

Space Weather Highlights
11 – 17 April 2005

SWO PRF 1546
19 April 2005

Solar activity ranged from very low to low. Two minor C-class flares were observed from Region 752 (N01, L=040, class/area, Eai/160 on 14 April), one each on 12 and 17 April. New Region 755 (S11, L=327, class/area, Hax/030 on 17 April) rotated into view on the 17th and was the most active region on the disk during the summary period. To date, three C-class flares were observed from the region, the largest a C4.6/sf at 17/2107 UTC. An associated CME was first observed on LASCO C2 imagery at 17/2126 UTC, but was not expected to be geoeffective. Just prior to rotating into view, the region produced a C3.3 at 17/0144 UTC with an associated Type II and an estimated shock velocity of 1003 km/s. 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 330 km/s early on 11 April to a high of near 650 km/s early on 13 April. The period began with solar wind speed weak at near 350 km/s and the IMF Bz ranging between +/- 3 nT. By about 1440 UTC on 11 April, solar wind data indicated a solar sector boundary crossing followed by a gradual increase in solar wind velocity and enhanced IMF. This boundary crossing preceded the presence of a favorably positioned coronal hole high speed wind stream. From late on 11 April through all of the 12th, the IMF Bz oscillated between +/- 12 nT. Wind speed topped out at near 650 km/s early on 13 April and by midday on 15 April, the coronal hole had rotated out of a geoeffective position. Through the remainder of the summary period, wind speed gradually declined and ended the period at near 385 km/s, while the IMF Bz relaxed and did not vary much beyond +/- 5 nT.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 11 April and 13 – 17 April.

The geomagnetic field ranged from quiet to major storm levels with one isolated period of severe storming observed at higher latitudes midday on 13 April. The period began with the geomagnetic field at quiet to unsettled levels with one isolated active period observed at middle latitudes late on the 11th. Early on the 12th, activity levels increased to minor to major storming as a recurrent coronal hole high speed wind stream rotated into a geoeffective position. These levels persisted through midday on the 14th. Thereafter, through midday on 15 April, activity levels were generally quiet to active with some minor storm periods observed at high latitudes midday on the 15th. For the remainder of the summary period, the field was quiet to unsettled as the coronal hole had rotated out of a geoeffective position.

Space Weather Outlook
20 April – 16 May 2005

Solar activity is expected to be at very low to low levels.

A greater than 10 MeV proton event is not expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 22 – 29 April, 02 – 08 May, and 10 – 14 May.

The geomagnetic field is expected to range from quiet to major storm levels. Recurrent coronal hole high speed wind streams are expected to produce unsettled to active conditions on 22 – 23 April; unsettled to major storm levels on 01 – 03 May; and unsettled to minor storm levels on 09 – 11 May. 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
11 April	88	17	90	A9.2	1	0	0	0	0	0	0	0
12 April	85	32	160	A6.9	1	0	0	1	0	0	0	0
13 April	84	45	220	A4.6	0	0	0	0	0	0	0	0
14 April	85	63	290	A5.4	0	0	0	0	0	0	0	0
15 April	85	61	230	A5.3	0	0	0	0	0	0	0	0
16 April	83	52	160	A5.5	0	0	0	0	0	0	0	0
17 April	84	54	200	A5.5	4	0	0	1	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
	11 April	1.2E+6	1.5E+4	3.1E+3		1.0E+8
12 April	5.3E+5	1.5E+4	3.3E+3		7.0E+6	
13 April	4.2E+6	1.5E+4	3.0E+3		9.1E+7	
14 April	1.0E+6	1.5E+4	3.1E+3		2.7E+8	
15 April	6.4E+5	1.4E+4	3.3E+3		5.5E+8	
16 April	4.9E+5	1.5E+4	3.2E+3		6.2E+8	
17 April	5.8E+5	1.4E+4	3.4E+3		1.0E+9	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	11 April	6	1-2-0-0-2-1-3-3	7	2-1-0-3-2-2-2-2	10
12 April	23	5-5-2-3-3-2-3-4	36	5-3-5-6-5-3-3-3	30	6-5-3-4-4-3-4-4
13 April	18	2-3-3-3-3-3-3-5	53	3-4-6-5-7-6-3-3	26	2-4-4-4-5-5-4-4
14 April	14	3-4-2-3-3-2-3-2	31	3-4-5-6-5-3-2-2	19	4-5-3-3-3-2-3-2
15 April	7	2-2-2-1-2-2-1-3	26	3-4-4-5-5-4-2-2	13	3-4-2-2-3-3-2-3
16 April	4	3-1-1-0-1-1-1-1	5	2-1-1-2-2-1-1-1	7	3-2-1-1-2-2-2-2
17 April	4	2-2-2-0-1-0-1-1	3	1-1-2-0-1-0-1-1	5	1-2-2-1-1-1-1-1

