

Space Weather Highlights **30 September - 06 October 2002**

SWO PRF 1414
08 October 2002

Solar activity ranged from low to high levels. Activity reached high levels on 04 – 05 October with the largest event an M5 flare, on 05 October, from Region 139 (N12, L=336, class/area Dkc/680 on 05 October). A Type II radio sweep measuring 325 km/s was associated with the M5 flare. For flare times and magnitudes, please refer to Energetic Flare and Optical Flare Lists. Region 139 exhibited rapid growth on 03-05 October and developed a magnetic delta configuration on 04 October, which only lasted a day. Region 139 produced two M-class events, on 04 October, each with an associated Type II radio sweep. Region 137 (S19, L=40, class/area Eki/310 on 03 October) produced four M-class flares on 04 October, with the largest an M4/1n at 04/0538 UTC. Region 137 showed signs of mixing polarities in the trailing spot on 03 October, but maintained only a beta-gamma magnetic configuration. On 04 October, Region 137 entered a gradual decay phase. Region 139 entered a gradual decay phase on 06 October, but still had signs of a weak delta configuration in the leader spot.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. A CME shock was recorded at ACE at 30/0730 UTC with an IMF Bz deflection to -18 nT. Late on 30 September, Bz went from a maximum positive value of 26 nT to a maximum negative value of -24 nT in a six-hour period. Solar Wind velocities jumped to about 360 km/s due to the initial CME shock on 30 September and continued a gradual increase into the next day with peak values near 425 km/s. Solar wind velocities increased to near 550 km/s on 02-03 October then began a variable decrease, ending the period near 360 km/s. The Bz component of the IMF was predominantly negative throughout the summary period. Average Bz values were near -5

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 high levels. High levels were observed on 05-06 October.

Geomagnetic field activity ranged from quiet to severe storm levels. On 30 September, two sudden impulses were recorded on the Boulder magnetometer, a 22 nT deflection at 30/0822 UTC and an 11 nT deflection at 30/1928 UTC. Resulting activity reached major storm levels and is believed to have originated from the M-class events that occurred on 27 September. Activity on 01-02 October reached severe storm conditions. The source of this activity is unclear but NASA/ACE data revealed a slow moving transient signature. Late on 03 October and early on 04 October, geomagnetic activity reached minor to severe storm levels and was probably due to CME activity observed on 30 September. Active to minor storm activity on 05-06 October was the result of predominantly southward Bz component of the IMF, which was most likely due to CME activity on 03-04 October.

Space Weather Outlook **09 October - 04 November 2002**

Solar activity is expected to be low to moderate during the forecast period. Moderate activity is possible early in the period due to Region 139 and the return of old Region 119 (S14, L=228). Moderate activity is possible late in the period with the Return of Region 134 and Region 137 on 19 October and 23 October, respectively.

There is a slight 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 10-12 October due to coronal hole effects.

The geomagnetic field is expected to be quiet to active levels. Coronal hole effects are expected on 09-10 October and weak coronal hole effects are possible on 03-04 nT from 02-06 October.



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
30 September	140	94	520	B9.0	14	1	0	15	2	0	0	0
01 October	140	105	650	B4.6	3	0	0	3	0	0	0	0
02 October	136	99	870	B5.4	8	0	0	5	0	0	0	0
03 October	146	81	720	B8.3	4	1	0	7	1	0	0	0
04 October	158	98	910	C1.1	12	6	0	16	3	0	0	0
05 October	155	155	1370	B9.8	9	2	0	11	1	0	0	0
06 October	162	126	1095	B9.2	4	2	0	2	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
	30 September	3.0E+5	1.0E+4	2.5E+3		8.5E+5
01 October	2.6E+5	1.0E+4	2.6E+3		8.7E+4	
02 October	1.4E+5	1.1E+4	2.6E+3		7.4E+5	
03 October	3.1E+5	1.1E+4	2.3E+3		8.5E+6	
04 October	7.0E+5	1.1E+4	2.4E+3		2.0E+7	
05 October	5.3E+5	1.1E+4	2.4E+3		5.1E+7	
06 October	2.6E+5	1.1E+4	2.5E+3		9.6E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	30 September	21	1-3-3-4-4-3-3-5	33	1-3-4-4-6-4-2-6	26
01 October	30	2-2-4-4-5-4-3-6	58	1-2-6-6-7-6-5-4	60	2-3-5-7-7-6-4-6
02 October	31	6-6-5-2-2-2-2-3	47	4-7-6-3-6-3-2-3	44	6-7-6-4-4-3-3-4
03 October	22	6-2-3-2-2-3-4-3	55	5-2-4-4-6-6-7-4	33	6-3-4-3-4-5-5-5
04 October	43	7-4-6-4-3-3-4-3	55	4-4-7-7-4-5-4-2	48	7-5-6-5-4-3-4-4
05 October	12	3-4-2-2-3-3-2-1	45	3-4-4-6-6-6-4-4	29	4-4-3-5-5-5-3-3
06 October	9	2-3-3-2-1-1-2-3	23	2-3-6-4-2-3-3-3	19	2-4-5-2-3-3-3-3

