

Solar activity reached R1 (Minor) levels on 23-29 Dec, R2 (Moderate) levels on 23, 26 and 29 Dec and R3 (Strong) levels on 29 Dec. During this highlight period, a total of 33 C-class, 41 M-class and 1 X-class flares were observed. Region 3932 (S17, L=155, class/area Fkc/480 on 23 Dec) contributed to 5 C-class and 10 M-class flares early in the highlight period on 23-24 Dec. The largest flare observed from Region 3932 was an M8.9 (R2-Moderate) event at 23/1112 UTC with a 732 km/s Type II and a 320 sfu Tenflare. Weak M-class activity was observed on 25 Dec from Region 3938 (N21, L=103, class/area Eac/210 on 26 Dec). At 26/0315 UTC, Region 3938 observed an M7.3/2b (R2-Moderate) flare. Weak M-class activity was observed on 27-28 Dec from Regions 3928 (S14, L=177, class/area Dkc/280 on 25 Dec), 3932, 3933 (S08, L=175, class/area Ekc/350 on 24 Dec) and 3938.

Activity picked up tremendously on 29 Dec with a total of 21 M-class flares and 1 X-class flare. Region 3936 (N14, L=144, class/area Ekc/400 on 26 Dec) produced 12 M-class flares on the 29th, including an M7.1 at 29/1509 and the largest event of the highlight period, an X1.1 flare at 29/0718 UTC. Region 3939 (S17, L=083, class/area Dso/120 on 29 Dec) produced an M2.0/Sf flare at 29/0430 UTC that resulted in an asymmetric, partial-halo CME with an Earth-directed component. Later on the 29th, this region produced an M3.3/1b flare at 29/1708 that resulted in another partial-halo CME. Analysis of a potential Earth-directed component was in progress at the time of this writing.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 23 Dec with a peak flux of 1,540 pfu observed at 23/1725 UTC. Normal to moderate levels were observed on 24-29 Dec.

Geomagnetic field activity reached unsettled to active levels on 23-24 Dec due to negative polarity CH HSS influence and weak CME effects. Quiet levels predominated on 25-29 Dec. Solar wind began the period on 23 Dec enhanced with wind speeds in the 600-675 km/s range, Bt at 10 nT and Bz at about -4 nT. Enhanced field conditions persisted on 24 Dec. From 25-29 Dec, field conditions approached nominal levels where wind speeds decayed to 300-400 km/s and Bt and Bz levels were at nominal levels.

## **Space Weather Outlook**

### **30 December - 25 January 2025**

Solar activity is expected to be at low to moderate R1-R2 (Minor-Moderate) levels, with a chance for isolated R3 (Strong) levels due to potential flare activity from numerous active regions.

There is a chance for a greater than 10 MeV proton event reaching the S1 (Minor) level during



the outlook period.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels with a chance for high levels on 01-04 Jan due to CME influence.

Geomagnetic field activity is expected to reach G3 (Strong) levels on 31 Dec and G1 (Minor) levels on 01 Jan due to CME influence. Unsettled to isolated active level are likely on 05-06 Jan, 10-12 Jan and 16-20 Jan due to CH HSS effects. Mostly quiet levels are likely on 30 Dec, 02-04 Jan, 07-09 Jan, 13-15 Jan and 21-25 Jan.



### Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
23 December	238	199	1920	C2.7	5	3	0	3	0	0	0	0
24 December	259	219	2130	C3.1	6	7	0	10	2	0	0	0
25 December	253	218	1950	C2.7	6	3	0	7	0	0	0	0
26 December	256	211	1770	C2.0	4	1	0	4	1	1	0	0
27 December	259	233	1120	C2.9	11	2	0	18	1	1	0	0
28 December	260	213	1225	C3.6	5	3	0	34	3	0	0	0
29 December	255	209	1090	C6.4	1	22	1	35	3	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)	
	>1 MeV	>10 MeV	>2MeV	
23 December	9.6e+05	2.5e+05	4.3e+07	
24 December	5.5e+05	1.5e+05	2.7e+07	
25 December	5.8e+05	1.1e+05	2.9e+07	
26 December	5.1e+05	6.8e+04	3.4e+07	
27 December	7.6e+05	4.3e+04	2.8e+07	
28 December	9.0e+05	3.0e+04	1.8e+07	
29 December	1.0e+06	2.4e+04	7.0e+06	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
23 December	11	3-1-2-1-2-4-2-3	13	3-1-1-1-4-4-2-3	12	4-2-2-1-2-3-3-3
24 December	9	2-2-1-1-3-3-2-3	16	2-2-1-0-5-5-2-2	12	3-3-2-1-3-3-2-4
25 December	5	2-1-1-2-2-2-1-0	3	1-2-2-2-1-0-0-0	5	2-2-2-2-1-1-1-0
26 December	3	0-0-1-0-2-2-1-1	0	0-0-0-0-0-0-0-0	3	0-0-1-1-1-1-1-1
27 December	3	1-0-0-0-2-2-1-0	1	0-0-0-2-1-0-0-0	4	1-0-1-1-1-1-1-1
28 December	4	0-0-1-1-2-3-2-0	2	0-0-1-2-0-0-1-0	4	1-1-1-2-1-1-2-1
29 December	5	1-0-1-2-2-2-2-1	5	0-0-3-3-1-0-0-1	5	1-1-1-2-2-1-1-1

