Space Weather Highlights
23 May - 29 May 2022

SWPC PRF 2439
30 May 2022

Solar activity ranged from very low to moderate levels throughout the week. Moderate solar activity was observed on 25 May when an M1/1n flare was observed at 25/1824 UTC from Region 3016 (S19, L=074, class/area=Dao/180 on 18 May), which was the largest event of the period. Solar activity was low on 23-24, and 26-28 May, and very low levels were observed on 29 May. Regions 3014 (N24, L=105, class/area=Dkc/1190 on 20 May) and 3017 (N13, L=085, class/area=Dai/130 on 23 May) were the most active and complex regions on the disk this period. No Earth-directed CMEs were detected this period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was normal to moderate throughout the week.

Geomagnetic field activity reached minor storm levels on 27-28 May due to negative polarity CH HSS influence. Geomagnetic field conditions were quiet and quiet to unsettled throughout the remainder of the period.

Space Weather Outlook
30 May - 25 June 2022

Solar activity is expected to be at mostly low levels throughout the period. M-class flare activity is possible on 07-22 Jun.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 30 May-04 Jun, and be predominately normal to moderate on 05-25 Jun.

Geomagnetic field activity is expected to reach minor storm levels on 24 Jun, and active levels on 12-13, 16-17, and 23 Jun, due to recurrent CH HSS influences. Quiet and quiet to unsettled conditions are expected to prevail throughout 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
23 May	158	132	1050	C1.2	2	0	0	1	0	0	0	0
24 May	147	137	920	C1.0	3	0	0	4	0	0	0	0
25 May	137	93	870	B8.8	2	1	0	3	1	0	0	0
26 May	123	87	670	B7.1	9	0	0	3	0	0	0	0
27 May	114	69	220	B6.1	6	0	0	6	0	0	0	0
28 May	102	34	180	B4.0	2	0	0	1	0	0	0	0
29 May	98	42	200	B2.1	0	0	0	5	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
23 May	6.8e+04	3.6e+04	4.6e+07
24 May	4.9e+04	3.6e+04	4.8e+07
25 May	5.8e+04	3.6e+04	1.9e+07
26 May	1.4e+06	3.8e+04	2.4e+07
27 May	8.3e+05	3.7e+04	4.3e+06
28 May	9.0e+04	3.4e+04	1.9e+06
29 May	6.9e+04	3.4e+04	2.0e+07

