

**Space Weather Highlights**  
**25 - 31 March 2002**

**SWO PRF 1387**  
**02 April 2002**

Activity was low during 25 – 29 March, then increased to moderate levels for the balance of the period. Region 9878 (N09, L = 040, class/area Esi/170 on 26 March) was the most notable of a few moderately complex sunspot groups that produced C-class flares during 25 – 29 March (for flare specifics, please refer to the Energetic Events or Optical Flares lists). It showed a delta magnetic configuration for a few days, but began to slowly decay on 29 March. Activity increased to moderate levels on 30 March due to a M3/1n flare at 30/1301 UTC from Region 9885 (N11, L = 320, class/area Fki/600 on 31 March). It produced another low-level M-class flare on 31 March. Region 9885 was active as it rotated into view on 28 March, possibly the source for a C7 X-ray flare at 28/1800 UTC. It grew during 28 – 30 March to include the development of a weak delta within its interior spots. However, it began to gradually decay on 31 March with loss of its delta. Region 9887 (N01, L = 297, class/area Eai/240 on 31 March) produced isolated subflares on 31 March as it began to grow. Currently, it is moderate in size and magnetic complexity.

Solar wind data were available from NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. The last of the CME passages associated with flare activity in old Region 9866 (S09, L = 191) occurred on 25 March. This relatively weak passage began at around 25/0030 UTC accompanied by increased solar wind velocities (peaks to 490 km/sec), minor increases in temperature, density, and total IMF field intensity; and mostly northward IMF Bz. A high-speed stream associated with a positive-polarity coronal hole was detected on 26 - 27 March. High speeds (peaks to 610 km/sec) and low proton densities occurred during this stream, which subsided early on 27 March. Another high-speed stream occurred during 30 – 31 March associated with low densities and velocities in the 600 – 800 km/sec range. This stream continued as the period ended.

There were no proton events at geo-synchronous orbit.

The greater than 2 MeV electron flux at geo-synchronous orbit was at normal levels for most of the period.

Quiet to unsettled conditions prevailed until late on 29 March. A sudden impulse occurred at 29/2237 UTC (31 nT, as measured by the Boulder USGS magnetometer), followed by an increase to unsettled to active levels for the remainder of the period.

**Space Weather Outlook**  
**03 - 29 April 2002**

Solar activity is expected to be at low to moderate levels. Isolated, low-level M-class flares are likely during the period.

The greater than 2 MeV electron flux may reach high levels during 03 – 05 April. Otherwise, normal to moderate levels are expected during the period.

There will be a slight chance for a proton event during 10 – 17 April.

Active conditions are possible during 25 – 27 April due to recurrent coronal hole effects.

Quiet to unsettled conditions are expected during the remainder of the period.



### *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
25 March	170	162	680	B7.5	8	0	0	3	0	0	0	0
26 March	166	145	690	B5.6	6	0	0	4	0	0	0	0
27 March	169	179	960	B6.1	6	0	0	0	0	0	0	0
28 March	176	144	740	B8.1	9	0	0	2	0	0	0	0
29 March	181	189	1360	B7.7	8	0	0	11	0	0	0	0
30 March	189	171	1210	C1.8	5	2	0	17	1	0	0	0
31 March	204	133	1270	C1.4	4	1	0	5	1	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)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
	25 March	2.1E+6	1.5E+4	1.7E+3		2.6E+6
26 March	3.7E+5	1.1E+4	2.3E+3		1.3E+6	
27 March	2.3E+5	1.1E+4	2.5E+3		3.0E+6	
28 March	3.2E+5	1.0E+4	2.5E+3		5.6E+6	
29 March	7.1E+5	1.1E+4	2.7E+3		5.6E+6	
30 March	2.3E+5	1.2E+4	2.6E+3		1.8E+5	
31 March	4.7E+5	1.1E+4	2.6E+3		2.5E+5	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	25 March	7	2-2-1-1-2-3-2-1	*	2-1-1-1-2-*-2-1	5
26 March	10	2-3-2-3-3-1-1-3	15	3-3-1-4-3-2-2-4	11	3-2-1-3-3-3-2-3
27 March	3	1-2-2-0-0-1-1-1	3	2-1-1-0-0-1-1-1	5	2-1-2-2-2-2-2-1
28 March	2	0-0-0-1-0-2-1-0	5	0-0-0-2-3-3-0-0	6	1-0-1-2-3-3-3-1
29 March	6	0-0-0-1-2-2-1-4	*	1-0-0-*-**-*-*	7	1-0-0-2-2-3-2-3
30 March	18	2-4-3-3-4-4-3-2	*	*-*-**-*-**-*-*	17	2-4-4-3-4-3-3-2
31 March	12	2-3-3-2-3-3-3-2	*	*-*-**-*-**-*-*	14	2-3-3-3-3-3-4-3



