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**Накопительный каталог солнечных вспышечных событий
рентгеновского класса M1 - X>17.5 XXV цикла солнечной активности
(I.2020 - VI.2031?)**

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DATE: y m d	Год, месяц, день реализации солнечного вспышечного события.
TIME (UT): to, tm, te	Время начала, максимума и конца полного вспышечного события: вспышки в H α и всплеска в диапазоне мягкого рентгена ($1 - 8 \text{ \AA} = 12.5 - 1 \text{ кэВ}$). Соответственно to и te определяются по более раннему началу и по более позднему концу в этих диапазонах, tm всегда определяется по всплеску в рентгене. Если наблюдается только рентгеновский всплеск, то конец события определяется по точке спада на половину интенсивности от I _{max} до фона.
CLASS: X-ray/opt	Рентгеновский класс и оптический балл вспышечного события.
L (J·m ⁻²)	Интегральный поток в стандартном рентгеновском диапазоне от начала всплеска через максимум до 1/2 максимальной интенсивности.
COORDINATES: lt, lg, L	Сферические гелиографические координаты вспышечного события в линии H α : lt (гелиографическая широта) – расстояние в угловых градусах от солнечного экватора; lg (гелиографическая долгота) – расстояние в угловых градусах от центрального меридиана Солнца; L (кэррингтоновская долгота) – абсолютная гелиографическая долгота активной области, где осуществилось вспышечное событие, в координатной системе, привязанной к вращению Солнца; первый кэррингтоновский оборот начался 13,601610.1853 г. (Юлианский день 2398140.10155) (https://www.solarmonitor.org/data/)
AR	Солнечная активная область. Переход по ссылке на соответствующую страницу сайта: http://helio.mssl.ucl.ac.uk/helio-vo/solar_activity/arstats/arstats_page5.php?region=XXXXX .
RADIO MHz: 245, 2695	Пиковое значение превышения предвсплескового фона радиоизлучения на соответствующих частотах в солнечных единицах потока (sfu), ($1 \text{ sfu} = 10^{-22} \cdot \text{Вт} \cdot \text{м}^{-2} \cdot \text{Гц}^{-1}$). (https://www.solarmonitor.org/data/).
RADIO SWEEP	Интенсивность спектральных радиовсплесков в относительной шкале (1 – малый, 3 – большой), в различных вспышечных событиях: Type II/2 0966 (км/с) – медленно дрейфующий всплеск интенсивности 2, с расчётной скоростью распространения ударной волны в короне Солнца 966 км/с. Type IV – широкополосный продолжительный радиовсплеск. (https://www.solarmonitor.org/data/)

CME: to/v/da/pa	Корональный выброс вещества: to – первое появление в поле зрения коронографа (LASCO SDO или предварительные данные CACTUS); v – линейная скорость (км/с); da – тип: Halo (360) and partial Halo, либо угловая ширина распространения в градусах; pa – позиционный угол первого появления, измеренный от Северного полюса против часовой стрелки в градусах; CME на LASCO : http://cdaw.gsfc.nasa.gov/CME_list/ CME на CACTUS (предварительное определение - символ "c" стоит после CME): https://www.sidc.be/cactus/catalog.php.
X-ray HARD: An/tm/Emax keV	A – космическая обсерватория (F – Fermi); n – число всплесков жёсткого рентгена в данном вспышечном событии; tm – время максимума интенсивности всплеска в канале наибольших энергий; Emax – максимальный энергетический канал, регистрирующий фотоны в кэВ: (12-25 keV) – https://hesperia.gsfc.nasa.gov/fermi/gbm/qlook/fermi_gbm_flare_list.txt (>100 MeV) – https://hesperia.gsfc.nasa.gov/fermi/lat/qlook/lat_events.txt
GOES PROTONS E>10MeV: d/tmax/Ipr/ GLE	d – день максимума потока солнечных протонов (E>10 MeV) от данного вспышечного события; tmax – время максимума потока протонов (E>10 MeV); Ipr – величина потока протонов (E>10 MeV), даётся в единицах потока протонов (1 pfu = 1 p / см² · с · ср); GLE – вспышка в космических лучах по данным нейтронных мониторов (Ground Level Event).
n	Регистрация солнечных нейтронов в данном вспышечном событии.
Attendant phenomena; remarks	Наблюдаемые активные динамические явления в данном вспышечном событии: WL – излучение в непрерывном спектре ("белая вспышка"); SPY – спрей; DSF – выброс солнечного волокна; LPS – вспышечные арочные системы; BSL – яркий выброс на лимбе (часто возвратный).
*	Перед 'to' означает, что все отмеченные вспышечные события являются компонентами одного вспышечного события
*	После всплеска в жёстком рентгене означает, что данные вспышечные события произошли во временных пределах данного рентгеновского всплеска.
g	Не было наблюдений CME на LASCO.
?	Перед CME означает, что характеристики CME могут быть уточнены.
?	Перед всплеском жёсткого рентгена означает, что время максимума всплеска по каким-либо причинам не наблюдалось.
	Если отсутствует балл H α -вспышки, координаты вспышечного события даются по рентгеновскому всплеску.

2020-2021

D A T E	T I M E	CLASS	COORDINATES	AR	RADIO MHz	DYNAMIC EVENT	CME	X-ray HARD	GOES PROTONS	Attendant
y m d	to tm te	X-ray/opt	L lt lg L		245 2695	RADIO SWEEP	to / v /da /pa	An / tm /Emax	E>10MeV	phenomena;
			J*m-2		sfu	km/s	km/s	keV	d tmax/Ipr /GLE	remarks
20201129	1234 1311 1341	M4.4/	.094 S23E90L252	12790?	110 240	II/2 0765	1326/2077/360/159	F /1240/12-25	01 0655/6.5	
20210419	2319 2342 2359	M1.1/	.013 S24E23L261	12816		*II/2 1202 IV/2	0024/0427/107/095			
20210507	1843 1904 1919	M3.9/1N	.045 N17E78L335	12822	160 24	II/3 0816	1924/0754/114/067	F /1858/12-25		
20210523	1100 1108 1114	2N/M1.1	.005 N20E05L100	12824	230 85		1148/0384/138/273	F /1103/12-25		
20210703	0704 0722 0727	M2.7/SF	.012 N23W78L100	12838	340		0736/0426/067/261			
20210703	1418 1434 1447	X1.5/SN	.046 N23W82L100	12838	120	II/1 0357	1448/0455/069/254	F /1426/12-25		
20210703	1655 1703 1714	M1.2/SF	.006 N24W82L100	12838				F /1706/12-25		
20210704	0501 0509 0515	M1.5/BSL	.007 N22W90L100	12838			0600/0211/061/253	F /0503/12-25		
20210828	0539 0623 0936	M4.7/1N	.054 S27W01L002	12860	340 60	II/1 0276 IV/1	0636/0174/205/177	F2/0553/12-25		
20210923	0427 0442 0527	1N/M2.8	.018 S27E21L353	12871	120	II/2 0966 IV/1	0548/0264/022/188	F /0436/12-25		
20210923	1523 1539 1608	M1.8/1N	.012 S29E16L353	12871			1612/0435/058/182	F /1529/12-25		
20211009	0619 0638 >0722	M1.6/2B	.015 N17E09L180	12882	3700 430	II/3 0934	0712/0712/360/265		09 2000/01	
20211026	0240 0247 0353	M1.3/BSL	.006 N14E88L212	12891				F /0244/12-25		
20211026	1542 1557 1602	M1.0/BSL	.005 N13E89L212	12891						
20211028	0730 0745 0822	M1.4/1N	.005 S30E03L274	12887			0936/0309/010/278			
20211028	1019 1037 >1111	M2.2/1F	.013 S30W02L274	12887			1036/0558/010/274	F /1024/12-25		
20211028	1517 1548 1641	X1.0/2N	.091 S26W05L274	12887	4300	II/3 1457 IV/2	1548/1519/360/309	F2/1601/>100	29 0250/29 /GLE	
20211029	0222 0253 0306	M1.5/1N	.014 N16E54L212	12891			0312/0434/008/341			
20211101	0057 0145 0300	M1.5/1F	.032 S29W45L274	12887	160 210	II/1 0626 IV/2	0200/0753/201/231	F /0124/12-25		
20211102	0120 0301 0521	M1.7/1F	.075 S26W69L274	12887	190 110		0248/1473/360/028	F2/0212/12-25		
20211109	1547 1702 1737	M2.0/	.057 N19W89L212	12891			1648/1350/176/321	F /1633/12-25	09 1900/02.26	
20211217	0039 0051 0134	M1.2/1F	.005 N19E11L270	12911				F2/0112/12-25		
20211220	1112 1136 1155	M1.8/1N	.030 S20W01L295	12908		II/2 0350	1224/0359/314/155	F /1129/12-25		
20211221	0743 0750 0757	M1.1/	.006 S17E89L192	12916						
20211221	1131 1144 1149	M1.4/	.005 S17E89L192	12916			1436/0105/111/284	F /1146/12-25		
20211222	0654 0706 0738	M1.3/1N	.011 S21W25L295	12908		II/2 0881		F /0701/12-25		
20211228	0350 0401 0410	M1.8/	.011 N20W20L209	12918				F /0738/12-25		
20211228	1559 1611 1620	M1.6/SF	.011 N19W26L209	12918				F /1610/12-25		

2022

D A T E	T I M E	CLASS	COORDINATES	AR	RADIO MHz	DYNAMIC EVENT	CME	X-ray HARD	GOES PROTONS	Attendant
y m d	to tm te	X-ray/opt	L lt lg L		245 2695	RADIO SWEEP	to / v /da /pa	An / tm /Emax	E>10MeV	phenomena;
			J*m-2		sfu	km/s	km/s	keV	d tmax/Ipr /GLE	remarks
20220101	0707 0730 0742	M1.1/SF	.014 N20W76L209	12918				F /0738/12-25		
20220114	0147 0203 0214	M1.8/	.014 N31E86L251	12932			0243/0555/033/072	F /0155/12-25		
20220118	1701 1744 1817	M1.5/SF	.034 N08W55L322	12929	110 150	II/1 0143 IV/1	1748/1014/153/286	F /1832/>100		
20220120	0541 0601 0620	M5.5/1F	.043 N08W76L322	12929	10000 350	II/2 0329 IV/1	0612/1431/211/279	F /0526/>100	20 1015/22.7	
20220129	2232 2332 0032	M1.1/SF	N18E06L113	12936			2336/0530/360/058	F2/2231/12-25		
20220212	0825 0844 0857	M1.4/SN	.016 S17W82L037	12939		II/2 0642 IV/1	0912/0280/102/265	F /0844/12-25		
20220214	1702 1736 1751	M1.0/SF	.017 N26W62L344	12941				F /1733/12-25		
20220215	1754 1815 1831	M1.3/SF	N26W81L344	12941			1836/0181/034/299	F /1802/12-25		
20220302	1731 1747 1810	M2.0/1B	.011 N15E29L034	12958	440	II/3 0690	1812/0266/128/066	F /1734/12-25		
20220311	2213 2232 2238	M2.2/SF	S27W63L010	12964			0012/0506/112/238	F /2225/12-25		
20220314	0829 0840 0845	M2.0/	.007 N23E03L265	12965			1124/0093/118/173?	F /0841/12-25		
20220315	1233 1239 1259	M1.4/SN	.002 N23W10L265	12965				F /1236/12-25		
20220315	2239 2246 0020	M1.5	N23W17L265	12965				F /2246/12-25		
20220325	0502 0526 0637	M1.5/1F	.026 S18E37L088	12974	100	II/2 0959 IV/2	0548/0495/360/097	F2/0541/12-25		

