

Space Weather Highlights
17 – 23 March 2008

SEC PRF 1699
25 March 2008

Solar activity was very low. Region 986 (S04, L = 098, class/area Bxo/010 on 17 March) rotated beyond the west limb as a spotless plage region on 19 March. Region 987 (S08, L = 258, class/area Cso/040 on 23 March) rotated onto the visible solar disk on 23 March. This region increased the X-ray background from below A-class to just below B-class. No X-ray flares were observed during the period; however, Region 987 did produce a Sf flare on 23 March at 2346 UTC.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels all days except for 21 and 23 March.

The geomagnetic field was at quiet levels on 17 March as a coronal hole high speed stream rotated out of geoeffective position. Throughout the remainder of the summary period activity levels were at mostly quiet levels, although there were several intervals of unsettled to active conditions due to sustained southward IMF Bz over several hours. ACE solar wind speeds reached a maximum of 576 km/s on 20 March at 1447 UTC, and a minimum of 405 km/s on 22 March at 0759 UTC. The IMF Bz varied between + 6 nT during the period.

Space Weather Outlook
26 March – 21 April 2008

Solar activity is expected to be low to moderate. At the time of writing there was a low-level M-class flare in progress from Region 989. This region remains capable of producing M-class activity. Regions 987 and 988 are also capable of producing C-class flares, and perhaps an isolated M-class flare. On 08 April when Region 989 departs the visible solar disk activity levels should decline to very low levels. Activity levels are expected to increase again to very low to low levels when Region 987 rotates back onto the visible solar disk on 19 April.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels during most of the period. However, the flux may drop to normal levels on 26 March, 02, 05, and 17 - 20 April.

The geomagnetic field is expected to be at unsettled to minor storm levels on 26 - 28 March due to a favorably positioned coronal hole high speed stream. Activity levels should decline to quiet to unsettled levels on 29 - 31 March as the high speed stream rotates out of a geoeffective position. 01 - 03 April a mostly quiet geomagnetic field is expected. On 04 - 11 April a coronal hole high speed stream is expected to influence the geomagnetic field bringing mostly unsettled to active conditions. For the remainder of the period predominately quiet 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
17 March	70	11	10	<A1.0	0	0	0	0	0	0	0	0
18 March	70	0	0	<A1.0	0	0	0	0	0	0	0	0
19 March	69	0	0	<A1.0	0	0	0	0	0	0	0	0
20 March	68	0	0	<A1.0	0	0	0	0	0	0	0	0
21 March	68	0	0	<A1.0	0	0	0	0	0	0	0	0
22 March	70	0	0	<A1.0	0	0	0	0	0	0	0	0
23 March	72	14	40	<A1.0	0	0	0	1	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
	17 March	3.5E+6	1.8E+4	4.2E+3		4.0E+8
18 March	3.1E+6	1.8E+4	4.1E+3		1.4E+8	
19 March	2.8E+6	1.6E+4	3.8E+3		1.2E+8	
20 March	3.5E+6	1.7E+4	4.1E+3		4.0E+7	
21 March	1.7E+6	1.8E+4	4.2E+3		3.6E+7	
22 March	1.2E+6	1.8E+4	4.3E+3		4.1E+7	
23 March	1.0E+6	1.8E+4	4.1E+3		2.8E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	17 March	3	2-0-0-0-1-2-2-1	4	2-0-1-2-0-2-2-1	4
18 March	7	3-3-2-1-1-1-1-1	8	2-2-3-2-3-2-1-1	8	3-4-1-1-1-1-0-1
19 March	5	0-0-2-0-3-2-2-2	10	0-0-1-0-5-3-2-2	6	0-1-1-1-3-3-1-2
20 March	7	2-1-1-2-3-2-2-1	16	2-1-1-4-6-2-1-0	8	2-1-1-1-4-2-2-2
21 March	4	2-1-0-0-1-1-2-2	5	1-1-2-3-1-1-1-1	5	2-1-0-1-1-2-2-2
22 March	4	2-0-1-1-1-1-1-2	3	1-1-1-2-0-0-1-2	5	1-0-1-1-1-1-1-3
23 March	7	3-1-3-2-2-1-1-1	11	2-2-2-5-3-1-1-0	8	3-3-3-2-1-1-1-1

