

Solar activity was at moderate levels during most of the period. Region 9415 (S22, L = 001, class/area Eko/880 on 07 April) had a deceptively quiet west limb passage on 16 April. However, it produced a flare from beyond the west limb (roughly W115) on 18 April associated with a Type II radio sweep, a C2 X-ray flare (peak at 18/0214 UTC), a solar proton event, and an impressive coronal mass ejection (CME), most of which was directed anti-Earthward. April 18 also saw the return of old Region 9393, which was renumbered as Region 9433 (N17, L = 155, class/area Fki/790 on 21 April). This region was the likely source for isolated, optically uncorrelated low-level M-class flares on 16 - 17 April (please refer to the Energetic Events listing for flare specifics). Region 9433 continued to produce isolated low-level M-class flares during the rest of the period, the largest of which was an M3/1n at 22/2044 UTC with an associated 270 SFU Tenflare and a Type II radio sweep. Most of the flares in Region 9433 have occurred within the trailer portion of the group, where new magnetic flux emerged during the last few days of the period resulting in the formation of a magnetic delta configuration on 22 April. Region 9433 continued (ominously) to increase in size and magnetic complexity as the period ended. The remaining regions were small- to moderate-sized and simply structured.

Data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Two CMEs passed the spacecraft during the period. The first shock, associated with the X14/2b flare of 15 April, reached ACE at 18/0005 UTC associated with abrupt increases in solar wind velocity, temperature, and total IMF field intensity. IMF Bz was variable following the shock with brief, intermittent periods of southward IMF Bz with maximum southerly deflections to minus 21 nT observed at 18/0320 UTC and 18/0430 UTC. The second weaker shock, likely associated with the 18 April C2 flare from beyond the west limb, passed ACE at 21/1500 UTC and was associated with relatively modest increases in velocity, density, and total IMF intensity. IMF Bz turned mostly northward following the shock, then took a southward turn at approximately 22/0330 UTC. IMF Bz remained southward for the rest of the day with maximum deflections to minus 11 nT.

Proton events at greater than 100 MeV and greater than 10 MeV were in progress as the period began in the wake of an X14/2b flare that occurred on 15 April. The greater than 100 MeV event began at 15/1405 UTC, reached a peak of 146 PFU at 15/1525 UTC, and ended at approximately 17/0510 UTC. The greater than 10 MeV event began at 15/1410 UTC, reached a peak of 951 PFU at 15/1920 UTC, and ended at 17/1700 UTC. Proton events at greater than 100 MeV and greater than 10 MeV also followed the C2 event from beyond the west limb on 18 April. The greater than 100 MeV event began at 18/0255 UTC, reached a maximum flux of 12 PFU at 18/0600 UTC, and ended at approximately 19/0325 UTC. The greater than 10 MeV event began at 10/0315UTC, reached a peak of 321 pfu at 18/1045 UTC, and ended at approximately 20/0820UTC. Ground level events and polar cap absorption events were associated with these proton events.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate to high levels during 16 - 17 April. Electron fluxes decreased to mostly normal levels for the remainder of the period.

The geomagnetic field was disturbed on 18 and 21 - 22 April due to CME passages at Earth. The 18 April disturbance began with a sudden storm commencement (SSC) at 18/0048 UTC (50 nT, Boulder USGS magnetometer) followed by active to major storm levels with severe storm levels at high latitudes. The storm subsided to mostly quiet to unsettled levels after 18/1200 UTC. The 21 - 22 April disturbance began at around 21/1530 UTC, following a relatively weak interplanetary shock passage. Field activity increased to active levels at around 21/2100 UTC. A subsequent increase to active to minor storm levels occurred during 22/0400 - 1800 UTC with periods of major to severe storming detected at a few high latitude monitoring stations. This disturbance continued as the period ended.



## **Space Weather Outlook**

### **25 April - 21 May 2001**

Solar activity is expected to range from moderate to high levels during the period. Region 9433 is expected to produce M-class flares during the period. This region could also produce isolated major flare activity before departing the visible disk on 02 May. Old Region 9415 is due back on 30 April and may provide an increased chance for isolated major flare activity. The same is true for (Old) Region 9433, which will return to the visible disk on 14 May.

Solar proton events will be possible during the period.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels during most of the period.

Geomagnetic field activity is expected to be at mostly unsettled levels during the period, barring an Earth-directed CME.



