

Space Weather Highlights
18 September – 24 September 2006

SEC PRF 1621
26 September 2006

Solar activity was at very low to low levels. Region 910 (S10, L=341, class/area, Csi/050 on 22 September) was the only spotted group on the visible disk and managed to produce two low level C-flares. The largest of these flares was a C1.3/Sf at 23/0002 UTC. Three Type II radio sweeps were observed during the summary period. The first was observed at 18/2356 UTC with an estimated shock velocity of 736 km/s. This sweep was associated with a faint, non-geoeffective CME. The second Type II was observed at 23/1106 UTC with an estimated shock velocity of 711 km/s. LASCO imagery during the time of the second type II showed a CME off the east limb. This was determined to be a backside event. The third Type II was observed at 24/1526 UTC with an estimated shock velocity of 660 km/s. A slow moving CME was observed in LASCO imagery off the south west limb. This CME is not expected to be geoeffective.

No greater than 10 MeV proton events were observed.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 18 – 23 September.

The geomagnetic field ranged from quiet to major storm levels. Solar wind speed ranged from a low of about 295 km/s early on 23 September to a high of about 690 km/s late on 24 September. The period began as a recurrent coronal hole high speed stream had become geoeffective. Solar wind steadily increased to about 630 km/s by late on the 18th, while the IMF Bz remained active with fluctuations between +/- 7 nT. The field responded with unsettled to active conditions at middle latitudes with unsettled to major storm periods at high latitudes through about midday on the 19th. Thereafter through about 23/1800 UTC, the field was at mostly quiet levels as wind speed gradually decayed to the period's low of just under 300 km/s and the IMF Bz did not vary much beyond +/- 3 nT. Late on 23 September, wind speed, density and temperature increased, all due to the occurrence of a solar sector boundary crossing and co-rotating interaction region in advance of a recurrent coronal hole high speed stream. The IMF Bz responded with fluctuations between +10 to -20 nT and as a result, the geomagnetic field became unsettled to active. Early on 24 September, wind speed had risen to a high of around 670 km/s, while the IMF Bz relaxed, not varying much beyond +/- 3 nT. The geomagnetic field responded with unsettled to active periods early in the day with high latitudes reaching active to major storm conditions. The period ended with the solar wind speed around 640 km/s.

Space Weather Outlook
27 September – 23 October 2006

Solar activity is expected to be at very low to low levels.

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 02 – 07 October and again on 15 – 23 October.

The geomagnetic field is expected to be mostly quiet to unsettled for the majority of the forecast period. Recurrent coronal hole high speed wind streams are expected to rotate into geoeffective positions 01 – 02 October, 14 – 15 October, and again on 21 October. Unsettled to major storm periods are possible on 01 – 02 October while unsettled to minor storm periods are possible on 14 – 15 October and 21 October.



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	
18 September	74	11	30	A2.7	1	0	0	0	0	0	0	0	0
19 September	73	11	30	A2.3	0	0	0	0	0	0	0	0	0
20 September	71	11	10	A1.2	0	0	0	0	0	0	0	0	0
21 September	71	11	10	<A1.0	0	0	0	2	0	0	0	0	0
22 September	72	17	50	A1.6	1	0	0	2	0	0	0	0	0
23 September	70	13	20	<A1.0	0	0	0	1	0	0	0	0	0
24 September	70	13	30	<A1.0	0	0	0	1	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	18 September	3.9E+6	1.7E+4	3.7E+3		3.6E+7
19 September	2.1E+6	1.6E+4	3.9E+3		6.5E+8	
20 September	9.8E+5	1.6E+4	4.0E+3		9.8E+8	
21 September	1.1E+6	1.6E+4	3.6E+3		9.5E+8	
22 September	1.2E+6	1.7E+4	3.7E+3		7.4E+8	
23 September	1.4E+6	1.6E+4	3.9E+3		2.9E+8	
24 September	7.0E+6	1.7E+4	3.4E+3		4.0E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	18 September	16	4-4-3-3-2-2-3-3	34	3-4-6-6-4-3-3-3	24
19 September	8	3-3-3-1-1-1-1-1	19	3-3-5-5-3-2-1-1	12	4-3-4-2-2-2-2-2
20 September	3	2-2-1-0-0-1-0-0	1	1-0-2-0-0-0-0-0	5	2-2-1-1-1-1-1-1
21 September	2	0-1-0-1-1-1-1-0	2	0-0-1-2-1-0-0-0	4	0-1-1-1-0-1-2-2
22 September	1	0-1-0-0-0-0-1-0	0	0-0-0-1-0-0-0-0	3	0-1-0-0-1-2-2-1
23 September	7	0-1-1-1-1-1-3-4	8	0-0-2-3-3-1-2-3	9	0-1-2-1-1-1-3-4
24 September	15	4-4-3-3-3-2-2-2	29	4-5-4-6-4-3-1-1	23	5-5-4-5-3-2-2-2

