The British Astronomical Association
A company limited by guarantee
Registered Charity No. 210769
Burlington House, Piccadilly, London, W1J 0DU
Telephone: 020 7734 4145 Fax No.: 020 7439 4629
Email: office@britastro.org Website: www.britastro.org
Founded in 1890

Please send all reports and observations to jacook@jacook.plus.com

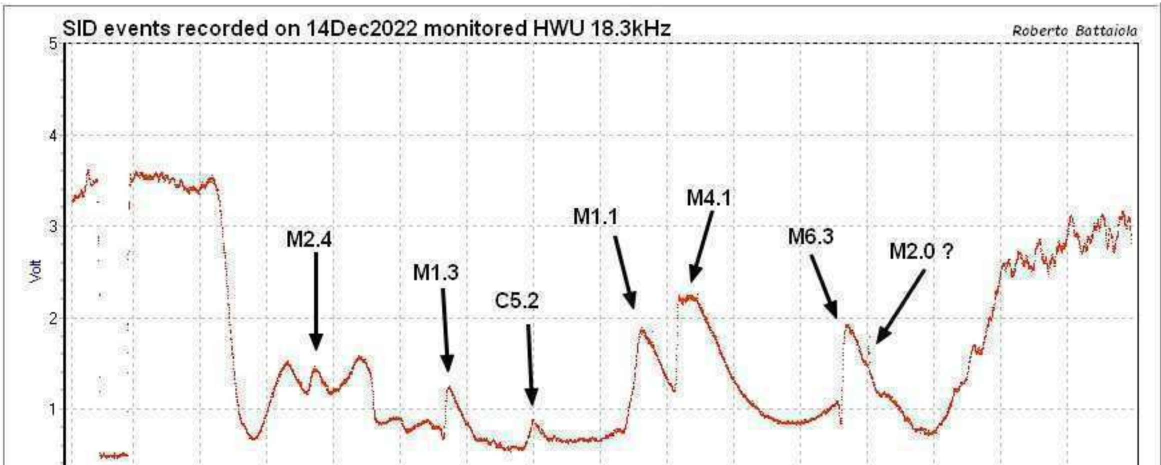
BAA Radio Astronomy Section. Director Paul Hearn.

RADIO SKY NEWS 2022 DECEMBER.

First I must correct an error in the November report. The magnetic recording for November 7th was from Roger Blackwell, not Mark Edwards. My apologies for the error.

VLF SID OBSERVATIONS.

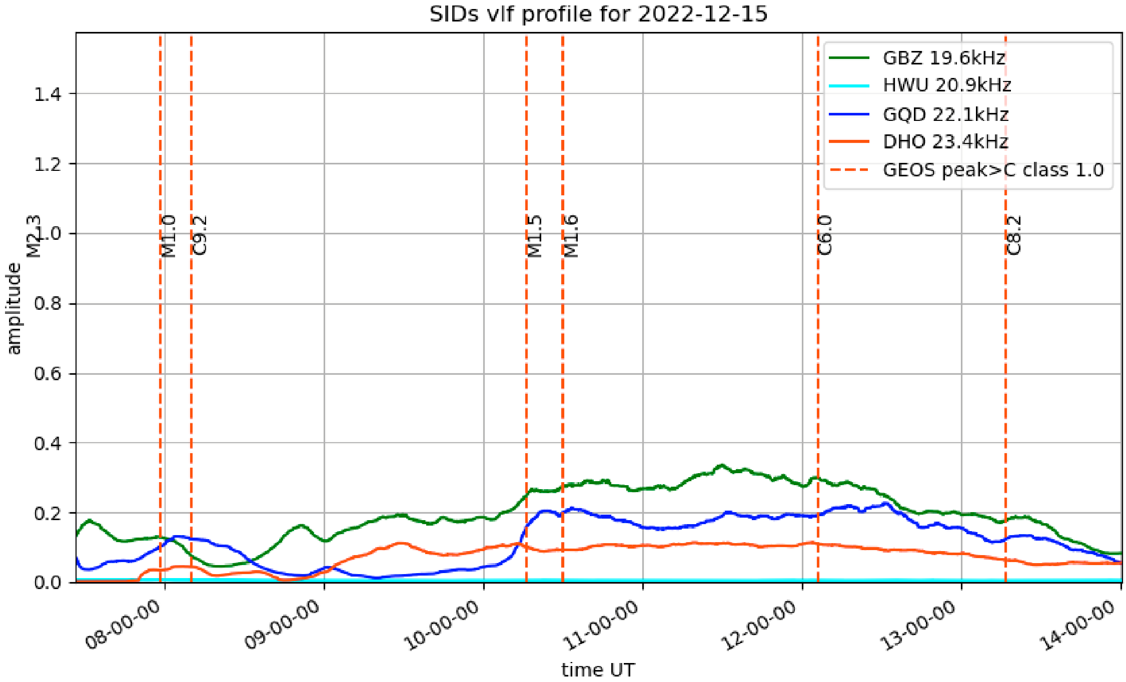
December was a very busy month for solar flares, with plenty of stronger M-class events. Roberto Battaiola describes it as a “fireworks December”, a very good description. His recording from the 14th gives an example of the mid-month activity:

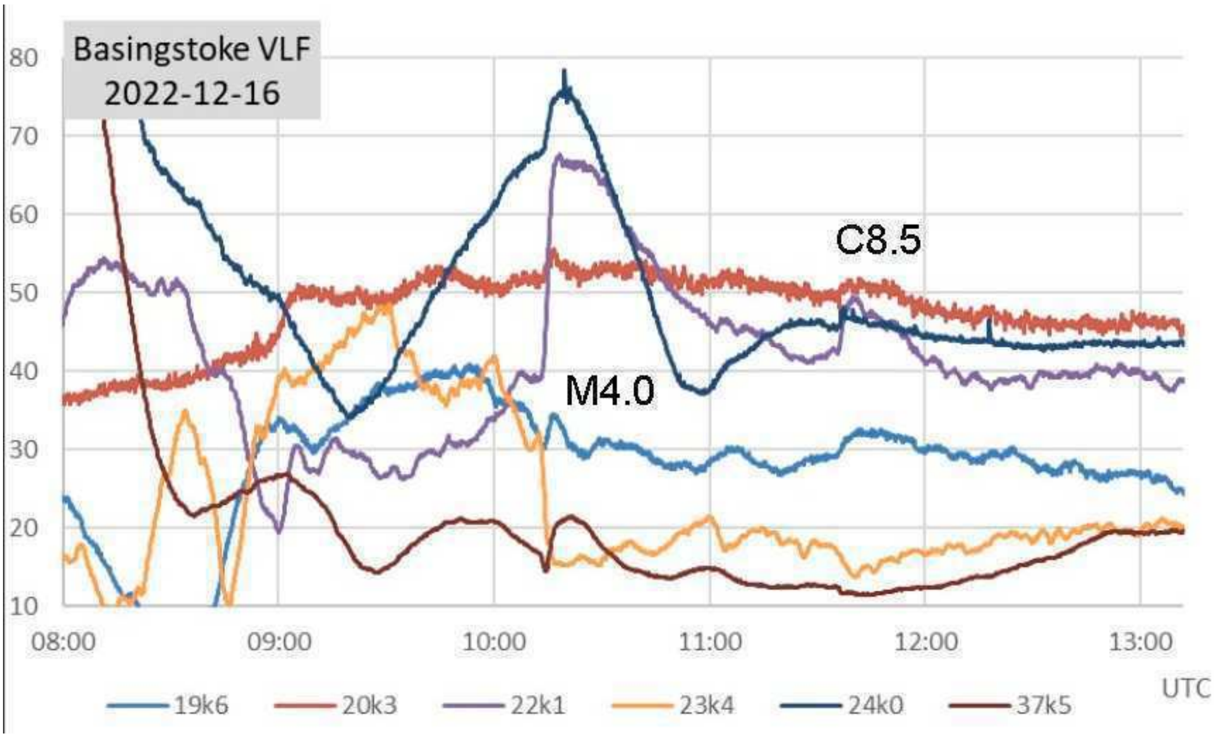


It also shows how many of the flares overlapped and merged, making analysis quite difficult. The spike at 15:00 identified as M2.0? is probably from the M3.2 flare. The very early M2.4 flare is also visible, lost in the morning sunrise to observers here in the UK.

All of the M-class flares in mid-December were produced by active region AR13165, a medium sized Southern hemisphere sunspot group that was approaching the Western limb of the sun. There are no X-class flares shown in the satellite data.

