

**Space Weather Highlights**  
**05 July - 11 July 2010**

**SWO PRF 1819**  
13 July 2010

Solar activity was at very low to low levels during the period. Activity was very low during 05 – 07 July due to isolated to occasional low-level B-class flares. Activity increased to low levels during 08 – 09 July due to isolated C-class flares from Region 1087 (N19, L =334, class/area Ero/120 on 11 July), the largest of which was a C3/Sf at 09/2002 UTC. Activity decreased to very low levels on 10 – 11 July with only isolated B-class flares from Region 1087.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during 05 July – 11 July.

Geomagnetic field activity was predominantly at quiet levels from 05 – 11 July.

**Space Weather Outlook**  
**14 July – 09 Aug 2010**

Solar activity is expected to be at very low to low levels during 14 – 21 July with a chance for isolated C-class flares and a slight chance for an M-class flare from Region 1087. Activity is expected to decrease to very low levels on 22 July as Region 1087 departs the visible disk. Activity is expected to increase once again to very low to low levels during 04 – 09 Aug with a chance for isolated C-class flares and a slight chance for an M-class flare as Old Region 1087 rotates back onto the disk.

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 14 – 19 July, and 26 July – 08 Aug. Normal to moderate flux levels are expected during the remainder of the period.

Geomagnetic field activity is expected to be at quiet to unsettled levels during 14 – 15 July, with a chance for active levels on 14 July, due to recurrent coronal hole high-speed stream (CH HSS) effects. Quiet conditions are expected during 16 – 22 July as the CH HSS rotates out of a geoeffective position. A second round of recurrent CH HSS effects are forecast for 23 – 29 July with unsettled to minor storm levels expected on 23 July, quiet to active levels expected on 24 July, and predominately quiet to unsettled levels expected during 25 – 29 July. Quiet conditions are expected during 30 July – 08 Aug as the effects from the CH HSS subside. Geomagnetic field activity is expected to increase once again to quiet to unsettled due to effects from a third recurrent CH HSS.



### Daily Solar Data

Date	Radio	Sun	Sunspot	X-ray	Flares							
	Flux	spot	Area	Background	X-ray Flux			Optical				
	10.7 cm	No.	(10 <sup>-6</sup> hemi.)		C	M	X	S	1	2	3	4
05 July	73	23	110	A4.5	0	0	0	0	0	0	0	0
06 July	73	23	120	A6.5	0	0	0	0	0	0	0	0
07 July	74	22	110	A7.6	0	0	0	0	0	0	0	0
08 July	76	11	50	B1.0	1	0	0	0	0	0	0	0
09 July	80	12	30	B1.3	2	0	0	1	0	0	0	0
10 July	80	18	100	B1.8	0	0	0	0	0	0	0	0
11 July	83	25	120	B1.4	0	0	0	0	0	0	0	0

### Daily Particle Data

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
05 July	5.6e+05	1.8e+04	7.3e+03		3.0e+08	
06 July	4.5e+05	1.8e+04	7.4e+03		2.9e+08	
07 July	6.1e+05	2.0e+04	7.7e+03		3.2e+08	
08 July	8.3e+05	1.9e+04	7.7e+03		3.2e+08	
09 July	2.7e+05	1.8e+04	6.9e+03		8.1e+07	
10 July	2.6e+05	1.5e+04	3.6e+03		6.2e+07	
11 July	5.9e+05	1.5e+04	3.7e+03		5.7e+07	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
05 July	2	1-0-1-1-1-0-0-1	2	1-1-1-1-1-1-0-0	5	2-1-1-1-1-1-1-2
06 July	1	1-0-1-0-0-0-0-0	1	2-1-0-0-0-0-0-0	3	2-1-1-0-0-1-0-1
07 July	2	0-0-0-0-1-1-1-1	1	0-1-0-0-0-0-0-0	3	1-1-0-0-1-1-1-2
08 July	2	0-0-0-0-0-1-2-2	-1	0--1--1--1--1--1--1-- 1	3	1-0-0-0-0-1-2-2
09 July	4	2-1-2-0-1-1-1-1	7	2-2-2-4-1-1-1-0	5	2-2-2-1-1-1-1-1
10 July	0	0-0-0-0-1-0-0-0	0	0-0-0-0-0-1-0-0	2	0-0-0-0-0-1-0-1
11 July	2	0-0-0-0-1-1-1-2	3	0-0-0-0-2-2-1-1	5	1-0-0-1-2-2-1-3

