

Space Weather Highlights 05 - 11 January 2004

SWO PRF 1480
13 January 2004

Solar activity was at low to high levels during the period. The period began with high level activity on 05 - 07 January. New Region 537 (N04, L= 009, class/area Dao/210 on 08 January) rotated around the east limb on 05 January and produced seven M-class flares over the next three days. On 05 January, this region produced a long duration M6 at 0345 UTC. On 06 January, an M5 flare occurred at 0629 UTC. Two M flares were observed from Region 537 on 07 January, an M4 at 0404 UTC and the largest event of the period an M8/Sf at 1027 UTC. Both of these flares were associated with Type II radio sweeps (756 km/s and 843 km/s respectively) and CMEs. The CMEs from the M4 and M8 were not Earth directed. Activity dropped to moderate levels on 08 - 09 January with Region 537 producing an M1/in flare at 0507 UTC on the 8th and an M3 at 0144 UTC on the 9th. Region 537 developed a beta-gamma-delta magnetic configuration on 08 January and continued to grow in area coverage until 09 January. Activity on 10 - 11 January was at low levels with C-class flares coming from Region 537 and Region 536 (S10, L= 074, class/area Ekc/980 on 06 January). Region 536 reached 980 millionths in area coverage and developed a beta-gamma-delta magnetic configuration on 06 January. On 10 January, this region began a slow gradual decay phase and simplified to a beta-gamma magnetic configuration on 09 January.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began on 05 January with elevated solar wind speeds due to a coronal hole high speed flow. Late on 06 January, a transient passed the ACE spacecraft and increased solar wind speed to near 800 km/s with periods of extended southward Bz. The signature of this transient is similar to a CME and maybe the result of the long duration M6 on 05 January, in combination with the ongoing high speed stream. Wind speeds decreased to about 500 km/s by 08 January. A second coronal hole high speed flow increased wind speeds on 09 - 11 January with peak values 700 km/s.

There were no greater than 10 MeV proton events at geosynchronous orbit during the summary period.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels every day during the period, 05 - 11 January.

The geomagnetic field ranged from quiet to minor storm levels. The period began with unsettled to active conditions on 05 January. Late on 06 January, and into 07 January activity increased to minor storm levels due to increased wind speed and extended periods of southward Bz. Activity decreased to quiet to unsettled levels on 08 January and a second coronal hole produced isolated periods of minor storm level on 09 - 10 January. The period ended on 11 January with quiet to active levels.

Space Weather Outlook 14 January - 09 February 2004

Solar activity is expected to be at low to moderate levels with a chance of major flare activity. Region 537 is expected to produce C-class flares and possibly an isolated M-class event through 19 January. SOHO/EIT imagery and enhanced activity on the east limb suggest several regions will be rotating around the east limb early in the period. This range of active longitudes is likely to produce low level activity with isolated M-class activity possible. Activity during the second half of the period is expected to be at low levels until Region 537 returns to the visible disk on 01 February.

There is a slight chance for a greater than 10 MeV proton event from Region 537, and perhaps from the active longitudes currently rotating onto the disk.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 17 -19 January, 28 - 29 January and again on 31 January - 09 February due to recurrent coronal holes.

