

Space Weather Highlights 20 - 26 October 2003

**SWO PRF 1469
28 October 2003**

Solar activity ranged from moderate to high levels. Moderate levels were observed on the 20th and 21st due to low M-class activity in Region 484 (N04, L=354, class/area Ekc/1750 on 23 October). On 22 October, Region 486 (S15, L=282, class/area Fkc/2200 on 25 October) rotated onto the visible disk producing several M-class flares including an M9 at 2007 UTC. An Earth directed CME was also observed on the 22nd originating in Region 484. High levels were observed on the 23rd with Region 486 producing two major flares – an X5/1b at 0835 UTC and an X1/1n flare at 2004 UTC. The X5 was the largest event of the period and had an associated Type II radio sweep (967 km/s) and a CME that was not Earth directed. Activity on 24 October was at high levels due to an M7/1n flare at 0254 UTC. Moderate level activity on 25 October included two long duration M1 flares - an M1/2n at 0446 UTC from Region 486 and an M1/Sf at 0553 UTC from Region 484. The latter event was associated with a Type II radio sweep. Activity on the 26th returned to high levels with two long duration X1 flares. The first event was an X1/3b from Region 486 that occurred at 0654 UTC and was associated with Type II (1302 km/s) and Type IV radio sweeps. The second event was an X1/1n from Region 484 that occurred at 1819 UTC with an associated Type II (950 km/s) and a partial halo CME off to the west.

At the Time of this report: Region 486 produced one of the largest flares of this solar cycle, an X17/4B proton flare peaking at 1110 UTC on 28 October. A very fast (near 2000 km/s), earthward directed halo CME was associated with this flare as well as a Type II (1250 km/s) and Type IV radio sweep. Region 486, with over 2100 millionths of white light areal coverage, is now one of the largest and most complex active regions of solar cycle 23. The X17 flare produced proton events at greater than 10 and greater than 100 MeV which remain in progress at this time. The greater than 100 MeV event began at 1145 UTC with a maximum so far of 176 pfu. The greater than 10 MeV proton event began at 1215 UTC with a maximum so far of 6020 pfu.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Early in the period solar wind speed was elevated near 750 km/s due to a coronal hole high speed stream. By 22 October wind speed was in decline and decreased to 400 km/s by early on 24 October. An interplanetary shock from the X5 flare on the 23rd was observed at ACE at 1450 UTC on 24 October with a 200 km/s jump in solar wind speed and total IMF measurement near 30 nT. Bz during and after this interplanetary shock remained mostly northward.

There was one greater than 10 MeV proton event at geosynchronous orbit during the period. The proton event began at 1825 UTC on 26 October, reached a peak value of 466 pfu at 2335 UTC and ended at 1910 UTC on 27 October.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 20 – 24 October.

Geomagnetic activity ranged from quiet to severe storm levels. Activity on 20 – 22 October reached minor storm levels with one period of isolated major storm levels on 22 October. This activity was due to coronal hole high speed stream effects. On 24 October, with the arrival of the interplanetary shock mentioned above activity reached severe storm levels for a brief period following a sudden impulse on the Boulder magnetometer at 1530 UTC. By 25 October activity was at quiet to active levels. The period ended on 26 October with quiet to unsettled levels.

Space Weather Outlook 29 October - 24 November 2003

Solar activity is expected to range from low to high levels. Regions 486 and 488 have the potential for M and X-class activity during the first week of the period. After these regions rotate beyond the west limb on 04 – 05 November, activity is expected to be low

Currently a greater than 10 MeV proton event is in progress and is expected to continue through the first three days of the period. Additional proton producing flares are likely while Regions 486 and 488 remain on the visible disk.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 12 – 19 November due to a large returning coronal hole.

The geomagnetic field is expected to range from quiet to severe storm levels during the period. The CME from the X17 flare is due to arrive late on day one or early on day two of the period. Severe geomagnetic activity is expected from the CME. A large coronal hole is due to return on 09 – 18 November and is expected to produce major storm levels.



