

Space Weather Highlights
23 - 29 September 2002

SWO PRF 1413
01 October 2002

Solar activity was at low to moderate levels. Activity reached moderate levels on 27 September and again on 29 September. The largest event was an M2.6/2n flare at 29/0639 UTC from Region 134 (N12, L=77, class/area Eai/250 on 29 September). On 24 September, Region 134 rotated onto the visible disk and has exhibited consistent growth and increasing magnetic complexity, developing a magnetic delta configuration in the large leader spot on 27 September. On 27 September Region 134 produced an M1.8/Sf at 27/1312 UTC with an associated Type II radio sweep (400 km/s). Region 134 also produced numerous C-class flares later in the summary period. Region 125 (S09, L=166 class/area Dao/140 on 29 September) produced a long duration C7 flare at 29/0859 UTC that is believed to be the source of a faint partial halo CME off the western limb observed by SOHO/LASCO C2 imagery at 29/0830 UTC.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Solar wind velocities were near 425 km/s at the beginning of the period and steadily decline to around 350 km/s on 25 September. A weak transient shock was observed late on 25 September and caused a slight increase solar wind speed, temperature, and density. On 27 – 29 September the solar wind velocity was steady near 325 km/s. No significant deflection in the Bz component of the IMF was noted.

There were no greater than 10 MeV proton events at geo-synchronous orbit during the summary period.

The greater than 2 MeV electron flux at geo-synchronous orbit reached normal to moderate levels. Moderate levels were observed on 24 – 26 September.

The geomagnetic field was at quiet to unsettled levels. Two recurring coronal holes rotated onto the visible disk early in the period.

Space Weather Outlook
02 October - 28 October 2002

Solar activity is expected to be low to moderate for most of the forecast period due to the growth and development of Region 134 and the return of old Region 105/114 complex.

There is a chance of a greater than 10 MeV proton event during the forecast period.

The greater than 2 MeV electron flux at geo-synchronous orbit may reach event threshold on 11-13 October due to coronal hole effects.

The geomagnetic field is expected to be quiet to unsettled for most of the forecast period. On 09-10 October, a recurring coronal hole in the southern hemisphere is expected to reach a geo-effective position and may result in active 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	
23 September	154	209	1600	B9.7	2	0	0	0	1	0	0	0	0
24 September	158	240	1430	B4.8	3	0	0	2	0	0	0	0	0
25 September	153	230	1670	B6.0	3	0	0	9	0	0	0	0	0
26 September	150	157	1270	B7.9	12	0	0	10	0	0	0	0	0
27 September	152	185	970	B6.2	5	2	0	6	0	0	0	0	0
28 September	149	140	790	C1.3	8	0	0	4	0	0	0	0	0
29 September	138	146	720	B6.0	7	1	0	4	1	1	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
	23 September	1.1E+5	9.8E+3	2.3E+3		4.6E+6
24 September	1.2E+5	1.1E+4	2.4E+3		6.0E+6	
25 September	2.2E+5	1.1E+4	2.6E+3		8.4E+6	
26 September	5.3E+5	1.1E+4	2.7E+3		1.4E+7	
27 September	1.1E+5	1.2E+4	2.4E+3		8.0E+5	
28 September	3.6E+5	1.0E+4	2.5E+3		7.6E+5	
29 September	4.7E+5	1.1E+4	2.6E+3		1.6E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	23 September	0	1-0-0-0-0-0-0-0	1	1-0-0-0-0-1-0-0	5
24 September	3	0-0-0-1-2-0-2-1	2	0-0-0-2-2-0-1-0	6	2-2-1-2-2-2-3-2
25 September	1	0-0-0-0-0-0-1-1	2	0-0-0-1-1-1-1-1	6	2-2-1-1-2-2-3-2
26 September	3	1-1-1-1-0-1-1-2	3	1-0-0-2-2-0-1-2	8	2-2-1-2-2-3-3-3
27 September	4	2-1-0-1-1-1-1-2	4	2-1-0-3-1-0-1-1	8	3-2-1-2-2-2-3-2
28 September	5	2-2-1-1-0-1-2-2	1	1-0-0-0-0-0-0-1	8	1-3-1-2-2-2-3-3
29 September	3	0-1-1-1-2-1-1-1	1	0-1-0-0-0-1-0-0	6	2-2-1-1-2-3-3-1

