

Space Weather Highlights
17-23 May 1999

Solar activity ranged from low to moderate levels. Activity was at moderate levels on 17 May with an optically uncorrelated M2 at 17/0455UT and a M1 at 17/2202UT. The remainder of the period was at low levels with numerous C-class flares. The most impressive of these was a long duration C2 flare at 21/1949UT which was also optically uncorrelated. LASCO/SOHO images showed a partial-halo CME event during this period which may have been associated with Region (N36, L=098, class/area Hkx/360) on 22 May.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Early in the period solar wind velocity rose from 325 to 720 km/sec, densities increased to 65 p/cc and IMF Bz was between plus and minus 20 nT. Velocities and density remained elevated until 19 May and then decreased to background levels for the remainder of the period. This activity was likely related to a shock preceding coronal hole influences.

There were no significant proton enhancements detected at geo-synchronous altitudes.

The greater than 2 MeV electron flux at geo-synchronous altitude reached moderate to high levels during 21-23 May.

The geomagnetic field was disturbed during 18 May with active levels at middle latitudes and minor to major storm levels at high latitudes. The disturbance was related to recurrent coronal hole effects. A 45 nT sudden impulse was observed on 18 May at 18/0058UT (as measured by the Boulder USGS magnetometer). On 23 May quiet to active levels were observed at middle latitudes with minor storm levels observed at high latitudes. The disturbance may have been due to the CME observed on 21 May.

Space Weather Outlook
26 May - 21 June 1999

Solar activity is expected to range from low to moderate levels. There is also a fair chance for an isolated major flare during the first half of June with the anticipated return of old active Region 8534 (S17, L=223) and Region 8541 (N22, L=192).

No significant proton flux enhancements are expected at geo-synchronous altitude.

The greater than 2 MeV electron flux at geo-synchronous altitude is expected to be at normal to moderate levels.

Geomagnetic field activity is expected to be at unsettled to active levels around 14 June due to coronal hole effects. Quiet to unsettled conditions are expected during the rest of the period, barring any Earth-directed coronal mass ejection.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10 ⁶ hemi.)	Sunspot Area (10 ⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
17 May	145	148	1190	B7.7	12	2	0	6	1	0	0	0
18 May	141	129	970	B6.9	4	0	0	5	0	0	0	0
19 May	142	120	630	B6.8	4	0	0	1	0	0	0	0
20 May	143	121	780	B4.8	3	0	0	11	0	0	0	0
21 May	140	128	1160	B5.1	1	0	0	9	0	0	0	0
22 May	140	121	1050	B8.5	1	0	0	3	0	0	0	0
23 May	141	104	750	B5.0	9	0	0	6	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
17 May	1.1E+5	1.4E+4	3.1E+3		3.7E+6	
18 May	9.8E+4	1.4E+4	3.4E+3		2.6E+5	
19 May	1.4E+5	1.5E+4	3.2E+3		4.1E+6	
20 May	1.6E+5	1.5E+4	3.1E+3		2.8E+7	
21 May	1.2E+5	1.4E+4	3.2E+3		5.1E+7	
22 May	1.3E+5	1.4E+4	3.0E+3		5.4E+7	
23 May	1.4E+5	1.3E+4	3.0E+3		1.1E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	17 May	1	0-0-0-1-0-1-1-0	5	0-0-0-4-2-1-1-0	5
18 May	21	4-4-3-3-4-3-4-3	32	3-4-5-4-6-4-3-3	23	3-4-5-4-4-4-4-3
19 May	8	3-2-1-1-2-2-2-3	15	4-2-1-1-3-5-2-2	10	3-3-2-1-2-2-3-3
20 May	4	1-2-1-1-1-1-1-2	14	3-3-2-5-2-1-2-2	10	2-3-2-3-3-2-1-3
21 May	5	2-2-1-1-2-1-1-2	9	3-3-1-0-1-2-1-4	7	3-3-1-1-2-3-2-2
22 May	3	0-1-1-0-2-1-1-1	*	1-*-1-0-2-1-0-3	5	1-1-1-0-2-2-2-2
23 May	8	2-1-2-3-3-2-2-1	15	2-1-1-5-5-1-2-0	10	3-2-2-4-4-2-2-1

