



**U.S. DEPARTMENT OF COMMERCE**

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**NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE**

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NOVEMBER 1999 NUMBER 663 - Part II

# **Solar-Geophysical Data comprehensive reports**

Data for May 1999 and Late Data

International Standard Serial Number: 0038-0911

Library of Congress Catalog Number: 79-640375 //r81

**NATIONAL GEOPHYSICAL DATA CENTER**

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Subscription information is on the inside back cover.

# SOLAR-GEOPHYSICAL DATA

Number 663

(Issued in Two Parts)

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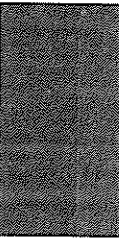
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MAY 1999

Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/	CMP	Dur	Imp	Obs	Area	Measurement	Corr	Remarks		
								USAF Region									Mo	Day
0024		03	15333	15346	1544	N21	W59	8524	04	29.2	11	SF				50		
	RAMY	03	1533	1534	1544	N22	W60	8524	04	29.1	11	SF	3	E		50		
	KANZ	03	1536	1540	1544	N20	W58	8524	04	29.3	8	SF	2	C				
		03	1753		1811	No Flare Patrol												
0025		03	19192	19211	1932	N22	W62	8524	04	29.1	13	SF				31		
	RAMY	03	1919	1921	1934	N22	W62	8524	04	29.1	15	SF	3	E		25		
	HOLL	03	1921	1922	1931	N22	W62	8524	04	29.1	10	SF	3	E		37		
0026	RAMY	03	2044	2045	2048	N22	W16	8526	05	2.6	4	SF	3	E		10		
		03	2050		2100	No Flare Patrol												
		03	2142		2400	No Flare Patrol												
		04	0000		0059	No Flare Patrol												
		04	0109		0125	No Flare Patrol												
		04	0302		0327	No Flare Patrol												
		04	0938		0940	No Flare Patrol												
		04	1000		1003	No Flare Patrol												
		04	1027		1052	No Flare Patrol												
		04	1059		1210	No Flare Patrol												
		04	1216		1222	No Flare Patrol												
		04	1228		1239	No Flare Patrol												
		04	1244		1254	No Flare Patrol												
		04	1304		1311	No Flare Patrol												
0027		04	1822*	18582	1928	N25	E22	8527	05	6.5	66	1F				165	F	
	RAMY	04	1822	1900	1931	N26	E20	8527	05	6.3	69	1F	3	E		174	F	
	HOLL	04	1846	1858	1924	N24	E24	8527	05	6.6	38	1F	3	E		156	F	
0028	HOLL	04	1929	1931	1935	N23	E26	8527	05	6.8	6	SF	3	E		11		
0029	HOLL	04	1831	1844	1846	N23	E23	8527	05	6.5	15	SF	3	E		40		
0030	URUM	05	0149	0153	0216	N12	E09	8525	05	5.7	27	SN		C		129	1.4	E
0031	URUM	05	0456	0500	0512	N19	W32	8526	05	2.8	16	SF		C		48	0.6	DG
		06	0916		0936	No Flare Patrol												
0032		06	1041	1048	1059	S18	E71	8534	05	11.8	18	SN				50	H	
	SVTO	06	1041	1048	1059	S18	E71	8534	05	11.8	18	SF	3	E		69		
	RAMY	06	1046E	1046U	1059D	S17	E71	8534	05	11.8	13D	SN	3	E		30	H	
0033	SVTO	06	1047	1058	1119	N18	W07	8525	05	5.9	32	SF	3	E		96	F	
0034	RAMY	06	1314	1314	1320	N20	W12	8525	05	5.6	6	SF	3	E		14		
0035	RAMY	06	1323	1327	1349	N20	W12	8525	05	5.6	26	SF	3	E		23		
0036		06	13234	13321	1342	N23	W08	8525	05	5.9	19	SF				28	F	
	RAMY	06	1323	1332	1345	N25	W05	8525	05	6.2	22	SF	3	E		11		
	SVTO	06	1323	1333U	1339	N22	W08	8525	05	5.9	16	SF	3	E		55	F	
	HOLL	06	1327	1333	1342	N21	W11	8525	05	5.7	15	SF	3	E		17		
0037	SVTO	06	1341	1341	1350	N15	W12	8525	05	5.7	9	SF	3	E		26	F	
0038		06	14441	14441	1450	N02	E63	8533	05	11.3	6	SF				16		
	RAMY	06	1444	1444	1450	N02	E63	8533	05	11.3	6	SF	3	E		19		
	HOLL	06	1445	1445	1449	N02	E63	8533	05	11.3	4	SF	3	E		13		
	SVTO	06	1445	1445	1451	N01	E63	8533	05	11.3	6	SF	3	E		16		
0039	LEAR	07	0254	0254	0259	N13	E55	8539	05	11.3	5	SF	3	E		14		
0040	LEAR	07	0445	0446	0454	N20	E87	8541	05	13.8	9	SF	4	E		14		
0041		07	06552	0700	0722	N15	E58	8539	05	11.7	27	SF				53	E	
	SVTO	07	0655	0700	0723	N15	E59	8539	05	11.7	28	SF	3	E		54		
	LEAR	07	0657	0700	0720	N15	E58	8539	05	11.7	23	SF	4	E		52	E	

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MAY 1999

Grp #	Sta	Start Day (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Dur Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
0042	LEAR	07 0700	0710	0717	N18	W53	8526	05	3.2	17	SF		4	E		11		
0043	SVTO	07 0914	0914	0921	N20	W54	8537	05	3.2	7	SF		3	E		16		
0044	SVTO	07 1249	1259	1313	N14	E55	8539	05	11.7	24	SF		3	E		11		
0045		07 1336	1338	1346	S26	E46	8536	05	11.1	10	SF					42		H
	RAMY	07 1336	1338	1344	S26	E46	8536	05	11.1	8	SF		3	E		44		
	HOLL	07 1336	1338	1344	S25	E46	8536	05	11.1	8	SF		3	E		36		
	SVTO	07 1336	1338	1349	S27	E46	8536	05	11.1	13	SF		3	E		45		H
0046	SVTO	07 1356	1357	1400	N19	W21	8525	05	6.0	4	SF		3	E		17		
0047		07 1414*	1427	1506	N18	W24	8525	05	5.8	52	2F					276		S
	SVTO	07 1414	1427U	1529D	N17	W25	8525	05	5.7	75D	2N		3	E		334		
	RAMY	07 1416	1427	1506	N20	W21	8525	05	6.0	50	1F		3	E		214		S
	HOLL	07 1424	1424U		N18	W25	8525	05	5.7		2F		3	E		281		
0048	HOLL	07 1425	1426	1510	N27	W17	8527	05	6.3	45	SF		3	E		33		
0049	HOLL	07 1608	1612	1614	N18	W59	8537	05	3.2	6	SF		3	E		15		
0050		07 1620	1621	1626	S26	E44	8536	05	11.1	6	SF					18		
	RAMY	07 1620	1621	1625	S26	E44	8536	05	11.1	5	SF		3	E		16		
	HOLL	07 1620	1621	1626	S25	E45	8536	05	11.2	6	SF		3	E		19		
0051		07 1630†	1633	1637	S26	E42	8536	05	10.9	7	SF					17		
	RAMY	07 1630	1633	1638	S26	E42	8536	05	10.9	8	SF		3	E		18		
	HOLL	07 1631	1633	1636	S25	E43	8536	05	11.0	5	SF		3	E		16		
0052	RAMY	07 1628	1628	1634	N19	W56	8537	05	3.4	6	SF		3	E		15		
0053	HOLL	07 1712	1715	1723	N14	E53	8539	05	11.7	11	SF		3	E		19		
0054	RAMY	07 1722	1722	1725	N11	W30	8538	05	5.5	3	SF		3	E		15		
0055	HOLL	07 1755	1758	1802	N19	W59	8537	05	3.2	7	SF		3	E		12		
0056	HOLL	07 1829	1830	1833	N12	W30	8525	05	5.5	4	SF		3	E		10		
0057	HOLL	07 1842	1852	1925	N15	E56	8539	05	12.0	43	SF		3	E		53		
0058	HOLL	07 1942	1943	1948	N20	W60	8537	05	3.2	6	SF		3	E		47		
0059	HOLL	07 1953	1958	2004	N20	W72	8537	05	2.3	11	SF		3	E		10		
0060	HOLL	07 2059	2100	2104	N21	E80	8541	05	14.0	5	SF		3	E		25		
0061	HOLL	07 2117	2121	2157	N16	E50	8539	05	11.7	40	SF		3	E		28		F
0062	HOLL	07 2145	2146	2201	S25	E39	8536	05	10.9	16	SF		3	E		56		
0063	HOLL	07 2331	2332	2334	N20	W62	8537	05	3.2	3	SF		3	E		16		
0064	LEAR	08 0037	0037	0041	N19	W63	8537	05	3.2	4	SF		2	E		11		
0065	LEAR	08 0101	0104	0109	N20	W62	8537	05	3.3	8	SF		3	E		11		
0066	LEAR	08 0119	0119	0122	N20	W61	8537	05	3.4	3	SF		3	E		16		
0067		08 0141	01423	0148	N18	W61	8537	05	3.4	7	SN					52	1.9	E
	LEAR	08 0141	0142	0148	N19	W61	8537	05	3.4	7	SF		3	E		23		
	URUM	08 0141	0145	0149	N18	W61	8537	05	3.4	8	SN			C		80	1.9	E
0068		08 0157	0157	0214	N20	W61	8537	05	3.4	17	SN					28	0.8	D
	URUM	08 0157E	0157	0212	N22	W60	8537	05	3.5	15D	SB			P		32	0.8	D
	LEAR	08 0157	0157	0215	N19	W62	8537	05	3.3	18	SF		3	E		24		
0069	URUM	08 0247	0304	0311	N19	W61	8537	05	3.5	24	1N			C		113	2.7	E

H $\alpha$  SOLAR FLARES

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May 99

MAY 1999

Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/		Dur (Min)	Imp Opt	Xray	Obs See	Type	Time (UT)	Area Measurement		Remarks
								USAF Region	CMP Mo Day							Apparent (10-6 Disk)	Corr (Sq Deg)	
0070		08	03261	03311	0338	N20	W60	8537	05	3.5	12	SN				30	1.0	D
	LEAR	08	0326	0332	0336	N19	W62	8537	05	3.4	10	SF	3	E		11		
	URUM	08	0327	0331	0339	N21	W58	8537	05	3.7	12	SB		C		48	1.0	D
0071	LEAR	08	0345	0346	0348	N20	W77	8526	05	2.3	3	SF	3	E		11		
0072	LEAR	08	0411	0411	0415	N17	W66	8537	05	3.1	4	SF	3	E		23		
0073		08	05093	0517	0521	N18	W64	8537	05	3.3	12	1N				66	2.7	EF
	URUM	08	0509	0517	0521	N20	W61	8537	05	3.5	12	1N		C		113	2.7	E
	LEAR	08	0512	0517	0521	N17	W67	8537	05	3.1	9	SF	3	E		19		F
0074	LEAR	08	0532	0534	0537	N19	W63	8537	05	3.4	5	SF	3	E		30		
0075	KANZ	08	0851	0851	0855	S19	E43	8534	05	11.6	4	SF	2	C				
0076	KANZ	08	1015	1015	1019	N14	W43	8525	05	5.2	4	SF	2	C				
0077	RAMY	08	1052E	1104U	1146	N18	E64	8541	05	13.3	54D	SF	3	E		89		F
0078	SVTO	08	1102E	1106U	1108D	N21	E73	8541	05	14.0	6D	1F	2	E		100		F
0079	RAMY	08	1123	1126	1137	N21	W71	8537	05	3.0	14	SF	3	E		37		
0080	RAMY	08	1143	1143	1154	N17	E19	8531	05	9.9	11	SF	3	E		10		
0081	RAMY	08	1156	1158	1212	N20	W69	8537	05	3.2	16	SF	3	E		34		F
0082	RAMY	08	1223	1223	1231	N19	W70	8537	05	3.2	8	SF	3	E		13		
0083	RAMY	08	1258	1306	1320	N19	W72	8537	05	3.0	22	SF	3	E		17		FH
0084	RAMY	08	1323	1324	1337	N19	W70	8537	05	3.2	14	SF	3	E		20		
0085		08	13428	13459	1356	N20	W75	8537	05	2.8	14	SF				18		
	RAMY	08	1342	1345	1354	N19	W71	8537	05	3.1	12	SF	3	E		26		
	SVTO	08	1350	1354	1357	N22	W79	8537	05	2.5	7	SF	3	E		10		
0086	HOLL	08	1348	1348	1353	N20	E70	8541	05	13.9	5	SF	3	E		18		
0087		08	13533	14101	1428	N20	E72	8541	05	14.1	35	SF				48		F
	SVTO	08	1353	1411	1422	N19	E71	8541	05	14.0	29	SF	3	E		50		F
	HOLL	08	1356	1410	1433	N21	E72	8541	05	14.1	37	SF	3	E		47		
0088	HOLL	08	1425	1429	1506	N19	W68	8537	05	3.4	41	SF	3	E		62		
0089	SVTO	08	1425	1429	1511	N23	W75	8526	05	2.8	46	1F	3	E		168		
0090	SVTO	08	1502	1502	1515	N28	E08		05	9.2	13	SF	3	E		11		
0091		08	15091	1510	1528	N16	W36	8525	05	5.9	19	SF				34		F
	HOLL	08	1509	1510	1528	N15	W38	8525	05	5.7	19	SF	3	E		37		
	SVTO	08	1510	1510	1528	N17	W34	8525	05	6.0	18	SF	3	E		30		F
0092	SVTO	08	1519	1520	1530	N23	W25	8527	05	6.7	11	SF	3	E		13		
0093	SVTO	08	1547	1547	1550	N21	W78	8526	05	2.7	3	SF	3	E		25		
0094	HOLL	08	1719	1720	1725	N19	W72	8537	05	3.2	6	SF	3	E		55		
0095	HOLL	08	1822	1835	1858	N19	W74	8537	05	3.1	36	SF	3	E		66		
0096	HOLL	08	1905	1917	1927	N19	W70	8537	05	3.4	22	SF	3	E		44		
0097	HOLL	08	1926	1930	1933	N21	E71	8541	05	14.2	7	SF	3	E		11		
0098	HOLL	08	1939	2031	2100	N19	W75	8537	05	3.1	81	1F	3	E		111		F
0099	HOLL	08	2105	2116	2155	N19	W77	8537	05	3.0	50	SF	3	E		89		



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Grp #	Sta	Start Day	Max (UT)	End (UT)	Lat	NOAA/ USAF Region	CMP Mo	Dur Day	Imp (Min)	Xray	Obs See	Type	Area Measurement			Remarks	
													Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)		
0100	HOLL	08	2156	2204	2221	N20 W77 8537	05	3.0	25	SF	3	E		83			
0101	HOLL	08	2226	2329	2444	N21 W78 8537	05	2.9	138	1F	3	E		107			
0102	HOLL	08	2255	2257	2259	S23 E27 8536	05	11.0	4	SF	3	E		63			
0103	HOLL	08	2343	2442	2543	N21 E68 8541	05	14.2	120	2N	3	E		260			
0104	LEAR	09	0004	0004	0027	N21 E69 8541	05	14.3	23	SF	4	E		13		E	
0105	LEAR	09	0035	0044	0103	N21 E69 8541	05	14.3	28	1F	4	E		106			
0106	LEAR	09	0254	0256	0301	N21 E67 8541	05	14.2	7	SF	3	E		63			
0107		09	0604	0608	0616	N19 W78 8537	05	3.3	12	SN				33		DG	
	URUM	09	0604	0612	0620	N21 W73 8537	05	3.6	16	SN		C		48		D G	
	LEAR	09	0605	0608	0613	N17 W82 8537	05	3.0	8	SF	3	E		18			
0108	LEAR	09	0629	0629	0637	N21 E63 8541	05	14.1	8	SF	3	E		12			
0109	LEAR	09	0639	0642	0647	N18 W78 8537	05	3.3	8	SF	3	E		36			
		09	1008		1053	No Flare Patrol											
0110	RAMY	09	1150	1150	1156	N21 W46 8525	05	6.0	6	SF	3	E		17			
0111	HOLL	09	1355	1358	1402	N21 E62 8541	05	14.3	7	SF	2	E		14			
0112		09	1534	1534	1538	N20 W86 8537	05	3.1	4	SF				40			
	SVTO	09	1534	1534	1537	N20 W83 8537	05	3.3	3	SF	3	E		26			
	RAMY	09	1534	1535	1539	N19 W89 8537	05	2.8	5	SF	3	E		55			
0113	RAMY	09	1609	1609	1614	N20 W89 8537	05	2.9	5	SF	3	E		12			
0114	RAMY	09	1645	1645	1651	N20 E59 8541	05	14.2	6	SF	3	E		13			
0115	RAMY	09	1653	1653	1657	N12 W57 8538	05	5.4	4	SF	3	E		11			
0116		09	1754	1755	1806	N20 E29 8535	05	12.0	12	SF				20			
	HOLL	09	1754	1755	1803	N20 E29 8535	05	12.0	9	SF	3	E		21			
	RAMY	09	1754	1755	1808	N19 E29 8535	05	11.9	14	SF	3	E		18			
0117		09	1755	1756	1806	N21 E57 8541	05	14.1	11	SF				13			
	HOLL	09	1755	1800	1805	N21 E55 8541	05	14.0	10	SF	3	E		11			
	RAMY	09	1756	1756	1807	N21 E59 8541	05	14.3	11	SF	3	E		15			
0118	RAMY	09	1806	1806	1813	N18 W02 8531	05	9.6	7	SF	3	E		24		F	
0119		09	1940	1945	1956	N21 E58 8541	05	14.3	16	SF				42			
	RAMY	09	1940	1945	1954	N20 E57 8541	05	14.2	14	SF	3	E		16			
	HOLL	09	1942	1945	1957	N22 E59 8541	05	14.3	15	SF	3	E		68			
0120		09	2106	2108	2121	N22 E56 8541	05	14.2	15	SF				11			
	RAMY	09	2106	2108	2119	N21 E55 8541	05	14.1	13	SF	3	E		11			
	HOLL	09	2107	2108	2123	N23 E56 8541	05	14.2	16	SF	3	E		11			
0121	HOLL	09	2116	2116	2122	N20 W89 8537	05	3.1	6	SF	3	E		13			
0122	HOLL	09	2223	2235	2259	N20 E51 8541	05	13.8	36	SF	3	E		17		F	
0123	HOLL	09	2322	2327	2333	N21 E56 8541	05	14.3	11	SF	3	E		34			
0124	HOLL	09	2325	2325	2329	S29 E56 8540	05	14.4	4	SF	3	E		12			
0125	HOLL	09	2330	2332	2341	S29 E58 8540	05	14.5	11	SF	3	E		23			
		10	0010		0020	No Flare Patrol											
0126	HOLL	10	0043	0045	0054	N22 E52 8541	05	14.0	11	SF	3	E		13			

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Grp #	Sta	Start Day	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Dur Day	Imp (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
0127	LEAR	10 0524	0529	0605	N16	E19	8539	05	11.7	41	2N		3	E		286		U
0128	KANZ	10 0755	0755	0807	N28	W14		05	9.2	12	SF		2	C				
0129	KANZ	10 0915	0919	0947	S25	E06	8536	05	10.8	32	SF		2	C				
		10 1000		1012														No Flare Patrol
		10 1018		1044														No Flare Patrol
0130	RAMY	10 1155	1156	1207	N20	E48	8541	05	14.2	12	SF		3	E		13		
0131		10 1250E	13092	1332	N20	E46	8541	05	14.0	42D	SF					34		FH
	SVTO	10 1250E	1301U	1324D	N19	E46	8541	05	14.0	34D	SF		3	E		29		
	HOLL	10 1308E	1309	1329	N20	E46	8541	05	14.1	21D	SF		3	E		29		
	RAMY	10 1310E	1311	1334	N20	E47	8541	05	14.1	24D	SF		3	E		44		FH
0132	KANZ	10 1346	1346	1350	N25	E70		05	16.0	4	SF		2	C				
0133		10 14066	14121	1426	N20	E47	8541	05	14.2	20	SF					16		FH
	RAMY	10 1406	1412	1423	N20	E46	8541	05	14.1	17	SF		3	E		21		FH
	HOLL	10 1412	1413	1430	N21	E48	8541	05	14.3	18	SF		3	E		12		
0134		10 1543*	15507	1607	N20	E46	8541	05	14.2	24	SF					24		
	RAMY	10 1543	1550	1612	N19	E46	8541	05	14.2	29	SF		3	E		29		
	HOLL	10 1554	1557	1602	N21	E47	8541	05	14.3	8	SF		3	E		18		
0135	HOLL	10 2021	2021	2027	S24	E33	8540	05	13.4	6	SF		3	E		10		
		10 2144		2227														No Flare Patrol
		10 2237		2244														No Flare Patrol
0136	HOLL	10 2314	2321	2346	N22	E44	8541	05	14.3	32	SF		3	E		17		
		10 2323		2344														No Flare Patrol
		11 0222		0239														No Flare Patrol
		11 0245		0414														No Flare Patrol
0137	SVTO	11 0425	0425	0432	N24	E12	8535	05	12.1	7	SF		3	E		19		
0138	SVTO	11 0931	0933	0945	N21	E37	8541	05	14.2	14	SF		3	E		38		F
0139	SVTO	11 0952	0956	1002	N20	E37	8541	05	14.2	10	SF		3	E		34		F
		11 1038		1100														No Flare Patrol
		11 1107		1144														No Flare Patrol
		11 1311		1329														No Flare Patrol
		11 1459		1503														No Flare Patrol
		11 1509		1802														No Flare Patrol
		11 1812		1837														No Flare Patrol
0140	HOLL	11 1906	1906	1914	N20	E02	8535	05	11.9	8	SF		3	E		20		F
0141	HOLL	11 1910	1911	1914	N21	E31	8541	05	14.2	4	SF		3	E		25		F
		11 1930		1942														No Flare Patrol
0142	HOLL	11 2025	2040	2127	N22	E31	8541	05	14.2	62	1F		3	E		166		
0143	HOLL	11 2042	2042	2101	S26	E22	8540	05	13.6	19	SF		3	E		10		
0144	HOLL	11 2143	2146	2208	S19	E79	8542	05	17.9	25	SF		3	E		45		
0145	HOLL	11 2145	2146	2300	N21	E30	8540	05	14.2	75	SF		3	E		71		
0146	HOLL	11 2228	2231	2248	N21	E28	8541	05	14.1	20	SF		3	E		24		
		12 0113		0227														No Flare Patrol
		12 0345		0457														No Flare Patrol



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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	NOAA/ USAF Region	CMP Mo Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement		Remarks	
													Time (UT)	Apparent (10-6 Disk)		Corr (Sq Deg)
			16 0758		0859	No Flare Patrol										
			16 0931		1025	No Flare Patrol										
			16 1036		1045	No Flare Patrol										
			16 1050		1129	No Flare Patrol										
			16 1153		1221	No Flare Patrol										
0173	HOLL	16	1346	1350	1359	S17 W75 8534	05 10.9	13	1N		3	E		121		
0174	HOLL	16	1654	1655	1658	S17 W76 8534	05 10.9	4	SF		3	E		26		
0175		16	1723	1725	1733	S16 W76 8534	05 11.0	10	SF					65		H
	RAMY	16	1721E	1725U	1731D	S16 W75 8534	05 11.0	10D	SF		2	E		60		H
	HOLL	16	1723	1725	1733	S17 W76 8534	05 10.9	10	SF		3	E		70		
0176		16	20091	2012	2024	S16 W76 8534	05 11.1	15	1F					123		H
	RAMY	16	2009	2011U	2026D	S15 W74 8534	05 11.2	17D	1F		2	E		118		H
	HOLL	16	2010	2012	2024	S16 W77 8534	05 11.0	14	1F		3	E		128		H
0177	HOLL	16	2227	2237	2240	S17 W78 8534	05 11.0	13	SF		3	E		20		H
0178	HOLL	16	2233	2235	2248	N22 W37 8541	05 14.1	15	SF		3	E		37		F
0179	HOLL	17	0020	0025	0034	S16 W79 8534	05 11.0	14	SF		3	E		59		H
0180	URUM	17	0148	0152	0212	S16 W77 8534	05 11.2	24	SN			C		32		DG
0181	URUM	17	0450	0454	0510	S14 W78 8534	05 11.3	20	1B			C		209		EG
0182	URUM	17	0502	0510	0518	N24 W55 8535	05 13.0	16	1N			C		161	3.3	E
0183	LEAR	17	0905	0907	0909	S16 W86 8534	05 10.8	4	SF		3	E		16		
			17 1118		1130	No Flare Patrol										
			17 1141		1146	No Flare Patrol										
			17 1155		1203	No Flare Patrol										
0184	HOLL	17	1306	1307	1319	N21 W43 8541	05 14.2	13	SF		3	E		33		
0185	HOLL	17	1437	1437	1442	N35 E44 8545	05 21.1	5	SF		3	E		13		
0186		17	1703	1706	1732	N20 W48 8541	05 14.0	29	1F					96		F
	HOLL	17	1703	1706	1731	N20 W49 8541	05 14.0	28	1F		3	E		101		F
	RAMY	17	1706E	1707U	1732	N20 W48 8541	05 14.0	26D	SF		2	E		90		F
0187		17	17544	17592	1803	S16 W88 8534	05 11.1	9	SF					20		
	RAMY	17	1754	1759	1759D	S16 W85 8534	05 11.3	5D	SF		3	E		22		
	HOLL	17	1758	1801	1803	S16 W91 8534	05 10.8	5	SF		3	E		19		
0188	HOLL	17	2004	2015	2032	N22 W54 8541	05 13.7	28	SF		3	E		86		F
0189	RAMY	17	2015E	2015U	2030	N21 W46 8541	05 14.3	15D	SF		3	E		86		F
0190		18	0359	03591	0418	N20 W50 8541	05 14.3	19	1N					104	2.1	E
	URUM	18	0359E	0359	0418	N21 W47 8541	05 14.6	19D	1N			P		129	2.1	E
	LEAR	18	0359	0400	0418	N19 W52 8541	05 14.2	19	SF		3	E		79		
0191	LEAR	18	0543	0544	0554	S28 W72 8540	05 12.6	11	SF		3	E		35		
0192	URUM	18	0546E	0546	0550D	S29 W58 8540	05 13.7	4D	SB			P		80	1.7	EG
0193	LEAR	18	0654	0655	0716	N39 E35 8545	05 21.1	22	SF		3	E		14		
0194	LEAR	18	0718	0718	0730	N19 W57 8541	05 13.9	12	SF		3	E		18		
			18 0859		0949	No Flare Patrol										
0195	KANZ	18	1042	1047	1055	S15 W78 8534	05 12.5	13	SF		2	C				
0196	KANZ	18	1306E	1306U	1315D	S21 E43 8548	05 21.8	9D	SF		2	C				

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Grp #	Sta	Start Day	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Dur Day	Imp (Min)	Opt	Xray	Obs See	Type	Area Measurement			Remarks	
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)		
		18 1840		1843	No Flare Patrol														
0197		18 1954	1954	2005	N38	E30	8545	05	21.2	11	SF						18		
	HOLL	18 1954	1954	2005	N38	E31	8545	05	21.3	11	SF		3	E			16		
	RAMY	18 1957E	1958U	2007D	N39	E30	8545	05	21.3	10D	SF		3	E			21		
		19 0151		0155	No Flare Patrol														
		19 0202		0216	No Flare Patrol														
		19 0308		0444	No Flare Patrol														
		19 0458		0459	No Flare Patrol														
		19 0521		0544	No Flare Patrol														
		19 0600		0605	No Flare Patrol														
		19 0641		0740	No Flare Patrol														
		19 0754		0948	No Flare Patrol														
		19 0950		1000	No Flare Patrol														
		19 1002		1008	No Flare Patrol														
		19 1010		1102	No Flare Patrol														
0198	HOLL	19 1446	1448	1451	N20	W70	8541	05	14.3	5	SF		3	E			30		
0199	URUM	20 0702	0706	0718	N24	W53	8549	05	16.2	16	1N			C			193	3.7	EG
		20 1233		1241	No Flare Patrol														
		20 1252		1306	No Flare Patrol														
0200	HOLL	20 2029	2031	2033	N26	W64	8549	05	15.9	4	SF		3	E			26		
0201	HOLL	20 2124	2125	2131	N27	W65	8549	05	15.8	7	SF		3	E			24		
0202	HOLL	20 2224	2224	2228	N27	W65	8549	05	15.9	4	SF		3	E			19		
0203	HOLL	20 2240	2241	2244	N26	W66	8549	05	15.8	4	SF		3	E			16		
0204	HOLL	20 2256	2257	2301	N26	W66	8549	05	15.8	5	SF		3	E			17		
0205	HOLL	20 2331	2331	2338	N27	W67	8549	05	15.7	7	SF		3	E			52		F
0206	URUM	21 0146	0154	0200	N24	W63	8549	05	16.2	14	1N			C			241		E
0207		21 0213	0221	0231	N26	W64	8549	05	16.1	18	SN						50		E
	URUM	21 0213	0221	0229	N25	W63	8549	05	16.2	16	SN			C			80		E
	LEAR	21 0224E	0226U	0233	N26	W66	8549	05	16.0	9D	SF		3	E			20		
0208	URUM	21 0241	0245	0252	N26	W59	8549	05	16.5	11	SN			C			32	0.7	D
0209	URUM	21 0458	0506	0518	N25	W60	8549	05	16.5	20	SN			C			80	1.9	E
0210	LEAR	21 0507	0508	0512	N24	W70	8549	05	15.8	5	SF		3	E			39		
0211		21 0745I	07443	0756	N26	W66	8549	05	16.2	11	SF						26		D
	URUM	21 0744E	0744	0756	N23	W62	8549	05	16.5	12D	SN			P			32		D
	SVTO	21 0745	0747	0751	N27	W68	8549	05	16.0	6	SF		3	E			16		
	LEAR	21 0746	0747	0801	N27	W68	8549	05	16.0	15	SF		3	E			29		
0212	SVTO	21 0941	0942	0944	N24	W68	8549	05	16.1	3	SF		3	E			14		
0213	SVTO	21 1107	1107	1120	N26	W71	8549	05	15.9	13	SF		3	E			11		
		21 1200		1212	No Flare Patrol														
0214	HOLL	21 1240E	1241U	1300	N26	W75	8549	05	15.7	20D	SF		3	E			51		F
0215	SVTO	21 1426	1431	1438	N27	W68	8549	05	16.3	12	SF		3	E			15		
0216	SVTO	21 1649	1649U	1651D	N25	W69	8549	05	16.3	2D	SF		2	E			12		
0217	RAMY	21 1814	1815	1818	N26	W72	8549	05	16.2	4	SN		3	E			25		
		21 2025		2046	No Flare Patrol														
		21 2159		2207	No Flare Patrol														

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Grp #	Sta	Start Day	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks	
														Time (UT)	Apparent (10 <sup>-6</sup> Disk)	Corr (Sq Deg)		
0218	HOLL	21	2316	2317	2321	S13 E55	8550	05 26.1	5	SF		3	E		26			
		22	0025		0032	No Flare Patrol												
0219		22	0251*	0256*	0321	S14 E51	8550	05 26.0	30	SN					48	1.0	E	
	URUM	22	0251	0256	0320	S13 E49	8550	05 25.8	29	SN			C		64	1.0	E	
	LEAR	22	0318	0318	0322	S14 E53	8550	05 26.1	4	SF		3	E		31			
0220	LEAR	22	0743	0744	0753	S19 W40	8544	05 19.3	10	SF		3	E		13			
		22	1116		1216	No Flare Patrol												
0221	HOLL	22	1912	1912	1919	N40 W19	8545	05 21.2	7	SF		3	E		11			
		22	2213		2400	No Flare Patrol												
		23	0000		0017	No Flare Patrol												
0222	LEAR	23	0317	0317	0323	N41 W25	8545	05 21.1	6	SF		3	E		13			
0223		23	0738	07393	0758	N40 W26	8545	05 21.2	20	SF					18			
	KANZ	23	0733E	0742	0758D	N41 W25	8545	05 21.3	25D	SF		2	C					
	LEAR	23	0738	0739	0758	N40 W27	8545	05 21.1	20	SF		4	E		18			
0224		23	07547	0805	0824	N38 W26	8545	05 21.2	30	SN					66	1.7	E	
	URUM	23	0754	0805	0825	N39 W25	8545	05 21.3	31	SB			C		113	1.7	E	
	LEAR	23	0801	0805	0822	N36 W27	8545	05 21.2	21	SF		4	E		18			
0225	URUM	23	0805	0810	0814	S14 E32	8550	05 25.7	9	SN			C		80	1.0	E	
0226	URUM	23	0849E	0849	0857	S15 E30	8550	05 25.6	8D	SB			P		48	0.6	D	
		23	0932		1009	No Flare Patrol												
0227	RAMY	23	1030E	1040	1107	N30 E40	8551	05 26.6	37D	SF		3	E		50			F
0228		23	14084	14122	1420	S16 E29	8550	05 25.8	12	SF					24			FH
	RAMY	23	1408	1412	1422	S15 E29	8550	05 25.8	14	SF		3	E		32			
	SVTO	23	1412	1414	1417	S16 E29	8550	05 25.8	5	SF		3	E		17			FH
0229		23	14261	14381	1511	N30 E40	8551	05 26.7	45	SF					84			F
	SVTO	23	1426	1439	1509	N29 E41	8551	05 26.8	43	SF		3	E		93			F
	RAMY	23	1427	1438	1513	N30 E38	8551	05 26.6	46	SF		3	E		74			F
		23	1719		1758	No Flare Patrol												
		23	1804		1915	No Flare Patrol												
		23	1948		2019	No Flare Patrol												
		23	2038		2340	No Flare Patrol												
		23	2347		2358	No Flare Patrol												
0230		24	06182	06198	0636	N29 E30	8551	05 26.6	18	SF					25	0.4	DF	
	SVTO	24	0618	0619	0631	N31 E32	8551	05 26.8	13	SF		3	E		18			F
	URUM	24	0619	0627	0646	N28 E29	8551	05 26.5	27	SF			C		32	0.4	D	
	KANZ	24	0620	0620	0632	N28 E30	8551	05 26.6	12	SF		2	C					
0231		24	0632	06275	0638	S14 E21	8550	05 25.8	6	SN					80	0.9	D	
	URUM	24	0627E	0627	0639	S14 E18	8550	05 25.6	12D	SN			P		80	0.9	D	
	KANZ	24	0632	0632	0636	S14 E24	8550	05 26.1	4	SF		2	C					
0232		24	0628	06283	0636	S14 E22	8550	05 25.9	8	SN					48	0.6	D	
	KANZ	24	0628	0628	0632	S15 E18	8550	05 25.6	4	SF		2	C					
	URUM	24	0631E	0631	0639	S13 E25	8550	05 26.1	8D	SN			P		48	0.6	D	
0233		24	0722	0722	0730	S15 E17	8550	05 25.6	8	SN					64	0.7	D	
	KANZ	24	0722	0722	0729D	S15 E17	8550	05 25.6	7D	SF		2	C					
	URUM	24	0722E	0722	0730	S15 E17	8550	05 25.6	8D	SN			P		64	0.7	D	

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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/USAF		Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
								Region	Mo Day						Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
0234		24	08066	08103	0816	N31	E30	8551	05	26.7	10	SF				52	1.6	EF
	URUM	24	0806	0810	0814	N31	E32	8551	05	26.9	8	SN		C		113	1.6	E
	SVTO	24	0809E	0810U	0818D	N29	E29	8551	05	26.6	9D	SF	3	E		28		F
	LEAR	24	0810	0813	0817	N32	E29	8551	05	26.6	7	SF	3	E		15		E
	KANZ	24	0812	0812	0816	N31	E30	8551	05	26.7	4	SF	2	C				
0235	URUM	24	0814E	0814	0814D	S14	E18	8550	05	25.7	4D	SN		P		48	0.5	D
0236		24	08593	09011	0912	N21	E72	8552	05	29.9	13	SN				32		D
	SVTO	24	0859	0902	0906	N21	E75	8552	05	30.1	7	SF	3	E		43		
	LEAR	24	0900	0902	0905	N21	E71	8552	05	29.8	5	SF	3	E		21		
	URUM	24	0901E	0901	0917	N20	E68	8552	05	29.6	16D	SB		P		32		D
	KANZ	24	0902	0902	0918	N21	E74	8552	05	30.0	16	SF	2	C				
0237	SVTO	24	0909	0913	0919	N20	E74	8552	05	30.0	10	SF	3	E		16		
0238	SVTO	24	1004	1006	1011	S13	E17	8550	05	25.7	7	SF	3	E		16		
0239		24	1022	10221	1026	N20	E72	8552	05	29.9	4	SF				33		
	KANZ	24	1022	1022	1026	N20	E70	8552	05	29.8	4	SF	2	C				
	SVTO	24	1022	1023	1025	N20	E73	8552	05	30.0	3	SF	3	E		33		
0240	SVTO	24	1328	1328	1333	N33	E30	8551	05	26.9	5	SF	3	E		29		
0241		24	1354	1354	1358	S14	E15	8550	05	25.7	4	SF				46		F
	SVTO	24	1351E	1354U	1403D	S14	E15	8550	05	25.7	12D	SF	3	E		46		F
	KANZ	24	1354	1354	1358	S14	E15	8550	05	25.7	4	SF	2	C				
		24	1451		1454	No Flare Patrol												
0242		24	17092	1711	1722	N20	E70	8552	05	30.1	13	SF				20		
	RAMY	24	1709	1711	1722	N20	E72	8552	05	30.2	13	SF	3	E		26		
	SVTO	24	1711	1711U	1718D	N19	E68	8552	05	29.9	7D	SF	3	E		13		
0243	RAMY	24	1741	1741	1756	S13	E16	8550	05	25.9	15	SF	3	E		47		
		24	1741		1749	No Flare Patrol												
		24	1921		1923	No Flare Patrol												
		24	2026		2400	No Flare Patrol												
0244		25	06023	06041	0610	S14	E06	8550	05	25.7	8	SF				10		FH
	SVTO	25	0602	0604	0612	S14	E06	8550	05	25.7	10	SF	3	E		10		FH
	KANZ	25	0605	0605	0609	S15	E06	8550	05	25.7	4	SF	2	C				
0245	KANZ	25	0657	0705	0713	N13	E16		05	26.5	16	SF	2	C				
0246		25	07071	07102	0716	N24	E68	8552	05	30.5	9	SF				14		
	SVTO	25	0707	0712	0716	N24	E69	8552	05	30.6	9	SF	3	E		13		
	LEAR	25	0708	0710	0716	N23	E67	8552	05	30.4	8	SF	4	E		14		
0247	KANZ	25	0753	0757	0801	S16	E03	8550	05	25.5	8	SF	2	C				
0248		25	0833	08331	0842	S15	E03	8550	05	25.6	9	SF				23		H
	KANZ	25	0833	0833	0845	S15	E03	8550	05	25.6	12	SF	2	C				
	SVTO	25	0833	0834	0839	S15	E03	8550	05	25.6	6	SF	3	E		23		H
0249	KANZ	25	0913	0913	0917	S15	E03	8550	05	25.6	4	SF	2	C				
0250	SVTO	25	1238	1239	1241	N18	E62	8552	05	30.2	3	SF	3	E		16		
0251	RAMY	25	1300	1301	1307	N21	E58	8552	05	30.0	7	SF	3	E		15		
		25	1943		1952	No Flare Patrol												
0252	HOLL	25	2249	2249	2252	N38	W55	8545	05	21.5	3	SF	3	E		19		
0253	HOLL	25	2316	2316	2324	S23	W56	8548	05	21.6	8	SF	3	E		19		
0254	HOLL	25	2356	2359	2405	N38	W57	8545	05	21.4	9	SF	3	E		16		

