

Space Weather Highlights
24 – 30 January 2011

SWPC PRF 1848
01 February 2011

Solar activity ranged from very low to moderate during the summary period. Region 1149 (N17, L= 349, class/area Dso/250 on 26 January) provided the bulk of activity producing 5 C-class events and the largest, an M1.3 at 28/0103Z as the region rotated around the west limb.

Associated with this event was a Type II Sweep with an estimated shock velocity of 732 km/s and a CME observed in LASCO C2 imagery off the NW limb at 28/0206Z. Due to the location of this CME, it was determined not to be Earth-directed. Earlier in the period, Region 1149 produced a C1.2 X-ray event at 27/1201Z with another Type II Sweep (901 km/s estimated SV). On 28 January, two new regions were numbered. Region 1150 (S21, L-182, class/area Dao/050 on 30 January) rotated onto the disk while Region 1151 (N09, L-306, class/area Cro/020 on 28 January) emerged on the disk. Both regions were quiet and stable producing only low-level B-class activity. A 26 degree filament erupted on 29/1219Z visible in SDO/AIA 193 imagery. An associated faint, partial-halo CME was observed in LASCO C3 imagery at 30/1954Z and appeared to be Earth-directed.

No proton events were observed at geosynchronous orbit. However, a 10 MeV proton enhancement of 2.8 pfu was recorded at 28/1625Z associated with the M1.3 X-ray event on 28 January.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate levels on 24 - 26 and 28 January and normal levels on 27 and 29 - 30 January.

Geomagnetic field levels were predominately quiet the entire summary period. Solar wind speeds were fairly benign ranging from a high of 407 km/s at 24/0843Z to a low of 266 km/s at 30/1946Z. The Bz component of the interplanetary magnetic field did not vary much beyond +/- 5 nT during the summary period.

Space Weather Outlook
02 February – 28 February 2011

Solar activity is expected to be at very low to low levels through 08 February. A slight chance for M-class activity is possible from 09 - 22 February due to the return of old Region 1149 (N17, L= 349). Very low to low levels are expected for the remainder of the outlook period (23 - 28 February).

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels during 02 - 03 February, increasing to moderate to high levels for 04 - 09 February. Normal to moderate levels are expected for the remainder of the outlook period (10 - 28 February).

Geomagnetic field activity is expected to be at quiet to unsettled levels on 02 - 04 February due to combined effects of a recurrent coronal hole high speed stream (CH HSS) and the 29 January



CME. Isolated active to minor storm periods are possible 02 - 03 February. Predominately quiet levels will return from 05 - 08 February. Quiet to unsettled levels are expected on 09 - 11 February due to another CH HSS. Isolated active periods are possible on 10 February. Predominately quiet conditions will prevail from 12 - 27 February. Quiet to unsettled levels, with isolated active periods, are expected by 28 February due to another CH HSS.



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
24 January	83	28	270	A6.4	1	0	0	0	0	0	0	0
25 January	81	27	230	A5.7	0	0	0	0	0	0	0	0
26 January	80	25	400	A6.1	0	0	0	1	0	0	0	0
27 January	81	0	0	A7.2	2	0	0	0	0	0	0	0
28 January	81	27	30	A9.3	2	1	0	2	0	0	0	0
29 January	81	27	25	A6.1	0	0	0	1	0	0	0	0
30 January	83	22	50	A5.3	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
	24 January	8.1e+05	1.4e+04	3.4e+03		1.7e+07
25 January	2.5e+05	1.4e+04	3.4e+03		4.0e+06	
26 January	3.0e+05	1.4e+04	3.2e+03		4.1e+06	
27 January	2.2e+05	1.5e+04	3.7e+03		2.9e+06	
28 January	1.8e+06	1.0e+05	4.8e+03		3.1e+06	
29 January	5.8e+05	2.1e+04	3.4e+03		1.1e+06	
30 January	2.8e+05	1.4e+04	3.2e+03		1.0e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	24 January	2	0-0-1-1-1-1-1-1	1	0-0-1-0-0-1-1-0	3
25 January	3	2-0-1-0-1-1-0-2	4	2-0-1-2-3-0-0-0	4	2-1-1-0-1-1-1-2
26 January	2	1-1-0-0-1-1-1-0	2	1-0-0-1-0-1-1-0	3	1-1-1-0-0-1-1-1
27 January	2	1-0-1-1-1-0-1-0	2	0-0-1-2-1-0-0-0	3	1-0-1-1-1-1-2-0
28 January	4	1-0-0-1-1-2-2-2	1	0-0-0-1-0-1-1-0	4	2-1-0-1-0-2-2-1
29 January	3	2-1-0-1-2-2-0-0	2	1-0-0-2-0-1-0-0	4	3-1-0-1-1-1-0-1
30 January	2	0-1-0-0-1-2-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-0-0-1