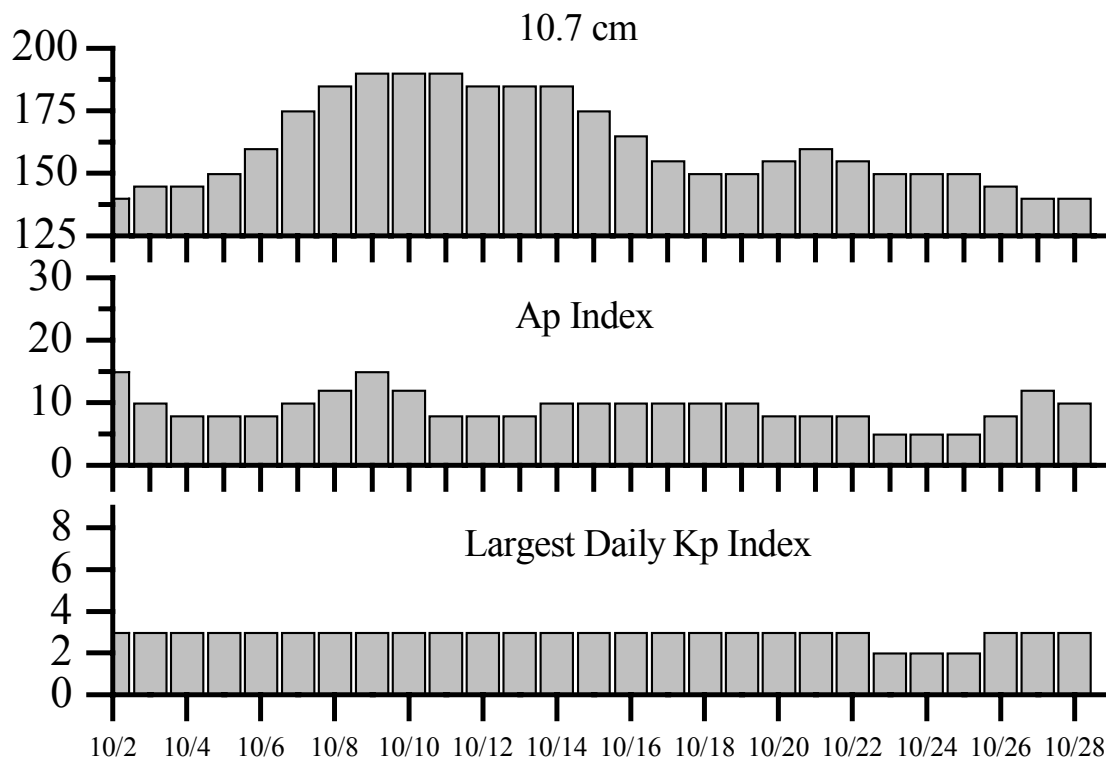


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
23 Sep 0009	6 - 245 MHz Radio Bursts	22 Sep
23 Sep 0009	1 - 245 MHz Radio Noise Storm	22 Sep
24 Sep 0013	4 - 245 MHz Radio Bursts	23 Sep
24 Sep 0013	1 - 245 MHz Radio Noise Storm	23 Sep
25 Sep 0029	5 - 245 MHz Radio Bursts	24 Sep
25 Sep 0029	1 - 245 MHz Radio Noise Storm	24 Sep
26 Sep 0017	4 - 245 MHz Radio Bursts	25 Sep
27 Sep 0042	6 - 245 MHz Radio Bursts	26 Sep
27 Sep 0148	SUMMARY: 10cm Radio Burst	27 Sep 0128
27 Sep 1323	SUMMARY: 10cm Radio Burst	27 Sep 1308
27 Sep 1350	ALERT: Type II Radio Emission	27 Sep 1316
28 Sep 0017	4 - 245 MHz Bursts	27 Sep
28 Sep 0017	1 - 245 MHz Radio Burst	27 Sep
29 Sep 0006	3 - 245 MHz Bursts	28 Sep