*Alerts and Warnings Issued*

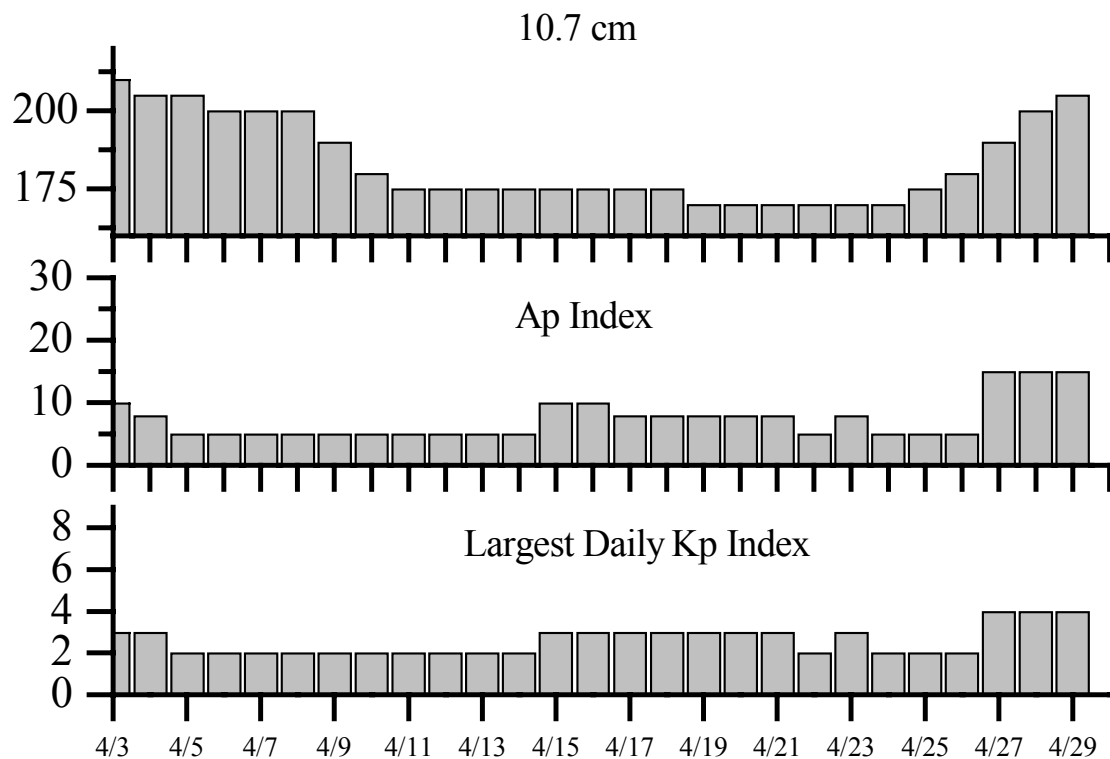
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<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
27 Mar	1 - 245 MHz Radio Burst	26 Mar
29 Mar	1 - 245 MHz Radio Burst	28 Mar
29 Mar	2 - 245 MHz Radio Noise Storms	28 Mar
29 Mar 2247	SUMMARY: Geomagnetic Sudden Impulse	29 Mar 2237
29 Mar 2251	ALERT: Geomagnetic K= 4	29 Mar 2247
30 Mar 0015	3 - 245 MHz Radio Bursts	29 Mar
30 Mar 439	WARNING: Geomagnetic K= 4	30 Mar 0439 -1500
30 Mar 442	ALERT: Geomagnetic K= 4	30 Mar 0441
30 Mar 1452	EXTENDED WARNING: Geomagnetic K= 4	03 Apr 1500
31 Mar 0007	2 - 245 MHz Bursts	30 Mar