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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
																Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
0255	HOLL	26	0007	0008	0014	S15	W03	8550	05	25.8	7	SF		3	E		19		F
0256		26	0016	00231	0028	N40	W54	8545	05	21.6	12	SF					40		F
	HOLL	26	0016	0023	0027	N39	W57	8545	05	21.4	11	SF		3	E		36		F
	LEAR	26	0016	0024	0028	N40	W52	8545	05	21.8	12	SF		3	E		45		
0257	LEAR	26	0032	0036	0039	N39	W56	8545	05	21.5	7	SF		3	E		34		
0258		26	0228	02293	0238	N22	E40	8554	05	29.2	10	1N					96	2.3	EH
	LEAR	26	0228	0229	0235	N22	E41	8554	05	29.2	7	SF		4	E		31		EH
	URUM	26	0232E	0232	0240	N21	E39	8554	05	29.1	8D	1B			P		161	2.3	E
0259	URUM	26	0304E	0304	0315	S15	W07	8550	05	25.6	11D	SN			P		80	0.9	E
0260	URUM	26	0323	0335	0347	N37	W58	8545	05	21.5	24	1B			C		96		E
0261	URUM	26	0423	0427	0446	N38	W56	8545	05	21.6	23	2N			C		241	5.8	E
0262		26	04531	04557	0520	S14	W06	8550	05	25.8	27	SN					79	1.7	EF
	LEAR	26	0453	0455	0515	S14	W07	8550	05	25.7	22	SF		3	E		33		F
	SVTO	26	0453	0457	0514	S14	W06	8550	05	25.8	21	SF		3	E		43		
	URUM	26	0454	0502	0530	S13	W05	8550	05	25.8	36	SB			C		161	1.7	E
0263		26	0822	0826	0829	N38	W60	8545	05	21.5	7	SF					16		
	LEAR	26	0822	0826	0830	N40	W61	8545	05	21.4	8	SF		3	E		16		
	KANZ	26	0824E	0824U	0828	N37	W60	8545	05	21.5	4D	SF		2	C				
0264		26	08552	0857	0908	N18	E47	8552	05	29.9	13	SF					43		
	LEAR	26	0855	0857	0907	N18	E46	8552	05	29.9	12	SF		3	E		43		
	KANZ	26	0857	0857	0909	N18	E48	8552	05	30.0	12	SF		2	C				
0265	RAMY	26	1149	1149	1157	N31	E05	8551	05	26.9	8	SF		3	E		12		
0266		26	14055	1412	1416	N18	E44	8552	05	29.9	11	SF					17		
	RAMY	26	1405	1412	1418	N19	E44	8552	05	29.9	13	SF		3	E		19		
	HOLL	26	1410	1412	1415	N18	E44	8552	05	29.9	5	SF		3	E		15		
0267	HOLL	26	1427	1428	1431	N18	E46	8552	05	30.1	4	SF		3	E		20		
0268	SVTO	26	1549	1551	1605	N16	E49	8552	05	30.4	16	SF		3	E		12		F
0269		26	1550*	1550*	1612	N18	E47	8552	05	30.2	22	SF					51		F
	RAMY	26	1550	1550	1604	N19	E48	8552	05	30.3	14	SF		3	E		13		F
	HOLL	26	1556	1611	1615	N19	E50	8552	05	30.5	19	SF		3	E		70		
	SVTO	26	1609	1610	1615	N17	E45	8552	05	30.1	6	SF		3	E		57		
	RAMY	26	1609	1610	1616	N18	E44	8552	05	30.0	7	SF		3	E		65		F
0270		26	17459	17479	1812	N24	E28	8554	05	28.9	27	SF					14		
	RAMY	26	1745	1747	1813	N24	E27	8554	05	28.8	28	SF		3	E		15		
	HOLL	26	1754	1756	1812	N25	E30	8554	05	29.1	18	SF		3	E		12		
0271	HOLL	26	1900	1901	1903	S20	W93	8544	05	19.7	3	SF		3	E		82		
0272	RAMY	26	1908	1912	1915	N24	E26	8554	05	28.8	7	SF		3	E		11		
0273	RAMY	26	1917	1921	2026	N17	E46	8552	05	30.3	69	2N		3	E		316		FU
0274	LEAR	27	0113	0116	0122	N18	E40	8552	05	30.1	9	SF		3	E		10		F
0275	SVTO	27	0533	0536	0555	N24	E21	8554	05	28.8	22	SF		3	E		60		F
0276	KANZ	27	0748	0748	0752	N15	E48	8559	05	30.9	4	SF		2	C				
0277	KANZ	27	0848	0848	0852	S27	E16		05	28.6	4	SF		2	C				
0278		27	09231	09241	0929	N31	W06	8551	05	26.9	6	SF					16		F
	SVTO	27	0923	0925	0930	N31	W07	8551	05	26.8	7	SF		3	E		16		F
	KANZ	27	0924	0924	0928	N31	W06	8551	05	26.9	4	SF		2	C				



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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks	
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)		
0279	RAMY	27	1106E	1107U	1112D	N19	E31	8552	05 29.8	6D	SF		3	E		27		F	
0280		27	11401	11402	1147	S30	E78	8557	06 2.6	7	SF					22			
	RAMY	27	1140	1140	1147	S30	E78	8557	06 2.6	7	SF		3	E		18			
	SVTO	27	1141	1142	1147	S31	E77	8557	06 2.6	6	SF		3	E		25			
0281		27	1302	13021	1314	N18	E32	8552	05 30.0	12	1N					120		F	
	SVTO	27	1302	1302	1313	N18	E32	8552	05 30.0	11	SN		3	E		83		F	
	HOLL	27	1302	1303	1314	N18	E31	8552	05 29.9	12	1F		3	E		157			
0282		27	1417	14171	1423	S22	W78	8548	05 21.6	6	SF					14			
	RAMY	27	1417	1417	1423	S22	W76	8548	05 21.7	6	SF		3	E		17			
	SVTO	27	1417	1418	1423	S21	W80	8548	05 21.5	6	SF		3	E		11			
0283	RAMY	27	1426	1433	1436	N24	E15	8554	05 28.8	10	SF		3	E		17			
0284	SVTO	27	1428	1429	1440	S29	E76	8557	06 2.6	12	SF		3	E		12			
0285	RAMY	27	1432	1435	1440	N21	E73	8555	06 2.2	8	SF		3	E		20		H	
0286	HOLL	27	1451	1452	1454	N20	E73	8555	06 2.2	3	SF		3	E		38			
0287	HOLL	27	1451	1453	1457	N24	E14	8554	05 28.7	6	SF		3	E		13			
0288	HOLL	27	1526	1528	1529	N17	E27	8552	05 29.7	3	SF		3	E		11			
0289		27	1528	1534	1606	S24	E79	8557	06 2.7	38	SF					41		F	
	RAMY	27	1528	1534	1606	S24	E81	8557	06 2.9	38	SF		3	E		41		F	
	KANZ	27	1534E	1534U	1538D	S23	E77	8557	06 2.6	4D	SF		2	C					
0290	SVTO	27	1535	1537	1538	S21	W81	8548	05 21.4	3	SF		3	E		16			
0291		27	15497	1549*	1606	S28	E78	8557	06 2.7	17	SF					25		F	
	SVTO	27	1549	1549	1602	S29	E75	8557	06 2.5	13	SF		3	E		17			
	HOLL	27	1556	1559	1610	S26	E81	8557	06 2.9	14	SF		3	E		33		F	
0292		27	16373	16521	1740	N24	E34	8552	05 30.3	63	1N					135		FH	
	RAMY	27	1637	1653	1741	N24	E34	8552	05 30.3	64	1N		3	E		190		H	
	HOLL	27	1639	1652	1739	N24	E34	8552	05 30.3	60	1F		3	E		114			
	SVTO	27	1640	1653	1736D	N24	E34	8552	05 30.3	56D	1N		3	E		101		FH	
0293	RAMY	27	1647	1647	1652	N38	W76	8545	05 21.5	5	SF		3	E		26			
0294	HOLL	27	1837	1840	1842	N17	E30	8552	05 30.0	5	SF		3	E		18			
0295	HOLL	27	1844	1847	1855	N17	E29	8552	05 30.0	11	SF		3	E		16			
0296	HOLL	27	2146	2148	2153	N24	E40	8552	05 31.0	7	SF		3	E		26			
		27	2220		2227	No Flare Patrol													
0297	HOLL	27	2235	2249	2254	N18	E22	8552	05 29.6	19	SF		3	E		13			
		27	2309		2400	No Flare Patrol													
		28	0000		0417	No Flare Patrol													
0298	SVTO	28	0551	0552	0602	N12	E81	8558	06 3.3	11	SF		3	E		57		H	
0299		28	09251	09262	0939	N26	E10	8554	05 29.2	14	SF					16			
	SVTO	28	0925	0928	0940	N26	E10	8554	05 29.2	15	SF		3	E		16			
	KANZ	28	0926	0926	0938	N25	E11	8554	05 29.2	12	SF		2	C					
0300		28	1157*	12125	1227	S28	E64	8557	06 2.5	30	SF					20			
	RAMY	28	1157	1212	1228	S28	E63	8557	06 2.4	31	SF		3	E		18			
	SVTO	28	1210	1217	1226	S28	E64	8557	06 2.5	16	SF		3	E		23			
0301	RAMY	28	1417	1417	1420	N39	W82	8545	05 21.9	3	SF		3	E		33			
0302	SVTO	28	1642	1643	1647	S30	E64	8557	06 2.7	5	SF		3	E		21			

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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Dur Day	Imp (Min)	Opt	Xray	Obs See	Type	Area Measurement			Remarks
																Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
0303	RAMY	28	1724	1724	1727	S29	E64	8557	06	2.7	3	SF		3	E		17		
0304	RAMY	28	1813	1813	1816	S29	E62	8557	06	2.6	3	SF		3	E		20		
			28 2114		2202			No Flare Patrol											
			28 2215		2400			No Flare Patrol											
			29 0000		0131			No Flare Patrol											
			29 0237		0357			No Flare Patrol											
0305	SVTO	29	0529	0529	0544	S26	E55	8557	06	2.5	15	SF		3	E		17		F
0306		29	0915	0915	0919	N24	W03	8554	05	29.1	4	SF					10		
	SVTO	29	0915	0915	0919	N24	W03	8554	05	29.1	4	SF		3	E		10		
	KANZ	29	0915	0915	0919	N24	W03	8554	05	29.1	4	SF		2	C				
0307	KANZ	29	1035	1035	1039	N18	E64	8558	06	3.3	4	SF		2	C				
0308		29	1303	1306	1310	N19	E05	8559	05	29.9	7	SF					19		
	KANZ	29	1303	1307	1311	N19	E05	8559	05	29.9	8	SF		2	C				
	RAMY	29	1304	1306	1310	N20	E05	8559	05	29.9	6	SF		3	E		26		
	SVTO	29	1304	1307	1309	N19	E05	8559	05	29.9	5	SF		3	E		12		
0309	RAMY	29	1324	1325	1330	N14	E62	8558	06	3.2	6	SF		3	E		11		
0310		29	1617	1618	1628	N25	W07	8554	05	29.1	11	SF					29		F
	RAMY	29	1617	1618	1628	N25	W07	8554	05	29.1	11	SF		3	E		30		
	HOLL	29	1617	1618	1629	N25	W06	8554	05	29.2	12	SF		3	E		35		
	SVTO	29	1618	1620	1626	N25	W07	8554	05	29.1	8	SF		3	E		21		F
0311		29	2007	2009	2020	N24	W12	8554	05	28.9	13	SF					48		H
	HOLL	29	2007	2009	2017	N24	W13	8554	05	28.8	10	SF		3	E		64		
	RAMY	29	2008E	2010U	2024	N24	W12	8554	05	28.9	16D	SF		3	E		33		H
0312	RAMY	29	2038E	2039U	2042	N19	E60	8560	06	3.4	4D	SF		3	E		16		
0313	HOLL	29	2038	2040	2043	S18	E58	8560	06	3.3	5	SF		3	E		47		
			29 2354		2400			No Flare Patrol											
			30 0000		0004			No Flare Patrol											
			30 0136		0403			No Flare Patrol											
0314	SVTO	30	0427E	0427U	0441	N15	E53	8558	06	3.2	14D	SF		3	E		68		H
0315	SVTO	30	0620	0621	0624	N31	W43	8551	05	26.9	4	SF		3	E		39		
0316		30	1152	1156	1214	N15	E52	8558	06	3.4	22	SF					20		H
	RAMY	30	1152E	1153U	1203D	N15	E52	8558	06	3.4	11D	SF		3	E		16		
	SVTO	30	1152	1156	1214	N15	E51	8558	06	3.3	22	SF		3	E		23		H
0317	HOLL	30	1323	1326	1338	N17	E47	8558	06	3.1	15	SF		3	E		26		
0318	HOLL	30	1623	1627	1640	N16	E49	8558	06	3.4	17	SF		3	E		11		
0319	RAMY	30	1816	1821	1833	N16	E45	8558	06	3.2	17	SF		3	E		25		
0320	RAMY	30	1818	1822	1835	N17	W18	8552	05	29.4	17	SF		3	E		19		
0321		30	1914	1917	1926	N14	E45	8558	06	3.2	12	SF					30		
	RAMY	30	1914	1917	1925	N13	E46	8558	06	3.3	11	SF		3	E		31		
	HOLL	30	1921	1924	1926	N15	E44	8558	06	3.1	5	SF		3	E		29		
			30 2330		2400			No Flare Patrol											
			31 0000		0034			No Flare Patrol											
0322		31	0807	0811	0823	S21	E30	8560	06	2.6	16	SF					46		
	KANZ	31	0807	0811	0823	S18	E31	8560	06	2.7	16	SF		2	C				
	SVTO	31	0808	0814	0823	S24	E30	8560	06	2.6	15	SF		3	E		46		

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H $\alpha$  SOLAR FLARES

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Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks	
																Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)		
0323		31	09351	09372	0950	N18	W27	8552	05	29.3	15	SF					67		F	
	KANZ	31	0935	0939	0951	N17	W28	8552	05	29.3	16	SF		2	C					
	SVTO	31	0936	0937	0949	N19	W26	8552	05	29.4	13	SF		3	E		67		F	
0324	RAMY	31	1202	1205	1212	S15	E31	8562	06	2.8	10	SF		3	E			14		
0325	HOLL	31	1421	1443	1458	S19	E29	8560	06	2.8	37	SF		3	E			28		
0326	RAMY	31	1627	1631	1640	S15	E26	8562	06	2.6	13	SF		3	E			24		
0327		31	1702	17021	1712	S14	E26	8562	06	2.7	10	SF						21		
	HOLL	31	1702	1702	1715	S14	E26	8562	06	2.7	13	SF		3	E			29		
	SVTO	31	1702	1703	1709	S15	E26	8562	06	2.7	7	SF		2	E			13		
0328	HOLL	31	1849	1852	1857	S19	E27	8560	06	2.8	8	SF		3	E			46		
0329	HOLL	31	1859	1859	1903	S24	E29	8560	06	3.0	4	SF		3	E			19		
		31	1942		1956	No Flare Patrol														
0330	HOLL	31	2023	2029	2037	S14	E24	8562	06	2.7	14	SF		3	E			41		
		31	2058		2329	No Flare Patrol														
		31	2357		2400	No Flare Patrol														

"Remarks"

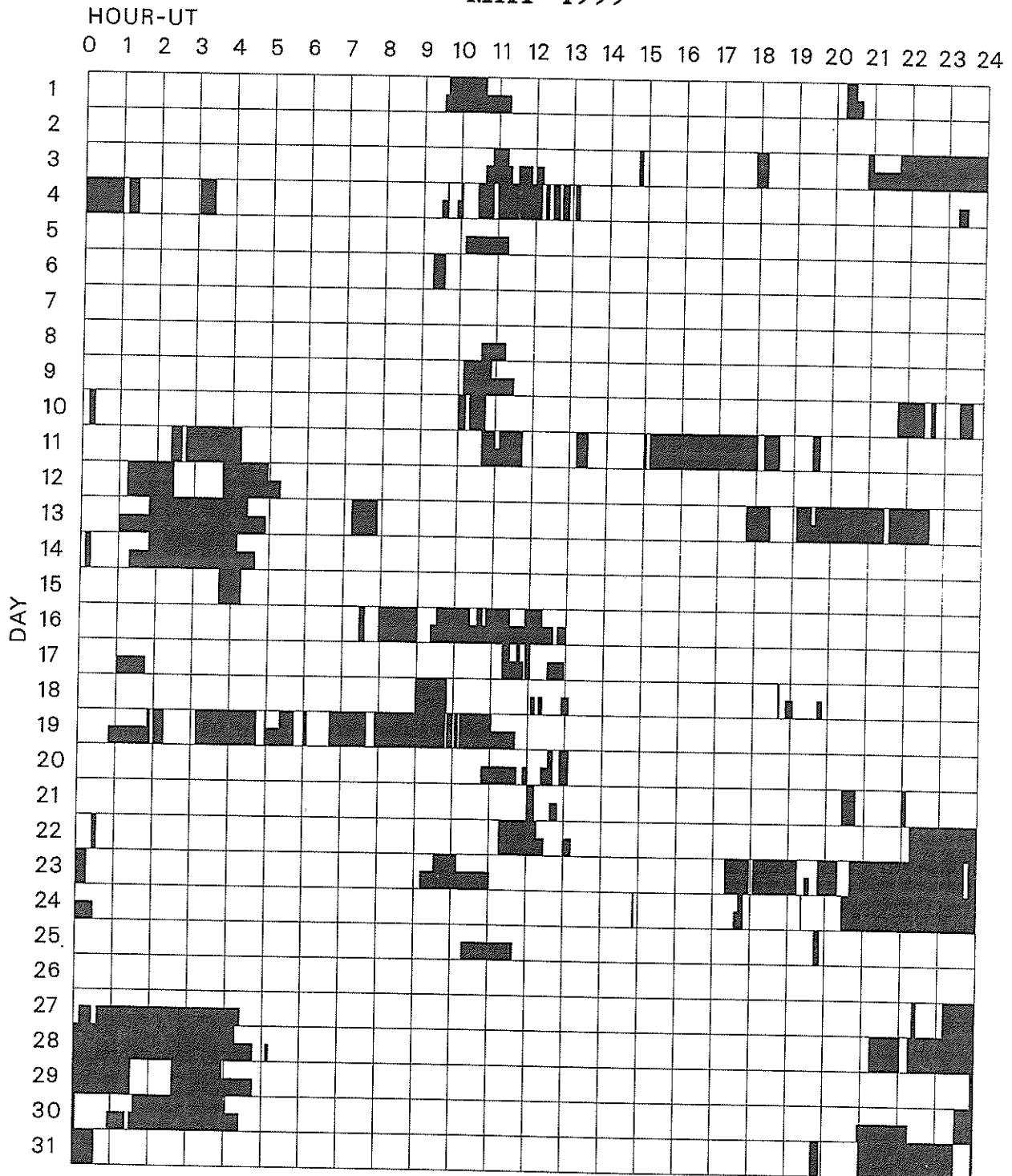
- |   |   |
|---|---|
| <p>A = Eruptive prominence whose base is less than 90 degrees from central meridian.<br/>         B = Probably the end of a more important flare.<br/>         C = Invisible 10 minutes before.<br/>         D = Brilliant point.<br/>         E = Two or more brilliant points.<br/>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

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

# INTERVALS OF NO FLARE PATROL OBSERVATION FOR PRECEDING SOLAR FLARE TABLE

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May 99

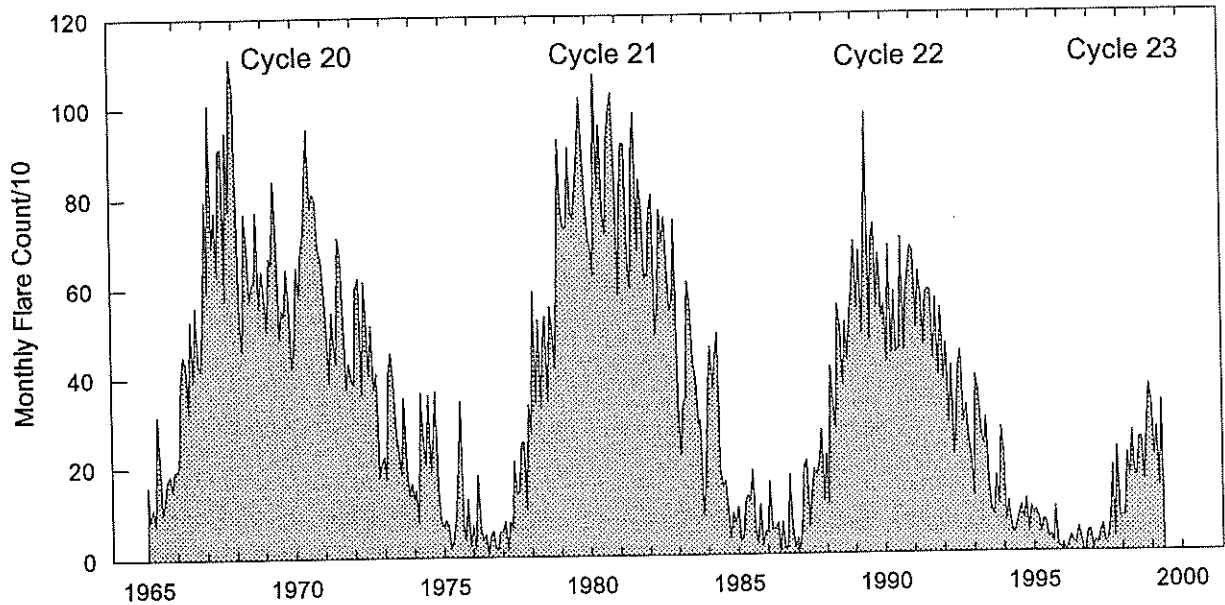
## MAY 1999



Times of no flare patrol, shown here as shades areas, combine reports from the stations listed below. Portions of a panel completely shaded mark dates and times of no patrol of any kind (neither visual or cinematographic): portions of a panel with only the bottom half shaded mark times of only visual patrol.

Holloman                      Kanzelhoehe                      Learmonth                      Ramey                      San Vito  
Urumqi

## Monthly Counts of Grouped Solar Flares Jan 1965 - May 1999



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1965	158	85	110	74	315	231	99	127	173	184	150	193	1899
1966	194	205	390	449	429	323	528	391	558	432	417	543	4859
1967	796	589	1009	694	771	629	907	911	573	946	775	1109	9709
1968	1037	773	519	460	768	697	573	611	616	772	556	640	8022
1969	581	504	669	655	839	694	489	551	540	643	566	422	7153
1970	466	646	578	688	722	836	954	780	811	797	687	667	8632
1971	598	505	387	546	461	430	713	673	518	375	431	394	6031
1972	384	599	621	361	614	541	404	515	371	408	175	210	5203
1973	221	171	410	453	388	270	232	182	353	201	136	163	3180
1974	127	148	79	364	255	204	360	187	270	366	153	81	2594
1975	68	82	69	19	42	85	196	346	68	38	127	25	1165
1976	69	18	180	60	38	48	6	47	57	23	13	55	614
1977	54	77	18	76	64	210	140	140	250	252	107	336	1724
1978	274	588	338	526	330	460	533	346	554	499	418	648	5514
1979	926	781	731	731	907	772	750	821	901	1018	888	786	10012
1980	703	689	621	1092	811	956	763	720	924	988	1027	838	10132
1981	578	782	914	915	658	592	893	982	680	836	773	615	9218
1982	631	766	803	490	553	769	696	753	615	544	564	748	7932
1983	332	220	337	346	609	561	427	389	289	298	88	152	4048
1984	353	461	366	440	492	185	151	161	95	36	92	69	2901
1985	104	29	38	119	129	116	185	53	25	108	19	50	975
1986	51	158	54	56	68	3	71	12	14	174	56	13	730
1987	36	7	52	192	205	61	132	185	172	198	273	114	1627
1988	217	109	413	328	274	551	502	375	513	429	518	587	4816
1989	695	544	672	488	691	977	474	699	733	547	665	526	7711
1990	550	424	684	442	580	445	454	703	449	574	623	682	6610
1991	672	503	625	570	458	574	582	581	425	565	396	544	6495
1992	380	462	287	412	214	271	413	447	287	325	248	206	3952
1993	123	392	357	262	237	296	154	92	82	167	104	275	2541
1994	217	67	111	60	40	56	81	101	72	117	45	99	1066
1995	82	95	77	42	69	66	29	37	23	99	14	6	639
1996	14	3	15	34	21	16	54	31	3	0	44	45	280
1997	8	22	18	43	59	18	26	75	188	31	228	74	790
1998	78	76	216	161	264	177	164	248	249	155	268	367	2423
1999	330	212	271	145	330								1288

The term 'grouped' means observations of the same event by different sites were lumped together and counted as one.

# S O L A R R A D I O E M I S S I O N

## Outstanding Occurrences

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MAY 1999

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m <sup>2</sup> Hz)	Mean		
01	280	CUBA	44 NS	1300.0E		530.0D		17.0		
	5730	IRKU	1 S	0615.4	0615.8	4.2	4.0	U		
	2800	PENT	3 S	2256.0	2257.0	8.0	14.0			
02	200	HIRA	8 S	0047.2	0047.4	0.4	220.0			0
	5730	IRKU	1 S	0727.4	0728.3	2.8	3.0	U		
	2840	BEIJ	1 S	0755.0	0757.0	5.0	5.7	4.2	U	
	5730	IRKU	1 S	0755.7	0757.0	2.9	3.0		U	
	200	HIRA	8 S	0810.2	0810.4	0.4	190.0			0
	204	IZMI	45 C	0810.2	0810.4	0.9	394.0			
	33	UPIC	4 S/F	0813.0	0813.5	1.0				
	204	IZMI	42 SER	0813.6	0813.7	0.9	39.0			
	204	IZMI	41 F	0906.0	0906.2	0.3	90.0			
	204	IZMI	41 F	0937.5	0937.9	0.9	173.0			
	204	IZMI	42 SER	1018.3	1025.3	7.9	38.0			
	2800	PENT	20 GRF	1436.0	1612.0	116.0	9.0			
	2800	PENT	20 GRF	1842.0	1845.0	50.0D	4.0			
	2800	PENT	1 S	2157.0	2200.0	10.0	5.0			
	200	HIRA	8 S	2242.2	2242.4	0.4	120.0			0
	500	HIRA	8 S	2242.2	2242.4	0.4	60.0			0
	2800	PENT	1 S	2332.0	2334.0	4.0	4.0			
5730	IRKU	1 S	2334.6	2334.8	0.5	2.0		U		
03	5730	IRKU	1 S	0152.6	0153.2	1.4	1.0		U	
	5730	IRKU	46 C	0530.0	0606.4	243.0	99.0		U	
	2840	BEIJ	5 S	0535.0	0548.5	64.0	58.8	45.0		
	2800	HIRA	46 C	0539.0	0548.0	60.0	140.0			0
	500	HIRA	46 C	0540.0	0552.0	50.0	210.0			WR
	1415	LEAR	48 C	0540.0	0548.0	50.0	220.0			QL=2 ST=2 TYP=8
	2695	SVTO	20 GRF	0540.0	0548.0	50.0	220.0			QL=4 ST=3 TYP=2
	1415	SVTO	48 C	0540.0	0548.0	54.0	220.0			QL=4 ST=2 TYP=8
	2695	LEAR	48 C	0540.0	0548.0	81.0	180.0			QL=2 ST=2 TYP=8
	200	HIRA	46 C	0541.0	0613.0	50.0	130.0			WR
	4995	SVTO	48 C	0542.0	0607.0	73.0	130.0			QL=4 ST=3 TYP=8
	610	SVTO	4 S/F	0543.0	0551.0	38.0	83.0			QL=4 ST=3 TYP=3
	8800	SVTO	20 GRF	0543.0	0607.0	62.0	85.0			QL=4 ST=2 TYP=2
	4995	LEAR	20 GRF	0543.0	0609.0	92.0	79.0			QL=4 ST=2 TYP=2
	410	SVTO	4 S/F	0544.0	0551.0	39.0	440.0			QL=4 ST=2 TYP=3
	8800	LEAR	20 GRF	0544.0	0607.0	84.0	91.0			QL=2 ST=2 TYP=2
	245	SVTO	4 S/F	0547.0	0613.0	34.0	350.0			QL=4 ST=2 TYP=3
	15400	SVTO	20 GRF	0548.0	0608.0	63.0	72.0			QL=4 ST=2 TYP=2
	15400	LEAR	20 GRF	0551.0	0607.0	30.0	59.0			QL=2 ST=2 TYP=2
	204	IZMI	45 C	0602.0E	0613.6	66.8U	277.0			QL=2 ST=2 TYP=2
	33	UPIC	4 S/F	0930.0	0930.5	1.5				
	204	IZMI	7 C	0930.8	0931.0	0.3	88.0			
	2800	PENT	1 S	1530.0	1533.0	7.0	10.0			
	2695	PALE	8 S	2309.0	2310.0	2.0	78.0			
	4995	PALE	8 S	2309.0	2310.0	2.0	73.0			QL=4 ST=2 TYP=3
	8800	PALE	8 S	2309.0	2310.0	2.0	160.0			QL=4 ST=2 TYP=3
	1415	PALE	8 S	2309.0	2310.0	2.0	81.0			QL=4 ST=2 TYP=3
5730	IRKU	46 C	2309.5	2310.3	4.0	68.0		U	QL=4 ST=2 TYP=3	
8800	LEAR	8 S	2310.0	2310.0		130.0				
1415	LEAR	8 S	2310.0	2310.0		52.0			QL=2 ST=2 TYP=3	
2695	LEAR	8 S	2310.0	2310.0		62.0			QL=2 ST=2 TYP=3	
15400	LEAR	8 S	2310.0	2310.0	1.0	62.0			QL=2 ST=2 TYP=3	
4995	LEAR	8 S	2310.0	2310.0		85.0			QL=2 ST=2 TYP=3	
15400	PALE	8 S	2310.0	2310.0		55.0			QL=2 ST=2 TYP=3	
						230.0			QL=4 ST=2 TYP=3	
04	204	IZMI	43 NS	0600.0		360.0D		10.0		
	127	TORN	44 NS	0620.0E		520.0D		2.0		V=0
	245	SGMR	43 NS	1425.0	1426.0	36.0	100.0			QL=4 ST=2 TYP=1
	245	SGMR	43 NS	1827.0	1846.0	20.0	97.0			QL=4 ST=2 TYP=1
	245	SGMR	43 NS	1946.0	2311.0	217.0	280.0			QL=2 ST=2 TYP=1
	2840	BEIJ	3 S	0040.0	0048.0	16.0	30.7			
	15400	SVTO	8 S	0415.0	0416.0	2.0	68.0		26.5	
	245	SVTO	8 S	0605.0	0605.0		51.0			QL=2 ST=2 TYP=3
	245	SVTO	4 S/F	0750.0	0750.0		55.0			QL=2 ST=2 TYP=3
204	IZMI	41 F	1157.3	1158.0	1.0	230.0			QL=4 ST=2 TYP=3	
245	SVTO	8 S	1424.0	1425.0	2.0	62.0			QL=4 ST=2 TYP=3	

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S O L A R R A D I O E M I S S I O N  
Outstanding Occurrences

MAY 1999

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 <sup>-22</sup> W/m <sup>2</sup> Hz)	Flux Density Mean	Int	Remarks
05	245	SVTO	43 NS	0441.0	0449.0	43.0	110.0			QL=2 ST=3 TYP=1
	245	SVTO	43 NS	0441.0	0449.0	1159.0	110.0			QL=2 ST=3 TYP=1
	204	IZMI	44 NS	0600.0E		360.0D		5.0		
	127	TORN	44 NS	0620.0E		520.0D		2.0		V=0
	245	SGMR	43 NS	1933.0	1933.0	78.0	52.0			QL=4 ST=2 TYP=1
	5730	IRKU	1 S	0614.6	0618.1	5.4	17.0		U	
	2800	PENT	20 GRF	1519.0	1522.0	10.0	3.0			
	410	SGMR	8 S	1925.0	1925.0	2.0	55.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	2116.0	2117.0	1.0	59.0			QL=4 ST=2 TYP=3
	245	PALE	8 S	2324.0	2325.0	1.0	120.0			QL=4 ST=2 TYP=3
06	204	IZMI	44 NS	0600.0E		360.0D		10.0		
	2840	BEIJ	1 S	0128.0	0134.0	8.0	9.3		6.5	
	5730	IRKU	4 S/F	0130.0	0133.5	8.6	8.0		U	
07	235	CUBA	44 NS	1510.0E		400.0D		6.0		
	280	CUBA	44 NS	1515.0E		395.0D		16.0		
	2800	PENT	1 S	0015.0	0016.0	2.0	6.0			
	2840	BEIJ	5 S	0425.0	0436.0	20.0	9.4		6.4	
	5730	IRKU	45 C	0432.0U	0437.7	19.3U	26.0		U	
	15400	LEAR	4 S/F	0434.0	0436.0	4.0	160.0			QL=2 ST=2 TYP=3
	8800	LEAR	4 S/F	0434.0	0436.0	6.0	170.0			QL=2 ST=2 TYP=3
	8800	SVTO	4 S/F	0434.0	0436.0	6.0	150.0			QL=4 ST=2 TYP=3
	15400	SVTO	4 S/F	0435.0	0436.0	3.0	130.0			QL=4 ST=2 TYP=3
	4995	SVTO	8 S	0436.0	0436.0		25.0		U	QL=4 ST=2 TYP=3
	2840	BEIJ	5 S	0654.0	0659.5	22.0	11.9		8.0	
	3000	IZMI	7 C	0659.1	0659.2	0.4	16.0			
	2800	PENT	4 S/F	1421.0	1426.0	28.0	28.0			
	6700	CUBA	20 GRF	1425.0	1433.0	73.0	9.0		4.0	00L
	1415	SGMR	4 S/F	1426.0	1426.0	4.0	49.0			QL=4 ST=2 TYP=3
	2695	SVTO	8 S	1426.0	1426.0	2.0	37.0			QL=4 ST=2 TYP=3
	1415	SVTO	8 S	1426.0	1426.0	1.0	37.0			QL=4 ST=2 TYP=3
	2695	SGMR	4 S/F	1426.0	1426.0	26.0	38.0			QL=4 ST=2 TYP=3
	4995	SGMR	4 S/F	1427.0	1427.0	11.0	29.0			QL=4 ST=2 TYP=3
	8800	SGMR	20 GRF	1427.0	1434.0	44.0	34.0			QL=4 ST=2 TYP=2
15400	SGMR	20 GRF	1427.0	1449.0	44.0	42.0			QL=4 ST=2 TYP=2	
2800	PENT	1 S	2112.0	2114.0	4.0	6.0				
08	410	PALE	43 NS	0130.0	0131.0	1350.0	130.0			QL=4 ST=1 TYP=1
	235	CUBA	44 NS	1300.0E		530.0D		13.0		
	280	CUBA	44 NS	1300.0E		530.0D		30.0		
	245	SGMR	43 NS	1546.0	1920.0	425.0	200.0			QL=4 ST=2 TYP=1
	245	PALE	43 NS	1707.0	1920.0	696.0	270.0			QL=4 ST=2 TYP=1
	2840	BEIJ	5 S	0013.0	0017.0	13.0	6.0		3.4	
	5730	IRKU	1 S	0016.3	0016.5	0.4	7.0		U	
	5730	IRKU	4 S/F	0059.2	0059.6	3.6	4.0		U	
	2840	BEIJ	5 S	0457.0	0500.0	14.0	2.8		1.6	
	2840	BEIJ	5 S	0812.0	0836.0	24.0	4.2		2.4	
	3000	IZMI	23 GRF	1040.3	1051.6	18.0U	36.0			
	610	SVTO	4 S/F	1049.0	1052.0	4.0	130.0			QL=2 ST=3 TYP=3
	245	SGMR	4 S/F	1050.0	1052.0	4.0	57.0			QL=4 ST=3 TYP=3
	8800	SGMR	4 S/F	1050.0	1051.0	4.0	280.0			QL=4 ST=3 TYP=3
	1415	SGMR	8 S	1050.0	1051.0	2.0	18.0			QL=4 ST=3 TYP=3
	4995	SGMR	4 S/F	1050.0	1051.0	4.0	120.0			QL=4 ST=3 TYP=3
	410	SGMR	4 S/F	1050.0	1054.0	4.0	45.0			QL=4 ST=3 TYP=3
	610	SGMR	4 S/F	1050.0	1051.0	4.0	11.0			QL=4 ST=3 TYP=3
	2695	SGMR	4 S/F	1050.0	1051.0	4.0	32.0			QL=4 ST=3 TYP=3
	15400	SGMR	4 S/F	1050.0	1051.0	4.0	220.0			QL=4 ST=3 TYP=3
	8800	SVTO	4 S/F	1050.0	1051.0	4.0	330.0			QL=4 ST=3 TYP=3
	4995	SVTO	4 S/F	1050.0	1051.0	3.0	120.0			QL=4 ST=3 TYP=3
	15400	SVTO	4 S/F	1050.0	1051.0	4.0	260.0			QL=4 ST=3 TYP=3
	2695	SVTO	8 S	1051.0	1051.0		30.0		U	QL=4 ST=3 TYP=3
	204	IZMI	42 SER	1056.2	1057.1	7.3	55.0			
	33	UPIC	46 C	1129.0	1130.0	2.5				
	245	SGMR	4 S/F	1222.0	1224.0	3.0	61.0			QL=4 ST=3 TYP=3
	245	SVTO	8 S	1223.0	1224.0	1.0	57.0			QL=4 ST=3 TYP=3
	2800	PENT	41 F	1421.0	1424.0	91.0	86.0			
	2695	SVTO	4 S/F	1423.0	1424.0	5.0	85.0			QL=4 ST=2 TYP=3
610	SVTO	8 S	1423.0	1424.0	1.0	100.0			QL=4 ST=2 TYP=3	

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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m 2 Hz)	Mean		
08	410	SVTO	8 S	1423.0	1424.0	1.0	72.0			
	2695	SGMR	4 S/F	1423.0	1424.0	11.0	90.0			QL=4 ST=2 TYP=3
	4995	SGMR	4 S/F	1423.0	1424.0	16.0	230.0			QL=4 ST=2 TYP=3
	4995	SVTO	4 S/F	1423.0	1424.0	14.0	210.0			QL=4 ST=2 TYP=3
	8800	SVTO	4 S/F	1423.0	1424.0	22.0	230.0			QL=4 ST=2 TYP=3
	6700	CUBA	46 C	1423.2	1424.3	12.5	479.0			QL=4 ST=2 TYP=3
	33	UPIC	46 C	1423.5	1425.0	3.0				00L
	1415	SGMR	4 S/F	1424.0	1424.0	5.0	43.0			
	1415	SVTO	8 S	1424.0	1424.0	1.0	36.0			QL=4 ST=2 TYP=3
	15400	SGMR	20 GRF	1424.0	1429.0	15.0	120.0			QL=4 ST=2 TYP=3
	410	SGMR	4 S/F	1424.0	1424.0	10.0	78.0			QL=4 ST=2 TYP=2
	245	SGMR	46 C	1424.0	1431.0	10.0	40.0			QL=4 ST=2 TYP=3
	610	SGMR	4 S/F	1424.0	1424.0	10.0	150.0			QL=4 ST=2 TYP=8
	15400	SVTO	20 GRF	1424.0	1429.0	21.0	87.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1428.0	1428.0		28.0			QL=4 ST=2 TYP=2
	6700	CUBA	29 PBI	1435.7		122.3	57.0	28.0		QL=4 ST=2 TYP=3
	245	SGMR	4 S/F	1450.0	1451.0	3.0	85.0			00L
	245	SVTO	8 S	1450.0	1451.0	1.0	78.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1454.0	1454.0	1.0	49.0			QL=4 ST=3 TYP=3
	245	SGMR	8 S	1456.0	1457.0	1.0	58.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1456.0	1457.0	1.0	52.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1527.0	1527.0		50.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1640.0	1641.0	2.0	110.0			QL=4 ST=2 TYP=3
245	SVTO	8 S	1641.0	1641.0		110.0			QL=4 ST=2 TYP=3	
245	SVTO	8 S	1718.0	1718.0	1.0	92.0			QL=4 ST=2 TYP=3	
410	SGMR	4 S/F	1733.0	1739.0	8.0	50.0			QL=4 ST=2 TYP=3	
410	SGMR	8 S	2202.0	2202.0	1.0	52.0			QL=4 ST=2 TYP=3	
09	410	PALE	43 NS	0130.0	0131.0	133.0	390.0			QL=4 ST=3 TYP=1
	245	SVTO	43 NS	0400.0	0449.0	810.0	440.0			QL=4 ST=2 TYP=1
	410	SVTO	43 NS	0402.0	0403.0	27.0	83.0			QL=4 ST=2 TYP=1
	204	IZMI	43 NS	0600.0		360.0D		25.0		
	245	SGMR	43 NS	0955.0	1620.0U	561.0	350.0			QL=4 ST=2 TYP=1
	280	CUBA	44 NS	1300.0E		530.0D		38.0		
	235	CUBA	44 NS	1300.0E		530.0D		20.0		
	245	SGMR	43 NS	2037.0	2154.0	98.0	96.0			
	5730	IRKU	45 C	0002.5	0004.5	5.5	8.0			QL=4 ST=2 TYP=1
	2840	BEIJ	5 S	0022.0	0038.5	23.0	7.9	4.5		U
	5730	IRKU	3 S	0319.5	0338.0	30.0	22.0			U
	33	UPIC	4 S/F	0717.0	0717.5	1.0				
	3000	IZMI	5 S	1105.5	1106.4	2.5U	9.0			
	6700	CUBA		1709.3						
	2800	PENT	41 F	1750.0	1758.0	27.0	147.0			00L
	8800	PALE	4 S/F	1756.0	1757.0	6.0	370.0			
	4995	SGMR	4 S/F	1756.0	1758.0	5.0	260.0			QL=4 ST=2 TYP=3
	8800	SGMR	4 S/F	1756.0	1757.0	6.0	490.0			QL=4 ST=2 TYP=3
	6700	CUBA	45 C	1756.0	1759.0	17.8	293.0	50.0		4L
	4995	PALE	4 S/F	1756.0	1758.0	15.0	260.0			
	15400	PALE	49 GB	1757.0	1757.0	4.0	650.0			QL=4 ST=2 TYP=3
	2695	PALE	4 S/F	1757.0	1759.0	4.0	160.0			QL=4 ST=2 TYP=3
	1415	PALE	4 S/F	1757.0	1758.0	3.0	75.0			QL=4 ST=2 TYP=3
	2695	SGMR	4 S/F	1757.0	1759.0	4.0	150.0			QL=4 ST=2 TYP=3
	15400	SGMR	49 GB	1757.0	1757.0	5.0	690.0			QL=4 ST=2 TYP=3
	1415	SGMR	4 S/F	1758.0	1758.0	3.0	70.0			QL=4 ST=2 TYP=6
	235	CUBA	7 C	1800.3	1802.0	2.7	1539.0			QL=4 ST=2 TYP=3
	245	PALE	49 GB	1801.0	1801.0	2.0	770.0			
	245	SGMR	49 GB	1801.0	1802.0	2.0	770.0			QL=4 ST=2 TYP=6
	410	SGMR	4 S/F	1803.0	1804.0	3.0	47.0			QL=4 ST=2 TYP=3
	410	PALE	49 GB	1804.0	1805.0	1.0	520.0			QL=4 ST=2 TYP=6
	410	SGMR	8 S	1807.0	1807.0		100.0			QL=4 ST=2 TYP=3
	10	245	SVTO	43 NS	0556.0	0621.0	91.0	260.0		
204		IZMI	44 NS	0600.0E		360.0D		15.0		
245		SGMR	43 NS	1205.0	1205.0	52.0	63.0			QL=4 ST=2 TYP=1
280		CUBA	44 NS	1300.0E		455.0D		21.0		
235		CUBA	44 NS	1300.0E		455.0D		12.0		
5730		IRKU	1 S	0250.0	0250.9	1.7	3.0			U
5730		IRKU	4 S/F	0317.0	0320.5	9.0	6.0			U
2840	BEIJ	45 C	0511.0	0526.5	33.0	87.0	45.2			