Geomagnetic activity is expected to range from quiet to minor storm levels. Unsettled to minor storm levels are possible early in period due to a coronal hole driven high speed on 16 - 17 January. A second recurrent coronal hole is expected to return on 27 - 28 January resulting in active to minor storm levels. The large transequatorial coronal hole of the last few rotations has broken up into several smaller coronal holes. This series of recurrent coronal hole is due to return on 30 January - 07 February and is expected to produce minor storm level activity.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
05 January	123	80	1050	C1.4	3	1	0	3	0	1	0	0
06 January	117	78	1060	B3.9	4	1	0	1	0	0	0	0
07 January	119	93	1010	B3.5	2	2	0	2	0	1	0	0
08 January	120	118	1010	B2.4	2	1	0	3	1	0	0	0
09 January	118	88	870	B2.3	4	2	0	3	1	1	0	0
10 January	119	66	760	B2.6	6	0	0	6	1	0	0	0
11 January	119	53	690	B3.7	6	0	0	3	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
05 January	2.2E+6	1.1E+4	2.5E+3		1.5E+8	
06 January	1.8E+6	1.2E+4	2.5E+3		2.6E+8	
07 January	6.8E+6	1.2E+4	2.2E+3		2.9E+8	
08 January	3.3E+6	1.1E+4	2.0E+3		4.0E+8	
09 January	2.1E+7	1.3E+4	1.8E+3		2.0E+8	
10 January	3.4E+6	1.0E+4	1.8E+3		4.4E+7	
11 January	3.6E+6	1.1E+4	2.0E+3		2.0E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	05 January	15	3-3-2-2-3-4-3-3	42	2-5-3-5-6-6-4-4	22
06 January	17	3-3-4-2-2-2-2-5	22	3-3-3-5-2-3-3-5	20	3-3-4-3-3-3-3-5
07 January	16	3-3-4-3-4-3-2-2	70	4-3-6-7-7-6-5-4	32	3-4-5-5-5-5-4-3
08 January	4	1-0-0-1-1-1-1-3	9	3-2-0-3-3-1-2-2	9	2-1-1-3-3-3-2-3
09 January	16	2-2-5-3-2-4-2-2	39	2-3-6-4-5-6-5-2	21	2-3-5-4-3-4-3-3
10 January	20	2-5-5-3-4-2-2-1	34	2-4-5-6-4-4-5-2	24	3-5-5-4-3-3-4-2
11 January	12	1-2-3-3-3-4-2-1	36	1-1-4-6-6-6-3-1	17	2-2-3-4-4-4-4-2



Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
05 Jan 0011	1 - 245 MHz Radio Bursts	04 Jan
05 Jan 0158	WARNING: Geomagnetic K= 5	05 Jan 0200 - 1500
05 Jan 0330	ALERT: X-Ray Flux > M5	05 Jan 0330
05 Jan 0405	ALERT: Type IV Radio Emission	05 Jan 0328
05 Jan 0515	SUMMARY: 10cm Radio Burst	05 Jan 0309
05 Jan 0525	SUMMARY: X-ray Event > M5	05 Jan 0250
05 Jan 1215	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 Jan 1155
05 Jan 1221	ALERT: STRATWARM	05 Jan
05 Jan 1437	WARNING: Geomagnetic K= 4	05 Jan 1440 - 06 Jan 1500
05 Jan 1653	WARNING: Geomagnetic K= 5	05 Jan 1654 - 05 Jan 2359
05 Jan 2031	WATCH: Geomagnetic A ≥ 20	08 Jan
05 Jan 2356	EXTENDED WARNING: Geomagnetic K= 5	05 Jan 1654 - 06 Jan 1500
05 Jan 0011	1 - 245 MHz Radio Bursts	05 Jan
05 Jan 0011	1 - 245 MHz Radio Noise Storm	05 Jan
06 Jan 0612	ALERT: Electron 2MeV Integral Flux > 1000pfu	06 Jan 0550
06 Jan 0628	ALERT: X-Ray Flux > M5	06 Jan 0627
06 Jan 0646	SUMMARY: X-ray Event > M5	06 Jan 0613
06 Jan 0717	SUMMARY: 10cm Radio Burst	06 Jan 0619
06 Jan 1322	ALERT: STRATWARM	06 Jan
06 Jan 1726	WATCH: Geomagnetic A ≥ 20	09 Jan
06 Jan 2118	WARNING: Geomagnetic K= 4	06 Jan 2120 - 07 Jan 1200
06 Jan 2241	ALERT: Geomagnetic K= 4	06 Jan 2239
06 Jan 2246	WARNING: Geomagnetic K= 5	06 Jan 2247 - 07 Jan 1500
06 Jan 2252	ALERT: Geomagnetic K= 5	06 Jan 2248
06 Jan 2302	WARNING: Geomagnetic K= 6	06 Jan 2305 - 07 Jan 0600
07 Jan 0012	1 - 245 MHz Radio Bursts	06 Jan
07 Jan 0425	ALERT: Type II Radio Emission	07 Jan 0405
07 Jan 0551	EXTENDED WARNING: Geomagnetic K= 6	06 Jan 2305 - 07 Jan 1200
07 Jan 0752	ALERT: Electron 2MeV Integral Flux > 1000pfu	07 Jan 0735
07 Jan 0830	ALERT: Geomagnetic K= 6	07 Jan 0828
07 Jan 1023	ALERT: X-Ray Flux exceeded M5	07 Jan 1023
07 Jan 1046	SUMMARY: X-ray Event > M5	07 Jan 1027
07 Jan 1057	SUMMARY: 10cm Radio Burst	07 Jan 1018
07 Jan 1059	ALERT: Type II Radio Emission	07 Jan 1032
07 Jan 1152	ALERT: Geomagnetic K= 6	07 Jan 1150
07 Jan 1353	ALERT: STRATWARM	07 Jan
07 Jan 1449	WARNING: Geomagnetic K= 4	07 Jan 1500 - 2359
07 Jan 1544	ALERT: Geomagnetic K= 5	07 Jan 1543
07 Jan 1549	WARNING: Geomagnetic K= 5	07 Jan 1550 - 2359
08 Jan 0012	1 - 245 MHz Radio Bursts	07 Jan
08 Jan 0012	1 - 245 MHz Radio Noise Storm	07 Jan
08 Jan 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	08 Jan 0500
08 Jan 1251	ALERT: STRATWARM	08 Jan
09 Jan 0115	2 - 245 MHz Radio Bursts	08 Jan
09 Jan 0115	1 - 245 MHz Radio Noise Storm	08 Jan
09 Jan 0044	WARNING: Geomagnetic K= 4	09 Jan 0045 - 0600
09 Jan 0231	SUMMARY: 10cm Radio Burst	09 Jan 0158
09 Jan 0714	WARNING: Geomagnetic K= 5	09 Jan 0713 - 1200
09 Jan 0717	ALERT: Geomagnetic K-index of 4	09 Jan 0707
09 Jan 0738	ALERT: Geomagnetic K= 5	09 Jan 0737
09 Jan 0746	ALERT: Electron 2MeV Integral Flux > 1000pfu	09 Jan 0725
09 Jan 1158	WARNING: Geomagnetic K= 4	09 Jan 1200 - 1800
09 Jan 1315	ALERT: STRATWARM	09 Jan
09 Jan 1713	WARNING: Geomagnetic K= 5	09 Jan 1715 - 2359