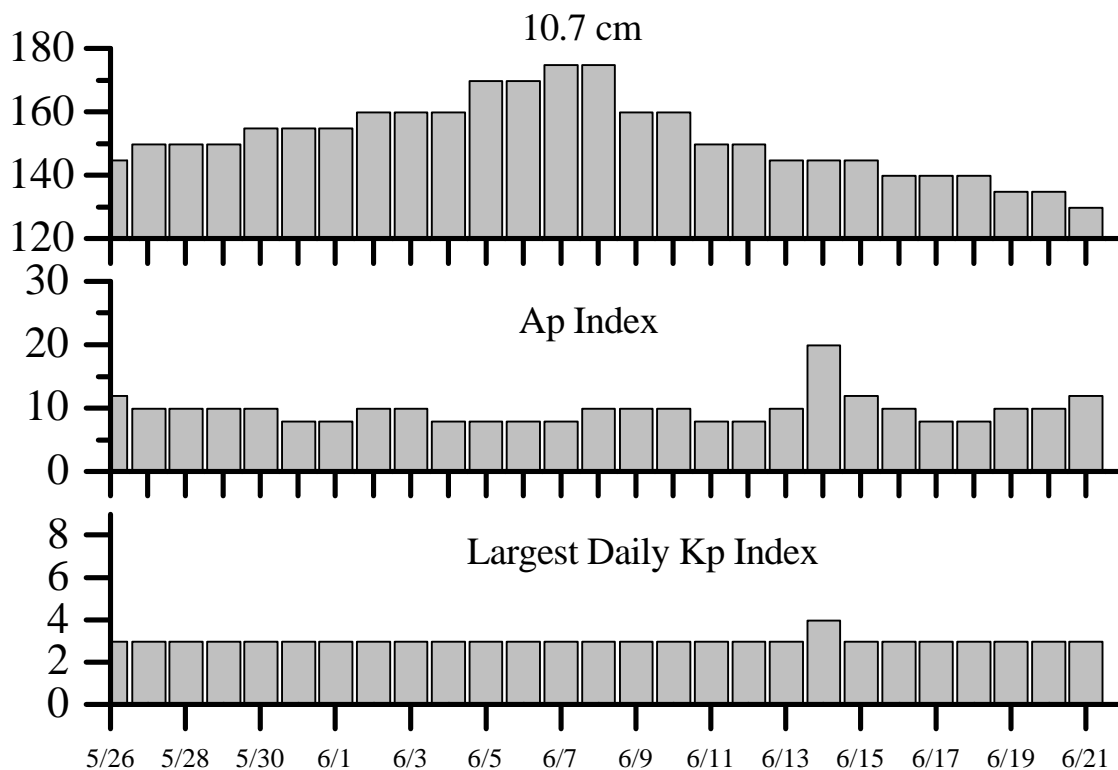


Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
18 May 0111	Sudden Impulse of 45 nT observed	18 May 0058
18 May 0309	K= 4 Observed	18 May 00-03
18 May 0309	K = 4 Warning valid	18 May 03-15
18 May 1756	K = 4 Warning valid	18/1800 - 19/1800 May
18 May 2102	A ≥ 20 Observed	18 May 2100
18 May 2141	A ≥ 20 Watch	19 May
19 May 1553	CANCELLED A ≥ 20 Watch	19 May
21 May 0021	1 - 245 MHz Burst	20 May
21 May 0021	245 MHz Radio Noise Storm	20 May
21 May 1440	>2MeV Electron Event ≥1000pfu	21 May 1420
22 May 0027	4 - 245 MHz Bursts	21 May
22 May 1202	CONTINUED >2MeV Electron Event ≥ 1000pfu	21 May 1420
23 May 0017	1 - 245 MHz Burst	22 May
23 May 1206	CONTINUED >2MeV Electron Event ≥1000pfu	21 May 1420
23 May 1206	K= 4 Observed	23 May 09-12
23 May 1506	K = 4 Observed	23 May 12-15



Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
26 May	145	12	3	09	160	10	3
27	150	10	3	10	160	10	3
28	150	10	3	11	150	8	3
29	150	10	3	12	150	8	3
30	155	10	3	13	145	10	3
31	155	8	3	14	145	20	4
01 Jun	160	8	3	15	145	12	3
02	160	10	3	16	140	10	3
03	160	10	3	17	140	8	3
04	170	8	3	18	140	8	3
05	170	8	3	19	135	10	3
06	170	8	3	20	135	10	3
07	175	8	3	21	130	12	3
08	175	10	3				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Max	Class	Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
							Lat	CMD	245	2695	II	IV
17 May	0449	0455	0500	M2.3	.008				70	69		
17 May	2150	2202	2212	M1.0	.009							

Flare List

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
17 May	0020	0025	0034	C9.7	SF	S16W79	8534
	0253	0258	0302	C1.6			
	0339	0345	0349	C3.9			
	0404	0407	0410	C1.2			
	0449	0455	0500	M2.3			
	0617	0620	0624	C1.4			
	0702	0705	0708	B9.0			
	0749	0753	0755	C2.0			
	0819	0822	0824	C1.0			
	0905	0907	0909	C5.3	SF	S16W86	8534
	1306	1307	1319		SF	N21W43	8541
	1318	1319	1320	C1.6			8541
	1437	1437	1442		SF	N35E44	8545
	1703	1706	1731	C6.2	1F	N20W49	8541
	1758	1801	1803	C5.6	SF	S16W91	8534
	2004	2015	2032	C1.6	SF	N22W54	8541
	18 May	2150	2202	2212	M1.0		
0114		0134	0159	C3.3			
0311		0323	0331	C9.0			
0359		0400	0418		SF	N19W52	8541
0543		0544	0554		SF	S28W72	8540
0654		0655	0716		SF	N39E35	8545
0718		0718	0730	C2.1	SF	N19W57	8541
1043		1130	1151	C3.9			
19 May	1954	1954	2005		SF	N38E31	8545
	1345	1349	1354	C1.1			
	1446	1448	1451		SF	N20W70	8541
	1841	1852	1907	C1.2			
	1957	2003	2019	C1.2			
20 May	2319	2323	2327	C1.0			
	0502	0508	0513	C2.3			
	0856	0901	0906	C2.1			
	B1120	U1120	A1126		SF	N37E04	8545
	1207	1212	1217		SF	N24W61	8549
	1556	1559	1601	B8.1			
	1622	1622	1637		SF	N23W63	8549
	1710	1711	1718		SF	N24W63	8549



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
20 May	1725	1731	1737	C1.6			
	1754	1755	1758		SF	N24W63	8549
	2029	2031	2033		SF	N26W64	8549
	2124	2125	2131		SF	N27W65	8549
	2224	2224	2228		SF	N27W65	8549
	2240	2241	2244		SF	N26W66	8549
	2256	2257	2301		SF	N26W66	8549
	2331	2331	2338		SF	N27W67	8549
21 May	0456	0500	0502	B8.7			
	0507	0508	0512		SF	N24W70	8549
	0746	0747	0801		SF	N27W68	8549
	0941	0942	0944	SF	N24W68	8549	
	1107	1107	1120	SF	N26W71	8549	
	B1240	U1241	1300	B7.9	SF	N26W75	8549
	1426	1431	1438		SF	N27W68	8549
	1649	U1649	A1651		SF	N25W69	8549
	1712	1949	2141	C2.4			
	1814	1815	1818		SN	N26W72	8549
2316	2317	2321	SF		S13E55	8550	
22 May	0318	0318	0322		SF	S14E53	8550
	0647	0652	0656	C1.4			
	0743	0744	0753		SF	S19W40	8544
	1912	1912	1919		SF	N40W19	8545
23 May	0238	0243	0246	C1.0			
	0317	0317	0323		SF	N41W25	8545
	0456	0459	0501	C1.8			
	0558	0602	0604	C1.2			
	0738	0739	0758		SF	N40W27	8545
	0801	0805	0822	C1.3	SF	N36W27	8545
	B1030	1040	1107	C1.8	SF	N30E40	8551
	1408	1412	1422	C1.3	SF	S15E29	8550
	1427	1438	1513	C3.4	SF	N30E38	8551
	1728	1731	1733	C1.9			
	2140	2143	2146	B9.3			
	2304	2312	2325	C1.1			