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
02 Oct	140	15	3	16 Oct	165	10	3
03	145	10	3	17	155	10	3
04	145	8	3	18	150	10	3
05	150	8	3	19	150	10	3
06	160	8	3	20	155	8	3
07	175	10	3	21	160	8	3
08	185	12	3	22	155	8	3
09	190	15	3	23	150	5	2
10	190	12	3	24	150	5	2
11	190	8	3	25	150	5	2
12	185	8	3	26	145	8	3
13	185	8	3	27	140	12	3
14	185	10	3	28	140	10	3
15	175	10	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	1/2 Max	Class	Integ Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
							Lat	CMD	245	2695	II	IV
27 Sep	1259	1312	1323	M1.8	.017	Sf	N13E45	0134	120	150	2	
27 Sep	1933	1942	1949	M1.4	.008	Sf	N13E38	0134	64	49		
29 Sep	0632	0639	0641	M2.6	.007	2n	N12E21	0134	7300	120		

Flare List

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
23 September	0437	0440	0435	C1.6	1f	S19W23	0120
	1114	1119	1122	C1.2			
	1758	1802	1804	B9.7			
24 September	0032	0037	0041	B6.8			
	1329	1331	1333		Sf	N18W21	0132
	1558	1559	1602	C3.1	Sf	S12W80	0119
	1958	2003	2008	C1.7			
	2027	2032	2037	C1.3			
25 September	0216	0216	0219		Sf	N10E74	0134
	0451	0453	0455		Sf	S11W89	0119
	0535	0543	0557		Sf	N10E72	0134
	0706	0706	0710		Sf	N10E72	0134
	0737	0738	0743		Sf	N12E74	0134
	0802	0802	0810		Sf	N12E74	0134
	0829	0832	0837		Sf	N12E73	0134
	0842	0845	0847		Sf	N12E73	0134
	1558	1605	1615	C2.0			
	1721	1728	1737	C2.2			
26 September	1811	1815	1819	C1.3			
	2342	2344	2348		Sf	N22W41	0132
	0028	0035	0038	C1.3			
	0155	0208	0215	C2.9	Sf	N20W39	0132
	0300	0301	0304		Sf	S08W27	0125
	0324	0328	0332	C2.9			
	0352	0400	0405	C4.0			
	0421	0422	0426	C1.8	Sf	S16W49	0127
	0426	0428	0441		Sf	N27E10	0129
	0515	0519	0522	C1.3			
	0654	0655	0717	C1.3	Sf	N19W42	0132
	0723	0724	0735		Sf	S16W50	0122
	0816	0818	0820	C1.1	Sf	N22W41	0132
0925	0931	0946		Sf	N12E54	0134	
1005	1007	1010	C1.3	Sf	N22W42	0132	
1334	1337	1344	C1.7				
1838	1842	1846	B9.5				



Flare List- continued.

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
26 September	1900	1922	1948	C1.6				
	2037	2037	2043	C1.1	Sf	N06E01	0130	
27 September	0118	0148	0237	C5.0				
	0319	0327	0406	C9.9	Sf	N11E49	0134	
	0405	0406	0409		Sf	N19W54	0132	
	0757	U0816	A0844	C4.8	Sf	N12E46	0134	
	B1329	U1333	1354	M1.8	Sf	N13E45	0134	
	1645	1701	1709	C3.2	Sf	N13E40	0134	
	1859	1904	1909	C3.4			0134	
	B1945	U1945	A1954	M1.4	Sf	N13E38	0134	
28 September	0040	0112	0135	C3.4			0134	
	0436	0440	0444	C1.0				
	0523	0525	0527	C1.0	Sf	S06W55	0125	
	0702	0703	0705		Sf	N12E31	0134	
	0714	0718	0740	C1.2	Sf	N12E31	0134	
	0728	0731	0734	C1.1			0134	
	0859	0859	A0910	B8.2	Sf	N11E29	0134	
	0958	1001	1006	B7.7			0134	
	1035	1055	1121	C3.4			0134	
	1919	1930	1934	C2.0			0134	
	2128	2131	2133	C1.5			0134	
	29 September	0022	0022	0025		Sf	S06W65	0125
		0155	0201	0209	C1.3			
0613		0614	0617		Sf	N12E22	0134	
0634		0638	0713	M2.6	2n	N12E21	0134	
0844		0851	0945	C7.8	Sf	S08W70	0125	
0857		0905	0940		Sf	S14W90	0122	
1446		1449	1509	C9.3	1n	N10E13	0134	
2130		2139	2143	C1.1				
2202		2219	2223	C1.5				
2251		2255	2303	C2.1				
2320		2327	2332	C5.3				
1600		1600	1605		Sf	S16W45	0119	
1735		1735	1740		Sf	S07E23	0125	
1917	1921	1928	C1.0					