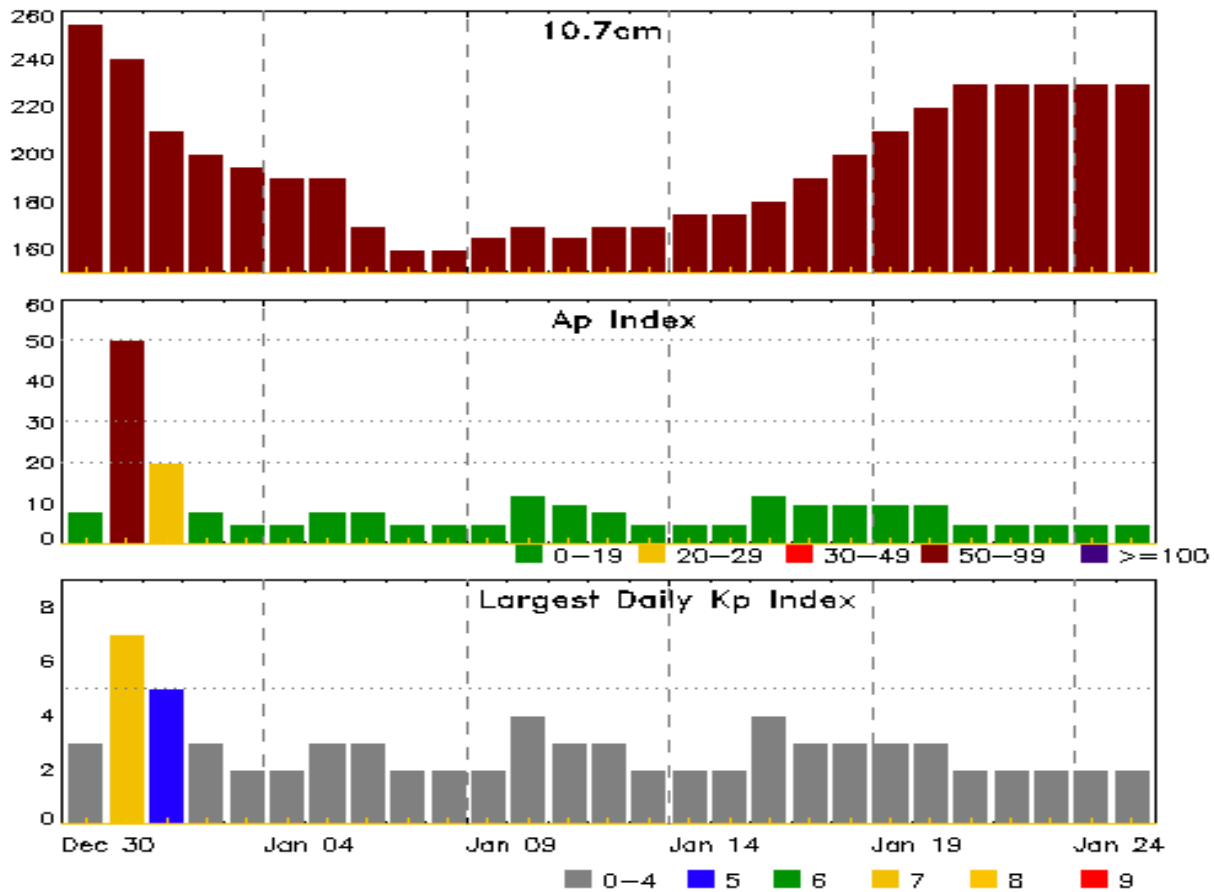


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
23 Dec 0301	ALERT: Geomagnetic K = 4	
23 Dec 1111	ALERT: X-ray Flux exceeded M5	23/1110
23 Dec 1121	SUMMARY: 10cm Radio Burst	23/1109 - 1109
23 Dec 1125	ALERT: Type II Radio Emission	23/1111
23 Dec 1141	SUMMARY: X-ray Event exceeded M5	23/1106 - 1116
23 Dec 1538	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	23/1520
23 Dec 1723	WARNING: Geomagnetic K = 4	23/1730 - 2359
23 Dec 2058	WATCH: Geomagnetic Storm Category G1 predicted	
24 Dec 0904	ALERT: Type II Radio Emission	24/0841
24 Dec 1747	WATCH: Geomagnetic Storm Category G1 predicted	
24 Dec 2146	WARNING: Geomagnetic K = 4	24/2200 - 25/1500
24 Dec 2152	WARNING: Geomagnetic K = 4	24/2150 - 25/1500
24 Dec 2317	ALERT: Geomagnetic K = 4	
25 Dec 0602	ALERT: Type II Radio Emission	25/0447
26 Dec 0312	ALERT: X-ray Flux exceeded M5	26/0311
26 Dec 0332	SUMMARY: X-ray Event exceeded M5	26/0252 - 0325
28 Dec 1130	SUMMARY: 10cm Radio Burst	28/1118 - 1120
29 Dec 0650	ALERT: Type IV Radio Emission	29/0520
29 Dec 0717	ALERT: X-ray Flux exceeded M5	29/0714
29 Dec 0741	SUMMARY: X-ray Event exceeded X1	29/0708 - 0734
29 Dec 1511	ALERT: X-ray Flux exceeded M5	29/1507
29 Dec 1536	SUMMARY: X-ray Event exceeded M5	29/1502 - 1524
29 Dec 2000	WATCH: Geomagnetic Storm Category G3 predicted	



## 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 Dec	255	8	3	13 Jan	170	5	2
31	240	50	7	14	175	5	2
01 Jan	210	20	5	15	175	5	2
02	200	8	3	16	180	12	4
03	195	5	2	17	190	10	3
04	190	5	2	18	200	10	3
05	190	8	3	19	210	10	3
06	170	8	3	20	220	10	3
07	160	5	2	21	230	5	2
08	160	5	2	22	230	5	2
09	165	5	2	23	230	5	2
10	170	12	4	24	230	5	2
11	165	10	3	25	230	5	2
12	170	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		Intensity	
									245	2695	II	IV
23 Dec	0210	0231	0259	M1.0	0.003							
23 Dec	0624	0629	0634	M1.0	0.004	SF	S15E22	3928				