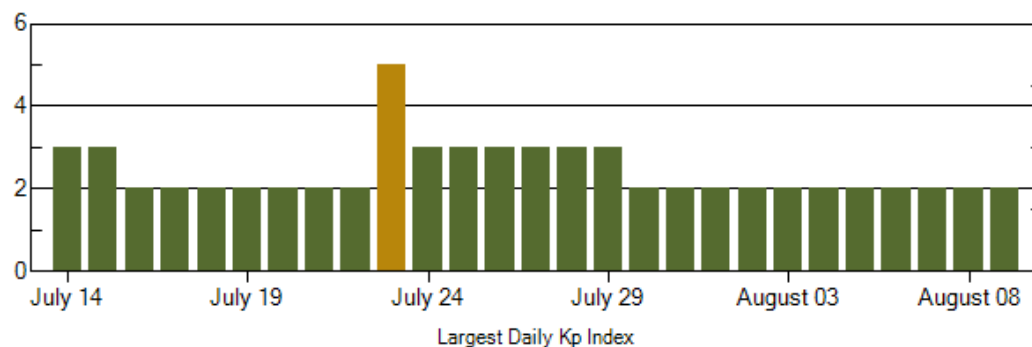
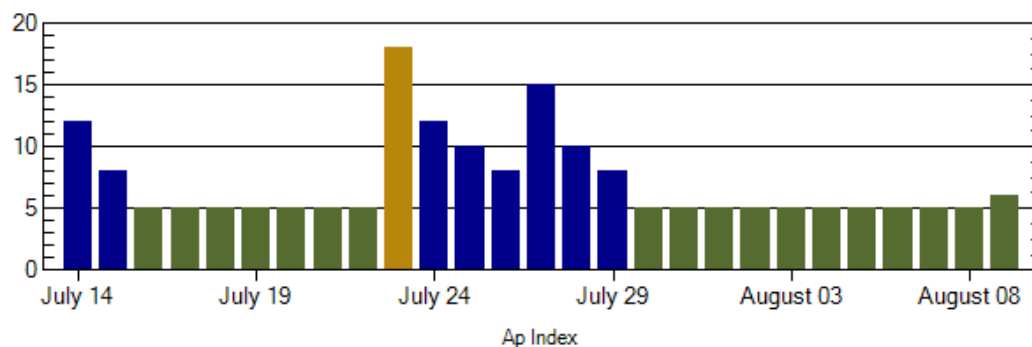
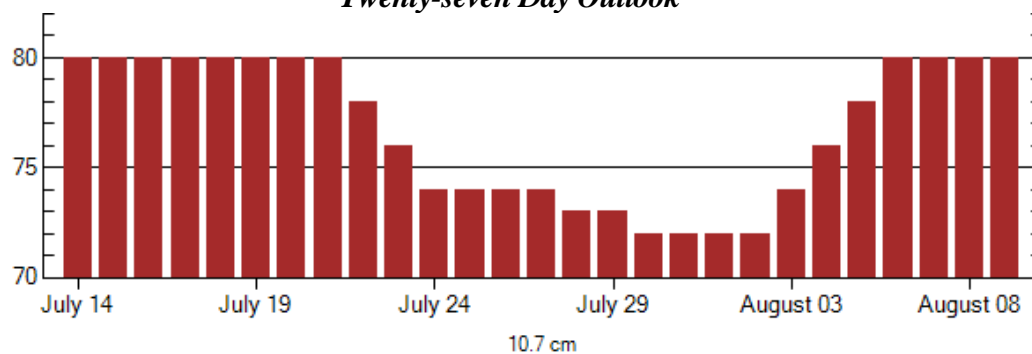


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
05 Jul 0502	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	03 Jul 0505
06 Jul 0508	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	03 Jul 0505
07 Jul 0506	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	03 Jul 0505
08 Jul 0515	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	03 Jul 0505
09 Jul 1124	ALERT: Electron 2MeV Integral Flux >= 1000pfu	09 Jul 1105
10 Jul 1331	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	09 Jul 1105
11 Jul 1421	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	09 Jul 1105



### 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
14 Jul	80	12	3	28 Jul	73	10	3
15	80	8	3	29	73	8	3
16	80	5	2	30	72	5	2
17	80	5	2	31	72	5	2
18	80	5	2	01 Aug	72	5	2
19	80	5	2	02	72	5	2
20	80	5	2	03	74	5	2
21	80	5	2	04	76	5	2
22	78	5	2	05	78	5	2
23	76	18	5	06	80	5	2
24	74	12	3	07	80	5	2
25	74	10	3	08	80	5	2
26	74	8	3	09	80	6	2



