

Space Weather Highlights 02 - 08 May 2005

SWO PRF 1549
10 May 2005

Solar activity ranged from low to moderate. The most active region on the disk was new Region 758 (S07E23, L=129, class/area, Eai/280 on 06 May), which rotated onto the disk on 01 May and produced ten C-class flares during the summary period. Of these ten flares, eight classified weak, but the remaining two were significant. The first of these occurred at 02/2248 UTC when the region produced a C8.0 long duration x-ray event (LDE) with an associated CME. A very bright post eruption arcade was visible on SXI and EIT imagery. Later in the period, Region 758 produced a C8.5/2f LDE at 06/1656 UTC with an associated Type II (1249 km/s) radio sweep and full halo CME. Region 756 (S06, L=229, class/area, Ekc/1030 on 28 April) produced the largest events of the period with 2 impulsive M-class x-ray events: the first was an M1.3 at 06/1128 UTC, and the second was an M1.4 at 07/0813 UTC. Neither of these events had associated CME signatures. Earlier in the period, Region 756 produced a C7.8/Sf at 05/2020 UTC. This region rotated off the disk late on 07 May. New region 759 (N12, L=055, class/area, Dko/340 on 08 May) rotated onto the disk produced two low-level C-class x-ray events midday on the 7th and one C-class event on the 8th. The remainder of the disk and limb were quiet and stable.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. Solar wind speed ranged from a low of near 325 km/s early on 05 May to a high of near 900 km/s by mid-day on 08 May. Beginning on 02 May, solar wind speed was gradually declining from around 650 km/s till early on 05 May. Solar wind speed persisted around 325 – 400 km/s until late on 07 May, when the effects of coronal hole high speed stream modified by a transient flow from the CME of 06/1728 UTC were observed. Solar wind speed reached a maximum of near 900 km/s between 08/0900 -1300 UTC. By the end of the period, solar wind speed had declined to approximately 700 km/s.

The greater than 10 MeV proton flux at geosynchronous orbit were enhanced on 06 – 07 May, but did not reach event threshold.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 02 – 06 May.

The geomagnetic field ranged from quiet to severe storm levels. On 02 May, activity was at quiet to unsettled levels and remained at these levels through late on the 7th. At 06/1306 UTC, the Boulder magnetometer observed a weak SI of 8 nT. The suspected cause of the SI was believed to be from the CME/C8.0 event late on 02 May. By 2000 UTC on 07 May, solar wind speed, temperature, and density all increased, while the IMF Bz oscillated through +11 and – 20 nT. The structure of the solar wind during this time appeared to be the onset of a coronal hole high speed stream which had been modified by transient flow. These conditions persisted until late on the 8th. The geomagnetic field responded with a minor storm period late on 07 May and mostly active to severe storming periods till late on the 8th. Conditions started to settle down to unsettled to active late on 08 May.

Space Weather Outlook 11 May - 06 June 2005

Solar activity is expected be at very low to moderate levels. Further M-class activity is expected from Region 758 until it departs the visible disk late on 14 May. Otherwise expect very low to low levels.

There is a slight chance for a greater than 10 MeV proton event from Region 758 until 14 May.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels 11 – 16 May, and 28 May – 02 June.

The geomagnetic field is expected to range from quiet to minor storm levels. Recurrent coronal hole high speed wind streams are expected to produce active to minor storm levels on 11 May, 17 May, 27 – 28 May, and 04 – 05 June. Otherwise, expect quiet to unsettled conditions.