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
20 October	135	113	1500	B6.5	8	1	0	7	0	0	0	0
21 October	152	144	1850	C1.4	5	2	0	8	0	0	0	0
22 October	154	117	1950	C4.9	0	7	0	18	0	0	0	0
23 October	183	122	2930	C3.0	0	3	2	7	3	0	0	0
24 October	191	160	3000	C1.6	7	4	0	9	3	0	0	0
25 October	222	139	4060	C1.6	11	3	0	8	1	1	0	0
26 October	298	191	3770	C2.2	1	2	2	7	1	1	1	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
	20 October	1.9E+6	1.2E+4	2.7E+3		2.3E+8
21 October	5.0E+6	1.3E+4	2.7E+3		1.4E+8	
22 October	6.3E+6	2.2E+4	2.1E+3		1.9E+8	
23 October	7.5E+6	6.4E+4	2.1E+3		1.2E+8	
24 October	1.1E+8	6.5E+4	2.1E+3		1.4E+8	
25 October	4.9E+6	1.9E+4	1.9E+3		5.3E+6	
26 October	1.7E+7	4.7E+6	8.8E+3		1.1E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 October	20	3-2-3-3-4-3-3-5	51	3-3-6-6-6-6-4-4	30
21 October	28	4-3-4-5-4-3-3-5	70	5-4-5-6-7-7-4-5	39	5-5-5-5-5-4-4-5
22 October	20	5-4-4-2-3-3-3-1	50	4-4-7-6-4-6-3-1	33	4-5-6-5-4-4-3-2
23 October	5	3-2-1-1-2-1-1-0	*	*-*-*-*-*-*-*	7	3-2-2-2-2-2-2-2
24 October	28	0-1-3-2-3-6-4-6	70	0-0-2-6-7-8-5-5	34	2-2-2-4-5-7-4-5
25 October	10	3-2-2-1-4-3-2-1	22	3-2-2-3-6-5-1-2	14	3-3-2-2-4-4-3-3
26 October	5	1-2-1-2-1-1-2-2	5	1-1-1-1-0-1-2-3	10	2-2-2-3-2-3-3-3



Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
20 Oct 0010	2 - 245 MHz Radio Bursts	19 Oct
20 Oct 0010	1 - 245 MHz Radio Noise Storm	19 Oct
20 Oct 0051	WARNING: Geomagnetic K = 5	20 Oct 0055 - 1500
20 Oct 0517	ALERT: Electron 2MeV Integral Flux > 1000pfu	20 Oct 0520
20 Oct 0528	ALERT: Geomagnetic K = 4	20 Oct 0527
20 Oct 1456	EXTENDED WARNING: Geomagnetic K = 5	20 Oct 0055 -
20 Oct 2318	EXTENDED WARNING: Geomagnetic K = 5	20 Oct 0055 -21 Oct 1500
20 Oct 2323	ALERT: Geomagnetic K = 5	20 Oct 2320
20 Oct 2356	WARNING: Geomagnetic K = 6	20 Oct 2357 - 21 Oct 1500
21 Oct 0012	1 - 245 MHz Radio Burst	20 Oct
21 Oct 0012	1 - 245 MHz Radio Noise Storm	20 Oct
21 Oct 0402	SUMMARY: 10cm Radio Burst	21 Oct 0344
21 Oct 0451	ALERT: Type II Radio Emission	21 Oct 0347
21 Oct 0516	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	21 Oct 0500
21 Oct 1453	EXTENDED WARNING: Geomagnetic K= 6	20 Oct 2357 -21 Oct 2359
21 Oct 2046	WATCH: Geomagnetic A \geq 20	22 Oct
21 Oct 2047	WATCH: Geomagnetic A \geq 20	23 Oct
21 Oct 2050	WATCH: Geomagnetic A \geq 20	24 Oct
21 Oct 2119	SUMMARY: 10cm Radio Burst	21 Oct 2034
21 Oct 2356	EXTENDED WARNING: Geomagnetic K= 6	20 Oct 2357 -22 Oct 1500
22 Oct 0018	5 - 245 MHz Radio Bursts	21 Oct
22 Oct 0018	1 - 245 MHz Radio Noise Storm	21 Oct
22 Oct 0347	SUMMARY: 10cm Radio Burst	22 Oct 0327
22 Oct 0451	SUMMARY: 10cm Radio Burst	22 Oct 0427
22 Oct 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	22 Oct 0500
22 Oct 1010	ALERT: Type II Radio Emission	22 Oct 0938
22 Oct 1452	WARNING: Geomagnetic K = 5	22 Oct 1452 - 2359
22 Oct 1959	ALERT: X-Ray Flux exceeded M5	22 Oct 1958
22 Oct 2025	SUMMARY: 10cm Radio Burst	22 Oct 1951
22 Oct 2038	SUMMARY: X-ray Event exceeded M5	22 Oct 2007
22 Oct 2123	WATCH: Geomagnetic A \geq 30	24 Oct
22 Oct 2356	WARNING: Geomagnetic K = 4	22 Oct 2358 -23 Oct 1500
23 Oct 0825	ALERT: X-Ray Flux exceeded M5	23 Oct 0825
23 Oct 0900	SUMMARY: X-ray Event exceeded X1	23 Oct 0835
23 Oct 0923	ALERT: Type II Radio Emission	23 Oct 0827
23 Oct 1030	SUMMARY: 10cm Radio Burst	23 Oct 0823
23 Oct 1111	ALERT: Electron 2MeV Integral Flux > 1000pfu	23 Oct 1050
23 Oct 1958	ALERT: X-Ray Flux exceeded M5	23 Oct 1957
23 Oct 2048	SUMMARY: X-ray Event > X1	23 Oct 2004
24 Oct 0241	ALERT: X-Ray Flux exceeded M5	24 Oct 0239
24 Oct 0316	SUMMARY: X-ray Event > M5	24 Oct 0253
24 Oct 0334	SUMMARY: 10cm Radio Burst	24 Oct 0230
24 Oct 0343	ALERT: Type IV Radio Emission	24 Oct 0230
24 Oct 0552	ALERT: Electron 2MeV Integral Flux > 1000pfu	24 Oct 0500
24 Oct 1354	WARNING: Geomagnetic K = 5	24 Oct 1354 -25 Oct 1500
24 Oct 1402	ALERT: Geomagnetic K = 5	24 Oct 1358
24 Oct 1507	WARNING: Geomagnetic K = 6	24 Oct 1600 - 2359
24 Oct 1510	WARNING: Geomagnetic Sudden Impulse expected	24 Oct 1525 - 1535
24 Oct 1533	SUMMARY: Geomagnetic Sudden Impulse	24 Oct 1529
24 Oct 1535	ALERT: Geomagnetic K = 6	24 Oct 1532
24 Oct 1608	WARNING: Geomagnetic K \geq 7	24 Oct 1615 - 2359
24 Oct 1655	ALERT: Geomagnetic K = 7	24 Oct 1652
25 Oct 0004	WARNING: Geomagnetic K = 6	25 Oct 0006 - 1500
25 Oct 0257	7 - 245 MHz Radio Bursts	24 Oct

