

Space Weather Highlights
20 – 26 February 2006

SEC PRF 1591
28 February 2006

Solar activity was at very low levels. The disk was spotless the entire period.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels 21 – 26 February

The geomagnetic field ranged from quiet to active at middle latitudes, while high latitudes observed quiet to severe storm levels. The period began with the solar wind speed at about 400 km/s, while the IMF Bz was weak, not varying much beyond +/- 5 nT. Wind speed gradually increased to 500 km/s by early on 20 February, and then rose sharply to near 600 km/s by midday on the 20th. This sharp increase was due to the onset of a coronal hole high speed stream. Beginning midday on the 20th, and for the next 12 hours, the IMF Bz fluctuated between +/- 10 nT. By late on 21 February, wind speed peaked to near 700 km/s. From midday on 20 February through midday on 22 February, the geomagnetic field responded with quiet to active conditions at middle latitudes, while quiet to severe storm conditions were observed at high latitudes. Thereafter, and through the end of the summary period, wind speed gradually decayed and ended the period at near 400 km/s. The IMF Bz remained weak, not varying much beyond +/- 5 nT, while the geomagnetic field was generally quiet to unsettled at all latitudes.

Space Weather Outlook
01 March - 27 March 2006

Solar activity is expected to be at very low to low levels during the forecast period.

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 20 – 25 March.

The geomagnetic field is expected to range from quiet to minor storm levels. Active to minor storm periods are possible on 19 - 22 March due to effects from a recurrent coronal hole wind stream. Otherwise, quiet to unsettled conditions are expected.



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
20 February	76	0	0	<A1.0	0	0	0	0	0	0	0	0
21 February	76	0	0	<A1.0	0	0	0	0	0	0	0	0
22 February	76	0	0	<A1.0	0	0	0	0	0	0	0	0
23 February	75	0	0	<A1.0	0	0	0	0	0	0	0	0
24 February	76	0	0	<A1.0	0	0	0	0	0	0	0	0
25 February	76	0	0	A2.1	0	0	0	0	0	0	0	0
26 February	77	0	0	A2.1	0	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)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	20 February	3.3E+6	1.5E+4	3.5E+3		7.6E+6
21 February	2.4E+6	1.5E+4	3.4E+3		2.0E+8	
22 February	1.4E+6	1.5E+4	3.6E+3		3.7E+8	
23 February	5.5E+5	1.4E+4	3.5E+3		4.9E+8	
24 February	5.3E+5	1.6E+4	3.5E+3		4.0E+8	
25 February	7.7E+5	1.5E+4	3.6E+3		3.3E+8	
26 February	7.7E+5	1.6E+4	3.6E+3		1.7E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 February	9	1-2-2-3-3-3-2-2	45	2-2-3-6-6-7-3-3	20
21 February	15	3-3-4-3-3-3-2-2	36	2-2-4-7-5-4-4-2	17	3-4-3-4-3-3-3-2
22 February	11	4-3-3-2-2-2-1-1	25	3-2-3-6-5-4-2-0	12	4-3-3-3-3-2-1-2
23 February	4	1-2-2-1-1-1-1-0	5	1-0-3-3-1-0-0-0	3	1-2-2-1-0-0-0-0
24 February	4	2-1-0-2-2-1-2-0	13	1-0-1-5-5-1-0-0	6	2-2-0-3-3-0-0-0
25 February	1	2-0-0-0-0-0-0-0	0	0-0-0-0-0-0-0-0	1	1-0-0-0-0-0-0-1
26 February	3	0-2-0-0-1-1-1-2	4	0-1-0-0-2-3-1-1	5	0-2-1-0-1-2-1-2

