

Space Weather Highlights
09 November – 15 November 2009

SWO PRF 1785
17 November 2009

Solar activity was very low. No flares occurred during the summary period. Region 1030 (N25, L=046, class/area Cro/050 on 05 November) was observed to have a few spots without penumbra at the beginning of the period and rotated off the visible disk on 12 November. Old Region 1029 (N17, L=213, class/area Eko/380 on 29 October), which rotated off the disk on 1 November, returned into view on 14 November as a spotless plage area. New Region 1031 (N30, L=257, class/area Bxo/010 on 15 November) emerged on the disk on 15 November. A small CME from the west limb was observed to enter the LASCO C2 field of view at 1254 UTC on 15 November. EUV imagery from the STEREO-A spacecraft clearly showed the source was in the vicinity of Region 1030 which was three days behind the limb at the time of the event.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels during the period.

The geomagnetic field was predominantly quiet throughout the summary period with the exception of a period of unsettled levels at high latitudes from 0600-1200 UTC on 09 November, a period of unsettled levels at some mid-latitude stations and active at high latitudes from 0900-1200 UTC on 14 November, and a period of unsettled levels at high latitudes from 1200-1800 UTC on 15 November. Solar wind observations from the ACE spacecraft showed a slow decline of solar wind velocity from about 450 km/s at the beginning of the period down to about 280 km/s by 2200 UTC on 11 November. In addition, the interplanetary magnetic field (IMF) showed a small increase between 2000 UTC on the 13th through 1840 UTC on the 15th, with peak Bt values around 8 nT and peak negative Bz values around -6 nT.

Space Weather Outlook
18 November 2009 – 14 December 2009

Solar activity is expected to be predominantly very low with just a slight chance for brief periods of low.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal levels through the period.

The geomagnetic field is expected to be mostly quiet for 18-19 November. An increase to unsettled with a chance for active periods is expected between 20-22 November due to effects from a favorably positioned coronal hole. Quiet levels are expected to prevail for the remainder of the interval from 23 November through 14 December.



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
09 November	72	14	10	<A1.0	0	0	0	0	0	0	0	0
10 November	73	13	10	<A1.0	0	0	0	0	0	0	0	0
11 November	72	11	10	<A1.0	0	0	0	0	0	0	0	0
12 November	73	11	10	<A1.0	0	0	0	0	0	0	0	0
13 November	74	0	0	<A1.0	0	0	0	0	0	0	0	0
14 November	75	0	0	<A1.0	0	0	0	0	0	0	0	0
15 November	75	11	10	<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
09 November	3.9e+05	2.0e+04	4.1e+03		7.9e+04	
10 November	3.5e+05	2.0e+04	4.6e+03		1.1e+05	
11 November	3.2e+05	2.0e+04	4.4e+03		1.3e+05	
12 November	3.8e+05	2.1e+04	4.6e+03		1.6e+05	
13 November	5.7e+05	2.0e+04	4.6e+03		1.6e+05	
14 November	5.4e+05	2.0e+04	4.3e+03		7.2e+04	
15 November	4.1e+05	2.0e+04	4.6e+03		5.5e+04	

