

Space Weather Highlights
13 - 19 April 2009

SWO PRF 1755
21 April 2009

Solar activity was very low. No flares were observed. The visible disk was spotless.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 13 - 14 April.

Geomagnetic field activity was at quiet levels during 13 - 15 April. Field activity increased to quiet to unsettled levels on 16 April, with an isolated active period observed at high latitudes, due to the influence of a coronal hole high-speed stream (CH HSS). ACE solar wind velocities increased from 303 km/s at 16/1351 UTC to a high of 547 km/s at 18/1921 UTC. During this period, the Bz component of the IMF varied between -8 nT and +10 nT. Field activity decreased to quiet levels on 18 - 19 April, and solar wind velocities gradually decreased to 431 km/s at the end of the forecast period.

Space Weather Outlook
22 April - 18 May 2009

Solar activity is expected to be very low.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to increase to high levels during 08 - 11 May. Normal flux levels are expected during the rest of the period.

Geomagnetic field activity is expected to be at mostly quiet levels through 05 May. Activity is expected to increase to quiet to unsettled levels during 06 - 09 May, with active conditions possible on 06 May, due to a recurrent CH HSS. Activity is expected to decrease to predominantly quiet levels during 10 - 18 May.



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
13 April	68	0	0	<A1.0	0	0	0	0	0	0	0	0
14 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0
15 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0
16 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0
17 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0
18 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0
19 April	70	0	0	<A1.0	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
	13 April	6.4e+05	1.9e+04	3.9e+03		1.6e+08
14 April	8.0e+05	2.0e+04	4.2e+03		1.3e+08	
15 April	5.8e+05	2.0e+04	4.6e+03		4.4e+07	
16 April	6.6e+05	1.9e+04	4.0e+03		1.6e+07	
17 April	6.3e+05	1.9e+04	4.0e+03		6.2e+06	
18 April	3.8e+05	1.9e+04	4.0e+03		1.4e+06	
19 April	4.4e+05	1.9e+04	4.4e+03		1.4e+06	