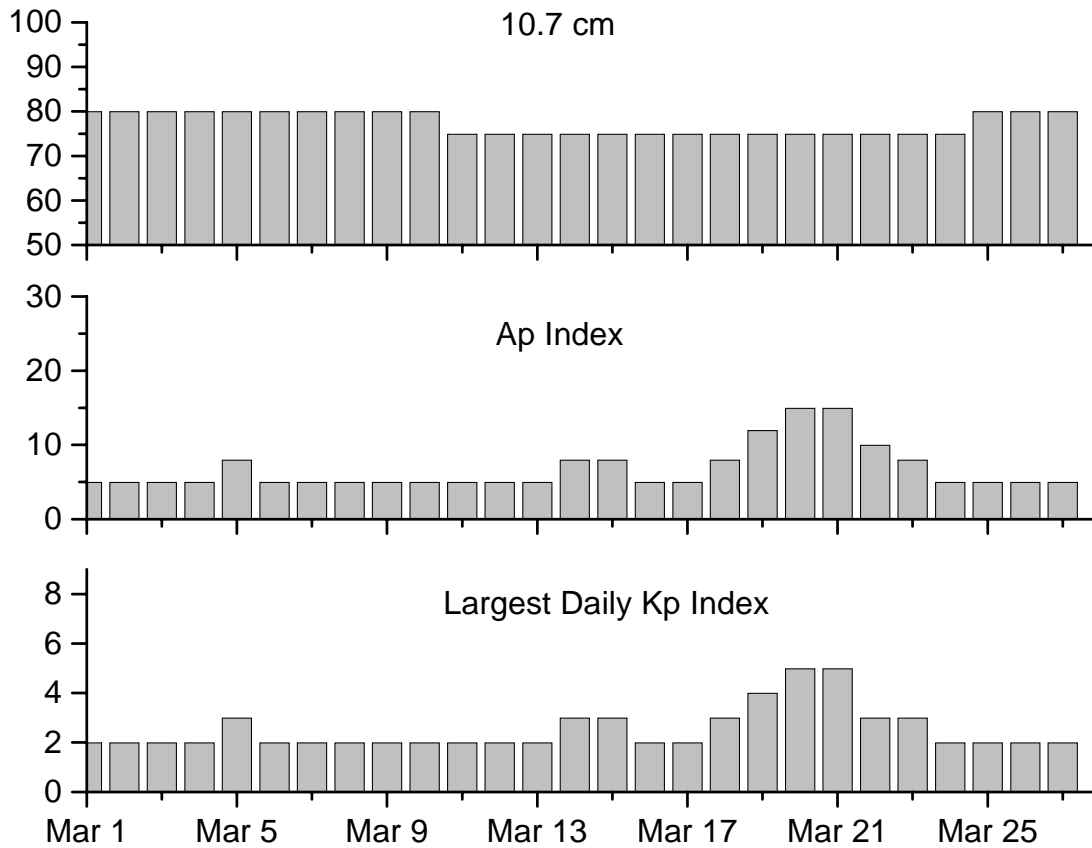


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
20 Feb 0855	WARNING: Geomagnetic K=4 expected	20 Feb 0855-1600
20 Feb 1018	ALERT: Geomagnetic K=4	20 Feb 1015
20 Feb 1624	ALERT: Geomagnetic K=5	20 Feb 1618
21 Feb 0711	WARNING: Geomagnetic K=4 expected	21 Feb 0711-1600
21 Feb 0801	ALERT: Geomagnetic K=4	21 Feb 0801
21 Feb 1150	ALERT: Electron 2MeV Integral Flux > 1000pfu	21 Feb 1140
21 Feb 1549	EXTENDED WARNING: Geomagnetic K= 4	21 Feb 0711-2359
21 Feb 2355	EXTENDED WARNING: Geomagnetic K=4	21 Feb 0711-22 Feb 1600
22 Feb 1410	ALERT: Electron 2MeV Integral Flux > 1000pfu	22 Feb 0500
22 Feb 1555	EXTENDED WARNING: Geomagnetic K=4	21 Feb 0711-22 Feb 2359
23 Feb 0534	ALERT: Electron 2MeV Integral Flux > 1000pfu	23 Feb 0500
24 Feb 0603	ALERT: Electron 2MeV Integral Flux > 1000pfu	24 Feb 0500
24 Feb 1347	ALERT: Geomagnetic K=4	24 Feb 1346
25 Feb 0542	ALERT: Electron 2MeV Integral Flux > 1000pfu	25 Feb 0500
26 Feb 0932	ALERT: Electron 2MeV Integral Flux > 1000pfu	26 Feb 0910



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
01 Mar	80	5	2	15 Mar	75	8	3
02	80	5	2	16	75	5	2
03	80	5	2	17	75	5	2
04	80	5	2	18	75	8	3
05	80	8	3	19	75	12	4
06	80	5	2	20	75	15	5
07	80	5	2	21	75	15	5
08	80	5	2	22	75	10	3
09	80	5	2	23	75	8	3
10	80	5	2	24	75	5	2
11	75	5	2	25	80	5	2
12	75	5	2	26	80	5	2
13	75	5	2	27	80	5	2
14	75	8	3				



Energetic Events

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

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
20 February	No Flares Observed						
21 February	No Flares Observed						
22 February	No Flares Observed						
23 February	No Flares Observed						
24 February	No Flares Observed						
25 February	2043	2058	2109	B1.9			
26 February	0751	0755	0759	B1.8			
	1401	1413	1418	B1.6			

