

Space Weather Highlights **05 - 11 July 2004**

SWO PRF 1506
13 Jul 2004

Solar activity was very low to low. Activity levels for the first six days of the summary period were very low. Region 639 (N13, L=249, class/area, Cao/150 on 29 June) produced several B-class flares on 05 July. A large halo CME was visible on LASCO imagery on 06 July. This was just one of several CMEs to originate from behind the solar disk. The likely source of these CMEs was old Region 635 (S11, L=055), which rotated around the west limb on 27 June with a moderately complex magnetic configuration. Very low conditions persisted from 07 – 10 July with developing Region 642 (S07, L=124, class/area, Cao/130 on 11 July) producing occasional B-class flares. Bright x-ray emissions and CME activity were observed off the southeast limb on 10 July indicating that a volatile active region was rotating into view. The period ended at low levels with several C-class flares occurring from this active region on the SE limb. At the time of this writing, M-class events were observed from activity on the SE limb and a rapidly developing region near N13W53.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began with the solar wind speed slightly elevated to approximately 450 km/s, but gradually decreased to near 300 km/s by 08 July. A sector boundary crossing was observed to occur early on 09 July. Total B field, which was less than 5 nT prior to the sector change, gradually increased to over 15 nT by 11 July. A coronal hole high speed stream was preceded by co-rotating interaction region (CIR) late on 10 July. Solar wind speed gradually increased to over 500 km/s through the end the period. IMF Bz was generally in the +5 to -5 nT range until after the sector crossing on 09 July. Bz was predominantly southward following the sector change with periods over -10 nT late on 11 July.

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

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels for a brief period on 05 July.

The geomagnetic field ranged from quiet to active. The first five days of the summary period were dominated by mostly quiet geomagnetic field conditions with isolated high latitude unsettled periods. The onset of the CIR on 10 July resulted in occasional active periods at all latitudes.

Space Weather Outlook **14 July - 09 August 2004**

Solar activity is expected to range from low to high levels. Mostly moderate to high level activity is expected early in the period from active regions in both the northwest and southeast solar quadrants. The complex active regions currently on the visible disk at the time of this writing have potential to produce moderate to high levels of activity until 24 July. Backside SOHO MDI imagery also indicate that one or more complex regions will rotate onto the visible on 17 – 18 July. Consequently, moderate or even isolated high activity levels are possible during the latter half of the forecast period.

A greater than 10 MeV proton event is possible.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 26 – 27 July due to a recurrent coronal hole high speed stream.

The geomagnetic field is expected to range from quiet to active levels with minor storm periods at high latitudes. Unsettled to active conditions with high latitude minor storm periods are possible on 16 – 17 July due to possible CME effects, and again on 25-26 July as a recurrent coronal high speed stream rotates into a geoeffective position.



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 July	78	26	50	A3.3	0	0	0	1	0	0	0	0
06 July	79	39	30	A3.4	0	0	0	0	0	0	0	0
07 July	79	31	50	A3.4	0	0	0	1	0	0	0	0
08 July	82	17	50	A5.9	0	0	0	1	0	0	0	0
09 July	87	32	90	B1.0	0	0	0	0	0	0	0	0
10 July	93	58	230	B1.5	0	0	0	0	0	0	0	0
11 July	104	98	320	B5.7	10	0	0	0	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 July	1.2E+5	1.4E+4	3.1E+3		4.7E+7
06 July	1.8E+5	1.4E+4	3.4E+3		3.4E+7	
07 July	2.2E+5	1.6E+4	3.5E+3		3.4E+7	
08 July	3.6E+5	1.6E+4	3.4E+3		4.2E+7	
09 July	3.3E+5	1.6E+4	3.5E+3		1.5E+7	
10 July	3.1E+5	1.5E+4	3.1E+3		8.4E+6	
11 July	5.9E+5	1.5E+4	3.1E+3		1.3E+6	