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 May	112	55	970	B2.3	1	0	0	0	0	0	0	0
03 May	112	79	1040	B2.6	1	0	0	2	1	0	0	0
04 May	109	61	1040	B2.0	1	0	0	3	0	0	0	0
05 May	109	50	830	B2.8	4	0	0	3	0	0	0	0
06 May	110	66	870	B2.3	5	1	0	3	0	1	0	0
07 May	100	55	400	B2.7	2	1	0	0	1	0	0	0
08 May	101	79	510	B2.4	1	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)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
	02 May	6.4E+5	1.3E+4	3.1E+3		3.5E+8
03 May	5.6E+5	1.3E+4	2.9E+3		2.1E+8	
04 May	5.5E+5	1.4E+4	3.2E+3		4.2E+8	
05 May	8.1E+5	1.5E+4	3.3E+3		4.3E+8	
06 May	4.5E+6	7.6E+4	3.2E+3		5.5E+8	
07 May	1.5E+7	1.4E+5	2.9E+3		4.1E+7	
08 May	1.1E+7	3.6E+4	2.9E+3		1.1E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	02 May	6	2-2-2-1-2-1-2-2	9	2-2-2-2-4-2-1-1	7
03 May	6	2-1-2-2-2-2-2-1	13	2-2-3-4-4-3-1-1	10	3-2-2-3-3-3-2-1
04 May	4	2-2-1-1-1-1-1-0	3	2-2-0-0-2-0-1-1	7	3-3-1-1-1-2-2-1
05 May	3	1-1-1-1-1-1-1-1	4	1-1-1-3-1-1-0-0	6	1-1-1-3-1-2-2-1
06 May	3	1-0-0-0-2-2-2-1	2	0-0-0-0-1-1-2-1	4	1-0-0-1-2-2-2-2
07 May	10	1-1-0-1-2-2-2-5	7	1-1-0-2-3-1-2-3	10	2-1-0-1-2-2-3-4
08 May	38	6-4-3-4-6-5-3-3	80	6-4-5-7-7-7-5-3	64	6-6-4-5-7-6-4-4