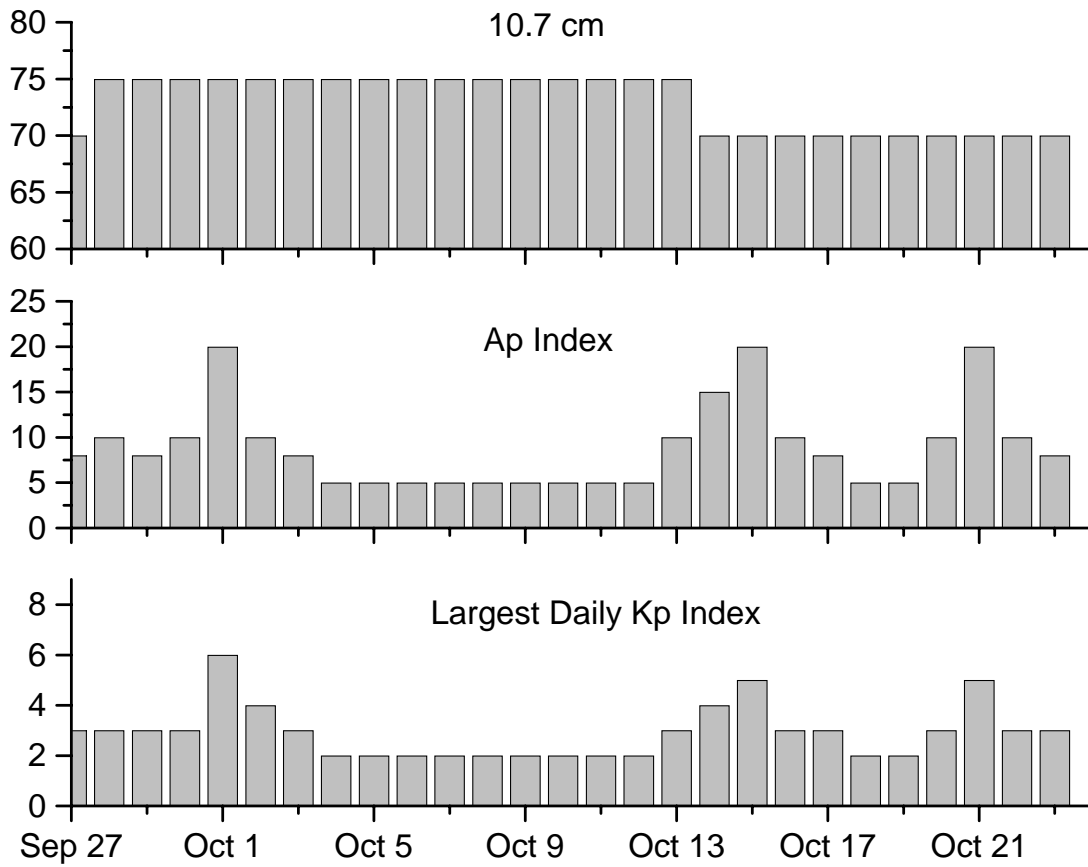


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
18 Sep 0202	WARNING: Geomagnetic K = 5	18 Sep 0202 – 1600
18 Sep 0207	ALERT: Geomagnetic K = 5	18 Sep 0205
18 Sep 1551	EXTENDED WARNING: Geomagnetic K = 4	17 Sep 2220 – 18/2359
18 Sep 1912	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	18 Sep 1855
19 Sep 0000	EXTENDED WARNING: Geomagnetic K = 4	17 Sep 2220 – 19/1600
19 Sep 0526	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	19 Sep 0520
20 Sep 0501	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	20 Sep 0500
21 Sep 0503	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	21 Sep 0500
22 Sep 0506	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	22 Sep 0500
23 Sep 0509	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	23 Sep 0500
23 Sep 1310	ALERT: Type II Radio Emission	23 Sep 1106
23 Sep 1712	WARNING: Geomagnetic K = 4	23 Sep 1711 – 21/1600
23 Sep 2142	ALERT: Geomagnetic K = 4	23 Sep 2140
24 Sep 0245	WARNING: Geomagnetic K = 5	24 Sep 0245 – 1600
24 Sep 0248	ALERT: Geomagnetic K = 5	24 Sep 0245
24 Sep 1130	ALERT: Geomagnetic K = 5	24 Sep 1129
24 Sep 1622	ALERT: Type II Radio Emission	24 Sep 1532



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
27 Sept	70	8	3	11 Oct	75	5	2
28	75	10	3	12	75	5	2
29	75	8	3	13	75	10	3
30	75	10	3	14	70	15	4
01 Oct	75	20	6	15	70	20	5
02	75	10	4	16	70	10	3
03	75	8	3	17	70	8	3
04	75	5	2	18	70	5	2
05	75	5	2	19	70	5	2
06	75	5	2	20	70	10	3
07	75	5	2	21	70	20	5
08	75	5	2	22	70	10	3