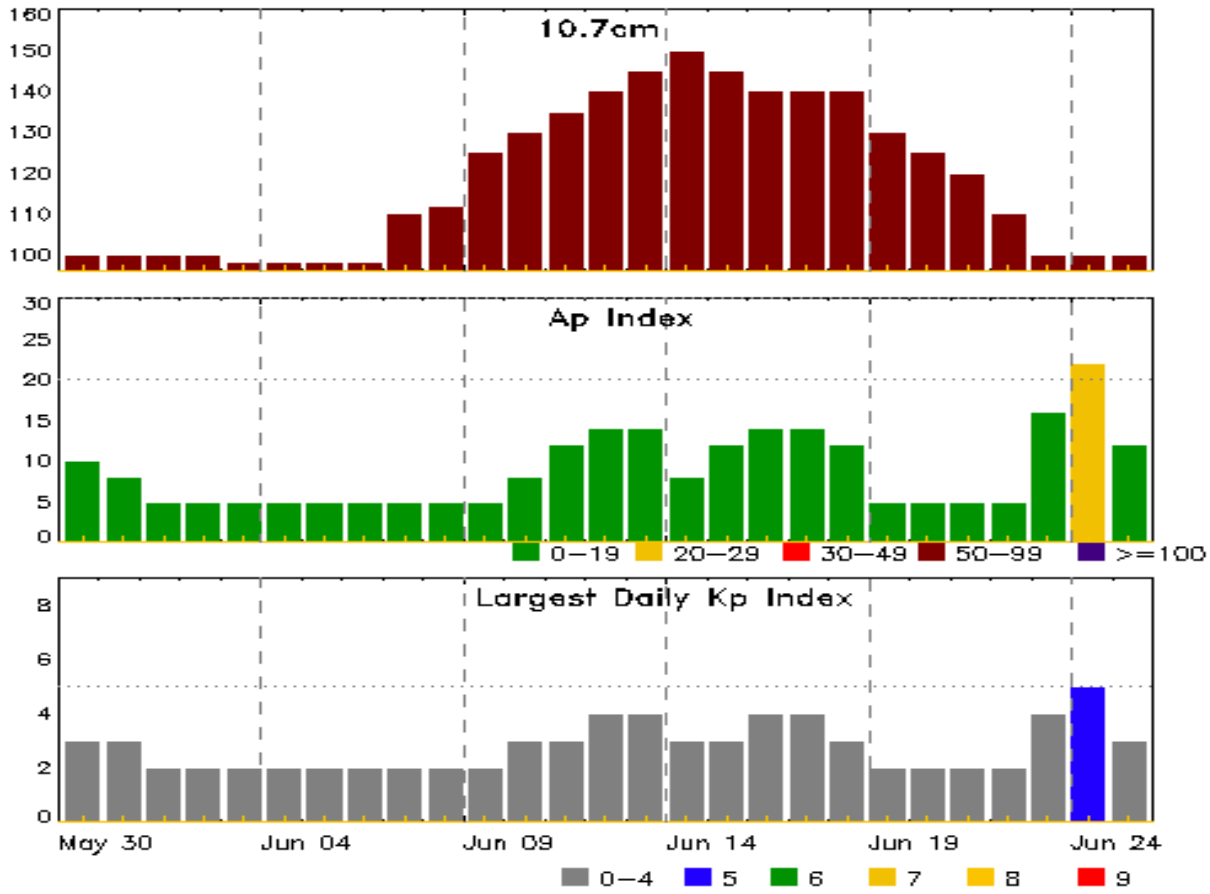
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
23 May	6	1-1-3-3-2-1-1-0	11	2-1-5-4-0-0-0-0	5	2-1-3-2-1-1-0-0
24 May	3	0-0-1-2-2-1-1-1	4	1-1-0-3-2-0-1-1	4	1-2-1-1-2-1-0-1
25 May	7	1-1-2-3-2-2-2-2	6	2-3-2-2-0-1-1-1	6	1-2-2-2-1-1-2-2
26 May	6	1-1-1-1-3-2-2-1	2	1-2-1-1-0-0-0-0	4	1-1-1-1-2-1-1-0
27 May	14	0-2-2-2-5-3-3-3	24	0-1-1-1-6-6-3-2	17	1-1-2-2-5-4-3-4
28 May	19	4-5-4-3-3-1-2-2	46	5-6-7-5-4-3-1-2	24	5-5-5-3-2-2-1-2
29 May	14	2-2-4-2-3-3-3-3	31	3-4-6-4-4-5-3-2	15	3-3-3-3-3-3-3-3

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
24 May 2304	ALERT: Type II Radio Emission	24/2243
25 May 1832	SUMMARY: 10cm Radio Burst	25/1816 - 1818
25 May 1842	ALERT: Type IV Radio Emission	25/1824
25 May 1847	ALERT: Type II Radio Emission	25/1817
27 May 1227	WARNING: Geomagnetic K = 4	27/1226 - 2359
27 May 1412	ALERT: Geomagnetic K = 4	27/1400
27 May 1413	WARNING: Geomagnetic K = 5	27/1412 - 2100
27 May 1418	ALERT: Geomagnetic K = 5	27/1417
27 May 2032	EXTENDED WARNING: Geomagnetic K = 5	27/1412 - 28/0600
27 May 2032	EXTENDED WARNING: Geomagnetic K = 4	27/1226 - 28/1200
28 May 0040	ALERT: Geomagnetic K = 5	28/0040
28 May 0544	ALERT: Geomagnetic K = 5	28/0542
28 May 0546	EXTENDED WARNING: Geomagnetic K = 4	27/1226 - 28/2100
28 May 0547	EXTENDED WARNING: Geomagnetic K = 5	27/1412 - 28/1800
28 May 0900	ALERT: Geomagnetic K = 5	28/0859
28 May 1750	ALERT: Type II Radio Emission	28/1558
29 May 0821	WARNING: Geomagnetic K = 4	29/0820 - 2100