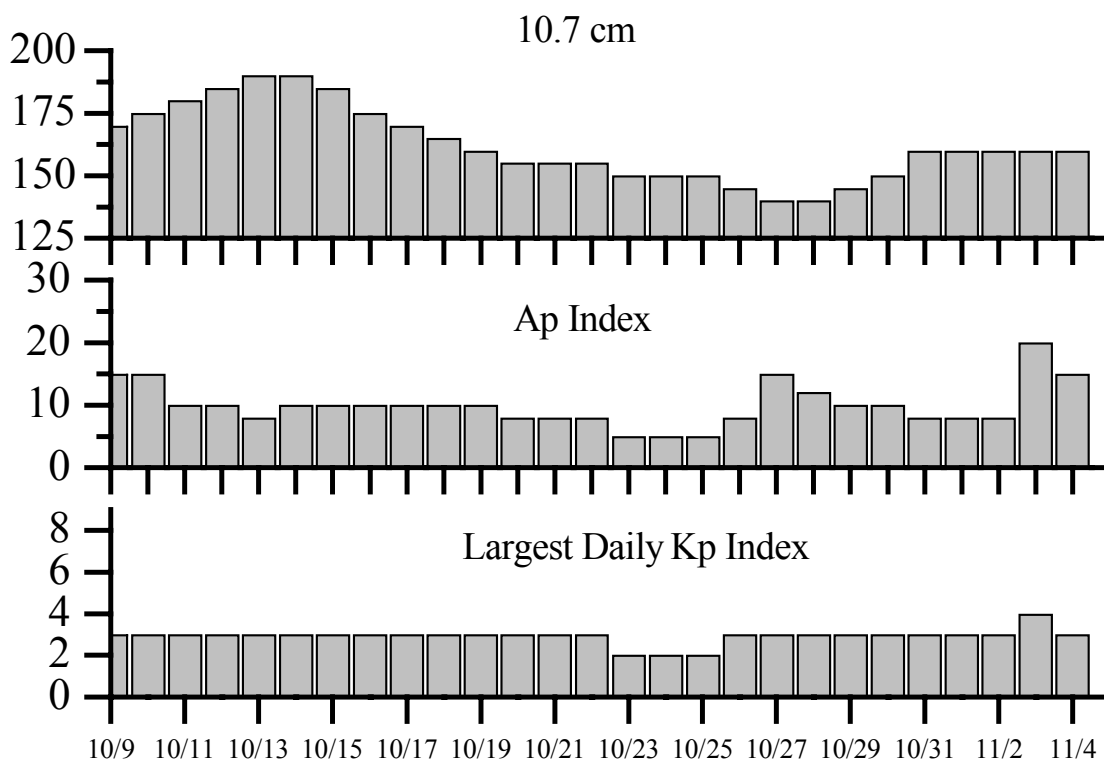


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
30 Sep 0018	2 -245 MHz Radio Bursts	29 Sep
30 Sep 0449	ALERT: Type II Radio Emission	30 Sep 0425
30 Sep 0717	ALERT: Type II Radio Emission	30 Sep 0706
30 Sep 0812	WARNING: Geomagnetic Sudden Impulse	30 Sep 0815 - 1000
30 Sep 0819	WARNING: Geomagnetic K= 4	30 Sep 0820 - 1500
30 Sep 0824	ALERT: Geomagnetic K= 4	30 Sep 0823
30 Sep 0848	SUMMARY: Geomagnetic Sudden Impulse	30 Sep 0822
30 Sep 0957	WARNING: Geomagnetic K= 5	30 Sep 1000 - 1500
30 Sep 1340	ALERT: Geomagnetic K= 5	30 Sep 1339
30 Sep 1445	EXTENDED WARNING: Geomagnetic K= 4	30 Sep 0820 - 01 Oct 0300
30 Sep 1949	SUMMARY: Geomagnetic Sudden Impulse	30 Sep 1928
30 Sep 2211	WARNING: Geomagnetic K= 5	30 Sep 2215 - 01 Oct 1500
01 Oct 0011	10 - 245 MHz Radio Bursts	30 Sep
01 Oct 0011	245 MHz Noise Storm	30 Sep
01 Oct 1007	ALERT: Geomagnetic K= 5	01 Oct 1007
01 Oct 1153	ALERT: Geomagnetic K= 6	01 Oct 1153
01 Oct 1334	ALERT: Geomagnetic K= 6	01 Oct 1333
01 Oct 1432	EXTENDED WARNING: Geomagnetic K= 5	30 Sep 2215 - 01 Oct 2359
01 Oct 2343	EXTENDED WARNING: Geomagnetic K= 5	30 Sep 2359 - 02 Oct 1500
02 Oct 0015	7 - 245 MHz Radio Bursts	01 Oct
02 Oct 0015	245 MHz Noise Storm	01 Oct
02 Oct 0053	ALERT: Geomagnetic K= 6	02 Oct 0053
02 Oct 0358	WARNING: Geomagnetic K= 6	02 Oct 0359 - 1500
02 Oct 2300	WARNING: Geomagnetic K= 4	02 Oct 2302 - 03/1500
02 Oct 2355	ALERT: Geomagnetic K= 4	02 Oct 2355
03 Oct 0011	4 - 245 MHz Radio Bursts	02 Oct