23 Dec	1106	1112	1116	M8.9	0.028			3932	3600	320	3	
24 Dec	0014	0019	0024	M4.7	0.016			3932	2900	140		
24 Dec	0828	0841	0845	M4.1	0.002	1B	S19E18	3932	1800	110	2	
24 Dec	1402	1410	1414	M1.1	0.003			3932	250			
24 Dec	1625	1634	1641	M1.3	0.009	1N	S17E16	3932				
24 Dec	1820	1824	1830	M1.0	0.004	SF	S18E22	3932				
24 Dec	2015	2028	2041	M1.0	0.015			3930				
24 Dec	2224	2234	2242	M1.2	0.003			3938				
25 Dec	0414	0430	0439	M2.8	0.009	SF	N17E64	3938				
25 Dec	0446	0449	0453	M4.9	0.012	SF	S10W04	3933	22000	200	2	
25 Dec	2359	0030	0053	M3.0	0.051	1N	N19E52	3938	100			
26 Dec	0252	0315	0325	M7.3	0.071	2B	N18E51	3938		100		
27 Dec	1527	1538	1545	M1.2	0.008	SF	S13W41	3928				
27 Dec	2029	2035	2041	M3.3	0.016	2N	N19E25	3938				
28 Dec	1112	1121	1131	M4.5	0.030	SF	S09W55	3932		300		
28 Dec	1514	1518	1523	M1.3	0.005	1F	S17W30	3932		120		
28 Dec	2204	2214	2223	M1.2	0.010			3933				
29 Dec	0228	0235	0238	M1.0	0.004	SF	N15W26	3929				
29 Dec	0238	0246	0253	M1.3	0.011	SF	N15W26	3936				
29 Dec	0325	0330	0340	M1.3	0.012	SF	N15W26	3936				
29 Dec	0356	0405	0414	M1.2	0.012			3940				
29 Dec	0418	0430	0445	M2.0	0.028	SF	S17E33	3939	100			
29 Dec	0512	0526	0532	M3.1	0.027	SF	S09W67	3933			2	
29 Dec	0541	0547	0558	M3.5	0.027	SF	S17E33	3939	150			
29 Dec	0648	0659	0708	M3.0	0.036	1N	N10W33	3936				
29 Dec	0708	0718	0734	X1.1	0.120	SF	N11W31	3936	230			
29 Dec	0754	0759	0900	M4.2	0.120			3936				
29 Dec	0941	0948	0955	M1.4	0.011			3936				
29 Dec	1026	1039	1054	M2.6	0.036	SF	N23E12	3938	150			
29 Dec	1215	1224	1229	M1.6	0.005	SF	N10W36	3936				
29 Dec	1250	1256	1300	M1.3	0.007	SN	N10W37	3936				
29 Dec	1502	1509	1522	M7.1	0.057			3936		78		
29 Dec	1656	1708	1720	M3.3	0.029			3939				
29 Dec	1746	1752	1758	M1.2	0.005	SN	S12W47	3932	100			
29 Dec	1758	1804	1808	M1.4	0.009	SF	S06E29	3940				
29 Dec	1827	1841	1858	M3.3	0.046	1N	N13W40	3934				



