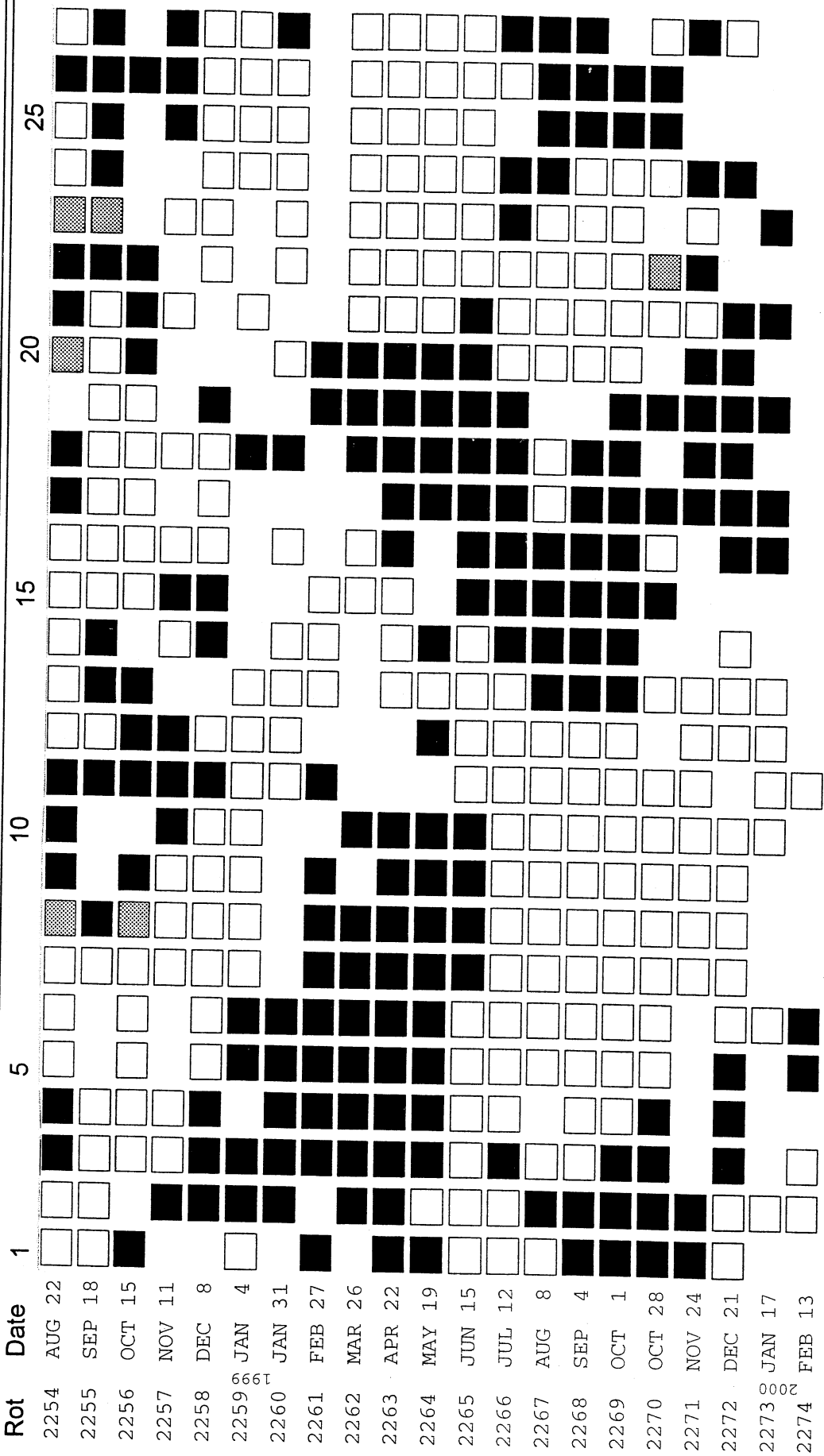
S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

35
Jan 00

JANUARY 2000

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m 2 Hz)	Mean		
02	2695	LEAR	4 S/F	2223.0	2225.0	3.0	78.0		QL=2 ST=2 TYP=3	
	8800	LEAR	4 S/F	2223.0	2225.0	4.0	340.0		QL=2 ST=2 TYP=3	
	8800	PALE	4 S/F	2223.0	2225.0	4.0	280.0		QL=4 ST=2 TYP=3	
	2695	PALE	4 S/F	2223.0	2225.0	4.0	93.0		QL=4 ST=2 TYP=3	
06	2695	SVTO	4 S/F	0647.0	0649.0	4.0	82.0		QL=2 ST=2 TYP=3	
	2695	LEAR	4 S/F	0648.0	0649.0	3.0	78.0		QL=4 ST=2 TYP=3	
	8800	LEAR	8 S	0648.0	0649.0	2.0	44.0		QL=4 ST=2 TYP=3	
10	8800	SVTO	20 GRF	0848.0	0901.0	22.0	41.0		QL=4 ST=2 TYP=2	
	8800	LEAR	20 GRF	0859.0	0901.0	5.0	42.0		QL=4 ST=2 TYP=2	
	8800	SGMR	48 C	1334.0	1339.0	19.0	120.0		QL=4 ST=2 TYP=8	
	2695	SGMR	8 S	1338.0	1339.0	2.0	37.0		QL=4 ST=2 TYP=3	
	8800	SVTO	4 S/F	1338.0	1339.0	11.0	74.0		QL=2 ST=2 TYP=3	
	8800	SGMR	20 GRF	1340.0	1359.0U	88.0	71.0		QL=4 ST=2 TYP=2	
11	8800	PALE	8 S	2143.0	2144.0	2.0	79.0		QL=4 ST=2 TYP=3	
12	8800	LEAR	4 S/F	0133.0	0135.0	6.0	370.0		QL=4 ST=2 TYP=3	
	8800	PALE	4 S/F	0133.0	0136.0	6.0	350.0		QL=4 ST=2 TYP=3	
	2695	LEAR	4 S/F	0135.0	0137.0	6.0	240.0		QL=4 ST=2 TYP=3	
	2695	PALE	4 S/F	0135.0	0137.0	7.0	240.0		QL=4 ST=2 TYP=3	
	2695	LEAR	8 S	0346.0	0346.0	2.0	39.0		QL=4 ST=2 TYP=3	
	8800	LEAR	8 S	0346.0	0346.0		23.0	U	QL=4 ST=2 TYP=3	
	8800	SGMR	8 S	1956.0	1957.0	2.0	88.0		QL=4 ST=2 TYP=3	
	2695	LEAR	4 S/F	2301.0	2304.0	6.0	88.0		QL=4 ST=2 TYP=3	
	2695	PALE	4 S/F	2302.0	2304.0	4.0	64.0		QL=4 ST=2 TYP=3	
	8800	PALE	8 S	2304.0	2304.0		25.0	U	QL=4 ST=2 TYP=3	
13	8800	SVTO	8 S	1511.0	1512.0	2.0	92.0		QL=2 ST=2 TYP=3	
	8800	SGMR	8 S	1512.0	1512.0	2.0	110.0		QL=4 ST=2 TYP=3	
14	8800	SGMR	8 S	1709.0	1709.0	1.0	89.0		QL=4 ST=2 TYP=3	
15	2695	LEAR	4 S/F	0156.0	0158.0	4.0	33.0		QL=4 ST=2 TYP=3	
	8800	LEAR	4 S/F	0156.0	0158.0	4.0	92.0		QL=4 ST=2 TYP=3	
17	8800	LEAR	4 S/F	0023.0	0024.0	3.0	35.0		QL=4 ST=2 TYP=3	
	8800	LEAR	20 GRF	0440.0	0619.0	127.0	44.0		QL=4 ST=2 TYP=2	
	2695	LEAR	20 GRF	0440.0	0630.0	165.0	57.0		QL=4 ST=2 TYP=2	
18	2695	SGMR	4 S/F	1711.0	1713.0	409.0	82.0		QL=4 ST=1 TYP=3	
	8800	SGMR	4 S/F	1712.0	1714.0	408.0	42.0		QL=4 ST=1 TYP=3	
20	2695	PALE	8 S	0224.0	0224.0	1.0	37.0		QL=4 ST=2 TYP=3	
	8800	PALE	8 S	0224.0	0224.0	1.0	140.0		QL=4 ST=2 TYP=3	
21	8800	LEAR	4 S/F	0507.0	0508.0	4.0	42.0		QL=4 ST=2 TYP=3	
	2695	LEAR	8 S	0507.0	0507.0	2.0	140.0		QL=4 ST=2 TYP=3	
	8800	SVTO	20 GRF	1038.0	1142.0	151.0	18.0		QL=4 ST=2 TYP=2	
	8800	PALE	4 S/F	2152.0	2158.0	6.0	30.0		QL=4 ST=2 TYP=3	
22	2695	PALE	4 S/F	1758.0	1759.0	3.0	250.0		QL=4 ST=2 TYP=3	
	8800	PALE	4 S/F	1758.0	1759.0	3.0	130.0		QL=4 ST=2 TYP=3	
25	2695	SGMR	8 S	1532.0	1532.0	1.0	39.0		QL=4 ST=2 TYP=3	
28	2695	SGMR	8 S	1953.0	1953.0	2.0	30.0		QL=4 ST=2 TYP=3	
	2695	PALE	4 S/F	1953.0	1954.0	28.0	25.0		QL=4 ST=2 TYP=3	
	2695	SGMR	20 GRF	1956.0	2008.0	17.0	78.0		QL=4 ST=2 TYP=2	
	8800	PALE	4 S/F	1958.0	2000.0	5.0	34.0		QL=4 ST=2 TYP=3	
	8800	SGMR	4 S/F	1959.0	2000.0	14.0	29.0		QL=4 ST=2 TYP=3	
	2695	PALE	8 S	2021.0	2021.0		49.0	U	QL=4 ST=2 TYP=3	

STANFORD MEAN SOLAR MAGNETIC FIELD

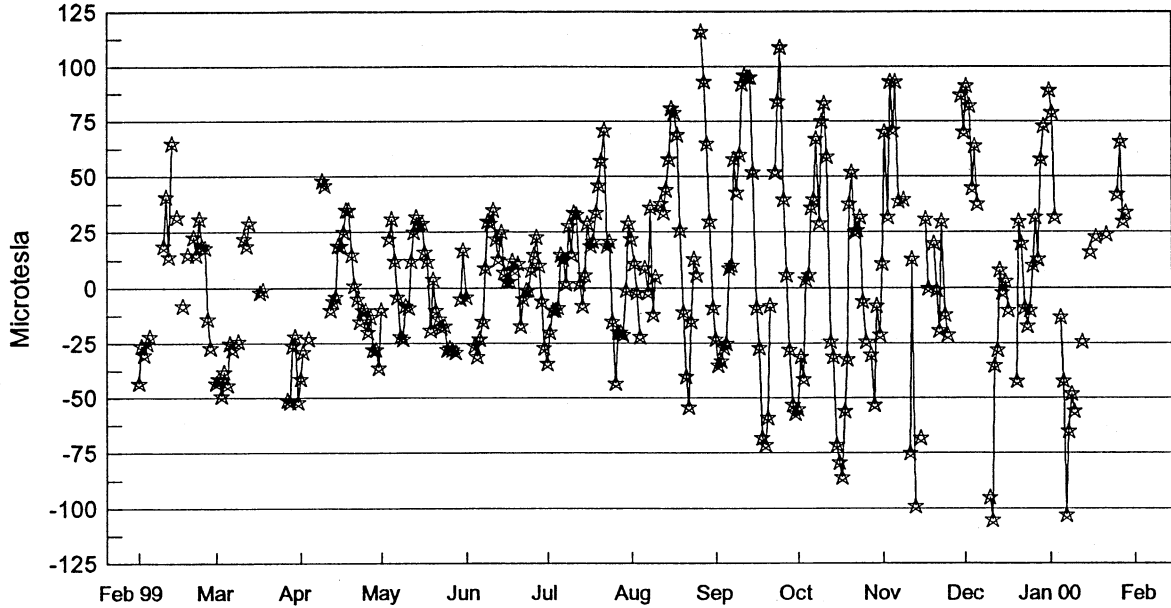


Mean Solar Magnetic Field Polarity: = field > 2 microT; = -2 microT ≤ field ≤ 2 microT

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

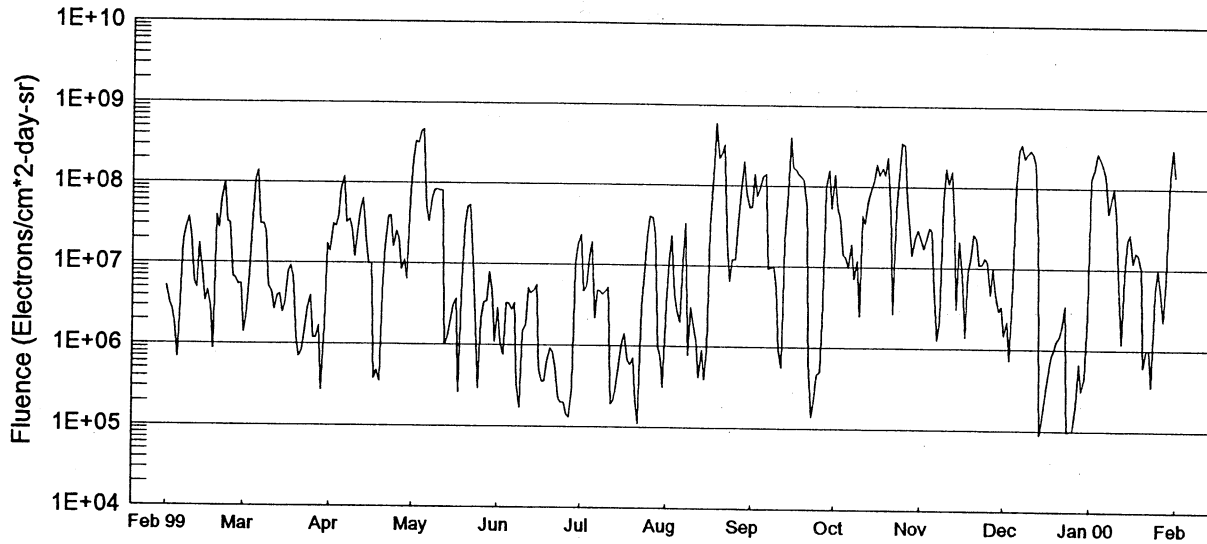
Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates are five days earlier, to mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

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



Day	Feb 99	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 00
1	-43	-43	-41	-10	-4	-34	22	-23	-55	11	70	89
2	-26	-41	-29	---	---	-20	11	-35	-31	70	91	79
3	-30	-49	---	---	---	-10	-2	-33	-41	32	82	32
4	-25	-38	-23	22	-26	-10	-22	-27	4	93	45	---
5	-22	-44	---	31	-31	-9	---	-25	6	71	64	-13
6	---	-25	---	12	-23	15	9	9	36	93	38	-42
7	---	-28	---	-4	-15	13	-2	10	40	39	---	-103
8	---	---	---	-22	9	2	36	58	67	---	---	-65
9	---	-24	48	-23	30	28	-12	43	29	40	---	-48
10	19	---	46	-8	29	15	5	60	75	---	-95	-56
11	41	22	---	-9	35	34	---	92	83	-75	-105	---
12	14	19	-10	12	22	33	38	96	59	13	-35	---
13	65	29	-6	25	13	2	34	95	-24	-99	-28	-24
14	---	---	-4	32	25	-8	44	95	-31	---	8	---
15	32	---	19	29	7	6	58	52	-71	-68	-2	---
16	---	---	19	29	3	29	81	-9	-79	---	3	16
17	-8	-2	25	16	3	19	79	-27	-86	31	-10	---
18	---	-1	35	12	12	21	69	-68	-56	0	---	23
19	15	---	35	-19	8	34	26	-71	-32	---	---	---
20	---	---	15	4	11	46	-11	-59	38	20	-42	---
21	23	---	1	-10	-17	57	-40	-8	52	-1	30	---
22	15	---	-5	-14	-5	71	-54	---	25	-19	20	24
23	31	---	-15	-18	-1	19	-15	52	26	30	-9	---
24	19	---	-10	-17	-1	21	13	84	32	-12	-17	---
25	18	---	-10	-28	8	-15	6	109	-6	-21	-10	---
26	-14	---	-20	-27	15	-43	---	40	-24	---	10	42
27	-27	-51	-13	-28	23	-20	116	6	---	---	32	66
28	---	-52	-28	-29	10	-20	93	-28	-30	---	13	30
29	---	-26	-28	---	-6	-21	65	-53	-53	---	58	34
30	---	-22	-36	-5	-27	-1	30	-57	-8	87	73	---
31	---	-52	---	17	---	29	-9	---	-21	---	---	---

GOES Daily Electron Fluence Feb 1999 - Jan 2000



Day	Feb 99	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 00
1	5.2E+06	1.4E+06	1.4E+07	1.9E+08	2.9E+06	2.3E+07	3.4E+06	5.5E+07	1.4E+08	2.2E+07	1.5E+06	1.3E+08
2	3.2E+06	2.2E+06	3.0E+07	3.3E+08	1.1E+06	4.7E+06	1.1E+07	1.4E+08	5.4E+07	1.7E+07	2.2E+06	1.7E+08
3	2.7E+06	7.2E+06	2.9E+07	3.2E+08	7.7E+05	5.5E+06	2.3E+07	7.5E+07	4.1E+07	2.2E+07	7.3E+05	2.7E+08
4	1.8E+06	2.9E+07	3.6E+07	4.4E+08	3.3E+06	1.2E+07	4.5E+06	9.7E+07	1.4E+07	3.1E+07	6.6E+06	2.3E+08
5	6.8E+05	1.1E+08	8.3E+07	4.6E+08	3.3E+06	1.9E+07	2.8E+06	1.3E+08	1.3E+07	2.8E+07	1.1E+08	1.9E+08
6	3.4E+06	1.4E+08	1.2E+08	4.9E+07	2.8E+06	2.2E+06	2.0E+06	1.4E+08	9.9E+06	5.7E+06	3.0E+08	1.4E+08
7	1.8E+07	3.0E+07	3.2E+07	3.3E+07	3.3E+06	4.8E+06	1.1E+07	9.4E+06	1.9E+07	1.3E+06	3.4E+08	4.9E+07
8	2.7E+07	3.0E+07	3.5E+07	6.4E+07	3.2E+05	4.7E+06	3.3E+07	9.7E+06	7.2E+06	2.2E+06	2.3E+08	7.0E+07
9	3.6E+07	2.4E+07	2.5E+07	8.2E+07	1.7E+05	4.3E+06	7.8E+05	1.0E+07	1.2E+07	6.7E+07	2.6E+08	1.0E+08
10	2.2E+07	5.3E+06	1.2E+07	8.4E+07	1.5E+06	4.7E+06	3.1E+06	5.4E+06	2.5E+06	1.7E+08	2.9E+08	4.7E+07
11	5.9E+06	4.4E+06	2.8E+07	8.0E+07	1.8E+06	5.3E+06	1.9E+06	9.4E+05	4.3E+07	1.1E+08	2.6E+08	6.2E+06
12	4.9E+06	2.7E+06	4.8E+07	8.0E+07	5.1E+06	1.9E+05	1.2E+06	5.6E+05	3.5E+07	1.6E+08	2.0E+08	1.2E+06
13	1.7E+07	4.0E+06	6.3E+07	1.0E+06	4.4E+06	2.1E+05	4.1E+05	2.1E+07	6.8E+07	3.8E+07	2.1E+07	8.6E+06
14	7.8E+06	4.1E+06	1.9E+07	1.2E+06	4.8E+06	3.1E+05	9.1E+05	8.2E+07	9.0E+07	3.1E+06	8.7E+04	2.3E+07
15	3.4E+06	2.5E+06	9.8E+06	2.0E+06	5.6E+06	6.3E+05	3.9E+05	4.0E+08	1.2E+08	2.1E+07	1.3E+05	2.7E+07
16	4.6E+06	3.2E+06	1.0E+07	3.1E+06	5.0E+05	1.1E+06	8.8E+05	1.7E+08	1.9E+08	7.9E+06	2.7E+05	1.2E+07
17	2.9E+06	7.9E+06	3.8E+05	3.7E+06	3.6E+05	1.4E+06	3.0E+07	1.6E+08	1.4E+08	1.4E+06	4.4E+05	1.6E+07
18	8.7E+05	9.2E+06	4.8E+05	2.6E+05	3.6E+05	6.8E+05	1.3E+08	1.4E+08	1.7E+08	8.9E+06	7.9E+05	1.5E+07
19	3.9E+07	6.6E+06	3.5E+05	4.1E+06	6.5E+05	5.9E+05	5.9E+08	1.3E+08	1.4E+08	1.3E+07	9.9E+05	1.0E+07
20	2.7E+07	1.2E+06	4.5E+06	2.8E+07	9.2E+05	7.1E+05	2.2E+08	1.2E+08	2.3E+08	2.6E+07	1.3E+06	6.1E+05
21	6.3E+07	7.0E+05	1.6E+07	5.1E+07	8.2E+05	2.1E+05	2.5E+08	5.7E+07	4.7E+07	2.3E+07	1.5E+06	1.0E+06
22	1.0E+08	8.2E+05	3.8E+07	5.4E+07	5.3E+05	1.1E+05	3.2E+08	6.6E+05	2.7E+06	1.1E+07	2.1E+06	1.0E+06
23	3.2E+07	1.5E+06	3.9E+07	1.1E+07	2.2E+05	3.1E+06	1.9E+07	1.4E+05	5.1E+07	1.1E+07	3.5E+06	3.5E+05
24	3.1E+07	2.8E+06	1.6E+07	2.3E+06	2.0E+05	7.5E+06	6.5E+06	2.2E+05	1.4E+08	1.3E+07	9.7E+04	5.4E+06
25	6.8E+06	4.0E+06	2.5E+07	2.9E+05	2.0E+05	2.2E+07	1.2E+07	4.6E+05	3.5E+08	1.2E+07	1.0E+05	1.0E+07
26	6.4E+06	1.2E+06	2.0E+07	2.1E+06	1.4E+05	4.0E+07	1.2E+07	5.0E+05	3.3E+08	4.7E+06	1.0E+05	5.5E+06
27	5.5E+06	1.2E+06	8.5E+06	3.4E+06	1.3E+05	3.9E+07	3.5E+07	3.7E+06	7.2E+07	1.0E+07	2.1E+05	2.3E+06
28	5.6E+06	1.7E+06	1.1E+07	3.5E+06	3.0E+05	2.3E+07	1.0E+08	9.9E+07	3.2E+07	4.9E+06	6.7E+05	7.4E+06
29		2.7E+05	6.4E+06	8.0E+06	1.0E+07	9.8E+05	2.0E+08	1.6E+08	1.4E+07	3.0E+06	3.1E+05	1.4E+08
30		1.7E+06	6.0E+07	4.7E+06	1.8E+07	7.5E+05	8.2E+07	5.4E+07	2.3E+07	3.4E+06	4.4E+05	3.1E+08
31		1.7E+07		1.1E+06		3.1E+05	5.4E+07		2.9E+07		2.8E+06	1.4E+08

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

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

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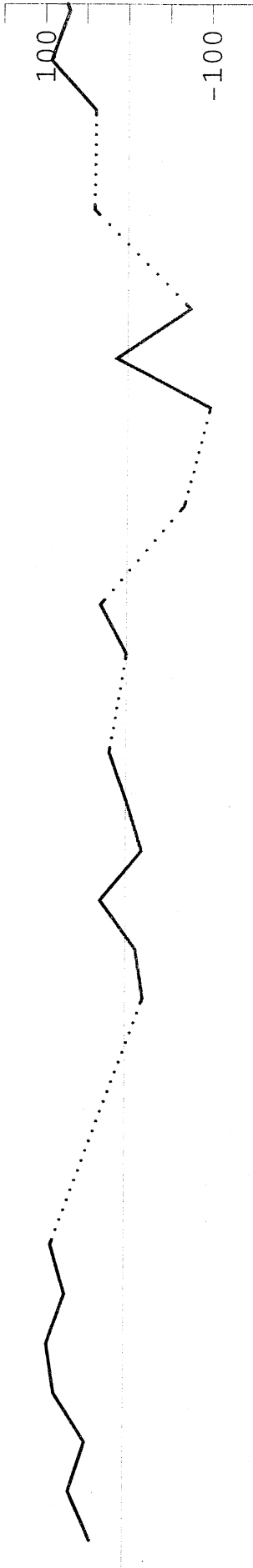
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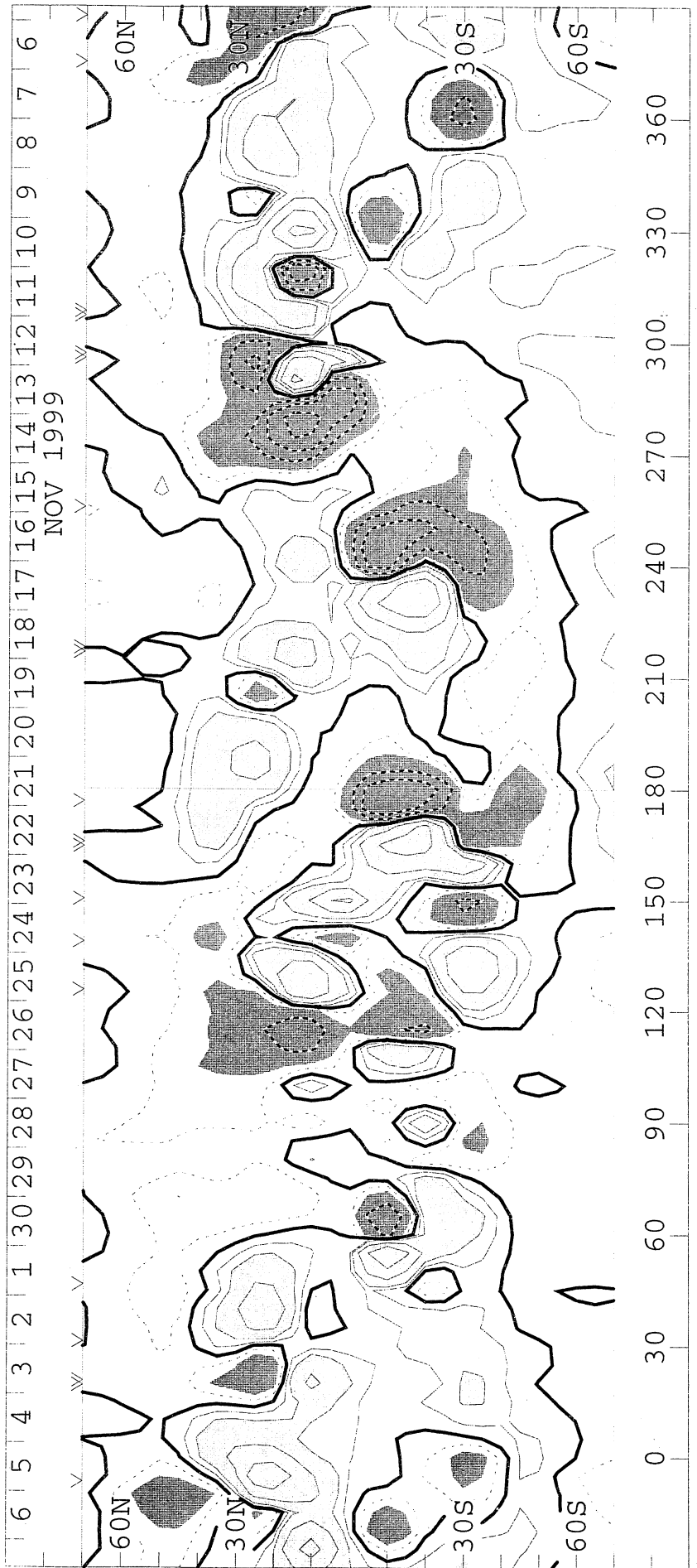
SOLAR MAGNETIC FIELD SYNOPTIC CHART
CARRINGTON ROTATION NUMBER 1956
(7 November to 5 December 1999)

WILCOX SOLAR OBSERVATORY

Mean Field



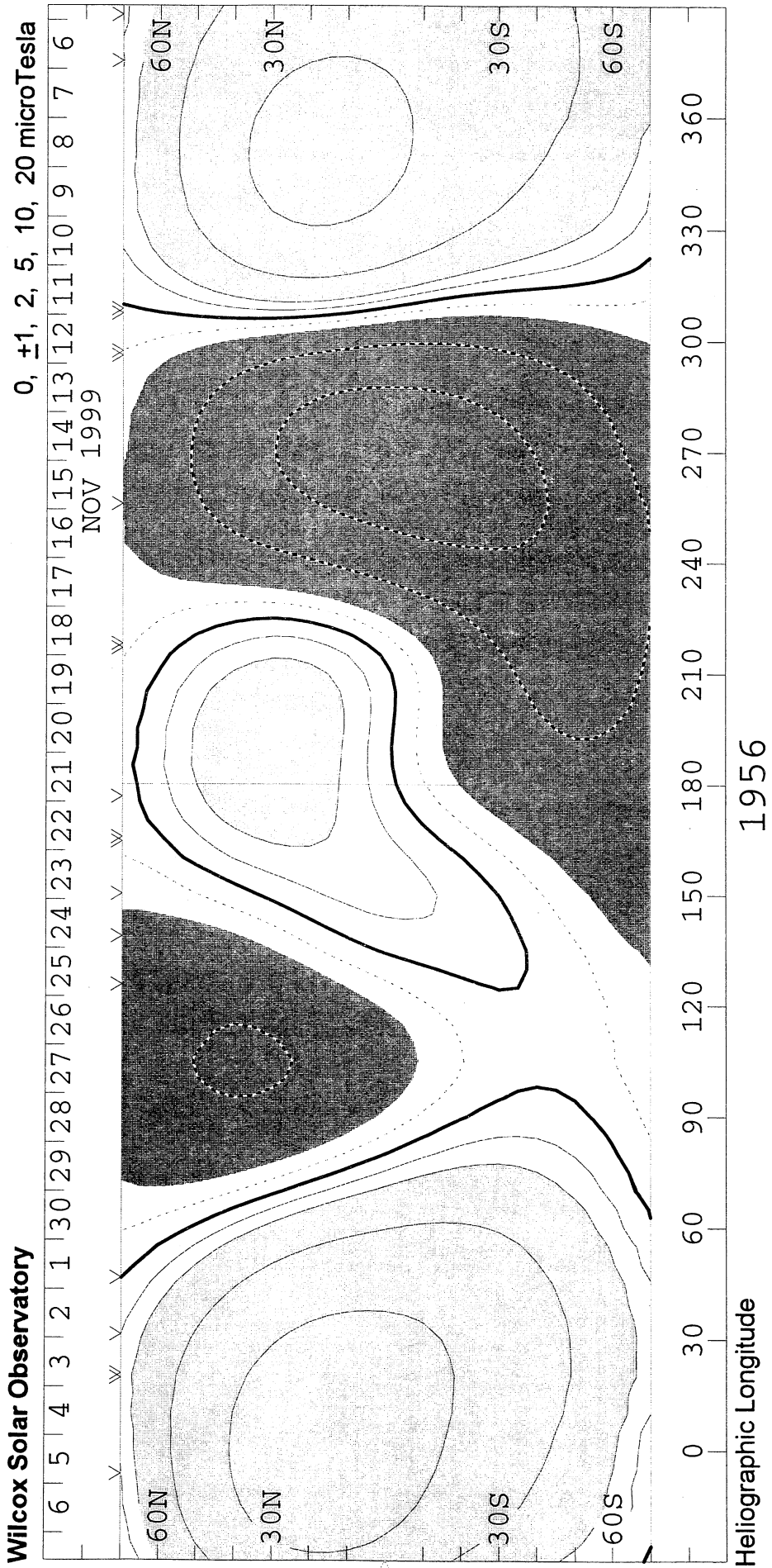
WSO - Photospheric Magnetic Field 0, ± 100 , 200, 500, 1000, 2000 MicroTesla



Heliographic Longitude

1956

SOLAR MAGNETIC FIELD SYNOPTIC CHART
SOURCE SURFACE FIELD
 CARRINGTON ROTATION NUMBER 1956
 (7 November to 5 December 1999)

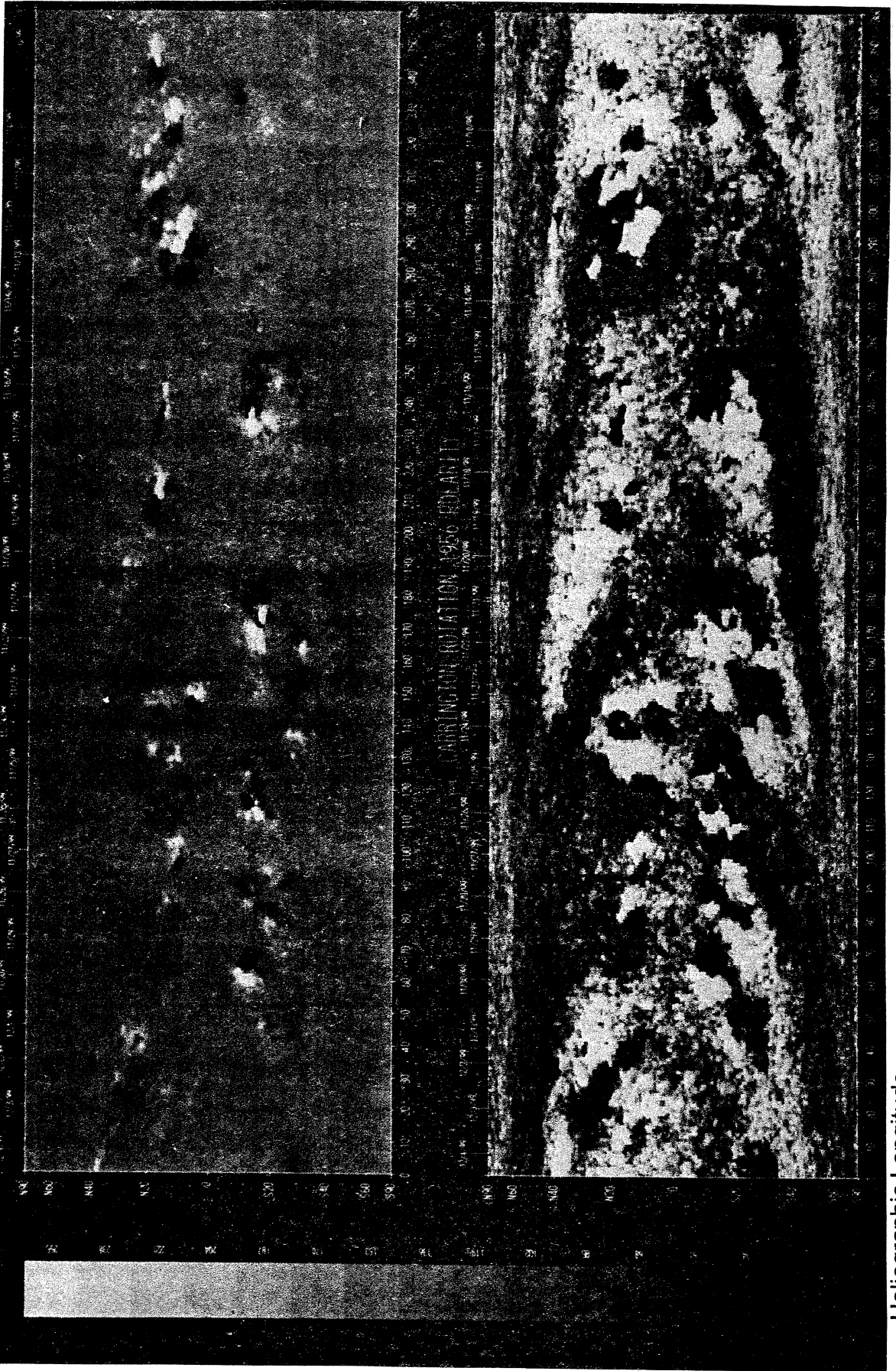


SOLAR MAGNETIC FIELD SYNOPSIS CHART

CARRINGTON ROTATION NUMBER 1956
(7 November to 5 December 1999)

National Solar Observatory/Kitt Peak

Dates of Observation



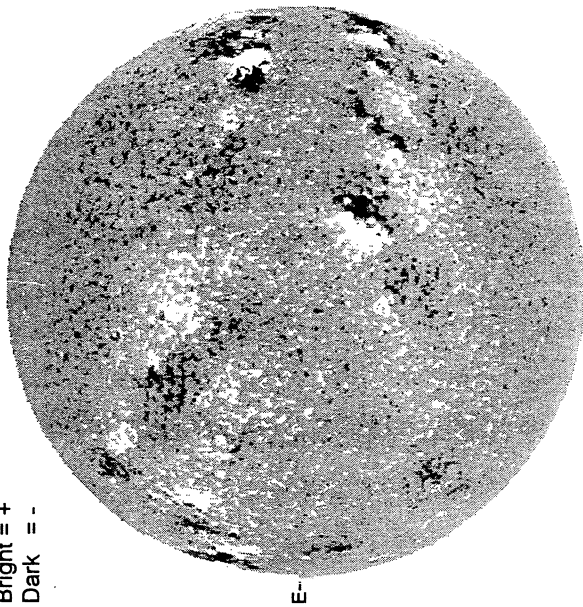
Heliographic Longitude

DECEMBER 1, 1999 (P= 16.28, Bo = 0.94, Lo = 56.43)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -

***868.8 nm**



1958 UT

STANFORD MAGNETOGRAM

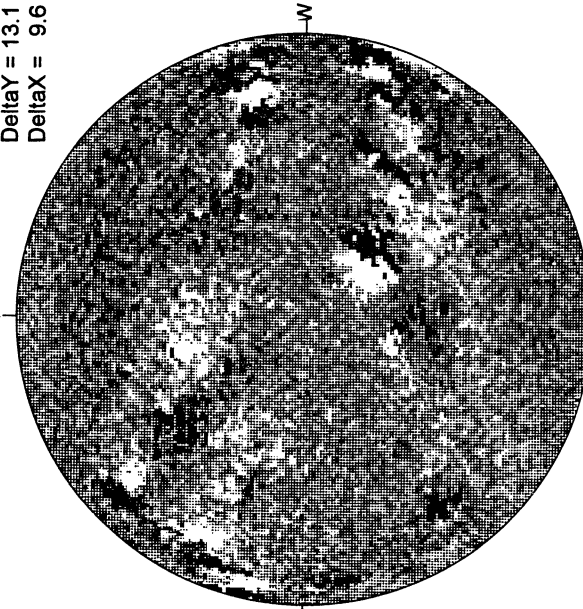
Solid = +
Dashed = -



1824 UT

MT. WILSON MAGNETOGRAM

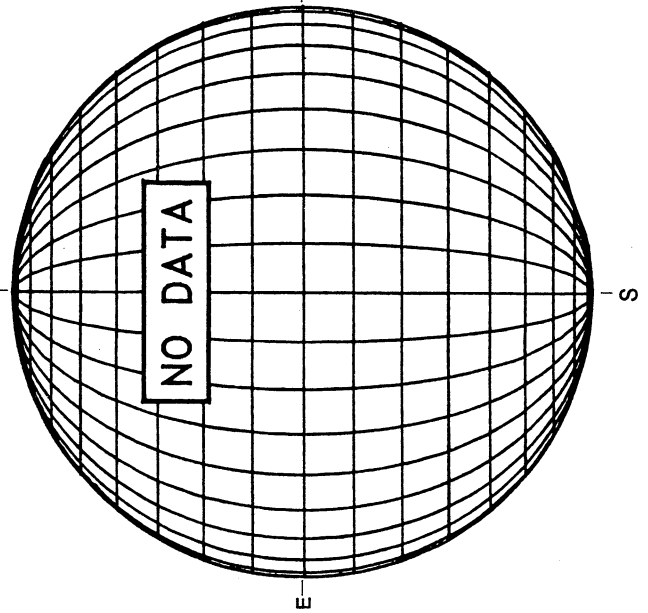
DeltaY = 13.1
DeltaX = 9.6



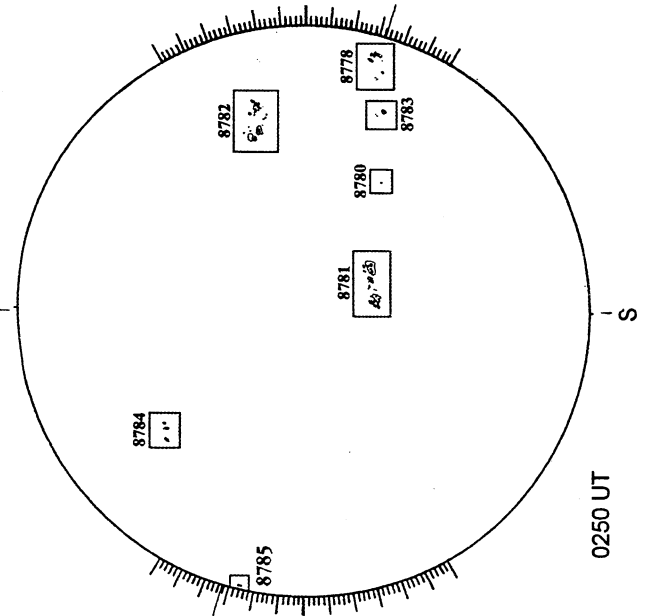
16.75 -
17.72 UT

White = +7.5G
Black = -7.5G

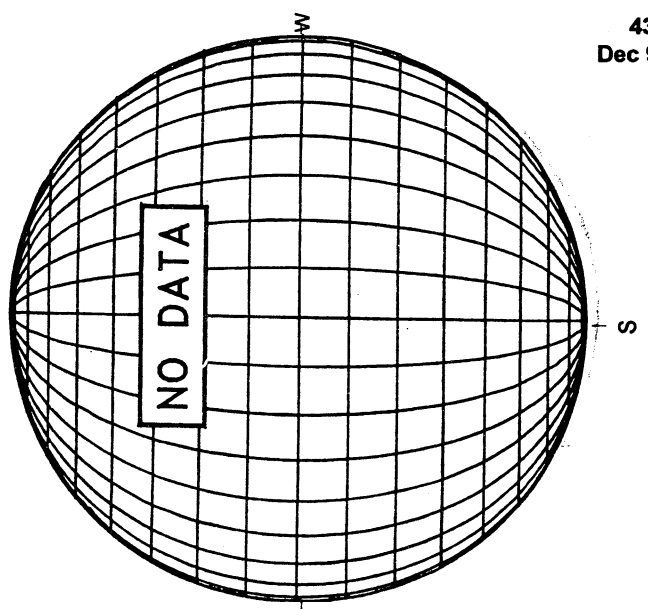
MEUDON H-ALPHA



LEARNMOUTH SUNSPOT



LOMNICKY PEAK CORONA (1.04 Radii)----

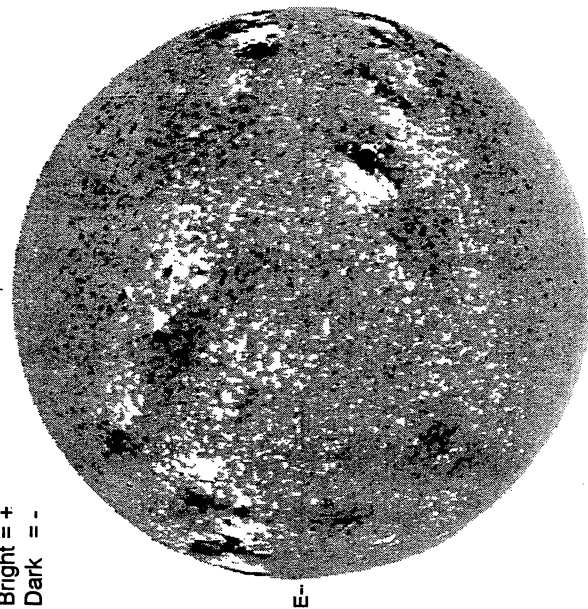


DECEMBER 2, 1999 (P = 15.90, Bo = 0.81, Lo = 43.25)

44
Dec 99

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



1600 UT

STANFORD MAGNETOGRAM

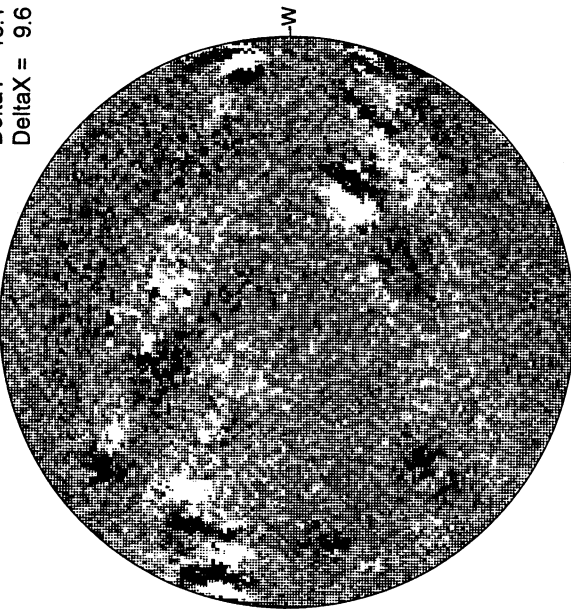
Solid = +
Dashed = -



2205 UT

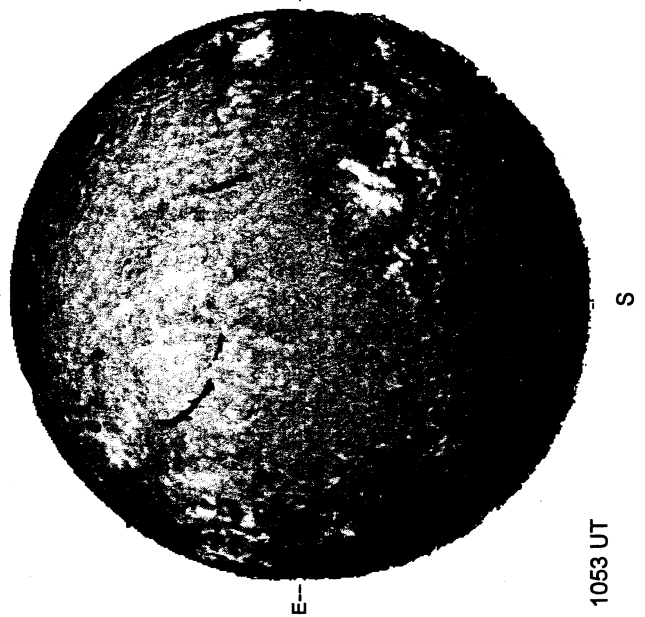
MT. WILSON MAGNETOGRAM

DeltaY = 13.1
DeltaX = 9.6



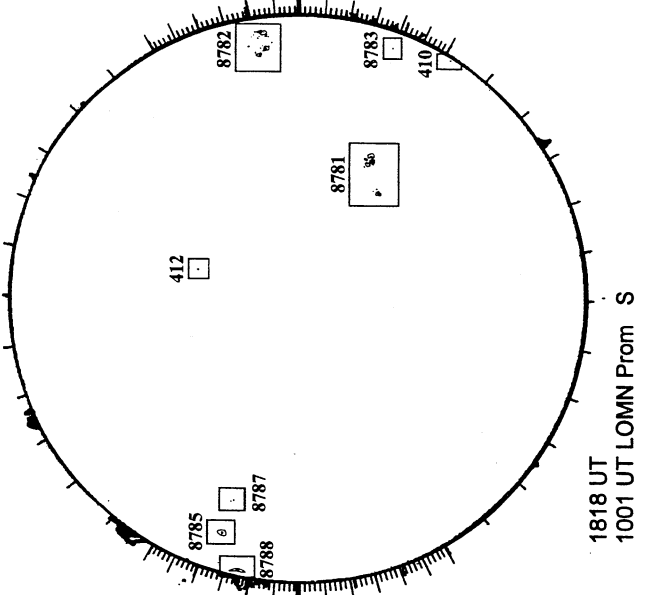
20.36 -
21.34 UT

MEUDON H-ALPHA



1053 UT

HOLLOMAN SUNSPOT

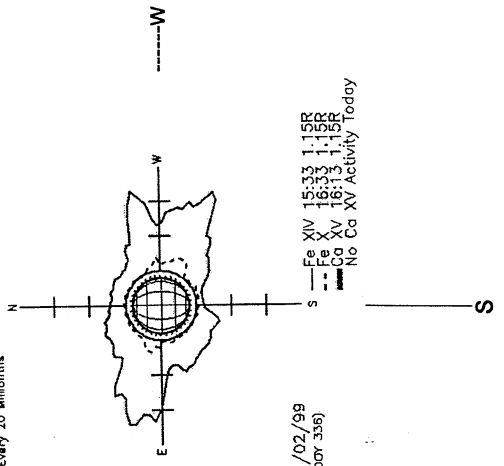


1818 UT
1001 UT LOMN Prom S

White = +7.5G
Black = -7.5G

SACRAMENTO PEAK CORONA (1.15 Radii)----

NSO / Sacramento Peak Coronal Data
Tick Marks Every 20 Millionths



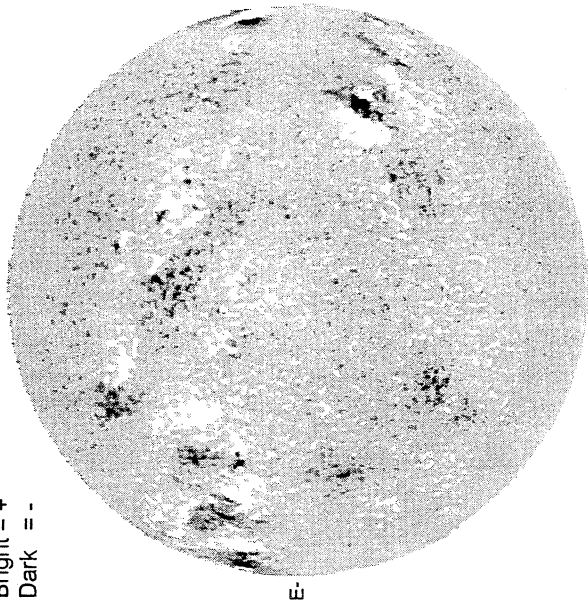
12/02/99
(000.336)

DECEMBER 3, 1999 (P = 15.51, Bo = 0.68, Lo = 30.07)

KITT PEAK MAGNETOGRAM

868.8 nm

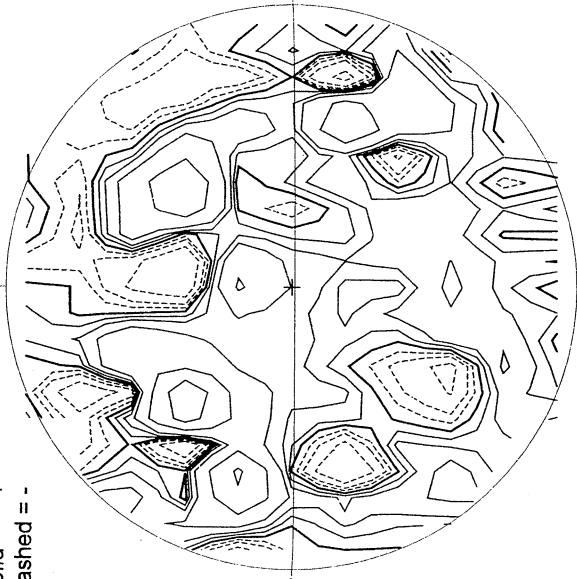
Bright = +
Dark = -



1603 UT

STANFORD MAGNETOGRAM

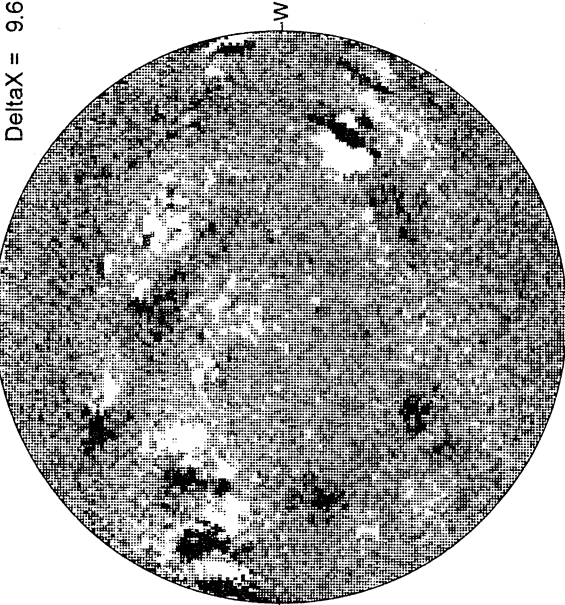
Solid = +
Dashed = -



1928 UT

MT. WILSON MAGNETOGRAM

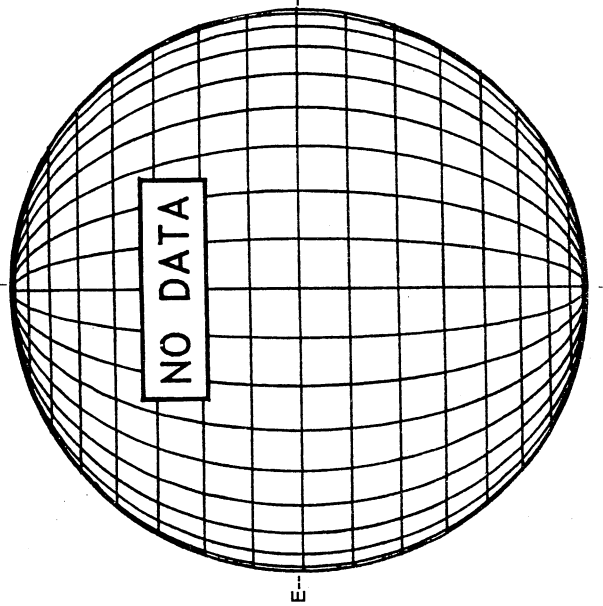
DeltaY = 13.1
DeltaX = 9.6



17.53 -
18.51 UT

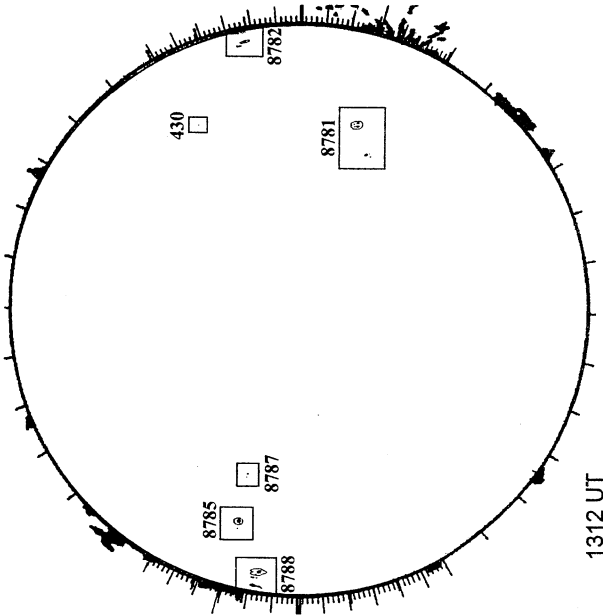
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



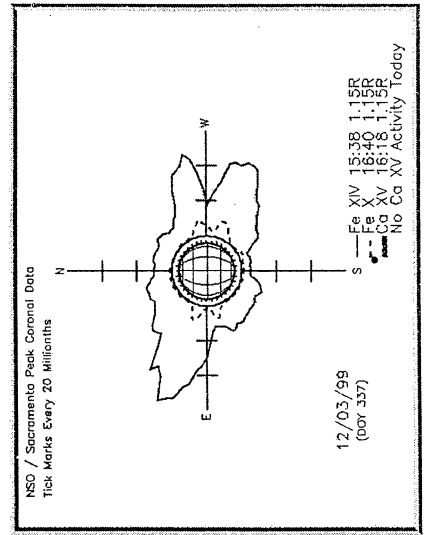
S

RAMEY SUNSPOT



1312 UT
0845 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



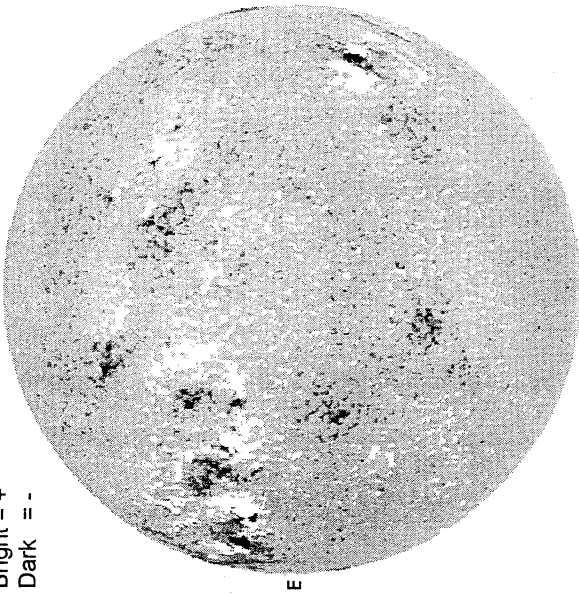
46
Dec 99

DECEMBER 4, 1999 (P= 15.11, Bo = 0.55, Lo = 16.90)

KITT PEAK MAGNETOGRAM

868.8 nm

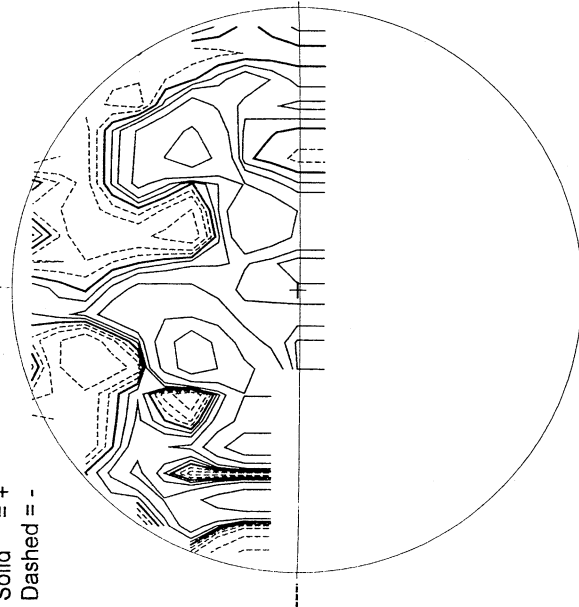
Bright = +
Dark = -



1740 UT

STANFORD MAGNETOGRAM

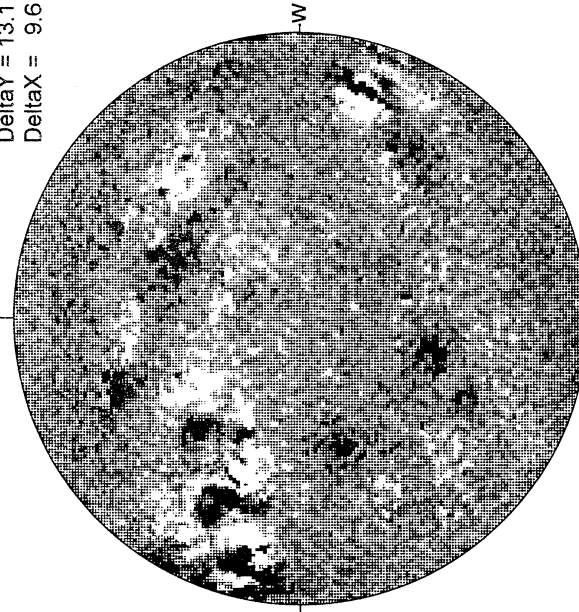
Solid = +
Dashed = -



1709 UT

MT. WILSON MAGNETOGRAM

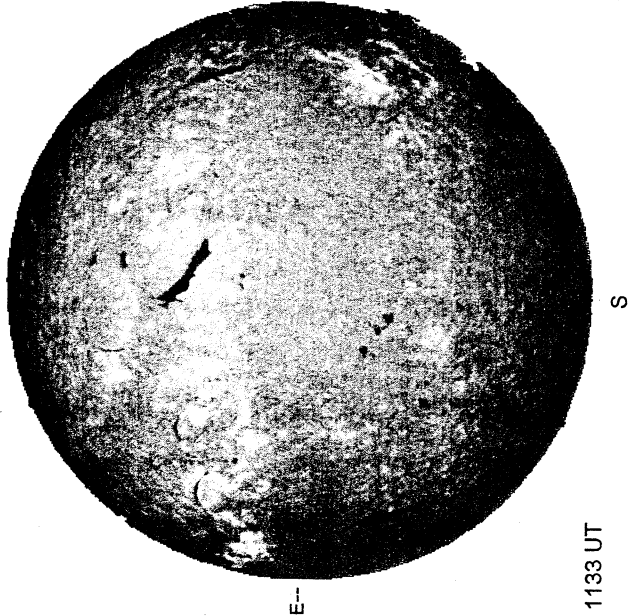
DeltaY = 13.1
DeltaX = 9.6



18.21 -
19.18 UT

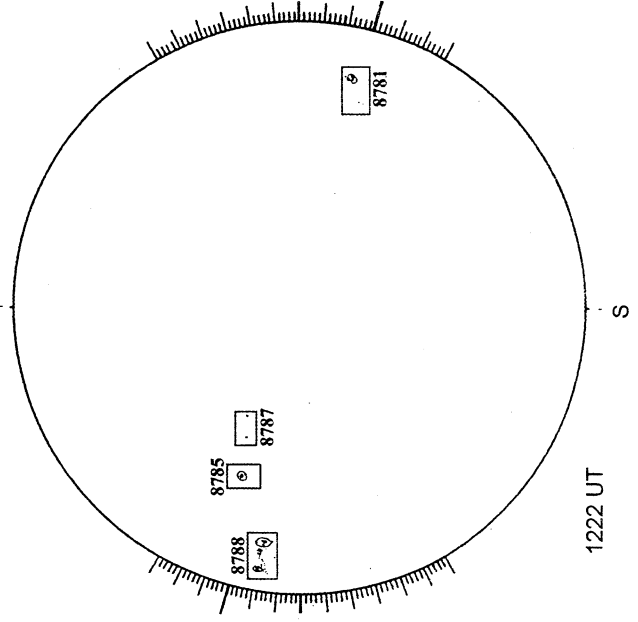
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



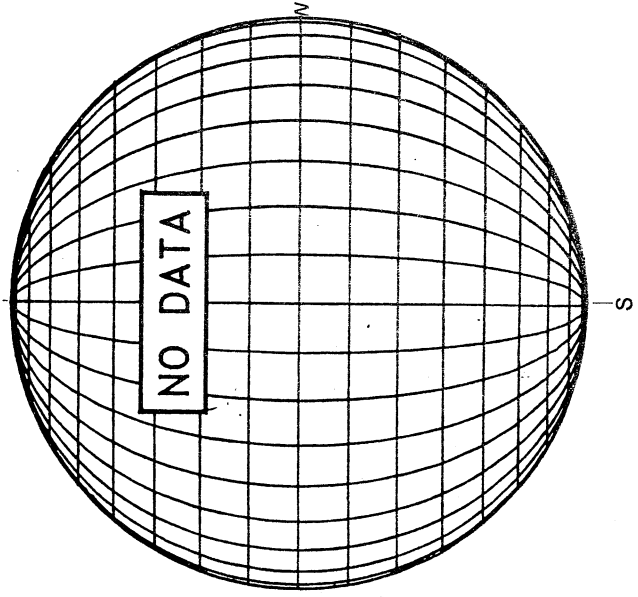
1133 UT

RAMEY SUNSPOT



1222 UT

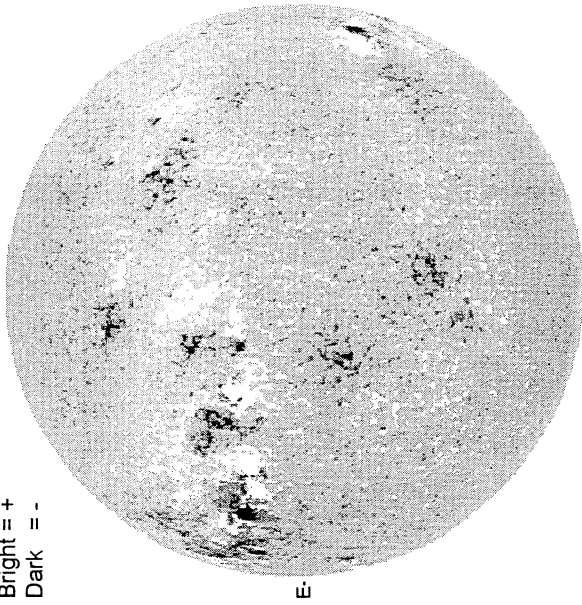
SACRAMENTO PEAK CORONA (1.15 Radii)----



DECEMBER 5, 1999 (P= 14.71, Bo = 0.43, Lo = 3.72)

KITT PEAK MAGNETOGRAM
N
868.8 nm

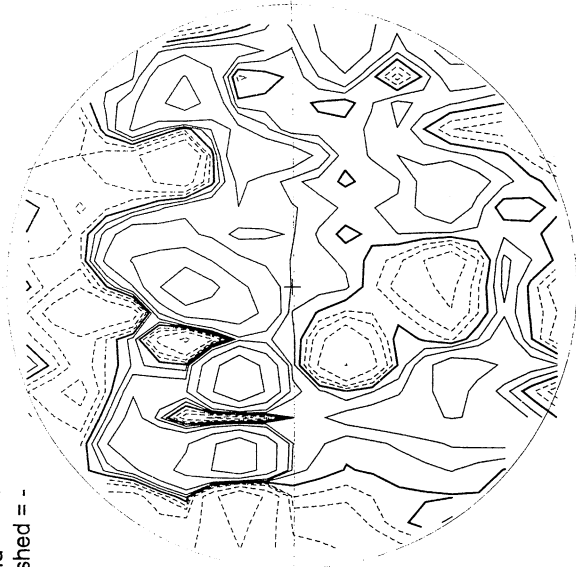
Bright = +
Dark = -



1627 UT

STANFORD MAGNETOGRAM

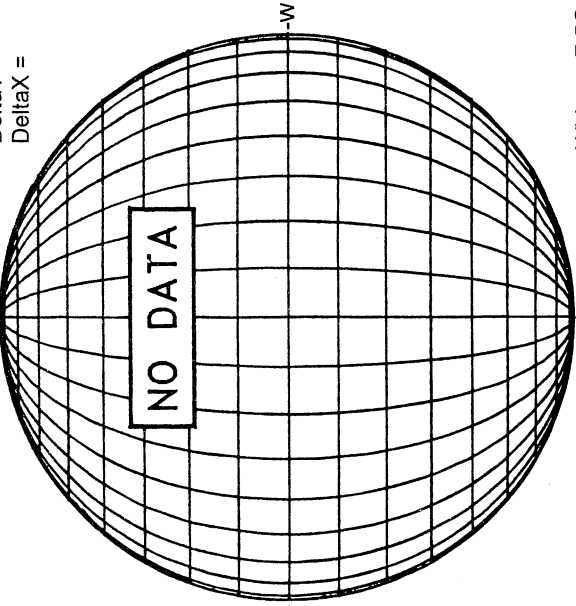
Solid = +
Dashed = -



1854 UT

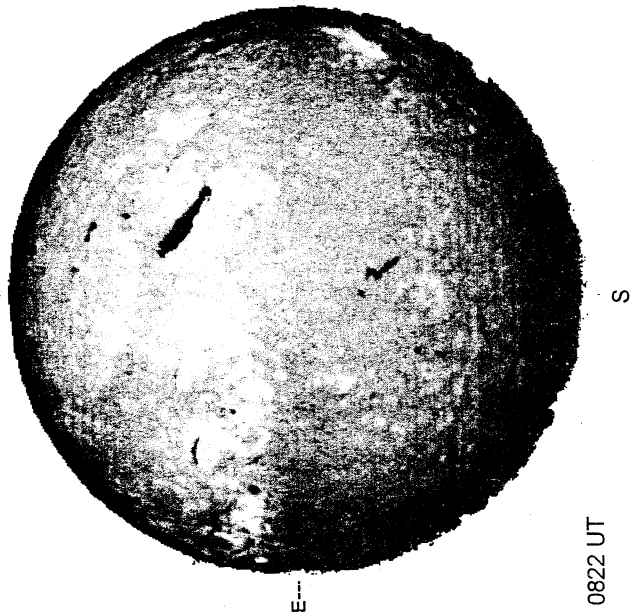
MT. WILSON MAGNETOGRAM

Delta Y =
Delta X =



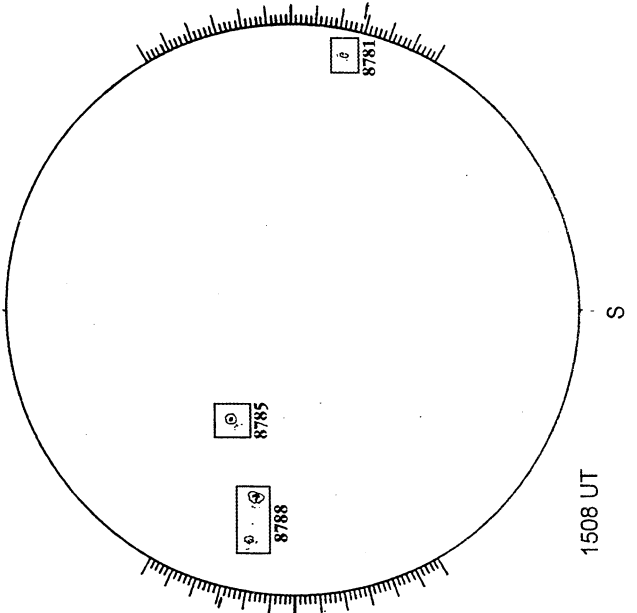
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



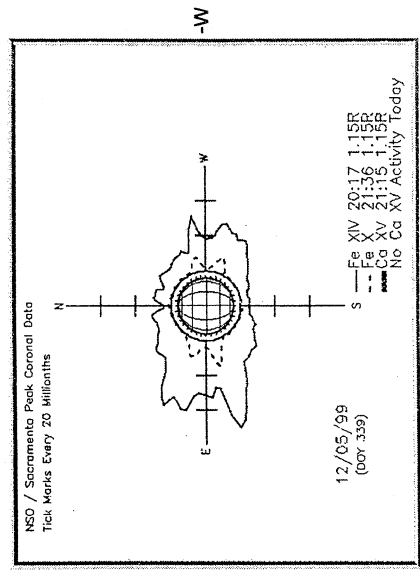
0822 UT

RAMEY SUNSPOT



1508 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

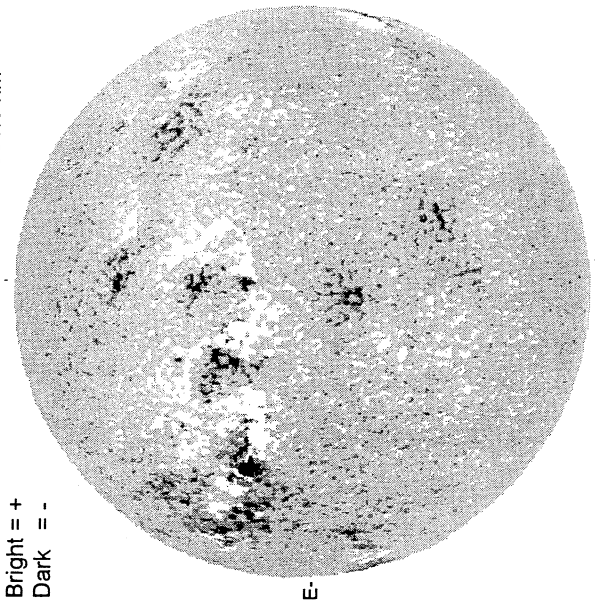


12/05/99
(00Y 339)

Fe XIV 20:17 1.15R
Fe XV 21:16 1.15R
Ca X 21:06 1.15R
No Ca XV Activity Today

DECEMBER 6, 1999 (P= 14.30, Bo = 0.30, Lo = 350.54)