### ***Energetic Events***

Energy 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			Rgn
	Begin	Max	End	X-ray Class.	Imp / Brtns	Location Lat CMD	
05 July	1836	0024	0312	B1.2			
06 July	1002	1011	1016	B1.0			
07 July	1735	1746	1755	B1.6			
	2041	2045	2048	B2.2			
	2139	2145	2151	B1.6			
08 July	2227	2232	2237	B2.9			
	0119	0127	0135	B4.1			
	0253	0259	0308	B6.3			
	2203	2216	2224	C1.2			
09 July	2357	0002	0006	B3.3			
	0144	0149	0158	B3.0			
	0853	0901	0907	C1.8			
	1236	1242	1259	B5.3			
	1500	1514	1523	B7.7			
10 July	B1944	2002	A2037	C3.4	SF	N19E72	1087
	2219	2222	2226	B6.9			
	2006	2013	2024	B3.0			
11 July	2234	2249	2302	B7.2			
	0042	0048	0057	B2.9			
	1558	1602	1608	B4.2			
	1719	1728	1740	B4.5			



### Region Summary

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

#### Region 1084

27 Jun	S19E59	145	90	2	HSX	1	A
28 Jun	S19E46	144	90	2	HSX	1	A
29 Jun	S19E34	143	100	2	HSX	1	A
30 Jun	S19E19	145	110	2	HSX	1	A
01 Jul	S19E07	144	110	2	HSX	1	A
02 Jul	S20W06	143	100	2	HSX	1	A
03 Jul	S19W19	143	150	2	HSX	1	A
04 Jul	S19W32	143	110	2	HSX	1	A
05 Jul	S19W46	143	100	2	HSX	1	A
06 Jul	S19W59	143	110	2	HSX	1	A
07 Jul	S19W71	143	100	2	HSX	1	A
08 Jul	S19W86	144	50	2	HSX	1	A

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 143

#### Region 1086

05 Jul	N18W53	151	10	2	BXO	2	B
06 Jul	N18W65	150	10	2	BXO	2	B
07 Jul	N18W78	150	10	1	HRX	1	A
08 Jul	N18W91	149					

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 151

#### Region 1087

08 Jul	N17E83	335					
09 Jul	N18E72	332	30	4	DRO	2	B
10 Jul	N19E57	334	100	10	DRO	8	B
11 Jul	N19E44	334	120	14	ERO	15	B

1  
2      1  
  
3 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 334



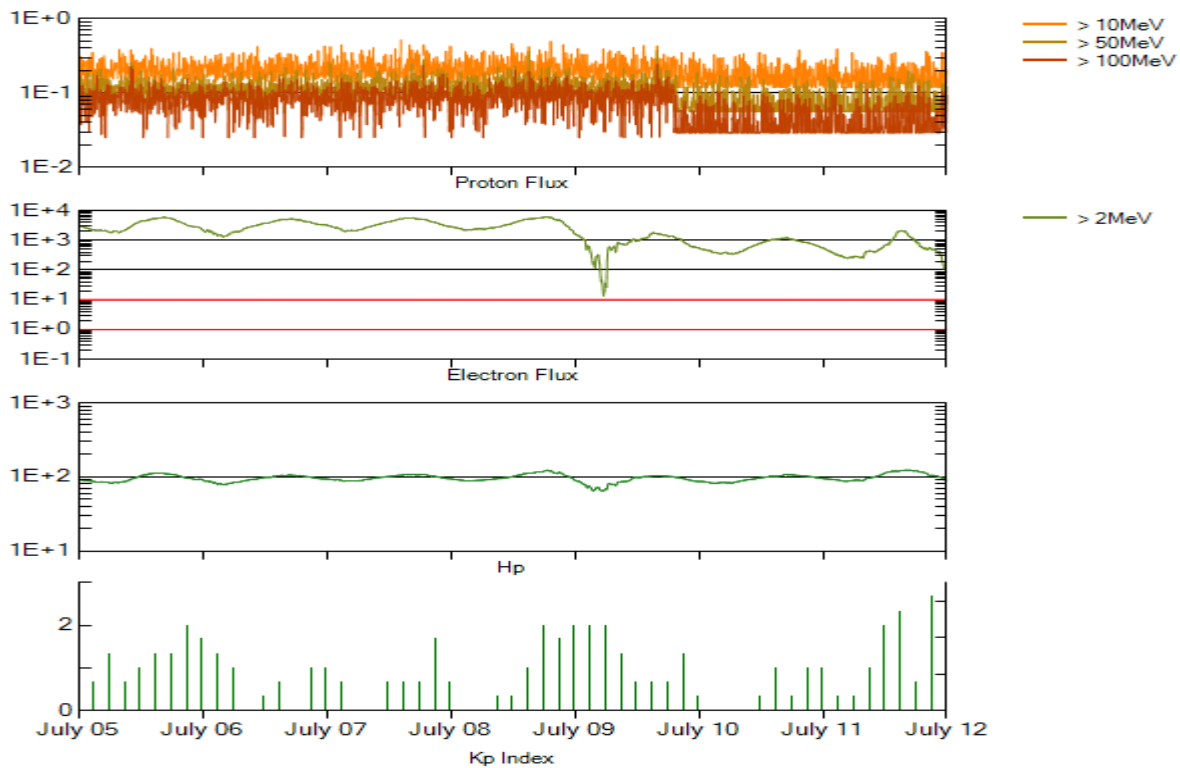
**Recent Solar Indices (preliminary)**  
**Of the observed monthly mean values**