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

Region 115

14 Sep	S03E45	241	0120	06	Dao	014	B										
15 Sep	S03E32	241	0120	08	Dso	014	B										
16 Sep	S03E19	241	0140	09	Dao	008	B										
17 Sep	S03E02	244	0210	11	Eai	020	B										
18 Sep	S03W11	244	0250	11	Eai	021	B						1				
19 Sep	S03W25	245	0160	11	Eao	015	B										
20 Sep	S04W38	245	0170	10	Dao	013	B	1					2				
21 Sep	S04W55	249	0160	05	Cao	003	B										
22 Sep	S04W71	251	0150	02	Hax	002	A										
23 Sep	S05W85	252	0080	02	Hax	002	A										
										1	0	0	3	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 244

Region 117

15 Sep	S09E72	201	0130	02	Hsx	001	A										
16 Sep	S09E59	201	0170	02	Hsx	001	A										
17 Sep	S10E46	200	0150	03	Hkx	002	B										
18 Sep	S09E32	201	0180	02	Hax	001	A										
19 Sep	S10E18	202	0200	02	Hsx	001	A										
20 Sep	S10E05	202	0180	02	Hsx	001	A										
21 Sep	S09W07	201	0170	04	Hsx	002	A										
22 Sep	S09W21	201	0160	03	Hsx	003	A										
23 Sep	S10W34	201	0180	05	Cso	003	B										
24 Sep	S08W48	202	0160	02	Hsx	001	A										
25 Sep	S09W60	201	0190	06	Dso	004	B										
26 Sep	S08W76	204	0170	03	Hsx	001	A										
27 Sep	S08W89	204	0120	02	Hsx	001	A										
										0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 202



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares								
	Helio		Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	
<i>Region 119</i>															
16 Sep	S14E32	228	0040	05	Cao	008	B	2			3				
17 Sep	S14E17	229	0090	07	Dao	010	B	6			12				
18 Sep	S14E04	229	0220	08	Dai	016	B	3			6	2			
19 Sep	S14W10	230	0380	08	Dki	018	Bd	1			2				
20 Sep	S14W24	231	0500	10	Dkc	027	Bgd	1			3				
21 Sep	S14W36	230	0670	10	Dkc	031	Bd	1			1				
22 Sep	S14W49	229	0650	12	Eki	033	Bd	2			3				
23 Sep	S14W59	226	0720	14	Eki	012	Bg								
24 Sep	S13W76	230	0430	13	Eki	011	Bg	1			1				
25 Sep	S13W88	229	0420	12	Eki	012	Bg				1				
								17	0	0	32	2	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 229

<i>Region 120</i>															
16 Sep	S19E57	203	0040	01	Hsx	001	A								
17 Sep	S19E43	203	0040	05	Cso	004	B								
18 Sep	S18E30	203	0020	04	Bxo	004	B								
19 Sep	S19E17	203	0020	04	Cso	004	B								
20 Sep	S18E03	204	0020	04	Bxo	004	B								
21 Sep	S19W10	204	0010	02	Bxo	003	B								
22 Sep	S19W23	204													
23 Sep	S19W36	204						1			1				
24 Sep	S19W49	204													
25 Sep	S19W62	204													
26 Sep	S19W75	204													
27 Sep	S19W88	204													
								1	0	0	0	1	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 204



