

**Space Weather Highlights**  
**18 – 24 July 2005**

**SWO PRF 1560**  
**26 July 2005**

Solar activity was very low throughout the period. No numbered regions were visible on the solar disk until new Region 791 (N13, L=151, class/area, Dao/110 on 24 July) developed on 23 July. This region grew to 110 millionths in area by the 24 July, however did not produce any significant flares. Several strong full halo CME's have been observed on LASCO imagery during the reporting period. These were determined to be backside events and not directed toward Earth. These events may be associated with old Region 786 (N12, L=56, class/area, Dhi/420 on 07 July) which rotated out of view on 14 July.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began as total magnetic field was declining after a weak CME was observed at ACE. By early on 20 July, solar wind parameters indicated the onset of a high speed coronal hole wind stream as speeds gradually increased to near 500 km/s, temperature and density increased, and the IMF Bz began rotating through +/- 10 nT. By early on 21 July, wind speed increased to near 600 km/s. Wind speed peaked at near 650 km/s early on 22 July, and gradually decayed, ending the period at near 300 km/s. The IMF Bz relaxed by 22 July, and did not vary much beyond +/- 3 nT through the remainder of the period.

A 10 MeV proton flux event at geosynchronous orbit was observed at 17/2240 UTC, with a peak of 22 PFU, and ended at 18/1015 UTC.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 21 - 24 July.

The geomagnetic field ranged from quiet to severe storm levels. The period began with quiet to major storm conditions with an isolated severe storm period at high latitudes. On 19 July, quiet to unsettled conditions were observed. On 20 – 21 July, a high speed coronal hole wind stream caused the geomagnetic field to respond with mostly unsettled to minor storm conditions with major storm periods at high latitudes. Thereafter, and through the end of the summary period, the field was at quiet to unsettled levels.

**Space Weather Outlook**  
**27 July - 22 August 2005**

Solar activity is expected be very low to low with isolated M-class activity possible from Region 791. Old Region 786 is due to rotate onto the visible disk on 28 July with old Region 790 (S10, L=013, class/area, Doa/190 on 16 July) returning on 31 July. Both of these Regions produced M-class flares while Region 786 produced an X1 flare on the 14 July. Further M-class activity from these regions is possible.

A greater than 10 MeV proton event is possible with significant flare activity after the return of old Region 786 on 28 July.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 27 July, 31 July – 02 August, 08 – 12 August, and 17 – 22 August.

The geomagnetic field is expected to range from quiet to minor storm levels. A recurrent high speed coronal hole wind stream is expected to produce unsettled to active levels on 28 – 29 July. Another high speed coronal hole wind stream is expected to cause unsettled to minor storm levels on 16 – 18 August. Otherwise, expect quiet to unsettled conditions.



**Daily Solar Data**

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
18 July	72	0	0	A2.9	0	0	0	0	0	0	0	0
19 July	71	0	0	A1.3	0	0	0	0	0	0	0	0
20 July	72	0	0	A1.3	0	0	0	0	0	0	0	0
21 July	73	0	0	A1.3	0	0	0	0	0	0	0	0
22 July	74	0	0	A1.8	0	0	0	0	0	0	0	0
23 July	80	20	90	A4.2	0	0	0	0	0	0	0	0
24 July	80	18	110	A4.3	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
18 July	1.4E+7	7.9E+5	2.9E+3		6.6E+6	
19 July	2.6E+6	1.5E+5	3.2E+3		1.8E+7	
20 July	7.4E+5	2.8E+4	3.4E+3		8.7E+6	
21 July	9.4E+5	1.5E+4	4.0E+3		3.9E+7	
22 July	8.0E+5	1.5E+4	4.1E+3		1.3E+8	
23 July	9.6E+5	1.4E+4	4.1E+3		2.1E+8	
24 July	2.7E+6	1.5E+4	4.2E+3		3.0E+8	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	18 July	19	3-4-5-3-2-1-2-4	49	4-4-8-4-5-3-1-2	34
19 July	8	3-1-2-1-1-2-2-3	8	2-3-3-1-2-2-1-2	10	3-2-3-1-2-2-2-3
20 July	14	3-3-3-2-3-3-3-3	33	3-3-3-6-6-4-3-3	20	4-3-3-3-4-3-3-4
21 July	19	5-4-4-3-2-2-2-3	35	5-4-6-6-2-3-3-2	29	5-5-4-5-2-3-2-3
22 July	8	3-2-1-1-2-2-3-2	15	3-3-2-2-4-3-3-3	13	3-3-2-2-3-3-3-3
23 July	2	1-0-1-0-1-1-1-1	3	2-1-1-2-1-1-0-0	5	2-1-1-1-1-1-2-1
24 July	3	0-1-0-1-2-1-1-1	3	1-1-1-1-1-1-1-1	5	1-1-1-1-3-2-2-1