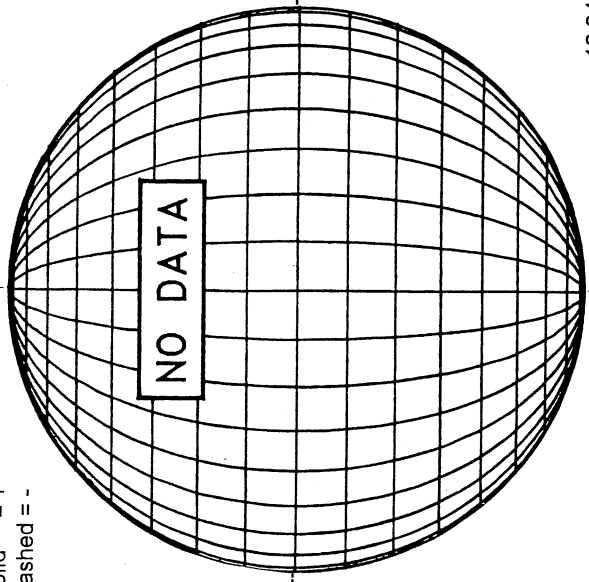
KITT PEAK MAGNETOGRAM
868.8 nm



Bright = +
Dark = -

1607 UT

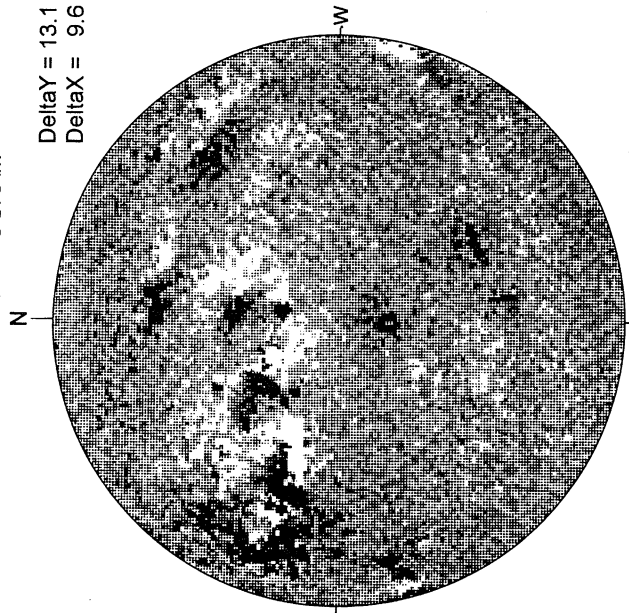
STANFORD MAGNETOGRAM



Solid = +
Dashed = -

18.34 -
19.31 UT

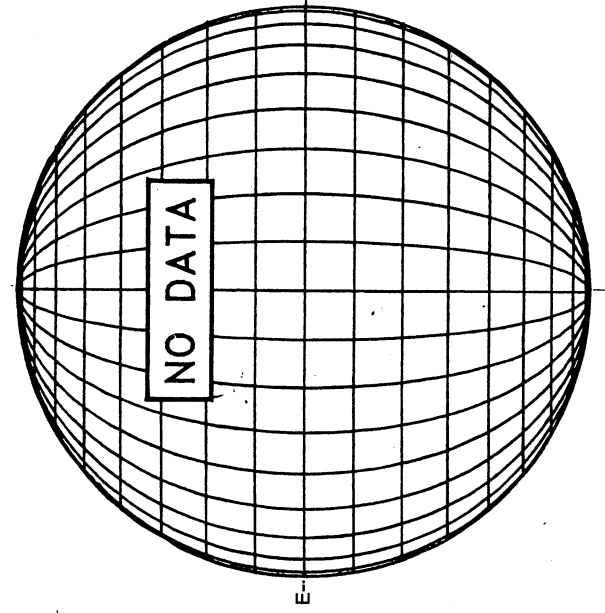
MT. WILSON MAGNETOGRAM



Delta Y = 13.1
Delta X = 9.6

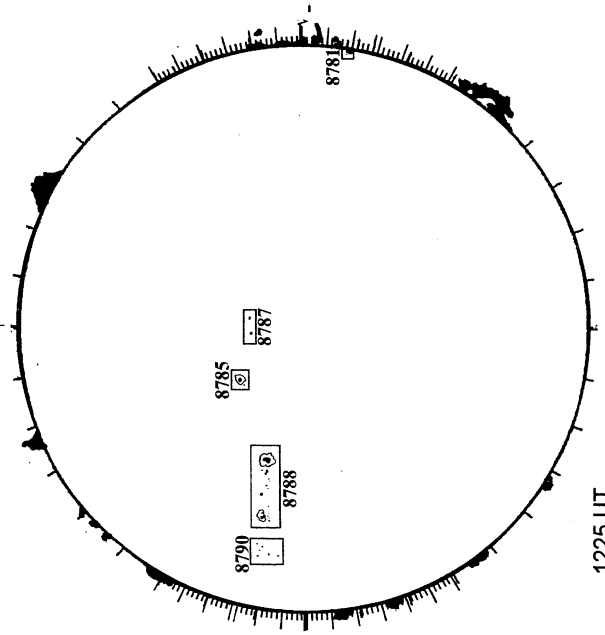
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



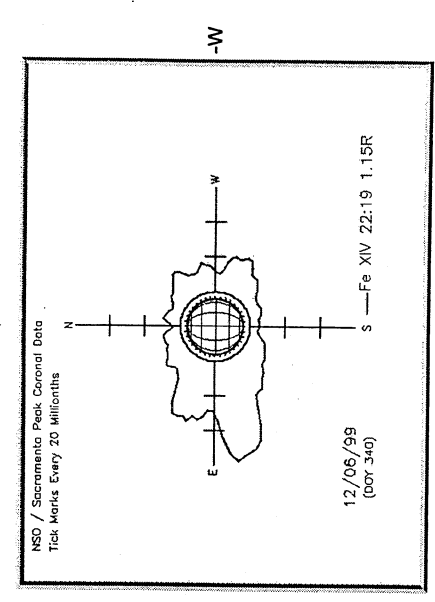
S

RAMEY SUNSPOT



1225 UT
1007 UT LOMN Prom S

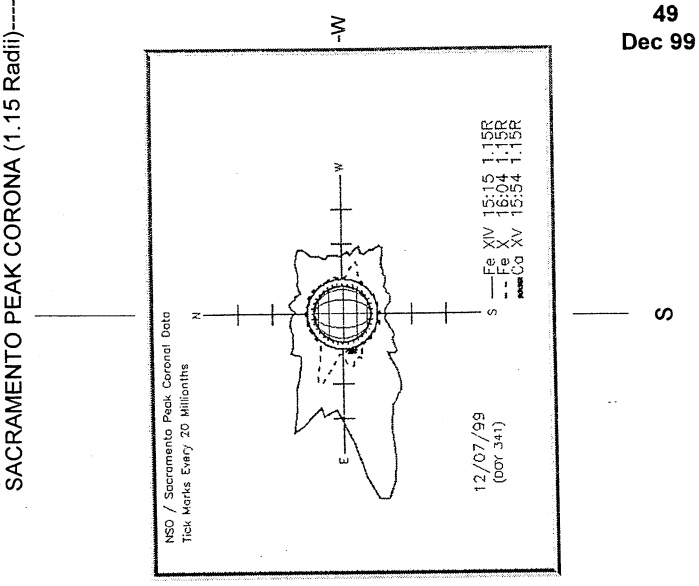
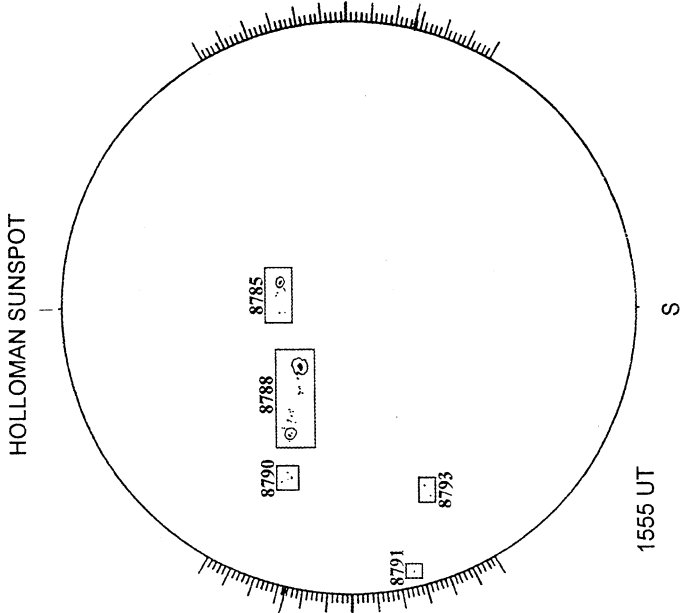
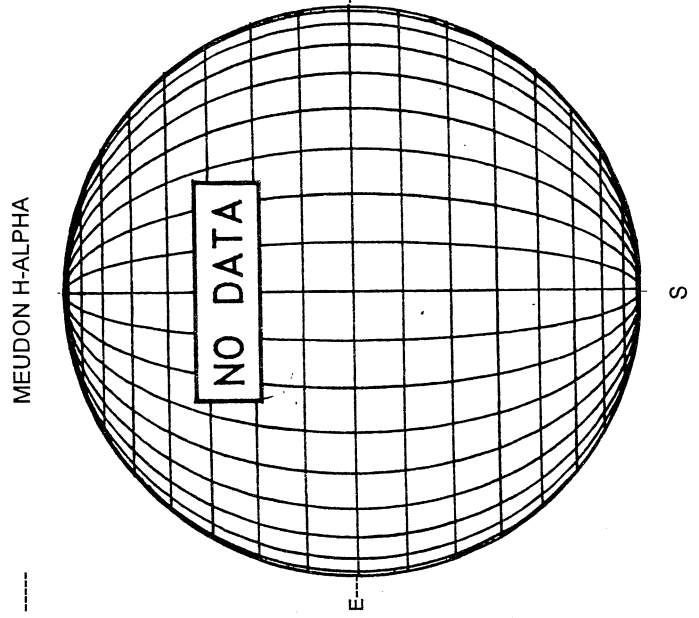
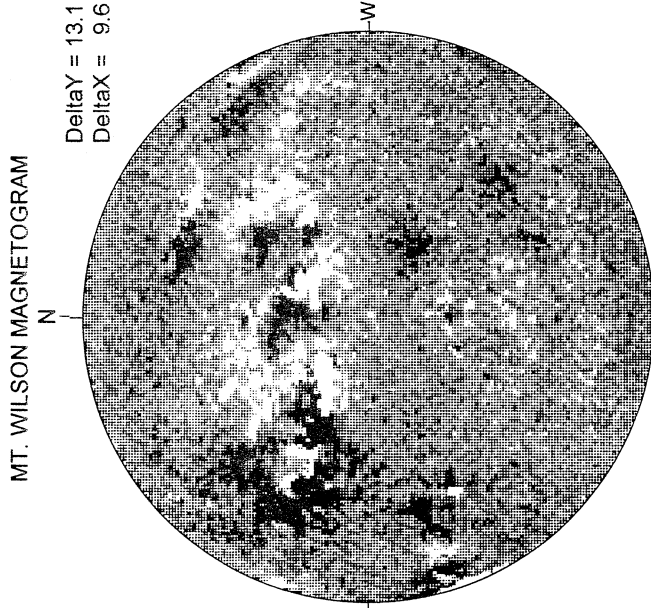
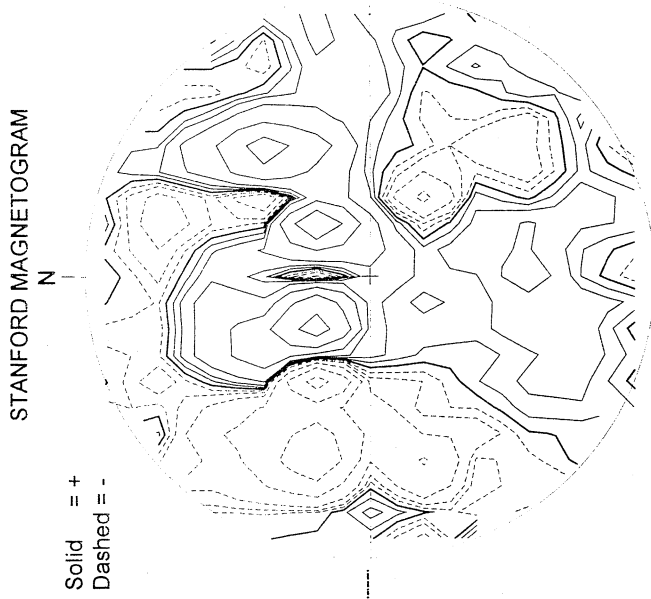
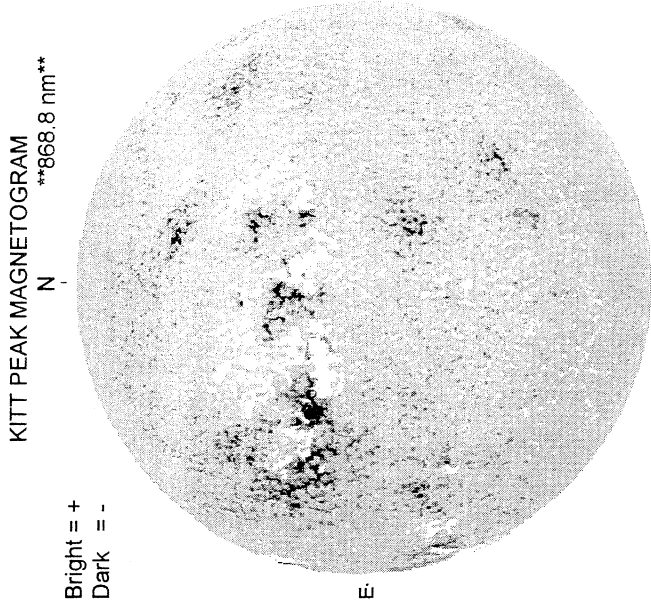
SACRAMENTO PEAK CORONA (1.15 Radii)----



12/06/99
(00Y 340)

Fe XIV 22:19 1.15R

DECEMBER 7, 1999 (P= 13.89, Bo = 0.17, Lo = 337.36)



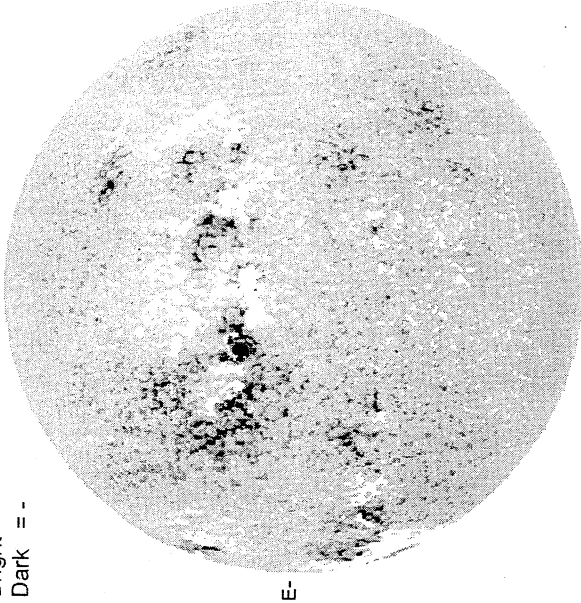
50
Dec 99

DECEMBER 8, 1999 (P = 13.47, Bo = 0.04, Lo = 324.19)

KITT PEAK MAGNETOGRAM
868.8 nm

Bright = +
Dark = -

N

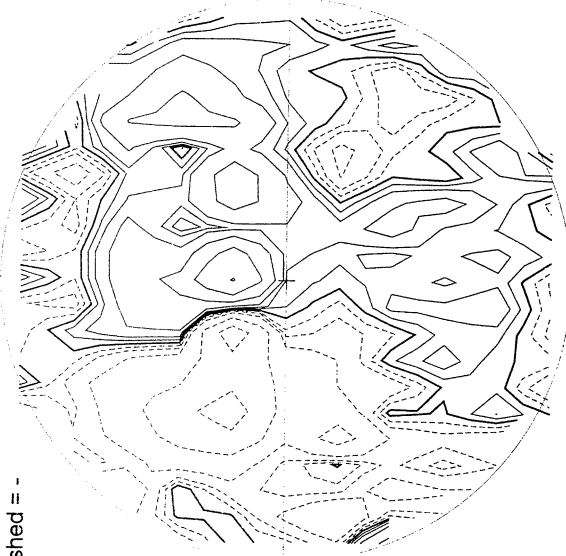


1727 UT

STANFORD MAGNETOGRAM

N

Solid = +
Dashed = -

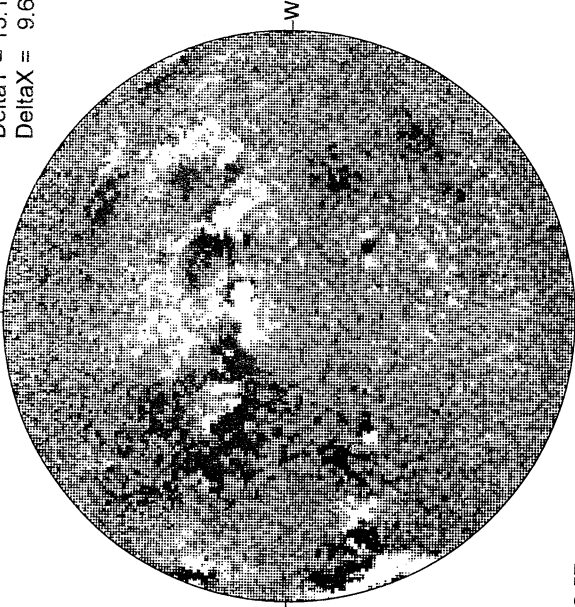


1959 UT

MT. WILSON MAGNETOGRAM

N

Delta Y = 13.1
Delta X = 9.6



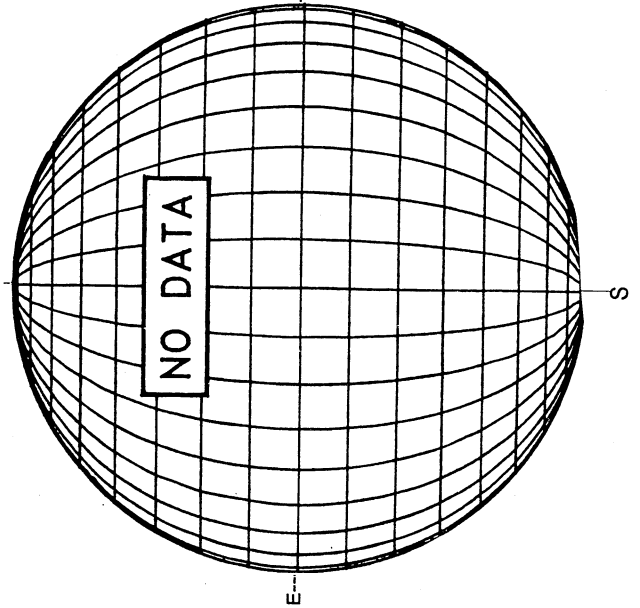
22.57 -
23.54 UT

White = +7.5G
Black = -7.5G

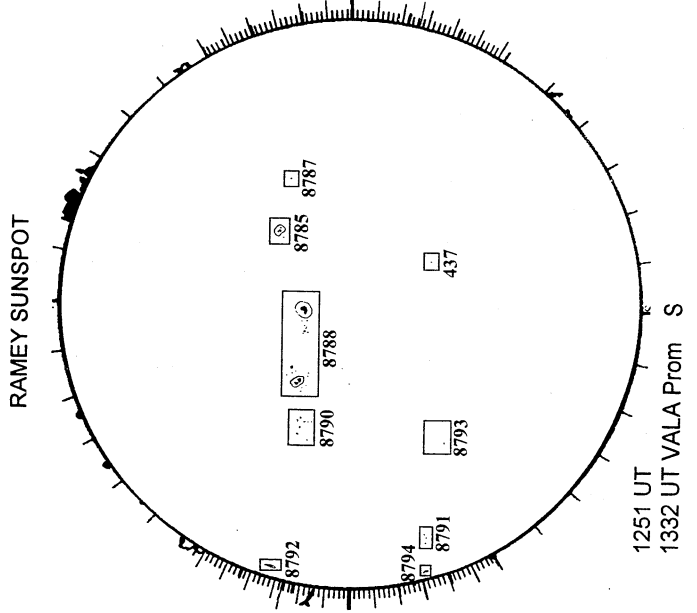
MEUDON H-ALPHA

RAMEY SUNSPOT

N

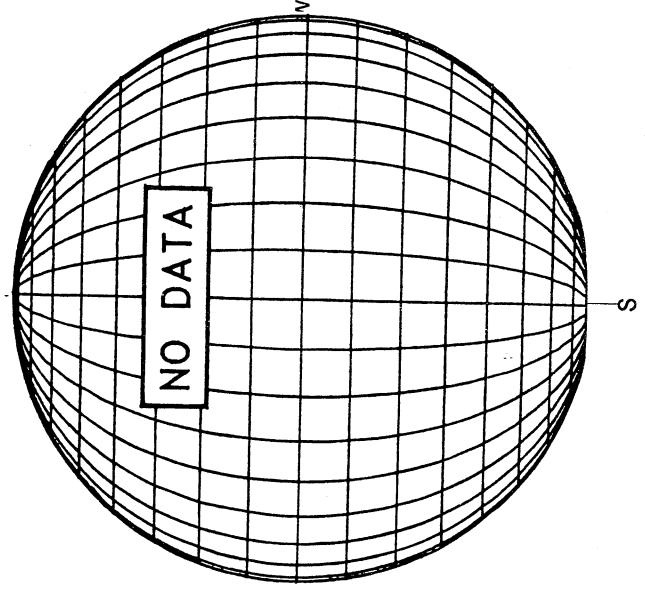


E



1251 UT
1332 UT VALA Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



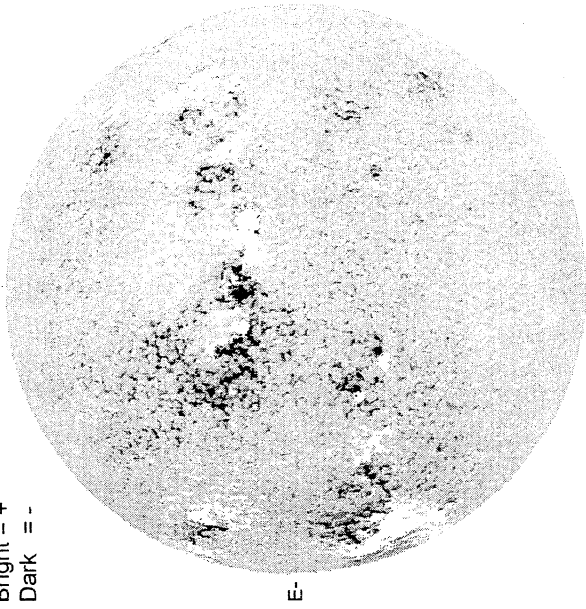
S

DECEMBER 9, 1999 (P= 13.05, B₀ = -0.09, L₀ = 311.01)

KITT PEAK MAGNETOGRAM

**868.8 nm

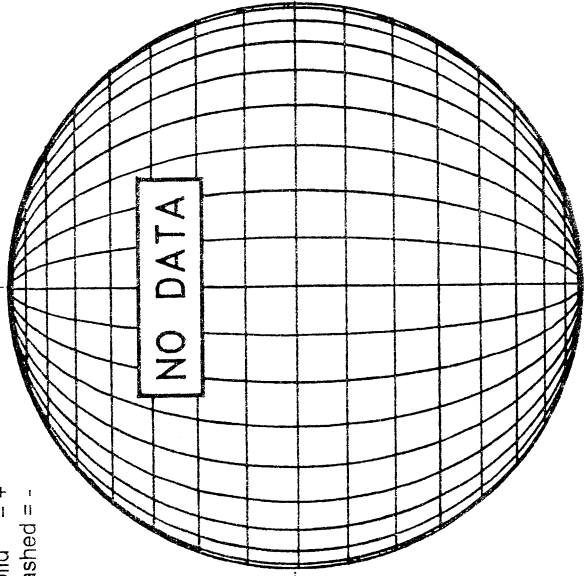
Bright = +
Dark = -



1603 UT

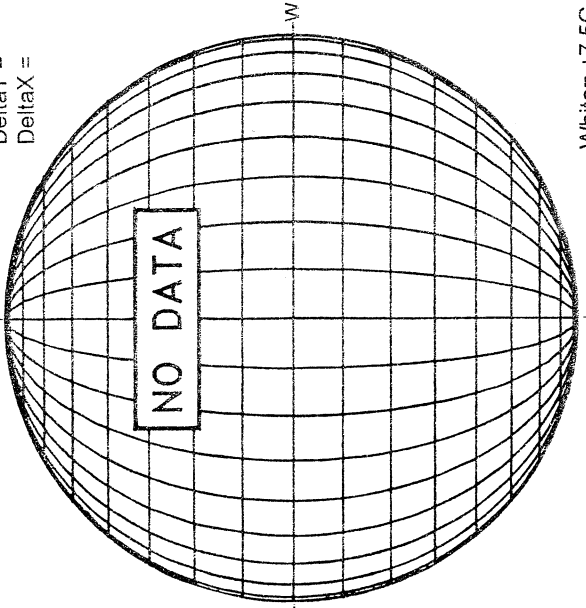
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



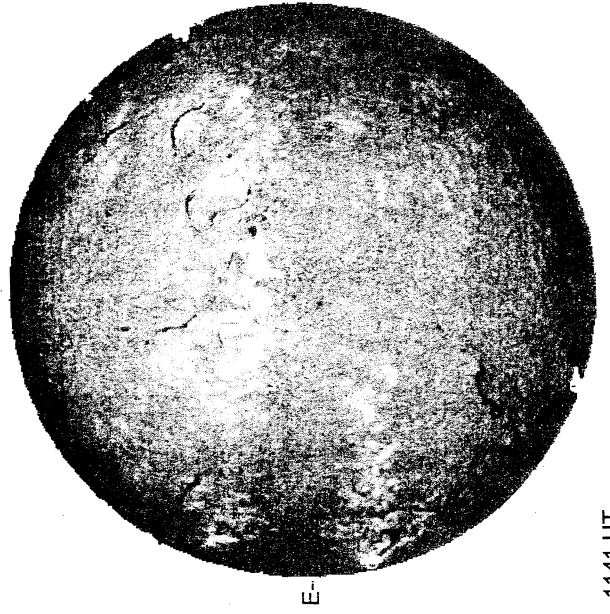
MT. WILSON MAGNETOGRAM

Delta Y =
Delta X =



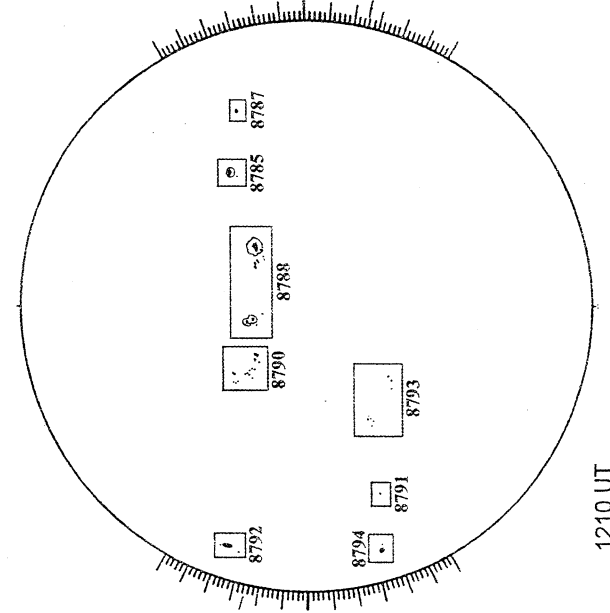
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



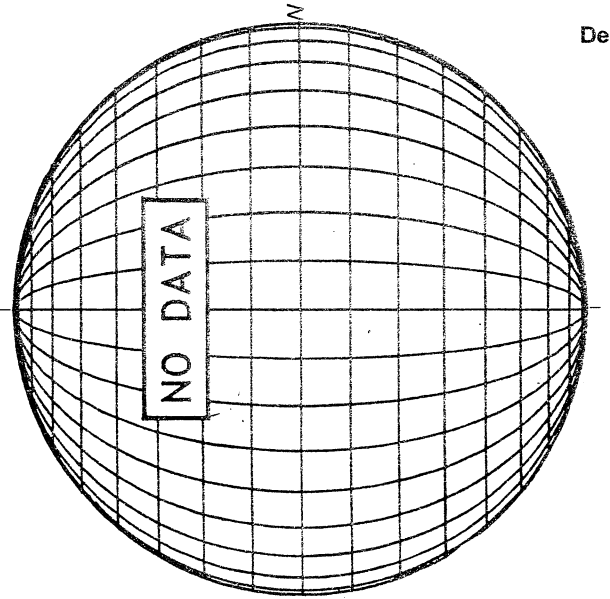
1141 UT

RAMEY SUNSPOT



1210 UT

SACRAMENTO PEAK CORONA (1.15 Radii)-----

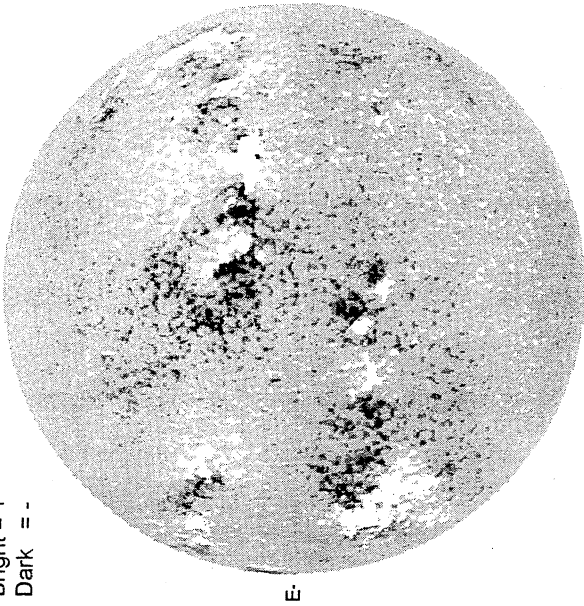


DECEMBER 10, 1999 (P= 12.62, Bo = -0.21, Lo = 297.83)

52
Dec 99

KITT PEAK MAGNETOGRAM
868.8 nm

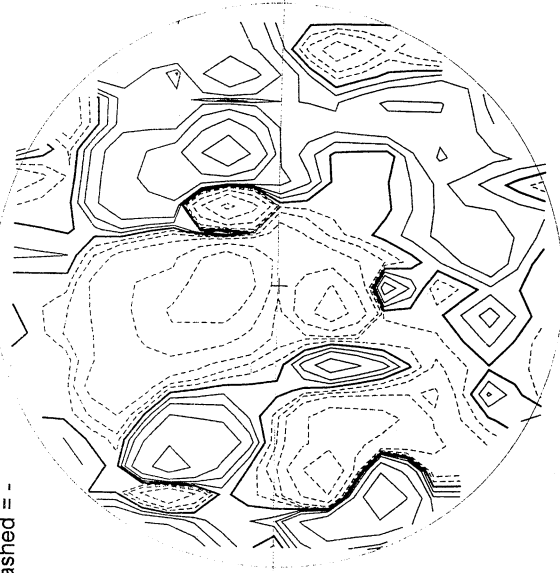
Bright = +
Dark = -



2113 UT

STANFORD MAGNETOGRAM

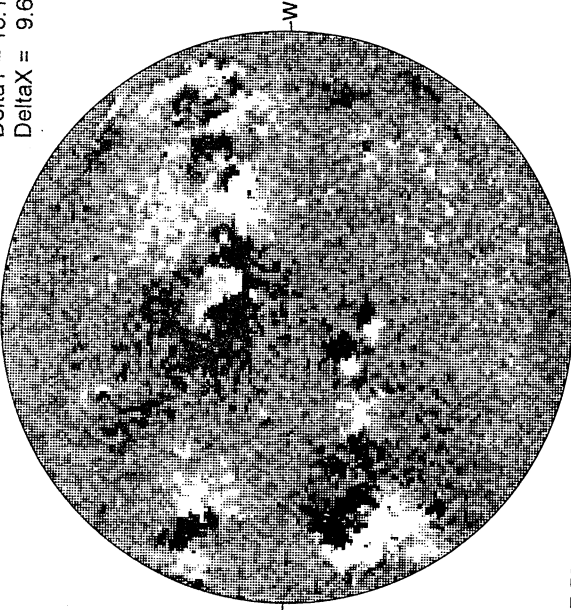
Solid = +
Dashed = -



2105 UT

MT. WILSON MAGNETOGRAM

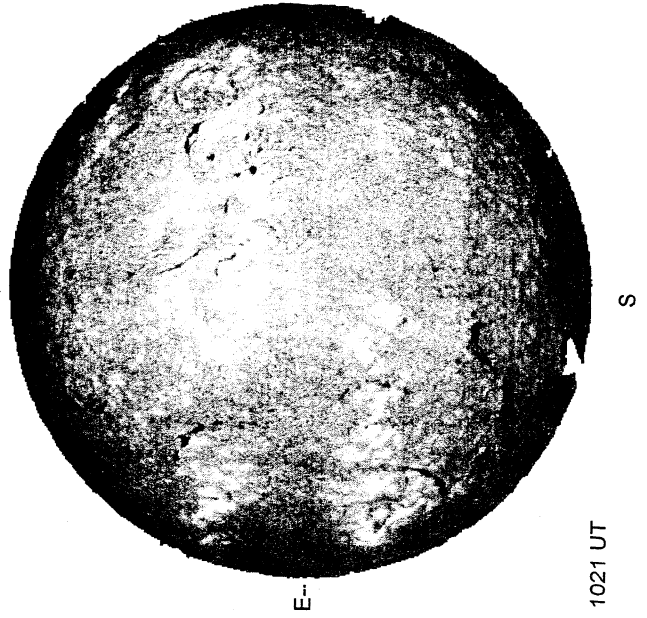
Delta Y = 13.1
Delta X = 9.6



17.53 -
18.50 UT

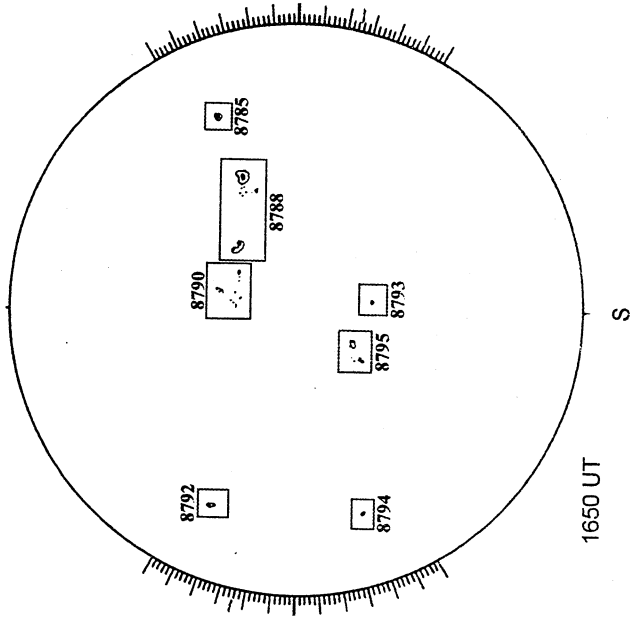
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



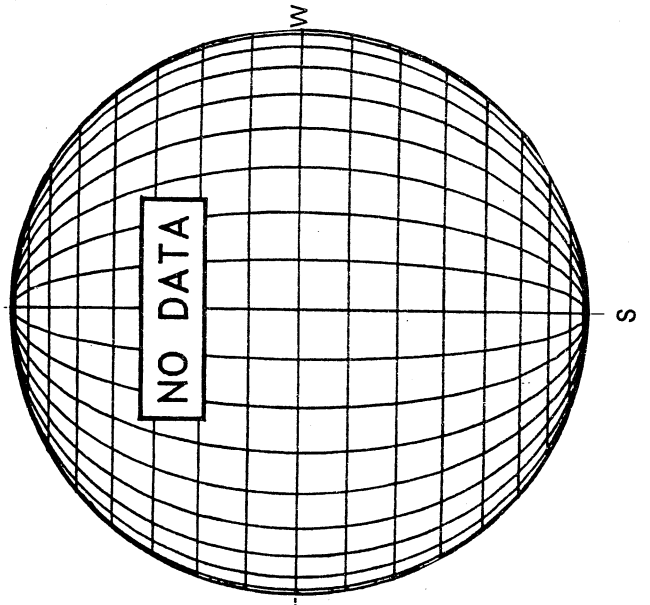
1021 UT

RAMEY SUNSPOT



1650 UT

SACRAMENTO PEAK CORONA (1.15 Radii) ----

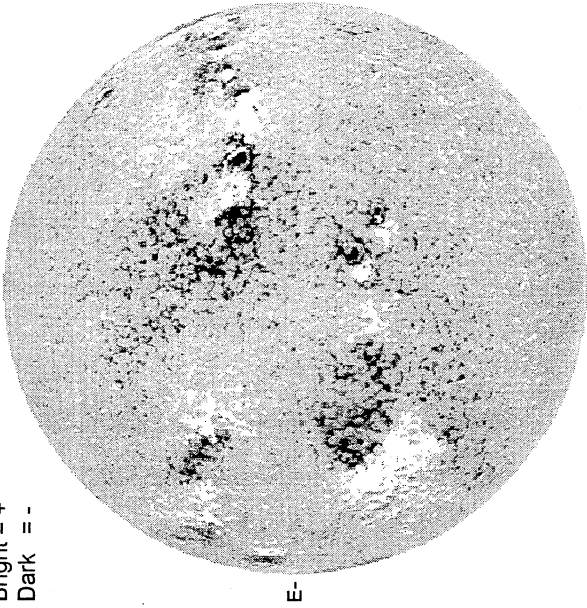


DECEMBER 11, 1999 (P= 12.19, Bo = -0.34, Lo = 284.66)

KITT PEAK MAGNETOGRAM

868.8 nm

Bright = +
Dark = -



1740 UT

STANFORD MAGNETOGRAM

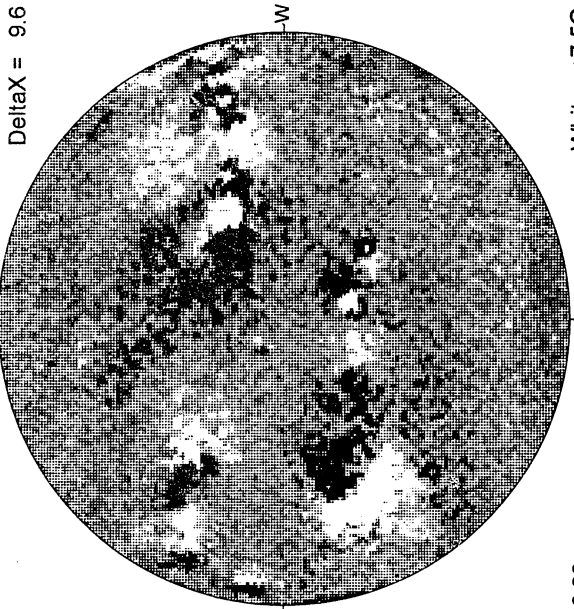
Solid = +
Dashed = -



1943 UT

MT. WILSON MAGNETOGRAM

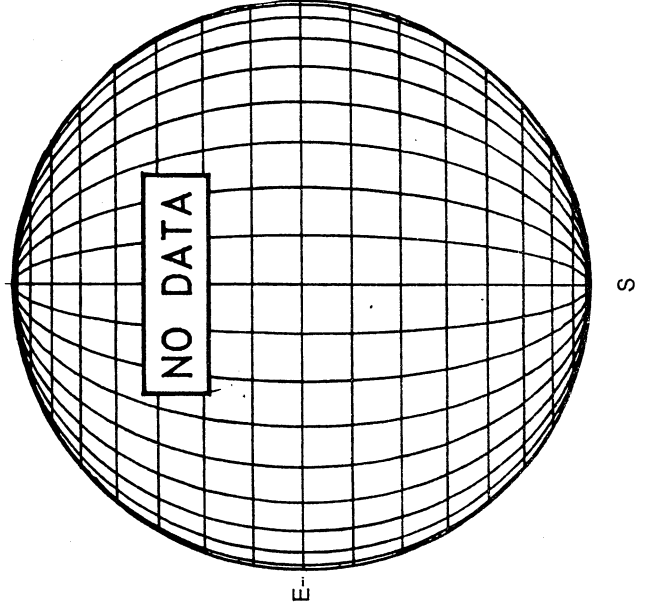
Delta Y = 13.0
Delta X = 9.6



20.20 -
21.17 UT

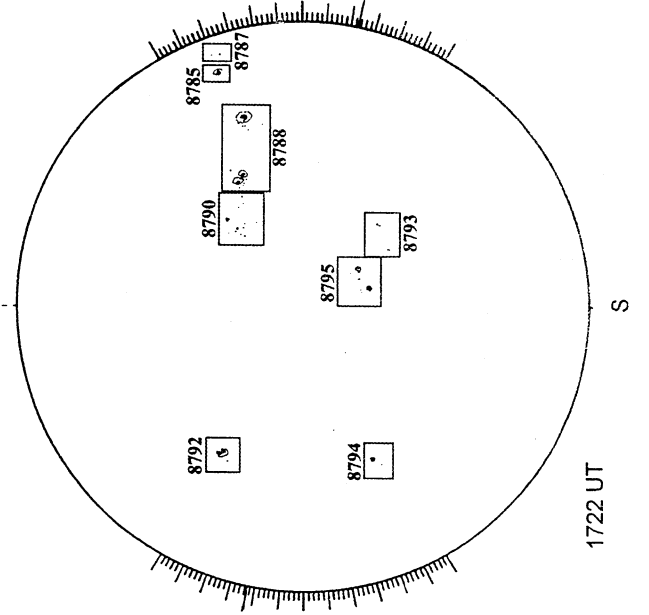
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



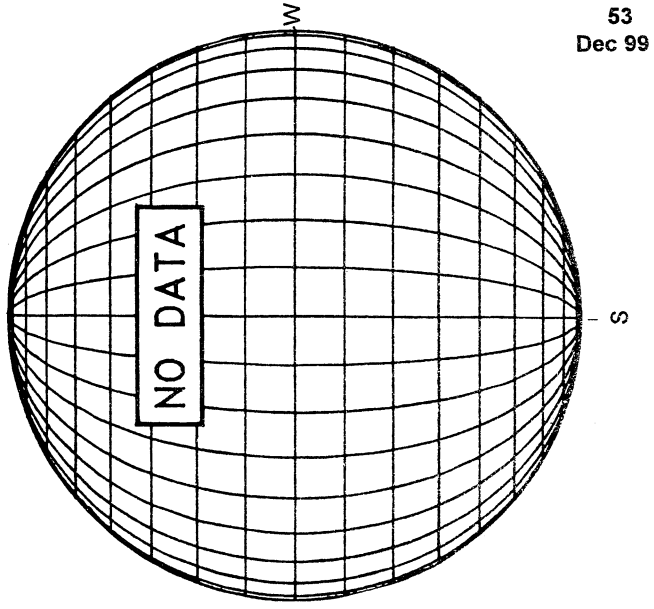
E-

RAMEY SUNSPOT



1722 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

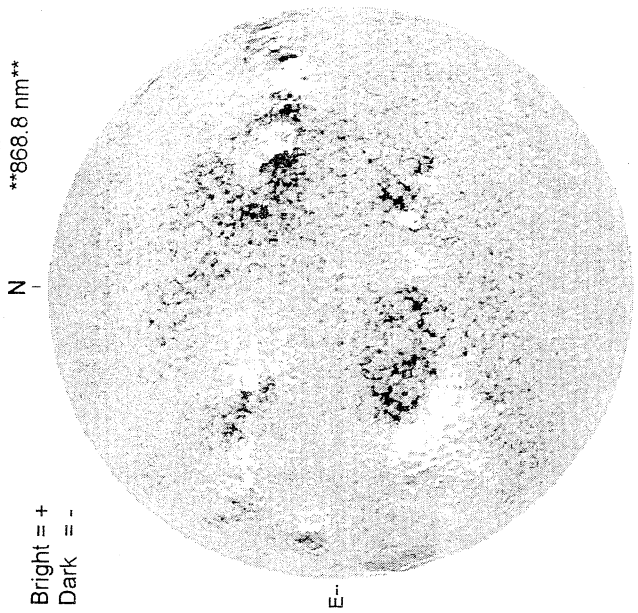


S

DECEMBER 12, 1999 (P = 11.75, Bo = -0.47, Lo = 271.48)

KITT PEAK MAGNETOGRAM
868.8 nm

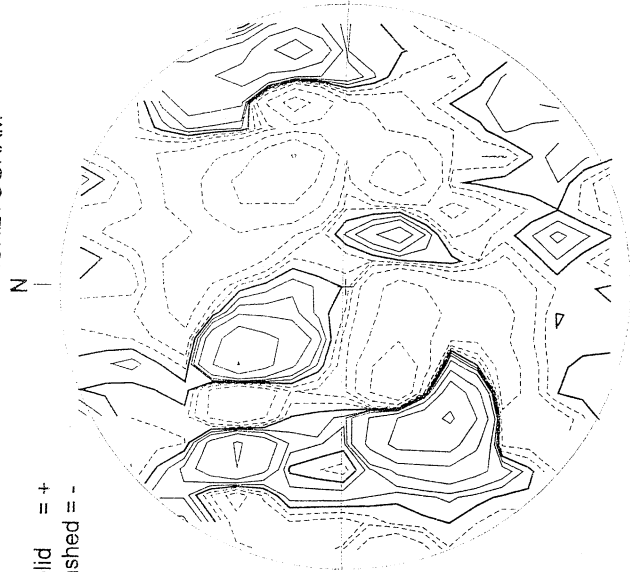
Bright = +
Dark = -



1642 UT

STANFORD MAGNETOGRAM

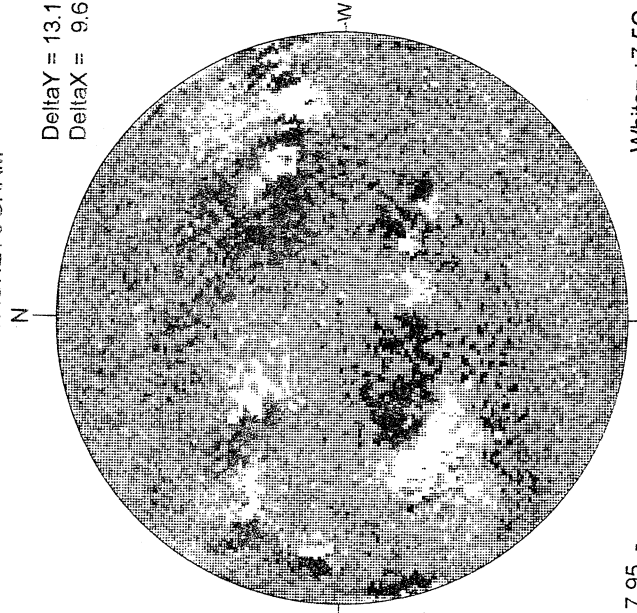
Solid = +
Dashed = -



2017 UT

MT. WILSON MAGNETOGRAM

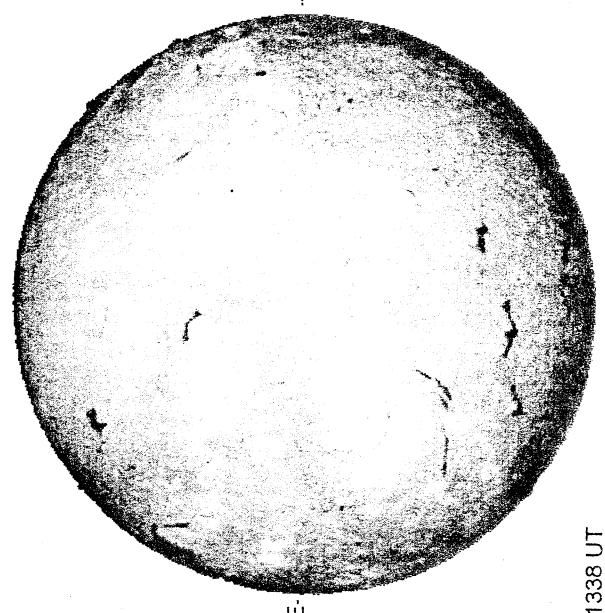
DeltaY = 13.1
DeltaX = 9.6



17.95 -
18.93 UT

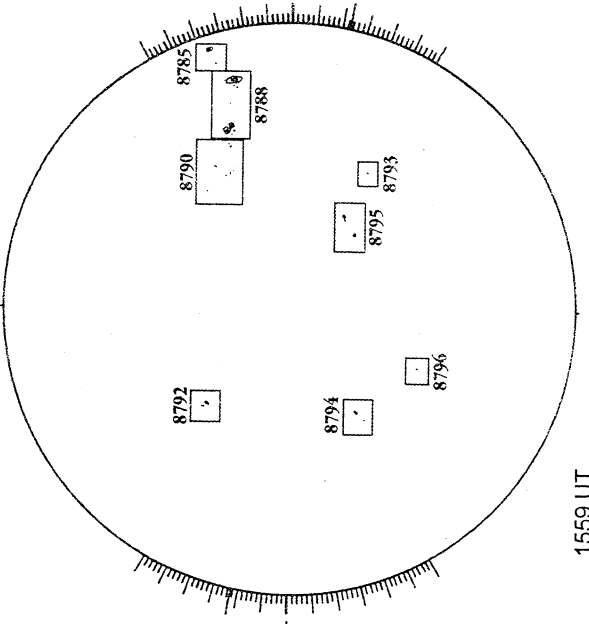
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



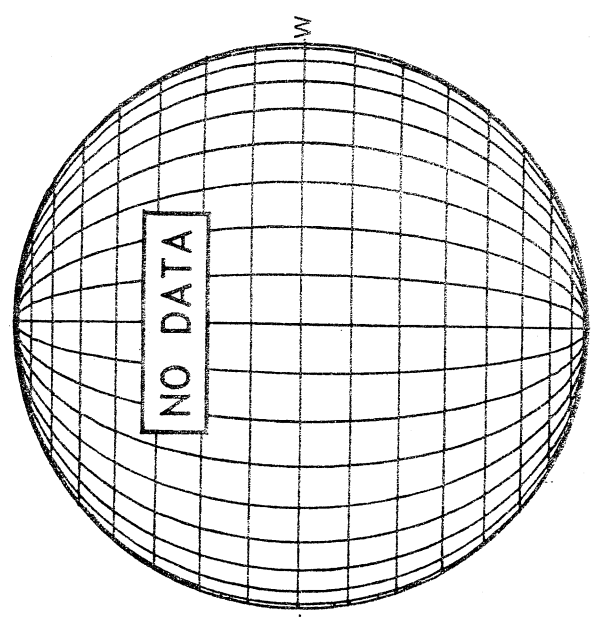
1338 UT

RAMEY SUNSPOT



1559 UT

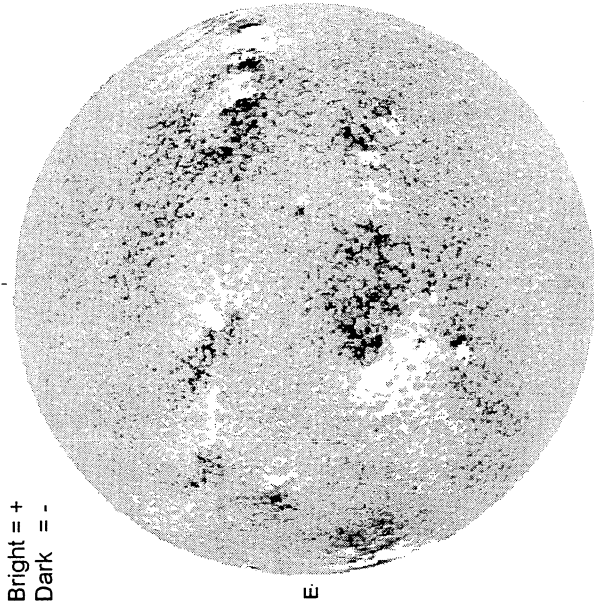
SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 13, 1999 (P= 11.31, Bo = -0.60, Lo = 258.31)

KITT PEAK MAGNETOGRAM

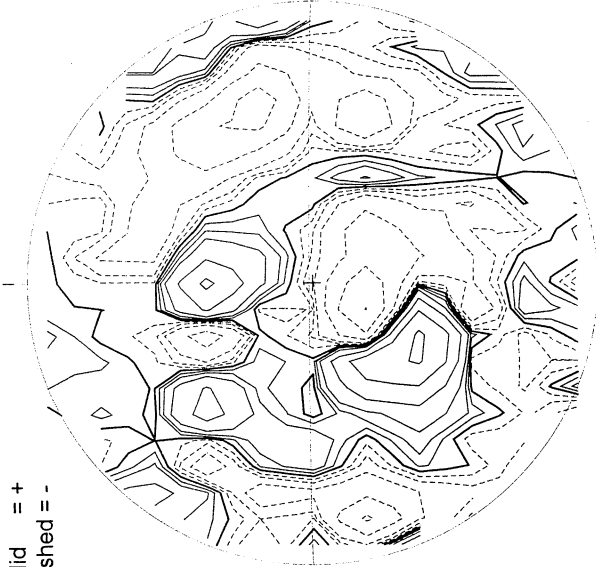
868.8 nm



Bright = +
Dark = -

1606 UT

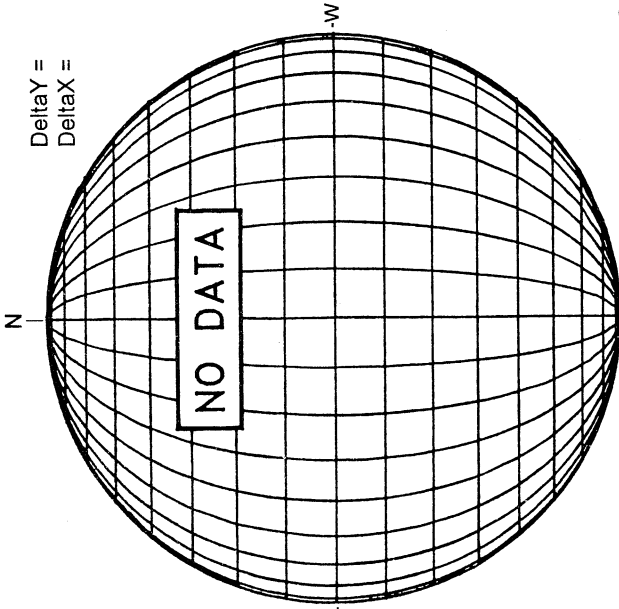
STANFORD MAGNETOGRAM



Solid = +
Dashed = -

2249 UT

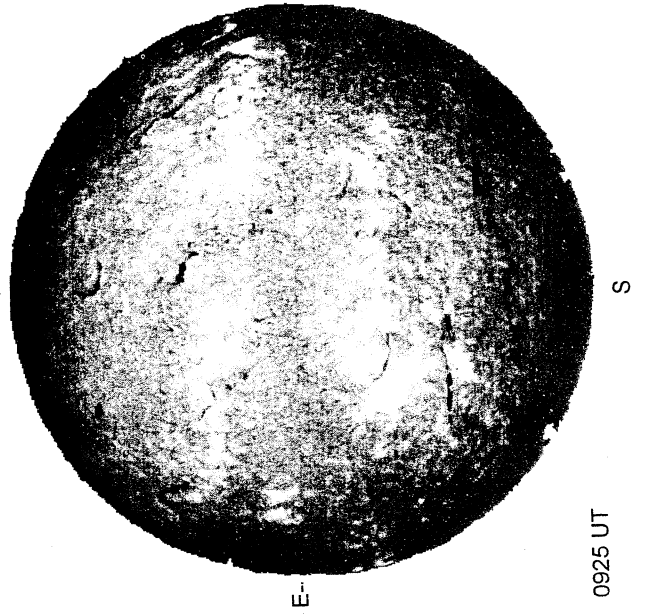
MT. WILSON MAGNETOGRAM



Delta Y =
Delta X =

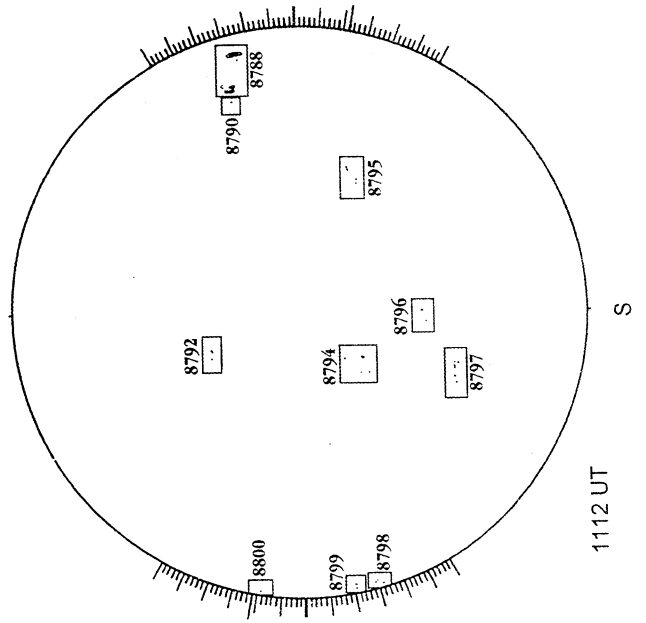
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



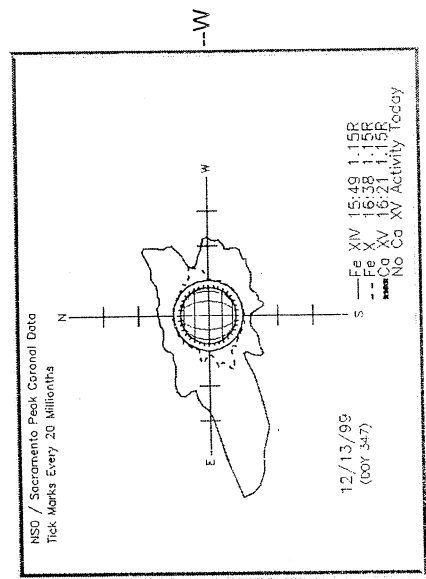
0925 UT

RAMEY SUNSPOT



1112 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



NSD / Sacramento Peak Coronal Data
Tick Marks Every 20 millionths

12/13/99
(00Y 547)

Fe XIV 15:49 1.588
Fe XV 16:29 1.588
Ca X 16:29 1.588
No Ca XV Activity Today

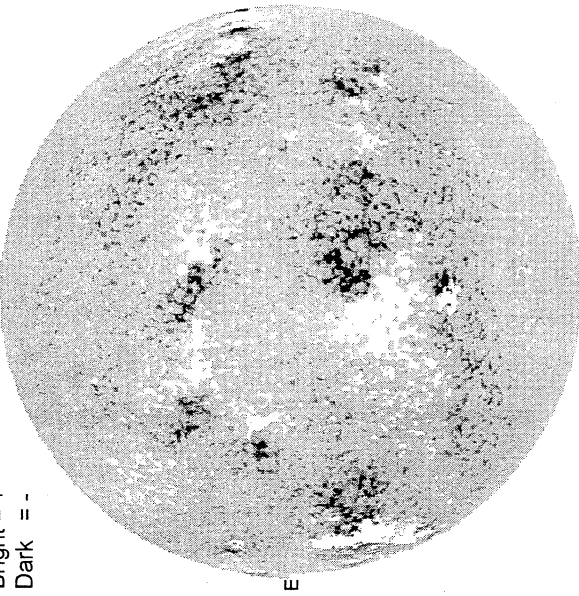
DECEMBER 14, 1999 (P = 10.87, Bo = -0.73, Lo = 245.13)

56
Dec 99

KITT PEAK MAGNETOGRAM

868.8 nm

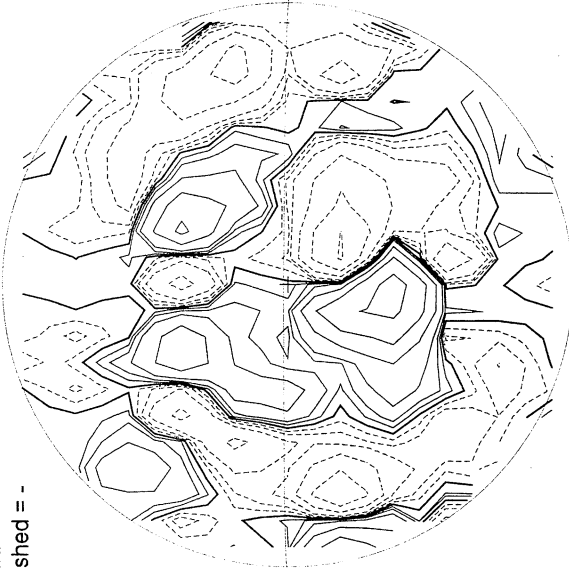
Bright = +
Dark = -



1814 UT

STANFORD MAGNETOGRAM

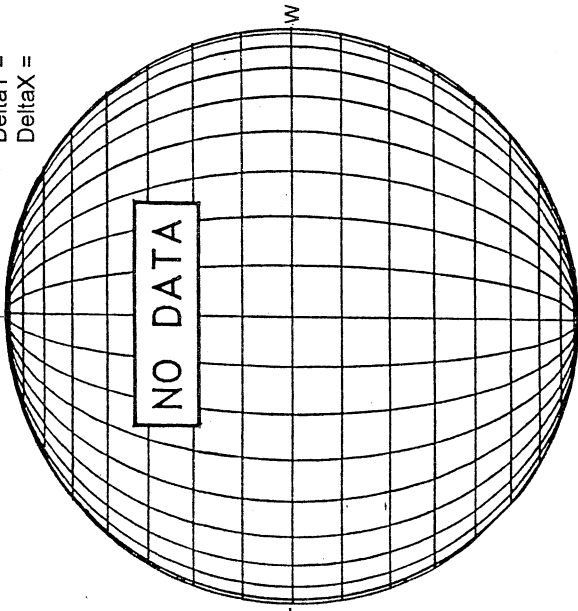
Solid = +
Dashed = -



2256 UT

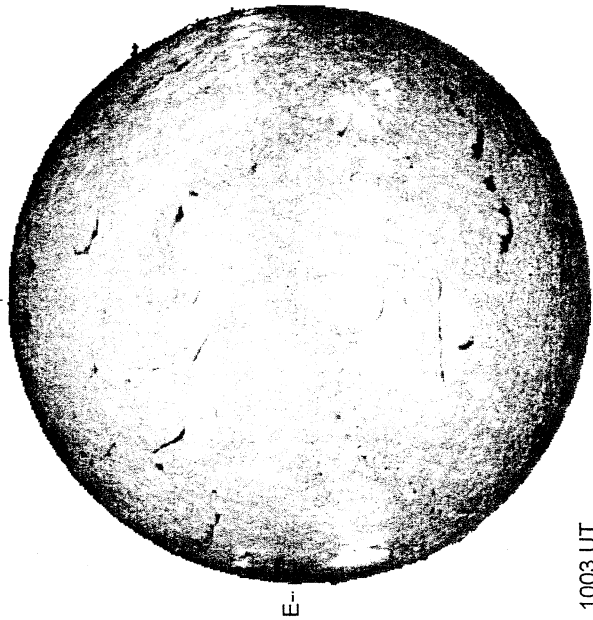
MT. WILSON MAGNETOGRAM

Delta Y =
Delta X =



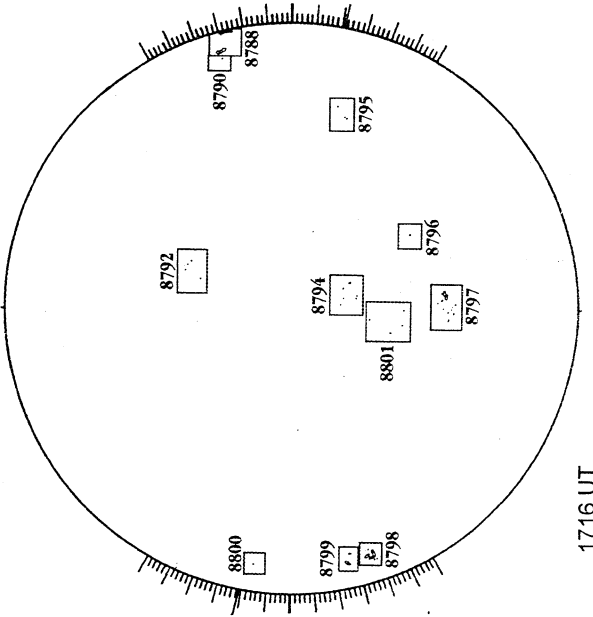
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



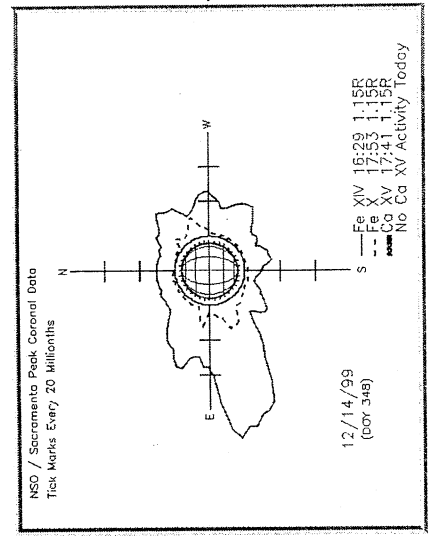
1003 UT

RAMEY SUNSPOT



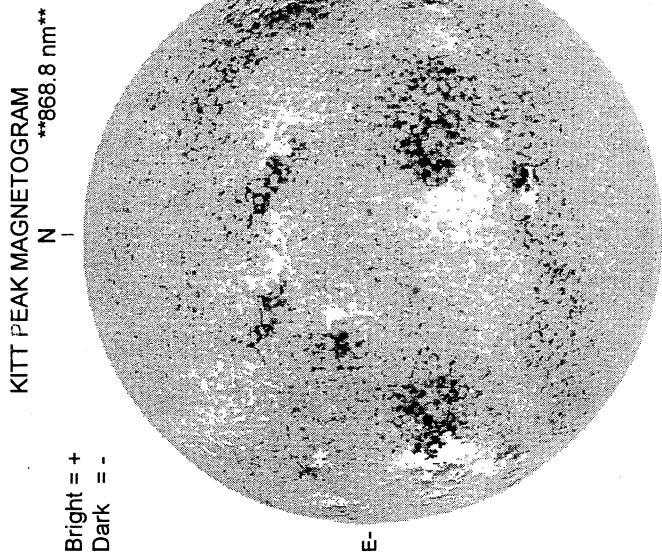
1716 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

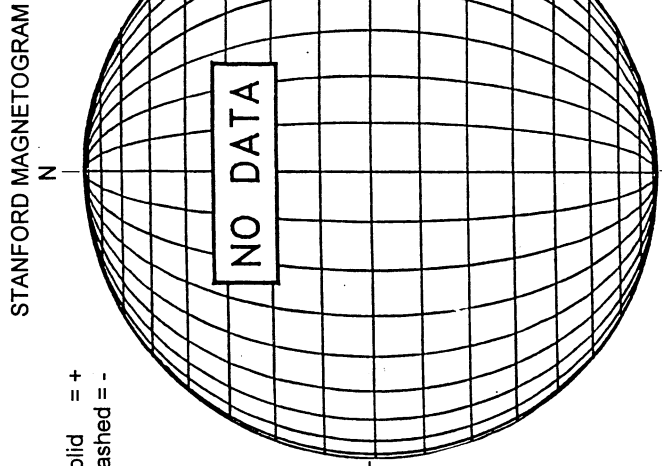


S

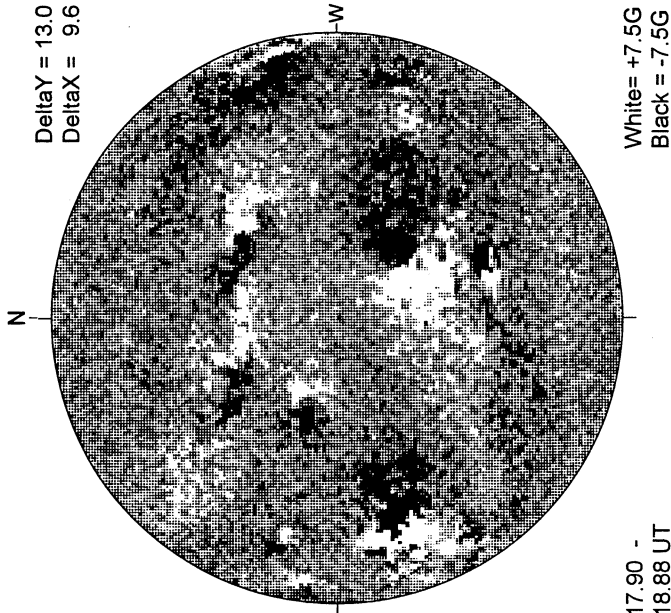
DECEMBER 15, 1999 (P = 10.42, Bo = -0.85, Lo = 231.96)



1553 UT

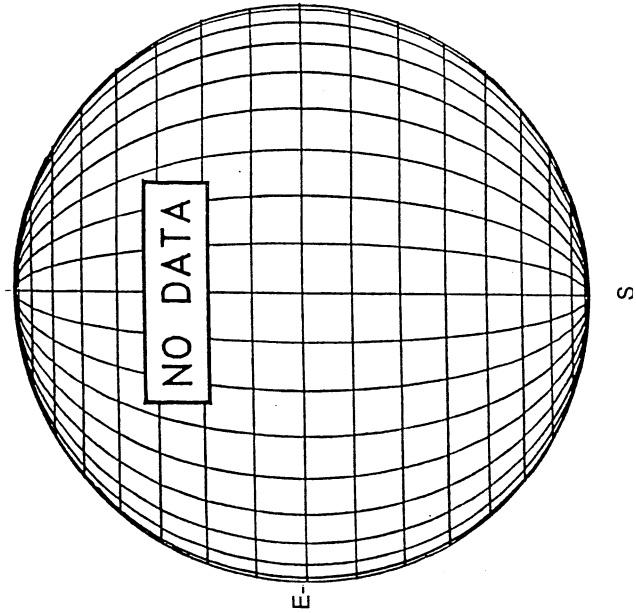


MT. WILSON MAGNETOGRAM

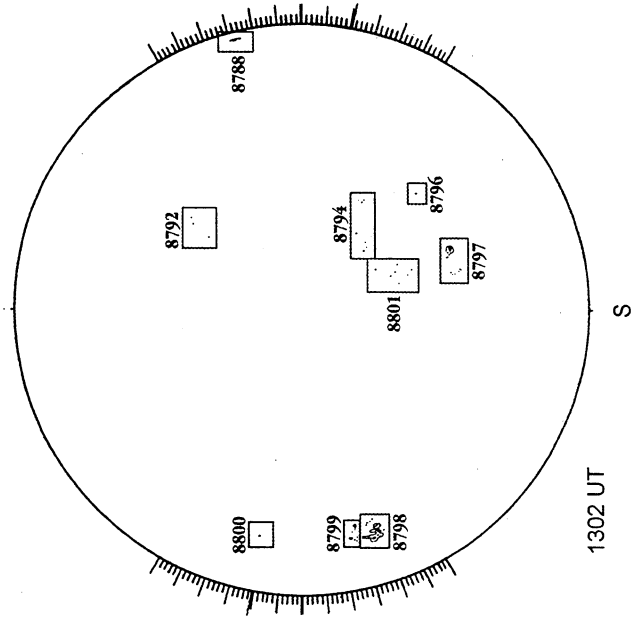


17.90 -
18.88 UT

MEUDON H-ALPHA

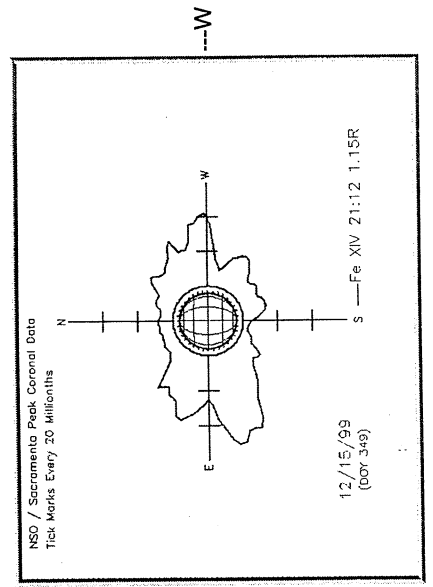


RAMEY SUNSPOT



1302 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

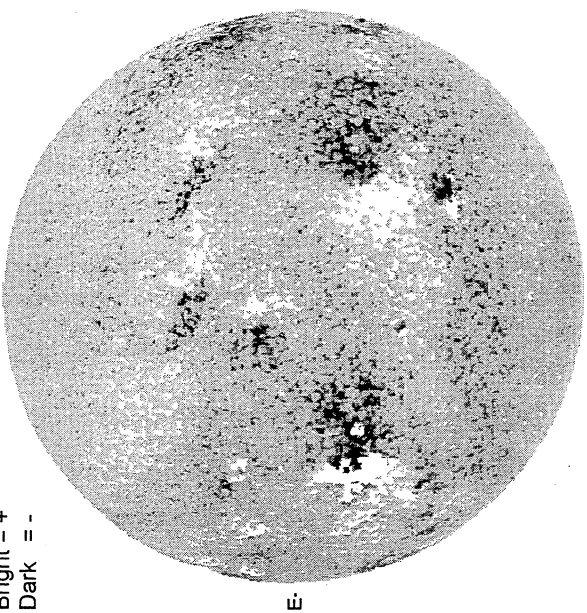


58
Dec 98

DECEMBER 16, 1999 (P= 9.96, Bo = -0.98, Lo = 218.78)

KITT PEAK MAGNETOGRAM
868.8 nm

Bright = +
Dark = -



1547 UT

STANFORD MAGNETOGRAM

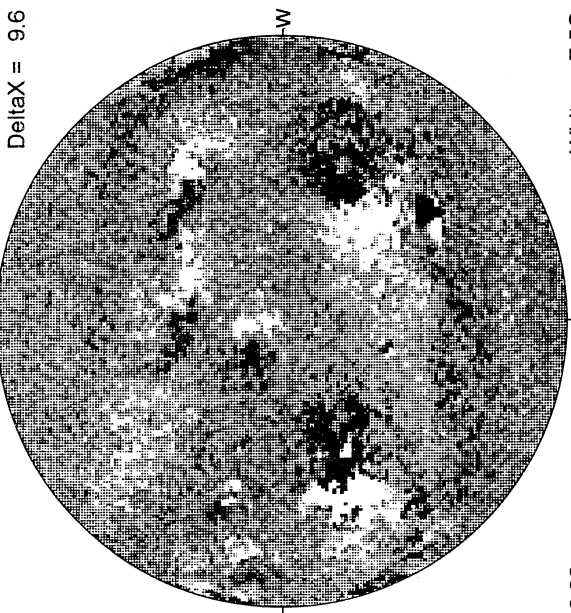
Solid = +
Dashed = -



1755 UT

MT. WILSON MAGNETOGRAM

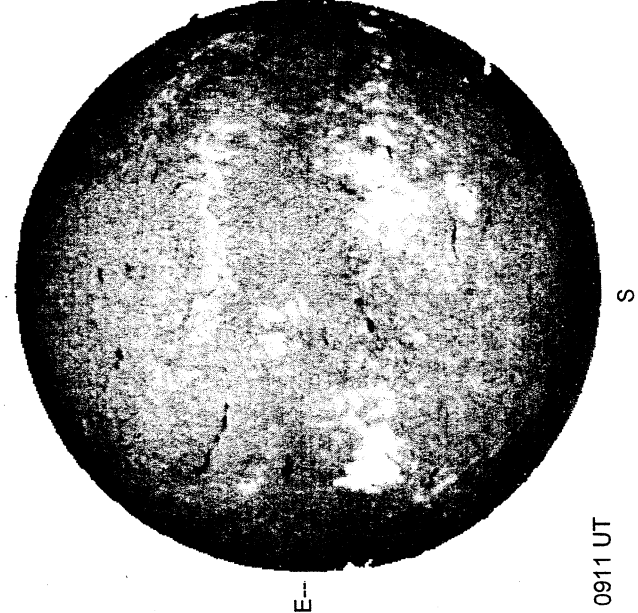
DeltaY = 13.1
DeltaX = 9.6



18.22 -
19.19 UT

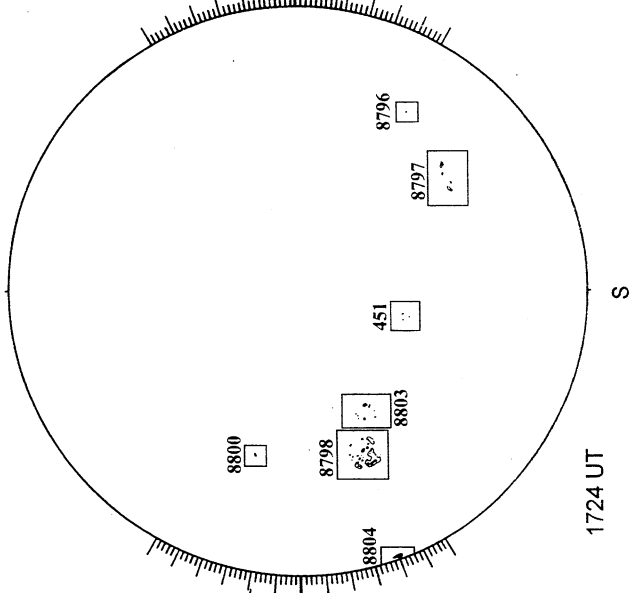
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



