Space Weather Highlights
25 April - 01 May 2022

SWPC PRF 2435
02 May 2022

Solar activity reached high levels during the period with an X1.1 flare at 30/1347 UTC from Region 2994 (N14, L=105, class/area Eko/670 on 25 Apr). This event was accompanied by a Type II radio emission (est 1071 km/s shock speed). This region produced the bulk of the activity during the period, including several M-class flares. Regions 2993 (N19, L=111, class/area Cao/200 on 25 Apr), 2995 (N13, L-75, class/area Hsx/210 on 25 Apr), and 2996 (N24, L=63, class/area Cro/30 on 25 Apr) each produced an M-class flare. There were numerous CMEs associated with the flare activity during the period but the regions were all either on or beyond the East or West limbs and not Earth-directed.

The greater than 10 MeV proton flux became elevated with peak flux 4.2 pfu at 29/2145 UTC, likely associated with an M1.2 flare from Region 2996.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 29 Apr and 1 May due to influences from a combination of a CH HSS and transient passage.

Geomagnetic field activity reached G1(Minor) storm levels on 27 Apr due to influences from transient passage. G1 levels were also observed on 30 Apr due to a combination of CH HSS influences and possible transient passage. Active levels were observed on 28-29 Apr due to CH HSS influences. Quiet to unsettled levels were observed on 25-26 Apr and 1 May.

Space Weather Outlook
02 May - 28 May 2022

Solar activity is expected to be at low levels with a chance for moderate levels on 11-25 May due to Regions 2993 and 2994 rotating back on the disk. Very low to low levels are expected on 2-10 May and 26-28 May.

There is a slight chance for a proton event at geosynchronous orbit on 11-25 May due to the potential from Regions 2993 and 2994 rotating back onto the visible disk.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to high levels on 2-4 May, 14-17 May, and 26-28 May due to influences from recurrent CH HSS activity. Normal to moderate levels are expected for the remainder of the period.

Geomagnetic field activity is expected to be reach G1 (Minor) storm levels on 24 May due to recurrent CH HSS influences. Unsettled to active levels are expected on 2 May, 20 May, and 25-27 May also due to recurrent CH HSS influences. Quiet to unsettled levels are expected for the remainder of the period.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
25 April	157	94	1320	B8.0	8	2	0	7	0	0	0	0
26 April	150	126	1170	B9.4	7	0	0	3	0	0	0	0
27 April	142	95	910	B8.2	4	0	0	7	1	0	0	0
28 April	132	118	800	B7.0	7	0	0	2	0	0	0	0
29 April	124	90	450	B6.5	7	2	0	2	1	0	0	0
30 April	120	50	390	C1.0	15	4	1	0	0	0	0	0
01 May	109	36	280	B9.5	5	0	0	1	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2} -day -sr)		Electron Fluence (electrons/cm^2 -day -sr)
	>1 MeV	>10 MeV	>2MeV
25 April	6.2e+04	3.8e+04	1.2e+07
26 April	5.7e+04	3.8e+04	1.4e+07
27 April	3.0e+05	3.9e+04	1.1e+07
28 April	3.8e+05	3.8e+04	7.2e+06
29 April	8.1e+06	1.1e+05	7.8e+07
30 April	3.7e+07	9.2e+04	1.6e+07
01 May	2.7e+06	4.7e+04	4.7e+07

