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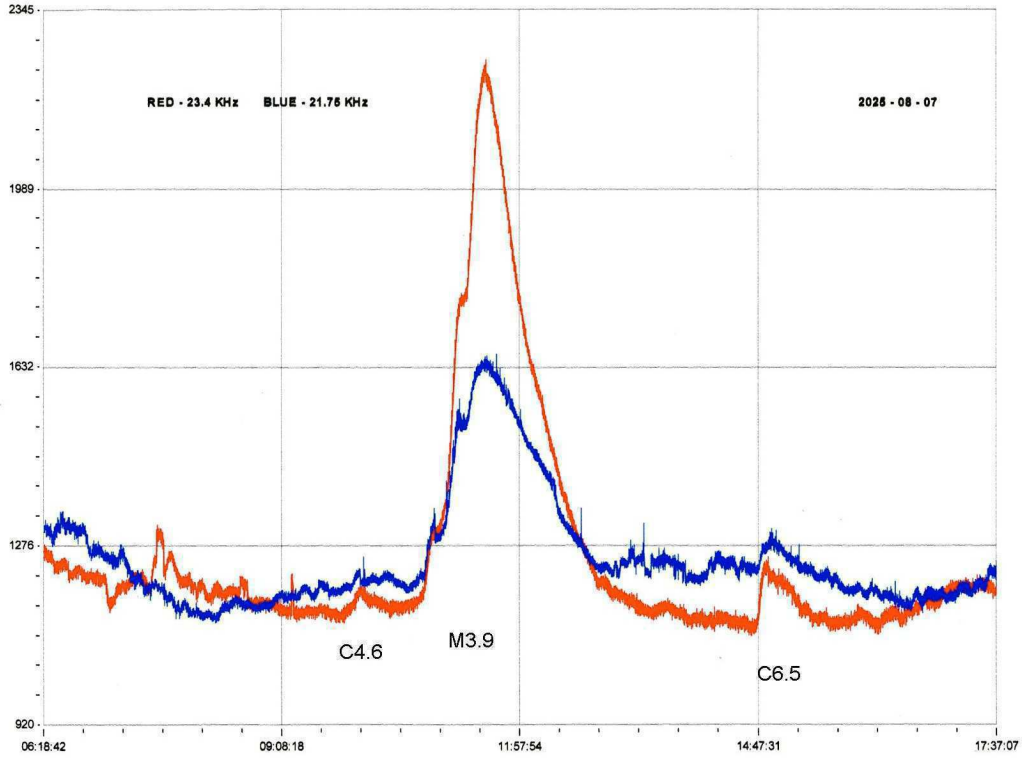
BAA Radio Astronomy Section. Director Paul Hearn.

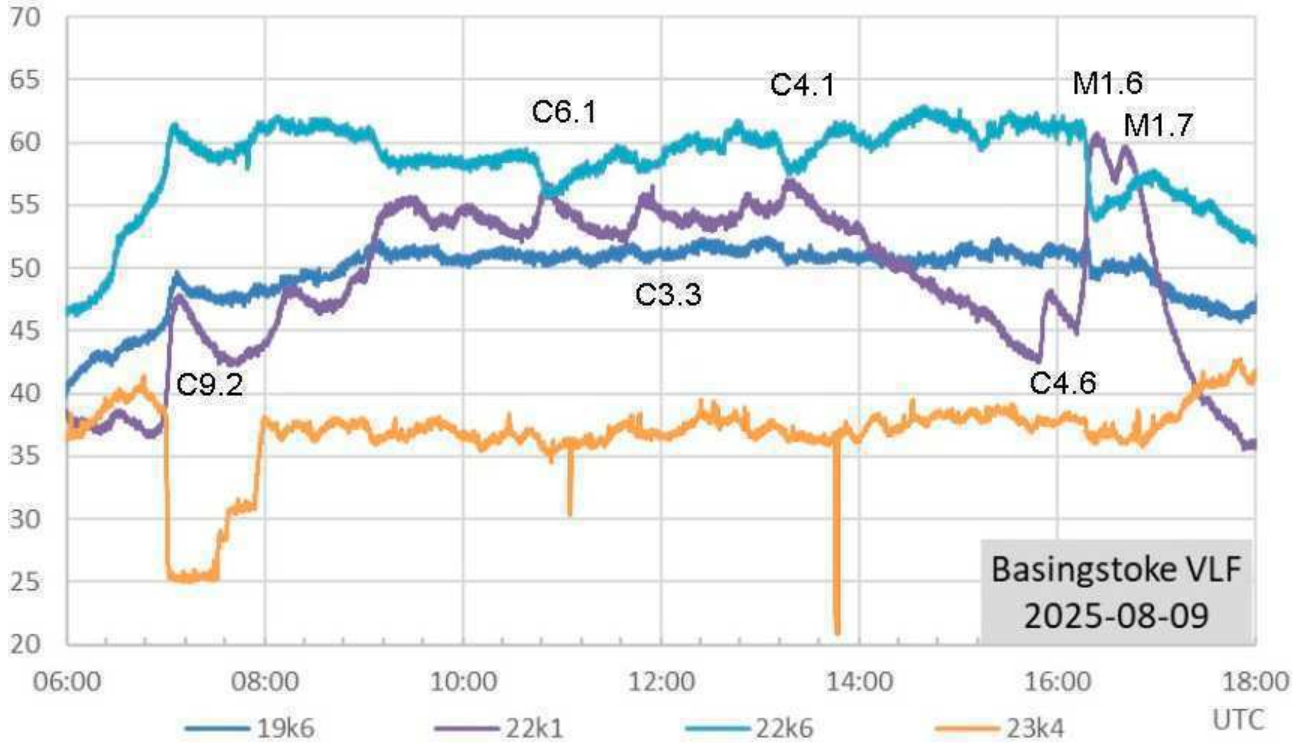
RADIO SKY NEWS 2025 AUGUST.