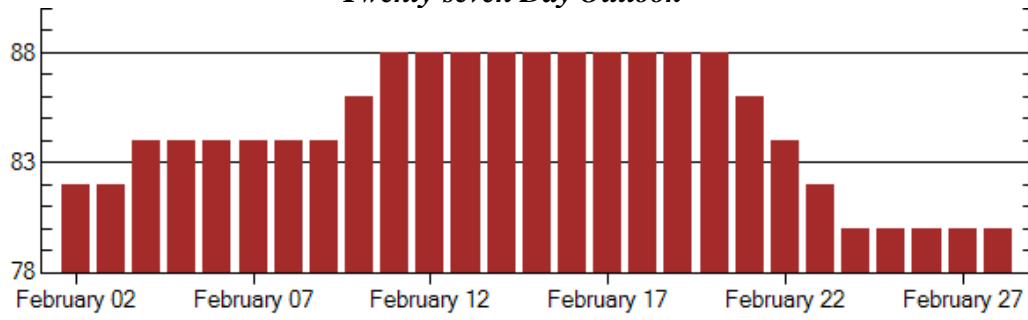


Alerts and Warnings Issued

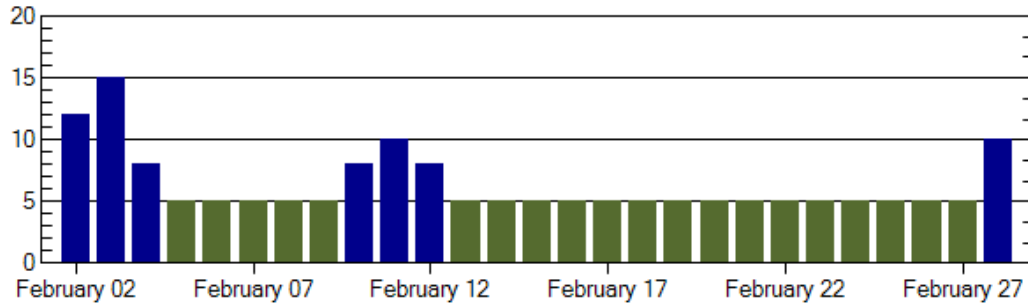
<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
27 Jan 1252	ALERT: Type II Radio Emission	27 Jan 0708
27 Jan 1311	CANCELLATION: Type II Radio Emission	
27 Jan 1347	ALERT: Type II Radio Emission	27 Jan 1208
28 Jan 0148	ALERT: Type II Radio Emission	28 Jan 0101



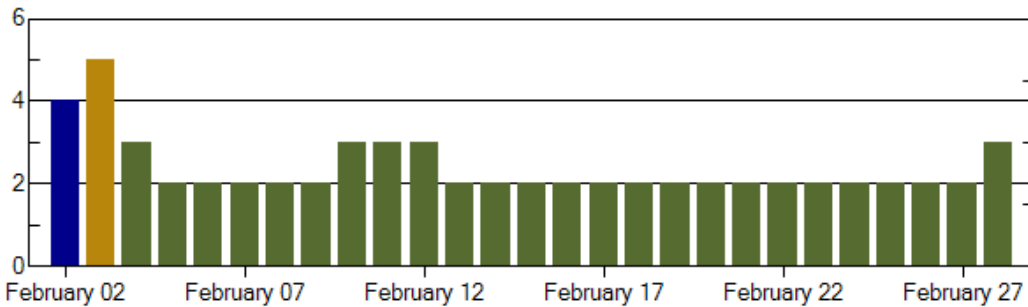
Twenty-seven Day Outlook



10.7 cm



Ap Index



Largest Daily Kp Index

Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
02 Feb	82	12	4	16 Feb	88	5	2
03	82	15	5	17	88	5	2
04	84	8	3	18	88	5	2
05	84	5	2	19	88	5	2
06	84	5	2	20	88	5	2
07	84	5	2	21	88	5	2
08	84	5	2	22	86	5	2
09	84	5	2	23	84	5	2
10	84	5	2	24	82	5	2
11	86	8	3	25	80	5	2
12	88	10	3	26	80	5	2
13	88	8	3	27	80	5	2
14	88	5	2	28	80	10	3
15	88	5	2				



