Space Weather Highlights
02 May - 08 May 2022

SWPC PRF 2436
09 May 2022

Solar activity was ranged from low to high levels. High levels were observed on 03-04 May in response to an X1/Sf flare (R3-Strong) at 03/1308 UTC, an M5 flare (R2-Moderate) 04/0019 UTC, and an M5/1b flare at 04/0900 UTC. The X-flare and first M-Flare were from Region 3006 (S29, L=245, class/area=Cao/080 on 07 May) as it was behind the SE limb. The last M5 flare was from Region 3004 (S16, L=324, class/area=Dkc/500 on 05 May). Associated with the M5 flare from Region 3006 was a Type IV radio sweep. Both regions produced moderate activity from smaller M1-M2 flares (R1-Minor) over 05 May. Only C-class activity was observed for 02 May and 06-08 May. The two regions were responsible for the vast majority of flare activity during the week. Only Region 3007 (S23, L=190, class/area=Cao/060 on 08 May) was able to produce additional flare activity but the events remained in the C-class range.

While many CMEs were observed in coronagraph imagery only two, one from 03 May and one from 07 May, were thought to have an Earth-directed component. Each CME was thought to only produce a weak glancing blow at Earth's magnetosphere on 08 May and 10 May respectively.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels every day over the reporting period due to activity from a negative polarity CH HSS. The maximum observed flux was 2,320 pfu at 03/1340 UTC.

Geomagnetic field activity was ranged from quiet to unsettled. A waning negative polarity CH HSS caused an isolated period of unsettled conditions at the beginning of 02 May. The remainder of the summary period was quiet.

Space Weather Outlook
09 May - 04 June 2022

Solar activity is expected to be at mostly low levels during the outlook period. However, there is a slight chance for M-class (R1-R2 Minor-Moderate) activity throughout the period due to multiple regions currently on the visible disk and several that are expected to rotate on back onto the visible disk that produced M-class activity before rotating beyond the W limb.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to range from moderate to high levels. High levels are expected from 26 May to 04 Jun due to influence from a recurrent, negative polarity CH HSS. The remainder of the outlook period is expected to reach moderate levels.

Geomagnetic field activity is expected to be at quiet to G1 (Minor) geomagnetic storm levels. G1

conditions are likely on 24 May; active conditions are likely on 20 May and 25-27 May due to recurrent CH HSS influence. Unsettled conditions over 10-11 May are likely due to influence from a glancing blow CME. Additional unsettled conditions are likely 21 May and 28 May due to recurrent CH HSS influence. The remainder of the outlook period is likely to be mostly quiet.

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
02 May	112	69	240	B5.9	2	0	0	0	0	0	0	0
03 May	114	53	270	B5.8	7	1	1	4	0	0	0	0
04 May	130	64	530	B9.6	15	5	0	19	3	0	0	0
05 May	120	85	720	B8.7	30	2	0	11	0	0	0	0
06 May	119	64	650	B6.9	15	0	0	2	0	0	0	0
07 May	118	66	660	B5.3	4	0	0	1	0	0	0	0
08 May	119	89	740	B4.8	6	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
02 May	2.6e+05	3.9e+04	6.7e+07
03 May	9.2e+04	3.7e+04	1.0e+08
04 May	7.4e+04	3.8e+04	5.3e+07
05 May	5.2e+04	3.7e+04	5.9e+07
06 May	4.6e+04	3.7e+04	6.1e+07
07 May	4.6e+04	3.8e+04	6.7e+07
08 May	4.9e+04	3.7e+04	2.7e+07