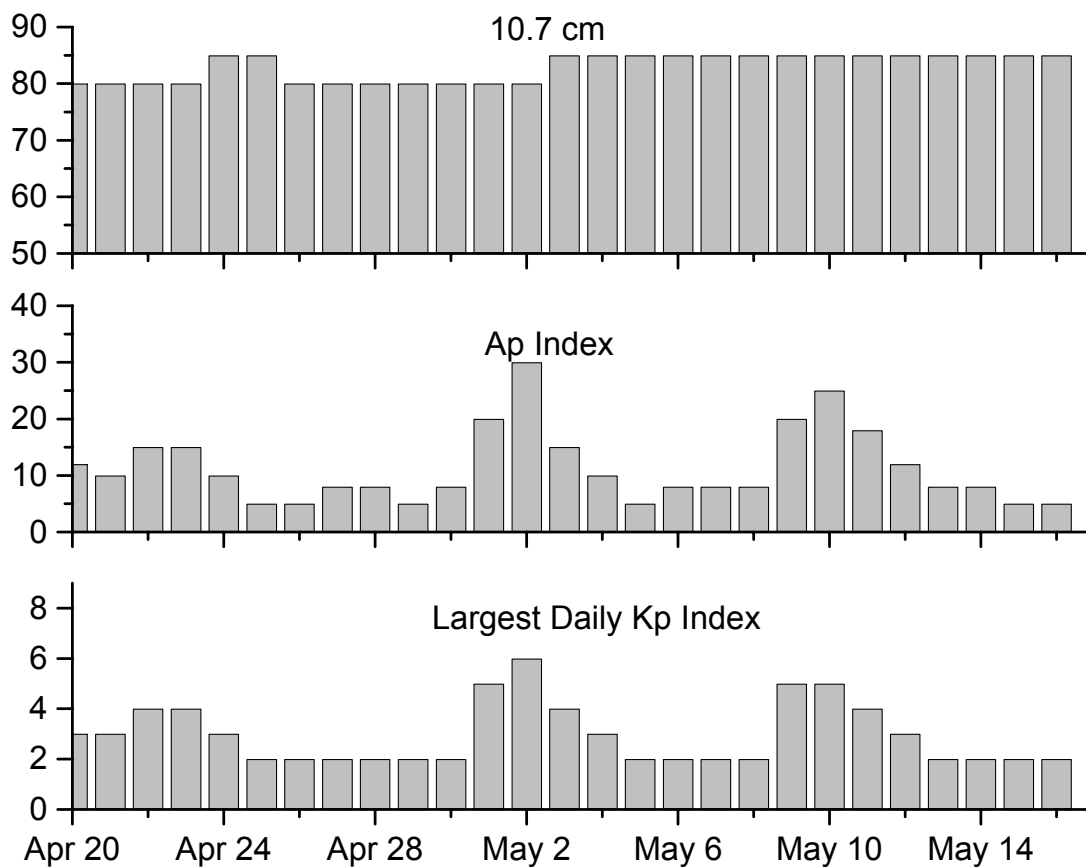


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
11 Apr 1001	ALERT: Electron 2MeV Integral Flux > 1000pfu	11 Apr 0940
11 Apr 1637	WARNING: Geomagnetic K= 4	11 Apr 1640 -12 Apr 1500
11 Apr 1757	ALERT: Geomagnetic K= 4	11 Apr 1754
12 Apr 0005	1 – 245 MHz Radio Burst	11 Apr
12 Apr 0112	WARNING: Geomagnetic K= 5	12 Apr 0112 -1500
12 Apr 0117	ALERT: Geomagnetic K= 5	12 Apr 0115
12 Apr 1455	EXTENDED WARNING: Geomagnetic K= 4	11 Apr 1640 -12 Apr 2359
12 Apr 2328	EXTENDED WARNING: Geomagnetic K=4	11 Apr 1640 - 13 Apr 1500
13 Apr 0009	1 – 245 MHz Radio Burst	12 Apr
13 Apr 1317	ALERT: Electron 2MeV Integral Flux > 1000pfu	13 Apr 1250
13 Apr 1442	EXTENDED WARNING: Geomagnetic K=4	11 Apr 1640 -13 Apr 2359
13 Apr 1614	WARNING: Geomagnetic K= 5 expected	13 Apr 1615 -13 Apr 2359
13 Apr 1705	ALERT: Geomagnetic K-index of 5	13 Apr 1702
13 Apr 2317	EXTENDED WARNING: Geomagnetic K= 4	11 Apr 1640 - 14 Apr 1500
14 Apr 0509	ALERT: Geomagnetic K= 5	14 Apr 0506
14 Apr 0532	ALERT: Electron 2MeV Integral Flux > 1000pfu	14 Apr 0515
14 Apr 1443	EXTENDED WARNING: Geomagnetic K= 4	11 Apr 1640 -Apr 14 2359
15 Apr 0529	ALERT: Geomagnetic K= 4	15 Apr 0526
15 Apr 0532	ALERT: Electron 2MeV Integral Flux >1000pfu	15 Apr 0500
16 Apr 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	16 Apr 0500
17 Apr 0212	ALERT: Type II Radio Emission	17 Apr 0144
17 Apr 0853	ALERT: Electron 2MeV Integral Flux > 1000pfu	17 Apr 0500