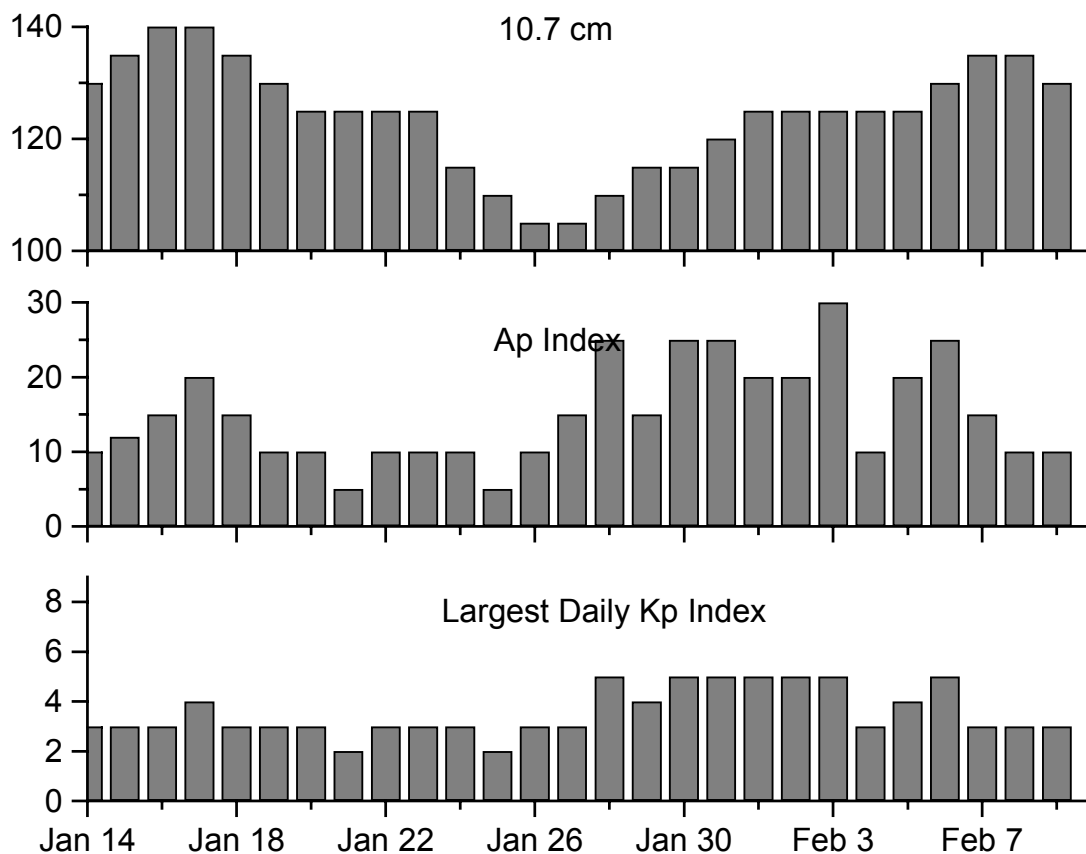


Alerts and Warnings Issued - continued.