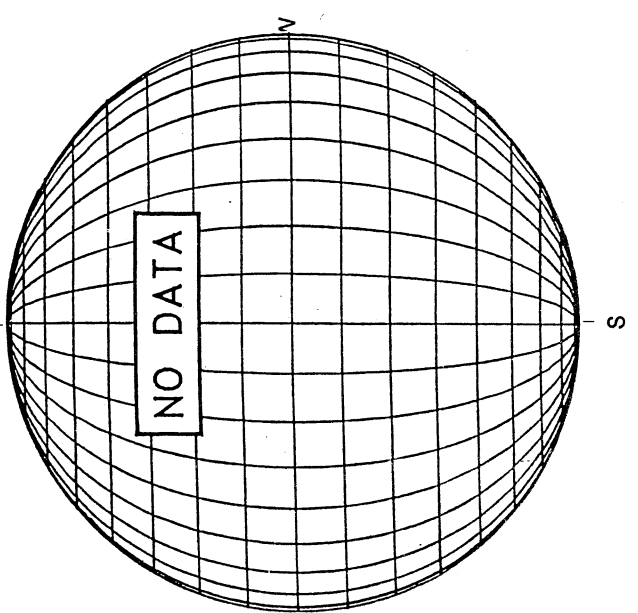
0911 UT

RAMEY SUNSPOT



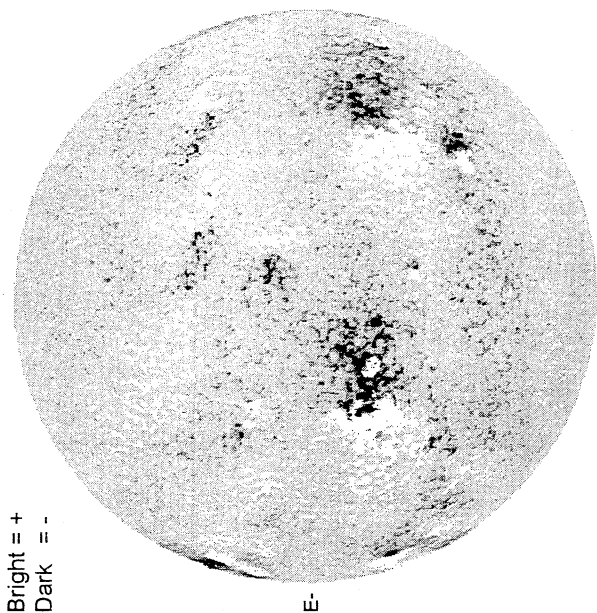
1724 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



DECEMBER 17, 1999 (P= 9.51, Bo = -1.11, Lo = 205.61)

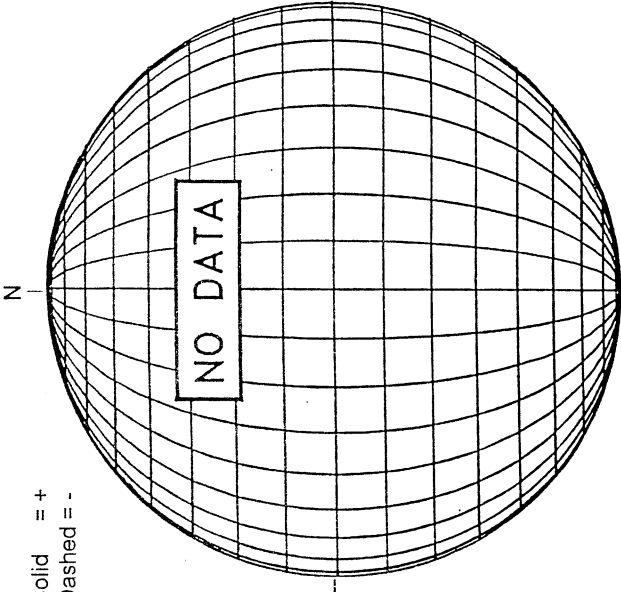
KITT PEAK MAGNETOGRAM
868.8 nm



Bright = +
Dark = -

1603 UT

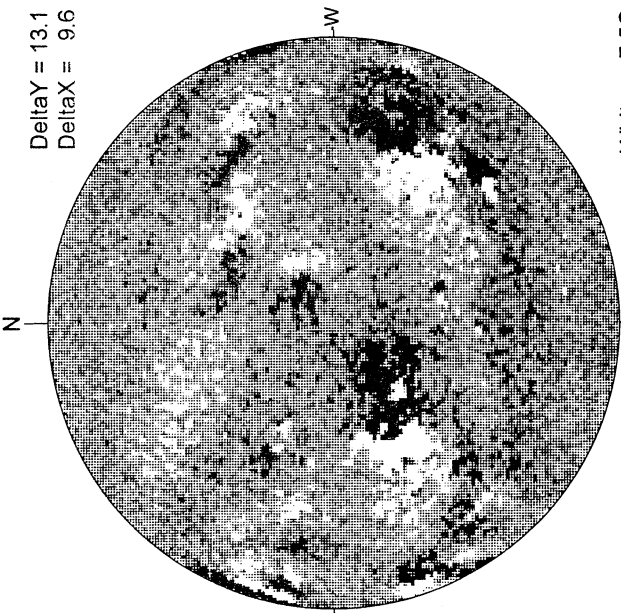
STANFORD MAGNETOGRAM



Solid = +
Dashed = -

18.47 -
19.44 UT

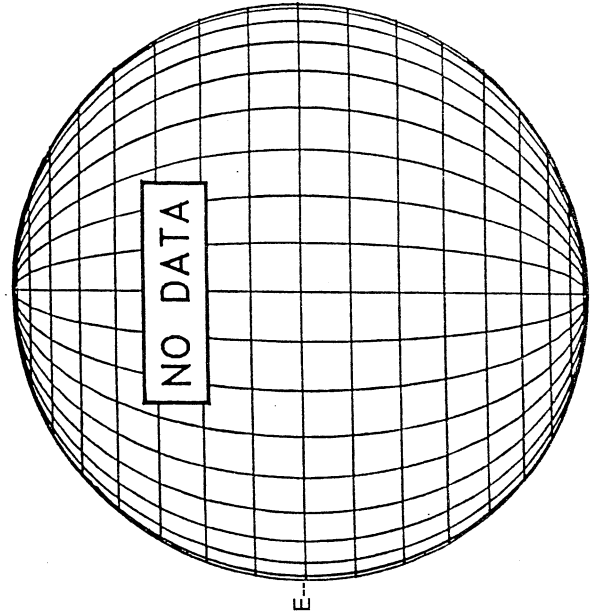
MT. WILSON MAGNETOGRAM



Delta Y = 13.1
Delta X = 9.6

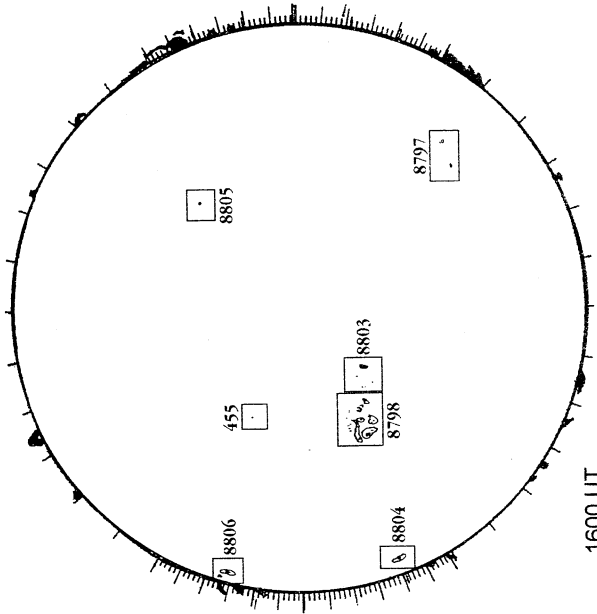
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



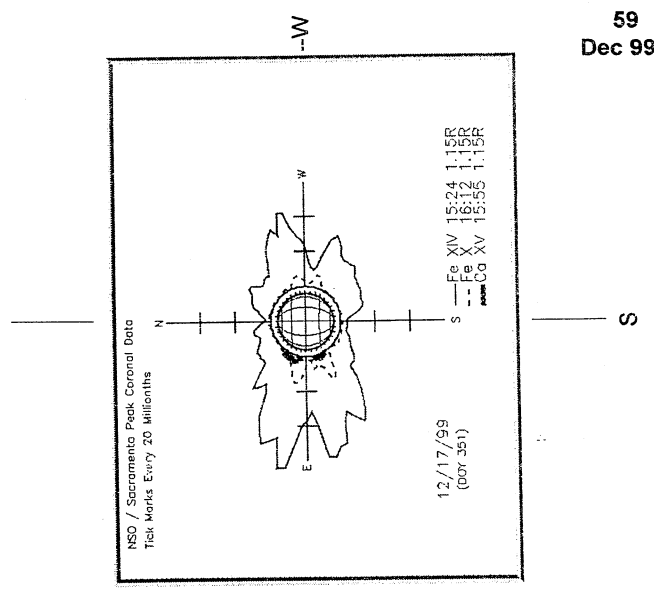
1600 UT

RAMEY SUNSPOT



1600 UT
0802 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



12/17/99
(day 351)

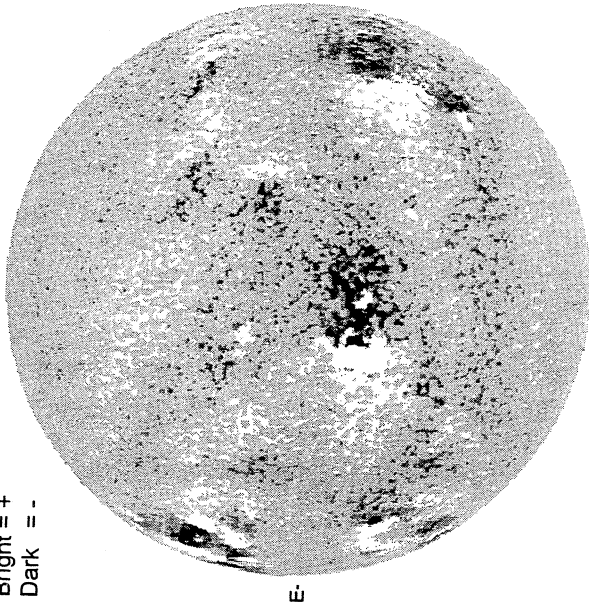
--- Fe XIV 15:24 1:15R
--- Fe X 16:12 1:15R
--- Co XV 15:55 1:15R

DECEMBER 18, 1999 (P= 9.05, Bo = -1.23, Lo = 192.43)

60
Dec 99

KITT PEAK MAGNETOGRAM
N
868.8 nm

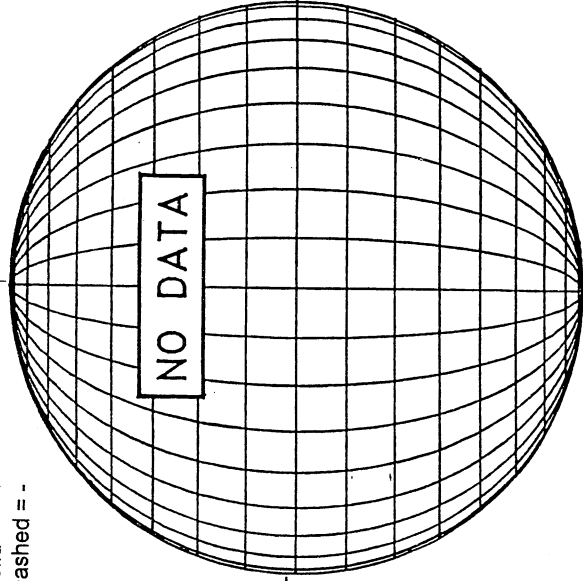
Bright = +
Dark = -



1621 UT

STANFORD MAGNETOGRAM
N

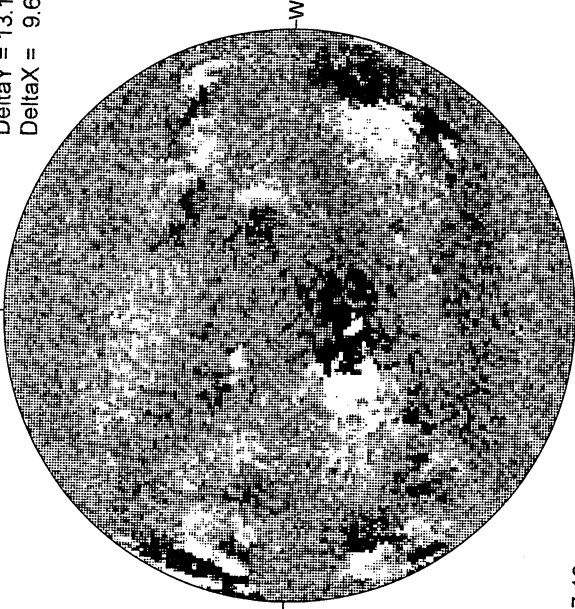
Solid = +
Dashed = -



17.19 -
18.17 UT

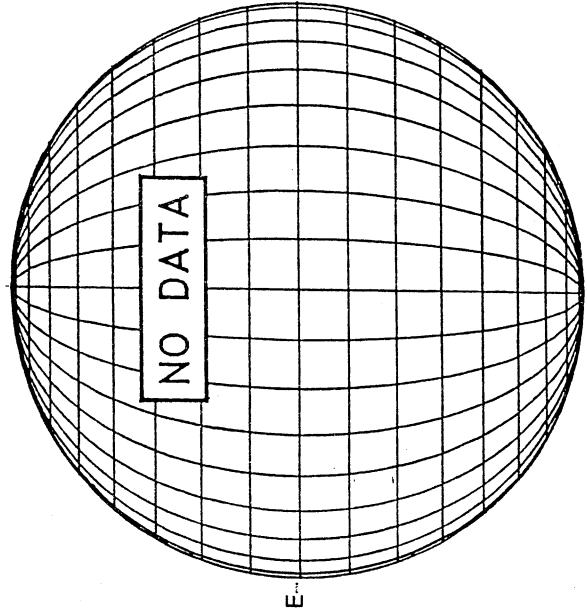
MT. WILSON MAGNETOGRAM
N

DeltaY = 13.1
DeltaX = 9.6



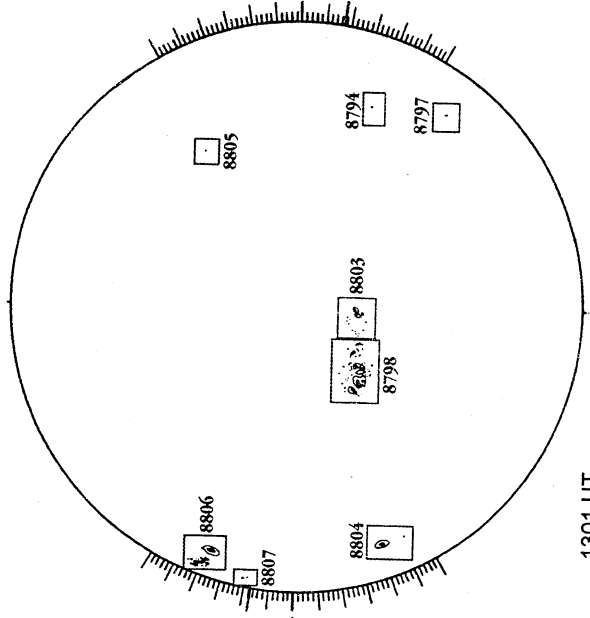
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA
E



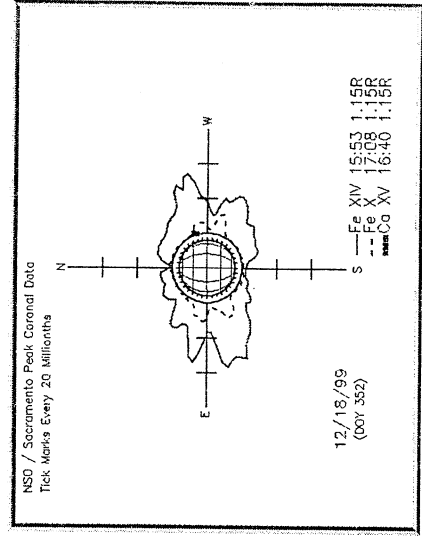
S

RAMEY SUNSPOT



1301 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----
N



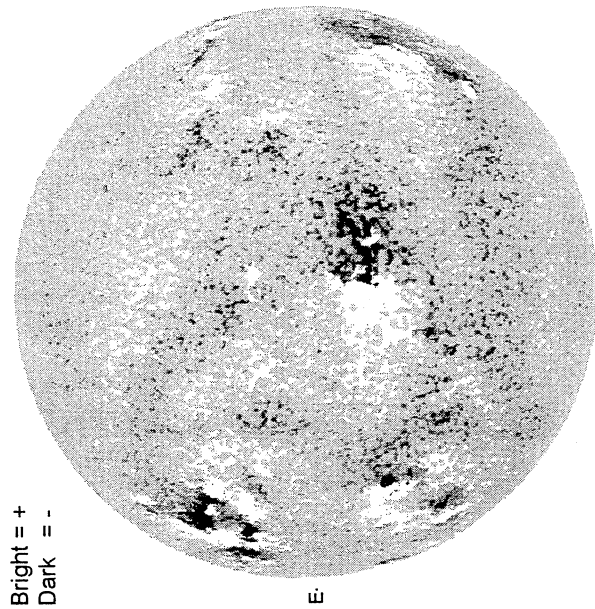
12/18/99
(00X 352)

Fe XIV 15:53 1.15R
Fe X 17:08 1.15R
Co XV 16:40 1.15R

S

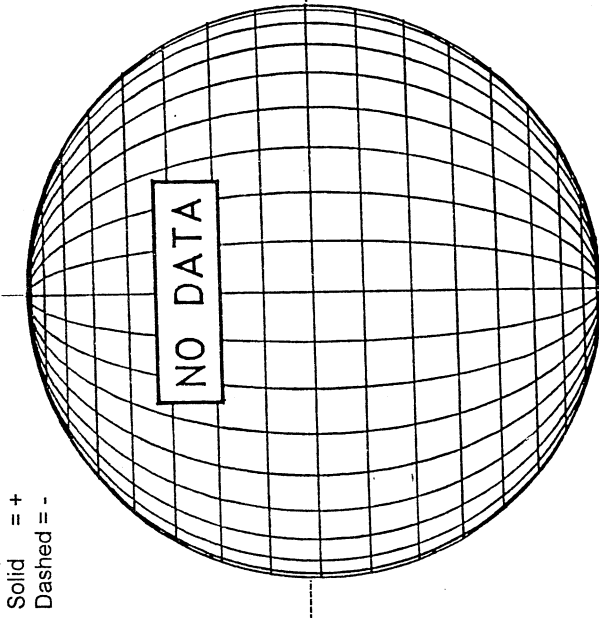
DECEMBER 19, 1999 (P= 8.59, Bo = -1.36, Lo = 179.26)

KITT PEAK MAGNETOGRAM
868.8 nm

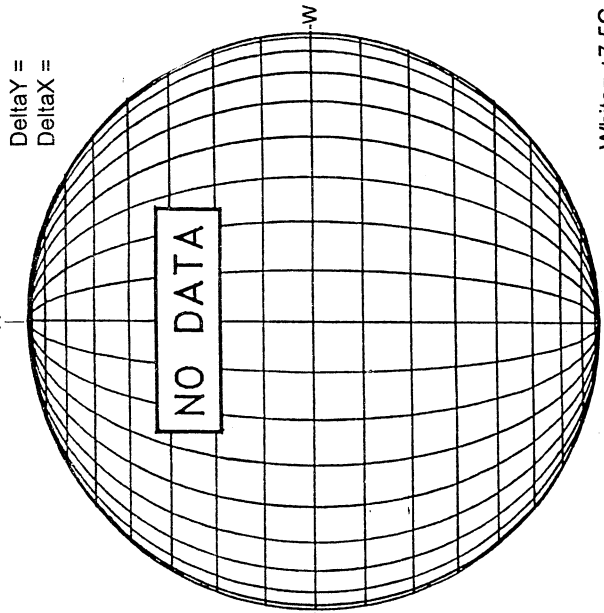


1601 UT

STANFORD MAGNETOGRAM

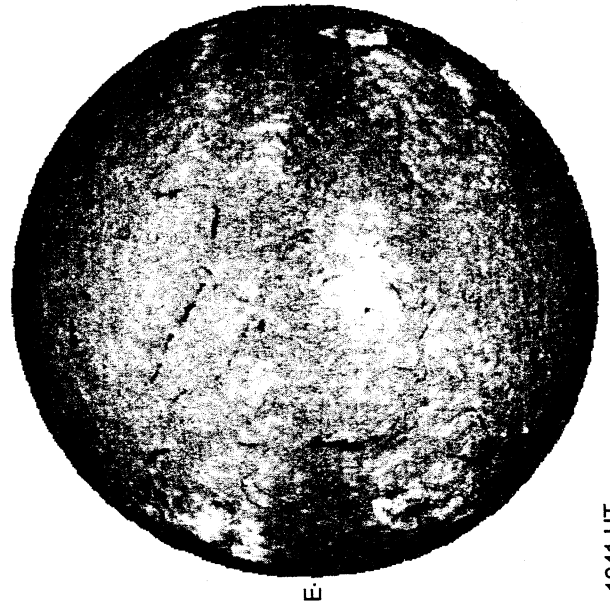


MT. WILSON MAGNETOGRAM



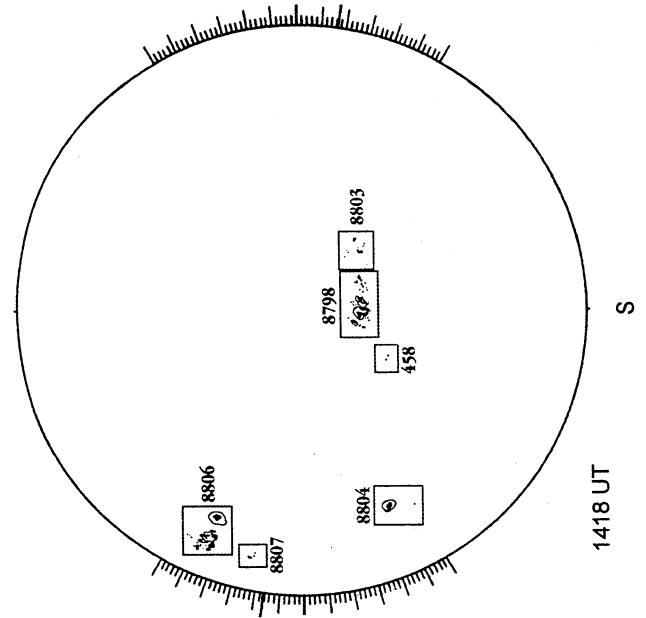
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



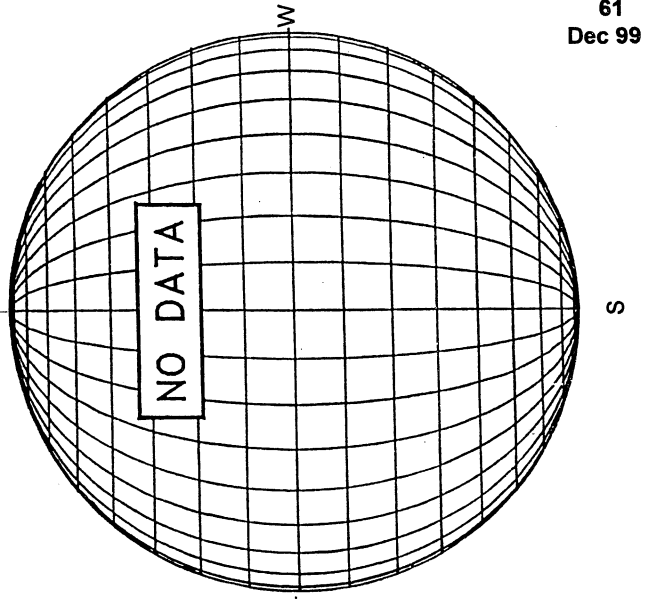
1041 UT

RAMEY SUNSPOT



1418 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

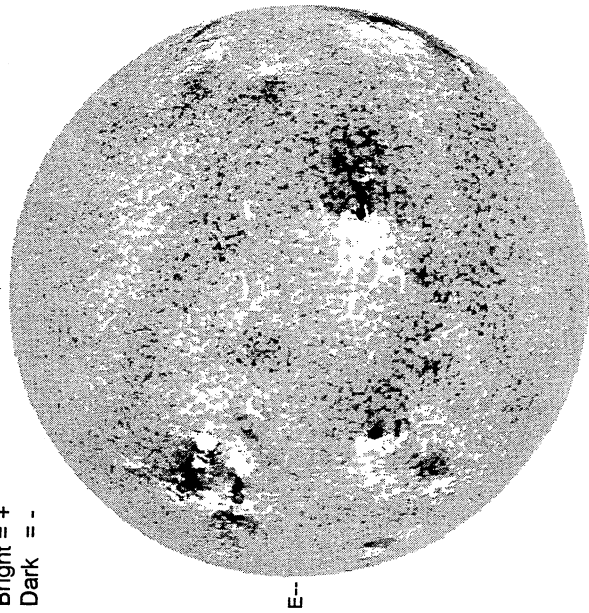


DECEMBER 20, 1999 (P= 8.12, Bo = -1.49, Lo = 166.08)

62
Dec 99

KITT PEAK MAGNETOGRAM
868.8 nm

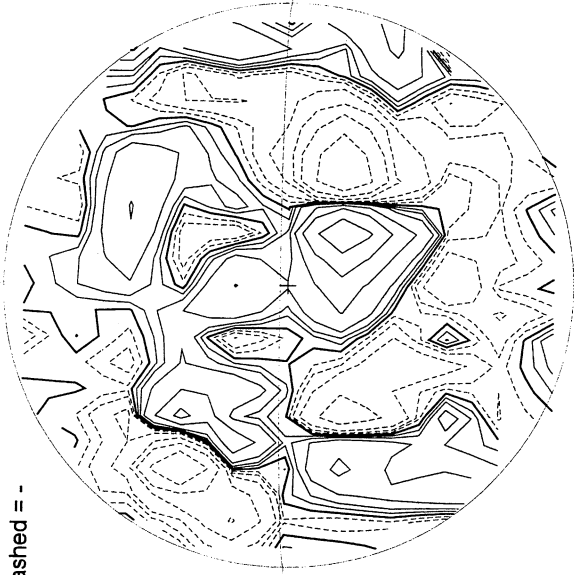
Bright = +
Dark = -



1611 UT

STANFORD MAGNETOGRAM

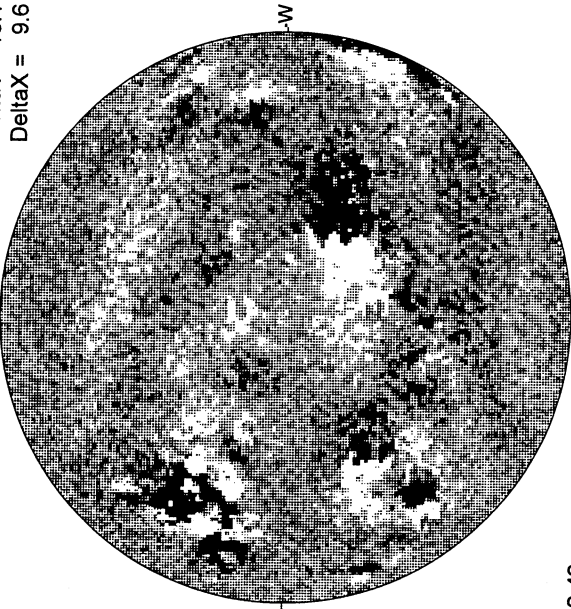
Solid = +
Dashed = -



1817 UT

MT. WILSON MAGNETOGRAM

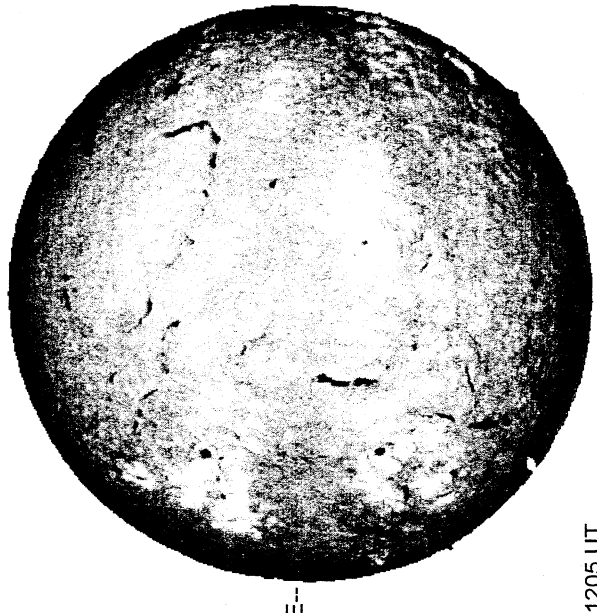
Delta Y = 13.1
Delta X = 9.6



18.42 -
19.39 UT

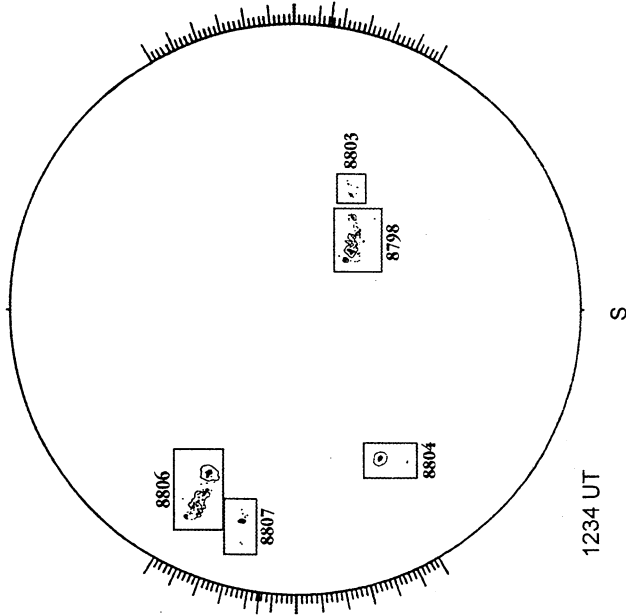
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



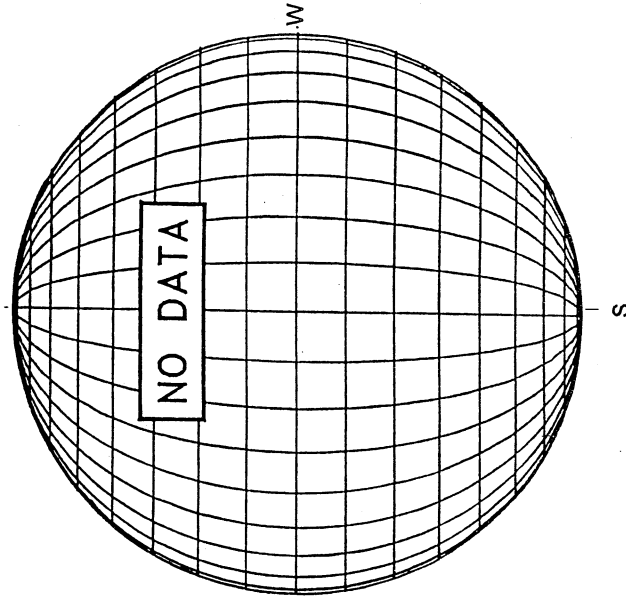
1205 UT

RAMEY SUNSPOT



1234 UT

LOMNICKY PEAK CORONA (1.04 Radii)----



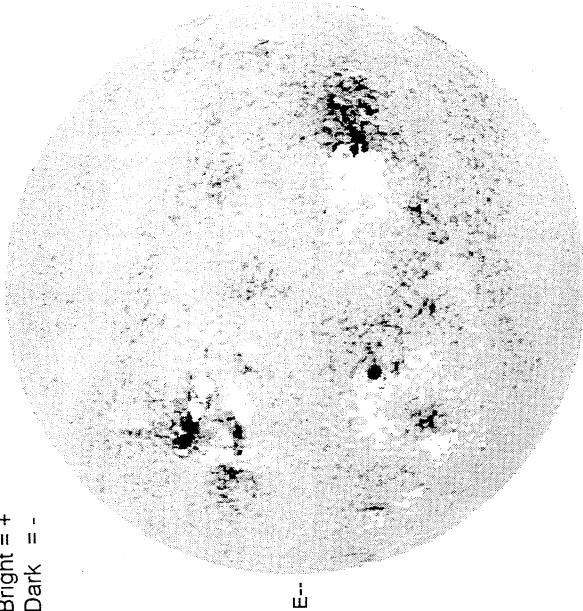
DECEMBER 21, 1999 (P= 7.65, Bo = -1.61, Lo = 152.91)

KITT PEAK MAGNETOGRAM

868.8 nm

Bright = +
Dark = -

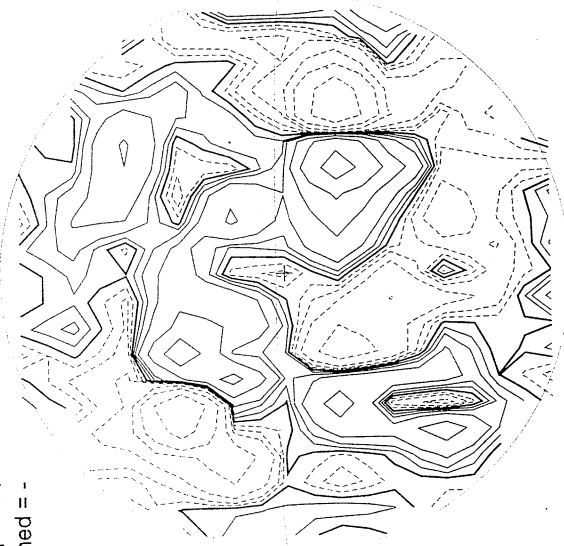
Delta Y = 13.1
Delta X = 9.6



1612 UT

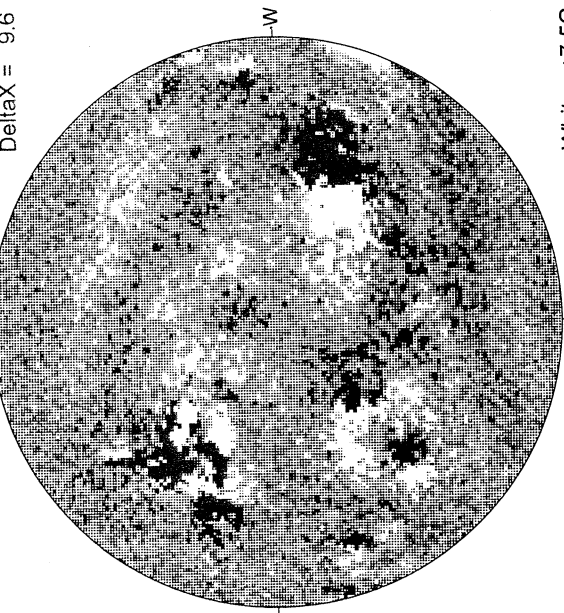
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



1750 UT

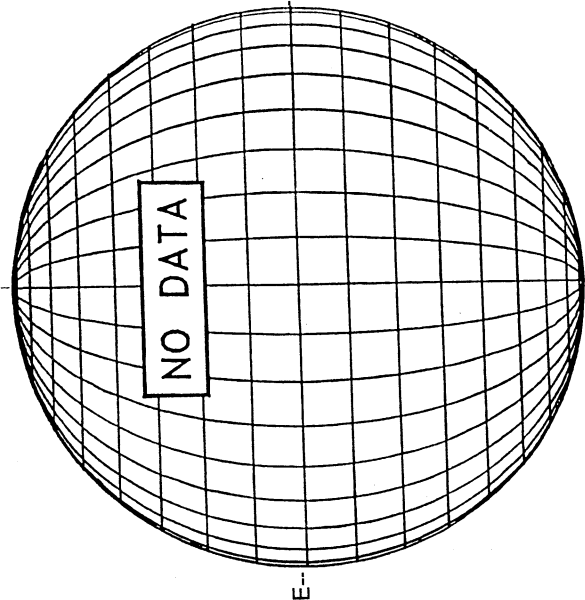
MT. WILSON MAGNETOGRAM



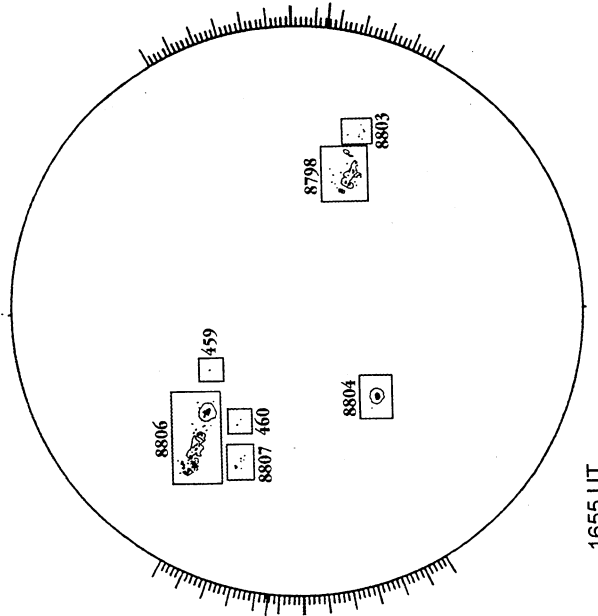
18.76 -
19.74 UT

White = +7.5G
Black = -7.5G

MEUDON H-ALPHA

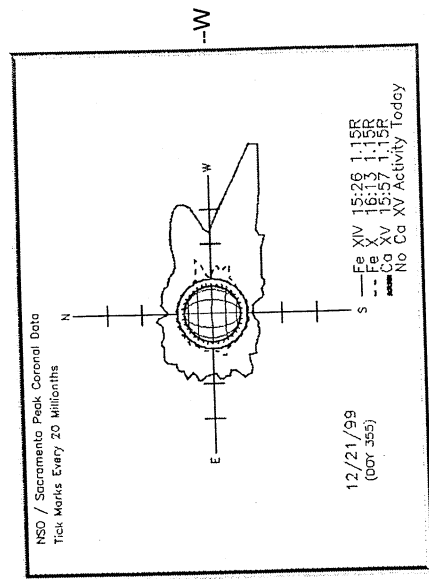


RAMEY SUNSPOT



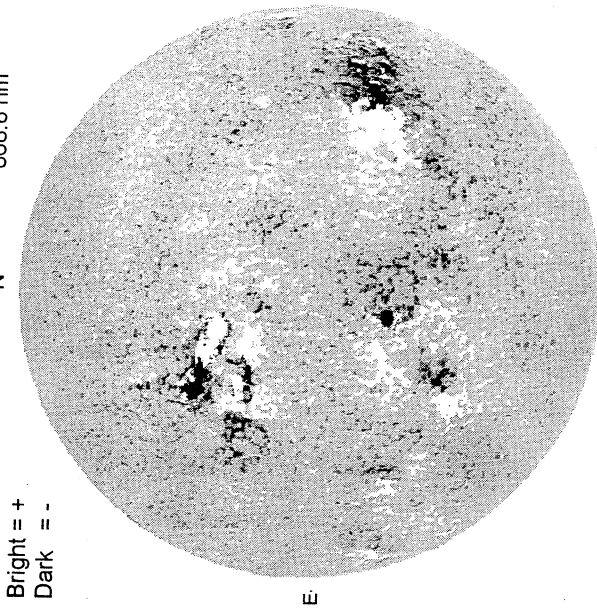
1655 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----



DECEMBER 22, 1999 (P= 7.18, Bo = -1.74, Lo = 139.74)

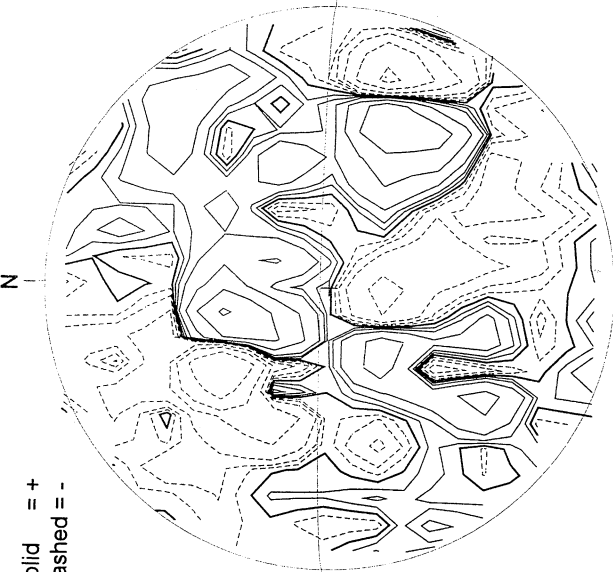
KITT PEAK MAGNETOGRAM
868.8 nm



Bright = +
Dark = -

1558 UT

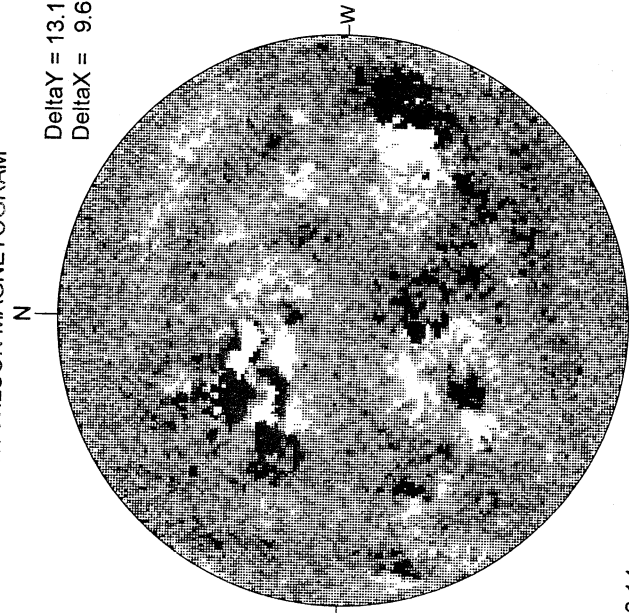
STANFORD MAGNETOGRAM



Solid = +
Dashed = -

1731 UT

MT. WILSON MAGNETOGRAM

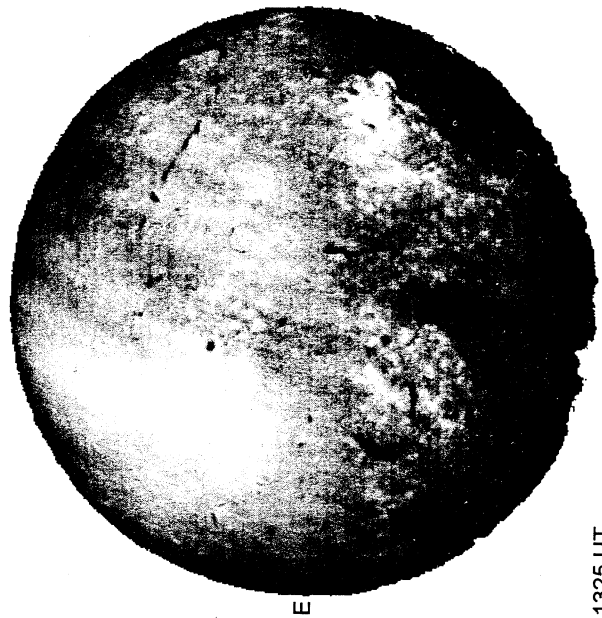


DeltaY = 13.1
DeltaX = 9.6

23.14 -
24.11 UT

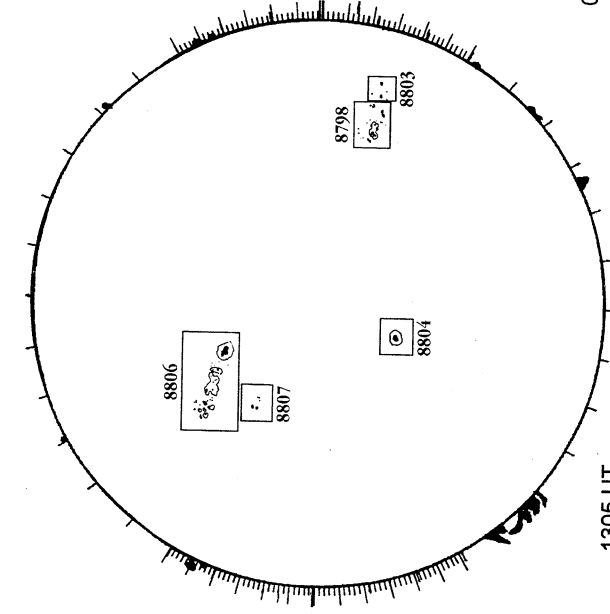
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



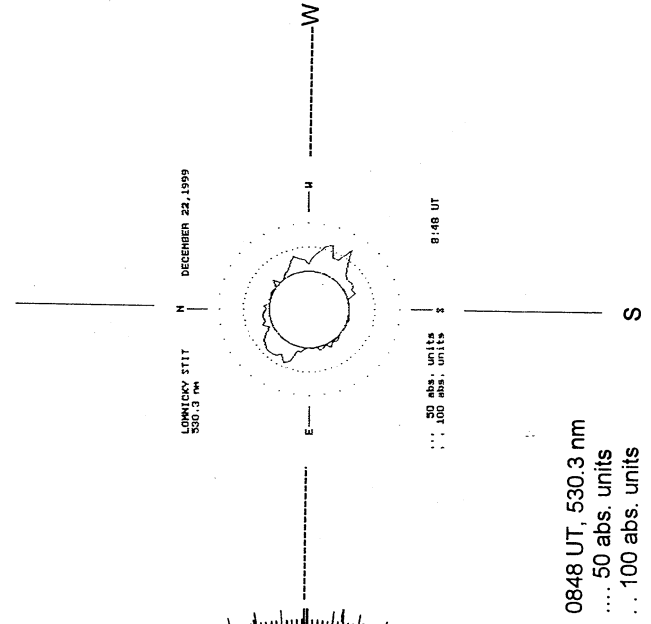
1325 UT

RAMEY SUNSPOT



1305 UT
0832 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)-----

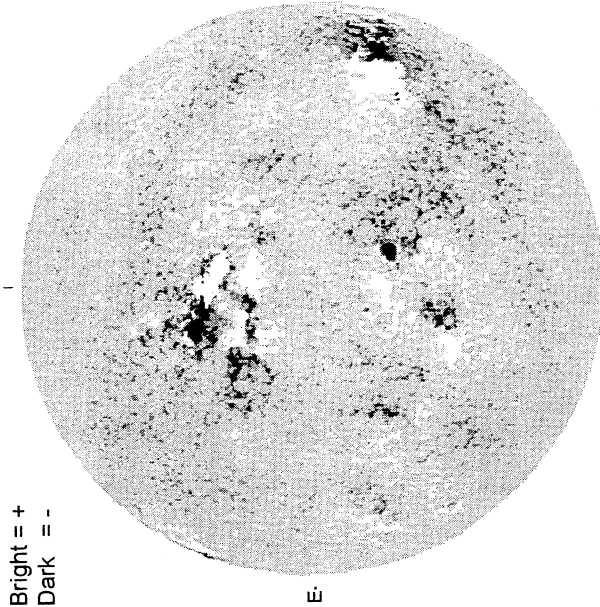


0848 UT, 530.3 nm
... 50 abs. units
... 100 abs. units

DECEMBER 23, 1999 (P = 6.71, Bo = -1.86, Lo = 126.56)

KITT PEAK MAGNETOGRAM

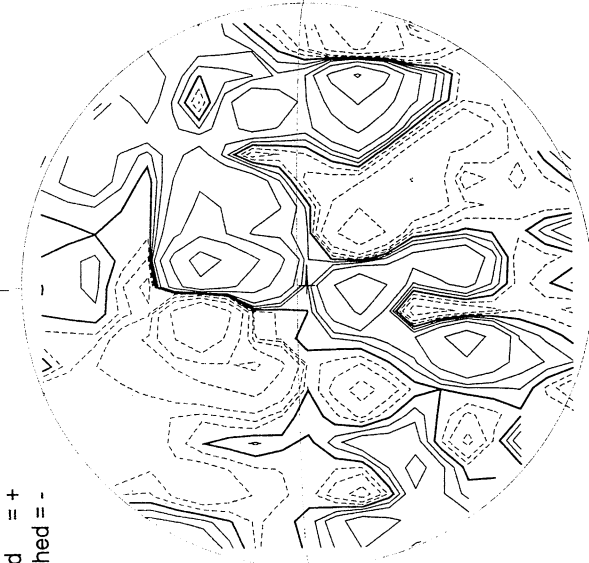
868.8 nm



Bright = +
Dark = -

1557 UT

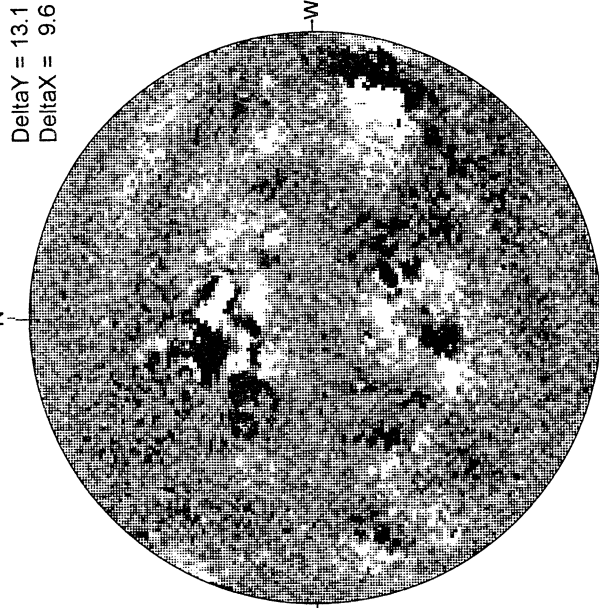
STANFORD MAGNETOGRAM



Solid = +
Dashed = -

1732 UT

MT. WILSON MAGNETOGRAM

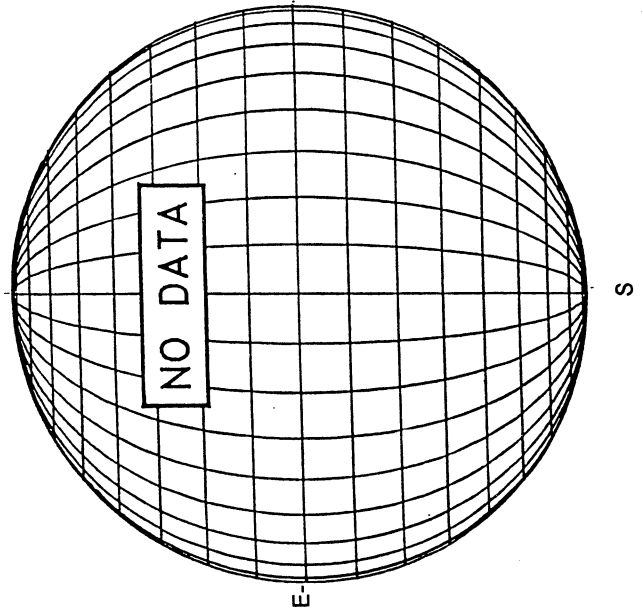


DeltaY = 13.1
DeltaX = 9.6

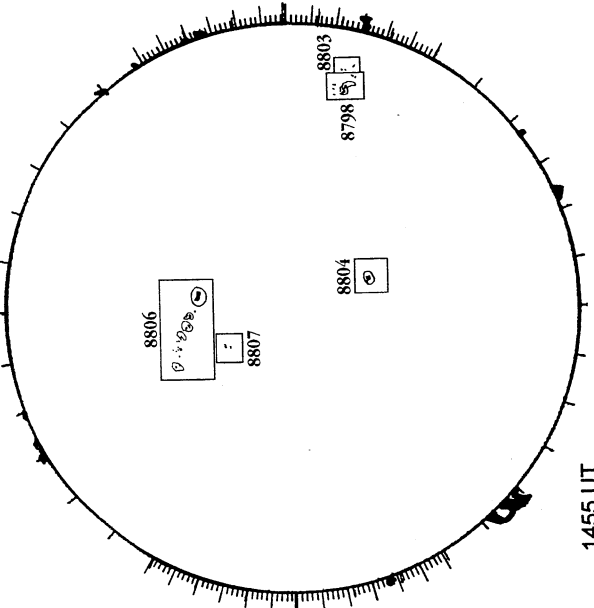
18.67 -
19.64 UT

White = +7.5G
Black = -7.5G

MEUDON H-ALPHA

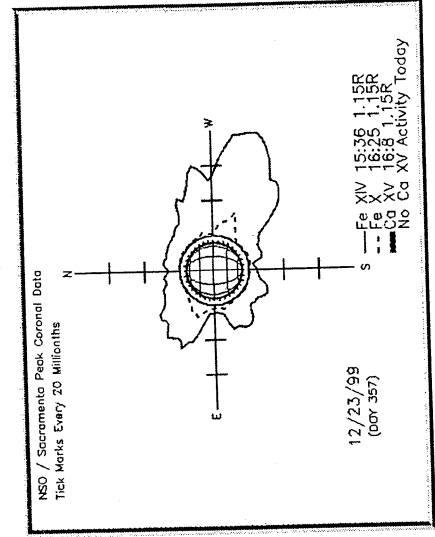


RAMEY SUNSPOT



1455 UT
0823 UT LOMN Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



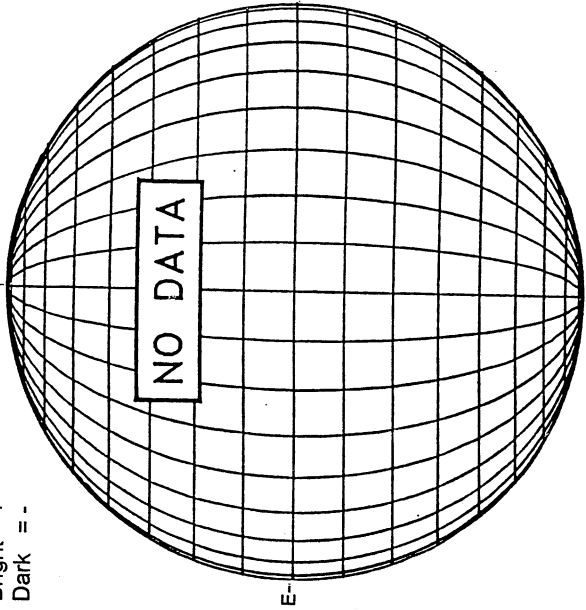
12/23/99
(007 357)

66
Dec 99

DECEMBER 24, 1999 (P= 6.23, Bo = -1.99, Lo = 113.39)

KITT PEAK MAGNETOGRAM
868.8 nm

Bright = +
Dark = -



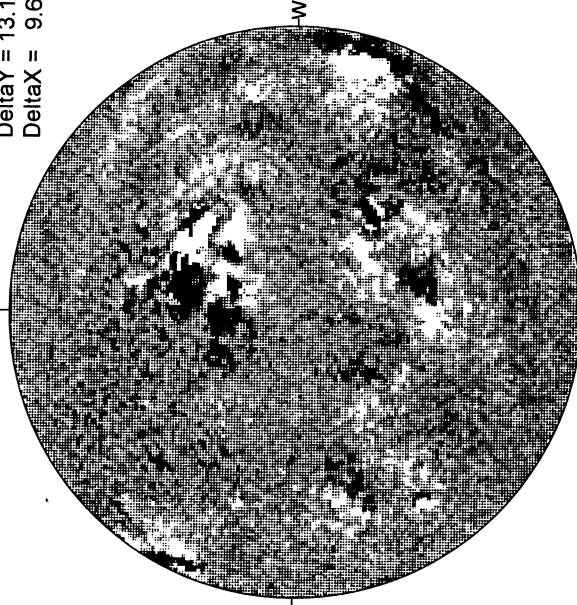
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

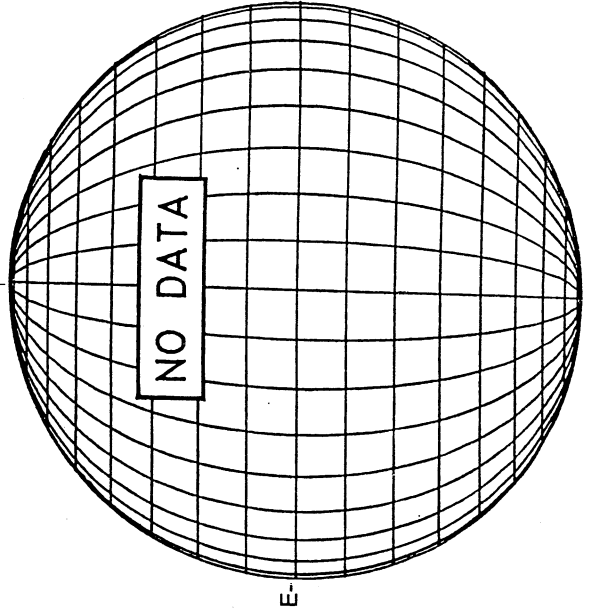
Delta Y = 13.1
Delta X = 9.6



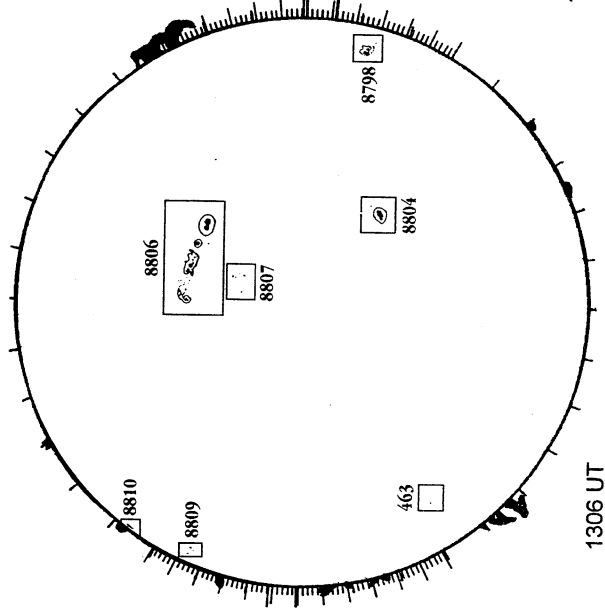
18.21 -
19.19 UT

White = +7.5G
Black = -7.5G

MEUDON H-ALPHA

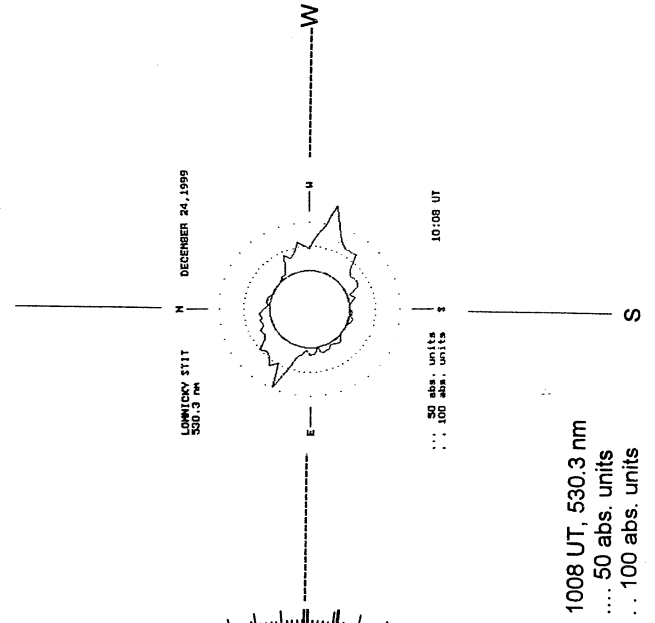


RAMEY SUNSPOT



1306 UT
0920 UT LOMN Prom S

LOMNICKY PEAK CORONA (1.04 Radii)

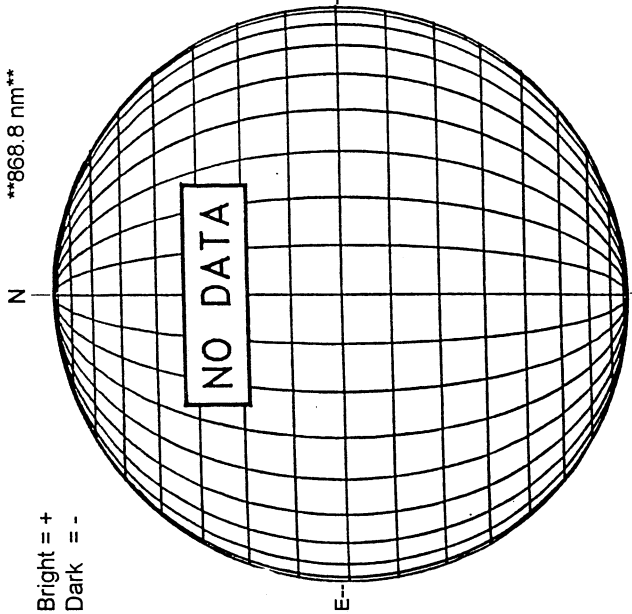


1008 UT, 530.3 nm
..... 50 abs. units
... 100 abs. units

DECEMBER 25, 1999 (P= 5.76, Bo = -2.11, Lo = 100.22)

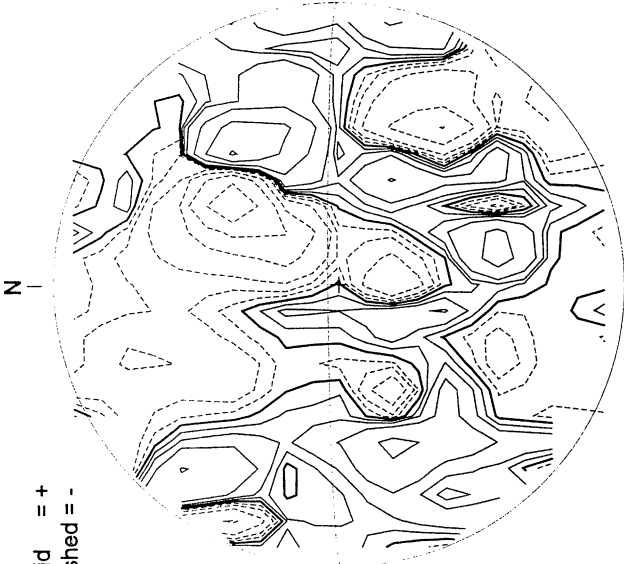
KITT PEAK MAGNETOGRAM
868.8 nm

Bright = +
Dark = -



STANFORD MAGNETOGRAM

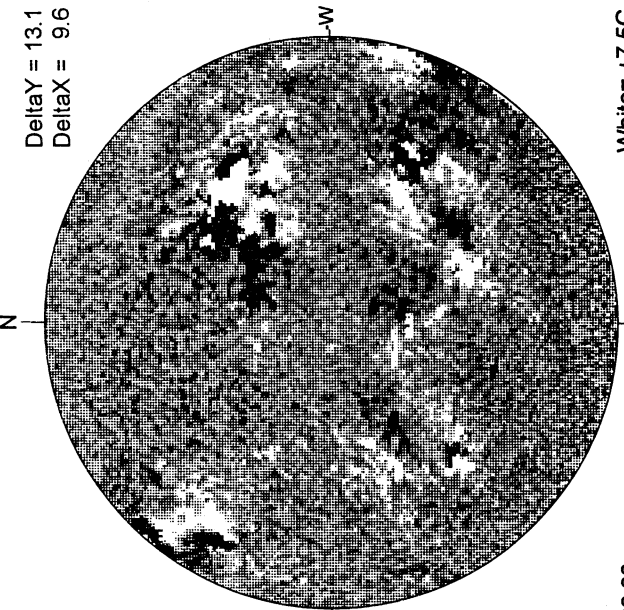
Solid = +
Dashed = -



1751 UT

MT. WILSON MAGNETOGRAM

Delta Y = 13.1
Delta X = 9.6



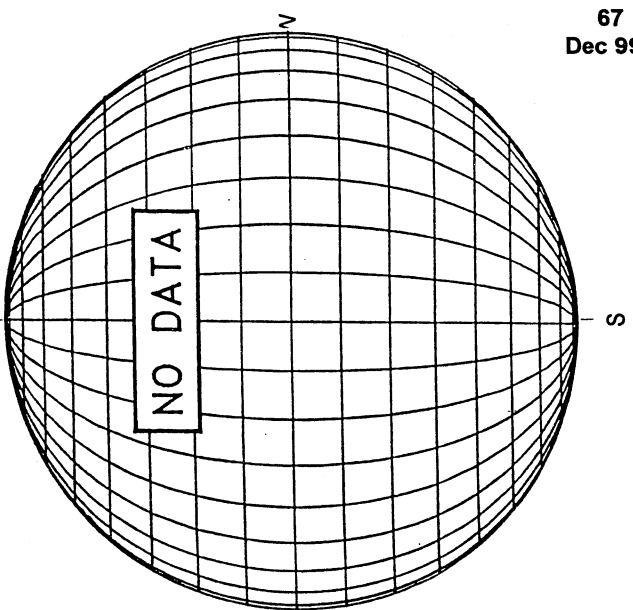
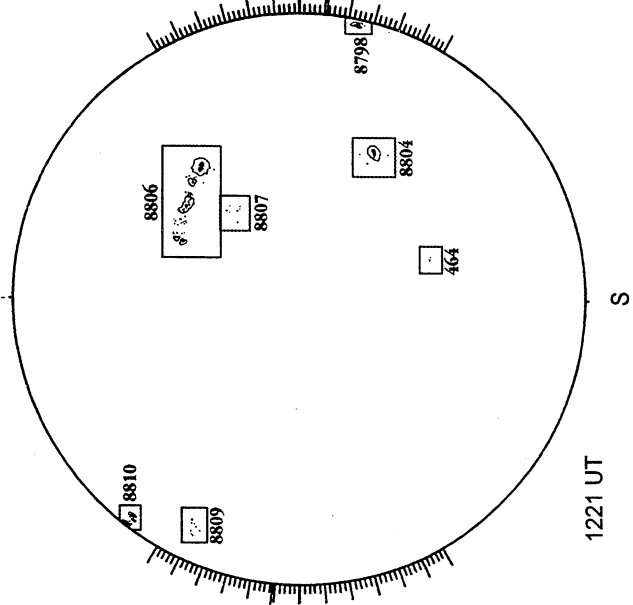
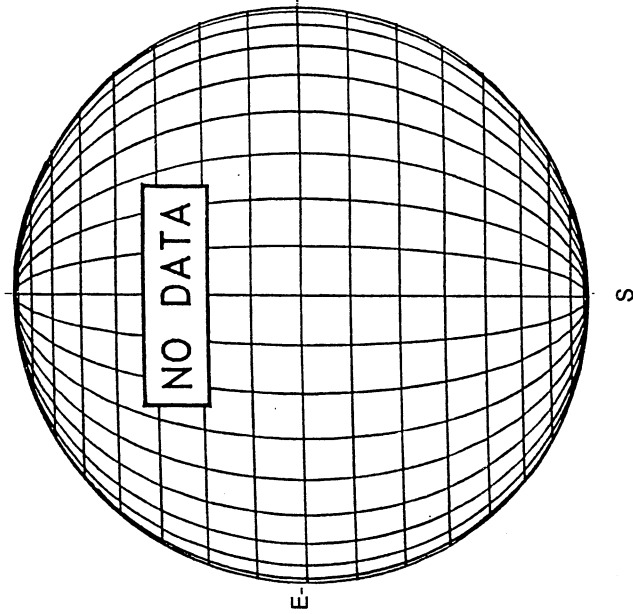
22.68 -
23.66 UT

White = +7.5G
Black = -7.5G

MEUDON H-ALPHA

RAMEY SUNSPOT

SACRAMENTO PEAK CORONA (1.15 Radii)----

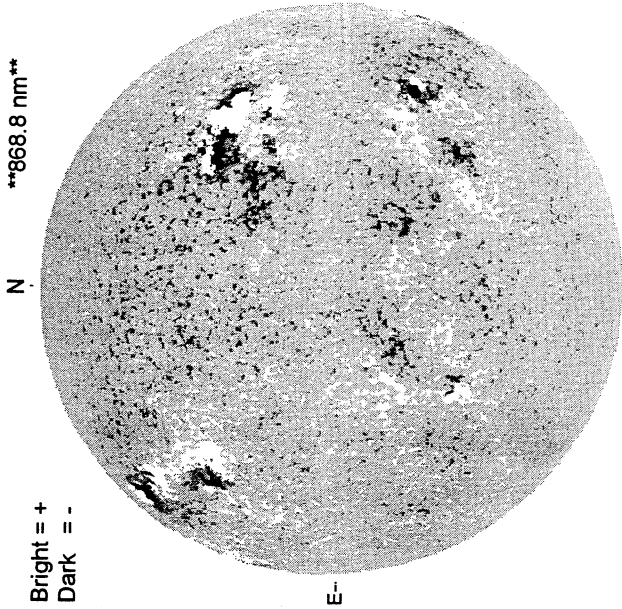


DECEMBER 26, 1999 (P= 5.28, Bo = -2.23, Lo = 87.04)