Region Summary

Date	Location		Sunspot Characteristics				Flares														
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical										
		Lon						C	M	X	S	1	2	3	4						
<i>Region 8533</i>																					
05 May	N05E74	223	0050	04	CAO	003	B														
06 May	N03E60	224	0060	07	CAO	004	B											1			
07 May	N03E46	225	0030	06	CSO	005	B														
08 May	N04E34	224	0040	05	CSO	005	B														
09 May	N04E20	225	0010	06	BXO	004	B														
10 May	N04E05	225	0000	03	BXO	002	B														
11 May	N03W05	222	0020	06	BXO	006	B														
12 May	N03W18	222																			
13 May	N03W31	222																			
14 May	N03W44	222																			
15 May	N03W57	222																			
16 May	N03W70	222																			
17 May	N03W83	222																			
													0	0	0	1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 225

<i>Region 8534</i>																					
05 May	S18E74	223	0030	01	HAX	001	A														
06 May	S18E60	224	0040	04	CAO	003	B	1					1								
07 May	S18E47	224	0040	02	HSX	001	A														
08 May	S17E35	223	0060	04	CSO	004	B														
09 May	S18E21	224	0040	03	CSO	004	B														
10 May	S18E08	222	0030	05	CSO	004	B														
11 May	S18W06	223	0050	04	CAO	011	B														
12 May	S18W19	223	0090	05	DAI	014	B	1					1								
13 May	S17W33	224	0080	07	DAO	011	B						1								
14 May	S17W47	225	0090	06	DAO	010	B						1								
15 May	S17W60	225	0090	07	DAO	006	B														
16 May	S16W77	228	0050	02	HAX	001	A	2	2				3	2							
17 May	S22W85	223	0060	04	CRO	003	B	3					3								
													7	2	0	10	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 223



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio Lon	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
<i>Region 8535</i>																		
06 May	N20E67	217	0160	03	HAX	001	A											
07 May	N21E54	217	0260	04	CHO	003	B											
08 May	N22E42	216	0300	05	DHO	004	B											
09 May	N21E30	215	0330	09	DKO	007	B											1
10 May	N21E16	214	0310	06	CKO	008	B											
11 May	N21E06	211	0320	12	CKO	010	B											2
12 May	N22W09	213	0270	10	CKO	011	B											
13 May	N22W23	214	0370	06	CKO	009	BG											
14 May	N21W36	214	0330	06	CKO	009	B											
15 May	N22W49	214	0370	06	CKO	007	B											
16 May	N22W62	213	0340	05	HKX	002	A											
17 May	N22W76	214	0320	06	DKC	002	A											
18 May	N22W88	213	0210	07	HSX	002	A											
								0	0	0	3	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 211

<i>Region 8539</i>															
Date	Location	Area	Extent	Spot Class	Spot Count	Mag Class	C	M	X	S	1	2	3	4	
07 May	N13E45	226	0030	08	BXO	006	B	2			6				
08 May	N14E31	227	0050	08	DSO	006	B								
09 May	N14E16	229	0020	06	BXO	004	B								
10 May	N13E03	227	0010	05	BXO	002	B	1					1		
11 May	N13W12	229	0010	04	BXO	002	B								
12 May	N13W25	229													
13 May	N13W38	229													
14 May	N13W51	229													
15 May	N13W64	229													
16 May	N13W77	229													
								2	1	0	6	0	1	0	0

Died on Disk.