### ***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		Intensity	
									245	2695	II	IV
29 Dec	2031	2039	2046	M1.1	0.007	SF	S15E60	3942				
29 Dec	2142	2153	2157	M1.5	0.014	SF	S16E18	3939				
29 Dec	2157	2206	2213	M1.8	0.017			3936				
29 Dec	2320	2330	2336	M1.9	0.012			3936				

### ***Flare List***

Date	Time			X-ray Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
23 Dec	0023	0032	0037	C3.8			
23 Dec	0210	0231	0259	M1.0			
23 Dec	0259	0308	0312	C9.1			3930
23 Dec	0508	0508	0511		SF	S12E39	3932
23 Dec	0624	0629	0634	M1.0	SF	S15E22	3928
23 Dec	1106	1112	1116	M8.9			3932
23 Dec	1232	1238	1244	C4.7			
23 Dec	1631	1645	1655	C3.9			
23 Dec	2035	2037	2047		SF	S19E25	3932
23 Dec	2348	0006	0014	C8.0			3932
24 Dec	0014	0019	0024	M4.7			3932
24 Dec	0828	0841	0845	M4.1	1B	S19E18	3932
24 Dec	0931	0941	0957	C8.9	SN	S08E03	3933
24 Dec	1308	1318	1324	C5.8			3932
24 Dec	1402	1410	1414	M1.1			3932
24 Dec	1455	1456	1501		SF	S08E02	3933
24 Dec	1507	1523	1538	C8.5	SF	S09W02	3933
24 Dec	1559	1607	1625	C5.3	SF	S08E02	3933
24 Dec	1625	1634	1641	M1.3	1N	S17E16	3932
24 Dec	1820	1826	1839	M1.0	SF	S18E22	3932
24 Dec	1853	1857	1906		SF	S09W00	3933
24 Dec	1931	1939	1947	C5.8	SF	S18E21	3932
24 Dec	1947	1955	2003	C6.6			3928
24 Dec	2015	2028	2041	M1.0			3930
24 Dec	2117	2118	2129		SF	S08W02	3933
24 Dec	2140	2142	2143		SF	S18E20	3932
24 Dec	2224	2234	2242	M1.2			3938



## *Flare List*

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
24 Dec	2255	2257	2301		SF	N13E24	3936
25 Dec	0414	0430	0439	M2.8	SF	N17E64	3938
25 Dec	0446	0449	0453	M4.9	SF	S10W04	3933
25 Dec	0557	0622	0636	C8.5	SF	N10E26	3936
25 Dec	0942	0950	0955	C3.6			3936
25 Dec	1502	1514	1524	C4.5	SF	N17E13	3936
25 Dec	1837	1841	1851	C5.1			3938
25 Dec	2018	2019	2023		SF	N15E12	3936
25 Dec	2041	2049	2056	C5.2	SF	N23E56	3938
25 Dec	2312	2321	2333	C4.7	SF	N11E10	3936
25 Dec	2359	0030	0053	M3.0	1N	N19E52	3938
26 Dec	0231	0242	0247		SF	S09W20	3933
26 Dec	0252	0315	0325	M7.3	2B	N18E51	3938
26 Dec	0733	0742	0752	C4.3			3938
26 Dec	1208	1216	1222	C3.4			3938
26 Dec	1447	1454	1500		SF	N15E43	3938
26 Dec	1828	1845	1912	C9.6			
26 Dec	1930	2015	2027		SF	N16E39	3938
26 Dec	2350	2356	0002	C5.0	SF	N16E40	3938
27 Dec	0044	0050	0056	C9.0	1F	N18E38	3938
27 Dec	0122	0127	0128		SF	N10W05	3936
27 Dec	0130	0130	0146		SF	N10W05	3936
27 Dec	0139	0139	0142		SF	N18E43	3938
27 Dec	0330	0336	0340	C4.0			3928
27 Dec	0535	0542	0551	C6.7			3939
27 Dec	0753	0805	0814	C9.5			3932
27 Dec	0800	0803	0804		SF	S05E65	
27 Dec	0802	0803	0810		SF	S21W14	3932
27 Dec	0805	0805	0821		SF	N12W09	3936
27 Dec	B0934	U0935	0947		SF	N25E41	3938
27 Dec	1119	1121	1122		SF	S03E62	3940
27 Dec	B1220	U1232	1238		SF	S14W40	3928
27 Dec	1228	1236	1246	C6.6	SF	S08W39	3933
27 Dec	B1312	U1312	1320		SF	N15W15	3936
27 Dec	1354	1400	1408	C5.3	SF	N19E32	3938
27 Dec	1431	1432	1434		SF	S14W14	3932
27 Dec	1518	1520	1523		SF	S06W45	3933
27 Dec	1527	1538	1545	M1.2	SF	S13W41	3928