68
Dec 99

KITT PEAK MAGNETOGRAM
868.8 nm

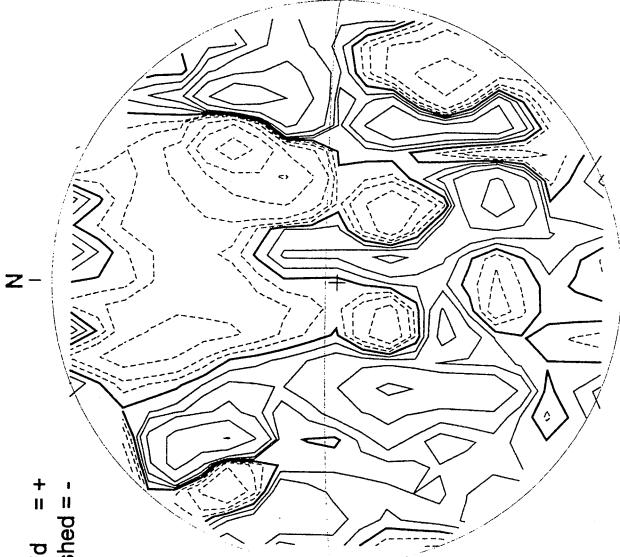
Bright = +
Dark = -



1554 UT

STANFORD MAGNETOGRAM

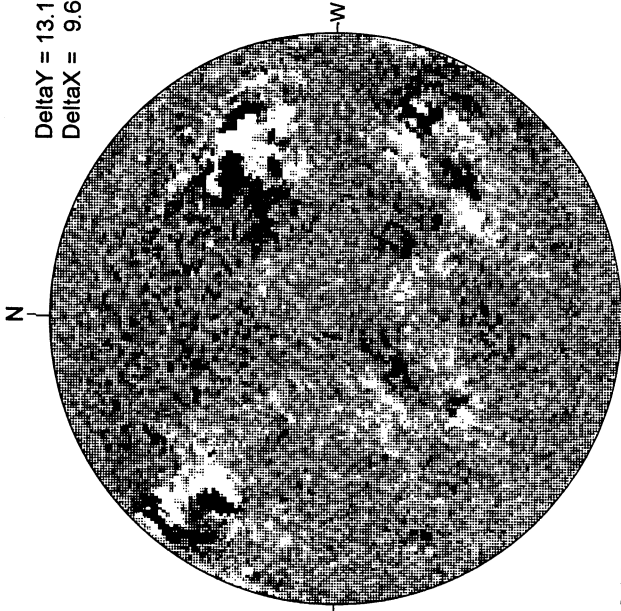
Solid = +
Dashed = -



1737 UT

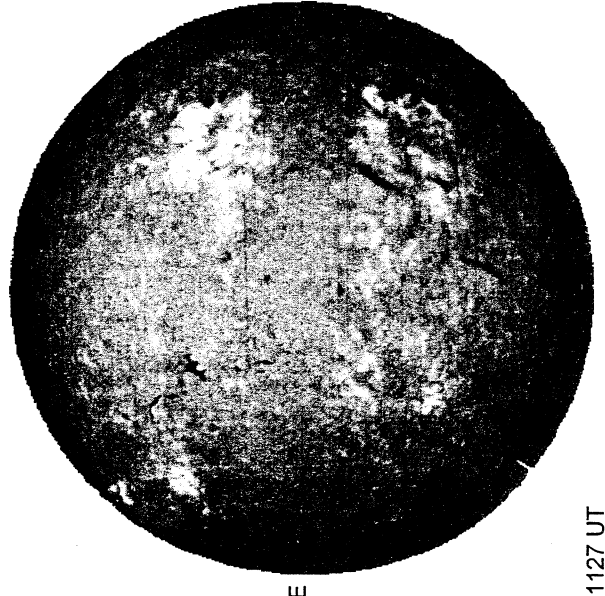
MT. WILSON MAGNETOGRAM

Delta Y = 13.1
Delta X = 9.6



20.21 -
21.18 UT

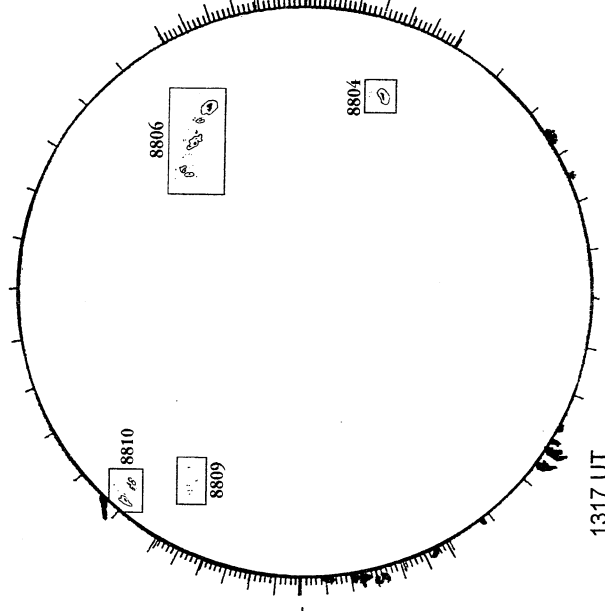
MEUDON H-ALPHA



1127 UT

RAMEY SUNSPOT

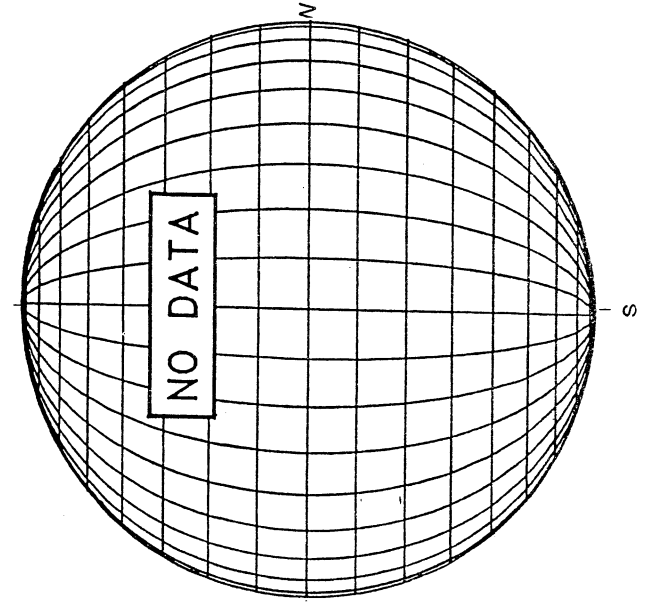
SACRAMENTO PEAK CORONA (1.15 Radii)----



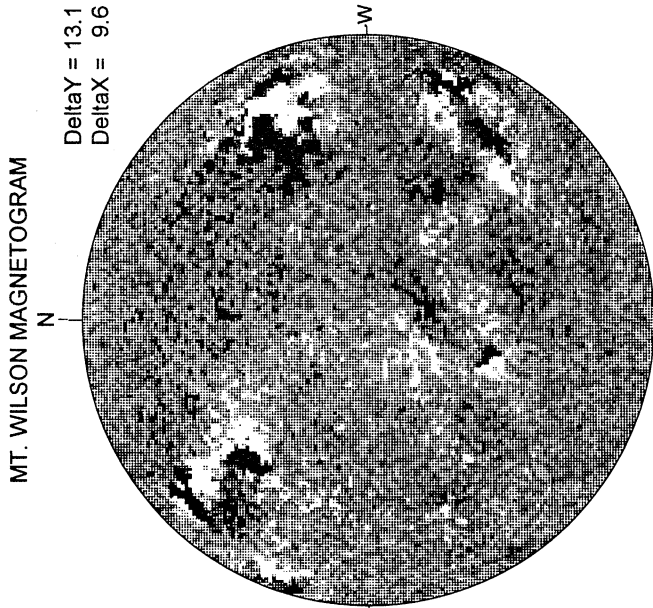
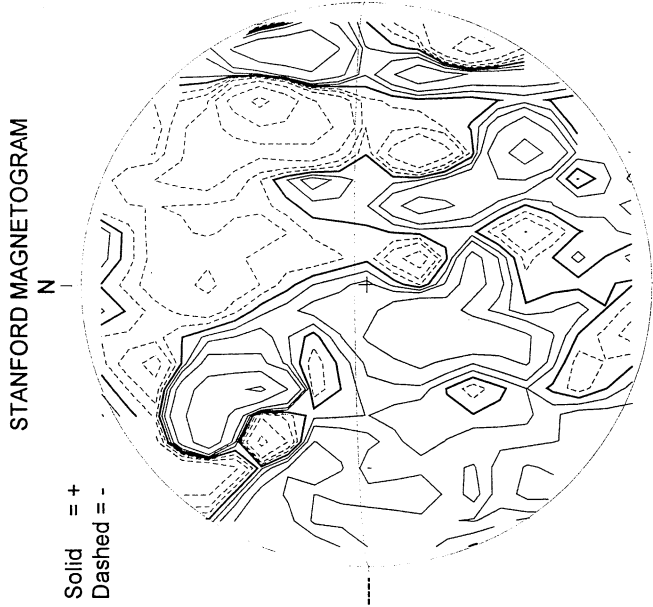
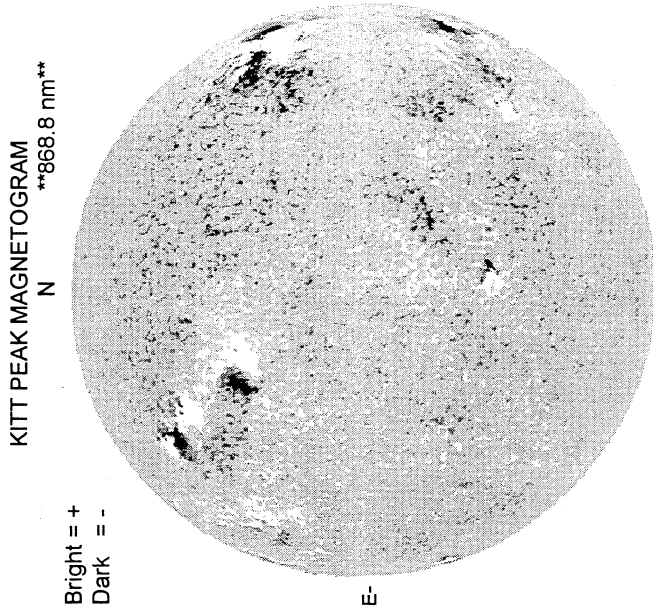
1317 UT
0811 UT LOMN Prom S

NO DATA

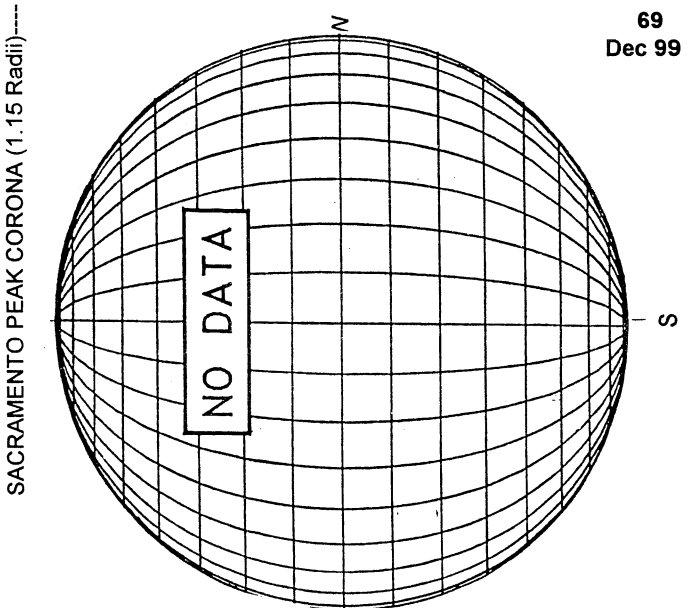
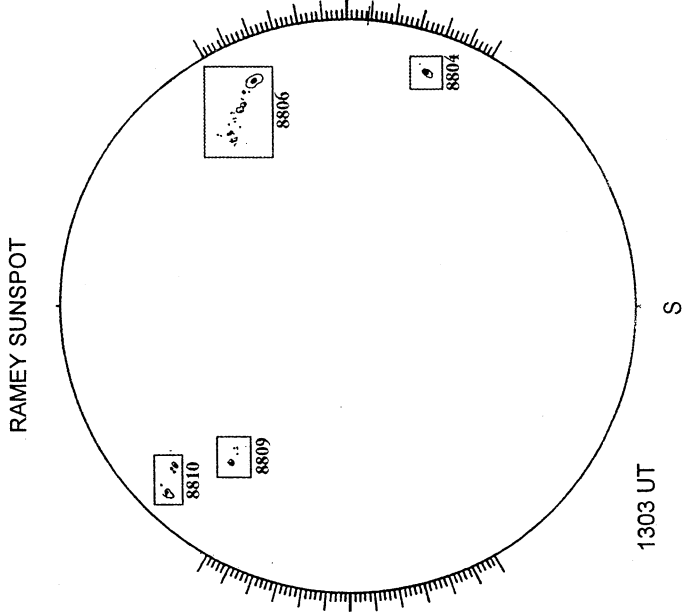
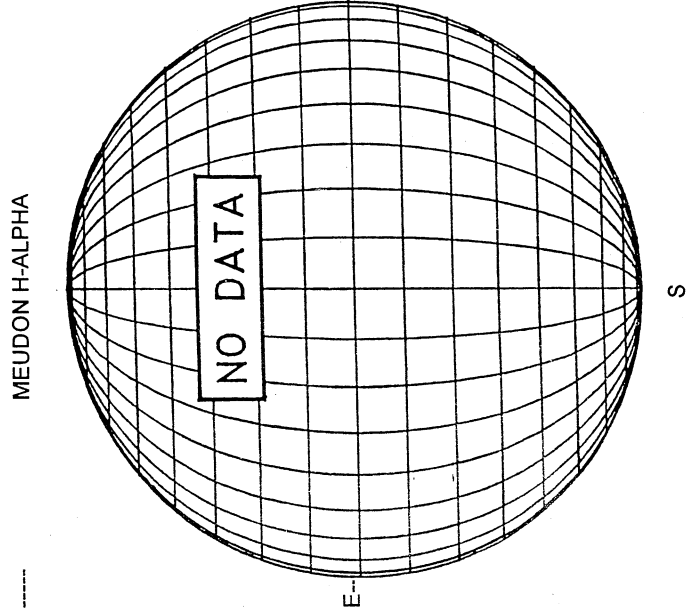
White = +7.5G
Black = -7.5G



DECEMBER 27, 1999 (P= 4.80, Bo = -2.35, Lo = 73.87)



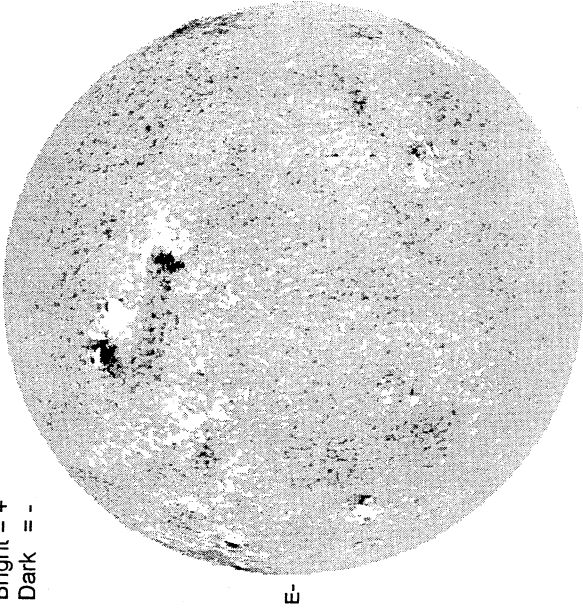
White = +7.5G
Black = -7.5G



DECEMBER 28, 1999 (P = 4.31, Bo = -2.48, Lo = 60.70)

KITT PEAK MAGNETOGRAM
N
868.8 nm

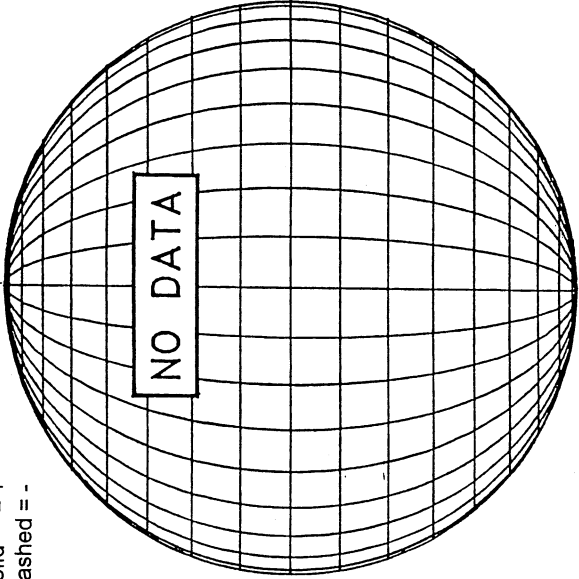
Bright = +
Dark = -



1554 UT

STANFORD MAGNETOGRAM
N

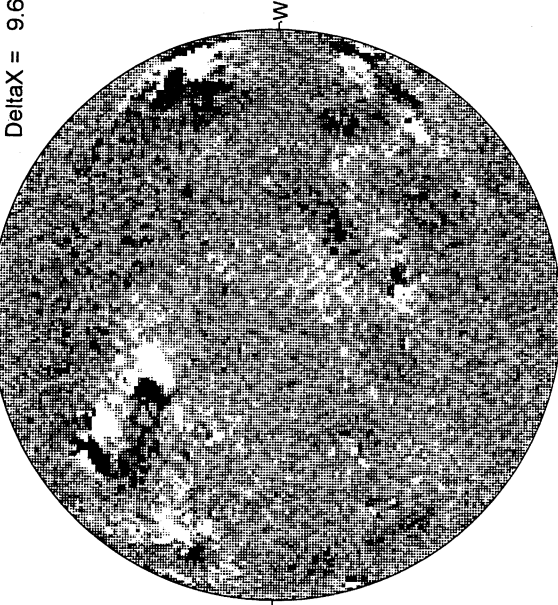
Solid = +
Dashed = -



22.46 -
23.45 UT

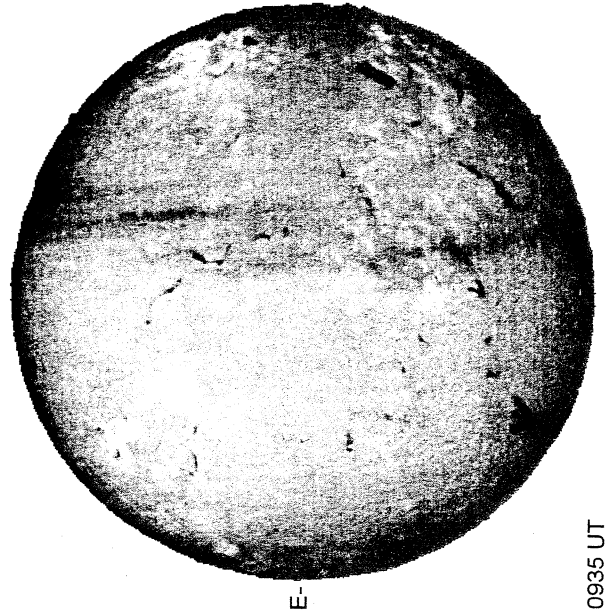
MT. WILSON MAGNETOGRAM
N

DeltaY = 13.1
DeltaX = 9.6



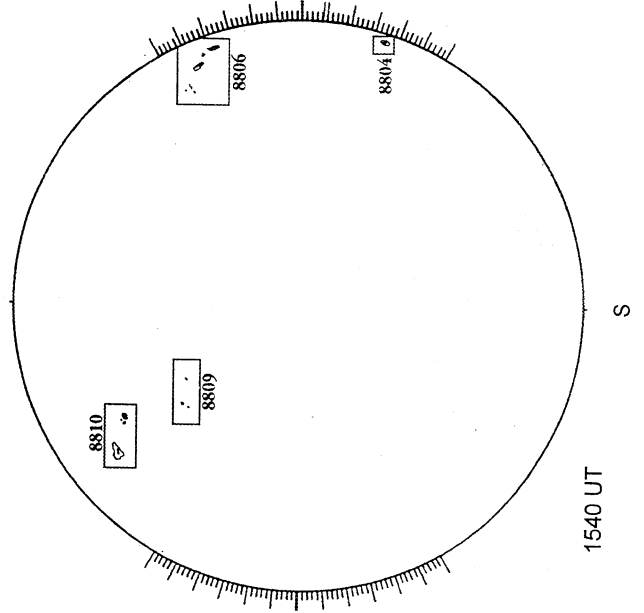
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA
E



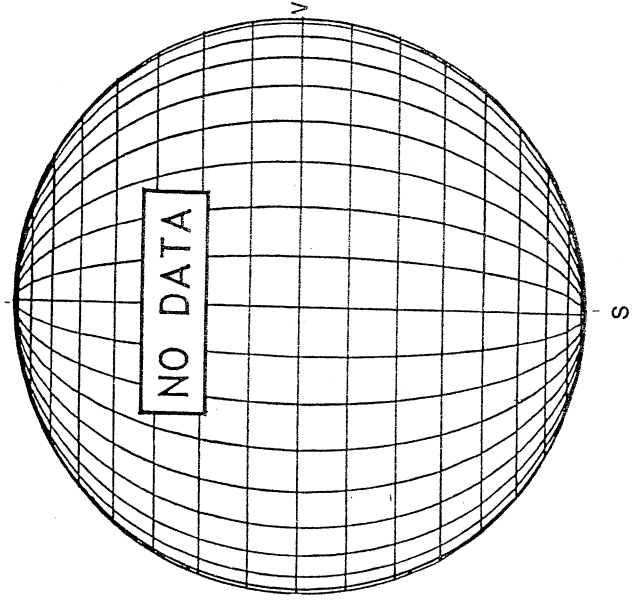
0935 UT

RAMEY SUNSPOT
S



1540 UT

LOMNICKY PEAK CORONA (1.04 Radii)----
V

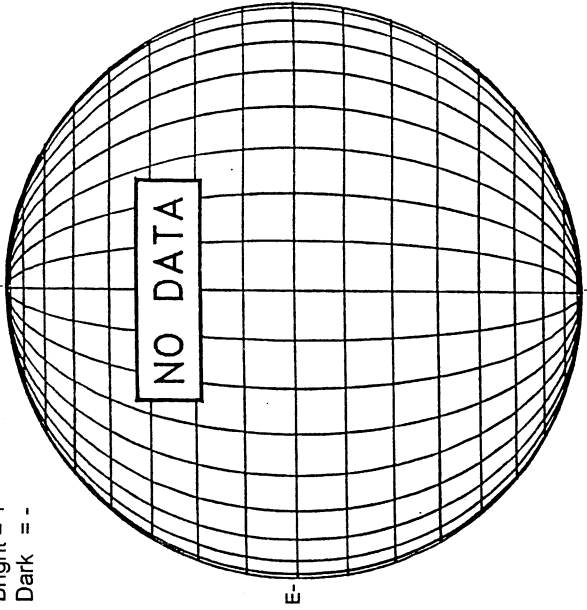


DECEMBER 29, 1999 (P = 3.83, Bo = -2.60, Lo = 47.53)

KITT PEAK MAGNETOGRAM

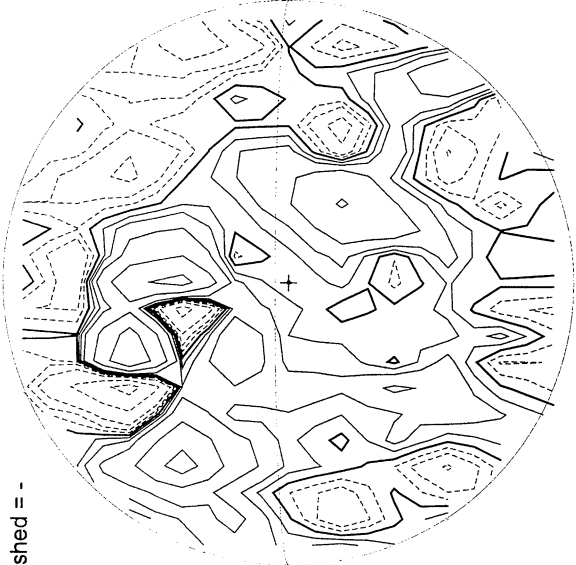
868.8 nm

Bright = +
Dark = -



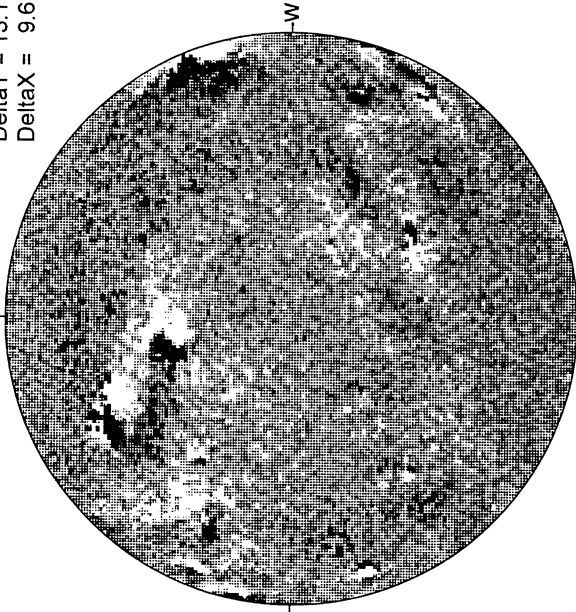
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

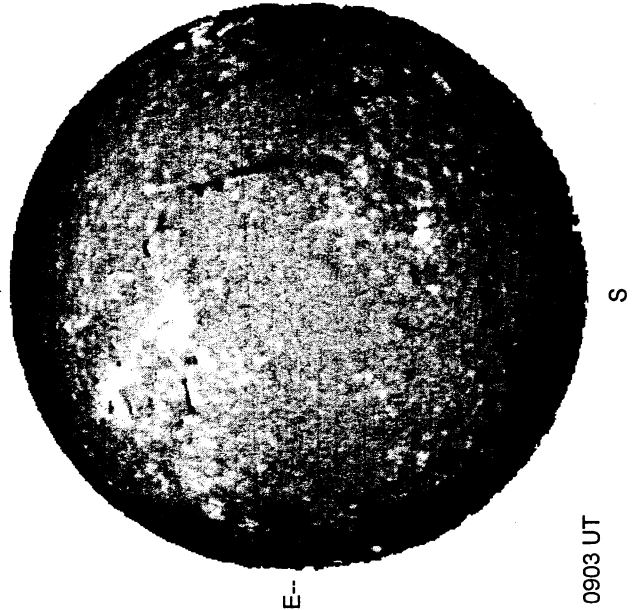
DeltaY = 13.1
DeltaX = 9.6



17.91 -
18.89 UT

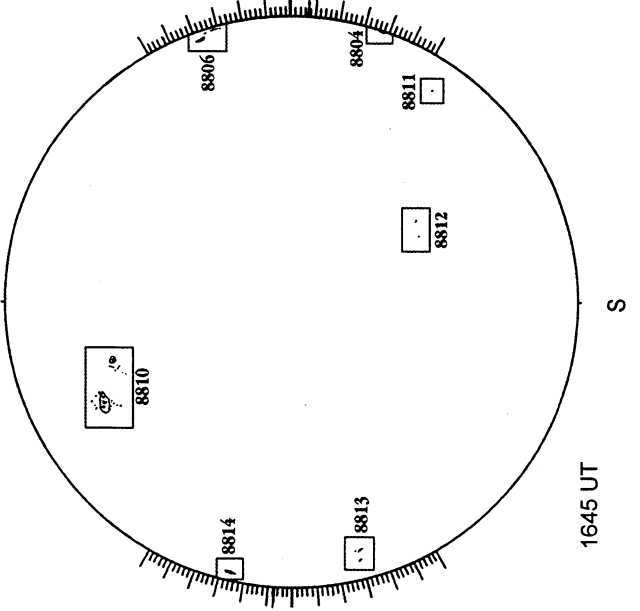
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



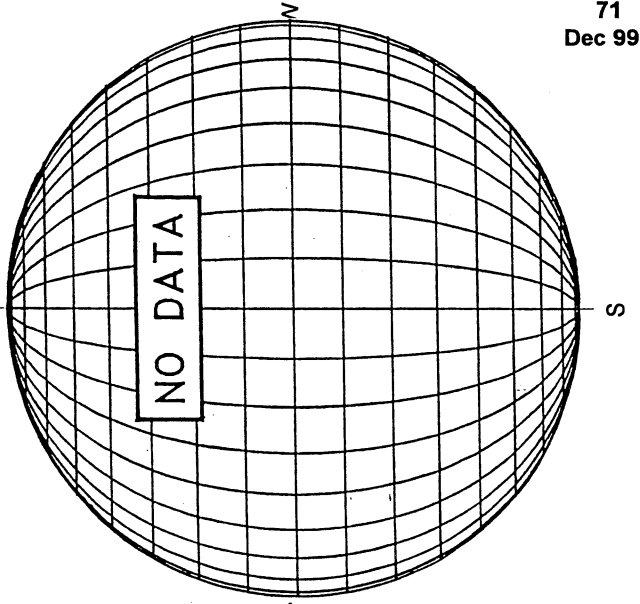
0903 UT

HOLLOMAN SUNSPOT



1645 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

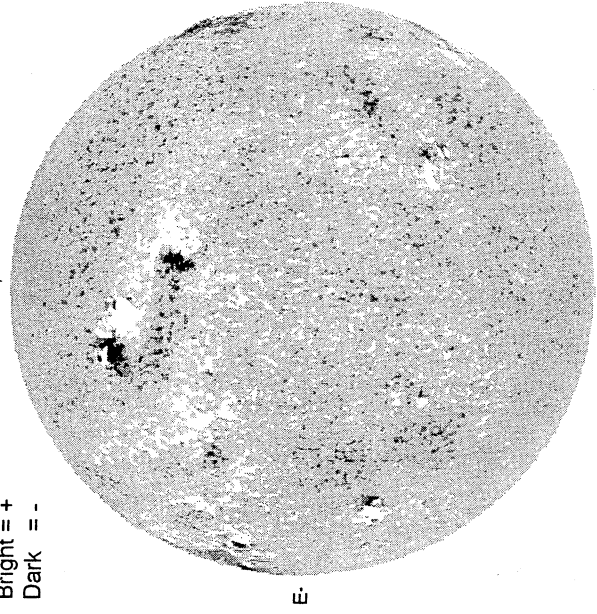


DECEMBER 30, 1999 (P= 3.35, Bo = -2.72, Lo = 34.36)

72
Dec 99

KITT PEAK MAGNETOGRAM
868.8 nm

Bright = +
Dark = -



1609 UT

STANFORD MAGNETOGRAM

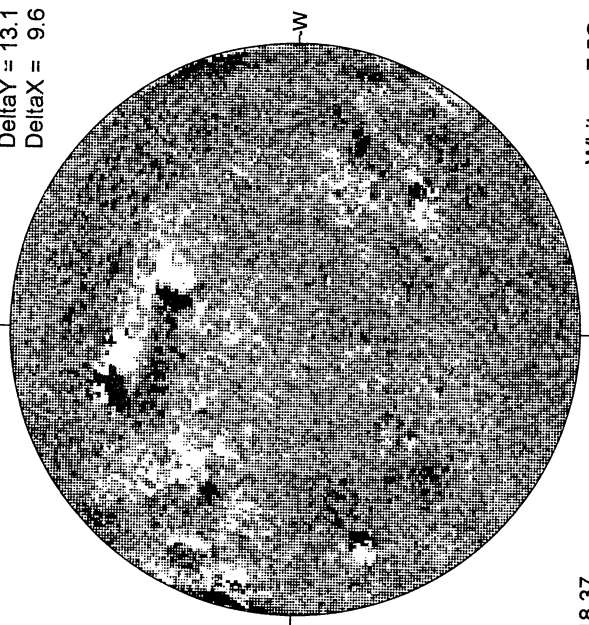
Solid = +
Dashed = -



1807 UT

MT. WILSON MAGNETOGRAM

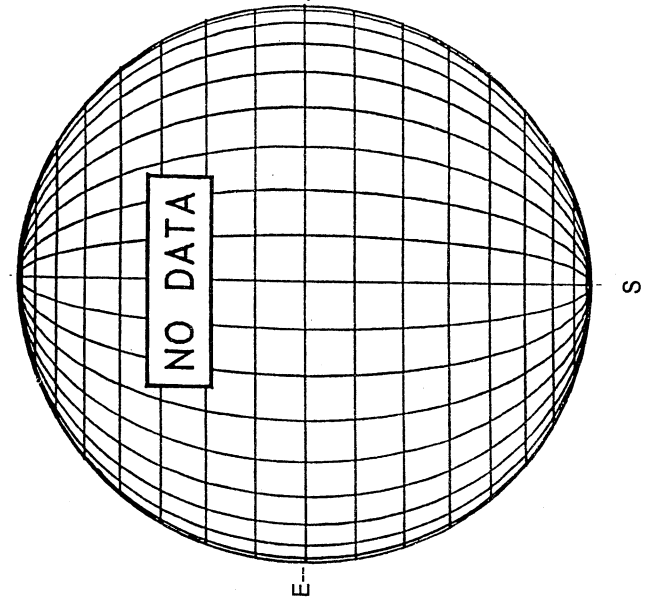
DeltaY = 13.1
DeltaX = 9.6



18.37 -
19.35 UT

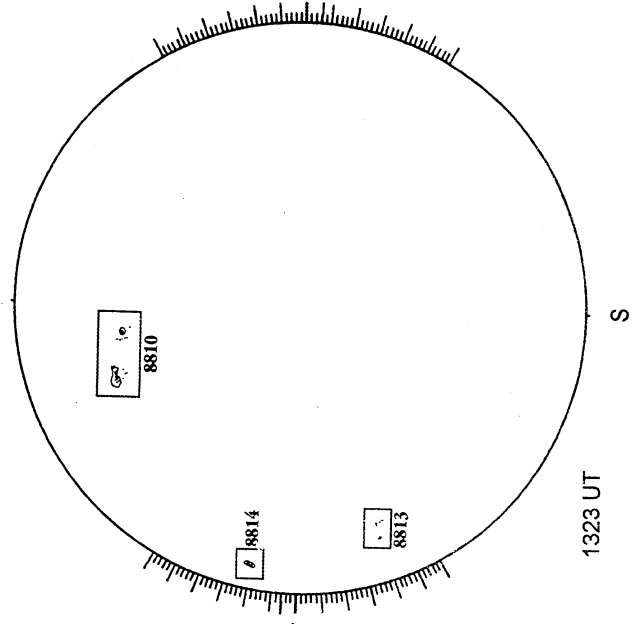
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



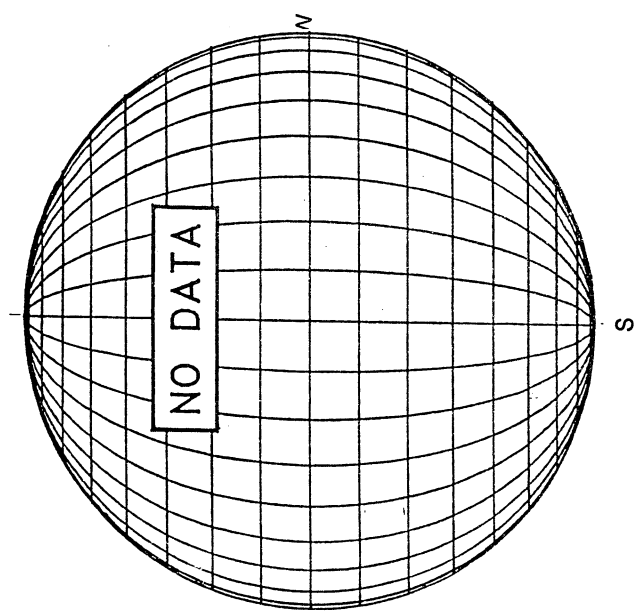
E

RAMEY SUNSPOT



1323 UT

SACRAMENTO PEAK CORONA (1.15 Radii)----

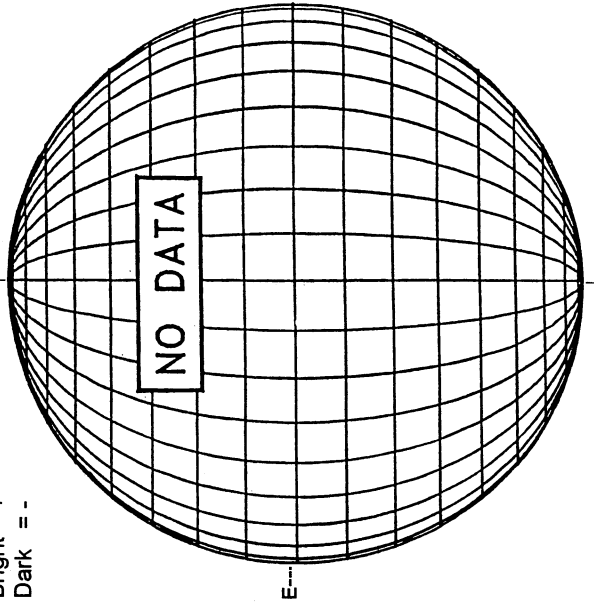


S

DECEMBER 31, 1999 (P= 2.86, Bo = -2.83, Lo = 21.18)

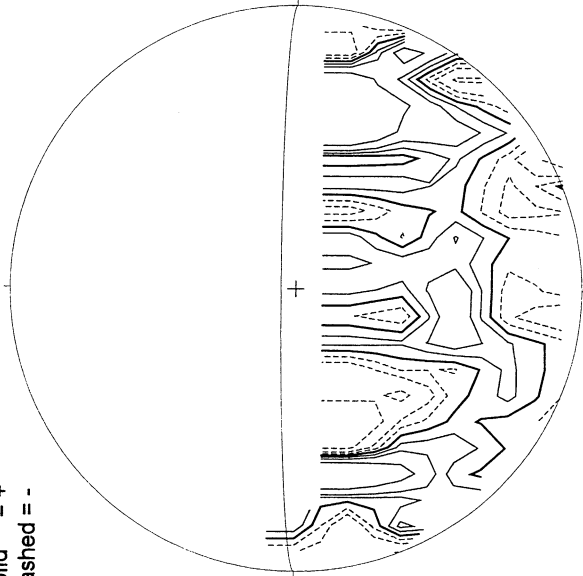
KITT PEAK MAGNETOGRAM
868.8 nm

Bright = +
Dark = -



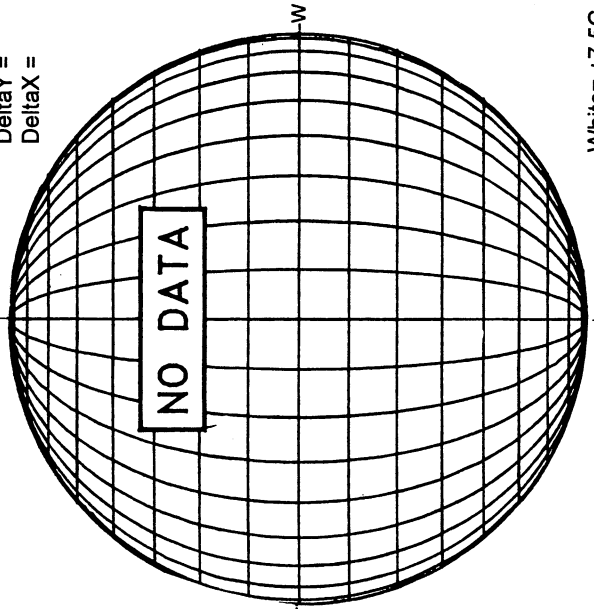
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



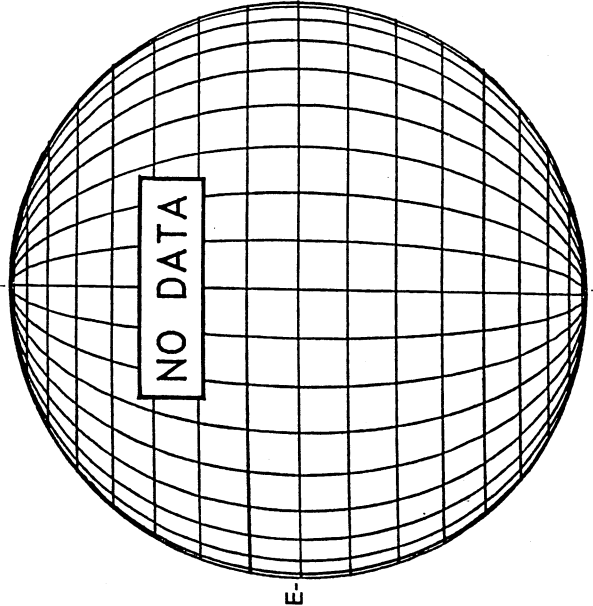
MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =



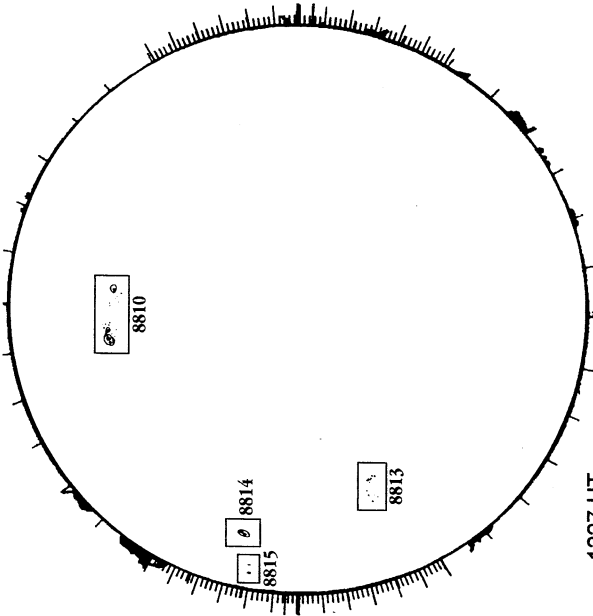
White = +7.5G
Black = -7.5G

MEUDON H-ALPHA



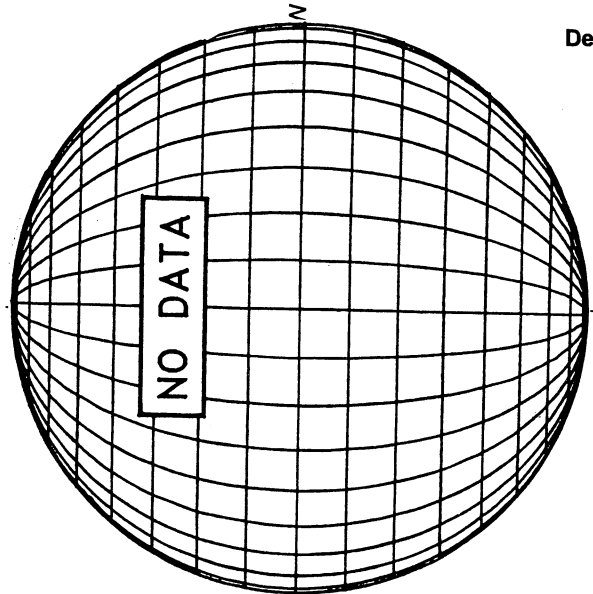
RAMEY SUNSPOT

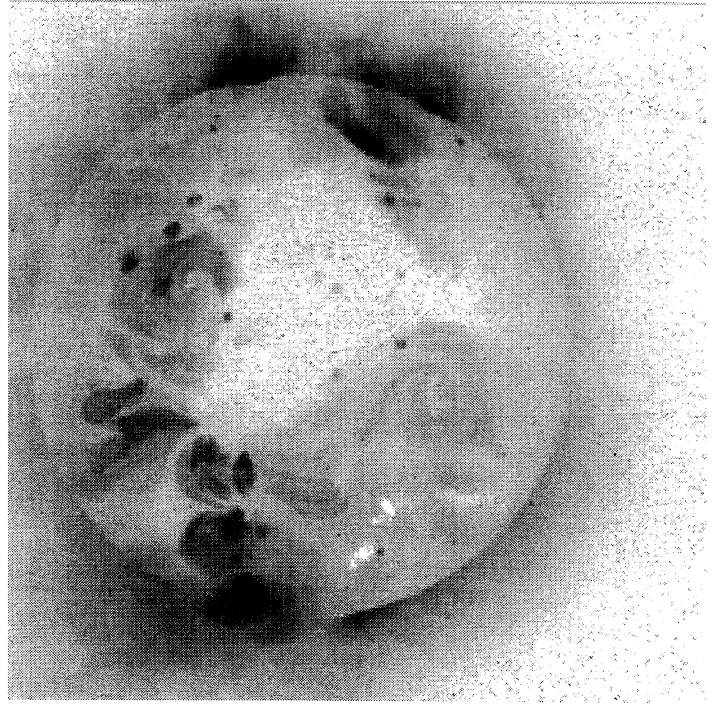
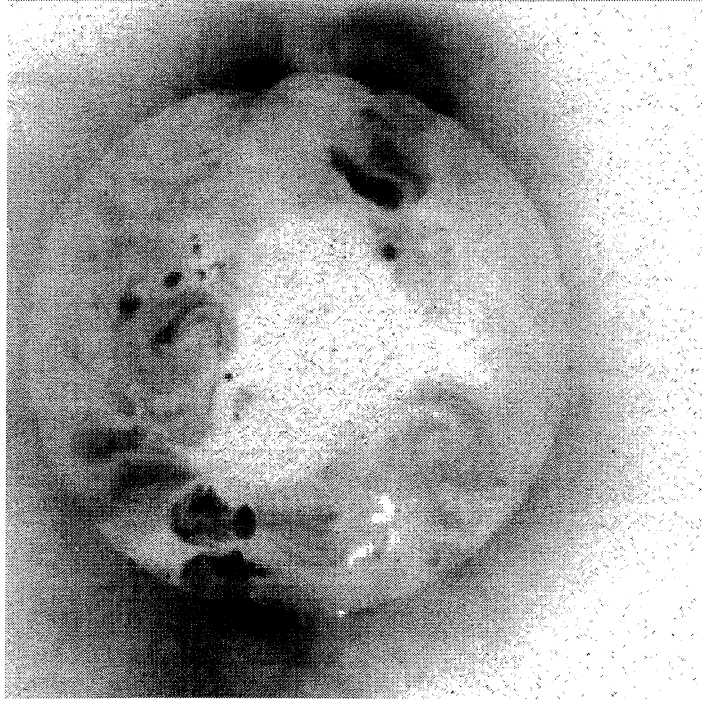
1831 UT



1227 UT
1017 UT VALA Prom S

SACRAMENTO PEAK CORONA (1.15 Radii)----



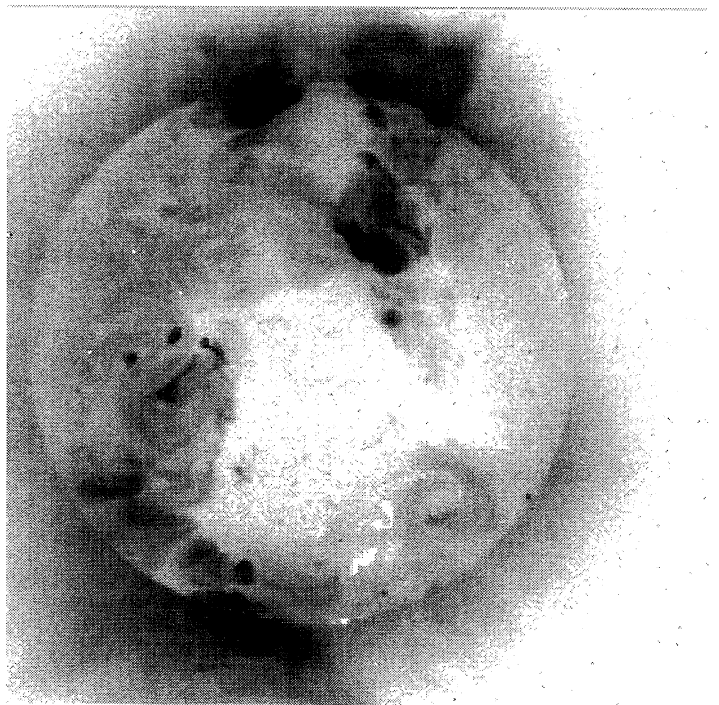
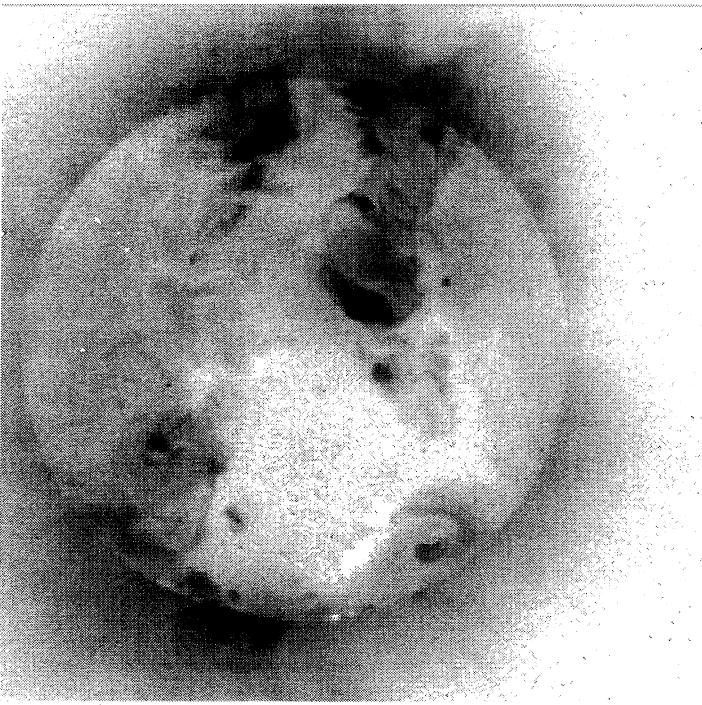


YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

December
1999

Day 1 Day 3
11:41:15 UT 11:59:53 UT

Day 2 Day 4
11:51:09 UT 11:59:45 UT

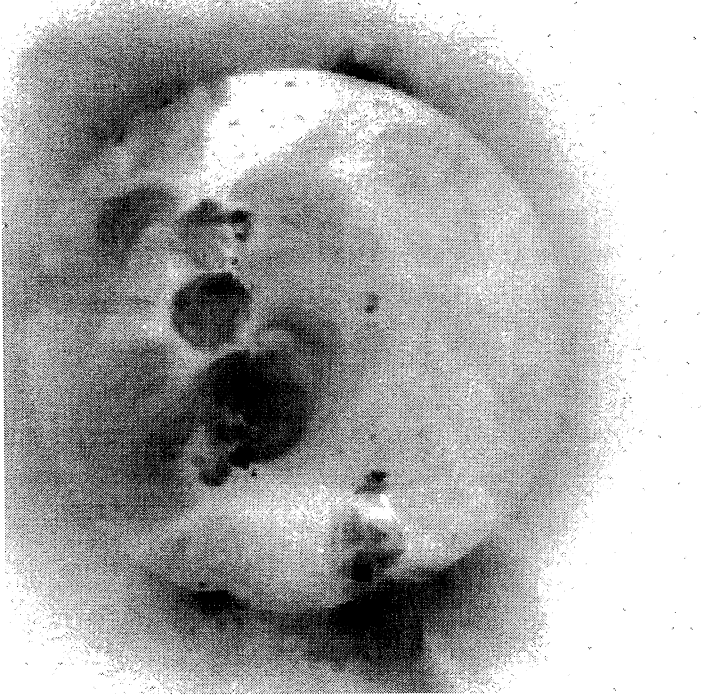
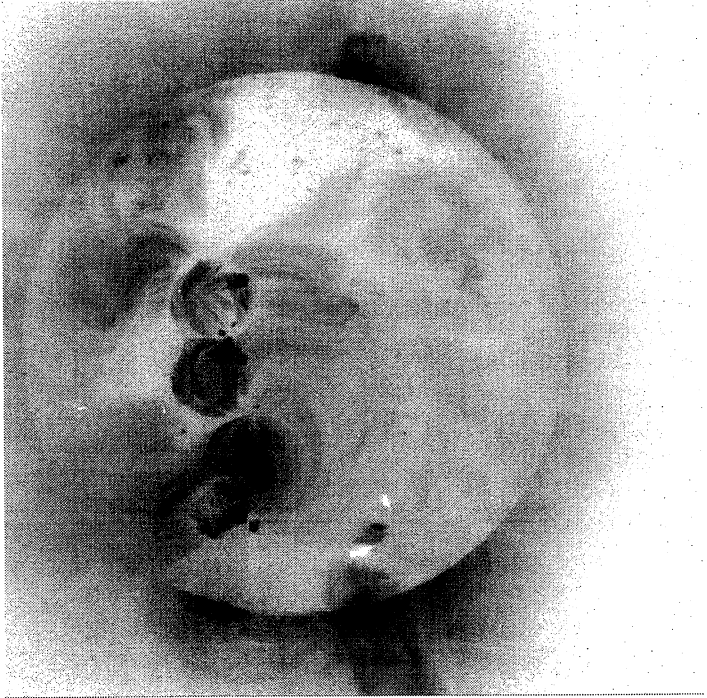
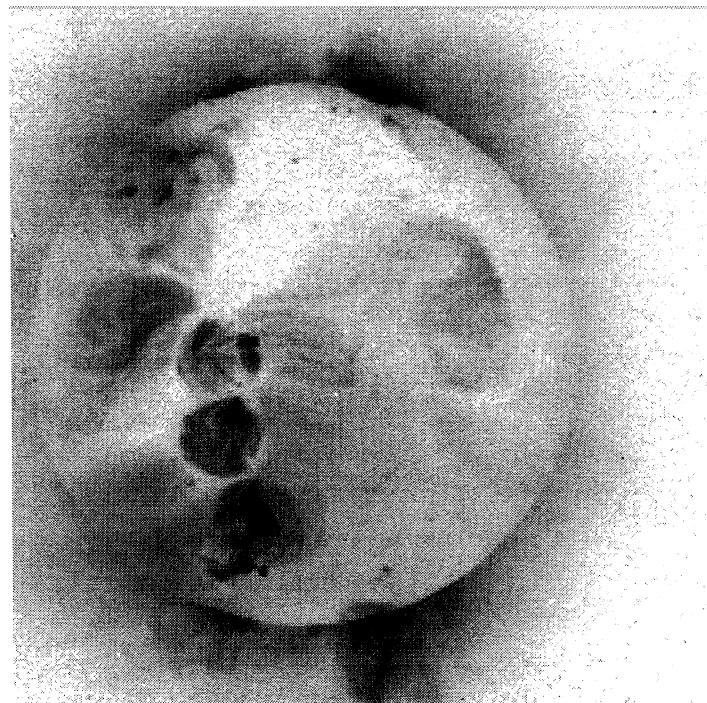


YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

December
1999

Day 5 Day 7
12:07:20 UT 11:12:56 UT

Day 6 Day 8
15:13:02 UT 11:29:46 UT

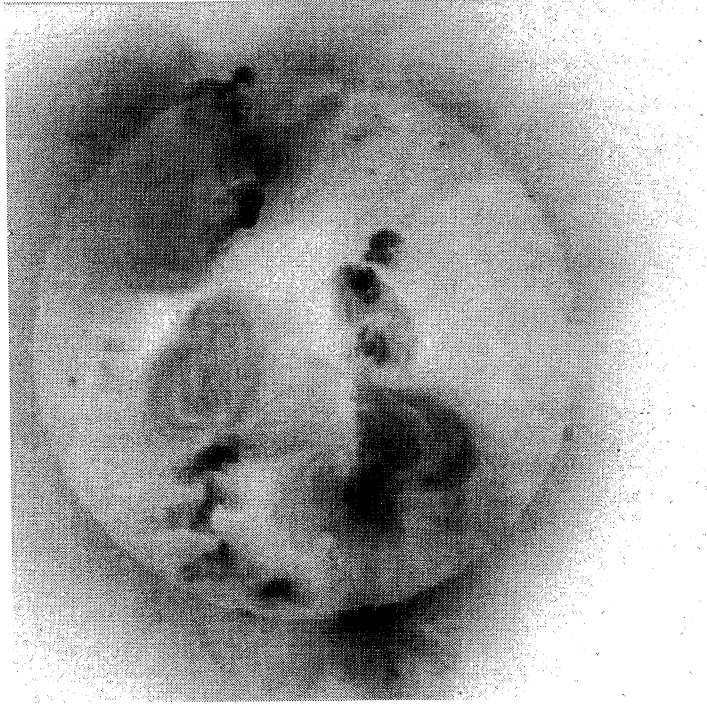
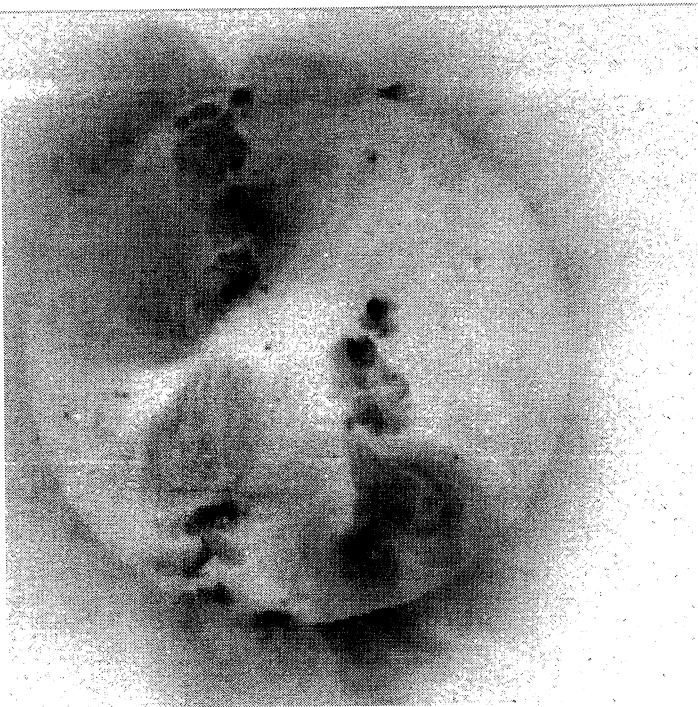
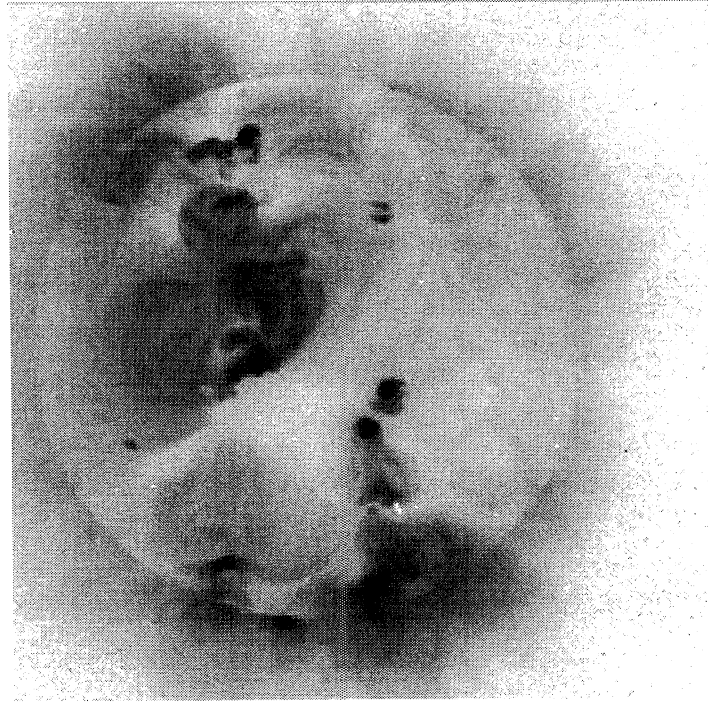
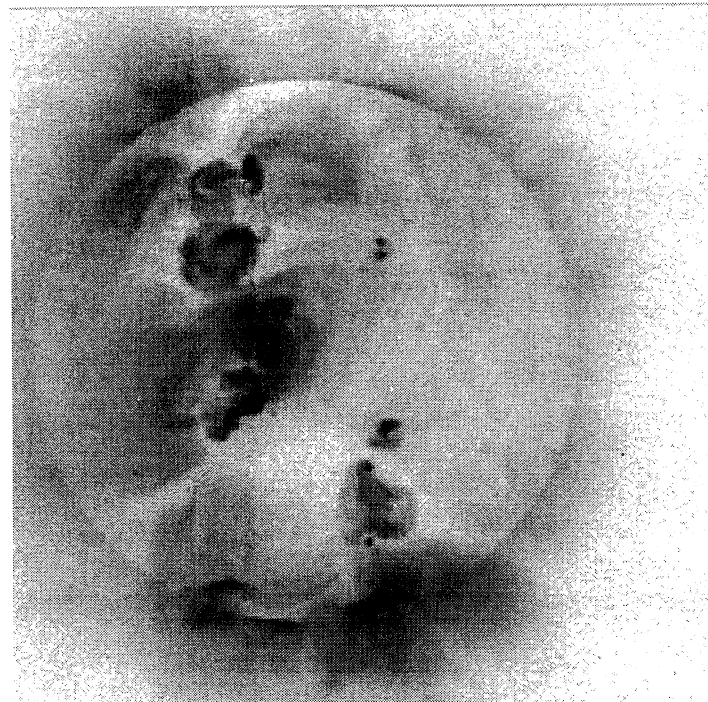


YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

December
1999

Day 9 12:40:14 UT Day 11 11:57:49 UT

Day 10 01:59:09 UT Day 12 11:54:53 UT

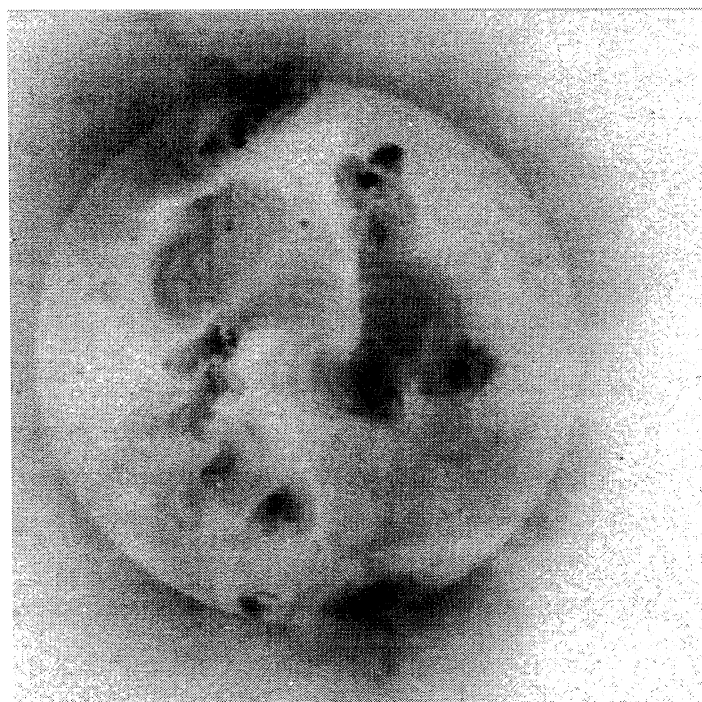
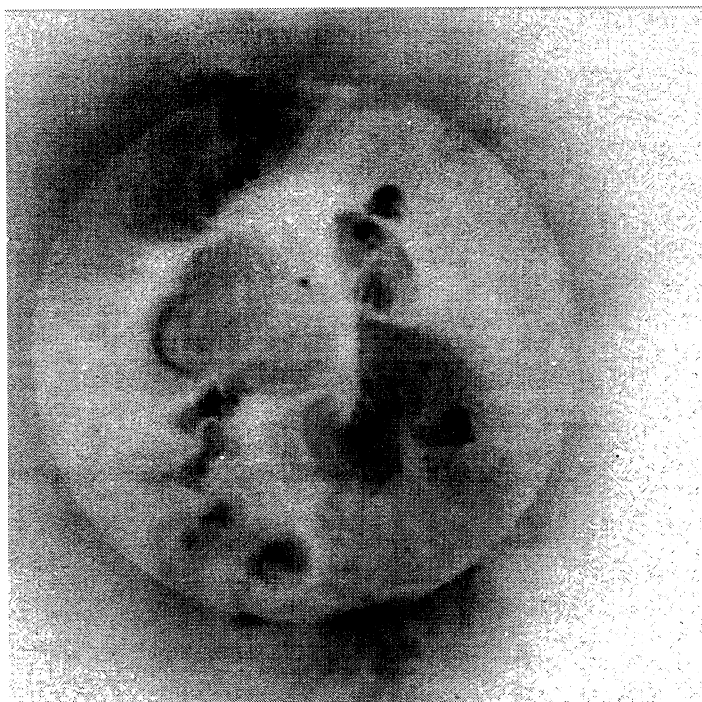
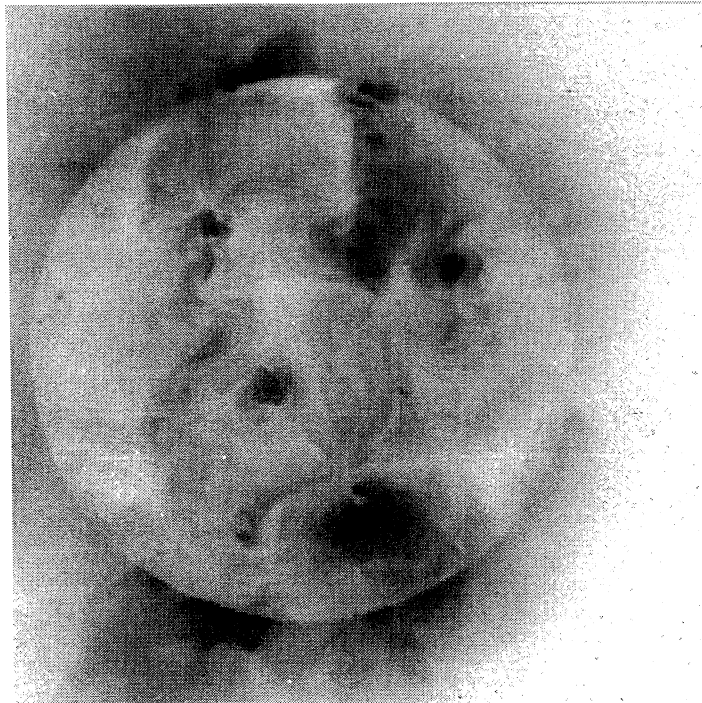
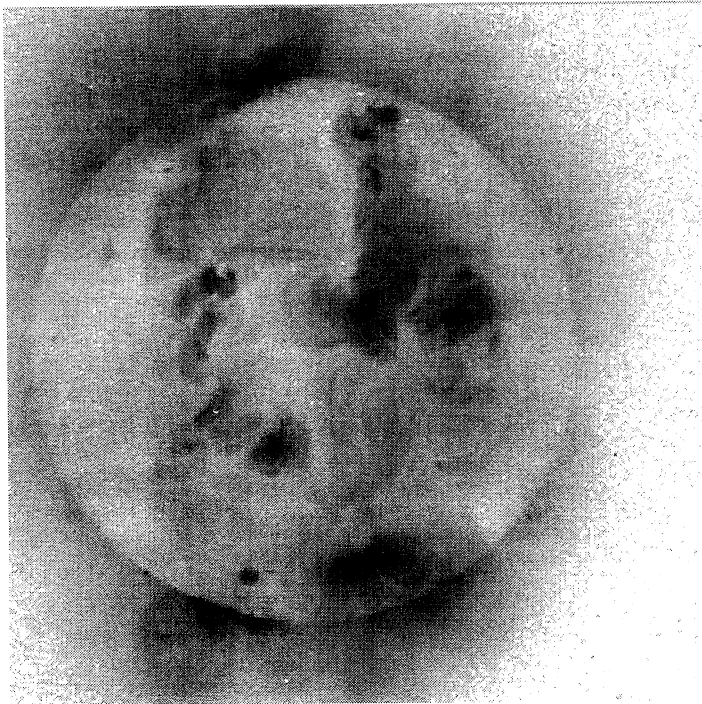


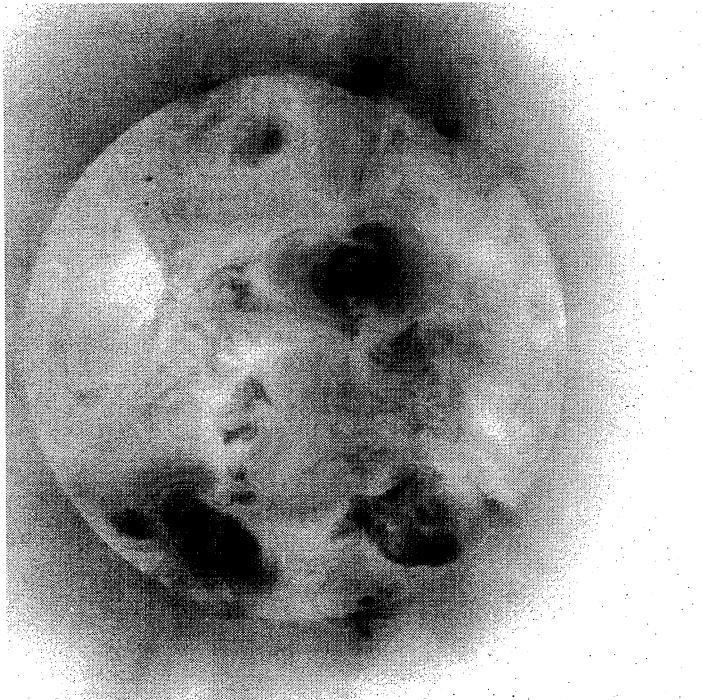
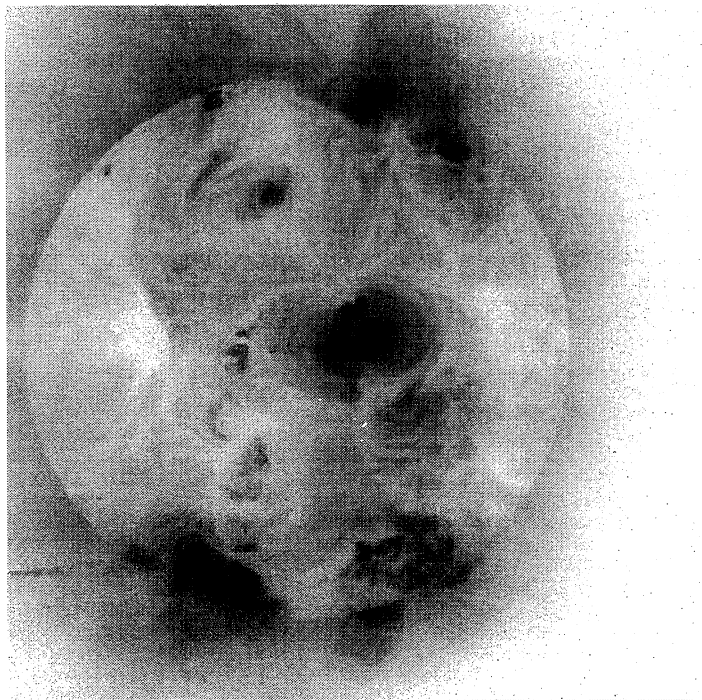
YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

December
1999

Day 13 12:01:49 UT
Day 15 12:28:28 UT

Day 14 12:20:13 UT
Day 16 11:14:04 UT



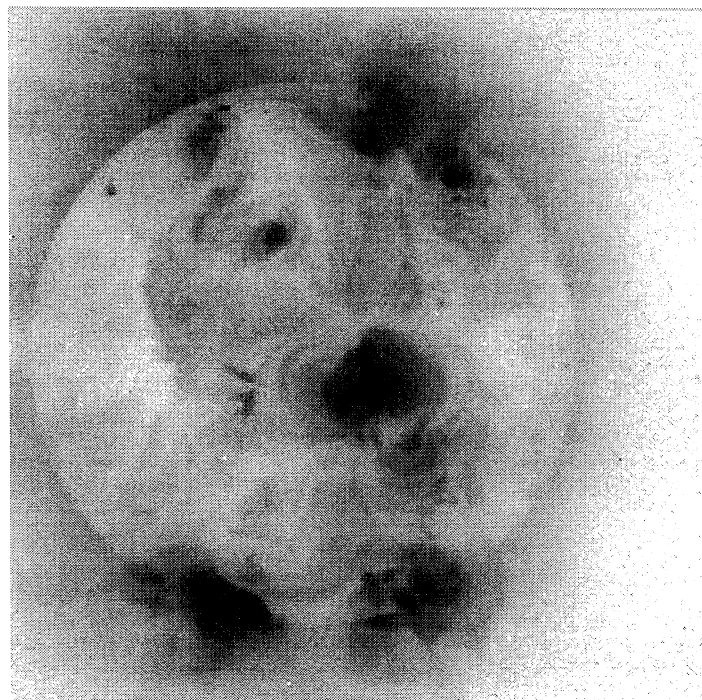
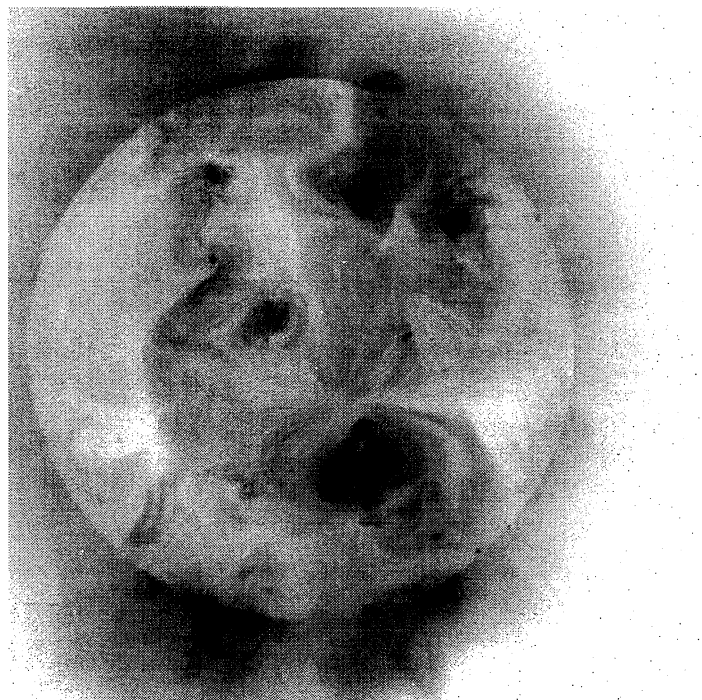


YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

December
1999

Day 17 Day 19
11:44:56 UT 11:59:04 UT

Day 18 Day 20
20:49:32 UT 12:18:52 UT

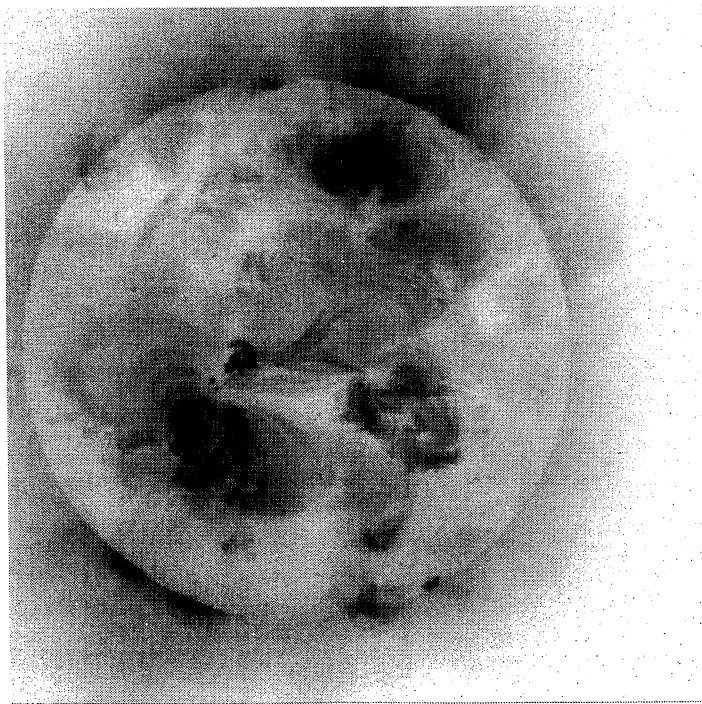
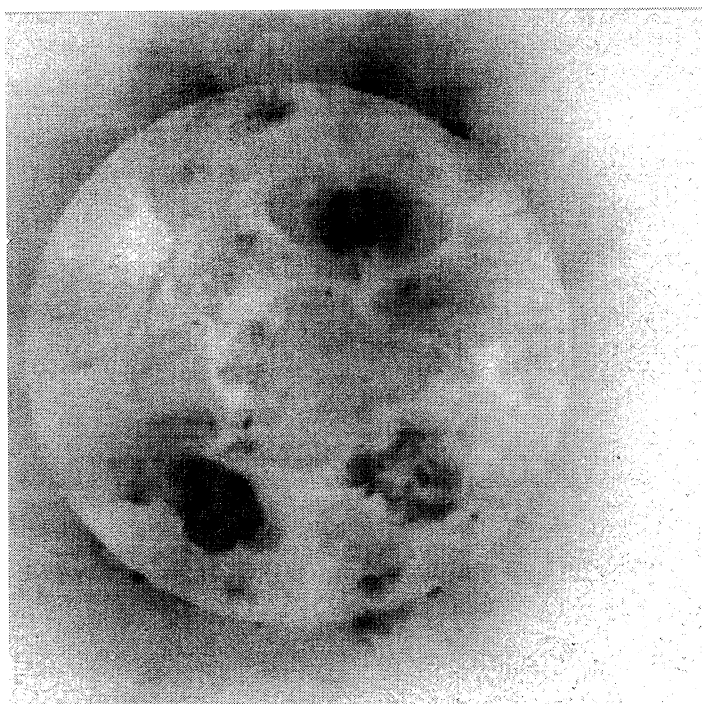
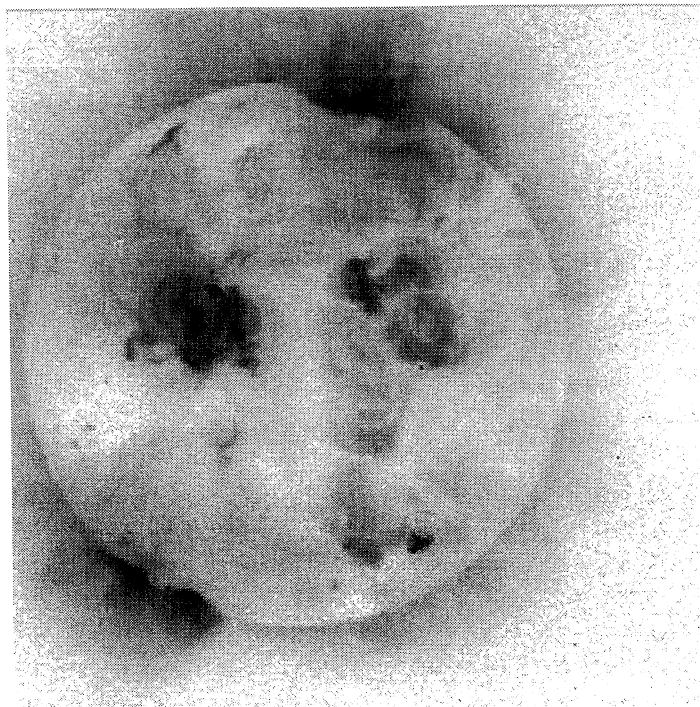
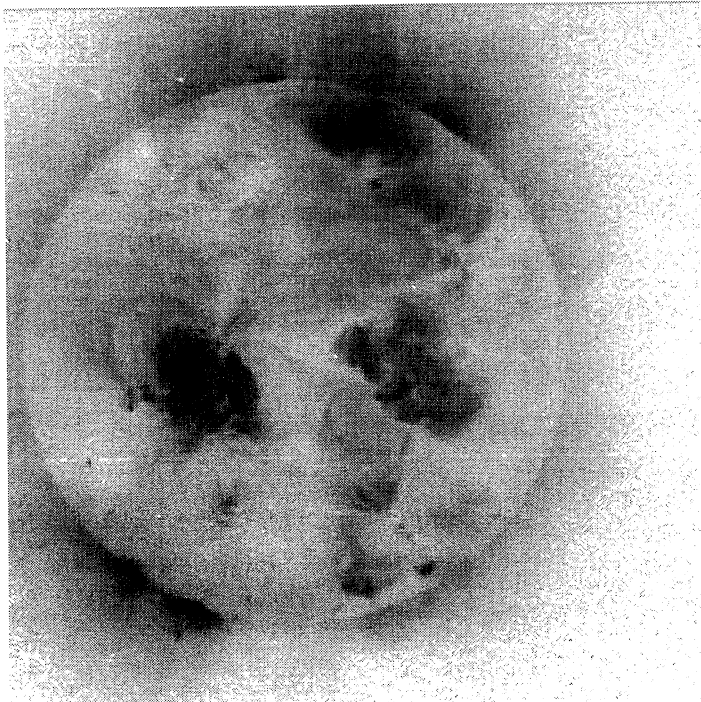


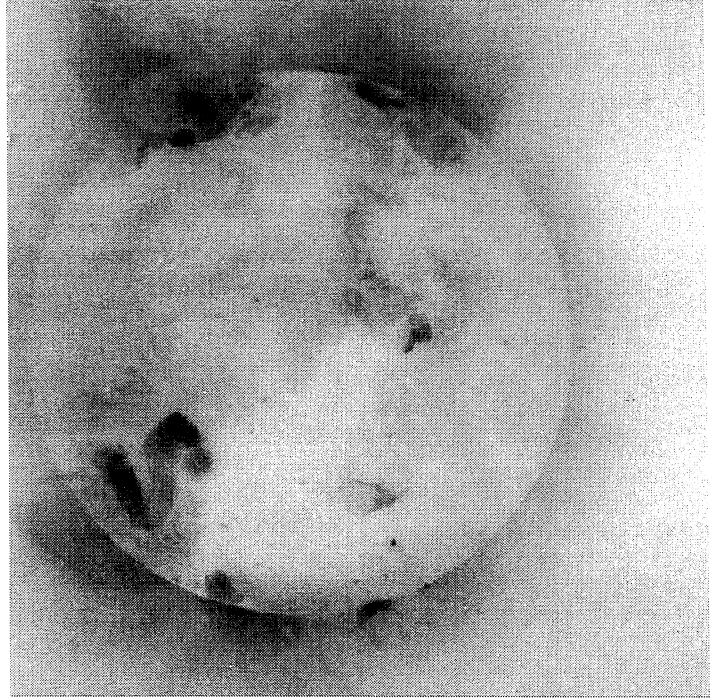
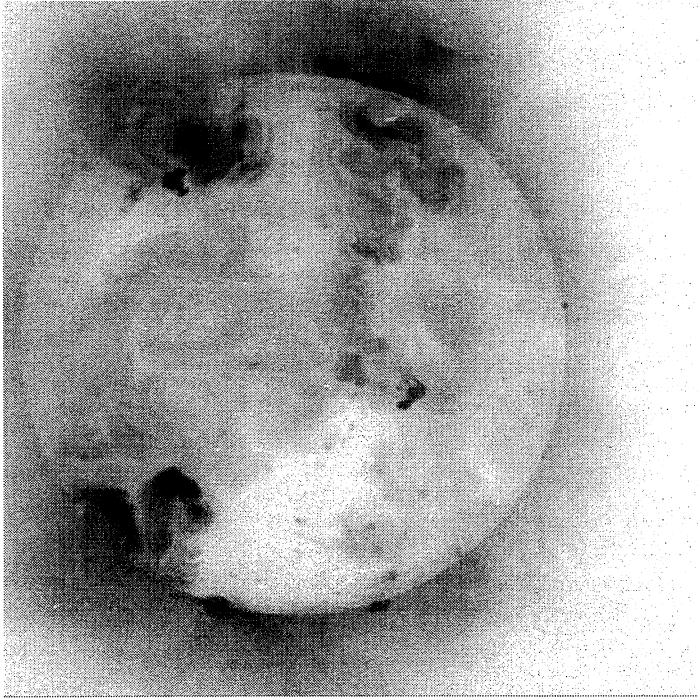
YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

December
1999

Day 21 12:04:11 UT
Day 23 11:23:07 UT

Day 22 12:37:57 UT
Day 24 13:00:11 UT



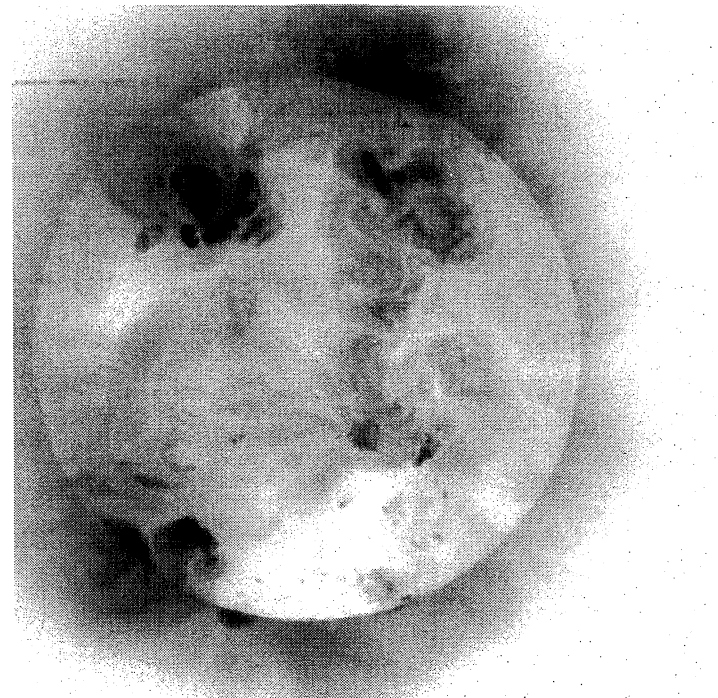
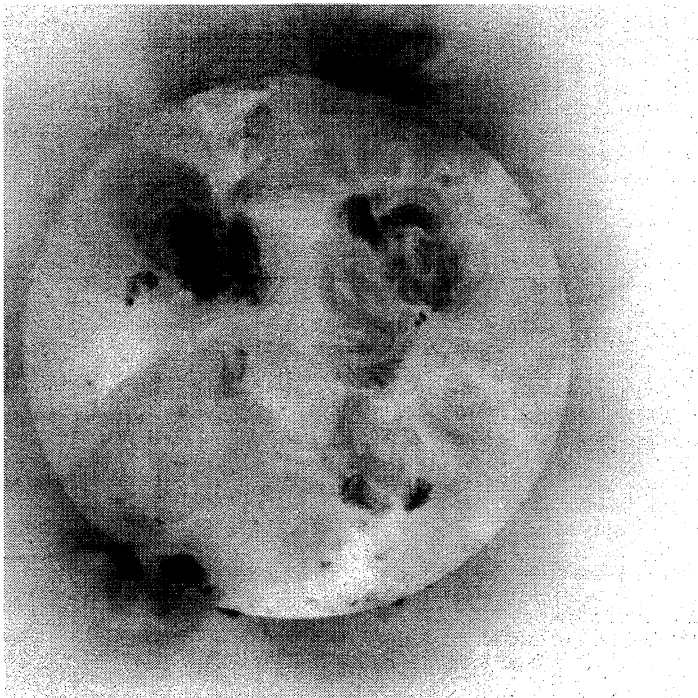


YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

December
1999

Day 25 Day 27
11:40:31 UT 11:51:54 UT

Day 26 Day 28
11:51:20 UT 12:15:30 UT

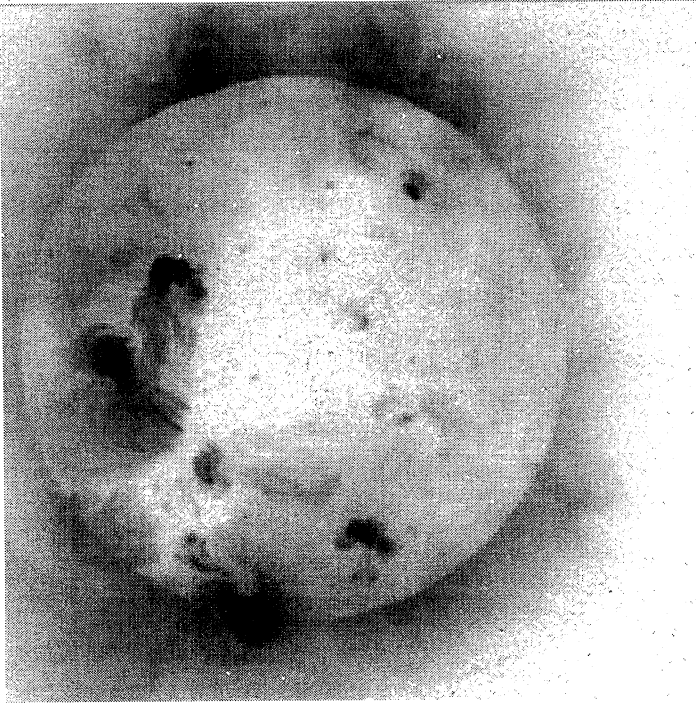
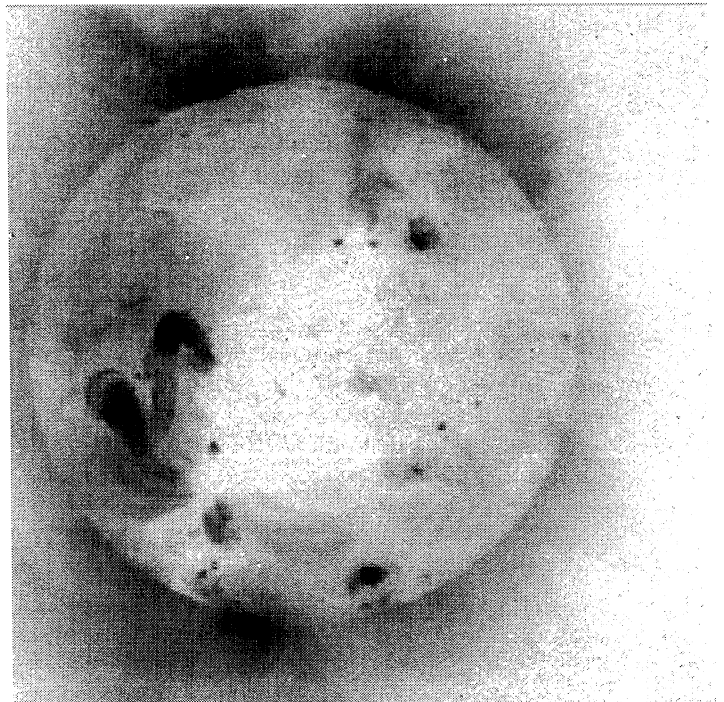
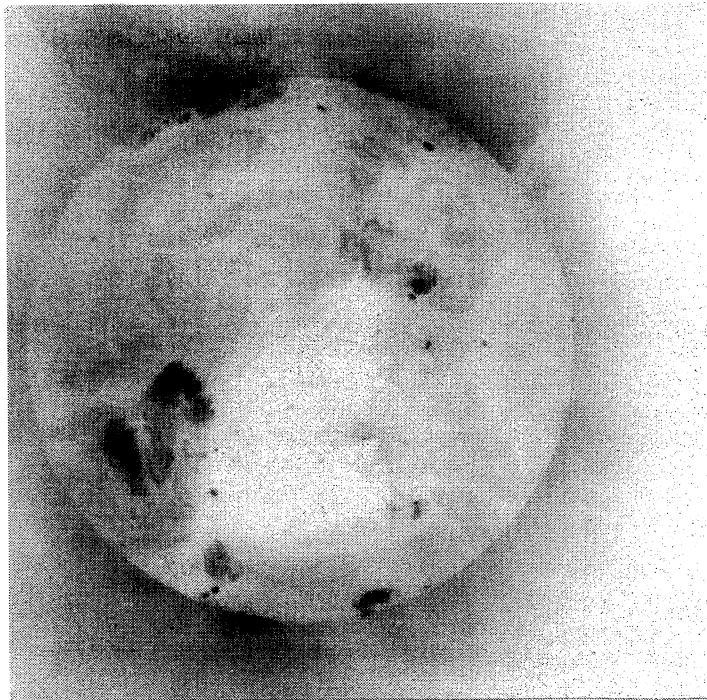


YOHKOH
SOFT X-RAY
TELESCOPE
IMAGES

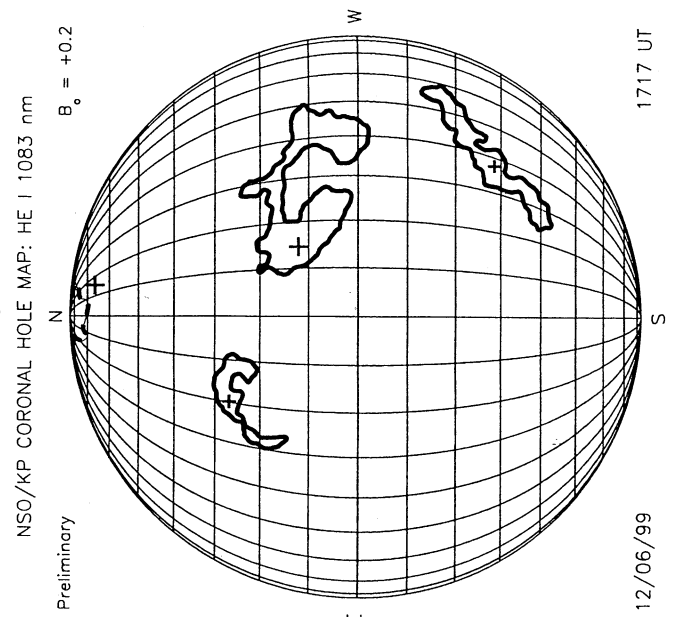
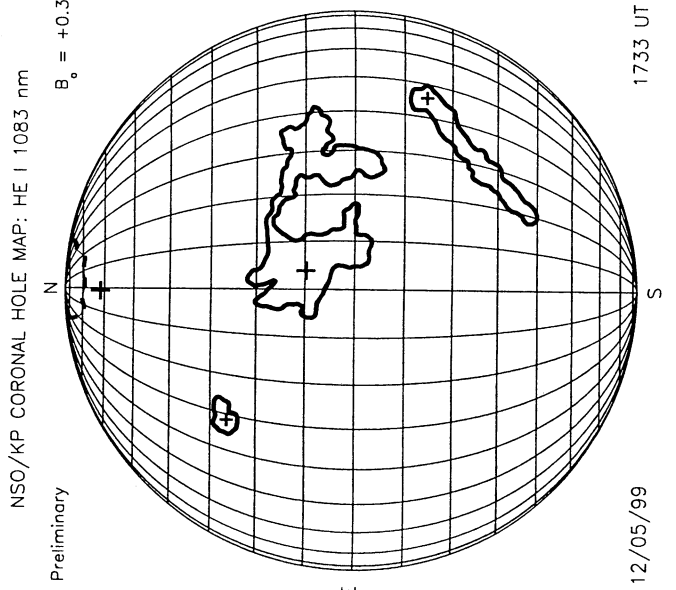
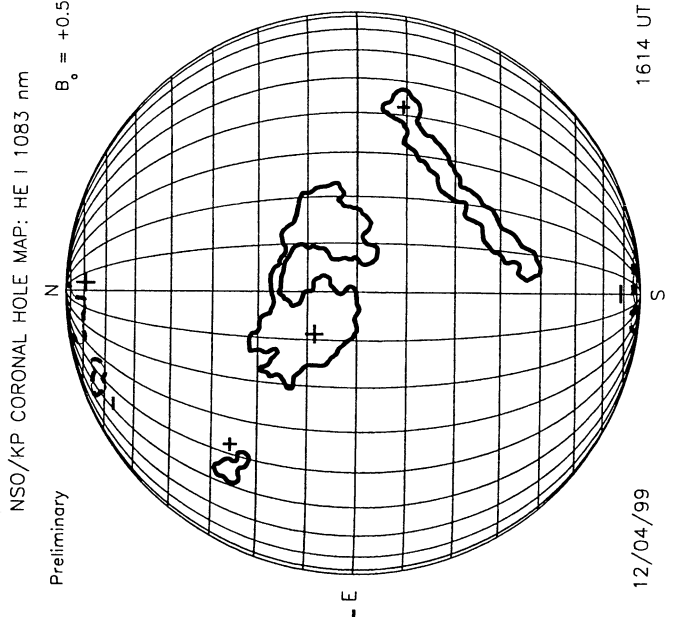
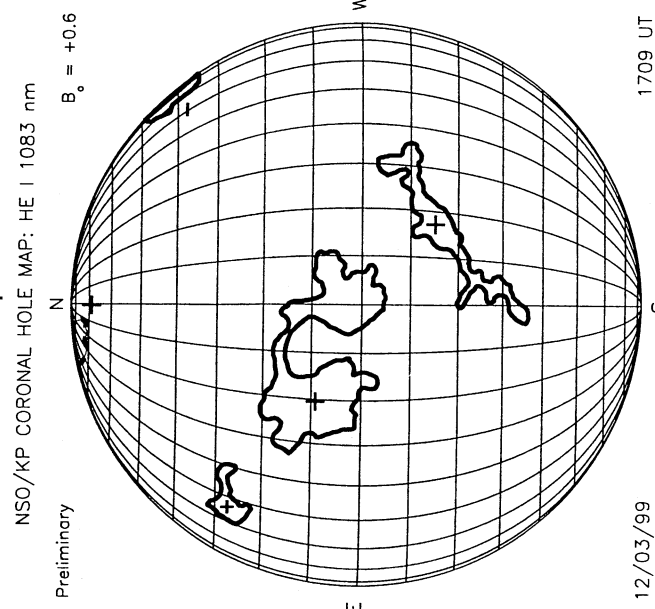
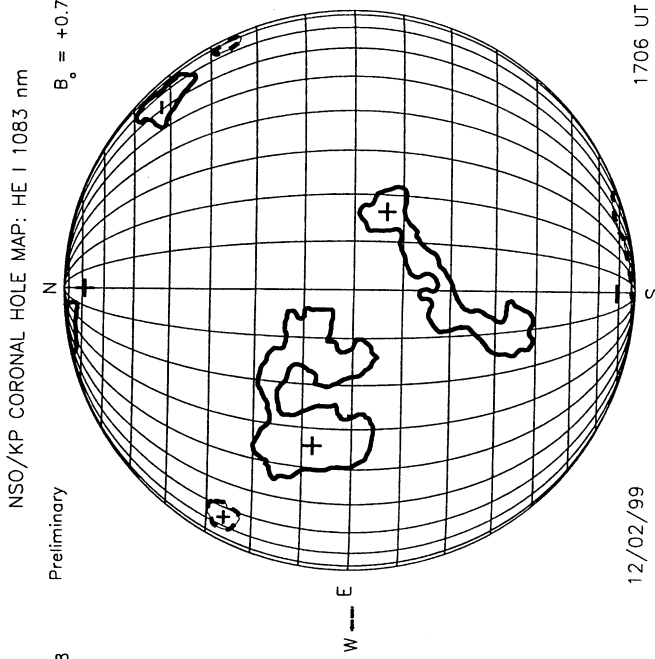
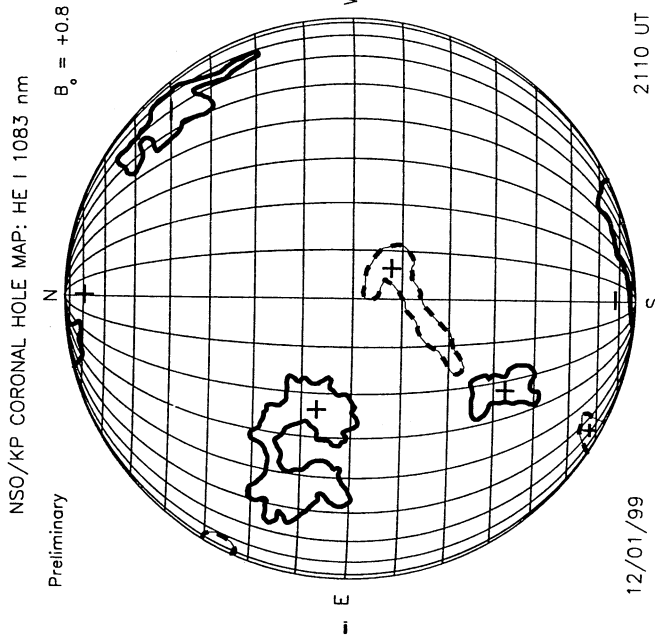
December
1999

Day 29 11:45:16 UT Day 31 09:40:09 UT

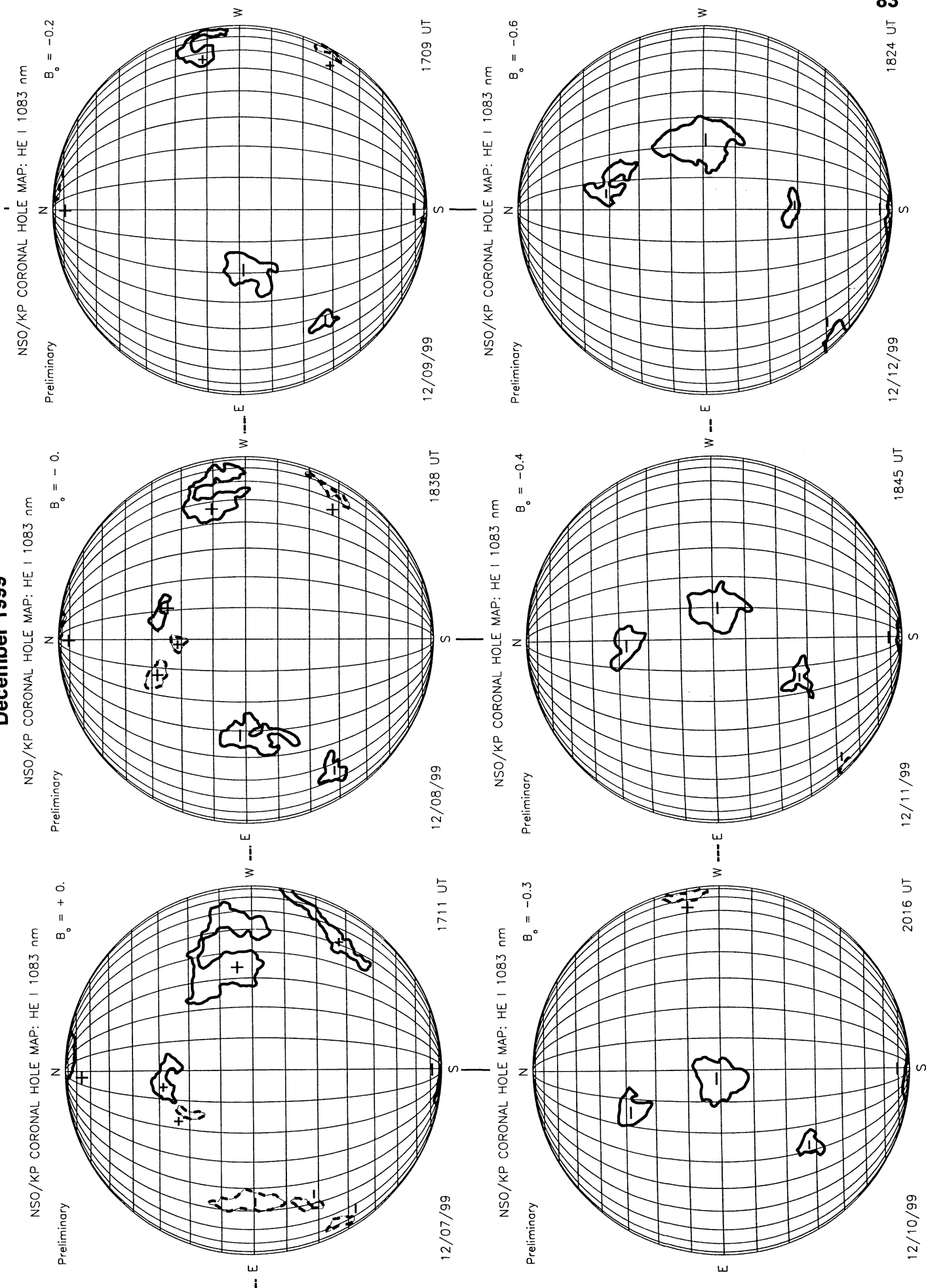
Day 30 09:26:18 UT



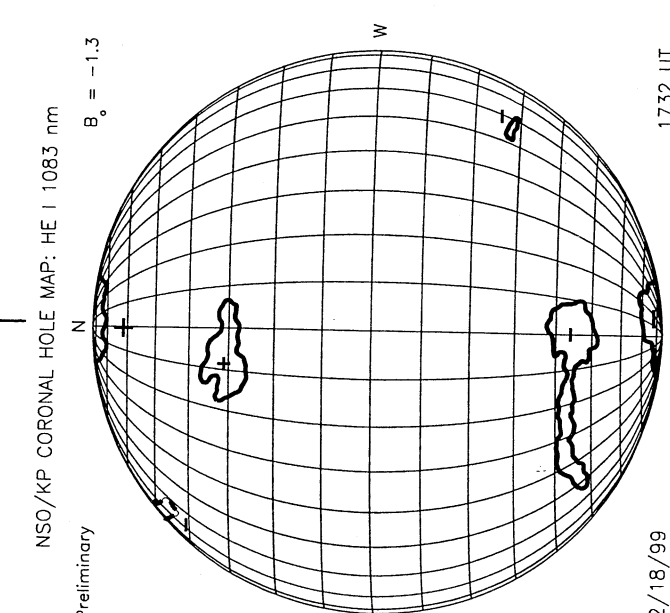
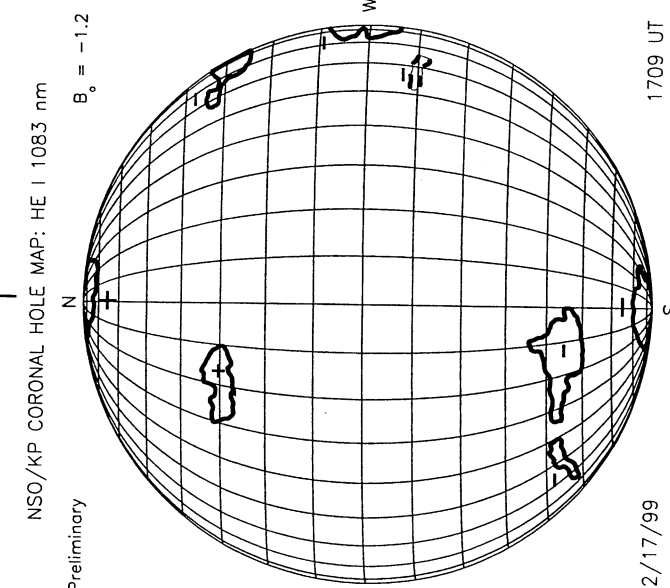
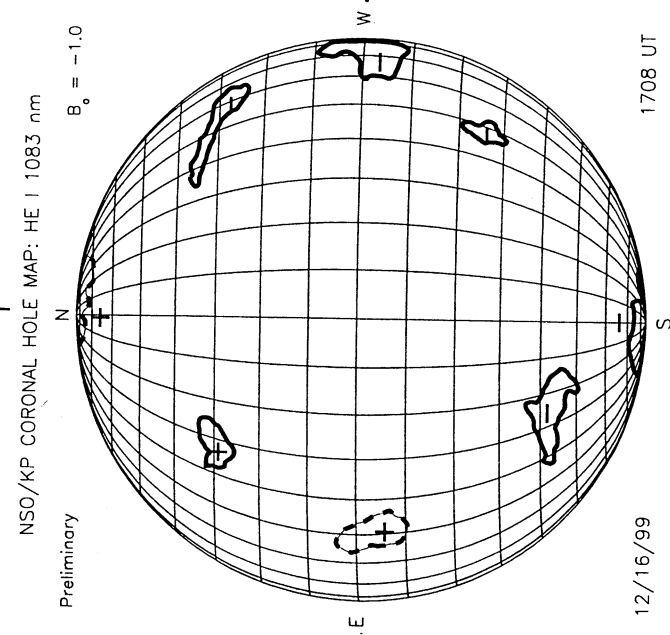
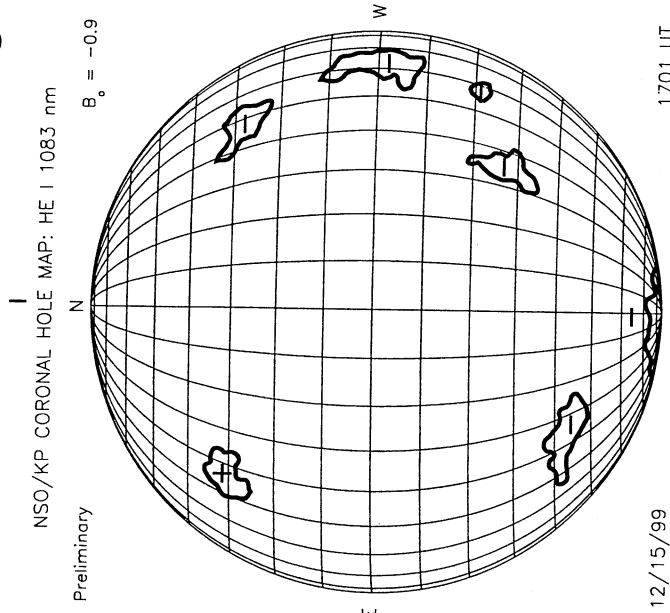
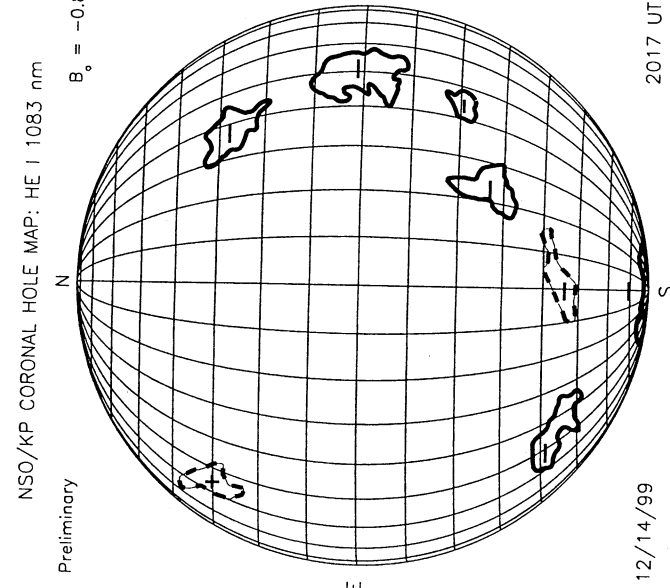
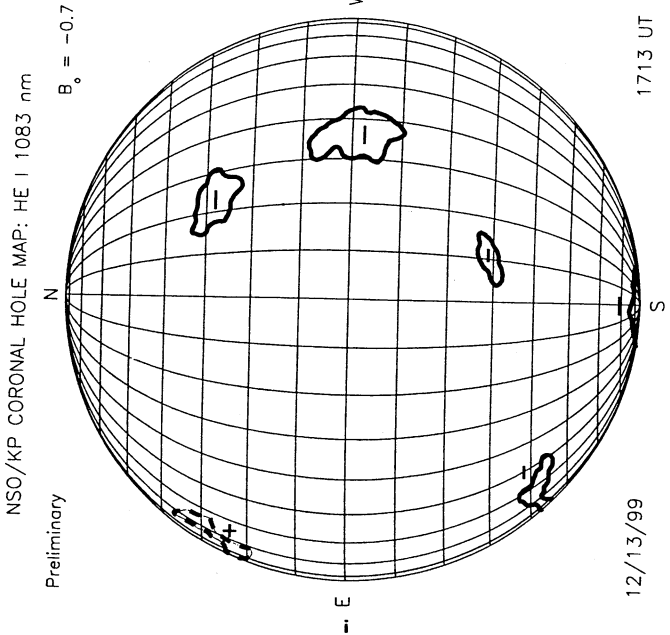
**KITT PEAK CORONAL HOLE MAPS HE I 1083 nm
December 1999**



KITT PEAK CORONAL HOLE MAPS HE I 1083 nm December 1999

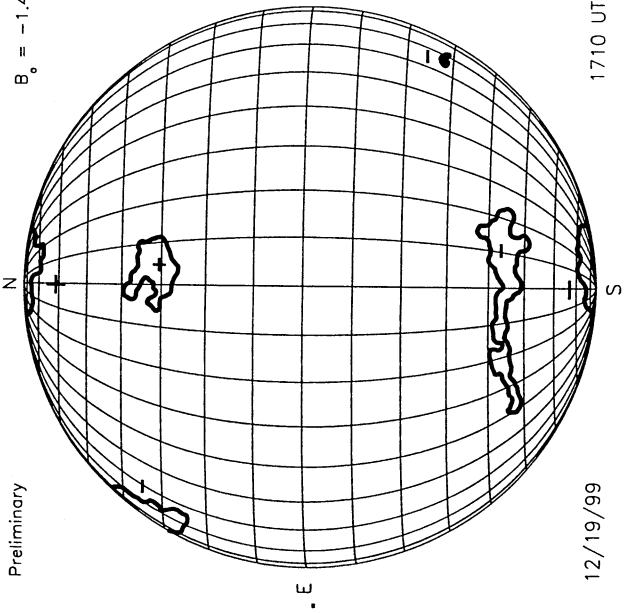


KITT PEAK CORONAL HOLE MAPS HE I 1083 nm December 1999

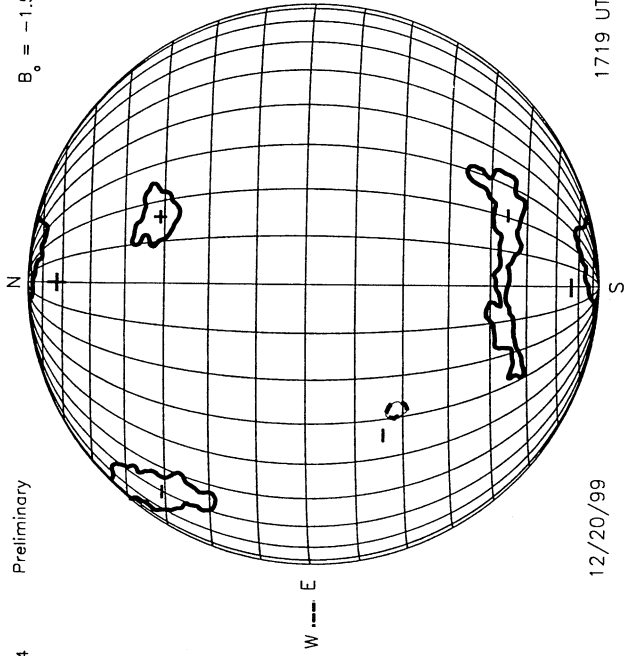


KITT PEAK CORONAL HOLE MAPS HE I 1083 nm December 1999

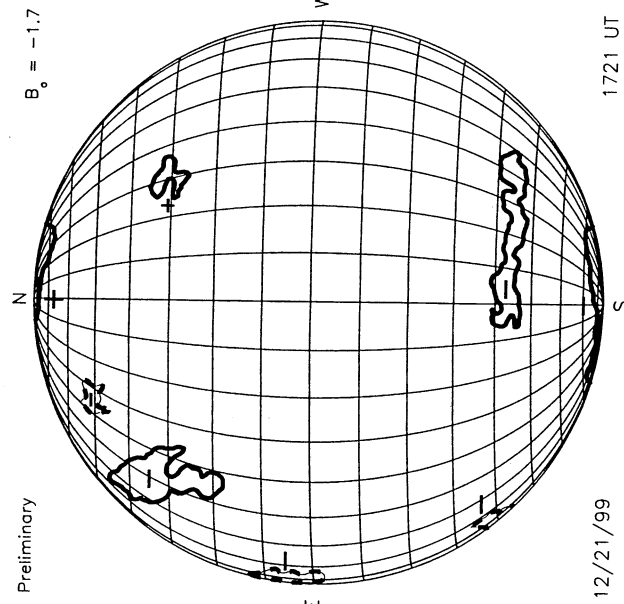
NSO/KP CORONAL HOLE MAP: HE I 1083 nm



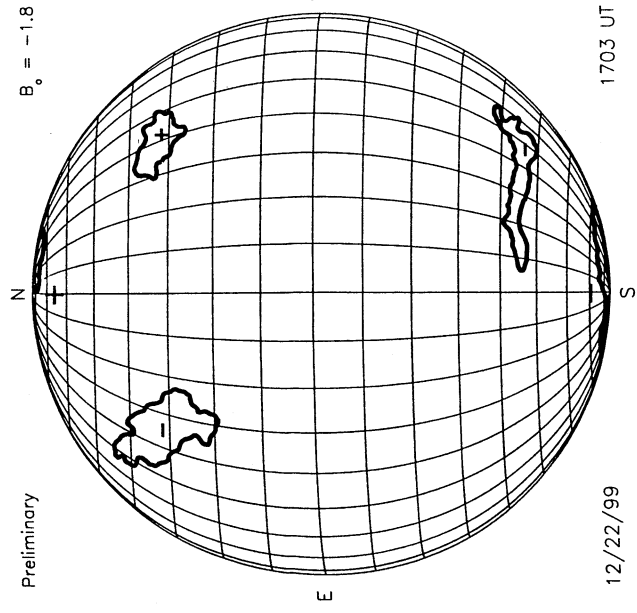
NSO/KP CORONAL HOLE MAP: HE I 1083 nm



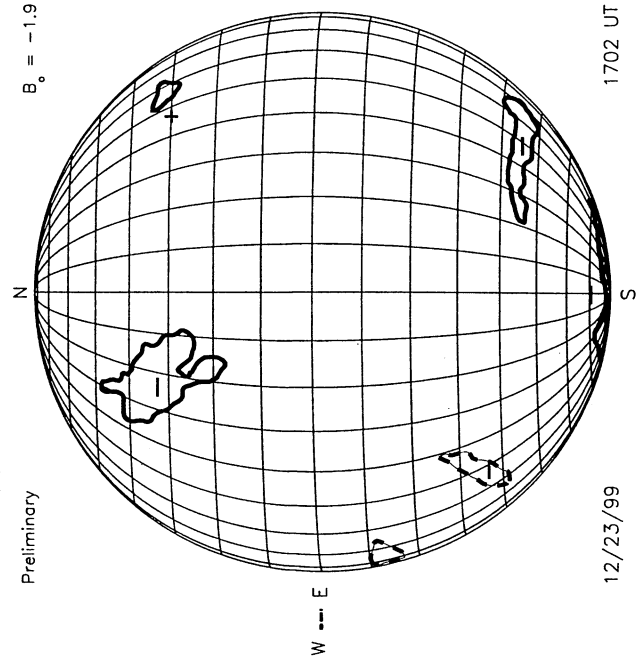
NSO/KP CORONAL HOLE MAP: HE I 1083 nm



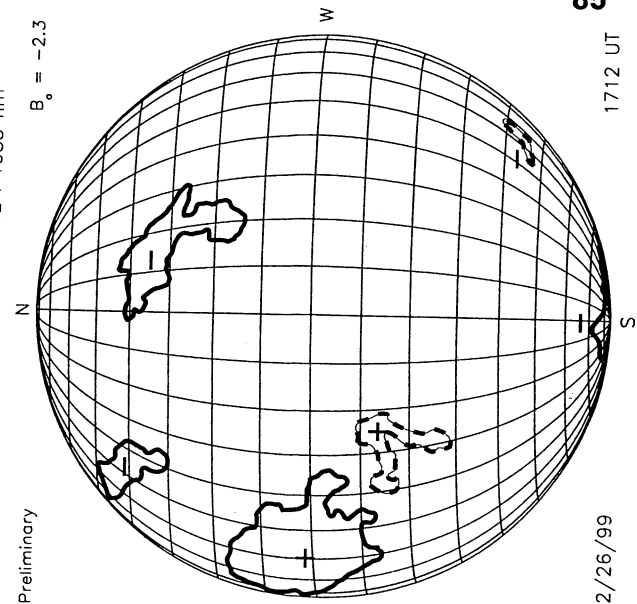
NSO/KP CORONAL HOLE MAP: HE I 1083 nm



NSO/KP CORONAL HOLE MAP: HE I 1083 nm

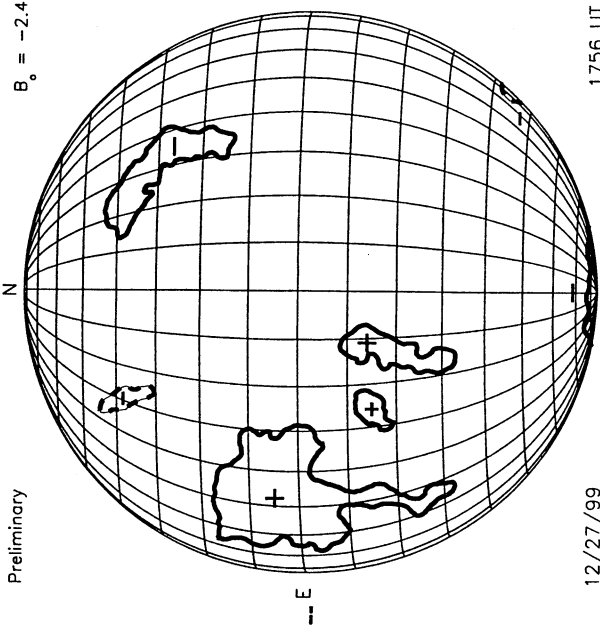


NSO/KP CORONAL HOLE MAP: HE I 1083 nm

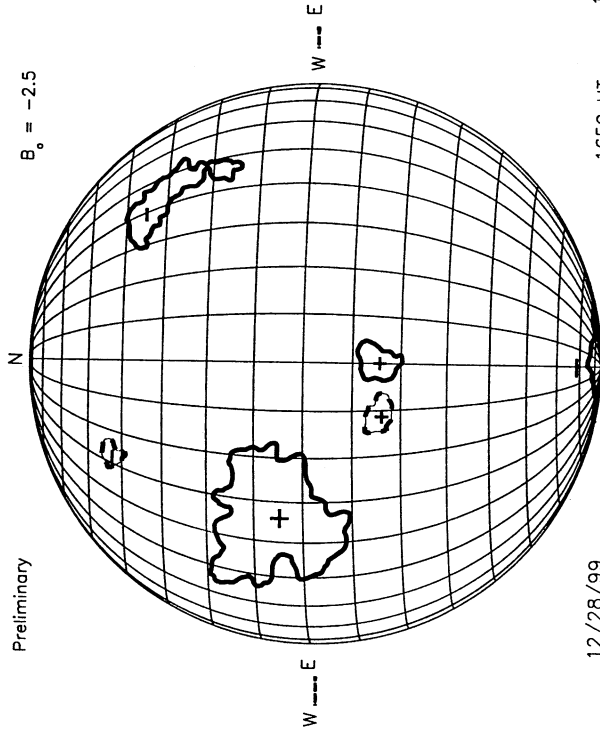


KITT PEAK CORONAL HOLE MAPS HE I 1083 nm December 1999

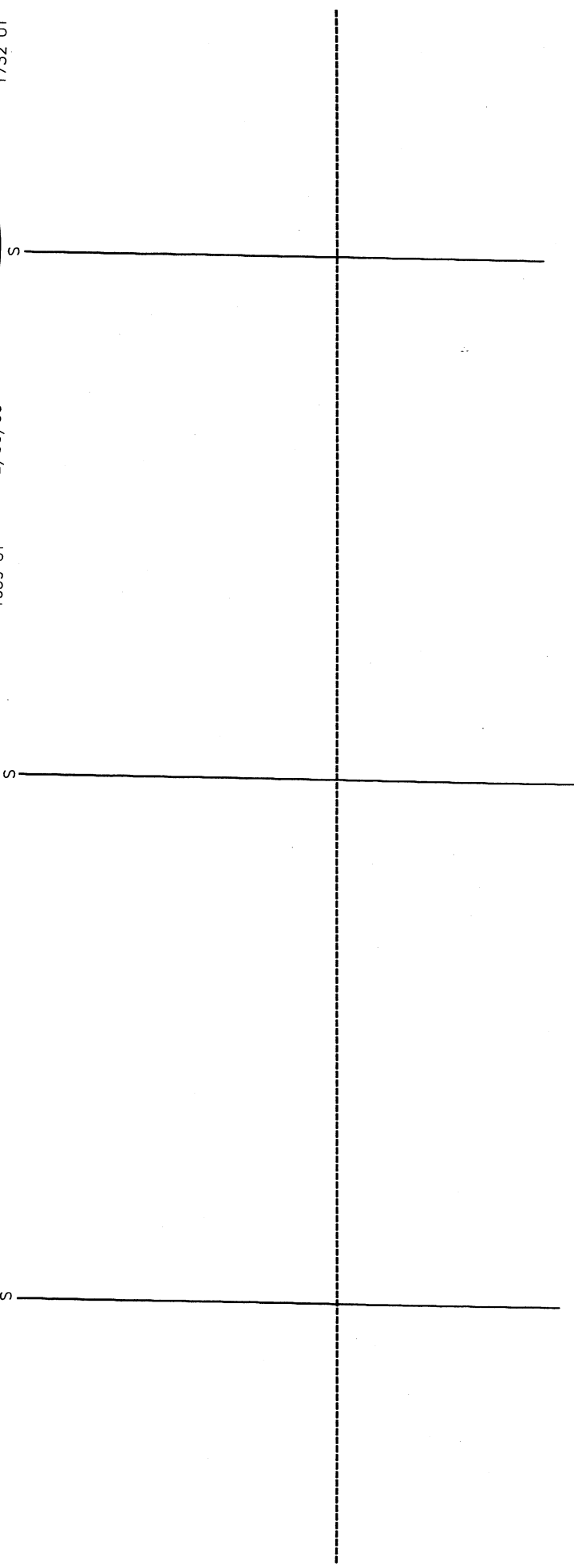
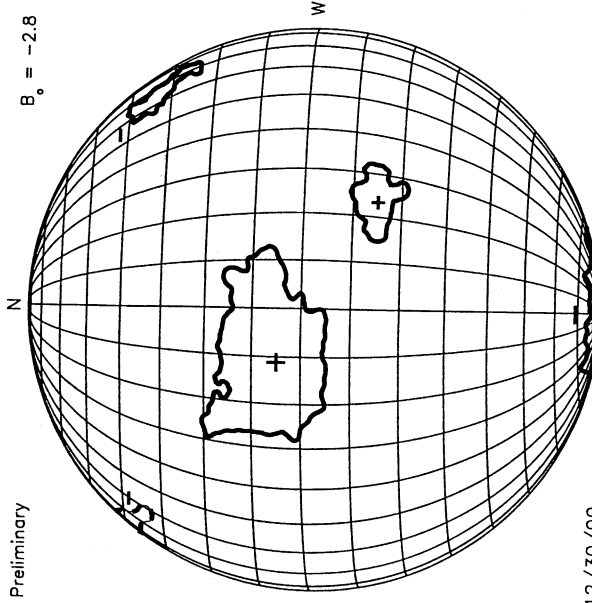
NSO/KP CORONAL HOLE MAP: HE I 1083 nm



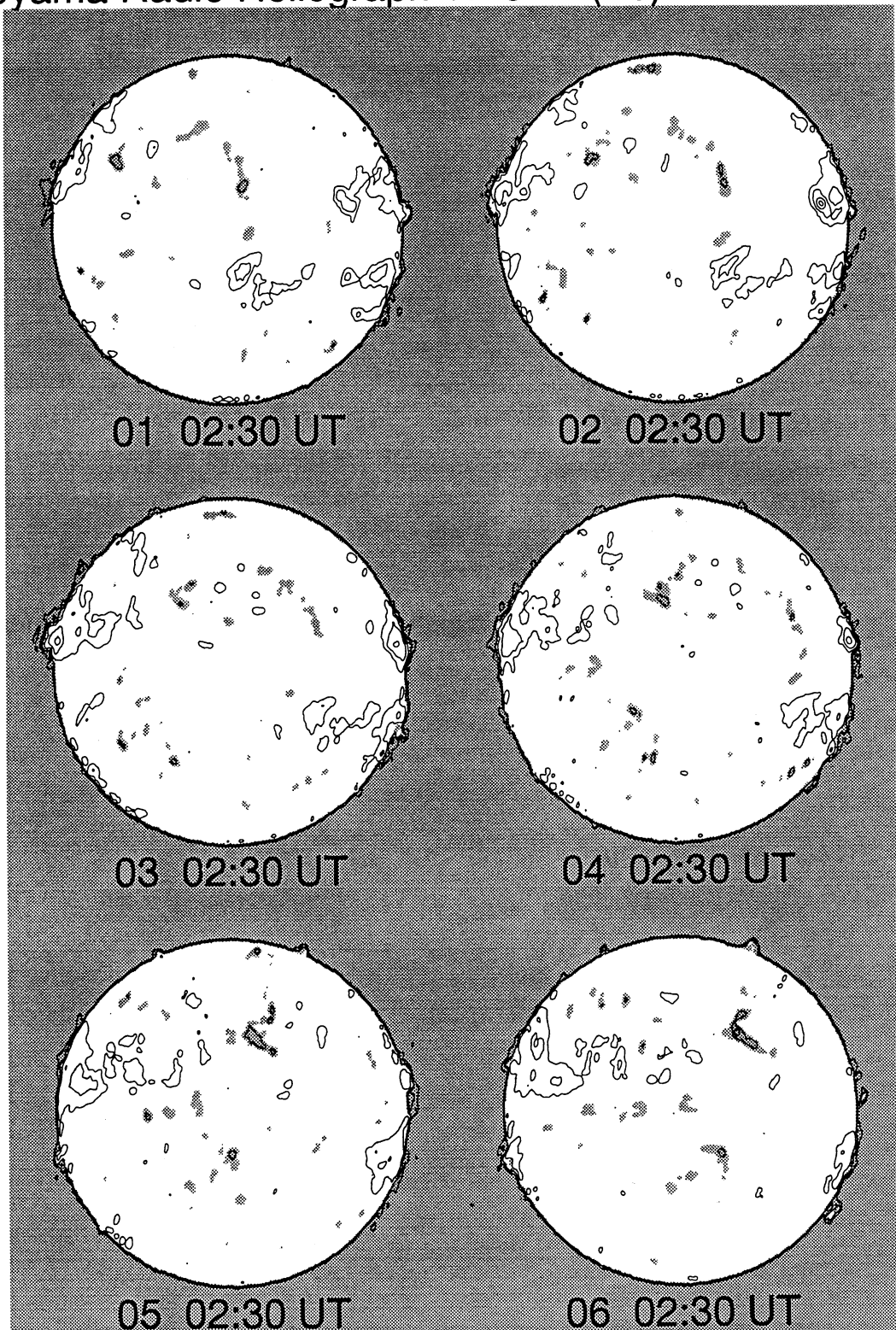
NSO/KP CORONAL HOLE MAP: HE I 1083 nm



NSO/KP CORONAL HOLE MAP: HE I 1083 nm

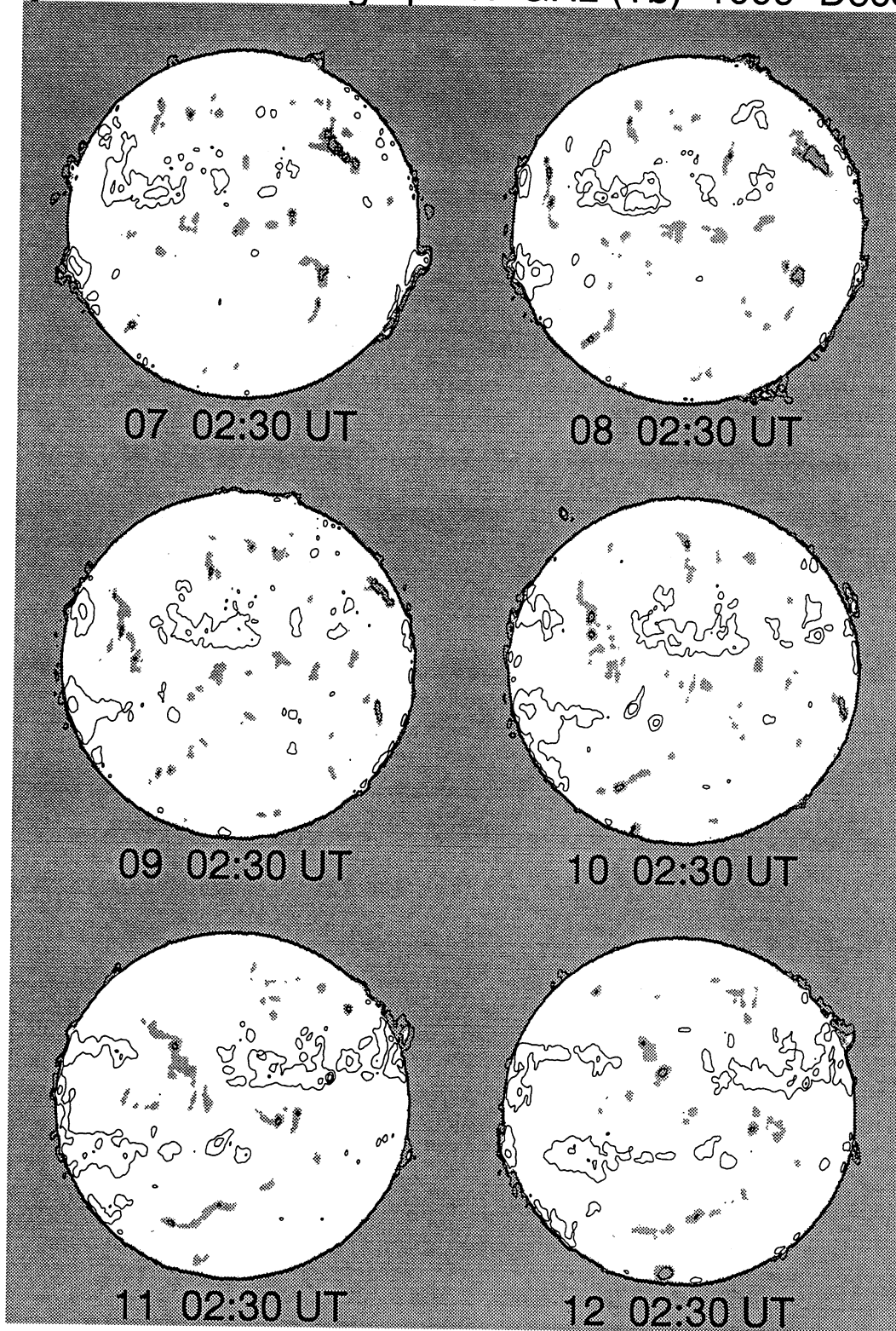


Nobeyama Radio Heliograph 17 GHz (Tb) 1999 December



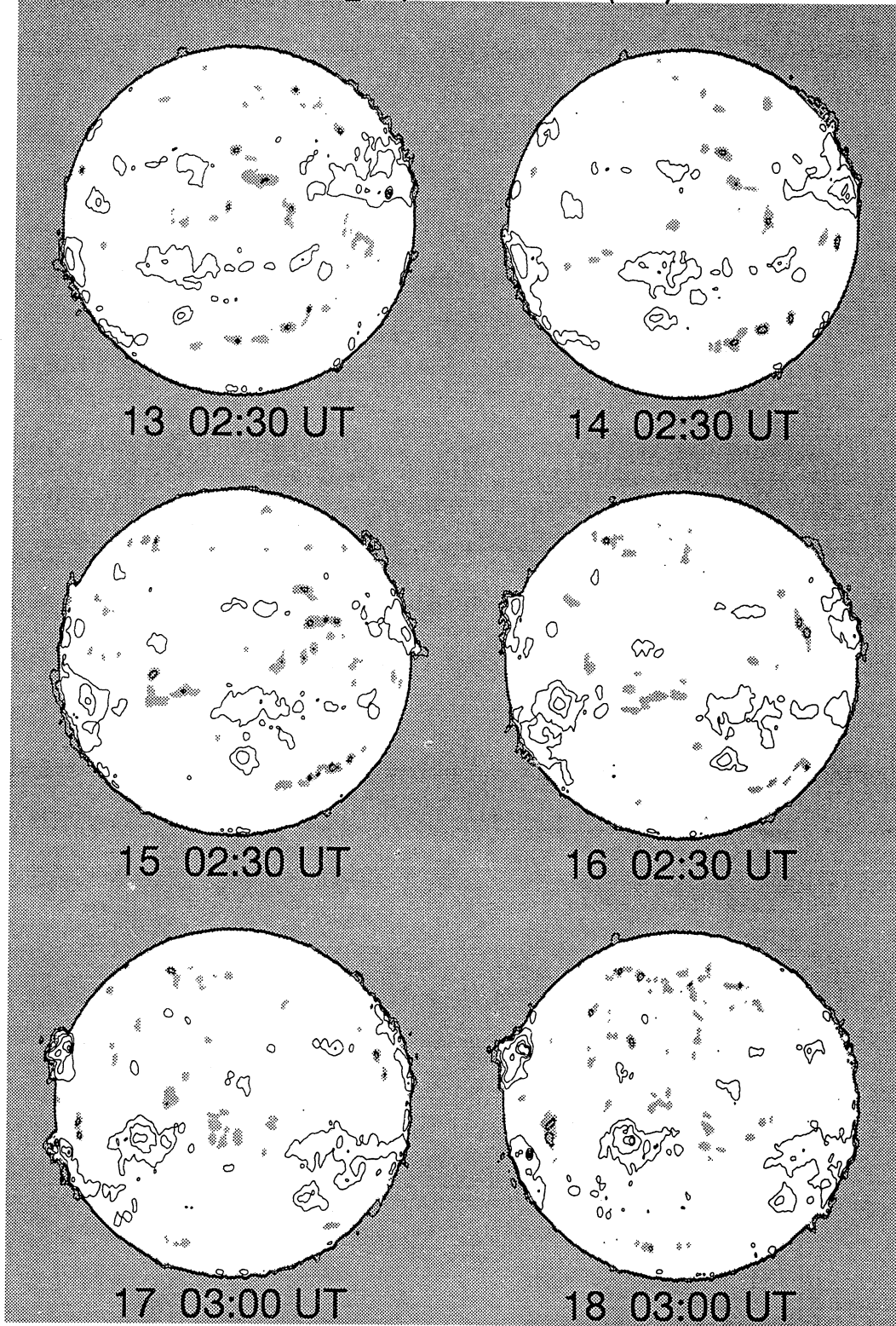
Contour Levels $T_b = [5, 8, 12, 20, 50, 100] \times 10^3 \text{ K}$
Grey level $T_b \leq 9,500 \text{ K}$

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 December



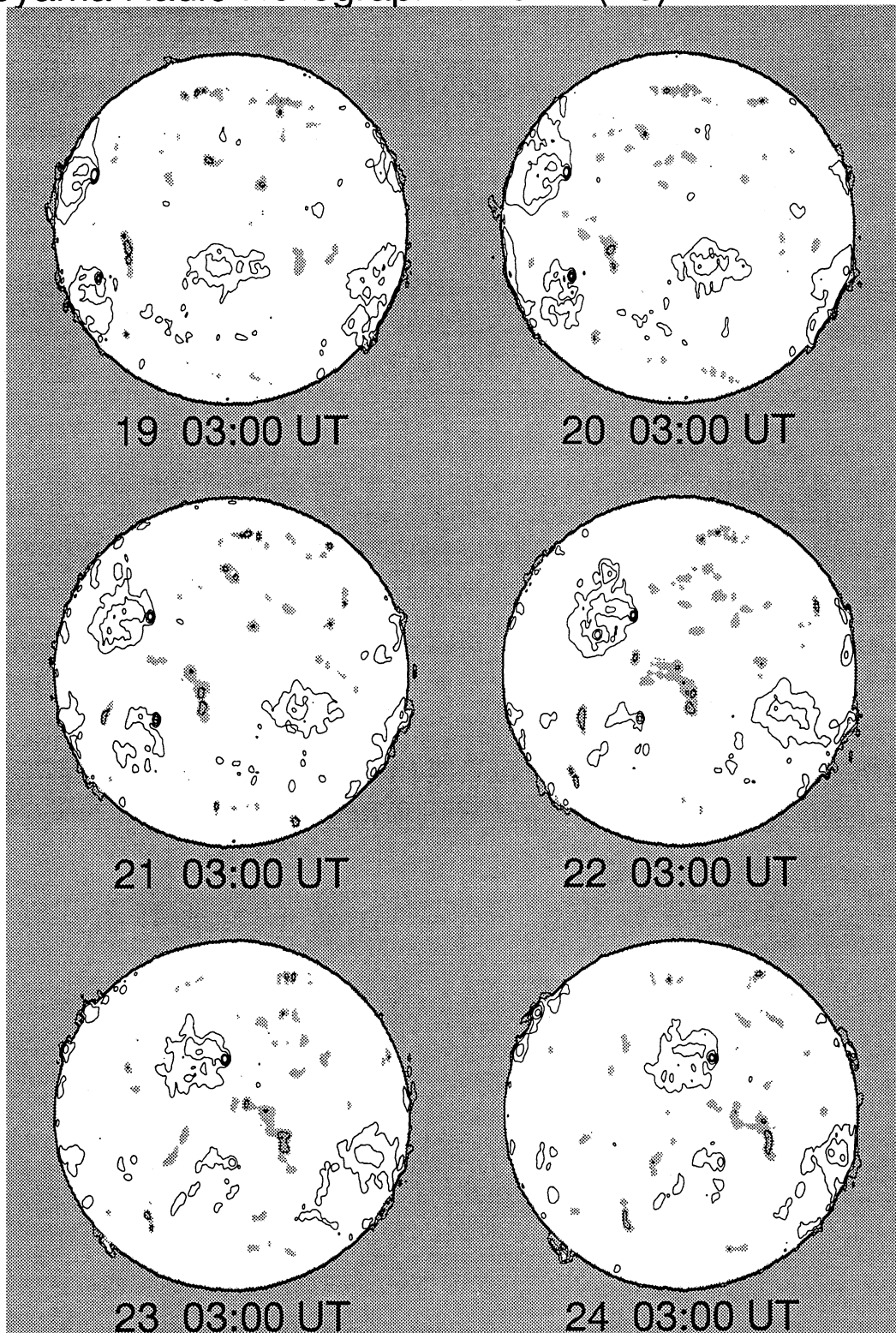
Contour Levels Tb=[5,8,12,20,50,100] x 10³ K
Grey level Tb ≤ 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 December



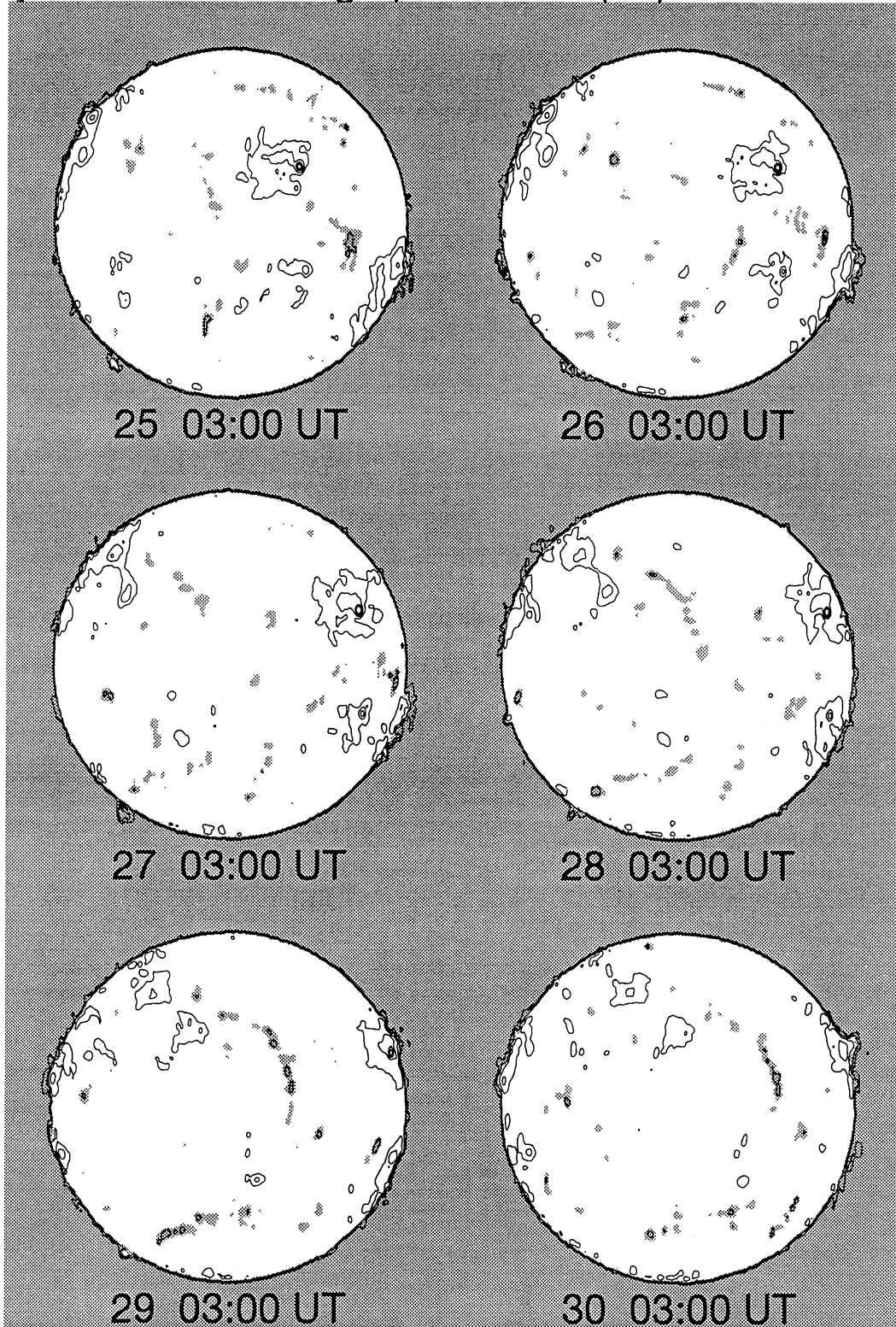
Contour Levels Tb=[5,8,12,20,50,100] x 10³ K
Grey level Tb ≤ 9,500 K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 December



Contour Levels $T_b = [5, 8, 12, 20, 50, 100] \times 10^3$ K
Grey level $T_b \leq 9,500$ K

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 December

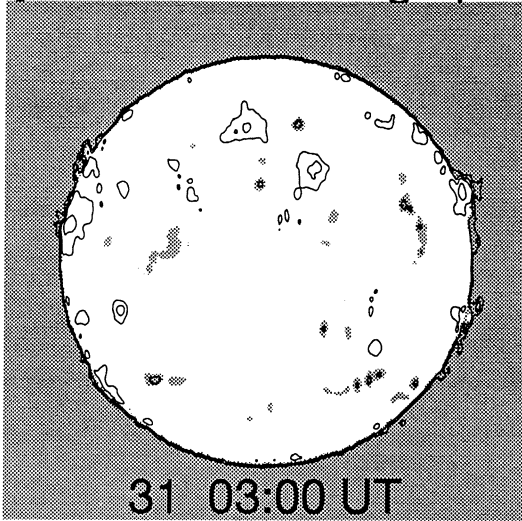


Contour Levels $T_b = [5, 8, 12, 20, 50, 100] \times 10^3 \text{ K}$
Grey level $T_b \leq 9,500 \text{ K}$

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Dec 99

Nobeyama Radio Heliograph 17 GHz (Tb) 1999 December



Contour Levels $T_b = [5, 8, 12, 20, 50, 100] \times 10^3 \text{ K}$
Grey level $T_b \leq 9,500 \text{ K}$

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

93
Dec 99

DECEMBER 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8789A		HOLL	11 25 1533	N04 E72	12 1.0		A	AX	10	1		3
8789B	29453	MWIL	11 26 1530	S18 E70	12 2.0	4	(AF)					
8789		SVTO	12 02 0749	N29 W02	12 2.2		B	BXO		3	4	3
8789		KAND	12 02 0820	N28 W01	12 2.3			BXO		3	4	4
8789	29463	MWIL	12 02 1530	N29 W05	12 2.2	3	(BP)					
8789		LEAR	12 03 0005	N29 W10	12 2.2		B	BXO	10	3	3	4
8789		HOLL	12 03 1600	N28 W20	12 2.1		B	BXO	10	2	2	3
8789		LEAR	12 05 0012	N29 W35	12 2.3		B	BXO		3	3	3
8786		SVTO	12 02 0749	N22 E01	12 2.4		B	CRO	10	4	4	3
8786		KAND	12 02 0820	N21 E01	12 2.4			BXO		4	4	4
8786	29464	MWIL	12 02 1530	N22 W03	12 2.4	3	(BG)					
8786		HOLL	12 02 1818	N22 W06	12 2.3		A	AX		1		3
8786		LEAR	12 03 0005	N21 W10	12 2.2		B	BXO		2	2	4
8786		HOLL	12 03 1600	N23 W26	12 1.7		B	BXO	20	2	3	3
8789C		HOLL	12 03 1600	N40 W13	12 2.6		B	CRO	20	4	4	3
8789C		LEAR	12 04 0008	N40 W15	12 2.8		A	AX		1		3
8784		VORO	11 26 2353	N30 E84	12 3.6			HRX	47	1		4
8784		KAND	11 30 0713	N30 E40	12 3.4			BXO		3	4	3
8784		RAMY	11 30 1236	N29 E38	12 3.5		B	BXO	10	3		3
8784		HOLL	11 30 1535	N31 E35	12 3.4		B	BXO	20	5	5	3
8784		VORO	11 30 2322	N31 E32	12 3.5			BXO	33	3	4	3
8784	29461	MWIL	11 30 2359	N29 E30	12 3.3	5	B					
8784		LEAR	12 01 0250	N30 E30	12 3.5		B	CRO	30	5	5	2
8784		KAND	12 01 0925	N29 E25	12 3.3			BXO		5	6	3
8784		SVTO	12 01 1154	N30 E23	12 3.3		B	DAO	20	3	6	2
8784	29461	MWIL	12 01 1545	N30 E20	12 3.2	4	(BP)					
8784		LEAR	12 02 0015	N30 E18	12 3.4		B	DSO	30	4	6	3
8784		SVTO	12 02 0749	N31 E12	12 3.3		B	CRO	10	4	6	3
8784		KAND	12 02 0820	N30 E13	12 3.4			BXO		5	6	4
8784	29461	MWIL	12 02 1530	N30 E10	12 3.4	3	(B)					
8784A	29468	MWIL	12 07 1600	N19 W37	12 4.8	3	(AP)					
8787		SVTO	12 02 0749	N13 E55	12 6.5		B	BXO		2	4	3
8787		KAND	12 02 0820	N12 E56	12 6.6			BXO		3	4	4
8787	29465	MWIL	12 02 1530	N13 E52	12 6.6	3	(B)					
8787		HOLL	12 02 1818	N14 E48	12 6.4		A	AX		2	1	3
8787		LEAR	12 03 0005	N10 E44	12 6.3		A	AX		1		4
8787		KAND	12 03 0910	N12 E39	12 6.3			AX		1	1	4
8787	29465	MWIL	12 03 1600	N12 E36	12 6.4	4	(AP)					
8787		HOLL	12 03 1600	N13 E33	12 6.1		B	BXO	20	3	2	3
8787		LEAR	12 04 0008	N11 E30	12 6.3		A	HR	10	1		3
8787		KAND	12 04 0730	N11 E25	12 6.2			BXO		2		4
8787		KAND	12 04 0730	N12 E31	12 6.6			AX		1		4
8787		SVTO	12 04 0813	N12 E24	12 6.1		A	HA	20	1	1	2
8787		RAMY	12 04 1222	N11 E25	12 6.4		B	BXO	10	2	5	2
8787	29465	MWIL	12 04 1545	N12 E23	12 6.4	4	(B)					
8787		HOLL	12 04 1618	N13 E23	12 6.4		B	BXO	10	2	6	4
8787		LEAR	12 05 0012	N11 E16	12 6.2		A	HS	10	1	1	3
8787	29465	MWIL	12 05 1545	N12 E10	12 6.4	4	(BP)					
8787		HOLL	12 05 1551	N13 E07	12 6.2		B	BXO	10	2	3	4
8787		VORO	12 05 2358	N14 E05	12 6.4			AXX	40	4	5	3
8787		LEAR	12 06 0127	N11 E04	12 6.4		B	CRO	10	2	5	3
8787		KAND	12 06 0730	N11 E01	12 6.4			BXO		4	3	3
8787		RAMY	12 06 1225	N11 W01	12 6.4		B	DSO	20	2	3	3
8787		SVTO	12 06 1249	N12 W02	12 6.4		B	DSO	20	2	4	2
8787	29465	MWIL	12 06 1600	N11 W02	12 6.5	4	(B)					
8787		HOLL	12 06 1620	N11 W04	12 6.4		B	BXO	20	5	5	2
8787		VORO	12 06 2336	N11 W08	12 6.4			HAX	25	4	5	3
8787		LEAR	12 07 0010	N11 W07	12 6.5		B	CRO	10	5	4	3
8787		SVTO	12 07 0741	N10 W13	12 6.3		B	BXO	10	4	5	3
8787		SVTO	12 08 0740	N12 W23	12 6.6		A	AX		1		3
8787		RAMY	12 08 1254	N12 W27	12 6.5		A	AX		1		3
8787		KAND	12 09 0715	N17 W40	12 6.3			AX		1	1	4