### 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
16 April	123	107	330	B6.9	4	1	0	1	0	0	0	0
17 April	126	89	160	B5.1	6	1	0	0	0	0	0	0
18 April	132	63	280	B5.7	3	0	0	0	0	0	0	0
19 April	145	85	770	B5.5	2	1	0	3	0	0	0	0
20 April	180	103	890	B5.4	8	2	0	2	3	0	0	0
21 April	191	156	1430	B6.4	6	0	0	6	0	0	0	0
22 April	193	164	1380	C1.1	13	1	0	9	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	>4Me
	16 April	9.8E+7	1.8E+7	3.2E+5		3.0E+8
17 April	3.9E+7	1.6E+6	6.3E+4		2.8E+8	
18 April	5.0E+7	1.2E+7	4.3E+5		2.2E+6	
19 April	1.6E+7	2.9E+6	4.9E+4		6.8E+5	
20 April	5.8E+6	7.0E+5	1.5E+4		1.1E+6	
21 April	1.5E+6	1.6E+5	8.0E+3		2.9E+6	
22 April	5.1E+5	4.4E+4	4.9E+3		3.9E+5	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	16 April	7	3-1-1-1-2-1-1-3	10	4-3-1-3-2-2-1-1	7
17 April	4	1-2-1-1-1-1-1-2	9	2-1-3-4-2-2-1-1	7	2-3-2-2-2-3-2-2
18 April	22	5-5-5-2-2-2-2-2	*	5-6-6-5-2-3-2-*	50	5-7-7-4-3-4-1-2
19 April	5	2-1-2-1-2-1-1-1	8	2-2-3-4-2-1-0-0	7	3-2-3-1-2-2-1-2
20 April	5	2-2-1-1-1-1-2-1	6	2-1-1-2-4-1-0-0	8	3-3-1-2-2-3-2-2
21 April	7	1-2-0-1-1-2-2-4	5	1-1-0-2-2-2-1-2	7	1-2-1-2-2-3-2-3
22 April	17	4-3-4-3-3-3-3-2	52	3-3-4-4-7-7-5-2	28	4-3-5-4-5-5-3-4



### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
16 Apr 0046	3 - 245 MHz Radio Bursts	15 Apr
16 Apr 0100	CONTINUED Protons Event >10 MeV >=10pfu	15 Apr 1410
16 Apr 0100	CONTINUED Electron Event >2MeV >=1000pfu	14 Apr 1415
16 Apr 0100	CONTINUED Proton event >100 MeV >1pfu	15 Apr 1405
16 Apr 0241	CANCELLED K= 4 Warning	15 Apr 0535 - 1500
16 Apr 1345	CONTINUED Proton Event >10MeV >=10pfu Warning	15/1408 - 17/1500 Apr
16 Apr 1347	CONTINUED Proton event >100 MeV >1pfu Warning	15/1406 - 17/1500 Apr
17 Apr 0009	1- 245 MHz Radio Burst	16 Apr
17 Apr 0100	CONTINUED Electron Event >2MeV >=1000pfu	14 Apr 1415
17 Apr 1217	ENDED Proton event >100 MeV >1pfu	17 Apr 0505
18 Apr 0023	K= 4 Warning	18 Apr 0025 - 1500
18 Apr 0100	CONTINUED Electron Event >2MeV >=1000pfu	14 Apr 1415
18 Apr 0100	Sudden Impulse observed at Boulder	18 Apr 0050
18 Apr 0123	K >= 6 Warning	18 Apr 0125 - 0600
18 Apr 0124	K= 5 Warning	18 Apr 0125 - 0900
18 Apr 0140	ENDED Protons Event >10 MeV >=10pfu	17 Apr 1700
18 Apr 0231	Type II Radio Emission	18 Apr 0217
18 Apr 0241	10cm Radio Burst 570 F.U.	18 Apr 0213
18 Apr 0301	K= 5 Observed	18 Apr 0000 -0300
18 Apr 0311	Proton event >100 MeV >1pfu Warning	18 Apr 0312 - 1500
18 Apr 0313	Proton event >100 MeV >1pfu	18 Apr 0255
18 Apr 0341	Protons Event >10 MeV >=10pfu	18 Apr 0315
18 Apr 0347	Proton Event >10MeV >=10pfu Warning	18 Apr 0350 - 2359
18 Apr 0704	CONTINUED K= 5 Warning	18 Apr 0125 - 1500
18 Apr 0900	A >=20 Observed	18 Apr 0900
18 Apr 1348	CONTINUED Proton Event >10MeV >=10pfu Warning	18/0350 – 19/0600 Apr
18 Apr 1350	CONTINUED Proton event >100 MeV >1pfu Warning	18/0312 – 19/0000 Apr
18 Apr 2356	CONTINUED Proton event >100 MeV >1pfu Warning	18/0312 – 19/0600 Apr
19 Apr 0100	CONTINUED Protons Event >10 MeV >=10pfu	18 Apr 0315
19 Apr 0100	CONTINUED Proton event >100 MeV >1pfu	18 Apr 0255
19 Apr 0550	CONTINUED Proton Event >10MeV >=10pfu Warning	18/0350 – 19/2359 Apr
19 Apr 0602	ENDED A >=20 Observed	18 Apr 0900
19 Apr 1153	ENDED Proton event >100 MeV >1pfu	19 Apr 0325
19 Apr 1203	10cm Radio Burst 270 F.U.	19 Apr 1202
19 Apr 2251	CONTINUED Proton Event >10MeV >=10pfu Warning	18/0350 - 20/2359 Apr
20 Apr 0100	CONTINUED Protons Event >10 MeV >=10pfu	18 Apr 0315
20 Apr 1512	ENDED Protons Event >10 MeV >=10pfu	20 Apr 1015
21 Apr 0304	2 – 245 MHz Bursts	20 Apr
21 Apr 1632	Sudden Impulse observed at Boulder	21 Apr 1601
21 Apr 1800	K= 4 Observed	21 Apr 1500 - 1800
21 Apr 2059	K= 4 Warning	21/2159 – 22/1500 Apr