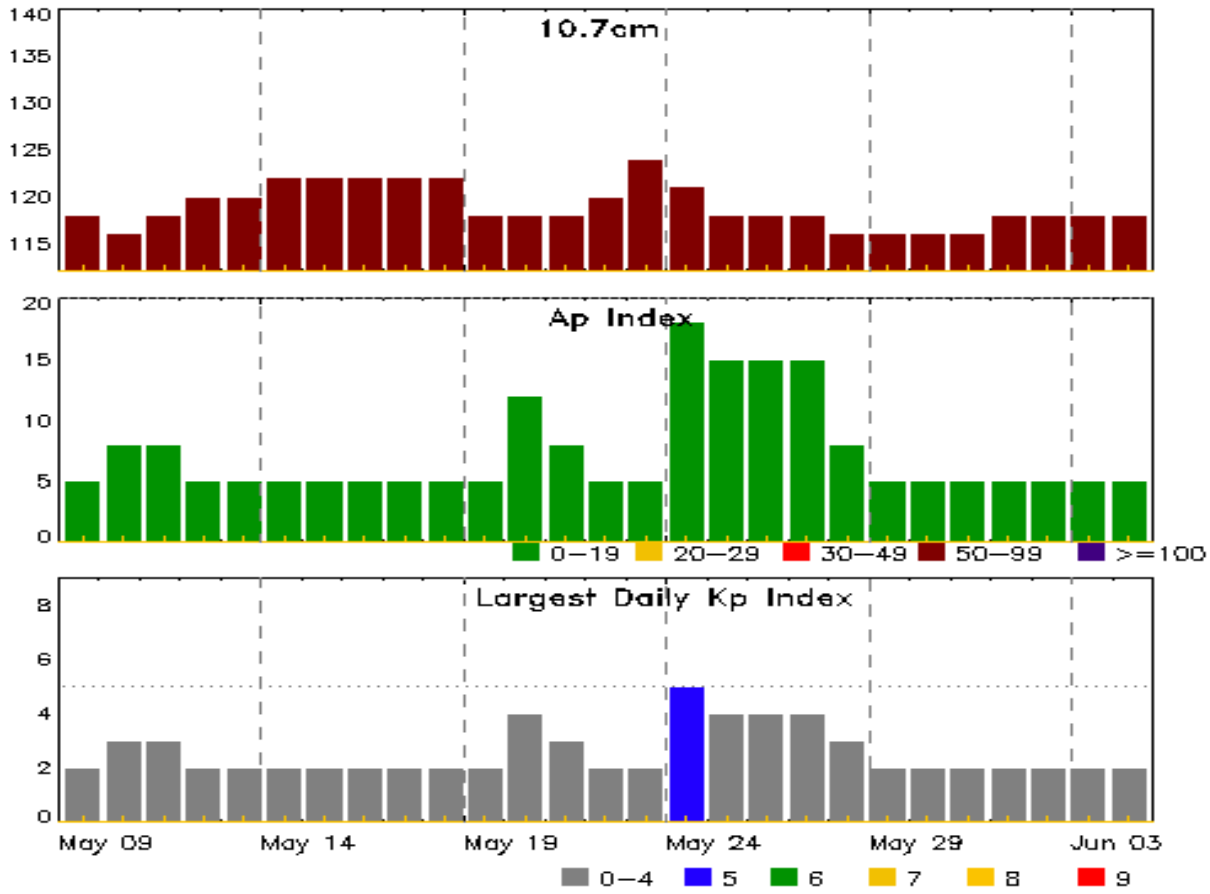
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
02 May	6	2-2-1-1-2-2-2-1	3	2-2-0-0-0-1-1-0	6	3-2-1-1-1-1-2-1
03 May	7	1-2-3-2-2-1-2-2	10	1-2-3-3-4-1-1-1	7	2-2-2-2-2-1-1-2
04 May	6	2-2-2-2-2-0-2-2	13	2-2-5-3-3-1-1-1	6	2-2-2-2-2-0-1-2
05 May	4	1-1-1-1-2-2-1-1	4	0-2-3-0-1-1-1-0	4	1-1-2-1-1-1-1-1
06 May	0	0-1-2-1-2-2-1-0	0	0-0-3-2-3-1-0-0	5	0-1-2-1-2-2-1-1
07 May	4	2-0-0-1-2-1-1-2	1	0-0-0-0-1-0-0-1	3	1-1-1-1-1-0-0-2
08 May	7	3-2-1-2-2-1-2-2	7	2-1-1-3-2-3-1-1	9	2-1-1-2-2-2-1-2