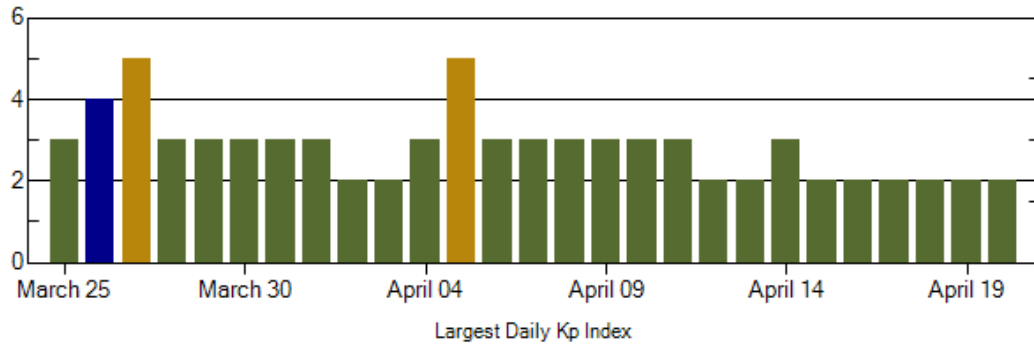
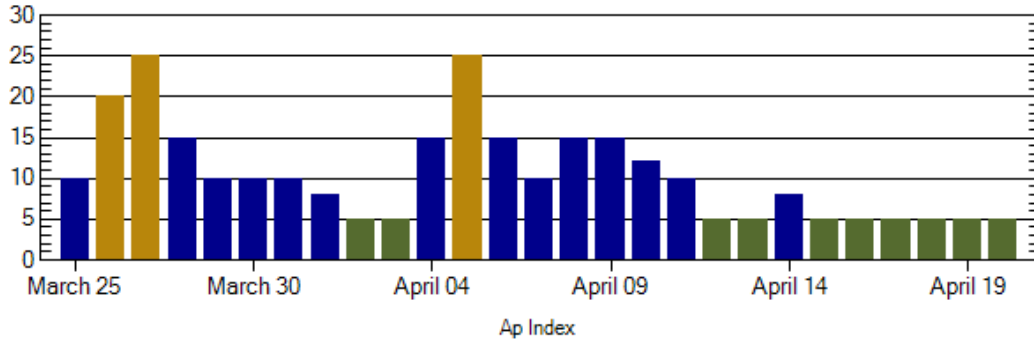
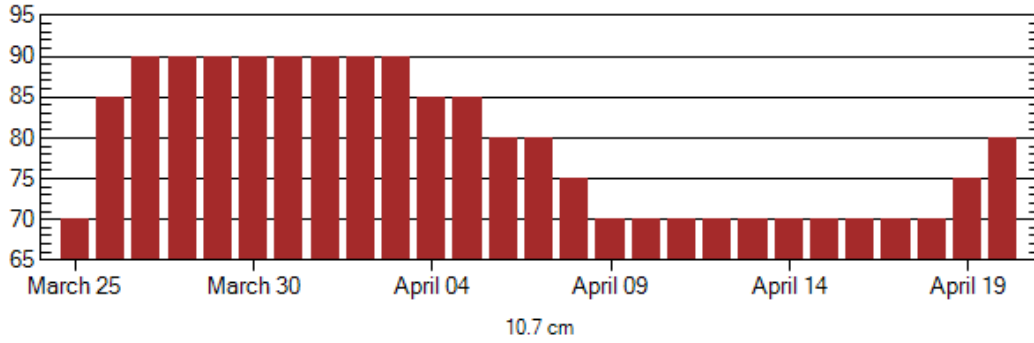