03 Oct 0107	ALERT: Geomagnetic K= 5	03 Oct 0107
03 Oct 0110	WARNING: Geomagnetic K= 5	03 Oct 0112 -1500
03 Oct 0113	ALERT: Geomagnetic K= 6	03 Oct 0113
03 Oct 1459	EXTENDED WARNING: Geomagnetic K= 4	02 Oct 2302 - 03/2359
03 Oct 2344	EXTENDED WARNING: Geomagnetic K= 4	02 Oct 2302 - 04/1500
04 Oct 0156	WARNING: Geomagnetic K= 5	04 Oct 0156 - 1500
04 Oct 0157	ALERT: Geomagnetic K= 5	04 Oct 0155
04 Oct 0205	WARNING: Geomagnetic K= 6	04 Oct 0205 - 1500
04 Oct 0207	ALERT: Geomagnetic K= 6	04 Oct 0204
04 Oct 0209	ALERT: Geomagnetic K= 7	04 Oct 0207
04 Oct 1329	ALERT: Type II Radio Emission	04 Oct 1257
04 Oct 1449	EXTENDED WARNING: Geomagnetic K= 4	02 Oct 2302 - 04/2359
04 Oct 2308	ALERT: Type II Radio Emission	04 Oct 2244
04 Oct 2334	EXTENDED WARNING: Geomagnetic K= 4	02 Oct 2302 - 05/1500
05 Oct 0027	3 - 245 MHz Radio Bursts	04 Oct
05 Oct 1454	EXTENDED WARNING: Geomagnetic K= 4	02 Oct 2302 - 05/2359
05 Oct 1654	ALERT: Electron 2MeV Flux exceeded 1000pfu	05 Oct 1635
05 Oct 2058	ALERT: X-Ray Flux exceeded M5	05 Oct 2057
05 Oct 2119	SUMMARY: X-ray Event exceeded M5	05 Oct 2100
05 Oct 2135	ALERT: Type II Radio Emission	05 Oct 2059
05 Oct 2312	WATCH: Geomagnetic A = 20	06 Oct
05 Oct 2313	WATCH: Geomagnetic A = 20	07 Oct
05 Oct 2314	WATCH: Geomagnetic A = 20	08 Oct
05 Oct 2334	EXTENDED WARNING: Geomagnetic K= 4	02 Oct 2302 - 06/1500
06 Oct 0020	4 - 245 MHz Radio Bursts	05 Oct
06 Oct 0523	ALERT: Electron 2MeV Flux exceeded 1000pfu	06 Oct 0505
06 Oct 0757	ALERT: Geomagnetic K= 5	06 Oct 0753