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## 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
03 Apr	210	10	3	17 Apr	175	8	3
04	205	8	3	18	175	8	3
05	205	5	2	19	175	8	3
06	200	5	2	20	170	8	3
07	200	5	2	21	170	8	3
08	200	5	2	22	170	8	3
09	190	5	2	23	170	5	2
10	180	5	2	24	170	8	3
11	175	5	2	25	170	5	2
12	175	5	2	26	175	5	2
13	175	5	2	27	180	15	4
14	175	5	2	28	190	15	4
15	175	10	3	29	200	15	4
16	175	10	3				



### *Energetic Events*

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/Location		Rgn #	Radio Flux		Intensity	
						Brtns	Lat CMD		245	2695	II	IV
30 Mar	1245	1301	1314	M3.4	.030	1n	N11E33	9885	24			
30 Mar	2219	2226	2234	M1.0	.006							
31 Mar	1039	1055	1115	M1.0	.016	1f	N10E21	9885				

### *Flare List*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
25 Mar	0113	0118	0123	C1.3			
	0135	0140	0144	C2.0			
	0254	0300	0306	C2.0			
	0629	0634	0641	C2.8			
	B1034	1038	1053	C6.0	SF	N09E26	9878
	1124	1127	1131	C2.1			
	1401	1405	1410	B9.9			
	1555	1555	1610	C1.8	SF	N08E21	9878
	1810	1811	1814		SF	S01W44	9881
	2001	2008	2012	C9.8			9878
26 Mar	0348	0355	0401	C1.5			
	0600	0603	0605	B7.6			
	0742	0745	0748	C1.0			
	1117	1118	1125		SF	S03W56	9881
	1509	1516	1543	C3.0	SF	N08E06	9878
	2000	2002	2011	C2.1	SF	S02W58	9881
	2027	2030	2034	C1.5	SF	S01W61	9881
27 Mar	2116	2120	2123	C2.1			
	0355	0400	0407	C2.3			
	0552	0557	0602	C1.6			
	0835	0840	0842	C1.2			
	1009	1013	1019	C1.3			
	1254	1302	1309	C3.0			
28 Mar	2040	2050	2104	C2.0			
	0021	0025	0030	C1.4			
	0152	0158	0221	C1.6			
	0337	0342	0348	C1.8			
	0505	0509	0523	C1.3			
	0951	U0953	1004	C1.4	SF	N17W01	9882
	1134	1141	1213	C2.5			
	1548	1549	1552	C1.6	SF	N10E61	9885
	1752	1800	1816	C7.6			
	2149	2156	2205	C2.9			
29 Mar	0105	0109	0111	C1.4			
	0353	0358	0413		SF	N11E55	9885
	0735	U0745	0750	C2.5	SF	N09W71	9880



*Flare List - continued.*

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
29 Mar	0908	0912	0925	C1.9				
	1011	1014	1017		SF	N06W65	9880	
	1041	1041	1045		SF	N13W67	9880	
	1107	1149	1202	C3.1			9880	
	1132	1139	1142		SF	N10W70	9880	
	1206	1209	1228		SF	N08W72	9880	
	1243	1251	1319	C6.5	SF	S19E18	9884	
	1321	1321	1330		SF	N10W74	9880	
	1416	1418	1421		SF	N10E49	9885	
	1715	1718	1721	C2.2				
	1855	1909	1933	C3.7	SF	N00E68	9887	
	1941	2005	2016		SF	N10E44	9885	
	2147	2151	2156	C4.2				
	30 Mar	0340	0343	0345	C1.5			
0649		0652	0659		SF	N11E37	9885	
0702		0711	0724	C9.1				
0851		0851	0854	C1.9	SF	N11E39	9885	
1141		1142	1148		SF	N10E31	9885	
B1159		U1159	1219	C5.1	SF	N10E34	9885	
1217		1218	1222		SF	N10E33	9885	
1235		1238	1240		SF	N11E33	9885	
1247		1302	1410	M3.4			9885	
1413		1413	1420		SF	N11E36	9885	
1535		1539	1543		SF	S19E05	9884	
1542		1542	1545		SF	S14E61	9888	
1647		1651	1657		SF	N11E33	9885	
1754		1754	1757		SF	N11E32	9885	
1808		1813	1820		SF	N10E31	9885	
1938		1939	1943	C4.5	SF	N11E32	9885	
1942		1944	1953		SF	N00E53	9887	
2057		2100	2106		SF	N11E32	9885	
2104		2107	2122		SF	S02E52	9887	
2112		2119	2124		SF	N11E30	9885	
2219		2226	2234	M1.0				
31 Mar		0039	0043	0053	C2.8			
		0157	0217	0228	C5.7			
		0934	0935	0939		SF	N10E22	9885
	1008	1009	1019	C2.9	SF	N10E23	9885	
	B1050	U1102	1149	M1.0	1F	N10E21	9885	
	1232	1250	1259		SF	N10E22	9885	
	1253	1256	1259		SF	N12E23	9885	
	1452	1454	1457	C5.2	SF	N12E32	9886	