## *Flare List*

Date	Time			X-ray Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
27 Dec	1652	1711	1720	C6.5			3938
27 Dec	1903	1909	1914	C5.1			
27 Dec	2021	2025	2029	C8.5			3938
27 Dec	2029	2035	2041	M3.3	2N	N19E25	3938
27 Dec	2209	2216	2229	C6.0			3932
27 Dec	2229	2238	2247	C5.6			3934
27 Dec	2244	2244	2255		SF	N10W15	3936
27 Dec	2305	2306	2308		SF	N17W60	3929
27 Dec	2330	2331	2336		SF	N17E23	3938
28 Dec	0054	0055	0059		SF	S05E55	3940
28 Dec	0104	0105	0107		SF	N10W15	3936
28 Dec	0356	0404	0417	C7.6			3933
28 Dec	0446	0447	0448		SF	N14W23	3936
28 Dec	0513	0517	0519		SF	N22E22	3938
28 Dec	B0700	U0704	0710		1F	N18W73	3929
28 Dec	0712	0717	0727	C6.2	SF	N20W73	3929
28 Dec	0755	0756	0758		SF	S08W57	3927
28 Dec	0800	0808	0813	C7.8	SF	S07W54	3933
28 Dec	0816	0816	0819		SF	N18W77	3929
28 Dec	0829	0830	0837		SF	N18W81	3929
28 Dec	0843	0843	0846		SF	N18W81	3929
28 Dec	0854	0859	0904		SF	N20W79	3929
28 Dec	0925	0929	0936		SF	N22E20	3938
28 Dec	0928	0939	0941		SF	N18W81	3929
28 Dec	0944	0948	1017		SF	N15W15	3936
28 Dec	1102	1109	1113	C7.1	SF	S07W56	3933
28 Dec	1112	1117	1143	M4.5	SF	S09W55	3932
28 Dec	1117	1119	1154		1B	S17W27	3932
28 Dec	1121	1126	1129		SF	N11W22	3936
28 Dec	1153	1153	1323		SF	N14W27	3934
28 Dec	1155	1155	1212		SF	N11W22	3936
28 Dec	1214	1223	1231		SF	N21E17	3938
28 Dec	1315	1317	1323		SF	N11W23	3936
28 Dec	1334	1335	1339		SF	N17W82	3929
28 Dec	1415	1420	1425		SF	N17W82	3929
28 Dec	1427	1427	1431		SF	N17W82	3929
28 Dec	1434	1435	1438		SF	N17W82	3929
28 Dec	1514	1518	1523	M1.3	1F	S17W30	3932



## *Flare List*

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
28 Dec	1540	1541	1543		SF	S06W61	3933
28 Dec	1550	1550	1556		SF	N20E17	3938
28 Dec	1630	1639	1643		SF	S06W61	3933
28 Dec	1751	1751	1802		SF	S06W61	3933
28 Dec	1832	1849	1854		SF	N12W27	3936
28 Dec	1854	1901	1905		SF	N19E14	3938
28 Dec	1913	2018	2112	C8.6			3939
28 Dec	1939	1939	1946		SF	S07W63	3933
28 Dec	1942	1951	2026		SF	S16E32	3939
28 Dec	2204	2214	2223	M1.2			3933
28 Dec	2302	2319	2327		SF	N15W26	3936
29 Dec	0117	0118	0120		SF	N15W26	3936
29 Dec	0142	0142	0152		SF	N22E20	3938
29 Dec	0157	0159	0203		SF	N22E20	3938
29 Dec	0228	0235	0238	M1.0	SF	N15W26	3929
29 Dec	0238	0246	0253	M1.3	SF	N15W26	3936
29 Dec	0300	0305	0314		SF	N22E20	3938
29 Dec	0325	0330	0340	M1.3	SF	N15W26	3936
29 Dec	0356	0405	0414	M1.2			3940
29 Dec	0418	0430	0445	M2.0	SF	S17E33	3939
29 Dec	0512	0526	0532	M3.1	SF	S09W67	3933
29 Dec	0540	0544	0617	M3.5	SF	S17E33	3939
29 Dec	0627	0628	0631		SF	N11W36	3936
29 Dec	0648	0659	0708	M3.0	1N	N10W33	3936
29 Dec	0708	0718	0734	X1.1			3936
29 Dec	0712	0712	0716		SF	N19E06	3938
29 Dec	0713	0719	0740		SF	N11W31	3936
29 Dec	0736	0736	0742		SF	S06E40	3940
29 Dec	0754	0759	0900	M4.2			3936
29 Dec	0941	0948	0955	M1.4			3936
29 Dec	1026	1039	1054	M2.6	SF	N23E12	3938
29 Dec	B1046	U1048	1056		SF	S14W40	3928
29 Dec	B1046	U1047	1055		SF	S21W42	3932
29 Dec	1118	U1119	1143		SF	N10W38	3934
29 Dec	1215	1224	1229	M1.6	SF	N10W36	3936
29 Dec	1247	1254	1301	M1.3	SN	N10W37	3936
29 Dec	1256	1256	1324		SF	N22E09	3938
29 Dec	1410	1410	1419		SF	N10W37	3936