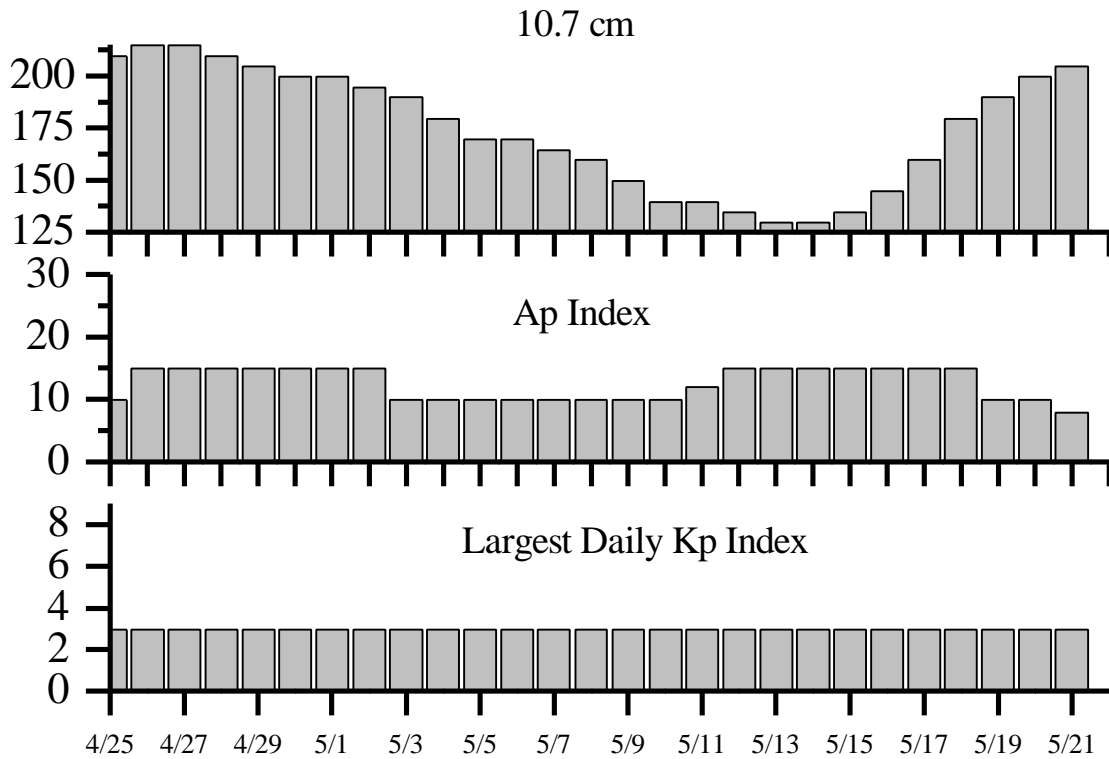


*Alerts and Warnings Issued – continued.*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
22 Apr 0023	2 – 245 MHz Bursts	21 Apr
22 Apr 0023	245 MHz Radio Noise Storm	21 Apr
22 Apr 1200	A $\geq$ 20 Observed	22 Apr 1200
22 Apr 1433	K= 5 Warning	22/1434 - 23/0000 Apr
22 Apr 1459	K= 5 Observed	22 Apr 1200 - 1500
22 Apr 2111	10cm Radio Burst 270 F.U.	22 Apr 2039
22 Apr 2307	Type II Radio Emission	22 Apr 2042



*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
25 Apr	210	10	3	09 May	150	10	3
26	215	15	3	10	140	10	3
27	215	15	3	11	140	12	3
28	210	15	3	12	135	15	3
29	205	15	3	13	130	15	3
30	200	15	3	14	130	15	3
01 May	200	15	3	15	135	15	3
02	195	15	3	16	145	15	3
03	190	10	3	17	160	15	3
04	180	10	3	18	180	15	3
05	170	10	3	19	190	10	3
06	170	10	3	20	200	10	3
07	165	10	3	21	205	8	3
08	160	10	3				



### *Energetic Events*

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
16 Apr	0616	0622	0625	M1.1	.003							
17 Apr	2118	2157	2216	M1.3	.029							
19 Apr	1122	1135	1155	M2.0	.025							
20 Apr	0501	0523	0543	M1.0	.017	1F	N16E63	9433				
20 Apr	1951	2004	2016	M4.1	.042	1F	N15E55	9433		70		
22 Apr	2037	2044	2047	M3.2	.010	1N	N14E18	9433	5700	270		3

### *Flare List*

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
16 April	0321	0325	0329	B9.0			
	0616	0622	0625	M1.1			
	0659	0700	0703	C3.7	SF	S19W90	9415
	1007	1011	1020	C1.0			
	1110	1124	1141	C2.9			
	1335	1357	1410	C1.2			
	2015	2021	2030	B8.3			
17 April	0325	0401	0412	C5.8			
	0455	0502	0518	C1.6			