DATE		TIME		CLASS	COORDINATES		AR	RADIO MHz	DYNAMIC EVENT		CME		X-ray HARD	GOES PROTONS	Attendant	
year	month	to	tm	te	X-ray/opt	L lt lg L		245 sfu	2695	RADIO SWEEP	to	/ v /da /pa	An / tm /Emax	E>10MeV	phenomena;	
						J*m-2				km/s		km/s	keV	d tmax/Ipr /GLE	remarks	
2022	03	28	1058	1129	1145	M4.0/1N	.044	N14W04L087	12975	3900		II/3 1259	IV/2	1200/0702/360/127	F /1118/12-25	28 1325/18.7
2022	03	28	1732	1741	1747	M1.0	.001	N13W08L085	12975	120					F /1710/12-25	
2022	03	28	1908	1923	1940	M1.0	.017	N14W07L085	12975					2024/0905/360/299	F /1854/12-25	
2022	03	28	2049	2059	2109	M1.1	.011	N13W10L085	12975	350					F /2023/12-25	
2022	03	29	0057	0111	0611	2N/M2.2	.025	N12W12L085	12975	170					F /0102/12-25	
2022	03	29	0148	0158	0203	2N/M1.1	.001	N13W11L085	12975	180	19					
2022	03	29	0917	0938	0955	M1.0	.016	N13W19L085	12975						F /0923/12-25	
2022	03	29	2143	2152	2157	M1.6		N15W24L085	12975						F /2148/12-25	
2022	03	30	1721	1737	1746	X1.3	.096	N13W31L085	12975	130000	540	II/3 1424	IV/1	1800/0641/360/298	F /1724/12-25	31 0630/10.6
2022	03	31	1817	1835	1934	M9.6/1B	.076	N12W47L085	12975	450	700	II/2 0772	IV/2	1912/0489/360/261	F2/1823/12-25	
2022	04	02	0239	0256	0307	M2.9	.023	N13W68L085	12975							
2022	04	02	1256	1444	1511	M3.9/1N	.140	N12W68L066	12976			II/2 0956		1336/1433/360/263	F3/1316/12-25	02 1600/32
2022	04	02	1734	1744	1751	M4.3/1N	.021	N13W78L085	12975	41	110				F /1738/12-25	
2022	04	15	1031	1149	1229	M2.2/	.015	N14E88L105	12994					1205/0796/212/089	Fgap 08-18.04	
2022	04	15	1347	1359	1411	M1.9/	.025	N14E88L105	12994							
2022	04	16	1449	1456	1509	M1.0/	.009	N19E87L111	12993							
2022	04	17	0200	0211	0223	M1.9/	.019	N20E83L111	12993							
2022	04	17	0317	0334	0351	X1.1/	.140	N12E88L105	12994	3400	130	II/2 0724		0348/0895/209/089		
2022	04	17	1952	2002	2020	M1.5/SF	.005	S29W70L248	12992	80	42					
2022	04	17	2228	2234	2240	M4.4/	.017	S30W72L248	12992	260	110					
2022	04	18	0737	0748	0805	M1.3/SF	.006	S30W78L248	12992							
2022	04	18	1004	1027	1049	M1.1	.020	N21E64L105	12993							
2022	04	18	1712	1724	1731	M1.9/SF	.009	S29W84L248	12992							
2022	04	19	0443	0450	0459	M1.0	.007	N22E47L111	12993	29	150				F /0446/12-25	
2022	04	19	2039	2049	2058	M3.7	.023	S29W87L248	12992						F /2041/12-25	
2022	04	19	2109	2113	2155	M1.6/SN	.007	N16E48L105	12994							
2022	04	20	*0107	0114	0120	M1.2	.006	S32W86L248	12992						F /0111/12-25*	
2022	04	20	*0120	0144	0219	M7.2/1N	.064	S33W86L248	12992	200				0200/0542/055/242	F /0111/12-25*	
2022	04	20	0341	0357	0404	X2.2/SF	.100	S34W86L248	12992	2600	510	II/3 1630		0412/1001/139/256	F /0413/12-25	
2022	04	20	1224	1252	1302	M1.9/SF	.019	S34W86L248	12992	130				1236/0342/056/237	F /1229/12-25	
2022	04	21	0147	0159	0246	M9.6/1N	.046	N22E23L111	12993	3000	370	II/2 1132	IV/1	0224/0357/090/026	F /0245/12-25	
2022	04	22	0452	0514	0528	M1.1	.001	N19E10L105	12994							
2022	04	22	1316	1330	1351	M3.4/2B	.010	N21E00L111	12993	210		II/1 0381		1624/0255/101/206?	F2/1223/12-25	
2022	04	25	0110	0156	0156	M1.0/SF		N26W24L111	12993						F /0134/12-25*	
2022	04	25	0118	0201	0239	M1.2/SF	.039	N17E04L076	12995					0200/0172/021/102?	F /0134/12-25*	
2022	04	25	0352	0402	0410	M1.1/SF	.005	N21W34L111	12993	190	42			0424/0197/049/099	F /0358/12-25	
2022	04	29	0715	0730	0756	M1.2/1F	.012	N26W39L067	12996	840	230			0736/1292/245/310	F /0719/12-25	29 2145/4.2
2022	04	29	1801	1810	1900	M1.3/SF	.010	N15W86L105	12994							
2022	04	30	0446	0501	0507	M2.6	.012	N14W88L105	12994	100				0548/0223/091/263		
2022	04	30	0525	0534	0540	M1.4	.010	N16W88L105	12994	33	65				F /0526/12-25	
2022	04	30	0948	0958	1005	M4.8	.025	N16W88L105	12994	130		II/1 0545		1012/0382/156/261	F /1003/12-25	
2022	04	30	1337	1347	1352	X1.1	.047	N16W88L105	12994	41000		II/2 1071		1400/0498/187/250		
2022	04	30	1942	1947	1954	M1.9	.008	N16W88L105	12994	11000		II/2 2683		2000/0648/209/264	F /1945/12-25	
2022	05	03	0734	0753	0801	M1.3	.001	S30E88L238	13006	130				0812/0252/040/111	F /0752/12-25	
2022	05	03	1309	1325	1331	X1.1	.044	S30E88L238	13006					1436/0102/016/159	F /1320/12-25	
2022	05	04	0008	0019	0025	M5.3	.022	S30E87L238	13006			IV/1			F /0015/12-25	
2022	05	04	0813	0859	1036	1B/M5.7	.040	S16W09L323	13004	590	32				F /0818/12-25	
2022	05	04	<1615	1632	1733	1N/M1.1	.010	S16W11L323	13004	190					F /1618/12-25	
2022	05	04	*1940	1948	2055	M1.5/1F	.015	S16W13L323	13004						F /1942/12-25	
2022	05	04	*2009	2027	2036	M1.6/1F	.021	S16W13L323	13004						F /2025/12-25	
2022	05	05	1308	1316	1322	M2.2/SN	.009	S15W24L323	13004	280					F /1313/12-25	

DATE y m d	TIME to tm te			CLASS X-ray/opt	COORDINATES L lt lg L			AR	RADIO MHz 245 2695 sfu		DYNAMIC EVENT RADIO SWEEP km/s		CME to / v /da /pa km/s		X-ray HARD An / tm /Emax keV		GOES PROTONS E>10MeV d tmax/Ipr /GLE		Attendant phenomena; remarks	
20220505	1402	1410	1416	M2.7/SF	.007	S30W04L238	13006		100					1748/0870/044/282?						
20220510	1350	1355	1430	X1.5/1B	.031	S30W04L238	13006		100		II/3 0718	IV/1		1436/0415/159/123				F2/1330/12-25		
20220511	1624	1658	1707	1N/M1.6	.013	S24E41L179	13007											F /1641/12-25		
20220511	*1808	1858	2050	M2.7/SF	.042	S17W89L323	13004		82	82	II/2 1345			1836/1100/194/228				F2/1856/12-25	12 2330/5	
20220511	*1927	1931	1935	M2.2	.012	S17W89L323	13004											F2/1856/12-25		
20220512	2004	2019	2027	M1.3	.009	N14E88L123	13011							2024/0719/091/064				F /2019/12-25		
20220514	2358	0008	0017	M2.2		N13E89L084	13017											F /2359/12-25		
20220516	1310	1327	1359	M2.4/SF	.031	N13E78L084	13017							1348/0224/065/078				F /1329/12-25		
20220518	2156	2202	2208	M1.1		N22E23L101	13014													
20220519	0632	0719	0757	M5.6/2B,1F	.054	N18E26L084	13017											F /0632/12-25		
20220519	0909	1009	1040	1N/M1.5	.011	N21E15L102	13014							1048/0355/038/135				F /1006/12-25		
20220519	1505	1513	1534	M1.1/SF	.008	N21E13L102	13014													
20220520	0735	0745	0841	M3.0/1B	.008	N20E03L106	13014			210								F /0742/12-25		DSF
20220525	1809	1824	1903	M1.3/1N	.018	S19W41L076	13016		82	160	II/3 1638	IV/2		1836/1134/360/215				F /1812/12-25		
20220610	1011	1104	>1114	M1.2/SF	.034	N17E89L114	13030											F /1012/12-25		
20220613	0258	0407	0512	M3.4	.180	N15E45L106	13032			670	II/2 0325	IV/1		0312/1150/360/098				F2/0301/12-25		
20220616	0347	0353	0357	M1.6	.003	S28W14L129	13031							0400/0405/038/185?				F /0351/12-25		
20220708	2007	2028	2149	M2.5	.079	N20E40L136	13053							2036/1223/360/077				F2/2102/12-25		
20220714	0422	0431	0447	M1.2/SF	.008	N15E81L049	13058							0412/0215/182/047				F /0427/12-25		
20220714	2142	2148	2153	M2.8		N15E69L017	13058							2212/0517/024/067				F /2143/12-25		
20220716	0616	0629	0651	M1.1/1N	.007	N18E19L059	13057													
20220716	1533	1544	1620	M1.4/1B	.005	S16W54L121	13055		250					1724/0539/102/185						
20220815	1427	1436	1600	1N/M1.0	.005	S22E00L033	13078		1700					1524/0450/125/164				F /1435/12-25		
20220815	1640	1654	1726	M2.7/1N	.001	S22W00L033	13078		220									F /1646/12-25		
20220815	1723	1735	1809	1F/M9.0	.005	S11W46L078	13079													
20220815	2147	2153	2158	M1.1		S22W03L033	13078											F /2152/12-25		
20220816	0752	0758	0805	M5.0	.022	S22W11L033	13078		1900	130								F /0814/12-25		
20220816	2110	2121	2128	M1.8		S22W15L033	13078											F /2111/12-25		
20220817	*1326	1345	1533	M2.0/1N	.008	S21W25L033	13078		320											
20220817	*1428	1452	1510	M1.0	.018	S26W25L033	13078		24000									F /1428/12-25		
20220818	*1000	1009	1321	1N/M1.3	.004	S23W38L033	13078		1100			IV/1						F2/1000/12-25		
20220818	*1037	1055	1113	1N/M1.5	.024	S27W37L033	13078		290		II/1 0749			1100/1327/360/174				F /1103/12-25		
20220818	1401	1413	1426	M1.3/1F	.005	S23W37L033	13078											F /1408/12-25		
20220819	0414	0444	0545	M1.6/SN	.036	S27W48L033	13078		880	150	II/2 0694	IV/1		0449/0996/104/227				F3/0425/12-25		
20220825	1939	1951	2002	M1.8	.015	S22E63L298	13088											F /1926/12-25		
20220825	2321	2327	2332	M1.0/1N	.007	S20E61L194	13089													
20220826	1041	1055	1105	M2.1/1N	.016	S22E52L194	13089											F /1044/12-25		
20220826	1208	1214	1221	M7.2/1B	.031	S22E51L194	13089											F /1214/12-25		
20220826	1224	1231	1238	M5.3	.040	S22E53L194	13089													
20220827	0152	0240	0305	M4.8/SF	.130	S19W58L298	13088		340	130	II/1	IV/1		0224/1284/360/225				F /0230/12-25	27 1220/27.5	
20220827	1129	1138	1143	M1.2/SN	.006	S28W66L298	13088													
20220827	1513	1525	1530	M1.1/SF	.008	S28W71L298	13088											F2/1514/12-25		
20220827	1545	1558	1621	M1.8	.027	S27W73L298	13088											F /1546/12-25		
20220828	0047	0134	0138	M1.4	.028	S27W85L298	13088											F /0053/12-25		
20220828	1548	1619	1646	M6.7/SF	.140	S28W80L298	13088		100		II/1			1612/1232/360/243						
20220828	1820	1832	1850	M4.6	.063	S26W86L298	13088											F /1809/12-25		
20220829	0324	0338	0347	M3.3/SF	.028	S23W80L298	13088											F /0340/12-25		
20220829	1048	1108	1112	M8.6	.030	S26W86L298	13088											F /1050/12-25		
20220829	1446	1456	1508	M2.5	.024	S28W86L298	13088							1524/0818/009/218				F /1446/12-25		
20220829	1845	1857	1908	M4.7	.044	S26W86L298	13088							1924/1088/020/221				F /1946/12-25		
20220830	*0125	0140	0158	M1.7		S24W86L298	13088													