## *Flare List*

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
29 Dec	1412	1420	1456		SF	S18E26	3939
29 Dec	1429	1436	A1504		SF	N10W37	3936
29 Dec	1502	1509	1522	M7.1			3936
29 Dec	1618	1621	1622		SF	N13W37	3936
29 Dec	1656	1708	1720	M3.3			3939
29 Dec	1701	1703	1707		SF	N19E01	3938
29 Dec	1701	1705	1854		1B	S16E21	3939
29 Dec	1727	1736	1804		SN	N12W39	3934
29 Dec	1746	1752	1758	M1.2	SN	S12W47	3932
29 Dec	1754	1754	1757		SF	S08W68	3933
29 Dec	1758	1804	1808	M1.4	SF	S06E29	3940
29 Dec	1827	1841	1858	M3.3	1N	N13W40	3934
29 Dec	1948	1948	1952		SF	N13W40	3934
29 Dec	1957	2003	2009	C8.7	SN	N12W42	3934
29 Dec	2031	2039	2046	M1.1	SF	S15E60	3942
29 Dec	2112	2112	2119		SF	S12W49	3932
29 Dec	2142	2153	2157	M1.5			3936
29 Dec	2157	2206	2213	M1.8			3936
29 Dec	2203	2204	2211		SF	S16E18	3939
29 Dec	2232	2237	2242		SF	S06E26	3940
29 Dec	2320	2330	2336	M1.9			3936

## Region Summary

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 <sup>-6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4
Region 3636															
11 Apr	S21E72	252	30	2	Hsx	2	A	3							
12 Apr	S21E58	252	50	3	Hsx	2	A				4				
13 Apr	S21E46	251	100	5	Cso	5	B								
14 Apr	S21E33	251	80	3	Cso	4	B	1			1				
15 Apr	S18E20	251	90	4	Cso	3	B				1				
16 Apr	S20E08	250	90	4	Cso	3	B								
17 Apr	S20W05	249	70	3	Cso	4	B								
18 Apr	S21W18	249	60	3	Cao	4	B								
19 Apr	S21W31	249	30	3	Cao	3	B								
20 Apr	S21W44	249	20	23	Cro	3	B	1			1				
21 Apr	S21W58	250	10	1	Axx	1	A								
22 Apr	S21W70	248	10	1	Axx	1	A	1			1				
23 Apr	S21W84	249	plage					1			1				
								7	0	0	9	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 249

### Region 3922

10 Dec	S17E59	294	20	3	Cro	4	B	6	3						
11 Dec	S18E48	292	50	6	Cso	5	B	1	1		1				
12 Dec	S18E36	291	30	6	Cao	3	B	1	2						
13 Dec	S18E22	292	20	5	Cso	5	B	3	2		3				
14 Dec	S18E09	292	plage					1							
15 Dec	S18W03	290	30	4	Cso	5	B	1			1				
16 Dec	S18W16	290	50	6	Dai	10	B	1							
17 Dec	S18W27	288	140	8	Dai	12	B	1			2				
18 Dec	S19W40	288	200	8	Dai	8	B								
19 Dec	S19W53	288	230	8	Dai	8	BG								
20 Dec	S19W64	285	250	11	Eko	10	B								
21 Dec	S19W78	286	240	10	Dao	5	B								
22 Dec	S19W91	286	120	10	Dao	2	B								
								15	8	0	7	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 290



### *Region Summary - continued*

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 <sup>-6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4

#### *Region 3925*

14 Dec	N10E49	252	10	2	Axx	2	A								
15 Dec	N10E36	251	10	1	Axx	1	A								
16 Dec	N09E20	254	plage												
17 Dec	N10E05	256	10	6	Bxo	1	B	1			1				
18 Dec	N10W10	258	10	1	Axx	1	A								
19 Dec	N10W22	257	10	1	Axx	1	A								
20 Dec	N10W32	254	10	1	Axx	1	A								
21 Dec	N10W46	254	plage												
22 Dec	N10W60	255	plage												
23 Dec	N10W74	256	plage												
24 Dec	N10W88	257	plage												
								1	0	0	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 256