SUNSPOT GROUPS
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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
8787		RAMY	12 09 1210	N13 W45	12 6.1		A	HS	10	1	1	3
8787	29473	MWIL	12 09 1700	N13 W47	12 6.2	3	(B)					
8787		HOLL	12 09 2010	N11 W49	12 6.1		B	BXO	20	3	3	3
8787		LEAR	12 10 0018	N13 W51	12 6.2		B	CRO	20	3	3	4
8787		SVTO	12 10 1159	N12 W56	12 6.3		B	BXO	10	2	4	2
8787		RAMY	12 11 1722	N17 W69	12 6.5		B	BXO		2	4	3
8785		VORO	11 30 2322	N14 E85	12 7.4			HAX	47	1		3
8785	29462	MWIL	11 30 2359	N13 E85	12 7.4	3	AP					
8785		LEAR	12 01 0250	N12 E80	12 7.1		A	AX	30	1	1	2
8785		KAND	12 01 0925	N13 E79	12 7.3			HS		1	3	3
8785		SVTO	12 01 1154	N15 E78	12 7.4		A	HS	90	1	3	2
8785	29462	MWIL	12 01 1545	N14 E74	12 7.2	4	(AP)					
8785		VORO	12 01 2334	N14 E72	12 7.4			HAX	110	1		2
8785		LEAR	12 02 0015	N13 E70	12 7.3		A	HA	220	2	3	3
8785		SVTO	12 02 0749	N15 E66	12 7.3		A	HS	100	2	2	3
8785		KAND	12 02 0820	N14 E66	12 7.3			HA		1	3	4
8785	29462	MWIL	12 02 1530	N14 E62	12 7.3	5	(AP)					
8785		HOLL	12 02 1818	N16 E59	12 7.2		A	HS	130	1	2	3
8785		VORO	12 02 2322	N14 E59	12 7.4			HAX	120	1		2
8785		LEAR	12 03 0005	N12 E56	12 7.2		A	HS	90	1	2	4
8785		KAND	12 03 0910	N13 E53	12 7.4			HS		1	3	4
8785	29462	MWIL	12 03 1600	N13 E48	12 7.3	5	(AP)					
8785		HOLL	12 03 1600	N15 E47	12 7.2		A	HS	120	3	5	3
8785		LEAR	12 04 0008	N12 E43	12 7.2		A	HS	80	1	2	3
8785		KAND	12 04 0730	N13 E41	12 7.4			CAO		6	5	4
8785		SVTO	12 04 0813	N14 E38	12 7.2		A	HS	130	1	3	2
8785		RAMY	12 04 1222	N11 E37	12 7.3		B	CSO	130	2	4	2
8785	29462	MWIL	12 04 1545	N13 E35	12 7.3	5	(AP)					
8785		HOLL	12 04 1618	N15 E34	12 7.2		A	HS	140	3	2	4
8785		LEAR	12 05 0012	N13 E31	12 7.3		B	CSO	90	5	3	3
8785		VORO	12 05 0120	N14 E30	12 7.3			HSX	188	1		3
8785		KAND	12 05 0915	N14 E26	12 7.3			HA		5	5	3
8785		RAMY	12 05 1508	N12 E23	12 7.4		B	DSO	170	5	3	2
8785	29462	MWIL	12 05 1545	N13 E22	12 7.3	5	(AP)					
8785		HOLL	12 05 1551	N14 E22	12 7.3		B	CSO	140	8	4	4
8785		LEAR	12 06 0127	N13 E17	12 7.3		B	CSO	90	3	3	3
8785		KAND	12 06 0730	N13 E15	12 7.4			CAO		6	9	3
8785		RAMY	12 06 1225	N13 E11	12 7.3		B	CAO	130	2	3	3
8785		SVTO	12 06 1249	N14 E10	12 7.3		A	HA	120	1	3	2
8785	29462	MWIL	12 06 1600	N13 E09	12 7.3	5	(AP)					
8785		HOLL	12 06 1620	N14 E08	12 7.3		B	CSO	210	7	5	2
8785		VORO	12 06 2336	N14 E08	12 7.6			HSX	105	5		3
8785		LEAR	12 07 0010	N13 E04	12 7.3		A	HS	150	3	3	3
8785		SVTO	12 07 0741	N14 W01	12 7.2		A	HA	170	1	3	3
8785		HOLL	12 07 1555	N14 W03	12 7.4		B	CSO	110	8	7	2
8785	29462	MWIL	12 07 1600	N14 W05	12 7.3	4	(BP)					
8785		VORO	12 07 2306	N14 W08	12 7.3			HSX	103	2		3
8785		LEAR	12 08 0043	N14 W09	12 7.3		A	HS	120	3	3	3
8785		SVTO	12 08 0740	N14 W11	12 7.5		B	CSO	180	5	7	3
8785		RAMY	12 08 1254	N14 W15	12 7.4		B	CSO	150	4	2	3
8785		KAND	12 08 1300	N14 W17	12 7.2			HA		2	3	1
8785	29462	MWIL	12 08 1700	N14 W18	12 7.3	4	(AP)					
8785		HOLL	12 08 1723	N14 W19	12 7.3		A	HS	150	3	2	2
8785		VORO	12 09 0045	N15 W22	12 7.4			HAX	98	2		3
8785		LEAR	12 09 0145	N14 W23	12 7.3		B	CSO	120	2	2	3
8785		KAND	12 09 0715	N14 W26	12 7.3			HA		2	3	4
8785		SVTO	12 09 1033	N14 W27	12 7.4		A	HS	90	1	2	3
8785		RAMY	12 09 1210	N15 W29	12 7.3		B	CSO	130	2	3	3
8785	29462	MWIL	12 09 1700	N15 W32	12 7.3	5	(AP)					
8785		HOLL	12 09 2010	N13 W35	12 7.2		A	HS	100	2	2	3
8785		LEAR	12 10 0018	N15 W36	12 7.3		A	HS	110	1	2	4
8785		VORO	12 10 0410	N14 W39	12 7.2			HAX	86	1		3
8785		SVTO	12 10 1159	N14 W42	12 7.3		A	HS	80	1	2	2
8785	29462	MWIL	12 10 1600	N15 W44	12 7.3	4	(AP)					
8785		RAMY	12 10 1650	N16 W45	12 7.3		A	HS	100	1	2	3
8785		LEAR	12 11 0025	N15 W49	12 7.3		B	CSO	90	3	2	2
8785		VORO	12 11 0107	N15 W50	12 7.3			HAX	87	1		3
8785		KAND	12 11 0855	N14 W50	12 7.6			CSO		4	14	3

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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
8785	29462	MWIL	12 11 1530	N15 W56	12 7.4	3	(AP)					
8785		RAMY	12 11 1722	N17 W60	12 7.2		A	HA	90	1	2	3
8785		VORO	12 11 2352	N15 W62	12 7.3			HAX	118	1		3
8785		LEAR	12 12 0135	N16 W62	12 7.4		A	HA	70	1	2	2
8785		SVTO	12 12 0727	N13 W67	12 7.2		A	HA	100	1	2	3
8785		KAND	12 12 0740	N13 W64	12 7.5			CSO		2	11	2
8785		HOLL	12 12 1528	N13 W67	12 7.6		B	CSO	60	2	7	2
8785	29462	MWIL	12 12 1530	N15 W66	12 7.6	5	(BP)					
8785		RAMY	12 12 1559	N16 W67	12 7.6		B	CSO	80	2	10	3
8785		VORO	12 12 2358	N15 W74	12 7.4			HAX	194	1		3
8785		LEAR	12 13 0120	N16 W75	12 7.4		A	HA	30	1	2	3
8785		KAND	12 13 0820	N14 W81	12 7.2			HA		1	1	3
8785A		RAMY	12 08 1254	S16 W09	12 7.8		A	AX		1		3
8785A	29474	MWIL	12 09 1700	S16 W23	12 8.0	3	(B)					
8785B		SVTO	12 12 0727	N12 W58	12 7.9		A	AX		1		3
8788	29466	MWIL	12 02 1530	N09 E80	12 8.6	4	(AP)					
8788		HOLL	12 02 1818	N13 E81	12 8.9		A	HK	180	1	5	3
8788		VORO	12 02 2322	N11 E79	12 8.9			HAX	271	1		2
8788		LEAR	12 03 0005	N09 E76	12 8.7		A	HA	150	1	2	4
8788		KAND	12 03 0910	N09 E79	12 9.3			EAO		4	15	4
8788	29466	MWIL	12 03 1600	N09 E71	12 9.0	4	(B)					
8788		HOLL	12 03 1600	N12 E74	12 9.2		B	EKO	440	12	15	3
8788		LEAR	12 04 0008	N09 E69	12 9.2		B	FKO	360	12	16	3
8788		KAND	12 04 0730	N10 E65	12 9.2			FAO		15	17	4
8788		SVTO	12 04 0813	N09 E65	12 9.2		B	FKO	770	10	18	2
8788		RAMY	12 04 1222	N08 E62	12 9.2		B	FKI	580	25	16	2
8788	29466	MWIL	12 04 1545	N09 E58	12 9.0	5	(D)					
8788		HOLL	12 04 1618	N12 E59	12 9.1		B	FKI	460	25	17	4
8788		LEAR	12 05 0012	N09 E55	12 9.1		B	FKO	530	13	17	3
8788		VORO	12 05 0120	N09 E49	12 8.7			HKX	473	4		3
8788		KAND	12 05 0915	N10 E50	12 9.1			FKI		15	16	3
8788		RAMY	12 05 1508	N09 E50	12 9.4		B	FKO	490	13	19	2
8788	29466	MWIL	12 05 1545	N10 E46	12 9.1	5	(BP)					
8788		HOLL	12 05 1551	N12 E46	12 9.1		BG	FKO	510	14	17	4
8788		VORO	12 05 2358	N10 E35	12 8.6			HKX	325	5		3
8788		LEAR	12 06 0127	N08 E41	12 9.1		B	FKO	540	13	16	3
8788		KAND	12 06 0730	N10 E37	12 9.1			FKI		18	17	3
8788		RAMY	12 06 1225	N09 E35	12 9.1		B	FKO	560	19	17	3
8788		SVTO	12 06 1249	N09 E35	12 9.2		B	FKI	480	16	18	2
8788	29466	MWIL	12 06 1600	N10 E33	12 9.1	5	(D)					
8788		HOLL	12 06 1620	N12 E32	12 9.1		B	FKO	620	21	17	2
8788		VORO	12 06 2336	N10 E22	12 8.6			HKX	492	3		3
8788		LEAR	12 07 0010	N09 E29	12 9.2		B	FKO	450	11	18	3
8788		SVTO	12 07 0741	N10 E24	12 9.1		BG	FKI	670	12	17	3
8788		HOLL	12 07 1555	N12 E19	12 9.1		B	BXO	600	22	19	2
8788	29466	MWIL	12 07 1600	N10 E21	12 9.2	5	(B)					
8788		VORO	12 07 2306	N10 E11	12 8.8			HKX	678	4	6	3
8788		LEAR	12 08 0043	N10 E16	12 9.2		B	FKO	520	14	18	3
8788		SVTO	12 08 0740	N11 E11	12 9.1		B	FKO	720	14	19	3
8788		RAMY	12 08 1254	N10 E09	12 9.2		BG	FHO	550	22	18	3
8788		KAND	12 08 1300	N10 E09	12 9.2			FKO		7	18	1
8788	29466	MWIL	12 08 1700	N10 E06	12 9.1	5	(B)					
8788		HOLL	12 08 1723	N12 E07	12 9.2		B	FHO	580	20	18	2
8788		VORO	12 09 0045	N10 W04	12 8.7			HRX	621	4	4	3
8788		LEAR	12 09 0145	N10 E02	12 9.2		B	FKO	560	13	18	3
8788		KAND	12 09 0715	N10 W01	12 9.2			FKO		12	18	4
8788		SVTO	12 09 1033	N11 W03	12 9.2		B	FKO	530	6	19	3
8788		RAMY	12 09 1210	N11 W03	12 9.3		B	FKO	630	11	18	3
8788	29466	MWIL	12 09 1700	N10 W07	12 9.2	5	(BG)					
8788		HOLL	12 09 2010	N10 W10	12 9.1		B	FHO	590	17	17	3
8788		LEAR	12 10 0018	N11 W10	12 9.3		B	FHO	520	16	18	4
8788		VORO	12 10 0410	N10 W22	12 8.5			HRX	633	3		3
8788		SVTO	12 10 1159	N11 W17	12 9.2		B	FKO	430	6	18	2
8788	29466	MWIL	12 10 1600	N10 W19	12 9.2	5	(B)					
8788		RAMY	12 10 1650	N11 W21	12 9.1		B	FKO	410	11	18	3
8788		LEAR	12 11 0025	N11 W25	12 9.1		B	FHO	430	10	17	2

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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
8788		VORO	12 11 0107	N10 W34	12 8.5			HRX	642	4		3
8788		KAND	12 11 0855	N10 W30	12 9.1			FHO		11	20	3
8788	29466	MWIL	12 11 1530	N10 W33	12 9.2	4	(B)					
8788		RAMY	12 11 1722	N12 W34	12 9.2		B	FKO	440	16	19	3
8788		VORO	12 11 2352	N10 W46	12 8.5			HRX	628	2		3
8788		LEAR	12 12 0135	N11 W38	12 9.2		B	FHO	370	9	18	2
8788		SVTO	12 12 0727	N08 W42	12 9.2		B	FKO	420	5	17	3
8788		KAND	12 12 0740	N10 W44	12 9.0			FHO		9	18	2
8788		HOLL	12 12 1528	N10 W48	12 9.0		B	FKO	350	8	17	2
8788	29466	MWIL	12 12 1530	N10 W45	12 9.3	6	(B)					
8788		RAMY	12 12 1559	N12 W47	12 9.1		B	FHO	360	7	18	3
8788		VORO	12 12 2343	N10 W58	12 8.6			HKX	381	1		2
8788		LEAR	12 13 0120	N11 W50	12 9.3		B	FHO	380	6	20	3
8788		KAND	12 13 0820	N09 W57	12 9.1			FHO		5	17	3
8788		RAMY	12 13 1112	N13 W60	12 8.9		B	FHO	290	8	17	2
8788		HOLL	12 13 1554	N09 W62	12 9.0		B	FHO	310	8	20	4
8788	29466	MWIL	12 13 1700	N10 W60	12 9.2	5	(B)					
8788		VORO	12 13 2348	N09 W71	12 8.7			HKX	259	1		2
8788		SVTO	12 14 0922	N08 W70	12 9.1		A	HA	180	1	2	3
8788		KAND	12 14 1200	N10 W70	12 9.2			FHO		4	18	4
8788	29466	MWIL	12 14 1545	N10 W73	12 9.2	4	(B)					
8788		HOLL	12 14 1622	N09 W75	12 9.0		B	FHO	280	5	21	2
8788		RAMY	12 14 1716	N14 W77	12 8.9		B	FHO	180	2	21	2
8788		KAND	12 15 0930	N11 W77	12 9.6			HA		1	2	3
8788	29466	MWIL	12 15 1545	N11 W79	12 9.7	4	(AF)					
8788A		VORO	12 05 0120	N11 E63	12 9.8			HAX	291	3		3
8788A		VORO	12 05 2358	N12 E49	12 9.7			HAX	204	3		3
8788A		VORO	12 06 2336	N12 E37	12 9.8			HAX	163	3		3
8788A		VORO	12 07 2306	N11 E24	12 9.8			HAX	143	3		3
8788A		VORO	12 09 0045	N11 E10	12 9.8			HAX	109	2		3
8788A		VORO	12 10 0410	N11 W06	12 9.7			HAX	89	2	1	3
8788A		VORO	12 11 0107	N11 W18	12 9.7			HAX	100	2	1	3
8788A		VORO	12 11 2352	N11 W31	12 9.7			HAX	138	4	1	3
8788A		VORO	12 12 2343	N11 W43	12 9.7			DAI	182	5	5	2
8788A		VORO	12 13 2348	N11 W58	12 9.6			DAI	140	8	9	2
8788A		SVTO	12 14 0922	N11 W65	12 9.5		A	HA	90	1	2	3
8788A		LEAR	12 15 0025	N11 W72	12 9.6		A	HA	100	1	2	3
8788A		RAMY	12 15 1302	N14 W78	12 9.6		A	HS	60	1	2	3
8788A		HOLL	12 15 1729	N19 W83	12 9.4		A	HA	60	2	10	2
8788A		VORO	12 15 2344	N11 W80	12 10.0			HAX	152	3	4	1
8790	29467	MWIL	12 05 1545	N07 E66	12 10.6	4	(BP)					
8790		HOLL	12 05 1551	N09 E66	12 10.6		A	AX	10	1		4
8790		VORO	12 05 2358	N08 E64	12 10.8			AXX	26	2		3
8790		LEAR	12 06 0127	N08 E60	12 10.5		B	BXO	10	2	4	3
8790		KAND	12 06 0730	N10 E57	12 10.6			BXI		5	3	3
8790		RAMY	12 06 1225	N08 E52	12 10.4		B	BXO	30	6	5	3
8790		SVTO	12 06 1249	N11 E55	12 10.7		B	CRO	20	4	5	2
8790	29467	MWIL	12 06 1600	N10 E51	12 10.5	4	(BG)					
8790		HOLL	12 06 1620	N12 E51	12 10.5		B	BXO	30	4	4	2
8790		VORO	12 06 2336	N11 E48	12 10.6			AXX	30	2		3
8790		LEAR	12 07 0010	N09 E48	12 10.6		B	BXO	10	4	4	3
8790		SVTO	12 07 0741	N11 E43	12 10.5		B	CRO	30	5	5	3
8790		HOLL	12 07 1555	N12 E37	12 10.4		B	FKO	20	4	4	2
8790	29467	MWIL	12 07 1600	N11 E37	12 10.4	3	(BG)					
8790		VORO	12 07 2306	N12 E35	12 10.6			AXX	31	3	5	3
8790		LEAR	12 08 0043	N11 E32	12 10.4		B	BXO	10	5	3	3
8790		SVTO	12 08 0740	N11 E29	12 10.5		B	DAO	40	5	4	3
8790		RAMY	12 08 1254	N09 E26	12 10.5		B	BXO	10	10	5	3
8790		KAND	12 08 1300	N11 E25	12 10.4			BXO		4	4	1
8790	29467	MWIL	12 08 1700	N10 E23	12 10.4	3	(BP)					
8790		HOLL	12 08 1723	N12 E23	12 10.4		B	CSO	20	4	5	2
8790		VORO	12 09 0045	N11 E19	12 10.5			AXX	38	4	4	3
8790		LEAR	12 09 0145	N11 E19	12 10.5		B	DSO	40	11	5	3
8790		KAND	12 09 0715	N12 E15	12 10.4			DXI		11	7	4
8790		SVTO	12 09 1033	N10 E14	12 10.5		B	DKO	40	4	5	3
8790		RAMY	12 09 1210	N13 E13	12 10.5		B	DSO	60	15	6	3
8790	29467	MWIL	12 09 1700	N12 E12	12 10.6	4	(B)					

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

97
Dec 99

DECEMBER 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8790		HOLL	12 09 2010	N12 E08	12 10.4		B	DRI	80	21	7	3
8790		LEAR	12 10 0018	N11 E06	12 10.5		B	DSO	90	17	8	4
8790		VORO	12 10 0410	N11 E03	12 10.4			AXX	65	7	5	3
8790	29467	SVTO	12 10 1159	N12 W01	12 10.4		B	DAI	120	10	8	2
8790		MWIL	12 10 1600	N12 W04	12 10.4	3	(B)					
8790		RAMY	12 10 1650	N13 W04	12 10.4		B	DAO	60	14	7	3
8790		LEAR	12 11 0025	N12 W08	12 10.4		B	DAO	60	15	9	2
8790		VORO	12 11 0107	N11 W10	12 10.3			AXX	57	6	6	3
8790		KAND	12 11 0855	N11 W14	12 10.3			BXO		3	4	3
8790		KAND	12 11 0855	N13 W10	12 10.6			BXI		12	6	3
8790	29477	MWIL	12 11 1530	N14 W17	12 10.4	2	(AP)					
8790		RAMY	12 11 1722	N13 W18	12 10.4		B	CRO	20	17	9	3
8790		VORO	12 11 2352	N13 W20	12 10.5			AXX	61	5	3	3
8790		LEAR	12 12 0135	N14 W23	12 10.3		B	CRO	20	7	9	2
8790		SVTO	12 12 0727	N10 W28	12 10.2		B	BXO	10	6	13	3
8790		KAND	12 12 0740	N10 W29	12 10.1			BXO		4	8	2
8790		KAND	12 12 0740	N13 W25	12 10.4			CAO		3	7	2
8790		HOLL	12 12 1528	N12 W29	12 10.4		B	BXO	10	4	5	2
8790	29467	MWIL	12 12 1530	N11 W31	12 10.3	4	(BP)					
8790	29477	MWIL	12 12 1530	N15 W28	12 10.5	3	(B)					
8790		RAMY	12 12 1559	N13 W30	12 10.4		B	BXO	10	10	11	3
8790		VORO	12 12 2343	N11 W33	12 10.5			AXX	4	1		2
8790		LEAR	12 13 0120	N11 W33	12 10.6		B	BXO		3	3	3
8790		KAND	12 13 0820	N10 W45	12 10.0			AX		1		3
8790		RAMY	12 13 1112	N13 W49	12 9.8		A	AX		1		2
8790	29467	MWIL	12 13 1700	N11 W47	12 10.2	4	(BP)					
8790		KAND	12 14 1200	N10 W61	12 9.9			AX		1	1	4
8790	29467	MWIL	12 14 1545	N11 W62	12 10.0	3	(AP)					
8790		RAMY	12 14 1716	N15 W66	12 9.7		A	AX		1		2
8793		HOLL	12 07 1555	S16 E41	12 10.8		B	BXO	10	2	4	2
8793	29469	MWIL	12 07 1600	S17 E42	12 10.8	4	(B)					
8793		LEAR	12 08 0043	S19 E38	12 10.9		A	AX		1		3
8793		SVTO	12 08 0740	S17 E34	12 10.9		B	CSO	30	2	4	3
8793		RAMY	12 08 1254	S17 E29	12 10.7		B	BXO		2	6	3
8793		KAND	12 08 1300	S17 E31	12 10.9			AX		1	1	1
8793		LEAR	12 09 0145	S17 E21	12 10.7		A	AX		1		3
8793		KAND	12 09 0715	S17 E21	12 10.9			BXO		3	3	4
8793		SVTO	12 09 1033	S17 E17	12 10.7		A	HR	10	1	1	3
8793		RAMY	12 09 1210	S15 E21	12 11.1		B	BXO	20	8	10	3
8793	29475	MWIL	12 09 1700	S17 E14	12 10.8	4	(BP)					
8793		HOLL	12 09 2010	S17 E13	12 10.8		B	CRO	30	8	4	3
8793		LEAR	12 10 0018	S17 E10	12 10.8		B	CAO	30	7	4	4
8793		SVTO	12 10 1159	S16 E03	12 10.7		A	HS	20	1	1	2
8793	29475	MWIL	12 10 1600	S16 W01	12 10.6	3	(AP)					
8793		RAMY	12 10 1650	S16 W02	12 10.5		A	HS	20	1	1	3
8793		LEAR	12 11 0025	S16 W06	12 10.6		A	HS	20	1	1	2
8793		KAND	12 11 0855	S16 W11	12 10.5			HS		1	1	3
8793	29475	MWIL	12 11 1530	S16 W15	12 10.5	3	(AP)					
8793		RAMY	12 11 1722	S16 W14	12 10.7		B	BXO	10	5	6	3
8793		LEAR	12 12 0135	S16 W21	12 10.5		A	HS	10	1	1	2
8793		SVTO	12 12 0727	S18 W24	12 10.5		A	AX		1		3
8793		KAND	12 12 0740	S17 W24	12 10.5			AX		1		2
8793		HOLL	12 12 1528	S17 W28	12 10.5		A	AX	10	1		2
8793	29475	MWIL	12 12 1530	S17 W29	12 10.4	4	(AP)					
8793		RAMY	12 12 1559	S17 W29	12 10.5		A	AX		1		3
8793		LEAR	12 13 0120	S17 W34	12 10.5		A	AX		1		3
8793		HOLL	12 15 1729	S16 W67	12 10.6		A	AX	10	1		2
8795	29476	MWIL	12 09 1700	S12 E22	12 11.4	4	(B)					
8795		HOLL	12 09 2010	S11 E21	12 11.4		B	DRO	30	4	3	3
8795		LEAR	12 10 0018	S12 E18	12 11.4		B	DSO	40	4	4	4
8795		VORO	12 10 0410	S15 E12	12 11.1			HAX	66	5	11	3
8795		SVTO	12 10 1159	S13 E13	12 11.5		B	DAO	80	3	5	2
8795	29476	MWIL	12 10 1600	S13 E10	12 11.4	4	(B)					
8795		RAMY	12 10 1650	S12 E09	12 11.4		B	DAO	90	5	5	3
8795		LEAR	12 11 0025	S12 E05	12 11.4		B	DAO	70	9	5	2
8795		VORO	12 11 0107	S15 W00	12 11.0			HAX	72	6	13	3
8795		KAND	12 11 0855	S12 W06	12 10.9			DAO		8	5	3

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

99
Dec 99

DECEMBER 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat	CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8792		RAMY	12 08 1254	N16	E75	12 14.2		A	HA	80	1	2	3
8792		KAND	12 08 1300	N17	E76	12 14.3			HA		1	3	1
8792	29471	MWIL	12 08 1700	N17	E70	12 14.0	4	(AP)					
8792		HOLL	12 08 1723	N19	E71	12 14.1		A	HS	180	1	2	2
8792		VORO	12 09 0045	N17	E68	12 14.2			HAX	143	2		3
8792		LEAR	12 09 0145	N16	E67	12 14.1		A	HA	90	1	2	3
8792		KAND	12 09 0715	N18	E66	12 14.3			HA		2	3	4
8792		SVTO	12 09 1033	N17	E65	12 14.4		B	HS	40	1	2	3
8792		RAMY	12 09 1210	N16	E61	12 14.1		B	CSO	100	3	3	3
8792	29471	MWIL	12 09 1700	N17	E60	12 14.3	4	(AP)					
8792		HOLL	12 09 2010	N19	E56	12 14.1		A	HA	100	2	2	3
8792		LEAR	12 10 0018	N16	E55	12 14.2		B	CAO	60	3	2	4
8792		VORO	12 10 0410	N18	E53	12 14.2			HAX	94	1		3
8792		SVTO	12 10 1159	N17	E51	12 14.4		B	CAO	80	2	2	2
8792	29471	MWIL	12 10 1600	N17	E47	12 14.2	4	(AP)					
8792		RAMY	12 10 1650	N17	E46	12 14.2		A	HA	50	2	2	3
8792		LEAR	12 11 0025	N17	E42	12 14.2		B	DAO	60	3	3	2
8792		VORO	12 11 0107	N17	E42	12 14.2			HAX	79	3		3
8792		KAND	12 11 0855	N17	E38	12 14.2			CAO		3	3	3
8792	29471	MWIL	12 11 1530	N18	E34	12 14.2	3	(AP)					
8792		RAMY	12 11 1722	N16	E33	12 14.2		B	CAO	100	4	3	3
8792		VORO	12 11 2352	N17	E29	12 14.2			HAX	73	3		3
8792		LEAR	12 12 0135	N17	E28	12 14.2		B	DAO	40	4	3	2
8792		SVTO	12 12 0727	N17	E25	12 14.2		B	CAO	40	4	5	3
8792		KAND	12 12 0740	N16	E24	12 14.1			DAO		7	6	2
8792		HOLL	12 12 1528	N18	E20	12 14.2		B	CSO	20	4	3	2
8792	29471	MWIL	12 12 1530	N17	E20	12 14.2	4	(BP)					
8792		RAMY	12 12 1559	N16	E21	12 14.2		B	CSO	20	4	2	3
8792		VORO	12 12 2343	N17	E16	12 14.2			HAX	20	1		2
8792		LEAR	12 13 0120	N16	E15	12 14.2		B	CAO	10	3	3	3
8792		KAND	12 13 0820	N16	E11	12 14.2			HA		2	2	3
8792		RAMY	12 13 1112	N18	E09	12 14.1		B	BXO		3	3	2
8792		HOLL	12 13 1554	N18	E04	12 14.0		B	CSO	10	2	4	4
8792	29471	MWIL	12 13 1700	N17	E05	12 14.1	4	(AP)					
8792		VORO	12 13 2348	N17	E03	12 14.2			AXX	10	1		2
8792		SVTO	12 14 0922	N16	W03	12 14.2		A	HA	10	1	1	3
8792		KAND	12 14 1200	N16	W04	12 14.2			AX		1	1	4
8792	29471	MWIL	12 14 1545	N18	W07	12 14.1	4	(AP)					
8792		HOLL	12 14 1622	N17	W08	12 14.1		A	AX		1		2
8792		RAMY	12 14 1716	N21	W08	12 14.1		B	BXO	10	5	4	2
8792		LEAR	12 15 0025	N19	W13	12 14.0		B	BXO	10	3	2	3
8792		RAMY	12 15 1302	N20	W18	12 14.2		B	BXO		3	6	3
8792	29471	MWIL	12 15 1545	N20	W21	12 14.0	4	(AP)					
8794		SVTO	12 08 0740	S13	E85	12 14.7		A	HS	40	1	5	3
8794		RAMY	12 08 1254	S16	E79	12 14.5		A	HA	20	1	1	3
8794		KAND	12 08 1300	S14	E78	12 14.4			HS		1	2	1
8794	29472	MWIL	12 08 1700	S15	E71	12 14.1	3	(AP)					
8794		HOLL	12 08 1723	S12	E74	12 14.3		A	HS	40	1	1	2
8794		VORO	12 09 0045	S14	E70	12 14.3			HRX	48	1		3
8794		LEAR	12 09 0145	S15	E69	12 14.3		A	HS	60	1	1	3
8794		KAND	12 09 0715	S13	E67	12 14.3			HS		1	2	4
8794		SVTO	12 09 1033	S14	E67	12 14.5		A	HS	40	1	1	3
8794		RAMY	12 09 1210	S15	E62	12 14.2		A	HS	40	1	1	3
8794	29472	MWIL	12 09 1700	S15	E65	12 14.6	4	(B)					
8794		HOLL	12 09 2010	S12	E65	12 14.7		B	ESO	60	4	12	3
8794		LEAR	12 10 0018	S15	E55	12 14.2		A	HS	30	1	1	4
8794		VORO	12 10 0410	S13	E55	12 14.3			HRX	56	1		3
8794		SVTO	12 10 1159	S14	E52	12 14.4		A	HS	30	1	2	2
8794	29472	MWIL	12 10 1600	S14	E48	12 14.3	3	(AP)					
8794		RAMY	12 10 1650	S14	E47	12 14.2		A	HS	30	1	1	3
8794		LEAR	12 11 0025	S14	E43	12 14.3		A	HS	30	1	2	2
8794		VORO	12 11 0107	S14	E44	12 14.4			AXX	20	1		3
8794		KAND	12 11 0855	S13	E40	12 14.4			CAO		3	3	3
8794	29472	MWIL	12 11 1530	S12	E35	12 14.3	3	(AP)					
8794		RAMY	12 11 1722	S15	E34	12 14.3		B	CSO	30	2	3	3
8794		VORO	12 11 2352	S13	E31	12 14.3			AXX	28	1		3
8794		LEAR	12 12 0135	S14	E30	12 14.3		B	CSO	40	3	3	2
8794		SVTO	12 12 0727	S13	E28	12 14.4		B	CSO	20	2	4	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)
DECEMBER 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8794		KAND	12 12 0740	S13 E27	12 14.3			CSO		2	3	2
8794		HOLL	12 12 1528	S12 E23	12 14.4		B	CSO	30	2	3	2
8794	29472	MWIL	12 12 1530	S14 E26	12 14.6	5	(BP)					
8794		RAMY	12 12 1559	S16 E23	12 14.4		B	CRO	20	2	3	3
8794		VORO	12 12 2343	S13 E18	12 14.3			HAX	44	1		2
8794		LEAR	12 13 0120	S13 E17	12 14.3		B	CSO	20	6	6	3
8794		KAND	12 13 0820	S14 E15	12 14.5			CAO		4	6	3
8794		RAMY	12 13 1112	S13 E11	12 14.3		B	CRO	10	4	5	2
8794	29472	HOLL	12 13 1554	S12 E10	12 14.4		B	CSO	30	5	4	4
8794		MWIL	12 13 1700	S13 E09	12 14.4	4	(AP)					
8794		VORO	12 13 2348	S13 E07	12 14.5			BXO	14	3	3	2
8794		SVTO	12 14 0922	S14 W01	12 14.3		A	HA	10	1	1	3
8794		KAND	12 14 1200	S13 W01	12 14.4			CSO		7	6	4
8794	29472	MWIL	12 14 1545	S15 E00	12 14.6	4	(BP)					
8794		HOLL	12 14 1622	S13 W04	12 14.4		A	HS	20	1		2
8794		RAMY	12 14 1716	S11 W03	12 14.5		B	BXO	10	6	5	2
8794		VORO	12 14 2356	S15 W05	12 14.6			BXI	28	8	7	2
8794		LEAR	12 15 0025	S14 W05	12 14.6		B	CSO	30	7	9	3
8794		KAND	12 15 0930	S14 W09	12 14.7			BXO		3	8	3
8794		RAMY	12 15 1302	S13 W18	12 14.2		B	BXO	10	7	12	3
8794	29472	MWIL	12 15 1545	S14 W15	12 14.5	4	(BP)					
8794		HOLL	12 15 1729	S14 W16	12 14.5		B	BXO	10	2	4	2
8794		VORO	12 15 2344	S15 W15	12 14.8			BXI	32	3	8	1
8794		LEAR	12 16 0037	S14 W15	12 14.9		B	BXO	30	10	11	5
8794	29472	MWIL	12 16 1545	S14 W27	12 14.6	4	(AP)					
8794		VORO	12 16 2346	S17 W26	12 15.0			AXX	14	2		2
8794		LEAR	12 17 0040	S14 W28	12 14.9		B	BXO	20	10	9	5
8794		LEAR	12 18 0202	S15 W41	12 15.0		B	BXO		2	2	4
8794		RAMY	12 18 1301	S16 W48	12 14.9		A	AX		2	1	4
8794	29472	MWIL	12 18 1545	S16 W48	12 15.0	4	(AF)					
8794		HOLL	12 18 1609	S17 W48	12 15.0		A	AX		1		4
8797		LEAR	12 13 0120	S35 E23	12 14.9		B	BXO		2	3	3
8797		KAND	12 13 0820	S33 E20	12 14.9			BXO		7	4	3
8797		RAMY	12 13 1112	S34 E15	12 14.7		B	BXO	10	6	6	2
8797		HOLL	12 13 1554	S32 E16	12 14.9		B	BXO	20	8	6	4
8797	29479	MWIL	12 13 1700	S34 E14	12 14.8	4	(BP)					
8797		VORO	12 13 2348	S33 E11	12 14.9			BXI	29	7	4	2
8797		SVTO	12 14 0922	S34 E06	12 14.9		B	DAI	80	6	5	3
8797		KAND	12 14 1200	S33 E03	12 14.7			CSO		8	5	4
8797	29479	MWIL	12 14 1545	S33 E02	12 14.8	4	(BP)					
8797		HOLL	12 14 1622	S33 E02	12 14.8		B	CAO	80	9	8	2
8797		RAMY	12 14 1716	S32 W01	12 14.6		B	CAO	50	12	7	2
8797		VORO	12 14 2356	S34 W03	12 14.7			DAI	141	9	4	2
8797		LEAR	12 15 0025	S33 W04	12 14.7		B	DAO	80	10	7	3
8797		KAND	12 15 0930	S33 W08	12 14.8			CAO		10	7	3
8797		RAMY	12 15 1302	S33 W12	12 14.6		B	CSO	80	11	7	3
8797	29479	MWIL	12 15 1545	S33 W13	12 14.6	4	(BP)					
8797		HOLL	12 15 1729	S33 W12	12 14.8		B	DSO	110	7	8	2
8797		VORO	12 15 2344	S35 W16	12 14.7			DAI	196	6	6	1
8797		LEAR	12 16 0037	S32 W17	12 14.7		B	DSO	100	11	7	5
8797		KAND	12 16 0940	S32 W22	12 14.7			DAO		7	6	2
8797	29479	MWIL	12 16 1545	S33 W25	12 14.7	4	(B)					
8797		RAMY	12 16 1724	S32 W28	12 14.5		B	DAO	60	4	6	2
8797		HOLL	12 16 1830	S34 W25	12 14.8		B	DSO	90	19	10	2
8797		VORO	12 16 2346	S34 W28	12 14.7			DAI	159	10	9	2
8797		LEAR	12 17 0040	S32 W29	12 14.7		B	DSO	80	14	8	5
8797		KAND	12 17 0655	S33 W32	12 14.7			DAO		8	7	3
8797	29479	MWIL	12 17 1530	S33 W37	12 14.7	5	(BP)					
8797		RAMY	12 17 1600	S32 W37	12 14.7		B	DAO	40	4	7	2
8797		HOLL	12 17 1621	S35 W38	12 14.6		B	DSO	40	6	8	3
8797		VORO	12 18 0010	S34 W43	12 14.6			BXO	22	3	5	2
8797		LEAR	12 18 0202	S32 W44	12 14.6		B	CRO	30	5	6	4
8797		KAND	12 18 0925	S33 W50	12 14.4			AX		1		3
8797		RAMY	12 18 1301	S31 W53	12 14.4		A	AX	10	2	1	4
8797	29479	MWIL	12 18 1545	S32 W53	12 14.5	4	(AP)					
8797		HOLL	12 18 1609	S34 W52	12 14.5		A	AX		1		4
8797		LEAR	12 19 0110	S32 W53	12 14.8		A	AX		1		3
8801		KAND	12 14 1200	S23 E08	12 15.1			AX		3	3	4

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

101
Dec 99

DECEMBER 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time		Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual	
			Mo	Day										(UT)
8801	29482	MWIL	12	14	1545	S23 E05	12 15.0	4	(B)					
8801		HOLL	12	14	1622	S23 E03	12 14.9		B	BXO	2	2	2	
8801		RAMY	12	14	1716	S19 E03	12 14.9		B	BXO	4	5	2	
8801		LEAR	12	15	0025	S21 E01	12 15.1		B	BXO	2	1	3	
8801		RAMY	12	15	1302	S20 W08	12 14.9		B	BXO	10	7	9	3
8801	29482	MWIL	12	15	1545	S22 W07	12 15.1	4	(AF)					
8801		HOLL	12	15	1729	S25 W11	12 14.9		A	AX	1		2	
8801		LEAR	12	16	0037	S19 W15	12 14.9		A	AX	1		5	
8805		VORO	12	14	2356	N17 E11	12 15.8			AXX	18	2	2	
8805		LEAR	12	17	0040	N18 W13	12 16.0		A	AX	2	2	5	
8805	29487	MWIL	12	17	1530	N18 W22	12 16.0	5	(AP)					
8805		RAMY	12	17	1600	N18 W23	12 15.9		A	HS	10	1	2	
8805		HOLL	12	17	1621	N17 W25	12 15.8		A	AX	10	2	3	
8805		VORO	12	17	2356	N17 W28	12 15.9			AXX	11	1	2	
8805		LEAR	12	18	0202	N18 W29	12 15.9		A	AX	1		4	
8805		KAND	12	18	0925	N18 W34	12 15.8			AX	1		3	
8805		RAMY	12	18	1301	N19 W36	12 15.8		A	AX	1		4	
8805		VORO	12	19	0055	N16 W40	12 16.0			AXX	4	1	3	
8802	29484	MWIL	12	16	1545	S22 E08	12 17.3	4	(B)					
8802		RAMY	12	16	1724	S23 E05	12 17.1		B	BXO	10	4	3	2
8802		HOLL	12	16	1830	S23 E08	12 17.4		B	BXO	10	4	3	2
8802A		LEAR	12	16	0037	S15 E28	12 18.1		A	AX	10	2		5
8803		RAMY	12	13	1112	S11 E78	12 19.3		B	BXO	2	5	2	
8803		VORO	12	14	2356	S15 E49	12 18.7			AXX	10	1	2	
8803		KAND	12	16	0940	S12 E31	12 18.7			BXO	5	4	2	
8803	29485	MWIL	12	16	1545	S12 E28	12 18.8	4	(BP)					
8803		RAMY	12	16	1724	S15 E26	12 18.7		B	DSO	40	10	4	2
8803		HOLL	12	16	1830	S13 E27	12 18.8		B	CRO	40	14	4	2
8803		VORO	12	16	2346	S13 E24	12 18.8			DAI	95	9	4	2
8803		LEAR	12	17	0040	S13 E23	12 18.8		B	DSO	50	13	5	5
8803		KAND	12	17	0655	S12 E20	12 18.8			CAO	20	6	3	
8803	29485	MWIL	12	17	1530	S13 E15	12 18.8	5	(BP)					
8803		RAMY	12	17	1600	S14 E13	12 18.6		B	CAO	50	8	6	2
8803		HOLL	12	17	1621	S13 E14	12 18.7		B	DAO	120	12	6	3
8803		VORO	12	18	0010	S13 E11	12 18.8			CAI	154	6	5	2
8803		LEAR	12	18	0202	S13 E09	12 18.8		B	DSO	90	14	5	4
8803		KAND	12	18	0925	S12 E05	12 18.8			CHO	15	6	3	
8803		RAMY	12	18	1301	S13 E03	12 18.8		B	CAO	80	16	6	4
8803	29485	MWIL	12	18	1545	S13 E01	12 18.7	5	(D)					
8803		HOLL	12	18	1609	S13 E05	12 19.0		B	DAO	130	28	8	4
8803		VORO	12	19	0055	S14 W04	12 18.7			DAI	113	15	5	3
8803		LEAR	12	19	0110	S13 W06	12 18.6		B	DAO	120	20	7	3
8803		SVTO	12	19	0801	S13 W07	12 18.8		B	DAO	100	8	7	2
8803		KAND	12	19	0830	S13 W08	12 18.7			DAO	8	6	5	
8803		RAMY	12	19	1418	S12 W11	12 18.8		B	DAO	30	14	6	3
8803	29485	MWIL	12	19	1545	S13 W13	12 18.7	4	(BP)					
8803		HOLL	12	19	2028	S13 W14	12 18.8		B	DSO	40	7	6	3
8803		LEAR	12	20	0040	S12 W18	12 18.7		BG	DAO	20	6	4	3
8803		SVTO	12	20	1100	S13 W25	12 18.6		B	DSO	50	8	6	2
8803		RAMY	12	20	1234	S13 W26	12 18.6		B	DAO	20	9	4	3
8803		HOLL	12	20	1553	S14 W27	12 18.6		B	BXO	20	7	4	2
8803	29485	MWIL	12	20	1600	S14 W27	12 18.6	4	(AP)					
8803		VORO	12	20	2338	S13 W25	12 19.1			BXO	17	2	1	2
8803		LEAR	12	21	0107	S12 W32	12 18.6		B	CAO	30	6	3	4
8803		KAND	12	21	0840	S12 W35	12 18.7			AX	2	1	2	
8803	29485	MWIL	12	21	1530	S15 W39	12 18.7	5	(B)					
8803		HOLL	12	21	1612	S15 W39	12 18.7		B	BXO	20	7	4	3
8803		RAMY	12	21	1655	S14 W40	12 18.7		B	BXO	10	7	5	2
8803		VORO	12	22	0000	S15 W43	12 18.7			DRI	53	6	8	3
8803		LEAR	12	22	0035	S14 W45	12 18.6		B	DAO	50	6	5	3
8803		RAMY	12	22	1305	S13 W52	12 18.6		B	DSO	60	6	8	2
8803	29485	MWIL	12	22	1545	S14 W54	12 18.6	4	(AP)					
8803		VORO	12	22	2338	S14 W56	12 18.7			BXO	15	3	8	2
8803		LEAR	12	23	0050	S13 W58	12 18.6		B	DAO	40	6	5	3
8803		SVTO	12	23	0819	S14 W62	12 18.7		B	DSO	40	2	9	2

SUNSPOT GROUPS
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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
8803		RAMY	12 23 1455	S12 W60	12 19.1		B	DSO	20	4	5	2
8803	29485	MWIL	12 23 1600	S15 W67	12 18.6	4	(BF)					
8803		HOLL	12 23 1600	S16 W68	12 18.5		A	AX		1		2
8803		LEAR	12 24 0020	S13 W67	12 18.9		B	BXO		3	3	3
8800		RAMY	12 13 1112	N09 E80	12 19.5		A	AX		1		2
8800		VORO	12 13 2348	N10 E75	12 19.6			AXX	20	1		2
8800		SVTO	12 14 0922	N10 E68	12 19.5		A	HR	30	1	1	3
8800		KAND	12 14 1200	N10 E68	12 19.6			AX		1	1	4
8800	29483	MWIL	12 14 1545	N10 E65	12 19.5	4	(AP)					
8800		HOLL	12 14 1622	N12 E64	12 19.5		A	AX	10	1		2
8800		RAMY	12 14 1716	N07 E65	12 19.6		A	AX		1		2
8800		VORO	12 14 2356	N10 E60	12 19.5			AXX	9	1		2
8800		LEAR	12 15 0025	N09 E59	12 19.4		A	HR	20	1	1	3
8800		RAMY	12 15 1302	N08 E53	12 19.5		A	AX		1		3
8800	29483	MWIL	12 15 1545	N10 E51	12 19.5	4	(AP)					
8800		HOLL	12 15 1729	N11 E49	12 19.4		A	AX		1		2
8800		VORO	12 15 2344	N12 E46	12 19.4			AXX	7	1		1
8800		LEAR	12 16 0037	N09 E46	12 19.5		A	AX		1		5
8800		KAND	12 16 0940	N10 E41	12 19.5			AX		2	1	2
8800	29483	MWIL	12 16 1545	N09 E37	12 19.4	4	(AP)					
8800		RAMY	12 16 1724	N08 E36	12 19.4		A	HS	20	1		2
8800		HOLL	12 16 1830	N10 E35	12 19.4		A	AX	10	2	1	2
8800		VORO	12 16 2346	N10 E32	12 19.4			AXX	11	1		2
8800		RAMY	12 17 1600	N08 E23	12 19.4		A	AX		1		2
8800		HOLL	12 17 1621	N10 E22	12 19.3		A	AX		1		3
8800		VORO	12 18 0010	N10 E18	12 19.3			AXX	7	1		2
8800		LEAR	12 18 0202	N10 E16	12 19.3		A	AX		1		4
8798		KAND	12 13 0820	S13 E85	12 19.8			AX		1	1	3
8798		RAMY	12 13 1112	S15 E79	12 19.4		B	BXO	10	5	4	2
8798		HOLL	12 13 1554	S13 E79	12 19.6		B	BXO	20	4	5	4
8798	29481	MWIL	12 13 1700	S14 E78	12 19.6	4	AP					
8798		VORO	12 13 2348	S14 E75	12 19.6			DAI	98	4	5	2
8798		SVTO	12 14 0922	S14 E69	12 19.6		B	DAO	80	3	5	3
8798		KAND	12 14 1200	S14 E68	12 19.6			DAO		7	4	4
8798	29481	MWIL	12 14 1545	S14 E65	12 19.6	4	(B)					
8798		HOLL	12 14 1622	S12 E63	12 19.4		B	DAI	120	8	6	2
8798		RAMY	12 14 1716	S16 E62	12 19.4		B	DAO	90	8	7	2
8798		VORO	12 14 2356	S14 E61	12 19.6			DAI	286	16	4	2
8798		LEAR	12 15 0025	S15 E60	12 19.5		B	DAI	150	15	5	3
8798		KAND	12 15 0930	S13 E57	12 19.7			DKC		21	8	3
8798		RAMY	12 15 1302	S15 E53	12 19.5		B	DKC	300	17	8	3
8798	29481	MWIL	12 15 1545	S14 E51	12 19.5	5	(B)					
8798		HOLL	12 15 1729	S12 E51	12 19.6		B	DKC	440	6	8	2
8798		VORO	12 15 2344	S14 E49	12 19.7			DKI	551	8	6	1
8798		LEAR	12 16 0037	S15 E46	12 19.5		B	DKC	300	20	8	5
8798		KAND	12 16 0940	S12 E42	12 19.6			DKC		27	9	2
8798	29481	MWIL	12 16 1545	S12 E38	12 19.5	5	(B)					
8798		RAMY	12 16 1724	S13 E35	12 19.4		B	DKI	590	22	8	2
8798		HOLL	12 16 1830	S12 E37	12 19.5		B	DKI	500	46	9	2
8798		VORO	12 16 2346	S10 E34	12 19.5			DAI	216	9	6	2
8798		VORO	12 16 2346	S13 E34	12 19.5			DKI	607	24	7	2
8798		LEAR	12 17 0040	S14 E34	12 19.6		B	DKC	430	54	9	5
8798		KAND	12 17 0655	S12 E30	12 19.5			DAI		51	9	3
8798	29481	MWIL	12 17 1530	S12 E26	12 19.6	5	(D)					
8798		RAMY	12 17 1600	S13 E24	12 19.5		B	DKI	700	23	10	2
8798		HOLL	12 17 1621	S12 E23	12 19.4		BGD	EKC	640	54	12	3
8798		VORO	12 18 0010	S12 E21	12 19.6			DAI	298	8	8	2
8798		VORO	12 18 0010	S13 E20	12 19.5			DKI	354	10	8	2
8798		LEAR	12 18 0202	S13 E19	12 19.5		BGD	DKC	490	54	10	4
8798		KAND	12 18 0925	S12 E15	12 19.5			DKC		40	10	3
8798		RAMY	12 18 1301	S13 E13	12 19.5		BG	EKI	460	52	12	4
8798	29481	MWIL	12 18 1545	S13 E12	12 19.6	5	(D)					
8798		HOLL	12 18 1609	S12 E10	12 19.4		BG	EKI	510	58	11	4
8798		VORO	12 19 0055	S14 E05	12 19.4			DKI	592	42	8	3
8798		LEAR	12 19 0110	S13 E08	12 19.6		BGD	EKI	520	58	11	3
8798		SVTO	12 19 0801	S13 E02	12 19.5		BG	EKI	520	28	13	2
8798		KAND	12 19 0830	S13 E02	12 19.5			EKI		44	12	5

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 (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8804		LEAR	12 17 0040	S17 E78	12 22.9		A	HA	90	1	2	5
8804		KAND	12 17 0655	S16 E76	12 23.0			HH		1	3	3
8804	29486	MWIL	12 17 1530	S17 E71	12 23.0	5	(AP)					
8804		RAMY	12 17 1600	S20 E70	12 23.0		A	HS	230	1	5	2
8804		HOLL	12 17 1621	S16 E69	12 22.9		A	HH	210	1	3	3
8804		VORO	12 18 0010	S17 E67	12 23.1			HKX	389	1		2
8804		LEAR	12 18 0202	S18 E65	12 23.0		A	HA	140	1	2	4
8804		KAND	12 18 0925	S16 E63	12 23.2			HH		1	3	3
8804		RAMY	12 18 1301	S21 E60	12 23.1		B	CHO	260	2	6	4
8804	29486	MWIL	12 18 1545	S17 E58	12 23.1	5	(AP)					
8804	29489	MWIL	12 18 1545	S22 E58	12 23.1	4	(AP)					
8804		HOLL	12 18 1609	S17 E58	12 23.1		B	CHO	220	3	3	4
8804		VORO	12 19 0055	S17 E54	12 23.1			HKX	394	1		3
8804		LEAR	12 19 0110	S18 E56	12 23.3		B	CHO	190	3	3	3
8804		SVTO	12 19 0801	S18 E51	12 23.2		B	CKO	340	3	6	2
8804		KAND	12 19 0830	S16 E50	12 23.1			HH		1	3	5
8804		KAND	12 19 0830	S22 E52	12 23.3			AX		1	1	5
8804		RAMY	12 19 1418	S21 E47	12 23.2		B	CHO	280	2	7	3
8804	29486	MWIL	12 19 1545	S17 E45	12 23.1	5	(AP)					
8804	29489	MWIL	12 19 1545	S23 E47	12 23.3	4	(AF)					
8804		HOLL	12 19 2028	S18 E44	12 23.2		B	DHO	220	3	4	3
8804		LEAR	12 20 0040	S20 E41	12 23.2		A	HH	260	4	4	3
8804		SVTO	12 20 1100	S19 E33	12 23.0		B	CHO	340	2	7	2
8804		RAMY	12 20 1234	S22 E35	12 23.2		B	CHO	320	3	9	3
8804		HOLL	12 20 1553	S19 E34	12 23.2		B	CHO	250	2	4	2
8804	29486	MWIL	12 20 1600	S17 E32	12 23.1	5	(AP)					
8804	29489	MWIL	12 20 1600	S23 E35	12 23.4	4	(AF)					
8804		VORO	12 20 2338	S18 E29	12 23.2			HAX	379	1		2
8804		LEAR	12 21 0107	S19 E27	12 23.1		A	HH	240	1	3	4
8804		KAND	12 21 0840	S16 E23	12 23.1			HH		1	4	2
8804	29486	MWIL	12 21 1530	S17 E19	12 23.1	6	(BP)					
8804		HOLL	12 21 1612	S17 E19	12 23.1		A	HH	310	1	3	3
8804		RAMY	12 21 1655	S17 E19	12 23.1		B	CHO	300	2	4	2
8804		VORO	12 22 0000	S15 E14	12 23.0			HHX	406	1		3
8804		LEAR	12 22 0035	S18 E14	12 23.1		A	HH	210	1	3	3
8804		RAMY	12 22 1305	S17 E07	12 23.1		A	HS	280	1	4	2
8804	29486	MWIL	12 22 1545	S17 E06	12 23.1	5	(AP)					
8804		VORO	12 22 2338	S17 E02	12 23.1			HHX	355	1		2
8804		LEAR	12 23 0050	S18 E01	12 23.1		A	HH	220	1	3	3
8804		SVTO	12 23 0819	S17 W03	12 23.1		A	HH	300	1	4	2
8804		RAMY	12 23 1455	S18 W06	12 23.2		A	HH	200	1	4	2
8804	29486	MWIL	12 23 1600	S17 W07	12 23.1	5	(AP)					
8804		HOLL	12 23 1600	S18 W07	12 23.1		A	HH	300	1	3	2
8804		LEAR	12 24 0020	S18 W13	12 23.0		A	HH	290	1	4	3
8804		RAMY	12 24 1306	S17 W19	12 23.1		A	HH	310	2	5	3
8804	29486	MWIL	12 24 1600	S17 W20	12 23.1	6	(AP)					
8804		LEAR	12 25 0015	S18 W26	12 23.0		A	HH	220	2	4	3
8804		VORO	12 25 0340	S18 W27	12 23.1			HKX	437	1		2
8804		SVTO	12 25 0832	S17 W30	12 23.1		B	CKO	220	2	6	2
8804		RAMY	12 25 1221	S16 W32	12 23.1		B	CAO	230	4	8	2
8804	29486	MWIL	12 25 1600	S16 W33	12 23.2	6	(BP)					
8804		LEAR	12 26 0145	S18 W39	12 23.1		B	CHO	220	4	7	3
8804		SVTO	12 26 1204	S16 W45	12 23.1		A	HK	270	1	4	1
8804		RAMY	12 26 1317	S16 W46	12 23.1		B	CAO	310	5	8	3
8804	29486	MWIL	12 26 1600	S17 W48	12 23.0	6	(AP)					
8804		HOLL	12 26 1815	S18 W48	12 23.1		A	HH	230	1	3	3
8804		LEAR	12 27 0036	S17 W52	12 23.1		B	CSO	160	3	3	3
8804	29486	MWIL	12 27 1545	S18 W60	12 23.1	5	(AP)					
8804		HOLL	12 27 1704	S18 W61	12 23.1		A	HS	210	3	3	4
8804		LEAR	12 28 0027	S17 W65	12 23.1		A	HS	180	3	5	4
8804		VORO	12 28 0233	S18 W65	12 23.1			HRX	90	1		1
8804		KAND	12 28 0935	S18 W70	12 23.1			HS		1	3	2
8804		SVTO	12 28 1308	S17 W75	12 22.8		A	HA	150	1	3	2
8804		HOLL	12 28 2053	S19 W76	12 23.1		A	HA	180	1	3	1
8804		VORO	12 28 2339	S18 W79	12 23.0			HRX	331	1		2
8804		LEAR	12 29 0010	S17 W79	12 23.0		A	HS	180	1	4	4
8804		SVTO	12 29 0950	S17 W85	12 22.9		A	HS	60	1	5	3
8804	29486	MWIL	12 29 1600	S17 W88	12 23.0	4	AP					
8804		HOLL	12 29 1645	S19 W87	12 23.0		A	HS	60	1	2	4

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NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time		Lat	CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
			Mo	Day											(UT)
8806		LEAR	12	30	0010	N22 W83	12 23.6		A	HA	60	2	5	3
8806		VORO	12	30	0241	N20 W82	12 23.8			HRX	113	1		2
8807		VORO	12	18	0010	N11 E82	12 24.2			CAO	53	2	9	2
8807		LEAR	12	18	0202	N11 E79	12 24.0		A	HA	30	1	1	4
8807		KAND	12	18	0925	N12 E80	12 24.4			HS		1	2	3
8807		RAMY	12	18	1301	N09 E75	12 24.2		B	CRO	30	2	3	4
8807	29490	MWIL	12	18	1545	N11 E72	12 24.1	4	(AF)					
8807		HOLL	12	18	1609	N13 E73	12 24.2		B	CSO	40	4	8	4
8807		VORO	12	19	0055	N12 E69	12 24.2			HAX	73	2		3
8807		LEAR	12	19	0110	N11 E70	12 24.3		B	CSO	40	4	8	3
8807		SVTO	12	19	0801	N12 E64	12 24.1		B	CRO	70	3	3	2
8807		KAND	12	19	0830	N12 E65	12 24.2			HS		2	2	5
8807		RAMY	12	19	1418	N10 E61	12 24.2		B	CRO	20	4	3	3
8807	29490	MWIL	12	19	1545	N11 E60	12 24.2	5	(AF)					
8807		HOLL	12	19	2028	N13 E58	12 24.2		B	CSO	40	3	2	3
8807		LEAR	12	20	0040	N10 E55	12 24.2		B	CAO	30	4	2	3
8807		SVTO	12	20	1100	N11 E49	12 24.1		B	CSO	30	5	4	2
8807		RAMY	12	20	1234	N09 E52	12 24.4		B	CAO	70	10	13	3
8807		HOLL	12	20	1553	N12 E47	12 24.2		B	CSO	30	2	3	2
8807	29490	MWIL	12	20	1600	N11 E48	12 24.3	4	(AF)					
8807		VORO	12	20	2338	N11 E44	12 24.3			HRX	26	1		2
8807		LEAR	12	21	0107	N10 E42	12 24.2		B	DSO	40	8	6	4
8807		KAND	12	21	0840	N13 E38	12 24.2			CAO		4	3	2
8807	29490	MWIL	12	21	1530	N11 E34	12 24.2	5	(BG)					
8807		HOLL	12	21	1612	N12 E32	12 24.1		B	CSO	30	5	4	3
8807		RAMY	12	21	1655	N11 E32	12 24.1		B	CRO	20	8	4	2
8807		VORO	12	22	0000	N12 E29	12 24.2			AXX	18	4		3
8807		LEAR	12	22	0035	N10 E28	12 24.1		B	DAO	30	6	6	3
8807		RAMY	12	22	1305	N11 E21	12 24.1		B	DSO	30	5	3	2
8807	29490	MWIL	12	22	1545	N11 E21	12 24.2	4	(AP)					
8807		VORO	12	22	2338	N12 E17	12 24.3			AXX	15	2		2
8807		LEAR	12	23	0050	N10 E14	12 24.1		B	CAO	20	6	5	3
8807		SVTO	12	23	0819	N11 E09	12 24.0		B	DAO	40	4	5	2
8807		RAMY	12	23	1455	N11 E07	12 24.1		B	DAO	20	2	1	2
8807		HOLL	12	23	1600	N11 E07	12 24.2		B	BXO	10	5	5	2
8807	29490	MWIL	12	23	1600	N11 E08	12 24.3	4	(B)					
8807		LEAR	12	24	0020	N12 E00	12 24.0		BG	EAO	20	11	12	3
8807		RAMY	12	24	1306	N11 W04	12 24.2		B	BXO	10	9	4	3
8807	29490	MWIL	12	24	1600	N11 W05	12 24.3	3	(BG)					
8807		LEAR	12	25	0015	N11 W08	12 24.4		B	CRO	10	6	8	3
8807		VORO	12	25	0340	N11 W10	12 24.4			AXX	3	1		2
8807		SVTO	12	25	0832	N11 W16	12 24.1		B	BXO	10	4	6	2
8807		RAMY	12	25	1221	N12 W18	12 24.1		B	BXO	10	7	4	2
8807	29490	MWIL	12	25	1600	N11 W19	12 24.2	3	(BP)					
8807		LEAR	12	26	0145	N11 W25	12 24.2		B	BXO	10	5	6	3
8807		VORO	12	28	0233	N10 W52	12 24.2			AXX	22	1		1
8811		LEAR	12	25	0015	S28 W04	12 24.7		A	AX		1		3
8811		RAMY	12	25	1221	S29 W10	12 24.7		A	AX		3	2	2
8811	29496	MWIL	12	25	1600	S29 W11	12 24.8	4	(B)					
8811		LEAR	12	26	0145	S28 W17	12 24.7		A	AX		1		3
8811		LEAR	12	29	0010	S28 W51	12 25.0		B	BXO	10	2	2	4
8811		HOLL	12	29	1645	S31 W60	12 25.0		A	AX		1		4
8812		RAMY	12	24	1306	S29 E52	12 28.6		B	BXO		2	3	3
8812		LEAR	12	27	0036	S26 E19	12 28.5		B	BXO		2	3	3
8812		VORO	12	28	0233	S24 E06	12 28.6			AXX	15	1		1
8812		VORO	12	28	2339	S27 W10	12 28.2			AXX	14	2		2
8812		LEAR	12	29	0010	S27 W08	12 28.4		B	CRO	20	5	4	4
8812		SVTO	12	29	0950	S28 W14	12 28.3		B	CSO	20	2	5	3
8812	29499	MWIL	12	29	1600	S28 W17	12 28.3	4	(B)					
8812		HOLL	12	29	1645	S29 W17	12 28.4		B	BXO	10	2	5	4
8812		LEAR	12	30	0010	S27 W22	12 28.3		B	CRO	10	5	7	3
8812		VORO	12	30	0241	S28 W25	12 28.1			AXX	9	1		2
8812		KAND	12	30	0755	S28 W28	12 28.1			AX		1	1	1
8812	29499	MWIL	12	30	1545	S28 W32	12 28.1	4	(BP)					
8812		HOLL	12	30	1627	S28 W32	12 28.2		A	AX		1		3
8812		LEAR	12	31	0145	S27 W35	12 28.3		A	AX		1		3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
8809		LEAR	12 24 0020	N20 E78	12 30.0		B	BXO		3	5	3
8809		RAMY	12 24 1306	N22 E73	12 30.1		B	BXO	10	3	7	3
8809	29495	MWIL	12 24 1600	N22 E68	12 29.9	4	(BP)					
8809		LEAR	12 25 0015	N21 E65	12 30.0		B	CSO	40	5	6	3
8809		VORO	12 25 0340	N23 E69	12 30.5			BXO	35	3	15	2
8809		SVTO	12 25 0832	N22 E64	12 30.3		B	CSO	20	5	7	2
8809		RAMY	12 25 1221	N21 E59	12 30.0		B	BXO	20	8	6	2
8809	29497	MWIL	12 25 1600	N21 E57	12 30.0	4	(B)					
8809		LEAR	12 26 0145	N21 E52	12 30.0		B	CSO	40	6	6	3
8809		SVTO	12 26 1204	N21 E46	12 30.0		B	DSO	30	5	8	1
8809		RAMY	12 26 1317	N21 E47	12 30.1		B	BXO	20	11	8	3
8809	29497	MWIL	12 26 1600	N22 E44	12 30.0	4	(B)					
8809		HOLL	12 26 1815	N22 E43	12 30.1		B	BXO	20	6	8	3
8809		LEAR	12 27 0036	N21 E38	12 29.9		B	BXO	20	8	9	3
8809	29497	MWIL	12 27 1545	N21 E32	12 30.1	5	(B)					
8809		HOLL	12 27 1704	N23 E30	12 30.0		B	DAO	50	6	6	4
8809		LEAR	12 28 0027	N22 E27	12 30.1		B	DAO	40	4	6	4
8809		VORO	12 28 0233	N23 E29	12 30.3			AXX	20	1		1
8809		KAND	12 28 0935	N22 E21	12 30.0			BXO		3	7	2
8809		SVTO	12 28 1308	N22 E21	12 30.2		B	DSO	40	4	7	2
8809		HOLL	12 28 2053	N23 E15	12 30.0		B	CSO	30	4	7	1
8809		VORO	12 28 2339	N21 E18	12 30.4			HAX	38	3		2
8809		LEAR	12 29 0010	N22 E15	12 30.1		B	CRO	30	6	8	4
8809		LEAR	12 30 0010	N24 E05	12 30.4		B	BXO		3	6	3
8809		LEAR	12 31 0145	N24 W08	12 30.4		B	BXO		2	6	3
8810		RAMY	12 24 1306	N35 E80	12 30.9		A	HS	30	1	1	3
8810	29494	MWIL	12 24 1600	N36 E75	12 30.7	4	(AP)					
8810		LEAR	12 25 0015	N35 E74	12 30.9		B	DAO	90	3	8	3
8810		VORO	12 25 0340	N36 E74	12 31.1			HAX	111	1		2
8810		SVTO	12 25 0832	N37 E74	12 31.3		B	ESO	150	7	14	2
8810		RAMY	12 25 1221	N36 E72	12 31.3		B	ESI	160	6	13	2
8810	29498	MWIL	12 25 1600	N36 E70	12 31.3	4	(B)					
8810		LEAR	12 26 0145	N35 E62	12 31.0		B	ESO	190	10	12	3
8810		SVTO	12 26 1204	N36 E61	12 31.4		B	FSO	250	4	16	1
8810		RAMY	12 26 1317	N36 E62	12 31.5		B	EKI	390	8	15	3
8810	29498	MWIL	12 26 1600	N37 E60	12 31.5	5	(B)					
8810		HOLL	12 26 1815	N38 E59	12 31.5		B	FKO	500	7	18	3
8810		LEAR	12 27 0036	N37 E56	12 31.5		B	EKO	280	7	15	3
8810	29498	MWIL	12 27 1545	N37 E47	12 31.4	5	(B)					
8810		HOLL	12 27 1704	N39 E46	12 31.4		B	FKO	510	14	18	4
8810		LEAR	12 28 0027	N38 E43	12 31.5		B	FKO	390	12	16	4
8810		VORO	12 28 0233	N36 E37	12 31.1			HAX	92	2	3	1
8810		VORO	12 28 0233	N39 E48	01 1.0			HAX	125	5		1
8810		KAND	12 28 0935	N38 E38	12 31.5			FKO		5	17	2
8810		SVTO	12 28 1308	N37 E37	12 31.5		B	FKO	490	8	18	2
8810		HOLL	12 28 2053	N39 E33	12 31.5		B	FKO	240	10	17	1
8810		VORO	12 28 2339	N38 E26	12 31.1			HAX	102	5	2	2
8810		LEAR	12 29 0010	N38 E30	12 31.4		B	FKO	380	14	17	4
8810		SVTO	12 29 0950	N37 E27	12 31.6		B	FKO	360	10	17	3
8810	29498	MWIL	12 29 1600	N37 E24	12 31.6	5	(BG)					
8810		HOLL	12 29 1645	N36 E22	12 31.5		B	EKO	320	25	15	4
8810		LEAR	12 30 0010	N38 E20	12 31.6		B	FAO	350	20	16	3
8810		VORO	12 30 0241	N37 E11	12 31.0			HAX	84	4		2
8810		VORO	12 30 0241	N39 E24	01 1.0			HAX	113	4		2
8810		KAND	12 30 0755	N38 E15	12 31.5			FAO		13	16	1
8810		SVTO	12 30 1034	N36 E13	12 31.5		B	FAO	300	7	15	2
8810		RAMY	12 30 1323	N36 E13	12 31.6		B	FAO	340	16	16	2
8810	29498	MWIL	12 30 1545	N37 E11	12 31.5	5	(BG)					
8810		HOLL	12 30 1627	N37 E08	12 31.3		B	FAO	300	17	16	3
8810		VORO	12 31 0003	N44 E01	12 31.1			HAX	160	4		2
8810		LEAR	12 31 0145	N38 E06	12 31.5		B	FAO	330	15	16	3
8810		SVTO	12 31 1126	N38 E02	12 31.6		B	EAO	340	10	16	3
8810		RAMY	12 31 1227	N37 E02	12 31.7		B	FSO	320	23	16	3
8810		HOLL	12 31 2108	N38 W06	12 31.4		B	FAO	340	17	16	3
8810		VORO	01 01 0003	N37 W11	12 31.1			CAO	121	3	4	2
8810		LEAR	01 01 0145	N38 W08	12 31.4		B	FAO	320	14	16	3
8810		KAND	01 01 0820	N36 W10	12 31.5			FAO		7	16	1
8810		RAMY	01 01 1245	N38 W10	12 31.7		BG	ESO	260	11	15	3

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SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1999

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time		Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual	
			Mo	Day										UT
8810		SVTO	01	01	1352	N37 W13	12 31.5		B	FAO	230	8	18	3
8810		HOLL	01	01	1951	N38 W17	12 31.4		B	FSO	310	6	16	2
8810		LEAR	01	02	0016	N37 W15	12 31.8		B	ESO	170	6	15	3
8810		SVTO	01	02	0922	N38 W23	12 31.5		B	EAO	170	5	14	2
8810	29498	RAMY	01	02	1318	N37 W23	12 31.7		B	FAO	190	8	16	3
8810		MWIL	01	02	1545	N37 W25	12 31.6	5	(B)					
8810		HOLL	01	02	1634	N37 W27	12 31.5		B	FSO	200	5	16	3
8810		LEAR	01	03	0003	N38 W30	12 31.6		B	FAO	180	5	16	4
8810		VORO	01	03	0053	N37 W36	12 31.1			HAX	26	1		2
8810		SVTO	01	03	0743	N38 W35	12 31.5		B	ESO	120	3	14	3
8810		KAND	01	03	1120	N37 W37	12 31.5			ESO		3	13	2
8810		RAMY	01	03	1238	N38 W35	12 31.7		B	ESO	180	3	15	3
8810	29498	MWIL	01	03	1545	N37 W36	12 31.7	5	(B)					
8810		HOLL	01	03	1801	N37 W40	12 31.5		B	ESO	130	2	12	2
8810		LEAR	01	04	0047	N39 W41	12 31.7		B	FAO	180	2	16	4
8810		VORO	01	04	0058	N36 W48	12 31.2			HAX	51	1		2
8810		KAND	01	04	0925	N37 W47	12 31.6			FAO		2	16	2
8810		RAMY	01	04	1506	N38 W48	12 31.7		B	FSO	160	4	16	3
8810	29498	MWIL	01	04	1545	N37 W50	12 31.6	5	(BF)					
8810		HOLL	01	04	1602	N37 W51	12 31.5		B	ESO	150	3	13	2
8810		VORO	01	05	0005	N36 W60	12 31.2			HAX	53	1		2
8810		LEAR	01	05	0741	N38 W57	12 31.7		B	ESO	150	3	15	3
8810		SVTO	01	05	0800	N37 W57	12 31.7		B	EAO	140	2	15	3
8810		RAMY	01	05	1220	N38 W57	12 31.9		B	DSO	130	3	15	3
8810		HOLL	01	05	1543	N37 W63	12 31.6		B	ESO	140	2	13	2
8810	29498	MWIL	01	05	1545	N37 W62	12 31.7	5	(BF)					
8810		LEAR	01	06	0018	N38 W64	12 31.8		B	EAO	140	4	14	3
8810		SVTO	01	06	0758	N37 W69	12 31.8		B	FSO	130	2	16	3
8810		RAMY	01	06	1258	N39 W73	12 31.6		B	FSO	90	2	19	3
8810	29498	MWIL	01	06	2000	N36 W70	01 1.2	3	(AP)					
8810		HOLL	01	06	2023	N36 W80	12 31.4		A	HA	40	1	2	3
8810		LEAR	01	07	0020	N38 W80	12 31.5		A	HA	40	2	2	3
8810	29498	MWIL	01	07	1600	N38 W80	01 1.2	3	AP					

Stations reporting:

HOLL = Holloman
KAND = Kandilli
LEAR = Learmonth

MWIL = Mt. Wilson
PALE = Palehua

RAMY = Ramey
SVTO = San Vito

TACH = Tashkent
VORO = Voroshilov

DECEMBER 1999

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type					Flare (UT)	X-ray Class	NOAA Region
						SWF	SEA	SPA	LF-SPA	SES			
02	1045	1057	1116	1	3		2				1052		8781
03	1358	1420	1500	2	1		1				No flare		
03	1951	1954	2004	1-	1					1	1948	C6.3	
04	1100	1120	1155	2	1		1				*		
05	0925	0926	0940	1-	1					1	0920	C1.5	8788
07	1012	1019	1047	1	3		1			1	1011	C4.3	
07	1555	1601	1615	1	1					1	1610	C1.1	8790
07	2022	2037	2115	2+	1					1	2044	C2.9	
08	1912	1915	1945	2	1					1	1911	C4.3	
09	1120	1152	1230	1	1		1				1117	C1.6	
09	1930	1957	2023	2+	1					1	1949	C2.2	8794
11	1329	1337	1414	1	1		1				No flare		
12	0902	0918	0936	1	1		1				No flare		
12	1050	1059	1126	1	1		1				No flare		
12	1256	1314	1356	1	1		1				No flare		
13	1246	1308	1411	1	1		1				1302	C1.1	
15	1317	1337	1422	1	1		1				No flare		
15	1430	1435	1458	1	1		1				No flare		
16	0835	0837	0900	1	1					1	0831	C2.2	8794
17	0537	0538	0610	1+	1					1	0533	C6.8	8798
17	0755	0757	0830	1+	1					1	0753	C3.0	
17	0933	0936	0945	1	3		1			1	0930	C4.9	8798
17	0956E	1000	1023	1	1					1	0953	C3.1	
17	1140	1145	1145D	1	1		1				*		
17	1852	1858	1912	1-	3					2	1855	C6.8	8798
18	0127	0130	0145	1+	1					1	0121	C9.4	8806
18	0428	0430	0453	1	1					1	0425	C5.3	8806
18	0952	1026	1043	2	1		1				No flare		
18	1054	1112	1149	2	1		1				No flare		
18	1637	1705	1745	2+	1					1	1647	C1.9	8806
18	1750	1803	1827	2	1					1	1809	C5.8	8806
18	1830	1832	1857	1+	1					1	1830	C5.7	8806
18	1906	1910	1934	1+	1					1	1909	M1.5	8806
19	1101	1114	1150	1	1		1				1117	C2.7	
19	1630	1633	1643	1-	1					1	No flare		
21	1629	1631	1638	1-	1					1	No flare		
21	1714	1717	1749	2-	3					3	1712	M1.1	8806
22	1055	1106	1114	2	5		1	1	1	1	1050	C6.3	
22	1900	1905	2010	2+	3					3	1852	M5.3	8806
23	0655	0659	0715	1	1					1	0702	C2.5	
23	1005	1006	1020	1-	1					1	1005	C2.9	8806
24	0802	0805	0835	1+	3		1			1	0803	C2.1	
24	0832	0838	0932	1	1		1				No flare		
24	0931	0934	0934D	2+	5		2	1		2	0928	C8.4	
24	1208	1212	1249	1	1		1				1204	C1.9	
25	1102	1130	1200	1	1		1				1124	C6.2	
25	1725	1733	1823	2+	1					1	1719	C3.3	8806

* = no flare patrol.

