

Solar activity was at low levels most of the period with the exception of 11 Mar when it reached moderate levels due to an M2/Sf flare at 11/2232 UTC from Region 2964 (S28, L=012, class/area Dso/070 on 10 Mar). Associated with the M2 flare was a CME off the SW limb beginning at 12/0000 UTC in SOHO/LASCO C2 imagery. WSA-Enlil analysis showed no Earth-directed component. Two other CMEs had Earth-directed components, however. The first was on 06 Mar that began as a filament eruption in the NE quadrant centered near N15W35 beginning at 06/2252 UTC. A subsequent CME was observed off the NW limb beginning at 07/0000 UTC. WSA-Enlil analysis showed a glancing blow arrival late on 10 Mar. The second was associated with a long duration C2 flare at 10/2045 UTC near Region 2962 (N26, L=324, Cro/030 on 06 Mar). A partial halo CME was observed from that event beginning at 10/1912 UTC. WSA-Enlil analysis showed an impact arrival around late on 13 Mar.

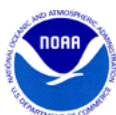
No proton events were observed at geosynchronous orbit. A proton enhancement of the greater than 10 MeV protons to 2 pfu was observed at 11/0720 UTC likely associated with the long duration C2 flare at 10/2045 UTC.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 07-10 March with a peak of 10,194 pfu observed at 07/1525 UTC. Normal to moderate levels were observed on 11-13 Mar.

Geomagnetic field activity began under waning negative polarity CH HSS conditions. Solar wind speed decreased from approximately 500 km/s to at or below 400 km/s by late on 08 Mar. Nominal levels followed through most of 10 Mar. The field responded with quiet to unsettled periods on 07 Mar through late on 10 Mar. At 10/1642 UTC, density increased to 32 1/cm³ while total field increased to a maximum of 18 nT at 10/2057 UTC while the Bz component was between +16/-10 nT as the 06 Mar CME began to impact the geomagnetic field. Solar wind speed was mostly between 350-420 km/s. Activity persisted through 12/0600 UTC with several prolonged periods of southward Bz. The geomagnetic field responded with active levels late on 10 Mar, followed by quiet to G1 (Minor) storm conditions on 11-12 Mar. Shortly following, at 13/1007 UTC, an interplanetary shock was observed at the DSCOVR spacecraft followed by a 33 nT geomagnetic sudden impulse at 13/1052 UTC (Wingst magnetometer) as the 10 Mar CME began to impact the geomagnetic field. Solar wind speed initially increased to 603 km/s at 13/1034 UTC, but then quickly subsided to between 430-500 km/s. Total field increased to a maximum of 25 nT at 13/1744 UTC and remained there through the end of the period. Southward deflections of the Bz component to near -24 nT were also observed. The geomagnetic field responded with active to G2 (Moderate) storm conditions on 13 Mar.

Space Weather Outlook
14 March - 09 April 2022

Solar activity is expected to be at very low to low levels with a chance for M-class (R1-R2,



Minor-Moderate) flares on 14-23 Mar due to potential flare activity from Region 2965. Very low to low activity is expected thereafter.

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 16-19 Mar due to CME influence. High levels are expected once again on 02-06 Apr due to recurrent CH HSS influence.

Geomagnetic field activity is expected to be at unsettled to G2 (Moderate) storm levels on 14 Mar followed by unsettled to G1 (Minor) storm levels on 15 Mar as activity from the 10 Mar CME persists. Unsettled to active levels are expected on 20-22 Mar, 26-27 Mar, and 31 Mar-03 Apr with G1 (Minor) storm conditions likely on 01 Apr due to recurrent CH HSSs.