Daily Geomagnetic Data

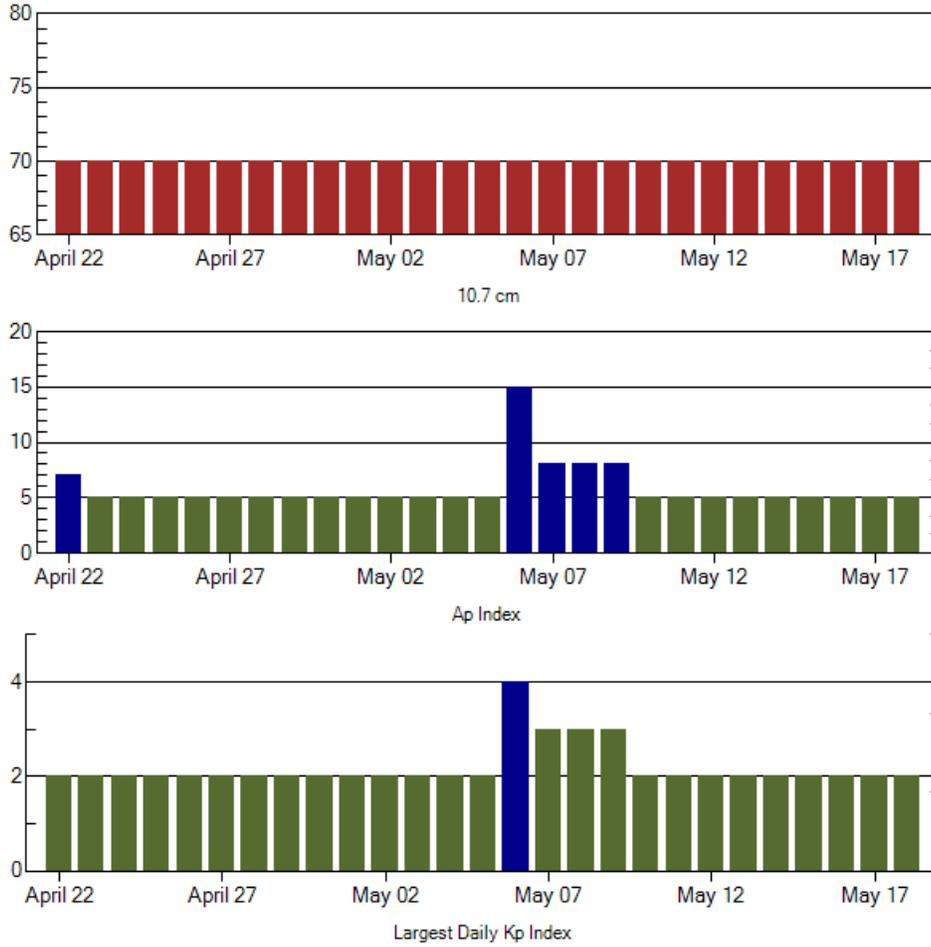
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	13 April	3	2-2-2-0-1-0-0-0	3	1-2-2-0-0-0-0-0	4
14 April	1	1-0-0-1-0-0-0-0	2	0-0-0-2-2-0-0-0	2	1-0-0-1-1-0-0-1
15 April	2	2-0-0-0-1-1-1-1	2	1-1-0-2-0-0-0-0	3	2-1-0-0-1-1-1-1
16 April	3	1-1-1-0-1-2-1-1	7	1-1-3-2-3-2-0-1	6	1-2-2-1-1-2-1-3
17 April	4	2-1-1-0-2-1-0-2	4	1-0-0-3-3-1-0-1	5	2-0-0-1-2-1-1-2
18 April	8	2-3-3-1-2-1-1-2	13	2-3-4-3-2-3-2-2	8	2-3-3-1-2-2-1-2
19 April	4	2-2-1-0-1-0-1-2	3	2-1-1-0-2-0-1-1	4	2-2-1-0-1-0-1-2

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
13 Apr 1041	ALERT: Electron 2MeV Integral Flux >= 1000pfu	13 Apr 1025
14 Apr 1256	ALERT: Electron 2MeV Integral Flux >= 1000pfu	14 Apr 1235



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
22 Apr	70	7	2	06 May	70	15	4
23	70	5	2	07	70	8	3
24	70	5	2	08	70	8	3
25	70	5	2	09	70	8	3
26	70	5	2	10	70	5	2
27	70	5	2	11	70	5	2
28	70	5	2	12	70	5	2
29	70	5	2	13	70	5	2
30	70	5	2	14	70	5	2
01 May	70	5	2	15	70	5	2
02	70	5	2	16	70	5	2
03	70	5	2	17	70	5	2
04	70	5	2	18	70	5	2
05	70	5	2				



Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn
	Begin	Max	End			Location Lat CMD	
13 April	No Flares Observed						
14 April	No Flares Observed						
15 April	No Flares Observed						
16 April	No Flares Observed						
17 April	No Flares Observed						
18 April	No Flares Observed						
19 April	No Flares Observed						

Region Summary

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

No active regions.