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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m <sup>2</sup> Hz)	Mean		
10	5730	IRKU	46 C	0518.0	0527.3	40.0	57.0		U	
	1415	LEAR	4 S/F	0524.0	0526.0	5.0	110.0			QL=2 ST=2 TYP=3
	610	SVTO	4 S/F	0524.0	0527.0	5.0	27.0			QL=4 ST=2 TYP=3
	245	SVTO	4 S/F	0524.0	0527.0	5.0	63.0			QL=4 ST=2 TYP=3
	500	HIRA	4 S/F	0524.5	0526.5	5.5	40.0			0
	1415	SVTO	4 S/F	0525.0	0526.0	4.0	110.0			QL=4 ST=2 TYP=3
	410	SVTO	4 S/F	0525.0	0527.0	3.0	35.0			QL=4 ST=2 TYP=3
	2695	SVTO	4 S/F	0525.0	0527.0	4.0	85.0			QL=4 ST=2 TYP=3
	4995	SVTO	4 S/F	0525.0	0527.0	6.0	57.0			QL=4 ST=2 TYP=3
	2800	HIRA	46 C	0525.5	0527.5	5.5	60.0			0
	4995	LEAR	4 S/F	0526.0	0527.0	3.0	58.0			QL=2 ST=2 TYP=3
	2695	LEAR	4 S/F	0526.0	0527.0	3.0	63.0			QL=2 ST=2 TYP=3
	8800	SVTO	4 S/F	0526.0	0527.0	8.0	40.0			QL=4 ST=2 TYP=3
	8800	LEAR	4 S/F	0526.0	0527.0	10.0	31.0			QL=2 ST=2 TYP=3
	15400	SVTO	20 GRF	0527.0	0534.0	14.0	41.0			QL=4 ST=2 TYP=2
	245	SVTO	4 S/F	0549.0	0552.0	4.0	170.0			QL=4 ST=2 TYP=3
	2840	BEIJ	1 S	0914.0	0918.0	7.0	9.8	5.1		
	5730	IRKU	20 GRF	0915.5	0918.0	44.5D	13.0		U	
	3000	IZMI	7 C	0916.0	0917.9	3.3	13.0			
	245	SGMR	8 S	1156.0	1156.0	1.0	49.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1205.0	1205.0		60.0			QL=4 ST=2 TYP=3
	6700	CUBA	20 GRF	1521.0	1557.0	103.0D	8.0			00L 1704-1719 0
	6700	CUBA	1 S	1727.6	1729.0	2.5	10.0	5.0		24L
	245	SGMR	8 S	1728.0	1728.0		57.0			QL=4 ST=2 TYP=3
	6700	CUBA	1 S	1739.7	1740.7	2.7	7.0	3.0		13L
	245	SGMR	8 S	1814.0	1816.0	2.0	80.0			QL=4 ST=2 TYP=3
	610	SGMR	8 S	1816.0	1816.0	1.0	10.0			QL=4 ST=2 TYP=3
	610	SGMR	8 S	1833.0	1833.0	2.0	14.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1833.0	1834.0	2.0	87.0			QL=4 ST=2 TYP=3
	2800	PENT	1 S	2205.0	2207.0	5.0	4.0			
11	235	CUBA	44 NS	1300.0E		530.0D		17.0		
	280	CUBA	44 NS	1300.0E		530.0D		17.0		
	245	SVTO	8 S	0423.0	0424.0	1.0	360.0			QL=4 ST=2 TYP=3
	200	HIRA	8 S	0424.0	0424.2	0.4	130.0			0
	3000	IZMI	7 C	0931.0	0934.5	6.3	11.0			
	5730	IRKU	1 S	0932.0	0934.4	6.7	7.0		U	
	5730	IRKU	1 S	0957.0	0958.2	3.0	2.0		U	
	3000	IZMI	7 C	1108.3	1108.9	2.4	23.0			
	8800	SGMR	8 S	1131.0	1131.0		330.0			QL=4 ST=3 TYP=3
	6700	CUBA	23 GRF	2037.0	2145.0	113.0D	10.0			00L SUNSET
	2800	PENT	20 GRF	2130.0	2148.0	62.0	12.0			
	610	PALE	48 C	2209.0	2220.0	18.0	190.0			QL=4 ST=2 TYP=8
15400	PALE	8 S	2211.0	2211.0	1.0	25.0			QL=4 ST=2 TYP=3	
8800	PALE	8 S	2214.0	2214.0		23.0			QL=4 ST=2 TYP=3	
12	204	IZMI	43 NS	0600.0		360.0D		15.0		
	127	TORN	44 NS	0620.0E		520.0D		13.0		V=2
	235	CUBA	44 NS	1300.0E		455.0D		17.0		
	280	CUBA	44 NS	1300.0E		520.0D		28.0		
	245	SVTO	43 NS	1429.0	1436.0	97.0	220.0			QL=4 ST=2 TYP=1
	245	SGMR	43 NS	1430.0	1436.0	96.0	300.0			QL=4 ST=2 TYP=1
	245	SGMR	44 NS	1646.0E	2249.0	397.0D	230.0			QL=4 ST=2 TYP=1
	245	SVTO	43 NS	1650.0	1711.0	42.0	98.0			QL=4 ST=3 TYP=1
	245	PALE	43 NS	1720.0	2249.0	669.0	280.0			QL=4 ST=2 TYP=1
	245	SVTO	43 NS	1750.0	1711.0	1422.0	98.0			QL=4 ST=2 TYP=1
	410	PALE	43 NS	1811.0	1837.0	89.0	66.0			QL=4 ST=2 TYP=1
	410	SGMR	43 NS	1817.0	1912.0	69.0	76.0			QL=4 ST=2 TYP=1
	5730	IRKU	1 S	0054.4	0054.8	1.6	2.0		U	
	5730	IRKU	1 S	0113.0	0113.2	0.7	2.0		U	
	5730	IRKU	1 S	0116.8	0117.1	1.2	3.0		U	
	5730	IRKU	1 S	0122.0	0122.6	1.0	2.0		U	
	2840	BEIJ	1 S	0352.0	0355.0	5.0	5.7	3.4		
	5730	IRKU	1 S	0354.5	0355.0	6.5	3.0		U	
	2840	BEIJ	1 S	0410.0	0412.9	7.0	3.2	1.9		
	2840	BEIJ	20 GRF	0430.0	0456.0	39.0	11.2	6.7		
	5730	IRKU	42 SER	0431.0	0456.6	45.0	8.0		U	
245	SVTO	8 S	0456.0	0456.0	1.0	180.0			QL=4 ST=2 TYP=3	
410	SVTO	8 S	0456.0	0456.0	1.0	58.0			QL=4 ST=2 TYP=3	

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Day	Freq Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 <sup>-22</sup> W/m <sup>2</sup> Hz)	Flux Density Mean	Int	Remarks	
12	610 SVTO	8 S	0456.0	0456.0	U	30.0				
	33 UPIC	45 C	0654.0	0654.3	1.0				QL=4 ST=2 TYP=3	
	204 IZMI	25 R	0940.00		140.00		35.0			
	245 SGMR	8 S	1344.0	1344.0	1.0	60.0			QL=4 ST=2 TYP=3	
	245 SVTO	8 S	1344.0	1344.0	1.0	67.0			QL=4 ST=2 TYP=3	
	410 SGMR	8 S	2015.0	2016.0	1.0	55.0			QL=4 ST=2 TYP=3	
	410 PALE	8 S	2337.0	2337.0	U	66.0			QL=4 ST=2 TYP=3	
13	245 SVTO	43 NS	0359.0	0436.0	800.0	650.0			QL=4 ST=2 TYP=1	
	204 IZMI	44 NS	0600.0E		360.00		60.0			
	127 TORN	44 NS	0620.0E		520.00		10.0		V=2	
	245 SGMR	43 NS	1001.0	1236.0	745.0	220.0			QL=4 ST=2 TYP=1	
	280 CUBA	44 NS	1300.0E		530.00		32.0			
	235 CUBA	44 NS	1300.0E		530.00		21.0			
	245 PALE	43 NS	1739.0	0204.0	666.0	230.0			QL=4 ST=2 TYP=1	
	245 SGMR	8 S	1046.0	1047.0	2.0	160.0			QL=4 ST=2 TYP=3	
	33 UPIC	45 C	1304.0	1305.0	1.5					
	245 SGMR	8 S	1413.0	1413.0	1.0	170.0			QL=4 ST=2 TYP=3	
	6700 CUBA	20 GRF	1453.0	1459.0	14.0	5.0	2.0		OOL	
		6700 CUBA	23 GRF	1637.0	1639.0	22.0	11.0	5.0		OOL
	14	245 SVTO	43 NS	0405.0	1547.0	790.0	120.0			QL=4 ST=3 TYP=1
245 SVTO		43 NS	0405.0	0424.00	1195.0	100.0			QL=4 ST=3 TYP=1	
245 SVTO		43 NS	0405.0	0416.00	1195.0	89.0			QL=4 ST=3 TYP=1	
204 IZMI		44 NS	0600.0E		360.00		25.0			
127 TORN		43 NS	0824.0		310.0		1.0		V=1	
245 SGMR		43 NS	1217.0	1318.0	161.0	130.0			QL=4 ST=2 TYP=1	
280 CUBA		44 NS	1300.0E		530.00		28.0			
235 CUBA		44 NS	1300.0E		530.00		20.0			
245 SGMR		43 NS	1538.0	1548.0	110.0	180.0			QL=4 ST=2 TYP=1	
245 SGMR		43 NS	1859.0	1906.0	220.0	120.0			QL=4 ST=2 TYP=1	
245 PALE		43 NS	1959.0	1906.0	325.0	120.0			QL=4 ST=2 TYP=1	
2840 BEIJ		1 S	0342.0	0351.0	11.0	7.2	4.9			
245 SVTO		8 S	0822.0	0822.0	U	160.0			QL=2 ST=2 TYP=3	
245 SGMR		8 S	1459.0	1500.0	1.0	84.0			QL=4 ST=2 TYP=3	
245 SGMR		8 S	1535.0	1535.0	2.0	77.0			QL=4 ST=2 TYP=3	
245 SGMR		8 S	1824.0	1824.0	1.0	67.0			QL=4 ST=2 TYP=3	
245 PALE		8 S	1839.0	1839.0	U	67.0			QL=4 ST=2 TYP=3	
	245 SGMR	8 S	1839.0	1839.0	U	65.0			QL=4 ST=2 TYP=3	
15	204 IZMI	44 NS	0600.0E		360.00		5.0			
	235 CUBA	44 NS	1300.0E		530.00		11.0			
	280 CUBA	44 NS	1300.0E		530.00		22.0			
	245 SGMR	43 NS	2042.0	2046.0	10.0	57.0			QL=4 ST=2 TYP=1	
	2840 BEIJ	1 S	0155.0	0157.0	5.0	3.8	2.6			
	245 SVTO	48 C	0419.0	0421.0	7.0	83.0			QL=4 ST=2 TYP=8	
	245 SVTO	8 S	0613.0	0614.0	1.0	56.0			QL=4 ST=2 TYP=3	
	245 SVTO	8 S	0626.0	0627.0	1.0	96.0			QL=4 ST=2 TYP=3	
	5730 IRKU	1 S	0930.0	0930.2	1.0	2.0	U			
	245 SGMR	8 S	1108.0	1109.0	1.0	64.0			QL=4 ST=2 TYP=3	
	610 SVTO	4 S/F	1207.0	1210.0	7.0	220.0			QL=4 ST=2 TYP=3	
	610 SGMR	4 S/F	1208.0	1210.0	7.0	210.0			QL=4 ST=2 TYP=3	
	410 SGMR	4 S/F	1209.0	1210.0	4.0	69.0			QL=4 ST=2 TYP=3	
	410 SVTO	4 S/F	1209.0	1209.0	4.0	55.0			QL=4 ST=2 TYP=3	
	245 SGMR	8 S	1211.0	1211.0	1.0	43.0			QL=4 ST=2 TYP=3	
	245 SGMR	4 S/F	1218.0	1221.0	4.0	27.0			QL=4 ST=2 TYP=3	
	410 SGMR	4 S/F	1218.0	1218.0	5.0	52.0			QL=4 ST=2 TYP=3	
	245 SVTO	8 S	1219.0	1220.0	2.0	95.0			QL=2 ST=2 TYP=3	
	410 SGMR	4 S/F	1225.0	1227.0	5.0	50.0			QL=4 ST=2 TYP=3	
	245 SGMR	8 S	1243.0	1244.0	1.0	80.0			QL=4 ST=2 TYP=3	
245 SVTO	8 S	1243.0	1244.0	1.0	100.0			QL=4 ST=2 TYP=3		
610 SGMR	8 S	1525.0	1525.0	1.0	110.0			QL=4 ST=2 TYP=3		
6700 CUBA	1 S	1720.9	1722.0	1.5	12.0	6.0		17L		
	245 PALE	8 S	1958.0	1959.0	1.0	220.0			QL=4 ST=2 TYP=3	
	245 SGMR	8 S	1958.0	1959.0	1.0	250.0			QL=4 ST=3 TYP=3	
16	204 IZMI	44 NS	0600.0E		360.00		10.0			
	235 CUBA	44 NS	1300.0E		530.00		12.0			
	280 CUBA	44 NS	1300.0E		530.00		25.0			

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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m 2 Hz)	Mean		
16	245	SGMR	43 NS	1711.0	1715.0	14.0	73.0		QL=4 ST=2 TYP=1	
				2102.0	2249.0	134.0	280.0	QL=4 ST=2 TYP=1		
	245	PALE	43 NS	2244.0	2251.0	119.0	310.0	QL=2 ST=2 TYP=1		
	245	SVTO	49 GB	0547.0	0550.0	5.0	590.0	QL=2 ST=3 TYP=6		
	245	SVTO	8 S	0743.0	0743.0	U	55.0	QL=4 ST=2 TYP=3		
	3000	IZMI	5 S	1016.2	1016.2	0.2	15.5			
	245	SGMR	8 S	1232.0	1232.0	U	94.0	QL=4 ST=2 TYP=3		
	245	SVTO	8 S	1232.0	1232.0	U	56.0	QL=4 ST=2 TYP=3		
	245	SGMR	4 S/F	1325.0	1328.0	3.0	53.0	QL=4 ST=3 TYP=3		
	2800	PENT	1 S	1347.0	1349.0	3.0	15.0			
	280	CUBA	6 S	1347.8	1349.4	1.6	27.0			
	15400	SGMR	4 S/F	1348.0	1349.0	4.0	260.0	QL=4 ST=2 TYP=3		
	8800	SGMR	8 S	1348.0	1349.0	2.0	150.0	QL=4 ST=2 TYP=3		
	245	SGMR	4 S/F	1348.0	1349.0	4.0	110.0	QL=4 ST=2 TYP=3		
	410	SGMR	4 S/F	1348.0	1348.0	4.0	72.0	QL=4 ST=2 TYP=3		
	1415	SVTO	8 S	1348.0	1349.0	2.0	33.0	QL=4 ST=2 TYP=3		
	15400	SVTO	8 S	1348.0	1349.0	2.0	250.0	QL=4 ST=2 TYP=3		
	4995	SVTO	8 S	1348.0	1349.0	2.0	29.0	QL=4 ST=2 TYP=3		
	610	SVTO	8 S	1348.0	1349.0	1.0	30.0	QL=4 ST=2 TYP=3		
	410	SVTO	8 S	1348.0	1349.0	1.0	100.0	QL=4 ST=2 TYP=3		
	245	SVTO	8 S	1348.0	1349.0	1.0	86.0	QL=4 ST=2 TYP=3		
	6700	CUBA	2 S/F	1348.2	1349.4	2.0	66.0	33.0 2L		
	4995	SGMR	8 S	1349.0	1349.0	U	35.0	QL=4 ST=2 TYP=3		
	8800	SVTO	8 S	1349.0	1349.0	U	130.0	QL=4 ST=2 TYP=3		
	410	SGMR	8 S	1530.0	1531.0	1.0	230.0	QL=4 ST=2 TYP=3		
	410	SVTO	8 S	1530.0	1531.0	1.0	250.0	QL=4 ST=2 TYP=3		
	245	SGMR	8 S	1541.0	1541.0	U	73.0	QL=4 ST=2 TYP=3		
	245	SVTO	8 S	1714.0	1715.0	1.0	53.0	QL=4 ST=2 TYP=3		
	245	SVTO	8 S	1718.0	1719.0	2.0	64.0	QL=4 ST=2 TYP=3		
	410	SGMR	8 S	1719.0	1719.0	U	280.0	QL=4 ST=2 TYP=3		
	2695	PALE	8 S	1723.0	1723.0	1.0	120.0	QL=4 ST=2 TYP=3		
	4995	PALE	8 S	1723.0	1723.0	1.0	47.0	QL=4 ST=2 TYP=3		
	8800	PALE	8 S	1723.0	1723.0	1.0	110.0	QL=4 ST=2 TYP=3		
	610	PALE	8 S	1723.0	1723.0	1.0	180.0	QL=2 ST=2 TYP=3		
	410	PALE	8 S	1723.0	1723.0	1.0	180.0	QL=4 ST=2 TYP=3		
	15400	PALE	8 S	1723.0	1723.0	1.0	97.0	QL=4 ST=2 TYP=3		
	1415	PALE	8 S	1723.0	1723.0	1.0	290.0	QL=4 ST=2 TYP=3		
	4995	SGMR	8 S	1723.0	1723.0	1.0	35.0	QL=4 ST=2 TYP=3		
	1415	SGMR	8 S	1723.0	1723.0	1.0	280.0	QL=4 ST=2 TYP=3		
	410	SGMR	8 S	1723.0	1723.0	1.0	180.0	QL=4 ST=2 TYP=3		
	2695	SGMR	8 S	1723.0	1723.0	1.0	120.0	QL=4 ST=2 TYP=3		
	8800	SGMR	8 S	1723.0	1723.0	1.0	130.0	QL=4 ST=2 TYP=3		
	15400	SGMR	8 S	1723.0	1723.0	1.0	230.0	QL=4 ST=2 TYP=3		
	610	SGMR	8 S	1723.0	1723.0	1.0	170.0	QL=4 ST=2 TYP=3		
	1415	SVTO	8 S	1723.0	1723.0	1.0	240.0	QL=2 ST=2 TYP=3		
245	SVTO	8 S	1723.0	1724.0	2.0	83.0	QL=4 ST=2 TYP=3			
2695	SVTO	8 S	1723.0	1723.0	1.0	110.0	QL=2 ST=2 TYP=3			
410	SVTO	8 S	1723.0	1723.0	1.0	220.0	QL=4 ST=2 TYP=3			
4995	SVTO	8 S	1723.0	1723.0	1.0	40.0	QL=2 ST=2 TYP=3			
15400	SVTO	8 S	1723.0	1723.0	1.0	160.0	QL=2 ST=2 TYP=3			
610	SVTO	8 S	1723.0	1723.0	1.0	120.0	QL=4 ST=2 TYP=3			
8800	SVTO	8 S	1723.0	1723.0	1.0	130.0	QL=2 ST=2 TYP=3			
6700	CUBA	2 S/F	1723.2	1723.8	2.1	71.0	35.0 00L			
245	SGMR	8 S	1724.0	1724.0	1.0	70.0	QL=4 ST=2 TYP=3			
245	SGMR	8 S	1817.0	1817.0	U	110.0	QL=4 ST=2 TYP=3			
410	PALE	8 S	2010.0	2010.0	1.0	96.0	QL=4 ST=2 TYP=3			
410	SGMR	8 S	2010.0	2010.0	1.0	92.0	QL=4 ST=2 TYP=3			
245	SGMR	8 S	2015.0	2016.0	1.0	55.0	QL=4 ST=2 TYP=3			
245	PALE	4 S/F	2225.0	2229.0	6.0	260.0	QL=2 ST=2 TYP=3			
245	SGMR	4 S/F	2225.0	2229.0	8.0	190.0	QL=4 ST=2 TYP=3			
410	PALE	49 GB	2226.0	2229.0	4.0	700.0	QL=2 ST=2 TYP=6			
610	PALE	4 S/F	2226.0	2229.0	5.0	31.0	QL=4 ST=2 TYP=3			
410	SGMR	49 GB	2226.0	2229.0	4.0	640.0	QL=4 ST=2 TYP=6			
2800	PENT	1 S	2228.0	2229.0	2.0	5.0				
6700	CUBA	45 C	2228.6	2233.4	7.2	36.0	10.0 12R			
8800	SGMR	8 S	2232.0	2233.0	1.0	59.0	QL=4 ST=2 TYP=3			
4995	SGMR	8 S	2233.0	2233.0	U	31.0	QL=4 ST=2 TYP=3			
17	204	IZMI	44 NS	0600.0E		360.0D		25.0		

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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 <sup>-22</sup> W/m <sup>2</sup> Hz)	Flux Density Mean	Int	Remarks
17	127	TORN	44 NS	0824.0E		318.0D		6.0		V=2
	280	CUBA	44 NS	1300.0E		530.0D		20.0		
	235	CUBA	44 NS	1300.0E		530.0D		15.0		
	410	SGMR	43 NS	1331.0	1344.0	14.0	160.0			QL=4 ST=2 TYP=1
	410	SVTO	43 NS	1331.0	1346.0	15.0	200.0			QL=4 ST=2 TYP=1
	245	SGMR	43 NS	1343.0	1350.0	26.0	340.0			QL=4 ST=2 TYP=1
	245	SVTO	43 NS	1343.0	1514.0	101.0	360.0			QL=2 ST=2 TYP=1
	245	SGMR	43 NS	1514.0	1519.0	6.0	58.0			QL=4 ST=2 TYP=1
	245	SGMR	43 NS	1604.0	1702.0	86.0	260.0			QL=4 ST=2 TYP=1
	245	PALE	43 NS	1640.0	1650.0	228.0	590.0			QL=4 ST=2 TYP=1
	245	SGMR	43 NS	1833.0	1844.0	102.0	220.0			QL=2 ST=2 TYP=1
	410	PALE	49 GB	0021.0	0021.0	2.0	3200.0			QL=4 ST=2 TYP=1
	610	PALE	8 S	0021.0	0021.0	1.0	240.0			QL=2 ST=2 TYP=6
	245	SVTO	49 GB	0405.0	0406.0	2.0	990.0			QL=4 ST=2 TYP=3
	200	HIRA	8 S	0406.6	0407.0	1.0	250.0			QL=4 ST=2 TYP=6
	15400	SVTO	48 C	0431.0	0453.0	28.0	210.0			0
	5730	IRKU	46 C	0451.8	0453.9	32.2	97.0		U	QL=4 ST=2 TYP=8
	15400	SVTO	4 S/F	0452.0	0453.0	7.0	180.0			QL=4 ST=3 TYP=3
	2800	HIRA	3 S	0452.2	0453.5	3.2	60.0			0
	8800	LEAR	4 S/F	0453.0	0453.0	3.0	200.0			QL=2 ST=2 TYP=3
	1415	LEAR	8 S	0453.0	0454.0	1.0	30.0			QL=2 ST=2 TYP=3
	2695	LEAR	8 S	0453.0	0453.0	1.0	65.0			QL=2 ST=2 TYP=3
	4995	LEAR	8 S	0453.0	0453.0	2.0	65.0			QL=2 ST=2 TYP=3
	15400	LEAR	4 S/F	0453.0	0453.0	3.0	170.0			QL=2 ST=2 TYP=3
	410	SVTO	8 S	0453.0	0453.0		160.0		U	QL=4 ST=2 TYP=3
	1415	SVTO	8 S	0453.0	0454.0	1.0	39.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	0453.0	0453.0		70.0		U	QL=4 ST=2 TYP=3
	2695	SVTO	8 S	0453.0	0453.0	2.0	69.0			QL=4 ST=2 TYP=3
	4995	SVTO	8 S	0453.0	0453.0	2.0	62.0			QL=4 ST=2 TYP=3
	8800	SVTO	8 S	0453.0	0453.0	2.0	160.0			QL=4 ST=2 TYP=3
	500	HIRA	42 SER	0453.0	0453.2	2.2	120.0			0
	204	IZMI	42 SER	0704.2	0705.0	14.0	197.0			0
	204	IZMI	45 C	0750.7	0752.3	22.0	1711.0			
	2840	BEIJ	3 S	0751.0	0752.0	10.0	12.9	8.4		
	200	HIRA	47 GB	0751.2	0751.5	1.4	900.0			0
	5730	IRKU	8 S	0751.6	0752.2	4.1	70.0		U	
	3000	IZMI	5 S	0752.0	0752.2	0.8	16.0	8.0		
	33	UPIC	46 C	0957.0	0957.8	1.2				
	204	IZMI	42 SER	1015.3	1015.4	0.9	96.0			
	245	SGMR	8 S	1137.0	1137.0	1.0	250.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1137.0	1137.0	1.0	200.0			QL=4 ST=2 TYP=3
	204	IZMI	7 C	1137.7	1137.9	0.4	281.0			
	245	SGMR	8 S	1227.0	1227.0	2.0	120.0			QL=4 ST=2 TYP=3
	33	UPIC	46 C	1305.7	1306.0	2.3				
	245	SGMR	49 GB	1317.0	1317.0	1.0	540.0			QL=4 ST=2 TYP=6
	610	SGMR	8 S	1317.0	1317.0	1.0	130.0			QL=4 ST=2 TYP=3
	410	SGMR	49 GB	1317.0	1317.0	1.0	1100.0			QL=4 ST=2 TYP=6
	410	SVTO	49 GB	1317.0	1317.0	2.0	820.0			QL=4 ST=2 TYP=6
	610	SVTO	8 S	1317.0	1317.0	1.0	90.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1317.0	1317.0	2.0	420.0			QL=4 ST=2 TYP=3
245	SGMR	8 S	1451.0	1451.0	1.0	160.0			QL=4 ST=2 TYP=3	
245	SVTO	4 S/F	1603.0	1605.0	3.0	160.0			QL=4 ST=2 TYP=3	
245	SGMR	49 GB	1649.0	1650.0	1.0	740.0			QL=2 ST=2 TYP=3	
245	SVTO	8 S	1649.0	1650.0	2.0	400.0			QL=4 ST=2 TYP=6	
6700	CUBA	21 GRF	1656.0	1709.0	36.0	17.0			QL=2 ST=2 TYP=3	
245	SGMR	8 S	1657.0	1657.0		440.0		U	00L 1703-1705	
4995	SVTO	4 S/F	1702.0	1705.0	6.0	53.0			QL=4 ST=2 TYP=3	
8800	SVTO	4 S/F	1702.0	1705.0	7.0	59.0			QL=4 ST=2 TYP=3	
8800	SGMR	4 S/F	1703.0	1705.0	4.0	110.0			QL=4 ST=2 TYP=3	
4995	SGMR	4 S/F	1703.0	1705.0	4.0	79.0			QL=4 ST=2 TYP=3	
6700	CUBA	1 S	1705.0E	1705.6	4.0D	81.0			QL=4 ST=2 TYP=3	
245	SGMR	4 S/F	1829.0	1830.0	3.0	100.0			10R	
410	PALE	8 S	2002.0	2003.0	2.0	76.0			QL=4 ST=2 TYP=3	
410	SGMR	4 S/F	2002.0	2003.0	3.0	72.0			QL=2 ST=2 TYP=3	
610	PALE	4 S/F	2003.0	2004.0	3.0	33.0			QL=4 ST=2 TYP=3	
2695	PALE	8 S	2003.0	2003.0	1.0	84.0			QL=4 ST=2 TYP=3	
245	PALE	8 S	2003.0	2003.0		390.0		U	QL=4 ST=2 TYP=3	
1415	SGMR	8 S	2003.0	2003.0	2.0	14.0			QL=2 ST=2 TYP=3	
245	SGMR	8 S	2003.0	2003.0	2.0	320.0			QL=4 ST=2 TYP=3	

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MAY 1999

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 <sup>-22</sup> W/m <sup>2</sup> Hz)	Mean		
17	[	610 SGMR	8 S	2003.0	2004.0	2.0	30.0			QL=4 ST=2 TYP=3
		200 HIRA	8 S	2003.5	2003.6	0.2	140.0			0
		245 SGMR	8 S	2006.0	2007.0	1.0	68.0			QL=4 ST=2 TYP=3
		245 SGMR	8 S	2126.0	2127.0	1.0	120.0			QL=4 ST=2 TYP=3
18	[	204 IZMI	44 NS	0600.0E		360.0D		15.0		
		127 TORN	43 NS	0950.0		310.0		2.0		V=2
		235 CUBA	44 NS	1300.0E		530.0D		15.0		
		280 CUBA	44 NS	1300.0E		530.0D		26.0		
		245 SGMR	43 NS	1513.0	1521.0	272.0	180.0			QL=4 ST=2 TYP=1
		245 PALE	43 NS	1641.0	1650.0	90.0	120.0			QL=2 ST=2 TYP=1
		245 PALE	43 NS	1943.0	2058.0	100.0	230.0			QL=2 ST=2 TYP=1
		410 PALE	4 S/F	0013.0	0014.0	3.0	71.0			QL=4 ST=2 TYP=3
		410 PALE	4 S/F	0040.0	0040.0	3.0	430.0			QL=4 ST=3 TYP=3
		200 HIRA	8 S	0308.2	0308.3	0.2	190.0			0
		5730 IRKU	42 SER	0314.0	0320.0	10.5	8.0		U	
		245 PALE	8 S	0359.0	0359.0	U	250.0			QL=2 ST=3 TYP=3
		245 SVTO	8 S	0359.0	0359.0	U	190.0			QL=2 ST=2 TYP=3
		200 HIRA	8 S	0359.0	0359.2	0.4	110.0			0
		245 SVTO	8 S	0636.0	0636.0	U	53.0			QL=4 ST=2 TYP=3
		5730 IRKU	1 S	0653.0	0655.0	4.0	4.0		U	
		2840 BEIJ	5 S	0713.0	0715.0	4.0	12.2		8.5	
		4995 SVTO	8 S	0714.0	0714.0	1.0	61.0			QL=4 ST=2 TYP=3
		8800 SVTO	8 S	0714.0	0714.0	1.0	72.0			QL=4 ST=2 TYP=3
		5730 IRKU	4 S/F	0714.0	0714.8	30.2	98.0		U	
		3000 IZMI	5 S	0714.4	0714.9	0.5	14.0			
		204 IZMI	42 SER	0821.5	0821.7	0.3	1093.0			
		204 IZMI	45 C	0822.1	0822.2	0.2	2508.0			
		127 TORN	48 C	1005.0	1005.8	9.0	500.0		70.0	
		245 SVTO	8 S	1042.0	1043.0	1.0	72.0			QL=4 ST=2 TYP=3
		245 SGMR	8 S	1152.0	1153.0	1.0	70.0			QL=4 ST=2 TYP=3
		245 SVTO	8 S	1153.0	1153.0	U	50.0			QL=4 ST=2 TYP=3
		245 SGMR	8 S	1424.0	1424.0	U	42.0			QL=4 ST=2 TYP=3
245 SGMR	8 S	1504.0	1504.0	2.0	100.0			QL=4 ST=2 TYP=3		
245 SVTO	8 S	1521.0	1521.0	1.0	110.0			QL=2 ST=2 TYP=3		
245 SGMR	8 S	2231.0	2233.0	2.0	61.0			QL=4 ST=2 TYP=3		
245 PALE	8 S	2350.0	2350.0	U	79.0			QL=2 ST=2 TYP=3		
19	[	245 SVTO	43 NS	0402.0	1158.0	676.0	2200.0			QL=4 ST=2 TYP=1
		204 IZMI	44 NS	0600.0E		360.0D		140.0		
		127 TORN	44 NS	0620.0E		520.0D		135.0		V=3
		410 SVTO	43 NS	0659.0	1242.0	391.0	570.0			QL=4 ST=2 TYP=1
		245 SGMR	43 NS	0959.0	1157.0	271.0	2100.0			QL=4 ST=2 TYP=1
		410 SGMR	43 NS	1003.0	1154.0	237.0	880.0			QL=4 ST=2 TYP=1
		280 CUBA	44 NS	1300.0E		530.0D		37.0		
		235 CUBA	44 NS	1300.0E		530.0D		28.0		
		245 PALE	8 S	0258.0	0259.0	1.0	170.0			QL=2 ST=2 TYP=3
		245 PALE	8 S	0416.0	0416.0	U	66.0			QL=2 ST=2 TYP=3
		33 UPIC	45 C	0923.0	0923.5	1.5				
		2840 BEIJ	20 GRF	0948.0	0952.5	13.0	4.3		3.2	
		245 SGMR	8 S	1024.0	1025.0	2.0	310.0			QL=4 ST=2 TYP=3
		410 SGMR	8 S	1026.0	1026.0	U	120.0			QL=4 ST=2 TYP=3
		245 SGMR	8 S	1049.0	1049.0	1.0	450.0			QL=4 ST=2 TYP=3
		245 SVTO	49 GB	1049.0	1051.0	2.0	6.0			QL=2 ST=2 TYP=6
		245 SGMR	8 S	1059.0	1100.0	2.0	400.0			QL=4 ST=2 TYP=3
		245 SGMR	49 GB	1102.0	1102.0	U	580.0			QL=4 ST=2 TYP=6
		245 SGMR	49 GB	1103.0	1103.0	1.0	1000.0			QL=4 ST=2 TYP=6
		245 SGMR	49 GB	1108.0	1108.0	1.0	840.0			QL=4 ST=2 TYP=6
		410 SGMR	8 S	1109.0	1109.0	U	220.0			QL=4 ST=2 TYP=3
		245 SGMR	49 GB	1131.0	1132.0	2.0	820.0			QL=4 ST=2 TYP=6
		245 SGMR	49 GB	1138.0	1139.0	4.0	1400.0			QL=4 ST=2 TYP=6
		245 SGMR	48 C	1142.0	1150.0	12.0	2000.0			QL=4 ST=2 TYP=8
		410 SGMR	48 C	1145.0	1148.0	6.0	460.0			QL=4 ST=2 TYP=8
		245 SGMR	48 C	1217.0	1221.0	6.0	1800.0			QL=4 ST=2 TYP=8
		235 CUBA	26 FAL	1300.0E	1300.0U	110.0D	316.0			SUNRISE
		280 CUBA	26 FAL	1300.0E	1300.0U	110.0D	444.0			SUNRISE
410 SGMR	8 S	1516.0	1517.0	2.0	100.0			QL=4 ST=2 TYP=3		
245 SGMR	8 S	1630.0	1632.0	2.0	92.0			QL=4 ST=2 TYP=3		

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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m <sup>2</sup> Hz)	Mean		
20	204	IZMI	44 NS	0600.0E		360.0D		15.0		
	127	TORN	43 NS	0940.0		240.0				V=1
	235	CUBA	44 NS	1300.0E		530.0D		44.0		
	280	CUBA	44 NS	1300.0E		530.0D		82.0		
	245	SGMR	43 NS	1620.0	1748.0	413.0	400.0			QL=4 ST=2 TYP=1
	410	SGMR	43 NS	1624.0	1647.0	316.0	120.0			QL=4 ST=3 TYP=1
	245	PALE	43 NS	1629.0	1701.0	523.0	330.0			QL=4 ST=2 TYP=1
	2840	BEIJ	1 S	0143.0	0145.5	5.0	2.6	1.9		
	204	IZMI	42 SER	0744.2	0744.4	0.4	165.0			
	204	IZMI	25 R	0934.0		146.0D		5.0		
	127	TORN	48 C	1218.0	1218.8	3.0	190.0	30.0		
	235	CUBA	24 R	1625.0	1750.0	325.0D		115.0		SUNSET
	280	CUBA	24 R	1625.0	1750.0	352.0D		193.0		SUNSET
	245	PALE	49 GB	1913.0	1914.0	1.0	660.0			QL=4 ST=2 TYP=6
21	204	IZMI	44 NS	0600.0E		360.0D		5.0		
	280	CUBA	44 NS	1300.0E		530.0D		18.0		
	235	CUBA	44 NS	1300.0E		530.0D		9.0		
	245	SVTO	8 S	0403.0	0404.0	1.0	53.0			QL=4 ST=2 TYP=3
	204	IZMI	7 C	0625.6	0626.0	0.5	27.0			
	245	SVTO	8 S	0928.0	0928.0	U	120.0			QL=2 ST=2 TYP=3
	245	SVTO	4 S/F	1001.0	1002.0	3.0	190.0			QL=2 ST=2 TYP=3
	245	SGMR	4 S/F	1002.0	1003.0	3.0	88.0			QL=2 ST=2 TYP=3
	245	SVTO	8 S	1022.0	1022.0	1.0	120.0			QL=2 ST=2 TYP=3
	245	SGMR	8 S	1345.0	1345.0	U	59.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1605.0	1605.0	U	60.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1605.0	1605.0	U	75.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1641.0	1642.0	1.0	58.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1642.0	1642.0	U	71.0			QL=4 ST=2 TYP=3
245	PALE	8 S	1715.0	1716.0	1.0	64.0			QL=4 ST=2 TYP=3	
245	SGMR	8 S	1716.0	1716.0	U	72.0			QL=4 ST=2 TYP=3	
245	SVTO	8 S	1716.0	1716.0	U	51.0			QL=4 ST=2 TYP=3	
245	PALE	8 S	2148.0	2149.0	1.0	180.0			QL=2 ST=2 TYP=3	
245	SGMR	8 S	2149.0	2149.0	1.0	170.0			QL=4 ST=2 TYP=3	
22	280	CUBA	44 NS	1300.0E		530.0D		16.0		
	235	CUBA	44 NS	1300.0E		530.0D		9.0		
	5730	IRKU	1 S	0533.8	0534.2	1.3	3.0	U		
	5730	IRKU	4 S/F	0650.0	0651.7	5.5	11.0	U		
	204	IZMI	41 F	0704.3	0704.6	0.5	35.0			
	245	SGMR	49 GB	1523.0	1524.0	2.0	2200.0			QL=4 ST=2 TYP=6
	410	SGMR	8 S	1524.0	1524.0	1.0	39.0			QL=4 ST=2 TYP=3
	410	SVTO	8 S	1524.0	1524.0	1.0	77.0			QL=4 ST=2 TYP=3
	245	SVTO	49 GB	1524.0	1524.0	1.0	2100.0			QL=4 ST=2 TYP=6
	245	PALE	4 S/F	1900.0	1901.0	8.0	57.0			QL=2 ST=2 TYP=3
	245	PALE	8 S	2108.0	2108.0	1.0	70.0			QL=2 ST=2 TYP=3
	245	SGMR	8 S	2108.0	2108.0	2.0	56.0			QL=4 ST=2 TYP=3
	245	PALE	8 S	2115.0	2115.0	2.0	55.0			QL=2 ST=2 TYP=3
	245	SGMR	8 S	2115.0	2115.0	U	54.0			QL=4 ST=2 TYP=3
23	204	IZMI	43 NS	0600.0		360.0D		10.0		
	127	TORN	43 NS	0730.0		420.0				V=1
	245	SGMR	43 NS	1112.0	1131.0	37.0	240.0			QL=4 ST=2 TYP=1
	245	SVTO	44 NS	1147.0E	1151.0	25.0D	350.0			QL=4 ST=2 TYP=1
	235	CUBA	44 NS	1300.0E		530.0D		11.0		
	280	CUBA	44 NS	1300.0E		530.0D		22.0		
	245	SGMR	43 NS	1306.0	1306.0	9.0	71.0			QL=4 ST=2 TYP=1
	245	SVTO	43 NS	1306.0	1308.0	18.0	290.0			QL=2 ST=2 TYP=1
	245	SGMR	43 NS	1421.0	1424.0	3.0	88.0			QL=4 ST=2 TYP=1
	245	SVTO	43 NS	1424.0	1442.0	89.0	140.0			QL=4 ST=2 TYP=1
	204	IZMI	42 SER	0730.4	0732.2	2.1	122.0			
	2840	BEIJ	1 S	0736.0	0740.5	10.0	4.4	3.2		
	5730	IRKU	21 GRF	0758.0	0810.0	30.0	12.0	U		
	204	IZMI	42 SER	0802.6	0809.6	10.3	630.0			
200	HIRA	42 SER	0805.0	0807.0	5.5	250.0			0	
245	SVTO	48 C	0805.0	0811.0	8.0	440.0			QL=4 ST=2 TYP=8	
610	SVTO	48 C	0807.0	0808.0	7.0	100.0			QL=4 ST=3 TYP=8	
500	HIRA	42 SER	0807.5	0812.5	5.5	70.0			0	
410	SVTO	48 C	0809.0	0811.0	2.0	96.0			QL=4 ST=2 TYP=8	