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1999

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type					Flare (UT)	X-ray Class	NOAA Region
						SWF	SEA	SPA	LF-SPA	SES			
26	0842	0854	0942	1+	3		1			1	0846	C3.3	8810
26	1018	1027	1056	1	1		1				No flare		
26	1124	1145	1209	1-	1		1				1126	C2.2	
26	1337	1346	1412	1	1		1				1336	C2.3	
27	0906	0918	0948	1	1			1			No flare		
27	1200	1203	1229	2	5	1	2	1			1154	M2.0	8806
28	1002	1011	1101	1	1		1				No flare		
28	1041	1048	1104	2	1			1			1036	C3.0	8806
28	1142	1206	1232	1	1		1				1212	C1.7	8806
28	1257	1326	1422	1	1		1				*		
29	0924	0929	1011	2-	3		1			1	0922	C8.8	8806
31	1206	1222	1314	1	1		1				No flare		
31	1630	1640	1700	1+	1					1	1628	C1.9	
31	1845	1852	1915	1+	1					1	1840	C2.7	

* = no flare patrol.

OBSERVATORIES REPORTING FOR DECEMBER 1999

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

Observations are not necessarily continuous.

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

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DECEMBER 1999

OBSERVATION			Sta	EVENT		Spectral Class	Event Remarks	Int (1-3)	FREQUENCY		Remarks		
Day (UT)	Start (UT)	End (UT)		Start (UT)	End (UT)				Lower (MHz)	Upper (MHz)			
01	0000	0728	HIRA										
			LEAR	0152.0	0152.0	III		1	30	55			
			LEAR	0220.0	0223.0	III		1	30	52			
				LEAR	0248.0	0248.0	III		1	30	56		
	0000	0750	CULG	0249.0	0249.0	III	B		1	28	85		
			LEAR	0544.0	0545.0	III		1	30	65			
			CULG	0545.0	0545.0	III	B		1	30	180		
	0810	1329		ONDR									
	0807	1349		POTS	0819	1349	U	I	S	2	40X	270U	
	0900	1530	BLEN										
			POTS	1003.9	1004.0	III	B		2	40X	65		
			POTS	1015.5	1015.6	III	B		2	40X	65		
			POTS	1050.0	1050.1	III	G		2	140	170U		
			POTS	1115.6	1115.8	III	G		2	40X	150		
			POTS	1146.6	1146.7	III	B		2	40X	65		
2124	2400		HIRA										
2005	2400		CULG	2128.0	2128.0	III	B		1	20	90		
02	0000	0728	HIRA										
			LEAR	0016.0	0141.0	CONT		1	30	80			
	0000	0750	CULG	0433.0	0530.0	I	S		1	70	160		
			CULG	0658.0	0659.0	III	G		1	20	140		
			CULG	0722.0	0722.0	III	B		1	45	150		
	0803	1400		POTS	0803.7	0803.8	III	B		1	75	150	
	0811	1328	ONDR										
			POTS	0813.2	0813.3	III	B		1	40X	90U		
				POTS	0820	1400	E	U	I	S,C,DC	2	110U	170U
	0900	1530	BLEN										
			POTS	0954.7	0954.9	III	B		2	110U	160		
			POTS	1058.7	1058.8	III	B		2	110U	170U		
			POTS	1103.3	1103.5	III	G		1	40X	60		
			SVTO	1157.0	1157.0	III			2	37	76		
			POTS	1157.3	1157.8	III	G		3	40X	170U		
POTS			1159.8	1159.9	DCIM			2	400	500			
POTS			1200.4	1201.9	III	G,RS		3	125	170U			
POTS			1231.6	1231.9	III	G		2	110U	170U			
POTS			1312.1	1312.2	III	B		2	110U	150			
2125	2400		HIRA										
2005	2400		CULG	2358.0	2358.0	III	B		1	60	130		
03	0000	0728	HIRA										
			LEAR	0039.0	0040.0	III		2	30	80			
	0000	0750	CULG	0040.0	0040.0	III	B		1	30	130		
			LEAR	0056.0	0056.0	III		1	30	60			
			CULG	0057.0	0057.0	III	B		1	25	90		
			CULG	0125.0	0125.0	III	B		1	40	150		
			LEAR	0125.0	0125.0	III		1	38	49			
			CULG	0159.0	0255.0	I	S		1	60	150		
			LEAR	0239.0	0424.0	CONT			1	55	80		
	CULG	0601.0	0602.0	III	G		1	40	85				
	LEAR	0601.0	0602.0	III		1	40	57					
	CULG	0734.0	0735.0	III	G		1	40	80				
	0813	1326		ONDR									
	0809	1400	POTS	0821	1400	E	U	I	S,W	1	110U	170U	
			POTS	0843.5	0844.1	III	G		2	40X	160		
0905	1530	BLEN											
		POTS	0919.5	0919.7	III	G		2	110U	160			
		POTS	0926.6	0927.3	III	G		3	70	170U			
		POTS	0928.4	0928.8	DCIM			2	400	500			
		POTS	0929.4	0930.5	III	G		3	55	225U			
		POTS	1000.3	1000.6	III	G		1	40X	60			
		POTS	1010.0	1010.5	III	G		1	110U	170U			
		POTS	1011.6	1011.8	III	G		1	110U	170U			
		POTS	1131.8	1132.5	III	G		2	110U	170U			
		POTS	1136.6	1137.4	III	G		2	110U	160			
2005	2400		PALE	1904.0	1913.0	III		2	25	57			
2126	2400		CULG										
			HIRA										

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OBSERVATION		Sta	EVENT		Spectral Class	Event Remarks	Int (1-3)	FREQUENCY		Remarks
Start Day (UT)	End (UT)		Start (UT)	End (UT)				Lower (MHz)	Upper (MHz)	
04	0000 0728	HIRA								
		LEAR	0019.0	0020.0	III		1	30	56	
	0000 0750	CULG	0020.0	0020.0	III	B	1	28	90	
	0813 1400	POTS	0813.3	0813.5	III	B	1	110U	160	
	0815 1325	ONDR								
		POTS	0830	1400	I	S	1	130	170U	
	0845 1445	BLEN								
		POTS	0947.9	0948.0	III	B	2	110U	160	
		POTS	1150.4	1150.8	UNCLF		2	400	500U	
		POTS	1157.9	1159.8	III	GG	3	110U	170U	
		POTS	1308.0	1308.2	III	B	2	110U	150	
		POTS	1350.6	1351.3	III	G	3	110U	170U	
		POTS	1353.5	1353.6	III	B	2	110U	170U	
		PALE	2018.0	2019.0	III		1	25	50	
	2005 2400	CULG	2018.0	2020.0	III	G	1	20	150	
		PALE	2052.0	2053.0	III		1	25	46	
		CULG	2053.0	2053.0	III	B	1	18	90	
		CULG	2125.0	2125.0	III	B	1	18	120	
		PALE	2125.0	2125.0	III		1	35	44	
		LEAR	2220.0	2220.0	III		1	30	65	
	2127 2400	HIRA	2220.8	2221.0	III	B	1	40	100	
		CULG	2221.0	2221.0	III	B	2	18	140	
		PALE	2221.0	2221.0	III		1	26	48	
		CULG	2232.0	2232.0	III	B	1	23	50	
		CULG	2249.0	2249.0	III	B	1	18	120	
		LEAR	2323.0	2324.0	III		2	30	70	
		CULG	2324.0	2324.0	III	B	1	18	90	
		CULG	2343.0	2344.0	III	G	1	20	160	
		LEAR	2343.0	2344.0	III		2	30	80	
		HIRA	2343.8	2344.0	III	B	1	50	200	
05	0000 0728	HIRA								
	0000 0750	CULG	0015.0	0139.0	III	N	1	25	140	
		LEAR	0021.0	0051.0	III	N	1	55	80	
		CULG	0225.0	0225.0	III	G	1	40	180	
		LEAR	0513.0	0514.0	III		2	30	80	
		CULG	0514.0	0514.0	III	B	1	23	90	
		LEAR	0533.0	0533.0	III		1	30	46	
		CULG	0608.0	0609.0	III	G	1	320	530	
		CULG	0748.0	0749.0	III	G	1	28	90	
		LEAR	0748.0	0748.0	III		1	30	80	
	0817 1325	ONDR								
	0811 1358	POTS	0822	1358	I	S,C,DC	3	110U	170U	
		POTS	0823.5	0826.0	III	GG	2	110U	170U	
		POTS	0830.7	0830.9	III	G	3	120	170U	
		POTS	0840.9	0841.1	III	G	3	110U	170U	
	0845 1445	BLEN								
		POTS	0926.6	0926.7	III	B	2	120	170U	
		POTS	0940.1	0940.2	III	B	2	110U	170U	
		POTS	1031.9	1032.0	III	B	2	110U	150	
		POTS	1032.5	1034.4	III	GG	2	110U	170U	
		POTS	1052.5	1053.2	III	G	2	110U	145	
		POTS	1104.0	1104.4	III	G	2	70	170U	
		POTS	1223.3	1223.5	III	B	2	110U	140	
		POTS	1250.0	1250.1	III	B	2	110U	160	
		POTS	1305.0	1305.1	III	B	2	110U	140	
	2005 2400	CULG	2011.0	2042.0	III	N	1	30	160	
		CULG	2133.0	2133.0	III	B	1	40	90	
		CULG	2148.0	2206.0	III	G	1	20	90	
		CULG	2222.0	2225.0	II	SH	1	55	75	FLA ESS 450
	2128 2400	HIRA	2222.0	2224.4	II		1	50	70	
		CULG	2325.0	2326.0	III	G	1	18	80	
		CULG	2332.0	2336.0	II	UE	1	60	110	
		CULG	2343.0	2343.0	III	B	1	20	90	
06	0000 0750	CULG	0000.0	0001.0	III	G	1	18	160	
		CULG	0017.0	0017.0	III	B	1	30	90	
		CULG	0054.0	0054.0	III	B	1	60	130	
		PALE	0059.0	0100.0	III		1	30	52	

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OBSERVATION			EVENT					FREQUENCY		Remarks
Start Day (UT)	End Day (UT)	Sta	Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	Lower (MHz)	Upper (MHz)	
06	0000 0728	CULG	0100.0	0101.0	III	G	2	18	170	
		HIRA	0130.8	0131.0	III	B	1	50	140	
		CULG	0131.0	0131.0	III	B	1	18	170	
		CULG	0230.0	0455.0	III	N	1	30	180	
		HIRA	0415.6	0415.8	III	B	1	30	80	
		CULG	0416.0	0416.0	III	B	2	18	90	
		CULG	0516.0	0703.0	III	N	1	18	230	
		CULG	0555.0	0555.0	III	B	2	18X	140	
		HIRA	0555.4	0555.6	III	B	2	40	140	
		SVTO	0702.0	0703.0	III		1	35	43	
		0818 1322	ONDR							
		0813 1357	POTS	0823 E	1357 U	I	S,C,DC	2	110U	170U
		0845 1445	BLEN							
			POTS	0909.0	0909.2	III	B,RS	2	45	75
		SVTO	0909.0	1000.0	III	N	2	35	74	
		POTS	0924.1	0924.8	III	B	2	40X	135	
		POTS	0942.9	0943.7	III	G	3	110U	170U	
		POTS	0949.4	0949.6	III	B	2	130	170U	
		POTS	1151.2	1151.7	III	G	3	110U	170U	
		POTS	1204.0	1204.1	III	B	2	110U	170U	
		POTS	1205.0	1205.1	III	G	2	110U	170U	
		SGMR	1400.0	1404.0	V		1	30	50	
	2010 2400	CULG	2018.0	2018.0	III	B	1	20	40	
	2010 2400	CULG	2018.0	2018.0	III	B	1	20	40	
		CULG	2101.0	2159.0	III	N	1	20	160	
		CULG	2101.0	2159.0	III	N	1	20	160	
		CULG	2121.0	2123.0	III	G	2	20	340	
		CULG	2121.0	2123.0	III	G	2	20	340	
		PALE	2121.0	2128.0	III		1	83	180	
	2129 2400	HIRA								
		CULG	2211.0	2215.0	UNCLF		1	40	70	
		CULG	2211.0	2215.0	UNCLF		1	40	70	
		CULG	2233.0	2233.0	III	B	1	20	120	
	CULG	2233.0	2233.0	III	B	1	20	120		
	CULG	2309.0	2340.0	III	N	1	23	180		
	CULG	2309.0	2340.0	III	N	1	23	180		
	LEAR	2340.0	2340.0	III		1	35	75		
07	0000 0750	CULG	0103.0	0112.0	III	G	1	40	180	
	0000 0750	CULG	0103.0	0112.0	III	G	1	40	180	
	0000 0445	HIRA	0103.6	0105.6	III	G	1	80	160	
		LEAR	0109.0	0112.0	III		1	35	80	
		PALE	0111.0	0140.0	III	N	1	54	165	
		HIRA	0111.4	0111.6	III	B	1	50	200	
		CULG	0140.0	0141.0	III	G	1	18	180	
		CULG	0140.0	0141.0	III	G	1	18	180	
		LEAR	0140.0	0140.0	III		2	30	80	
		HIRA	0140.4	0140.6	III	B	1	50	160	
		LEAR	0245.0	0246.0	III		1	30	50	
		CULG	0246.0	0246.0	III	B	1	30	180	
		CULG	0246.0	0246.0	III	B	1	30	180	
		LEAR	0439.0	0441.0	III		2	30	65	
		CULG	0440.0	0442.0	III	G	2	18	140	
		LEAR	0641.0	0641.0	III		1	30	50	
		LEAR	0721.0	0722.0	III		1	30	55	
		LEAR	0756.0	0756.0	III		1	30	60	
	0812 1356	POTS	0824 E	1356	I	S,C,DC	2	110U	170U	
	0824 1322	ONDR								
		POTS	0832.4	0832.5	III	B	2	110U	160	
		POTS	0833.5	0834.8	III	G	2	110U	150	
		POTS	0838.6	0839.2	III	G	1	110U	170U	
	0845 1445	BLEN								
		POTS	0859.0	0859.1	III	B	2	110U	135	
		POTS	0909.1	0909.3	III	B	2	110U	150	
		POTS	0914.4	0915.0	III	G	2	110U	170U	
		POTS	0933.2	0933.6	III	G	1	110U	170U	
		POTS	0945.5	0946.6	III	G	3	110U	170U	
		POTS	1005.0	1005.1	III	B	1	110U	170U	
		POTS	1008.5	1008.6	III	B	1	110U	140	

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OBSERVATION		Sta	EVENT		Spectral Class	Event Remarks	Int (1-3)	FREQUENCY		Remarks
Start Day (UT)	End (UT)		Start (UT)	End (UT)				Lower (MHz)	Upper (MHz)	
07		POTS	1010.3	1010.5	III	G	1	110U	145	
		POTS	1013.8	1014.9	III	G,C	2	110U	170U	
		POTS	1015.9	1017.2	III	G	2	110U	170U	
		POTS	1018.5	1019.0	III	G	2	110U	170U	
		POTS	1021.7	1021.8	III	B	2	110U	170U	
		POTS	1023.2	1023.4	III	B	2	110U	170U	
		POTS	1023.6	1024.1	III	G	1	110U	140	
		POTS	1027.6	1028.3	III	G	2	110U	170U	
		POTS	1032.8	1033.5	III	G	1	110U	170U	
		POTS	1038.5	1038.6	III	G	2	110U	160	
		POTS	1040.3	1040.6	III	G	2	110U	170U	
		POTS	1041.3	1042.8	III	G	2	110U	170U	
		POTS	1043.3	1043.4	III	B	2	110U	170U	
		POTS	1053.2	1053.3	III	B	2	110U	145	
		POTS	1057.6	1057.7	III	B	1	110U	150	
		POTS	1112.1	1112.2	III	B	2	110U	160	
		POTS	1121.6	1121.7	III	B	2	110U	160	
		POTS	1125.4	1126.1	III	G	2	110U	170U	
		POTS	1144.1	1145.6	III	G	2	110U	170U	
		POTS	1150.8	1153.6	III	GG,RS	3	110U	170U	
		SVTO	1151.0	1152.0	III		2	36J	77U	
		POTS	1210.0	1210.2	III	G	2	110U	160	
		POTS	1217.0	1217.2	III	G	2	110U	170U	
		POTS	1218.3	1218.4	III	B	3	110U	170U	
		POTS	1220.3	1220.4	III	B	3	110U	170U	
		POTS	1231.6	1231.7	III	B	2	110U	170U	
		SVTO	1256.0	1257.0	V		2	35	85	
		POTS	1256.3	1257.6	III	G	3	110U	170U	
		SGMR	1257.0	1257.0	III		1	30	50	
		POTS	1303.5	1303.6	III	B	1	110U	145	
		POTS	1317.0	1317.3	III	G	2	110U	170U	
		POTS	1343.0	1343.1	III	B	3	110U	170U	
		SGMR	1611.0	1614.0	V		2	30	80	
		PALE	1908.0	1913.0	III		1	25	180	
		PALE	1950.0	1959.0	III		1	25	46	
	2010 2400	CULG	2010.0E	2044.0	III	N	1	20	90	
		CULG	2021.0	2022.0	III	G	2	18	180	
		PALE	2021.0	2021.0	III		1	25	180	
		SGMR	2021.0	2021.0	III		1	30	47	
		PALE	2116.0	2118.0	V		1	25	180	
		CULG	2117.0	2121.0	III	G	2	18X	360	
		LEAR	2325.0	2326.0	III		2	30	80	
		PALE	2325.0	2335.0	III		1	25	54	
	2130 2400	HIRA	2325.8	2326.0	III	B	1	30	50X	
		CULG	2326.0	2326.0	III	B	2	18	150	
		CULG	2334.0	2335.0	III	G	1	20	160	
		LEAR	2334.0	2335.0	III		2	30	80	
08		LEAR	0127.0	0129.0	III		3	30	80	
	0000 0750	CULG	0127.0	0129.0	III	G	2	18	180	
		PALE	0128.0	0129.0	III		1	31	113	
		CULG	0138.0	0143.0	III	GG	3	18X	180	
		LEAR	0138.0	0142.0	III		3	30	80	
		PALE	0138.0	0142.0	III		1	35	180	
	0000 0335	HIRA	0139.2	0139.4	III	B	2	30	50X	
		CULG	0224.0	0225.0	III	G	1	40	140	
		LEAR	0224.0	0224.0	III		1	50	80	
		CULG	0250.0	0250.0	III	B	1	20	80	
		LEAR	0250.0	0250.0	III		2	30	70	
		CULG	0327.0	0328.0	III	G	1	30	90	
		LEAR	0327.0	0327.0	III		1	30	75	
		LEAR	0354.0	0359.0	III		3	30	80	
		CULG	0355.0	0356.0	III	G	2	18	90	
		CULG	0359.0	0359.0	III	B	2	18X	160	
		LEAR	0409.0	0410.0	III		2	30	75	
		CULG	0410.0	0410.0	III	B	1	20	90	
		LEAR	0438.0	0754.0	III	N	2	30	55	
		CULG	0439.0	0534.0	III	N	1	23	160	
		LEAR	0459.0	0501.0	III		2	30	80	

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Day	Start (UT)	End (UT)	Sta	Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	Lower (MHz)		Upper (MHz)
08			CULG	0519.0	0520.0	III	G	1	18X	140	
			CULG	0526.0	0528.0	III	G	1	35	460	
			CULG	0536.0	0536.0	III	B	1	23	180	
			CULG	0544.0	0750.00	III	S	1	25	180	
			CULG	0600.0	0601.0	III	G	3	18X	170	
			LEAR	0631.0	0853.0	CONT		2	30	80	
			CULG	0747.0	0747.0	III	B	2	25	160	
		0752	1355	POTS	0753.3	0753.9	III	G	1	110U	160
		0821	1323	ONDR							
				POTS	0828	E 1355 U	I	S,C,DC	2	110U	170U
		0845	1440	BLEN							
				POTS	0853.0	0853.3	III	G	3	40X	170U
				SVTO	1008.0	1119.0	III	N	2	40	85
				POTS	1025.9	1026.6	III	GG	3	110U	170U
				POTS	1035.8	1035.9	III	B	2	110U	170U
				POTS	1042.8	1043.3	III	G	1	110U	150
				POTS	1044.1	1045.0	III	G	3	110U	170U
				POTS	1102.9	1103.5	III	G	2	110U	170U
				POTS	1118.3	1119.0	III	G	3	110U	170U
				POTS	1137.8	1138.1	III	G	2	110U	170U
				POTS	1215.6	1215.7	III	B	2	110U	170U
				POTS	1219.9	1220.1	III	B	2	110U	160
				POTS	1327.8	1327.9	III	B	2	110U	170U
				POTS	1334.7	1335.3	III	G	2	110U	170U
				POTS	1349.0	1349.3	III	B	3	110U	170U
				PALE	2033.0	2038.0	III		1	25	180
				PALE	2037.0	2038.0	III		1	53	180
		2131	2400	HIRA							
		2230	2400	CULG	2252.0	2252.0	III	B	1	30	90
				CULG	2308.0	2308.0	III	B	1	30	90
				LEAR	2341.0	2348.0	III		1	60	75
				CULG	2347.0	2349.0	III	G	1	40	160
				PALE	2347.0	2348.0	III		1	84	180
09	0000	0728	HIRA								
			LEAR	0011.0	0016.0	III		1	30	60	
		0000	0750	CULG	0016.0	0016.0	III	B	1	30	90
				LEAR	0042.0	0055.0	III	N	1	30	65
				CULG	0054.0	0055.0	III	G	1	28	90
				LEAR	0156.0	0156.0	III		2	30	55
				CULG	0157.0	0157.0	III	B	1	23	50
				LEAR	0210.0	0210.0	III		1	30	55
				LEAR	0252.0	0252.0	III		1	30	50
				PALE	0307.0	0308.0	III		1	25	55
				LEAR	0311.0	0330.0	III	N	1	30	80
				CULG	0329.0	0330.0	III	G	1	35	170
				LEAR	0604.0	0604.0	III		1	30	45
		0823	1320	ONDR							
		0814	1224	POTS	0826	E 1224 U	I	S,W	1	120	170U
		0845	1440	BLEN							
				POTS	0857.3	0858.0	III	G	2	110U	170U
				POTS	0914.3	0914.5	III	G	2	110U	145
				POTS	0924.8	0924.9	III	B	1	110U	160
				POTS	0948.1	0949.0	III	G	2	110U	170U
				POTS	0949.5	0949.6	III	B	2	110U	140
				POTS	1137.9	1139.0	III	G,C	2	110U	170U
				POTS	1149.8	1149.9	III	B	1	110U	145
				POTS	1201.6	1201.7	III	B	1	110U	145
				POTS	1206.0	1206.1	III	B	1	110U	150
				POTS	1212.1	1212.5	III	G	1	110U	140
		1240	1338	POTS	1240	E 1338 U	I	S	2	120	170U
				POTS	1325.1	1325.7	III	G	2	40X	140
				SGMR	1734.0	1737.0	III		1	30	50
				PALE	1906.0	1909.0	III		1	117	162
				PALE	1916.0	1924.0	III		1	25	147
				PALE	2007.0	2013.0	III		1	25	71
		2010	2400	CULG	2010.0E	2400.00	I	S	1	80	170
			CULG	2013.0	2014.0	III	G	1	20	140	
			CULG	2036.0	2036.0	III	B	1	23	40	

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OBSERVATION			EVENT				FREQUENCY		Remarks			
Start Day (UT)	End Day (UT)	Sta	Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	Lower (MHz)		Upper (MHz)		
09	2132 2400	CULG	2045.0	2045.0	III	B	1	30	90			
		CULG	2126.0	2129.0	III	G	1	23	100			
		HIRA										
		CULG	2146.0	2146.0	III	B	1	23	90			
		CULG	2212.0	2245.0	III	N	1	20	80			
		CULG	2336.0	2342.0	III	G	1	20	80			
		LEAR	2336.0	2342.0	III		2	30	65			
		PALE	2338.0	2338.0	III		1	30	45			
10	0000 0750	CULG	0000.0E	0100.0	I	S	1	100	170			
		LEAR	0007.0	1041.0	CONT		1	30	80			
		CULG	0011.0	0038.0	III	N	1	30	80			
		LEAR	0035.0	0037.0	III		2	30	58			
		PALE	0035.0	0037.0	III		1	46	66			
		CULG	0156.0	0239.0	III	N	1	25	80			
		LEAR	0156.0	0339.0	III	N	2	30	80			
		CULG	0339.0	0340.0	III	G	1	18	90			
		CULG	0403.0	0410.0	III	G	1	18	60			
		0000 0728	HIRA	0410.8	0411.0	III	B	1	200	400		
			CULG	0411.0	0411.0	III	B	1	120	400		
			CULG	0418.0	0750.00	I	S	1	70	180		
			CULG	0438.0	0607.0	III	N	1	18	90		
			LEAR	0644.0	0646.0	III		2	30	80		
			CULG	0645.0	0647.0	III	G	1	20	100		
			0755 1354	POTS	0755	E 1354	U	I	S,C,DC	3	40X	375U
	ONDR											
	0845 1440	SVTO	0917.0	0918.0	III		1	67U	80U			
		SVTO	0923.0	1253.0	CONT		2	55U	85U			
		POTS	0954.7	0954.9	III	B	1	40X	70			
		BLEN	1017.5	1145.0	DCIM	P	1	1750	2800X			
		POTS	1053.8	1054.1	III	G	1	200U	375U			
		POTS	1056.1	1057.2	III	G	1	200U	375U			
		PALE	2002.0	0019.0	III	N	1	25U	166U			
		2015 2400	CULG	2059.0	2059.0	III	B	1	20	140		
			CULG	2149.0	2245.0	III	N	1	18	140		
			CULG	2332.0	2348.0	III	N	1	35	90		
			CULG	2346.0	2346.0	III	B	1	150	300		
		2133 2400	HIRA	2346.2	2346.4	III	B	1	130	230		
		11	0000 0755	CULG	0004.0	0041.0	III	N	1	20	100	
				LEAR	0006.0	0020.0	III	N	2	30	71	
LEAR				0040.0	0040.0	III		2	30	60		
PALE	0040.0			0040.0	III		1	29	47			
CULG	0154.0			0156.0	III	G	1	20	140			
LEAR	0154.0			0155.0	III		2	30	80			
0000 0728	HIRA			0154.6	0154.8	III	B	1	50	120		
	CULG			0210.0	0210.0	III	B	1	70	140		
	CULG			0214.0	0755.00	I	S	1	60	180		
	CULG			0228.0	0241.0	III	G	1	25	100		
	LEAR			0228.0	0240.0	III	N	2	30	67		
	LEAR			0259.0	0810.0	CONT		1	65	80		
	CULG			0324.0	0331.0	III	G	1	18	100		
	LEAR			0324.0	0729.0	III	N	2	30	80		
	CULG			0342.0	0402.0	CONT		1	100	500		
	CULG			0351.0	0353.0	III	G	1	23	50		
	CULG		0420.0	0434.0	III	N	1	30	90			
	CULG		0549.0	0549.0	III	B	1	30	90			
	HIRA		0610.8	0615.8	III	G	1	100	320			
	CULG		0611.0	0616.0	III	G	1	40	300			
CULG	0642.0		0642.0	III	B	1	25	70				
0804 1353	POTS		0826	E 1353	U	I	S,C,DC	2	110U	170U		
	ONDR											
	0845 1440		BLEN									
			POTS	0925.8	0926.6	III	G	2	70U	360U		
			POTS	0931.5	0931.6	III	B	1	130	150		
			POTS	0949.1	0950.1	III	G	2	110U	150		
			POTS	0958.5	1001.5	III	GG	3	40X	170U		
			POTS	1008.4	1008.5	III	B	2	140	250U		
			POTS	1035.9	1037.1	III	G	1	40X	70		

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OBSERVATION		Sta	Start (UT)	End (UT)	EVENT		Int (1-3)	FREQUENCY		Remarks
Start Day (UT)	End (UT)				Spectral Class	Event Remarks		Lower (MHz)	Upper (MHz)	
11		POTS	1038	1157	III	N	1	40X	70	
		POTS	1119.2	1120.6	III	G	2	40X	70	
		POTS	1159.1	1159.2	III	B	1	145U	250U	
		POTS	1201.2	1201.4	III	G	1	145U	325U	
		POTS	1316.7	1317.0	III	G	2	40X	150	
		POTS	1318.1	1318.2	III	B	2	110U	150	
		SVTO	1336.0	1457.0	CONT		1	40U	75U	
		POTS	1347.9	1348.1	III	B	2	120U	170U	
		POTS	1350.6	1351.9	III	G	3	75	250U	
2134	2400	HIRA								
2015	2400	CULG	2201.0	2202.0	III	G	1	23	80	
12	0000 0755	CULG	0036.0	0037.0	III	G	1	100	180	
		CULG	0136.0	0137.0	III	G	1	20	160	
		LEAR	0136.0	0137.0	III		2	30	70	
		PALE	0136.0	0136.0	III		1	32	48	
	0000 0728	HIRA	0136.6	0136.8	III	B	1	50	160	
		CULG	0618.0	0618.0	III	B	1	120	300	
		HIRA	0618.2	0618.4	III	B	1	120	280	
		LEAR	0754.0	0755.0	III		2	30	80	
		SVTO	0754.0	0755.0	III		1	35	85	
		CULG	0755.0	0755.0	III	B	2	20	150	
0816	1352	POTS	0826 E	1352 U	I	S,C	1	110U	170U	
0827	1319	ONDR								
		LEAR	0835.0	0836.0	III		2	30	80	
		SVTO	0835.0	0836.0	III		2	35	85	
		POTS	0835.2	0838.2	III	GG	3	40X	170U	
		POTS	0857.5	0857.9	III	G	2	110U	170U	
0900	1440	BLEN								
		POTS	1034.9	1036.0	III	G	3	40X	170U	
		SVTO	1035.0	1035.0	III		2	50	81	
		SVTO	1035.0	1035.0	III		2	54	77	
		POTS	1151.4	1151.7	III	G	2	155	300U	
2015	2400	CULG	2040.0	2041.0	III	G	1	30	100	
2134	2400	HIRA								
13		LEAR	0231.0	0236.0	III		2	30	80	
		PALE	0231.0	0231.0	III		1	40	93	
0000	0755	CULG	0231.0	0236.0	III	G	1	20	180	
0000	0728	HIRA	0231.6	0231.8	III	B	1	40	200	
0816	1351	POTS	0827 E	1351 U	I	S,W	1	110U	170U	
0828	1320	ONDR								
		POTS	0845.2	0847.0	III	GG	3	110U	170U	
		POTS	0848.4	0848.7	III	G	2	110U	170U	
		POTS	0944.4	0944.6	III	B	2	110U	160	
		POTS	1006.4	1006.6	III	G	2	110U	170U	
		POTS	1011.8	1012.1	III	G	1	110U	170U	
0900	1440	BLEN	1109.0	1111.5	DCIM	P	1	1750	2800X	
		POTS	1142.2	1142.3	III	B	1	110U	150	
2015	2400	CULG								
2135	2400	HIRA								
14		LEAR	0013.0	0013.0	III		1	30	70	
0000	0800	CULG	0013.0	0015.0	III	G	1	23	90	
		CULG	0305.0	0306.0	III	G	2	30	180	
		LEAR	0305.0	0306.0	III		2	30	80	
		PALE	0305.0	0305.0	III		1	84	155	
0000	0729	HIRA	0305.6	0305.8	III	B	2	50	180	
		CULG	0339.0	0339.0	III	B	1	60	170	
		CULG	0403.0	0406.0	III	G	1	60	170	
		CULG	0443.0	0444.0	III	G	1	18	90	
		LEAR	0443.0	0444.0	III		2	30	80	
		CULG	0457.0	0457.0	III	B	1	60	170	
		LEAR	0457.0	0457.0	III		1	58	80	
		CULG	0542.0	0548.0	III	G	1	35	180	
		HIRA	0542.2	0542.4	III	B	1	80	180	
0816	1352	POTS	0827.6	0827.7	DCIM		2	400	500U	
0829	1318	ONDR								
		POTS	0853.5	0853.6	III	B	2	110U	170U	

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OBSERVATION			Start (UT)	End (UT)	EVENT		Int (1-3)	FREQUENCY		Remarks	
Day	Start (UT)	End (UT)			Sta	Spectral Class		Event Remarks	Lower (MHz)		Upper (MHz)
14			POTS	0918.1	0918.2	III	B	2	110U	170U	
			POTS	0959.3	0959.5	DCIM		2	400	500U	
			POTS	1041	1042	I	S,W	1	110U	170U	
			POTS	1053.4	1053.5	III	B	2	110U	225	
			POTS	1057.6	1057.7	III	G	1	140U	170U	
			POTS	1111.6	1113.3	III	G	2	110U	170U	
			POTS	1121.5	1123.1	III	G	2	110U	170U	
			POTS	1142.7	1143.1	III	G	2	75	170U	
			POTS	1159.4	1159.5	III	B	2	140U	160	
			POTS	1224.7	1225.5	III	G	3	110U	170U	
			POTS	1226.6	1226.7	III	B	1	145U	170U	
			POTS	1234.4	1234.5	III	B	2	110U	170U	
			POTS	1235.0	1235.3	III	G	2	110U	170U	
			POTS	1236.5	1237.0	III	G	2	40X	70	
			POTS	1236.7	1237.1	III	G	2	110U	170U	
			POTS	1250.4	1250.6	III	G	1	110U	160	
			POTS	1330.5	1331.1	III	G	2	110U	170U	
	1345 1440		BLEN								
	2135 2400		HIRA								
			PALE	2245.0	2245.0	III		1	30	36	
	2015 2400		CULG	2245.0	2245.0	III	B	1	28	90	
15			LEAR	0059.0	0100.0	III		1	30	55	
	0000 0800		CULG	0059.0	0059.0	III	B	1	25	100	
	0000 0729		HIRA	0156.8	0202.2	III	G	1	120	330	
			CULG	0157.0	0202.0	III	G	1	100	280	
			PALE	0200.0	0200.0	III		1	120	157	
	0655 1200		IZMI	0755.2	0755.6	III	G	1	200	270X	
	0830 1319		ONDR								
	0840 1440		BLEN								
			LEAR	0929.0	0934.0	III		2	30	71	
			IZMI	0929.1	0929.7	III	G	1	45X	90U	
	0817 1351		POTS	0929.1	0929.5	III	G,P	2	40X	170U	
			SVTO	0933.0	0934.0	III		2	35	85	
			POTS	0933.6	0934.9	III	G,P	2	40X	170U	
			IZMI	0933.7	0934.7	III	GG	2	45X	125	
			POTS	1013.2	1013.3	III	B	1	110U	160	
			POTS	1017	1020	I	S,W	1	150	170U	
			POTS	1118.3	1118.6	III	G	1	200U	300U	
			POTS	1120.1	1121.5	III	G	1	200U	320U	
			IZMI	1120.5	1122.4	III	G	1	200	270X	
			POTS	1122.0	1122.9	III	GG	2	160	400U	
			POTS	1124.3	1125.2	III	GG	1	250U	400U	
			POTS	1146.3	1146.4	III	B	1	250U	350U	
			POTS	1147.4	1147.5	III	B	1	200U	350U	
	2020 2400		CULG	2230.0	2231.0	III	G	1	260	660	
	2136 2400		HIRA	2230.2	2230.8	III	G	1	300	500	
16			LEAR	0034.0	0034.0	III		1	45	58	
	0000 0730		HIRA	0302.2	0316.2	III	G	1	130	400	
	0000 0800		CULG	0316.0	0316.0	III	B	1	140	280	
			CULG	0429.0	0429.0	III	B	2	60	250	
			HIRA	0429.4	0429.6	III	B	2	80	240	
			LEAR	0450.0	0453.0	III		2	30	80	
			HIRA	0450.8	0452.4	III	G	2	50	330	
			CULG	0451.0	0453.0	III	G	2	18	500	
			CULG	0650.0	0653.0	III	G	2	35	370	
			HIRA	0651.6	0653.0	III	G	2	70	330	
			LEAR	0652.0	0652.0	III		2	43	80	
			CULG	0703.0	0705.0	III	G	1	50	300	
	0658 1200		IZMI	0703.0	0704.8	III	GG	2	45X	270X	
			HIRA	0703.2	0703.8	III	G	1	80	250	
			IZMI	0735.3	0735.4	III	G	1	230	270X	
			IZMI	0735.8	0738.5	III	GG,FS	2	50	270X	
			CULG	0736.0	0738.0	III	G	1	60	450	
			IZMI	0736.4	0737.6	CONT		1	200	270X	
			LEAR	0737.0	0738.0	III		1	51	80	
			IZMI	0739.5	0746.5	III	S	1	135U	270X	
			IZMI	0739.9	0741.2	II	HARM	2	108	260	

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OBSERVATION		Sta	Start (UT)	End (UT)	EVENT		Int (1-3)	FREQUENCY		Remarks	
Start (UT)	End (UT)				Spectral Class	Event Remarks		Lower (MHz)	Upper (MHz)		
16		CULG	0740.0	0749.0	II	FN	1	40	130		
		CULG	0740.0	0749.0	II	SH	2	80	260	ESS 600	
		IZMI	0741.4	0748.6	II	HARM,FS	2	50	180U		
		LEAR	0744.0	0747.0	II		1	50	70	ESS 0500	
	0817	1157	POTS	0818	0856	I	S,C,DC	1	110U	170U	
			IZMI	0818.3	0819.0	III	G,U	2	50	270X	
			LEAR	0820.0	0820.0	III		2	45	80	
			SVTO	0820.0	0820.0	III		2	57U	85U	
			IZMI	0820.6	0820.9	III	G	2	45	250	
			POTS	0820.6	0820.8	III	B	1	75	170U	
			IZMI	0821.4	0821.6	III	G	2	50	240	
			POTS	0821.5	0821.6	III	B	1	110U	160	
	0831	1320	ONDR								
	0840	1440	BLEN								
			POTS	0843.6	0844.5	III	GG,U	3	110U	170U	
			IZMI	0844.0	0844.2	III	G	2	120	260	
			POTS	0845.4	0846.4	III	G	2	110U	170U	
			IZMI	0854.5	0854.7	III	G	1	55	160	
			POTS	0854.5	0854.8	III	G	2	40X	170U	
			POTS	0924.3	0924.9	III	G	3	110U	170U	
			IZMI	0924.5	0924.7	III	G	1	50	220	
			IZMI	0936.4	0936.5	III	B	1	200	250	
			IZMI	0955.9	0956.2	III	G	2	200	270X	
			IZMI	0958.7	0959.5	III	G	2	190	270X	
			POTS	1024	1025	I	S	1	150	170U	
			IZMI	1048.8	1049.8	III	GG	2	105	270X	
			POTS	1048.9	1050.1	III	GG	2	110U	300U	
			IZMI	1053.1	1054.1	III	GG	1	200	270X	
			POTS	1053.1	1054.2	III	G	2	110U	260U	
			IZMI	1057.3	1057.5	III	G,C	2	140	270X	
			POTS	1057.3	1057.8	III	G,U	3	110U	450U	
			POTS	1058.5	1058.6	III	B	1	140	300U	
		POTS	1101.7	1102.4	III	G	2	110U	250U		
		POTS	1114.5	1114.6	III	B	2	130	170U		
		IZMI	1136.4	1136.4	III	B	1	220	270X		
		PALE	2013.0	2013.0	III		1	129	180		
2020	2400	CULG	2030.0	2032.0	III	G	1	35	90		
2136	2400	HIRA									
17	0000	0730	HIRA	0534.6	0538.2	III	G	1	150	320	
	0658	1200	IZMI	0702.7	0702.9	III	G	1	135	270	
			IZMI	0711.4	0711.7	III	G	1	135	240	
	0000	0800	CULG	0712.0	0713.0	III	G	1	60	250	
			IZMI	0712.5	0713.1	III	GG	2	120	270X	
			HIRA	0712.6	0712.8	III	B	1	120	300	
			IZMI	0716.6	0716.7	III	G	1	105	215	
			IZMI	0720.9	0721.4	III	G	1	200	215	
			IZMI	0802.0	0802.4	III	G	2	200	270X	
			IZMI	0806.4	0806.5	III	G	1	200	270X	
	0832	1318	ONDR								
	0817	1350	POTS	0843	0844	I	S	1	160	170U	
			POTS	0918	0919	I	S	1	140	170U	
			POTS	0941	0942	I	S	1	140	170U	
			POTS	0943.9	0944.1	III	B	2	110U	135	
			POTS	1003.2	1003.7	III	G	2	110U	170U	
			POTS	1011	1012	I	S	1	140	170U	
			POTS	1031	1032	I	S	1	160	170U	
			POTS	1119	1120	I	S	1	140	170U	
			IZMI	1122.7	1123.3	III	GG	2	120	270X	
			POTS	1122.8	1123.4	III	G	3	120	330U	
	0840	1440	BLEN	1123.2	1127.2	DCIM	P	1	1000X	1900	
			POTS	1124	1350 U	I	S	1	140	170U	
			IZMI	1125.7	1126.1	III	G	2	200	270X	
			POTS	1126.1	1126.2	III	B	1	220U	570U	
			POTS	1312.2	1312.4	DCIM		2	680	800X	
	2137	2400	HIRA								
	2020	2400	CULG	2151.0	2153.0	III	G	1	350	750	
	18	0000	0730	HIRA							

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OBSERVATION			EVENT				FREQUENCY		Remarks	
Day	Start (UT)	End (UT)	Sta	Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)		Lower (MHz)
18	0000	0800	CULG							
	0648	1200	IZMI	1130.7	1130.8	III	B	1	45	65
	0818	1350	POTS	1224.5	1224.6	III	B	1	110U	140
			POTS	1315.9	1317.0	DCIM		3	450	800X
	0833	1319	ONDR	1316.0	1316.5	DCIM	G	1	2000X	4500X
	0850	1440	BLEN	1316.0	1317.4	DCIM	C	3	1000	2800X
			POTS	1318.1	1318.2	DCIM		2	600	800X
			POTS	1322.0	1323.8	III	G	3	40X	170U
			POTS	1325.2	1327.2	III	G	2	40X	170U
	2020	2400	CULG	2332.0	2333.0	III	G	1	260	460
	2137	2400	HIRA	2332.8	2333.0	III	B	2	160	440
19	0000	0800	CULG	0008.0	0008.0	III	B	1	23	180
			CULG	0111.0	0122.0	III	G	1	130	750
	0000	0731	HIRA	0117.2	0117.4	III	B	1	160	400
			HIRA	0216.8	0217.0	III	B	1	130	340
			CULG	0217.0	0217.0	III	B	1	120	400
			CULG	0758.0	0759.0	III	G	1	60	180
	0834	1320	ONDR							
	0850	1440	BLEN							
	0828	1350	POTS	0916	0917	I	S	1	150	170U
			POTS	0917.1	0917.2	III	B	2	130	170U
			POTS	1204.7	1207.0	III	G,C	3	40X	170U
			SVTO	1205.0	1206.0	III		2	35U	85U
			POTS	1212.1	1216.6	II	UE	2	110U	150
			POTS	1230.9	1236.8	II	UE	3	55	85
			SVTO	1231.0	1235.0	II		2	55	85
	2020	2400	CULG							ESS 0500
	2138	2400	HIRA							
20	0000	0731	HIRA							
	0000	0800	CULG	0119.0	0119.0	III	G	1	360	840
			CULG	0347.0	0347.0	III	B	1	45	60
			LEAR	0347.0	0347.0	III		1	45	57
			CULG	0707.0	0800.00	III	N	1	20	100
			LEAR	0713.0	0742.0	III	N	1	30	60
			SVTO	0741.0	0741.0	III		1	77	85
	0659	1200	IZMI	0741.7	0741.9	III	B	1	50	90
			IZMI	0742.9	0745.2	III	GG	1	200	270X
			IZMI	0748.1	0748.3	III	B	1	50	90
			IZMI	0749.4	0750.0	III	GG	2	200	270X
	0835	1320	ONDR							
	0855	1440	BLEN							
	0818	1350	POTS	0909.3	0909.6	III	B	1	40X	140
			POTS	0918	1350 U	I	S,C,DC	2	50	170U
			POTS	0942.7	0942.9	III	B	2	110U	170U
			IZMI	1010.00	1140.00	I	S	1	55	200
			POTS	1032.7	1034.4	III	GG	3	110U	170U
			IZMI	1033.0	1034.3	III	GG	1	55	155
			POTS	1039.5	1040.2	III	G	2	110U	170U
			POTS	1040.9	1041.4	III	G,RS	2	110U	145
			POTS	1042.2	1043.0	III	G	3	110U	170U
			SVTO	1128.0	1129.0	III		1	53	76
			SVTO	1129.0	1130.0	III		2	53	76
			POTS	1129.2	1130.7	III	G	2	40X	160
			IZMI	1129.4	1129.7	III	B	2	45X	240
			IZMI	1130.4	1130.7	III	B	2	45X	145
			IZMI	1131.7	1131.9	III	B	1	45	95
			POTS	1133.8	1134.1	III	G	2	40X	140
			POTS	1324.6	1324.9	III	B	2	40X	160
			SGMR	1554.0	1555.0	III		1	30	70
	2020	2400	CULG	2035.0	2035.0	III	B	1	30	90
	2139	2400	HIRA							
21			LEAR	0251.0	0252.0	III		1	30	50
	0000	0800	CULG	0252.0	0252.0	III	B	1	30	70
			CULG	0333.0	0333.0	III	B	1	50	150
			CULG	0342.0	0342.0	III	B	1	40	130
			CULG	0527.0	0527.0	III	B	1	100	180

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OBSERVATION			EVENT				FREQUENCY			Remarks		
Day	Start (UT)	End (UT)	Sta	Start (UT)	End (UT)	Spectral Class	Event Remarks	Int (1-3)	Lower (MHz)		Upper (MHz)	
21	0000	0731	CULG	0537.0	0537.0	III	B	1	23	180		
			LEAR	0537.0	0545.0	III		2	30	80		
			HIRA	0537.4	0537.6	III	B	1	50	140		
			CULG	0545.0	0545.0	III	B	1	23	120		
			LEAR	0722.0	0722.0	III		2	30	60		
			CULG	0732.0	0800.00	III	N	1	20	90		
			SVTO	0732.0	0732.0	III		1	35	46		
	0818	1352	LEAR	0749.0	0749.0	III			2	30	80	
			POTS	0830	1352	I	S,C,DC	2	110U	170U		
			POTS	0836.3	0836.5	III	B	1	40X	120		
	0709	0804	POTS	0840.0	0840.1	III	B	1	125	170U		
			IZMI	0845.5	0845.7	III	G	1	45	90		
	0855	1440	POTS	0852.5	0853.4	III	G	1	110U	150		
			BLEN									
	0843	1200	IZMI	0908.2	0909.7	III	GG	2	45	95		
			IZMI	0911.2	0911.6	I	GG	1	205	220		
	0835	1321	POTS	0925.5	0926.3	III	G	2	40X	140		
			IZMI	0926.1	0926.2	III	G,HARM	2	45X	95		
			POTS	0929.5	0929.7	III	G	2	40X	145		
			POTS	0935.3	0935.4	III	B	1	40X	140		
			POTS	0936.1	0936.3	III	G	2	40X	150		
			IZMI	0943.4	0943.6	III	B	2	50	95		
			POTS	0943.4	0943.6	III	G	1	40X	90U		
			IZMI	0949.1	0949.2	III	B	1	80	145		
			POTS	0949.1	0949.2	III	B	2	110U	145		
			IZMI	1006.1	1006.3	III	B	1	45	85		
			POTS	1006.2	1006.4	III	B	1	40X	120		
			IZMI	1014.1	1014.3	III	G,FS	2	45	95		
			IZMI	1018.2	1018.4	III	B	1	50	120		
			IZMI	1029.7	1030.0	III	G	2	55	150		
			POTS	1029.8	1030.1	III	G	2	40X	140		
			ONDR	1034.1	1034.5	DCIM	G	1	2390	4500X		
			POTS	1034.9	1035.3	III	G	2	130	170U		
			IZMI	1036.2	1037.7	III	G	2	110	245		
			POTS	1036.2	1037.7	III	G	3	110U	170U		
			POTS	1041.9	1042.1	III	B	1	40X	160		
	POTS	1101.9	1102.9	III	G	2	40X	170U				
	IZMI	1102.6	1102.8	III	B	2	55	90				
	IZMI	1135.0	1135.5	III	GG	2	45X	170				
	POTS	1135.0	1135.3	III	G	3	40X	170U				
	SVTO	1135.0	1135.0	III		2	35	82				
	IZMI	1136.8	1137.6	III	G	2	45	95				
	POTS	1137.5	1137.6	III	B	2	110U	170U				
IZMI	1141.5	1141.9	III	G	1	45	70					
IZMI	1143.6	1144.8	III	GG	2	45X	160					
POTS	1143.6	1143.8	III	B	2	40X	120					
POTS	1144.5	1145.0	III	G	3	110U	170U					
IZMI	1148.9	1150.2	III	GG	2	45	175					
POTS	1148.9	1151.0	III	G	3	40X	170U					
POTS	1204.0	1205.4	III	GG	3	40X	170U					
SVTO	1204.0	1205.0	III		2	35	85					
POTS	1229.2	1229.3	III	B	2	110U	170U					
POTS	1231.6	1232.2	III	G	2	110U	170U					
POTS	1238.2	1238.6	III	G	2	130	170U					
SVTO	1249.0	1500.0	CONT		1	35	85					
POTS	1258.3	1258.4	III	B	1	140	170U					
POTS	1300.3	1300.5	III	G	2	130	170U					
POTS	1303.9	1304.2	III	G	2	110U	170U					
POTS	1304.4	1304.7	III	G	2	40X	90U					
SVTO	1308.0	1308.0	III		1	35	80					
POTS	1308.4	1308.6	III	B	2	40X	170U					
POTS	1309.3	1310.1	III	G	2	110U	145					
POTS	1315.4	1315.7	III	G	3	110U	170U					
POTS	1322.8	1322.9	III	B	2	110U	170U					
POTS	1330.4	1330.9	III	G	3	40X	170U					
POTS	1349.0	1350.5	III	G	2	110U	170U					
SGMR	1400.0	1400.0	III		1	30	45					
SGMR	1432.0	1445.0	III	N	1	30	50					
SGMR	1628.0	1628.0	III		1	30	80					

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OBSERVATION		Sta	EVENT		Event Remarks	Int (1-3)	FREQUENCY		Remarks	
Start Day (UT)	End (UT)		Start (UT)	End (UT)			Spectral Class	Lower (MHz)		Upper (MHz)
21		SGMR	1658.0	1658.0	III		30	80		
		PALE	1714.0	1716.0	III		25	60		
		SGMR	1714.0	1718.0	V		30	80		
		PALE	1852.0	1925.0	III	N	2	25	75	
		SGMR	1852.0	1854.0	V		2	30	80	
	2020 2400		CULG	2020.0E	2400.0D	I	S	1	100	180
			CULG	2020.0E	2044.0	III	N	1	23	180
			PALE	2031.0	2031.0	III		1	25	45
			CULG	2047.0	2048.0	III	G	2	30	180
			PALE	2047.0	2048.0	III		1	25	75
			CULG	2129.0	2400.0D	III	N	1	20	180
			PALE	2142.0	2144.0	V		3	25	75
			CULG	2143.0	2146.0	III	G	3	18X	730
			CULG	2147.0	2148.0	III	G	1	35	300
		LEAR	2219.0	2220.0	III		1	30	65	
2140 2400		PALE	2219.0	2220.0	III		2	25	45	
		HIRA	2220.0	2220.4	III	B	1	50	210	
		LEAR	2248.0	2248.0	III		1	30	55	
22	0000 0800	CULG	0000.0E	0800.0D	III	N	1	23	180	
		CULG	0000.0E	0226.0	I	S	1	110	170	
		LEAR	0031.0	0032.0	III		2	30	80	
		PALE	0031.0	0031.0	III		1	25	45	
	0000 0731	HIRA	0031.0	0031.2	III	B	1	50	130	
		LEAR	0042.0	0043.0	III		1	30	60	
		LEAR	0103.0	1047.0	III	N	2	30	70	
		LEAR	0201.0	0212.0	II		2	30	70	
		CULG	0202.0	0214.0	II	UE	1	30	80	
		HIRA	0227.4	0228.4	III	G	1	50	140	
		HIRA	0328.2	0332.6	III	G	1	80	160	
		HIRA	0351.2	0352.6	III	G	1	50	120	
		LEAR	0427.0	0430.0	III		3	30	80	
		HIRA	0427.8	0429.0	III	G	3	40	260	
		CULG	0428.0	0429.0	III	G	3	20	260	
	0657 1200	CULG	0641.0	0800.0D	I	S	1	110	170	
		IZMI	0647.5	0647.6	III	B	2	45X	65	
		IZMI	0650.0U	0712.0U	III	N	1	45X	95	
		IZMI	0657.0	1200.0D	I	N	1	45	270	
		IZMI	0701.6	0701.7	III	B	2	105	270X	
		IZMI	0713.4	0713.4	III	B	1	200	260	
		IZMI	0721.9	0727.3	III	GG,C	2	45X	180	
		CULG	0722.0	0728.0	III	G	2	20	180	
		LEAR	0722.0	0727.0	III		3	30	80	
		SVTO	0722.0	0726.0	III		2	60	85	
		IZMI	0746.3	0746.8	III	G	1	45X	65	
		IZMI	0752.0U	1200.0D	III	N	1	45X	95	
	0811 1350	SVTO	0811.0	0812.0	III		2	35	85	
		POTS	0811.5	0812.2	III	G	2	40X	140	
		IZMI	0811.8	0812.1	III	G	2	45X	165	
		POTS	0829 E	1350 U	I	S,C,DC	3	40X	170U	
		IZMI	0842.5	0848.4	III	GG	2	45X	150	
		SVTO	0843.0	0858.0	III	N	3	35	85	
		POTS	0843.5	0844.7	III	G	3	40X	160	
POTS		0846.7	0847.0	III	G	3	40X	150		
POTS		0848.3	0848.4	III	B	2	75	130		
IZMI		0856.0	0858.4	III	GG	3	45X	170		
LEAR		0856.0	0858.0	III		3	30	80		
POTS		0856.4	0858.4	III	G,C	3	40X	170U		
IZMI		0856.5	0858.5U	CONT		2	45X	100U		
POTS		0904.1	0904.2	III	B	2	110U	145		
IZMI		0921.2	0921.4	III	G	2	60	145		
SVTO		0943.0	0955.0	III	N	2	50	78		
POTS	0943.7	0944.5	III	G	2	40X	75			
IZMI	0947.9	0949.6	III	GG,C	2	45X	170			
POTS	0947.9	0948.5	III	G	3	40X	170U			
POTS	0952.7	0952.9	III	B	3	110U	170U			
IZMI	1000.7	1003.8	III	GG	2	45X	95			
POTS	1000.7	1003.7	III	GG	3	40X	170U			
IZMI	1015.4	1016.1	III	GG	2	45X	160			

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OBSERVATION		Sta	EVENT		Event Remarks	Int (1-3)	FREQUENCY		Remarks	
Start Day (UT)	End (UT)		Start (UT)	End (UT)			Spectral Class	Lower (MHz)		Upper (MHz)
22		POTS	1015.5	1016.1	III	G	3	40X	170U	
		IZMI	1017.7	1019.0	III	GG	2	45X	165	
		POTS	1017.8	1019.1	III	GG	3	40X	170U	
		POTS	1021.7	1022.8	III	G	2	40X	75	
		POTS	1040.7	1040.9	III	B	1	40X	70	
		POTS	1042	1350 U	III	N	1	40X	70U	
		POTS	1052.9	1056.0	IV		3	40X	170U	
		IZMI	1053.0	1054.5	III	GG	2	45X	180	
		IZMI	1053.0	1056.9	CONT	FS	2	45X	245	
		SVTO	1053.0	1055.0	III		3	35	85	
0843	1323	ONDR	1053.0	1055.3	DCIM	G	2	2000X	4500X	
		ONDR	1053.2	1055.4	DCIM	G	1	800X	2000X	
0855	1440	BLEN	1053.2	1055.1	DCIM	C	1	1000X	2800X	
		IZMI	1054.5	1055.7	I	GG.DC	2	100	180	
		POTS	1054.5	1056.0	II	UE	3	120	170U	
		SVTO	1059.0	1500.0	CONT		2	35	85	
		SVTO	1114.0	1119.0	III		3	35	85	
		POTS	1114.1	1117.6	III	GG	3	40X	170U	
		IZMI	1114.2	1117.2	III	GG	2	45X	180	
		ONDR	1115.1	1115.2	DCIM	G	1	2135	4500X	
		IZMI	1118.5	1119.6	III	GG	2	45X	270	
		POTS	1118.5	1119.4	III	G	3	40X	170U	
		POTS	1244.7	1244.9	III	G	3	40X	120	
		POTS	1252.3	1252.4	III	B	2	110U	150	
		POTS	1316.7	1317.2	III	G	2	40X	120U	
		POTS	1318.4	1318.6	III	G	3	40X	150	
		BLEN	1346.6	1353.8	DCIM	C	1	1100	2600	
		SGMR	1348.0	1348.0	III		1	30	45	
		SGMR	1448.0	1455.0	III		1	30	80	
		CULG	2020.0E	2245.0	I	S	1	60	150	
2020	2400	CULG	2020.0E	2400.0D	III	N	1	20	180	
		CULG	2212.0	2213.0	III	G	3	20	180	
2141	2400	HIRA	2212.0	2212.4	III	B	3	30	220	
		CULG	2258.0	2303.0	III	G	2	18	180	
		LEAR	2258.0	2302.0	III		2	30	80	
		HIRA	2258.4	2302.2	III	G	2	25X	220	
		LEAR	2322.0	0839.0	CONT		2	30	80	
23	0000 0800	CULG	0000.0E	0800.0D	III	N	1	20	180	
		CULG	0032.0	0035.0	III	G	3	18	180	
		LEAR	0032.0	0035.0	III		3	30	80	
		PALE	0032.0	0035.0	III		2	25	75	
0000	0731	HIRA	0032.2	0033.6	III	G	3	25X	220	
		PALE	0129.0	0130.0	III		1	28	50	
		HIRA	0129.8	0130.0	III	B	1	25X	120	
		HIRA	0150.8	0151.0	III	B	1	25X	80	
		CULG	0243.0	0244.0	III	G	3	18	180	
		LEAR	0243.0	0245.0	III		3	30	80	
		PALE	0243.0	0244.0	III		2	30	75	
		HIRA	0243.2	0244.0	III	G	3	25X	170	
		LEAR	0312.0	0317.0	III		3	30	80	
		HIRA	0313.0	0315.2	III	G	3	30	200	
		CULG	0314.0	0315.0	III	G	3	18	180	
		PALE	0314.0	0315.0	III		2	35	75	
		CULG	0409.0	0800.0D	I	S	1	60	150	
		CULG	0431.0	0432.0	III	G	2	23	300	
		HIRA	0431.4	0431.6	III	B	2	50	260	
		CULG	0502.0	0508.0	III	GG	3	18	170	
		HIRA	0502.0	0507.6	III	G	3	50	140	
		LEAR	0502.0	0508.0	III		3	30	80	
		CULG	0534.0	0534.0	III	B	2	23	150	
		HIRA	0534.0	0534.2	III	B	2	50	120	
		CULG	0619.0	0623.0	III	G	2	25	170	
		LEAR	0619.0	0628.0	III		3	30	80	
		HIRA	0619.6	0621.8	III	G	1	50	200	
		CULG	0626.0	0628.0	III	G	3	18	280	
		HIRA	0627.8	0628.0	III	B	1	50	300	
0648	1200	IZMI	0645.0U	1200.0D	I	N	2	45U	270X	
		IZMI	0647.0U	1200.0D	III	N	2	45X	125	

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OBSERVATION		Sta	EVENT		Spectral Class	Event Remarks	Int (1-3)	FREQUENCY		Remarks
Start Day (UT)	End (UT)		Start (UT)	End (UT)				Lower (MHz)	Upper (MHz)	
23		SVTO	0718.0	1501.0	CONT		2	35U	85U	
		CULG	0731.0	0751.0	III	N	1	23	90	
		IZMI	0807.5	0810.0	III	GG	1	45X	145	
0811	1031	POTS	0816.5	0817.4	III	G	2	40X	90U	
		POTS	0829 E	1031 U	I	S,C,DC	2	50	170U	
		LEAR	0833.0	0835.0	III		3	30	80	
		SVTO	0833.0	0835.0	V		3	35	85	
		IZMI	0833.4	0835.3	III	GG,C	2	45X	180	
		POTS	0833.4	0835.4	III	GG,C	3	40X	170U	
0836	1322	ONDR								
		POTS	0838.5	0839.0	III	G	2	40X	150	
0855	1440	BLEN								
		POTS	0900.3	0900.4	III	B	1	40X	70	
		POTS	0906	1031	III	N	1	40X	70U	
		LEAR	0916.0	0917.0	III		2	30	80	
		IZMI	0916.2	0917.6	III	GG	2	45X	120	
		POTS	0917.1	0917.5	III	G	2	40X	90U	
		IZMI	0945.6	0946.6	III	GG	2	45	215	
		POTS	0946.4	0946.6	III	G	3	40X	170U	
		LEAR	1006.0	1009.0	III		3	30	80	
		SVTO	1006.0	1009.0	V		3	35	85	
		POTS	1006.7	1009.2	III	GG,C	3	40X	170U	
		IZMI	1006.8	1011.5	III	GG	2	45X	180	
		IZMI	1007.2	1010.0U	CONT		2	45X	250	
		POTS	1010.9	1011.5	III	G	3	110U	155	
		POTS	1025.7	1025.9	III	G	3	40X	125	
1047	1344	POTS	1047 E	1344 U	I	S,C,DC	3	40X	350U	
		SVTO	1101.0	1107.0	III		2	42	85	
		IZMI	1101.8	1102.2	III	GG	2	45X	180	
		POTS	1101.9	1102.8	III	G	3	40X	170U	
		POTS	1104	1344 U	III	N	1	40X	70U	
		IZMI	1104.5	1105.1	III	G	2	45X	250	
		POTS	1104.5	1108.3	III	G	3	40X	400	
		IZMI	1106.1	1106.9	III	GG	2	45X	270X	
		IZMI	1106.3	1106.8	V	G	2	45	65	
		IZMI	1117.4	1118.3	III	G	2	45X	270X	
		POTS	1117.5	1118.4	III	G,RS,C	3	40X	325U	
		POTS	1118.9	1119.3	III	G	2	40X	90U	
		POTS	1122.7	1122.8	III	B	3	110U	170U	
		POTS	1156.9	1157.1	III	B	2	40X	65	
		POTS	1223.5	1223.9	III	G	2	40X	70	
		SGMR	1243.0	1244.0	III		1	30	80	
		SVTO	1243.0	1244.0	V		3	35	85	
		POTS	1243.2	1244.9	III	GG,C	3	40X	170U	
		POTS	1247.8	1248.1	III	G	2	40X	90U	
		POTS	1252.9	1253.3	III	G	3	40X	90U	
		POTS	1302.3	1302.5	III	G	2	40X	90U	
		POTS	1307.9	1308.2	III	B	3	40X	170U	
		POTS	1319.1	1319.3	III	B	2	40X	75	
		POTS	1321.7	1321.8	III	B	2	40X	60	
		SGMR	1524.0	1538.0	III	N	2	30	80	
		SGMR	1635.0	1635.0	III		1	30	55	
		SGMR	1713.0	1724.0	III		2	30	80	
		PALE	1915.0	1917.0	III		1	27	46	
		PALE	1932.0	1936.0	III		3	25	75	
		SGMR	1932.0	1935.0	V		3	30	80	
		PALE	1953.0	2000.0	III		1	28	45	
2020	2400	CULG	2020.0E	2400.00	I	S	1	70	170	
		CULG	2031.0	2032.0	III	G	2	18	170	
		PALE	2031.0	2032.0	III		2	28	45	
		CULG	2055.0	2056.0	III	G	3	18	170	
		PALE	2055.0	2056.0	III		1	28	50	
		CULG	2138.0	2152.0	III	GG	2	18	180	
		PALE	2138.0	2152.0	III	N	1	25	55	
		CULG	2208.0	2400.00	III	N	1	23	170	
		LEAR	2240.0	2241.0	III		2	30	80	
		PALE	2240.0	2305.0	III	N	1	25	50	
		LEAR	2257.0	2306.0	III		2	30	80	
		LEAR	2315.0	2316.0	III		1	70	80	

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OBSERVATION		Sta	EVENT		Event Remarks	Int (1-3)	FREQUENCY		Remarks
Start Day (UT)	End (UT)		Start (UT)	End (UT)			Spectral Class	Lower (MHz)	
23		LEAR	2326.0	0111.0	III N	3	30	50	
24		CULG	0000.0E	0111.0	III N	1	18	160	
		PALE	0000.0	0105.0	III N	1	25	75	
	0000 0800	CULG	0000.0E	0800.0D	I S	1	100	170	
		CULG	0031.0	0033.0	III G	2	18X	180	
		LEAR	0203.0	0225.0	III N	2	30	80	
		CULG	0206.0	0219.0	III GG	1	20	100	
		LEAR	0247.0	0539.0	III N	3	30	80	
		CULG	0248.0	0248.0	III B	1	23	170	
		CULG	0302.0	0303.0	III G	2	20	150	
		PALE	0302.0	0303.0	III	1	30	55	
		CULG	0317.0	0403.0	III N	1	20	180	
		CULG	0341.0	0342.0	III G	3	18	180	
		CULG	0346.0	0346.0	III B	1	28	90	
		CULG	0402.0	0403.0	III G	1	18	180	
		CULG	0434.0	0437.0	III G	2	18	180	
		CULG	0453.0	0514.0	III N	1	25	120	
		CULG	0458.0	0500.0	III G	2	18	120	
		CULG	0528.0	0534.0	III GG	3	18X	180	
		CULG	0537.0	0539.0	III G	2	18	180	
	0702 1200	IZMI	0702.0E	1200.0D	I S	2	90U	270X	
		CULG	0746.0	0746.0	III B	1	23	90	
		SVTO	0746.0	0839.0	III N	2	35	85	
		LEAR	0748.0	0858.0	III N	2	30	80	
		CULG	0756.0	0756.0	III B	1	23	90	
		IZMI	0815.4	0823.2	III N	1	45X	95	
		IZMI	0817.2	0818.2	III G	2	45X	160	
	0811 1351	POTS	0817.4	0818.2	III G	3	40X	170U	
		IZMI	0819.7	0820.0	III G	2	45X	95	
		POTS	0829 E	1351 U	I S,C,DC	3	40X	350U	
		IZMI	0836.9	0838.9	III G	2	45X	85	
		POTS	0837	1337	III N	1	40X	70U	
	0837 1324	ONDR							
	0855 1440	BLEN							
		SVTO	0949.0	0950.0	III	1	68	75	
		POTS	1024.3	1024.5	III B	2	40X	60	
		SVTO	1127.0	1128.0	III	1	55	82	
		POTS	1128.1	1128.6	III G	2	40X	170U	
		IZMI	1128.2	1128.6	III G	2	45x	125	
		SVTO	1141.0	1501.0	CONT	2	35	85	
		SVTO	1151.0	1155.0	III	2	35	85	
		IZMI	1151.6	1152.3	III G	2	45X	175	
		POTS	1151.6	1152.3	III G,P	3	40X	170U	
		POTS	1153.2	1155.2	III GG,P	3	40X	250U	
		IZMI	1153.3	1155.0	III GG	2	45X	180	
		POTS	1227.8	1228.1	III G	2	40X	70	
		POTS	1236.1	1236.3	III G	3	40X	90U	
		POTS	1254.9	1255.5	III G,RS,U	3	40X	90U	
	2020 2400	CULG	2024.0	2024.0	III B	1	40	460	
		CULG	2101.0	2400.0D	I S	1	120	180	
		CULG	2113.0	2206.0	III S	1	50U	150	
		LEAR	2252.0	2253.0	III	1	30	53	
		CULG	2328.0	2328.0	III B	1	18	180	
		LEAR	2330.0	2331.0	III	1	30	45	
		CULG	2353.0	2353.0	III B	1	20	90	
25	0000 0800	CULG	0000.0E	0102.0	I S	1	100	170	
		CULG	0022.0	0114.0	III N	1	28	140	
		LEAR	0022.0	0104.0	CONT	1	40	80	
		LEAR	0044.0	0044.0	III	2	30	55	
		CULG	0156.0	0156.0	III B	1	20	180	
		LEAR	0156.0	0156.0	III	2	30	70	
		LEAR	0702.0	0720.0	III	1	30	55	
	0703 1200	IZMI	0710.8	0710.9	III B	2	200	245	
		IZMI	0713.2	0713.3	III B	1	45	80	
		LEAR	0719.0	0719.0	III	1	30	40	
		CULG	0749.0	0749.0	III B	2	50	170	
		SVTO	0749.0	0749.0	III	2	64	78	