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
02 May 1243	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	01/1335
03 May 0826	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	01/1335
03 May 1330	ALERT: X-ray Flux exceeded M5	03/1323
03 May 1353	SUMMARY: X-ray Event exceeded X1	03/1309 - 1331
03 May 2158	ALERT: Type IV Radio Emission	03/2042
04 May 0021	ALERT: X-ray Flux exceeded M5	04/0018
04 May 0033	SUMMARY: X-ray Event exceeded M5	04/0008 - 0025
04 May 0040	ALERT: Type IV Radio Emission	04/0000
04 May 0901	ALERT: X-ray Flux exceeded M5	04/0858
04 May 0919	SUMMARY: X-ray Event exceeded M5	04/0845 - 0910
04 May 1156	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	01/1335
05 May 0115	ALERT: Type IV Radio Emission	04/2233
05 May 1426	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	01/1335
06 May 0633	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	01/1335
07 May 1232	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	01/1335
08 May 1456	CONTINUED 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
09 May	118	5	2	23 May	124	5	2
10	116	8	3	24	121	18	5
11	118	8	3	25	118	15	4
12	120	5	2	26	118	15	4
13	120	5	2	27	118	15	4
14	122	5	2	28	116	8	3
15	122	5	2	29	116	5	2
16	122	5	2	30	116	5	2
17	122	5	2	31	116	5	2
18	122	5	2	01 Jun	118	5	2
19	118	5	2	02	118	5	2
20	118	12	4	03	118	5	2
21	118	8	3	04	118	5	2
22	120	5	2				

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
03 May	0734	0753	0801	M1.3	0.011								
03 May	1309	1325	1331	X1.1	0.044	SF	S16	E05	3004	130			
04 May	0008	0019	0025	M5.3	0.022								
04 May	0845	0859	0910	M5.7	0.040	1B	S16	W09	3004	590	32		
04 May	1625	1632	1640	M1.1	0.010	1N	S16	W11	3004				
04 May	1940	1948	2003	M1.5	0.015				3006				
04 May	2009	2027	2036	M1.6	0.021				3004				
05 May	1308	1316	1322	M2.2	0.009	SN	S16	W24	3004	280			
05 May	1402	1410	1414	M2.7	0.007	SF	S29	E64	3006	100			

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat	CMD
02 May	0245	0251	0256	C1.2			2994
02 May	1855	1920	1944	C3.2			
03 May	0009	0015	0019	B8.9			
03 May	0100	0106	0114	B8.1			
03 May	0127	0138	0148	C6.2			
03 May	0200	0201	0204		SF	S15E10	3004
03 May	0439	0453	0458	C2.8			
03 May	0458	0503	0507	C2.5			
03 May	0711	0721	0724	B9.7	SF	S15E09	3004
03 May	0724	0728	0732	C1.1			3004
03 May	0734	0753	0801	M1.3			
03 May	1152	1203	1209	C1.6			
03 May	1306	1308	1313	X1.1	SF	S16E05	3006
03 May	1845	1853	1857	C1.5			
03 May	2041	1844	2125	C2.4	SF	S15E01	3004
04 May	0008	0019	0025	M5.3			
04 May	0037	0419	0509		SF	S16E17	3004
04 May	0224	0232	0236	C2.4			3004
04 May	0314	0319	0323	C1.2			3004
04 May	0334	0339	0342	C1.0			
04 May	0342	0347	0357	C1.4			3004
04 May	B0510	0528	0601	C6.7	SF	S17W04	