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
10 Jan 0000	WARNING: Geomagnetic K= 4	10 Jan 0000 - 0600
10 Jan 0038	5 - 245 MHz Radio Bursts	09 Jan
10 Jan 0038	1 - 245 MHz Radio Noise Storm	09 Jan
10 Jan 0413	WARNING: Geomagnetic K= 5	10 Jan 0412 - 1200
10 Jan 0434	ALERT: Geomagnetic K= 5	10 Jan 0428
10 Jan 1255	ALERT: STRATWARM	10 Jan
10 Jan 1915	ALERT: Electron 2MeV Integral Flux > 1000pfu	10 Jan 1900
10 Jan 1958	ALERT: Geomagnetic K= 4	10 Jan 1955
10 Jan 2000	WARNING: Geomagnetic K= 4	10 Jan 2000 - 1500
11 Jan 1019	WARNING: Geomagnetic K= 5	11 Jan 1020 - 1500
11 Jan 1117	ALERT: Electron 2MeV Integral Flux > 1000pfu	11 Jan 1055
11 Jan 1450	EXTENDED WARNING: Geomagnetic K= 5	11 Jan 1020 - 2359
11 Jan 1938	ALERT: STRATWARM	11 Jan
11 Jan 2328	EXTENDED WARNING: Geomagnetic K= 4	10 Jan 2000 - 12 Jan 1500



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
14 Jan	130	10	3	28 Jan	110	25	5
15	135	12	3	29	115	15	4
16	140	15	3	30	115	25	5
17	140	20	4	31	120	25	5
18	135	15	3	01 Feb	125	20	5
19	130	10	3	02	125	20	5
20	125	10	3	03	125	30	5
21	125	5	2	04	125	10	3
22	125	10	3	05	125	20	4
23	125	10	3	06	130	25	5
24	115	10	3	07	135	15	3
25	110	5	2	08	135	10	3
26	105	10	3	09	130	10	3
27	105	15	3				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Class	Integ Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max				Lat	CMD		245	2695	II	IV
05 Jan 04	0250	0345	0520	M6.9	.320					400		2	
06 Jan 04	0613	0629	0636	M5.8	.037				537	340			
07 Jan 04	0343	0404	0421	M4.5	.057	2n	N02E82		537	160		1	
07 Jan 04	1014	1027	1033	M8.3	.048	Sf	N02E69		537	330	510	1	
08 Jan 04	0453	0507	0521	M1.3	.016	1n	N01E64		537	88	73		
09 Jan 04	0113	0122	0127	M1.1	.004	2n	N02E50		537				
09 Jan 04	0133	0144	0154	M3.2	.029				537	53	130		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn	
	Begin	Max	End					
05 January	B0010	0018	0037	C7.5	Sf	S11E39	536	
	B0039	0054	A0054		Sf	S12E41		
	B0100	0105	0137		Sf	S12E41		
	B0240	0322	0558		2n	S08E38		
		0250	0345		0520	M6.9		
		1825	2021		2052	C2.6		
06 January	2053	2112	2127	C4.2				
	0225	0228	0231	C1.0		537		
	0613	0629	0636	M5.8		537		
	0713	0718	0723	C2.5				
	1754	1757	1800	B6.7		537		
	2151	2155	2159	C1.0		536		
07 January	2235	2237	2241	C1.1	Sf	S11E03	536	
	0009	0014	0024	B9.1			537	
	B0420	0423	0434	M4.5	2n	N02E82	537	
	0631	0636	0640	B9.2			537	
	0715	0721	0731	B7.5			536	
	0824	0845	0850	C2.9			536	
	B1024	U1024	A1111	M8.3	Sf	N02E69	537	
	1256	1259	1302	B5.4			536	
	1332	1335	1339	B4.4			536	
	1431	1435	1438	C1.0			536	
	1500	1505	1507	B8.4			536	
	1520	1521	1525		Sf	N04E68	537	
1551	1600	1607	B7.7			536		
1739	1742	1745	B7.5			537		
1749	1758	1802	B9.6			537		
08 January	0009	0012	0016	B6.4			536	
	B0222	0226	0229	B6.6	Sf	N03E65	537	
	0410	0412	0420		Sf	N02E64	537	
	0427	0431	0434		Sf	N02E64	537	
	0455	0503	0554	M1.3	1n	N01E64	537	



