

Space Weather Highlights
02 August - 08 August 2010

SWPC PRF 1823
10 August 2010

Solar activity was at very low to low levels during the majority of the period with isolated moderate activity observed late on 07 August. Several B-class flares were observed throughout the period with Region 1093 (N12, L=348, class/area Cso/180 on 06 August) producing a C1 flare at 05/2135 UTC. Region 1093 also produced an M1/2f x-ray flare at 07/1824 UTC. Associated with this event were a Type II (675 km/s) and a Type IV radio sweep, two 10 cm bursts (110 and 150 sfu), significant radio signatures at 245-1415 MHz, and an Earth-directed full halo coronal mass ejection (CME). The remainder of the disk and limb was quiet and stable.

No proton events were observed at geosynchronous orbit. However a proton enhancement of 5.29 pfu at 10 MeV was observed on 03/1930Z associated with the CME activity of 01 August.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels from 02 - 03 August, decreasing to moderate levels on 04 -05 August and increasing back to high levels on 06 -08 August.

Geomagnetic field activity was at quiet levels from 02 August through late on 03 August. Activity increased to unsettled to major storm levels from late on 03 August to early on 05 August when levels returned to mostly quiet. A geomagnetic sudden impulse (SI) of 21 nT was observed at Boulder at 03/1741Z which was preceded by an interplanetary shock at ACE at 03/1656Z. Both effects were due to the arrival of a CME associated with the long duration C3 flare on 01 August. Major storm levels occurred from 03/2100 - 04/0300 UTC with increased solar wind velocities (peak 657 km/s), increased IMF BT (peak 18 nT), and a sustained period of southward Bz (peak deflection -13 nT). Another major storm period was observed at high latitudes at 02/1800-2100 UTC with a sustained Bz (peak deflection -6 nT) and wind velocities at around 550 km/s. Activity levels decreased to mostly quiet levels with isolated active periods on 05 August and thereafter, the field returned to mostly quiet.

Space Weather Outlook
04 August – 30 August 2010

Solar activity is expected to be at very low to low levels. A chance for an M-class flare exists through 16 August, when Region 1093 is due to rotate around the west limb.

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 11 – 23 August and at high levels throughout the remainder of the period (24 August – 06 September).

Geomagnetic field activity is expected to be at quiet to unsettled levels with isolated active periods on 11-12 August due to the arrival of the full-halo CME observed on 07 August. Mostly quiet conditions are expected from 13 August - 21 August. A recurrent coronal hole high-speed stream (CH HSS) is forecasted to become geoeffective on 22 August - 24 August when the field is expected to become quiet to unsettled. Mostly quiet conditions are expected for the remainder of the period (25 August - 06 September).



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
02 August	79	17	280	B1.0	0	0	0	0	0	0	0 0
03 August	81	13	190	B1.0	0	0	0	0	0	0	0 0
04 August	81	27	280	B1.0	0	0	0	0	0	0	0 0
05 August	83	54	430	B1.1	1	0	0	0	0	0	0 0
06 August	82	49	430	B1.2	0	0	0	0	0	0	0 0
07 August	91	47	300	B1.0	0	1	0	0	0	1	0 0
08 August	83	46	340	A9.9	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
02 August	1.6e+06	1.8e+04	3.3e+03		2.3e+08	
03 August	1.7e+07	1.1e+05	3.4e+03		1.1e+08	
04 August	1.1e+07	4.3e+04	2.8e+03		4.5e+06	
05 August	1.2e+06	1.5e+04	3.5e+03		8.5e+06	
06 August	4.6e+05	1.4e+04	3.6e+03		1.1e+08	
07 August	3.4e+05	1.5e+04	3.9e+03		2.5e+08	
08 August	5.3e+05	2.8e+04	3.6e+03		2.4e+08	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
02 August	5	1-2-1-1-2-2-1-2	5	2-1-2-2-2-2-0-1	5	1-2-1-1-1-2-1-2
03 August	14	1-3-2-1-1-3-3-5	14	2-2-2-2-1-3-3-5	20	2-3-2-1-1-2-5-6
04 August	26	5-4-3-4-4-2-4-4	-1	5-5-2--1--1--1--1--1	42	6-5-3-5-4-4-6-4
05 August	7	3-3-0-1-2-1-2-2	10	4-3-1-2-3-2-1-1	10	4-3-0-1-1-2-2-2
06 August	6	1-3-2-1-1-1-2-2	9	1-4-2-2-3-1-1-1	8	2-3-2-1-2-1-3-2
07 August	4	1-1-1-1-1-1-2-1	4	1-1-2-3-1-1-0-0	5	1-2-1-1-1-1-1-1
08 August	2	0-0-0-1-1-1-2-1	1	0-0-0-0-0-1-2-0	4	1-0-0-1-1-1-2-2