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
17 Mar 0504	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	17 Mar 0500
18 Mar 0342	WARNING: Geomagnetic K = 4	18 Mar 0342 – 1600
18 Mar 0347	ALERT: Geomagnetic K = 4	18 Mar 0347
18 Mar 1213	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	18 Mar 1150
19 Mar 0911	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	19 Mar 0845
20 Mar 1147	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	20 Mar 1130
20 Mar 1243	WARNING: Geomagnetic K = 4	20 Mar 1245 – 1600
20 Mar 1248	ALERT: Geomagnetic K = 4	20 Mar 1248
22 Mar 2146	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	22 Mar 2130



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 Mar	85	20	4	09 Apr	70	15	3
27	90	25	5	10	70	12	3
28	90	15	3	11	70	10	3
29	90	10	3	12	70	5	2
30	90	10	3	13	70	5	2
31	90	10	3	14	70	8	3
01 Apr	90	8	3	15	70	5	2
02	90	5	2	16	70	5	2
03	90	5	2	17	70	5	2
04	85	15	3	18	70	5	2
05	85	25	5	19	75	5	2
06	80	15	3	20	80	5	2
07	80	10	3	21	85	5	2
08	75	15	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 X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
17 March	<i>No Flares Observed</i>						
18 March	<i>No Flares Observed</i>						
19 March	<i>No Flares Observed</i>						
20 March	<i>No Flares Observed</i>						
21 March	<i>No Flares Observed</i>						
22 March	<i>No Flares Observed</i>						
23 March	2345	2346	2350		Sf	S09E50	987

Region Summary

Date	Location		Sunspot Characteristics					Flares		X-ray		Optical	
	Helio		Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	C	M	X	S	1	2
	(° Lat ° CMD)	Lon											
<i>Region 986</i>													
15 Mar	S04W41	094	0020	03	Bxo	002	B						
16 Mar	S04W56	096	0020	02	Bxo	002	B						
17 Mar	S04W71	098	0010	00	Axx	001	A						
18 Mar	S04W84	098											
								0	0	0	0	0	0
Crossed West Limb. Absolute heliographic longitude: 094													
<i>Region 987</i>													
23 Mar	S08E50	258	0040	03	Cso	004	B				1		
								0	0	0	1	0	0
Still on Disk. Absolute heliographic longitude: 258													