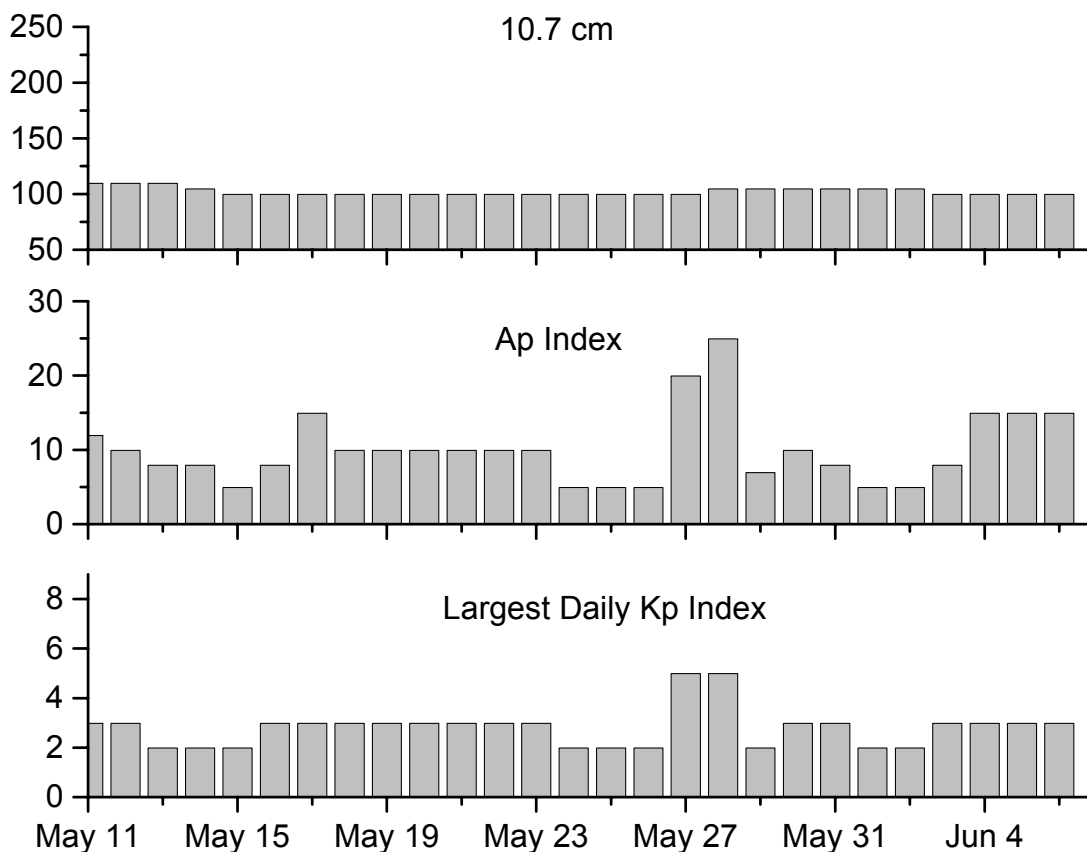


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
02 May 0013	2 – 245 MHz Radio Bursts	01 May
02 May 0515	ALERT: Electron 2MeV Integral Flux > 1000pfu	02 May 0500
03 May 0009	2 – 245 MHz Radio Bursts	02 May
03 May 1055	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 May 1035
03 May 2029	ALERT: Type II Radio Emission	02 May 2239
04 May 0008	2 – 245 MHz Radio Bursts	03 May
04 May 0515	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 May 0500
05 May 0010	8 – 245 MHz Radio Bursts	04 May
05 May 0010	1 – 245 MHz Radio Noise Storm	04 May
05 May 0803	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 May 0745
06 May 0009	8 – 245 MHz Radio Bursts	05 May
06 May 0009	1 – 245 MHz Radio Noise Storm	05 May
06 May 0515	ALERT: Electron 2MeV Integral Flux > 1000pfu	06 May 0500
06 May 1319	SUMMARY: Geomagnetic Sudden Impulse	06 May 1306
06 May 1717	ALERT: Type II Radio Emission	06 May 1648
06 May 2043	WATCH: Geomagnetic A \geq 20	08 May
06 May 2046	WATCH: Geomagnetic A \geq 20	09 May
07 May 0014	2 – 245 MHz Radio Bursts	06 May
07 May 1941	SUMMARY: Geomagnetic Sudden Impulse	07 May 1844
07 May 2134	WATCH: Geomagnetic A \geq 20	10 May
07 May 2233	WARNING: Geomagnetic K = 4	07 May 2230 - 08 May 1500
07 May 2236	ALERT: Geomagnetic K = 4	07 May 2235
07 May 2337	WARNING: Geomagnetic K = 5	07 May 2337 - 08 May 1500
07 May 2352	ALERT: Geomagnetic K = 5	07 May 2351
08 May 0148	ALERT: Geomagnetic K = 5	08 May 0147
08 May 0254	WARNING: Geomagnetic K = 6	08 May 0254 - 1500
08 May 0258	ALERT: Geomagnetic K = 6	08 May 0258
08 May 1338	ALERT: Geomagnetic K = 6	08 May 1330
08 May 1454	EXTENDED WARNING: Geomagnetic K = 6	08 May 0254 - 2359
08 May 1724	ALERT: Geomagnetic K = 6	08 May 1723
08 May 2338	EXTENDED WARNING: Geomagnetic K = 4	07 May 2230 - 09 May 1500



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 May	110	12	3	25 May	100	5	2
12	110	10	3	26	100	5	2
13	110	8	3	27	100	20	4
14	105	8	3	28	105	25	5
15	100	5	2	29	105	7	3
16	100	8	3	30	105	10	3
17	100	15	3	31	105	8	3
18	100	10	3	01 Jun	105	5	2
19	100	10	3	02	105	5	2
20	100	10	3	03	100	8	3
21	100	10	3	04	100	15	3
22	100	10	3	05	100	15	3
23	100	10	3	06	100	15	3
24	100	5	2				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	Max	Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
06 May 05	1111	1128	1135	M1.3	.008			756	240	73		
07 May 05	0757	0813	0819	M1.4	.009			756	70			

Flare List

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
02 May	0518	0524	0530	B9.5			
	0836	0840	0847	B4.7			756
	1035	1039	1041	B5.9			
	1144	1149	1153	B4.9			
	1218	1225	1231	B6.5			
	1239	1244	1248	B6.1			
	1327	1333	1339	B5.0			
	1422	1426	1429	B6.1			
	1431	1435	1440	B7.4			
	1901	1912	1918	B7.5			
	2113	2248	0107	C8.0			758
03 May	B0100	0106	0132		Sf	S06E72	
	B0148	0152	A0152		Sf	S07E72	
	B0201	0201	0212		1f	S07E72	
	1028	1036	1045	C2.7			758
	1419	1423	1448	B4.4			758
	1643	1649	1651	B4.6			758
04 May	1836	1843	1853	B8.1			758
	0148	0154	0203	B5.3			756
	0258	0302	0310	B4.2			758
	0448	0451	0453	B4.1			758
	0732	0735	0737	B3.2			758
	1213	1216	1220	B2.9			
	1315	1320	1323	B6.4			
	1400	1415	1428	C1.1			
	B2133	2155	2204		Sf	S09E54	758
	2140	2217	2225		Sf	S08E56	758
05 May	2246	2247	2251		Sf	S09E44	758
	B0016	0023	0026		Sf	S09E53	758
	0236	0310	0316	C1.3			758
	0805	0809	0813	B6.4			758
	1047	1103	1116	C1.7			758
	1313	1316	1318	B6.0			
	1435	1440	1455	C2.4			758
	2020	2020	2027	C7.8	Sf	S03W65	756
	B2346	0000	0014		Sf	S08E52	758