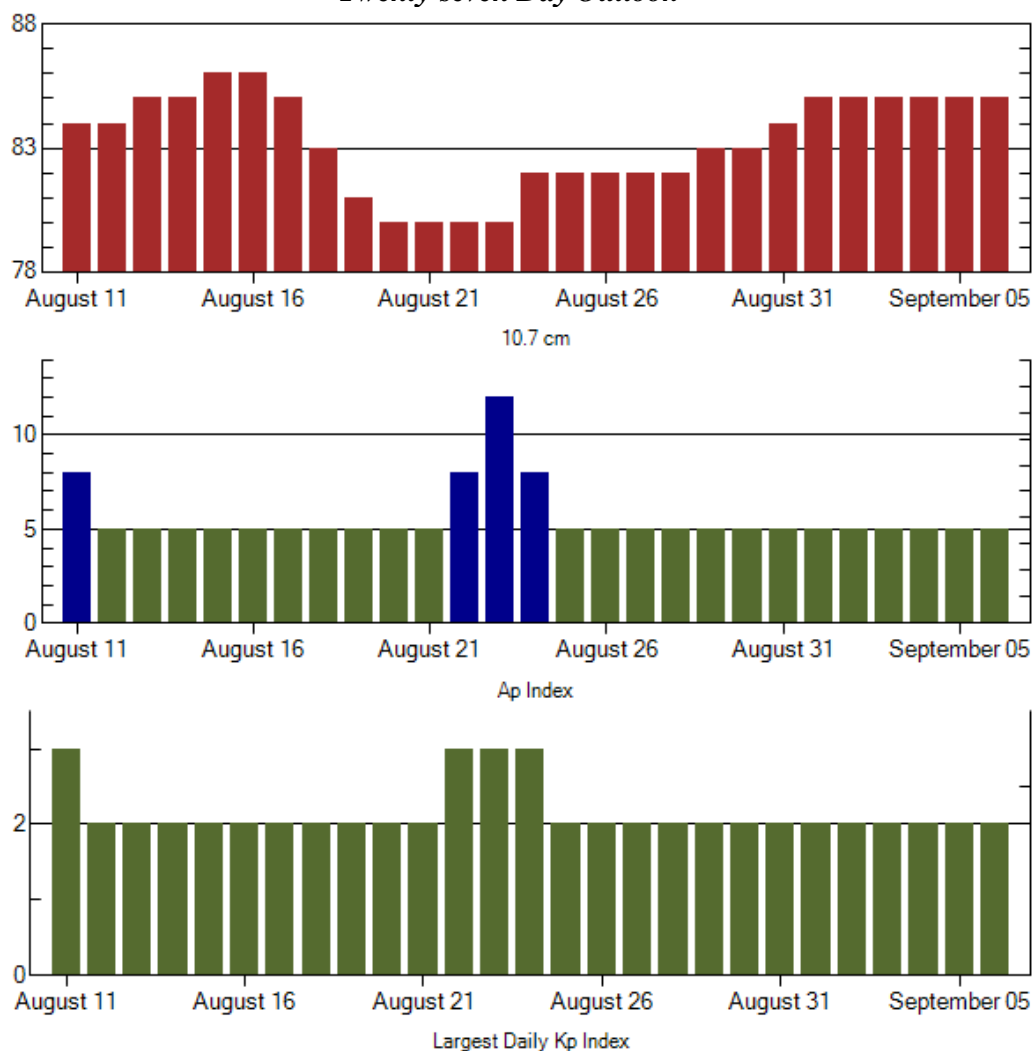


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
02 Aug 0506	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	28 Jul 1325
02 Aug 1956	WATCH: Geomagnetic A >= 20	05 Aug
03 Aug 0936	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	28 Jul 1325
03 Aug 1703	WARNING: Geomagnetic Sudden Impulse expected	03 Aug 1730 - 1800
03 Aug 1753	SUMMARY: Geomagnetic Sudden Impulse	03 Aug 1741
03 Aug 1827	WARNING: Geomagnetic K = 4	03 Aug 1830 - 04/1500
03 Aug 1951	WATCH: Geomagnetic A >= 20	04 Aug
03 Aug 1952	WATCH: Geomagnetic A >= 30	05 Aug
03 Aug 2043	ALERT: Geomagnetic K = 4	03 Aug 2042
03 Aug 2046	WARNING: Geomagnetic K = 5	03 Aug 2100 - 04/0600
03 Aug 2209	ALERT: Geomagnetic K = 5	03 Aug 2208
04 Aug 0042	WARNING: Geomagnetic K = 6	04 Aug 0045 - 0900
04 Aug 0049	ALERT: Geomagnetic K = 6	04 Aug 0046
04 Aug 1032	WARNING: Geomagnetic K = 5	04 Aug 1020 - 1600
04 Aug 1032	ALERT: Geomagnetic K = 5	04 Aug 1025
04 Aug 1456	EXTENDED WARNING: Geomagnetic K = 4	03 Aug 1830 - 05/0000
04 Aug 1605	WATCH: Geomagnetic A >= 20	06 Aug
04 Aug 2349	EXTENDED WARNING: Geomagnetic K = 4	03 Aug 1830 - 05/1500