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
08 January	0843	0850	0858	B4.6			536
	0934	0937	0944	B5.8			536
	1148	1152	1154	B8.5			537
	1204	1209	1214	B4.2			
	1214	1217	1220	B7.9			536
	1315	1324	1332	B3.2			537
	1507	1512	1521	B7.7			536
	1636	1641	1646	C1.3			537
	1719	1735	1750	C1.1			537
	1902	1905	1909	B9.7			536
09 January	B0119	0143	0243	M1.1	2n	N02E50	537
	0133	0144	0154	M3.2			537
	0334	0335	0339		Sf	N01E49	537
	0506	0508	0518	C1.3	1f	N05E46	537
	1006	1010	1012	B6.3			536
	1208	1214	1218	B8.9			536
	1344	1349	1352	B8.9			536
	1632	1636	1638	B5.9			536
	1747	1754	1807	B4.5			
	1841	1843	1849	C1.8	Sf	N08E42	537
	1855	1855	1906		Sf	S07W29	536
	1933	1936	1941	B5.1			536
	1955	1958	2001	C1.0			536
	2025	2035	2046	B9.6			534
	2133	2136	2138	B5.9			536
	2216	2220	2224	B4.8			536
	2307	2308	2310	C1.0			536
10 January	0118	0119	0124	C1.2	Sf	S12W31	536
	0328	0330	0346	C1.9	Sf	S12W29	536
	0420	0421	0452	C7.3	1f	S11W30	536
	0508	0512	0540	C7.7	Sf	S13W32	536
	0813	0817	0819	B8.7			536
	1000	1000	1009	B9.3	Sf	N06E30	537
	1142	1146	1150	B6.1			537
	1534	1538	1541	B5.7			537
	1718	1721	1724	B8.0			537
	1922	1925	1930	B7.2			537
	B2102	2102	2106	C1.1	Sf	S11W35	536
B2209	2209	2223	C1.1	Sf	S08W45		
11 January	0318	0318	0325	C1.0	Sf	S11W43	536
	0416	0417	0421	C1.0	Sf	S11W40	536
	0721	0721	0724	C1.6	Sf	S11W47	536



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
11 January	1010	1013	1017	C1.1			537
	1732	1736	1741	B9.1			537
	1828	1834	1837	C1.8			537
	1900	1904	1907	C1.7			536
	2206	2209	2211	B6.7			536

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

Region 533

28 Dec	N16E54	149	0040	03	Dso	002	B										
29 Dec	N16E38	152	0010	01	Axx	001	A										
30 Dec	N16E25	152															
31 Dec	N16E12	152															
01 Jan	N16W01	152															
02 Jan	N16W14	152															
03 Jan	N16W27	152															
04 Jan	N16W40	152															
05 Jan	N16W53	152															
06 Jan	N16W66	152															
07 Jan	N16W79	152															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 152

Region 534

31 Dec	S05E40	124	0010	03	Bxo	002	B										
01 Jan	S06E28	123	0090	08	Dso	013	B	1		1							
02 Jan	S06E15	122	0100	09	Dsi	013	B	1		1							
03 Jan	S05E02	122	0110	10	Dao	015	B										
04 Jan	S05W13	125	0070	10	Dao	014	B										
05 Jan	S06W23	122	0070	08	Dso	013	B										
06 Jan	S07W40	126	0020	06	Dro	008	B										
07 Jan	S07W53	126															
08 Jan	S07W66	126															
09 Jan	S07W79	126															
10 Jan	S07W92	126															

2 0 0 2 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 122



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 535

01 Jan	S19W38	189	0020	03	Cro	003	B											
02 Jan	S19W51	188	0080	04	Dso	005	B											
03 Jan	S18W64	188	0130	05	Dao	008	B											
04 Jan	S21W76	188	0110	06	Dao	007	B											
05 Jan	S22W86	185	0020	03	Hsx	002	A											
										0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 189