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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m 2 Hz)	Mean		
23	204	IZMI	45 C	0845.4	0845.5	1.4	1013.0			
	204	IZMI	42 SER	0904.3	0905.2	2.9	132.0			
	245	SGMR	8 S	1012.0	1012.0	1.0	260.0			QL=4 ST=2 TYP=3
	410	SGMR	8 S	1012.0	1012.0	1.0	84.0			QL=4 ST=2 TYP=3
	204	IZMI	45 C	1012.0	1012.6	1.5	868.0			
	245	SGMR	8 S	1015.0	1015.0	U	82.0			QL=4 ST=2 TYP=3
	204	IZMI	41 F	1015.1	1015.3	0.5	465.0			
	204	IZMI	42 SER	1123.6	1128.2	4.6	789.0			
	245	SVTO	8 S	1131.0	1131.0	1.0	180.0			QL=4 ST=2 TYP=3
	410	SVTO	8 S	1131.0	1131.0	U	26.0			QL=4 ST=2 TYP=3
	410	SGMR	8 S	1146.0	1146.0	2.0	91.0			QL=4 ST=2 TYP=3
	410	SVTO	8 S	1146.0	1146.0	U	95.0			QL=4 ST=2 TYP=3
	127	TORN	5 S	1224.0	1224.3	2.0	50.0	10.0		
	245	SVTO	49 GB	1412.0	1414.0	3.0	580.0			QL=4 ST=2 TYP=6
	245	SGMR	49 GB	1413.0	1414.0	2.0	710.0			QL=4 ST=2 TYP=6
	410	SVTO	8 S	1413.0	1414.0	1.0	52.0			QL=4 ST=2 TYP=3
	410	SGMR	8 S	1414.0	1414.0	U	44.0			QL=4 ST=2 TYP=3
	6700	CUBA	23 GRF	1432.0	1455.0	65.0	7.0	3.0		OOL
	245	SGMR	8 S	1631.0	1631.0	U	160.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1631.0	1631.0	U	100.0			QL=4 ST=2 TYP=3
	245	PALE	8 S	1725.0	1725.0	1.0	320.0			QL=2 ST=2 TYP=3
	245	SGMR	8 S	1725.0	1725.0	1.0	300.0			QL=4 ST=2 TYP=3
	2695	SVTO	8 S	1725.0	1725.0	U	32.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1725.0	1725.0	1.0	240.0			QL=4 ST=2 TYP=3
	610	PALE	4 S/F	1729.0	1730.0	4.0	88.0			QL=4 ST=2 TYP=3
	2800	PENT	2 S/F	1729.0	1729.0	3.0	9.0			
	610	SGMR	4 S/F	1729.0	1730.0	3.0	94.0			QL=4 ST=2 TYP=3
	610	SVTO	8 S	1729.0	1730.0	2.0	95.0			QL=4 ST=2 TYP=3
	245	PALE	8 S	1730.0	1730.0	U	210.0			QL=2 ST=2 TYP=3
	245	SGMR	8 S	1730.0	1730.0	U	190.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1730.0	1730.0	U	190.0			QL=4 ST=2 TYP=3
	6700	CUBA	1 S	1730.4	1731.0	1.1	8.0	4.0		28R
	6700	CUBA	20 GRF	1818.0	1900.0	117.0	7.0	3.0		OOL
	410	PALE	49 GB	2142.0	2142.0	4.0	780.0			QL=2 ST=2 TYP=6
	245	PALE	49 GB	2142.0	2142.0	4.0	2600.0			QL=2 ST=2 TYP=6
	410	SGMR	49 GB	2142.0	2142.0	1.0	700.0			QL=4 ST=2 TYP=6
	245	SGMR	49 GB	2142.0	2143.0	1.0	2700.0			QL=4 ST=2 TYP=6
	500	HIRA	8 S	2142.6	2142.7	0.2	200.0			0
	200	HIRA	8 S	2142.7	2142.9	0.4	270.0			0
	245	SGMR	8 S	2208.0	2209.0	2.0	67.0			QL=4 ST=2 TYP=3
410	PALE	8 S	2235.0	2235.0	U	53.0			QL=4 ST=2 TYP=3	
410	SGMR	8 S	2235.0	2235.0	U	180.0			QL=4 ST=2 TYP=3	
410	PALE	8 S	2328.0	2329.0	1.0	81.0			QL=4 ST=2 TYP=3	
24	245	SVTO	43 NS	0431.0	0456.0	25.0	200.0			QL=4 ST=3 TYP=1
	204	IZMI	44 NS	0600.0E		360.0D		17.0		
	127	TORN	44 NS	0620.0E		440.0D				V=1, DISTURBED
	245	SGMR	43 NS	1025.0	1025.0	23.0	61.0			QL=4 ST=2 TYP=1
	235	CUBA	44 NS	1300.0E		530.0D		11.0		
	280	CUBA	44 NS	1300.0E		530.0D		21.0		
	245	SGMR	43 NS	1334.0	1751.0	492.0	230.0			QL=4 ST=2 TYP=1
	245	PALE	43 NS	1701.0	1751.0	173.0	230.0			QL=4 ST=2 TYP=1
	245	PALE	8 S	0023.0	0023.0	U	100.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	0423.0	0423.0	2.0	240.0			QL=2 ST=2 TYP=3
	2695	SVTO	8 S	0424.0	0424.0	U	60.0			QL=4 ST=2 TYP=3
	3000	IZMI	5 S	0556.4	0556.4	0.1	30.0			
	2840	BEIJ	1 S	0558.0	0600.5	10.0	10.9	7.8		
	3000	IZMI	7 C	0600.0	0600.1	0.3	12.0			
	245	SVTO	8 S	0623.0	0624.0	1.0	200.0			QL=4 ST=2 TYP=3
	204	IZMI	42 SER	0623.2	0623.8	9.0	282.0			
	204	IZMI	42 SER	0714.1	0724.3	14.9	586.0			
	33	UPIC	46 C	0719.0	0721.6	3.2				
	245	SVTO	8 S	0721.0	0721.0	1.0	94.0			QL=2 ST=2 TYP=3
	204	IZMI	42 SER	0810.2	0812.0	2.4	285.0			0
	500	HIRA	42 SER	0810.5	0812.0	1.8	40.0			QL=4 ST=3 TYP=3
	410	SVTO	8 S	0811.0	0812.0	1.0	93.0			
	33	UPIC	2 S/F	0811.7	0812.0	1.1				
	245	SVTO	8 S	0812.0	0812.0	U	72.0			QL=4 ST=3 TYP=3
5730	IRKU	4 S/F	0857.0	0859.6	10.0	7.0		U		

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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 <sup>-22</sup> W/m <sup>2</sup> Hz)	Mean		
24	245	SGMR	8 S	1010.0	1010.0	1.0	150.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1201.0	1201.0	1.0	62.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1227.0	1227.0	1.0	100.0			QL=4 ST=3 TYP=3
	245	SGMR	8 S	1228.0	1228.0	1.0	120.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1323.0	1324.0	1.0	66.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1324.0	1324.0	1.0	50.0			QL=4 ST=2 TYP=3
	410	SGMR	8 S	1415.0	1415.0	U	54.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1535.0	1536.0	1.0	88.0			QL=2 ST=2 TYP=3
	245	SGMR	8 S	1554.0	1554.0	U	270.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1554.0	1554.0	U	480.0			QL=2 ST=2 TYP=3
	245	SVTO	8 S	1614.0	1614.0	1.0	140.0			QL=2 ST=2 TYP=3
	2800	PENT	3 S	1735.0	1738.0	6.0	4.0			QL=2 ST=2 TYP=3
	2840	BEIJ	3 S	2252.0	2256.5	10.0	36.9	26.4		
2840	BEIJ	20 GRF	2326.0	2331.5	15.0	3.8	2.7			
25	204	IZMI	44 NS	0600.0E		360.0D		10.0		
	127	TORN	44 NS	0620.0E		520.0D		3.0		V=1
	235	CUBA	44 NS	1300.0E		530.0D		11.0		
	280	CUBA	44 NS	1300.0E		530.0D		20.0		
	5730	IRKU	4 S/F	0254.4	0255.0		15.6	22.0	U	
	200	HIRA	42 SER	0429.0	0429.2	1.0	180.0			0
	200	HIRA	47 GB	0518.7	0519.0	0.6	2300.0			0
	204	IZMI	42 SER	0604.9	0606.7	6.0	162.0			
	204	IZMI	7 C	0615.2	0615.3	0.2	40.0			
	200	HIRA	8 S	0658.2	0658.3	0.2	80.0			0
	204	IZMI	45 C	0658.2	0658.3	0.5	268.0			
	204	IZMI	7 C	0659.4	0659.5	0.2	53.0			
	245	SVTO	8 S	0743.0	0743.0	U	58.0			QL=2 ST=2 TYP=3
	204	IZMI	45 C	0750.8	0751.1	0.5	3479.0			
	245	SVTO	49 GB	0751.0	0751.0	2.0	620.0			QL=2 ST=2 TYP=6
	410	SVTO	8 S	0751.0	0751.0	1.0	39.0			QL=4 ST=2 TYP=3
	200	HIRA	47 GB	0751.2	0751.4	1.2	500.0			0
	204	IZMI	45 C	0751.4	0751.6	2.1	442.0			
	204	IZMI	41 F	0754.7	0754.8	0.4	252.0			
	2840	BEIJ	1 S	0831.0	0833.5	4.0	3.1	2.1		
	204	IZMI	45 C	0833.1	0833.2	0.9	585.0			
	200	HIRA	8 S	0833.5	0833.7	0.6	200.0			0
	245	SVTO	8 S	0910.0	0911.0	1.0	100.0			QL=2 ST=3 TYP=3
	245	SVTO	8 S	0943.0	0944.0	2.0	410.0			QL=2 ST=2 TYP=3
	245	SGMR	8 S	1003.0	1004.0	1.0	170.0			QL=4 ST=2 TYP=3
	410	SGMR	8 S	1003.0	1004.0	1.0	38.0			QL=4 ST=2 TYP=3
	410	SVTO	8 S	1003.0	1004.0	2.0	140.0			QL=4 ST=3 TYP=3
	245	SVTO	8 S	1003.0	1004.0	1.0	13.0			QL=2 ST=3 TYP=3
	204	IZMI	42 SER	1003.4	1006.2	3.6	70.0			
	410	SVTO	8 S	1005.0	1006.0	1.0	150.0			QL=4 ST=3 TYP=3
	410	SGMR	8 S	1006.0	1006.0	1.0	120.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1006.0	1006.0	1.0	96.0			QL=4 ST=2 TYP=3
	610	SGMR	8 S	1006.0	1006.0	1.0	30.0			QL=4 ST=2 TYP=3
245	SVTO	8 S	1006.0	1006.0	1.0	95.0			QL=2 ST=3 TYP=3	
204	IZMI	41 F	1015.9	1016.2	0.6	111.0				
245	SGMR	8 S	1016.0	1016.0	U	270.0			QL=4 ST=2 TYP=3	
245	SGMR	8 S	1052.0	1052.0	1.0	63.0			QL=4 ST=2 TYP=3	
204	IZMI	7 C	1052.6	1052.8	0.3	76.0				
2800	PENT	1 S	2333.0	2336.0	5.0	6.0				
5730	IRKU	4 S/F	2348.3	2349.3	10.4	14.0		U		
26	204	IZMI	44 NS	0600.0E		360.0D		20.0		
	127	TORN	44 NS	0620.0E		520.0D		20.0		V=2
	33	UPIC	43 NS	0804.0	0855.0	365.0				
	235	CUBA	44 NS	1300.0E		530.0D		10.0		
	280	CUBA	44 NS	1300.0E		530.0D		17.0		
	5730	IRKU	4 S/F	0218.7	0219.1	5.3	10.0		U	
	200	HIRA	42 SER	0226.2	0226.4	0.8	150.0			
	2840	BEIJ	1 S	0451.0	0455.5	6.0	7.5	4.9		WL
	5730	IRKU	4 S/F	0454.3	0455.5	4.7	20.0		U	
	33	UPIC	42 SER	0804.0	0855.0	52.2				
	5730	IRKU	42 SER	0817.7	0821.2	5.3	8.0		U	
	2840	BEIJ	1 S	0855.0	0855.5	5.0	9.8	6.5		
	5730	IRKU	45 C	0855.5	0856.1	2.0	18.0		U	



S O L A R R A D I O E M I S S I O N  
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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks	
							Peak (10 -22 W/m <sup>2</sup> Hz)	Mean			
26	6700	CUBA	21 GRF	1911.0	1934.0	115.0	27.0	13.0		OOL	
	6700	CUBA	2 S/F	1917.5	1919.4	5.5	20.0	10.0		13L	
27	127	TORN	43 NS	0900.0		360.0		2.0		V=1	
	235	CUBA	44 NS	1300.0E		530.0D		7.0			
	280	CUBA	44 NS	1300.0E		530.0D		17.0			
	245	SGMR	43 NS	1305.0	1315.0	167.0	130.0			QL=4 ST=3 TYP=1	
	4995	SVTO	8 S	0532.0	0533.0	1.0	33.0			QL=4 ST=2 TYP=3	
	8800	SVTO	8 S	0532.0	0533.0	1.0	50.0			QL=4 ST=2 TYP=3	
	5730	IRKU	4 S/F	0532.0	0533.3	4.6	34.0		U		
	15400	SVTO	8 S	0533.0	0533.0		29.0		U	QL=4 ST=2 TYP=3	
	5730	IRKU	8 S	0747.7	0747.7	0.1	10.0		U		
	5730	IRKU	8 S	0747.8	0747.9	0.2	27.0		U		
	2840	BEIJ	1 S	0929.0	0931.0	4.0	5.5		3.7		
	1415	SVTO	49 GB	0930.0	0933.0	3.0	860.0			QL=4 ST=2 TYP=6	
	2695	SVTO	49 GB	0931.0	0933.0	4.0	16000.0			QL=4 ST=2 TYP=6	
	245	SGMR	8 S	1218.0	1219.0	1.0	75.0			QL=4 ST=2 TYP=3	
	6700	CUBA	21 GRF	1257.0	1301.0	49.0	15.0			OOL	
	6700	CUBA	1 S	1301.4	1302.0	1.2	15.0		7.0	OOL	
	245	SVTO	8 S	1305.0	1305.0		65.0			QL=2 ST=2 TYP=3	
	6700	CUBA	22 GRF	1408.0	1653.0	279.0	35.0		17.0	8R	
	2800	PENT	20 GRF	1524.0	1529.0	29.0	13.0				
	4995	PALE	20 GRF	1638.0	1646.0	26.0	52.0			QL=4 ST=2 TYP=2	
	2695	PALE	20 GRF	1639.0	1646.0	17.0	58.0			QL=4 ST=2 TYP=2	
610	SVTO	48 C	1643.0	1644.0	7.0	180.0			QL=4 ST=2 TYP=8		
1415	PALE	48 C	1643.0	1648.0	13.0	78.0			QL=4 ST=2 TYP=8		
2695	SVTO	4 S/F	1643.0	1644.0	10.0	24.0			QL=4 ST=2 TYP=3		
610	PALE	4 S/F	1644.0	1644.0	5.0	170.0			QL=4 ST=2 TYP=3		
1415	SVTO	4 S/F	1644.0	1648.0	9.0	40.0			QL=4 ST=2 TYP=3		
610	SGMR	48 C	1645.0	1646.0	8.0	200.0			QL=2 ST=2 TYP=8		
2800	PENT	41 F	2156.0	2202.0	9.0	9.0					
245	SGMR	8 S	2242.0	2242.0		65.0			QL=4 ST=2 TYP=3		
28	204	IZMI	43 NS	0600.0		360.0D		10.0			
	127	TORN	44 NS	0620.0E		380.0D		1.0		V=1	
	410	SVTO	43 NS	0623.0	0625.0	47.0	97.0			QL=2 ST=2 TYP=1	
	245	SVTO	43 NS	0623.0	0640.0	55.0	100.0			QL=2 ST=2 TYP=1	
	235	CUBA	44 NS	1300.0E		530.0D		9.0			
	280	CUBA	44 NS	1300.0E		530.0D		15.0			
	200	HIRA	8 S	0052.0	0052.3	0.6	90.0			WR	
	610	SVTO	4 S/F	0623.0	0625.0	17.0	50.0			QL=4 ST=2 TYP=3	
	245	SGMR	4 S/F	1154.0	1154.0	3.0	48.0			QL=4 ST=2 TYP=3	
	245	SGMR	4 S/F	1915.0	1917.0	8.0	73.0			QL=4 ST=2 TYP=3	
	410	SGMR	8 S	1951.0	1952.0	2.0	73.0			QL=4 ST=2 TYP=3	
	245	SGMR	8 S	1958.0	1959.0	2.0	60.0			QL=4 ST=2 TYP=3	
	245	SGMR	8 S	2002.0	2002.0	2.0	58.0			QL=4 ST=2 TYP=3	
	29	204	IZMI	44 NS	0600.0E		360.0D		5.0		
		235	CUBA	44 NS	1300.0E		530.0D		9.0		
280		CUBA	44 NS	1300.0E		530.0D		17.0			
2840		BEIJ	45 C	0256.0	0311.5	68.0	135.0		83.9		
2695		LEAR	4 S/F	0307.0	0311.0	13.0	120.0			QL=2 ST=2 TYP=3	
4995		PALE	4 S/F	0307.0	0310.0	14.0	280.0			QL=4 ST=2 TYP=3	
2800		HIRA	45 C	0307.0	0311.5	16.0	210.0			0	
8800		PALE	4 S/F	0308.0	0310.0	8.0	200.0			QL=4 ST=2 TYP=3	
15400		PALE	4 S/F	0308.0	0310.0	5.0	160.0			QL=4 ST=2 TYP=3	
4995		LEAR	4 S/F	0308.0	0310.0	11.0	260.0			QL=2 ST=2 TYP=3	
8800		LEAR	4 S/F	0308.0	0310.0	14.0	300.0			QL=2 ST=2 TYP=3	
2695		PALE	4 S/F	0308.0	0311.0	12.0	110.0			QL=4 ST=2 TYP=3	
410		PALE	8 S	0309.0	0309.0		44.0			QL=4 ST=2 TYP=3	
1415		PALE	8 S	0309.0	0311.0	2.0	24.0			QL=4 ST=2 TYP=3	
500		HIRA	8 S	0310.2	0310.3	0.2	30.0			0	
1415		LEAR	8 S	0311.0	0311.0		21.0			QL=2 ST=2 TYP=3	
245		PALE	8 S	0313.0	0315.0	2.0	140.0			QL=4 ST=2 TYP=3	
200		HIRA	42 SER	0320.4	0320.5	1.0	90.0			WR	
245	SVTO	8 S	0718.0	0718.0	1.0	390.0			QL=2 ST=2 TYP=3		
245	SVTO	49 GB	0728.0	0729.0	1.0	660.0			QL=4 ST=2 TYP=6		
2840	BEIJ	1 S	0746.0	0749.0	7.0	6.0		3.7			
4995	SVTO	8 S	0919.0	0919.0	1.0	110.0			QL=4 ST=2 TYP=3		

S O L A R R A D I O E M I S S I O N  
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MAY 1999

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 <sup>-22</sup> W/m <sup>2</sup> Hz)	Mean		
29	245	SGMR	8 S	1314.0	1315.0	1.0	230.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1314.0	1314.0	1.0	290.0			QL=4 ST=2 TYP=3
	245	SGMR	4 S/F	1624.0	1627.0	4.0	87.0			QL=4 ST=2 TYP=3
	245	SVTO	4 S/F	1625.0	1627.0	3.0	61.0			QL=2 ST=2 TYP=3
	245	PALE	8 S	1719.0	1719.0	U	63.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1719.0	1719.0	U	52.0			QL=4 ST=2 TYP=3
	8800	PALE	8 S	2007.0	2008.0	2.0	43.0			QL=4 ST=2 TYP=3
	2695	PALE	8 S	2007.0	2008.0	1.0	33.0			QL=4 ST=2 TYP=3
	4995	PALE	8 S	2007.0	2008.0	2.0	55.0			QL=4 ST=2 TYP=3
	8800	SGMR	8 S	2007.0	2008.0	2.0	46.0			QL=4 ST=2 TYP=3
	2695	SGMR	8 S	2007.0	2008.0	1.0	35.0			QL=4 ST=2 TYP=3
	4995	SGMR	8 S	2007.0	2008.0	1.0	52.0			QL=4 ST=2 TYP=3
	6700	CUBA	2 S/F	2007.0	2008.2	4.5	45.0	22.0		7L
	245	PALE	49 GB	2316.0	2317.0	3.0	860.0			QL=4 ST=2 TYP=6
245	SGMR	49 GB	2317.0	2317.0	U	610.0			QL=2 ST=2 TYP=6	
30	204	IZMI	44 NS	0600.0E		360.0D		10.0		
	127	TORN	43 NS	0830.0		250.0				V=1
	280	CUBA	44 NS	1300.0E		530.0D		22.0		
	235	CUBA	44 NS	1300.0E		530.0D		12.0		
	245	SGMR	43 NS	1605.0	1618.0	34.0	100.0			QL=4 ST=2 TYP=1
	245	SVTO	43 NS	1610.0	1614.0	29.0	89.0			QL=4 ST=3 TYP=1
	245	SVTO	43 NS	1610.0	1614.0	470.0	89.0			QL=4 ST=3 TYP=1
	245	PALE	43 NS	1809.0	1815.0	113.0	130.0			QL=4 ST=3 TYP=1
	245	SGMR	43 NS	2117.0	2117.0	94.0	85.0			QL=4 ST=2 TYP=1
	204	IZMI	42 SER	0648.7	0649.0	0.5	700.0			
	200	HIRA	8 S	0648.7	0648.8	0.2	330.0			0
	204	IZMI	42 SER	0812.6	0816.5	4.6	431.0			
	200	HIRA	42 SER	0812.7	0816.5	4.2	140.0			0
	3000	IZMI	5 S	0944.8	0944.9	0.2	17.0	8.0		
	245	SGMR	8 S	1023.0	1023.0	2.0	51.0			QL=4 ST=2 TYP=3
	245	SGMR	4 S/F	1034.0	1035.0	3.0	73.0			QL=4 ST=2 TYP=3
	204	IZMI	25 R	1034.4		85.6D		20.0		
	245	SGMR	4 S/F	1037.0	1039.0	5.0	130.0			QL=4 ST=2 TYP=3
	245	SVTO	4 S/F	1039.0	1039.0U	3.0	130.0			QL=2 ST=2 TYP=3
	127	TORN	7 C	1137.4	1137.9	1.8	250.0		40.0	
	245	SGMR	8 S	1337.0	1337.0	1.0	57.0			QL=4 ST=2 TYP=3
	245	SVTO	8 S	1337.0	1337.0	1.0	54.0			QL=2 ST=2 TYP=3
	245	SVTO	8 S	1605.0	1607.0	2.0	150.0			QL=2 ST=2 TYP=3
	245	PALE	8 S	1637.0	1639.0	2.0	54.0			QL=4 ST=2 TYP=3
	6700	CUBA	20 GRF	1722.0	1901.0	204.0	13.0	6.0		15L
	245	SGMR	4 S/F	1735.0	1738.0	4.0	55.0			QL=4 ST=2 TYP=3
	245	SGMR	48 C	1806.0	1814.0	24.0	110.0			QL=4 ST=2 TYP=8
	2800	PENT	20 GRF	1811.0	1820.0	22.0	8.0			
	410	SGMR	4 S/F	1853.0	1854.0	8.0	53.0			QL=4 ST=2 TYP=3
	245	SGMR	8 S	1907.0	1907.0	1.0	62.0			QL=4 ST=2 TYP=3
	245	SGMR	49 GB	1948.0	1950.0	4.0	640.0			QL=4 ST=2 TYP=6
	245	PALE	49 GB	1950.0	1950.0	U	730.0			QL=4 ST=2 TYP=6
	245	SGMR	8 S	2001.0	2002.0	1.0	420.0			QL=4 ST=2 TYP=6
245	SGMR	8 S	2252.0	2252.0	U	53.0			QL=4 ST=2 TYP=3	
2800	PENT	40 F	2330.0	2352.0	43.0	23.0				
410	PALE	4 S/F	2351.0	2351.0	3.0	87.0			QL=4 ST=2 TYP=3	
245	PALE	4 S/F	2351.0	2351.0	3.0	94.0			QL=4 ST=2 TYP=3	
610	PALE	4 S/F	2351.0	2352.0	3.0	170.0			QL=4 ST=2 TYP=3	
500	HIRA	46 C	2351.0	2351.5	6.0	130.0			ML	
1415	PALE	4 S/F	2353.0	2354.0	3.0	42.0			QL=4 ST=2 TYP=3	
31	204	IZMI	44 NS	0600.0E		360.0D		40.0		
	127	TORN	44 NS	0620.0E		520.0D		5.0		V=2
	245	SVTO	43 NS	0716.0	1157.0	523.0	820.0			QL=4 ST=2 TYP=1
	410	SVTO	43 NS	0957.0	1001.0	63.0	200.0			QL=4 ST=3 TYP=1
	245	SGMR	43 NS	1011.0	1038.0	106.0	820.0			QL=4 ST=3 TYP=1
	245	SGMR	43 NS	1220.0	1238.0	175.0	210.0			QL=4 ST=3 TYP=1
	410	SVTO	43 NS	1235.0	1243.0	112.0	75.0			QL=4 ST=3 TYP=1
	410	SVTO	43 NS	1235.0	1243.0	685.0	350.0			QL=4 ST=3 TYP=1
	410	SVTO	43 NS	1235.0	1243.0	685.0	75.0			QL=4 ST=3 TYP=1
	410	SGMR	43 NS	1243.0	1245.0	7.0	75.0			QL=4 ST=3 TYP=1
	235	CUBA	44 NS	1300.0E		530.0D		14.0		
	280	CUBA	44 NS	1300.0E		530.0D		24.0		

S O L A R R A D I O E M I S S I O N  
Outstanding Occurrences

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Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks	
							Peak (10 -22 W/m <sup>2</sup> Hz)	Mean			
31	410	SGMR	43 NS	1336.0	1336.0	44.0	120.0			QL=4 ST=3 TYP=1	
	245	SGMR	43 NS	1650.0	1711.0	41.0	80.0			QL=4 ST=3 TYP=1	
	245	SVTO	43 NS	1705.0	1713.0	33.0	370.0			QL=2 ST=2 TYP=1	
	245	SVTO	4 S/F	0602.0	0603.0	3.0	200.0			QL=2 ST=2 TYP=3	
	245	SVTO	8 S	0611.0	0611.0	1.0	130.0			QL=2 ST=2 TYP=3	
	33	UPIC	2 S/F	0700.0	0700.5	2.0					
	2840	BEIJ	5 S	0932.0	0936.5	9.0	45.9	29.3			
	127	TORN	48 C	0934.0	0936.8	5.5	390.0	50.0			
	33	UPIC	48 C	0935.0	0936.5	10.0					
	204	IZMI	45 C	0935.4	0936.7	2.7	6000.0				
	3000	IZMI	7 C	0935.6	0936.6	2.0	69.0				
	245	SGMR	8 S	0956.0	0957.0	2.0	250.0				QL=4 ST=2 TYP=3
	245	SGMR	8 S	0959.0	0959.0	U	64.0				QL=4 ST=2 TYP=3
	245	SGMR	8 S	1001.0	1002.0	2.0	170.0				QL=4 ST=2 TYP=3
	245	SGMR	4 S/F	1004.0	1005.0	5.0	99.0				QL=4 ST=2 TYP=3
	410	SGMR	4 S/F	1004.0	1005.0	5.0	55.0				QL=4 ST=2 TYP=3
	245	SGMR	8 S	1217.0	1217.0	1.0	110.0				QL=4 ST=3 TYP=3
	245	SVTO	8 S	1217.0	1217.0	1.0	85.0				QL=2 ST=2 TYP=3
	245	SVTO	8 S	1229.0	1230.0	1.0	350.0				QL=4 ST=2 TYP=3
	245	SGMR	8 S	1230.0	1230.0	1.0	340.0				QL=4 ST=2 TYP=3
	127	TORN	45 C	1247.0	1250.5	7.0	500.0	120.0			
	410	SGMR	8 S	1311.0	1311.0	1.0	59.0				QL=4 ST=3 TYP=3
	245	SVTO	4 S/F	1350.0	1352.0	3.0	160.0				QL=2 ST=2 TYP=3
	245	SGMR	8 S	1351.0	1352.0	2.0	160.0				QL=4 ST=3 TYP=3
	410	SVTO	48 C	1400.0	1406.0	8.0	95.0				QL=4 ST=2 TYP=8
	245	SVTO	49 GB	1401.0	1402.0	4.0	700.0				QL=2 ST=2 TYP=6
	410	SGMR	8 S	1402.0	1403.0	2.0	80.0				QL=4 ST=3 TYP=3
	245	SGMR	8 S	1402.0	1402.0	2.0	160.0				QL=4 ST=3 TYP=3
	610	SGMR	8 S	1403.0	1403.0	1.0	15.0				QL=4 ST=3 TYP=3
	410	SGMR	8 S	1511.0	1511.0	2.0	63.0				QL=4 ST=3 TYP=3
	410	SVTO	8 S	1511.0	1511.0	2.0	60.0				QL=4 ST=2 TYP=3
245	SGMR	4 S/F	1556.0	1558.0	3.0	89.0				QL=4 ST=3 TYP=3	
410	SGMR	8 S	1557.0	1558.0	1.0	40.0				QL=4 ST=3 TYP=3	
245	SGMR	4 S/F	1907.0	1910.0	8.0	140.0				QL=4 ST=2 TYP=3	
245	PALE	8 S	1956.0	1956.0	U	81.0				QL=4 ST=2 TYP=3	
245	SGMR	8 S	1956.0	1956.0	1.0	67.0				QL=4 ST=2 TYP=3	
245	PALE	8 S	2019.0	2019.0	1.0	55.0				QL=4 ST=3 TYP=3	
245	SGMR	8 S	2019.0	2019.0	2.0	60.0				QL=4 ST=2 TYP=3	
245	PALE	8 S	2126.0	2126.0	U	69.0				QL=4 ST=2 TYP=3	
2800	PENT	1 S	2204.0	2215.0	28.0	11.0					
245	SGMR	4 S/F	2310.0	2315.0	5.0	80.0				QL=4 ST=2 TYP=3	
2840	BEIJ	5 S	2330.0	2352.5	30.0	28.5	18.2				

Reports are received routinely from the following observatories:

BERN = Berne	HUMN = Humain	ONDR = Ondrejov	SVTO = San Vito
CRIM = Crimea	IZMI = IZMIRAN	PEKG = Peking	TORN = Torun
CUBA = Havana	KISV = Kislovodsk	PALE = Palehua	TRST = Trieste
GORK = Gorky	KRAK = Krakow	PENT = Penticton	TYKW = Toyokawa
HIRA = Hiraiso	LEAR = Learmonth	POTS = Potsdam	UPIC = Upice
HUAN = Huancayo	NOBE = Nobeyama	SGMR = Sagamore Hill	

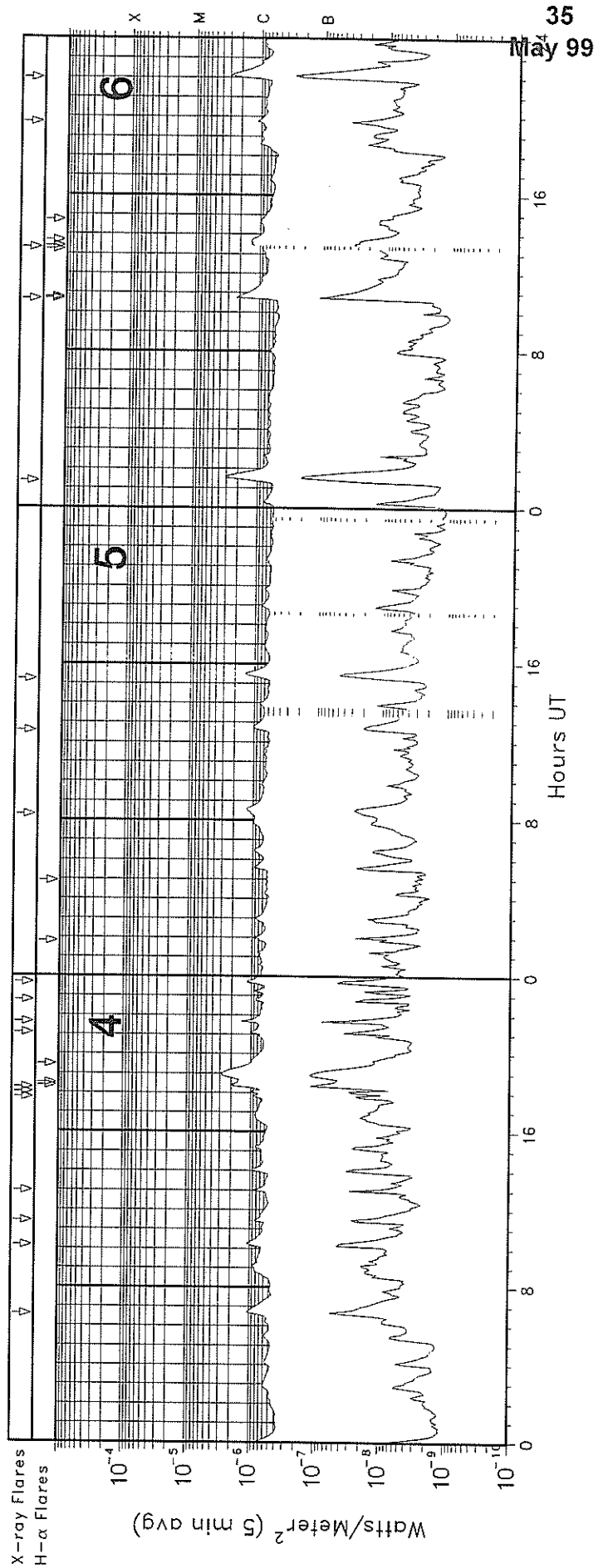
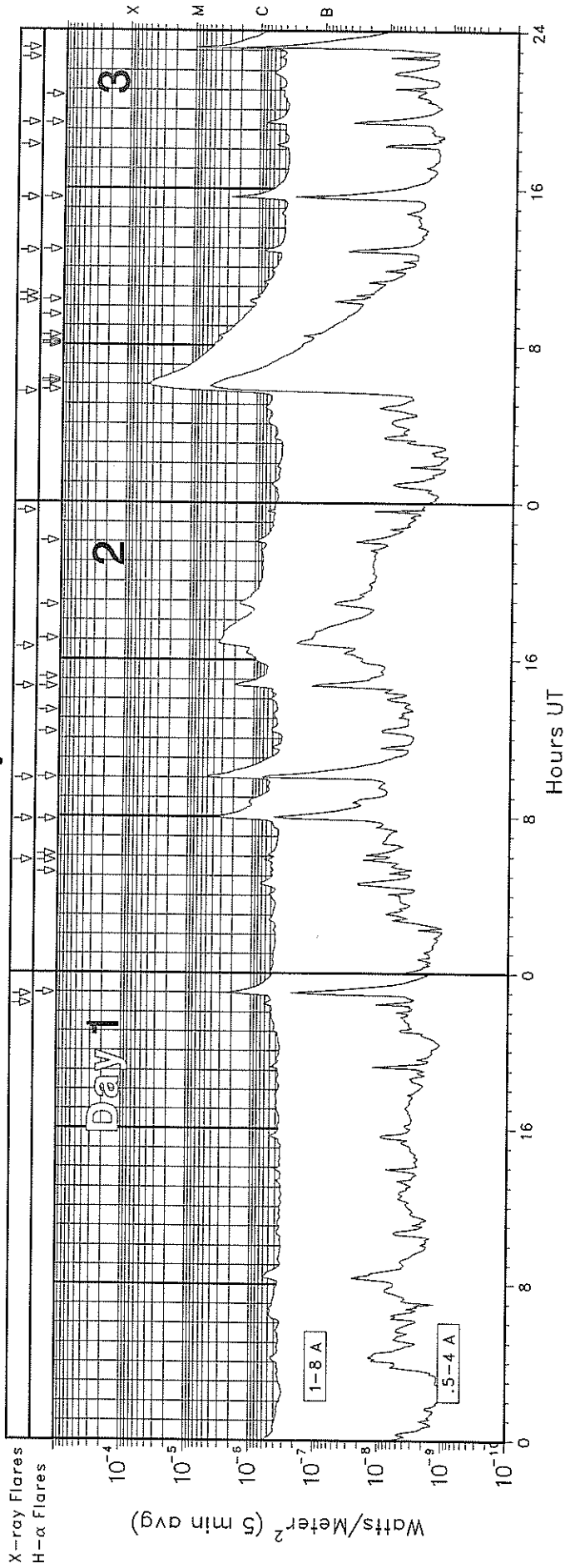
Explanation of Type Code:

1 Simple 1	7 Minor +	24 Rise	30 Post Burst Increase A	43 Onset of Noise Storm
2 Simple 1F	8 Spike	25 Rise A	31 Post Burst Decrease	44 Noise Storm in Progress
3 Simple 2	20 Simple 3	26 Fall	33 Absorption	45 Complex
4 Simple 2F	21 Simple 3A	27 Rise and Fall	40 Fluctuation	46 Complex F
5 Simple	22 Simple 3F	28 Precursor	41 Group of Bursts	47 Great Burst
6 Minor	23 Simple 3AF	29 Post Burst Increase	42 Series of Bursts	48 Major
1A Simple 1A	4A Simple 2AF	24PF Post Rise F	27F Rise and Fall F	
3A Simple 2A	40 Rise Only	16A Fall A	27AF Rise and Fall AF	
21A Simple 3A GRF	40F Rise Only F	260 Fall Only	31A Post Burst Decrease A	
2A Simple 1AF	4P Post Rise	26F Fall F	32A Absorption A	