05 Aug 1617	CANCELLATION: Geomagnetic A >= 30	
05 Aug 1619	CANCELLATION: Geomagnetic A >= 20	
06 Aug 0936	ALERT: Electron 2MeV Integral Flux >= 1000pfu	06 Aug 0920
07 Aug 0520	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	06 Aug 0920
07 Aug 1900	ALERT: Type IV Radio Emission	07 Aug 1812
07 Aug 1915	ALERT: Type II Radio Emission	07 Aug 1808
07 Aug 1958	SUMMARY: 10cm Radio Burst	07 Aug 1827 - 1830
07 Aug 2000	SUMMARY: 10cm Radio Burst	07 Aug 1851 - 1902
08 Aug 0507	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	06 Aug 0920



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
11 Aug	84	8	3	25 Aug	82	5	2
12	84	5	2	26	82	5	2
13	85	5	2	27	82	5	2
14	85	5	2	28	82	5	2
15	86	5	2	29	83	5	2
16	86	5	2	30	83	5	2
17	85	5	2	31	84	5	2
18	83	5	2	01 Sep	85	5	2
19	81	5	2	02	85	5	2
20	80	5	2	03	85	5	2
21	80	5	2	04	85	5	2
22	80	8	3	05	85	5	2
23	80	12	3	06	85	5	2
24	82	8	3				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	$\frac{1}{2}$			Integ		Imp/	Location	Rgn	Radio Flux		Intensity	
	Begin	Max	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II	IV
07 Aug	1755	1824	1847	M1.0	0.018	2F	N11E34	1093	120	100	2	2