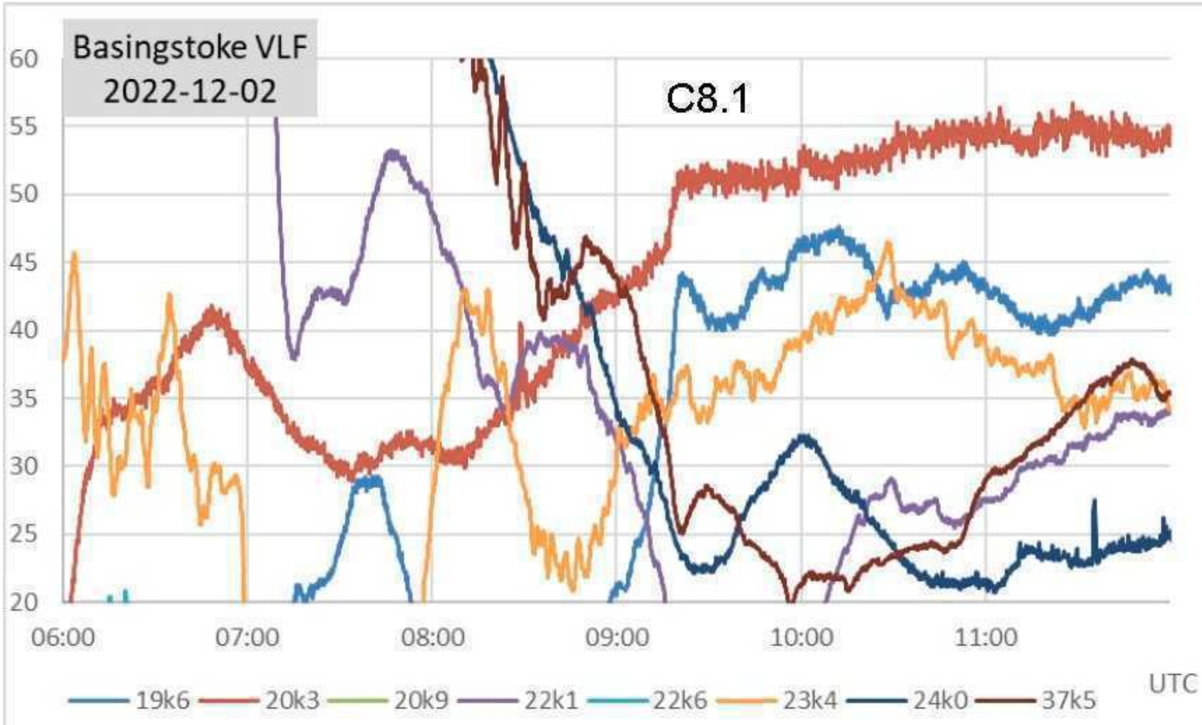
Activity continued on the 15th, shown in the recording by Mark Prescott. Background levels were also quite high, so even the M-class flares did not produce clear SIDs for all observers.

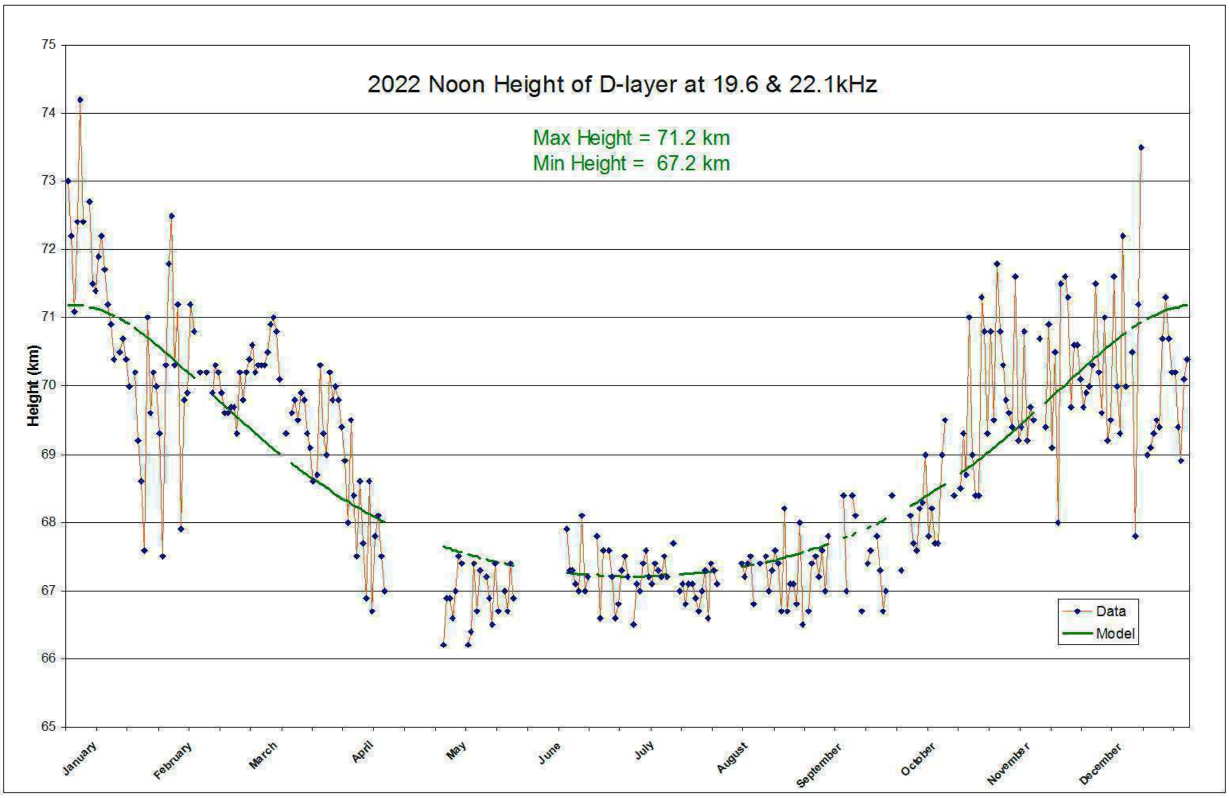




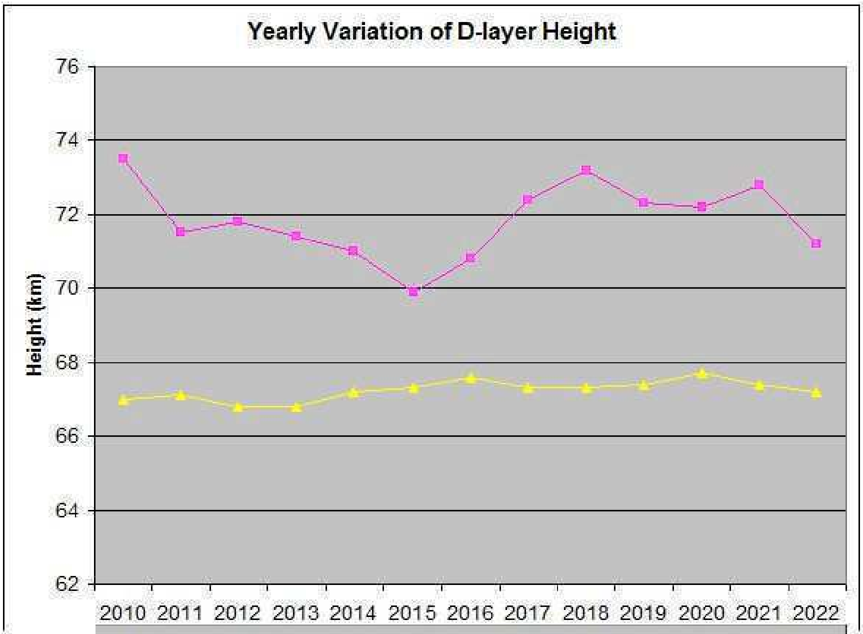
Paul Hyde's recording from the 16th shows the M4 flare peaking at 10:19UT. There is a clear SID at 22.1kHz, with a much less distinct effect at 19.6kHz. There is a small 'spike & wave' SID at 37.5kHz, while it sits on sunrise for the 24kHz trans-Atlantic signal.

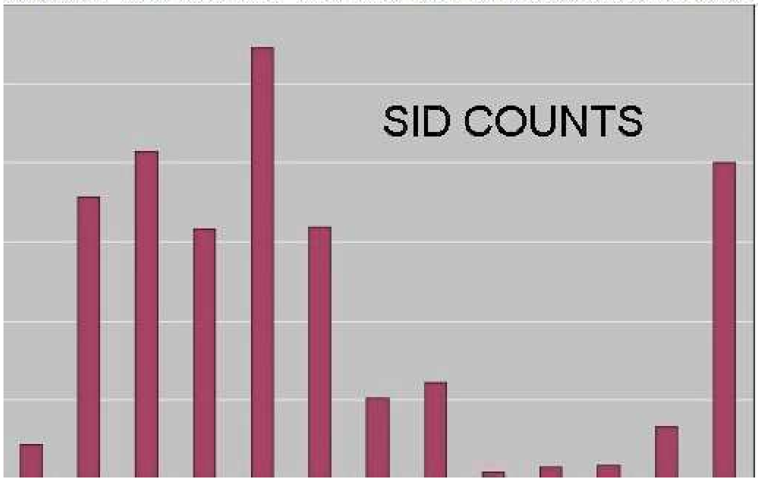
With the sun at its lowest altitude in the sky during December, the Ionosphere D-region is often very unstable. My own recordings have been very noisy, saturating the receiver on several days. Paul Hyde's recording from the less active 2nd shows a well camouflaged C8.1 flare, nearly lost shortly after the local sunrise, followed by generally unstable conditions.