	0541	0552	0611	C4.7			
	1206	1229	1250	C1.9			
	1344	1401	1415	C2.2			
	1807	1853	1904	C2.5			
18 April	2118	2157	2216	M1.3			
	0133	0136	0141	B9.1			
	0211	0214	0216	C2.2			
	0604	0611	0616	C1.9			
19 April	1813	1821	1827	C1.2			
	0441	0441	0447	C1.3	SF	N19E72	9433
	0529	0531	0538	C1.2	SF	N16E78	9433
	0612	0614	0617	B8.9	SF	N20E71	9433
	1122	1135	1155	M2.0			
20 April	2145	2149	2152	B7.5			
	0503	0518	0556	M1.0	1F	N16E63	9433
	0707	0708	0720	C1.9	SF	N18E53	9433
	0848	0850	0902	C1.5	SF	N06E01	9432
	1253	1304	1317	C7.0			
	1407	1417	1428	C4.2			
	1654	1658	1701	C1.8			
	1820	1832	1839	C2.2			
	1913	1916	1923	C4.0	1F	N18E66	9433
	1953	1956	2059	M4.1	1F	N15E55	9433
2128	2134	2140	C8.0				



*Flare List – continued.*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
21 April	0439	0448	0508	C4.8			
	1010	1015	1020		SF	N17E53	9433
	1544	1546	1557		SF	S19E07	9435
	1659	1707	1718	C2.1			
	1807	1810	1815	C1.7	SF	N15E34	9433
	1932	1932	1939	C1.7	SF	N12E33	9433
	B2207	2214	2221	C3.3	SF	N16E35	9433
	2239	2243	2255	C3.6	SF	N16E47	9433
	22 April	0129	0133	0141	C1.8		
0134		0148	0156	C1.7	SF	N20E30	9433
0515		0515	0521	C2.8	SF	N20E40	9433
0811		U0813	A0911	C3.7	SF	N20E39	9433
0827		0830	0833	C1.9			
0840		0846	0850	C1.8			
1011		1018	1027	C4.0			
1050		1054	1057	C1.1			
1230		1232	1236		SF	N17E40	9433
1348		1348	1352		SF	N17E32	9433
1508		1512	1514	C2.1			
1708		1709	1713	C2.2	SF	N12E21	9433
2040		2045	2104	M3.2	1N	N14E18	9433
2136		2136	2144	C1.7	SF	N17E22	9433
2200		2203	2222	C3.5	SF	N17E21	9433
2238	2240	2252	C3.8	SF	N15E25	9433	