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
30 May	100	10	3	13 Jun	145	14	4
31	100	8	3	14	150	8	3
01 Jun	100	5	2	15	145	12	3
02	100	5	2	16	140	14	4
03	98	5	2	17	140	14	4
04	98	5	2	18	140	12	3
05	98	5	2	19	130	5	2
06	98	5	2	20	125	5	2
07	110	5	2	21	120	5	2
08	112	5	2	22	110	5	2
09	125	5	2	23	100	16	4
10	130	8	3	24	100	22	5
11	135	12	3	25	100	12	3
12	140	14	4				

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 May	1809	1824	1843	M1.3	0.018	1N	S19W41	3016	82	160		3	1

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
23 May	0025	0041	0049	C3.1			3019
23 May	0842	0847	0851	C3.4			
23 May	1043	1050	1054	C5.2	SF	N15W16	3017
24 May	0235	0238	0248		SF	N18W75	
24 May	0249	0252	0254		SF	N18W75	
24 May	0321	0328	0328		SF	N18W75	
24 May	0603	0610	0620	C3.1			3014
24 May	0900	0905	0915	C4.5	SF	N19W30	3017
24 May	1150	1205	1216	C3.6			3010
24 May	1326	1332	1335	C1.4			3011
24 May	2203	2217	2225	C5.1	SF	S11E80	3023
25 May	0452	0502	0511	C1.5			3019
25 May	1107	1119	1127	C2.0	SF	N11W03	3019
25 May	1140	1144	1149		SF	N10W03	3019
25 May	1622	1640	1658	C2.1	SF	N13W04	3019
25 May	1809	1824	1843	M1.3	1N	S19W41	3016
26 May	0210	0220	0225	C2.9			3014
26 May	0253	0302	0307	C2.1			3017
26 May	0327	0342	0352	C2.9			
26 May	0352	0356	0400	C3.4			3017
26 May	0442	0449	0457	C7.2	SF	N10W63	3015
26 May	1002	1007	1013	C1.3			3017
26 May	1308	1319	1325	C1.6	SF	N12W67	3015
26 May	1731	1752	1801	C2.8			3017
26 May	1913	1921	1927	C1.7	SF	N12W67	3017
27 May	0031	0039	0043	C1.0			3024
27 May	0216	0230	0239	C1.9			
27 May	1110	1127	1137	C2.3	SF	N13E10	3021
27 May	1151	1200	1211	C1.6			3021
27 May	1250	1253	1257		SF	S35E49	3024

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
27 May	1303	1303	1308		SF	N13E10	3021
27 May	1530	1543	1552	C1.3			3023
27 May	1627	1628	1630		SF	N13W81	3017
27 May	1722	1723	1726		SF	N13W80	3015
27 May	1926	1933	1938	C1.4	SF	S32E46	3024
27 May	2353	0001	0007	B7.7			3021
28 May	0129	0138	0147	B7.5			
28 May	0637	0646	0653	C1.3			
28 May	1114	1118	1122		SF	N13W04	3021
28 May	1853	1904	1912	C1.8			3021
29 May	0042	0053	0102	B7.4			
29 May	1606	1614	1618	B4.2	SF	N27W48	3025
29 May	1702	1705	1709	B7.1	SF	N27W47	3025
29 May	1739	1748	1752	B5.0			3025
29 May	1805	1812	1816	B5.5	SF	N27W48	3025
29 May	1937	1947	1952	B4.7	SF	N27W49	3025
29 May	2050	2100	2108	B7.2	SF	N27W49	3025

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 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								
09 May	S32W90	332	60	1	Hsx	1	A								
								3	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 334