VLF SID OBSERVATIONS.

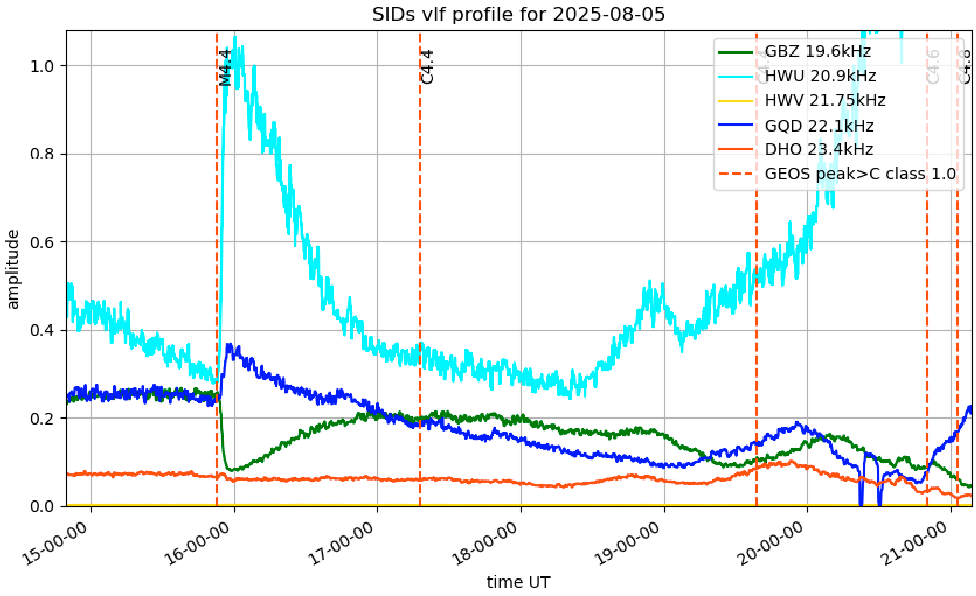
Solar activity in August increased after falling in June and July. We recorded 66 flares as SIDs in August compared with 50 in June and 35 in July. The flare strength also increased, with 18 M-class recorded. The satellite X-ray data does not show any X-class flares in August. August's flaring activity shows a large gap from the 16th to 22nd when no SIDs were recorded. The satellite data for this period includes mostly very small C-class flares, with a few M-flares during our night-time. The Bartels chart shows a similar reduction in activity In July and June, matching the solar rotation. Solar section data also shows a drop in sunspot counts during these periods.