Daily Geomagnetic Data

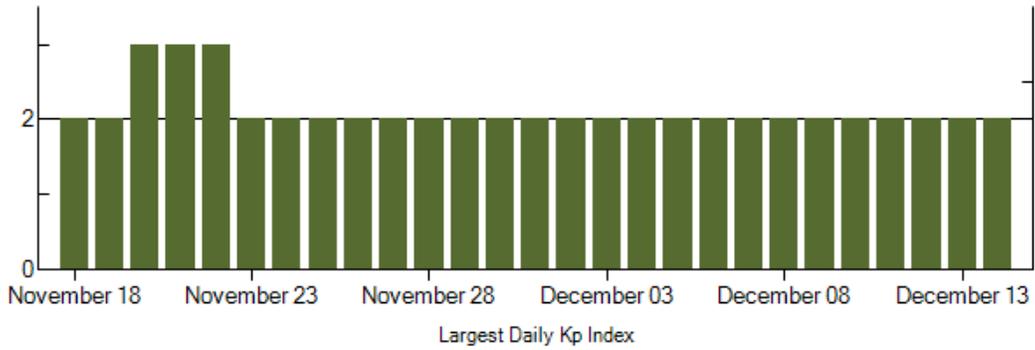
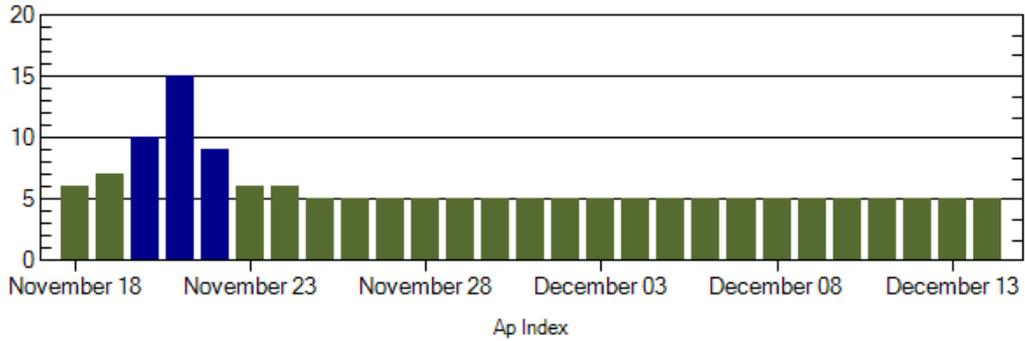
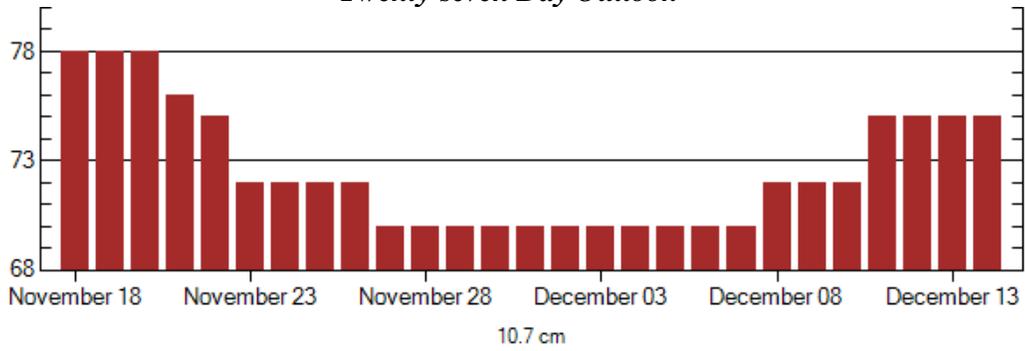
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	09 November	2	1-1-1-1-0-1-0-0	5	1-1-3-3-0-0-0-0	4
10 November	0	0-0-0-0-0-1-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-1-0-1
11 November	0	0-0-0-0-0-0-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-0-0-0
12 November	0	0-0-0-0-0-1-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-0-0-0
13 November	2	0-0-0-0-1-1-1-1	0	0-0-0-0-0-0-0-0	2	0-0-0-0-0-0-0-1
14 November	3	0-1-2-2-2-0-0-1	5	0-0-2-4-2-0-0-0	5	1-1-2-2-2-0-1-2
15 November	3	1-1-2-1-1-1-1-0	5	0-0-1-1-3-3-1-0	4	1-1-2-0-2-2-1-0

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
<i>No Alerts Issued</i>		



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
18 Nov	78	6	2	02 Dec	70	5	2
19	78	7	2	03	70	5	2
20	78	10	3	04	70	5	2
21	76	15	3	05	70	5	2
22	75	9	3	06	70	5	2
23	72	6	2	07	70	5	2
24	72	6	2	08	72	5	2
25	72	5	2	09	72	5	2
26	72	5	2	10	72	5	2
27	70	5	2	11	75	5	2
28	70	5	2	12	75	5	2
29	70	5	2	13	75	5	2
30	70	5	2	14	75	5	2
01 Dec	70	5	2				