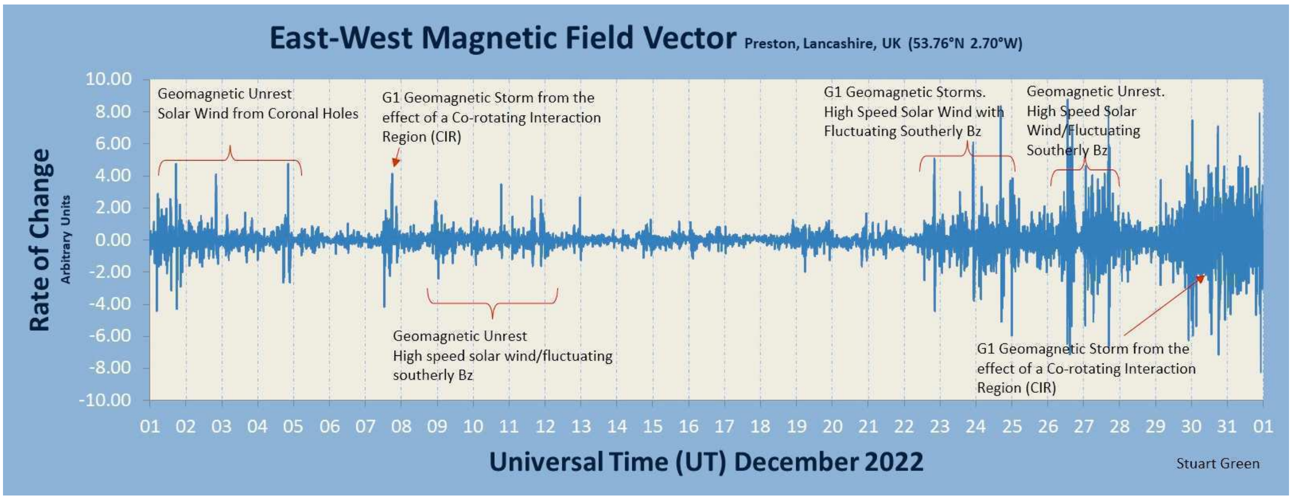
Mark Edwards has produced his analysis of D-region heights through the year, data points shown in red with the model output in green. The general winter instability just described results in the wider spread of data points from November to February. The chart on the next page shows how these heights have varied since 2010, compared with our SID counts over that period. The minimum height has been fairly stable around 67km, while the maximum height seems to fall as solar activity increases, rising during the solar minimum period.



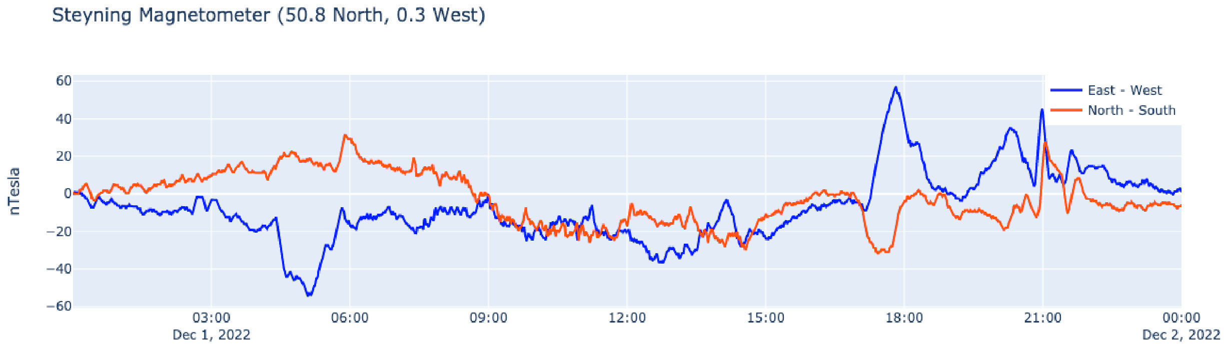


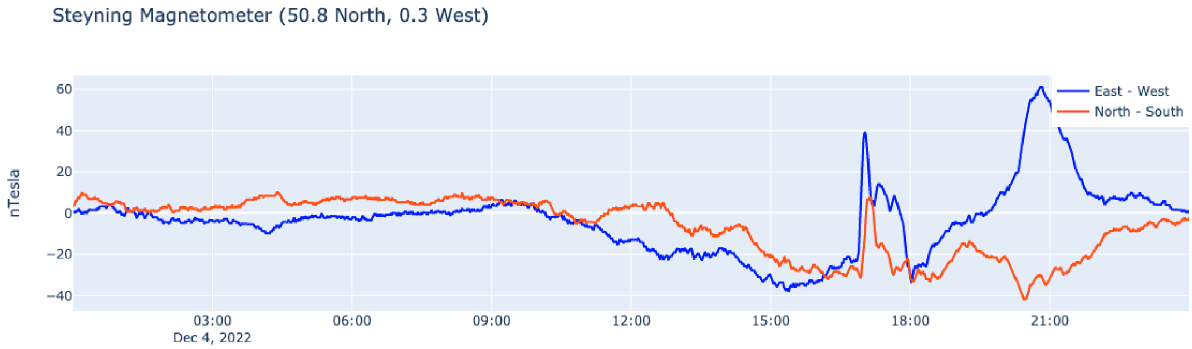
The SID counts are the number of individual peaks recorded, rather than the number of classified flares. This probably better represents solar activity, given that many of the stronger flares do have multiple peaks. The chart shows that the current solar cycle is making a very strong start, with 800 SIDs recorded in 2022.

MAGNETIC OBSERVATIONS.

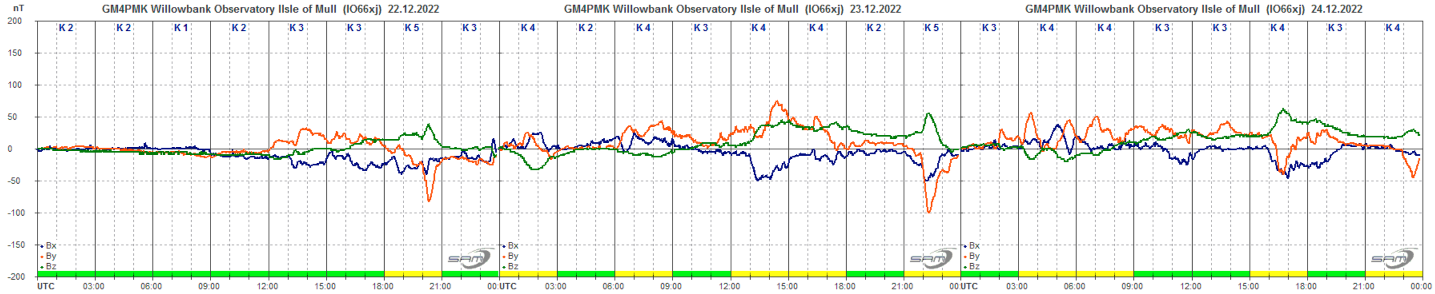


Stuart Green's monthly summary of magnetic activity shows a fairly gentle start to December, becoming much more active during the last week of the month. Once again most of the activity has been from faster solar winds, with little effect from CMEs. Some of the M-class flares did produce a CME, but they were not directed towards Earth, and so had little impact. The fast solar winds at the end of November continued into early December with some mild magnetic disturbances. Nick Quinn's recording from the 1st shows the disturbance:

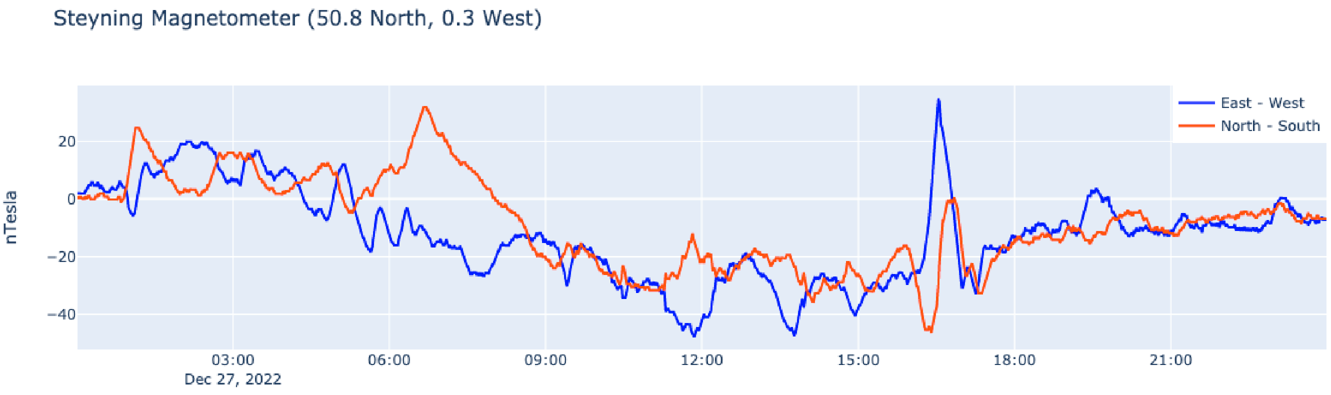




This continued into the 4th, with a larger equatorial coronal hole creating a more turbulent solar wind and a more active magnetic disturbance from the afternoon into the evening. There was less disturbance on the 5th and 6th, with another mild disturbance on the 7th. Conditions then remained fairly quiet until the coronal holes again began to be geo-effective from the 22nd.