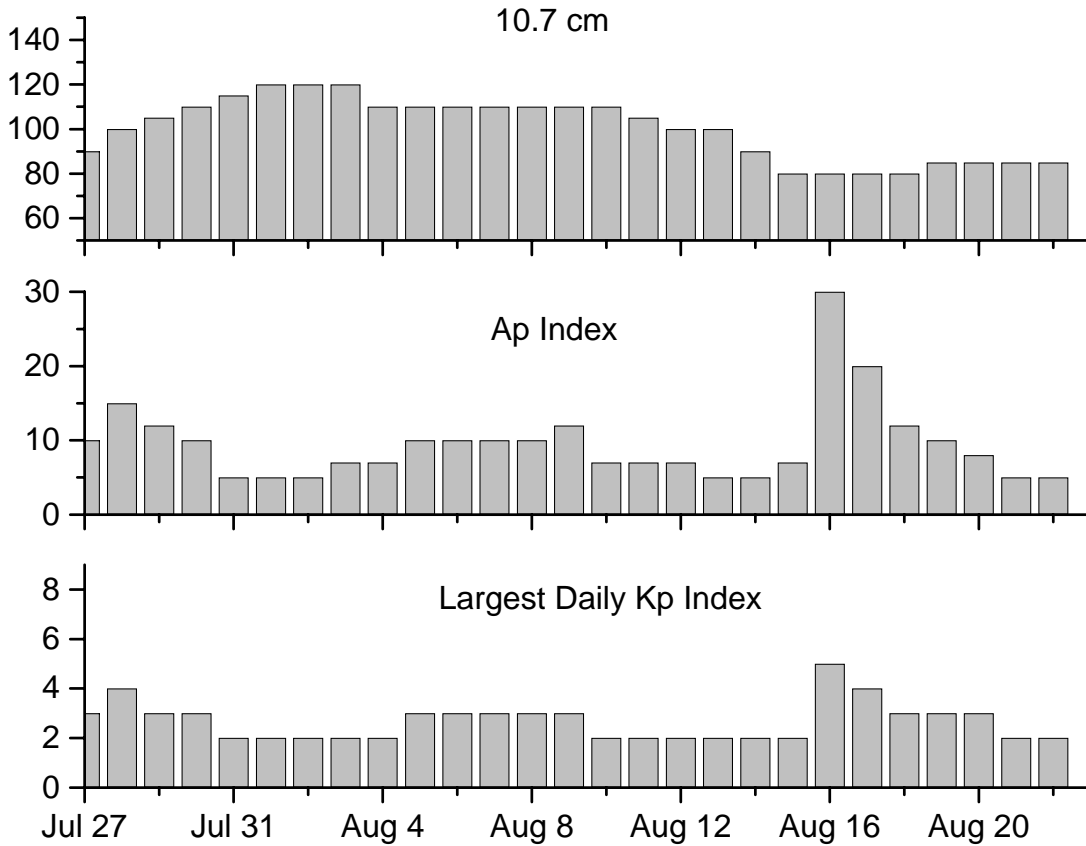


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
18 Jul 0105	CONTINUED ALERT: Proton 10MeV Integral Flux $\geq$ 10 pfu	14 Jul 0245
18 Jul 0428	ALERT: Geomagnetic K=6	18 Jul 0425
18 Jul 0711	WARNING: Geomagnetic K=6	18 Jul 0712 – 1600
18 Jul 0718	ALERT: Geomagnetic K=6	18 Jul 0714
18 Jul 2237	SUMMARY: Proton 10MeV Integral Flux $\geq$ 10 pfu	14 Jul 0245
20 Jul 0300	ALERT: Geomagnetic K=4	20 Jul 0259
20 Jul 0309	WARNING: Geomagnetic K=4	20 Jul 0310 – 1500
20 Jul 1457	EXTENDED WARNING: Geomagnetic K=4	20 Jul 0310 – 2359
20 Jul 2003	WATCH: Geomagnetic A $\geq$ 20	21 Jul
20 Jul 2335	EXTENDED WARNING: Geomagnetic K=4	20 Jul 0310 – 21/1600
21 Jul 0028	ALERT: Geomagnetic K=5	21 Jul 0027
21 Jul 0032	WARNING: Geomagnetic K=5	21 Jul 0035 – 1600
21 Jul 1316	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	21 Jul 1215
21 Jul 1722	WARNING: Geomagnetic K=4	21 Jul 1722 – 2359
22 Jul 1706	WARNING: Geomagnetic K=4	22 Jul 1707 – 2359
23 Jul 0032	245 MHz Radio Burst	22 Jul
23 Jul 0600	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	23 Jul 0535
24 Jul 0027	245 MHz Radio Burst	23 Jul
24 Jul 0515	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	24 Jul 0500
24 Jul 1448	ALERT: Type II Radio Emission	24 Jul 1351