Flare List – continued.

Date	Begin	Time		Optical	Imp / Brtns	Location Lat CMD	Rgn
		Max	End	X-ray Class.			
06 May	B0054	0055	0059		Sf	S09E39	758
	B0112	0116	0117		Sf	S09E38	758
	0309	0311	0316	C9.3	Sf	S06W74	756
	0526	0553	0603	C2.2			758
	0912	0931	0953	C1.0			758
	1111	1128	1135	M1.3			756
	1606	1656	1830	C8.5	2f	S09E28	758
	2337	2342	2346	C1.0			758
07 May	B0041	0044	0051		1f	S09E25	758
	0334	0338	0342	B8.5			
	0757	0813	0819	M1.4			756
	0846	0851	0857	C1.2			
	0907	0916	0926	B9.1			
	1148	1156	1203	C1.2			
	1332	1340	1348	B5.8			758
	1422	1426	1431	B4.6			758
	1454	1457	1502	B3.9			758
	1633	1640	1646	B6.7			758
1649	1653	1657	B8.0			758	
08 May	2024	2027	2029	B3.9			
	0923	0928	0935	C1.2			
	1312	1316	1319	B5.9			
	2308	2311	2315	B4.0			



Region Summary

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 756</i>																		
25 Apr	S06E68	230	0330	06	Cko	004	B											
26 Apr	S06E55	230	0550	06	Dkc	010	Bd	4				4						
27 Apr	S06E42	230	0760	11	Ekc	021	Bd											
28 Apr	S06E29	229	1030	12	Ekc	044	Bd	1				1						
29 Apr	S06E17	228	0890	11	Ekc	021	Bd	1				1						
30 Apr	S07E01	231	1000	12	Ekc	027	Bg	1				2	1					
01 May	S06W11	230	0810	11	Ekc	033	Bd					1						
02 May	S08W23	229	0770	09	Dkc	020	Bd											
03 May	S07W38	231	0770	08	Dkc	030	Bd											
04 May	S07W52	231	0760	09	Dkc	012	Bd											
05 May	S09W65	230	0640	11	Ekc	011	Bd	1				1						
06 May	S08W79	231	0590	06	Dac	006	Bd	1	1			1						
07 May	S07W88	227	0260	05	Dso	004	B		1									
								9	2	0	11	1	0	0	0			

Crossed West Limb.

Absolute heliographic longitude: 231

<i>Region 757</i>																		
28 Apr	S05E03	255	0030	05	Dao	007	B											
29 Apr	S05W10	255	0040	06	Dso	005	B											
30 Apr	S06W23	255	0060	07	Dso	006	B											
01 May	S06W38	257	0100	06	Dao	008	B					1						
02 May	S06W50	256	0100	08	Dso	004	B											
03 May	S06W65	258	0070	08	Dao	005	B											
04 May	S05W79	258	0030	01	Hsx	001	A											
								0	0	0	1	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 255

<i>Region 758</i>																		
02 May	S10E74	132	0100	02	Hax	001	A	1										1
03 May	S07E63	130	0200	08	Dai	014	B	1										
04 May	S07E51	128	0250	11	Eai	018	B	1				3						
05 May	S06E37	128	0190	13	Eso	019	Bd	3				2						
06 May	S07E23	129	0280	14	Eai	040	Bg	4				2		1				
07 May	S07E10	129	0140	17	Fai	031	B						1					
08 May	S08W06	132	0170	21	Fai	051	Bg											
								10	0	0	7	1	1	0	1			

Still on Disk.