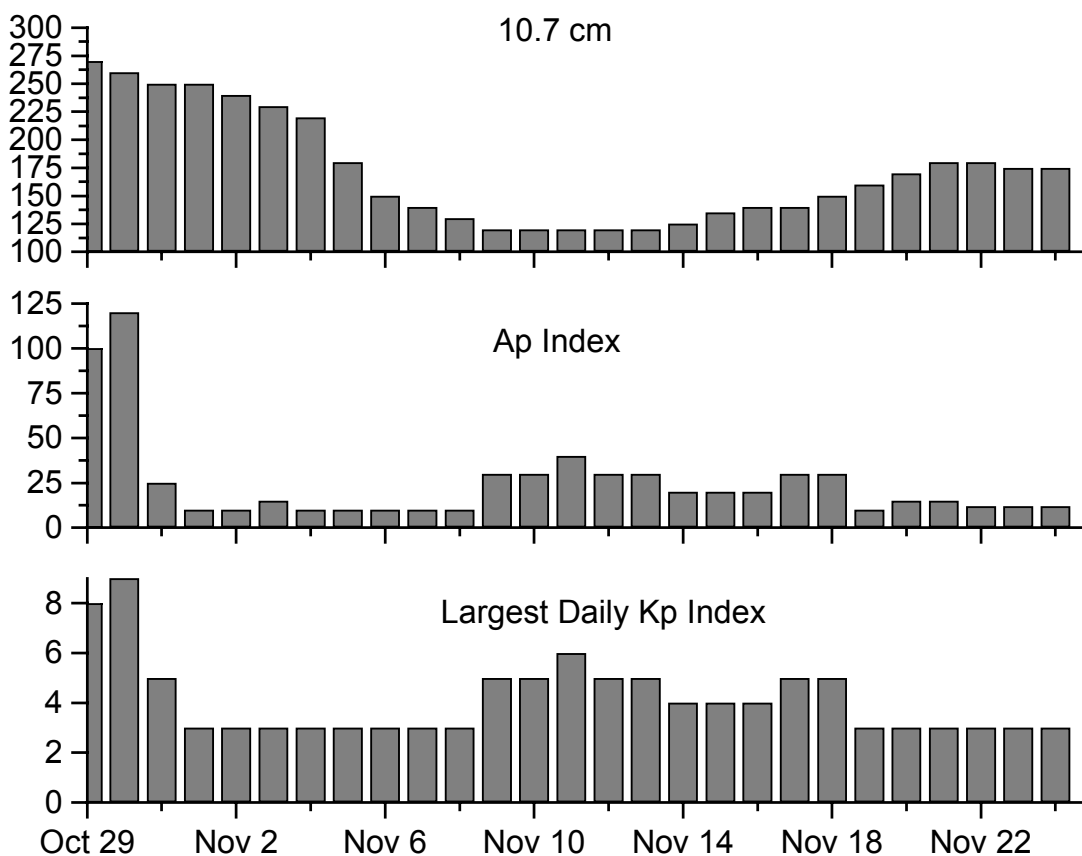


Alerts and Warnings Issued - continued.