#### *Region 3926*

15 Dec	S20E67	220	110	3	Hsx	1	A								
16 Dec	S20E56	218	120	9	Cso	3	B								
17 Dec	S21E41	220	160	9	Cso	3	B								
18 Dec	S21E28	220	140	2	Hsx	1	A								
19 Dec	S20E16	222	100	2	Hsx	1	A								
20 Dec	S20E04	219	150	3	Hax	2	A								
21 Dec	S20W10	218	120	3	Hax	2	A								
22 Dec	S21W23	218	100	3	Hsx	1	A								
23 Dec	S19W35	217	100	3	Hsx	1	A								
24 Dec	S21W48	217	80	3	Hax	1	A								
25 Dec	S21W62	218	90	3	Hax	1	A								
26 Dec	S21W76	219	90	3	Hax	1	A								
								0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 219



### *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	4
Region 3927															
17 Dec	S08E89	173	plage					1							
18 Dec	S08E69	179						150							
19 Dec	S10E57	178	140	9	Dai	7	BG	4	2						
20 Dec	S11E44	178	280	13	Eki	10	BG								
21 Dec	S08E25	183	100	2	Hsx	1	A	2							
22 Dec	S08E11	184	90	2	Hsx	1	A	1							
23 Dec	S08W03	185	90	2	Hsx	1	A								
24 Dec	S08W16	185	90	2	Hax	1	A								
25 Dec	S08W30	185	60	2	Hax	2	A								
26 Dec	S08W43	186	40	2	Hax	1	A								
27 Dec	S08W58	187	5	1	Axx	1	A								
28 Dec	S08W71	187	5	1	Axx	1	A		1						
29 Dec	S08W85	188	plage												
								13	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 185

### **Region 3928**

19 Dec	S14E60	175	80	5	Dao	4	B	3	2						
20 Dec	S17E49	173	150	10	Dai	6	BG	4	1		1				
21 Dec	S14E34	174	220	9	Dai	12	B	1			1				
22 Dec	S13E20	175	260	9	Dki	18	BG	2			1				
23 Dec	S14E06	176	260	9	Dko	18	BG		1		1				
24 Dec	S14W07	176	280	9	Dkc	20	BG	1							
25 Dec	S14W22	177	280	9	Dkc	26	BG								
26 Dec	S14W35	178	200	13	Eac	16	BG								
27 Dec	S14W50	179	120	9	Dai	17	BG	1	1		2				
28 Dec	S15W61	177	100	6	Dao	6	B								
29 Dec	S14W75	178	10	1	Hrx	1	A				1				
								12	5	0	7	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 176



### *Region Summary - continued*

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10 <sup>-6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
Region 3929															
20 Dec	N17E31	191	20	2	Hsx	1	A	1							
21 Dec	N17E18	190	10	1	Axx	1	A								
22 Dec	N17E04	191	10	1	Axx	1	A								
23 Dec	N15W10	192	20	4	Bxo	4	B								
24 Dec	N15W24	193	10	4	Bxo	2	B								
25 Dec	N15W38	194	plage												
26 Dec	N15W52	195	plage												
27 Dec	N18W67	196	10	4	Bxo	2	B				1				
28 Dec	N17W80	196	30	4	Cao	3	B	1			10	1			
29 Dec	N18W93	196	30	4	Cao	3	B		1		1				
								2	1	0	12	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 191

### **Region 3930**

20 Dec	S20W36	258	100	3	Cai	5	B								
21 Dec	S22W49	257	80	5	Cai	5	B	2			2				
22 Dec	S22W62	257	90	6	Dai	7	B	6	1		2				
23 Dec	S23W76	258	180	10	Eai	6	B	1							
24 Dec	S23W89	258	180	11	Eai	6	B		1						
								9	2	0	4	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 258

### **Region 3931**

20 Dec	N23E32	190	10	2	Bxo	3	B								
21 Dec	N24E18	190	20	4	Bxo	3	B								
22 Dec	N25E05	190	10	1	Axx	1	A								
23 Dec	N25W09	191	plage												
24 Dec	N25W23	192	plage												
25 Dec	N25W45	193	plage												
26 Dec	N25W51	194	plage												
27 Dec	N25W66	195	plage												
28 Dec	N25W80	196	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 190



### *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	4
Region 3932															
20 Dec	S18E62	160	180	7	Dai	8	B	2			1				
21 Dec	S17E54	154	310	13	Ekc	12	B	4	1		1				
22 Dec	S17E42	153	480	12	Ekc	17	BG	2	2		4	1			
23 Dec	S17E27	155	480	19	Fkc	25	BGD	1	1		2				
24 Dec	S18E13	156	380	17	Fkc	30	BG	2	5		3	2			
25 Dec	S18E01	154	380	17	Fkc	34	BG		1						
26 Dec	S17W08	151	280	12	Ekc	21	BGD								
27 Dec	S17W23	152	120	6	Dac	24	BGD	2			2				
28 Dec	S17W37	153	140	7	Dac	13	BG		2		1	2			
29 Dec	S17W50	153	40	8	Dai	13	BG		1		3				
								13	13	0	17	5	0	0	0

Still on Disk.