Roger Blackwell's recordings over the 22nd to 24th show some moderate disturbance from the solar wind. The 25th remained fairly quiet, activity increasing again in the afternoon of the 26th. The disturbance continued on the 27th, shown in the recording by Nick Quinn:

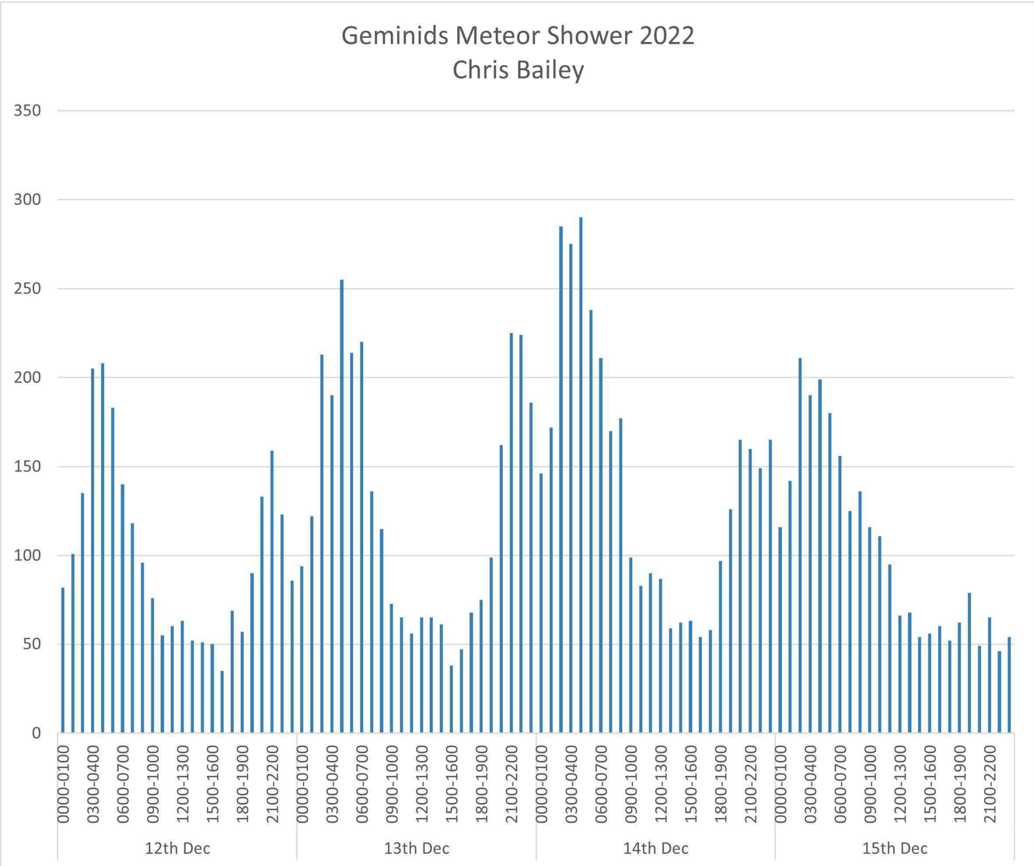


The 28th and 29th were less disturbed, activity increasing again on the 30th.

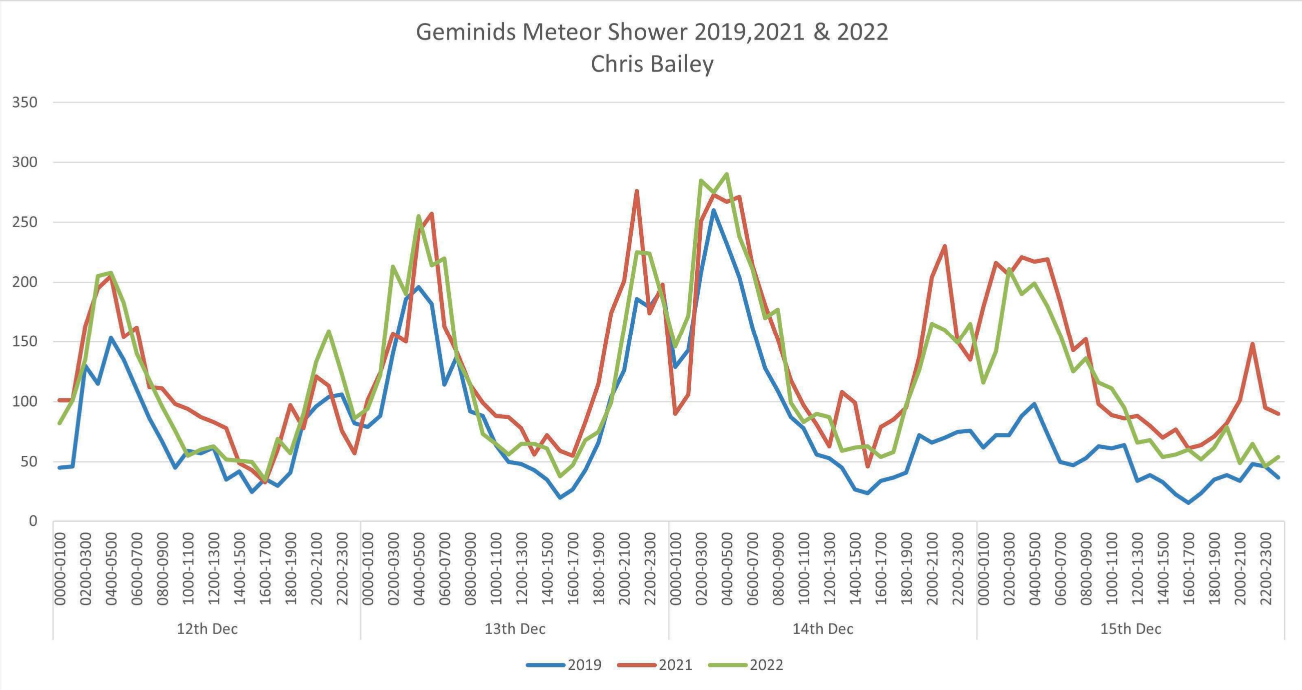
Magnetic observations received from Roger Blackwell, Stuart Green, Nick Quinn and John Cook.

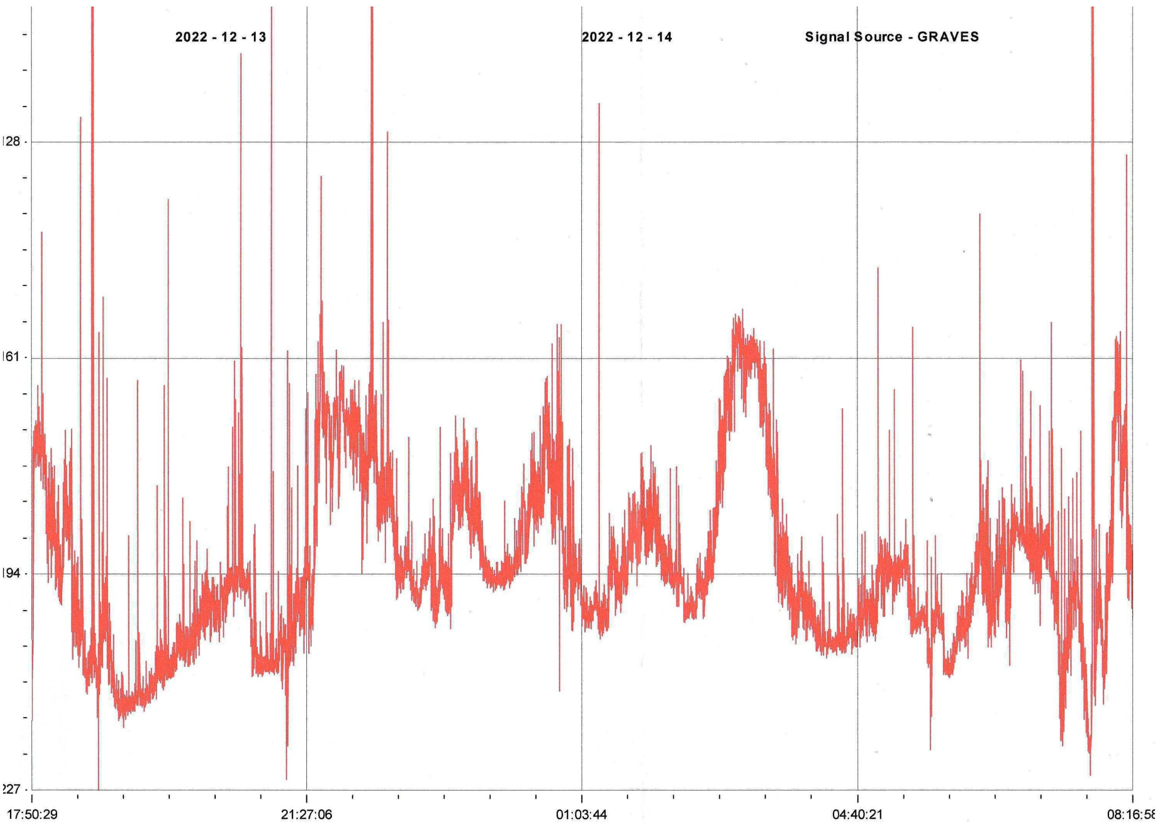
METEORS.