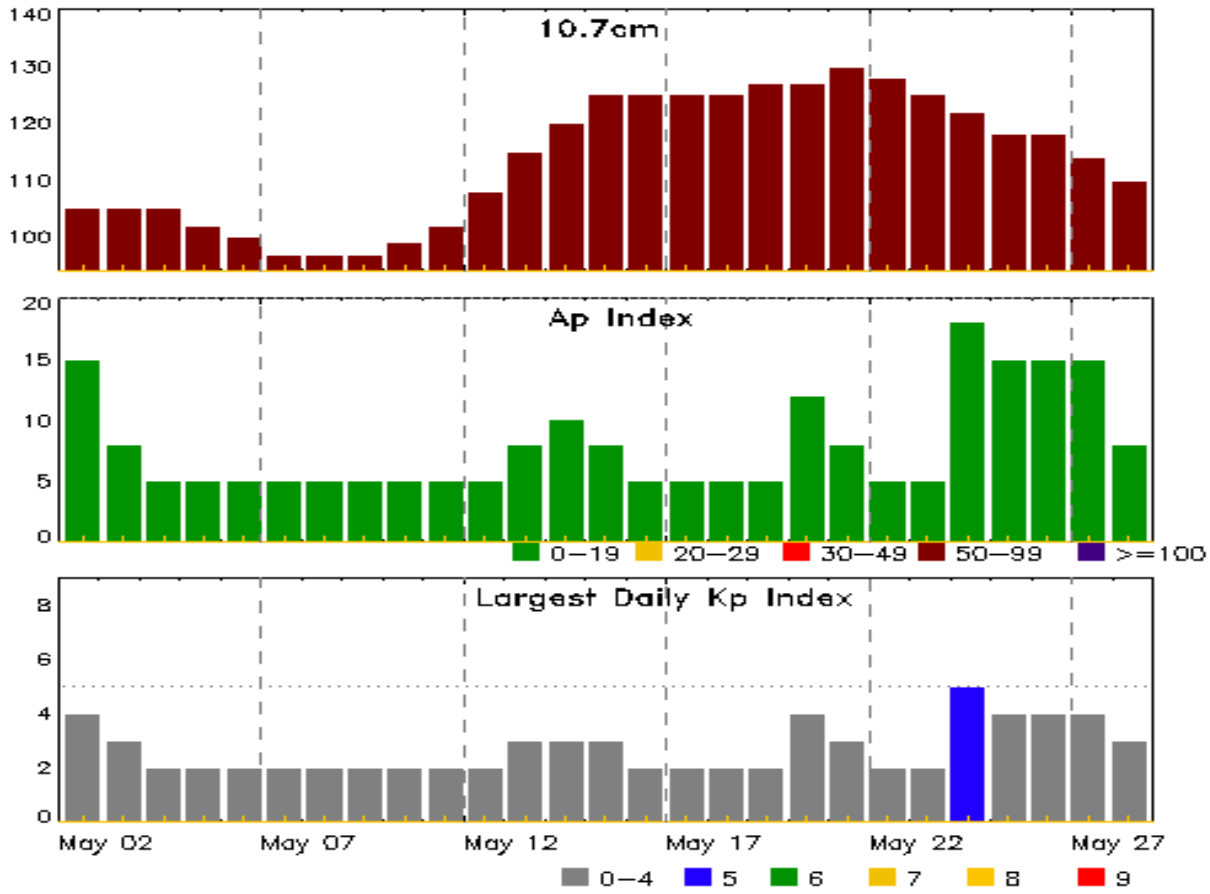
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
25 April	4	0-0-1-2-2-1-2-1	8	0-1-1-5-2-1-1-0	5	1-1-1-2-1-1-2-1
26 April	3	0-0-1-1-2-1-1-1	1	0-0-1-0-1-0-0-0	3	0-0-1-1-1-1-1-1
27 April	16	2-2-2-1-5-3-3-4	22	2-2-1-1-6-5-3-3	21	2-2-1-1-5-4-3-5
28 April	11	2-3-3-1-2-2-3-3	21	3-3-5-5-3-3-2-2	14	3-3-4-2-2-2-3-3
29 April	10	3-3-2-2-3-2-2-2	23	2-4-3-5-5-4-2-2	15	4-4-3-2-3-3-3-2
30 April	16	4-4-3-1-3-4-2-2	33	5-5-5-5-3-5-1-1	18	4-5-3-3-2-3-2-2
01 May	9	2-3-3-2-2-2-2-2	11	1-3-3-4-3-1-1-2	15	3-3-3-2-2-1-2-2