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
20 Apr	80	12	3	04 May	85	10	3
21	80	10	3	05	85	5	2
22	80	15	4	06	85	8	2
23	80	15	4	07	85	8	2
24	85	10	3	08	85	8	2
25	85	5	2	09	85	20	5
26	80	5	2	10	85	85	5
27 Apr	80	8	2	11	85	18	4
28	80	8	2	12	85	12	3
29	80	5	2	13	85	8	2
30	80	8	2	14	85	8	2
01 May	80	20	5	15	85	5	2
02	80	30	6	16	85	5	2
03	85	15	4				



Energetic Events

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

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
11 April	0112	0117	0120	B3.0			751
	0201	0204	0206	B5.4			751
	0248	0253	0255	C1.0			751
	0448	0501	0515	B4.8			
	0602	0606	0612	B2.6			751
	0823	0828	0830	B7.8			751
	1217	1222	1235	B1.8			
12 April	1524	1528	1533	B2.5			
	1842	1845	1928	B2.9			
	0015	0020	0031	B2.0			
	0142	0153	0217	B7.9			
	0349	0354	0358	B2.3			
	0613	0618	0623	B2.8			
	0714	0743	0759	B2.2			
13 April	0928	0934	0939	B2.4			
	1035	1039	1049	B4.4			
	1718	1719	1724	C2.0	Sf	N00E77	752
	No Flares Observed						
14 April	0246	0250	0303	B1.3			752
	1011	1017	1023	B2.9			752
	1043	1046	1048	B1.0			752
	1820	1823	1825	B1.7			754
15 April	No Flares Observed						
16 April	0833	0838	0845	B3.0			
	1316	1344	1352	B2.7			
	1526	1530	1535	B1.1			
	1614	1627	1638	B7.7			
	2130	2136	2143	B3.2			
17 April	0134	0144	0152	C3.3			755
	0248	0251	0254	B1.2			752
	0319	0322	0324	B1.0			
	0719	0723	0728	B1.2			
	1212	1224	1233	C1.2			752
	1242	1249	1255	C2.1			755
	2059	2108	2119	C4.6	Sf	S13E77	755



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

Region 749

03 Apr	S06E63	165	0050	01	Hsx	001	A										
04 Apr	S06E52	163	0040	01	Hsx	002	A										
05 Apr	S06E38	164	0020	02	Hax	001	A										
06 Apr	S05E24	164	0020	01	Hsx	001	A										
07 Apr	S05E11	164	0020	01	Hsx	002	A										
08 Apr	S06W02	164	0020	01	Hax	002	A										
09 Apr	S05W17	166	0010	01	Hsx	001	A										
10 Apr	S06W30	166	0010	01	Axx	001	A										
11 Apr	S06W43	166															
12 Apr	S06W56	166															
13 Apr	S06W69	166															
14 Apr	S06W82	166															
15 Apr	S06W95	166															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 164

Region 750

05 Apr	S08E84	118	0120	01	Hax	001	A										
06 Apr	S07E65	123	0070	02	Hax	001	A										
07 Apr	S07E51	124	0140	07	Dai	012	B										
08 Apr	S07E36	126	0150	07	Dao	009	B										
09 Apr	S07E24	125	0100	04	Dai	006	B										
10 Apr	S07E12	124	0070	05	Dso	006	B										
11 Apr	S07W01	124	0090	05	Cso	007	B										
12 Apr	S07W15	124	0080	08	Dso	009	B										
13 Apr	S07W28	124	0060	07	Cso	005	B										
14 Apr	S07W41	124	0040	02	Hsx	002	A										
15 Apr	S07W54	124	0030	01	Hsx	001	A										
16 Apr	S08W66	123	0020	01	Hsx	001	A										
17 Apr	S07W80	123	0030	01	Hrx	001	A										