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
25 Oct 0257	1 - 245 MHz Radio Noise Storm	24 Oct
25 Oct 0628	ALERT: Type II Radio Emission	25 Oct 0552
25 Oct 1357	WATCH: Geomagnetic A \geq 30	26 Oct
25 Oct 1358	WATCH: Geomagnetic A \geq 20	27 Oct
25 Oct 1450	WARNING: Geomagnetic K = 4	25 Oct 1450 - 2359
25 Oct 2354	EXTENDED WARNING: Geomagnetic K = 4	25 Oct 1450 - 26 Oct 1500
26 Oct 0615	ALERT: X-Ray Flux exceeded M5	26 Oct 0614
26 Oct 0711	ALERT: Type II Radio Emission	26 Oct 0617
26 Oct 0714	ALERT: Type IV Radio Emission	26 Oct 0632
26 Oct 0740	SUMMARY: X-ray Event exceeded X1	26 Oct 0654
26 Oct 0928	SUMMARY: 10cm Radio Burst	26 Oct 0610
26 Oct 1741	ALERT: X-Ray Flux exceeded M5	26 Oct 1741
26 Oct 1805	ALERT: Type II Radio Emission	26 Oct 1735
26 Oct 1811	WARNING: Proton 10MeV Integral Flux > 10pfu	26 Oct 1811 - 2100
26 Oct 1815	WARNING: Proton 100MeV Integral Flux > 1pfu expected	26 Oct 1815 - 2100
26 Oct 1831	ALERT: Proton Event 10MeV Integral Flux exceeded 10pfu	26 Oct 1825
26 Oct 1916	SUMMARY: 10cm Radio Burst	26 Oct 1717
26 Oct 1927	ALERT: Proton Event 10MeV Integral Flux > 100pfu	26 Oct 1910
26 Oct 1954	WARNING: Geomagnetic K = 4	26 Oct 1954 - 2359
26 Oct 2013	SUMMARY: X-ray Event exceeded X1	26 Oct 1819
26 Oct 2051	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	26 Oct 1811 - 27 Oct 1500
26 Oct 2101	ALERT: Geomagnetic K=4	26 Oct 2025
26 Oct 2139	ALERT: X-Ray Flux exceeded M5	26 Oct 2138
26 Oct 2205	SUMMARY: X-ray Event exceeded M5	26 Oct 2140
26 Oct 2342	EXTENDED WARNING: Geomagnetic K = 4	26 Oct 1954 - 27 Oct 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
29 Oct	270	100	8	12 Nov	120	30	5
30	260	120	9	13	120	30	5
31	250	25	5	14	125	20	4
01 Nov	250	10	3	15	135	20	4
02	240	10	3	16	140	20	4
03	230	15	3	17	140	30	5
04	220	10	3	18	150	30	5
05	180	10	3	19	160	10	10
06	150	10	3	20	170	15	15
07	140	10	3	21	180	15	15
08	130	10	3	22	180	12	12
09	120	30	5	23	175	12	12
10	120	30	5	24	175	12	12
11	120	40	6				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
							Lat	CMD		245	2695	II	IV
20 Oct	0645	0722	0743	M1.9	.039				484				
21 Oct	0821	0827	0831	M1.0	.004	Sf	N03E34	484		35			
21 Oct	1922	2330	0305	M2.4	.270								
22 Oct	0328	0351	0521	M3.7	.190	Sf	N07E25	484		320			
22 Oct	0830	0844	0853	M1.7				486					
22 Oct	0937	0956	0959	M1.7	.019			486		1300	15		1
22 Oct	1506	1511	1513	M1.4	.004	Sn	N05E22	484		220			
22 Oct	1557	1601	1604	M1.2	.004	Sn	N03E17	484					
22 Oct	1947	2007	2028	M9.9	.160	Sf	S18E78	486		100	240		
22 Oct	2156	2204	2217	M2.1	.023			486					
23 Oct	0235	0241	0244	M2.4	.007	Sn	N03E15	484		1300	54		
23 Oct	0702	0708	0710	M3.2	.008	1n	N04E13	484		1800	150		
23 Oct	0819	0835	0849	X5.4	.600	1b	S21E88	486		10000	1500		3
23 Oct	1049	1053	1055	M2.7	.007			484		360	130		
23 Oct	1950	2004	2014	X1.1	.098	1n	S17E84	486		2500	77		
24 Oct	0227	0254	0314	M7.6	.160	1n	S19E72	486		6800	73		2
24 Oct	0504	0510	0516	M4.2	.019	1f	S24E74	486		91			
24 Oct	1842	1856	1905	M1.3	.014			486					
24 Oct	2135	2140	2145	M1.0	.004	1n	N05W09	484		1500			
25 Oct	0417	0446	0528	M1.2	.041	2n	S15E43	486		64			
25 Oct	0544	0553	0626	M1.7	.038	Sf	N00W15	484		1100	130		1
25 Oct	1026	1035	1045	M1.5	.012	Sf	N03W20	484		200	220		
26 Oct	0557	0654	0733	X1.2	.510	3b	S15E44	486		14000	4000		3 3
26 Oct	1415	1420	1424	M1.0	.004	Sf	N05W33	484					
26 Oct	1721	1819	1921	X1.2	.630	1n	N02W38	484		1100	2000		2
26 Oct	2134	2140	2148	M7.6	.043	2n	N01W38	484		57			