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

Region 123

17 Sep	S16E30	216	0020	03	Hrx	003	A												
18 Sep	S16E16	217	0020	04	Bxo	005	B												
19 Sep	S14E04	216	0040	07	Dso	009	B					1							
20 Sep	S14W10	217	0090	10	Dao	014	B					1							
21 Sep	S15W21	215	0060	09	Dao	014	B	1				1							
22 Sep	S13W38	218	0040	05	Cao	005	B												
23 Sep	S16W54	221	0030	01	Hsx	001	A												
24 Sep	S17W67	221	0020	01	Axx	001	A												
25 Sep	S16W80	221	0020	01	Hsx	001	A												
												1	0	0	3	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 216

Region 125

18 Sep	S08E69	164	0010	01	Axx	001	A											
19 Sep	S08E55	165	0020	01	Axx	001	A	1					1					
20 Sep	S09E40	167	0020	03	Bxo	003	B											
21 Sep	S09E27	167	0020	03	Cao	003	B											
22 Sep	S09E14	166	0020	02	Hsx	004	A					1						
23 Sep	S09E01	166	0010	01	Axx	002	A											
24 Sep	S07W07	161	0020	06	Bxo	009	B											
25 Sep	S07W24	165	0020	05	Cso	005	B											
26 Sep	S07W37	165	0020	05	Cso	005	B						1					
27 Sep	S08W52	167	0030	04	Cro	005	B											
28 Sep	S08W65	166	0110	05	Dao	005	B	1				1						
29 Sep	S09W78	166	0140	09	Dao	005	B	1				2						
								3	0	0	0	5	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 166



Region Summary - continued.

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

Region 126

19 Sep	S23E75	145	0060	01	Hsx	001	A										
20 Sep	S24E62	145	0180	06	Dao	004	B	1	2		4						
21 Sep	S23E52	142	0100	06	Dao	005	B										
22 Sep	S23E39	141	0080	05	Dao	005	B										
23 Sep	S22E24	143	0010	01	Axx	002	A										
24 Sep	S22E10	144	0010	01	Hrx	001	A										
25 Sep	S22W03	144															
26 Sep	S22W16	144															
27 Sep	S22W29	144															
28 Sep	S22W42	144															
29 Sep	S22W55	144															
										1	2	0	4	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 144

Region 127

20 Sep	S14E19	188	0050	03	Dao	010	B										
21 Sep	S14E05	189	0130	07	Dao	019	B										
22 Sep	S13W09	189	0190	09	Dao	017	B				1						
23 Sep	S13W21	188	0170	09	Dao	015	B										
24 Sep	S13W35	189	0190	09	Dai	022	B										
25 Sep	S14W47	188	0210	10	Dai	019	B										
26 Sep	S13W61	189	0270	10	Dao	010	Bg	1			1						
27 Sep	S13W74	189	0190	10	Cao	007	B										
28 Sep	S10W92	193	0120	03	Cao	004	B										
										1	0	0	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 189

Region 128

20 Sep	N11E63	144	0020	00	Axx	001	A										
21 Sep	N10E49	145	0010	00	Axx	001	A										
22 Sep	N10E36	145															
23 Sep	N10E23	145															
24 Sep	N10E10	145															
25 Sep	N10W03	145															
26 Sep	N10W16	145															
27 Sep	N10W29	145															
28 Sep	N10W42	145															
29 Sep	N10W55	145															
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 145



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

Region 136

29 Sep	S27W36	124	0020	03	Cso	002	B	0	0	0	0	0	0	0	0	0
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Still on Disk.

Absolute heliographic longitude: 124

Region 137

29 Sep	S16E50	038	0040	08	Cso	003	B	0	0	0	0	0	0	0	0	0
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Still on Disk.