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location	Lat CMD	
02 August	0419	0426	0438	B8.9				
	1721	1725	1730	B1.8				1092
03 August	1140	1149	1155	B5.2				
	1202	1206	1212	B3.4				
	1417	1425	1428	B2.4				
	1657	1700	1704	B3.7				
	1007	1023	1046	B2.0				
	1227	1234	1240	B2.5				
	2045	2048	2051	B1.5				
04 August	0236	0239	0242	B2.0				
	0251	0254	0258	B6.6				1093
	0913	0920	0939	B6.5				1093
	1902	1906	1909	B4.9				1093
	2215	2220	2223	B2.3				
05 August	0016	0026	0039	B2.8				1092
	2039	2135	2203	C1.3				1093
	2223	2227	2230	B5.7				1094
06 August	0114	0136	0157	B5.6				1093
	0203	0207	0209	B4.5				1093
	0610	0633	0745	B2.8				
	1521	1527	1535	B3.5				
07 August	0230	0244	0256	B3.0				1094
	0509	0513	0515	B1.7				
	1758	1815	1955	M1.0	2F	N11E34		1093
	2240	2243	2246	B2.9				
08 August	0743	0751	0828	B2.1				1093
	1413	1417	1423	B2.3				1093



Region Summary

Date	Location		Area (10 ⁻⁶ hemi)	Sunspot Characteristics				Flares							
	° Lat ° CMD)	Helio		Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4
Region 1090															
24 Jul	N23E58	149	10	1	AXX	1	A								
25 Jul	N23E43	151		5	BXO	3	B								
26 Jul	N22E29	151		1	AXX	1	A								
27 Jul	N22E16	151													
28 Jul	N22E03	151													
29 Jul	N22W10	151													
30 Jul	N22W23	151													
31 Jul	N22W36	151													
01 Aug	N22W49	151													
02 Aug	N22W62	151													
03 Aug	N22W75	151													
04 Aug	N22W88	151													

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 151

<i>Region 1092</i>															
28 Jul	N16E76	78	180	6	CSO	2	B								
29 Jul	N14E63	77	210	9	CSO	2	B								
30 Jul	N15E49	79	170	7	CSO	4	B					2			
31 Jul	N13E35	79	230	3	HKX	2	A					1			
01 Aug	N13E21	79	290	4	HKX	3	A	1				1			
02 Aug	N16E10	76	280	11	CHO	7	B								
03 Aug	N15W04	77	190	10	CHO	3	B								
04 Aug	N14W15	75	180	6	CSO	4	B								
05 Aug	N13W33	80	200	3	HSX	1	A								
06 Aug	N12W46	79	210	5	HHX	1	A								
07 Aug	N13W60	80	130	2	HSX	1	A								
08 Aug	N13W74	81	180	3	HSX	1	A								

1 0 0 4 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 77



Region Summary (Cont)

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 1093</i>																
04 Aug	N10E65	355	100	4	CAO	3	B									
05 Aug	N11E58	348	170	8	CAO	4	B	1								
06 Aug	N12E45	348	180	9	CSO	3	B									
07 Aug	N10E30	350	130	2	HSX	1	A		1				1			
08 Aug	N11E15	350	140	3	CSO	2	B									
									1	1	0	0	0	1	0	0

Still on Disk.

Absolute heliographic longitude: 350

<i>Region 1094</i>															
05 Aug	N25W58	104	50	4	CSO	7	B								
06 Aug	N26W71	104	30	7	BXO	3	B								
07 Aug	N25W85	105	30	10	BXO	3	B								
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 104

<i>Region 1095</i>															
05 Aug	S18E46	0	10	1	BXO	2	B								
06 Aug	S19E34	359	10	1	HAX	2	A								
07 Aug	S18E19	1	10	11	AXX	2	A								
08 Aug	S17E08	0	10	1	HRX	2	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 0