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
07 March	118	84	510	B4.7	2	0	0	1	0	0	0	0
08 March	115	93	480	B4.4	2	0	0	1	0	0	0	0
09 March	115	89	920	B3.6	2	0	0	0	0	0	0	0
10 March	127	90	1170	B4.3	1	0	0	0	0	0	0	0
11 March	127	81	1080	B6.8	6	1	0	2	0	0	0	0
12 March	125	93	1040	B5.1	3	0	0	0	0	0	0	0
13 March	123	64	940	B4.7	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	
	07 March	1.1e+05	4.1e+04	3.5e+08
08 March	5.1e+04	4.1e+04	2.1e+08	
09 March	6.3e+04	4.2e+04	2.6e+08	
10 March	1.8e+05	4.2e+04	2.9e+08	
11 March	2.8e+06	7.3e+04	2.6e+06	
12 March	9.8e+06	5.3e+04	1.2e+06	
13 March	2.5e+07	4.6e+04	4.6e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	07 March	7	2-2-1-2-3-2-1-1	13	1-2-1-4-4-4-2-1	9
08 March	5	2-2-0-1-1-2-1-2	3	2-1-0-2-1-0-1-1	6	3-2-1-1-1-1-1-2
09 March	4	2-0-1-1-2-1-0-2	3	1-1-0-1-3-1-0-0	5	3-1-1-1-1-0-1-2
10 March	7	1-1-1-2-2-2-3-2	20	1-1-4-3-5-4-4-2	10	2-1-2-2-2-3-4-2
11 March	15	4-3-4-2-3-2-2-3	22	2-3-4-4-4-5-2-3	20	4-3-4-2-3-3-3-5
12 March	7	3-3-2-1-1-1-1-1	0	3-5-4-1-3-0-0-0	13	5-4-3-1-1-0-1-2
13 March	30	1-1-0-4-5-4-5-6	65	0-0-0-5-7-7-7-5	7	2-1-0-4-6-5-6-6



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
07 Mar 0602	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	06/1250
08 Mar 0500	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	06/1250
09 Mar 0459	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	06/1250
10 Mar 0459	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	06/1250
10 Mar 1926	WARNING: Geomagnetic K = 4	10/1925 - 11/0300
10 Mar 1948	ALERT: Geomagnetic K = 4	10/1936
11 Mar 0034	EXTENDED WARNING: Geomagnetic K = 4	10/1925 - 11/0900
11 Mar 0648	WARNING: Geomagnetic K = 5	11/0650 - 1200
11 Mar 0855	EXTENDED WARNING: Geomagnetic K = 4	10/1925 - 11/1500
11 Mar 1802	WATCH: Geomagnetic Storm Category G2 predicted	
11 Mar 2202	WARNING: Geomagnetic K = 4	11/2202 - 12/0900
11 Mar 2317	ALERT: Geomagnetic K = 4	11/2316
11 Mar 2328	WARNING: Geomagnetic K = 5	11/2328 - 12/0600
12 Mar 0009	ALERT: Geomagnetic K = 5	11/2359
12 Mar 0302	ALERT: Geomagnetic K = 5	12/0259
12 Mar 1847	WATCH: Geomagnetic Storm Category G1 predicted	
13 Mar 1043	WARNING: Geomagnetic Sudden Impulse expected	13/1045 - 1115
13 Mar 1102	WARNING: Geomagnetic K = 4	13/1100 - 2100
13 Mar 1110	SUMMARY: Geomagnetic Sudden Impulse	13/1052
13 Mar 1203	ALERT: Geomagnetic K = 4	13/1159
13 Mar 1238	EXTENDED WARNING: Geomagnetic K = 4	13/1100 - 14/0600
13 Mar 1239	WARNING: Geomagnetic K = 5	13/1240 - 2359
13 Mar 1350	ALERT: Geomagnetic K = 5	13/1344
13 Mar 1356	WARNING: Geomagnetic K = 6	13/1357 - 1800
13 Mar 1451	ALERT: Geomagnetic K = 6	13/1441
13 Mar 1630	ALERT: Geomagnetic K = 5	13/1626
13 Mar 1758	EXTENDED WARNING: Geomagnetic K = 6	13/1357 - 2359