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 124



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

Region 752

12 Apr	N00E76	033	0080	10	Dso	003	B	1			1						
13 Apr	N01E56	040	0150	10	Dao	008	B										
14 Apr	N01E43	040	0160	11	Eai	010	Bg										
15 Apr	N01E30	040	0140	11	Eso	008	Bg										
16 Apr	N02E14	043	0090	07	Dso	005	B										
17 Apr	N02E00	043	0110	07	Cso	008	B	1									
								2	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 043

Region 753

13 Apr	N12W06	102	0010	03	Cso	002	B										
14 Apr	N12W19	102	0010	06	Bxo	006	B										
15 Apr	N12W32	102	0010	05	Bxo	005	B										
16 Apr	N12W45	102	0010	01	Axx	001	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 102

Region 754

14 Apr	S08E51	032	0080	04	Dai	005	B										
15 Apr	S08E38	032	0050	05	Cso	007	B										
16 Apr	S08E23	034	0040	05	Dso	005	B										
17 Apr	S08E11	032	0030	04	Cso	004	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 032

Region 755

17 Apr	S11E76	327	0030	02	Hax	001	A	3			1						
								3	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 327

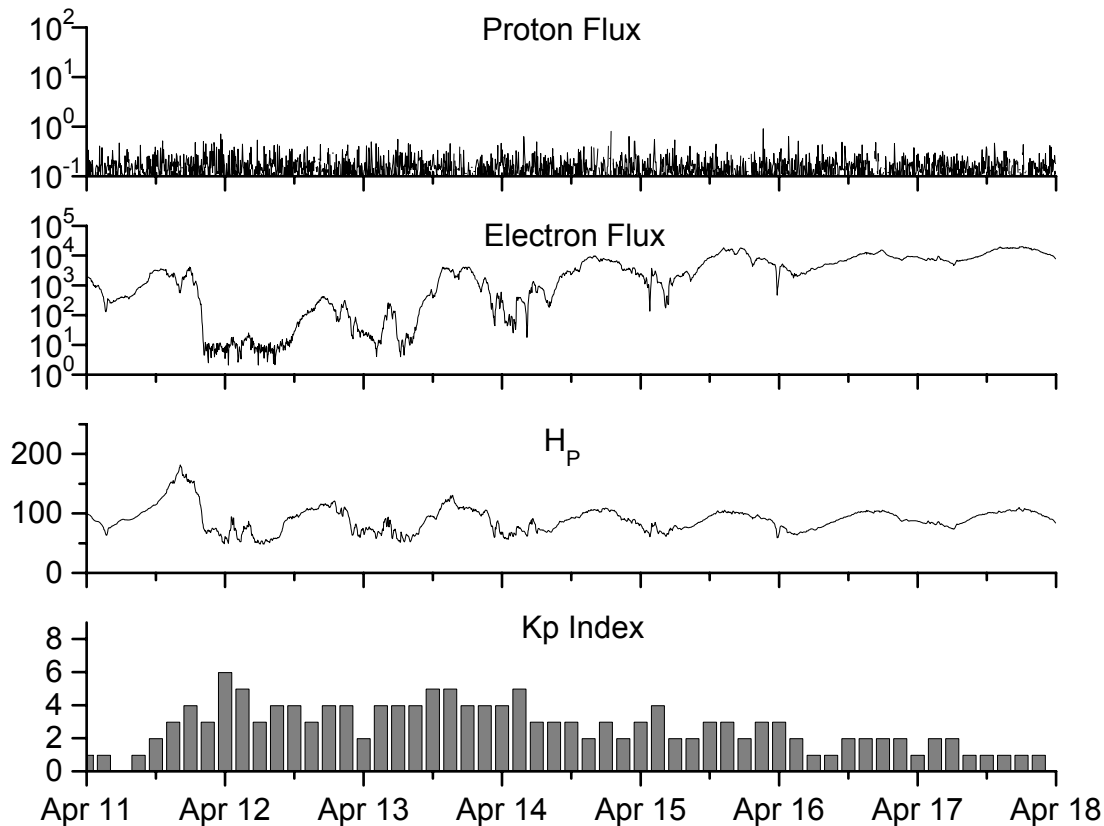


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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									
April	119.7	60.0	0.50	121.5	70.3	126.3	135.0	20	20.1
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			105.7		9	
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	

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 11 April 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W112) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