Energetic Events

Date	Time		X-ray Integ	Optical Information			Peak		Sweep Freq		
	Begin	Max		Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity
			245						2695	II	IV
28 Jan	0044	0103 0110	M1.3	0.009							1

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
24 January	0049	0053	0057	B2.2				1147
	0330	0335	0341	B2.1				1147
	0556	0615	0632	C1.4				1149
	0951	0954	0958	B2.3				1149
	0130	0133	0135	B1.0				
	1056	1107	1113	B1.4				
25 January	0325	0328	0331	B1.0				1149
26 January	0031	0037	0040	B1.5				1149
	0207	0211	0214	B3.2				1149
	0402	0406	0416	B2.3				1149
	0651	0657	0706	B1.8				1149
	0854	0857	0859	B1.1				1149
	1514	1518	1521	B2.0				1149
	1914	1918	1925	B1.3				1149
	2119	2122	2124	B1.0				
	2143	2147	2150	B2.7				1149
	2209	2210	2213	B3.2	SF	N09W76		1149
	1701	1703	1706	A9.5				1149
27 January	0200	0213	0226	B4.3				1149
	0645	0648	0653	B1.1				1149
	0840	0850	0853	B6.6				1149
	1105	1116	1122	B1.6				1149
	1153	1201	1205	C1.2				1149
	1213	1218	1226	B1.9				1149
28 January	1950	2003	2019	C1.5				
	0044	0103	0110	M1.3				1149
	0331	0336	0340	B5.2				
	0402	0425	0435	C1.5				1149
	1005	1022	1030	C1.5				1149
	1344	1348	1354	B1.6				
	1611	1612	1617	B2.4	SF	S21E70		1150
	1754	1757	1804	B6.2	SF	S21E69		1150



Flare List - continued

Date	Time			X-ray Class.	Imp/ Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
29 January	0328	0336	0347	B6.7				1150
	0758	0803	0807	B1.4				1150
	1147	1157	1208	B7.3				1150
	1630	1632	1637	B1.8	SF	S21E55		1150
	1653	1658	1700	B2.8				1150
30 January	1201	1258	1331	B1.3				1150
	1755	1836	1909	B2.3				1150

Region Summary

Date	Location		Sunspot Characteristics					Flares						
	° Lat ° CMD)	Helio Lon	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray		Optical				
								C	M	X	S	1	2	3
<i>Region 1147</i>														
15 Jan	N24E80	344	120	1	HRX	1	A							
16 Jan	N27E65	339	120	6	DSO	5	B							
17 Jan	N25E52	339	150	11	CSO	12	B							
18 Jan	N26E37	340	160	13	CSO	12	BG							
19 Jan	N25E22	343	130	9	CSO	7	BG							
20 Jan	N24E09	342	170	9	CSO	9	B							
21 Jan	N24W07	345	90	5	HSX	2	A	1						
22 Jan	N24W22	347	90	2	HSX	1	A							
23 Jan	N24W36	348	80	2	HSX	1	A							
24 Jan	N24W49	347	110	2	HSX	1	A							
25 Jan	N24W65	351	100	1	HSX	1	A							
26 Jan	N24W77	349	150	2	HSX	1	A							
27 Jan	N24W90	350												
								1	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 345

<i>Region 1149</i>														
21 Jan	N18W05	343	70	7	DRI	20	BG	5		3				
22 Jan	N18W19	344	150	8	DSI	15	BG	1						
23 Jan	N18W32	344	180	9	DRI	17	B							
24 Jan	N16W45	344	160	9	DSI	7	B	1						
25 Jan	N17W62	347	130	9	DSO	6	B							
26 Jan	N17W77	349	250	4	DSO	4	B			1				
27 Jan	N16W90	350						1						
								8	0	0	4	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 343



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares																
	° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical													
		Lon						C	M	X	S	1	2	3	4									
<i>Region 1150</i>																								
28 Jan	S22E62	184	10	3	BXO	5	B														2			
29 Jan	S22E50	182	20	6	BXO	6	B														1			
30 Jan	S21E37	182	50	8	DAO	12	B																	
													0	0	0	3	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 182

<i>Region 1151</i>																								
28 Jan	N09W60	306	20	2	CRO	2	B																	
29 Jan	N11W71	303	5	1	AXX	1	A																	
30 Jan	N11W84	303																						
													0	0	0	0	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 306