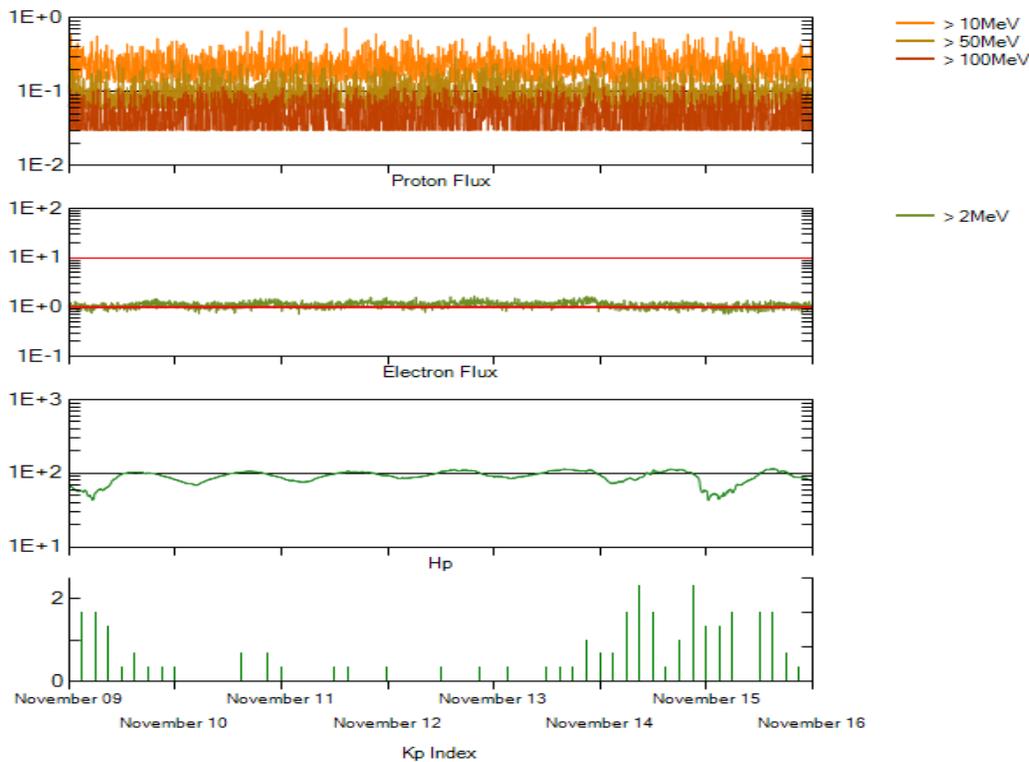
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers			Smooth values		Radio Flux		Geomagnetic	
	Observed SEC	values RI	Ratio RI/SEC	SEC	RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
November	2.5	1.7	0.68	9.4	5.7	69.6	71.4	7	7.8
December	16.2	10.1	0.62	8.1	4.9	78.5	70.8	6	7.8
2008									
January	5.1	3.3	0.65	6.9	4.2	74.3	70.3	8	7.8
February	3.8	2.1	0.55	5.9	3.6	71.1	69.9	11	7.6
March	15.9	9.3	0.58	5.3	3.3	72.9	69.8	11	7.5
April	4.9	2.9	0.59	5.3	3.4	70.2	69.8	9	7.3
May	5.7	3.2	0.56	5.7	3.5	68.4	69.8	6	7.2
June	4.2	3.4	0.81	5.2	3.3	65.9	69.4	7	7.0
July	1.0	0.8	0.80	4.5	2.8	65.7	68.8	5	6.8
August	0.0	0.5	**	4.4	2.7	66.3	68.6	5	6.3
September	1.5	1.1	0.73	3.7	2.3	67.1	68.4	6	5.8
October	5.2	2.9	0.56	2.9	1.9	68.3	68.2	7	5.4
November	6.8	4.1	0.60	2.7	1.8	68.6	68.3	4	5.1
December	1.3	0.8	0.62	2.7	1.7	69.2	68.5	4	4.9
2009									
January	2.8	1.3	0.46	3.0	1.8	69.8	68.7	4	4.7
February	2.5	1.4	0.56	3.1	1.9	70.0	68.8	5	4.7
March	0.7	0.7	1.00	3.4	2.0	69.2	69.0	5	4.6
April	1.2	1.2	1.00			69.7		4	
May	3.9	2.9	0.74			70.5		4	
June	6.6	2.6	0.39			68.6		4	
July	5.0	3.5	0.70			68.2		4	
August	0.3	0.0	0.00			67.4		5	
September	6.6	4.2	0.64			70.5		4	
October	7.0	4.6	0.66			72.4		3	

NOTE: Values are final except for the most recent 6 months which are considered preliminary. Cycle 23 started in May 1996 with an RI=8.0. Cycle 23 maximum was April 2000 with an RI=120.8.