09	75	5	2	23	70	8	3
10	75	5	2				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	1/2 Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV

No Events Observed

Flare List

Date	Time			Optical X-ray Class.	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
18 September	0924	0932	0944	B2.8			908
	1702	1706	1710	B1.3			
	1925	1945	2001	C1.0			910
	2349	2356	0001	B8.0			910
19 September	0536	0547	0558	B1.2			
	0748	0834	0905	B3.7			910
20 September	<i>No Flares Observed</i>						
21 September	2120	2132	2218	B5.4	Sf	S08E10	910
	2250	2253	2257		Sf	S09E09	910
22 September	0127	0131	0138	B1.4			
	0549	0553	0558	B1.1			
	0902	0906	0909	B2.7			
	1259	1303	1309	B1.9			
	1349	1353	1427		Sf	S10E01	910
	1544	1545	1554	B2.2	Sf	S09E04	910
	2217	2220	2222	B4.5			
	2254	2259	2302	B3.9			
2319	2325	2327	B2.9				
23 September	0001	0003	0004	C1.3	Sf	S08W08	910
24 September	0455	0457	0501	B2.8	Sn	S08W21	910

Region Summary

Date	Location		Sunspot Characteristics						
	° Lat ° CMD	Helio Lon	Flares				Flares		
			Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray	
C	M	X	S	1	2	3	4		

Region 910

18 Sep	S08E49	341	0030	01	Hsx	001	A	1									
19 Sep	S09E37	340	0030	01	Hsx	001	A										
20 Sep	S09E24	339	0010	01	Hrx	001	A										
21 Sep	S09E10	340	0010	01	Hsx	001	A				2						
22 Sep	S10W04	341	0050	04	Csi	007	B	1		2							
23 Sep	S10W18	342	0020	01	Cro	003	B										
24 Sep	S09W32	343	0030	03	Axx	003	A				1						
								2	0	0	5	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 341