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
26 Apr 2011	WATCH: Geomagnetic Storm Category G1 predicted	
27 Apr 1309	WARNING: Geomagnetic K = 4	27/1310 - 2100
27 Apr 1353	ALERT: Geomagnetic K = 4	27/1350
27 Apr 1357	WARNING: Geomagnetic K = 5	27/1356 - 2100
27 Apr 1403	ALERT: Geomagnetic K = 5	27/1402
27 Apr 1711	SUMMARY: 10cm Radio Burst	27/1652 - 1652
27 Apr 2054	EXTENDED WARNING: Geomagnetic K = 4	27/1310 - 28/0600
27 Apr 2339	WARNING: Geomagnetic K = 5	27/2338 - 28/0600
28 Apr 0000	ALERT: Geomagnetic K = 5	27/2359
28 Apr 0528	EXTENDED WARNING: Geomagnetic K = 4	27/1310 - 28/1200
29 Apr 0126	WARNING: Geomagnetic K = 4	29/0126 - 0600
29 Apr 0258	ALERT: Geomagnetic K = 4	29/0259
29 Apr 0555	EXTENDED WARNING: Geomagnetic K = 4	29/0126 - 1500
29 Apr 0748	SUMMARY: 10cm Radio Burst	29/0720 - 0728
29 Apr 1255	ALERT: Electron 2MeV Integral Flux >= 1000pfu	29/1220
30 Apr 0038	WARNING: Geomagnetic K = 4	30/0038 - 0600
30 Apr 0215	ALERT: Geomagnetic K = 4	30/0207
30 Apr 0233	WARNING: Geomagnetic K = 5	30/0233 - 1200
30 Apr 0234	EXTENDED WARNING: Geomagnetic K = 4	30/0038 - 1500
30 Apr 0542	ALERT: Geomagnetic K = 5	30/0540
30 Apr 1023	ALERT: Type II Radio Emission	30/0957
30 Apr 1347	ALERT: X-ray Flux exceeded M5	30/1344
30 Apr 1429	SUMMARY: X-ray Event exceeded X1	30/1337 - 1352
30 Apr 1440	ALERT: Type II Radio Emission	30/1345
01 May 1353	ALERT: Electron 2MeV Integral Flux >= 1000pfu	01/1335

Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
02 May	105	15	4	16 May	125	5	2
03	105	8	3	17	125	5	2
04	105	5	2	18	125	5	2
05	102	5	2	19	127	5	2
06	100	5	2	20	127	12	4
07	97	5	2	21	130	8	3
08	97	5	2	22	128	5	2
09	97	5	2	23	125	5	2
10	99	5	2	24	122	18	5
11	102	5	2	25	118	15	4
12	108	5	2	26	118	15	4
13	115	8	3	27	114	15	4
14	120	10	3	28	110	8	3
15	125	8	3				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV
25 Apr	0118	0201	0239	M1.2	0.039	SF	N17E04	2995				
25 Apr	0352	0402	0407	M1.1	0.005	SF	N24W35	2993		190	42	
29 Apr	0715	0730	0742	M1.2	0.012	1F	N25W37	2996		840	230	
29 Apr	1801	1810	1822	M1.2	0.010	SF	N15E85	2994				
30 Apr	0446	0501	0507	M2.6	0.012			2994		100		
30 Apr	0525	0534	0540	M1.4	0.010			2994		33	65	
30 Apr	0948	0958	1005	M4.8	0.025			2994		130		1
30 Apr	1337	1347	1352	X1.1	0.047			2994		41000		2
30 Apr	1942	1947	1954	M1.9	0.008			2994		11000		2