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									
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	1.8	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	6.1	70.5	73.3	4	3.8
October	7.0	4.8	0.66	11.3	7.0	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	13.1	0.62			81.1		3	
February	31.0	18.6	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		8	

**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 05 July 2010*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>–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/cm<sup>2</sup>–sec–sr) with energies greater than 2 MeV at GOES-13.

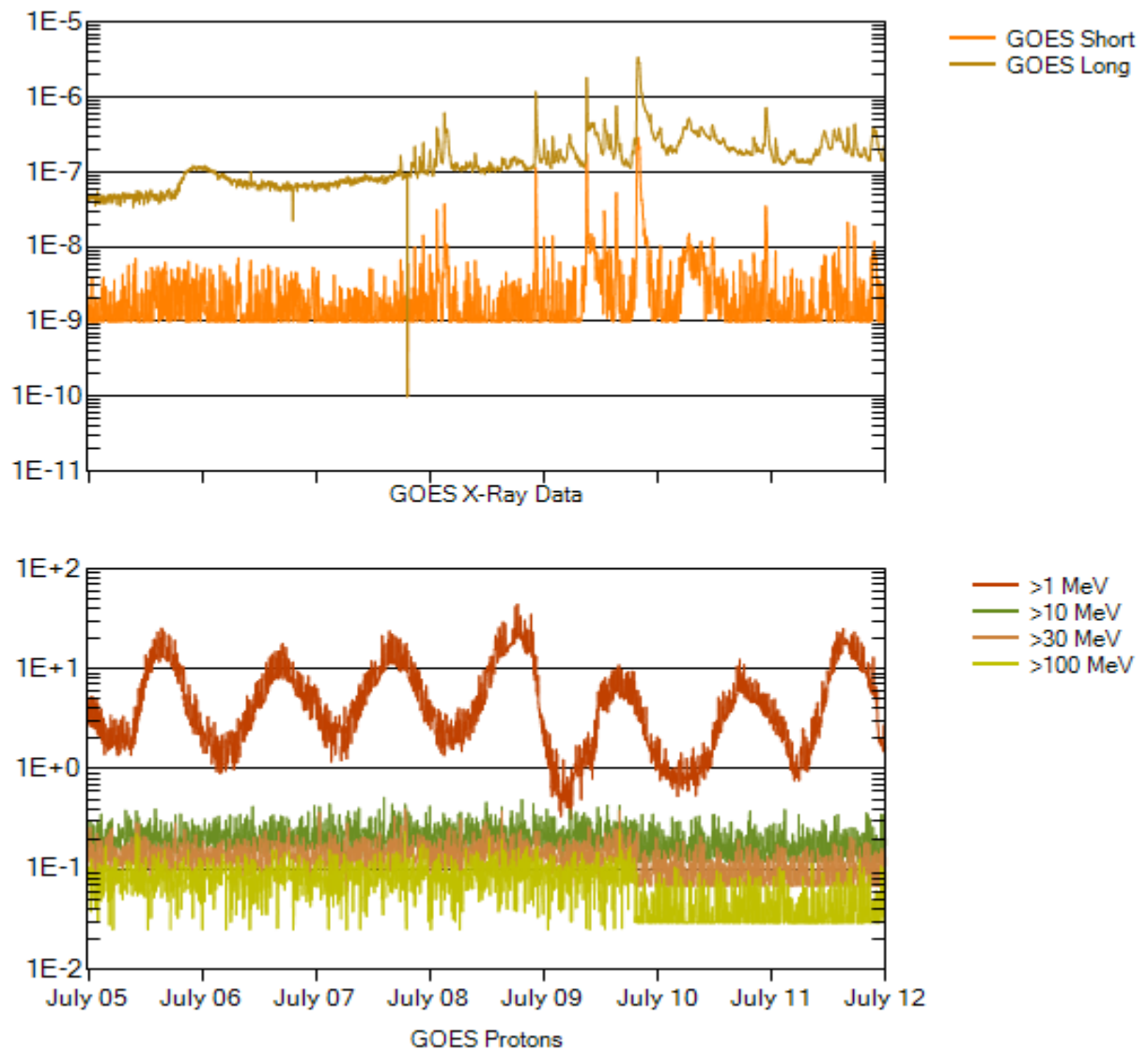
The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as measured by GOES-13. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

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 ( $\text{Watts/m}^2$ ) 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.