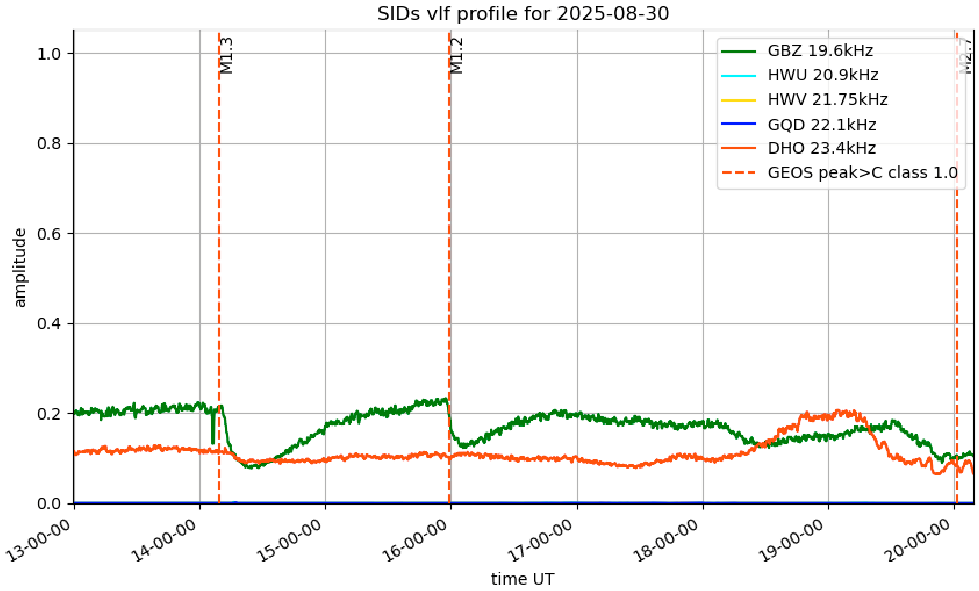
Colin Clements' recording from the 7th shows one of the stronger flares, at M3.9. Both signals show two minor peaks during the rising phase of the flare, a feature also shown in my own recording. The satellite data shows that there were two nearly simultaneous flares from the same active region. Colin's chart also shows the two smaller flares clearly at 23.4kHz.



August 9th was another busy day for flares, including another multiple peaked event seen near the end of Paul Hyde's recording. The M1.6 and M1.7 flares peaked about 20 minutes apart, following the weaker C4.6 flare about 20 minutes earlier. All of the flares shown were from the same active region. 22.1kHz and 22.6kHz show clear mirror SIDs, while 23.4kHz has remained unresponsive. 19.6kHz only shows a very weak response to the stronger flares, which is rather unusual for this signal.