### Region Summary

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 9418

04 Apr N23E69	349	0130	02	HSX	001	A													
05 Apr N27E58	347	0230	11	EAO	008	B		1			3								
06 Apr N27E45	347	0200	10	DAO	008	B													
07 Apr N26E32	347	0210	11	EAO	011	B													
08 Apr N27E19	347	0230	12	EAO	019	B													
09 Apr N27E07	345	0210	12	EAO	017	B													
10 Apr N26W07	346	0190	10	DAO	013	B													
11 Apr N27W20	346	0160	12	ESO	007	B													
12 Apr N27W33	346	0110	12	ESO	004	B													
13 Apr N26W46	346	0120	12	ESO	005	B													
14 Apr N26W59	345	0200	11	EAO	007	BG		1			1								
15 Apr N26W72	345	0170	12	EAO	004	B													
16 Apr N27W84	344	0120	13	EAO	005	B													
							0	2	0	4	0	0	0	0	0				

Crossed West Limb.

Absolute heliographic longitude: 345

#### Region 9420

05 Apr S08E76	329	0040	03	HSX	001	A													
06 Apr S06E62	330	0070	02	HSX	002	A													
07 Apr S07E49	330	0070	01	HSX	002	A													
08 Apr S06E36	330	0080	02	HSX	001	A													
09 Apr S07E22	330	0040	01	HSX	001	A													
10 Apr S07E10	329	0050	04	CSO	003	B													
11 Apr S07W05	331	0050	03	CSO	004	B													
12 Apr S07W18	331	0040	02	HSX	001	A													
13 Apr S08W31	331	0040	03	CAO	003	B													
14 Apr S07W44	330	0010	03	HRX	004	A													
15 Apr S07W59	332	0020	01	HRX	001	A													
16 Apr S06W71	331	0020	01	HRX	001	A													
17 Apr S07W83	330	0000	00	AXX	001	A													
							0	0	0	0	0	0	0	0	0				

Crossed West Limb.

Absolute heliographic longitude: 331



**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 9422*

07 Apr	S13E78	301	0050	02	HAX	001	A											
08 Apr	S12E64	302	0050	02	HSX	001	A											
09 Apr	S12E51	301	0070	02	HAX	002	A											
10 Apr	S13E37	302	0050	01	HSX	002	A											
11 Apr	S12E23	303	0060	04	DSO	006	B										2	
12 Apr	S12E09	304	0070	04	DAO	006	B											
13 Apr	S12W04	304	0050	05	DAO	006	BG											
14 Apr	S12W17	303	0040	05	DAO	008	BG											
15 Apr	S12W30	303	0020	03	CSO	004	B											
16 Apr	S12W43	303	0010	02	CSO	004	B											
17 Apr	S13W54	301	0010	03	BXO	003	B											
18 Apr	S13W67	301																
19 Apr	S13W80	301																
																		0 0 0 2 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 304

*Region 9424*

08 Apr	S16E34	332	0000	04	BXO	005	B											
09 Apr	S16E22	330	0020	05	CSO	002	B											
10 Apr	S17E08	331	0020	02	HSX	002	A											
11 Apr	S17W06	332	0040	06	DAO	009	B	1					1					
12 Apr	S17W20	333	0060	07	DSO	012	B											
13 Apr	S18W34	334	0030	07	DSO	006	B											
14 Apr	S18W46	332	0010	08	CRO	004	B											
15 Apr	S17W62	335	0020	01	CRO	003	B											
16 Apr	S16W72	332	0020	03	CRO	004	B											
17 Apr	S15W85	332	0020	01	BXO	002	B											
																		1 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 332