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
09 Oct	170	15	3	23 Oct	150	5	2
10	175	15	3	24	150	5	2
11	180	10	3	25	150	5	2
12	185	10	3	26	145	8	3
13	190	8	3	27	140	15	3
14	190	10	3	28	140	12	3
15	185	10	3	29	145	10	3
16	175	10	3	30	150	10	3
17	170	10	3	31	160	8	3
18	165	10	3	01 Nov	160	8	3
19	160	10	3	02	160	8	3
20	155	8	3	03	160	20	4
21	155	8	3	04	160	15	3
22	155	8	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	$\frac{1}{2}$	Class	Integ Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		
			Max				Lat	CMD		245	2695	Intensity
											II	IV
30 Sep	0142	0150	0154	M2.1	.007	1b	N13E10		134			
03 Oct	0215	0221	0226	M2.1	.007	1n	S19E06		137			
04 Oct	0039	0043	0053	M1.0	.006	Sf	S19W07		137			
04 Oct	0534	0538	0541	M4.0	.011	1n	S19W09		137	90		
04 Oct	1054	1105	1109	M3.5	.012	1n	S20W10		137			
04 Oct	1243	1255	1307	M1.2	.013	1f	N08E49		139	52	38	1
04 Oct	1704	1711	1715	M1.2	.005	Sf	S21W16		137			
04 Oct	2232	2243	2251	M2.7	.016	Sf	N13E43		139	5300	140	2
05 Oct	1039	1046	1048	M1.2	.003					95		
05 Oct	2042	2100	2108	M5.9	.043	1f	N14E31		139	140	100	1
06 Oct	0446	0451	0453	M2.4	.005	1n	N12E31		139			
06 Oct	1149	1155	1158	M1.0	.003	Sf	N07E30		139			

Flare List

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
30 September	B0005	U0011	0026		Sf	S20E46	137	
	B0011	U0040	0103		Sf	N13E09	134	
		0031	0037	0043		Sf	S18E50	137
		0144	0149	0223	M2.1	1b	N13E10	134
		0303	0307	0310		Sf	S20E44	137
		0310	0313	0315	C1.6	Sf	N12E05	134
		0319	0323	0325		Sf	N13E10	134
		0415	0425	0428	C2.1	Sf	N11E10	134
		0530	0532	0537	C5.3	1f	N13E07	134
		0543	0545	0548	C5.1	Sf	N12E03	134
		0637	0641	0652	C3.2	Sf	N12E08	134
		0658	0701	0703	C2.6			
		0745	0747	0749		Sf	N12E07	134
		0804	0807	0818	C2.1	Sf	N12E07	134
		0836	0844	0853	C1.7			
		0918	0919	0927	C2.2	Sf	N12E07	134
		1036	1040	1042	C1.3			
		1056	1103	1111	C2.0			
	01 October	B1129	U1129	1134		Sf	N14E03	134
			1140	1142	1147	C2.2	Sf	N13W02
		1659	1720	1738	C2.3	Sf	N14E00	134
		1854	1901	1907	C2.2			134
		0501	0505	0515	C1.4	Sf	S20E29	137
		0523	0527	0531	C1.0			137
		0857	0857	0910		Sf	S18E32	137
		B1413	U1413	1448		Sf	S30W03	137
		1532	1539	1546	C1.3			
		1811	1815	1837	B9.6			



Flare List- continued.

Date	Optical Time			X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn	
	Begin	Max	End					
02 October	0656	0656	0701	B9.2	Sf	S18E20	0137	
	0723	0725	0727	B6.2			0137	
	0730	0734	0736		Sf	S18E20	0137	
	B1209	1217	1237	C1.6	Sf	S18E17	0134	
	B1538	U1632	A1643	C1.1	Sf	S15E17	0137	
	1815	1821	1827	C1.5			0137	
	1834	1839	1845	C2.0			0137	
	1912	1915	1938	C4.2	Sf	S19E14	0137	
	2112	2118	2124	C2.0			0137	
	2141	2146	2214	C1.6			0137	
	2227	2241	2254	C5.5			0137	
	03 October	0111	0111	0115		Sf	S19E07	0137
		0119	0120	0123		Sf	N29W79	0129
0130		0131	0133		Sf	N29W80	0129	
0138		0144	0158		Sf	S19E07	0137	
0159		0221	0301	M2.1	ln	S19E06	0137	
0331		0335	0338	C1.4				
1007		1014	1035	C1.4				
B1213		U1213	A1358		Sf	S17E06	0137	
B1238		U1243	1340	C2.5	Sf	N09W33	0134	
04 October	1530	0000	1540	C3.6	Sb	S16E90		
	0041	0045	0107	M1.0	Sf	S19W07	0137	
	0139	0139	0142		Sf	N08E63	0139	
	0151	0155	0157	C7.0				
	0420	0425	0446	C4.1	Sf	S20W09	0137	
	0421	0430	0501		Sf	N10E55	0139	
	0457	0501	0503	C5.3				
	B0536	U0537	0606	M4.0	ln	S19W09	0137	
	0845	0847	0855	C2.0	Sf	N09E54	0139	
	B0910	0911	0915	C8.0	Sf	S19W13	0137	
	1026	1031	1045	C6.2	Sf	N07E50	0139	
	B1037	U1112	1140	M3.5	ln	S20W10	0137	
	1200	1203	1207	C3.2				
	1216	1221	1224		Sf	N09E55	0139	
	1245	1250	1313	M1.2	lf	N08E49	0139	
	1307	1310	1314		Sf	S18W16	0137	
	B1338	U1340	A1348		Sf	N16E52	0139	
	1552	1554	1613	C9.0	Sf	S19W13	0137	
1708	1709	1726	M1.2	Sf	S21W16	0137		
1911	1913	1922	C5.7	Sf	N14E47	0139		
2003	2005	2021	C4.8	Sf	N12E46	0139		
2052	2100	2104	C4.5					