		Region 3010													
12 May	S13E71	131	30	2	Hsx	1	A	2							
13 May	S15E61	128	90	8	Dso	5	B								
14 May	S15E48	128	190	9	Dso	12	B	3			4				
15 May	S15E35	128	190	9	Dso	12	B				1				
16 May	S16E24	125	100	14	Cso	23	B				1				
17 May	S15E10	126	60	15	Cso	19	B	1							
18 May	S15W04	127	70	14	Cso	20	B				1				
19 May	S16W18	128	50	11	Cso	16	B	1			3				
20 May	S14W31	127	50	10	Cro	9	B				2				
21 May	S14W44	127	20	6	Cro	9	B	2			1				
22 May	S18W58	128	10	6	Bxo	2	B								
23 May	S17W72	129	10	6	Bxo	3	B								
24 May	S17W86	130	0	6	Bxo	3	B	1							
								10	0	0	13	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 127

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 3011												
13 May	N16E66	123	30	6	Cro	3	B	2							
14 May	N16E53	123	30	4	Cro	2	B	2			3				
15 May	N16E40	123	10	5	Bxo	2	B								
16 May	N16E25	124	10	5	Bxo	3	B				1				
17 May	N18E08	128	0		Axx	1	A								
18 May	N18W06	129	plage					1							
19 May	N14W20	130	plage												
20 May	N16W34	130	plage												
21 May	N15W47	130	30	3	Cao	3	B	2			1				
22 May	N15W61	131	10	1	Axx	1	A								
23 May	N16W74	131	20	3	Cro	3	B								
24 May	N18W88	132	10	3	Cro	3	B								
								7	0	0	5	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 129

			Region 3013												
14 May	S28E29	147	10	2	Bxo	3	B								
15 May	S28E16	147	10	1	Axx	1	A								
16 May	S27E03	146	0	3	Axx	2	A								
17 May	S27W11	147	plage												
18 May	S27W25	148	plage												
19 May	S27W39	149	plage												
20 May	S27W53	149	plage												
21 May	S27W67	150	plage												
22 May	S27W81	151	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 146

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 3014												
15 May	N21E53	110	100	5	Cao	7	B								
16 May	N22E44	105	140	10	Dac	13	BD				1				
17 May	N22E31	105	220	10	Dac	18	BG	4			2				
18 May	N21E17	106	850	11	Ekc	30	BGD	3	1		5				
19 May	N22E04	106	1100	11	Ekc	30	BGD	3	2		10				
20 May	N24W09	105	1190	10	Dkc	12	BGD	2	1		3	1			
21 May	N22W24	107	940	11	Ekc	14	BGD	2			1				
22 May	N22W38	108	890	11	Ekc	18	BGD	3							
23 May	N22W50	107	800	13	Ekc	18	BD								
24 May	N22W62	106	720	10	Dkc	16	BD	1							
25 May	N22W74	104	550	10	Dkc	10	BD								
26 May	N22W87	104	270	8	Dkc	6	BD	1							
								19	4	0	22	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 106

			Region 3015												
15 May	N14E55	108	60	4	Dao	4	B								
16 May	N13E42	107	110	5	Hsx	7	A								
17 May	N13E28	108	90	5	Hsx	5	A	1							
18 May	N13E14	109	100	5	Hsx	5	A								
19 May	N14E01	109	50	4	Hsx	5	A	1			4				
20 May	N14W13	109	20	1	Cso	2	B								
21 May	N14W25	108	10	1	Hsx	1	A								
22 May	N14W39	109	10	1	Hsx	1	A								
23 May	N14W53	110	plage												
24 May	N11W67	111	plage												
25 May	N10W82	112	plage												
								2	0	0	4	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 109

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 3016												
16 May	S18E73	76	100	2	Hsx	3	A								
17 May	S18E62	74	100	9	Dso	3	B								
18 May	S19E49	74	180	9	Dao	6	B								
19 May	S19E35	75	140	11	Eao	4	B								
20 May	S19E21	75	70	9	Dao	5	B								
21 May	S19E09	74	40	7	Cao	2	B								
22 May	S19W07	77	20	7	Cao	4	B								
23 May	S17W20	77	10	7	Bxo	4	B								
24 May	S18W33	77	10	1	Axx	1	A								
25 May	S18W47	77	plage						1			1			
26 May	S19W61	78	plage												
27 May	S19W75	79	plage												
28 May	S19W89	80	plage												
								0	1	0	0	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 77