Observations of the Geminid meteor shower were made by Colin Clements and Chris Bailey, showing some good activity.



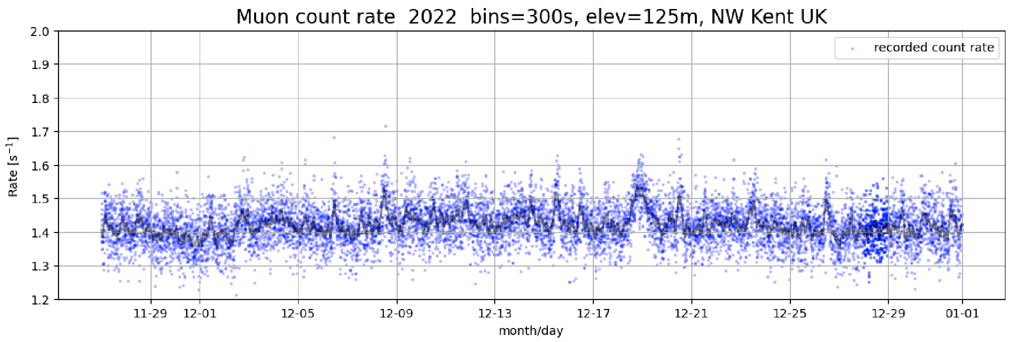
This chart from Chris Bailey shows activity peaks around 03 to 07UT over the 12th to 15th, strongest on the 14th. This matches well with the predictions in the 2022 BAA handbook. Chris has also compared Geminid counts over the last four years, shown on the next page. 2019 seems to have been slightly weaker, with similar numbers in 2021 and 2022. Counts were made over 30 second bands, and carefully examined to remove Starlink interference. 2020 is missing due to equipment problems.

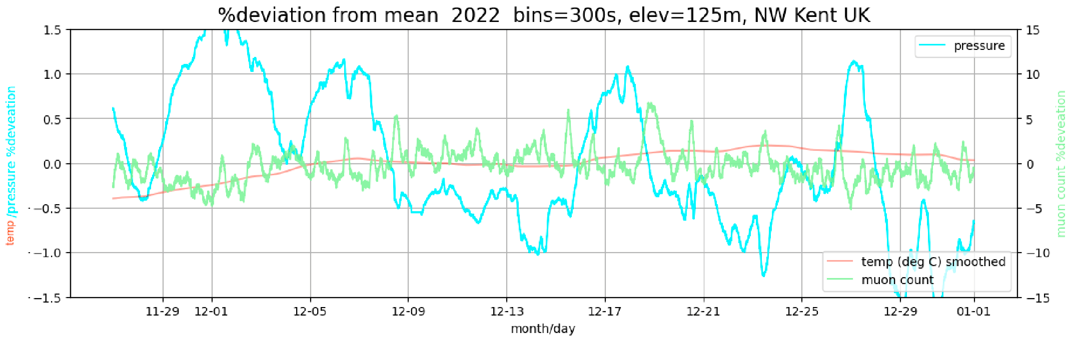


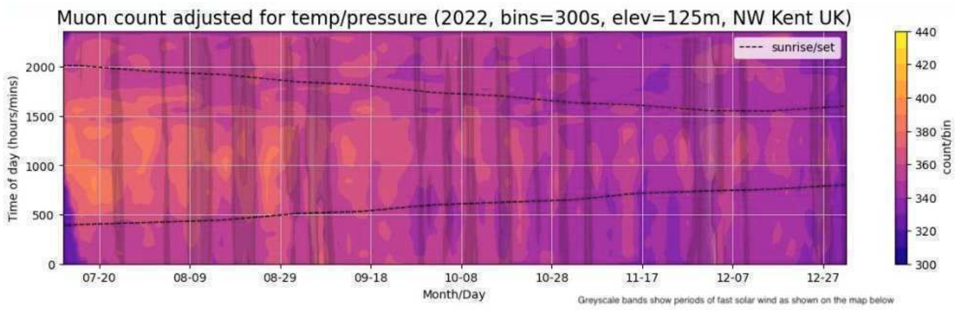


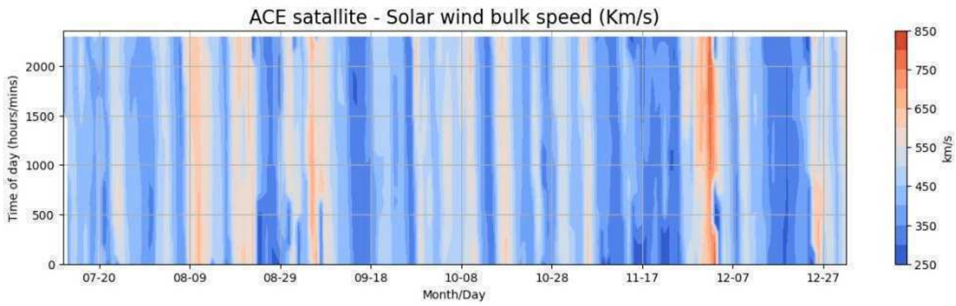
Colin Clements' chart shows the evening of the 13th into the morning of the 14th, but does include 'noise' spikes unrelated to meteors. The early morning peak is also clear, with smaller peaks throughout the period. Similar small peaks were also recorded on the 15th.