### 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
27 July	90	10	3	10 Aug	110	7	2
28	100	15	4	11	105	7	2
29	105	12	3	12	100	7	2
30	110	10	3	13	100	5	2
31	115	5	2	14	90	5	2
01 Aug	120	5	2	15	80	7	2
02	120	5	2	16	80	30	5
03	120	7	2	17	80	20	4
04	110	7	2	18	80	12	3
05	110	10	3	19	85	10	3
06	110	10	3	20	85	8	3
07	110	10	3	21	85	5	2
08	110	10	3	22	85	5	2
09	110	12	3				



***Energetic Events***

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

***No Events Observed***

***Flare List***

Date	Time			Optical	Imp/ Brtns	Location		Rgn
	Begin	Max	End	X-ray Class.		Lat	CMD	
18 July	0101	0116	0121	B3.5				790
	0730	0734	0738	B1.3				
19 July	<i>No Flares Observed</i>							
20 July	<i>No Flares Observed</i>							
21 July	<i>No Flares Observed</i>							
22 July	<i>No Flares Observed</i>							
23 July	0143	0146	0150	B1.2				
	0245	0248	0250	B1.1				
	0323	0328	0335	B1.1				
	0620	0623	0627	B1.0				
	1051	1056	1105	B3.1				
24 July	<i>No Flares Observed</i>							

***Region Summary***

Date	Location		Sunspot Characteristics				Flares							
	Helio		Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3

*Region 791*

23 Jul	N13E50	151	0090	06	Dai	010	B										
24 Jul	N13E36	151	0110	07	Dao	008	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 151