Flare List

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
20 October	0006	0024	0026	C5.1	Sf	N03E52	484	
	0057	0107	0144	C4.9	Sf	N03E51	484	
	0344	0347	0349	B8.6				
	0534	0541	0544	C1.8				
	0645	0722	0743	M1.9			484	
	1445	1449	1452	C3.3			484	
	1553	1555	1620	C3.2	Sf	N03E45	484	
	1649	1703	1727		Sf	N05E40	484	
	1822	1824	1829	C2.4	Sf	N07E41	484	
	1958	1959	2022	C5.9	Sf	N02E41	484	
	2030	2046	2053	C4.5	Sf	N07E41	484	
	2200	2200	2212		Sf	N03E42	484	
	21 October	0252	0252	0304	C2.5	Sf	N05E35	484
		0334	0343	0411		Sf	N06E37	484
0453		0459	0503	C6.0	Sf	N06E35	484	
0824		0825	0841	M1.0	Sf	N03E34	484	
1242		1245	1252	C3.4				



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
21 October	1511	1512	1525		Sf	N02E31	484
	1759	1800	1804	C2.5	Sf	N07E28	484
	1917	1920	1924	C3.3			
	1922	2330	0305	M2.4			
	2023	2024	2029		Sf	S09E16	483
22 October	2031	2037	2045		Sf	N07E27	484
	0133	0133	0135		Sf	N06E24	484
	0158	0201	0212		Sf	N04E26	484
	0213	0221	0231		Sf	N05E26	484
	0236	0238	0243		Sf	N04E28	484
	0333	0333	0338	M3.7	Sf	N07E25	484
	0414	0422	0437		Sf	N04E24	484
	0439	0526	0859		Sf	N05E20	484
	B0607	0612	0613		Sf	N06E22	
	0830	0844	0853	M1.7			486
	0937	0956	0959	M1.7			486
	1424	1427	1439		Sf	N03E18	484
	1507	1511	1518	M1.4	Sn	N05E22	484
	1559	1601	1610	M1.2	Sn	N03E17	484
	1701	1703	1716		Sf	N03E16	484
	1821	1822	1829		Sf	N07E16	484
	2013	2013	2017		Sf	N03E14	484
	2020	2028	2043	M9.9	Sf	S18E78	486
	2037	2038	2044		Sf	N03E14	484
	2156	2204	2217	M2.1			486
	2244	2245	2247		Sf	N03E13	484
2358	0000	0002		Sf	N03E12	484	
23 October	0116	0117	0132		Sf	N03E11	484
	B0117	0117	0124		Sf	N00E15	
	0236	0240	0250	M2.4	Sn	N03E15	484
	0630	0630	0633		Sf	N03E14	484
	0705	0707	0718	M3.2	ln	N04E13	484
	0824	0846	0921	X5.4	lb	S21E88	486
	1049	1053	1055	M2.7			484
	1422	1423	1437		Sf	N05E00	484
	1813	1813	1821		Sf	N01E05	484
	1955	1957	2028	X1.1	ln	S17E84	486
24 October	2307	2307	2314		Sf	N08E00	484
	0154	0159	0215		Sf	N01E00	484
	0222	0247	0328	M7.6	ln	S19E72	486
	0508	0510	0519	M4.2	lf	S24E74	486
	0556	0557	0558		Sf	N04E00	484
	0603	0607	0612	C7.5			



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
24 October	0621	0621	0629		Sf	S15E66	486	
	0635	0638	0642		Sf	S15E66	486	
	0747	0747	0804		Sf	N01W08	484	
	0826	0829	0836		Sf	N04W02	484	
	0839	0840	0843	C4.8	Sf	N03W07	484	
	0915	0918	0924	C4.6				
	0952	0959	1008	C5.7				
	1031	1035	1037	C9.1				
	1536	1712	1818	C8.9	Sf	S17E55	486	
	1842	1856	1905	M1.3			486	
	2024	2024	2031	C5.3	Sf	N04W08	484	
	2138	2139	2148	M1.0	1n	N05W09	484	
	25 October	0155	0157	0159		Sf	N04W11	484
		0202	0206	0214	C4.3			
0259		0300	0307	C2.6	Sf	N03W17	484	
0332		0352	0415	C3.9	Sf	N05W13	484	
0353		0356	0359	C3.4				
0415		0550	0709	M1.2	2n	S15E43	486	
0552		0601	0622	M1.7	Sf	N00W15	484	
0607		0616	0623		Sf	S10E48	486	
0711		0714	0719		Sf	S18E49	486	
0938		0949	0952	C3.4				
B1039		U1040	A1044	M1.5	Sf	N03W20	484	
1124		1128	1132	C3.4				
1438		1452	1504	C4.2				
1800		1804	1806	C2.4				
1834		1840	1851		Sf	S11E37	486	
1925		1933	1944	C3.2				
2033		2043	2051	C3.3				
26 October	B2228	2230	2237	C7.9	1n	S19E48		
	0045	0050	0057	C3.2				
	B0144	U0144	0150		Sf	S17E49	486	
	B0452	0456	0459		Sf	S16E50		
	B0617	0627	A0000	X1.2	3b	S15E44	486	
	1423	1424	1443	M1.0	Sf	N05W33	484	
	1618	1619	1628		Sf	S18E29	486	
	1721	1733	2016	X1.2	1n	N02W38	484	
	1725	1726	1732		Sf	S09W44	483	
	B2003	2031	2033		Sf	N04W40		
	B2055	2059	2102		Sf	N02W47		
	2126	2139	2226	M7.6	2n	N01W38	484	