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
25 Apr	0118	0201	0239	M1.2			2995
25 Apr	0132	0139	0152		SF	N22W26	2993
25 Apr	0155	0156	0157		SF	N22W26	2993
25 Apr	0158	0159	0207		SF	N17E04	2995
25 Apr	0352	0402	0407	M1.1	SF	N24W35	2993
25 Apr	0551	0604	0613	C4.6	SF	N17W32	2994
25 Apr	0850	0853	0903	C1.6	SF	N22W37	2993
25 Apr	1205	1212	1219	C1.2			
25 Apr	1248	1255	1300	C1.3			
25 Apr	1430	1437	1441	C1.2			
25 Apr	1600	1618	1646	C3.0	SF	N12W28	2994
25 Apr	1724	1735	1745	C6.8			
25 Apr	2038	2110	2208	C4.8			2993
26 Apr	0819	0828	0950	C2.2	SF	N19W16	2995
26 Apr	0950	0958	1005	C2.1	SF	N21W48	2993
26 Apr	1112	1118	1124	C2.8			
26 Apr	1230	1244	1249	C2.9			3001
26 Apr	1249	1303	1321	C3.2	SF	N15W42	2994
26 Apr	1616	1624	1631	C3.9			2991
26 Apr	1902	1910	1915	C1.1			
27 Apr	0359	0405	0427	C1.3			2994
27 Apr	0817	0840	0857	C3.3	SF	N28W11	2996

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
27 Apr	0901	0906	0910		SF	N13W56	2994
27 Apr	1046	1048	1112	C2.0	SF	S29E73	3001
27 Apr	1349	1352	1354		SF	S24E37	2999
27 Apr	1414	1454	0127	C7.6	1F	N26W16	2996
27 Apr	1533	1533	1536		SF	N22W17	2996
27 Apr	1537	1539	1544		SF	N22W17	2996
27 Apr	1614	1614	1617		SF	N26E03	
28 Apr	0127	0137	0158	C1.1			2994
28 Apr	0224	0306	0327	C6.7			2996
28 Apr	1129	1139	1147	C2.1	SF	N16W71	2994
28 Apr	1202	1210	1218	C1.2			2994
28 Apr	1408	1415	1421	C1.1	SF	N17W47	2995
28 Apr	1756	1812	1836	C3.7			2994
28 Apr	2345	2352	0005	C1.2			2994
29 Apr	0316	0331	0335	C1.4	SF	N14W86	2994
29 Apr	0620	0638	0652	C1.5			2996
29 Apr	0652	0657	0706	C1.3			2995
29 Apr	0715	0730	0742	M1.2	1F	N25W37	2996
29 Apr	0914	0922	0929	C2.4			2994
29 Apr	0929	0941	0947	C2.2			3001
29 Apr	1640	1648	1654	C1.9			2994
29 Apr	1801	1810	1822	M1.2	SF	N15E85	2994
29 Apr	2242	2256	2314	C3.0			2994
30 Apr	0118	0129	0138	C5.2			2994
30 Apr	0138	0142	0147	C4.3			2994
30 Apr	0404	0415	0425	C1.9			2997
30 Apr	0446	0501	0507	M2.6			2994
30 Apr	0525	0534	0540	M1.4			2994
30 Apr	0722	0734	0740	C4.6			2994
30 Apr	0740	0752	0757	C6.6			2994
30 Apr	0836	0844	0854	C6.0			2994
30 Apr	0902	0909	0915	C5.0			2994
30 Apr	0948	0958	1005	M4.8			2994
30 Apr	1053	1058	1105	C2.3			2994
30 Apr	1114	1124	1134	C5.4			2997
30 Apr	1134	1141	1145	C5.7			2994
30 Apr	1337	1347	1352	X1.1			2994
30 Apr	1733	1738	1742	C3.2			2994

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
30 Apr	1812	1825	1844	C4.0			2994
30 Apr	1855	1906	1923	C3.9			2994
30 Apr	1942	1947	1954	M1.9			2994
30 Apr	2013	2019	2023	C2.5			2994
30 Apr	2147	2159	2215	C2.9			2994
01 May	0810	0816	0822	C1.8			2994
01 May	1055	1128	1152	C3.1			
01 May	1314	1326	1342	C2.6	SF	N25W71	2996
01 May	1807	1832	1852	C1.7			2994
01 May	2203	2218	2235	C2.5			2994