### 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	4							
<i>Region 9871</i>																						
13 Mar	S21E70	141	0150	08	Dao	004	B			1		1										
14 Mar	S20E58	140	0210	13	Eao	007	B	1						1								
15 Mar	S20E44	141	0200	14	Eso	006	B					1										
16 Mar	S21E31	140	0280	13	Eao	013	B	1				1										
17 Mar	S18E20	138	0330	13	Eso	015	B	2	1			3										
18 Mar	S19E07	138	0330	12	Eao	018	B	3				3	1									
19 Mar	S19W06	138	0260	12	Eao	014	B					1										
20 Mar	S19W19	138	0240	13	Eao	014	B					1										
21 Mar	S18W32	138	0240	13	Eko	015	Bg	1				1										
22 Mar	S19W47	139	0200	11	Eao	007	Bg					1										
23 Mar	S18W60	139	0170	10	Dso	005	B															
24 Mar	S18W72	138	0100	10	Dao	006	B															
25 Mar	S17W87	140	0050	09	Dso	003	B															
								8	2	0	13	2	0	0	0	0						

Crossed West Limb.

Absolute heliographic longitude: 138

<i>Region 9874</i>																						
19 Mar	N17E21	111	0020	03	Cso	003	B															
20 Mar	N18E08	111	0030	04	Cso	009	B															
21 Mar	N17W05	111	0010	02	Axx	003	A															
22 Mar	N18W17	109	0000	01	Axx	001	A															
23 Mar	N18W30	109																				
24 Mar	N18W43	109																				
25 Mar	N18W56	109																				
26 Mar	N18W69	109																				
27 Mar	N18W82	109																				
28 Mar	N18W95	109																				
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 111







**Region Summary - continued.**

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	4			
<i>Region 9878</i>																		
20 Mar	N08E75	044	0060	03	Hsx	001	A											
21 Mar	N09E64	042	0110	11	Cao	005	B						2					
22 Mar	N08E53	039	0150	10	Dao	009	B	1										
23 Mar	N10E43	036	0150	16	Fao	015	B	1			1							
24 Mar	N09E28	038	0100	13	Esi	016	Bg											
25 Mar	N08E15	038	0150	14	Esi	018	Bg	3			2							
26 Mar	N08E00	040	0170	11	Esi	023	Bg	1			1							
27 Mar	N10W13	039	0150	11	Eai	020	Bgd											
28 Mar	N09W26	039	0080	11	Eao	009	Bg											
29 Mar	N09W40	040	0080	09	Dso	009	B											
30 Mar	N09W55	042	0060	07	Dso	005	B											
31 Mar	N08W68	042	0020	06	Bxo	002	B											
								6	0	0	6	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 040

<i>Region 9880</i>																		
21 Mar	N08E35	071	0010	04	Bxo	005	B											
22 Mar	N06E20	072	0010	03	Bxo	003	B											
23 Mar	N06E07	072	0020	04	Cro	005	B											
24 Mar	N07W08	074	0020	06	Cso	010	B											
25 Mar	N08W22	075	0080	07	Dao	015	B											
26 Mar	N08W36	076	0080	07	Dao	011	B											
27 Mar	N08W50	076	0220	08	Dai	019	Bg	1										
28 Mar	N09W63	076	0210	10	Dao	013	B											
29 Mar	N08W76	076	0400	10	Dao	014	Bg	2			6							
30 Mar	N08W89	076	0120	08	Dao	004	B											
								3	0	0	6	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 072