**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 9426*

11 Apr	S09E40	286	0030	04	CSO	006	B											
12 Apr	S09E25	288	0060	06	DSO	008	B											
13 Apr	S10E13	287	0060	07	DSO	006	B											
14 Apr	S10W02	288	0020	06	CSO	004	B											
15 Apr	S09W16	289	0010	01	HSX	002	A											1
16 Apr	S08W27	287	0020	04	CSO	005	B											
17 Apr	S08W40	287	0010	02	BXO	004	B											
18 Apr	S08W53	287																
19 Apr	S08W66	287																

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 288

*Region 9427*

11 Apr	S06W12	338	0030	03	DAO	005	B											
12 Apr	S08W26	339	0040	05	DSO	005	B											
13 Apr	S08W39	339	0060	05	DAO	007	B											
14 Apr	S08W52	338	0030	04	CRO	005	B											
15 Apr	S08W64	337	0020	02	HSX	001	A											
16 Apr	S06W79	339	0020	03	HSX	002	A											

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 338

*Region 9428*

14 Apr	N14W39	325	0010	03	BXO	003	B											
15 Apr	N14W52	325																
16 Apr	N14W65	325																
17 Apr	N14W78	325																
18 Apr	N14W91	325																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 325



**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 9429*

14 Apr	N09E62	224	0080	02	HSX	001	A										
15 Apr	N08E50	223	0120	02	HSX	001	A										
16 Apr	N09E36	224	0090	02	HSX	001	A										
17 Apr	N08E23	224	0080	02	HAX	001	A										
18 Apr	N08E09	225	0080	02	HSX	001	A										
19 Apr	N08W04	225	0060	02	HSX	001	A										
20 Apr	N09W18	225	0050	02	HSX	001	A										
21 Apr	N08W31	225	0060	02	HSX	001	A										
22 Apr	N08W45	226	0050	02	HSX	001	A										

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 225

*Region 9430*

16 Apr	S16W33	293	0030	05	DRO	005	B										
17 Apr	S17W46	293	0030	07	CRO	006	B										
18 Apr	S17W59	293	0020	03	CRO	003	B										
19 Apr	S17W72	293															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 293

*Region 9431*

17 Apr	S10E49	198	0010	01	AXX	002	A										
18 Apr	S11E36	198	0000	00	AXX	001	A										
19 Apr	S11E23	198															
20 Apr	S12E15	192	0030	04	CSO	004	B										
21 Apr	S11E00	194	0130	05	DAO	008	B										
22 Apr	S11W15	196	0060	05	DAO	007	B										

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 194

*Region 9432*

18 Apr	N08E20	214	0030	04	CRO	006	B										
19 Apr	N07E06	215	0050	05	DAO	009	B										
20 Apr	N08W06	213	0050	07	DAO	011	B	1			1						
21 Apr	N08W16	210	0100	07	DAO	013	B										
22 Apr	N08W34	215	0090	07	DAO	012	B										

1 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 215



**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 9433*

18 Apr	N14E74	160	0150	06	DAO	002	B											
19 Apr	N17E64	157	0590	19	FHO	017	B	2				3						
20 Apr	N17E52	155	0700	16	FHO	017	BG	2	2			1	3					
21 Apr	N16E40	154	0790	22	FKI	035	BG	4				5						
22 Apr	N17E26	155	0760	19	FKI	047	BGD	8	1			9	1					
								16	3	0	18	4	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 155

*Region 9434*

19 Apr	N19W23	244	0050	04	DAO	004	B											
20 Apr	N19W38	245	0030	05	DSO	003	B											
21 Apr	N20W51	245	0020	04	CSO	002	B											
22 Apr	N17W67	248	0010	00	AXX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 244

*Region 9435*

19 Apr	S21E28	193	0020	03	CSO	004	B											
20 Apr	S20E14	193	0030	04	DAO	007	B											
21 Apr	S20E01	193	0210	09	DAO	015	B					1						
22 Apr	S20W12	193	0250	10	DAO	014	B											
								0	0	0	1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 193

*Region 9436*

21 Apr	S11E72	122	0070	02	HSX	001	A											
22 Apr	S10E59	122	0100	02	HSX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 122

*Region 9437*

21 Apr	N08E76	118	0050	02	HSX	001	A											
22 Apr	N10E61	120	0060	01	HAX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 120