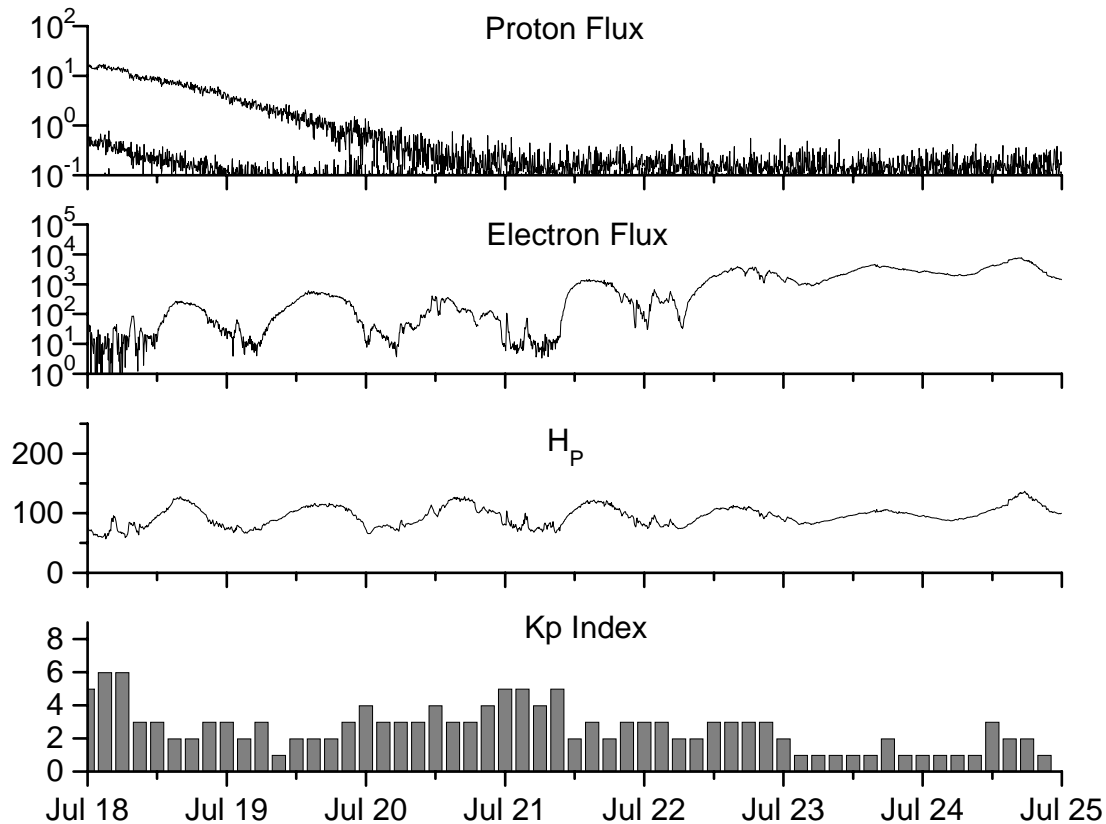


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2003</b>									
June	118.4	77.4	0.65	113.6	65.2	129.4	130.2	24	21.5
July	132.8	85.0	0.64	106.9	62.0	127.8	127.2	19	22.0
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
<b>2004</b>									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
<b>2005</b>									
January	52.0	31.3	0.60			102.4		22	
February	45.4	29.1	0.64			97.3		11	
March	41.0	24.8	0.60			90.0		12	
April	41.5	24.4	0.59			85.9		12	
May	65.4	42.6	0.65			99.5		20	
June	59.8	39.6	0.66			93.7		13	

**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.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 18 July 2005*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W115) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