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

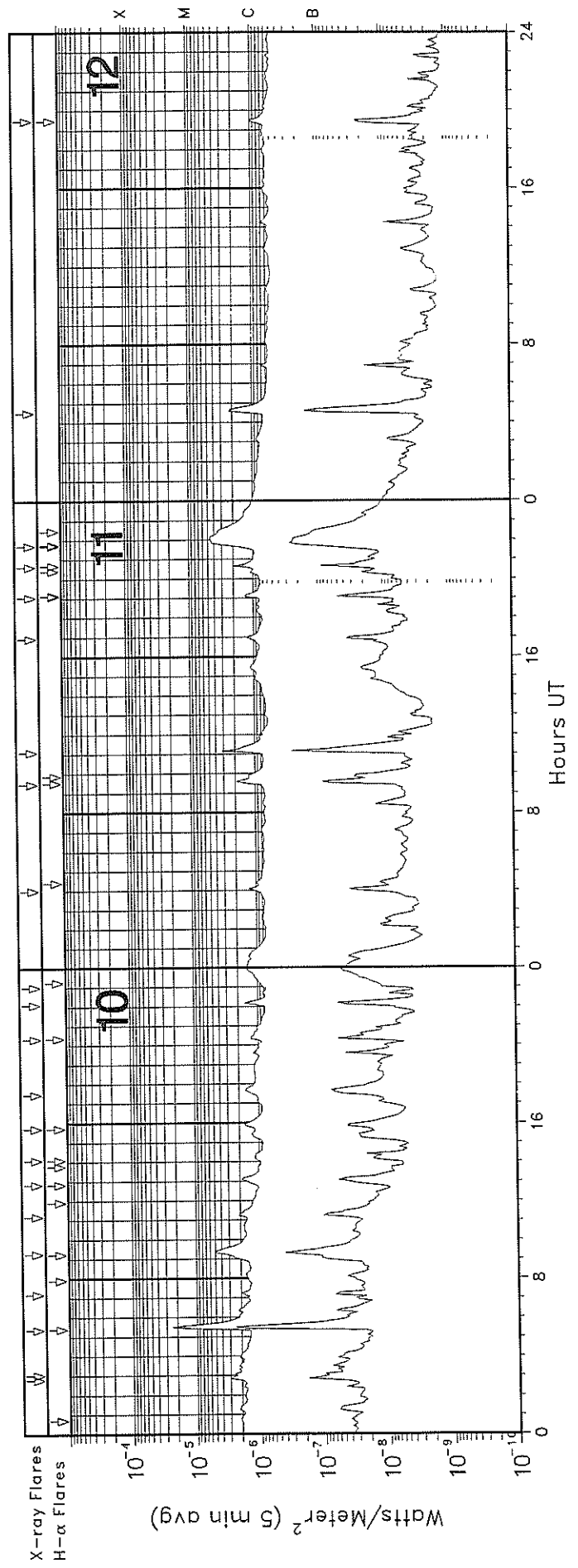
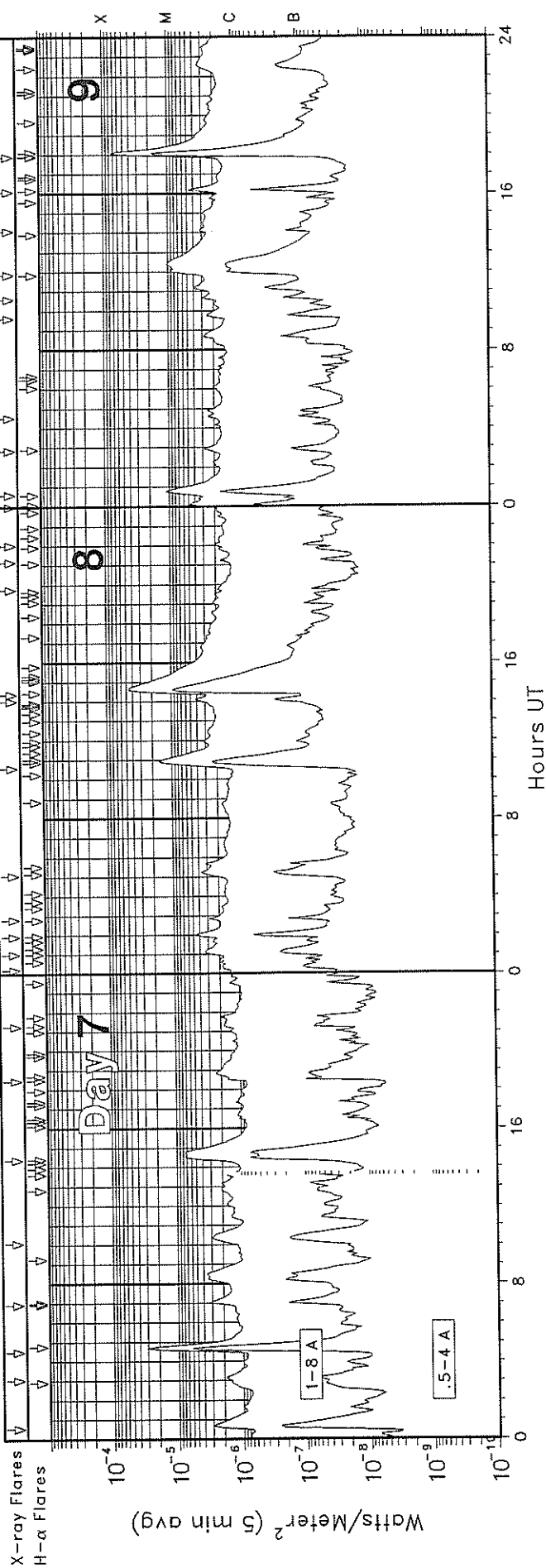
# GOES X-RAY DETECTOR

## May 1999



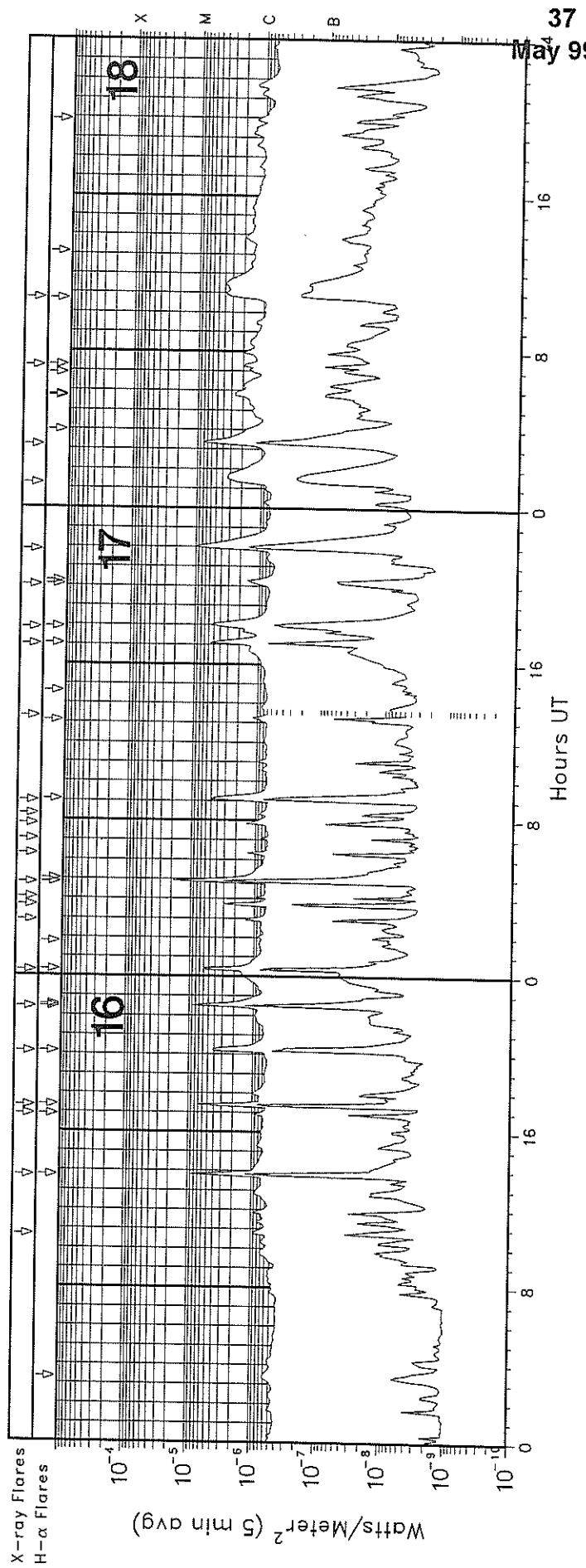
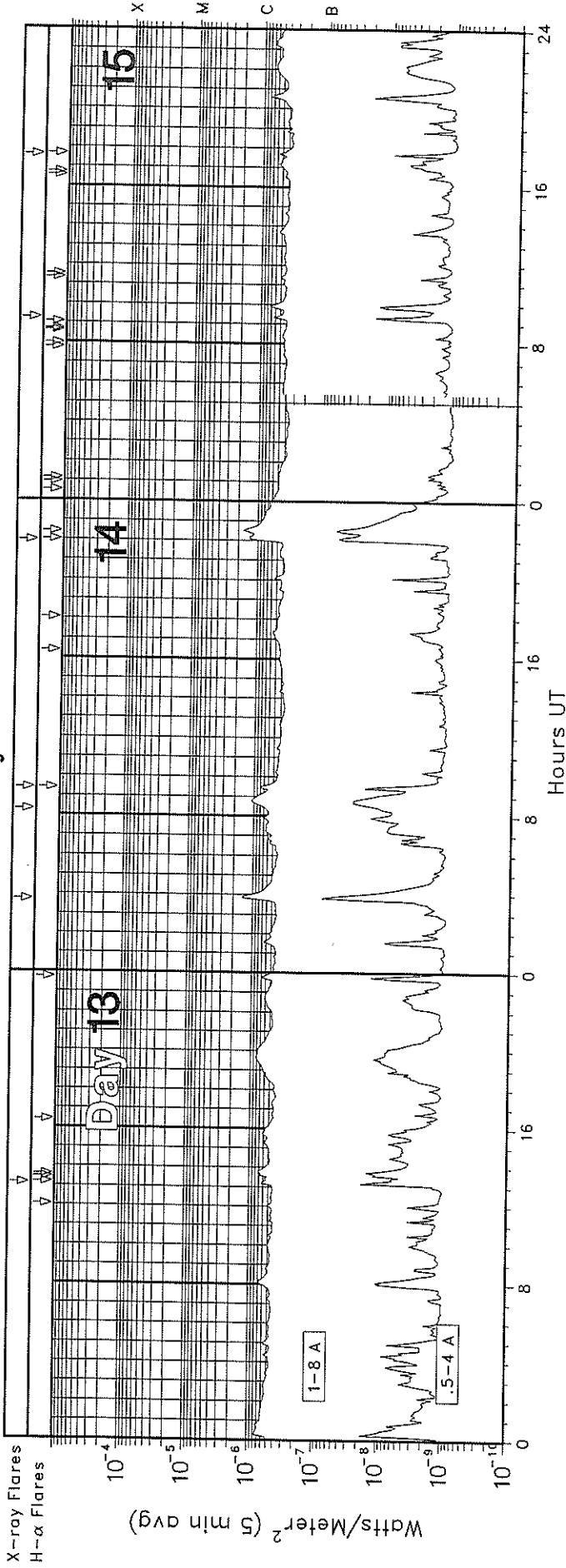
# GOES X-RAY DETECTOR

May 1999



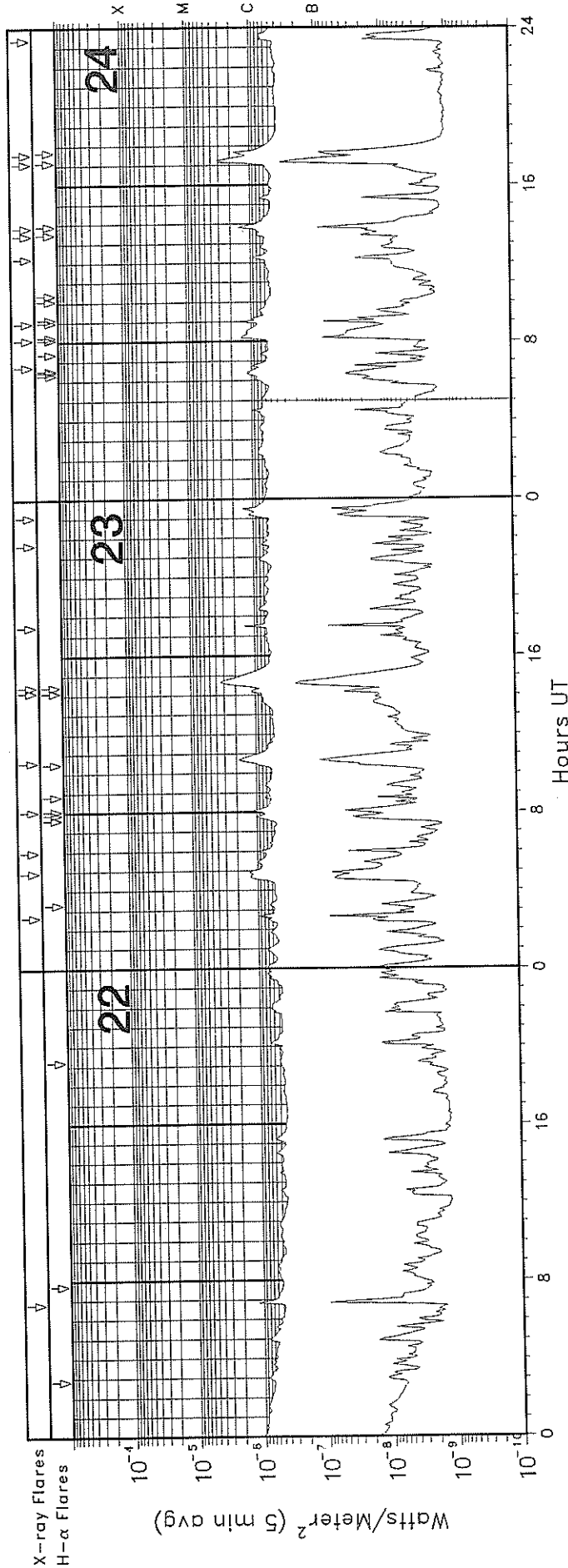
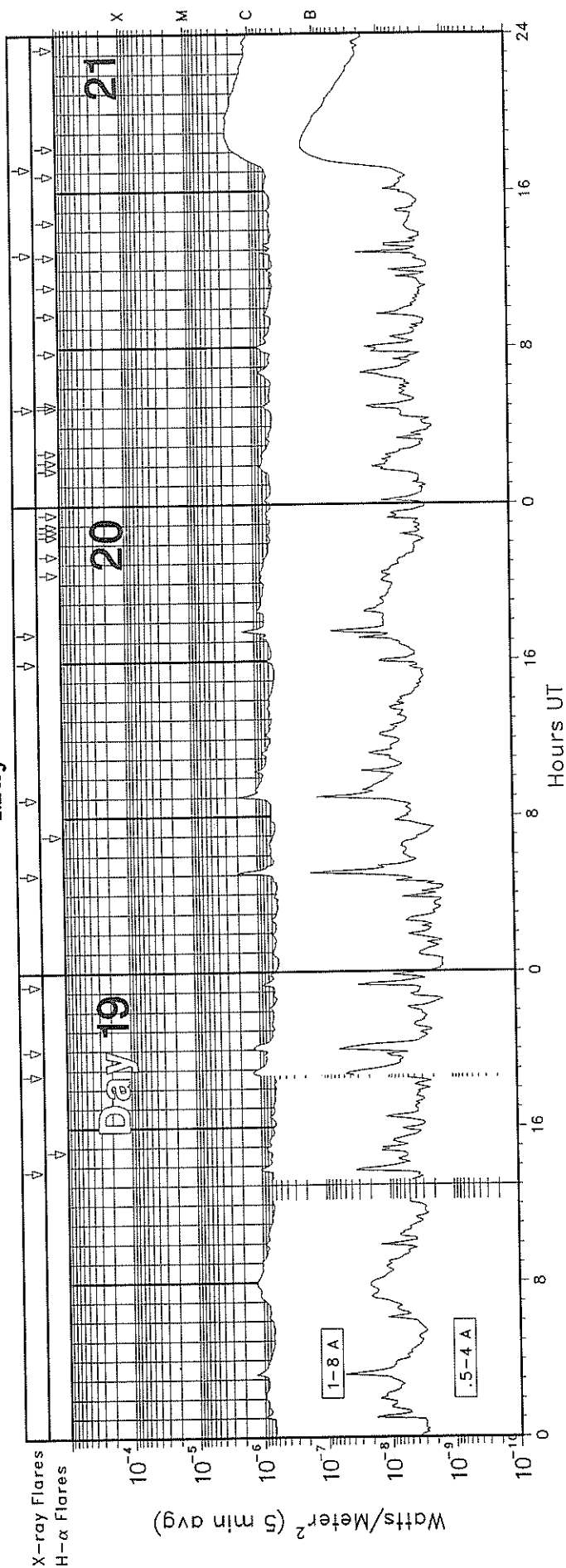
# GOES X-RAY DETECTOR

May 1999



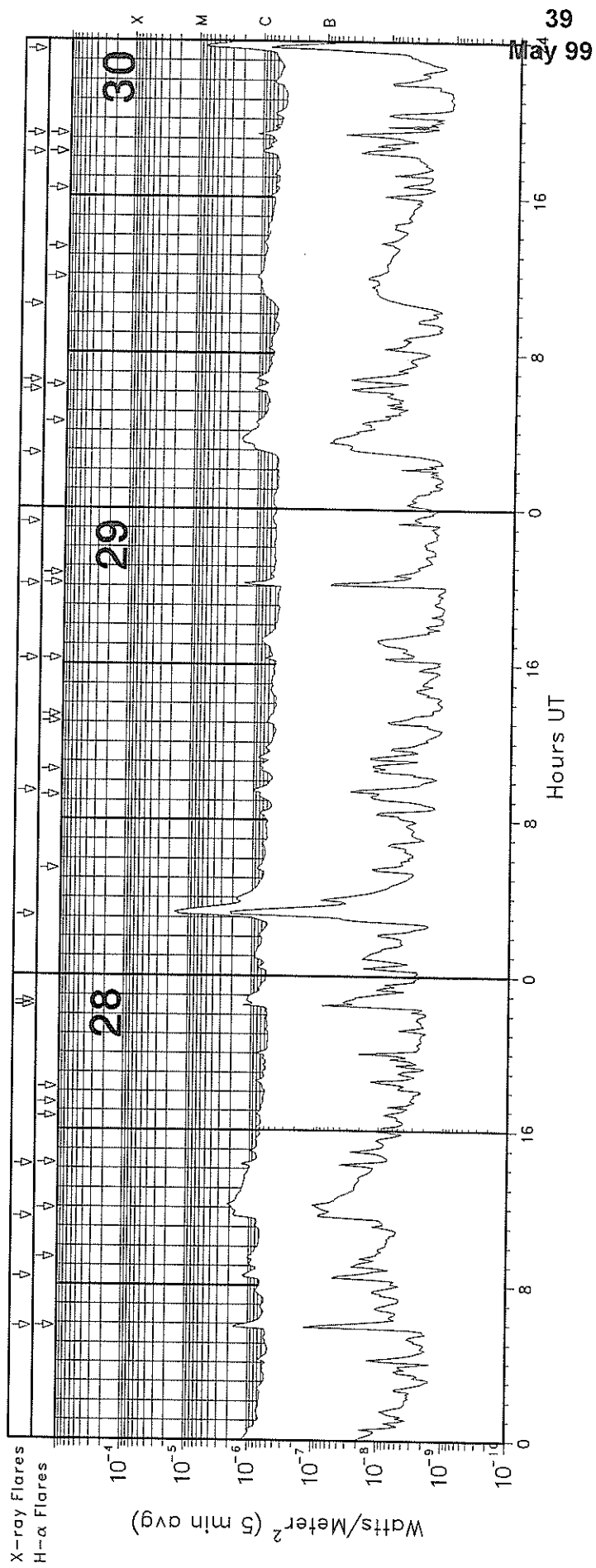
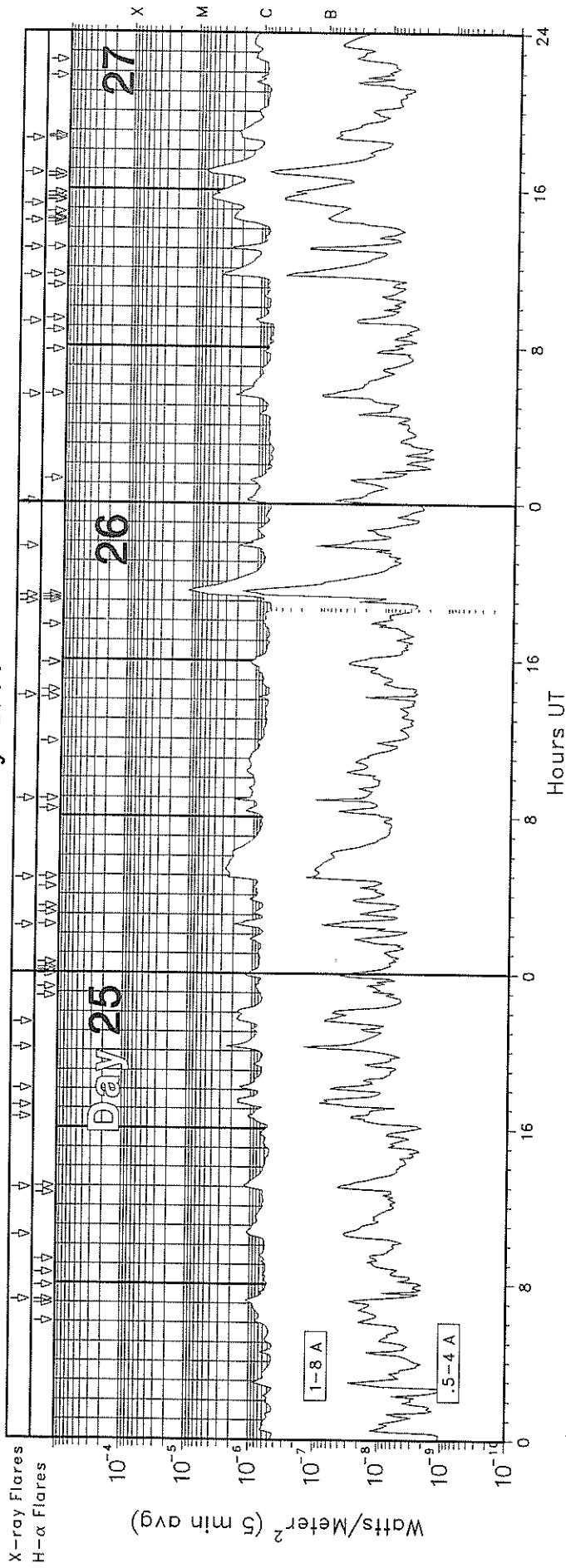
# GOES X-RAY DETECTOR

May 1999



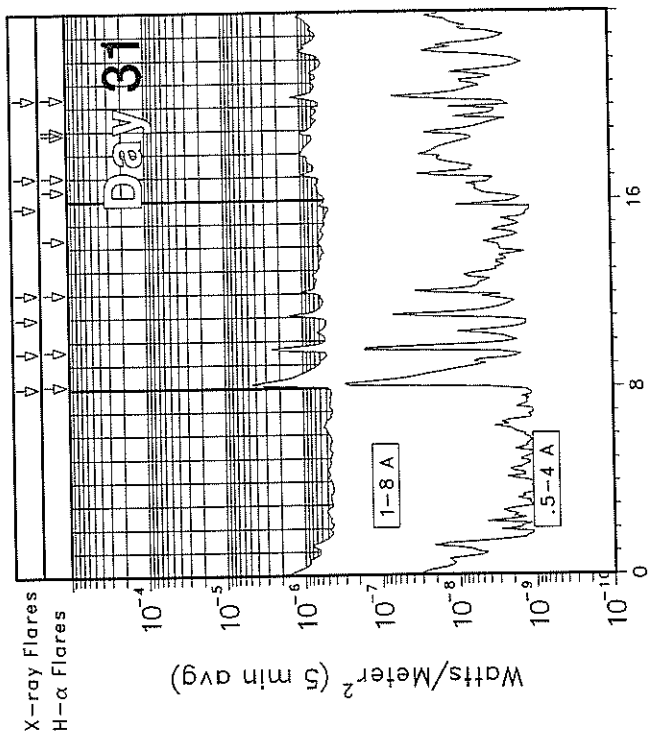
# GOES X-RAY DETECTOR

May 1999





# GOES X-RAY DETECTOR May 1999



GOES SOLAR X-RAY FLARES  
 \*\*Preliminary Listing\*\*

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May 1999

Day (UT)	Start (UT)	Max (UT)	End (UT)	Lat	CMD	Opt	Imp Xray	NOAA/ USAF Region	Flux
01	2225	2228	2230				B7.3		1.9E-04
01	2254	2300	2306	N22	W40	SF	C3.0	8524	1.3E-03
02	0547	0551	0553				B7.4		2.3E-04
02	0752	0800	0810	N21	W43	SF	C4.1	8524	2.9E-03
02	0958	1003	1009				C7.5		2.9E-03
02	1436	1446	1456	N16	E42	1F	C2.0		1.9E-03
02	1637	1652	1716	N24	E52	SF	C2.2	8527	6.7E-03
02	2333	2336	2338				B7.8		2.0E-04
03	0536	0602	0632	N15	E32	2N	M4.4		9.9E-02
03	1016	1019	1021	N21	W58	SF	C2.0	8524	4.5E-04
03	1036	1039	1041				C1.2		3.1E-04
03	1250	1254	1257	N24	W60	SF	C1.1	8524	3.5E-04
03	1530	1538	1541	N22	W60	SF	C2.7	8524	1.2E-03
03	1811	1814	1817				B7.2		2.0E-04
03	1918	1923	1927	N22	W62	SF	C1.0	8524	4.0E-04
03	2238	2241	2243				B5.9		1.5E-04
03	2307	2311	2313				M1.9		2.8E-03
04	0636	0643	0655				C1.1		1.1E-03
04	1009	1015	1027				C1.1		1.1E-03
04	1125	1128	1133				B9.3		4.0E-04
04	1258	1302	1306				C1.0		4.1E-04
04	1746	1750	1754				C1.0		4.3E-04
04	1801	1805	1808				C1.1		4.3E-04
04	1816	1858	1916				C2.8		7.4E-03
04	2104	2109	2111				C1.3		4.3E-04
04	2138	2143	2145				C1.7		5.4E-04
04	2246	2249	2251				C1.2		2.9E-04
04	2341	2344	2346				C1.7		3.9E-04
05	0818	0831	0844				C1.2		1.8E-03
05	1234	1245	1304				C1.0		1.6E-03
05	1512	1530	1540				C1.4		1.8E-03
06	0121	0135	0146				C3.3		3.5E-03
06	1040	1048	1103	S18	E71	SF	C2.4	8534	2.4E-03
06	1319	1330	1351	N20	W12	SF	C1.3	8525	2.1E-03
06	1942	1946	1951				C1.1		5.8E-04
06	2157	2207	2220				C3.1		3.2E-03
07	0032	0042	0059				C3.1		3.7E-03
07	0302	0311	0316				C1.8		1.4E-03
07	0428	0441	0449	N20	E87	SF	M3.2		2.2E-02
07	0655	0703	0715	N15	E59	SF	C3.2	8526	3.2E-03
07	1004	1022	1040				C2.9		5.1E-03
07	1423	1432	1459	N20	W21	1F	C7.4	8525	1.4E-02
07	1828	1834	1836	N12	W30	SF	C2.3	8525	7.3E-04
07	2116	2119	2122	N16	E50	SF	C2.1		6.6E-04
08	0013	0017	0019				C2.0		6.1E-04
08	0100	0112	0123	N20	W62	SF	C3.3	8537	4.2E-03
08	0155	0203	0211	N19	W62	SF	C4.6	8537	4.0E-03
08	0248	0251	0254				C3.1		9.9E-04
08	0505	0515	0518	N17	W67	SF	C3.2	8537	2.4E-03
08	1036	1058	1114	N18	E64	SF	M1.6		2.3E-02
08	1401	1408	1414	N19	E71	SF	C4.2	8541	3.0E-03
08	1422	1440	1501	N23	W75	1F	M4.6	8526	7.4E-02
08	1945	1948	1951	N19	W75	1F	C2.1	8537	6.8E-04
08	2111	2115	2118	N19	W77	SF	C2.0		6.9E-04
08	2201	2204	2206	N20	W77	SF	C2.8		6.8E-04
08	2359	0007	0021	N21	E69	SF	C5.0		5.2E-03
09	0036	0047	0058	N21	E69	1F	M1.1	8541	1.2E-02
09	0251	0257	0303	N21	E67	SF	C2.8	8541	1.9E-03

Day (UT)	Start (UT)	Max (UT)	End (UT)	Lat	CMD	Opt	Imp Xray	NOAA/ USAF Region	Flux
09	0432	0436	0441				C2.5		1.3E-03
09	0938	0949	0955				C3.0		2.3E-03
09	1037	1041	1049				C3.2		2.0E-03
09	1152	1227	1248				M1.0		2.8E-02
09	1405	1408	1412				C3.7		1.4E-03
09	1606	1612	1619	N20	W89	SF	C5.1	8537	2.9E-03
09	1753	1807	1815				M7.6	8537	6.1E-02
10	0248	0251	0258				C3.3		1.7E-03
10	0302	0305	0307				C3.2		8.5E-04
10	0522	0531	0537	N16	E19	2N	M2.5	8539	1.4E-02
10	0711	0714	0718				C2.1		8.3E-04
10	0916	0923	0931				C5.3		4.1E-03
10	1112	1119	1124				C2.3		1.5E-03
10	1250	1308	1314	N20	E46	SF	C1.9	8541	2.2E-03
10	1406	1410	1429	N20	E46	SF	C1.1	8541	1.6E-03
10	1544	1557	1601	N21	E47	SF	C1.7	8541	1.5E-03
10	1728	1742	1751				C1.6		2.0E-03
10	2019	2022	2031	S24	E33	SF	C1.3	8540	9.0E-04
10	2205	2211	2218				C1.6		1.1E-03
10	2301	2355	0053	N22	E44	SF	C1.4	8541	8.0E-03
11	0400	0405	0409				C1.3		6.3E-04
11	0929	0935	0944	N21	E37	SF	C2.0	8541	1.5E-03
11	1106	1110	1114				C3.9		1.2E-03
11	1656	1700	1706				C1.3		7.3E-04
11	1904	1908	1915	N20	E02	SF	C1.5	8541	8.6E-04
11	2038	2041	2045	N22	E31	1F	C2.1	8541	7.6E-04
11	2143	2208	2233	S19	E79	SF	C4.7		1.2E-02
12	0430	0437	0449				C2.2		2.2E-03
12	1928	1930	1933	S16	W18	SF	C1.0	8534	3.0E-04
13	1309	1313	1316	S16	W28	SF	B8.2	8534	2.7E-04
14	0344	0354	0402				C1.5		1.3E-03
14	0819	0847	0908				C1.0		2.6E-03
14	0925	0929	0932	S18	W36	SF	B9.3	8534	3.5E-04
14	2158	2231	2246				C1.6	8540	3.6E-03
15	0916	0921	0926	S19	E56	SF	B6.8	8544	3.5E-04
15	1738	1741	1745	S25	W61	SF	B6.1	8536	2.3E-04
16	1042	1054	1100				B9.3		9.0E-04
16	1345	1350	1353	S17	W75	1N	M1.2	8534	3.1E-03
16	1654	1657	1700	S17	W76	SF	C1.0	8534	3.4E-04
16	1720	1725	1728	S17	W76	SF	M1.1	8534	2.7E-03
16	2007	2013	2023	S16	W77	1F	C5.7	8534	3.4E-03
16	2225	2233	2237				M1.0	8541	4.1E-03
17	0018	0024	0028	S16	W79	SF	C9.7	8534	3.4E-03
17	0253	0258	0302				C1.6		7.0E-04
17	0339	0345	0349				C3.9		1.5E-03
17	0404	0407	0410				C1.2		3.4E-04
17	0449	0455	0500				M2.3		7.7E-03
17	0617	0620	0624				C1.4		5.2E-04
17	0702	0705	0708				B9.0		2.8E-04
17	0749	0753	0755				C2.0		4.9E-04
17	0819	0822	0824				C1.0		2.6E-04
17	0900	0907	0916	S16	W86	SF	C5.3	8534	3.5E-03
17	1318B	1319	1320				C1.6	8541	1.9E-04
17	1700	1707	1713	N20	W49	1F	C6.2	8541	3.2E-03
17	1751	1803	1810	S16	W91	SF	C5.6	8534	4.7E-03
17	2001	2016	2021	N22	W54	SF	C1.6	8541	1.4E-03
17	2150	2202	2212				M1.0		8.8E-03

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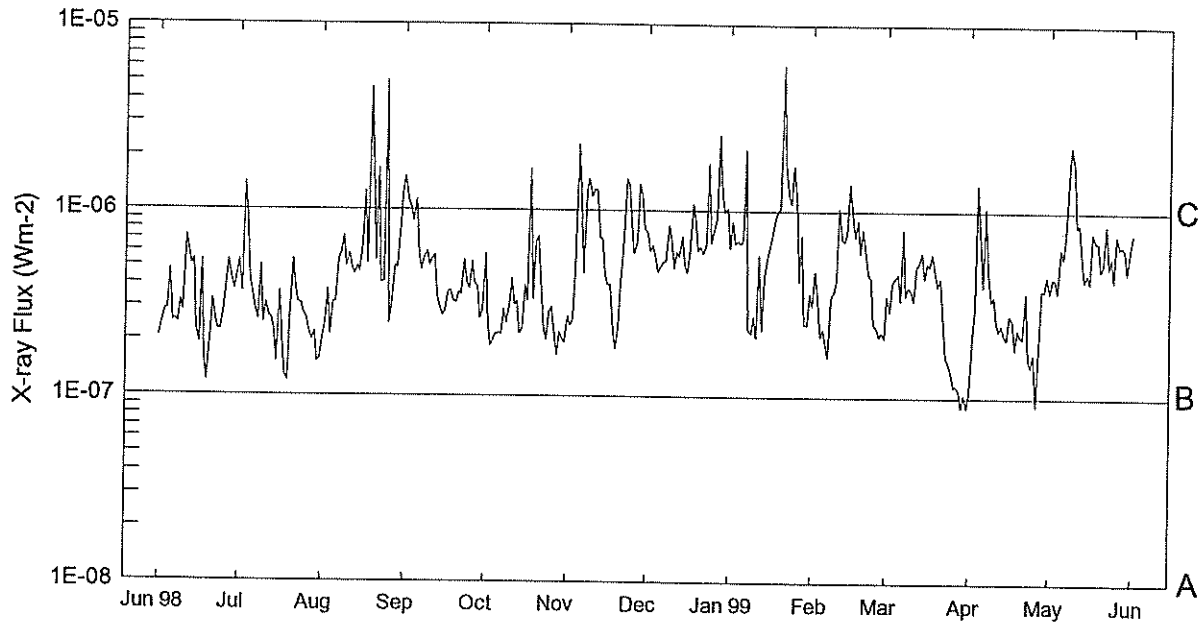
GOES SOLAR X-RAY FLARES  
\*\*Preliminary Listing\*\*

May 1999

Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	Opt	Imp Xray	NOAA/ USAF Region	Flux
18	0114	0134	0159				C3.3		7.3E-03
18	0311	0323	0331				C9.0		6.8E-03
18	0714	0718	0724	N19	W57	SF	C2.1	8545	1.1E-03
18	1043	1130	1151				C3.9		1.4E-02
19	1345	1349	1354				C1.1		5.5E-04
19	1841	1852	1907				C1.2		1.8E-03
19	1957	2003	2019				C1.2		1.5E-03
19	2319	2323	2327				C1.0		4.2E-04
20	0502	0508	0513				C2.3		1.1E-03
20	0856	0901	0906				C2.1		9.5E-04
20	1556	1559	1601				B8.1		2.0E-04
20	1725	1731	1737				C1.6		9.2E-04
21	0456	0500	0502				B8.7		2.6E-04
21	1249	1253	1255	N26	W75	SF	B7.9	8547	2.4E-04
21	1712	1949	2141				C2.4		3.0E-02
22	0647	0652	0656				C1.4		5.4E-04
23	0238	0243	0246				C1.0		4.3E-04
23	0456	0459	0501				C1.8		4.5E-04
23	0558	0602	0604				C1.2		3.4E-04
23	0804	0807	0809	N36	W27	SF	C1.3	8545	3.4E-04
23	1035	1043	1052	N30	E40	SF	C1.8	8551	1.7E-03
23	1409	1415	1417	S15	E29	SF	C1.3	8550	5.6E-04
23	1425	1440	1454	N30	E38	SF	C3.4	8551	4.4E-03
23	1728	1731	1733				C1.9		4.2E-04
23	2140	2143	2146				B9.3		2.8E-04
23	2304	2312	2325				C1.1		1.3E-03
24	0644	0648	0651	N31	E32	SF	C1.0	8551	4.0E-04
24	0806	0813	0838	N32	E29	SF	C1.6	8551	2.3E-03
24	0857	0901	0904	N21	E71	SF	C1.7	8552	5.4E-04
24	1214	1219	1223				C1.0		4.7E-04
24	1325	1328	1331	N33	E30	SF	C1.0	8551	3.0E-04
24	1349	1353	1357	S14	E15	SF	C1.8	8550	7.1E-04
24	1705	1714	1726	N20	E72	SF	C3.3	8552	3.0E-03
24	1735	1740	1743	S13	E16	SF	C2.1	8550	7.8E-04
24	2323	2339	2346				B7.4		9.1E-04
25	0708	0710	0751	N23	E67	SF	C1.1	8552	
25	1029	1039	1051				C1.1		
25	1255	1303	1320	N21	E58	SF	C1.2	8552	
25	1633	1635	1644	N37	W53	SF	C1.0	8545	
25	1709	1722	1739	S14	E00	SF	C1.6		2.4E-03
25	1801	1809	1820	S20	W54	SF	C1.4	8545	
25	2009	2016	2021	N38	W53	SF	C2.5		1.4E-03
25	2127	2137	2221				C1.6		

Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	Opt	Imp Xray	NOAA/ USAF Region	Flux
26	0225	0230	0235	N22	E41	SF	C2.3	8554	9.7E-04
26	0450	0522	0622	S14	W06	SF	C2.7	8550	1.3E-02
26	0853	0857	0859	N18	E46	SF	C2.7	8552	6.9E-04
26	1409	1412	1414	N19	E44	SF	B9.9	8552	2.6E-04
26	1857	1901	1906	S20	W93	SF	B9.7	8544	4.5E-04
26	1915	1932	1945	N17	E46	2N	M1.2		1.3E-02
26	2144	2153	2158				C2.1		1.3E-03
27	0004	0014	0028				C1.5		1.8E-03
27	0530	0534	0539	N24	E21	SF	C2.9	8554	1.1E-03
27	0913	0917	0920				C1.2		4.0E-04
27	1136	1143	1154	S30	E78	SF	C4.5		3.4E-03
27	1259	1304	1309	N18	E31	1F	C3.4	8552	1.6E-03
27	1423	1440	1505	S22	W76	SF	C2.7	8548	5.9E-03
27	1515	1535	1603				C6.2	8557	1.4E-02
27	1649	1659	1708	N38	W76	SF	C7.4	8545	7.6E-03
27	1833	1859	1913	N17	E29	SF	C2.3	8552	5.0E-03
28	0549	0553	0558	N12	E81	SF	C2.3		8.9E-04
28	0823	0831	0840				C1.2		1.1E-03
28	1130	1213	1242	S28	E63	SF	C2.1	8557	7.2E-03
28	1412	1416	1421	N39	W82	SF	C1.3	8545	6.7E-04
28	2226	2232	2236				C1.7		6.8E-04
28	2239	2244	2304				C1.2		1.6E-03
29	0304	0315	0327				M1.6		1.5E-02
29	0928	0934	0942				C1.1		7.9E-04
29	1615	1620	1623	N25	W06	SF	B7.9	8554	3.2E-04
29	2004	2009	2013	N24	W13	SF	C2.3	8554	7.5E-04
29	2315	2318	2320				B7.3		1.7E-04
30	0249	0338	0426				C1.8		7.2E-03
30	0605	0612	0623	N31	W43	SF	C1.1	8551	1.1E-03
30	0634	0643	0654				C1.1		1.2E-03
30	1025	1155	1320				C1.1		9.2E-03
30	1814	1824	1831				C1.0	8552	8.8E-04
30	1912	1916	1921	N15	E44	SF	C1.2	8558	5.7E-04
30	2331	2345	2354				C8.7		6.9E-03
31	0802	0810	0819	S24	E30	SF	C4.8	8560	3.2E-03
31	0933	0940	0945	N19	W26	SF	C2.8	8552	1.4E-03
31	1058	1107	1110				C1.7		7.9E-04
31	1201	1205	1210	S15	E31	SF	C1.1		5.0E-04
31	1544	1547	1551				B6.4		2.4E-04
31	1700	1706	1713	S14	E26	SF	C1.0	8562	6.9E-04
31	2021	2026	2030	S14	E24	SF	C1.3	8562	6.3E-04