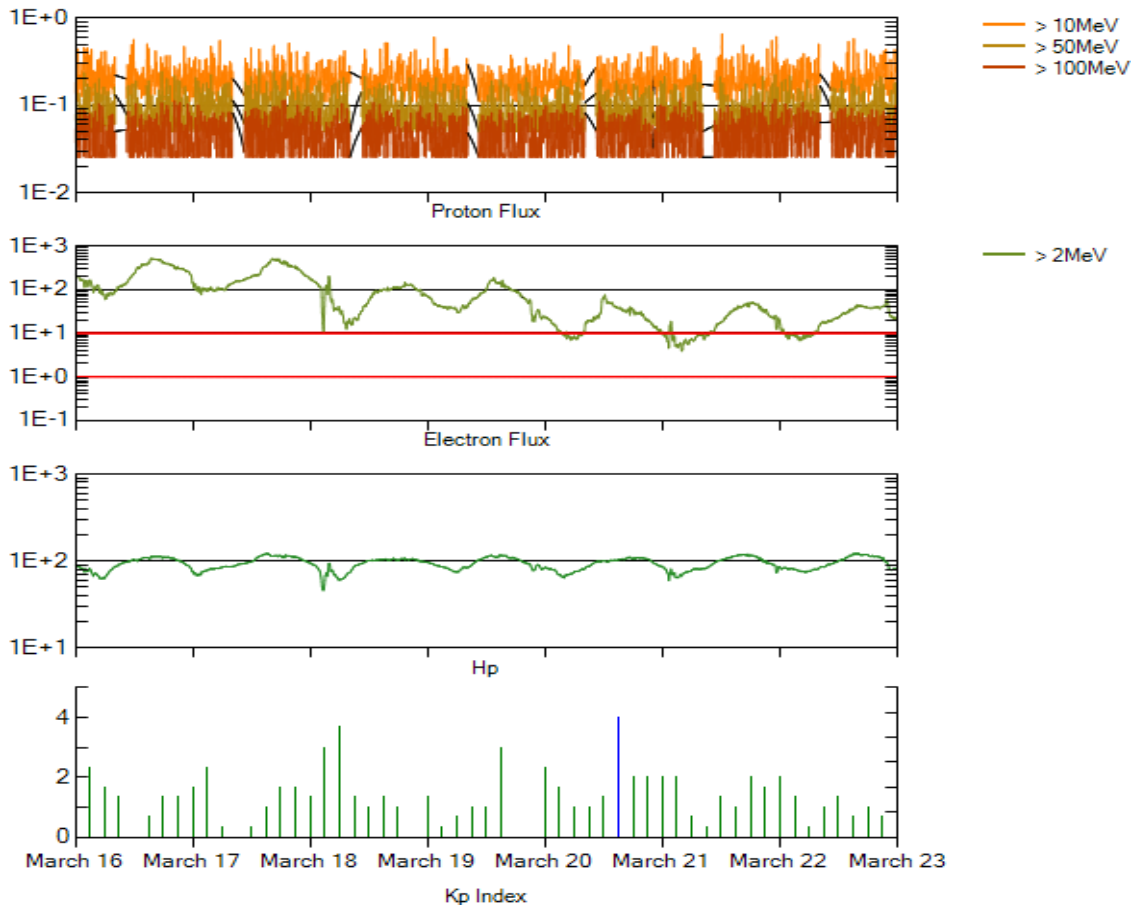
Recent Solar Indices (preliminary)
Of the observed monthly mean values

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
2006									
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	9	8.3
July	22.6	12.2	0.54	27.2	15.3	75.8	80.3	7	8.7
August	22.8	12.9	0.57	27.6	15.6	79.0	80.3	9	8.7
September	25.2	14.5	0.58	27.7	15.6	77.8	80.2	8	8.7
October	15.7	10.4	0.66	25.2	14.2	74.3	79.4	8	8.6
November	31.5	21.5	0.68	22.3	12.7	86.4	78.5	9	8.5
December	22.2	13.6	0.61	20.7	12.1	84.3	77.9	15	8.5
2007									
January	26.6	16.9	0.64	19.7	12.0	83.5	77.5	6	8.4
February	17.2	10.6	0.62	18.9	11.6	77.8	76.9	6	8.4
March	9.7	4.8	0.49	17.5	10.8	72.3	76.0	8	8.4
April	6.9	3.7	0.54	16.0	9.9	72.4	75.2	9	8.5
May	19.4	11.7	0.60	14.2	8.7	74.5	74.2	9	8.4
June	20.0	12.0	0.60	12.8	7.7	73.7	73.2	7	7.8
July	15.6	10.0	0.64	11.6	7.0	71.6	72.5	8	7.4
August	9.9	6.2	0.63	10.2	6.1	69.2	71.8	7	7.6
September	4.8	2.4	0.50			67.1		9	
October	1.3	0.9	0.70			65.5		9	
November	2.5	1.7	0.68			69.7		5	
December	16.2	10.1	0.62			78.6		4	
2008									
January	5.1	3.4	0.67			72.1		6	
February	3.8	2.1	0.55			71.2		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 17 March 2008*

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.