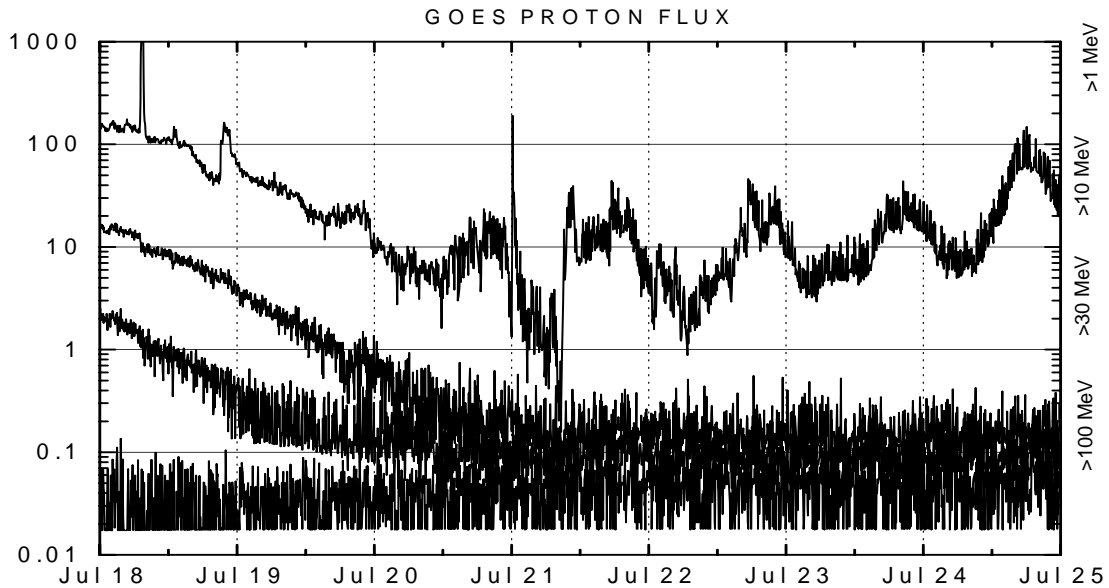
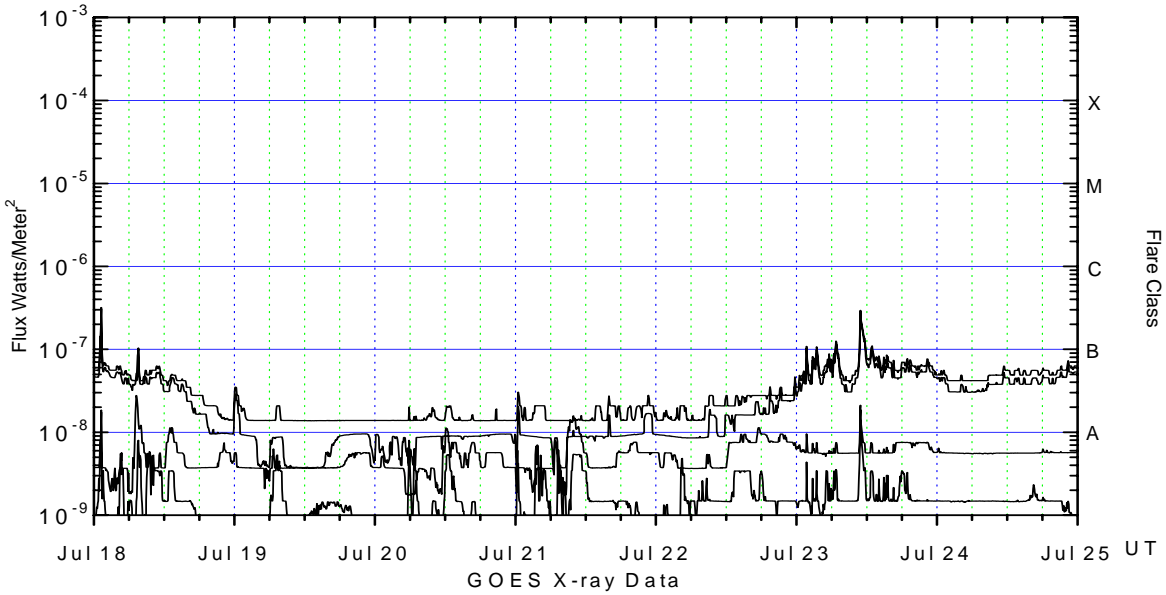
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*K<sub>p</sub>* 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 K<sub>p</sub> values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO 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 K<sub>p</sub> 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<sup>2</sup>) as measured by GOES 12 (W75) and GOES 10 (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 (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W115) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