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





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 09 November 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.

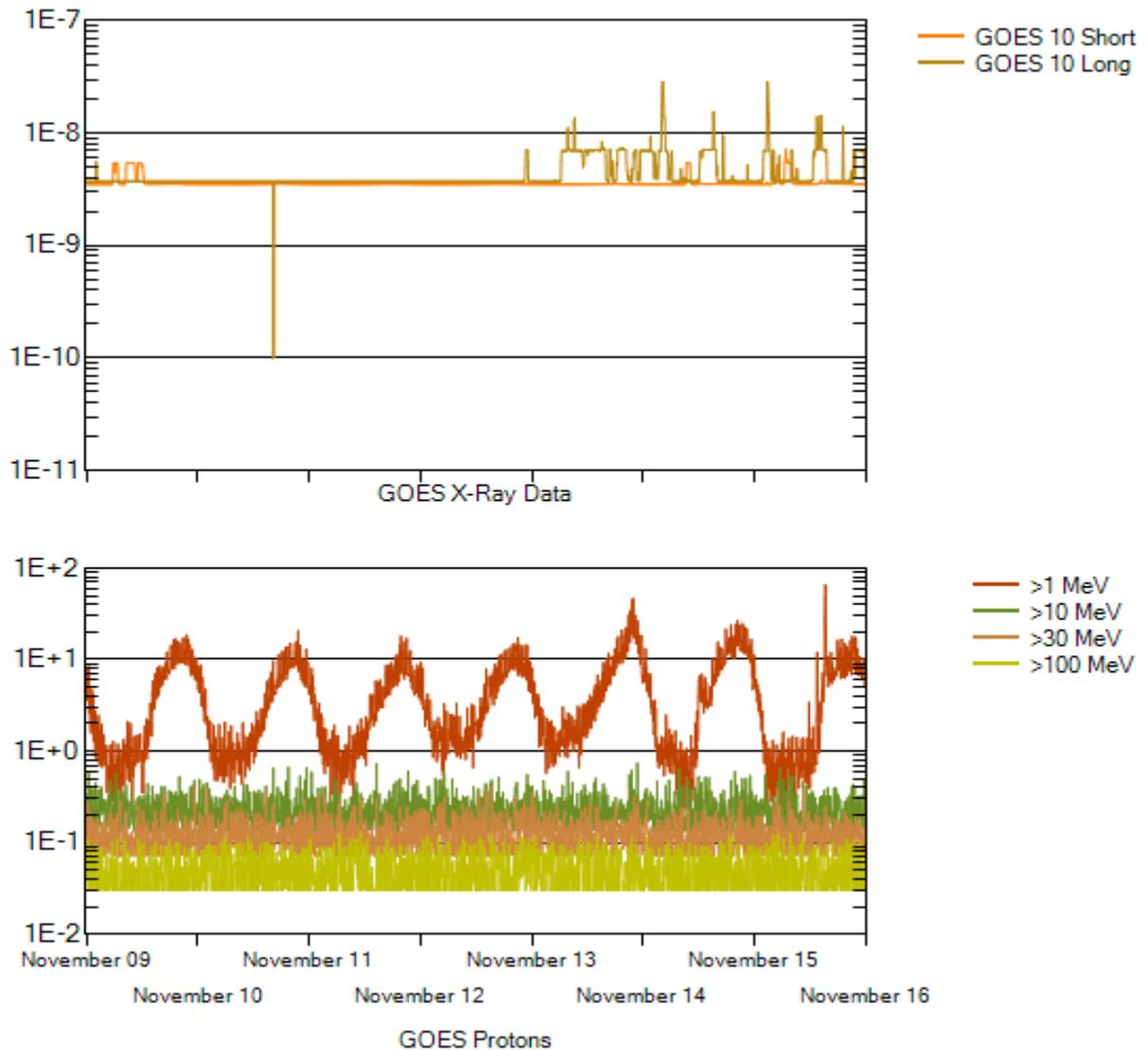
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-11.

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) in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

Proton plot contains the five-minute averaged integral proton flux ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-11 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.