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OBSERVATION		Sta	EVENT		Spectral Class	Event Remarks	Int (1-3)	FREQUENCY		Remarks
Start Day (UT)	End Day (UT)		Start (UT)	End (UT)				Lower (MHz)	Upper (MHz)	
25		IZMI	0749.1	0749.4	III	G	2	60	270X	
		IZMI	0749.2	0749.5	V	G,HARM	2	60	160	
		IZMI	0758.8	0758.9	III	B	1	45	85	
		IZMI	0804.1	0804.2	III	B	1	50	80	
		IZMI	0815.0	1200.0D	I	S	2	100	270X	
0811	1350	POTS	0829 E	1350 U	I	S,C,DC	2	40X	400	
0837	1323	ONDR								
0855	1440	BLN								
		IZMI	1032.4	1058.0U	III	N	1	45X	90	
2020	2400	CULG	2139.0	2139.0	III	B	1	20	60	
		CULG	2208.0	2210.0	III	G	1	18	100	
26	0000 0800	CULG	0005.0	0006.0	III	G	1	20	35	
		CULG	0013.0	0014.0	III	G	1	20	90	
		LEAR	0013.0	0014.0	III		2	30	80	
		LEAR	0239.0	0239.0	III		1	35	50	
		CULG	0241.0	0241.0	III	B	1	200	460	
		CULG	0342.0	0342.0	III	B	1	35	140	
		CULG	0436.0	0454.0	III	N	2	18X	260	
		LEAR	0436.0	0454.0	III	N	2	30	80	
		CULG	0627.0	0629.0	III	G	1	30	100	
		CULG	0714.0	0723.0	III	G	1	23	100	
		LEAR	0714.0	0719.0	III		1	30	60	
0722	1200	IZMI	0722.0E	1200.0U	I	N	2	180U	270X	
		IZMI	0722.7	0722.9	III	B	1	80	125	
		CULG	0744.0	0753.0	III	G	1	20	90	
		IZMI	0746.6	1200.0U	III	N	1	45X	95	
		CULG	0755.0	0756.0	III	G	2	20	130	
		LEAR	0755.0	0802.0	III		3	30	80	
		SVTO	0755.0	0755.0	III		2	35	85	
		IZMI	0755.1	0755.7	III	G	2	45X	135	
		IZMI	0800.2	0802.4	III	GG	2	45X	120	
0811	1350	POTS	0828 E	1350 U	I	S	2	40X	400U	
0837	1324	ONDR								
		LEAR	0839.0	0839.0	III		1	30	50	
		SVTO	0844.0	1046.0	CONT		2	35	80	
0855	1440	BLN								
		IZMI	0856.2	0857.2	III	G	2	45X	150	
		POTS	0856.2	0856.7	III	G	2	50X	160	
		IZMI	0917.8	0920.0	III	GG	2	45X	150	
		POTS	0918.4	0918.5	III	B	1	110U	150	
		POTS	0919.2	0919.8	III	G	2	110U	160	
		IZMI	0950.0	0953.4	III	GG	2	45X	160	
		POTS	0950.1	0953.5	III	GG	3	110U	170U	
		POTS	0954.2	0954.5	DCIM		2	450	600U	
		POTS	0954.5	0955.0	III	G	2	110U	170U	
		POTS	1015.0	1015.1	III	B	1	110U	145	
		POTS	1028.1	1028.2	III	B	2	40X	160	
		POTS	1031.2	1032.2	III	G	2	110U	170U	
		IZMI	1031.9	1032.0	III	G	2	95	180	
		IZMI	1055.3	1055.4	III	G	2	185	270X	
		POTS	1055.3	1055.4	III	B	2	200U	275U	
		IZMI	1111.3	1111.7	III	G	2	45X	95	
		POTS	1111.4	1111.6	III	B	2	40X	60	
		POTS	1113.2	1113.3	III	B	2	110U	170U	
		IZMI	1114.0	1114.2	III	B	2	45X	95	
		SVTO	1131.0	1502.0	CONT		2	35	85	
		POTS	1140.6	1140.8	III	B	2	40X	150	
		IZMI	1141.6	1142.9	III	G	2	45X	245	
		POTS	1141.7	1142.9	III	G	2	40X	130	
		POTS	1143	1343	III	N	1	40X	70U	
		POTS	1204.6	1208.6	III	GG	3	40X	90U	
		POTS	1233.7	1234.1	III	G	2	40X	120	
		SGMR	1257.0	1257.0	III		1	30	60	
		POTS	1257.1	1258.2	III	G	3	40X	170U	
		POTS	1305.9	1306.3	III	G	1	40X	170U	
		POTS	1309.8	1309.9	III	G	1	110U	170U	
		POTS	1321.1	1323.5	III	G	3	40X	170U	
		POTS	1324.4	1325.2	III	G	3	40X	250U	

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OBSERVATION		Sta	Start (UT)	End (UT)	EVENT		Int (1-3)	FREQUENCY		Remarks	
Start Day (UT)	End (UT)				Spectral Class	Event Remarks		Lower (MHz)	Upper (MHz)		
26		POTS	1332.0	1332.4	III	G	1	40X	140		
		POTS	1341.5	1341.6	III	B	2	120	170U		
		SGMR	1525.0	1527.0	III		1	30	72		
		SGMR	1640.0	1648.0	III		2	30	80		
		SGMR	1657.0	1658.0	III		1	30	80		
		SGMR	1733.0	1735.0	III		2	30	80		
		SGMR	1828.0	1829.0	III		1	30	75		
		PALE	1927.0	1930.0	III		1	25	45		
	2020	2400	CULG	2112.0	2206.0	III	N	1	30	120	
			CULG	2324.0	2325.0	III	G	1	20	150	
			LEAR	2324.0	2324.0	III		1	30	70	
			CULG	2332.0	2342.0	III	GG	1	20	150	
			LEAR	2332.0	2340.0	III		1	30	80	
27	0000	0755	CULG	0003.0	0008.0	III	G	1	25	160	
			LEAR	0008.0	0008.0	III		2	35	70	
			CULG	0047.0	0048.0	III	B	1	35	90	
			CULG	0134.0	0144.0	III	GG	1	18	120	
			LEAR	0134.0	0310.0	III	N	2	30	80	
			CULG	0147.0	0154.0	III	GG	3	18X	300	
	0015	0735	HIRA	0147.8	0153.0	III	G	3	25X	330	
			CULG	0155.0	0210.0	II	FN	3	23	90	
			CULG	0155.0	0214.0	II	SH	3	35	180	ESS 500
			CULG	0157.0	0200.0	III	G	1	18	170	
			LEAR	0158.0	0215.0	II		3	30	80	ESS 0500
			HIRA	0159.0	0202.6	II	FN	3	40	60	ESS 500
			HIRA	0159.0	0208.0	II	SH	3	50	120	ESS 500
			CULG	0244.0	0310.0	III	N	1	18	80	
			CULG	0334.0	0337.0	III	G	1	18	110	
			HIRA	0336.8	0337.0	III	B	1	50	90	
			LEAR	0527.0	0528.0	III		1	30	80	
			CULG	0528.0	0529.0	III	G	1	23	90	
			HIRA	0528.0	0528.2	III	B	1	50	80	
			CULG	0646.0	0647.0	III	G	1	30	90	
			LEAR	0646.0	0646.0	III		1	30	60	
	0646	1200	IZMI	0646.4	0646.9	III	G	2	50	135	
			HIRA	0646.6	0646.8	III	B	1	50	80	
			IZMI	0801.7	0801.9	III	B	2	45	70	
			IZMI	0810.5	0810.7	III	B,HARM	1	45X	150	
			IZMI	0815.5	0815.6	III	B	2	55	65	
	0811	1351	POTS	0830.9	0831.0	III	B	2	110U	145	
			IZMI	0859.7	0900.2	III	B	2	85	170	
			POTS	0859.7	0900.2	III	G	3	110U	170U	
			POTS	0901	0902	I	S,W	1	110U	170U	
			POTS	0912.1	0912.2	III	B	1	110U	150	
			IZMI	0912.3	0912.5	III	G	1	45	80	
			POTS	0933	0935	I	S,W	1	110U	170U	
			IZMI	0935.0U	1135.0U	I	N	1	220	245	
			POTS	0951.4	0951.7	III	B	3	50	160	
			POTS	1024	1025	I	S	2	150	170U	
	0855	1440	BLEN	1035.0	1052.2	DCIM	C	3	1100	2800X	
			POTS	1041	1351 U	I	S,C	2	40X	400	
			ONDR	1044.1	1051.4	DCIM	G	1	800X	2000X	
	0837	1326	ONDR	1044.5	1052.3	DCIM	GG	2	2000X	4500X	
			POTS	1047.4	1048.0	III	G	2	110U	350U	
			IZMI	1047.6	1048.2	III	G	2	45X	95	
		POTS	1047.7	1048.2	UNCLF		3	45	60		
		POTS	1050	1345	III	N	1	40X	70U		
		BLEN	1152.0	1208.1	DCIM	C	1	1000X	2800X		
		ONDR	1157.4	1211.4	DCIM	GG	2	800X	2000X		
		POTS	1159.6	1202.9	DCIM		3	200U	800X		
		IZMI	1200.0	1200.4	III	GG	2	200	270X		
		SVTO	1200.0	1203.0	III		1	47	73		
		BLEN	1200.4	1202.2	III	GG,RS	3	1000X	2600		
		POTS	1200.9	1201.9	III	G	3	40X	70		
		POTS	1202.8	1203.5	II	SH	1	240	300U		
		POTS	1202.8	1203.9	II	F	2	120	155		
		POTS	1203.3	1203.6	III	B	2	40X	70		
		POTS	1205.9	1206.3	III	G,RS	2	140	325		

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OBSERVATION		Sta	Start (UT)	End (UT)	EVENT		Int (1-3)	FREQUENCY		Remarks
Start Day (UT)	End Day (UT)				Spectral Class	Event Remarks		Lower (MHz)	Upper (MHz)	
27		POTS	1206.9	1208.2	II	UE	2	110U	145	
		POTS	1346.2	1348.7	III	GG,RS	3	40X	160	
		ONDR	1457.4	1211.2	DCIM	GG	2	2000X	4500X	
	2020 2400	CULG	2122.0	2125.0	III	G	1	18	90	
	2142 2400	HIRA								
		CULG	2151.0	2152.0	III	G	1	25	90	
28	0000 0755	CULG	0042.0	0046.0	CONT		2	380	1200	
		CULG	0043.0	0046.0	III	G	3	18X	400	
		LEAR	0043.0	0120.0	III	N	3	30	80	
		PALE	0043.0	0049.0	V		3	25	75	
	0000 0735	HIRA	0043.0	0044.8	III	G	3	25X	400	
		CULG	0046.0	0053.0	III	GG	2	18	170	
		CULG	0046.0	0055.0	II	FN	2	30	150	
		CULG	0046.0	0055.0	II	SH	2	55	300	SWF ESS 800
		HIRA	0046.0	0047.4	II	FN	3	80	120	
		HIRA	0046.0	0049.2	II	SH	3	130	230	
		HIRA	0053.4	0103.0	II		3	50	100	
		CULG	0056.0	0106.0	II	SH	2	45	110	ESS 550
		LEAR	0056.0	0102.0	II		3	30	80	ESS 0500
		CULG	0057.0	0105.0	II	FN	1	25	50	
		PALE	0057.0	0116.0	III	N	1	30	65	
		CULG	0059.0	0111.0	CONT		1	90	170	
		CULG	0107.0	0108.0	III	G	2	20	180	
		HIRA	0107.4	0118.6	III	G	2	40	180	
		CULG	0112.0	0120.0	III	GG	1	23	520	
		LEAR	0120.0	0203.0	IV		1	30	80	
		CULG	0447.0	0447.0	III	B	2	20	140	
		LEAR	0447.0	0449.0	III		2	30	80	
	0811 1351	POTS	0838.8	0839.9	III	G	2	40X	170U	
		LEAR	0839.0	0839.0	III		2	30	80	
		SVTO	0839.0	0839.0	III		1	36	59	
	0701 1200	IZMI	0839.0	0941.2	III	G	2	45X	150	
		POTS	0840.6	0840.7	III	B	2	110U	160	
	0855 1440	BLEN								
		IZMI	0910.7	0910.9	III	B	2	45	150	
		POTS	0910.7	0910.8	III	B	2	110U	170U	
		IZMI	1009.5	1009.7	III	B	1	45	70	
		IZMI	1040.9	1041.0	III	B	1	240	270X	
		POTS	1040.9	1041.2	III	G	1	200U	370U	
	0837 1326	ONDR	1042.1	1044.1	DCIM	G	1	2105	4500X	
		ONDR	1213.5	1215.3	DCIM	G	1	2000X	4500X	
		POTS	1213.6	1217.1	III	GG,RS	3	40X	325U	
		SVTO	1214.0	1215.0	V		3	35	85	
		POTS	1218.7	1218.9	III	G	3	40X	160	
		PALE	2008.0	2013.0	III		1	05	40	
	2020 2400	CULG								
	2142 2400	HIRA								
29	0000 0736	HIRA	0208.8	0209.0	III	B	1	160	350	
		HIRA	0307.6	0307.8	III	B	1	140	400	
	0000 0755	CULG	0430.0	0430.0	III	B	1	140	340	
		HIRA	0430.4	0430.6	III	B	1	130	340	
		CULG	0541.0	0541.0	III	B	1	30	90	
		LEAR	0541.0	0541.0	III		1	32	45	
	0659 1200	IZMI	0832.3	0833.3	III	GG	2	45X	70	
	0811 1351	POTS	0841.7	0841.8	III	B	1	110U	160	
		POTS	0850	0852	I	S,W	1	150	170U	
		POTS	0904	0905	I	W	1	150	170U	
	0855 1440	BLEN	0916.2	0927.0	DCIM	C	2	1000X	2800X	
		SVTO	0924.0	0927.0	V		3	35	85	
		POTS	0924.4	0924.5	DCIM		1	400	450	
	0837 1328	ONDR	0924.5	0926.3	DCIM	G	2	2000X	4500X	
		IZMI	0924.6	0928.0	III	GG	2	45X	270X	
		POTS	0924.6	0926.6	III	G,C	3	40X	170U	
		LEAR	0925.0	0928.0	V		3	30	80	
		ONDR	0925.0	0926.2	DCIM	GG	2	800X	2000X	
		IZMI	0925.1	0927.4	V	G,HARM	2	45X	215	
		POTS	0926.6	0927.1	V		3	40X	70	

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

129
Dec 99

DECEMBER 1999

OBSERVATION		Sta	EVENT		Event Remarks	Int (1-3)	FREQUENCY		Remarks		
Start Day (UT)	End (UT)		Start (UT)	End (UT)			Spectral Class	Lower (MHz)		Upper (MHz)	
29		POTS	0928.0	0928.8	III	G	2	125	170U		
		IZMI	0932.3	1005.0U	I	S	1	55	270X		
		POTS	0934	1140	I	S	2	130	350U		
		IZMI	0934.7	0937.4	II	HARM	2	55	150		
		POTS	0935.3	0939 U	II	SH,H	3	110U	150		
		POTS	0935.4	0936.1	II	F	1	60	70		
		SVTO	0937.0	1022.0	IV		2	42	85		
		POTS	0939.2	0951 U	II	SH	3	110U	170U		
		LEAR	0943.0	1003.0	IV		1	35	80		
		POTS	1003.2	1003.3	III	B	1	110U	160		
		POTS	1040.5	1040.7	III	G	2	110U	150		
		POTS	1045.6	1045.9	III	B	2	40X	130		
		POTS	1119.9	1120.0	III	B	1	40X	150		
		POTS	1211.1	1211.2	III	B	1	125	160		
		POTS	1256.6	1256.7	III	B	2	140U	170U		
		SGMR	1609.0	1611.0	V		1	30	70		
	2142	2400	HIRA								
	2020	2400	CULG	2147.0	2147.0	III	B	1	40	140	
	30	0000	0755	CULG	0027.0	0027.0	III	G	1	100	160
				CULG	0510.0	0510.0	III	B	1	40	170
			LEAR	0510.0	0510.0	III		1	40	70	
0000		0736	HIRA	0510.2	0510.4	III	B	1	80	140	
0837		1329	ONDR								
0811		1351	POTS	0856.6	0856.7	III	B	1	110U	170U	
0900		1440	BLEN								
			POTS	0941.8	0942.1	III	G	2	40X	170U	
0658		1200	IZMI	0941.8	0942.1	III	G	2	45X	90	
			POTS	0953.1	0953.2	III	B	2	110U	145	
			IZMI	1010.0	1010.5	III	G	2	45X	175	
			POTS	1010.0	1010.5	III	G	3	110U	170U	
			POTS	1014.1	1014.3	III	G	2	110U	150	
			IZMI	1014.2	1014.4	III	B	1	45X	85	
			POTS	1220.2	1220.6	III	G	2	40X	150	
			POTS	1244.4	1244.9	III	G	2	40X	150	
			POTS	1253.6	1254.7	III	G	2	40X	170U	
			POTS	1254	1255	I	S	1	110U	150	
			POTS	1303.4	1304.7	III	G	2	110U	170U	
			POTS	1305.8	1306.1	III	G	2	110U	150	
2142		2400	HIRA								
			LEAR	2312.0	2312.0	III		1	30	60	
			PALE	2312.0	2312.0	III		1	30	45	
2020		2400	CULG	2312.0	2312.0	III	B	1	20	150	
			CULG	2351.0	2351.0	III	B	1	40	170	
31			LEAR	0426.0	0427.0	III		1	30	80	
		0000	0755	CULG	0427.0	0428.0	III	G	1	30	150
	0000	0737	HIRA	0427.2	0427.4	III	B	1	60	120	
			CULG	0523.0	0523.0	III	B	1	30	130	
			LEAR	0523.0	0523.0	III		2	30	60	
	0646	1200	IZMI								
			LEAR	0716.0	0719.0	III		2	30	60	
			SVTO	0724.0	0725.0	III		1	35	85	
			CULG	0743.0	0750.0	III	GG	1	45	80	
	0837	1330	ONDR								
	0900	1440	BLEN								
	0811	1352	POTS	1159	1316	I	S	2	135	170U	
			SGMR	1434.0	1435.0	III		1	30	50	
			SVTO	1434.0	1434.0	III		1	35	48	
			PALE	2126.0	2130.0	III		1	25	45	
	2020	2400	CULG	2127.0	2130.0	III	G	2	20	90	
	2142	2400	HIRA								

NOTE: The sensitivity of the Potsdam receivers 40-90 MHz and 200-400 MHz was reduced during the entire month.

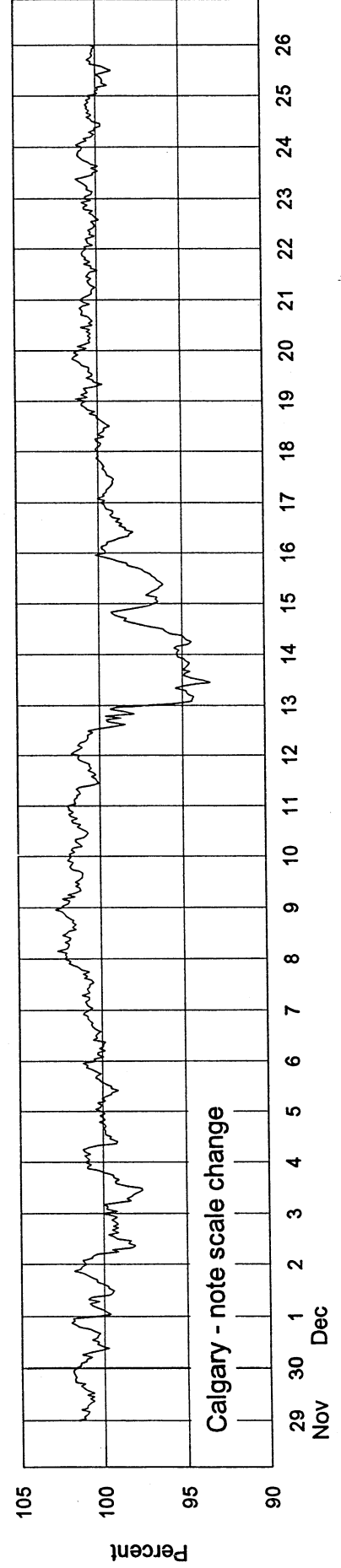
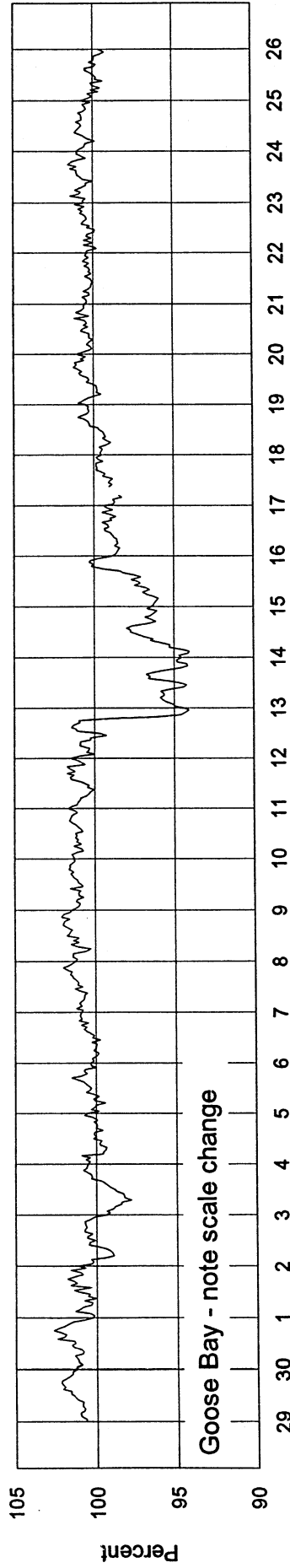
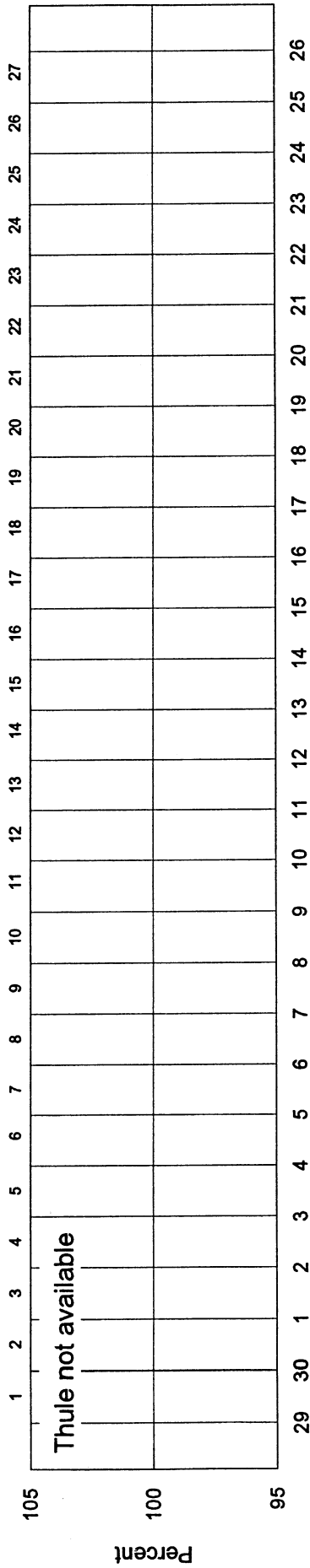
COSMIC RAY INDICES
(Neutron Monitor)
December 1999

Day	THULE Average (cts/h)/100	GOOSE BAY Average (cts/h)/100	CALGARY Average (cts/h)/300	KIEL Average (cts/h)/100	MOSCOW Average (cts/h)/64	CLIMAX Average (cts/h)/100	BEIJING Average (cts/h)/256	HALEAKALA Average (cts/h)/1000
1	No data	6743.4	3653.2	5766.9	8594.5	3868.7	1948.4	3502.5
2	at time of	6698.1	3621.0	5761.0	8575.2	3836.7	1926.6	3470.8
3	publication	6639.7	3610.5	5722.4	8579.7	3827.4	1912.8	3446.6(24)
4		6687.4	3645.0	5772.7	8623.1	3861.7	1933.0	3464.7(24)
5		6711.1	3641.5	5793.4	8673.2	3859.3	1935.2	3480.5(24)
6		6707.7	3651.5	5781.8	8710.5	3870.2	1942.9	3499.2(24)
7		6762.0	3673.3	5810.4	8709.5	3895.6	1945.5	3520.0(28)
8		6782.3	3711.7	5851.2	8729.3	3940.8	1949.9	3525.0
9		6765.3	3697.5	5851.2	8678.9	3923.2	1941.8	3502.5
10		6764.0	3691.2	5851.2	8676.3	3915.5	1939.7	3483.6
11		6750.4	3672.0	5825.7	8660.7	3912.0	1938.6	3480.2
12		6659.7	3642.8	5779.9	8562.0	3884.2	1932.0	3472.5
13		6371.2	3446.3	5559.5	8204.8	3657.6	1888.6	3397.7
14		6429.8	3512.8	5555.2	8234.3	3740.6	1894.8	3435.2
15		6532.2	3539.7	5681.4	8398.4	3748.6	1912.1	3438.0
16		6609.8	3602.5	5718.2	8463.9	3815.0	1929.8	3467.7
17		6633.2(21)	3623.2	5738.4	8527.3	3827.4	1940.4	3476.9
18		6675.2	3639.3	5773.0	8582.1	3849.4	1958.4	3493.7
19		6716.8	3664.2	5797.9	8595.5	3873.2	1970.1	3502.2
20		6718.7	3661.7	5798.8	8603.8	3862.0	1975.7	3508.2
21		6708.0	3656.3	5801.0	8647.5	3862.8	1972.5	3510.7
22		6711.7	3651.5	5773.0	8638.3	3849.0	1959.6	3510.2
23		6741.9	3659.0	5782.0	8615.3	3842.2	1952.2	3502.3
24		6729.4	3652.2	5782.4	8599.8	3829.8	1943.0	3505.6
25		6682.9	3634.0	5761.5	8567.5	3808.5	1939.5	3507.8
26		6613.1	3585.8	5738.1	8549.7	3757.5	1928.0	3481.7
27		6585.0	3578.7	5714.8	8480.9	3755.1	1925.0	3466.3
28		6621.5	3578.0	5738.7	8492.7	3760.0	1930.7	3466.5
29		6684.2	3612.3	5777.7	8542.2	3824.8	1943.9	3485.5
30		6789.1	3686.5	5832.5	8645.6	3894.1	1956.9	3513.2
31		6718.1(17)	3661.2	5809.0	8617.8	3880.7	1948.2	3507.8
Mean		6675.6	3630.8	5764.5	8573.6	3839.7	1939.2	3485.1

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

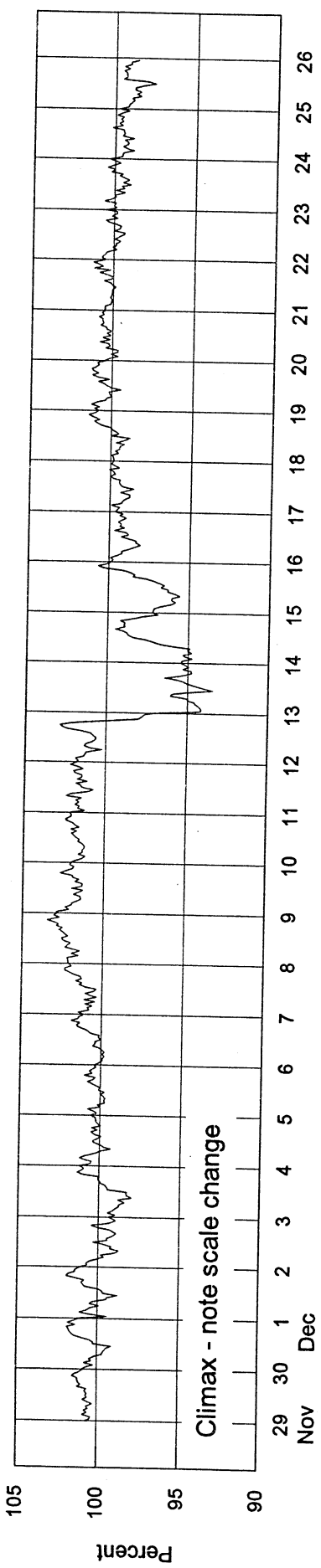
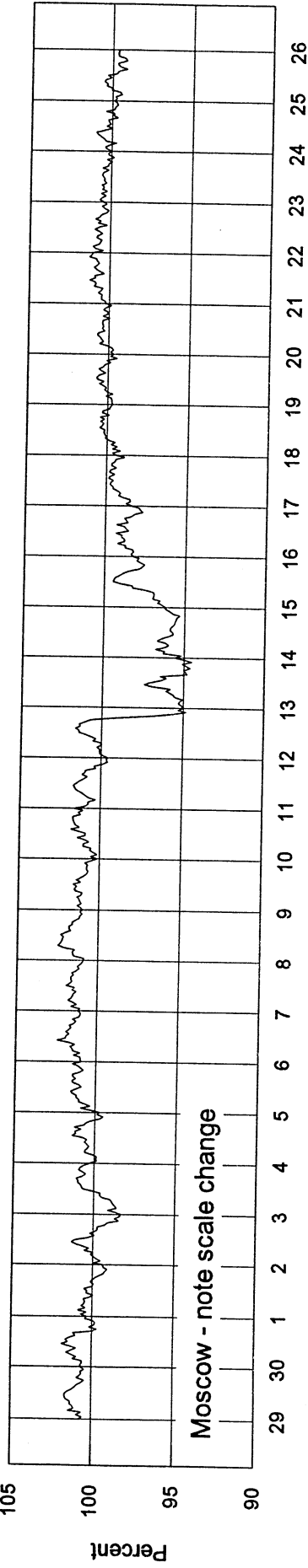
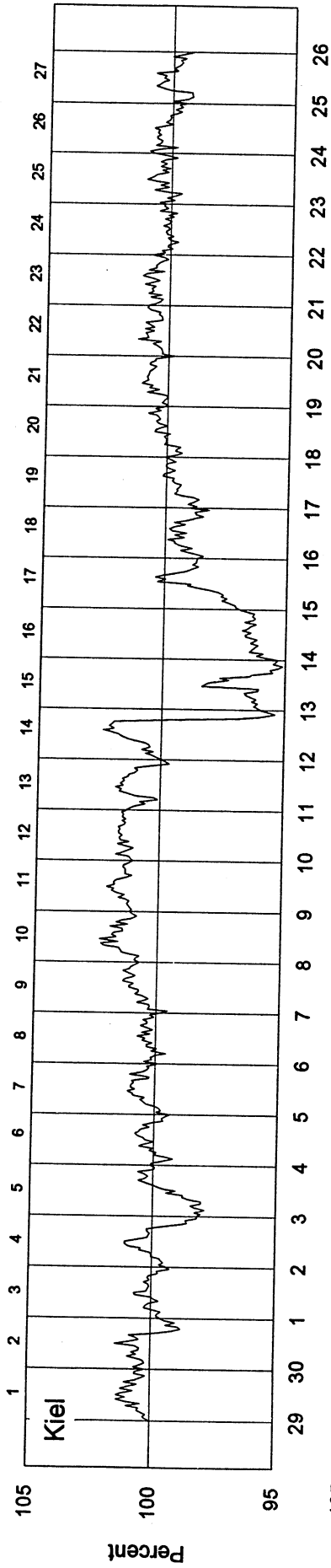
COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2271 - Beginning 29 Nov 99



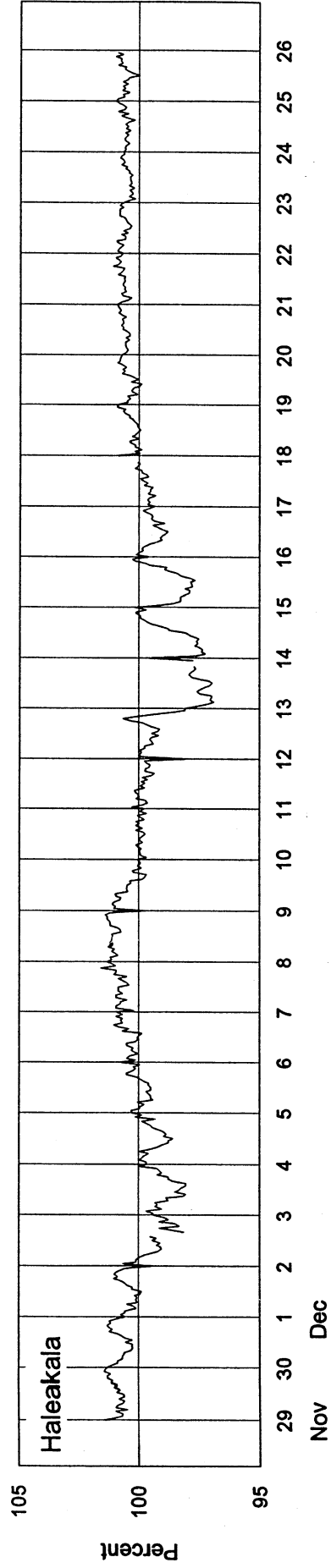
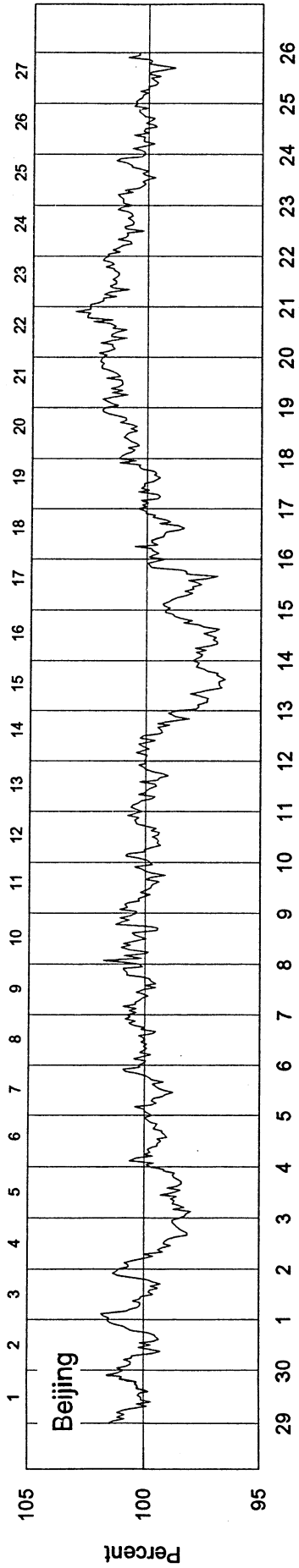
COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2271 - Beginning 29 Nov 99

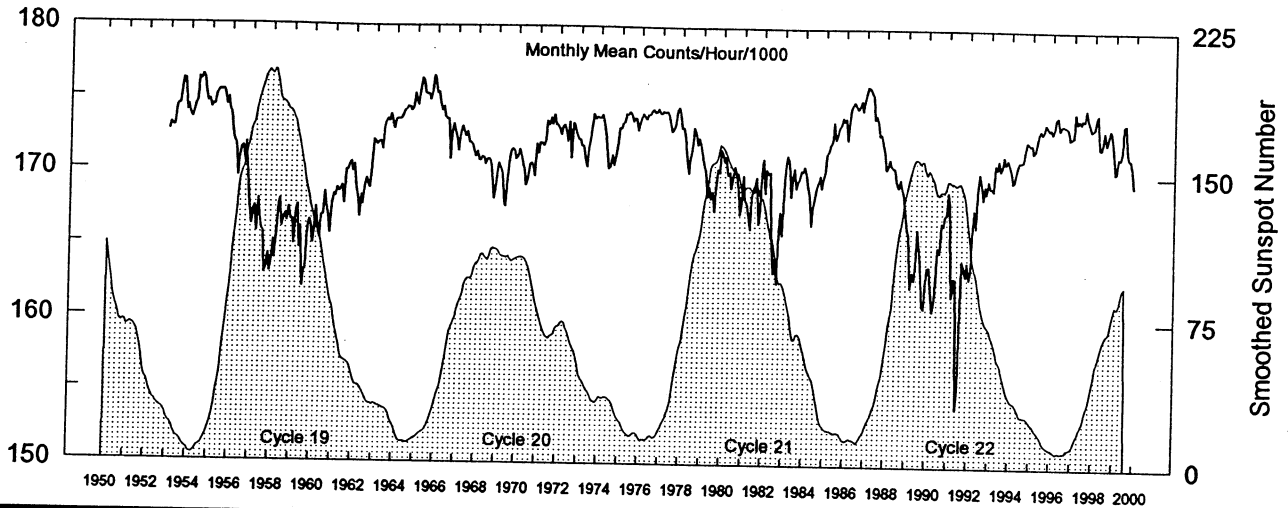


COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2271 - Beginning 29 Nov 99



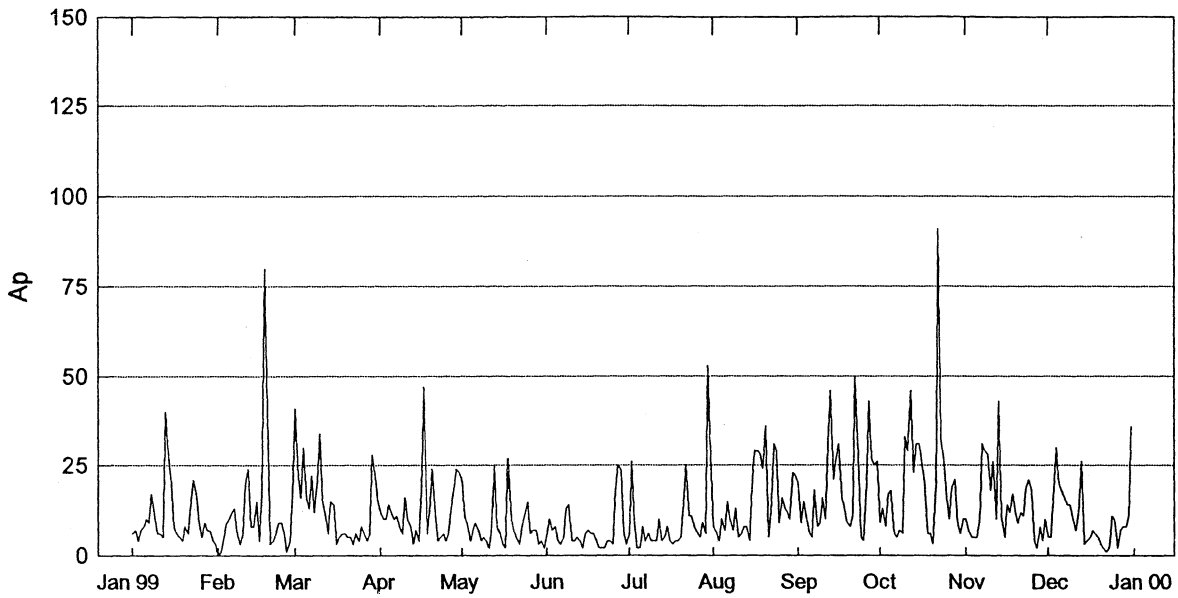
huancayo NEUTRON MONITOR Pressure-Corrected/Adjusted Values Jan 1953 - Dec 1999



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

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 Rigidity=12.91GV (1980). Multiply table entries by 2057.6 to obtain equivalent Haleakala counting rate. NOTE: Monthly means for January 1995 through March 1998 are corrected values.

Daily Average Indices Ap Jan 1999 - Dec 1999

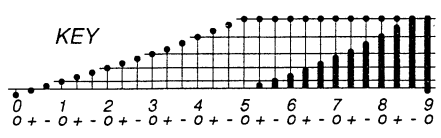
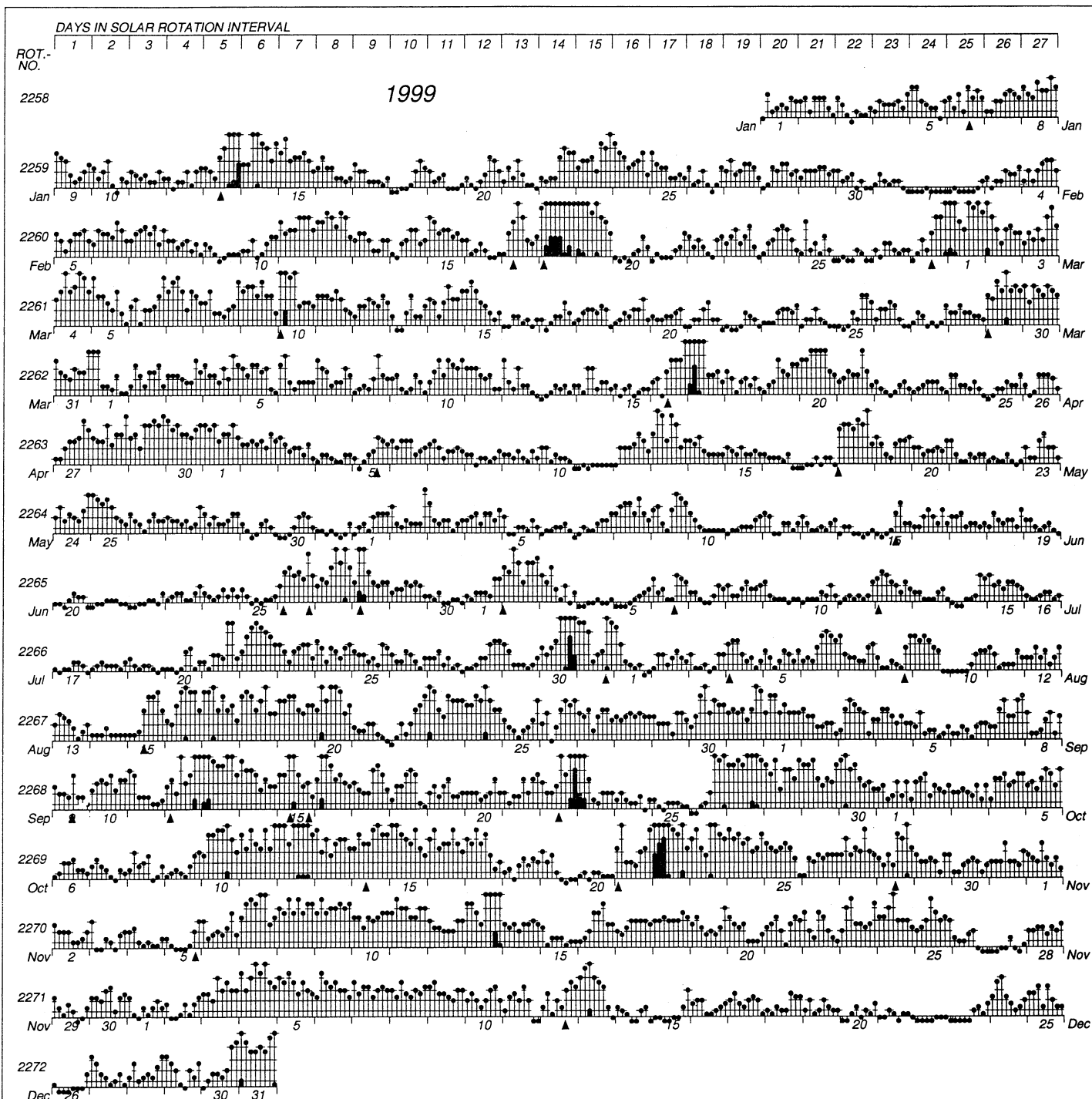


Day	Jan 99	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	6	0	41	12	21	6	6	8	20	9	10	5
2	7	1	22	10	11	10	26	6	9	13	7	5
3	4	5	16	10	8	7	9	4	15	8	5	16
4	7	9	30	14	4	8	2	10	11	17	5	30
5	8	10	16	12	7	4	2	7	6	18	5	20
6	10	12	13	10	9	3	8	15	5	6	10	18
7	9	13	22	11	7	5	4	10	18	5	31	16
8	17	6	12	8	4	13	6	7	8	7	29	14
9	11	3	21	6	5	14	4	13	9	6	28	14
10	6	6	34	16	4	4	4	5	16	33	18	10
11	6	20	15	10	2	4	4	6	10	29	26	7
12	5	24	11	8	8	5	10	8	31	46	10	11
13	40	8	6	3	25	4	4	8	46	23	43	26
14	29	8	15	7	8	2	5	4	21	31	11	3
15	20	15	14	4	6	6	8	19	27	31	5	4
16	8	4	3	18	3	7	4	29	31	26	14	5
17	6	17	5	47	2	6	3	29	16	21	12	7
18	5	80	6	6	27	6	4	28	13	6	17	6
19	4	40	6	12	10	4	4	24	9	6	12	5
20	8	3	5	24	7	2	5	36	8	3	9	3
21	6	4	5	12	5	2	14	5	11	20	12	2
22	14	6	3	4	3	2	25	12	50	91	11	1
23	21	9	6	5	8	4	11	31	28	32	19	2
24	17	9	4	6	11	4	11	29	5	26	21	11
25	9	6	8	4	15	3	8	9	4	16	18	10
26	5	1	6	6	6	18	6	16	20	10	4	2
27	9	4	4	14	7	25	5	13	43	19	2	7
28	7	17	6	19	7	24	9	12	27	21	8	8
29	7		28	24	3	6	6	10	25	9	4	8
30	4		22	23	4	3	53	23	26	6	10	11
31	3		15		2		28	22		10		36
Mean	10	12	14	12	8	7	10	15	19	19	14	10

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

GeoForschungsZentrum Potsdam

Kp for 1999

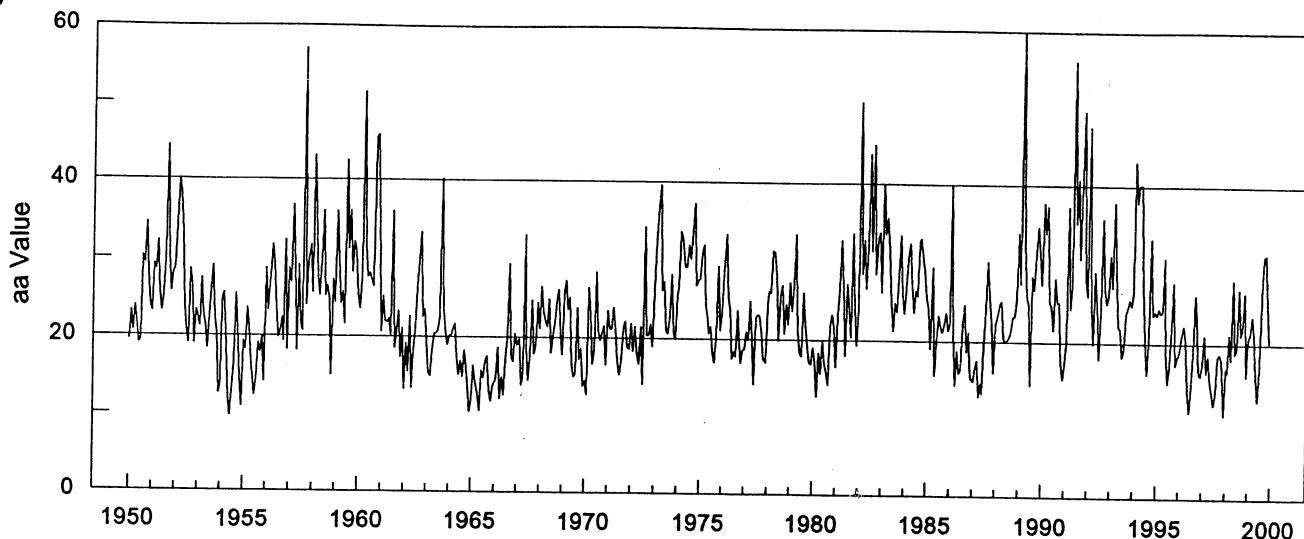


▲ = sudden commencement

PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES

Kp 1999

Monthly Mean aa Index Jan 1950 - Dec 1999



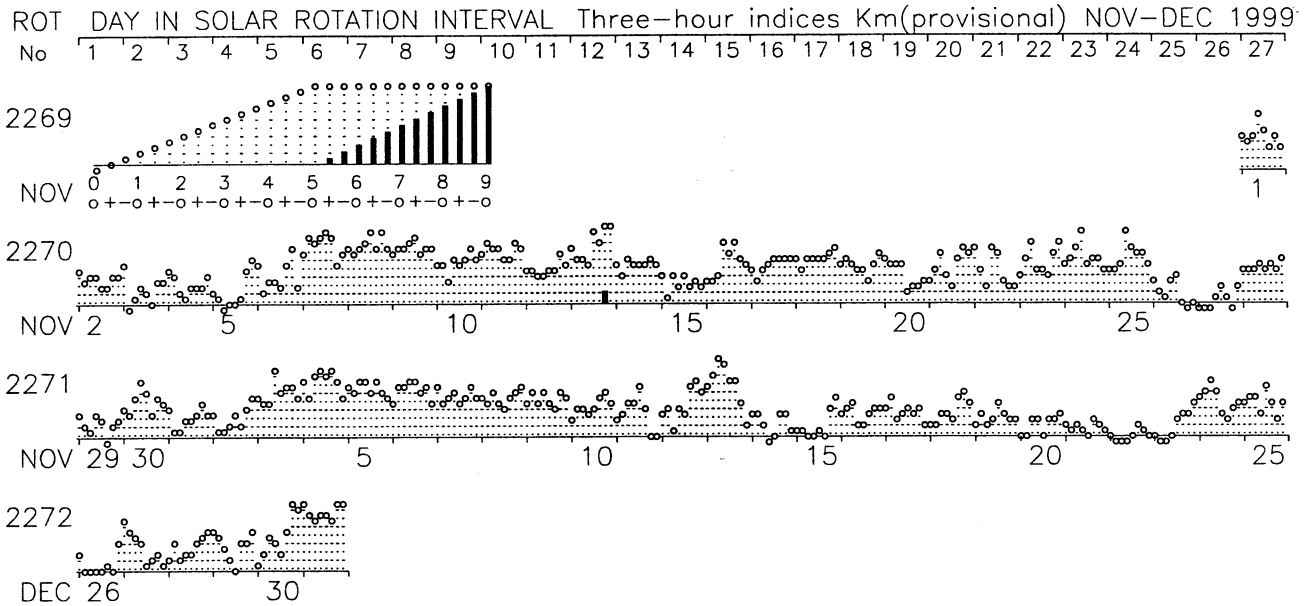
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	22.5	26.1	29.0	22.4	20.2	12.6	22.2
1954	13.9	24.5	25.5	20.6	12.0	9.7	13.1	16.5	25.4	21.1	14.5	10.9	17.3
1955	19.3	18.2	23.6	21.1	16.7	15.1	12.3	14.3	19.1	17.8	19.9	14.1	17.6
1956	28.7	23.3	27.6	31.7	29.3	23.5	19.8	20.7	22.4	19.3	32.3	18.2	24.7
1957	28.7	26.8	36.7	28.8	18.1	29.1	21.7	20.7	57.0	24.0	29.5	31.7	29.4
1958	25.5	43.2	36.1	27.6	25.2	29.7	36.0	25.1	26.5	24.7	15.0	27.2	28.5
1959	24.3	35.9	29.9	24.2	25.7	21.6	42.5	31.2	36.1	28.2	32.1	30.8	30.2
1960	25.2	23.5	27.6	51.5	31.6	27.6	28.1	27.2	26.4	45.6	45.9	34.5	32.9
1961	20.6	25.1	22.0	21.8	22.3	20.1	36.0	18.5	20.7	23.3	17.3	21.1	22.4
1962	13.2	19.2	15.5	22.6	13.4	18.1	21.0	26.2	29.8	33.3	22.5	23.5	21.5
1963	19.3	15.3	14.9	18.2	20.4	20.5	20.8	22.5	40.2	23.5	20.7	18.9	21.3
1964	20.1	20.1	21.0	21.7	17.5	15.1	16.9	14.8	18.2	16.9	13.8	10.3	17.2
1965	11.8	16.3	14.3	12.6	10.5	15.7	14.7	16.8	17.5	13.1	11.7	13.8	14.1
1966	14.2	14.8	18.6	12.0	14.8	12.5	17.1	20.0	29.4	17.5	16.8	20.5	17.3
1967	18.9	19.8	13.8	15.5	33.1	18.6	14.4	17.5	24.7	17.8	18.9	24.5	19.8
1968	21.1	26.5	23.3	22.2	21.4	24.9	18.0	20.1	22.0	24.8	26.2	20.3	22.6
1969	17.8	25.8	27.3	23.6	25.2	16.7	15.0	15.3	23.8	17.2	18.7	13.8	20.0
1970	14.4	12.7	26.4	23.1	16.6	18.3	28.4	21.0	19.7	20.6	21.6	16.5	19.9
1971	23.5	21.2	21.1	23.9	21.1	17.0	15.2	17.1	21.4	22.2	18.8	18.6	20.1
1972	21.9	18.3	21.5	18.1	16.6	21.5	14.0	34.2	20.4	20.4	21.8	18.9	20.6
1973	26.1	32.7	36.9	39.6	26.1	27.3	20.9	20.6	22.8	28.2	20.7	19.9	26.8
1974	25.8	26.4	33.7	32.9	29.2	29.2	32.0	30.2	33.7	37.3	26.8	27.5	30.4
1975	27.6	31.1	32.0	24.3	22.7	20.7	21.7	18.1	16.9	20.2	29.3	21.1	23.8
1976	23.3	28.5	33.4	25.4	23.7	17.5	18.4	17.7	23.7	20.4	16.9	18.6	22.3
1977	18.7	21.0	19.9	24.9	20.1	14.2	22.9	23.2	23.0	20.9	17.3	17.0	20.3
1978	24.6	26.2	25.9	31.3	31.2	28.3	19.9	25.6	27.0	20.8	24.6	22.0	25.6
1979	27.3	23.7	26.9	33.5	21.0	18.3	17.9	26.0	22.0	19.3	17.1	16.8	22.5
1980	19.0	17.3	12.7	18.4	15.6	20.0	17.0	15.9	14.2	21.9	23.3	21.7	18.1
1981	16.5	23.1	26.6	32.8	26.9	18.0	27.2	24.0	20.4	33.7	24.1	19.3	24.4
1982	24.2	50.6	28.5	32.9	26.7	32.1	43.9	31.4	45.1	28.5	33.0	33.8	34.2
1983	26.2	40.0	33.6	35.7	31.6	24.9	21.3	24.9	23.7	28.3	33.5	26.0	29.1
1984	23.5	26.7	30.7	32.5	27.2	23.7	26.4	25.8	32.6	33.1	31.0	29.0	28.5
1985	25.7	24.1	19.0	29.5	15.6	19.9	23.4	22.0	21.2	22.2	23.7	21.4	22.3
1986	22.4	40.0	21.1	14.3	18.8	15.9	16.3	22.3	24.7	18.6	21.2	15.3	20.9
1987	14.8	16.6	17.6	12.9	14.7	13.2	19.3	24.3	30.3	25.8	22.4	16.0	19.0
1988	22.4	23.4	24.8	25.2	20.5	20.0	20.2	20.6	21.4	23.2	23.3	25.5	22.5
1989	33.9	27.5	60.1	32.8	25.7	24.9	14.4	28.4	26.7	31.4	34.7	31.4	31.0
1990	27.4	37.8	33.9	37.4	25.1	24.6	21.6	28.2	25.1	25.1	17.4	15.2	26.6
1991	17.2	20.1	37.3	24.3	27.3	56.2	35.2	40.8	30.7	44.1	49.7	28.0	34.2
1992	25.9	47.7	24.5	19.8	29.1	24.8	17.9	24.1	35.8	27.0	25.0	26.1	27.3
1993	31.2	27.1	37.9	29.2	22.1	21.8	18.2	19.2	23.8	24.6	25.5	24.8	25.5
1994	26.5	43.2	37.9	40.2	40.2	27.2	20.6	16.0	20.2	33.3	23.6	24.1	29.4
1995	23.6	24.5	23.8	24.2	30.9	19.1	14.9	17.0	22.2	27.9	17.2	18.2	22.0
1996	18.8	20.8	22.3	20.5	14.0	11.1	14.7	18.8	26.2	23.5	16.3	15.9	18.6
1997	17.4	21.0	16.3	18.4	15.1	13.7	12.1	13.7	18.4	18.7	18.0	10.8	16.1
1998	16.8	16.4	21.2	18.0	28.1	18.8	19.3	27.0	21.1	22.4	26.5	15.9	21.0
1999	20.8	21.3	23.5	21.3	15.8	12.7	16.9	26.2	31.2	31.3	25.1	20.1	22.2

PLANETARY GEOMAGNETIC ACTIVITY

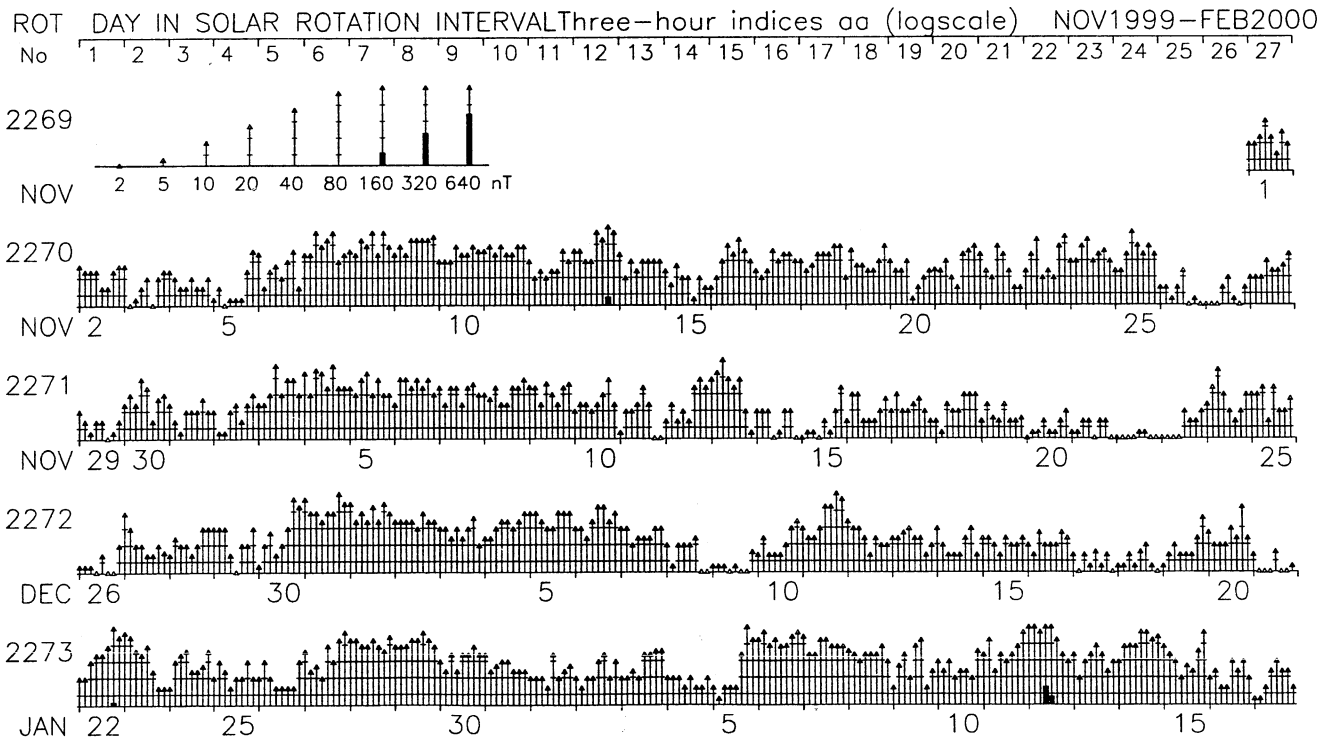
3-HOUR-RANGE INDICES Km AND aa BY 27-DAY SOLAR ROTATION INTERVAL

ISGI PUBLICATION OFFICE – EMail : ISGI.PUBOFF@cetp.ipsl.fr

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



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

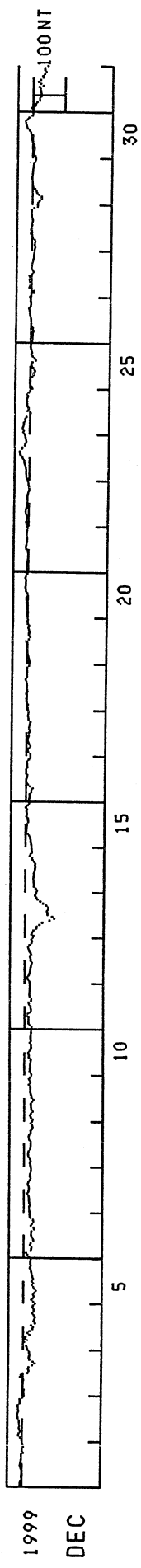


Indices Derivation at Universite Paris Sud; Graph Prepared at ISGI Publication Office.

HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

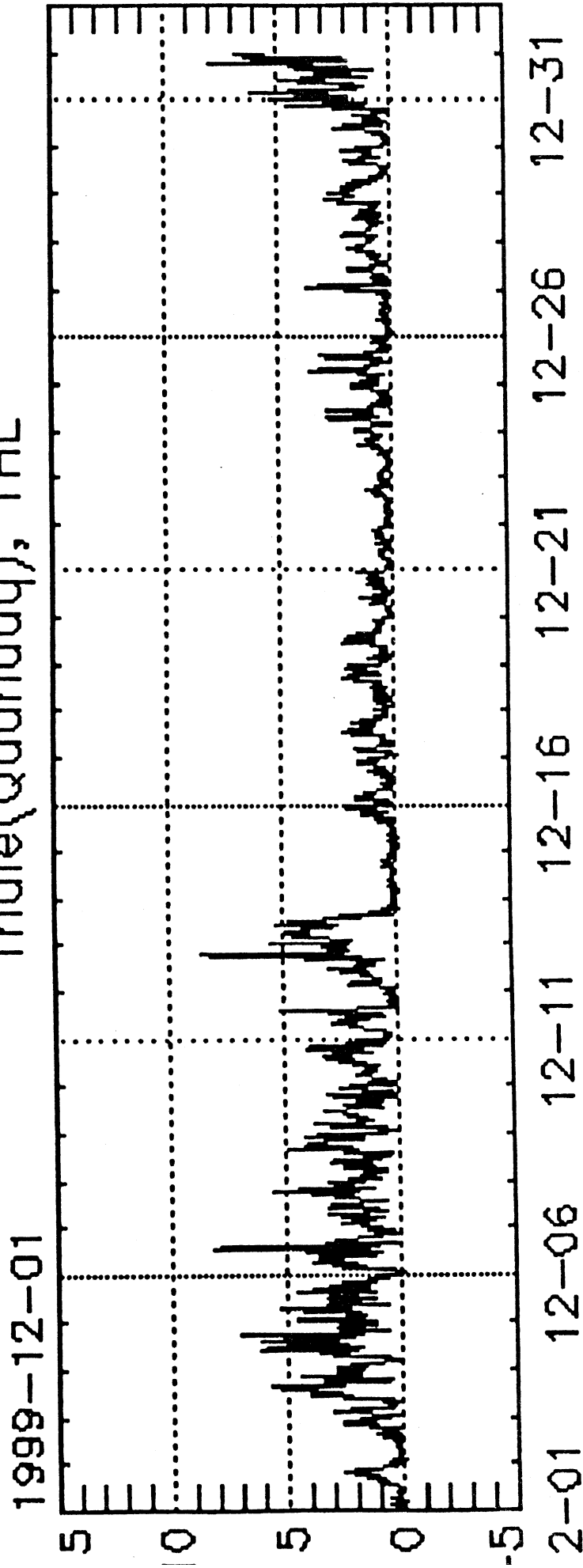
DECEMBER 1999

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	U. T.	
1	7	7	5	1	3	3	1	1	3	5	7	6	6	4	3	4	4	-4	1	1	-4	-1	1	2	23	24
2	3	7	13	11	7	9	11	10	11	12	11	15	17	19	15	14	15	15	15	10	10	-1	0	3	1	2
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4	-11	-9	2	-4	-12	-5	-7	-21	-14	-20	-29	-31	-24	-37	-33	-36	-37	-32	-28	-33	-33	-29	-31	-14	-14	-37
5	-30	-24	-28	-32	-30	-36	-40	-34	-31	-27	-31	-26	-31	-29	-27	-25	-25	-22	-19	-23	-19	-21	-22	-22	-37	-22
6	-16	-11	-8	-23	-25	-24	-21	-22	-30	-29	-24	-22	-23	-25	-33	-31	-23	-27	-31	-28	-20	-18	-17	-17	-17	-17
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Note: The baselines for the observatories were adjusted for secular change for the Provisional Dst values for December 1999.

WDC C1 for Geomagnetism, Copenhagen
Polar Cap index
Thule(Qaanaaq), THL

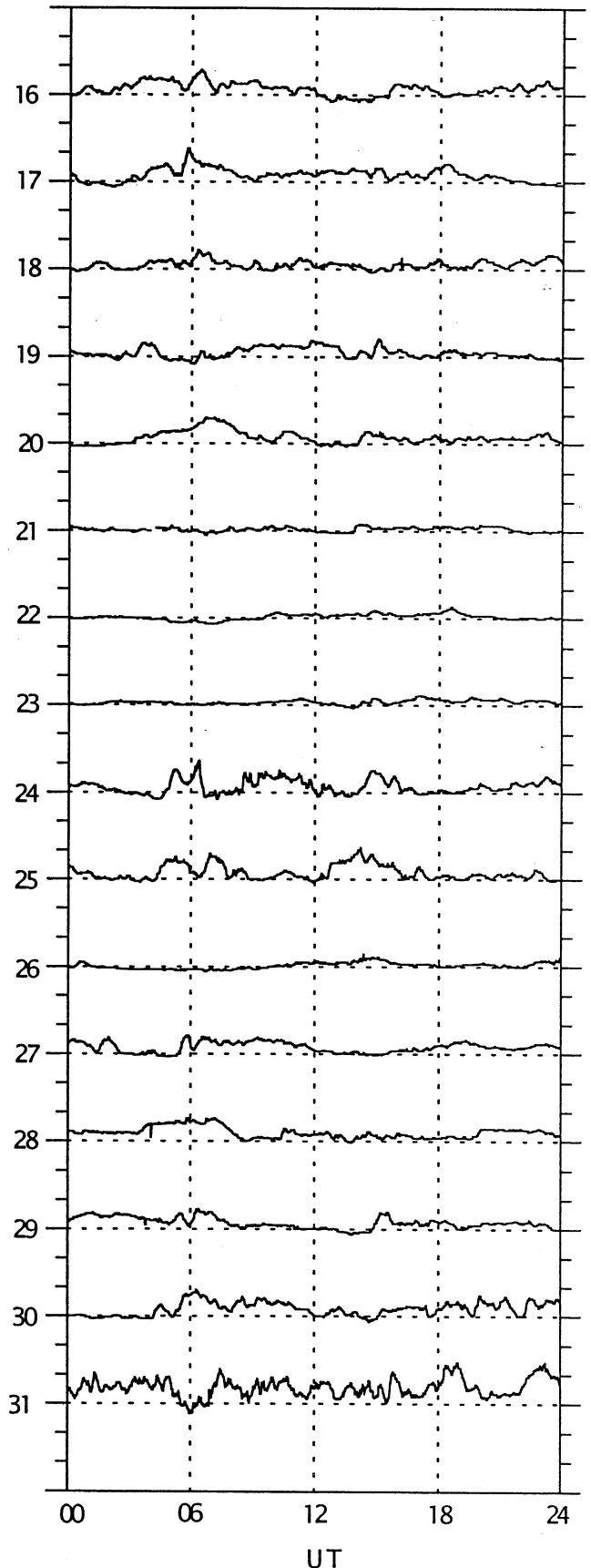
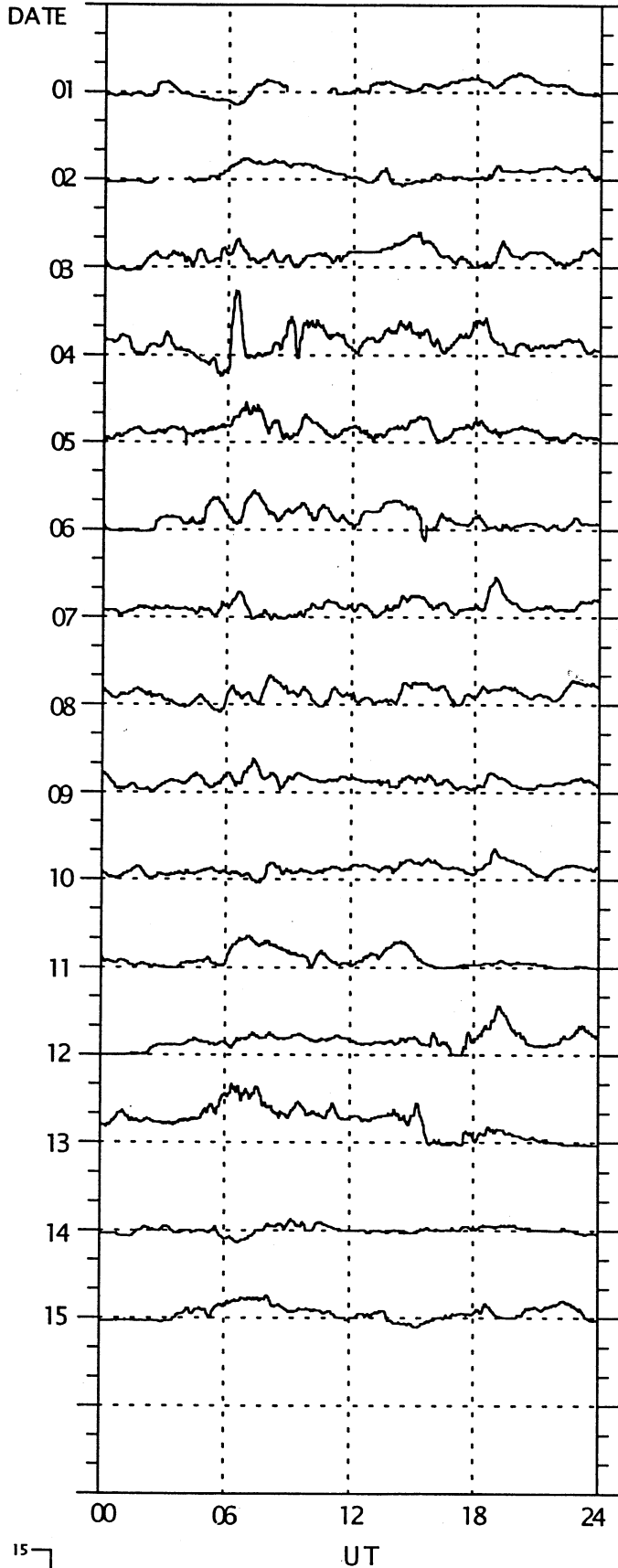


Date, mm-dd
Data source: Solar-Terrestrial Physics Division
Danish Meteorological Institute

PC-INDEX

Vostok

December, 1999



1-min Values

Arctic & Antarctic Research Institute, Russia

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

DECEMBER 1999

Sta	Geomag Lat	Commencement		Type	SC Amplitudes			Maximum 3-Hour K Index Day(3-Hour Periods)	Ranges			End Hour Day (UT)	
		Day	Time (UT)		D (Min)	H (Gamma)	Z (Gamma)		D (Min)	H (Gamma)	Z (Gamma)		
KRC	16.4N	03	0015	..	..	..	..	03(4) 04(4,6)	5	9	114	50	05 05
UJJ	13.6N	03	1000	..	..	..	..		-	6	116	18	04 21
NGP	11.3N	03	1000	..	..	..	..		-	6	136	14	04 21
ABG	09.4N	03	1000	..	..	..	..	03(4) 04(3,4,5,6)	5	6	128	22	04 21
HYB	07.6N	03	0200	..	..	..	..	03(4,6) 04(6)	5	6	125	19	05 24
PND	02.0N	03	1000	..	..	..	..		-	5	134	64	04 21
TIR	00.6S	03	1000	..	..	..	..		-	5	180	74	04 21
ETT	00.7S	03	0200	..	..	..	..		-	--	162	61	04 22
BJI	28.8N	12	1550	SC	0.6	23	1	13(3)	5	6	139	21	13 21
KRC	16.4N	12	1704	..	..	..	..	13(3)	6	8	107	43	14 03
UJJ	13.6N	12	1500	..	..	..	..		-	5	108	17	13 20
NGP	11.3N	12	1500	..	..	..	..		-	5	123	16	13 20
ABG	09.4N	12	1500	..	..	..	..	13(3,6)	5	6	122	26	13 20
HYB	07.6N	12	1551	SC	- 0.2	13	- 2	13(3)	6	5	119	21	13 22
PND	02.0N	12	1500	..	..	..	..		-	5	140	89	13 20
TIR	00.6S	12	1500	..	..	..	..		-	6	196	115	13 20
ETT	00.7S	12	1551	SC	- 0.3	11	12		-	--	185	83	13 21
HYB	07.6N	23	1200	..	..	..	..	24(3)	5	3	120	21	25 24
ETT	00.7S	23	1200	..	..	..	..		-	--	163	61	25 24
HYB	07.6N	26	2219	SC	- 0.2	6	- 1		-	--	--	--	-- --
ETT	00.7S	26	2218	SC	- 0.3	10	6		-	--	150	55	27 13
KRC	16.4N	30	1235	..	..	..	..	31(2,6,7)	5	6	101	38	31 00
UJJ	13.6N	30	1700	..	..	..	..		-	4	84	32	31 23
NGP	11.3N	30	1700	..	..	..	..		-	4	99	27	31 23
ABG	09.4N	30	1700	..	..	..	..	31(2,7)	5	4	94	45	31 23
HYB	07.6N	30	1200	..	..	..	..	31(6)	5	4	94	33	02 24
PND	02.0N	30	1700	..	..	..	..		-	4	87	57	31 23
TIR	00.6S	30	1700	..	..	..	..		-	4	106	50	31 23
ETT	00.7S	30	0500	..	..	..	..		-	--	--	--	02 20

Stations:

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

Stations reporting no storms observed: HER

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

DECEMBER 1999

Storm Sudden Commencements (SSC)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
12	1551	A: HRB COI BJI	01	1007-1024	BDV
		B: NGK* VAL* BDV* CLF* NAG* MMB KAK KNY	17	0625-0639	BDV
		C: QUE HYB GNA CNB	28	0042-0105	MMB+ KAK+ KNY+
		-: WNG*			

REPORTING OBSERVATORIES (up to the 2nd of February 2000):

SOD NUR WNG NGK VAL BDV CLF HRB NAG MMB EBR COI BJI SPT KAK KNY QUE HYB GNA CNB

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

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