Absolute heliographic longitude: 227



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares													
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical									
		Lon						C	M	X	S	1	2	3	4					
<i>Region 8540</i>																				
07 May	S28E70	201	0060	09	CSO	003	B													
08 May	S28E59	199	0140	11	EAO	005	B													
09 May	S28E46	199	0080	10	DSO	009	B					2								
10 May	S27E33	197	0100	10	DSO	010	B	1				1								
11 May	S26E19	198	0050	12	BXO	013	B					1								
12 May	S27E08	196	0040	13	CRO	012	B													
13 May	S27W05	196	0020	12	BXO	006	B													
14 May	S25W22	200	0010	05	BXO	005	B	1				1								
15 May	S25W33	198	0000	05	BXO	002	B													
16 May	S31W38	189	0000	00	AXX	001	A					1								
17 May	S31W51	189																		
18 May	S31W64	189											1							
19 May	S29W76	188	0000	00	AXX	001	A													
20 May	S29W89	188																		
											2	0	0	7	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 196

Region 8541

08 May	N22E67	191	0130	11	ESO	009	B	2	1		3		1							
09 May	N22E53	192	0190	12	EAI	020	B	1	1		10		1							
10 May	N22E38	192	0230	14	EAI	024	B	4			6									
11 May	N22E25	192	0170	13	FAC	023	B	3			5		1							
12 May	N21E13	191	0130	14	ESO	022	B													
13 May	N21W01	192	0090	14	ESO	018	B				2									
14 May	N21W14	192	0080	12	ESO	015	B													
15 May	N21W26	191	0100	14	ESO	027	B				3									
16 May	N20W39	190	0130	11	EAO	019	B		1		1									
17 May	N21W53	191	0230	12	EAO	015	B	3			2		1							
18 May	N20W65	190	0180	09	DAO	011	B	1			2									
19 May	N21W78	190	0090	08	DAO	005	B				1									
20 May	N21W91	190	0000	00		000														
											14	3	0	35	3	1	0	0		

Crossed West Limb.

Absolute heliographic longitude: 192



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares							
	° Lat ° CMD	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
		Lon						C	M	X	S	1	2	3

Region 8542

12 May	S19E58	146	0030	01	HSX	001	A										
13 May	S19E44	147	0030	01	HSX	001	A										
14 May	S19E32	146	0070	02	HSX	001	A										
15 May	S19E18	147	0040	01	HSX	001	A										
16 May	S19E06	145	0030	02	HSX	001	A										
17 May	S19W06	144	0040	02	HSX	001	A										
18 May	S19W20	145	0030	01	HSX	001	A										
19 May	S18W32	144	0030	04	CSO	003	B										
20 May	S18W45	144	0030	01	HSX	001	A										
21 May	S18W59	144	0030	01	HSX	001	A										
22 May	S20W72	144	0030	01	HSX	001	A										
23 May	S20W85	144	0010	01	AXX	001	A										

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 145

Region 8543

13 May	N06E45	146	0000	00	AXX	001	A										1
14 May	N06E32	146	0000	00		000											
15 May	N06E16	149	0000	01	AXX	002	A										
16 May	N06E03	148	0000	03	BXO	002	B										
17 May	N06W11	149	0000	00	BXO	002	B										
18 May	N06W24	149															
19 May	N06W37	149															
20 May	N06W50	149															
21 May	N06W63	149															
22 May	N06W76	149															
23 May	N06W89	149															

0 0 0 1 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 148



Region Summary-continued

Date	Location		Sunspot Characteristics					Flares						
	° Lat ° CMD	Helio Lon	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
								C	M	X	S	1	2	3

Region 8544

14 May	S20E60	118	0010	04	BXO	003	B												2	
15 May	S21E48	117	0090	08	DAO	012	B												8	
16 May	S20E34	117	0160	10	DAO	015	B													
17 May	S20E20	118	0180	12	EAO	016	B													
18 May	S20E06	119	0150	12	EAO	019	B													
19 May	S19W07	119	0130	13	EAO	023	B													
20 May	S20W20	119	0140	14	EAO	028	B													
21 May	S19W35	120	0170	15	EAI	020	B													
22 May	S21W47	119	0190	15	ESO	014	B												1	
23 May	S22W59	118	0150	16	FSO	009	B													
																				0 0 0 11 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 119