			Region 3017												
16 May	N14E66	84	20	6	Cro	6	BG		1		1				
17 May	N14E52	84	20	6	Cro	4	B								
18 May	N14E40	82	20	9	Cro	2	B								
19 May	N13E27	83	30	10	Cro	9	B		1			1			
20 May	N14E14	82	30	6	Cro	6	B	1			2				
21 May	N14W00	83	30	7	Cro	7	B								
22 May	N14W14	84	40	10	Cro	13	B	3			1				
23 May	N13W28	85	130	10	Dai	13	BG				1				
24 May	N13W42	86	120	12	Eso	9	B								
25 May	N12W57	87	110	8	Dso	4	B								
26 May	N12W71	88	110	8	Dso	4	B	5			1				
27 May	N12W85	89	10	1	Axx	1	A				1				
								9	2	0	7	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 83

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 3018												
17 May	S12E54	82	20	3	Cro	5	B								
18 May	S11E41	82	10	2	Axx	4	A								
19 May	S11E26	84	0	1	Axx	3	A								
20 May	S11E12	83	plage												
21 May	S11W02	85	plage												
22 May	S11W16	86	plage												
23 May	S11W30	87	plage												
24 May	S11W44	88	plage												
25 May	S11W58	88	plage												
26 May	S11W72	89	plage												
27 May	S11W86	90	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 85

			Region 3019												
19 May	N11E69	41	20	4	Cro	3	B								
20 May	N11E55	41	20	2	Cro	4	A	1				1			
21 May	N11E41	42	30	6	Cro	4	B								
22 May	N11E27	43	20	4	Cro	4	B								
23 May	N12E17	40	10	4	Bxo	4	B	1							
24 May	N14E05	39	10	3	Axx	4	A								
25 May	N14W09	39	plage					2			3				
26 May	N14W22	39	0	1	Axx	1	A								
27 May	N14W36	40	0	1	Axx	1	A								
28 May	N14W50	41	plage												
29 May	N14W64	41	plage												
								4	0	0	3	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 39

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 3020												
22 May	S20E58	12	20	2	Hsx	1	A								
23 May	S21E44	13	40	1	Hsx	1	A								
24 May	S21E31	13	30	1	Hsx	1	A								
25 May	S21E18	12	30	1	Hsx	1	A								
26 May	S21E05	12	20	1	Hsx	1	A								
27 May	S21W09	13	20	1	Hrx	1	A								
28 May	S21W23	14	plage												
29 May	S21W37	14	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 12

			Region 3021												
22 May	N14E67	2	20	3	Cro	4	B								
23 May	N14E54	3	30	6	Dro	6	B								
24 May	N13E40	4	10	5	Bxo	5	B								
25 May	N13E28	2	10	4	Bxo	4	B								
26 May	N12E14	3	10	2	Bxo	2	B								
27 May	N13E02	3	10	3	Bxo	3	B	2			2				
28 May	N13W10	1	0		Axx	1	A	1			1				
29 May	N13W24	1	plage												
								3	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 3

			Region 3022												
24 May	S08E57	347	10	3	Bxo	5	B								
25 May	S08E43	347	0		Axx	1	A								
26 May	S08E29	348	plage												
27 May	S08E15	349	plage												
28 May	S08E01	350	plage												
29 May	S08W13	350	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 350

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 3023												
24 May	S12E76	328	plage					1							
25 May	S13E65	325	120	3	Hsx	2	A								
26 May	S14E50	327	180	3	Hax	2	A								
27 May	S14E38	326	120	3	Hax	2	A	1							
28 May	S13E25	325	110	3	Hax	2	A								
29 May	S12E12	325	110	3	Hax	3	A								
								2	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 325

			Region 3024												
25 May	S33E68	322	50	1	Hsx	1	A								
26 May	S33E54	323	80	2	Hsx	1	A								
27 May	S33E43	321	60	2	Hsx	1	A	2			2				
28 May	S33E31	320	70	2	Hsx	1	A								
29 May	S33E18	319	60	1	Hsx	1	A								
								2	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 319

			Region 3025												
29 May	N28W53	30	30	5	Cro	8	B				5				
								0	0	0	5	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 30

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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https://www.ngdc.noaa.gov/stp/satellite/goes-r.html -- NCEI GOES data textarchive

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