Region Summary

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

Region 854

15 Feb	S07E23	327	0030	05	Dso	005	B								
16 Feb	S07E10	327	0030	06	Dao	006	B								
17 Feb	S08W09	333	0010	00	Axx	001	A								
18 Feb	S08W22	333													
19 Feb	S08W35	333													
20 Feb	S08W48	333													
21 Feb	S08W61	333													
22 Feb	S08W74	333													
23 Feb	S08W87	333													

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 333



Region Summary-Continued

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

Region 855

16 Feb	N06E28	309	0020	01	Hax	001	A										
17 Feb	N05E15	309	0010	02	Axx	002	A										
18 Feb	N05E02	309															
19 Feb	N05W11	309															
20 Feb	N05W24	309															
21 Feb	N05W37	309															
22 Feb	N05W50	309															
23 Feb	N05W63	309															
24 Feb	N05W76	309															
25 Feb	N05W89	309															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 309

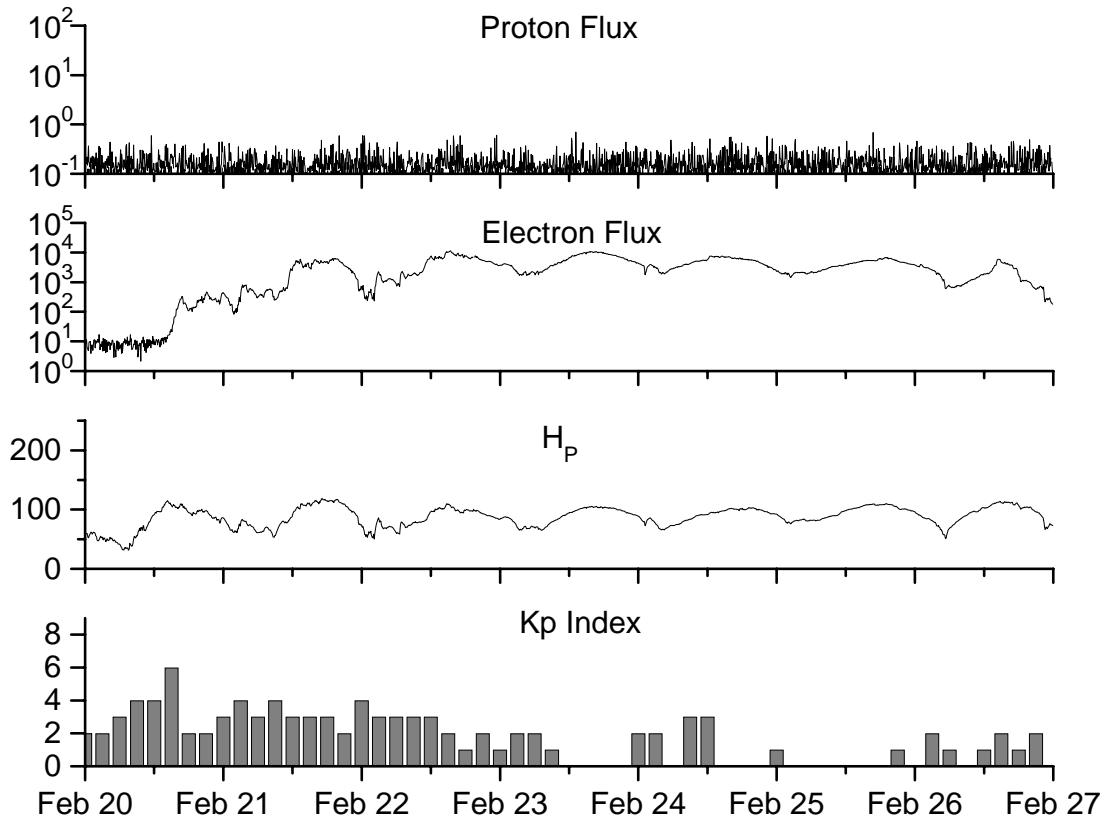


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SEC	values RI	Ratio RI/SEC	Smooth SEC	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2004									
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
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			96.6		16	
August	65.6	36.4	0.55			90.7		16	
September	39.2	22.1	0.56			90.8		21	
October	13.0	8.5	0.65			76.7		7	
November	32.2	18.0	0.56			86.3		8	
December	62.6	41.2	0.66			90.8		7	
2005									
January	28.0	15.4	0.55			83.8		6	

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 20 February 2006*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W105) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