MUONS



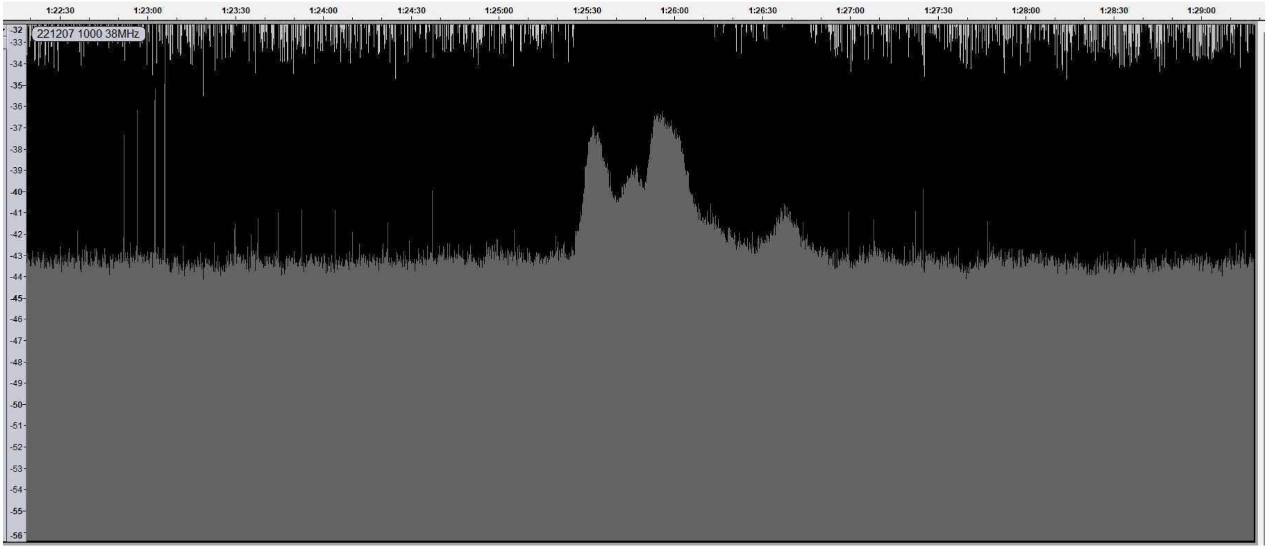


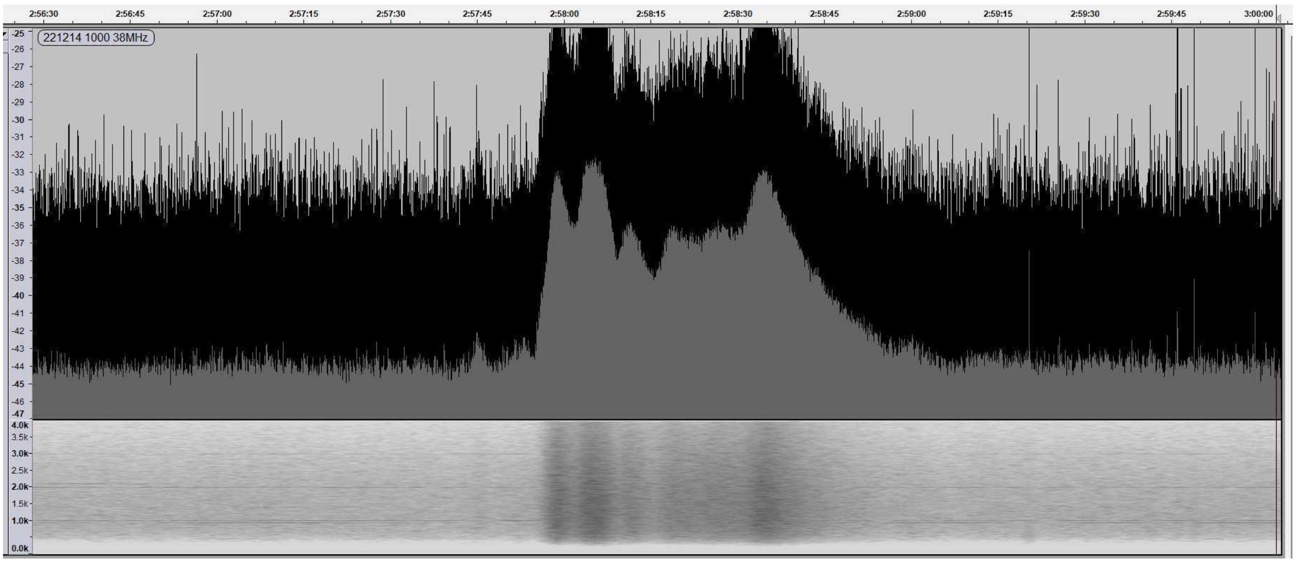




The top chart shows the muon counts for December, recorded by Mark Prescott, together with pressure and temperature variations. The second chart shows adjusted counts from July to the end of the year in the upper panel. The black lines show sunset and sunrise times, with the brighter yellow regions indicating higher muon counts. These clearly follow the day length and season. The higher solar altitude gives a warmer atmosphere in summer, causing it to expand slightly resulting in a lower density. This allows more cosmic particles into the lower regions, converting into muons as they react with the atmospheric gases. This does give some confidence in the detection equipment and method.

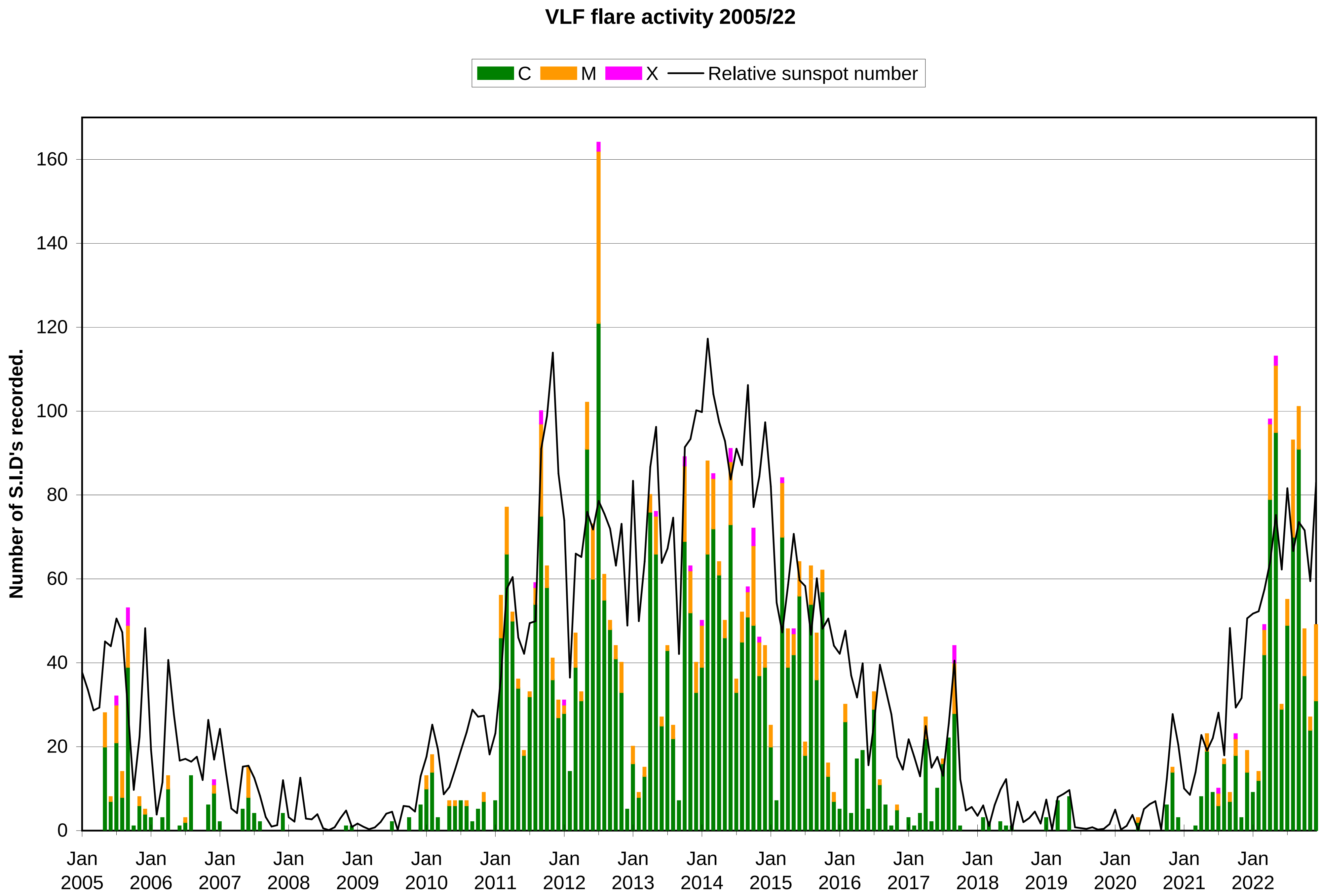
SOLAR EMISSIONS.





Colin Briden has recorded two type III radio bursts. The first was at 11:25UT on the 7th, matching a small C1.2 flare. The burst lasts about 1 minute, and rises about 6dB above the background. The second was at 12:58UT on the 14th, matching the series of M-flares recorded as SIDs. This one rises about 11dB above the background level and also lasts about a minute. Colin has added a spectrogram below the main amplitude display. He also notes that interference has become more of a problem while the sun is lower in the winter sky. Looking forward to the spring, I hope that this problem improves.

Our series of zoom meetings organised by Paul Hearn continues. Full details of these meetings can be found through the BAA web site.



VLF flare activity 2005/22
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
0
20
40
60
80
100
120
140
160
Jan 2005
Jan 2006
Jan 2007
Jan 2008
Jan 2009
Jan 2010
Jan 2011
Jan 2012
Jan 2013
Jan 2014
Jan 2015
Jan 2016
Jan 2017
Jan 2018
Jan 2019
Jan 2020
Jan 2021
Jan 2022