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 479

10 Oct	N24E63	102	0020	01	Axx	001	A										
11 Oct	N23E52	100	0030	02	Hsx	001	A										
12 Oct	N23E40	099	0020	01	Hsx	001	A										
13 Oct	N23E26	099	0020	01	Hax	002	A										
14 Oct	N24E07	100	0010	02	Bxo	003	B										
15 Oct	N24W06	105															
16 Oct	N24W19	105															
17 Oct	N24W31	104	0010	02	Hax	002	A										
18 Oct	N25W44	103	0020	04	Cso	004	B										
19 Oct	N25W58	104	0010	01	Axx	001	A										
20 Oct	N25W72	105	0010	05	Bxo	002	B										
21 Oct	S25W85	105	0010	01	Axx	001	A										
22 Oct	S25W98	105															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 105

Region 481

17 Oct	S08W17	090	0030	04	Cao	005	B										
18 Oct	S08W32	091	0030	04	Cso	008	B										
19 Oct	S09W48	094	0010	02	Axx	003	A										
20 Oct	S09W63	096	0020	01	Axx	001	A										
21 Oct	S09W76	096															
22 Oct	S09W89	096															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 090

Region 482

17 Oct	N16E62	011	0060	05	Cso	004	B										
18 Oct	N17E50	009	0070	07	Cao	008	B										
19 Oct	N16E34	012	0050	03	Dao	005	B										
20 Oct	N15E20	013	0030	02	Hax	007	A										
21 Oct	N14E05	015	0020	03	Cro	002	B										
22 Oct	N14W08	015	0010	01	Hsx	001	A										
23 Oct	N15W21	015															
24 Oct	N17W31	011	0000	00	Axx	001	A										
25 Oct	N17W44	011															
26 Oct	N17W57	011															

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 015



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 483

18 Oct	S08E55	004	0010	00	Axx	001	A											
19 Oct	S09E40	006	0010	05	Bxo	002	B											
20 Oct	S11E27	006	0020	03	Dao	007	B											
21 Oct	S10E13	007	0070	04	Dac	015	B					1						
22 Oct	S10E00	007	0020	03	Bxo	005	B											
23 Oct	S10W13	006	0010	03	Bxo	003	B											
24 Oct	S10W25	005																
25 Oct	S10W38	005																
26 Oct	S10W51	005									1	1						
								0	0	1	2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 007

Region 484

18 Oct	N05E68	351	0240	04	Dac	020	B	9			8	2						
19 Oct	N06E53	353	1030	10	Dkc	028	Bgd	2	2	1	9	2						
20 Oct	N05E40	353	1420	11	Ekc	046	Bgd	7	1		7	1						
21 Oct	N04E26	354	1720	16	Dkc	069	Bgd	3	1		7							
22 Oct	N04E13	354	1750	11	Ekc	056	Bgd		2		16							
23 Oct	N04W00	354	1750	13	Ekc	053	Bgd		3		6	1						
24 Oct	N05W15	355	1460	12	Ekc	067	Bgd	2	1		6	1						
25 Oct	N04W28	355	1700	10	Dkc	052	Bgd	2	2		5							
26 Oct	N03W41	355	1350	11	Ekc	057	Bgd		2	1	1	1	1					
								25	14	2	65	8	1	0	0			

Still on Disk.

Absolute heliographic longitude: 354

Region 485

21 Oct	S06E47	333	0030	06	Dro	007	B											
22 Oct	S06E34	333	0020	05	Bxo	004	B											
23 Oct	S06E21	332	0010	02	Hrx	002	A											
24 Oct	S07E08	332	0000	02	Bxo	003	B											
25 Oct	S07W05	332																
26 Oct	S07W18	332																
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 332



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 486

22 Oct	S16E81	286	0150	05	Hkx	001	A	4	1								
23 Oct	S16E70	285	1160	14	Ekc	024	Bgd		2	2							
24 Oct	S16E57	283	1540	16	Fkc	049	Bgd	1	2	3	2						
25 Oct	S15E45	282	2200	18	Fkc	052	Bgd	1	3	1							
26 Oct	S15E31	283	2170	19	Fkc	094	Bgd		1	2			1				
								1	7	3	9	4	1	1	0		

Still on Disk.