Absolute heliographic longitude: 038

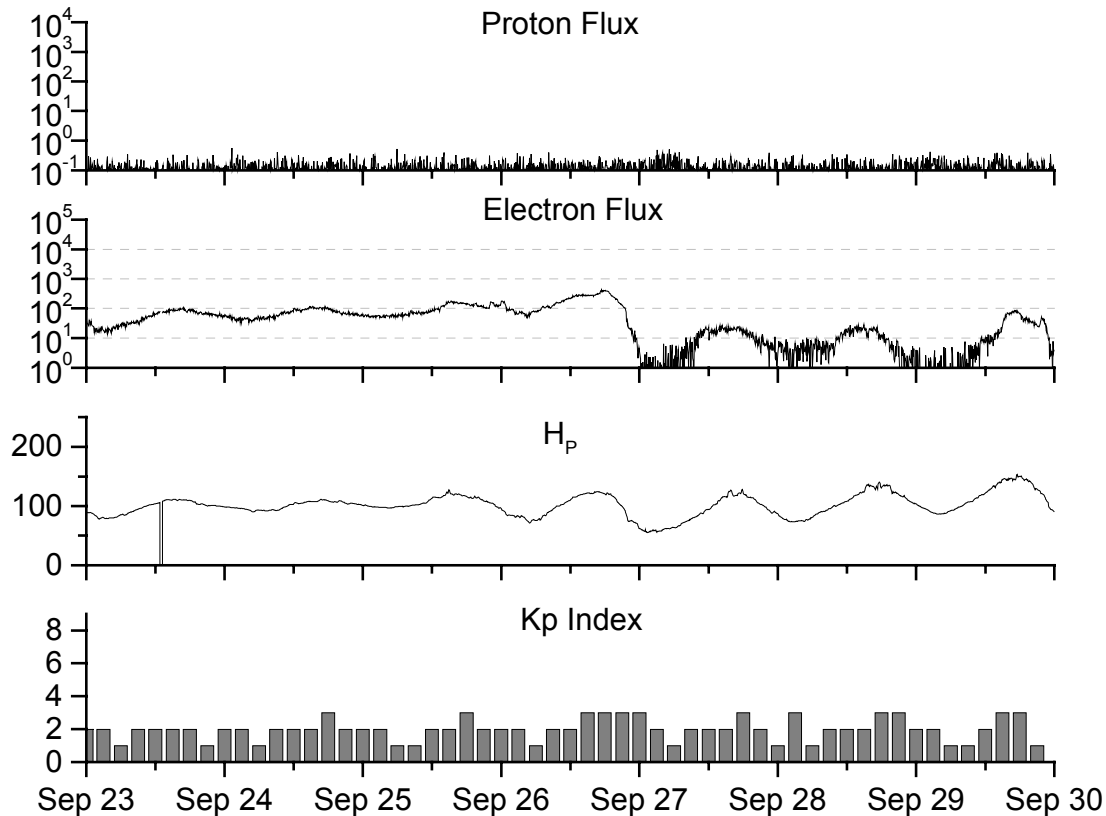


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2000									
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
2001									
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	178.8	114.3	233.3	191.3	12	12.3
October	197.4	125.6	0.64	179.5	114.1	208.2	191.9	18	11.9
November	178.6	106.5	0.60	183.7	115.6	212.5	193.6	14	11.9
December	217.5	131.8	0.61	184.5	114.7	236.6	193.8	08	12.0
2002									
January	189.0	113.9	0.60	184.8	113.5	226.4	194.6	07	12.0
February	194.5	108.0	0.56	188.6	114.7	205.1	197.2	09	12.2
March	153.1	98.1	0.64			179.5		10	
April	194.9	120.4	0.62			189.7		15	
May	204.1	120.8	0.59			178.4		15	
June	146.0	88.5	0.61			148.8		11	
July	183.5	99.9	0.54			174.5		13	
August	191.0	116.4	0.61			184.0		16	