Region 536

01 Jan	S11E73	078	0380	05	Hkx	001	A	2		1								
02 Jan	S11E63	074	0770	11	Eko	003	B	3										
03 Jan	S12E51	073	0910	11	Eko	012	B	1		2								
04 Jan	S10E38	074	0740	11	Eki	029	B	5		1								
05 Jan	S11E25	074	0960	11	Ekc	035	Bg	1		1								
06 Jan	S10E12	074	0980	11	Ekc	034	Bgd	2		1								
07 Jan	S12W04	076	0800	14	Ekc	038	Bgd	2										
08 Jan	S11W16	075	0780	10	Dkc	055	Bgd											
09 Jan	S12W28	074	0600	11	Ekc	049	Bg	2		1								
10 Jan	S12W41	074	0550	11	Ekc	030	Bg	5		4	1							
11 Jan	S12W54	074	0480	11	Ekc	022	Bg	4		3								
								27	0	0	14	1	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 076

Region 537

06 Jan	N04E76	010	0060	07	Hax	006	A	1	1									
07 Jan	N05E64	008	0190	07	Cso	010	B		2	2	1							
08 Jan	N04E50	009	0210	07	Dao	019	Bgd	2	1	3	1							
09 Jan	N05E37	009	0270	07	Cko	019	Bgd	2	2	2	1	1						
10 Jan	N05E24	009	0210	07	Dkc	016	Bgd			1								
11 Jan	N05E11	009	0210	07	Dkc	011	Bgd	2										
								7	6	0	8	2	2	0	0			

Still on Disk.

Absolute heliographic longitude: 009



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 538

07 Jan	N07E04	068	0010	03	Cro	003	B										
08 Jan	N05W04	063	0010	02	Bxo	002	B										
09 Jan	N05W17	063															
10 Jan	N05W30	063															
11 Jan	N05W43	063															

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 068

Region 539

07 Jan	N09E29	043	0010	04	Cro	002	B										
08 Jan	N09E15	044	0010	03	Bxo	002	B										
09 Jan	N09E02	044															
10 Jan	N09W11	044															
11 Jan	N09W24	044															

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Still on Disk.