Absolute heliographic longitude: 283

Region 487

25 Oct	N13E72	255	0160	07	Cso	005	B										
26 Oct	N14E60	254	0250	08	Dao	010	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 254

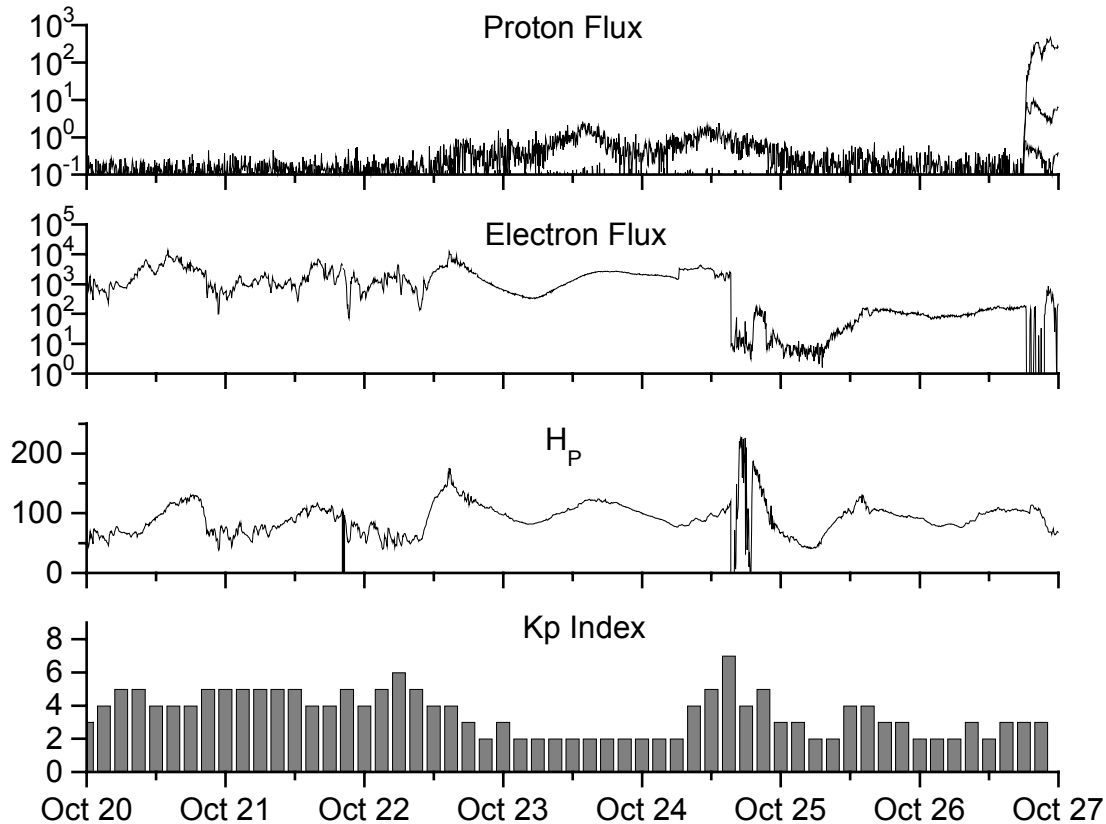


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2001									
October	197.3	125.5	0.64	179.5	114.0	208.1	191.9	20	12.0
November	178.6	106.5	0.60	183.7	115.5	212.7	193.7	16	12.0
December	217.5	132.2	0.61	184.5	114.6	235.6	193.9	09	12.2
2002									
January	189.0	114.1	0.60	184.8	113.5	227.3	194.6	08	12.3
February	194.5	107.4	0.55	188.6	114.7	205.0	197.2	10	12.8
March	153.1	98.4	0.64	188.9	113.3	180.3	195.7	10	12.9
April	194.9	120.7	0.62	186.2	110.5	189.8	191.5	15	13.2
May	204.1	120.8	0.59	183.6	108.9	178.4	188.0	15	13.3
June	146.0	88.3	0.60	179.9	106.3	148.7	183.0	11	13.5
July	183.5	99.6	0.54	175.4	102.7	173.5	176.3	11	13.7
August	191.0	116.4	0.61	169.2	98.7	183.9	169.5	16	14.2
September	206.4	109.6	0.53	163.4	94.6	175.8	164.1	14	15.0
October	153.9	97.5	0.63	158.8	90.5	167.0	159.4	23	15.6
November	159.8	95.5	0.60	150.9	85.2	168.7	154.8	16	16.3
December	147.9	80.8	0.55	144.6	82.1	158.6	150.9	13	17.0
2003									
January	149.3	79.7	0.53	141.7	81.0	144.0	149.2	13	18.2
February	87.0	46.0	0.53	136.4	78.5	124.5	144.7	17	18.9
March	119.7	61.1	0.51	128.1	74.2	132.2	139.5	21	19.4
April	119.7	60.0	0.50			126.3		20	
May	89.6	55.2	0.62			129.3		26	
June	118.4	77.4	0.65			129.4		24	
July	132.8	85.0	0.64			127.8		20	
August	114.3	72.7	0.64			122.1		23	
September	82.6	48.8	0.59			112.3		19	