Absolute heliographic longitude: 132



Region Summary – continued.

Location		Sunspot Characteristics					Flares								
Date	(° 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	4

Region 759

08 May N12E71 055 0340 08 Dko 008 B 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 055

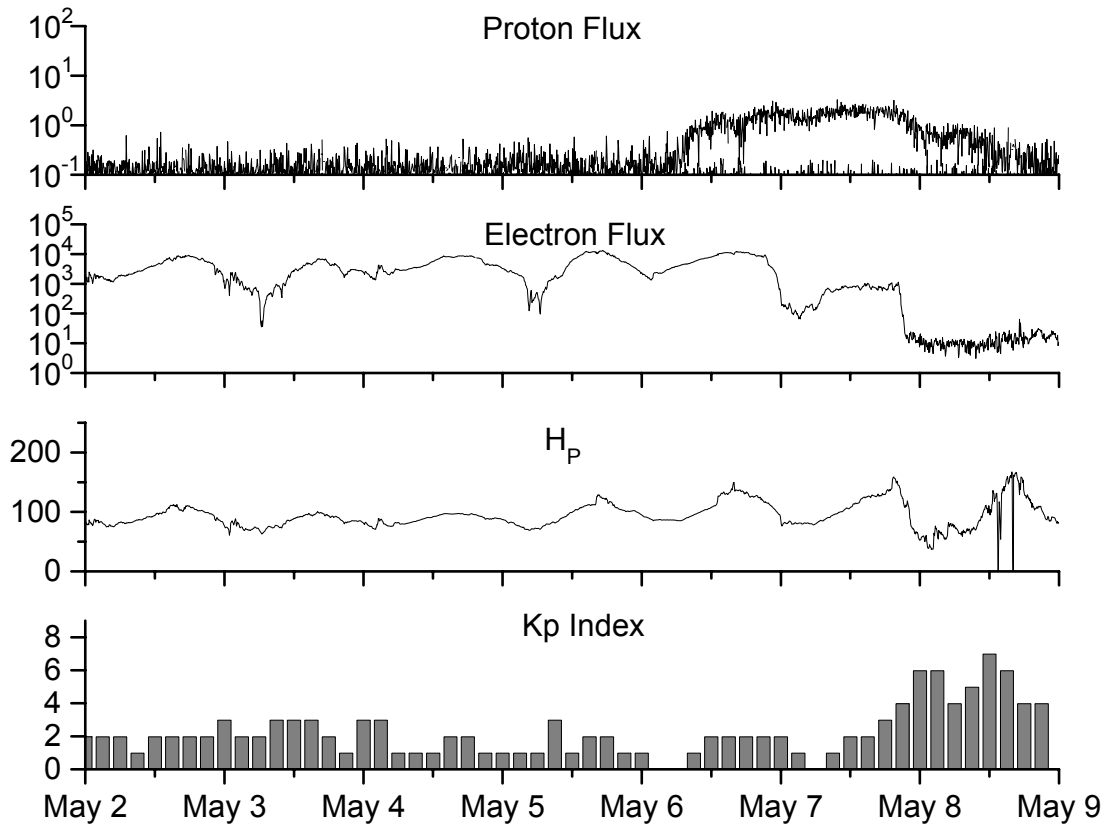


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2003									
May	89.6	55.2	0.62	118.3	67.8	129.3	133.1	26	21.0
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
2004									
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			113.2		26	
December	34.7	17.9	0.52			94.6		11	
2005									
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	

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 02 May 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