<i>Region 9881</i>																		
22 Mar	S05W09	101	0020	07	Cro	003	B											
23 Mar	S04W20	099	0020	06	Bxo	004	B											
24 Mar	S03W34	100	0020	05	Cso	007	B	1			1							
25 Mar	S03W48	101	0130	06	Dao	014	B				1							
26 Mar	S03W62	102	0180	09	Dso	011	B	2			3							
27 Mar	S03W75	101	0160	09	Dao	008	B											
28 Mar	S03W87	100	0060	02	Hsx	001	A											
								3	0	0	5	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 101



**Region Summary - continued.**

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

*Region 9882*

22 Mar N14E72	020	0040	04	Bxo	002	B											
23 Mar N14E54	025	0130	06	Dao	006	B											
24 Mar N16E41	025	0090	06	Dao	006	B											
25 Mar N16E28	025	0050	07	Cao	005	B											
26 Mar N16E14	026	0020	08	Dso	004	B											
27 Mar N16E01	025	0050	08	Dro	007	B											
28 Mar N16W12	025								1				1				
29 Mar N16W25	025																
30 Mar N16W38	025																
31 Mar N16W51	025																
									1	0	0	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 025

*Region 9883*

23 Mar N06E67	012	0030	02	Hsx	001	A											
24 Mar N06E58	008	0050	02	Hsx	001	A											
25 Mar N06E44	009	0040	02	Hsx	001	A											
26 Mar N06E30	010	0040	01	Hsx	001	A											
27 Mar N06E17	009	0040	01	Hsx	002	A											
28 Mar N06E04	009	0020	01	Hsx	001	A											
29 Mar N07W10	010	0020	02	Hsx	003	A											
30 Mar N07W23	010	0000	00	Axx	001	A											
31 Mar N07W36	010																
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 009

*Region 9884*

27 Mar S18E38	348	0040	04	Cao	006	B											
28 Mar S19E25	348	0040	05	Cro	007	B											
29 Mar S19E14	346	0060	05	Dso	013	B			1				1				
30 Mar S19E02	345	0060	06	Dao	011	B							1				
31 Mar S19W11	345	0100	07	Dao	005	B											
									1	0	0	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 345



**Region Summary - continued.**

Date	Location		Sunspot Characteristics				Flares							
	( ° Lat ° CMD)	Helio Lon	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
							C	M	X	S	1	2	3	4

*Region 9885*

27 Mar	N11E69	317	0120	07	Dao	004	B								
28 Mar	N11E56	317	0190	10	Dso	006	B	1			1				
29 Mar	N12E44	316	0460	15	Eai	025	Bg				3				
30 Mar	N11E27	320	0580	13	Eki	032	Bgd	3	1		13	1			
31 Mar	N10E14	320	0600	16	Fki	019	Bg	1	1		4	1			
								5	2	0	21	2	0	0	0

Still on Disk.

Absolute heliographic longitude: 320

*Region 9886*

29 Mar	N11E59	301	0090	06	Dso	007	B								
30 Mar	N12E42	305	0080	08	Dao	008	B								
31 Mar	N11E30	304	0100	09	Dso	008	B	1			1				
								1	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 304

*Region 9887*

29 Mar	N01E66	294	0010	04	Bxo	003	B	1			1				
30 Mar	N01E51	296	0170	08	Dao	010	B				2				
31 Mar	N01E37	297	0240	11	Eai	011	Bg								
								1	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 297

*Region 9888*

29 Mar	S11E70	290	0150	04	Cao	004	B								
30 Mar	S12E58	289	0110	05	Cao	005	B				1				
31 Mar	S13E46	288	0190	07	Dso	005	B								
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 288