Daily Geomagnetic Data

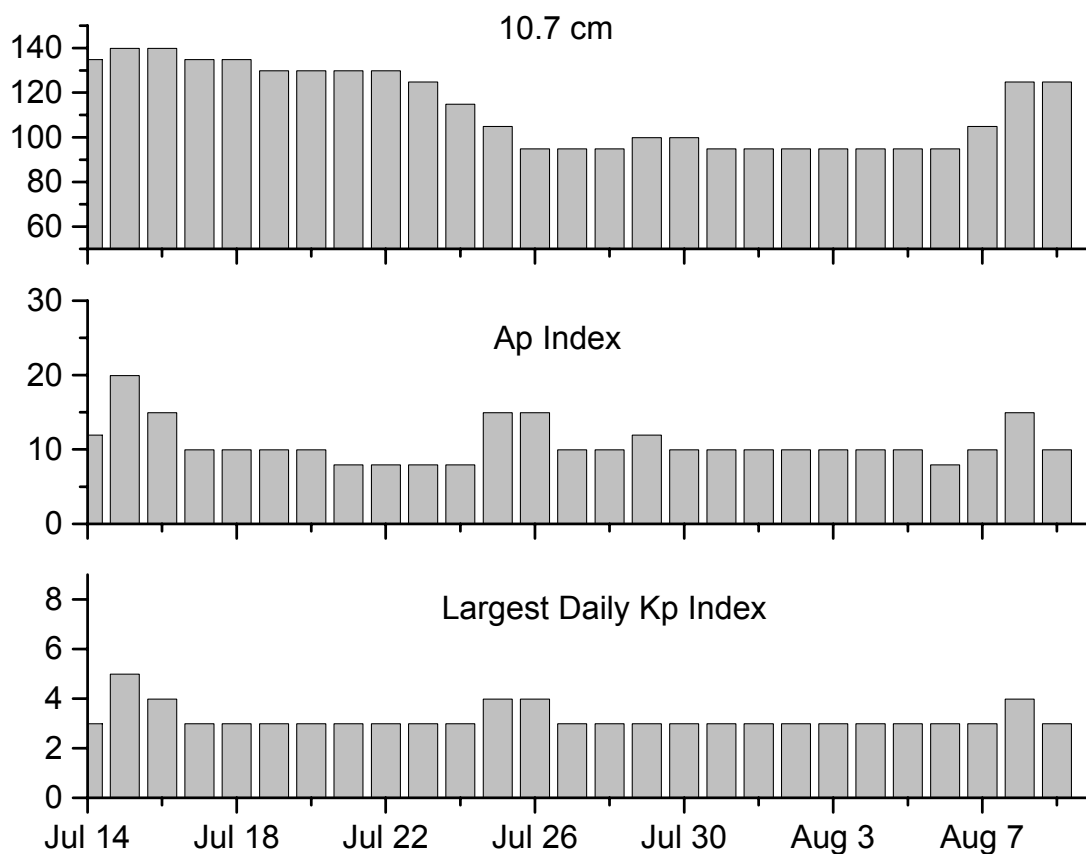
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	28 June	11	2-4-1-2-2-1-3-3	*	1-1-0-1-1-0-0-*	13
29 June	15	3-3-3-2-2-4-3-3	29	5-5-4-4-5-3-3-2	20	4-4-4-3-3-3-4-3
30 June	8	3-2-3-2-2-1-2-2	21	3-2-5-4-4-2-2-4	10	3-2-3-3-3-2-3-2
01 July	9	2-2-3-2-2-1-3-2	24	2-3-5-6-3-3-2-2	13	3-3-3-3-3-3-3-2
02 July	8	2-2-1-2-2-1-3-3	6	2-2-1-1-3-1-1-1	9	2-3-2-2-3-2-2-3
03 July	5	2-1-1-1-1-2-2-1	10	2-2-3-3-4-1-1-1	9	2-1-2-3-3-3-3-1
04 July	4	1-1-1-1-1-1-1-2	8	2-2-2-4-1-1-1-1	6	2-2-2-2-1-2-2-2

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
05 Jul 0005	1 – 245 MHz Radio Burst	04 Jul
05 Jul 1406	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 Jul 1345 UTC
06 Jul 0010	2 – 245 MHz Radio Bursts	05 Jul
06 Jul 1422	ALERT: Type II Radio Emission	05 Jul 2232
11 Jul 2138	ALERT: Geomagnetic K= 4	11 Jul 2135
11 Jul 2209	WARNING: Geomagnetic K= 4	11 Jul 2210 – 12 Jul 1500
11 Jul 2249	WARNING: Geomagnetic K= 5	11 Jul 2248 - 2359
11 Jul 2304	ALERT: Geomagnetic K= 5	11 Jul 2300



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 Jul	135	12	3	28 Jul	95	10	3
15	140	20	5	29	100	12	3
16	140	15	4	30	100	10	3
17	135	10	3	31	95	10	3
18	135	10	3	01 Aug	95	10	3
19	130	10	3	02	95	10	3
20	130	10	3	03	95	10	3
21	130	8	3	04	95	10	3
22	130	8	3	05	95	10	3
23	125	8	3	06	95	8	3
24	115	8	3	07	105	10	3
25	105	15	4	08	125	15	4
26	95	15	4	09	125	10	3
27	95	10	3				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	Begin	Max	Integ	Imp/	Location	Rgn	Radio Flux		Intensity	
			Class	Flux	Brtns	Lat CMD	#	245	2695	II