# Preliminary GOES Satellite Daily X-Ray Background Jun 98 - May 99



Day	Jun 98	Jul	Aug	Sep	Oct	Nov	Dec	Jan 99	Feb	Mar	Apr	May
1	B2.0	B5.3	B1.9	C1.5	B5.8	B2.7	B7.5	B6.3	B3.0	B3.5	B1.1	B3.7
2	B2.4	B3.6	B2.4	C1.1	B2.4	B2.4	B6.0	B8.7	B4.7	B2.8	B1.9	B4.3
3	B2.8	C1.4	B3.7	C1.0	B1.8	B2.6	B6.5	B6.7	B3.5	B4.1	B2.9	B4.3
4	B2.8	B9.2	B2.1	B8.7	B2.0	B4.8	B5.4	B6.8	B2.1	B4.3	C1.3	B3.7
5	B4.7	B4.2	B3.1	C1.1	B2.1	C2.3	B4.7	B6.6	B2.3	B4.6	B6.8	B6.3
6	B2.4	B3.5	B3.1	B5.8	B2.1	C1.1	B5.0	B7.0	B1.9	B3.3	B3.9	B5.6
7	B2.5	B2.8	B5.4	B4.7	B2.1	B4.6	B5.3	C2.1	B1.6	B8.0	C1.0	B7.6
8	B2.4	B2.5	B5.8	B5.4	B2.9	C1.3	B5.3	B2.3	B3.4	B3.5	B4.8	C1.6
9	B3.2	B5.0	B7.2	B6.0	B2.4	C1.5	B8.3	B2.2	B3.6	B3.9	B3.3	C2.2
10	B2.8	B2.4	B4.9	B5.0	B3.0	C1.2	B6.8	B2.7	B4.1	B3.7	B3.5	C1.8
11	B7.2	B3.1	B5.8	B5.4	B4.2	C1.3	B4.9	B2.0	C1.0	B3.3	B2.6	B8.4
12	B6.0	B2.6	B4.8	B5.7	B3.0	C1.3	B6.0	B5.7	B7.1	B5.0	B2.3	B8.7
13	B5.0	B2.6	B4.5	B3.4	B3.2	B7.1	B5.6	B2.2	B6.8	B5.2	B2.4	B5.4
14	B5.3	B2.2	B4.9	B2.9	B2.1	B7.0	B7.2	B4.4	B7.8	B6.0	B2.1	B4.2
15	B2.3	B1.5	B4.6	B2.7	B2.3	B4.5	B5.1	B5.5	C1.4	B4.3	B2.0	B4.6
16	B1.9	B3.6	B6.5	B2.8	B3.9	B4.0	B4.6	B6.6	B9.2	B5.3	B2.8	B4.1
17	B5.3	B2.0	C1.2	B3.6	B3.2	B4.0	B5.8	B7.4	B7.2	B5.0	B2.6	B7.7
18	B1.5	B1.2	B5.1	B3.7	C1.6	B2.3	C1.0	B9.2	B8.9	B5.9	B1.8	B6.9
19	B1.2	B1.2	C4.5	B3.2	B3.3	B1.8	B8.7	C1.0	B6.0	B4.6	B2.3	B6.8
20	B1.9	B2.5	C1.6	B3.1	B6.7	B2.3	B6.1	C1.0	B7.9	B3.9	B2.1	B4.8
21	B3.2	B5.4	B5.3	B3.5	B7.2	B4.2	B6.3	C6.1	B5.9	B4.4	B2.0	B5.1
22	B2.6	B3.8	C1.6	B3.5	B3.7	B7.2	B5.9	C1.8	B4.6	B2.8	B3.6	B8.5
23	B2.2	B3.1	B4.0	B5.3	B2.3	C1.5	B6.5	C1.2	B4.4	B1.6	B1.6	B5.0
24	B2.2	B3.1	B4.1	B4.1	B2.0	C1.4	C1.8	C1.0	B2.4	B1.5	B1.4	B5.6
25	B2.7	B2.7	B4.9	B3.7	B2.8	B8.4	B6.7	C1.7	B2.3	B1.4	B1.7	B4.2
26	B3.8	B2.6	B2.4	B5.3	B3.0	B5.9	B8.0	C1.1	B2.1	B1.1	A9.1	B7.5
27	B5.3	B2.2	B3.0	B4.0	B2.1	B6.8	B9.2	B4.2	B2.2	B1.1	B1.8	B6.5
28	B4.4	B2.0	B5.0	B3.8	B1.6	C1.4	C2.5	B7.4	B2.0	B1.1	B3.8	B6.6
29	B3.7	B2.2	B4.8	B2.6	B2.2	C1.2	C1.2	B2.4		A8.9	B3.7	B6.3
30	B4.4	B1.5	B7.3	B2.8	B2.0	B8.0	B9.9	B2.4		B1.0	B4.4	B4.7
31		B1.5	C1.2		B1.9		C1.0	B3.6		A8.9		B6.3

44  
May 99

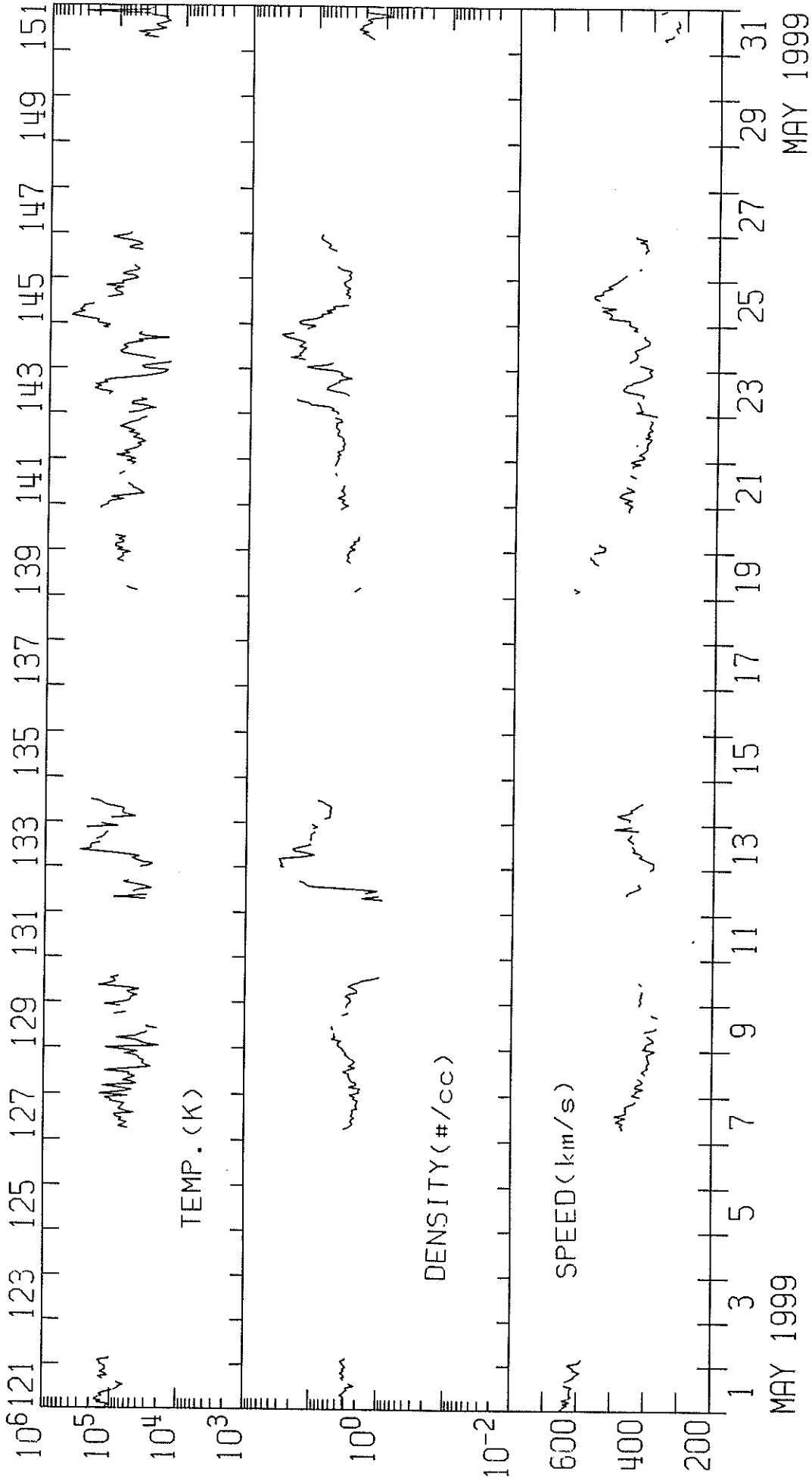
ACTIVE PROMINENCES AND FILAMENTS

MAY 1999

Day	Event Type	Start (UT)	End (UT)	Lat	CMD	CMP Mo	Day	Imp	Extent	Blue Shift (.1 A)	Red Shift (.1 A)	Obs Type	Sta	NOAA/USAF Reg#	Remarks
01	APR	0823E	1134D	N74	W90	04	23.2	1	6			P	WROC		
04	APR	0725E	0850	N17	E90	05	11.1	1	9			P	WROC		
04	BSL	0726	0746D	N29	E90	05	11.4	0	4			P	WROC		
04	APR	0740E	0757D	N52	E90	05	12.0	1	1			P	WROC		
07	DSF	1406	1444	N21	W19	05	6.1	3	06	9	9	E	RAMY	8525	Flare Associated
07	DSF	1410	1439	N21	W20	05	6.0	3	05	0	0	E	HOLL	8525	
07	DSF	1622	1634	S41	W22	05	5.9	2	06	0	0	E	RAMY	8532	
08	ASR	0823	0845	N25	E84	05	14.8			5	3	E	SVTO		
08	SPY	2330	2356	N27	E90	05	16.0			7	6	E	LEAR		
08	EPL	2347	2354	N27	E90	05	16.0	3		9	9	E	HOLL		
10	APR	0936E	1218D	S28	W90	05	3.4	1	14			P	WROC		
10	BSL	1119E	1137	S26	W90	05	3.5	1	6			P	WROC		
16	EPL	1729	0000	S15	W86	05	10.2	3		9	9	E	HOLL	8534	Flare Associated
16	BSL	1729	1759	S16	W85	05	10.3			9	9	E	HOLL	8534	Flare Associated
16	BSL	1745E	1810D	S16	W80	05	10.7			9	9	E	RAMY	8534	Flare Associated
17	CAP	0855E	1147D	S51	W90	05	9.7	2	9			P	WROC		
17	BSL	1050E	1121	S56	W90	05	9.6	1	6			P	WROC		
17	BSL	1112E	1121D	S61	W90	05	9.5	0	3			P	WROC		
18	APR	0714E	0812	S57	W90	05	10.5	1	6			P	WROC		
18	APR	0716E	1230	N05	W90	05	11.6	1	11			P	WROC		
18	ASR	0900	1125	S57	W90	05	10.5	1	8			P	WROC		
19	APR	0723E	1100D	N23	W90	05	12.4	1	13			P	WROC		
19	BSL	0802	0840	S27	W90	05	12.3	1	5			P	WROC		
19	APR	0802E	1100D	N00	W90	05	12.6	2	7			P	WROC		
20	EPL	0909E	0932D	N70	E90	05	28.5	2	4			P	WROC		
21	DSF	1850U	1339U	S26	E29	05	24.0		22	0	0	E	RAMY		
24	DSF	0907U	0032U	S16	E30	05	26.6		08	0	0	E	LEAR	8550	
25	BSL	0917E	0935	S55	W90	05	17.6	0	3			P	WROC		
25	BSL	0923E	0935	N55	E90	06	2.2	0	4			P	WROC		
27	APR	0953E	1407D	N47	E90	06	3.9	1	3			P	WROC		
27	BSL	1018E	1050	N10	E90	06	3.2	1	6			P	WROC		
27	APR	1146E	1407D	S00	E90	06	3.2	2	5			P	WROC		
27	EPL	1422	1517	N22	E90	06	3.5	3		9	9	E	RAMY		
27	EPL	1423E	1526D	N23	E90	06	3.5	3		9	9	E	HOLL		
27	EPL	1423E	1517	N17	E90	06	3.4	3		9	9	E	SVTO		
27	LPS	1756	2024D	S22	E90	06	3.7			6	5	E	RAMY	8557	
27	LPS	1803	1840D	S21	E90	06	3.6			9	9	E	HOLL	8557	
27	EPL	1856	1912	N20	E90	06	3.7	3		9	9	E	HOLL		
27	BSL	1858	1910D	N20	E90	06	3.7			9	9	E	RAMY		
28	ASR	0725E	1309D	N03	W90	05	21.6	0	4			P	WROC		
28	APR	0808E	0820	S25	W90	05	21.4	1	4			P	WROC		
31	DSF	1657U	0424U	S15	W41	05	28.6		25	0	0	E	SVTO		

IMP 8 SOLAR WIND PLASMA  
MAY 1999

MIT/CSR IMP 8 PLASMA PARAMETERS



MAY 1999

MAY 1999

IMP 8

MIT

ONE-HOUR AVERAGES

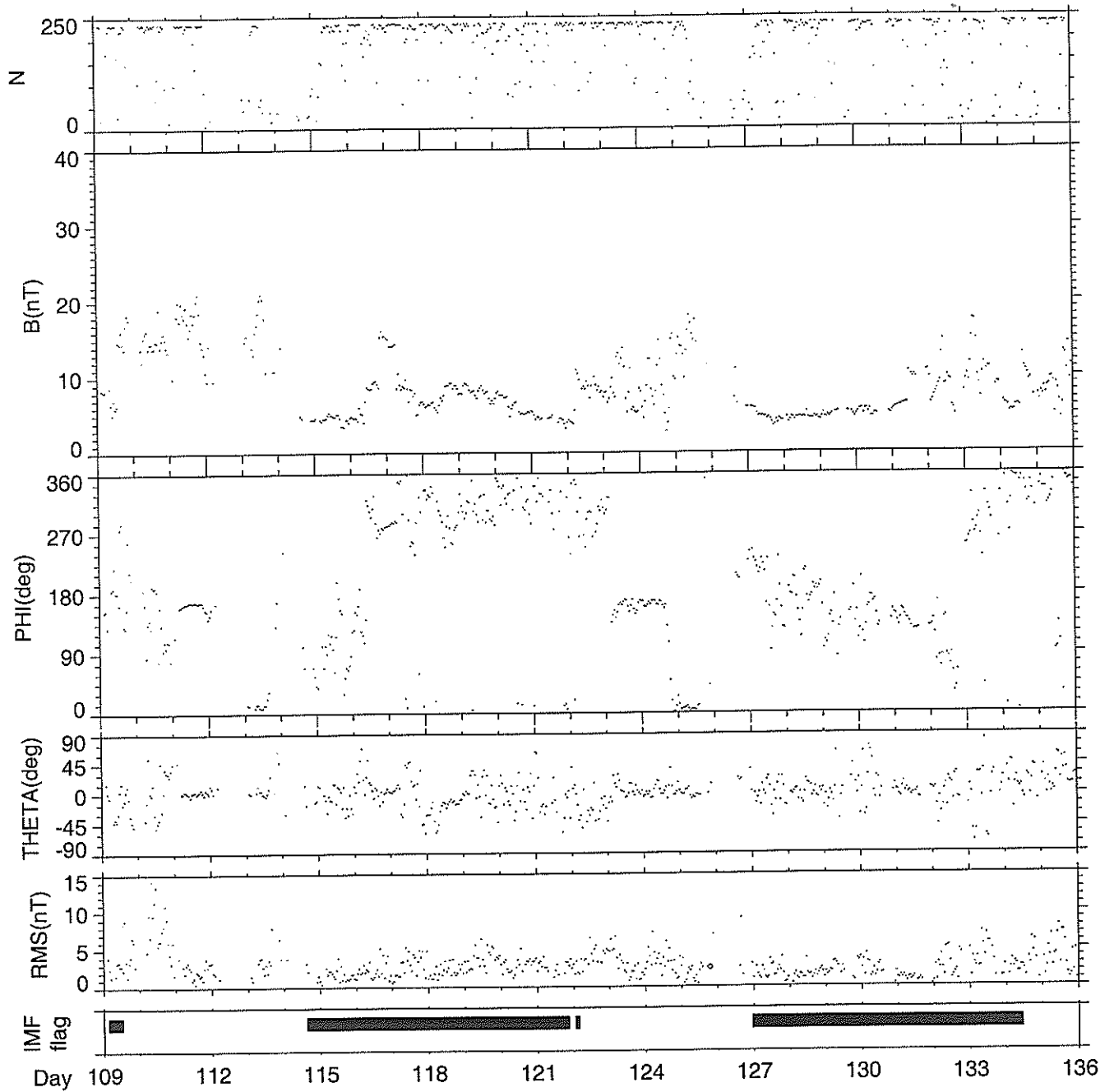
### IMP-8 Magnetic Field Data in GSE Coordinates

1 Hour Averages

(c) DOY 109 - 136

April 19 1999 -

May 16 1999



Generation Date : Tue Jun 15 15:58:11 1999

NOTE: The IMF "flag" (black boxes at the bottom of the plots) indicates where the interplanetary magnetic field regions are according to a dynamic model of the location of the bow shock. At all other times IMP-8 is in the magnetosphere.

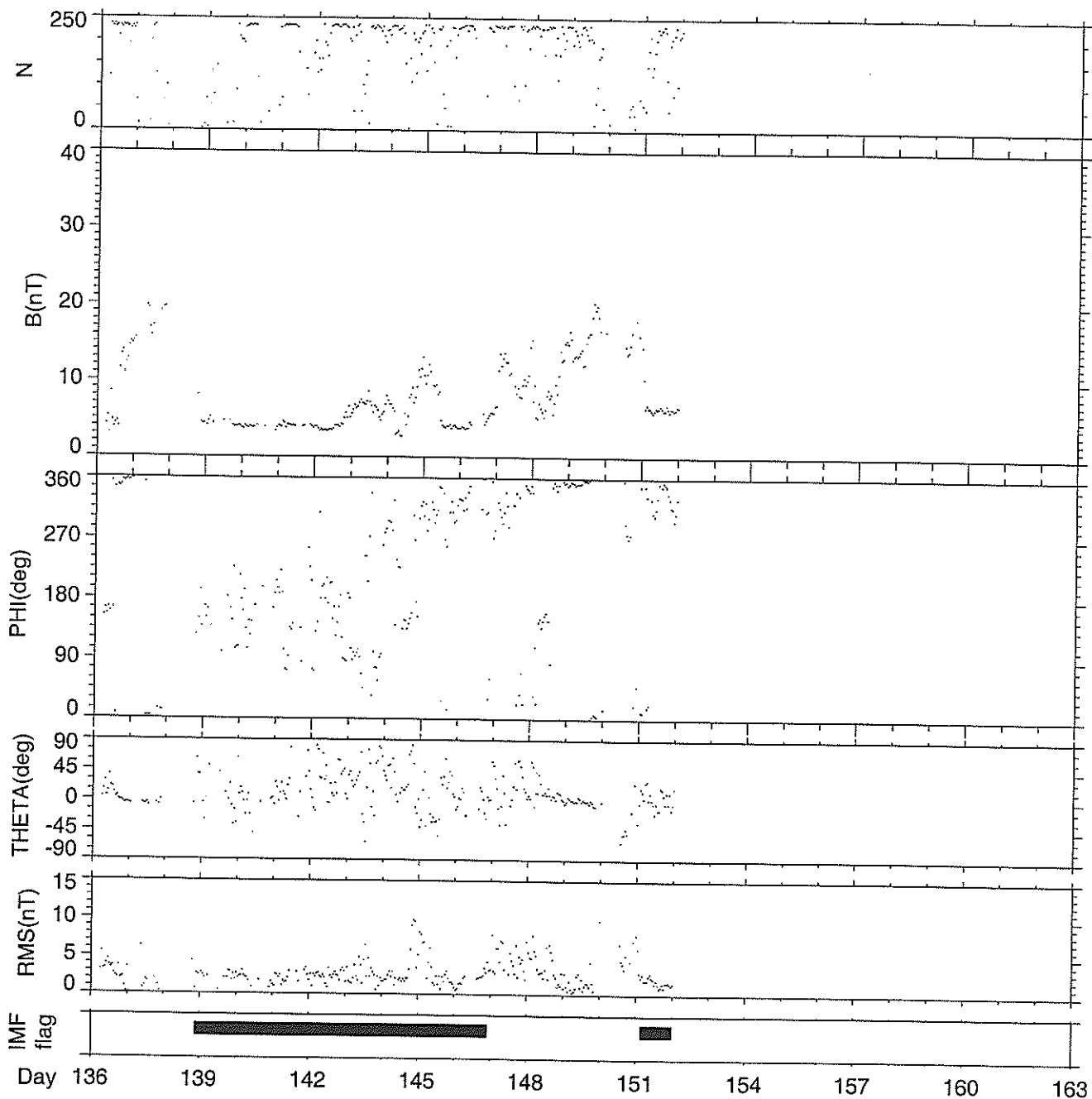
IMP-8 Magnetic Field Data in GSE Coordinates

1 Hour Averages

(c) DOY 136 - 152

May 16 1999 -

June 1 1999



Generation Date : Tue Jun 15 15:58:13 1999

NOTE: The IMF "flag" (black boxes at the bottom of the plots) indicates where the interplanetary magnetic field regions are according to a dynamic model of the location of the bow shock. At all other times IMP-8 is in the magnetosphere.





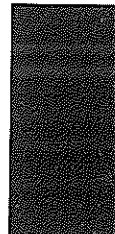
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Comprehensive Reports

Number 663 Part II

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

AUGUST 1999

Storm Sudden Commencements (SSC)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
04	0219	A: WNG* HRB* NAG* COI GUI ETT	02	0025-0035	MMB+ KAK+ KNY+
		B: NGK* BDV* CLF* GCK* EBR* HYB CNB	02	2123-2140	CNB
		C: QUE	04	0548-0635	MMB+ KAK+ KNY+
08	1841	C: WNG NGK BDV QUE ETT	10	1633-1650	GUI
15	1044	A: HRB* NAG* COI COI GUI	20	2306-2315	MMB+ KAK+ KNY+
		B: NUR* WNG NGK* BDV* CLF* GCK EBR QUE	21	1631-1640	WNG NGK BDV+
		C: HYB ETT GNA CNB	21	2213-2220	MMB+ KAK+ KNY+
			25	0134-0145	MMB+ KAK+ KNY+
			26	1106-1111	BDV+
			28	0055-0100	MMB+ KAK+ KNY+
			31	1259-1304	BDV+

**REPORTING OBSERVATORIES** (up to the 4th of October 1999):

SOD NUR WNG NGK BDV CLF HRB NAG GCK MMB EBR COI SPT KAK KNY QUE GUI HYB ETT GNA  
HER 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 (+).

## San Fernando Observatory (SFO) Photometric Observations January 1997-December 1998

The data presented here are based on synoptic full-disk images obtained by photoelectric photometry of sunspots at the solar San Fernando Observatory (SFO) (see Chapman et al., 1994). A description of the Cartesian Full Disk Telescope (CFDT) can be found in Chapman et al. (1989, 1992). This system has obtained photometric images of the Sun at several wavelengths since 1985. Results for the wavelength 672.3 nm are presented here.

Rapid changes in the total solar irradiance from space borne sensors are largely due to the passage of large sunspots across the disk. The effects of sunspots have often been modeled using ground-based observations by the use of a Photometric Sunspot Index (PSI), usually assuming all sunspots have the same thermal structure. The SFO data measures the mean temperature or bolometric contrast and corrected hemispherical areas, incorporating these into the PSI calculation. A discussion is found in Chapman et al. (1994). The PSI is calculated for each sunspot group and then summed over all groups present on the solar disk. The PSI is given by (Willson et al., 1981; Foukal 1981; Hudson et al., 1982)

$$PSI = \alpha \sum_i A_s^i \mu_i [(3\mu_i + 2)/2]$$

where  $A_s^i$  is the area of a sunspot in millionths of the solar hemisphere  
 $\mu_i$  is the cosine of the heliocentric angle theta,  
 and  $\alpha$  is the bolometric contrast.

With photometric images, one can determine the relative temperature of each pixel from its contrast, assuming LTE (see the discussion in Chapman et al., 1994). The San Fernando PSI has  $\alpha = 0.328$  and  $A_s^i$  is the corrected area of each sunspot pixel.

Recent investigations have shown that the bolometric contrast ( $\alpha$ ) is not constant but depends on the umbral/penumbral area ratio of a sunspot. Changes in  $\alpha$  can be up to a factor of 2. The sunspot pixels are used to determine a photometric deficit in the irradiance (DEF) by summing the measured contrast of each sunspot pixel, projected against the disk, and weighted by the observed limb darkening at that wavelength. For single sunspot groups from one day to the next, it was found that the DEF and the PSI were highly correlated. However, there were often smoothly changing temporal differences. The obvious cause for differences between these two quantities must be related to temporal changes in  $\alpha$  for the sunspot group.

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The tables give the date and time of the observations, the hemispherical area in pixels (5" square), the corrected total area, corrected umbral area, photometric deficit, and photometric sunspot index (PSI) in parts per million (PPM) of the solar hemisphere (or millionths of the solar hemisphere). Zeroes mean there were no sunspots visible. In the 1985 data there are no times for the first nine entries which were made before the clock was on-line. Also, there are some days with inconsistent UT date and time because the SFO date does not change when observations continue past 24:00:00 UT. If an observation is shown with a UT time of between 00:00:01 and 03:00:00, then that observation belongs to the previous UT day. The date is always the correct local date.

Data for 1985-1996 appeared in previous issues of SGD. Mar 85-Dec 89 in 611B 30; Jan 90-Dec 94 in 612B 36; Jan-Jul 95 in 615B 32; Aug 95-Jun 96 in 624B 24 and Jul-Dec 96 in 630B 32. These data are available on-line via the NGDC ftp anonymous account (log on as anonymous with your e-mail address as the password):

```
ftp ftp.ngdc.noaa.gov
cd STP/SOLAR_DATA/SUNSPOT_PHOTOMETRY
```

Alternatively the data can be accessed via our world wide web page at <http://www.ngdc.noaa.gov/stp>. Click on the Solar and Upper Atmosphere icon, then on Get Data, then scroll down to Sunspot\_Photometry.

## REFERENCES

Chapman, G.A., A.D. Herzog, J.K. Lawrence and M.S. Templer, *ApJ*, **343**, 547, 1989.

Chapman, G.A., A.D. Herzog, J.K. Lawrence, S.R. Walton, H.S. Hudson and B.M. Fisher, *J Geophys. Res.*, **97**, 8211, 1992.

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Foukal, P. in *Physics of Sunspots*, ed. L.E. Cram and J.H. Thomas, Sacramento Peak Obs, Sunspot, NM, 391, 1981.

Hudson, H.S., S. Silva, M. Woodward and R.C. Willson, *Solar Physics*, **76**, 211, 1982.

Willson, R.C., S. Gulkis, M. Janssen, H.S. Hudson, and G.A. Chapman, *Science*, **211**, 700, 1981.

**SAN FERNANDO OBSERVATORY  
1997 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Jan-97						
2-Jan-97						
3-Jan-97	20:19:32	228249.2	0	0	0	0
4-Jan-97						
5-Jan-97						
6-Jan-97	22:15:56	228279.3	0	0	0	0
7-Jan-97						
8-Jan-97	19:15:13	228155.4	0	0	0	0
9-Jan-97	19:21:19	228247.6	0	0	0	0
10-Jan-97	22:20:40	228149.6	0	0	0	0
11-Jan-97						
12-Jan-97						
13-Jan-97						
14-Jan-97						
15-Jan-97						
16-Jan-97	19:57:54	227838.3	0	0	0	0
17-Jan-97						
18-Jan-97						
19-Jan-97						
20-Jan-97						
21-Jan-97						
22-Jan-97						
23-Jan-97						
24-Jan-97						
25-Jan-97						
26-Jan-97						
27-Jan-97						
28-Jan-97						
29-Jan-97	19:26:50	227479.9	27.1	0	-5.6	-16
30-Jan-97	18:09:06	227517.8	14.6	0	-2.9	-10.2
31-Jan-97	19:23:44	226400.4	0	0	0	0
1-Feb-97	21:42:23	227178.8	0	0	0	0
2-Feb-97						
3-Feb-97	19:40:16	227049.8	205.5	0	-55.8	-132.5
4-Feb-97	21:16:01	226965.2	191.2	0	-36.7	-85.1
5-Feb-97	19:47:55	226892	59	0	-6	-15.1
6-Feb-97	21:17:54	226799.9	10.6	0	-1.9	-6.5
7-Feb-97						
8-Feb-97						
9-Feb-97						
10-Feb-97						
11-Feb-97	19:36:33	226513.3	0	0	0	0
12-Feb-97						
13-Feb-97	18:30:50	226159.8	0	0	0	0
14-Feb-97	19:37:36	226240.8	0	0	0	0
15-Feb-97						
16-Feb-97						
17-Feb-97						
18-Feb-97	19:20:29	226239.9	0	0	0	0
19-Feb-97	18:45:50	225912.7	0	0	0	0
20-Feb-97	20:51:54	225609.1	0	0	0	0
21-Feb-97						
22-Feb-97	20:20:17	225461.7	0	0	0	0
23-Feb-97	17:42:20	225422.9	0	0	0	0
24-Feb-97	22:05:47	225083.1	0	0	0	0
25-Feb-97	19:43:45	225238.9	0	0	0	0
26-Feb-97						
27-Feb-97						
28-Feb-97	21:15:03	224681.7	0	0	0	0



**SAN FERNANDO OBSERVATORY  
1997 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-May-97	19:21:46	217294.3	0	0	0	0
2-May-97	20:26:17	217206.5	0	0	0	0
3-May-97	18:24:57	217326.3	0	0	0	0
4-May-97						
5-May-97	21:24:06	216848.8	0	0	0	0
6-May-97	19:47:20	216709.6	104.1	0	-15	-25.2
7-May-97	18:48:37	216690.4	92.3	0	-19.2	-34.5
8-May-97	20:07:06	216618.4	98.1	6.1	-30.5	-51.6
9-May-97	17:49:58	216435.1	87.5	0	-31.5	-55
10-May-97	19:26:29	216376.7	112.3	0	-39.3	-78.6
11-May-97	17:14:15	216483.3	110.8	0	-41	-79.2
12-May-97						
13-May-97	18:53:22	216124.6	52	0	-15.7	-30.1
14-May-97	17:55:52	216116.5	60.9	0	-13.2	-27.7
15-May-97	19:44:56	215880.7	35.6	0	-3.2	-10.8
16-May-97						
17-May-97						
18-May-97						
19-May-97	22:14:32	215595.8	110	0	-42	-85.9
20-May-97						
21-May-97	19:42:05	215280	302.7	19.5	-88	-185.9
22-May-97	21:58:31	215061	164.3	21.8	-50.3	-104.6
23-May-97						
24-May-97	18:47:46	215226.8	116.1	8.4	-23.4	-39.4
25-May-97						
26-May-97						
27-May-97	21:01:15	214795.5	0	0	0	0
28-May-97	18:56:55	214870.5	0	0	0	0
29-May-97	20:30:33	214834.5	8.1	0	-0.8	-2.8
30-May-97	18:16:14	214780.8	19.9	0	-2.9	-9.4
31-May-97	18:59:27	214571.5	17.1	0	-4.1	-10.2

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Jun-97	16:55:15	214484	100.6	0	-21.2	-51.8
2-Jun-97	20:18:12	214459.9	140.1	0	-44.7	-86
3-Jun-97	20:34:32	214234.5	155	10.6	-53.4	-102.6
4-Jun-97						
5-Jun-97						
6-Jun-97	18:08:18	214462.6	85.3	0	-16.3	-41.1
7-Jun-97						
8-Jun-97						
9-Jun-97	18:59:38	214107.9	0	0	0	0
10-Jun-97	18:35:34	214200.4	6.2	0	-1.2	-3.3
11-Jun-97	18:56:34	213823.3	0	0	0	0
12-Jun-97						
13-Jun-97	18:56:12	214078.3	0	0	0	0
14-Jun-97						
15-Jun-97	20:10:18	213741.9	0	0	0	0
16-Jun-97	18:26:36	213848.7	19.8	0	-5.3	-14.8
17-Jun-97	19:28:46	213756.8	10.8	0	-2.5	-7.1
18-Jun-97	18:54:47	213826.2	0	0	0	0
19-Jun-97	18:44:39	213893.2	0	0	0	0
20-Jun-97	19:48:53	213717.2	0	0	0	0
21-Jun-97	22:52:46	213599.1	0	0	0	0
22-Jun-97	19:12:50	213745.3	0	0	0	0
23-Jun-97	19:42:39	213566.8	0	0	0	0
24-Jun-97	18:56:35	213756.4	0	0	0	0
25-Jun-97	19:10:10	213692.6	10.2	0	-2.6	-7.3
26-Jun-97	20:03:48	213476.3	11.7	0	-2.3	-6.8
27-Jun-97	18:19:19	213459.7	0	0	0	0
28-Jun-97	18:53:21	213644.7	0	0	0	0
29-Jun-97	19:32:49	213566.8	0	0	0	0
30-Jun-97	19:27:07	213375.4	0	0	0	0



**SAN FERNANDO OBSERVATORY  
1997 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI	Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Jul-97	19:02:33	213612.9	0	0	0	0	1-Aug-97	19:28:49	222607.5	0	0	0	0
2-Jul-97	19:05:29	213323.2	0	0	0	0	2-Aug-97						
3-Jul-97	19:08:36	213615.7	0	0	0	0	3-Aug-97						
4-Jul-97	19:04:38	213570.6	0	0	0	0	4-Aug-97						
5-Jul-97	19:10:07	213326.3	0	0	0	0	5-Aug-97	19:09:40	214334.4	21.5	0	-5.3	-14.1
6-Jul-97	19:14:19	213437.6	0	0	0	0	6-Aug-97	18:43:07	214409.2	83	0	-14.5	-42
7-Jul-97	18:27:50	213765	0	0	0	0	7-Aug-97						
8-Jul-97	19:44:58	213360.1	0	0	0	0	8-Aug-97	21:44:54	214189.7	53	0	-12.4	-35.5
9-Jul-97	19:16:27	213596.3	9.4	0	-2.7	-7.7	9-Aug-97	21:23:05	214308.5	15.6	0	-3.7	-10.8
10-Jul-97	18:25:37	213518.4	0	0	0	0	10-Aug-97						
11-Jul-97							11-Aug-97						
12-Jul-97	19:41:45	213463.4	0	0	0	0	12-Aug-97						
13-Jul-97	18:56:30	213560.5	0	0	0	0	13-Aug-97	19:16:16	214813	165.9	0	-29.4	-70.5
14-Jul-97	22:09:57	213405.6	0	0	0	0	14-Aug-97	18:16:34	214910.8	121.1	0	-31	-65.7
15-Jul-97							15-Aug-97	18:53:44	214895.9	88.9	0	-27.4	-60.6
16-Jul-97							16-Aug-97	22:01:17	215030.8	52.4	0	-22	-41.3
17-Jul-97							17-Aug-97						
18-Jul-97	20:04:43	213350.4	0	0	0	0	18-Aug-97	19:17:31	215377.6	72.6	4.8	-28.8	-55.7
19-Jul-97							19-Aug-97	17:46:52	215706.9	73.4	0	-26.6	-49.5
20-Jul-97	18:28:33	213676.5	0	0	0	0	20-Aug-97	18:36:30	215540.7	43	0	-12.8	-22.7
21-Jul-97	19:54:35	213515.4	0	0	0	0	21-Aug-97	17:41:13	215670.7	46.7	0	-7.5	-17.3
22-Jul-97							22-Aug-97	18:14:40	215581	0	0	0	0
23-Jul-97	18:51:47	213595.3	15.3	0	-4.1	-11	23-Aug-97	20:40:43	215523.7	0	0	0	0
24-Jul-97	18:29:46	213883.7	29.8	0	-4.9	-16.7	24-Aug-97	21:10:38	215641.6	0	0	0	0
25-Jul-97	18:50:14	213805	172.4	0	-27.5	-64.1	25-Aug-97						
26-Jul-97							26-Aug-97	17:22:06	216005.7	96	0	-12.8	-30
27-Jul-97	20:10:54	213759.2	0	0	0	0	27-Aug-97	19:36:41	215603.1	86.2	0	-16.2	-40.6
28-Jul-97	21:31:35	213796.7	0	0	0	0	28-Aug-97	17:10:25	215816.8	176.6	0	-43.3	-104.8
29-Jul-97	21:30:28	213743.6	0	0	0	0	29-Aug-97	17:56:37	215849.9	177.5	5	-61.8	-126.1
30-Jul-97	18:21:15	214181.1	0	0	0	0	30-Aug-97						
31-Jul-97	18:54:50	213987.4	0	0	0	0	31-Aug-97						

**SAN FERNANDO OBSERVATORY  
1997 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI (PPM)
1-Sep-97	19:35:10	216345	149.3	0	-31.8	-67.5
2-Sep-97	17:38:16	216594.5	390.4	0	-62.2	-120.3
3-Sep-97	18:55:46	216369.3	395.7	25.5	-104.1	-186.7
4-Sep-97	19:44:44	216591.9	529.9	52.2	-168.4	-307.8
5-Sep-97	18:36:48	216614	887	56.2	-217.3	-389.9
6-Sep-97	18:49:45	216978.4	1321.2	115.1	-352.4	-628
7-Sep-97	20:45:26	216720.9	1736.5	169.9	-504.4	-916.5
8-Sep-97	17:45:52	216981	1600.2	198	-499.8	-868
9-Sep-97	17:11:42	217241.2	1318.8	135.3	-375.5	-676.2
10-Sep-97	19:21:40	217219.7	1239	103.1	-323	-597.4
11-Sep-97	20:39:42	217162.6	846.8	45.6	-244.4	-464.8
12-Sep-97	19:35:45	217611.3	698.8	14.9	-155.3	-310.5
13-Sep-97	18:56:40	217787.5	260.9	4.9	-58.3	-114.3
14-Sep-97	19:34:14	217797.3	115	0	-40.9	-82.4
15-Sep-97	18:59:02	217763.7	113.3	0	-35.2	-72
16-Sep-97	18:42:26	218346.9	79.8	0	-17.6	-41.4
17-Sep-97	18:21:59	218686.5	30	0	-4.2	-11.5
18-Sep-97	19:07:52	218518.2	116.1	0	-16.3	-39.1
19-Sep-97	19:04:04	218792.8	241.6	6.5	-61	-113.7
20-Sep-97	19:29:31	219157.5	276	23	-56.2	-102
21-Sep-97	19:11:26	219200.9	244.4	0	-30.1	-60.1
22-Sep-97	18:13:43	219600.1	120.4	0	-6	-17.4
23-Oct-97	19:54:38	219317.8	42.8	0	-3.7	-9.8
24-Oct-97	19:16:57	219883.7	67.1	0	-10.6	-30.1
25-Oct-97	20:01:24	219990.5	17.2	0	-4.1	-9.8
26-Oct-97	17:23:53	220345.7	0	0	0	0
27-Oct-97	20:41:46	220572.3	11.1	0	-2.2	-6.6
28-Oct-97	19:22:54	220772.8	41.8	0	-9	-27.4
29-Oct-97	19:23:15	220841.4	126	0	-34.1	-87.2
30-Oct-97	19:19:25	220988.6	101.1	0	-25.3	-69.5
31-Oct-97	19:13:26	221332.1	48.5	0	-13.3	-30.1
1-Oct-97	18:48:27	221338.1	62	0	-11.3	-31
2-Oct-97	17:18:32	221353.3	68.3	0	-7.6	-22.1
3-Oct-97	19:19:02	221687.8	77.9	0	-15.1	-37.2
4-Oct-97	17:54:09	221693	61.8	0	-13.9	-36.2
5-Oct-97	17:38:47	221743.8	75.9	0	-19.1	-52
6-Oct-97	18:10:50	222208	4.6	0	-1	-3.6
7-Oct-97	19:46:04	222258.8	0	0	0	0
8-Oct-97	19:55:47	222571	0	0	0	0
9-Oct-97	18:56:33	222563.5	24.9	0	-2.8	-8
10-Oct-97	18:06:56	222757.9	41.5	0	-5.9	-18.6
11-Oct-97	19:31:35	223124	183.2	0	-34.6	-75.2
12-Oct-97	17:55:14	223144.6	275.9	0	-69.7	-148.4
13-Oct-97	20:06:46	223272	188	0	-50.5	-120.9