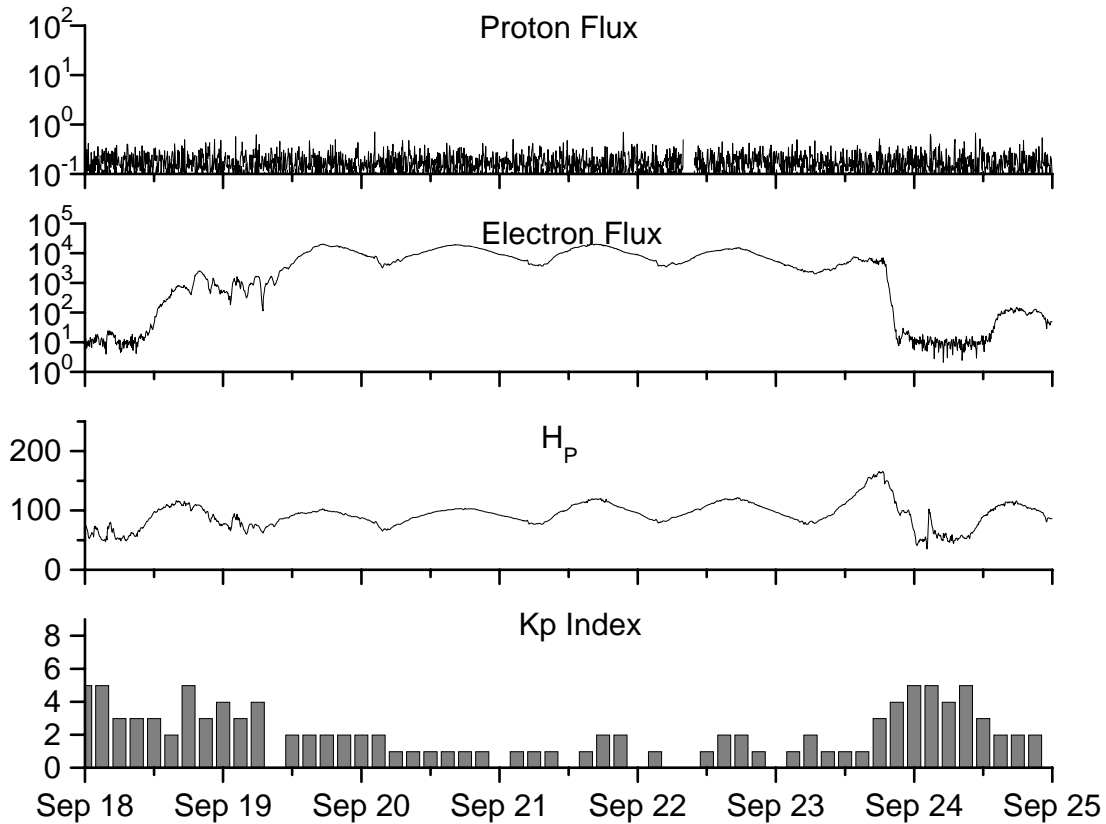


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2004									
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
2005									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	48.1	29.2	96.6	90.9	16	13.1
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56	42.9	25.9	90.8	87.8	21	11.8
October	13.0	8.5	0.65	42.6	25.5	76.7	87.4	7	11.6
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
2006									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51			75.5		8	
April	55.2	30.2	0.55			89.0		11	
May	39.6	22.2	0.56			81.0		8	
June	37.7	13.9	0.37			80.1		8	
July	22.6	12.2	0.54			75.8		7	
August	22.8	12.9	0.57			79.0		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 18 September 2006