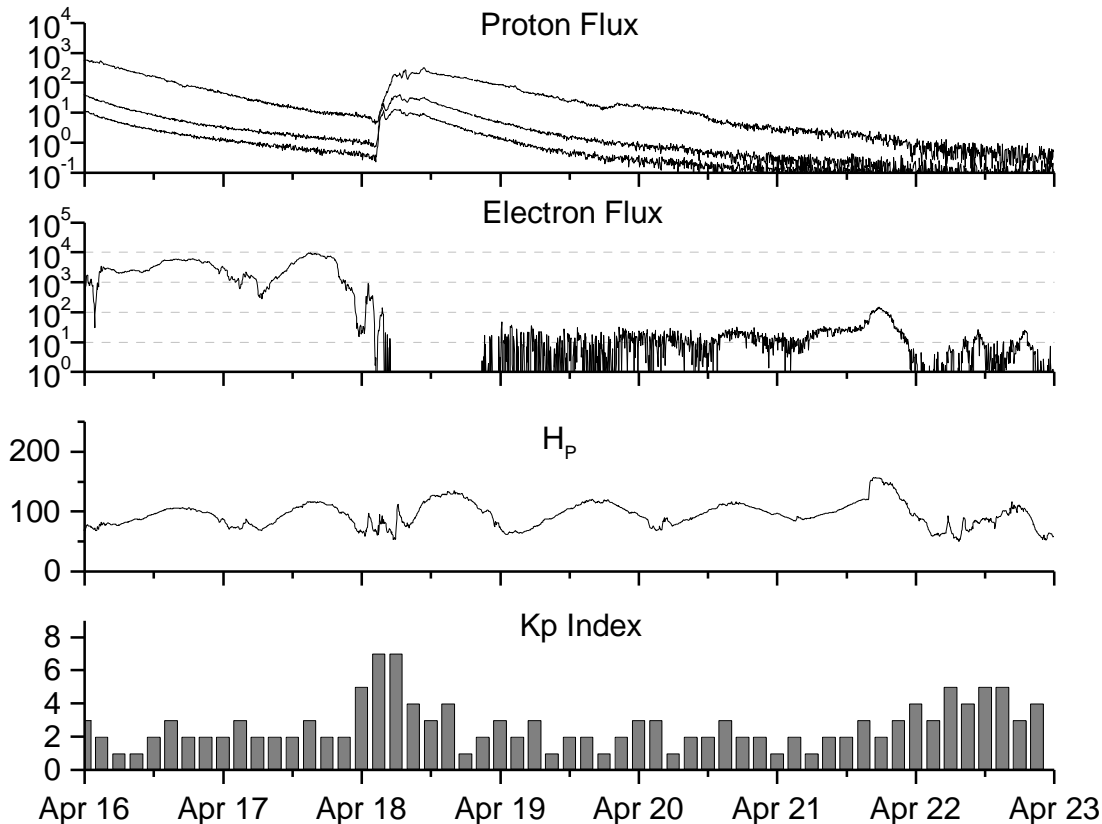


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>1999</b>									
April	92.9	63.7	0.69	123.8	85.5	117.2	145.8	12	12.2
May	140.5	106.4	0.76	131.7	90.5	148.6	149.9	08	12.4
June	208.3	137.7	0.66	136.0	93.1	169.8	152.9	07	12.4
July	169.2	113.5	0.67	138.0	94.3	165.6	154.4	10	12.6
August	136.1	93.7	0.69	142.8	97.5	170.8	156.3	15	12.9
September	107.4	71.5	0.67	150.0	102.3	135.7	161.0	19	12.8
October	167.7	116.7	0.70	158.5	107.8	164.8	167.2	19	12.7
November	199.3	133.2	0.67	164.7	110.0	191.5	171.5	14	13.1
December	123.5	86.4	0.69	165.9	111.1	169.8	173.4	10	13.8
<b>2000</b>									
January	140.8	90.1	0.64	168.0	112.9	158.1	175.5	13	14.5
February	161.9	112.9	0.70	172.1	116.7	173.2	176.8	15	15.0
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			167.7		18	
November	149.9	106.5	0.71			178.8		17	
December	146.4	104.5	0.71			173.6		08	
<b>2001</b>									
January	142.7	95.1	0.67			166.7		08	
February	131.0	80.1	0.61			147.3		06	
March	166.7	114.2	0.69			177.7		17	

**NOTE:** All smoothed values after December 1999 and monthly values after June 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 16 April 2001*

*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.