<i>Region 1096</i>															
08 Aug	N22W05	12	10	1	AXX	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 12



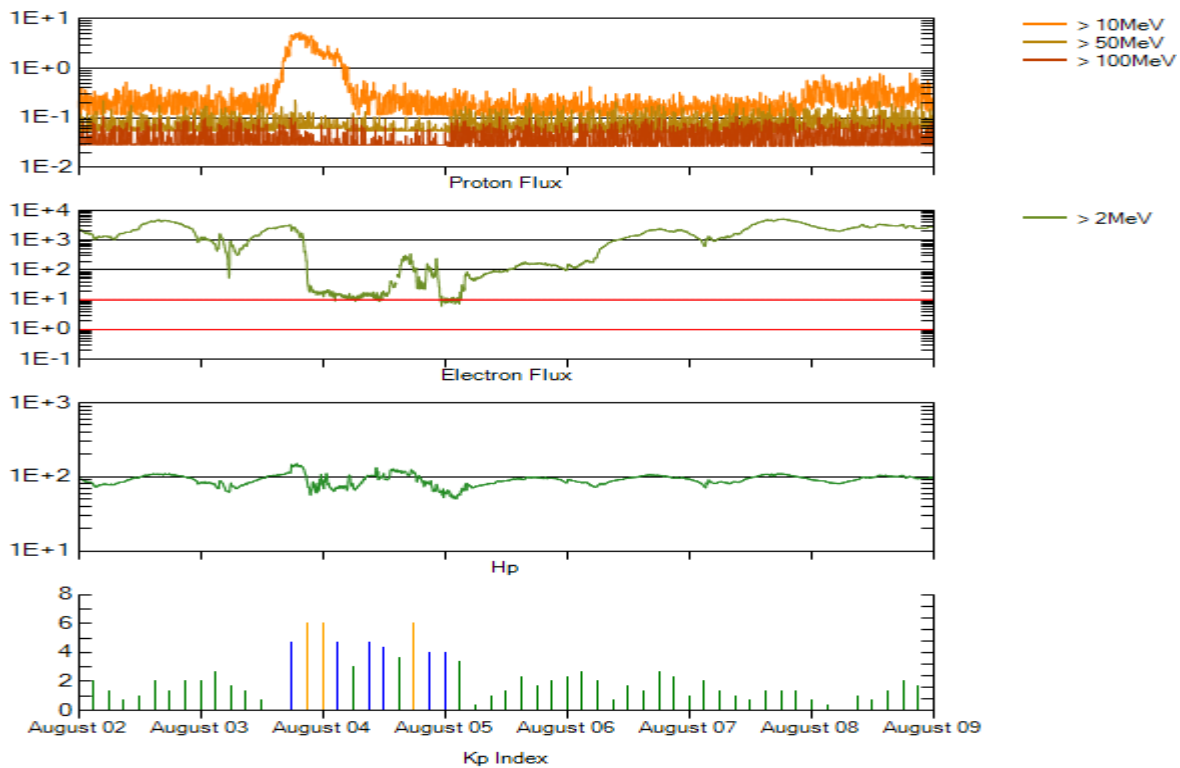
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values	Ratio	Smooth values			*Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2008									
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	1.8	68.3	68.2	7	5.4
November	6.8	4.1	0.60	2.7	1.7	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	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			84.7		5	
March	24.7	15.4	0.62			83.3		5	
April	11.2	7.9	0.71			75.9		10	
May	19.9	8.8	0.44			73.8		8	
June	17.9	13.5	0.75			72.6		7	
July	23.1	16.1	0.70			79.9		6	

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 zero, so a ratio could not be computed.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 02 August 2010