**SAN FERNANDO OBSERVATORY  
1997 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI	Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Nov-97	19:36:53	223545.8	216.4	0	-64	-152.6	1-Dec-97	20:20:05	226507.5	586.2	89.2	-244.3	-431.1
2-Nov-97	19:35:57	223726.4	222.7	9.9	-78.8	-155.4	2-Dec-97	19:17:20	226464	559.8	94	-245.2	-415
3-Nov-97	20:21:45	223841	952	120.5	-363.1	-603.2	3-Dec-97	20:23:40	226502.8	480.4	89.5	-205.4	-328.3
4-Nov-97							4-Dec-97						
5-Nov-97	19:24:27	224019.5	1282.9	98.7	-266.9	-485.4	5-Dec-97						
6-Nov-97	18:08:13	224056.6	777.2	67	-122.5	-218.9	6-Dec-97						
7-Nov-97							7-Dec-97						
8-Nov-97							8-Dec-97						
9-Nov-97	19:42:46	224379.7	0	0	0	0	9-Dec-97	19:30:25	227025	155.2	0	-35.6	-89.1
10-Nov-97							10-Dec-97	20:40:10	226901	142.7	0	-32.2	-78
11-Nov-97							11-Dec-97	20:06:00	226873	171	0	-33.2	-84.7
12-Nov-97	20:17:03	224575.4	27.1	0	-2.6	-7.6	12-Dec-97						
13-Nov-97							13-Dec-97						
14-Nov-97	20:09:36	224783.9	166	0	-16.5	-39.3	14-Dec-97						
15-Nov-97							15-Dec-97	20:00:40	227095.8	111.1	0	-13.8	-37.5
16-Nov-97							16-Dec-97	19:50:47	227222.6	163.6	0	-39.6	-86.9
17-Nov-97							17-Dec-97						
18-Nov-97							18-Dec-97						
19-Nov-97							19-Dec-97	19:06:09	227396.3	70.7	0	-23.7	-51.9
20-Nov-97	18:25:21	225262.3	282.3	38.3	-118.8	-205.5	20-Dec-97						
21-Nov-97							21-Dec-97						
22-Nov-97	21:17:07	225502.8	357.2	6.2	-91.7	-189.8	22-Dec-97	20:01:34	227508.4	253.7	0	-29.3	-77.4
23-Nov-97							23-Dec-97	20:59:44	227437.9	493.7	0	-107.1	-221.2
24-Nov-97							24-Dec-97	19:24:56	227837.3	398.9	0	-109	-220.4
25-Nov-97							25-Dec-97	19:37:40	227839.5	518.8	40.6	-143.8	-269.1
26-Nov-97							26-Dec-97	18:17:50	227611.3	499.8	54.1	-159	-293.7
27-Nov-97							27-Dec-97	21:06:45	227655.1	521.8	22.1	-177.3	-337.5
28-Nov-97	19:45:48	226136.9	662.2	47.1	-134.2	-261.4	28-Dec-97	19:59:11	227895.8	470.6	10	-157.7	-313.2
29-Nov-97							29-Dec-97						
30-Nov-97							30-Dec-97	20:08:38	227771.5	428.8	0	-123.5	-259.7
							31-Dec-97	22:28:00	227839.3	361.1	0	-100.4	-203.9

**SAN FERNANDO OBSERVATORY  
1998 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Jan-98	19:49:35	227863	217.5	5.9	-57	-117.9
2-Jan-98						
3-Jan-98						
4-Jan-98						
5-Jan-98	19:23:51	227836.8	0	0	0	0
6-Jan-98	21:49:40	227806.3	0	0	0	0
7-Jan-98						
8-Jan-98						
9-Jan-98						
10-Jan-98						
11-Jan-98						
12-Jan-98						
13-Jan-98	18:57:31	227837.6	238.9	4.7	-79.3	-176.6
14-Jan-98						
15-Jan-98						
16-Jan-98	22:59:20	227700.5	354.6	37	-81.6	-140.1
17-Jan-98						
18-Jan-98						
19-Jan-98						
20-Jan-98						
21-Jan-98	21:24:05	227434.6	0	0	0	0
22-Jan-98	19:38:37	227306.5	0	0	0	0
23-Jan-98	21:00:35	227299.2	137.9	0	-23.9	-59.8
24-Jan-98	19:35:24	227045.3	193.3	0	-42.8	-89.3
25-Jan-98	19:30:13	227129.8	332.3	17.6	-79.8	-167.1
26-Jan-98						
27-Jan-98	21:43:30	227423.5	332	10.1	-101.2	-205.5
28-Jan-98						
29-Jan-98						
30-Jan-98	19:15:23	227070	140.2	24.5	-41.9	-69.2
31-Jan-98						

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Feb-98						
2-Feb-98						
3-Feb-98						
4-Feb-98						
5-Feb-98						
6-Feb-98						
7-Feb-98						
8-Feb-98						
9-Feb-98	22:14:08	226452.1	59.3	0	-16	-40.9
10-Feb-98						
11-Feb-98	21:51:42	226353.3	97.6	0	-17.5	-40.2
12-Feb-98						
13-Feb-98						
14-Feb-98						
15-Feb-98	18:33:05	226172.8	638.2	65.4	-244.5	-471.1
16-Feb-98						
17-Feb-98						
18-Feb-98	19:46:15	225593	459.4	91.5	-167.2	-261
19-Feb-98						
20-Feb-98	19:31:32	225503.5	343.3	74.2	-64	-92.4
21-Feb-98						
22-Feb-98						
23-Feb-98						
24-Feb-98	18:44:02	225287.2	125.6	0	-32.9	-90
25-Feb-98						
26-Feb-98	18:22:31	224814.2	124.5	0	-34.6	-85.4
27-Feb-98	19:18:50	224601	55.9	0	-12.6	-32.1
28-Feb-98	19:59:39	224294	88.2	0	-28.9	-58.3

**SAN FERNANDO OBSERVATORY**  
**1998 SUNSPOT OBSERVATIONS**  
 WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Mar-98	18:49:40	224368.1	248.5	19.4	-62.7	-117.5
2-Mar-98	19:27:40	224531.3	487	21.2	-141.7	-284
3-Mar-98						
4-Mar-98						
5-Mar-98						
6-Mar-98	20:30:17	224051.4	0	0	0	0
7-Mar-98	20:29:42	223685.2	63.7	0	-15.6	-34.8
8-Mar-98	18:25:08	223577.7	45.1	0	-10.9	-30.9
9-Mar-98						
10-Mar-98	19:17:43	223259.4	161.7	0	-39.5	-85.2
11-Mar-98	20:17:53	223206	279.5	18.9	-54.5	-115.1
12-Mar-98						
13-Mar-98						
14-Mar-98	22:00:33	222949.3	901	72.2	-346.1	-644.6
15-Mar-98	18:42:20	222885.1	1014.2	121.2	-437.1	-774.4
16-Mar-98						
17-Mar-98						
18-Mar-98	20:47:36	222393.1	1032.2	121.7	-309.6	-531.6
19-Mar-98						
20-Mar-98						
21-Mar-98	20:19:59	222361.2	357	0	-33.8	-81
22-Mar-98						
23-Mar-98	18:51:32	221609.4	850.3	44.5	-171.5	-333.4
24-Mar-98	18:33:18	221800.6	969.1	106.4	-265	-476.2
25-Mar-98						
26-Mar-98						
27-Mar-98						
28-Mar-98						
29-Mar-98	18:29:46	220834.2	449.6	93.6	-211.1	-321.1
30-Mar-98	19:37:37	220682.1	605.2	81.2	-201.7	-329.7
31-Mar-98						
1-Apr-98						
2-Apr-98						
3-Apr-98						
4-Apr-98						
5-Apr-98						
6-Apr-98						
7-Apr-98						
8-Apr-98	18:28:45	219947.7	883.2	75.6	-279.8	-534.1
9-Apr-98	17:36:21	219882.6	841.8	91.6	-306.2	-555.3
10-Apr-98	18:11:10	219508.5	748.1	109.1	-307.7	-512.4
11-Apr-98						
12-Apr-98	17:19:10	219668	455.1	49	-154.4	-272.6
13-Apr-98						
14-Apr-98	17:41:26	219029.2	342.7	45.5	-86.7	-160.3
15-Apr-98	17:55:45	219136	357.8	34.5	-77.6	-144.8
16-Apr-98	17:47:27	218776.4	279.4	0	-28	-63.4
17-Apr-98	18:02:36	218629	5.1	0	-0.9	-3.5
18-Apr-98	19:57:06	218417.6	82.9	0	-23.9	-55.9
19-Apr-98	18:01:33	218698.5	59.5	0	-12.3	-37.4
20-Apr-98	20:05:22	218333.9	101.2	0	-23.8	-50.2
21-Apr-98	18:45:59	218242.2	113.7	0	-18.2	-39
22-Apr-98	18:49:29	218224	55	0	-2.9	-9
23-Apr-98						
24-Apr-98						
25-Apr-98	19:59:53	217602	0	0	0	0
26-Apr-98	17:34:30	217815.4	272.6	40.2	-45.6	-68.4
27-Apr-98	18:32:00	217709	294.8	42.2	-79.2	-125.4
28-Apr-98						
29-Apr-98	18:57:03	217289.1	279.2	70.9	-144.5	-195.9
30-Apr-98	18:44:25	216998.5	388.3	62.1	-185.6	-269.1

**SAN FERNANDO OBSERVATORY  
1998 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-May-98						
2-May-98						
3-May-98						
4-May-98						
5-May-98						
6-May-98						
7-May-98						
8-May-98						
9-May-98						
10-May-98						
11-May-98						
12-May-98						
13-May-98						
14-May-98						
15-May-98	18:22:30	215751.5	527.2	27.8	-130.6	-265.6
16-May-98	21:20:42	215509.1	618	5.4	-125.1	-258.6
17-May-98						
18-May-98	19:26:03	215510.9	173.1	0	-47.7	-116.9
19-May-98						
20-May-98						
21-May-98	19:18:27	215116.5	16	0	-1.8	-5.7
22-May-98	18:45:59	214953.2	0	0	0	0
23-May-98						
24-May-98						
25-May-98						
26-May-98						
27-May-98	18:45:11	214884.5	501.5	37.4	-74.1	-135.3
28-May-98						
29-May-98						
30-May-98	19:46:08	214570.3	202	21.2	-78.9	-134.5
31-May-98						

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Jun-98	18:55:18	214672.1	363.9	13.4	-103.5	-203.5
2-Jun-98	19:14:38	214337.7	398.5	22.1	-125	-244.3
3-Jun-98						
4-Jun-98						
5-Jun-98	18:15:13	214250.4	644.4	119.6	-243.6	-381.8
6-Jun-98						
7-Jun-98						
8-Jun-98						
9-Jun-98						
10-Jun-98						
11-Jun-98						
12-Jun-98						
13-Jun-98	21:10:43	213666.2	487.9	83.1	-66.8	-115.3
14-Jun-98	20:57:57	213797.8	263.2	65.5	-70.9	-100.3
15-Jun-98	18:56:46	213461.3	241.8	58.8	-82.3	-123.2
16-Jun-98						
17-Jun-98	21:24:10	213434.8	316.2	55.5	-140.3	-197.5
18-Jun-98	17:04:47	213549.6	315.4	58.6	-141.5	-212.4
19-Jun-98	20:14:34	213586.3	321.6	70.5	-156.6	-224.9
20-Jun-98	20:57:38	213460.3	442	59.1	-172.5	-290.5
21-Jun-98						
22-Jun-98	18:34:33	213638.6	299.8	37.5	-79.5	-133.7
23-Jun-98	21:06:40	213323.3	432.5	22	-58.5	-109.5
24-Jun-98	20:12:40	213312.6	349.1	24.2	-64.1	-123.7
25-Jun-98	20:23:06	213421.6	362.5	12.5	-79.1	-166.6
26-Jun-98	17:36:00	213534.4	387	43.2	-100.5	-187.1
27-Jun-98	19:00:55	213101.4	307.5	39.6	-107.7	-194.7
28-Jun-98	17:34:35	213656.9	427.6	24.1	-126.3	-257.5
29-Jun-98	18:33:17	213528	507.3	30.6	-148.4	-277.3
30-Jun-98	19:50:44	213095.8	464.4	27.3	-137.3	-257.4

**SAN FERNANDO OBSERVATORY  
1998 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI	Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI	
1-Jul-98	18:57:32	213664.2	782.9	87	-162.4	-297	1-Aug-98	20:20:59	213903.1	613.2	97.8	-90.9	-160.1	
2-Jul-98	18:49:15	213364.5	742.9	76.8	-180.1	-317.4	2-Aug-98	17:27:55	214272.5	115.3	0	-25.2	-52.6	
3-Jul-98							3-Aug-98	19:27:24	214000.1	133.3	0	-25.3	-56.7	
4-Jul-98							4-Aug-98	19:09:12	214304.6	339.5	0	-68.7	-137.5	
5-Jul-98	20:39:42	213090.1	500.3	91.4	-208.5	-334.9	5-Aug-98	20:13:45	214231.8	573.9	19.8	-128.1	-271	
6-Jul-98	18:39:34	213467.8	361.7	70.7	-171.3	-265.6	6-Aug-98	18:33:06	214608.6	865.9	28.5	-240	-469.5	
7-Jul-98	17:01:43	213218.3	390.6	68.3	-168.7	-271.6	7-Aug-98	19:42:34	214363	1259.3	159.4	-324.3	-588.1	
8-Jul-98	18:35:51	213284.4	323.1	47.1	-114.1	-186.3	8-Aug-98	20:42:13	214321.3	1513.1	235.8	-404.8	-709.1	
9-Jul-98	18:30:36	213608.3	296	35.3	-78	-129.3	9-Aug-98	17:08:47	214724.2	1693.9	237.9	-507.7	-880.6	
10-Jul-98	18:14:02	213495.8	192.2	8.1	-31.5	-57.4	10-Aug-98							
11-Jul-98	18:25:33	213387.8	89.9	0	-8.2	-20.2	11-Aug-98	18:30:27	214782.3	1613.7	287.3	-602.8	-910.9	
12-Jul-98							12-Aug-98	18:34:02	214838.2	1384.9	272.3	-615.1	-894.3	
13-Jul-98	18:09:50	213497.3	150	12.2	-42.4	-83.4	13-Aug-98	18:35:41	214895.6	1231.9	238.9	-587.9	-889.2	
14-Jul-98							14-Aug-98	18:46:56	214962.5	1319.4	247.9	-612	-933.4	
15-Jul-98	19:59:47	213231.3	89.3	0	-26.9	-61.2	15-Aug-98	17:59:40	215350.2	1172.3	187.3	-478.4	-733	
16-Jul-98	17:34:51	213740.9	194.8	0	-59.1	-132.5	16-Aug-98	17:32:25	215384.1	1273.1	165.9	-368.9	-627.7	
17-Jul-98	19:53:56	213376.7	194	25.8	-70.1	-133.2	17-Aug-98	21:02:20	215307.2	1209.9	175.7	-247.3	-423.5	
18-Jul-98	19:45:43	213412.2	115.3	5.5	-38.4	-73.6	18-Aug-98	20:34:30	215109.4	825.7	34.8	-123.2	-235.6	
19-Jul-98							19-Aug-98	19:42:23	215266.7	372.1	6	-65.3	-128.1	
20-Jul-98							20-Aug-98	19:01:15	215427.5	905.5	85.5	-151.4	-277.4	
21-Jul-98	20:02:28	213604.2	199.9	13.3	-47.7	-91.1	21-Aug-98	19:20:15	215322.4	938.5	77.6	-224.9	-401.3	
22-Jul-98	21:43:25	213636.1	481.6	73.6	-77.5	-126.9	22-Aug-98	19:17:28	215687	880.4	62.7	-262.4	-471.6	
23-Jul-98	20:10:15	213792.8	640.4	68.2	-115.1	-200.7	23-Aug-98	18:15:43	215906.7	727.6	66.9	-242.8	-438.7	
24-Jul-98	21:17:14	213817.8	980.2	120.4	-267.9	-441.3	24-Aug-98	20:18:30	215532.6	707.8	68.3	-243.4	-453.4	
25-Jul-98	19:05:07	213528.9	1152	163.1	-392.9	-625.5	25-Aug-98	18:37:06	215877.5	585.4	31.4	-197.4	-387.5	
26-Jul-98	16:35:31	213795.3	1107.8	149.1	-428.4	-690.3	26-Aug-98	18:54:45	216071.5	438.9	44.4	-138.6	-286.7	
27-Jul-98	20:15:17	213717.6	1018.2	174.7	-440.6	-659.8	27-Aug-98	18:14:39	216306.7	453.2	22	-136.5	-289.3	
28-Jul-98	19:50:05	213606.3	896	150.3	-364	-568.4	28-Aug-98	19:12:17	215930.5	519	25	-153	-319.3	
29-Jul-98	19:45:51	213793.1	825	132.3	-318.2	-478	29-Aug-98	19:54:09	216255.4	1056	130	-275.8	-467.9	
30-Jul-98	19:42:25	213898.8	730.3	159	-249.2	-363.1	30-Aug-98	17:32:10	216531.9	2358.1	193.1	-468	-860.6	
31-Jul-98	20:14:30	213905.6	633.9	116.3	-148	-239.2	31-Aug-98	19:15:44	216362.5	2562.5	405.2	-618.8	-975.3	

**SAN FERNANDO OBSERVATORY  
1998 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Sep-98	18:54:27	216691.8	2792.7	374.5	-692.6	-1130.7
2-Sep-98	19:04:53	216799.6	1887.5	318.6	-727	-1084.9
3-Sep-98	20:40:51	216521.9	1662.4	270.9	-694.6	-1092.7
4-Sep-98						
5-Sep-98						
6-Sep-98						
7-Sep-98						
8-Sep-98	19:30:12	217498.9	1285.4	64.4	-323.4	-608.3
9-Sep-98						
10-Sep-98	20:04:11	217261.1	778.4	68.4	-289.4	-523.9
11-Sep-98	20:32:10	217568.3	889	82.4	-280.1	-522
12-Sep-98	19:56:42	217581.2	791.1	25.8	-191	-399.7
13-Sep-98	17:27:25	217823.4	665.6	22.2	-137.8	-290.1
14-Sep-98	19:47:51	217828.6	391.3	6.9	-77.3	-154.7
15-Sep-98	19:33:23	218054.4	207.2	0	-54	-113.9
16-Sep-98	19:12:07	218037.8	192.5	0	-51	-109.9
17-Sep-98	18:53:01	218161.8	218.5	0	-48.7	-111.2
18-Sep-98	19:18:07	218245.3	593.6	87.7	-104.4	-182.7
19-Sep-98	17:43:44	218314.3	687.5	101.1	-171.8	-294.9
20-Sep-98						
21-Sep-98						
22-Sep-98						
23-Sep-98						
24-Sep-98						
25-Sep-98						
26-Sep-98						
27-Sep-98						
28-Sep-98	18:58:58	219333.8	553.9	82.2	-90	-143.8
29-Sep-98						
30-Sep-98	21:29:36	219751.5	0	0	0	0
1-Oct-98	19:41:21	219752.1	0	0	0	0
2-Oct-98						
3-Oct-98						
4-Oct-98	17:21:17	220691.1	297.2	30.6	-82.1	-145.1
5-Oct-98	19:27:40	220263.2	277.1	10.4	-91	-176.5
6-Oct-98	21:10:49	220496.8	307.3	4.8	-115.1	-230.1
7-Oct-98						
8-Oct-98	18:46:47	221002.1	327.5	14.3	-98.2	-200.9
9-Oct-98	18:35:59	221226.8	347.3	0	-83.1	-185.3
10-Oct-98	19:35:12	221005.8	341.8	0	-87.9	-190.2
11-Oct-98	18:44:39	221165.6	247.1	0	-61.9	-136
12-Oct-98						
13-Oct-98	18:08:23	221401	137.1	0	-42.1	-99.2
14-Oct-98						
15-Oct-98						
16-Oct-98	19:11:44	221708.9	800.5	32.2	-199.4	-405.9
17-Oct-98	19:56:54	222061.2	872.7	67.5	-184.8	-357.1
18-Oct-98	18:40:39	222109	685.2	24.7	-106	-232.4
19-Oct-98	20:13:50	222252.2	134	0	-25	-63.2
20-Oct-98	18:54:39	222727.6	125.3	0	-27.1	-75.9
21-Oct-98	18:58:55	222507.2	363.6	19.6	-90.5	-188.1
22-Oct-98	18:42:23	222808.4	458.6	56.9	-106.3	-195.9
23-Oct-98	20:08:00	222821.8	318.8	24	-40.7	-78
24-Oct-98						
25-Oct-98	17:11:35	222825.6	18.5	0	-1.9	-5.1
26-Oct-98	21:28:02	223040.8	31.6	0	-6.6	-15.2
27-Oct-98	19:46:51	223520.1	53.5	0	-13.9	-33.1
28-Oct-98	20:23:48	223435.3	43.2	0	-15.8	-31.7
29-Oct-98						
30-Oct-98	20:04:13	223796.3	333.6	54.9	-67.2	-108.9
31-Oct-98	20:31:24	223852.7	361.7	66.2	-107.4	-167.8

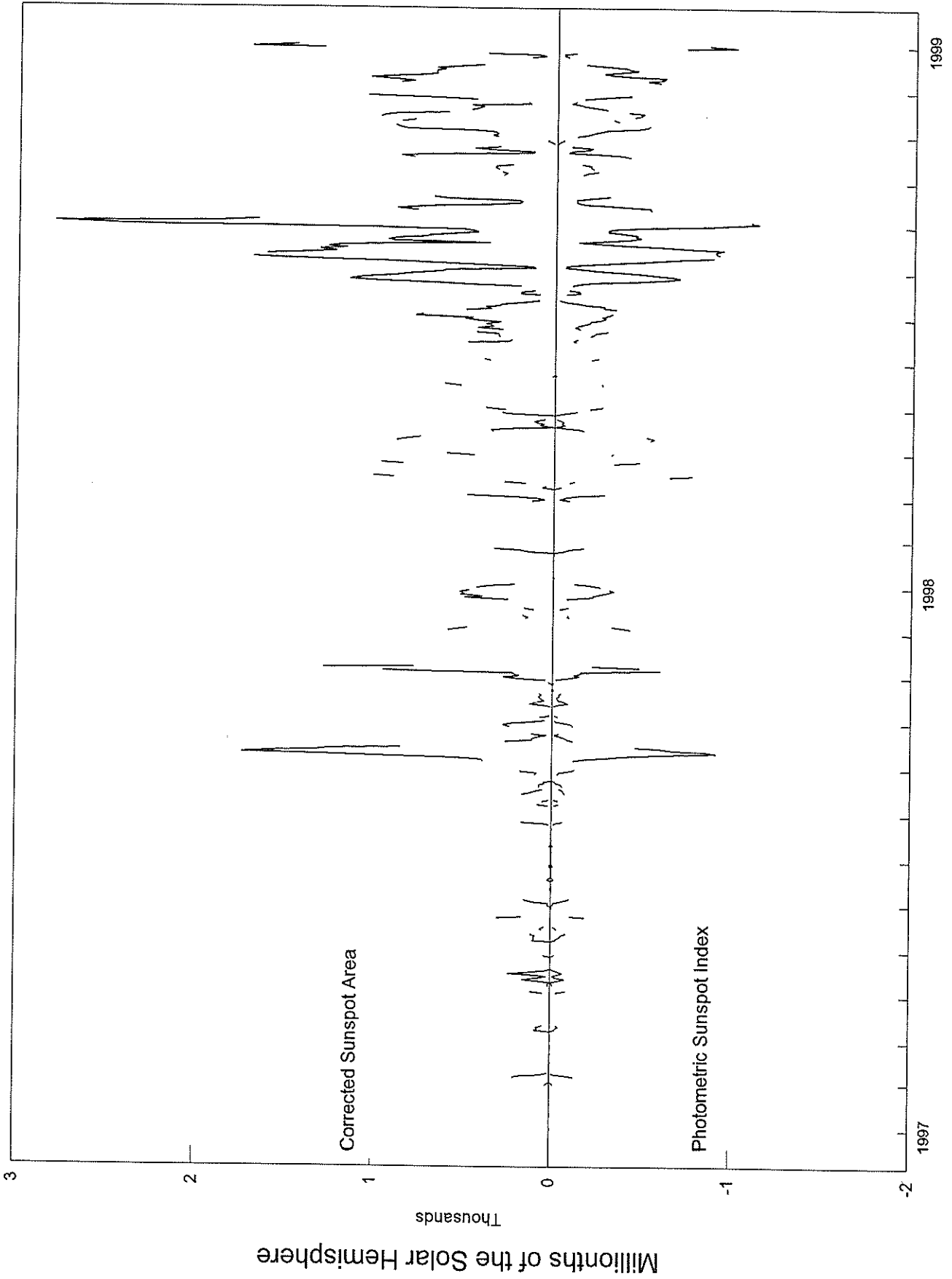


**SAN FERNANDO OBSERVATORY  
1998 SUNSPOT OBSERVATIONS**

WAVELENGTH 672.3nm

Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI	Date	Time (UT)	Hemi Area in Pixels (5" square)	Corr. Total Area (PPM)	Corr. Umbral Area (PPM)	Photo-metric Deficit (PPM)	PSI
1-Nov-98	19:44:36	223947.1	331.4	88.1	-137.5	-194.5	1-Dec-98						
2-Nov-98	20:12:57	224095	343.1	83.2	-168.3	-242.4	2-Dec-98	20:29:10	226907.6	1209.9	169.2	-385.6	-638.9
3-Nov-98	19:49:51	224268	453	74	-187.4	-274.6	3-Dec-98						
4-Nov-98	20:16:56	224243.4	836.4	148.2	-282.8	-447.6	4-Dec-98	20:27:22	227021.1	873.9	116.4	-343.1	-571.4
5-Nov-98	19:47:02	224492.4	872.7	134.9	-296.4	-502.3	5-Dec-98	20:08:02	227009.5	801.9	38.8	-260.7	-503.5
6-Nov-98	20:34:57	224500.9	905.1	128.3	-302	-516.8	6-Dec-98	20:36:20	227207	897.6	61	-298.5	-592.1
7-Nov-98							7-Dec-98	19:48:42	227126.2	1043.9	18.8	-282.9	-602.5
8-Nov-98							8-Dec-98	21:00:19	227153	920	0	-177.2	-409.5
9-Nov-98	20:34:06	224878.2	869.5	93.3	-201.1	-339	9-Dec-98	20:08:58	227097.6	742.9	0	-141.1	-302.5
10-Nov-98	20:12:59	225060.8	793.5	142.3	-202.3	-312.2	10-Dec-98	19:57:25	227598.7	676.4	47.6	-140.2	-259.8
11-Nov-98							11-Dec-98	19:44:42	227330.3	681	26.3	-185.1	-373.7
12-Nov-98	20:14:51	225320.1	987.7	140.1	-275.3	-432.9	12-Dec-98	20:19:41	227480	677.3	70.3	-237.7	-444.5
13-Nov-98	20:13:23	225285	972.9	172.6	-313.8	-469	13-Dec-98	19:51:39	227375.4	629.5	26.1	-190.8	-396.9
14-Nov-98	20:17:40	225395.5	893.7	159.9	-327.9	-481.6	14-Dec-98	20:27:26	227162.3	673.9	50.2	-194.7	-382.5
15-Nov-98	19:37:24	225522	607.4	144.3	-283.3	-393.5	15-Dec-98	18:47:42	227412.9	524	55.5	-139.6	-251.8
16-Nov-98							16-Dec-98	19:26:54	227564.9	411.6	24.6	-85.4	-154.4
17-Nov-98	22:20:14	225496.5	479.7	106.5	-198.4	-274.3	17-Dec-98						
18-Nov-98	20:03:50	225546.6	431.4	100.3	-150.7	-207.1	18-Dec-98						
19-Nov-98	21:15:06	225574.4	413.9	92.5	-106	-146.7	19-Dec-98						
20-Nov-98	20:49:47	225548.2	476	83.4	-79.3	-126.4	20-Dec-98						
21-Nov-98	20:10:01	226168.9	149.4	0	-38.2	-77.7	21-Dec-98	18:30:08	227913	145.4	0	-24.9	-59.7
22-Nov-98	20:02:11	226250.7	165.6	0	-52.7	-105.3	22-Dec-98	20:21:03	227855.4	69.1	0	-14.9	-37.1
23-Nov-98							23-Dec-98	20:00:56	227945.8	111.4	0	-12.7	-32.6
24-Nov-98	19:47:30	226488.7	455.4	48.6	-84.8	-150.1	24-Dec-98	17:55:19	227939.8	392.3	0	-47.9	-101.7
25-Nov-98	19:49:32	226388.1	666.3	55.1	-134.7	-247.3	25-Dec-98						
26-Nov-98	20:11:09	226441.6	1062.1	74.1	-234.4	-412.8	26-Dec-98						
27-Nov-98							27-Dec-98						
28-Nov-98							28-Dec-98	19:25:15	228120.8	1305.3	93.5	-368.4	-717.6
29-Nov-98							29-Dec-98	17:52:30	227904.5	1706.3	84.6	-492.7	-1000.7
30-Nov-98							30-Dec-98	21:44:35	227888.4	1454.1	81.3	-420.5	-846.1
31-Nov-98	20:10:03	226730.1	915.1	122.8	-306.3	-548.8	31-Dec-98	20:31:48	228139	1266.4	87	-366.7	-731.8

# Corrected Sunspot Area and Photometric Sunspot Index



## San Fernando Observatory Calcium II K-line Facular Data

The K-line data presented here were obtained from photometric images taken at the San Fernando Observatory (SFO) with a 2.5 cm telescope and photometer known as the Cartesian Full Disk Telescope No. 1 (CFDT1). The system and the method of acquiring these data are described more fully in Chapman, et al. (1992,1996). The filter used in these observations has a FWHM of 1 nm centered on the Ca II K-line (3934 nm).

Facular pixels in the K-line are determined by the following procedure. The quiet sun limb darkening is first removed from flattened images, then pixels having a contrast greater or equal to 4.8% are identified as facular. This value is approximately 3 times the standard deviation of the quiet sun near disk center. Since facular contrast is observed to increase toward the limb, the 4.8% criterion is increased as the inverse of  $\mu$  to compensate for this contrast increase.

The facular area is corrected for foreshortening and is in millionths of a solar hemisphere.

The various irradiance indices derived from the K-line images are as follows:

The index called PFIFX is the excess spectral irradiance in the K-line. The measured contrast of each facular pixel is weighted by the quiet sun intensity at that disk position and all such quantities for the solar disk are summed. This index should correspond to the spectral irradiance measured by a spacecraft in this band.

The remaining indices are for modeling variations in total solar irradiance. PFIF, PFIFA, PFIFB, and PFIFC differ in the assumed contrast of faculae at the center of the solar disk and are based on a simple center-to-limb variation in contrast. PFIFSOFIA is from Sofia, et al. (1982); PFIFOUK is from Foukal (1981); and PFIF2 is from Lawrence and Chapman (1988). These last three differ somewhat in their assumed center-to-limb variation.

In conclusion, for variations in spectral irradiance, use PFIFX. For variations in total irradiance, use of PFIF, PFIFA, PFIFB, PFIFSOFIA, or PFIFOUK is recommended.

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Foukal, P, in *Physics of Sunspots*, L.E. Cram and J.H. Thomas, eds. Sacramento Peak Obs., Sunspot, NM, p.391, 1981.

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Sofia, S., Oster, L., and Schatten, K.H., *Solar Phys.* **80**, 87, 1982.

**SAN FERNANDO OBSERVATORY**  
**1997 Ca II K-line Facular Data**

WAVELENGTH 3934nm

Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
1-Jan-97											
2-Jan-97											
3-Jan-97	20:35:00	228914.7	1067.9	150.7	21.9	16.1	10.3	7.9	39.3	23.9	13.3
4-Jan-97											
5-Jan-97											
6-Jan-97	22:31:30	228852.7	1421.9	237.2	15.3	5.1	-5.2	7.9	46.1	18.8	9.8
7-Jan-97											
8-Jan-97	19:32:15	228875.9	1299.9	185.5	22.6	14.8	7	8.8	46	25.4	13.6
9-Jan-97	19:42:30	228788.2	1290.5	167.9	27.3	20.5	13.7	9.5	47.7	27	16.8
10-Jan-97	22:32:25	228802.6	803.7	95.2	15.7	11.2	6.8	5.5	29	14.5	9.5
11-Jan-97											
12-Jan-97											
13-Jan-97											
14-Jan-97											
15-Jan-97											
16-Jan-97	20:16:00	228546.9	642.9	85.9	8.2	3.9	-0.4	3.8	21.2	5.2	6.4
17-Jan-97											
18-Jan-97											
19-Jan-97											
20-Jan-97											
21-Jan-97											
22-Jan-97											
23-Jan-97											
24-Jan-97											
25-Jan-97											
26-Jan-97											
27-Jan-97											
28-Jan-97											
29-Jan-97	19:50:00	228060.9	1170.5	206.7	8.9	-0.1	-9.1	5.9	36	5	8.3
30-Jan-97	18:25:56	228066.4	1077.9	190.3	6.9	-1.6	-10.2	5.1	32.6	4.8	6.2
31-Jan-97											
1-Feb-97	21:32:57	227870.5	1869.6	289.4	18.6	5	-8.7	10.1	59.5	13.3	15.1
2-Feb-97	18:08:00	227830.3	1518	254.7	16.4	5.6	-5.3	8.4	49.1	16.4	11.5
3-Feb-97	19:55:31	227728.7	1781.5	296.1	20.1	7.4	-5.3	10.1	58.1	22.9	13.3
4-Feb-97	21:33:30	227544.6	1843.1	299.1	25.8	13.6	1.5	11.3	62.1	23.5	18
5-Feb-97											
6-Feb-97	21:37:30	227414.3	1247.9	174.5	23.7	16.9	10	8.1	44.4	18.3	14.1
7-Feb-97											
8-Feb-97											
9-Feb-97											
10-Feb-97											
11-Feb-97	19:54:47	227148.5	395.2	52.3	4.5	1.7	-1.1	2.2	12.9	5	3
12-Feb-97											
13-Feb-97	18:48:30	226846	50.8	6.9	0.2	-0.2	-0.6	0.2	1.5	0	0.3
14-Feb-97	20:13:52	226996	532	76.9	2.4	-1.9	-6.3	2.3	15.6	-0.3	3.1
15-Feb-97											
16-Feb-97											
17-Feb-97											
18-Feb-97	19:42:15	226774.4	488.2	54.8	13.8	12	10.1	3.9	19.3	9.4	8.3

**SAN FERNANDO OBSERVATORY**  
**1997 Ca II K-line Facular Data**  
 WAVELENGTH 3934nm

Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
19-Feb-97	19:01:41	226415.2	343.6	38.8	6.8	5	3.3	2	12.1	3	3.8
20-Feb-97	21:16:30	226324.9	75	10.1	0.4	-0.3	-0.9	0.3	2.2	0	0.4
21-Feb-97	19:53:46	226320.9	52.9	6.9	0.3	-0.1	-0.5	0.3	1.6	0.1	0.3
22-Feb-97	20:37:21	226132.7	178.9	21.1	3.1	2.1	1	1.1	6.3	2.7	1.9
23-Feb-97	17:38:00	225824.8	194.3	20.9	5.3	4.5	3.8	1.5	7.6	3.8	3.2
24-Feb-97	22:20:42	225734.3	535.4	63.6	11.2	8.4	5.5	3.8	19.6	10	6.9
25-Feb-97	20:02:39	225931.4	1135.2	141	23.3	17.4	11.4	7.7	41.2	18.7	13.7
26-Feb-97	19:16:35	225715.3	1377.6	191	24.9	17	9	9.2	48.8	20.8	16.1
27-Feb-97											
28-Feb-97	18:59:59	225436.3	1781.8	267.5	28.2	17	5.8	11.6	61.7	28.3	18.6
1-Mar-97	21:22:32	225259.5	2167.7	329	30.9	16.6	2.4	13.5	73.8	36.1	19.4
2-Mar-97											
3-Mar-97	20:40:30	224923.8	1225.1	162.6	25.7	19.1	12.5	9.2	45.4	28.5	15.6
4-Mar-97	19:29:16	224987.2	725.7	93.2	15.6	11.8	8	5.5	27	15.6	9.8
5-Mar-97											
6-Mar-97	21:20:30	224867.8	472	53.6	9	6.5	3.9	3.1	16.8	5.4	5.8
7-Mar-97	19:33:17	224560	1678.1	180.3	43.2	36.5	29.8	11.2	63.3	19.3	23.7
8-Mar-97	20:50:44	224478.9	2575.4	319.9	65.8	54.6	43.4	20.4	99.5	53.9	40.6
9-Mar-97	19:12:41	224478.4	2994.1	464.6	57	39.8	22.7	21.3	108.3	63.4	35
10-Mar-97	19:53:00	224278.6	3215.2	598	38	15.4	-7.2	18.5	105.8	46.1	24.1
11-Mar-97											
12-Mar-97	19:24:13	224000.8	3459.8	700.5	12.4	-16.7	-45.8	14.5	99.8	-5	17.6
13-Mar-97											
14-Mar-97											
15-Mar-97											
16-Mar-97											
17-Mar-97	20:29:36	223546.7	1528.3	166.5	48.1	43.4	38.7	12.6	62.2	31.7	27.6
18-Mar-97	20:28:33	223397	323	47	3.4	1.2	-1.1	1.6	10.3	1.4	2.4
19-Mar-97	20:57:49	223163.2	299.9	40.6	3.4	1.3	-0.8	1.7	9.8	3.1	2.5
20-Mar-97											
21-Mar-97											
22-Mar-97	20:27:32	222827.8	291.3	40	2.7	0.5	-1.7	1.5	9.2	1.9	2.1
23-Mar-97											
24-Mar-97	22:44:00	222186.9	367.2	44.6	7.5	5.5	3.5	2.6	13.3	6	4.7
25-Mar-97	20:21:01	222365.3	483.4	65.8	5.3	1.9	-1.6	2.7	15.6	4.5	4
26-Mar-97	19:54:13	222234.5	308.5	42.8	3	0.7	-1.5	1.6	9.8	2.6	2.2
27-Mar-97	22:15:10	222161.9	283.6	37.4	3.1	1.1	-1	1.6	9.2	2.7	2.3
28-Mar-97											
29-Mar-97	19:18:30	221709.4	1487.9	203.4	32	24.2	16.4	11.2	55.3	31.3	20.1
30-Mar-97											
31-Mar-97											
1-Apr-97	20:03:08	221253.7	1446.9	268.4	9.1	-2.4	-13.9	6.8	43.7	6	8.2
2-Apr-97	19:23:25	221036.8	866.1	155.5	4.3	-2.7	-9.8	3.8	25.6	1.1	4.7
3-Apr-97											
4-Apr-97											
5-Apr-97											
6-Apr-97	19:27:00	220965.5	3590.3	528.4	69.5	49.3	29.1	25.4	130.1	74.1	42.2
7-Apr-97	18:49:01	220757.5	3085	497.6	41.3	20.9	0.5	17.8	102.7	33.9	27.1