Flare List- continued.

Date	Optical Time			X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
04 October	2235	2243	2308	M2.7	Sf	N13E43	0139
	2335	2335	2350	C6.2	Sf	S21W19	0137
05 October	0134	0136	0151		Sf	S16W24	0137
	0237	0237	0244	C2.8	Sf	S18W20	0137
	0249	0300	0328		Sf	N10E42	0139
	0354	0356	0400		Sf	N16W58	0134
	0519	0522	0528	C4.2			
	B0631	U0631	A0635		Sf	N12E44	0139
	B0725	U0727	A0731		Sf	N08E44	0139
	B0730	U0732	A0736	C3.4	Sf	S17W25	0137
	B0753	U0753	A0756	C2.0	Sf	N07E38	0139
	0853	0858	0904	C2.5			
	1039	1046	1048	M1.2			
	B1049	1106	1117		Sf	S21W25	0137
	1131	1132	1144	C1.3	Sf	S19W23	0137
	1149	1155	1202	C1.7			
	1722	1727	1734		Sf	N14E33	0139
	1916	1919	1922	B9.7			
2047	2105	2127	M5.9	1f	N14E31	0139	
2247	2252	2256	C6.2				
2331	2337	2342	C1.7				
06 October	0117	0122	0124	C2.6			
	0208	0212	0214	C1.8			
	0223	0226	0228	C1.1			
	0438	0510	0516		Sf	S20W37	0137
	0450	0452	0500	M2.4	1n	N12E31	0139
	1005	1010	1022	C2.2			
B1153	U1153	A1205	M1.0	Sf	N07E30	0139	



Region Summary

Location		Sunspot Characteristics					Flares																
Date	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	4								
<i>Region 125</i>																							
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									
30 Sep	S10W89	164	0040	01	Hsx	001	A																
								3	0	0	5	1	0	0	0	0							

Crossed West Limb.

Absolute heliographic longitude: 166

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																			
30 Sep	S22W68	144																			
01 Oct	S22W81	144																			
02 Oct	S22W94	144																			
								1	2	0	4	0	0	0	0	0					

Crossed West Limb.

Absolute heliographic longitude: 144



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	4							
<i>Region 128</i>																						
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																				
30 Sep	N10W68	145																				
01 Oct	N10W81	145																				
02 Oct	N10W94	145																				

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 145

<i>Region 129</i>																						
22 Sep	N25E54	126	0010	01	Axx	001	A															
23 Sep	N26E41	126	0010	01	Axx	001	A															
24 Sep	N26E26	128	0020	05	Dso	008	B															
25 Sep	N26E12	129	0030	06	Dso	008	B															
26 Sep	N27W01	129	0030	06	Dao	009	B						1									
27 Sep	N27W13	128	0010	05	Bxo	011	B															
28 Sep	N28W25	126	0020	03	Cso	004	B															
29 Sep	N26W39	127	0020	01	Axx	002	A															
30 Sep	N28W53	128	0020	02	Bxo	002	B															
01 Oct	N28W66	128																				
02 Oct	N28W79	128																				