Absolute heliographic longitude: 044

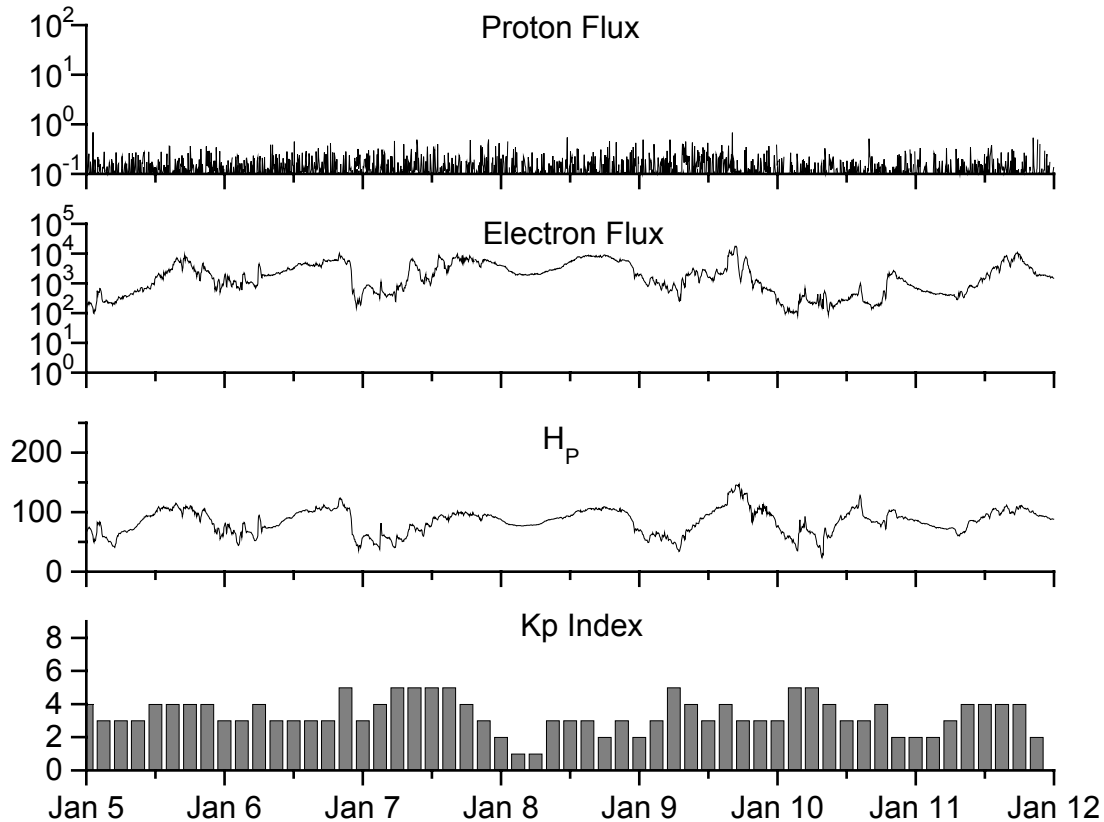


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2002									
January	189.0	114.1	0.60	184.8	113.5	227.3	194.6	08	12.3
February	194.5	107.4	0.55	188.6	114.7	205.0	197.2	10	12.8
March	153.1	98.4	0.64	188.9	113.3	180.3	195.7	10	12.9
April	194.9	120.7	0.62	186.2	110.5	189.8	191.5	15	13.2
May	204.1	120.8	0.59	183.6	108.9	178.4	188.0	15	13.3
June	146.0	88.3	0.60	179.9	106.3	148.7	183.0	11	13.5
July	183.5	99.6	0.54	175.4	102.7	173.5	176.3	11	13.7
August	191.0	116.4	0.61	169.2	98.7	183.9	169.5	16	14.2
September	206.4	109.6	0.53	163.4	94.6	175.8	164.1	14	15.0
October	153.9	97.5	0.63	158.8	90.5	167.0	159.4	23	15.6
November	159.8	95.5	0.60	150.9	85.2	168.7	154.8	16	16.3
December	147.9	80.8	0.55	144.6	82.1	158.6	150.9	13	17.0
2003									
January	149.3	79.7	0.53	141.7	81.0	144.0	149.2	13	18.2
February	87.0	46.0	0.53	136.4	78.5	124.5	144.7	17	18.9
March	119.7	61.1	0.51	128.1	74.2	132.2	139.5	21	19.4
April	119.7	60.0	0.50	121.5	70.3	126.3	136.3	20	20.0
May	89.6	55.2	0.62	118.3	67.8	129.3	135.0	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	132.6	24	21.8
July	132.8	85.0	0.64			127.8		20	
August	114.3	72.7	0.64			122.1		23	
September	82.6	48.8	0.59			112.3		19	
October	118.9	65.6	0.55			153.1		32	
November	118.9	67.2	0.57			153.1		31	
December	75.4	47.0	0.62			115.1		17	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. *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 05 January 2004