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
04 May	0603	0647	0719		SF	S16W07	3004
04 May	0646	0650	0655		SF	S16W07	3004
04 May	0721	U0735	A0746	B8.9	SF	S16W09	3004
04 May	0751	0819	0838	C3.5	SF	S16W07	3004
04 May	0813	0900	1036	M5.7	1B	S16W09	3004
04 May	1012	1018	1024	C3.9			
04 May	1149	1204	1214	C2.7	SF	S16W10	3004
04 May	1216	1216	1217		SF	S30E73	
04 May	1245	1255	1321	C2.4	SF	S15W10	3004
04 May	B1439	U1439	1505		SF	S16W13	3004
04 May	1542	1548	1557	C2.8	SF	S16W13	3004
04 May	B1615	1631	1733	M1.1	1N	S16W11	3004
04 May	1820	1830	1841	C3.0	SF	S16W13	3004
04 May	1855	1905	1913	C8.6	SF	S16W13	3004
04 May	1931	1937	1941	C4.1			3004
04 May	1940	1948	2003	M1.5			3006
04 May	1958	2030	2055		1F	S16W13	3004
04 May	2009	2027	2036	M1.6			3004
04 May	2101	2117	2130		SF	S16W15	3004
04 May	2142	2145	2147		SF	S16W15	3004
04 May	2205	2209	2215	C1.4	SF	S16W15	3004
04 May	2248	2259	2320	C3.0	SF	S16W16	3004
04 May	2326	2327	2333		SF	S16W16	3004
04 May	2339	2340	2342		SF	S16W16	3004
05 May	0107	0136	0242	C2.5	SF	S16W17	3004
05 May	0126	0138	0144	C4.0			3004
05 May	0252	0303	0312	C3.8			3004
05 May	0316	0322	0326	C2.9	SF	S18W19	3004
05 May	0410	0424	0429	C2.9			3004
05 May	0439	0449	0455	C5.7			3004
05 May	0556	0621	A0701	C2.1	SF	S16W21	3004
05 May	0640	0646	0654	C1.9			3004
05 May	0703	0712	0715	C2.9			3004
05 May	0715	0720	0724	C3.8			3004
05 May	0741	0746	0752	C1.8			3006
05 May	0816	0822	0824	C1.0			3004
05 May	0824	0835	0841	C2.6			3004
05 May	0845	0903	0915	C4.1			3004

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
05 May	0953	1000	1004	C1.7			3004
05 May	1115	1119	1125	C6.5			3006
05 May	1144	1155	1159	C8.7			3004
05 May	1247	1251	1255	C1.7	SF	S16W24	3004
05 May	1256	1304	1308	C1.8	SF	S15W24	3004
05 May	1308	1316	1322	M2.2	SN	S16W24	3004
05 May	1334	1337	1341	C6.8			3004
05 May	1402	1410	1414	M2.7	SF	S29E64	3006
05 May	1530	1539	1543	C3.4	SF	S16W26	3004
05 May	1602	1612	1621	C1.4			3004
05 May	1744	1752	1801	B8.4			3006
05 May	1801	1804	1810	C1.4			3004
05 May	1825	1832	1837	C1.3			3006
05 May	1904	1909	1918	C1.7			3004
05 May	2215	2220	2227	C2.4	SF	S16W27	3004
05 May	2259	2303	2309	C2.6	SF	S16W29	3004
05 May	2332	2337	2344	C1.7			3004
05 May	2346	2350	2355	C3.1	SF	S16W29	3004
05 May	2356	2359	0003	C3.9	SF	S16W29	3004
06 May	0228	0233	0247	C1.6			3004
06 May	0410	0429	0432	C3.0			3004
06 May	0432	0439	0443	C3.2			3006
06 May	0645	0649	0654	C2.0			3006
06 May	0823	0835	0842	C1.4			3006
06 May	1018	1024	1034	C1.7			3006
06 May	1136	1144	1152	C1.3			3006
06 May	1212	1219	1225	C1.4			3006
06 May	1436	1441	1450	B9.4			3006
06 May	1513	1517	1524	C1.5			3004
06 May	1615	1622	1627	C4.8	SF	S16W38	3004
06 May	1932	1941	1947	C1.2			3004
06 May	2019	2034	2048	C1.6			
06 May	2142	2156	2208	C1.2			
06 May	2220	2224	2233	C1.1			
06 May	2346	2353	0001	C1.1			
07 May	0505	0511	0524	B7.0			3006
07 May	0556	0605	0609	C3.6	SF	S29E32	3006
07 May	0734	0739	0749	C1.0			3006