DATE y m d	TIME to tm te			CLASS X-ray/opt	COORDINATES			AR	RADIO MHz		DYNAMIC EVENT RADIO SWEEP	CME				X-ray HARD		GOES PROTONS		Attendant phenomena; remarks
					L J*m-2	lt	lg		L	245		2695	to	/v	/da	/pa	An	/tm	Emax	
										sfu	km/s									
20220830	*0158	0213	0224	M1.5	.023	S26W86L298	13088						0312/0114/026/299	F4/0159/12-25	30	0210/0.88				
20220830	1804	1929	2123	M2.1	.190	S25W86L298	13088						1812/1247/360/268	F2/1918/12-25						
20220905	1758	1805	1814	M1.0	.007	S26W86L194	13089							F /1801/12-25						
20220912	2337	2344	2348	M1.7/SF		N19W41L049	13098							F /2342/12-25						
20220914	0941	1019	1056	M1.1/SF	.027	N22W58L049	13098					0936/0637/020/293	F2/1014/12-25							
20220916	0944	0949	0956	M7.9	.030	N18W81L049	13098							F /0947/12-25						
20220916	1549	1559	1612	M6.2/SN	.057	N18W81L049	13098							F /1549/12-25						
20220917	1242	1339	1353	M1.9	.031	N22W87L049	13098					1325/0313/074/304	F2/1254/12-25							
20220917	2032	2041	2052	M2.6	.021	N18W87L049	13098							F /2033/12-25						
20220920	1113	1122	1145	M1.0/1N	.009	S25W17L302	13102		3000			1136/0286/111/301								
20220921	0651	0702	0717	M1.0	.010	S25E73L196	13107							F /0657/12-25						
20220923	1748	1810	1841	M1.7/SF	.040	N16E84L158	13110		150	130	II/2 2453 IV/1	1812/1776/189/102	F /1800/12-25							
20220930	0346	0401	0651	M1.1	.007	N25E87L062	13112					0500/0569/040/271	F /0350/12-25							
20220930	1611	1622	1633	M2.9	.022	N20E87L062	13112						F /1612/12-25							
20220930	1730	1734	1745	M1.3	.009	N24E87L062	13112		730				F /1731/12-25							
20221001	1958	2010	2044	M5.8/1B	.030	N17W35L158	13110		220			2024/1122/069/297	F /2022/12-25							
20221002	0208	0221	0239	M8.7/1N	.036	N17W39L158	13110		910	190	IV/1	0236/1222/153/287	F /0243/12-25							
20221002	1352	1405	1423	M1.2/SF	.017	N23E71L062	13112					1505/0334/066/297	F2/1409/12-25							
20221002	1534	1545	1554	M1.0/SF	.008	N22E69L062	13112						F /1537/12-25							
20221002	1953	2025	2034	X1.0	.086	N17W49L158	13110		1400	560	II/2 1157	2036/1086/360/312	F /2033/>100							
20221003	0219	0223	0311	M2.6/SF	.040	N23E63L062	13112			170		0236/0611/239/143	F /0230/12-25							
20221003	0938	1011	1027	M4.2	.072	N18W58L158	13110		310	110		0948/1059/081/309	F2/0939/12-25							
20221003	1103	1111	1119	M1.5	.011	N18W59L158	13110						F /1045/12-25							
20221003	1520	1530	1548	M1.6/1N	.013	N23E56L052	13112					1524/0577/010/060	F /1525/12-25							
20221003	1957	2028	2053	M1.2		N17W64L158	13110					2036/0964/057/310	F /1958/12-25							
20221003	2111	2122	2131	M1.7		N17W64L158	13110						F /2131/12-25							
20221004	1240	1315	1351	SN/M1.6	.039	N17W75L158	13110		2200		IV/2	1325/1089/067/314	F /1323/12-25							
20221007	<1253	1444	1532	1F/M1.0	.036	N28E09L044	13116					1512/0616/026/067	F /1420/12-25							
20221010	<0000	0047	0114	1F/M1.0	.011	N24W23L044	13116						F /0007/12-25							
20221010	1605	1628	1653	M2.4/SF	.039	N24W33L062	13112					1624/1213/009/276	F /1603/12-25							
20221011	0836	0842	0854	M3.9/SB	.009	N24W35L044	13116		5500	140	II/2 0967	0912/0252/088/286	F /0847/12-25							
20221011	1047	1052	1057	M1.5	.005	N23W45L044	13116		29000		II/2 0237	1124/0246/086/286	F /1049/12-25							
20221012	2354	0019	0037	M1.5/SF		N24W65L062	13112			93		0312/0156/067/295	F /0022/12-25							
20221014	0920	0944	0959	M1.3	.012	N20W88L062	13112					1000/0223/093/313	F2/0941/12-25							
20221106	2359	0011	0016	M5.2/	.005	N16E69L321	13141				II/2 0927	0048/0422/084/125								
20221111	0700	0714	0720	M1.2/1F	.006	N14W03L321	13141		7900		IV/1	0912/0190/137/282	F /0708/12-25							
20221111	1127	1140	1146	M1.2/SN	.005	N12W11L321	13141		7200		IV/1	1136/0385/016/269	F /1133/12-25							
20221112	0009	0018	0028	M1.1/SF	.005	N14W20L321	13141						F /0013/12-25							
20221115	0242	0251	0307	M1.0/1N, SF	.003	N22W64L330	13140					0500/0286/027/287	F2/0249/12-25							
20221119	1242	1256	1311	M1.8	.017	N20W50L254	13150		410		II/2 1118 IV/1	1326/0422/165/325	F2/1253/12-25							
20221201	0704	0721	0736	M1.0/1N	.011	N28W34L009	13152					0748/0813/115/359	F /0712/12-25							
20221203	1736	1741	1745	M1.2/SN	.003	N18E83L290	13157		200		II/2	1800/0307/088/109								
20221214	0730	0740	0747	M2.4/1N	.017	S21W39L278	13165						F /0738/12-25							
20221214	0824	0831	0837	M1.1/1F	.008	S16W89L319	13153		110		II/2	0836/0452/093/268	F /0814/12-25							
20221214	0833	0935	1037	1F/M1.3	.009	S21W40L278	13165						F /0921/12-25							
20221214	*1145	1217	1259	M1.1	.015	S21W42L278	13165						F /1223/12-25							
20221214	*1224	1231	1238	M4.1	.020	S20W42L278	13165						F2/1256/12-25							
20221214	*1243	1247	1257	M1.4		S21W41L278	13165													
20221214	1431	1442	1449	M6.3/2B	.031	S20W49L278	13165		100				F /1435/12-25							
20221214	1454	1459	1504	M3.2	.018	S20W43L278	13165													
20221214	1703	1712	1723	M2.2	.016	S20W46L278	13165						F /1706/12-25							

D A T E	T I M E	CLASS	COORDINATES	AR	RADIO MHz	DYNAMIC EVENT	CME	X-ray HARD	GOES PROTONS	Attendant
y m d	to tm te	X-ray/opt	L lt lg L		245 2695	RADIO SWEEP	to / v /da /pa	An / tm /Emax	E>10MeV	n phenomena;
			J*m-2		sfu	km/s	km/s	keV	d tmax/Ipr /GLE	remarks
20230110	0208 0216	0224 M1.0/SF	.007 S12E68L179	13184				F /0213/12-25		
20230110	0233 0241	0331 M2.6/2N	.025 S18W33L281	13181				F /0234/12-25		
20230110	1059 1108	1112 M1.1	.005 S13E63L179	13184				F /1103/12-25		
20230110	1717 1728	1734 M1.3	.009 N22E66L168	13186				F /1724/12-25		
20230110	1744 1748	1752 M1.2	.004 S13E59L179	13184				F /1746/12-25		
20230110	2239 2247	2317 X1.0/2B	.028 N25E66L168	13186	120 320	IV/2	2312/0807/021/096	F /2243/12-25		
20230111	0039 0059	0155 M2.4/1F	.023 N25E66L168	13186	100	IV/2		F /0120/12-25		
20230111	0111 0121	0201 M5.6/1B	.021 S13E75L179	13184	24000 290	II/1 0625	0126/1083/089/072	F /0146/12-25		
20230111	0526 0601	0634 M1.3/SF	.031 S14W53L281	13181				F /0607/12-25		
20230111	0825 0833	0837 M3.1/SN	.006 N22E66L168	13186			0836/1047/144/047	F /0831/12-25		
20230112	*0553 0618	0633 M1.1	.014 N22E47L168	13186				F /0557/12-25		
20230112	*0633 0646	0702 M1.5	.024 N23E49L168	13186						
20230112	1108 1128	1146 M1.2/SF	.022 S14W69L281	13181				F /1111/12-25		
20230112	1439 1457	1510 M1.0	.014 S17W10L226	13182				F /1444/12-25		
20230112	1903 1913	1924 M1.0	.011 S17W14L226	13182				F /1847/12-25		
20230113	0249 0259	0326 1N/M1.4	.007 N27E41L168	13186	400			F /0239/12-25		
20230113	1005 1015	1019 M3.9/SN	.013 S19W84L281	13181	1300	II/2 0381				
20230114	0129 0209	0230 M1.3/SF	.043 N18E75L118	13192				F2/0043/12-25		
20230114	2006 2021	2028 M3.5	.030 S17W42L226	13182		100		F /1957/12-25		
20230114	2037 2100	2119 M4.6/	.090 S15W43L226	13182			2136/0335/202/241	F /2120/12-25		
20230115	0258 0308	0408 M6.0/SF	.140 N13E56L123	13191	720	II/1 0223	0348/0809/127/123	F /0340/15-25		
20230115	1416 1431	1511 M4.8/2B	.060 S15E54L120	13190				F /1446/15-25		
20230117	2316 2329	2344 M1.8	.019 S17E24L120	13190	130			F /2351/12-25		
20230118	1021 1035	1053 M1.8	.019 S16E20L120	13190				F /1057/12-25		
20230119	0400 0403	0409 M1.1/SF	.004 N11E43L084	13196						
20230119	1006 1012	1019 M1.7	.009 N11E40L084	13196	100					
20230119	1025 1027	1045 M1.0/SF	.012 N11E40L084	13196				?F /1100/12-25		
20230122	1212 1226	1234 M1.1	.012 S24W50L132	13194				F /1152/15-25		
20230122	1649 1702	1740 M1.6/1B	.012 S24W52L132	13194						
20230125	0937 1011	1049 M4.6/SF	.150 S12W78L120	13190			1012/0354/141/248	F /0923/12-25		
20230125	1642 1701	1722 M1.3/SF	.019 N16W77L118	13192				F /1718/12-25		
20230125	2223 2235	2244 M2.0	.014 N14W88L118	13192				F /2228/12-25		
20230126	1253 1306	1326 M2.8	.021 N18W87L118	13192				F /1257/12-25		
20230207	1333 1353	1422 M1.0	.022 S14E88L121	13220			1436/0391/083/127	F /1334/12-25		
20230207	2001 2007	2014 M1.5/1N	.008 N30E05L226	13213		57		F /2002/12-25		
20230207	*2246 2258	2305 M3.8	.012 N28E02L226	13213						
20230207	*2305 2307	2309 M6.3	.012 N30E03L226	13213	120		0024/0568/011/041	F /0215/12-25		
20230208	0245 0253	0257 M2.0	.007 N30E01L226	13213						
20230208	1528 1603	1626 M1.6/2N	.037 N31W05L226	13213	470			F2/1543/12-25		
20230208	1956 2012	2046 M1.5/1N	.037 S09E72L139	13217			2036/0500/018/101	F /2028/12-25		
20230208	2103 2113	2148 M1.7/1F	.011 N30W10L226	13213						
20230209	0245 0310	0328 M3.0	.041 S02E70L139	13217	230			F /0250/12-25		
20230209	0711 0717	0721 M1.1/SF	.004 S02E70L139	13217	530					
20230209	0849 0907	0924 M2.8	.038 S12E85L139	13217	220	II/1	IV/1 0924/0622/107/106	F /0932/12-25		
20230209	1430 1456	1527 M1.5/1N	.012 N30W18L226	13213				F4/1449/15-25		
20230209	1510 1525	1552 M1.4/SN	.015 S09E69L139	13217				F /1529/12-15		
20230209	1818 1842	1902 M1.8	.037 N31W18L226	13213			1836/0262/029/231	F2/0250/12-25		
20230210	0245 0345	0403 M3.7/2N	.046 N29W25L226	13213	370 110	II/2	IV/1 0347/0308/047/158	F2/0250/12-25		
20230210	0802 0805	0809 M1.4/SN	.004 N31W27L226	13213			0924/0324/116/209	F /0803/12-25		
20230210	1435 1455	1512 M1.1/SF	.018 N34W29L226	13213	870			F /1516/12-25		
20230210	1529 1600	1613 M1.6/SF	.033 N14W62L226	13213				F /1552/12-25		