No Events Observed

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn
	Begin	Max	End				
05 July	0553	0557	0603	B1.1			639
	1553	1554	1558	B2.6	Sf	N07W34	639
	1856	1900	1904	B1.2			639
	2047	2054	2059	B1.3			639
06 July	1201	1206	1210	B1.7			
	1231	1320	1531	B1.3			
	1516	1520	1524	B1.9			
07 July	0211	0217	0222	B3.8			639
	1712	1713	1725	B4.9	Sf	N15E17	641
	2121	2126	2129	B1.1			642
	2158	2206	2213	B2.1			642
08 July	0014	0016	0025	B7.1	Sf	S05E65	642
	0509	0515	0519	B1.8			642
	0602	0606	0610	B1.3			639
	0654	0710	0725	B3.6			642
	1425	1433	1442	B4.8			642
	2223	2229	2244	B2.2			642
09 July	No Flares Observed						
10 July	No Flares Observed						
11 July	0603	0753	0834	C3.6			
	0937	0944	0951	C4.2			
	1017	1029	1046	C2.4			
	1316	1335	1350	C4.2			
	1503	1508	1511	B8.9			
	1649	1658	1706	C2.8			
	1724	1734	1741	C3.3			
	1940	1950	1958	C3.2			
	2104	2112	2121	C2.5			
	2251	2259	2314	C1.7			
	2317	2343	0001	C3.0			



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

Region 639

27 Jun	N11E73	261	0010	00		000	B											
28 Jun	N13E60	248	0070	05	Dao	004	B											
29 Jun	N13E46	249	0150	08	Cao	008	B											
30 Jun	N09E31	251	0100	08	Cao	007	B											
01 Jul	N10E19	250	0050	07	Cso	004	B											
02 Jul	N09E06	250	0090	08	Cao	008	B											
03 Jul	N08W10	253	0060	02	Hsx	004	A											
04 Jul	N09W20	248	0040	07	Dao	010	B											
05 Jul	N08W35	250	0020	05	Bxo	005	B											1
06 Jul	N09W51	253	0010	06	Bxo	006	B											
07 Jul	N10W64	249	0020	07	Bxo	006	B											
08 Jul	N12W71	247																
09 Jul	N12W84	247																
																		0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 250

Region 640

27 Jun	S09E68	256	0040	01	Axx	002	B											
28 Jun	S07E56	252	0040	04	Dao	002	B											
29 Jun	S07E41	254	0050	04	Dao	004	B											
30 Jun	S08E28	254	0020	05	Cso	004	B											
01 Jul	S09E15	254	0060	04	Cso	002	B											
02 Jul	S09E02	254	0020	05	Dso	005	B											
03 Jul	S09W13	256	0030	06	Bxo	007	B											
04 Jul	S10W25	253	0010	05	Bxo	007	B											
05 Jul	S08W39	254	0030	01	Axx	001	A											
06 Jul	S07W55	257	0010	01	Axx	002	A											
07 Jul	S07W68	257																
08 Jul	S07W81	257																
09 Jul	S07W94	257																
																		1 0 0 2 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 254



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 641

04 Jul	N14E54	174																	
05 Jul	N14E41	174																	
06 Jul	N15E25	177	0010	01	Axx	001	A												
07 Jul	N15E12	177											1						
08 Jul	N15W01	177																	
09 Jul	N15W14	177																	
10 Jul	N15W27	177																	
11 Jul	N15W40	177																	
																			0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 177

Region 642

07 Jul	S08E63	126	0030	07	Bxo	005	B												
08 Jul	S07E51	125	0050	10	Cao	007	B						1						
09 Jul	S07E39	124	0070	07	Dao	009	B												
10 Jul	S07E26	123	0090	09	Dao	011	B												
11 Jul	S07E12	124	0130	10	Cao	027	B												
																			0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 124

Region 643

09 Jul	S08W07	169	0020	04	Cao	003	B												
10 Jul	S09W22	171	0020	04	Cao	003	B												
11 Jul	S08W37	173	0010	02	Bxo	002	B												
																			0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 169

Region 644

10 Jul	N11E69	080	0100	03	Hsx	001	A												
11 Jul	N12E58	078	0140	03	Hax	001	A												
																			0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 078

Region 645

10 Jul	N12W11	160	0020	03	Bxo	003	B												
11 Jul	N11W18	154	0020	03	Dro	004	B												
																			0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 160



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 646

11 Jul	N13W33	169	0010	04	Cro	003	B															

Still on Disk.