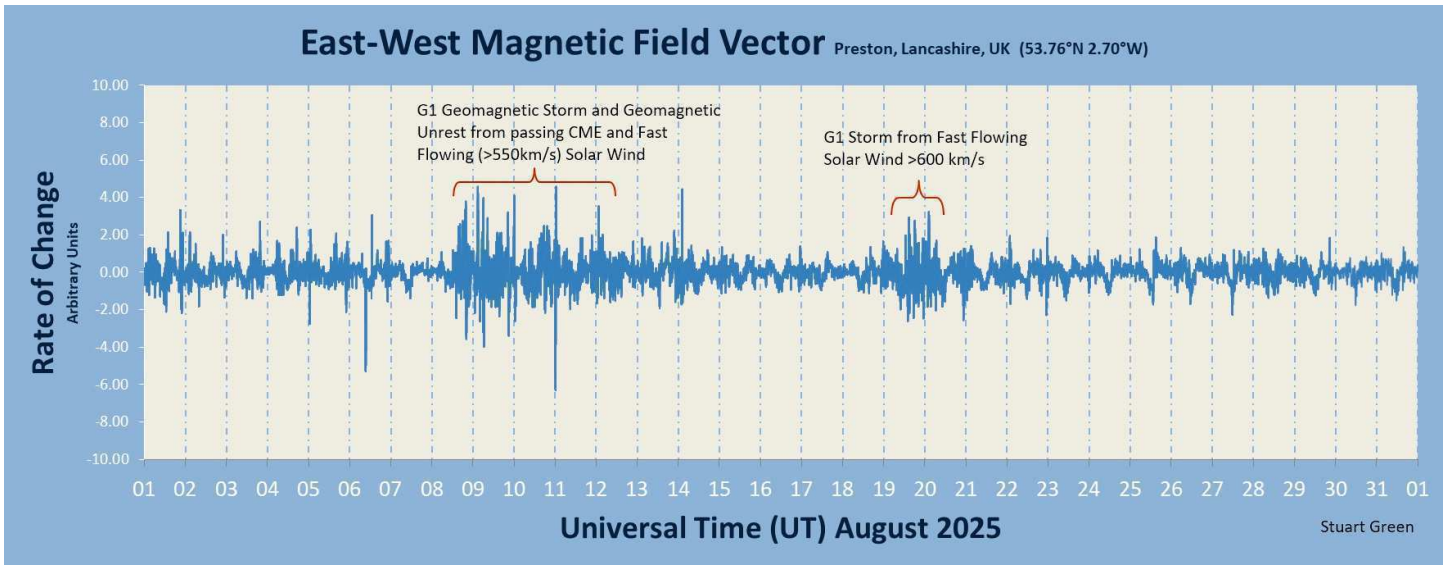


Mark Prescott recorded a strong SID from the M4.4 flare on the 5th. This was quite late in the afternoon, but the longer summer day length allowed it to show before the sunset effects started. 19.6kHz and 22.1kHz show their usual mirror SIDs. The C4.4 flare is not very clear, but has left a small trace. 23.4kHz is again unresponsive.

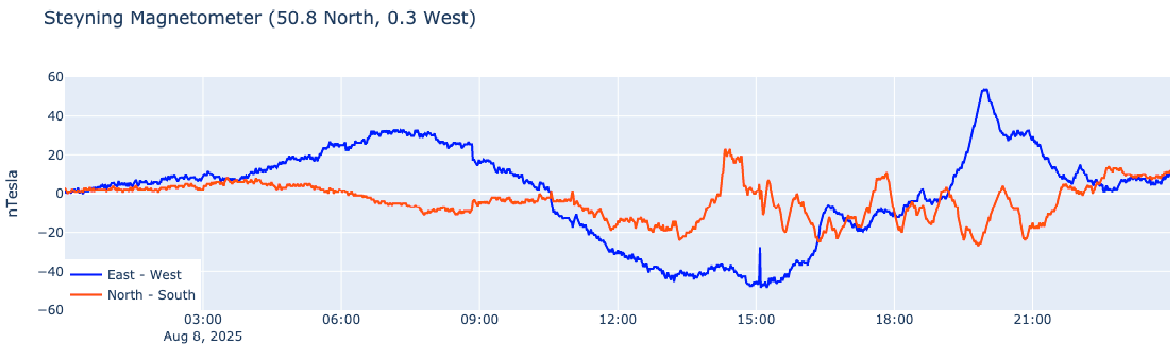


Activity picked up again in the last week of August, with another pair of M-flares on the 30th. These were far enough apart to produce individual SIDs, recorded by Mark Prescott at 19.6kHz. 22.1kHz went off-air on the 18th, remaining off for the rest of the month.

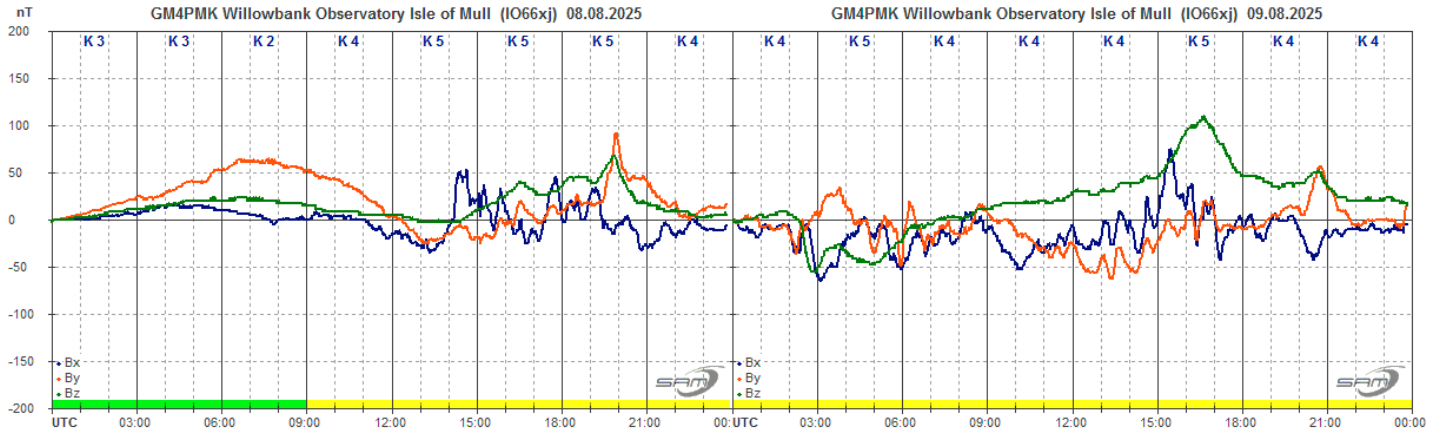
MAGNETIC OBSERVATIONS.