	Xray class	Observers	John Cook (23.4kHz/*22.1kHz*)				Roberto Battaiola 18.3kHz				Paul Hyde (22.1kHz/*24kHz*)				Mark Edwards (24.0/*18.3*/**37.5kHz**)				Colin Clements (23.4kHz/*18.3kHz*)			
			Tuned radio frequency receiver, 0.58m frame aerial.				Modified AAVSO receiver.				Spectrum Lab / PC 1.5m frame aerial.				Spectrum Lab / PC 2m loop aerial.				Tuned Radio Frequency receivers, 0.76m screened loop aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
2	C8.1	4									09:19	09:24	09:41	1	*09:17*	*09:23*	*09:41*	*1*				
3	**M1.2**	1													17:41	17:46	17:56	1-				
7	C5.8	6	13:03	13:04	13:13	1-	13:02	13:05	13:15	1-	13:01	13:04	13:20	1	13:03	13:04	13:23	1				
11	C2.9	1									11:30	11:40	11:51	1								
14	**M2.4**	1					07:34	07:41	07:53	1												
14	**M1.3**	7	09:23	09:27	09:54	1+	09:20	09:28	09:49	1+	09:20	09:25	09:48	1+	*09:22*	*09:29*	*09:46*	*1*				
14	C5.2	2					10:25	10:34	10:47	1					*10:27*	*10:35*	*10:45*	*1-*				
14	?	1													**11:48**	**11:52**	**?**	**-**				
14	**M1.1**	6	11:54	11:59	?	-	11:45	12:00	12:25	2	11:52	11:59	12:22	1+	**11:55**	**12:00**	**12:18**	**1**	11:55	12:15	12:27	1+
14	**M4.1**	8	12:27	12:33	13:23	2+	12:27	12:31	13:38	2+	12:25	12:30	13:36	2+	12:28	12:33	13:14	2+	12:29	12:30	13:10	2
14	?	1													***12:55***	***12:57***	***13:03***	***1-***				
14	?	1													***13:14***	***13:23***	***13:33***	***1***				
14	**M6.3**	8	14:37	14:39	?	-	14:39	14:43	14:57	1-	14:33	14:43	15:32	2+	14:36	14:44	?	-				
14	**M3.2**	3	*14:56*	*14:59*	*15:10*	*1-*	15:00	15:02	15:03	1-					14:57	14:59	15:59	2+				
15	C9.2	1					07:54	08:07	08:12	1-												
15	?	2													*10:01*	*10:20*	*?*	*-*				
15	**M1.6**	5	10:05	10:24	11:14	2+	09:59	10:31	11:22	2+					*10:26*	*10:29*	*11:26*	*2+*				
15	?	1													***10:46***	***10:52***	***11:07***	***1***				
15	C6.0	2	12:01	12:05	?	-									12:03	12:11	12:35	1+				
15	?	1													12:46	12:48	13:04	1-				
15	C8.2	4	*13:10*	*13:15*	*13:32*	*1*	13:07	13:16	13:24	1-	13:11	13:15	13:33	1	13:10	13:18	?	-				
15	?	1													13:37	13:40	14:04	1+				
15	C9.1	3					14:02	14:14	14:25	1	14:04	14:12	14:38	2	14:08	14:18	15:21	2+				
15	C8.0	1													15:50	15:52	15:59	1-				
15	**M1.0**	1													16:04	16:09	16:12	1-				
16	**M1.5**	2	09:01	09:05	?	-	08:56	09:06	09:28	1+												
16	**M1.1**	3	09:31	09:34	09:38	1-	09:28	09:43	09:55	1+												
16	**M4.0**	7	*10:15*	*10:18*	*10:56*	*2*	10:02	10:18	11:01	2+	10:12	10:19	10:59	2+	10:15	10:21	10:33	1-				
16	?	1													*10:57*	*11:07*	*?*	*-*				
16	C8.5	5	11:38	11:41	12:05	1+	11:33	11:38	12:10	2	11:35	11:38	12:11	2	*11:35*	*11:42*	*12:48*	*2+*				
16	C4.7	3	13:28	13:31	13:39	1-	13:20	13:27	13:35	1-					13:27	13:31	13:40	1-				
16	C5.8	3					13:44	13:50	14:05	1	13:47	13:53	14:02	1-	13:48	13:55	14:09	1				
16	**M2.4**	6	*14:32*	*14:41*	*15:00*	*1+*	14:31	14:39	15:04	2	14:31	14:41	?	-	14:32	14:43	?	-				
16	?	1													15:15	15:17	?	-				
16	**M1.2**	1													15:36	15:41	15:55	1				
18	C5.8	2	10:07	10:10	10:27	1	09:57	10:08	10:24	1+												
18	C4.7	1													14:14	14:16	14:22	1-				
19	C4.5	1					10:31	10:40	10:46	1-												
19	C7.3	1					11:34	11:51	12:04	1+												
19	C8.0	1													*14:23*	*14:30*	*14:41*	*1-*				
20	?	4									13:51	13:56	?	-	13:53	13:59	?	-				
20	**M1.1**	6	13:54	13:56	?	-	13:52	14:06	14:23	1+	14:04	14:07	14:28	1	14:03	14:08	15:02	2+				
21	C3.2	2					12:04	12:08	12:15	1-					*12:08*	*12:11*	*12:15*	*1-*				
22	C3.4	1													15:00	15:03	15:15	1-				
23	C2.3	2					10:46	10:51	11:02	1-												
23	C6.6	3					14:33	14:41	14:56	1					14:40	14:45	15:00	1				
24	C1.9	2					13:50	13:55	13:58	1-					13:56	13:59	14:02	1-				
26	C2.8	1													*09:55*	*10:03*	*?*	*-*				
26	?	1													*10:10*	*10:12*	*10:16*	*1-*				
26	C3.6	2					12:28	12:31	12:40	1-					*12:29*	*12:31*	*12:35*	*1-*				
26	?	1													*13:35*	*13:37*	*13:45*	*1-*				
26	C3.3	2					13:37	13:42	13:47	1-					*13:46*	*13:49*	*13:56*	*1-*				
27	C3.3	1													12:55	12:59	13:07	1-				
27	**M1.2**	1													16:23	16:26	16:37	1-				
29	C3.9	1					11:09	11:18	11:24	1-												
29	**M2.4**	1													18:16	18:20	18:27	1-				
30	C5.5	1					07:55	07:57	07:59	1-												
30	C9.6	7	11:09	11:13	11:22	1-	11:07	11:12	11:24	1-	11:07	11:14	11:26	1	11:10	11:16	11:25	1-				
30	C4.5	1													14:03	14:08	14:35	1+				
30	**M1.4**	3					15:17	15:22	15:28	1-	15:26	15:28	15:35	1-	15:27	15:29	15:49	1				
31	C4.9	3	*11:28*	*11:32*	*11:46*	*1-*									11:30	11:36	11:53	1				

	Xray class		Steve Parkinson (Various)				Andrew Thomas (18.3kHz)				Phil Rourke (23.4kHz)				Mark Prescott (19.6kHz/*20.9kHz*)				John Elliot (18.3kHz)			
			Tuned radio frequency receiver, frame aerials.				Tuned radio frequency receiver, 0.6m frame aerial.				Spectrum Lab, 0.6m frame aerial.				SpetrumLab/Starbase, mini-whip aerial.			Active	Tuned radio frequency receiver, 0.5m frame aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
2	C8.1														?	09:14	09:25	-				
3	**M1.2**																					
7	C5.8		13:02	13:04	13:15	1-																
11	C2.9																					
14	**M2.4**																					
14	**M1.3**		09:23	09:28	09:37	1-									09:23	09:31	09:47	1				
14	C5.2																					
14	?																					
14	**M1.1**		11:47	12:00	?	-																
14	**M4.1**		12:27	12:37	13:05	2									12:31	12:36	13:04	2				
14	?																					
14	?																					
14	**M6.3**		14:37	14:44	15:11	2									*14:41*	*14:47*	*15:08*	*1+*	14:40	14:45	15:30	2+
14	**M3.2**																					
15	C9.2																					
15	?														*10:07*	*10:23*	*?*	-				
15	**M1.6**														*?*	*10:34*	*11:04*	-				
15	?																					
15	C6.0																					
15	?																					
15	C8.2																					
15	?																					
15	C9.1																					
15	C8.0																					
15	**M1.0**																					
16	**M1.5**																					
16	**M1.1**														09:42	09:47	09:55	1-				
16	**M4.0**		10:15	10:29	11:05	2+									10:21	10:31	10:53	1+				
16	?																					
16	C8.5		11:38	11:43	12:05	1+																
16	C4.7																					
16	C5.8																					
16	**M2.4**		14:34	14:41	14:59	1									14:36	14:45	15:02	1+				
16	?																					
16	**M1.2**																					
18	C5.8																					
18	C4.7																					
19	C4.5																					
19	C7.3																					
19	C8.0																					
20	?		13:52	13:57	?	-									*13:55*	*14:00*	*?*	-				
20	**M1.1**		14:03	14:07	14:20	1-									*?*	*14:10*	*14:42*	-				
21	C3.2																					
22	C3.4																					
23	C2.3																					
23	C6.6																					
24	C1.9																					
26	C2.8																					
26	?																					
26	C3.6																					
26	?																					
26	C3.3																					
27	C3.3																					
27	**M1.2**																					
29	C3.9																					
29	**M2.4**																					
30	C5.5																					
30	C9.6		11:07	11:15	11:32	1									11:10	11:17	11:37	1+				
30	C4.5																					
30	**M1.4**																					
31	C4.9																					

BAA Radio Astronomy Section. **2022 DECEMBER.**

	Xray class		Chris Bailey				Andrew Lutley (23.4kHz)	Peter Meadows (23.4kHz)		
			Spectrum Lab.				Tuned radio frequency receiver, 0.6m frame aerial.	Tuned radio frequency receiver, 0.6m frame aerial.		
DAY			START	PEAK	END (UT)		START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
2	C8.1		09:16	09:22	09:36	1				
3	**M1.2**									
7	C5.8		13:00	13:04	13:40	2				
11	C2.9									
14	**M2.4**									
14	**M1.3**		09:22	09:27	09:48	1+				
14	C5.2									
14	?									
14	**M1.1**									
14	**M4.1**		12:28	12:33	13:10	2				
14	?									
14	?									
14	**M6.3**		14:36	14:43	14:55	1				
14	**M3.2**									
15	C9.2									
15	?									
15	**M1.6**		09:55	10:14	11:10	2+				
15	?									
15	C6.0									
15	?									
15	C8.2									
15	?									
15	C9.1									
15	C8.0									
15	**M1.0**									
16	**M1.5**									
16	**M1.1**									
16	**M4.0**		10:15	10:23	11:15	2+				
16	?									
16	C8.5									
16	C4.7									
16	C5.8									
16	**M2.4**									
16	?									
16	**M1.2**									
18	C5.8									
18	C4.7									
19	C4.5									
19	C7.3									
19	C8.0									
20	?									
20	**M1.1**									
21	C3.2									
22	C3.4									
23	C2.3		10:50	10:52	11:08	1-				
23	C6.6		14:36	14:46	14:55	1				
24	C1.9									
26	C2.8									
26	?									
26	C3.6									
26	?									
26	C3.3									
27	C3.3									
27	**M1.2**									
29	C3.9									
29	**M2.4**									
30	C5.5									
30	C9.6		11:08	11:15	11:25	1-				
30	C4.5									
30	**M1.4**									
31	C4.9		11:24	11:35	11:50	1+				

BAA Radio Astronomy Section.