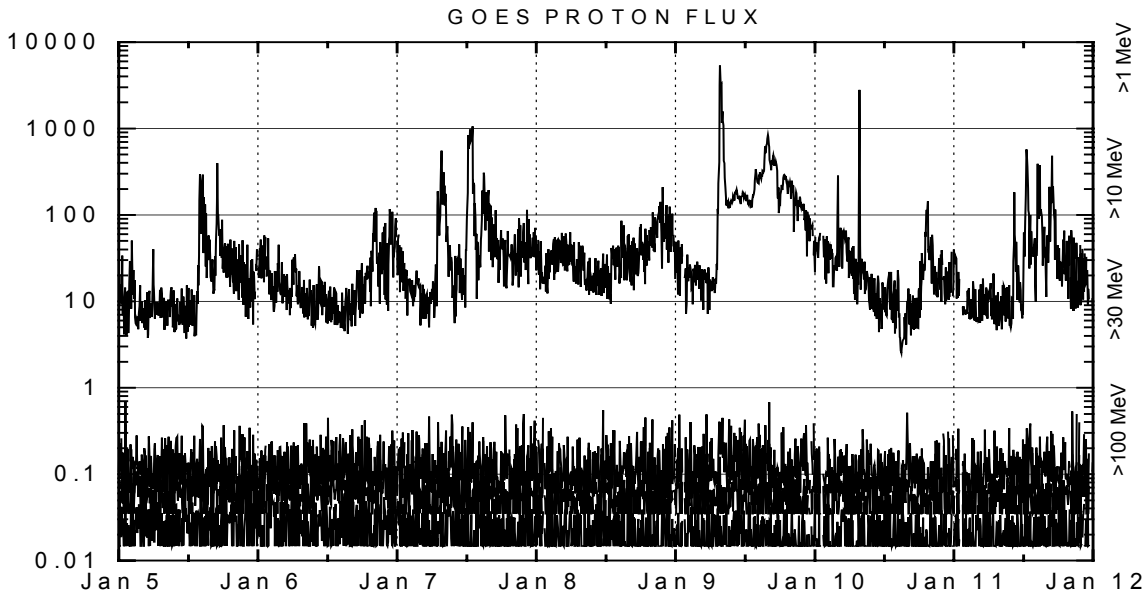
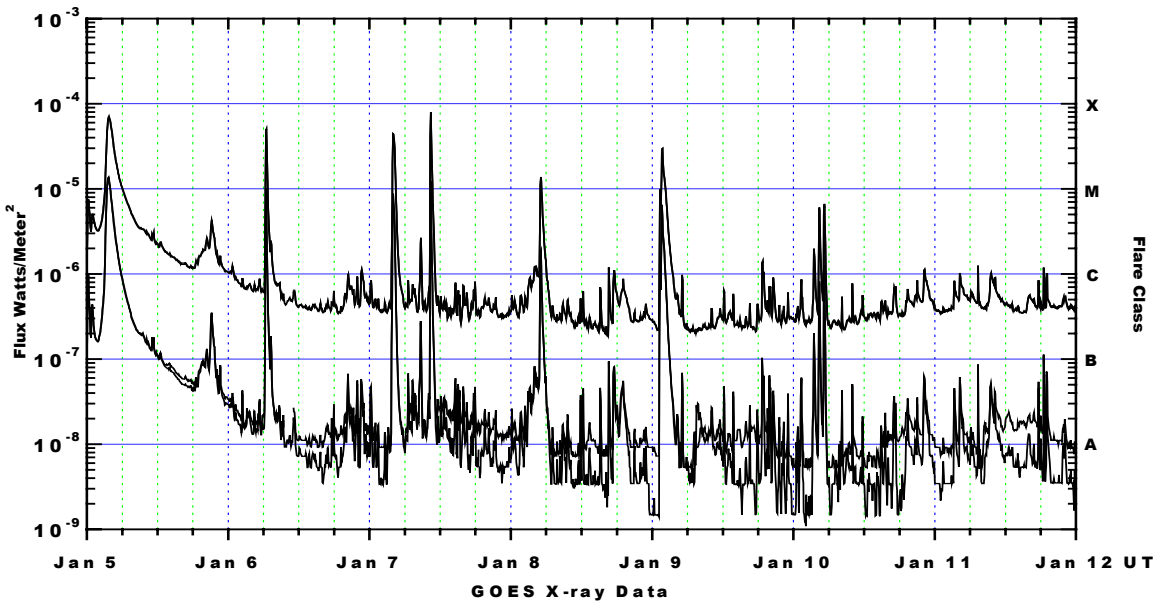
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12.

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. 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 Air Force Weather Agency) 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_{parallel} is subject to 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 12 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-11 (W113) 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.





Space
Environment
Center

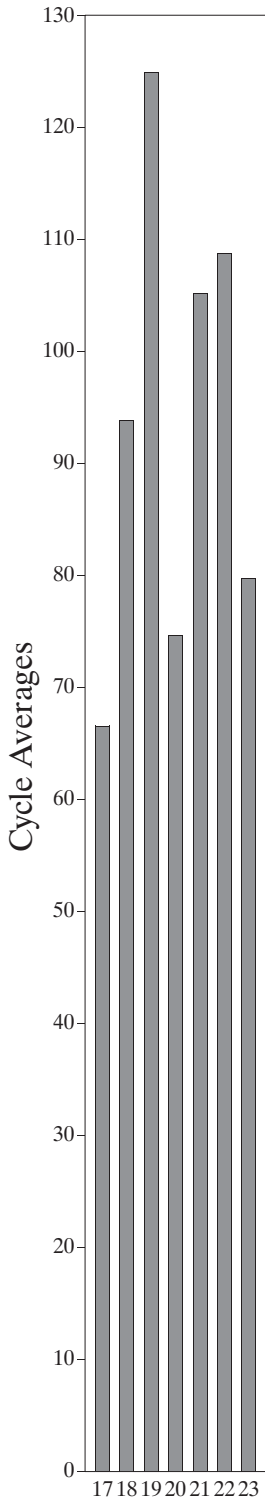
Sunspot Number (RI)

December 2003
(Month 87)

Preliminary data



Comparison of Cycles
at current month in cycle



K. Tegnell

Cycle