DATE		TIME			CLASS	COORDINATES			AR	RADIO MHz		DYNAMIC EVENT	CME			X-ray HARD		GOES PROTONS			Attendant									
y	m	d	to	tm	te	X-ray/opt	L	lt	lg	L	245	2695	RADIO SWEEP	to	/ v	/da	/pa	An	/ tm	/Emax	E>10MeV	n	phenomena;							
																							sfu	km/s	km/s		keV	d tmax/Ipr	/GLE	remarks
20230210	2234	2241	2248	M1.2/1N	.008	S18E63L121	13220				410																			
20230211	0759	0808	0815	M2.2/1N	.017	N07W69L252	13208											F /0752/12-25												
20230211	1042	1058	1129	M1.0/1N	.008	S18E58L121	13220							1112/1498/360/022			F /1047/15-25													
20230211	1129	1134	1141	M1.4	.009	N29W70L249	13222																							
20230211	1205	1209	1215	M1.5	.009	S09E41L139	13217																							
20230211	1218	1223	1228	M1.1	.007	S10E40L139	13217											F /1220/12-25												
20230211	1228	1240	1249	M1.5/SF	.017	N06W71L251	13208																							
20230211	1540	1548	1618	X1.1/2B	.046	S10E39L139	13217											F /1544/12-25												
20230211	1711	1723	1731	M1.4/SF	.011	N07W74L251	13208											F2/1715/12-25												
20230212	0835	0848	0859	M3.1/1B	.014	S10E29L139	13217				200							F /0847/12-25												
20230212	0911	0927	0937	M1.4	.018	S09E31L139	13217				100																			
20230212	1323	1334	1344	M1.2	.010	N28W85L249	13222											F /1343/12-25												
20230212	1533	1538	1601	M1.0/SN	.013	S09E26L139	13217				1400			1538/0416/045/132			F /1535/12-25													
20230213	0504	0518	0543	M1.0	.017	N10E46L113	13226											F /0513/12-25												
20230213	1549	1556	1614	M1.4	.009	N10E40L113	13226																							
20230214	0157	0203	0220	M1.8/1N	.006	N10E34L113	13226							0336/0357/126/090			F /1058/12-25													
20230214	1159	1212	1246	M2.6	.047	N29W85L226	13213											F2/1206/12-25												
20230215	0433	0447	0507	M1.1	.017	N30W85L226	13213											F /0444/12-25												
20230215	0516	0523	0530	M2.0	.014	N27W86L226	13213							0624/0071/033/206			F /0516/12-25													
20230215	0642	0705	0728	M1.3	.018	N27W86L226	13213											F /0642/12-25												
20230215	2105	2114	2118	M1.0	.004	N30W85L226	13213				600							F /2109/12-25												
20230216	0019	0032	0043	M1.1	.009	N25E86L035	13229											F /0022/12-25												
20230217	1938	2016	2050	X2.2	.510	N25E67L035	13229				320	550	II/3	2012/1315/360/045			F /2000/12-25													
20230220	1447	1458	1503	M4.4/SF	.016	N26E75L343	13234							1524/0339/063/065			F /1454/12-25													
20230221	1105	1123	1131	M4.7	.038	N14W70L113	13226											F2/1124/12-25												
20230221	1957	2017	2030	M5.0	.053	N26E64L343	13234				30	32	II/2	2048/0413/069/069			F /2000/12-25													
20230222	0451	0512	0540	M1.4	.029	N26E59L343	13234					120						F /0455/12-25												
20230222	1336	1350	1358	M2.6	.017	N26E53L343	13234							1348/0450/100/054																
20230223	0611	0614	0618	M1.5	.004	N20E20L007	13235				5300			0648/0400/024/047			F /0612/12-15													
20230223	0832	0848	0909	M1.0	.009	N26E43L343	13234																							
20230224	1711	1715	1720	M1.1	.004	N20E01L007	13235											F /1713/12-25												
20230224	2003	2030	2129	M3.7	.100	N29W24L035	13229						IV/2	2036/1336/360/351			F /2010/12-25			24/2335/3										
20230225	1534	1540	1546	M1.0	.004	S24W00L356	13236											F /1537/12-25												
20230225	1840	1944	2100	M6.4/3N	.200	N24W45L035	13229						II/2 3133	1924/1170/360/284			F2/1948/12-25			26/0440/58										
20230228	1735	1750	1756	M8.6	.057	N27W29L343	13234				140			1824/0325/070/319			F /1739/12-25													
20230301	0056	0107	0118	M1.0/SF	.008	S15E69L241	13240							0137/0199/049/105																
20230302	2105	2116	2125	M3.8	.030	N21W64L343	13234							2136/0244/096/293																
20230303	1008	1112	>1229	M3.3/1F	.047	N21W66L343	13234							1124/0517/057/210			F /1033/12-25													
20230303	1742	1752	1825	X2.1/1B	.091	N22W80L343	13234				360	710	II/1 1247	IV/1	1812/0709/360/271			F2/1749/12-25												
20230304	0706	0710	0721	M1.0/SN	.003	N17W39L306	13243				370			0724/1178/084/266			F2/0709/12-25													
20230304	1334	1342	>1356	M1.2/1F	.007	N08E41L216	13242											F /1336/12-25												
20230304	1519	1557	1626	M5.2	.140	N19W87L343	13234						II/2 0815	IV/2	1536/0933/360/263			F /1504/12-25												
20230305	0240	0252	0303	M1.3/SF	.010	N09W01L260	13238							0248/0550/014/321			F /0246/12-25													
20230305	1624	1641	1659	M1.1/SF	.009	N10W12L260	13238											F /1629/12-25												
20230305	1653	1701	1711	M1.0	.011	N14E37L216	13242																							
20230305	2129	2136	2141	M5.0	.021	N18W60L306	13243					91						F /2130/12-25												
20230306	0208	0228	0336	M5.8/2N	.044	N18W63L306	13243				480		IV/1	0312/0873/360/276			F2/0214/12-25													
20230306	0857	0912	0937	M1.3	.021	N24W86L343	13234											F2/0902/12-25												
20230306	1724	1750	1810	M1.0	.021	N14E24L216	13242											F /1747/12-25												
20230308	0953	1012	1046	M1.2	.026	N09W07L216	13242							1148/0296/013/256			F /0958/12-25													
20230308	2235	2244	2252	M1.3/1N	.007	S23E13L196	13245				110							F /2239/12-25												

D A T E	T I M E	CLASS	COORDINATES	AR	RADIO MHz	DYNAMIC EVENT	CME	X-ray HARD	GOES PROTONS	Attendant
y m d	to tm te	X-ray/opt	L lt lg L		245 2695	RADIO SWEEP	to / v /da /pa	An / tm /Emax	E>10MeV	n phenomena;
			J*m-2		sfu	km/s	km/s	keV	d tmax/Ipr /GLE	remarks
20230317	1504 1507	1511 M1.1/SN	.003 S22W66L160	13247						
20230320	0119 0148	0226 M1.2	.042 S21E57L009	13256			0227/0386/062/079	F3/0103/12-25		
20230329	0218 0233	0240 X1.2	.058 S21W59L009	13256	140	50				
20230329	1347 1407	1415 M1.2/1F	.010 S21W67L009	13256			1400/1008/015/211	F2/2342/12-25		
20230329	2335 2347	0015 M1.1/1N	.008 S20W72L009	13256						
20230330	0724 0737	0746 M5.4/1F	.026 S22W77L009	13256	590	120	II/2 0279 IV/2 0748/0487/224/238	F /0745/12-25	30 1016/0.61	
20230406	0536 0553	0611 M3.0	.030 S21E87L009	13272		100		F2/0613/12-25		
20230408	0138 0146	0150 M2.9/1N	.010 S18E61L009	13272				F /0514/12-25		
20230410	0414 0520	0731 M2.8/1N	.018 S21E87L052	13276				F /1007/12-25		
20230411	0951 1016	1039 M1.3/1N	.010 S19E17L009	13272			0648/0297/053/116	F/ 1007/12-25		
20230414	1610 1618	1625 M1.1	.006 N10E56L022	13282						
20230414	2318 2327	>0036 M1.5/1N	.005 N11E54L022	13282				F /2325/12-25		
20230421	1744 1812	2001 M1.8/2N	.039 S23W10L001	13283	110		II/3 0580 IV/2 1812/1284/360/180	F /1810/12-25		
20230427	1104 1114	1123 M1.8/SN	.009 S22W05L265	13288				F /1112/12-25		
20230430	1956 2028	2052 M2.4/1F	.038 N14E81L141	13293			2024/0924/157/066	F2/2012/12-25		
20230501	0055 0121	0129 M1.1	.012 S24W42L269	13288						
20230501	1302 1309	1313 M7.1	.012 S24W45L269	13288	1300	150	1412/0445/027/198	F /0925/12-25		
20230503	0913 0927	0935 M4.2/1B	.021 S24W83L269	13288			0924/0494/034/215			
20230503	1003 1014	1019 M3.1	.015 N12E42L141	13293						
20230503	1036 1045	1049 M7.2	.024 N12E42L141	13293				F2/1037/12-25		
20230503	1224 1235	1241 M1.7	.009 N12E41L141	13293						
20230503	1335 1350	1420 M2.2/1B	.008 N14E43L141	13293				F /1345/12-25		
20230504	0805 0844	>0947 M3.9/SB	.080 N14E32L124	13296	22000	350	II/2 0717 IV/2 0848/0810/360/067	F3/0845/12-25		
20230505	0730 0801	0833 M2.1	.060 N15E29L124	13296	5300	550	II/2 0997 IV/2 0800/0770/360/027	F /0717/12-25		
20230505	1518 1531	1615 M1.2/1N	.006 N15E29L124	13296	340		1548/0652/122/011	F /1536/12-25		
20230507	*2140 2234	2258 M1.5	.026 N16W06L124	13296	300		IV/2	F2/2220/12-25		
20230507	*2253 2323	2346 M1.6	.064 N15W05L124	13296	3000		2312/1075/360/274		08 1240/38	
20230508	2011 2025	2033 M2.3/2B	.016 N13W18L124	13296	1300		2236/0217/099/249	?F /2040/12-25		
20230509	0339 0354	0423 1N/M6.5	.044 N12W13L124	13296	740	360	II/2 0774 0424/0415/076/284	F /0347/12-25		
20230509	0555 0613	0640 M1.2	.013 N13W24L124	13296	1100	210	IV/2 0424/0416/076/269	F /0612/12-25		
20230509	1000 1020	1043 M1.4	.016 N13W30L124	13296				F /1006/12-25		
20230509	1820 1858	1924 M4.2/1B	.100 N15W31L124	13296	3200	1300	II/2 1892 IV/3 1900/1209/360/297	F /1843/12-25	09 2335/83	
20230509	2032 2052	2104 M5.0/1N	.055 N14W35L124	13296	200	180		F /2033/12-25		
20230510	1319 1421	1556 1B/M2.2	.018 N13W51L141	13293			1505/0441/092/290	F /1418/12-25		
20230511	0847 0901	>0948 M2.1/1N	.018 S06W41L127	13294	5000	100	II/2 0419 0924/0365/191/233	F /0906/12-25		
20230511	1813 1829	1902 M1.8/1N	.014 S05W44L127	13294	330	180	II/2 0356 1848/0424/092/245	F /1820/12-25		
20230516	1631 1643	1651 M9.6	.054 S23E89L285	13310			1700/0234/151/126			
20230518	0613 0626	0638 M1.0	.009 N17E88L272	13311				F /0621/12-25		
20230518	0648 0655	0702 M1.2	.007 N18E88L272	13311						
20230518	*1132 1147	1200 M2.2	.014 N18E88L272	13311				F /1150/12-25		
20230518	*1200 1213	1222 M1.9	.024 N20E88L272	13311				F /1212/12-25		
20230518	1239 1249	1256 M1.6	.016 N18E84L272	13311						
20230518	1732 1751	1801 M1.1	.012 N18E82L272	13311						
20230518	*2012 2023	2051 M3.8	.012 N17E77L272	13311				F /2017/12-25		
20230518	*2051 2105	2116 M4.5	.057 N18E81L272	13311			2112/0520/020/036	F /2121/12-25		
20230519	0041 0048	0054 M5.3/1N	.025 N18E74L272	13311				F /0042/12-25		
20230519	0305 0312	0323 M1.6/SN	.014 N19E72L272	13311			0324/0086/088/023			
20230519	0449 0500	0510 M2.5/1N	.018 N19E72L272	13311						
20230519	1945 2006	2014 M2.3/SF	.020 N16E61L272	13311				F /1948/12-25		
20230519	2014 2026	2038 M2.7	.034 N17E60L272	13311						
20230520	0649 0702	0712 M1.0/SF	.011 N19E72L272	13311				F /0652/12-25		