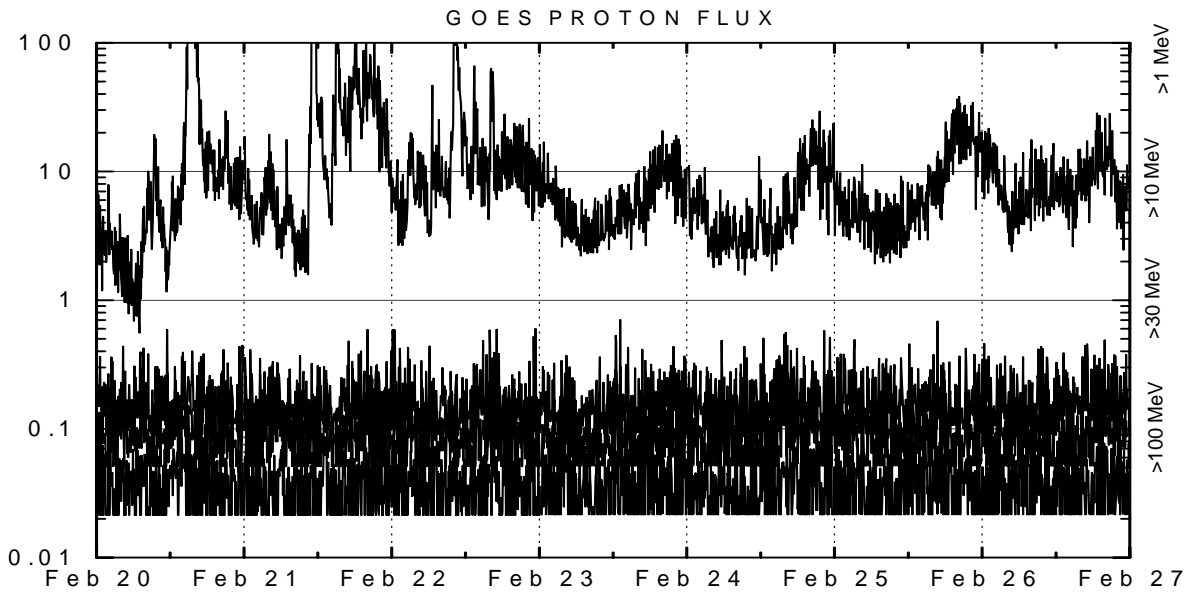
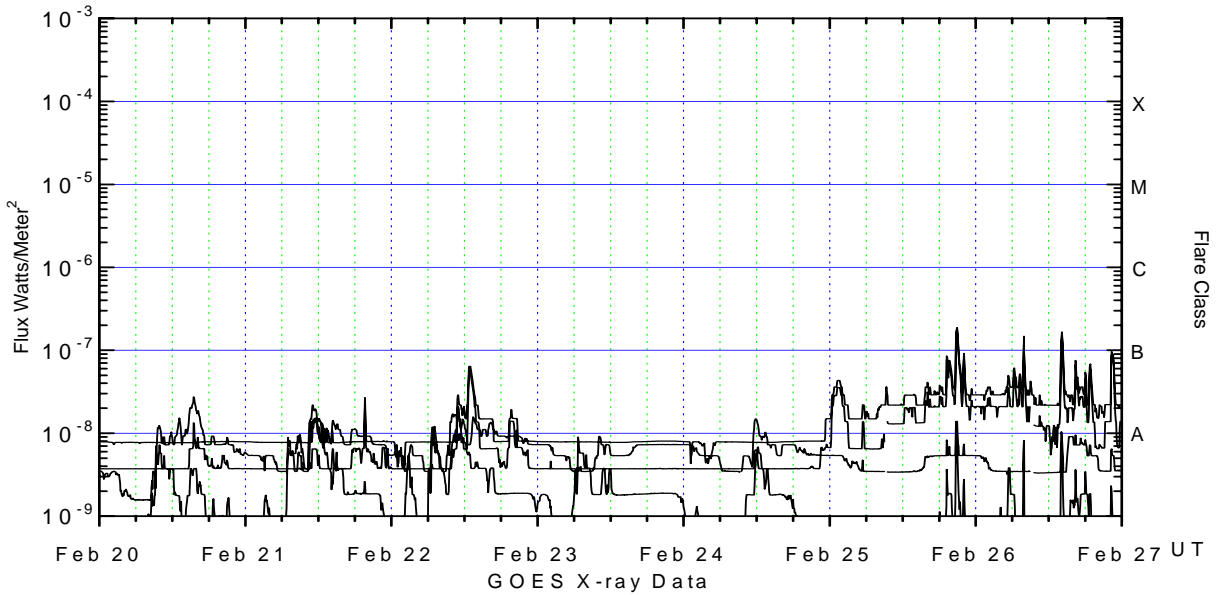
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

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 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 (W75) and GOES 10 (W136) 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 (W107) 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.