BARTELS DIAGRAM

KEY: DISTURBED. | ACTIVE | SFE | B, C, M, X = FLARE MAGNITUDE. | Synodic rotation start (carrington's).

ROTATION																											
2543 F	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	2020 February 1	2	2227 3
2544 F	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	2228 1
2545 F	2020 March 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	2229 28
2546 F	29	30	31	2020 April 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2547 F	2230 25	26	27	28	29	30	2020 May 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
2548 F	2231 22	23	24	25	26	27	28	29 MCCB	30	31	2020 June 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2549 F	2032 18	19	20	21	22	23	24	25	26	27	28	29	30	2020 July 1	2	3	4	5	6	7	8	9	10	11	12	13	14
2550 F	2033 15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	2020 August 1	2	3	4	5	6	7	8	9	10
2551 F	11	2234 12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	2020 September 1	2	3	4	5	6
2552 F	7	2235 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	2020 October 1	2	3
2553 F	4	2236 5	6	7	8	9	10	11	12	13	14	15	16 CC	17	18	19	20	21	22	23	24	25	26	27 C	28	29 BCCC	30
2554 F	31	2237 1 B	2020 November 2	3	4 B	5 CBCC	6 CBC	7 B	8	9	10 C	11 C	12	13	14	15	16	17	18	19	20	21	22 CC	23	24	25	26 C
2555 F	27	28 C	2238 29 CM	30	2020 December 1	2	3	4	5	6 C	7 C	8	9	10	11	12	13	14 C	15	16	17	18	19	20	21	22	23
2556 F	24	25	2239 26	27	28	29	30	31	2021 January 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2557 F	20	21	22	2240 23	24	25	26	27	28	29	30	31	2021 February 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2558 F	16	17	18	2241 19	20	21	22	23	24	25	26	27	28	2021 March 1	2	3	4	5	6	7	8	9 C	10	11	12	13	14
2559 F	15 B	16	17	2242 18	19	20	21	22	23	24	25 B	26	27	28	29	30	31	2021 April 1	2	3	4	5	6	7	8	9	10
2560 F	11	12	13	2243 14	15	16	17 B	18	19	20 C	21	22 CCCC	23	24	25	26	27	28	29	30	2021 May 1	2	3	4	5	6	7 M
2561 F	8 CC	9 CC	10	2244 11	12 C	13	14	15	16	17	18	19	20	21 C	22 CCMM	23 CCBM	24	25	26 CCCC	27	28 C	29	30	31	2021 June 1	2	3
2562 F	4	5	6	7	2245 8 CCC	9 CCB	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25 C	26	27	28 CBC	29	30 CC
2563 F	2021 July 1	2	3 MCXM	4 MC	2246 5	6	7	8	9 CCB	10	11	12	13	14	15	16 C	17	18 C	19	20	21	22	23	24	25	26	27
2564 F	28	29	30	31	2021 August 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 CCC	21	22 C	23
2565 F	24 C	25	26	27 CCCC	2248 28 MCCC	29 CC	30 C	31	2021 September 1	2	3	4	5	6	7	8 CC	9 C	10	11	12	13	14	15	16	17	18	19
2566 F	20	21 C	22	23 MM	24	2249 25	26 C	27	28 C	29	30 C	2021 October 1	2	3	4	5	6	7	8	9 M	10	11	12	13	14	15	16
2567 F	17	18	19	20	21	2250 22	23	24	25	26 CCCM	27 CCCC	28 CMMX	29 CC	30 CCC	31	2021 November 1	2	3	4 CC	5	6	7	8	9	10	11	12
2568 F	13 C	14	15	16	17	2251 18	19	20	21	22	23	24	25	26	27	28	29	30	2021 December 1	2	3	4	5 M	6	7	8	9
2569 F	10	11	12	13	14	2252 15 CCC	16 CC	17 C	18	19	20 CM	21 M	22 MCC	23	24 CC	25 CCCM	26	27	28	29	30	31	2022 January 1	2	3	4	5
2570 F	6	7	8	9	10	11	2253 12	13 C	14 C	15	16	17	18	19	20	21	22	23	24	25 C	26 CC	27	28 C	29 BCCC	30	31	1 C
2571 F	2022 February 2 CC	3	4 CC	5	6	7	2254 8	9 C	10	11	12 MCCC	13	14 CCM	15	16	17	18	19	20	21	22	23	24	25	26	27	28 C
2572 F	2022 March 1 CM	2	3	4	5	6 C	2255 7 C	8	9	10	11 CCCC	12 C	13	14 M	15 CCMC	16	17	18	19	20 CC	21	22 CC	23 CCCC	24 C	25	26 C	27 C
2573 F	28 CMC	29 MCCC	30 CCCC	31 CCCX	2022 April 1 CCCC	2 CCMM	3 CC	2256 4 C	5	6 C	7	8 CC	9 C	10	11	12 CBCC	13	14	15 MMCC	16 CCCM	17 CCCM	18 MMCM	19 CCCC	20 CMCC	21 CC	22 CMC	23 C
2574 F	24	25 MCCC	26 CCCC	27 CCC	28 CC	29 MCCM	30 MMXM	2022 May 1 CCCC	2	3 MCX	4 BMCM	5 CMMC	6 CC	7 CC	8 CCC	9 C	10 CCX	11 CCMM	12 CCCM	13 CCCC	14 CCCC	15 C	16 CMC	17 CCCC	18 CCCC	19 CMMM	20 CMM
2575 F	21 CCC	22 CC	23 CC	24 CC	25 CCM	26 CC	27 CC	2258 28 CC	29	30	31	2022 June 1	2	3	4	5	6	7	8	9 CC	10 CCMC	11 C	12	13 C	14 CCCC	15	16 C
2576 F	17 CCCC	18 CCC	19 C	20 CC	21 C	22 CC	23 CC	2259 24 C	25 C	26	27	28	29	30	2022 July 1	2	3 BC	4 C	5 CC	6	7	8 M	9 CCCC	10 CCCC	11 CM	12 CCCC	13 CCC
2577 F	14 CMCM	15 CCC	16 MCM	17 CCCC	18	19 C	20 CCCC	21	2260 22	23 CCCC	24 C	25	26 C	27 C	28	29	30	31	2022 August 1	2 CC	3 C	4	5 CC	6	7	8	9
2578 F	10	11 C	12 CC	13 CCCC	14 C	15 CMMM	16 MCC	17 CCMM	2261 18 CMMM	19 MCCM	20	21 C	22 C	23	24	25 CCCM	26 CMMM	27 CMMM	28 CCMM	29 CMMM	30 CCCM	31 C	2022 September 1 CC	2 CCCC	3 CCCC	4 CCCC	5 CCMC
2579 F	6 CC	7	8	9	10 C	11 CCCC	12 CCCC	13 CCCC	2262 14 MCCC	15	16 MM	17 M	18 CC	19 C	20 MCCC	21 M	22 CCCC	23 CCCM	24 CCCC	25	26 CCC	27 CCCC	28	29 CC	30 CCMM	2022 October 1 CC	2 CMMC
2580 F	2022 October 3 CMMM	4 M	5 C	6	7 CM	8 C	9 CCCC	10 CM	2263 11 MMCC	12 CC	13 C	14 M	15 C	16 C	17	18 C	19	20 CC	21	22 CB	23	24 CC	25 C	26 C	27	28	29
2581 F	30	31	2022 November 1	2	3	4	5	6 C	7 C	2264 8	9	10 C	11 MCCM	12 CC	13 C	14 C	15 CCC	16 CC	17 CC	18 CCC	19 M	20	21	22 CCC	23	24	25
2582 F	26	27	28	29 C	30	2022 December 1	2 C	3 M	4	2265 5	6	7 C	8	9	10	11 C	12	13	14 MMMM	15 CMCM	16 MMMC	17	18 CC	19 CCC	20 M	21 C	22 C
2583 F	23 CC	24 C	25	26 CCC	27 CM	28	29 CM	30 CCCM	31 C	2023 January 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18