DATE		TIME		CLASS	COORDINATES	AR	RADIO MHZ		DYNAMIC EVENT	CME		X-ray HARD		GOES PROTONS		Attendant phenomena; remarks											
y	m	d	to				tm	te		X-ray/opt	L	lt	lg	L	245		2695	RADIO SWEEP	to	/ v /da /pa	An / tm /Emax	E>10MeV	d tmax/Ipr	/GLE			
																					sfu		km/s	km/s	keV		
20230520	0716	0732	0736	M6.4/1N	.033	N19E72L272	13311	140			0748/0199/043/146	F	/0714/12-25														
20230520	0918	0927	0932	M1.1	.008	S27E66L262	13312				0948/0223/064/144																
20230520	1048	1054	1110	M1.6	.017	N17E57L272	13311				1224/0234/035/152																
20230520	1225	1235	1240	M8.9	.030	N17E56L272	13311				1400/0196/027/153																
20230520	1454	1500	1504	M5.6	.018	N17E55L272	13311	60				F	/1454/12-25														
20230520	1857	1903	1907	M1.1	.006	N18E53L272	13311				2012/0193/054/144																
20230520	2252	2306	2321	M5.1/1F	.050	N19E49L272	13311	170				F	/2258/12-25														
20230521	0218	0223	0233	M1.4/SN	.009	N20E47L272	13311					F	/0219/12-25														
20230521	1549	1604	1618	M2.6/SN	.026	N17E40L272	13311					F	/1555/12-25														
20230522	1330	1337	1343	M1.9/SF	.008	N18E24L272	13311		II/		1409/0249/087/13																
20230523	1207	1213	1217	M3.0/SN	.007	N17E11L272	13311					F	/1217/12-25														
20230524	0951	0958	1002	M1.0/SN	.003	N18E00L272	13311																				
20230524	1704	1721	1748	M1.8/1F	.031	N18W03L272	13311	140				F2/1708/12-25															
20230524	1753	1800	1818	M1.0/SF	.013	S17E38L234	13315																				
20230525	1437	1446	1509	M1.1/1N	.007	S26W04L262	13312	100			1524/0404/106/214																
20230526	2248	2303	2326	M1.4	.004	S19E07L234	13315					F	/2237/12-25														
20230528	1021	1055	1036	M1.0/1N	.012	S15W12L234	13315																				
20230530	0754	0810	0819	M1.2/SF	.001	N00E00L285	13310					F	/0800/12-25														
20230530	1015	1022	1029	M1.3	.006	S22W89L285	13310	210																			
20230530	1336	1338	1400	M1.4/1B	.003	S20W41L234	13315				1424/0216/071/320	F	/1342/12-25														
20230531	0424	0438	0444	M1.3	.009	S07E89L104	13323					F	/0430/12-25														
20230531	1223	1226	1230	M1.0	.002	S17W20L200	13319																				
20230531	2147	2208	2214	M1.1/SF	.001	S06E89L104	13323					F	/2152/12-25														
20230531	2214	2252	2312	M4.2	.100	S06E82L104	13323					F	/2258/12-25														
20230602	0232	0241	0245	M1.5	.004	N16E02L159	13324					F	/0239/12-25														
20230607	1118	1146	1159	M4.7	.059	S15E36L053	13327	100			1236/0164/053/097	F	/1145/12-25														
20230609	1648	1711	1734	M2.5	.030	S21E48L017	13331				1724/0651/199/093	F	/1659/12-25														
20230616	0521	0530	0541	M1.0	.001	N17E69L263	13337				0548/0892/086/052	F	/0534/12-25														
20230616	1020	1038	1102	M1.1	.170	N13E65L266	13338				1100/0904/060/077	F	/1025/12-25														
20230616	1952	1959	2007	M1.0	.005	S24W46L017	13331																				
20230618	0025	0031	0040	M1.3	.007	S21E26L279	13336					F	/0028/12-25														
20230618	1325	1420	1517	M2.5/2N	.048	S23E22L279	13336		II/1 0440		1400/0832/084/131	F	/1351/12-25														
20230619	0337	0350	0358	M1.4	.110	S12E89L207	13341		II/2 0355		0424/0271/069/065																
20230619	1206	1214	1218	M1.1/SF	.005	S13E79L207	13341	190	II/2 0954		1248/0198/062/069	F	/1208/12-25														
20230620	*1109	1113	1117	M1.1	.009	S21W67L342	13342				1124/0376/066/236	F	/1052/12-25														
20230620	*1117	1125	1135	M1.8	.009	S21W68L342	13342				1124/0376/066/236	F	/1118/12-25														
20230620	1544	1548	1633	M1.1	.002	S20W71L342	13342					F	/1544/12-25														
20230620	1642	1709	1735	X1.1	.140	S17E73L207	13341	200	480	II/2 1027	IV/1	1712/1113/360/101	F2/1652/12-25														
20230621	1231	1244	1254	M1.1/1N	.010	S13E58L207	13341					F	/1237/12-25														
20230621	1531	1538	1543	M1.0/SF	.004	N19W05L263	13337		II/1 0556		1624/0371/069/295																
20230622	1057	1121	1136	M1.1/1N	.017	S12E44L207	13341					F	/1122/12-25														
20230622	2329	2344	0007	M4.9	.045	S21E41L207	13341	39	140	II/2	IV/1	F	/0003/12-25														
20230624	1211	1217	1224	M1.1/SN	.006	N21W42L263	13337	310			1236/0688/119/289																
20230626	1608	1634	1622	M1.6/1N	.012	N23W38L233	13340																				
20230627	1453	1514	1639	M1.3/2B	.004	N23W49L233	13340					F3/1510/12-25															
20230628	0826	0844	0859	M1.9/2N	.020	N22W60L233	13340					F	/0841/12-25														
20230629	1400	1415	1502	M3.8/2B	.022	N17W13L170	13351																				
20230701	2207	2223	2231	M1.1/SN	.009	S20E55L070	13359	410			2312/0233/033/096	F	/2213/12-25														
20230702	0229	0235	0240	M2.1	.007	S22E55L070	13359	42000	II/3 0379		0312/0284/054/094	?F	/0250/12-25														
20230702	2254	2314	2358	X1.1	.260	N16W60L166	13354		200			F	/2316/12-25														
20230703	0629	0653	0738	M1.4/1N	.007	S15E40L072	13358																				