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 129



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	4	
<i>Region 130</i>																
22 Sep	N06E52	128	0020	01	Axx	003	A									
23 Sep	N06E37	130	0020	02	Hsx	002	A									
24 Sep	N06E25	129	0040	06	Cso	011	B									
25 Sep	N06E10	131	0120	06	Dao	010	B									
26 Sep	N06W04	132	0240	07	Dao	008	B	1				1				
27 Sep	N06W17	132	0150	07	Dao	009	B									
28 Sep	N05W32	133	0140	06	Dso	003	B									
29 Sep	N05W44	132	0130	06	Dso	005	B									
30 Sep	N04W59	134	0100	03	Hsx	002	A									
01 Oct	N03W73	135	0080	02	Dso	003	B									
02 Oct	N04W87	136	0070	02	Hsx	001	A									
								1	0	0	1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 132

Region 131

22 Sep	S07E35	145	0030	03	Cao	002	B									
23 Sep	S06E21	146	0010	02	Axx	002	A									
24 Sep	S06E07	147	0010	05	Bxo	003	B									
25 Sep	S06W09	150	0010	04	Bxo	004	B									
26 Sep	S06W22	150														
27 Sep	S06W35	150	0000	01	Bxo	002	B									
28 Sep	S06W48	150														
29 Sep	S06W61	150														
30 Sep	S06W74	150														
01 Oct	S06W87	150														
								0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 147



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares											
	(° 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			
<i>Region 133</i>																		
23 Sep	S25E20	147	0070	06	Dao	007	B											
24 Sep	S25E05	149	0050	08	Dao	007	B											
25 Sep	S26W07	148	0050	09	Dao	008	B											
26 Sep	S26W20	148	0030	09	Cao	006	B											
27 Sep	S27W29	144	0000	00	Axx	001	A											
28 Sep	S27W42	144																
29 Sep	S27W55	144																
30 Sep	S27W68	144																
01 Oct	S27W81	144																
02 Oct	S27W94	144																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 149

<i>Region 134</i>																		
24 Sep	N11E79	075	0050	05	Cao	003	B											
25 Sep	N10E64	077	0150	10	Dao	007	B					7						
26 Sep	N11E50	078	0210	12	Eao	009	B					1						
27 Sep	N11E38	077	0170	10	Dai	018	Bgd	3	2			5						
28 Sep	N11E25	076	0180	11	Eai	028	Bgd	6				3						
29 Sep	N12E11	077	0250	13	Eai	038	Bgd	3	1			1	1	1				
30 Sep	N13W02	077	0270	10	Dai	023	Bgd	10	1			12	2					
01 Oct	N12W15	077	0350	11	Eai	024	Bgd											
02 Oct	N13W29	078	0350	10	Dki	013	Bg	1				1						
03 Oct	N14W42	077	0230	10	Dai	014	Bg	1				1						
04 Oct	N14W56	078	0180	09	Dai	009	Bg											
05 Oct	N13W70	078	0180	09	Dao	008	B					1						
06 Oct	N12W85	080	0090	10	Dso	003	B											

24 4 0 32 3 1 0 0

Still on Disk.

Absolute heliographic longitude: 77



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 135

27 Sep	S26E06	109	0040	03	Dso	004	B											
28 Sep	S25W08	109	0040	04	Dao	006	B											
29 Sep	S25W21	109	0020	05	Cro	004	B											
30 Sep	S23W36	111	0020	03	Bxo	002	B											
01 Oct	S23W49	111																
02 Oct	S23W62	111																
03 Oct	S23W75	111																
04 Oct	S23W88	111																
								0	0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 109

Region 136

29 Sep	S27W36	124	0020	03	Cso	002	B											
30 Sep	S27W49	124																
01 Oct	S31W61	123	0010	03	Bxo	003	B											
02 Oct	S31W74	123																
03 Oct	S31W87	123																
								0	0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 124

Region 137

29 Sep	S16E50	038	0040	08	Cso	003	B											
30 Sep	S17E36	039	0070	07	Cso	004	B						3					
01 Oct	S18E21	041	0170	09	Dai	017	Bg	1					3					
02 Oct	S18E08	041	0310	10	Dki	029	Bg	7					4					
03 Oct	S19W05	040	0310	11	Eki	019	Bg		1				3	1				
04 Oct	S19W20	042	0220	11	Esi	017	Bg	4	4				7	2				
05 Oct	S19W33	041	0230	11	Eai	022	Bg	3					5					
06 Oct	S19W48	043	0215	11	Eai	017	Bg						1					
								15	5	0	26	3	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 40



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares							
	(° 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 138

01 Oct	N09W11	073	0040	05	Cao	008	B								
02 Oct	N10W25	074	0020	02	Hsx	002	A								
03 Oct	N10W37	072	0020	02	Hsx	003	A								
04 Oct	N10W51	073	0010	03	Bxo	003	B								
05 Oct	N15W68	076	0020	02	Hsx	003	A								
06 Oct	N15W81	076													

Still on Disk.