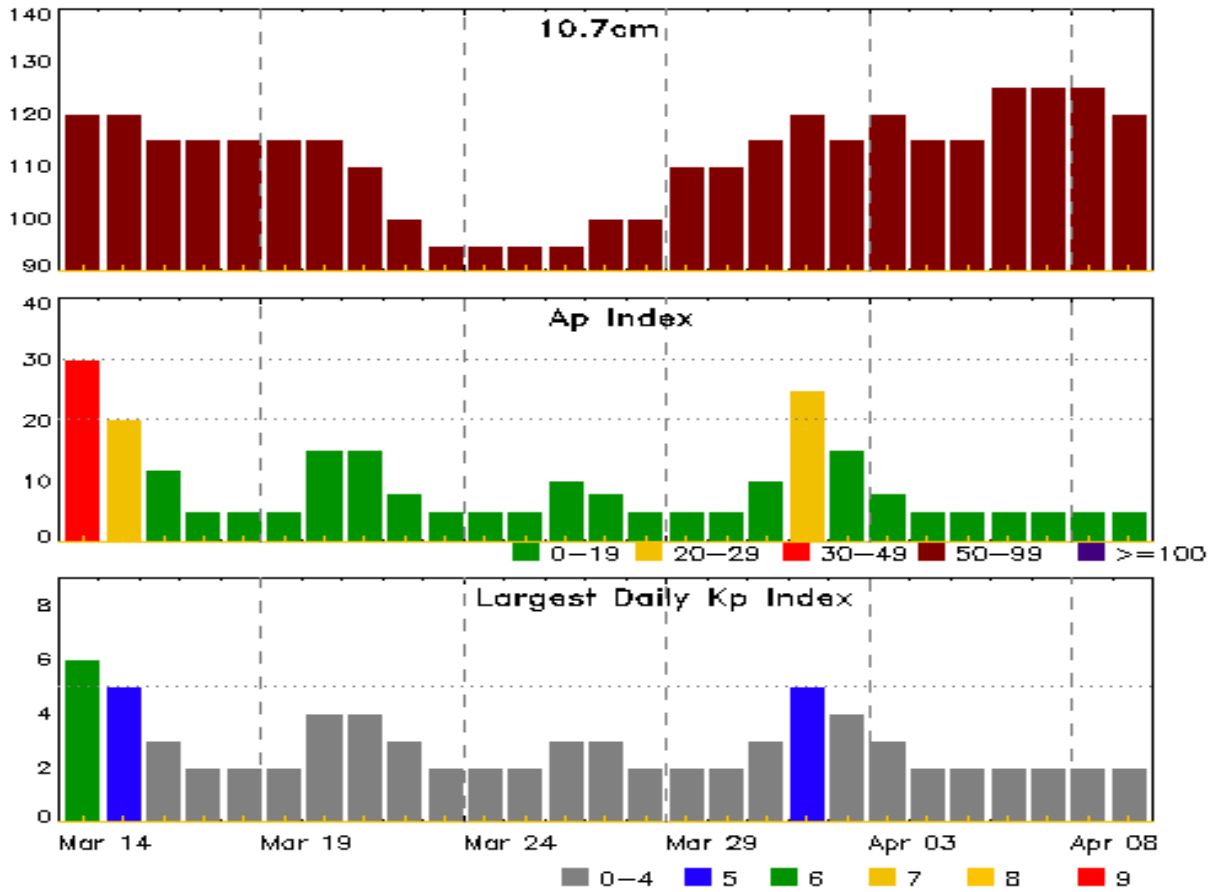


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
13 Mar 1758	EXTENDED WARNING: Geomagnetic K = 5	13/1240 - 14/0600
13 Mar 1813	EXTENDED WARNING: Geomagnetic K = 4	13/1100 - 14/1200
13 Mar 1910	ALERT: Geomagnetic K = 5	13/1900
13 Mar 2003	ALERT: Geomagnetic K = 6	13/1956
13 Mar 2228	EXTENDED WARNING: Geomagnetic K = 6	13/1357 - 14/0600
13 Mar 2258	ALERT: Geomagnetic K = 5	13/2257
13 Mar 2352	ALERT: Geomagnetic K = 6	13/2352



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
14 Mar	120	30	6	28 Mar	100	5	2
15	120	20	5	29	110	5	2
16	115	12	3	30	110	5	2
17	115	5	2	31	115	10	3
18	115	5	2	01 Apr	120	25	5
19	115	5	2	02	115	15	4
20	115	15	4	03	120	8	3
21	110	15	4	04	115	5	2
22	100	8	3	05	115	5	2
23	95	5	2	06	125	5	2
24	95	5	2	07	125	5	2
25	95	5	2	08	125	5	2
26	95	10	3	09	120	5	2
27	100	8	3				



Energetic Events

Date	Time			X-ray	Optical Information			Peak		Sweep Freq		
	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux 245	Radio Flux 2695	Intensity II	Intensity IV
11 Mar	2213	2232	2238	M2.2	0.011	SF	S28W63		2964	100		