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 20 October 2003

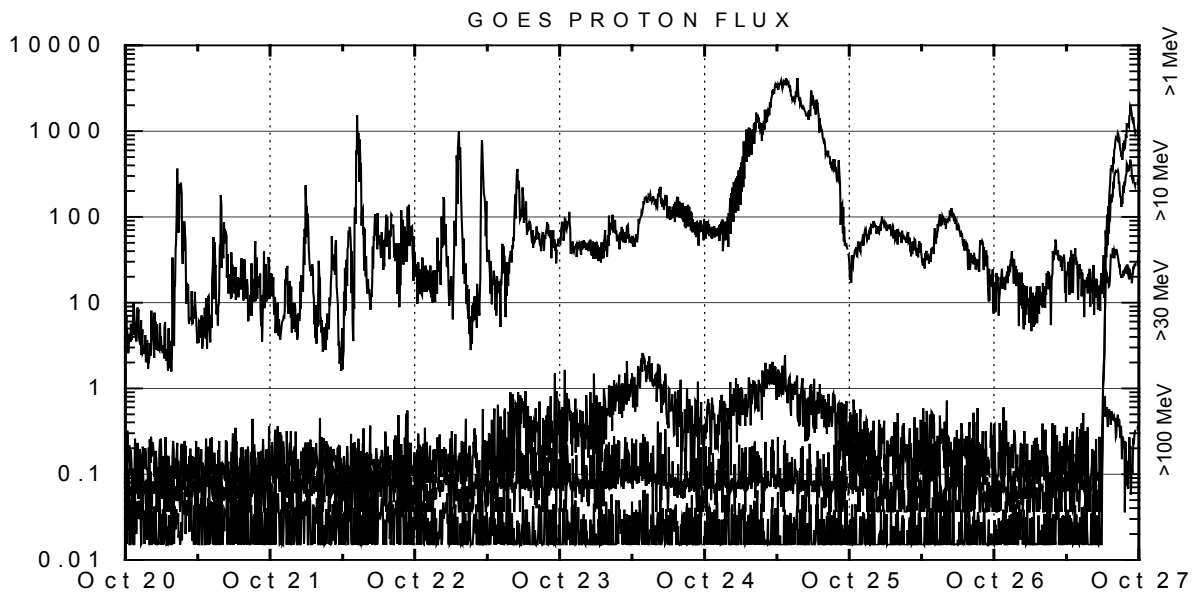
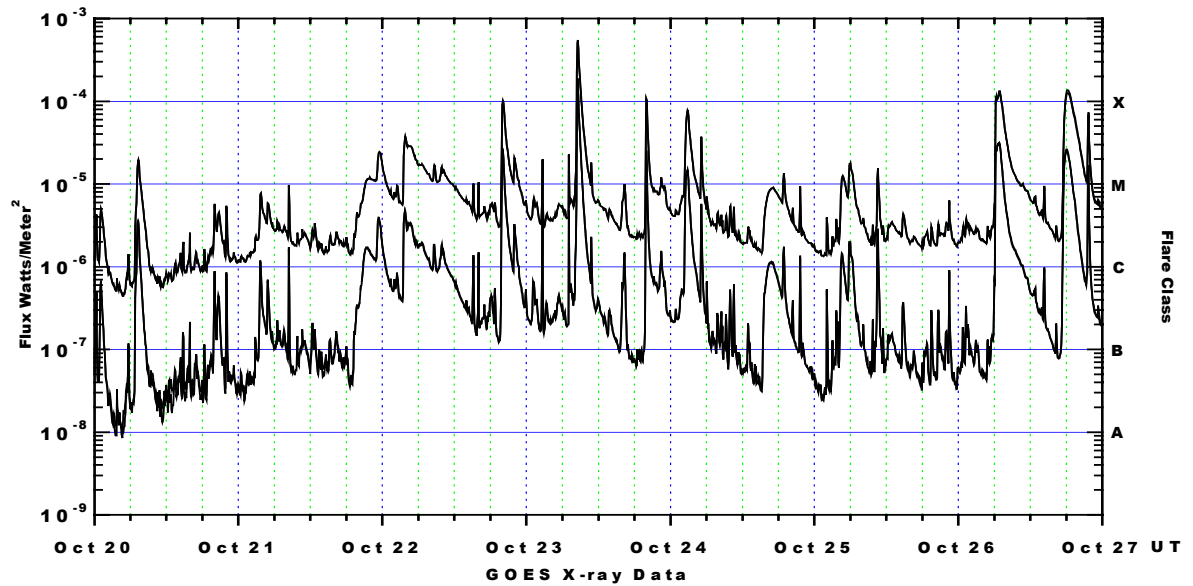
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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

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 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.





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 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-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.