Region 8545

14 May	N37E71	107	0080	03	HSX	001	A													
15 May	N36E62	103	0230	03	HKX	001	A													
16 May	N37E49	102	0260	05	HKX	002	A													
17 May	N36E38	100	0290	05	HKX	003	A												1	
18 May	N37E25	100	0340	03	HKX	001	A	1											2	
19 May	N38E13	099	0350	05	CKO	006	B													
20 May	N36E01	098	0320	06	CKO	005	B												1	
21 May	N36W10	095	0350	06	CKO	006	B													
22 May	N36W24	096	0360	05	HKX	002	A												1	
23 May	N35W36	095	0330	06	CAO	003	B	1											3	
																				2 0 0 8 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 098

Region 8546

15 May	S33W45	210	0000	02	BXO	002	B													
16 May	S34W61	212	0030	04	CSO	003	B													
17 May	S32W73	211	0050	06	DAO	003	B													
18 May	S32W86	211	0030	06	BXO	002	B													
																				0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 210



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares							
	° Lat ° CMD	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
		Lon						C	M	X	S	1	2	3

Region 8547

15 May	N22W15	180	0020	03	BXO	007	B										
16 May	N21W30	181	0020	06	CSO	005	B										
17 May	N22W42	180	0010	01	BXO	002	B										
18 May	N24W53	178	0010	04	BXO	003	B										
19 May	N24W69	181	0010	05	BXO	004	B										

0 0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 180

Region 8548

17 May	S21E48	090	0010	00	AXX	001	A										
18 May	S21E35	090	0020	05	BXO	010	B										
19 May	S19E23	089	0020	08	CRO	008	B										
20 May	S20E08	091	0050	09	CSO	016	B										
21 May	S20W06	091	0100	10	DAO	014	B										
22 May	S19W19	091	0110	09	DAO	016	B										
23 May	S20W30	089	0070	11	CAO	011	B										

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 091

Region 8549

20 May	N24W63	162	0120	07	CAO	007	B					10					
21 May	N26W79	164	0230	10	DAO	007	B					8					
22 May	N25W85	157	0120	02	HAX	001	A										
23 May	N25W98	157	0000	00		000											

0 0 0 18 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 162

Region 8550

20 May	S14E70	029	0120	10	CSO	004	B										
21 May	S14E55	030	0220	10	DAO	008	B					1					
22 May	S14E43	029	0190	11	ESO	014	B					1					
23 May	S13E30	029	0150	12	EAO	014	B	1				1					

1 0 0 3 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 029



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares							
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
		Lon						C	M	X	S	1	2	3

Region 8551

21 May	N32E62	023	0060	04	CSO	002	B										
22 May	N33E50	022	0050	03	CSO	003	B										
23 May	N32E36	023	0040	07	CSO	006	B	2				2					
								2	0	0	0	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 023