Absolute heliographic longitude: 073

Region 139

02 Oct	N14E72	337	0120	06	Dso	004	B								
03 Oct	N14E59	336	0160	05	Cso	005	B								
04 Oct	N14E47	335	0410	10	Dki	018	Bgd	4	2	9	1				
05 Oct	N12E32	336	0680	10	Dkc	044	Bg	1	1	5	1				
06 Oct	N11E19	336	0570	11	Eki	032	Bg		2	1	1				
								5	5	0	15	3	0	0	0

Still on Disk.

Absolute heliographic longitude: 336

Region 140

04 Oct	S07E76	306	0090	02	Hax	001	A								
05 Oct	S07E62	306	0230	09	Cao	005	B								
06 Oct	S07E50	305	0160	11	Cao	006	B								

Still on Disk.

Absolute heliographic longitude: 305

Region 141

05 Oct	S07E20	348	0020	03	Bxo	002	B								
06 Oct	S07E05	350	0040	04	Dso	007	B								

Still on Disk.

Absolute heliographic longitude: 350

Region 142

05 Oct	N07E64	304	0010	01	Axx	001	A								
06 Oct	N06E50	305	0020	01	Hsx	001	A								

Still on Disk.

Absolute heliographic longitude: 305

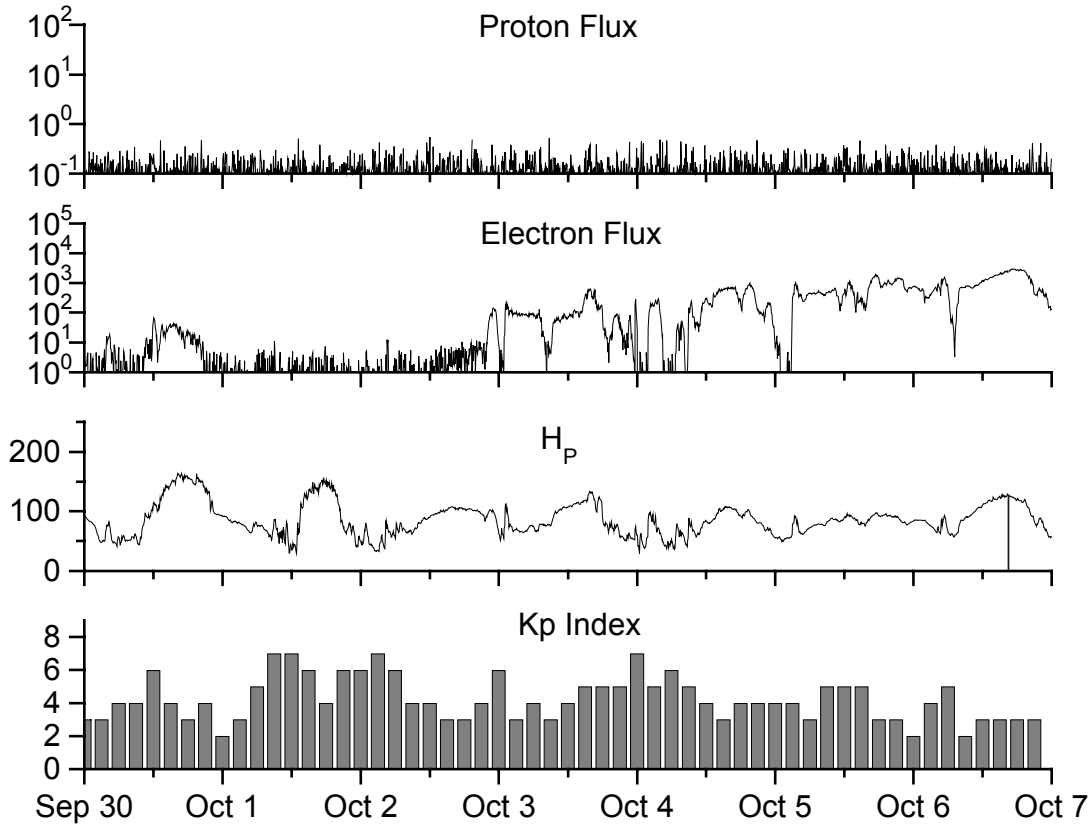


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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 30 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.