D A T E	T I M E			CLASS	COORDINATES			AR	RADIO MHz		DYNAMIC EVENT	CME				X-ray HARD	GOES PROTONS		Attendant
y m d	to	tm	te	X-ray/opt	L	lt	lg	L	245	2695	RADIO SWEEP	to	/ v	/da	/pa	An / tm /Emax	E>10MeV	n	phenomena;
					J*m-2				sfu		km/s		km/s			keV	d tmax/Ipr	/GLE	remarks
20230704	1220	1235	1316	M1.5/SF	.021	N16W89L166		13354								F /1224/12-25			
20230705	1836	1858	1925	M1.0	.001	N17W89L166		13354								F /1839/12-25			
20230706	1032	1049	1116	M1.1	.016	N15W89L166		13354											
20230707	0617	0629	0638	M4.0/2B	.023	S21W13L070		13359	830	190						F /0624/12-25			
20230710	0329	0355	0412	M2.3/2N	.040	S13W49L052		13366	180	23	II/1 1062	0400/1160/360/204				F /0353/12-25			
20230710	2206	2218	2229	M1.4/1N	.013	S12W59L072		13358	59	120						F /2208/12-25			
20230711	1419	1435	1445	M2.0	.018	N25E88L276		13372				1512/0201/064/045				F /1444/12-25			
20230711	1602	1612	1635	M1.1	.020	N24E88L276		13372				1636/0502/360/010				F /1619/12-25			
20230711	1751	1808	1816	M6.8/SF	.052	S19W57L050		13368								F /1755/12-25			
20230711	1920	1929	1939	M1.0/SF	.011	N24E87L276		13372				1924/0826/360/144				F /1929/12-25			
20230711	2204	2215	2224	M5.8	.032	N25E88L276		13372	140	65	IV/2					F /2239/12-25			
20230711	2334	2337	2345	M1.2		S19W59L050		13368											
20230712	0021	0031	0040	M1.4/SF	.013	N11W24L052		13366								F2/0025/12-25			
20230712	0431	0445	0458	M1.3	.003	N24E88L276		13372	100							F /0459/12-25			
20230712	0510	0514	0523	M1.3	.003	N25W48L038		13361								F /0510/12-25			
20230712	0849	0855	0900	M6.9/1N	.025	N24E77L276		13372								F /0840/12-25			
20230713	1855	1920	1936	M2.1/1N	.032	N24E57L276		13372								F /1902/12-25			
20230714	0922	0936	0949	M1.0/SF		S19W24L344		13363	210			1004/0421/103/209				F /0924/12-25			
20230715	0721	0741	0810	M2.9/2B	.037	S25W40L344		13363	3600	570		0737/0836/167/220				F /0728/12-25			
20230715	0942	0953	1018	M1.0/1N	.004	N21E42L276		13372	1500		II/2 0662					F2/0949/12-25			
20230715	1005	1010	1014	M2.2	.005	N21E41L276		13372	1100		II/2 0335	?1032/0887/081/061							
20230716	0816	0826	0854	M1.0	.001	N21E30L276		13372	550										
20230716	1457	1512	1508	M1.7	.001	N21E26L276		13372	6900	170	IV/2					F /1507/12-25			
20230716	1736	1746	1817	M4.0/2B	.001	S24W59L276		13363	38	130		1753/1239/182/220				F /1738/12-25			
20230717	2241	2254	2306	M2.7	.028	S25W81L344		13363	100			2254/2075/131/225				F2/2246/12-25			
20230717	2337	0006	0023	M5.7	.150	S26W87L344		13363	340	190		2336/1385/360/223				F /0021/12-25	18 0115/620		
20230718	0645	0656	0702	M1.5	.010	N11E89L175?		13379?				0724/0428/010/036				F /0650/12-25			
20230718	*1932	1948	2000	M1.3	.020	N27E35L229		13376								F /1922/12-25*			
20230718	*2000	2005	2011	M1.4	.007	N26E35L229		13376				2012/1272/360/031				F /1922/12-25*			
20230718	2016	2017	2022	M2.1/SF	.001	N20W12L272		13372											
20230718	2016	2027	2035	M2.1	.021	S21W87L344		13363				2048/0467/056/257							
20230719	1049	1057	1102	M1.4/SF	.007	S20W88L344		13363											
20230719	1704	1725	1743	M3.8	.052	S18W88L344		13363			II/1 0429	1736/0716/179/262				F /1732/12-25			
20230722	0312	0355	0415	M3.1/2N	.043	N23W54L276		13372				0400/0549/144/248				F /0322/12-25			
20230722	0412	0424	0515	M1.0/1F	.007	N06W29L245		13373								F /0412/12-25			
20230725	0136	0203	0222	M1.5/2N	.029	N25W51L229		13376	180			0212/0325/070/292				F /0147/12-25			
20230725	2108	2116	2124	M1.6/SF	.010	N19W61L229		13376								F /2108/12-25			
20230726	0421	0428	0433	M1.2	.008	N21W65L229		13376											
20230726	1017	1037	1048	M4.6	.040	N21W70L229		13376				1100/0444/041/280				F /1024/12-25			
20230726	1505	1613	1650	1B/M2.0	.013	N20W76L229		13376								F /1552/12-25*			
20230727	0944	0951	0958	M1.9/SF	.013	N21W85L229		13376								F /0935/12-25			
20230727	2204	2234	2305	M1.7/SF	.051	S21E68L092		13388								F /2205/12-25			
20230728	1539	1616	1658	M4.1	.056	N27W87L229		13376			II/2	1600/1896/360/314				F /1542/12-25	29 0920/154		
20230729	1611	1624	1637	M1.4/1N	.014	S11W09L125		13380		100									
20230730	*0801	0814	0846	M1.8/1F	.014	S18E57L052		13390	110	120									
20230730	0818	0806	0922	*M1.9/SF	.009	S18E59L052		13390	370										
20230731	0842	0909	>0941	M1.7/2F	.021	S20E44L052		13390								F /1542/12-25			
20230801	0138	0158	0246	M1.0/SF	.012	S09W40L125		13380								F /0143/12-25*			
20230801	0158	0203	0207	SF/M1.3	.007	S09W41L125		13380								F /0143/12-25*			
20230801	0427	0504	1034	*M2.2/1N	.006	S09W41L125		13380								F /0143/12-25			
20230801	0530	0537	0543	*1N/M1.3	.009	S09W42L125		13380								F /0526/12-25			

DATE			TIME			CLASS	COORDINATES			AR	RADIO MHZ		DYNAMIC EVENT		CME		X-ray HARD		GOES PROTONS		Attendant
y	m	d	to	tm	te	X-ray/opt	L	lt	lg	L	245	2695	RADIO SWEEP	to	/ v /da /pa	An / tm /Emax	E>10MeV	d tmax/Ipr	n	phenomena; remarks	
20230801	0628	0657	0719	*1N/M1.3	.074	S09W43L125	13380				110						F /0630/12-25				
20230801	0903	0909	0916	*1N/M1.3	.009	S08W42L125	13380														
20230801	1402	1409	1434	M1.4/1N	.012	S08W45L125	13380										F /1420/12-25				
20230801	2139	2158	2151	M1.0	.008	S10W52L125	13380														
20230802	0803	0812	0938	M1.3/1F	.011	S10W58L125	13380				710		II/2 0286	IV/2	0912/0572/360/256	F3/0803/12-25					
20230802	1040	1054	1057	M1.2/1F	.003	S10W60L125	13380										F /1059/12-25				
20230802	*1446	1452	1659	M1.7/SF	.005	S10W62L125	13380										F /1452/12-25				
20230802	*1612	1622	1626	SF/M1.3	.005	S10W63L125	13380														
20230802	1909	1914	1921	M1.1	.008	S11W65L125	13380										F /1924/12-25				
20230803	1147	1155	>1201	M2.0/SF	.006	S11W74L125	13380														
20230804	0338	0424	0623	M1.9/1N	.079	N11W52L095	13386				810	140			0417/1029/360/293	F /0407/12-25					
20230805	0616	0722	0810	M1.6/SF	.110	N07W69L095	13386						II/2 0572		0700/1000/360/246	F /0703/12-25	05 1745/18.5				
20230805	0923	0952	0936	M2.1	.027	S08W88L125	13380									F /0924/12-25					
20230805	2145	2221	2244	X1.6	.300	N11W77L095	13386				460		II/1 0772		2212/1647/360/299	F3/2207/12-25	08 0115/47				
20230806	1820	1840	1911	M5.5/SN	.060	N08W89L095	13386				630				1848/1182/236/251	F /1843/12-25					
20230807	0429	0441	0451	M2.4	.019	N10W89L095	13386								?0500/0509/080/252	/12-25					
20230807	1525	1611	>1632	*M1.0/SF	.032	N16W81L068	13387								1639/0602/094/254	F /1606/12-25					
20230807	1530	1627	1636	*M1.0/SF	.032	N15W79L095	13386								1639/0602/094/254						
20230807	1937	1951	>2123	M1.4/2N	.011	N19W75L068	13387									F2/1939/12-25					
20230807	2030	2046	2118	X1.5	.280	N12W88L095	13386				1600		II/2		2048/1851/360/290	F /2051/12-25					
20230808	0909	0931	0941	M3.6/1N	.025	N18W84L068	13387														
20230822	2235	2304	2338	M1.1/SF	.002	N10W30L188	13405				300				2322/0528/098/236	F /2242/12-25					
20230825	0056	0109	0144	M1.5/1N	.001	S12E50L081	13415									F /2242/12-25					
20230826	2205	2250	2342	M1.1	.044	S05E89L001	13417								2236/0666/254/100	F /2231/12-25					
20230901	0220	0352	0447	M1.2	.067	N16W64L094	13413				190		II/2 0743	IV/2	0324/1339/301/336	F /0338/12-25	01 0610/25.8				
20230902	0633	0712	0734	M3.4/SF	.075	N06W89L094	13413				230				0712/1176/156/260	F /0638/12-25					
20230903	0014	0033	0023	M1.1	.009	N11W88L094	13413								0036/0575/088/287	F /0015/12-25					
20230903	0809	0836	0856	M6.0	.064	N12W88L094	13413								0912/1349/249/301	F /0809/12-25					
20230905	0803	0812	0840	M2.0/1N	.016	N14W02L343	13421									F /0806/12-25					
20230905	1933	1945	2007	M1.2/1N	.011	N15W10L343	13421						II/2 1314								
20230905	2321	2339	0007	M1.0/1F	.009	N15W11L343	13421									F /2326/12-25					
20230907	1858	1909	1952	M2.1/1B	.022	N22E56L247	13425				8000		II/2 1238		1924/0634/124/073						
20230911	0108	0128	0213	M1.4/1F	.029	N09E65L204	13429				100		II/2 0547		0148/0545/166/071						
20230911	0358	0407	0427	M1.1/SN	.009	S05E58L203	13431														
20230911	1438	1449	1459	M1.1/SN	.009	S06E52L203	13431														
20230912	0418	0426	0516	M1.9/1B	.007	N22E02L247	13425														
20230912	0647	0707	0757	M2.6/2N	.001	N16W32L281	13423					170									
20230914	0640	0745	0839	M1.4	.065	N10E15L204	13429								0724/0804/360/304						
20230914	1923	1931	1958	M1.9/SN	.011	N10E09L204	13429					460									
20230914	2117	2126	2141	M2.5/SN	.013	N10E07L204	13429														
20230915	2219	2234	2229	M1.7	.006	N10W07L204	13429														
20230916	0038	0050	0111	M2.9/1N	.015	N10W08L204	13429														
20230916	0528	0538	0638	M3.4/1B	.032	N10W11L204	13429														
20230919	0345	0355	0404	M1.1/SF	.007	N07E53L116	13435				140				0424/0473/100/123						
20230919	0923	0938	0944	M1.8	.001	N07E51L116	13435								1000/0418/125/130						
20230919	2001	2014	2021	M4.0	.024	N07E45L116	13435				1300				2035/0483/114/136	F /12-25					
20230920	1411	1419	1425	M8.2	.036	N07E35L116	13435						II/2 1054		1506/0199/048/027						
20230921	1242	1254	1302	M8.7	.001	N07E22L116	13435								1336/0347/067/027	F /12-25					
20230922	0203	0430	0656	M1.2	.002	N13E18L116	13435				2400				0224/0983/109/038	F2/12-25					
20230922	1553	1623	1640	M1.4	.004	N29W36L145	13443				2900					F2/12-25					
20230922	1706	1720	1715	M1.5	.010	N29W38L145	13443				1300										