Region Summary

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 2991												
14 Apr	S24E63	149	60	2	Hsx	1	A								
15 Apr	S24E51	148	60	2	Hsx	1	A								
16 Apr	S24E39	147	60	2	Hax	1	A								
17 Apr	S24E26	146	50	2	Hax	1	A								
18 Apr	S24E12	147	50	1	Hax	1	A								
19 Apr	S23W01	147	30	1	Hsx	1	A								
20 Apr	S23W15	148	10	1	Hsx	1	A								
21 Apr	S21W20	139	30	3	Cro	6	B								
22 Apr	S22W33	140	30	4	Cro	5	B								
23 Apr	S23W51	144	10	2	Axx	2	A								
24 Apr	S23W63	143	10		Axx	1	A								
25 Apr	S23W77	144	plage												
								0	0	0	0	0	0	0	0

Died on Disk.
Absolute heliographic longitude: 147

			Region 2993												
15 Apr	N22E89	111	plage						2						
16 Apr	N22E75	111	300	8	Cho	6	B	9	1						
17 Apr	N21E61	111	400	9	Dho	8	B	4	2						
18 Apr	N18E51	108	560	7	Dhi	12	BG	6	2		4				
19 Apr	N19E36	109	680	12	Ehi	19	BG	2	1		1				
20 Apr	N20E24	109	490	10	Dhi	19	BG	4	1		8				
21 Apr	N22E08	111	600	19	Fkc	35	BG	1	1		6	1			
22 Apr	N19W04	110	500	11	Ekc	18	BG	4	2		1		1		
23 Apr	N19W18	111	360	8	Dkc	10	B	5			4				
24 Apr	N19W32	111	440	7	Dkc	11	BGD	1			2				
25 Apr	N19W45	111	200	5	Cao	7	BG	2	1		4				
26 Apr	N20W56	109	230	10	Cso	9	B	1			1				
27 Apr	N20W71	111	180	6	Hax	3	A								
28 Apr	N20W85	112	80	5	Hax	3	A								
								39	13	0	31	1	1	0	0

Crossed West Limb.
Absolute heliographic longitude: 110

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 2994												
15 Apr	N14E89	111	plage					2							
16 Apr	N14E75	111	250	5	Hhx	1	A								
17 Apr	N13E66	106	350	12	Eho	5	B	2		1					
18 Apr	N13E53	107	450	12	Eko	7	BG	2							
19 Apr	N14E40	106	930	13	Eko	7	BG	4	1		2				
20 Apr	N14E25	107	610	8	Dko	8	BG	2	1		5	1			
21 Apr	N15E15	104	770	12	Ekc	22	BG	2			4	1			
22 Apr	N14W00	105	700	12	Eki	19	B								
23 Apr	N14W12	105	580	12	Eki	22	B	3			1				
24 Apr	N14W27	107	650	12	Eki	20	BG	1							
25 Apr	N14W39	105	670	11	Eko	12	BG	2			2				
26 Apr	N16W54	107	430	11	Eko	16	BG	1			1				
27 Apr	N15W66	107	320	13	Eko	11	B	1			1				
28 Apr	N14W79	106	300	13	Eko	10	B	5			1				
29 Apr	N15W92	106	30	1	Hax	1	A	4	1		2				
								31	3	1	19	2	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 105

			Region 2995												
19 Apr	N13E69	76	180	2	Hsx	1	A								
20 Apr	N14E56	76	240	3	Hsx	1	A								
21 Apr	N16E44	75	260	8	Cho	3	B								
22 Apr	N14E29	76	270	7	Cho	5	B								
23 Apr	N15E18	74	280	9	Cho	7	B								
24 Apr	N15E02	77	290	4	Hhx	3	A								
25 Apr	N13W09	75	210	6	Hsx	4	A		1		1				
26 Apr	N14W24	78	170	2	Hsx	2	A	1			1				
27 Apr	N14W38	78	120	3	Hsx	1	A								
28 Apr	N14W52	79	130	5	Cso	11	B	1			1				
29 Apr	N14W66	80	130	2	Hsx	1	A	1							
30 Apr	N15W79	80	130	2	Hsx	1	A								
01 May	N15W93	81	90	2	Hsx	1	A								
								3	1	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 77