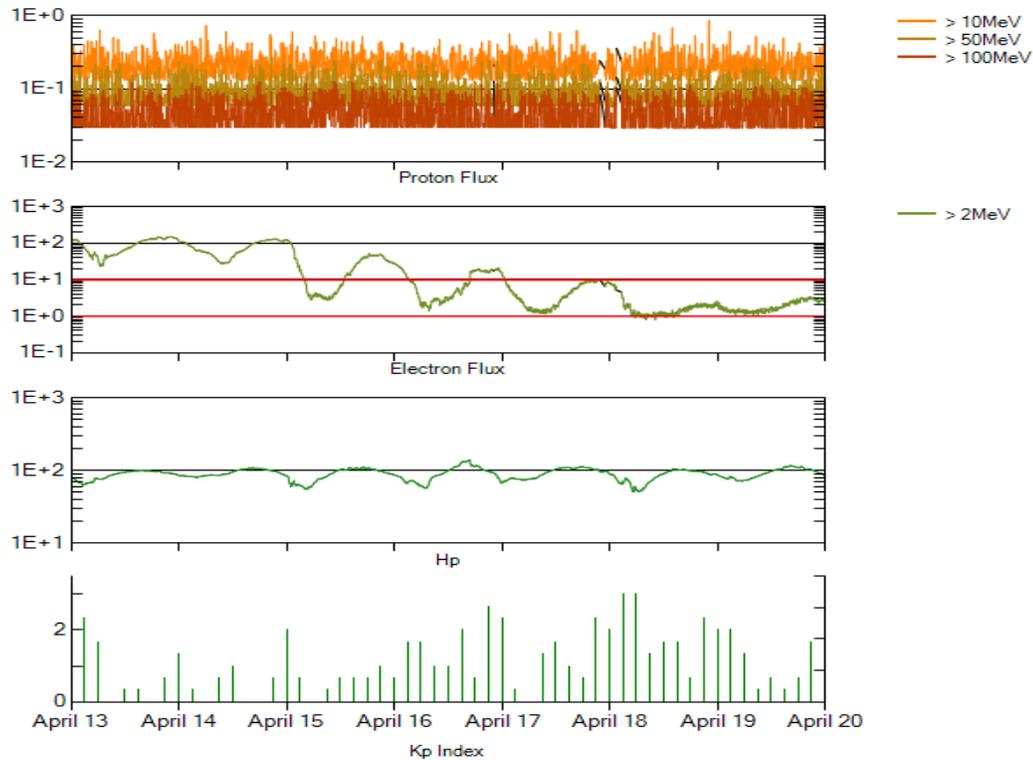
Recent Solar Indices (preliminary)
Of the observed monthly mean values

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
2007									
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	9.9	5.9	67.1	71.5	9	7.8
October	1.3	0.9	0.70	10.0	6.1	65.5	71.5	9	7.9
November	2.5	1.7	0.68	9.4	5.7	69.7	71.1	5	7.8
December	16.2	10.1	0.62	8.1	5.0	78.6	70.5	4	7.8
2008									
January	5.1	3.4	0.67	6.9	4.2	72.1	70.0	6	7.7
February	3.8	2.1	0.55	5.9	3.6	71.2	69.6	9	7.6
March	15.9	9.3	0.58	5.3	3.3	72.9	69.5	10	7.4
April	4.9	2.9	0.59	5.3	3.3	70.3	69.6	9	7.1
May	5.7	2.9	0.51	5.7	3.5	68.4	69.7	6	6.9
June	4.2	3.1	0.74	5.2	3.2	65.9	69.2	7	6.8
July	1.0	0.5	0.50	4.5	2.7	65.8	68.8	6	6.6
August	0.0	0.5	**	4.4	2.6	66.4	68.6	5	6.2
September	1.5	1.1	0.73	3.7	2.2	67.1	68.4	5	5.8
October	5.2	2.9	0.56			68.3		6	
November	6.8	4.1	0.60			68.6		3	
December	1.3	0.8	0.62			69.2		2	
2009									
January	2.8	1.5	0.54			69.8		3	
February	2.5	1.4	0.56			70.0		4	
March	0.7	0.7	1.00			69.2		4	

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.

**SWPC sunspot number was less than RI value, so a ratio could not be done.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 13 April 2009*

GOES-11 designated Primary Electron Satellite and GOES-10 Secondary: December 1, 2008 the GOES-12 Electron sensor began experiencing periods of noise and sensor is unreliable.

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.