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
07 Mar	0823	0830	0834	B8.8	SF	S19W04	2961
07 Mar	1458	1504	1510	C1.1			2961
07 Mar	2034	2042	2052	B9.4			
07 Mar	2233	2249	2313	C1.8			
08 Mar	0138	0146	0156	B7.9			
08 Mar	0301	0313	0322	C2.0			
08 Mar	0741	0751	0757	B8.7	SF	S14W58	2961
08 Mar	0853	0901	0909	B9.2			
08 Mar	0943	0950	0958	B6.5			2964
08 Mar	1000	1009	1017	B8.6			
08 Mar	1146	1152	1159	B6.8			2964
08 Mar	1356	1403	1422	B5.7			2965
08 Mar	1421	1430	1443	B6.8			
08 Mar	1557	1603	1607	B6.0			2965
08 Mar	1705	1711	1715	B6.3			2965
08 Mar	2222	2227	2232	C1.1			
09 Mar	0634	0648	0656	B6.3			2964
09 Mar	0656	0702	0710	B6.5			2964
09 Mar	0749	0756	0803	C1.0			2965
09 Mar	0844	0855	0903	B7.7			2965
09 Mar	1124	1133	1139	B7.3			2965
09 Mar	1242	1249	1254	C1.0			2965
10 Mar	0150	0156	0207	B5.4			2960
10 Mar	0918	0933	0943	B7.7			2965
10 Mar	2337	2343	2349	C2.6			
11 Mar	0837	0846	0853	C2.1			
11 Mar	1111	1122	1134	C2.2			2964
11 Mar	1256	1308	1317	C1.6			2964
11 Mar	B1324	U1327	A1329		SF	N21E48	2965
11 Mar	1330	1334	1338	C2.1			2965



Flare List

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
11 Mar	1439	1452	1508	C1.6			2965
11 Mar	1528	1538	1548	C1.4			2964
11 Mar	2213	2232	2238	M2.2	SF	S28W63	2964
12 Mar	0016	0023	0034	C1.0			2965
12 Mar	0518	0528	0535	C2.0			2965
12 Mar	1509	1520	1536	C1.2			2962
13 Mar	0002	0014	0027	C1.4			2968
13 Mar	0312	0323	0331	C4.9	SF	N30W36	2962
13 Mar	0559	0615	0631	C1.4			2964
13 Mar	1147	1155	1200	B9.0			2965
13 Mar	1935	1958	2003	C1.3			2964
13 Mar	2225	2234	2241	B9.1			2965
13 Mar	2324	2341	2355	C3.9			2964



Region Summary

Date	Location		Sunspot Characteristics				Flares							
	Lat CMD	Lon	Helio 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
								C	M	X	S	1	2	3

Region 2956

27 Feb	N25E19	80	10	1	Axx	2	A											
28 Feb	N25E06	79	10	4	Bxo	4	B											
01 Mar	N27W09	81	10	2	Bxo	3	B											
02 Mar	N25W23	82	10	2	Axx	2	A											
03 Mar	N25W37	83	plage															
04 Mar	N25W51	84	plage															
05 Mar	N25W65	85	plage															
06 Mar	N25W79	86	plage															
									0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 79

Region 2957

27 Feb	S13E57	42	10	3	Bxo	4	B	1										
28 Feb	S16E49	35	10	3	Bxo	6	B											
01 Mar	S12E34	37	30	3	Cro	5	B				2							
02 Mar	S15E07	52	180	12	Eai	10	BG	1			5							
03 Mar	S15E13	33	140	8	Dso	7	B											
04 Mar	S14W04	37	230	11	Dao	13	B											
05 Mar	S16W18	38	240	10	Dai	14	B											
06 Mar	S15W31	38	200	11	Eai	13	B	1			1							
07 Mar	S17W46	39	120	10	Dso	7	B											
08 Mar	S17W57	37	100	10	Dso	3	B											
09 Mar	S16W66	33	100	1	Hsx	1	A											
10 Mar	S16W79	33	90	1	Hsx	1	A											
11 Mar	S16W92	33	30	1	Hsx	1	A											
									3	0	0	8	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 37



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Helio Lon	Area 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
Region 2958																		
28 Feb	N16E50	34	10	2	Cro	3	B											
01 Mar	N18E37	34	20	3	Cro	2	B											
02 Mar	N20E24	34	50	2	Bxo	2	B	1	1				1					
03 Mar	N17E11	35	60	2	Bxo	2	B	1										
04 Mar	N17W03	36	plage															
05 Mar	N17W15	35	20	2	Bxo	3	B											
06 Mar	N17W29	36	10	1	Axx	1	A											
07 Mar	N17W43	36	plage															
08 Mar	N17W56	36	plage															
09 Mar	N17W69	36	plage															
10 Mar	N17W82	36	plage															
								2	1	0	0	0	1	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 36