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

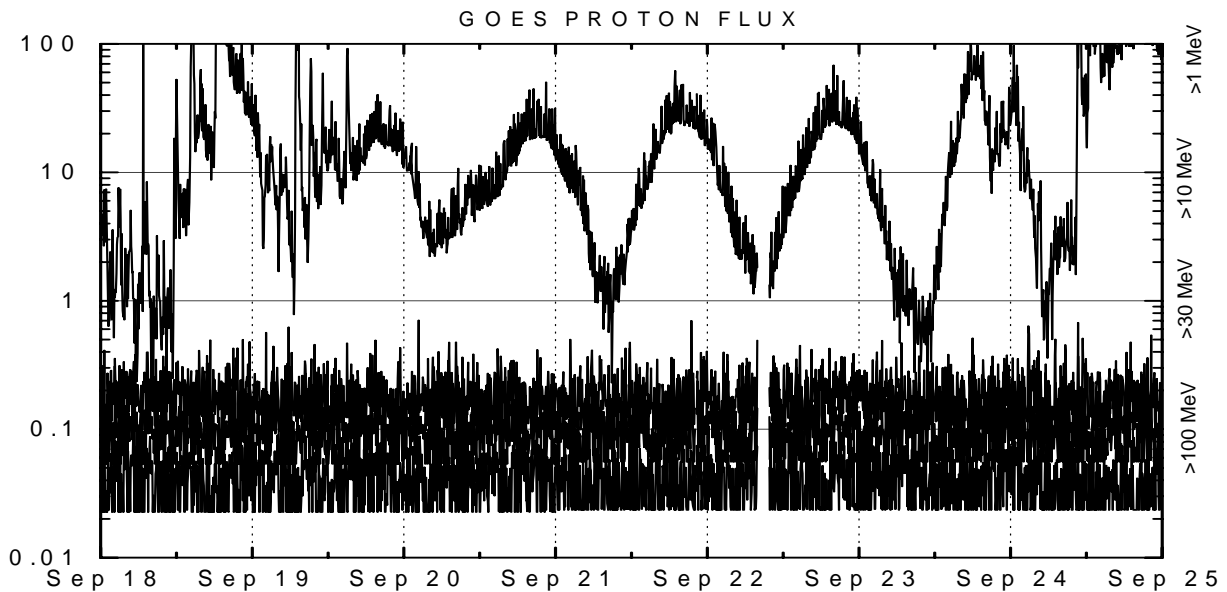
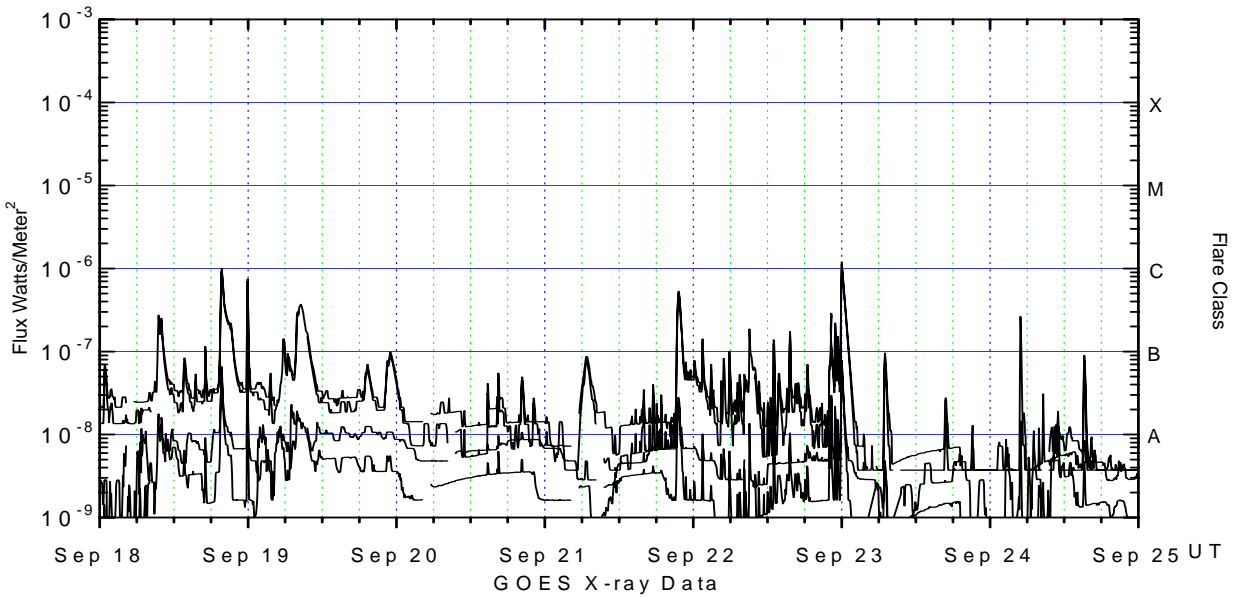
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

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 Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) 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 SEC 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 (W075) and GOES 11 (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 (W135) 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.