*Region 9889*

31 Mar	S20E48	286	0020	05	Cso	002	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 286

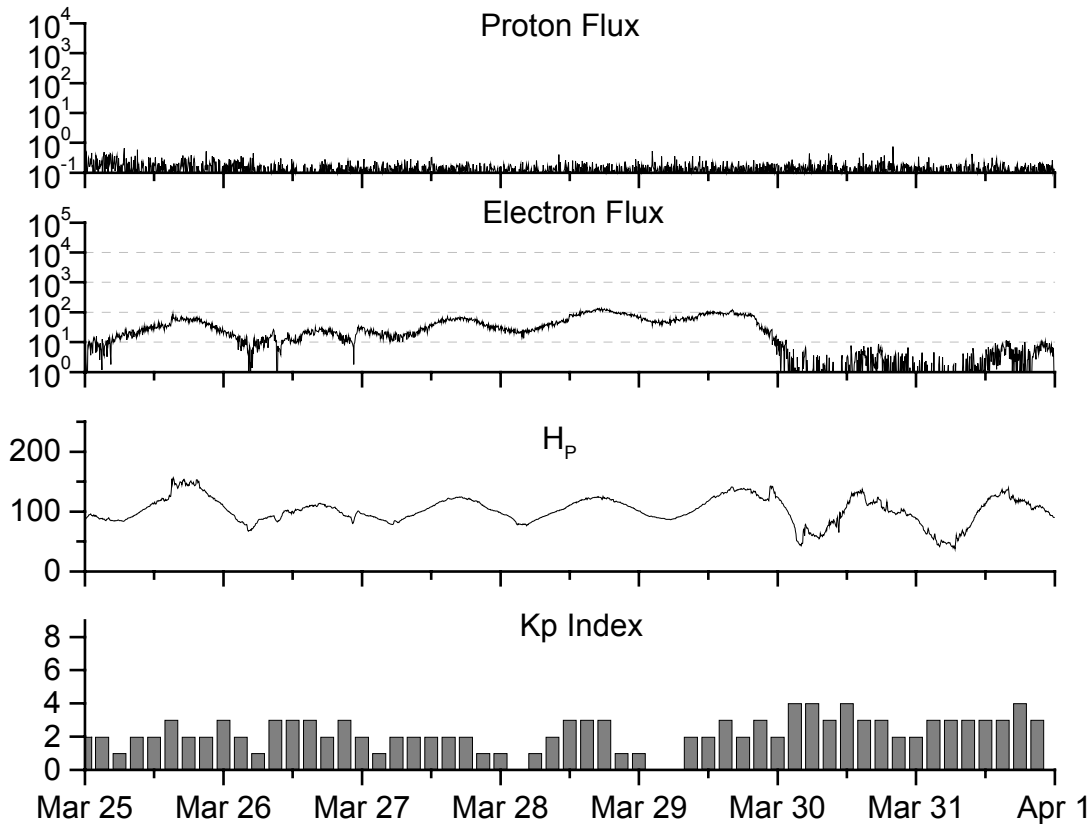


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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
<b>2000</b>									
March	203.6	138.5	0.68	175.4	119.9	208.2	178.4	09	15.0
April	193.4	125.5	0.65	176.3	120.8	184.2	180.5	15	15.0
May	188.8	121.6	0.64	173.1	119.0	184.5	180.0	15	15.0
June	190.3	124.9	0.66	172.0	118.7	179.8	179.7	15	15.1
July	236.7	169.1	0.71	173.0	119.7	204.7	180.2	21	14.8
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	157.9	109.9	0.70	169.0	116.2	182.1	177.1	18	14.2
October	138.9	100.1	0.72	166.2	114.4	167.7	175.6	18	14.6
November	149.9	106.5	0.71	162.7	112.7	178.8	173.6	17	14.6
December	146.4	104.5	0.71	160.8	112.1	173.6	172.0	08	14.4
<b>2001</b>									
January	142.7	95.1	0.67	156.3	108.8	166.7	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	147.3	165.8	06	13.3
March	166.7	114.2	0.69	154.0	104.9	177.7	167.9	17	12.9
April	163.6	108.2	0.66	159.4	107.7	178.3	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	148.7	174.8	12	12.5
June	196.7	134.0	0.68	167.2	109.9	173.7	178.8	12	12.4
July	124.6	82.2	0.66	172.1	111.8	131.3	183.9	11	12.4
August	159.4	106.8	0.67	176.7	113.8	163.2	188.8	13	12.5
September	229.1	150.7	0.66			233.3		12	
October	197.4	125.6	0.64			208.2		18	
November	178.6	106.5	0.60			212.5		14	
December	217.5	131.8	0.61			236.6		08	
<b>2002</b>									
January	189.0	113.9	0.60			226.4		07	
February	194.5	108.0	0.56			205.1		09	

**NOTE:** All smoothed values after June 1999 and monthly values after December 2000 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 22, RI= 158.5, occurred July 1989. \*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 25 March 2002*