Region 2959

03 Mar	S19E23	23	10	1	Axx	1	A											
04 Mar	S19E09	24	plage															
05 Mar	S19W05	25	plage															
06 Mar	S19W19	26	plage															
07 Mar	S19W33	26	plage															
08 Mar	S19W46	26	plage															
09 Mar	S19W59	26	plage															
10 Mar	S19W72	26	plage															
11 Mar	S19W85	26	plage															
								0	0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 25



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares															
	Lat	CMD	Helio Lon	Area 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
Region 2960																							
02 Mar	S21E81		339	plage								2											
03 Mar	S21E67		339	110	5	Dao	4	B	1				1										
04 Mar	S21E57		336	430	6	Dho	5	B	1				2										
05 Mar	S20E45		335	450	10	Dki	8	B	1				2										
06 Mar	S20E31		336	420	10	Dhi	9	B															
07 Mar	S21E18		335	340	11	Ehi	14	BG															
08 Mar	S21E07		333	320	12	Ehi	14	BG															
09 Mar	S20W05		332	400	11	Eho	7	B															
10 Mar	S20W18		332	390	11	Eho	5	B															
11 Mar	S20W31		332	380	9	Dho	2	B															
12 Mar	S20W45		333	320	8	Cho	2	B															
13 Mar	S20W61		335	300	7	Cho	2	B															
									5	0	0	5	0	0	0	0	0						

Still on Disk.

Absolute heliographic longitude: 332

Region 2961

03 Mar	S13E05		41	40	5	Cao	6	B													
04 Mar	S13W15		48	50	5	Cao	7	B													
05 Mar	S14W29		49	30	6	Cro	7	B	1				1								
06 Mar	S14W43		50	10	1	Axx	1	A					1								
07 Mar	S13W55		48	10	2	Bxo	3	B	1												
08 Mar	S13W68		48	plage									1								
09 Mar	S13W81		48	plage																	
									2	0	0	3	0	0	0	0	0				

Crossed West Limb.

Absolute heliographic longitude: 41



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares										
	Lat CMD	Helio Lon	Area 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
								C	M	X	S	1	2	3	4		
Region 2962																	
05 Mar	N26E55	325	30	2	Bxo	2	B	3									
06 Mar	N26E43	324	30	4	Cro	8	B	3				1					
07 Mar	N28E30	323	30	7	Cro	5	B										
08 Mar	N27E18	322	20	7	Cro	4	B										
09 Mar	N27E05	322	10	1	Axx	1	A										
10 Mar	N27W08	322	10	1	Axx	1	A										
11 Mar	N27W21	322	plage														
12 Mar	N27W35	323	plage					1									
13 Mar	N27W49	323	plage					1				1					
								8	0	0		2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 322

Region 2963

07 Mar	S18W13	6	10	5	Bxo	5	B										
08 Mar	S18W26	6	10	5	Bxo	4	B										
09 Mar	S18W39	6	plage														
10 Mar	S18W52	9	plage														
11 Mar	S18W66	7	plage														
12 Mar	S18W80	8	plage														
								0	0	0		0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 6

Region 2964

08 Mar	S27W30	10	10	6	Dro	5	B										
09 Mar	S19W41	10	70	5	Dso	5	B										
10 Mar	S28W54	12	70	5	Dso	5	B										
11 Mar	S28W68	9	60	10	Dso	9	B	3	1			1					
12 Mar	S27W81	9	60	9	Dso	5	B										
								3	1	0		1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 10



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Helio Lon	Area 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
Region 2965																		
08 Mar	N22E75	265	20	4	Dao	3	B											
09 Mar	N23E60	267	330	15	Eki	11	B	2										
10 Mar	N23E47	267	600	15	Eki	14	B											
11 Mar	N23E34	267	600	15	Eki	15	B	2				1						
12 Mar	N23E22	266	620	17	Fki	34	BG	2										
13 Mar	N24E09	265	600	17	Fki	20	B											
								6	0	0	1	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 265

Region 2966

09 Mar	S23W48	15	10	4	Bxo	4	B											
10 Mar	S23W61	17	10	4	Bxo	4	B											
11 Mar	S23W75	16	10	4	Bxo	4	B											
12 Mar	S23W89	17	10	1	Axx	1	A											
								0	0	0	0	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 15

Region 2967

12 Mar	N17E60	228	30	1	Hsx	1	A											
13 Mar	N17E46	228	30	1	Hsx	1	A											
								0	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 228

Region 2968

13 Mar	S21E43	231	10	1	Axx	1	A	1										
								1	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 231



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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Current

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