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 2996												
20 Apr	N23E65	67	50	2	Hsx	1	A								
21 Apr	N25E56	64	100	7	Cao	3	B								
22 Apr	N25E40	66	90	4	Cao	4	B	1			1				
23 Apr	N25E27	65	70	2	Cao	3	B								
24 Apr	N26E15	64	80	2	Cao	2	B								
25 Apr	N24E03	63	30	5	Cro	5	B								
26 Apr	N25W11	64	10	5	Bxo	7	B								
27 Apr	N25W25	66	plage					2			3	1			
28 Apr	N25W39	66	plage					1							
29 Apr	N25W53	67	plage					1	1			1			
30 Apr	N25W67	68	plage												
01 May	N25W81	68	plage					1			1				
								6	1	0	5	2	0	0	0

Still on Disk.
Absolute heliographic longitude: 63

			Region 2997												
23 Apr	N14E63	30	10	4	Bxo	3	B								
24 Apr	N13E49	31	10	6	Bxo	4	B								
25 Apr	N11E34	31	30	9	Cro	5	B								
26 Apr	N12E22	31	30	9	Cro	7	B								
27 Apr	N12E13	27	30	12	Cro	4	B								
28 Apr	N12W04	31	20	12	Cro	4	B								
29 Apr	N12W19	33	20	10	Bxo	7	B								
30 Apr	N12W32	33	10	10	Bxo	3	B	2							
01 May	N13W46	34	plage												
								2	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 31

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 2998												
23 Apr	S19E13	80	120	2	Hsx	1	A								
24 Apr	S19W01	81	120	2	Hax	1	A								
25 Apr	S19W15	82	plage												
26 Apr	S19W29	83	plage												
27 Apr	S19W43	84	plage												
28 Apr	S19W57	84	plage												
29 Apr	S19W71	85	plage												
30 Apr	S19W85	86	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 81

			Region 2999												
25 Apr	S20E49	17	180	3	Hax	1	A								
26 Apr	S20E37	16	140	4	Hax	3	A								
27 Apr	S20E23	18	100	4	Hax	4	A				1				
28 Apr	S20E12	15	110	7	Hsx	6	A								
29 Apr	S21W00	14	120	10	Cso	6	B								
30 Apr	S21W13	14	130	5	Cso	5	B								
01 May	S20W27	14	80	6	Hax	3	A								
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 14

			Region 3000												
26 Apr	S16E71	342	50	1	Hsx	1	A								
27 Apr	S16E56	344	40	2	Hsx	1	A								
28 Apr	S17E44	343	20	1	Hrx	2	A								
29 Apr	S17E31	343	10	2	Hrx	2	A								
30 Apr	S17E18	343	plage												
01 May	S17E04	344	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 344

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3001												
26 Apr	S29E68	345	110	2	Hsx	1	A	1							
27 Apr	S26E58	343	120	4	Hsx	1	A	1			1				
28 Apr	S32E48	339	130	2	Hsx	1	A								
29 Apr	S32E35	339	120	2	Hax	1	A	1							
30 Apr	S32E22	339	120	2	Hsx	1	A								
01 May	S32E09	339	110	2	Hax	2	A								
								3	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 339

			Region 3002												
28 Apr	N13E25	357	10	2	Axx	1	A								
29 Apr	N13E11	3	plage												
30 Apr	N13W03	4	plage												
01 May	N13W17	5	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 4

			Region 3003												
29 Apr	S23E50	324	20	2	Bxo	2	B								
30 Apr	S23E36	325	plage												
01 May	S23E22	326	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 326

Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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