Absolute heliographic longitude: 169

Region 647

11 Jul	S14E61	075	0010	01	Axx	001	A															

Still on Disk.

Absolute heliographic longitude: 075

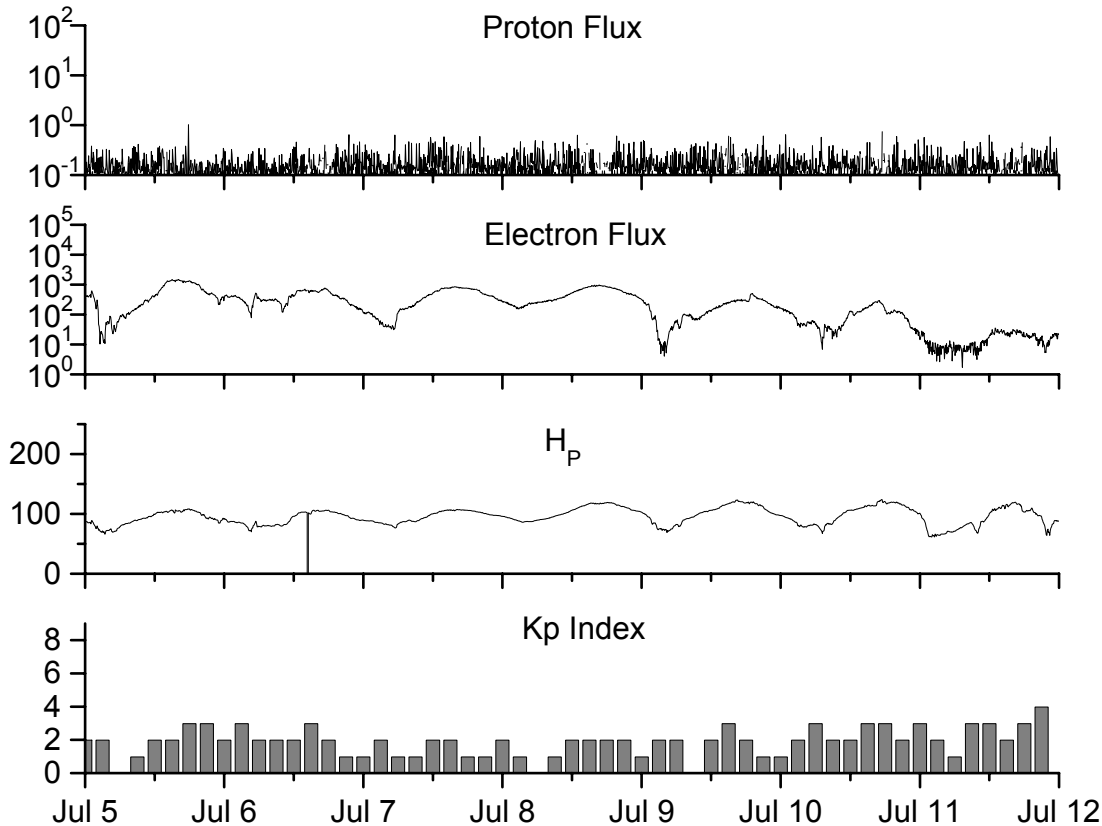


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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									
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	106.9	62.0	127.8	129.5	20	22.3
August	114.3	72.7	0.64	102.8	60.3	122.1	127.5	23	22.4
September	82.6	48.8	0.59	100.7	59.8	112.3	126.0	19	21.9
October	118.9	65.6	0.55	96.6	58.4	153.1	124.1	32	21.1
November	118.9	67.2	0.57	93.6	57.0	153.1	121.8	31	20.0
December	75.4	47.0	0.62			115.1		18	
2004									
January	62.3	37.2	0.60			114.1		20	
February	75.6	46.0	0.61			107.0		13	
March	81.0	48.9	0.60			112.2		12	
April	59.3	39.3	0.66			101.3		10	
May	77.3	41.5	0.54			99.7		9	
June	78.9	43.2	0.55			99.7		9	

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 28 June 2004

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W98) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