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
07 May	1235	1244	1256	B8.1			3004
07 May	1258	1307	1312	C1.4			3004
07 May	1500	1507	1513	C2.2			
08 May	0034	0041	0045	C1.7			3004
08 May	0338	0353	0402	C6.4			3007
08 May	0711	0716	0720	B9.0			3004
08 May	0740	0747	0753	C1.8			3004
08 May	0859	0906	0911	C1.0			3004
08 May	0939	0945	0955	B9.0			3004
08 May	1006	1008	1012	B8.7			3004
08 May	1217	1231	1236	C4.1	SF	S14W64	3004
08 May	1923	1938	1952	C8.2			3007

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 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

Crossed West Limb.
Absolute heliographic longitude: 77

			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

Crossed West Limb.
Absolute heliographic longitude: 63

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 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												
02 May	N12W58	33	10	4	Bxo	3	B								
03 May	N13W72	32	plage												
04 May	N13W86	34	plage												
								2	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 31

			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								
02 May	S19W41	16	70	2	Hsx	2	A								
03 May	S20W54	15	90	1	Hsx	1	A								
04 May	S21W67	15	90	1	Hsx	1	A								
05 May	S21W80	15	70	1	Hsx	1	A								
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 14

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 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												
02 May	S17W10	345	plage												
03 May	S17W24	345	plage												
04 May	S17W38	346	plage												
05 May	S17W51	346	plage												
06 May	S17W64	346	plage												
07 May	S17W78	346	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 344

			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								
02 May	S32E01	334	110	7	Hsx	2	A								
03 May	S31W14	335	80	2	Hsx	1	A								
04 May	S32W27	335	90	1	Hsx	1	A								
05 May	S32W40	335	90	2	Hsx	1	A								
06 May	S32W53	335	90	2	Hsx	1	A								
07 May	S32W67	335	90	2	Hsx	1	A								
08 May	S32W80	335	90	2	Hsx	1	A								
								3	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 334

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 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												
02 May	N13W31	6	plage												
03 May	N13W45	6	plage												
04 May	N13W59	7	plage												
05 May	N13W73	8	plage												
06 May	N13W86	8	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
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												
02 May	S23E08	327	plage												
03 May	S23W06	327	plage												
04 May	S23W20	328	plage												
05 May	S24W27	322	10	2	Bxo	3	B								
06 May	S24W40	322	plage												
07 May	S24W54	322	plage												
08 May	S24W67	322	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 327

			Region 3004												
02 May	S16E12	323	30	6	Bxo	9	B								
03 May	S15W02	322	100	7	Csi	21	B	2			4				
04 May	S16W17	325	300	9	Dkc	18	BG	12	3		17	3			
05 May	S16W29	324	500	9	Dkc	26	BD	27	1		10				
06 May	S16W42	324	490	9	Dkc	25	BD	5			2				
07 May	S16W56	324	490	9	Dkc	25	BD	1							
08 May	S16W69	324	480	8	Dkc	22	BD	4			1				
								51	4	0	34	3	0	0	0

Still on Disk.
Absolute heliographic longitude: 322

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 3005												
02 May	N20E05	330	20	3	Bxo	3	B								
03 May	N20W08	329	plage												
04 May	N20W22	330	plage												
05 May	N20W36	331	plage												
06 May	N20W49	331	plage												
07 May	N20W63	331	plage												
08 May	N20W76	331	30	3	Cao	3	B								
								0	0	0	0	0	0	0	0
Still on Disk. Absolute heliographic longitude: 330															
			Region 3006												
03 May	S27E76	246	plage							1					
04 May	S27E62	246	50	6	Cro	4	B		1						
05 May	S29E50	245	50	9	Cao	4	B	3	1		1				
06 May	S29E37	245	70	9	Cao	8	B	6							
07 May	S29E23	245	80	9	Cao	10	B	2			1				
08 May	S29E10	245	80	9	Cao	10	B								
								11	2	1	2	0	0	0	0
Still on Disk. Absolute heliographic longitude: 245															
			Region 3007												
08 May	S23E64	190	60	5	Cao	3	B	2							
								2	0	0	0	0	0	0	0
Still on Disk. Absolute heliographic longitude: 190															

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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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