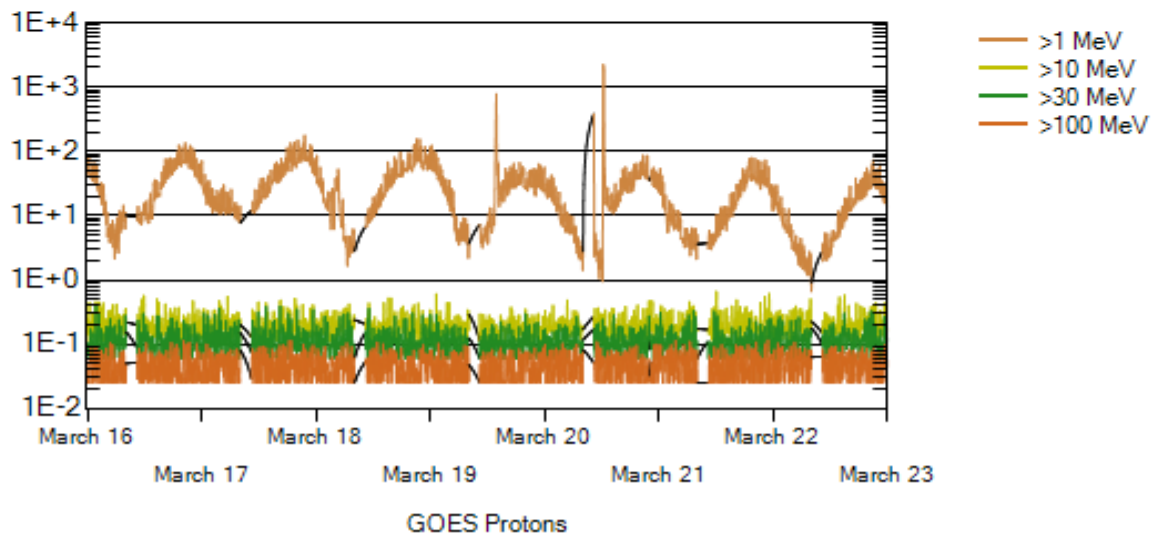
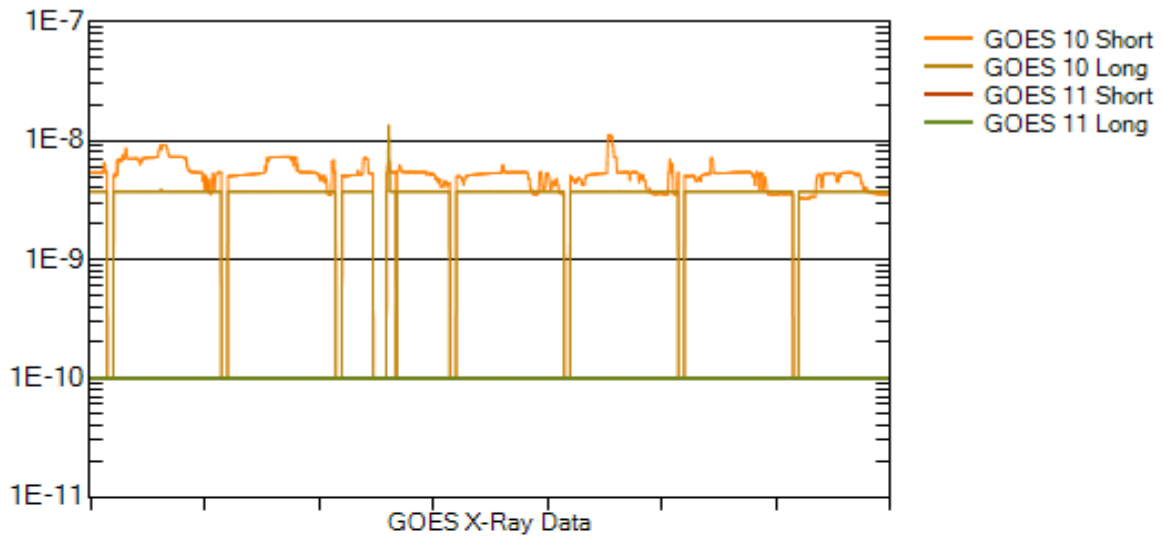
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

Hp 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.

Kp 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 Kp 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 Kp 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/m^2) as measured by GOES 10 (W060) 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 ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.