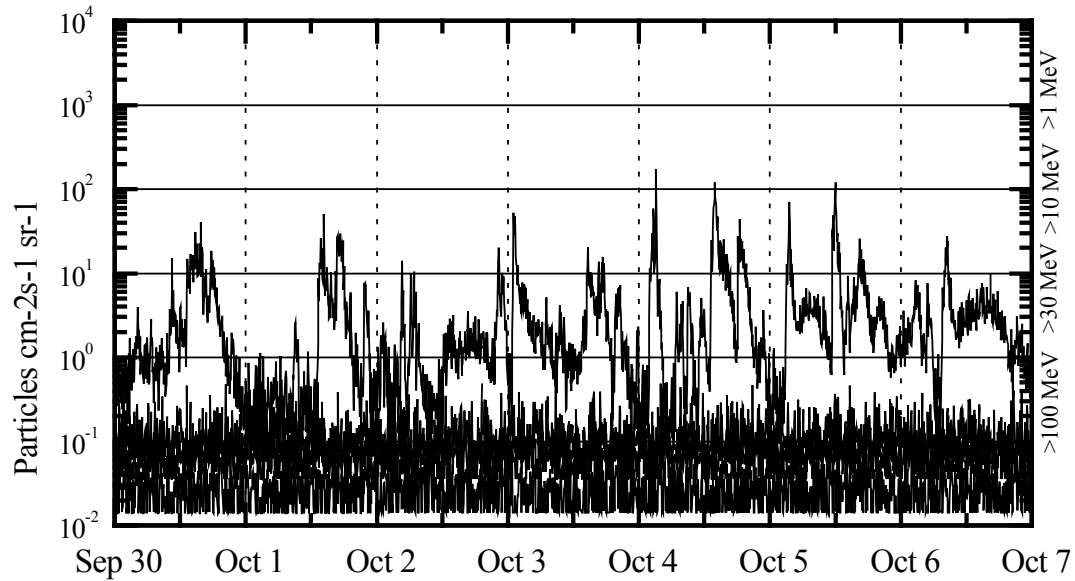
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

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.

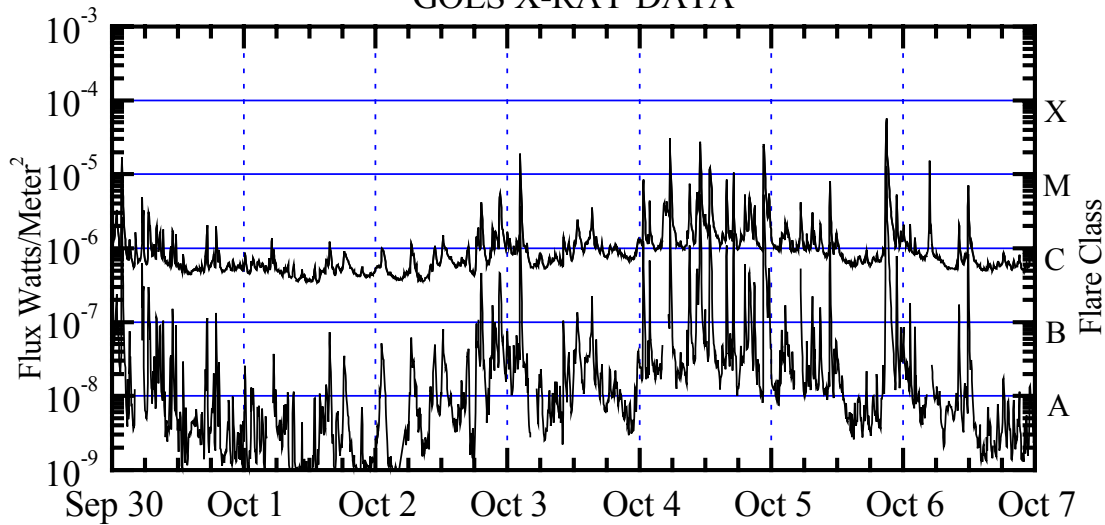
K_p plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data 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_p is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



GOES PROTON FLUX



GOES X-RAY DATA



Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five-minute averaged x-ray flux (watts/m^2) 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 ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-8 (W75) for each of the energy thresholds: >1 , >10 , >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.



Optical Flares



Space Environment Center



September 2002
(Month 72)

Preliminary data

Comparison of Cycles at current month in cycle