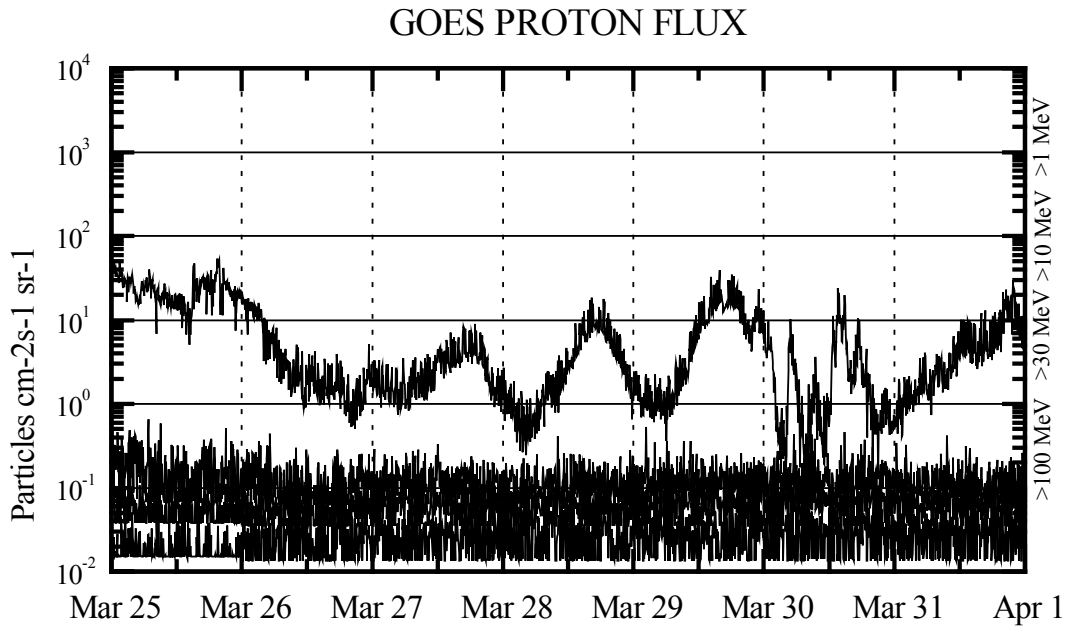
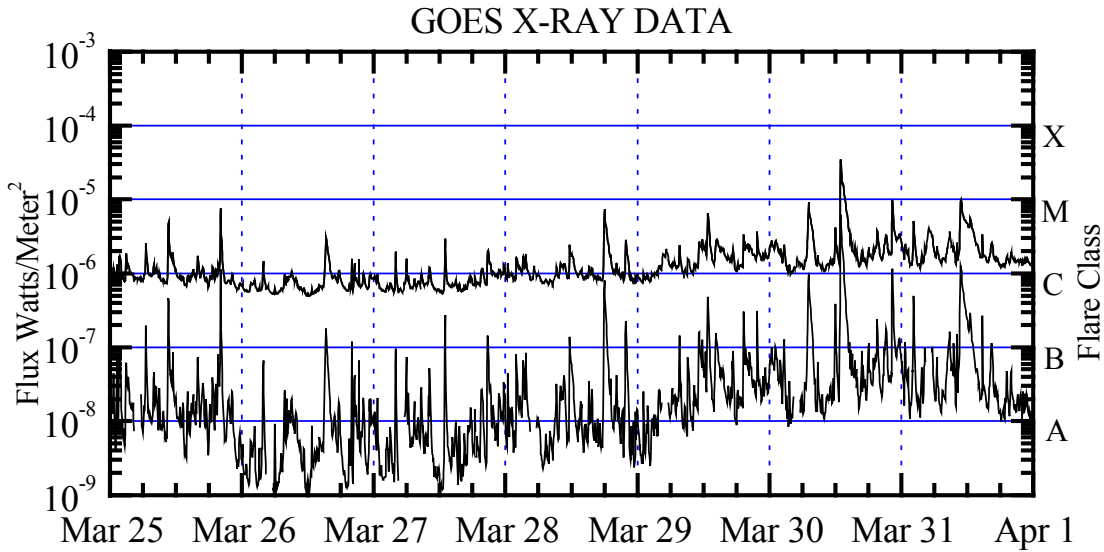
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*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-8.

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. 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 Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) 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<sub>p</sub> 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 8 and 10 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-8 (W75) 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.