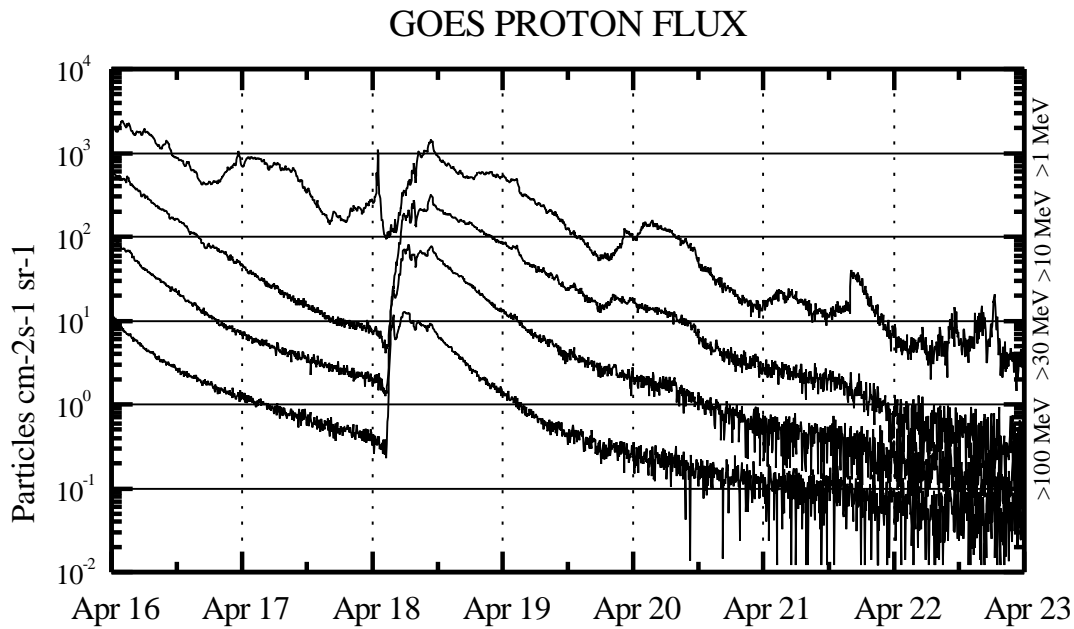
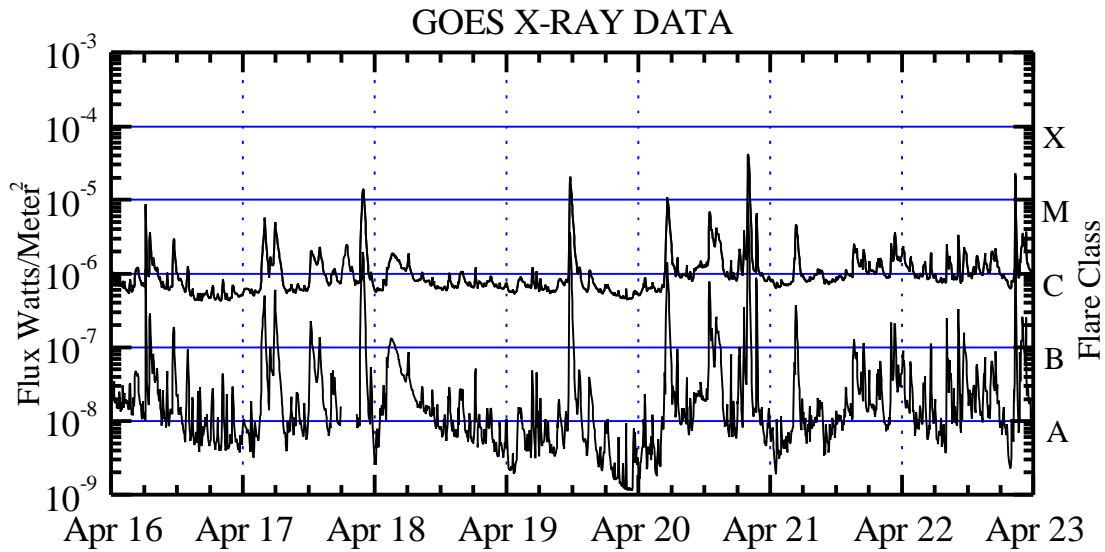
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-8.

*Hp* 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.

*Kp* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> Space Weather Squadron) 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 Kp 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 Kp are “ global ” parameters that are applicable to a first order approximation over large areas. Hparallel 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.