Absolute heliographic longitude: 154

### **Region 3933**

21 Dec	S08E34	174	200	10	Dao	7	B				1	1			
22 Dec	S07E21	174	260	9	Dko	9	B								
23 Dec	S08E07	175	300	16	Fki	18	BD								
24 Dec	S08W06	175	350	14	Ekc	18	BGD	3			6				
25 Dec	S08W21	176	350	14	Ekc	18	BGD				1				
26 Dec	S08W34	177	300	13	Eko	12	BG				1				
27 Dec	S07W48	177	200	10	Dac	16	BG	1			2				
28 Dec	S08W61	177	140	11	Eai	9	B	3	1		6				
29 Dec	S08W75	178	180	15	Eai	8	BG		1		2				
								7	2	0	19	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 175





### *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	4
Region 3934															
21 Dec	N12E60	148	60	9	Dro	4	B								
22 Dec	N13E47	148	150	17	Fao	8	B				1				
23 Dec	N12E30	152	40	7	Cso	4	B								
24 Dec	N13E13	156	40	1	Cso	2	B								
25 Dec	N13W01	156	40	1	Hax	1	A								
26 Dec	N13W15	158	20	1	Hax	1	A								
27 Dec	N13W30	159	plage					1							
28 Dec	N13W44	160	plage								1				
29 Dec	N13W58	161	plage					1	1		4	1			
								2	1	0	6	1	0	0	

Still on Disk.

Absolute heliographic longitude: 156

### **Region 3935**

22 Dec	S18E67	128	140	3	Hsx	1	A								
23 Dec	S18E57	124	150	5	Cso	2	B								
24 Dec	S18E43	126	150	4	Cso	2	B								
25 Dec	S18E29	126	150	3	Cso	2	B								
26 Dec	S18E15	128	150	4	Cao	2	B								
27 Dec	S18E01	128	60	2	Hsx	1	A								
28 Dec	S19W12	128	80	2	Hsx	1	A								
29 Dec	S19W24	127	60	2	Hsx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 128

### **Region 3936**

23 Dec	N13E41	142	260	8	Dko	9	B								
24 Dec	N13E27	142	350	10	Dkc	9	B				1				
25 Dec	N13E12	143	350	9	Dkc	9	B	4			4				
26 Dec	N14W01	144	400	12	Ekc	23	B								
27 Dec	N14W16	145	330	11	Ekc	25	BD				5				
28 Dec	N13W29	145	350	11	Ekc	30	BD				8				
29 Dec	N13W41	144	380	15	Ekc	20	BGD		11	1	10	1			
								4	11	1	28	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 144



### *Region Summary - continued*

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 <sup>-6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4

#### *Region 3937*

23 Dec	S11E66	116	40	2	Hrx	1	A								
24 Dec	S12E52	117	40	1	Hsx	1	A								
25 Dec	S12E38	117	40	1	Hsx	1	A								
26 Dec	S12E25	118	40	2	Hsx	1	A								
27 Dec	S13E10	119	20	1	Hsx	1	A								
28 Dec	S12W01	117	30	1	Hsx	1	A								
29 Dec	S12W14	117	20	1	Hsx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 117

#### *Region 3938*

24 Dec	N20E66	103	180	9	Dsi	7	BG		1						
25 Dec	N20E53	102	180	8	Dsi	12	BG	2	2		2				
26 Dec	N21E40	103	210	12	Eac	22	BGD	3	1		3	1	1		
27 Dec	N19E25	104	150	7	Dac	21	BG	4	1		4	1	1		
28 Dec	N19E12	104	210	9	Dai	20	BG				5				
29 Dec	N20W01	104	170	8	Dai	21	BG		1		7				
								9	6	0	21	2	2	0	0

Still on Disk.

Absolute heliographic longitude: 104

#### *Region 3939*

25 Dec	S17E74	82	30	3	Cso	2	B								
26 Dec	S17E60	83	40	4	Hsx	1	A								
27 Dec	S17E45	84	80	2	Hsx	2	A	1							
28 Dec	S17E34	82	110	5	Dso	6	B	1			1				
29 Dec	S17E20	83	120	7	Dso	14	B		3		4	1			
								2	3	0	5	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 83

#### *Region 3940*

27 Dec	S05E38	91	5	1	Axx	1	A				1				
28 Dec	S06E38	78	10	1	Axx	1	A				1				
29 Dec	S06E24	80	plage						2		3				
								0	2	0	5	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 80



### *Region Summary - continued*

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 <sup>-6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4

#### *Region 3941*

27 Dec	S05E50	79	20	2	Hax	2	A								
28 Dec	S06E37	79	20	5	Bxo	2	B								
29 Dec	S06E26	77	70	9	Dai	16	BG								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 77

#### *Region 3942*

29 Dec	S13E54	49	10	1	Axx	1	A		1						
								0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 49

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

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