**SAN FERNANDO OBSERVATORY**  
**1997 Ca II K-line Facular Data**  
 WAVELENGTH 3934nm

Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
27-May-97	21:12:52	215396	2098.8	321.4	35.3	22.7	10	13.3	73.3	37	20
28-May-97	19:14:00	215442.7	2880.8	439.7	52.6	36.1	19.6	19	102.2	46.3	32.1
29-May-97	20:42:08	215490.5	3113.7	477.6	57.2	39.2	21.1	21.4	111.3	57.8	35.6
30-May-97	18:33:28	215383.2	3200.9	499	57.7	38.9	20	21.9	114.2	64.8	34.6
31-May-97	19:15:58	215291.9	3716.6	578.8	61.6	38.8	15.9	24.6	130.2	69.5	37.7
1-Jun-97	17:12:00	215021.3	3503.4	555.7	55.4	33.3	11.3	22.8	121.6	63	34.4
2-Jun-97	20:32:30	215087.9	3705.5	620.1	46.4	20.9	-4.6	21.6	123	53.2	29.4
3-Jun-97	20:47:49	214915.1	2819.7	478.8	34.1	14.4	-5.3	16.4	93.2	42.8	21.1
4-Jun-97											
5-Jun-97											
6-Jun-97	18:25:30	215110.3	1547.4	200.7	37.9	30.8	23.6	12	59.3	35.3	22.4
7-Jun-97											
8-Jun-97											
9-Jun-97	19:17:00	214701.1	345	39.7	8.5	6.9	5.3	2.7	13.2	7.1	5.3
10-Jun-97	18:53:00	214792.7	486.8	60.2	9.9	7.2	4.5	3.6	17.9	11.2	6
11-Jun-97	19:13:00	214567.2	656.8	85.6	11.5	7.6	3.7	4.3	23.2	12.3	6.8
12-Jun-97											
13-Jun-97	19:08:37	214618.4	1473.3	222.6	20.2	10.3	0.4	9	49.8	25.1	12.2
14-Jun-97											
15-Jun-97	20:27:30	214256.1	1965.6	341.1	12.6	-3	-18.6	9.3	59.4	6.2	12.1
16-Jun-97	18:43:30	214421.5	2056.8	351.2	14	-2.1	-18.2	9.9	62.4	5.3	13.7
17-Jun-97	19:45:30	214259.8	1763.7	291.7	19.5	7	-5.6	9.7	57	16.7	13.9
18-Jun-97	19:12:01	214491.5	1872.8	302.8	25.9	13.4	0.9	11.5	63.4	30.5	16.4
19-Jun-97	19:02:30	214603.2	1246.1	176.2	25.9	19.2	12.5	9.2	46	27.8	15.8
20-Jun-97	20:05:31	214438.3	738.2	93.6	16.8	13.3	9.7	5.3	27.4	12.1	10.1
21-Jun-97	23:08:45	214591.7	316.5	40.7	5.3	3.4	1.5	2.1	11.1	5.3	3.4
22-Jun-97	19:29:30	214395.2	418.4	61.3	2.9	-0.4	-3.7	2	12.8	1.8	2.6
23-Jun-97	19:59:00	214327.7	782.1	130.8	6.3	0.3	-5.7	3.9	24.2	3.4	5.6
24-Jun-97	19:16:30	214271.8	820.3	141.6	6.9	0.7	-5.5	4.1	25.5	4.1	5.6
25-Jun-97	19:26:30	214254.4	1375.5	228.3	16.9	7.4	-2	7.9	45.4	17	11.3
26-Jun-97	20:20:02	214198.3	1359.2	205.4	22.1	13.7	5.2	9	47.6	27.1	13.2
27-Jun-97	18:36:00	214263.4	1354.2	218.5	27.3	19.8	12.3	9.9	49.7	30.4	16.5
28-Jun-97	19:09:30	214460	1253.9	177.2	29.1	23	17	9.4	47.2	24.8	17.7
29-Jun-97	19:49:30	214182.7	808.9	98.7	17.1	13.2	9.2	5	29.1	9.7	9.2
30-Jun-97	19:44:06	213989.7	772.3	100.9	13.8	9.2	4.7	5.1	27.3	12.4	8.6
1-Jul-97	19:19:30	214365.2	878	117.5	14.8	9.4	4.1	5.9	30.9	16.4	9.2
2-Jul-97	20:26:51	213945	896.1	121.9	14.5	8.9	3.3	5.9	31.3	16.5	9.1
3-Jul-97	19:26:00	214313.7	891.9	123	14.4	8.9	3.3	5.8	31	15.8	9
4-Jul-97	19:21:42	214228.5	598.1	86.2	8.1	4.1	0.1	3.6	20.2	9.7	5
5-Jul-97	19:26:33	214000.8	696	101.7	8.3	3.5	-1.4	4	23	10.2	5.2
6-Jul-97	19:37:30	214254.7	622.3	88.8	9.3	5.2	1.2	4	21.4	11.2	5.7
7-Jul-97	18:40:55	214290.4	704	92.1	13	8.9	4.9	4.9	25.3	13.8	8.2
8-Jul-97	20:01:30	214003.9	873.6	137.9	12.4	6.8	1.2	5.2	29.3	6.4	9.4
9-Jul-97	19:33:00	214379.8	897.2	139.1	10.5	4.4	-1.7	4.7	28.8	1.3	8.3
10-Jul-97	18:42:30	214295.8	716.9	135.4	4.2	-1.5	-7.3	3.3	21.5	2.7	3.9
11-Jul-97											
12-Jul-97	20:00:54	214220.6	521.5	78.5	8.1	4.9	1.6	3.4	18	7.6	5.6
13-Jul-97	19:13:00	214157.3	368.8	47.5	6.9	4.9	2.8	2.4	13.1	4	4.7





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Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
1-Sep-97											
2-Sep-97	19:47:38	216528.1	6698.8	983.1	148	113.7	79.3	50.9	251.2	158.9	88.4
3-Sep-97											
4-Sep-97	17:54:00	216869.4	5961.5	740.4	163.9	140.5	117.1	47.1	234.1	126.1	95.1
5-Sep-97	19:12:00	216619.6	3142.4	433.8	59.4	42	24.7	19.9	111.6	47.9	33.2
6-Sep-97	20:00:30	216891.8	2893.1	443.3	39.6	20.5	1.4	17.3	97	35.3	26.7
7-Sep-97	19:05:40	216851.6	3585.1	569.6	42.8	17.9	-7.1	20.7	117.8	42.4	29.9
8-Sep-97	19:08:31	217288.9	4592.3	692.6	68.3	39	9.7	27.9	156.3	64.5	42.5
9-Sep-97	21:03:15	217076	5434.7	779.1	91.3	58.3	25.2	35.9	190.4	92	57.9
10-Sep-97	18:03:30	217352.6	6315.5	989.9	97.4	57.4	17.3	40.8	217.7	100.2	64.4
11-Sep-97	17:28:00	217594.6	7086.3	1086	108.3	63.4	18.4	44.8	243.1	103.4	71.4
12-Sep-97	19:37:31	217524.1	6440.2	1035	102.9	63.1	23.3	39.8	222.1	98	61
13-Sep-97	20:54:59	217553.8	6950.5	1116	123.5	82.3	41	47.4	247.3	140.7	73.8
14-Sep-97											
15-Sep-97	19:51:00	218034.3	7347.5	1036	175.6	140.9	106.1	56.9	279.9	166.7	105.1
16-Sep-97											
17-Sep-97	18:47:30	217999.1	2994.5	477.3	43.3	24.4	5.4	16.9	100.3	26.4	27.6
18-Sep-97	19:50:30	218142.4	2084.6	395	15.1	-1.1	-17.4	10.1	64	14.3	11.8
19-Sep-97	19:15:35	218195.5	1665.9	300.9	18	6	-6	9.2	54.1	22.5	11.3
20-Sep-97	18:59:00	218518	1713.3	284.9	29.1	18.6	8.1	11.6	60.6	37.2	17
21-Sep-97	18:38:16	218959.6	1989.2	259	52	43.3	34.8	16.2	77.8	48.9	31.1
22-Sep-97	19:17:30	218909.6	3363.9	398.5	94.9	81.9	68.9	28	133.8	78.3	57
23-Sep-97	17:28:16	219113.2	3989.9	463	104.1	87.4	70.6	30.7	154.5	84.6	59.8
24-Sep-97											
25-Sep-97											
26-Sep-97											
27-Sep-97	19:19:46	219227	4253.2	638.6	53.5	24.2	-5.1	25.1	141.4	62.6	34.2
28-Sep-97	19:44:46	219480.3	4068.2	590.4	64.3	38.7	13.1	26.4	141.2	74.5	39.3
29-Sep-97	19:30:50	219668.2	3050.4	404.5	61.8	45.1	28.5	22.1	111.8	67.4	36.6
30-Sep-97	18:29:42	219909.6	1950.9	228.2	49.7	41.1	32.4	15.6	75.7	47.3	29.5
1-Oct-97	20:11:07	219706.5	793.7	78.2	23.5	20.7	17.9	6.7	32	18.2	14
2-Oct-97											
3-Oct-97	19:34:42	220155.3	1745.7	221.3	45.5	38	30.5	14.1	68	39.7	27.7
4-Oct-97	20:13:13	220474.7	2821.9	379	56.3	40.8	25.2	20.4	103.1	60.9	34.3
5-Oct-97											
6-Oct-97											
7-Oct-97	17:40:00	220415	3473.7	497.1	53	31	9	21.9	119.1	50.5	34.8
8-Oct-97	19:31:00	220891.1	4760	717.7	69.1	38.1	7.1	29.8	162.2	74.4	44.9
9-Oct-97											
10-Oct-97	20:57:21	221020	4249.6	608.6	59.1	30.8	2.5	26.2	144	72	36.2
11-Oct-97	19:48:00	221043.7	3774.3	529.2	65.3	42.6	19.9	25.2	133.3	72.1	39.1
12-Oct-97	19:39:16	221301.8	4038.4	551.7	83.4	61.6	39.8	29.8	148.8	89.2	51.1
13-Oct-97	19:34:30	221252.4	3387.6	431.8	75.5	58.6	41.7	24.8	126.2	66	45.6
14-Oct-97	19:29:05	221665	1964	282.5	36.9	25.9	14.9	12.6	69.8	32.5	20.5
15-Oct-97	19:00:35	221721.8	1640.9	237.3	28.4	18.5	8.6	11.2	58.1	33.3	17.1
16-Oct-97	17:34:30	221704.1	2016.7	275.6	40	28.8	17.7	14.4	73.4	42.1	24.1
17-Oct-97	19:43:30	222172.2	2535.9	326.4	58.3	46.1	33.9	18.7	95	46.5	35.6
18-Oct-97	18:11:16	222138.2	2974.4	422.4	61.4	45.9	30.4	20.2	107.9	45.6	37.1
19-Oct-97	17:54:16	222138.8	2106.2	332.5	24.3	9.5	-5.3	12	68.8	23.7	17.2



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1-Dec-97	20:35:36	226824.9	8545.4	1480	101.6	41.7	-18.2	49.3	281.2	116.7	66.1
2-Dec-97	19:34:47	226707.7	7706.3	1286	84.4	29.4	-25.7	42.7	249.4	79.9	59.8
3-Dec-97	20:39:30	226778.4	5882.4	965	55.7	12.1	-31.4	30.9	186.5	53.7	40
4-Dec-97											
5-Dec-97											
6-Dec-97											
7-Dec-97											
8-Dec-97											
9-Dec-97	19:47:30	227304.8	2173.5	334.9	33.5	19.6	5.7	13.9	75	39.3	20.3
10-Dec-97											
11-Dec-97	20:22:07	227521.7	2174.3	310.8	34.9	21.3	7.6	14.3	75.7	40.3	21.6
12-Dec-97											
13-Dec-97											
14-Dec-97											
15-Dec-97	20:16:31	227374	2160.2	288.1	46.6	35.5	24.4	15.6	79.9	42.1	28.2
16-Dec-97	20:34:00	227483	1772.5	243.7	27.5	16.4	5.4	10.7	60.7	25	16.4
17-Dec-97											
18-Dec-97											
19-Dec-97	19:21:29	227816.8	1260.6	195.6	11.8	2.4	-7	6.7	39.9	11.5	8.7
20-Dec-97											
21-Dec-97											
22-Dec-97	20:12:59	227877.3	1585	178.2	43.3	36.8	30.4	13.1	62.6	38.1	26.1
23-Dec-97	21:14:50	227931.4	2371.1	312.3	54.7	43	31.2	18.4	89.8	56.6	32.9
24-Dec-97	19:41:10	228273	4035.4	617.1	66.1	41.3	16.5	25.8	140.6	73.4	38.1
25-Dec-97	19:56:41	228331.6	5381.6	837.7	76.5	41.5	6.5	32.2	181.5	67.9	49.7
26-Dec-97	18:36:50	228129	5896	978.8	71.1	30.2	-10.6	33.8	193.6	64.8	49.9
27-Dec-97	21:22:08	228116.8	7117.3	1210	78.2	27.4	-23.5	39.6	230.8	80.1	53.8
28-Dec-97	20:32:00	228378.4	5993.8	972.1	75.8	34.7	-6.4	35	199.2	86.8	47.4
29-Dec-97											
30-Dec-97	20:28:28	228286	6413.3	955.7	112.2	74	35.8	43.2	226.8	115.2	70.4
31-Dec-97	22:39:45	228363.2	5475.4	767.1	108.2	78.4	48.7	36.9	197.4	93.5	63.6

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1-Jan-98	20:05:45	228425.9	3898.5	591.3	68.8	45.8	22.7	25.9	138	73.8	40.3
2-Jan-98											
3-Jan-98											
4-Jan-98											
5-Jan-98	19:39:30	228329.2	1280.6	159.5	26.7	19.9	13.1	9.3	47.2	26.5	16.3
6-Jan-98	22:05:30	228315.8	1157.8	156.1	20.7	13.9	7	7.7	41.1	21.9	12.2
7-Jan-98											
8-Jan-98											
9-Jan-98											
10-Jan-98											
11-Jan-98											
12-Jan-98											
13-Jan-98	19:12:45	228326.5	2216.2	334.2	23.4	7.3	-8.7	12.1	71.4	23.1	16.3
14-Jan-98											
15-Jan-98											
16-Jan-98	23:06:59	228026.5	3611.7	508	68.4	47.9	27.3	25.3	130.1	70.7	42.3
17-Jan-98											
18-Jan-98											
19-Jan-98											
20-Jan-98											
21-Jan-98	21:39:10	227922.3	3141.5	492.8	39.4	17.7	-4	18.5	104.4	47.3	24.8
22-Jan-98	19:58:30	227745	2835.8	423.6	35.7	16.4	-3	16.3	93.8	33.9	23.6
23-Jan-98	20:55:52	227917.5	4717.8	684.3	73.8	44.6	15.4	28.8	161.5	58.3	47.3
24-Jan-98	19:51:16	227853.6	5133.7	740.6	77.3	44.6	11.9	31.7	175.4	74.2	49.1
25-Jan-98	19:46:00	227861.3	7125.6	1020	133.3	92.3	51.4	49.6	256.1	143	81
26-Jan-98											
27-Jan-98	21:59:20	227864.7	4866.6	683	87.2	58.6	30	32.9	173	92.3	52.8
28-Jan-98											
29-Jan-98											
30-Jan-98	19:32:05	227628.3	5149.1	859.2	75.8	42.3	8.8	32.4	176.4	91.4	46.1
31-Jan-98											
1-Feb-98											
2-Feb-98											
3-Feb-98											
4-Feb-98											
5-Feb-98											
6-Feb-98											
7-Feb-98											
8-Feb-98											
9-Feb-98	19:51:41	226910.9	1164.7	162.1	11.7	3.2	-5.3	6.3	37.3	11.5	8.5
10-Feb-98											
11-Feb-98	22:01:46	226742.1	2126.3	277.8	41.2	29.6	18	14.1	76	30.7	25.4
12-Feb-98											
13-Feb-98											
14-Feb-98											
15-Feb-98	18:51:00	226336.1	4198.7	673.2	61.1	33.8	6.6	26.1	143	63.4	39.7
16-Feb-98											
17-Feb-98											
18-Feb-98	20:02:00	225996.3	6437.9	1054	86.8	43.5	0.3	39.1	216.7	101.3	54.8





**SAN FERNANDO OBSERVATORY**  
**1998 Ca II K-line Facular Data**  
 WAVELENGTH 3934nm

Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
27-May-98	19:00:50	215052.9	4886.5	598.9	127.7	107.4	87.2	37	188.4	89	75.3
28-May-98											
29-May-98											
30-May-98	19:55:05	214883.7	4579.9	680	72.8	44.3	15.9	28.7	158.2	73.1	43.6
31-May-98	20:07:54	214726.3	5154.3	761	90	59.3	28.6	34.5	182.1	93.2	55.5
1-Jun-98	19:12:00	214942.1	5171.2	797.2	86	54.3	22.5	34.2	181.3	96	52.7
2-Jun-98											
3-Jun-98											
4-Jun-98											
5-Jun-98	18:31:30	214575.8	9093.4	1348	181.7	132	82.2	64.6	331	177.9	111.5
6-Jun-98											
7-Jun-98											
8-Jun-98											
9-Jun-98											
10-Jun-98											
11-Jun-98											
12-Jun-98											
13-Jun-98	21:26:43	214214.7	7281.8	1011	123.4	79.7	35.9	47.1	254.6	116.5	76.1
14-Jun-98	21:16:00	214204.5	7017.3	983.7	121.2	79.3	37.3	46.5	247.2	123.8	74.4
15-Jun-98	19:19:00	214033.6	6702.7	950.5	111.7	70.4	29.2	44.5	235.3	130.2	67.4
16-Jun-98											
17-Jun-98	21:39:30	213874.4	6802.1	1046	96.6	52.1	7.7	41	229.9	96.1	60.8
18-Jun-98	17:23:00	214030	6654.5	1051	90.2	45.9	1.6	39.9	223.1	86.3	60.6
19-Jun-98	20:30:00	214032.4	6277.9	970.6	93.9	53.7	13.4	39.4	214.6	92.6	61.5
20-Jun-98	21:13:37	213973.7	6064.4	871.2	110.9	75.9	40.9	40.7	215.9	107.3	67.3
21-Jun-98											
22-Jun-98	18:39:30	213962.9	4312.6	583.4	93.4	71.2	48.9	31.9	160.2	91.3	56.6
23-Jun-98	21:23:10	213741	4084.2	477.6	112.3	96.8	81.2	30.5	158.9	71.9	63.1
24-Jun-98	20:28:32	213829.3	3627.6	469.1	93.9	78.4	62.9	28.4	140.4	76.4	56.1
25-Jun-98	20:42:31	213853.9	4154.7	623.3	89.2	67.6	46	30.7	154.2	90	53.5
26-Jun-98	17:52:00	213931.9	3953.1	609.9	70.5	47.3	24	26.4	140.3	75.1	41.5
27-Jun-98	19:19:00	213657.7	6471.1	1072	101.3	60.8	20.2	41.1	223.1	99	65
28-Jun-98	17:55:30	213966.1	8798.2	1317	159.5	109.4	59.4	55.9	309.5	118.7	96.7
29-Jun-98	18:50:30	213950.1	12094.3	1861	225.7	157.3	88.9	81	430.8	188.9	141.7
30-Jun-98	20:06:30	213543.8	13142.4	2075	235.2	157.8	80.4	89.4	467.3	248.9	144.2
1-Jul-98	19:20:00	213913.3	12623.8	2029	204	125.2	46.4	82.7	440.5	241.2	122.8
2-Jul-98	19:06:30	213875.7	12295.3	1924	204.8	130	55.3	79.4	429.1	202.8	125.8
3-Jul-98											
4-Jul-98											
5-Jul-98	20:58:00	213553.1	12089.5	1916	191.1	115.4	39.8	76.9	418.1	201.5	117
6-Jul-98	18:55:36	213855.4	12298	1962	206.8	132.3	57.9	80.2	430.1	203.9	128.8
7-Jul-98	17:19:00	213706.2	11106.6	1693	208.2	144.9	81.7	76.8	397.9	194.2	132.9
8-Jul-98	19:01:00	213893.7	8608.1	1242	159.3	110.5	61.6	56.6	305.8	138.7	95.3
9-Jul-98	18:46:46	213900	6843	1001	123.6	83.6	43.6	46.3	243.7	131.1	74
10-Jul-98	19:27:52	213723.8	6334.2	887.7	128.5	94.4	60.3	44.6	230.9	121.8	77.1
11-Jul-98	18:42:00	213852.6	6893	880.7	167.3	135.8	104.3	52	261.9	133.1	101.1
12-Jul-98											
13-Jul-98	18:30:01	213752.1	7227.5	1124	117.8	72.9	28	47.4	252.5	136.8	70.8

**SAN FERNANDO OBSERVATORY**  
**1998 Ca II K-line Facular Data**  
 WAVELENGTH 3934nm

Date	U.T.	Hemirearea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
14-Jul-98	17:43:27	213979.8	7614.1	1249	91.9	38.9	-14.2	44	251.1	103	59.9
15-Jul-98	20:17:30	213593.8	7766.2	1351	78.9	22.4	-34	41.6	248.2	71	56.5
16-Jul-98	17:51:51	214074.7	8213.3	1343	98.7	42.1	-14.4	45.5	268.3	78.2	67.2
17-Jul-98	20:10:00	213906.4	8023.2	1277	105.6	51.4	-2.9	47.8	268.3	113.6	68.4
18-Jul-98	20:00:30	213896.8	7178.6	1086	116.8	72.1	27.4	47.4	250.8	136.8	71.1
19-Jul-98											
20-Jul-98											
21-Jul-98	20:18:30	214176.4	4929.1	646.9	110.2	85.4	60.6	37	184.5	106.1	66.7
22-Jul-98	22:00:30	214217.1	5198.1	700.8	104	75.7	47.3	36.3	189	101.7	61.6
23-Jul-98	20:19:30	214124.7	6532.1	912.7	122.4	85.6	48.7	43.8	233	106.5	75.4
24-Jul-98	21:53:00	214309.4	6940.8	1038	104.9	60.6	16.3	43.7	237.7	103.1	68.5
25-Jul-98	19:22:00	213972.7	6539.8	980.8	85.5	41.1	-3.2	39	218.4	92.1	55.8
26-Jul-98	16:52:30	214036	7281.2	1115	101.1	52.9	4.7	44.2	245.7	107.4	64.4
27-Jul-98	20:31:30	214087.4	7894.9	1187	120.9	70.6	20.4	50.3	271.6	127.2	77.3
28-Jul-98	20:07:00	214022.7	8819	1254	149.9	96.7	43.5	57.9	309.5	153.1	91.9
29-Jul-98	20:05:00	214262.8	9609.1	1386	180.4	125.6	70.7	66.3	345	185.4	109.1
30-Jul-98	19:59:00	214321.3	9152.5	1330	173.3	121.2	69.1	63.7	329.6	182.4	104.7
31-Jul-98	20:31:40	214278.1	8770.6	1261	158.5	107.4	56.2	59.5	312.1	161.1	97.3
1-Aug-98	20:36:49	214322.7	8324.9	1159	152.5	104.8	57.1	55.4	295.6	133.3	94.9
2-Aug-98	17:45:35	214560.9	7003.8	983.7	117.8	76	34.2	43.7	243.2	96.6	71.7
3-Aug-98	19:48:30	214437.1	6991.8	1027	102.6	57.7	12.7	42.5	237.4	95.1	65.4
4-Aug-98	19:24:32	214658.3	7270.2	1067	105.6	58.6	11.6	44.8	246.7	97.5	70.6
5-Aug-98	20:29:45	214639	6416	939.6	107.1	67.8	28.5	42.6	224.9	116.1	67
6-Aug-98	18:48:40	214879.3	6631.2	891.7	138.4	103.2	68.1	48	243.9	134.3	83.9
7-Aug-98	19:58:15	214709.4	7729.7	1039	167.7	128.4	89.1	55.2	285.6	147.2	99.1
8-Aug-98	20:57:50	214781.2	10034.1	1384	212.2	160.3	108.5	70.2	367.8	178.9	126
9-Aug-98	17:25:10	215037.8	11406.5	1726	218.6	154.8	90.9	78.5	410.3	205.2	134.1
10-Aug-98											
11-Aug-98	19:33:56	215128.2	12796.9	2090	200.1	119.3	38.5	82.5	442.5	217.4	126.3
12-Aug-98	18:49:45	215266.6	14654.2	2449	239.1	149.5	59.9	93.6	508	211.7	154.2
13-Aug-98	18:50:45	215318	12227.6	1932	190.1	114.6	39	73.4	416.8	132.9	122.8
14-Aug-98	19:02:15	215432.4	8464.9	1380	106.5	49	-8.6	48.1	279.1	90.5	71.6
15-Aug-98	18:15:45	215570	7531.1	1215	107.7	58.3	9	46.6	255.9	118.2	68.4
16-Aug-98	17:48:30	215663.2	8151.3	1242	150.7	103.5	56.3	56.3	292.3	165.1	90.3
17-Aug-98	21:18:30	215729.4	8230.5	1089	200.7	162.7	124.7	63.8	314.6	179.2	121.2
18-Aug-98	20:49:40	215284.8	8083.6	1032	194.8	157.6	120.4	60.6	306.5	157.6	116.4
19-Aug-98	19:58:15	215561.7	7536.6	987	167.8	131.1	94.3	51.8	278.1	125.1	95.6
20-Aug-98	19:17:40	215794.6	7699.6	1125	141	96.9	52.8	51.2	273.2	120.5	88.1
21-Aug-98	19:36:00	215741.2	9862.9	1518	178.9	121.9	64.9	66.2	350	163.2	112.4
22-Aug-98	19:33:33	215917.2	11056.6	1761	191	124.7	58.4	73.8	389.8	197.9	118.7
23-Aug-98	18:32:16	216256.3	11881.2	1850	204.1	132.8	61.4	78.8	418.3	213.7	124.9
24-Aug-98	20:33:40	215873.3	11479	1830	178.1	105.3	32.6	73.7	396.3	194.6	112
25-Aug-98	18:52:30	216315.5	10277.1	1698	139.7	71.3	2.8	61.7	345	139.5	91.8
26-Aug-98	19:10:30	216268.6	10059.5	1668	113.5	42.6	-28.3	55.5	326.1	96	79.9
27-Aug-98	18:31:15	216543.2	10575.4	1813	116.3	41	-34.4	58.9	342.3	105.9	84.1
28-Aug-98	19:29:30	216376.7	10164.1	1671	128.3	59	-10.3	59.3	336.2	116.5	89
29-Aug-98	20:09:31	216592.8	9582.4	1467	148	87.8	27.5	59.9	328.8	137.1	94.9
30-Aug-98	17:48:20	216871.3	9376.4	1335	186.5	135.7	84.9	64	339	162.8	111.4
31-Aug-98	19:32:45	216607.1	9249.6	1227	202.3	155.1	107.8	68.3	344.1	194.9	121.7



**SAN FERNANDO OBSERVATORY**  
**1998 Ca II K-line Facular Data**  
 WAVELENGTH 3934nm

Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
1-Sep-98	19:17:30	216891.7	10231.9	1330	234.5	184.6	134.7	76	384.2	211.3	139.3
2-Sep-98	19:21:35	217159.4	8662.5	1195	165.2	116.6	68	58.9	311.1	159.6	97.9
3-Sep-98	20:52:45	216976	7012.9	1082	95.9	49.1	2.2	42.5	236.4	110.6	59.4
4-Sep-98											
5-Sep-98											
6-Sep-98											
7-Sep-98	17:41:10	217536.5	12884.5	2009	232.2	156.7	81.1	87.6	458.8	247.6	140.6
8-Sep-98	19:46:30	217814.8	13856.2	2177	215.5	129.3	43.2	85.2	474	169	141.2
9-Sep-98	20:44:30	217686.6	12243	2022	140.4	54.6	-31.2	68.6	397.6	105.5	105
10-Sep-98	20:27:52	217735.2	12822.7	2314	115.6	19.6	-76.5	66.9	403.8	104.7	88.4
11-Sep-98	20:58:00	218047.7	13612.5	2391	151.1	53.8	-43.4	76.2	442.9	171.8	99.5
12-Sep-98	20:12:34	218084.5	12496.5	2136	174.2	91.4	8.6	76.5	422.5	192.5	110.8
13-Sep-98	17:44:45	218220.8	11348.1	1803	203.4	136.9	70.4	77	402.9	199.9	128.3
14-Sep-98	20:02:15	218266.2	9951	1496	198.6	144.3	90.1	69.5	361.2	184.8	120.5
15-Sep-98	19:55:11	218445.8	7330	1165	130.1	86.8	43.5	48.9	259.9	139.8	76.4
16-Sep-98	19:31:30	218413.5	6710.4	1008	124.5	85.9	47.3	46.6	240.3	124	78.7
17-Sep-98	19:12:01	218578.7	7624.8	1051	154.8	114.1	73.5	53.3	276.7	120.4	99.4
18-Sep-98	19:34:00	218637.3	8027	1029	173.7	133.6	93.5	54.6	294	127.2	100.6
19-Sep-98	18:00:00	218738	9544.6	1330	185.7	132.6	79.5	66.4	345	181.8	112.4
20-Sep-98											
21-Sep-98											
22-Sep-98											
23-Sep-98											
24-Sep-98											
25-Sep-98											
26-Sep-98											
27-Sep-98											
28-Sep-98	19:15:01	219859.9	9555.9	1325	207.5	158.3	109.1	70.5	355.1	203.5	124.6
29-Sep-98											
30-Sep-98	21:42:14	220580.7	7460.3	1140	129.7	85	40.4	50.2	263.5	134.2	81.5
1-Oct-98	19:58:31	220183.8	7240.7	1047	131.1	88.9	46.7	49.2	257.8	134.5	80.2
2-Oct-98											
3-Oct-98											
4-Oct-98	17:37:49	220807.5	6950.9	954.4	127.2	86.8	46.5	48.1	248.4	131.3	79.8
5-Oct-98	19:43:15	220628.1	6838.1	1007	90.8	44.9	-1.1	40.7	228.6	91.5	59.6
6-Oct-98	0.895451	221153.7	8074.5	1260	98.7	43	-12.7	46.6	265.9	93.1	68.3
7-Oct-98											
8-Oct-98	19:03:31	221281.2	10225.3	1597	139.5	72.1	4.7	60	341.8	115.4	93.3
9-Oct-98	18:51:41	221617.2	10094.5	1626	136.4	68.8	1.2	60.9	339	144.5	88.9
10-Oct-98	19:58:03	221445.1	9202.9	1482	131	70.4	9.9	57	312.6	147.5	82.7
11-Oct-98	19:01:31	221415	8611.1	1352	137.2	83.4	29.6	55.8	298.6	143.3	87.2
12-Oct-98											
13-Oct-98	18:24:30	221844.8	6607.8	959.3	107.9	67.5	27.1	41.8	229.1	101.2	66.2
14-Oct-98											
15-Oct-98											
16-Oct-98	19:27:30	222132.1	8703.9	1221	162	111.9	61.9	60	312.1	169.5	98.1
17-Oct-98	20:12:33	222542.4	9996.8	1453	186.1	128.8	71.5	68.6	358	186.7	113.8
18-Oct-98	18:59:00	222594.8	9444.8	1385	162.3	105.9	49.6	61.7	331.3	150.7	101.8
19-Oct-98	20:29:00	222546	8665.1	1332	117.9	60.4	3	51.4	290.3	109.2	77.5

## SAN FERNANDO OBSERVATORY

## 1998 Ca II K-line Facular Data

WAVELENGTH 3934nm

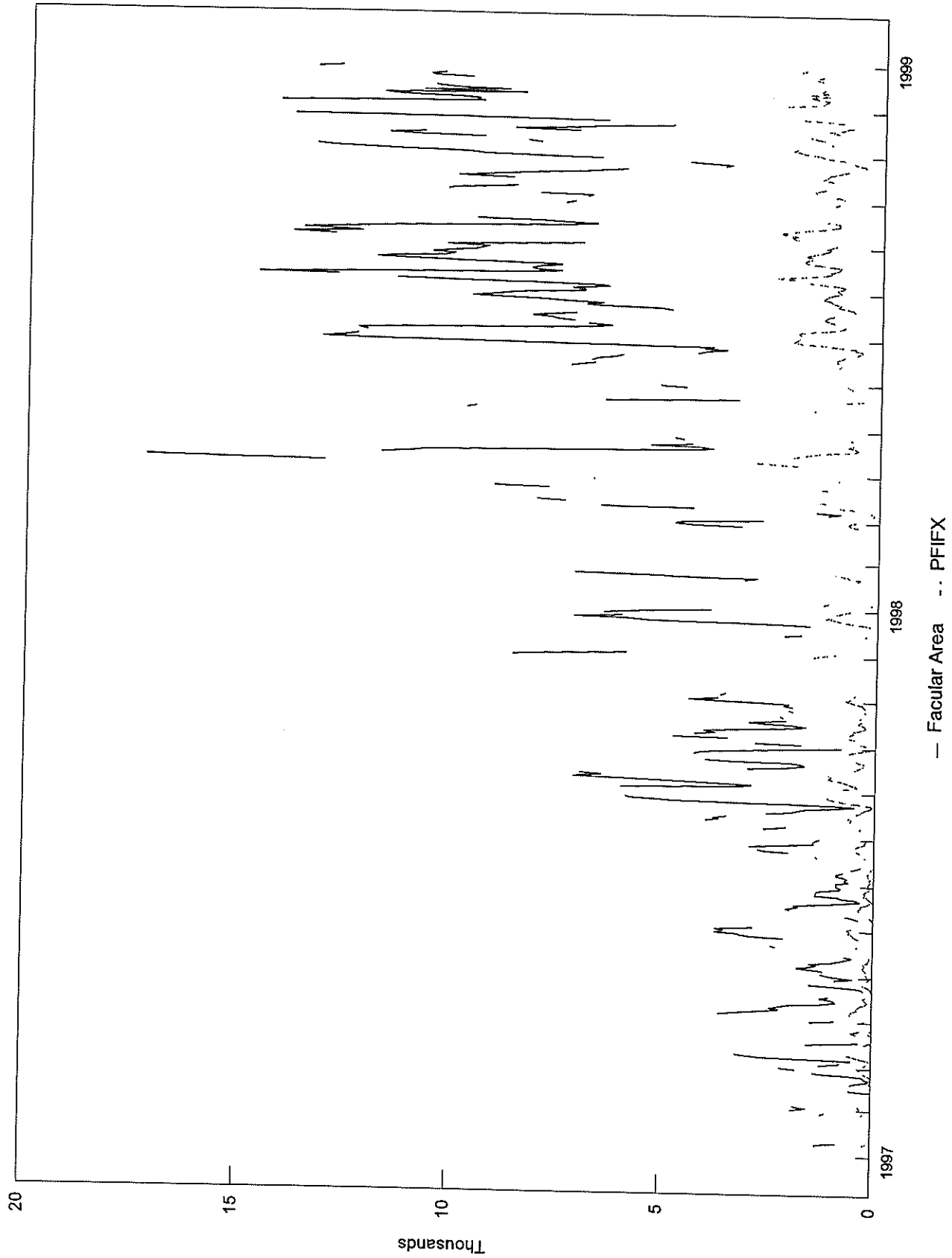
Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
20-Oct-98	19:14:30	222974.8	8039.6	1289	95.2	39.4	-16.5	44.7	262.7	88.4	62.3
21-Oct-98	19:16:30	223089	7051.4	1110	86.3	37.6	-11.2	40.9	232.5	85.3	59.2
22-Oct-98	19:07:31	223096.4	6569	988.6	101.9	60.5	19	42	226.3	101.6	66.5
23-Oct-98	20:23:50	223163.7	6027.8	832.5	118.6	85.4	52.3	41.7	218	111	71.3
24-Oct-98											
25-Oct-98	17:28:00	223156.2	3746.1	451.6	92.9	76	59	29.1	143.8	84.2	54.9
26-Oct-98	21:39:16	223486.1	3578.4	447.3	83	65.7	48.3	27	135	76.8	49.6
27-Oct-98	20:16:15	223803.4	4135.3	613.1	71.1	46	21	27.9	146.2	81.9	43
28-Oct-98	20:36:31	223833	4562.1	736.8	60.7	29.9	-1	27.5	153.2	71.9	38
29-Oct-98											
30-Oct-98	20:20:00	224090.4	6634	954.8	114.9	76	37.1	42	231.5	86	72.7
31-Oct-98	20:46:58	224226	8106	1221	147.5	100.6	53.6	55	288.2	136.3	94.2
1-Nov-98	20:03:00	224364.1	9392	1438	166.6	111.1	55.5	63.5	333.3	177.7	101.4
2-Nov-98	20:54:41	224551.9	9752.4	1549	142.8	79.3	15.9	61.1	333.2	163.2	88.9
3-Nov-98	20:11:29	224579	11226.5	1873	143.8	67.7	-8.3	64.8	371.8	130.5	95.8
4-Nov-98	20:37:00	224675.8	12101.9	1967	159.1	78	-3	70.6	402.3	134.4	108.6
5-Nov-98	20:07:30	224845.6	12980.9	2149	185.3	100.5	15.6	79.5	439.9	188.3	119.6
6-Nov-98	20:50:30	224899	13341.9	2059	226	145	64	88.7	469	245.3	138.8
7-Nov-98											
8-Nov-98											
9-Nov-98	20:49:30	225232.3	8062.9	1239	120.3	69.6	19	47	272.4	84.6	75.9
10-Nov-98	20:28:29	225475.2	8387.7	1297	123.7	70.1	16.6	50.7	284.2	99.1	82
11-Nov-98											
12-Nov-98	20:39:01	225532.5	9402.6	1435	179.4	126.1	72.9	65.7	339.1	185.4	109.4
13-Nov-98	20:32:20	225679.3	10785.5	1562	219.8	161.8	103.8	76.6	393.9	208.3	133.7
14-Nov-98	20:33:35	225813.2	11639.2	1742	211.9	144.8	77.7	77.8	413.3	194.4	131.1
15-Nov-98	19:59:30	226003.7	10787.9	1756	158.8	89	19.3	67.2	368.1	166.8	101.3
16-Nov-98											
17-Nov-98	22:32:20	225871.5	7171.5	1098	95	46.4	-2.1	43.2	240.6	111.4	60
18-Nov-98	20:22:30	225864.9	8682.3	1338	148.3	96.1	43.9	57.1	304.8	147.2	92.1
19-Nov-98	21:09:56	226016.9	7281.3	1005	150.2	111.5	72.8	51.9	266.4	137.2	92.2
20-Nov-98	21:05:45	226059.4	6540.6	886.9	138.6	104.3	70.1	47.2	241.2	133.2	82.6
21-Nov-98	20:25:58	226636	4996.1	712.6	96.1	68.1	40.1	34.4	180.1	96.2	56.9
22-Nov-98	20:22:01	226637.4	4952	716.8	86.5	57.5	28.5	31.6	173.6	73.9	52.5
23-Nov-98											
24-Nov-98	20:05:30	226755.3	6504.4	992.7	110.1	70.8	31.6	42.6	227.9	109.8	68.2
25-Nov-98	20:16:31	226860.4	8812.4	1266	174.5	126.3	78.1	60.9	319.2	164.6	103.7
26-Nov-98	20:31:30	226883.8	13873.3	1970	294.4	222.2	150	99.4	511	272.7	175.6
27-Nov-98											
28-Nov-98											
29-Nov-98											
30-Nov-98	20:26:40	227261.8	18261.6	3293	194	62.6	-68.7	99.2	587.9	184.5	134.5

**SAN FERNANDO OBSERVATORY**  
**1998 Ca II K-line Facular Data**

WAVELENGTH 3934nm

Date	U.T.	Hemiarea (pixels)	Fac Area (ppm)	PFIFX (ppm)	PFIFA (ppm)	PFIFB (ppm)	PFIFC (ppm)	PFIF2 (ppm)	PFIF (ppm)	PFIFOUKAL (ppm)	PFISOFIA (ppm)
1-Dec-98											
2-Dec-98	20:49:30	227131.6	20516.2	3372	314.4	184.3	54.2	129.1	704.6	317.3	199.3
3-Dec-98											
4-Dec-98											
5-Dec-98	20:43:32	227509.7	14207.3	2311	225.2	136.8	48.4	90.3	490.5	214.5	144.1
6-Dec-98	20:29:30	227209.2	9422.6	1495	130.9	69.4	7.9	55.2	315.4	100.1	87.8
7-Dec-98	20:53:15	227551	9605.3	1453	145.8	85.2	24.6	58.3	327.5	126.6	91.9
8-Dec-98	20:09:30	227482.7	9527.7	1423	156.5	98	39.5	61.4	332	164.4	94.5
9-Dec-98	20:52:00	227606.4	10004.9	1330	203.5	149.4	95.2	71.7	366.1	204.5	123
10-Dec-98	20:29:30	227607.4	11306	1593	228.9	167.6	106.4	81	412.7	218.6	142.3
11-Dec-98	20:14:10	227959.4	11768.7	1761	212.9	145	77.1	77.7	416.6	188.1	131.1
12-Dec-98	20:01:03	227589.4	8436.9	1348	110.3	53.3	-3.7	49.7	281.3	113.1	71.5
13-Dec-98	20:36:40	227914.9	10830.3	1771	142.6	69.6	-3.3	63.7	361.4	145.4	91.6
14-Dec-98	20:09:01	228027.5	8833.5	1379	128.1	70.3	12.6	55.1	301.3	149.4	78.9
15-Dec-98	20:43:30	227537.2	10004.7	1507	174.8	115.1	55.4	66.7	354	194.6	102.5
16-Dec-98	19:06:00	227869	10500.7	1452	220.5	165.2	109.8	75.7	386.6	213.2	132.3
17-Dec-98	19:47:30	228022.3	10565.5	1461	231.9	178.2	124.5	78	393	213.9	141.7
18-Dec-98											
19-Dec-98											
20-Dec-98											
21-Dec-98											
22-Dec-98	18:47:00	228241.7	9702.8	1505	143	80.3	17.5	60.5	331.4	155.2	89.9
23-Dec-98	20:42:31	228279.5	10567.5	1616	168.9	103	37	68.4	366.9	181.5	105.5
24-Dec-98	20:21:00	228248.7	10684.6	1608	173.4	107.5	41.5	68.7	371.3	177.6	107.1
25-Dec-98	18:13:01	228260	10337.5	1464	172.5	109.7	47	66.8	360.8	169	106.3
26-Dec-98											
27-Dec-98											
28-Dec-98	19:42:30	228524.5	13326.4	2003	210	126.2	42.5	85.5	461.3	230.7	129
29-Dec-98	18:10:00	228299.6	12752.1	1857	215.3	138.1	60.8	83.8	447.2	223.2	132.7
30-Dec-98											
31-Dec-98	20:46:00	228607.1	12242.4	1818	195.9	119.3	42.8	79.5	425.7	222.2	119.5

# Facular Area and PFIFX



Millionths of the Solar Hemisphere



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The ICSU Panel on WDCs has recommended that it would be appropriate courtesy to acknowledge in publications that data were obtained from the originating station or investigator through the intermediary of the WDCs. The following statement is suggested:

"Data used in this study were provided by WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder Colorado 80303, USA."