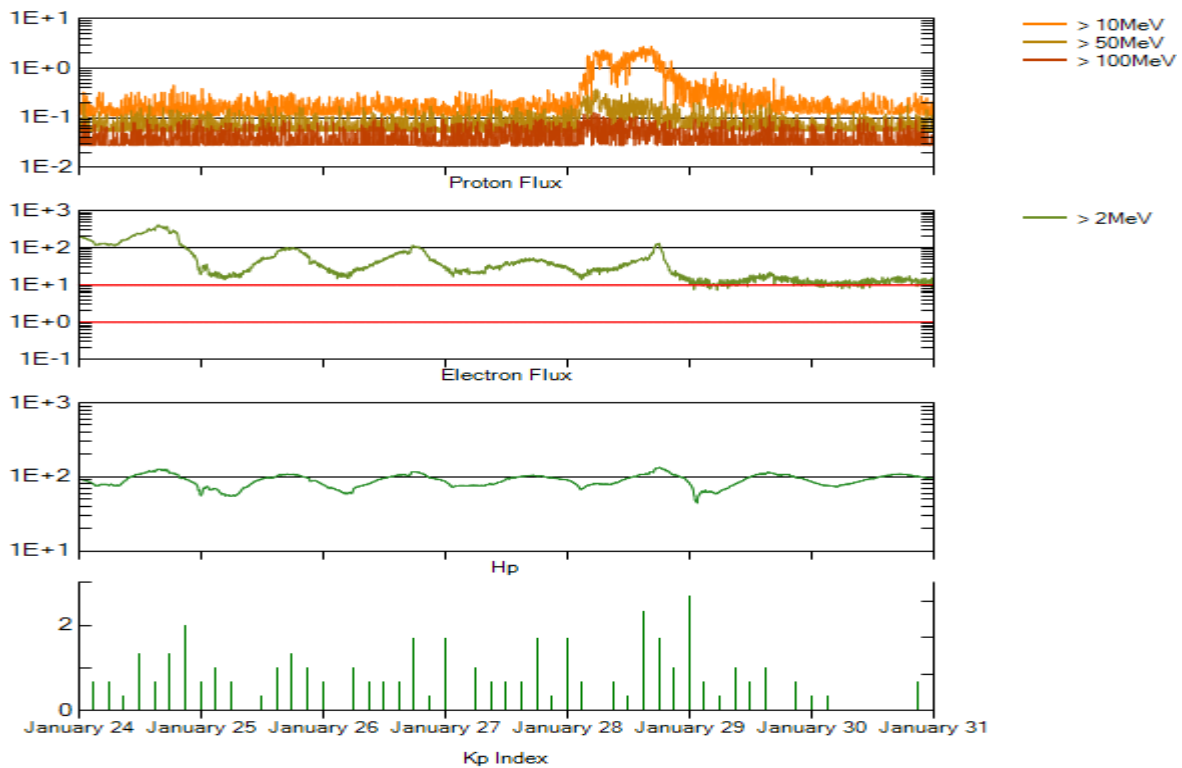


Recent Solar Indices (preliminary)
Of the observed monthly mean values

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
2009									
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	0.8	1.00	3.7	2.2	69.7	69.3	4	4.3
May	3.9	2.9	0.74	3.8	2.3	70.5	69.7	4	4.1
June	6.6	2.9	0.39	4.4	2.7	68.6	70.2	4	4.0
July	5.0	3.2	0.70	5.8	3.6	68.2	71.0	4	3.9
August	0.3	0.0	0.00	7.7	4.8	67.4	72.1	5	3.8
September	6.6	4.3	0.64	9.9	6.2	70.5	73.3	4	3.8
October	7.0	4.8	0.66	11.3	7.1	72.3	74.1	3	4.1
November	7.7	4.1	0.55	12.4	7.6	73.6	74.5	3	4.5
December	15.7	10.8	0.68	13.6	8.3	76.8	74.9	2	4.8
2010									
January	21.3	13.2	0.62	14.8	9.3	81.1	75.5	3	5.0
February	31.0	18.8	0.60	16.7	10.6	84.7	76.5	5	5.1
March	24.7	15.4	0.62	19.1	12.3	83.3	77.5	5	5.3
April	11.2	8.0	0.71	21.4	14.0	75.9	78.3	10	5.5
May	19.9	8.7	0.44	23.8	15.5	73.8	79.0	8	5.7
June	17.9	13.6	0.75	25.2	16.4	72.6	79.7	7	5.8
July	23.1	16.1	0.70	25.9	16.8	79.9	80.1	5	6.0
August	28.2	19.6	0.70			79.7		8	
September	35.6	25.2	0.71			81.1		5	
October	35.0	23.5	0.67			81.6		6	
November	36.1	21.6	0.60			82.5		5	
December	22.0	14.5	0.66			84.3		4	
2011									
January	32.1	19.0	0.59			83.7		4	