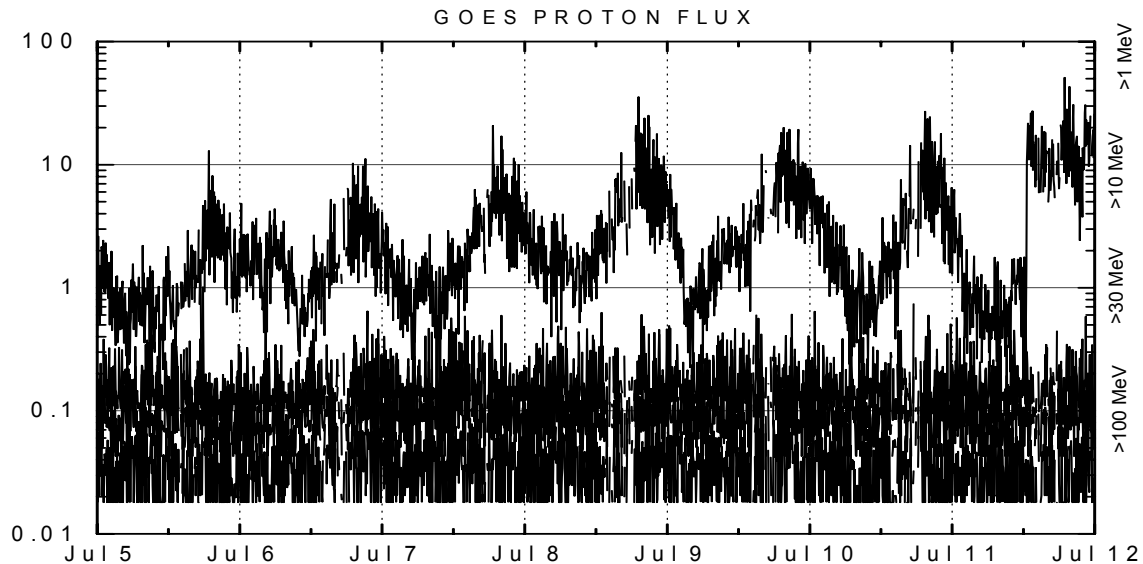
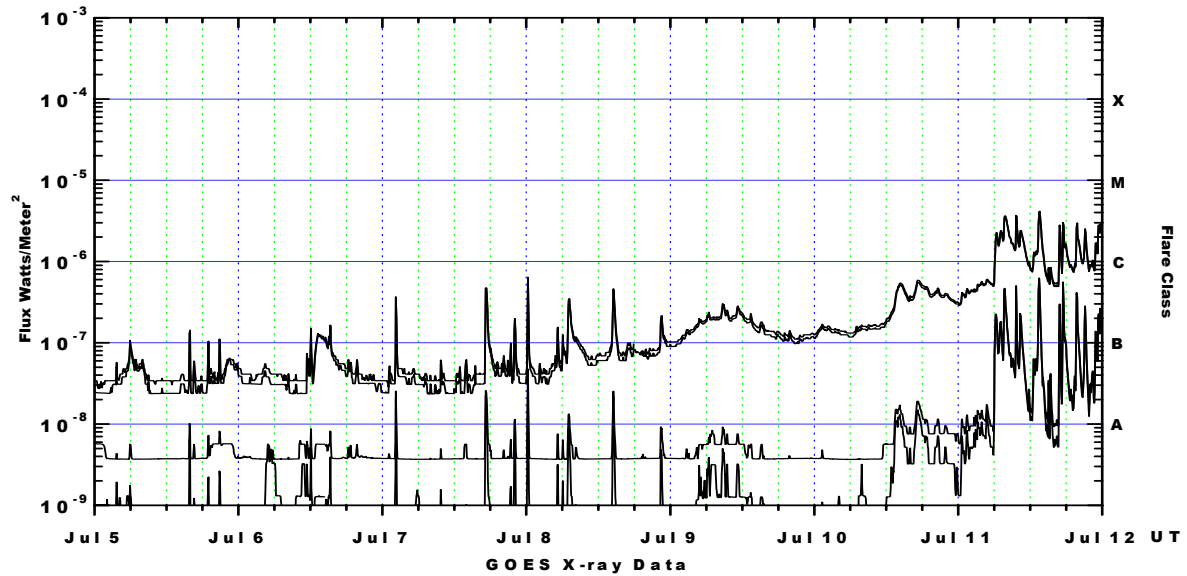
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

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_p 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 (W75) and GOES 10 (W135) 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 (W98) 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.



M5 or Greater X-Ray Flares



Space Environment Center

June 2004
(Month 93)

Preliminary data

Comparison of Cycles at current month in cycle