DATE		TIME		CLASS	COORDINATES			AR	RADIO MHz	DYNAMIC EVENT	CME			X-ray HARD	GOES PROTONS		Attendant	
year	month	day	hour	minute	X-ray/opt	lon	lat	lg L	sfu	RADIO SWEEP	to	/ v	/da	/pa	An	/ tm	/Emax	phenomena;
						J*m-2				km/s			km/s			keV	d tmax/Ipr	remarks
20230922	2225	2300	2319	M1.9		.025	N28W40	L145								F /2256/12-25		
20230924	0259	0328	0416	1N/M4.4		.039	S13E21	L073	120							F /0324/12-25	24	/0.4
20230924	1451	1500	1505	M1.0		.005	N27W57	L145	360	II/1 0755		1524/0614/090/208						
20230928	0858	0907	0911	M1.2/SF		.004	S19E66	L334				?0927/0455/048/127						
20230930	1616	1635	1649	M1.2		.018	N11E66	L299				1645/0374/063/084			F /1620/12-25			
20231001	0110	0132	0143	M2.5		.028	N10E61	L300								F /0121/12-25		
20231002	1235	1246	1258	M1.9/1N		.015	N20E65	L274								F /1246/12-25		
20231007	1757	1806	1810	M1.7/SB		.005	S10E39	L233	920	II/1						F /1829/12-25		
20231010	0155	0209	0222	M1.6/SF		.018	N12W63	L299								F /0204/12-25		
20231010	1208	1217	1229	M2.3/SF		.020	N09W69	L300								F /1214/12-25		
20231012	0450	0458	0505	M1.1		.008	N17W88	L299								F2/0454/12-25		
20231026	2247	2324	2340	M1.4		.005	N20E88	L337		II/2		2314/1238/360/086					DSF	
20231101	0607	0626	0643	M1.1		.001	S11E88	L205								F /0619/12-25		
20231101	1137	1226	1243	M1.4		.039	S09E88	L205	23000			1248/0583/047/111				F /1247/12-25		
20231102	1218	1222	1226	M1.6/SB		.003	S18W30	L327										
20231102	1908	1921	1940	M1.0		.007	S09E88	L205										
20231105	1134	1143	1147	M1.8/1N		.005	S09E52	L205								F /1143/12-25		
20231105	1424	1432	1436	M1.6		.004	S09E51	L205		140						F /1432/12-25		
20231111	1701	1729	1745	M1.2/SF		.002	S18W58	L230								F /1728/12-25		
20231114	2258	2305	2309	M1.1/SN		.003	S20W75	L205								F /2305/12-25		
20231118	0537	0542	0550	M1.2		.006	N23E89	L344										
20231118	1634	1644	1654	M1.1		.009	N16E89	L344										
20231118	2226	2234	2240	M1.0		.008	N14E89	L344								F /2230/12-25		
20231120	0854	0903	0912	M1.2		.007	N19E76	L344								F /0907/12-25		
20231123	0259	0338	0405	M1.4/EPL		.003	S20E55	L330	110			0312/0982/172/045				F /0322/12-25		
20231123	1425	1437	1442	M1.0		.006	N20E16	L344	2500							F /1432/12-25		
20231124	0917	0933	0943	M1.1/1F		.011	S16W02	L003								F2/0942/12-25		
20231128	1907	1932	1935	*M3.4		.014	S15W02	L302	6500	720	II/2					F /1943/12-25		
20231128	1935	1950	2009	*M9.8		.016	S16W00	L302			II/1	2012/0741/360/285				F /1958/12-25		
20231201	0412	0439	0456	M1.1		.027	N12W73	L342								F /0431/12-25		
20231201	2055	2120	2137	M1.0		.031	S18W39	L302				2124/0217/032/309				F /2102/12-25		
20231205	0639	0644	0648	M1.6/1F		.005	N18E78	L142	800							F /0643/12-25		
20231205	2059	2110	2117	M1.0.1N		.006	N20E70	L142										
20231205	2117	2120	2125	M1.4		.006	N20E72	L142								F /2121/12-25		
20231206	0530	0541	0601	M2.1/2N		.014	N18E66	L142								F /0540/12-25		
20231206	2126	2144	2155	M2.3/1B		.020	N20E55	L142										
20231208	2257	2307	2314	M5.4/1B		.027	S20W48	L213								F /2155/12-25		
20231209	0928	0955	1006	M1.5/SF		.013	S20W55	L213		240		0936/0234/078/253						
20231209	1303	1319	1337	M1.0		.015	S21W54	L213										
20231210	0342	0353	0358	M2.3/SF		.009	S20W66	L213								F /0352/12-25		
20231210	2237	2243	2248	M1.4		.005	S21W77	L213								F /2244/12-25		
20231214	0711	0744	0801	M5.8/SF		.066	N04W41	L131		100						F /0742/12-25		
20231214	1329	1348	1408	M2.3		.032	N04W50	L131				?1326/0395/099/333				F /1347/12-25		
20231214	1647	1702	1836	X2.8/1B		.190	N04W53	L131			II/2 1218	IV/2 1712/0948/360/291				F2/1702/12-25	15	0015/13.9
20231215	0703	0715	0723	M6.3/1N		.066	N03W61	L131	250	1200		IV/2 0748/1018/235/260				F /0712/12-25		
20231215	0723	0734	0824	1N/M6.9		.078	N03W61	L131	320									
20231217	2008	2017	2021	M1.1		.004	N09W89	L131								F /2016/12-25		
20231221	0519	0538	0549	M4.2/1N		.043	S12W61	L067	750			0600/0577/143/286				F /0536/12-25		
20231221	2342	0004	0022	M3.3/1N		.044	S10W72	L067								F /2358/12-25		
20231224	1109	1118	1124	M2.9/1N		.015	S20W27	L343	2300							F /1112/12-25		
20231224	1637	1649	1709	M2.6/1F		.017	S17W33	L343								F /1647/12-25		

DATE		TIME			CLASS	COORDINATES			AR	RADIO MHz		DYNAMIC EVENT		CME		X-ray HARD		GOES PROTONS		Attendant		
year	month	day	hour	minute	X-ray/opt	lon	lat	long	lon	245	2695	RADIO SWEEP	to	/v	/da	/pa	An	/tm	/Emax	E>10MeV	n	phenomena; remarks
						J*m-2				sfu		km/s			km/s				keV	d tmax/Ipr	/GLE	
2023	12	24	1921	1951	2016	M1.1	.025	S20E89L224?	13534?									F	/1932/12-25			
2023	12	31	1844	1912	1940	M1.0	.026	N04E73L152	13536									F	/1903/12-25			
2023	12	31	2135	2155	2317	X5.0/3B	.550	N04E73L152	13536	1500	3100		IV/2	2200/2852/360/112			F2/2156/>100					
2024																						
2024	01	01	0833	0854	0904	M2.3/1N	.025	N04E70L152	13536													
2024	01	01	1154	1225	1235	M4.7	.044	N04E69L152	13536									F2/1220/12-25				
2024	01	02	1802	1830	1856	M1.1	.025	N05E58L152	13536	130								F	/1836/12-25			
2024	01	04	*0108	0116	0122	M1.1/2N	.003	N02E38L152	13536									F	/0113/12-25			
2024	01	04	*0122	0155	0213	2N/M3.9	.069	N04E38L152	13536									F	/0153/12-25			
2024	01	10	1239	1255	1305	M1.4	.016	S20E88L100	13538									F	/1259/12-25			
2024	01	10	2318	2328	2335	M1.9/SF	.018	N22W77L177	13538	130								F	/2328/12-25			
2024	01	11	1244	1251	1255	M1.3	.006	N19W88L177	13538									F	/1251/12-25			
2024	01	11	1749	1752	1759	M1.5	.007	N09W54L139	13539									F	/1751/12-25			
2024	01	11	1908	1923	1949	M1.2	.022	N18W88L177	13538	390								F	/1911/12-25			
2024	01	12	0255	0258	0302	M1.0/SN	.003	N18E19L064	13547									F	/0258/12-55			
2024	01	22	0609	0622	0636	M1.5/1N	.002	N29E27L287	13559		110			0648/0481/036/049c								
2024	01	22	1843	1947	2029	1F/M2.0	.010	S15W30L287	13559									F	/1946/12-25			
2024	01	22	1928	1932	1936	M1.2	.009	S16W28L325	13561													
2024	01	22	2114	2121	2132	M3.4	.021	S17W29L325	13561									F	/2121/12-25			
2024	01	22	2136	2143	2158	M1.6	.019	S17W29L325	13561	330				2148/0229/012/247c								
2024	01	22	2219	2222	2226	M2.1	.006	S17W30L325	13561					2224/0343/058/230c								
2024	01	23	0309	0331	0338	M5.1	.041	N29E18L287	13559	440	140			0348/0880/042/014c			F	/0330/12-25				
2024	01	23	0752	0811	0818	M2.4	.006	S17W36L325	13561									F	/0805/12-25			
2024	01	23	0818	0822	0826	M2.3/1F	.010	S19W37L325	13561													
2024	01	23	*1240	1258	1303	M1.0	.006	S17W37L325	13561									F	/1256/12-25			
2024	01	23	*1303	1308	1313	M1.0	.006	N30E13L287	13559									F	/1256/12-25			
2024	01	23	1445	1459	1505	M1.3	.013	S18W41L325	13561													
2024	01	23	1636	1640	1647	M4.3	.019	S17W39L325	13561													
2024	01	23	*1819	1828	1846	M1.0	.009	S17W43L325	13561													
2024	01	23	*1835	1844	1849	M1.1	.009	S16W43L325	13561													
2024	01	23	1957	2001	2005	M1.0	.001	S17W42L325	13561													
2024	01	24	0021	0038	0043	M1.0	.011	S18W42L325	13561									F	/0035/12-25			
2024	01	24	0131	0140	0153	M2.6/SF	.025	S16W48L325	13561		100			0136/0222/050/220c			F	/0137/12-25				
2024	01	24	0518	0543	0600	M1.4	.025	S16W51L325	13561									F	/0529/12-25			
2024	01	24	2044	2058	2111	M1.3	.012	S17W58L325	13561					?2136/0250/032/233c								
2024	01	29	0129	0140	0158	M1.2/SF	.011	N30W62L287	13559	430				0148/0985/060/285c			F	/0154/12-25				
2024	01	29	0354	0438	0456	M6.8/SF	.190	N28W86L287	13559		2700	II/2 512		0436/0606/360/144c			F	/0416/12-25	29/0615/137			
2024	02	02	0252	0301	0305	M1.1	.004	S18E60L104	13571	310		II/3 144		0324/0641/046/134c			F	/0301/12-25				
2024	02	04	1140	1153	1208	M1.4/SF	.015	S15E86L055	13576									F	/1148/12-25			
2024	02	04	1622	1638	1646	M1.5	.015	S15E79L055	13576									F	/1643/12-25			
2024	02	04	1705	1712	1719	M1.3	.002	S15E77L055	13576													
2024	02	04	1816	1829	1843	M1.1	.012	S36W46L178	13575									F	/1826/12-25			
2024	02	04	2052	2057	2101	M1.2	.004	S20E83L055	13576		96							F	/2056/12-25			
2024	02	04	2220	2228	2234	M2.1	.015	S14E86L055	13576													
2024	02	04	2234	2237	2242	M2.7	.012	S15E73L055	13576													
2024	02	04	2245	2248	2302	M1.8?		S09E89L043	13576									F	/2302/12-25			
2024	02	05	0413	0428	0447	*M2.1	.002	S16E74L178	13576													
2024	02	05	0436	0438	0456	*M1.4	.002	S15E71L178	13576													
2024	02	05	0610	0622	0626	M1.4	.006	S20E77L055	13576													