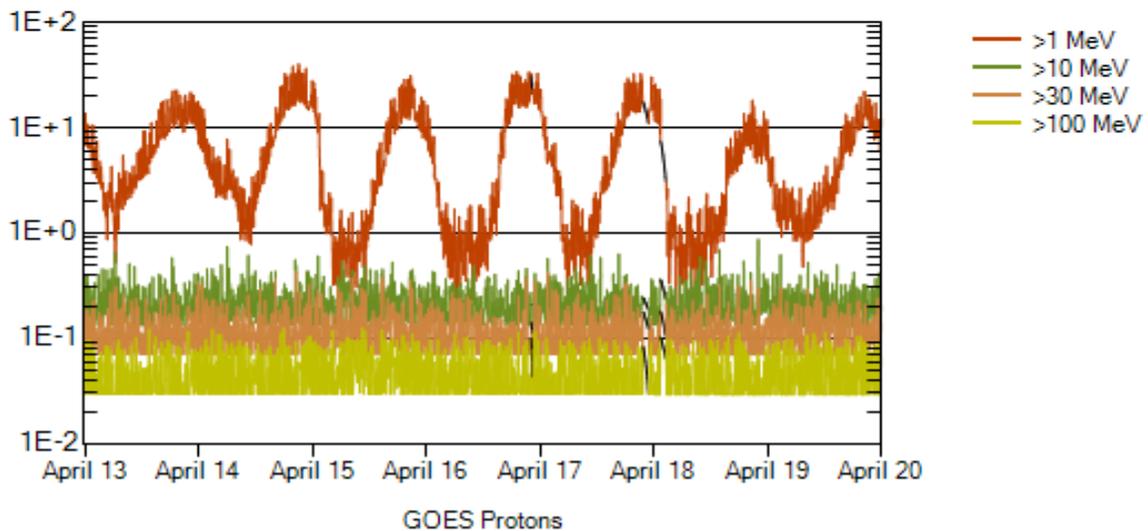
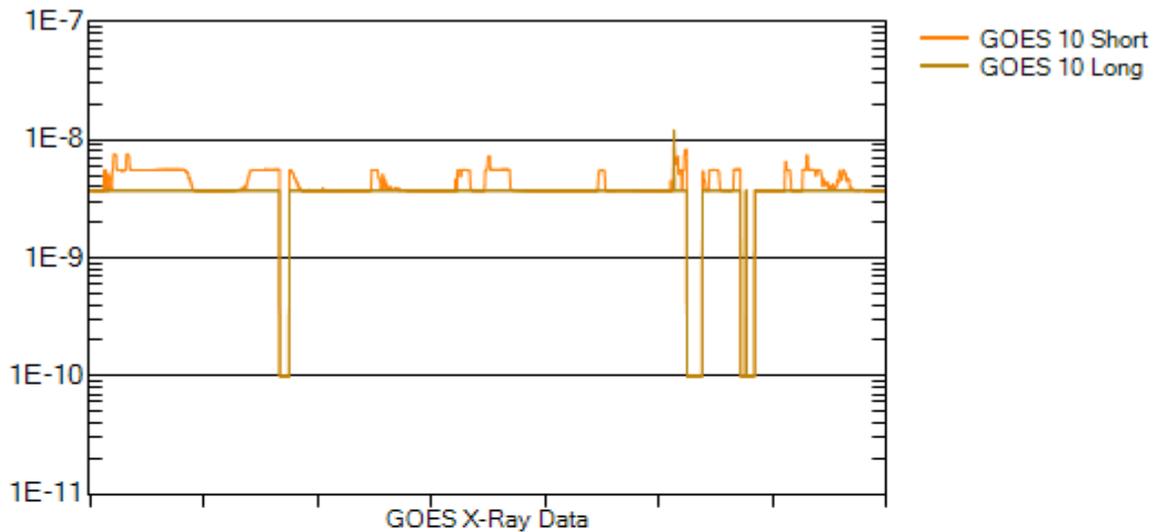
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-11 (W135).

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-11. 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 SWPC 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.