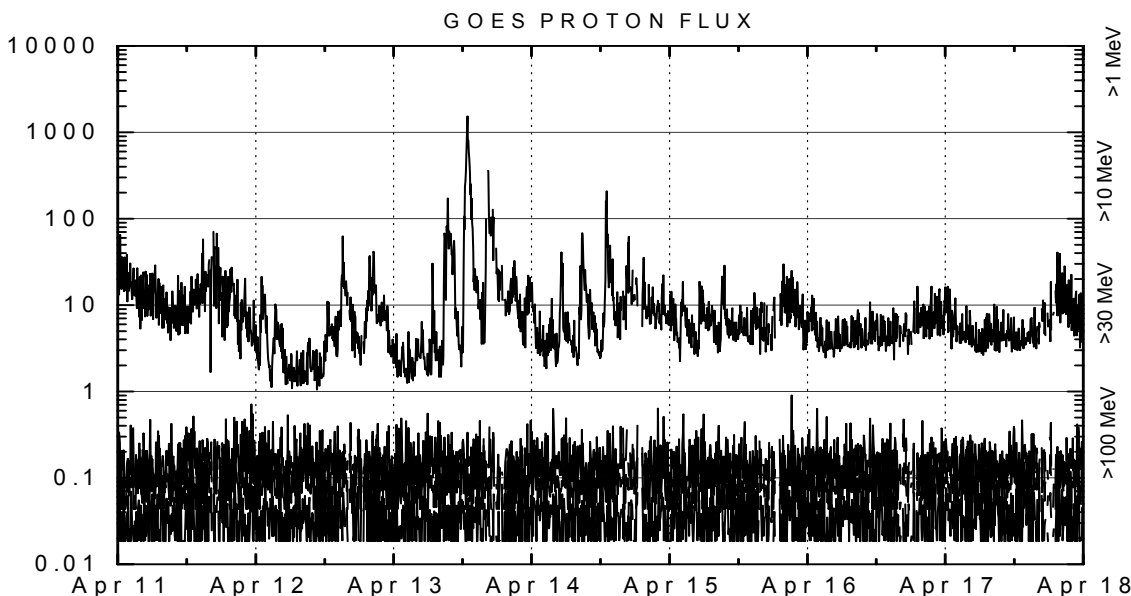
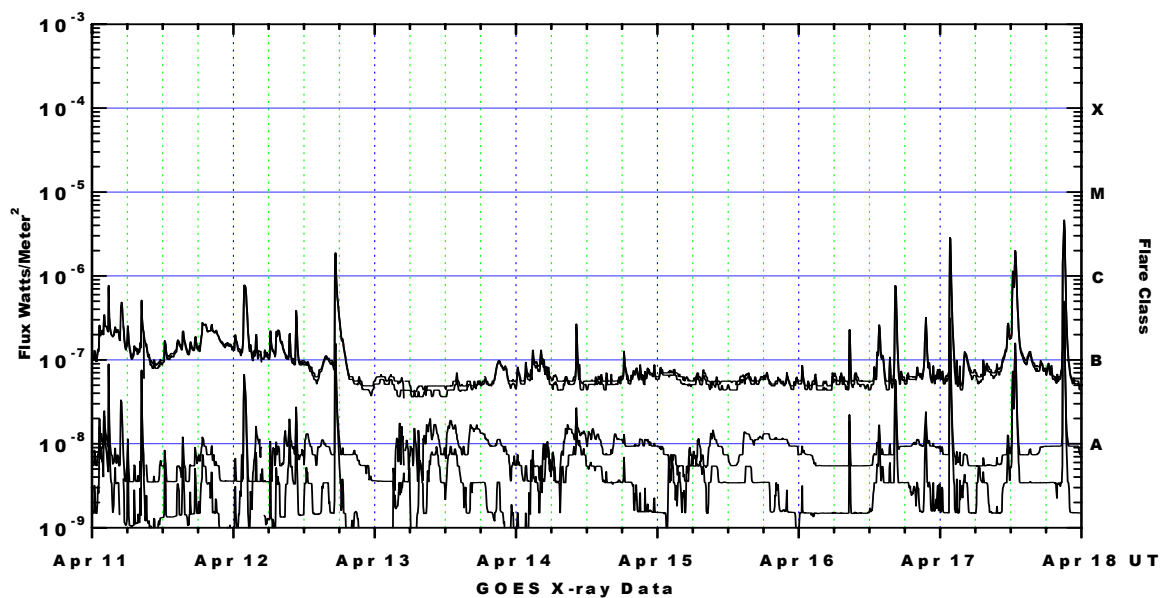
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W75).

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 (W112) 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.