DATE		TIME		CLASS		COORDINATES		AR		RADIO MHZ		DYNAMIC EVENT		CME		X-ray HARD		GOES PROTONS		Attendant				
y	m	d	to	tm	te	X-ray/opt	L	lt	lg	L	245	2695	RADIO	SWEEP	to	/ v	/da	/pa	An	/ tm	/Emax	E>10MeV	n	phenomena;
							J*m-2				sfu			km/s		km/s					d tmax/Ipr	/GLE		remarks
20240206	0215	0228	0237	M2.2		.006	S39W62L178									0236/1041/108/203c								
20240206	0237	0312	0332	M4.2		.013	S40W63L178				3300	480	II/1 0431	IV/2					F	/0310/12-25				
20240206	1838	1849	1907	M1.3		.019	S36W72L178				110								F	/1847/12-25				
20240207	0304	0331	0349	M5.1/SF		.014	S40W78L178				970	390				0324/1077/056/227c			F	/0319/12-25				
20240207	1741	1805	1835	M1.3		.030	S15E38L055												F	/1829/12-25				
20240208	1241	1312	1337	M3.4		.075	S18E28L055									?1325/0453/028/231c			F	/1320/12-25				
20240208	1411	1418	1425	M1.2		.009	S15W83L169												F	/1417/12-25				
20240208	1517	1523	1527	M1.8/1F		.009	S15E25L055																	
20240208	1856	1902	1906	M1.3/1F		.004	S15E20L055												F	/1902/12-25				
20240208	2316	2355	0036	M3.9		.008	S35W85L178									2348/1041/048/233c			F3/2337/12-25					
20240209	0036	0041	0045	M3.1/1N		.003	S16E17L055					100							F	/0041/12-25				
20240209	1253	1314	1332	X3.3		.430	S37W85L178					1000		IV/2		1325/1017/138/234c			F2/1313/>100		09/1530/187			
20240209	1754	1800	1807	M1.2		.007	S14E07L055				130	57				1812/0258/008/285c			F	/1759/12-25				
20240210	0042	0051	0100	M1.5/SF		.011	S14E05L055												F2/0048/12-25					
20240210	0304	0354	0411	M3.4		.096	S15E88L335					250				0424/0801/360/144c			F	/0350/12-25				
20240210	2256	2307	2314	M9.0		.045	S12W12L055				190	360	II/3 2170	IV/3	2336/0600/098/326c			F	/2305/12-25					
20240211	2235	2245	2250	M1.0		.005	N10E88L282												F	/2240/12-25				
20240212	0323	0348	0353	M6.5/2B		.028	S17W26L055				1000								F	/0344/12-25				
20240212	1250	1308	1321	M1.1		.014	S16W28L055												F	/1304/12-25				
20240212	1531	1548	1603	M1.4/1F		.020	S12W34L055									1545/0703/218/268c			F	/1542/12-25				
20240212	2035	2117	2151	M2.7		.093	N28E86L282									2148/0822/162/102c			F	/2056/12-25				
20240212	2200	2204	2303	M1.6			S14W36L055									2224/0600/008/161c			F	/2203/12-25				
20240214	0302	0310	0323	M1.0		.009	N07W26L034												F	/0307/12-25				
20240214	0726	0735	0742	M1.0/SF		.006	S17W57L055												F	/0733/12-25				
20240215	1650	1707	1725	M1.8		.021	S13W79L055												F	/1704/12-25				
20240216	0239	0251	0257	M1.5		.008	S13W88L055									0248/0452/078/348c								
20240216	0642	0653	0658	X2.5/1N		.084	S16W80L055					420	II/3	IV/2					F	/0653/>100				
20240216	2157	2209	2216	M3.0		.016	S14W88L055												F	/2215/12-25				
20240221	2252	2307	2314	X1.8		.099	N17E39L224												F	/2305/12-25				
20240221	2358	0014	0031	M1.5		.026	S35E85L224									0024/0976/062/138c			F	/0006/12-25				
20240222	0617	0632	0640	X1.7/2B		.088	N16E35L224					99							F	/0633/12-25				
20240222	2029	2046	2103	M4.8/2B		.053	N18E29L224												F	/2042/12-25				
20240222	2208	2234	2243	X6.3		.450	N17E27L224				390	240				2236/0265/008/087c			F	/2234/12-25				
20240223	1312	1328	1354	M1.0		.019	N16E19L224									1348/0188/006/038c			F	/1321/12-25				
20240223	1541	1553	1606	M1.4/1N		.018	N18E18L224									1624/0133/006/044c			F	/1545/12-25				
20240223	1726	1747	1807	M2.6/1N		.039	N18E18L224												F	/1545/12-25				
20240224	0621	0634	0644	M4.5		.033	N18E08L224												F	/0631/12-25				
20240224	1032	1057	1113	*M2.2		.027	N15E08L224												F	/1116/12-25				
20240224	1103	1118	1125	*M3.6		.038	N18E05L224												F	/1116/12-15				
20240224	1154	1159	1220	M1.0		.005	N16E10L124																	
20240225	1647	1722	1740	M2.0/1N		.046	N14W07L124									1700/0315/062/100c			F	/1708/12-25				
20240228	1637	1819	1930	M1.3		.160	N19W58L124				3590					1724/0532/096/299c			F2/1744/12-25					
20240308	2118	2126	2131	M1.3/SF		.004	S14W15L066				19	49							F2/2126/12-25					
20240310	1200	1213	1220	M7.4		.035	S13W38L066						II/3 0714		?1248/0288/052/287c			F	/1212/12-25					
20240314	0552	0604	0611	M1.0/SF		.005	S11W82L066												F	/0602/12-25				
20240316	1622	1635	1644	M3.5		.025	S14E88L215												F	/1629/12-25				
20240316	2127	2155	2211	M1.1		.021	S15E88L215																	
20240318	0321	0332	0345	M2.7		.002	N22W86L215												F	/0328/12-25				
20240318	0406	0414	0424	M1.0		.009	N15E70L215																	
20240318	1902	1919	1928	M6.7		.049	S11E70L215												F	/1917/12-25				
20240319	0224	0229	0238	M1.4		.007	S13E68L215																	

DATE			TIME			CLASS		COORDINATES			AR		RADIO MHZ		DYNAMIC EVENT		CME		X-ray HARD		GOES PROTONS		Attendant										
y	m	d	to	tm	te	X-ray/opt	L	lt	lg	L		245	2695	RADIO SWEEP		to	/ v	/da	/pa	An	/ tm	E/Emax	d tmax/Ipr	n	phenomena; remarks								
							J*m-2					sfu		km/s		km/s					keV	/GLE											
20240319	2317	2327	2332	M2.1/SN	.009	S15E56L215	13615																		0248/0320/092/193c	F	/2326/12-25						
20240320	0723	0736	0815	M7.4/3B	.055	S10E48L215	13615																100			F	/0733/12-25						
20240320	2246	2255	2300	M1.9	.003	S15E43L215	13615																100			F	/2256/12-25						
20240322	2018	2032	2049	M4.3/2B	.042	S14E18L215	13615																										
20240322	2120	2122	2125	M1.1/SN	.004	S14E18L215	13615																				F3/2121/12-25						
20240323	0058	0133	0316	X1.1/2F	.350	S14E15L215	13614																350	240	II/2/0791	0136/0942/360/144c	F2/0134/12-25						
20240323	0647	0655	0659	M1.1/SF	.006	S13E04L215	13615																				F	/0655/12-25					
20240323	0701	0709	0728	M2.5	.036	S14E11L215	13615																				F	/0704/12-25					
20240323	0726	0738	0747	M3.1	.035	S14E10L215	13615																										
20240323	1122	1129	1136	M1.0/SF	.008	S15E10L215	13615																										
20240323	1236	1247	1256	M1.3/1B	.011	S15E09L215	13615																				F	/0704/12-25					
20240323	1304	1311	1320	M1.1	.003	S11W01L215	13615																				F	/1315/12-25					
20240323	1331	1337	1344	M1.9	.005	S14E00L215	13615																				F	/1336/12-25					
20240323	1351	1402	1415	M5.3	.064	S14W00L215	13615																				F	/1425/12-25					
20240323	1449	1453	1458	M1.5	.007	S14W00L215	13615																										
20240323	1501	1513	1517	M3.8	.013	S14E01L215	13615																				F	/1509/12-25					
20240323	1622	1651	1707	M2.8	.056	S13E02L215	13615																				F	/1645/12-25					
20240323	2330	2349	0007	M2.5	.030	S11W01L215	13615																				F	/2346/12-25					
20240324	0051	0104	0112	M1.0/2N	.002	S14E00L215	13615																										
20240324	0112	0125	0130	M1.5	.006	S14W00L215	13615																				F2/0120/12-25						
20240324	0143	0154	0157	M2.1/2N	.008	S14W00L215	13615																				F	/0154/12-25					
20240324	0157	0205	0209	M2.3	.007	S14E01L215	13615																										
20240324	0209	0218	0234	M2.7	.033	S13E02L215	13615																										
20240324	0559	0606	0610	M2.2/1B	.002	S14W04L215	13615																				F	/0606/12-25					
20240324	0736	0751	0807	M1.3/2N	.021	S14E00L215	13615																				F	/0808/12-25					
20240324	1210	1218	1222	M1.1/1N	.004	S14W01L215	13615																										
20240324	1227	1234	1239	M1.0/SF	.007	S14W02L215	13615																				F	/1229/12-25					
20240324	1300	1313	1331	M1.3	.002	S13W02L215	13615																				F2/1312/12-25						
20240325	0637	0644	0648	M4.4/SB	.008	S13W02L215	13615																				F	/0644/12-25					
20240326	0028	0036	0040	M1.8/SN	.001	S13W36L215	13615																										
20240326	1011	1017	1024	M1.0	.005	S13W25L215	13615																										
20240326	1036	1043	1052	M1.3	.009	S11W34L215	13615																				F	/1042/12-25					
20240326	1255	1330	1341	M1.9	.038	S14W31L215	13615																				F	/1326/12-25					
20240326	1341	1346	1350	M1.7	.009	N18W75L252	13621																										
20240326	2143	2158	2207	M1.6	.014	S11W41L215	13615																				F	/2153/12-25					
20240327	0137	0144	0152	M1.1/1F	.001	S13W37L215	13615																										
20240327	0633	0641	0650	M1.1/1N	.001	S11W48L215	13615																										
20240328	0616	0629	0636	M7.0	.037	s14W51L215	13615																										
20240328	1540	1556	1603	M6.1/1N	.032	S13W58L252	13615																		1548/0265/010/228c	F	/1603/12-25						
20240328	1921	1931	1938	M1.1/1F	.010	S13W59L215	13615																490			F	/1927/12-25						
20240328	2029	2056	2101	X1.1/3B	.130	S14W61L215	13615																				F	/2054/12-25					
20240329	0217	0230	0242	M3.2/SF	.034	S15W63L215	13615																750			F	/0226/12-25						
20240329	1919	1934	1956	M1.2/SF	.023	S12W78L215	13615																				F	/1929/12-25					
20240330	2101	2115	2216	M9.4	.270	S12W88L215	13515																				F	/2150/12-25					
20240330	2248	2253	2307	M4.5		S14W88L215	13615																										
20240401	0113	0132	0149	M3.9/SF	.062	N10W64L175	13625																										
20240401	0138	0230	0142	M3.4	.005	S18W88L215	13615																5										
20240411	*1652	1706	1711	M5.4	.022	S13E88L230	13637																5500		IV/1	1700/1302/113/032c	F	/1658/12-25					
20240413	0458	0502	0506	M2.4/SF	.004	S10E80L230	13637																1500			0512/0606/026/082c							
20240414	0224	0232	0236	M4.3/1F	.010	S11E67L230	13637																				0236/0892/016/105c	F	/1229/12-25				
20240415	0106	0118	0126	M1.7/SF	.011	N28E61L220	13639																										

D A T E			T I M E			CLASS	COORDINATES				AR	RADIO MHz		DYNAMIC EVENT		CME				X-ray HARD			GOES PROTONS			Attendant phenomena; remarks
y	m	d	to	tm	te	X-ray/opt	L	lt	lg	L	245	2695	RADIO	SWEEP	to	/ v	/da	/pa	An	/ tm	/Emax	E>10MeV	d	tmax/Ipr	/GLE	
							J*m-2					sfu		km/s		km/s					keV					
2024	04	15	0715	0732	0738	M1.0/1F	.013	N30E57L220		13639																
2024	04	15	0838	0842	0847	M2.3/1B	.009	N27W29L313		13634	13000	100														
2024	04	15	0921	0932	0942	M1.2/SF	.010	N29E60L220		13639											F /0946/12-25					
2024	04	15	1343	1352	1458	M1.1/1F	.005	N28E56L220		13639											F /1418/12-25					
2024	04	15	1401	1404	1406	M1.4/SN	.005	N26W33L313		13634																
2024	04	15	1408	1417	1427	M2.2	.021	N29E55L220		13639											F /1418/12-25					
2024	04	15	1925	1932	1939	M4.0/1N	.018	N28E56L220		13639											F /1929/12-25					
2024	04	16	1749	1802	1814	M1.1/2N	.014	S10E36L222		13645											F /1749/12-25					
2024	04	17	2155	2208	2217	M1.6/2N	.012	S07E22L213		13643					2236/0248/032/143						F /2201/12-25					
2024	04	18	0232	0248	0253	M2.2/SF	.014	S11E27L213		13643											F /0238/12-25					
2024	04	18	0717	0737	0809	M1.3/SF	.029	S12E23L213		13643											F /0720/12-25					
2024	04	18	1922	2016	2021	M1.6/SF	.010	S12E17L218		13647											F /1948/12-25					
2024	04	19	0440	0453	0503	M2.1/SF	.017	N20W58L218		13635																
2024	04	19	1253	1306	1322	M1.0	.013	S17W00L228		13647	210										F /1312/12-25					
2024	04	21	1239	1259	1316	M1.0/1F	.025	S06W25L222		13645	190										F /1338/12-25					
2024	04	21	1507	1514	1520	M2.2/SF	.010	N22E19L180		13646		120			1526/0593/054/188						F /1508/12-25					
2024	04	21	2144	2152	2157	M3.4/SN	.013	S17W37L249		13638	380	120	II/1 0278		2212/0573/068/191											