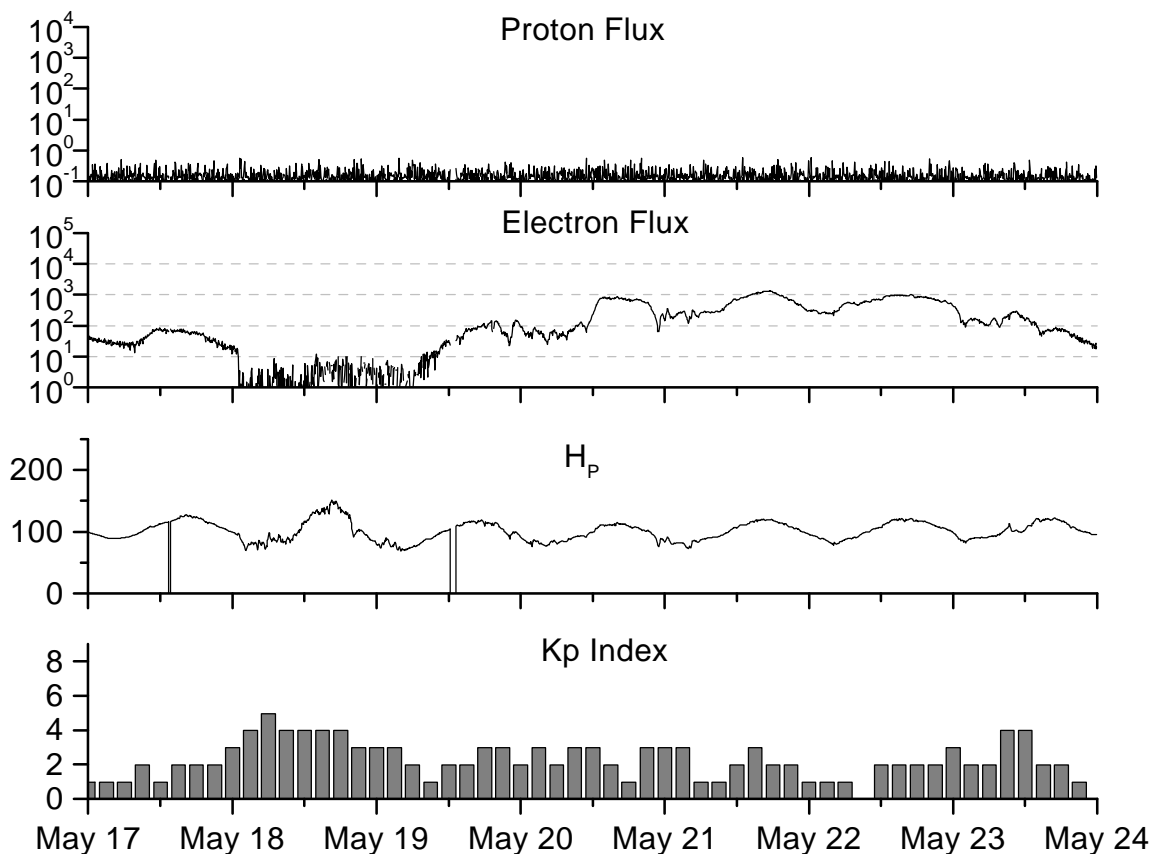
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
1997									
May	28.6	18.5	0.65	26.4	18.3	74.6	78.4	08	08.6
June	22.1	12.7	0.57	29.0	20.3	71.7	80.1	07	08.6
July	17.0	10.4	0.61	32.4	22.6	71.1	81.8	06	08.5
August	36.7	24.4	0.66	35.9	25.0	79.0	83.4	07	08.3
September	52.8	51.3	0.88	40.5	28.3	96.2	85.7	10	08.4
October	33.6	22.8	0.68	45.4	31.8	84.9	88.6	11	08.6
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	05	09.5
1998									
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	08	09.9
February	54.4	40.3	0.74	67.4	48.8	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	109.1	10	11.3
May	74.3	56.3	0.76	81.4	59.3	106.7	112.4	18	11.6
June	93.6	70.7	0.76	85.9	62.4	108.4	116.2	10	11.9
July	98.3	66.2	0.67	90.3	65.4	114.0	120.3	11	12.2
August	118.6	91.7	0.77			136.0		18	12.4
September	119.0	92.9	0.78			138.4		14	12.5
October	77.0	55.6	0.72			121.9		13	
November	99.5	73.6	0.74			140.2		16	
December	120.8	81.6	0.68			150.1		08	
1999									
January	94.3	62.4	0.66			142.6		10	
February	93.4	66.1	0.70			142.0		11	
March	100.5	69.1	0.70			126.3		13	
April	92.9	63.9	0.69			117.3		12	

NOTE: All smoothed values after January 1998 and monthly values after September 1998 are preliminary estimates.

The lowest smoothed sunspot indices number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI=158.5, occurred July 1989. * After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 17 May 1999

Protons plot contains the five-minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