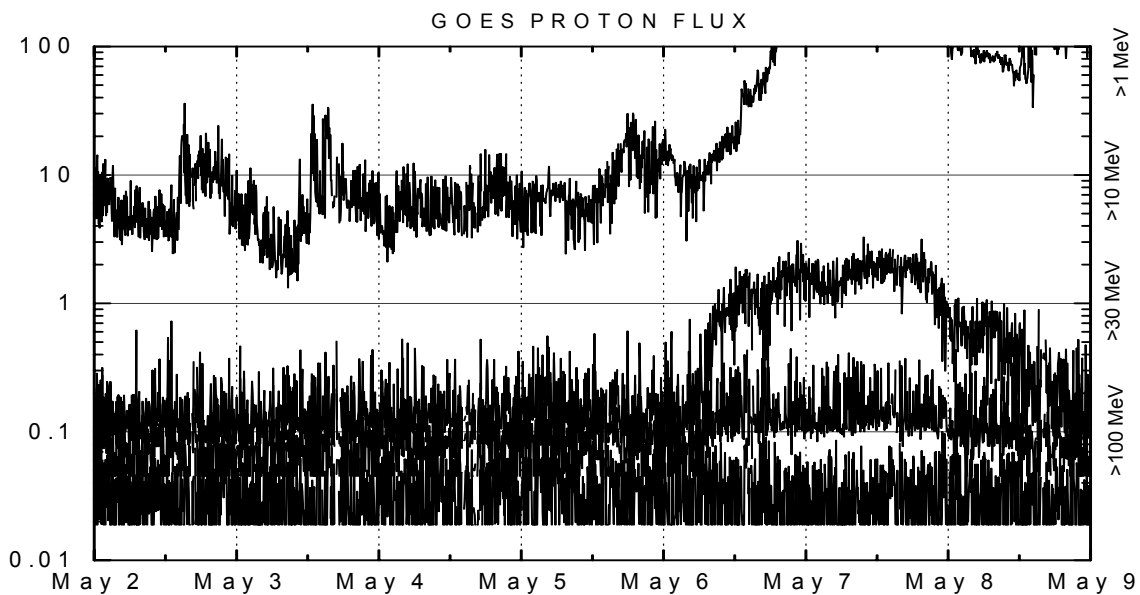
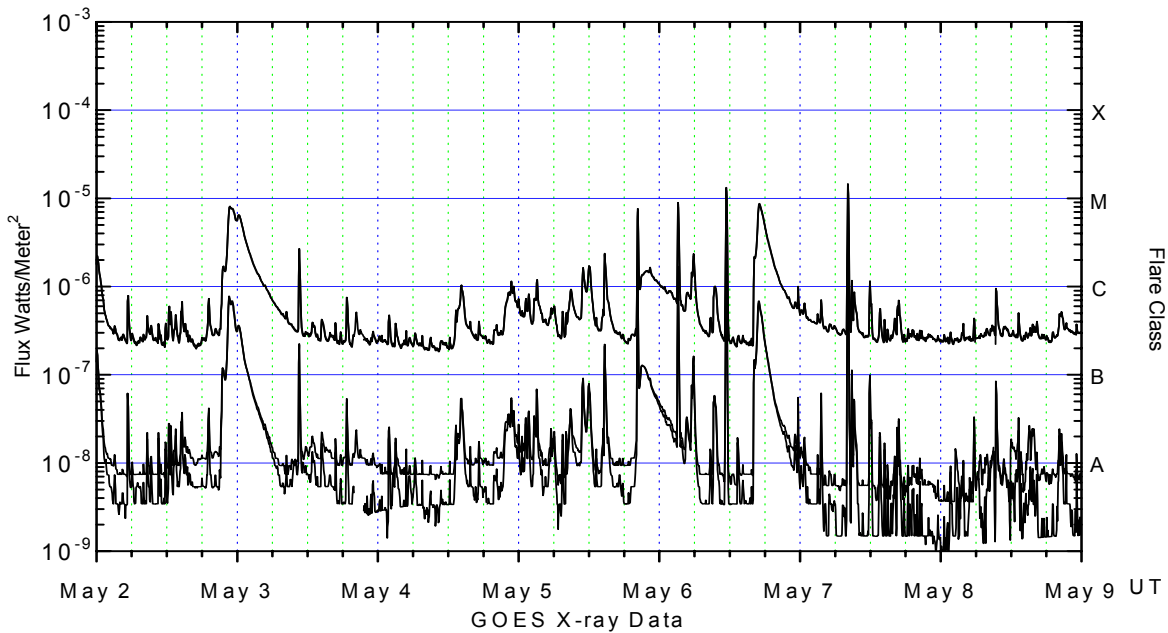
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W75).

H_p 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_p 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_p 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_p 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/m²) 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/cm²-sec-sr) as measured by GOES-11 (W113) 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.