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 23 September 2002

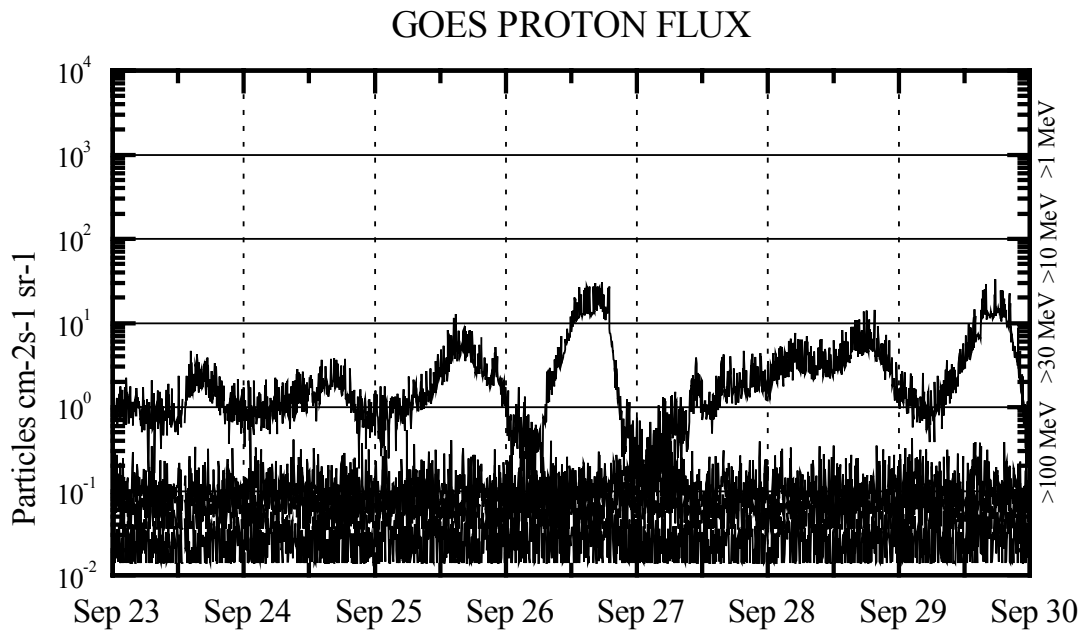
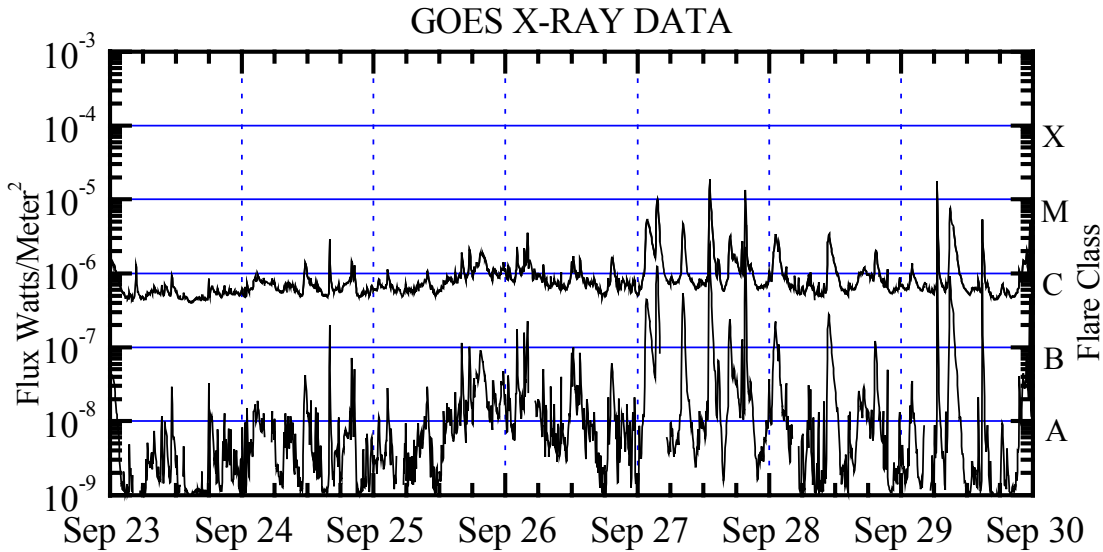
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

H_p 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_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 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_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_pparallel 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 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/cm²-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/cm²-sec-sr) at greater than 10 MeV.