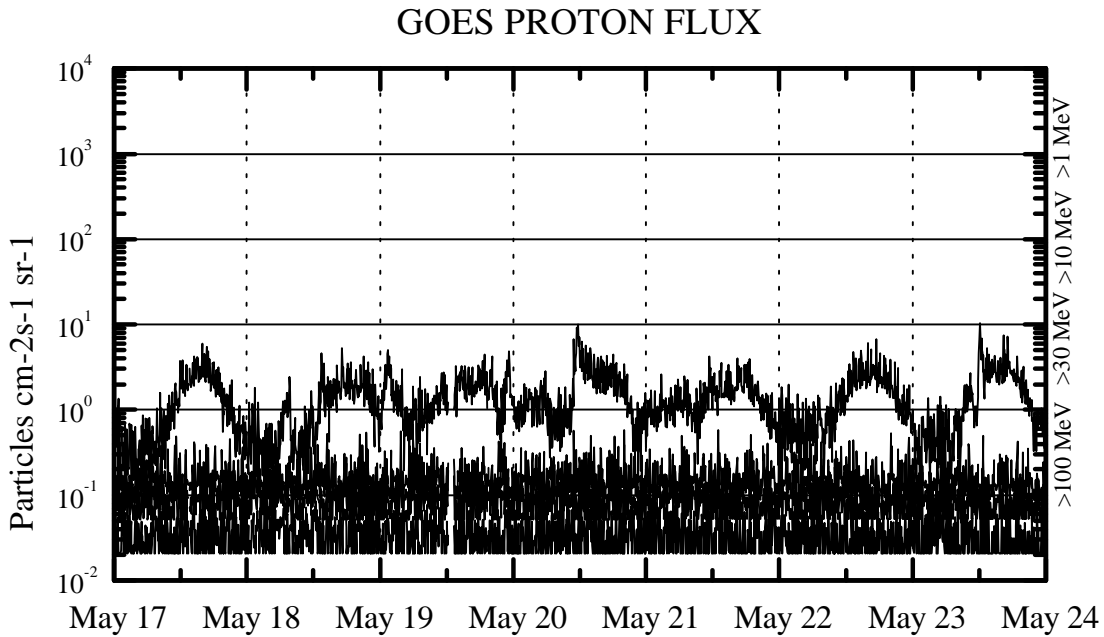
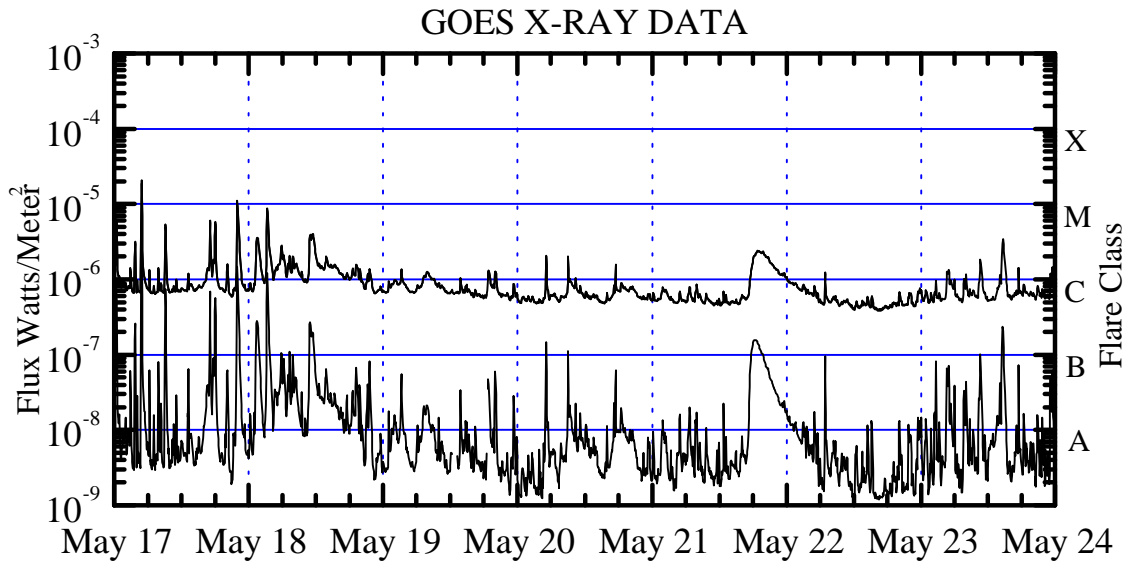
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-8.

H_p plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are "global" parameters that are applicable to a first order approximation over large areas. H_p is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five minute averaged x-ray flux (watts/m²) as measured by GOES 8 and 10 in two wavelength bands, .05 -.4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