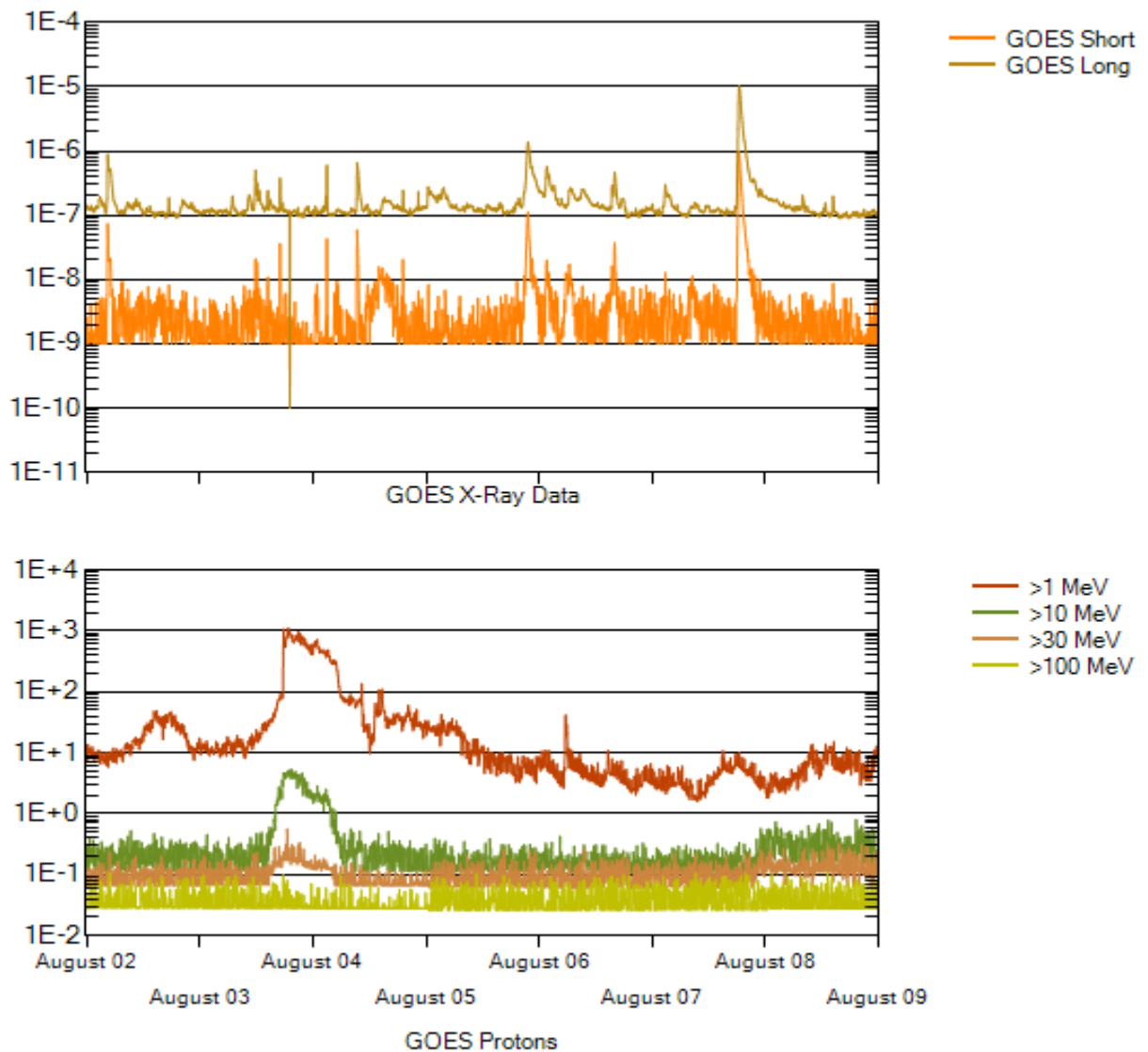
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²–sec–sr) as measured by GOES-13 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV. The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²–sec–sr) with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

The x-ray plot contains five-minute averaged x-ray flux (Watts/m^2) 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 ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-13 for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.