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. Solar minimum for cycle 23 was December 2008.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 24 January 2011*

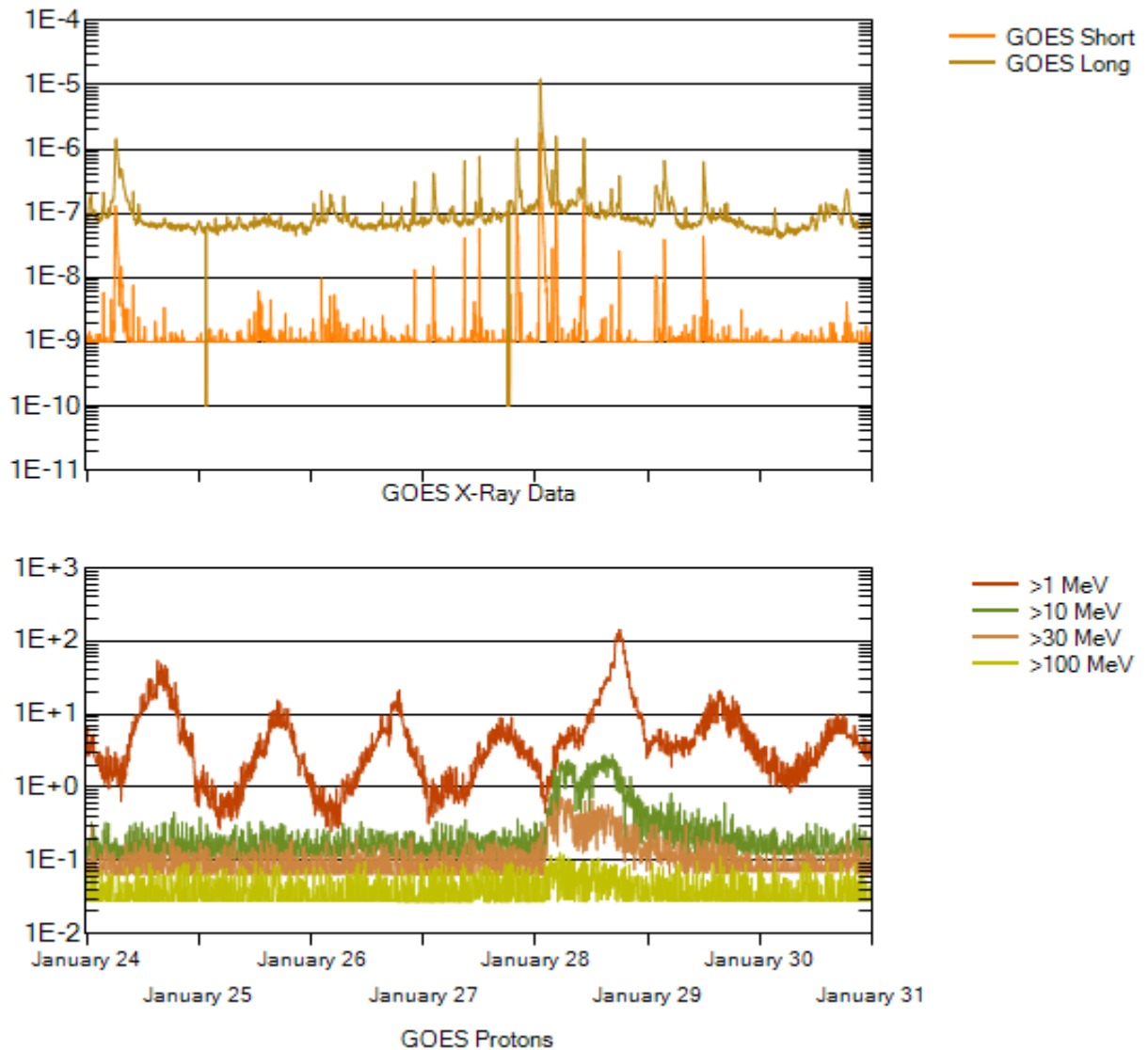
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-13 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV. The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-13.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as measured by GOES-13. The Hp 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
Week Beginning 24 January 2011

The x-ray plot contains five-minute averaged x-ray flux (Watts/m²) as measured by GOES 14 (W105) 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.

The proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-13 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.