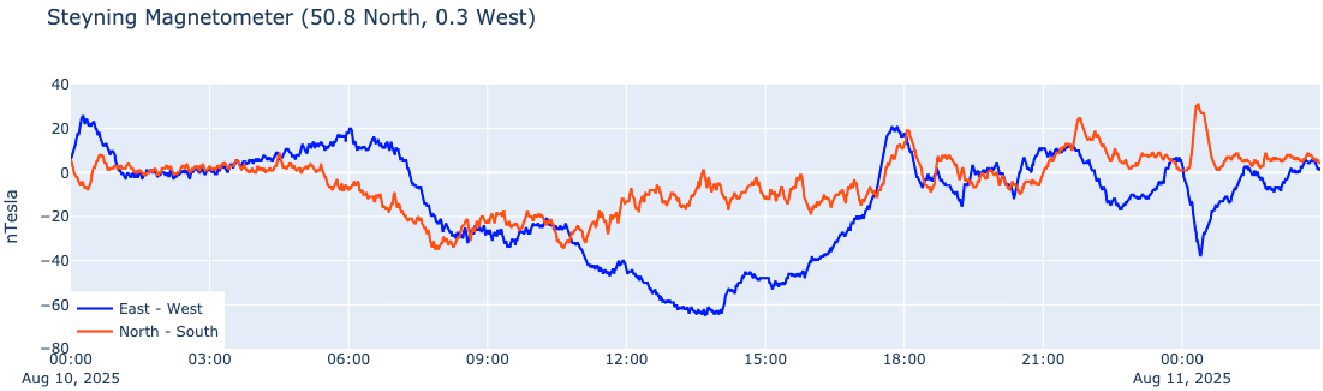
The summary of magnetic activity from Stuart Green shows just two periods of significant disturbance. The first of these started in the afternoon of the 8th, shown in the recording from Nick Quinn:

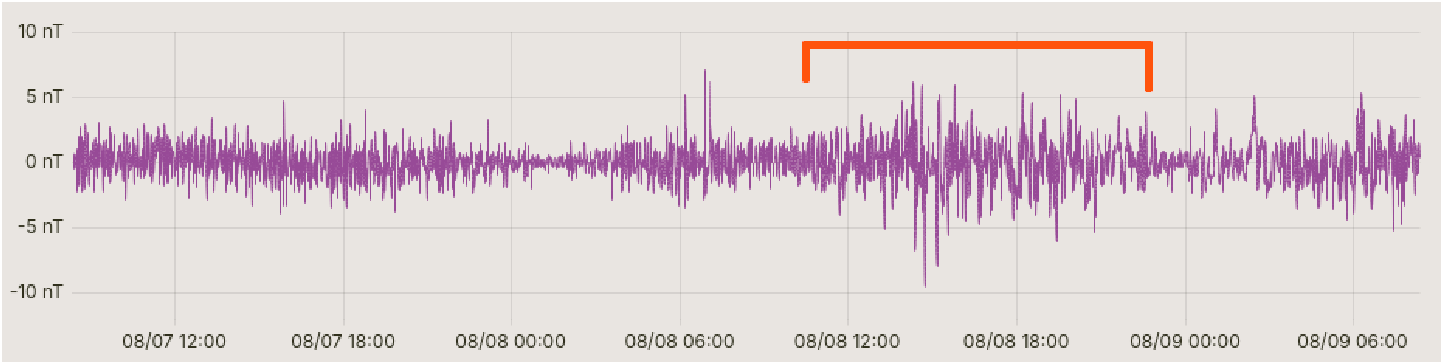


This activity appears to be a combination of a strong coronal hole solar wind and a CME. There is a noticeable spike in the East – West (blue) trace just after 15:00UT that initially looks like some local interference. However, there does seem to be a similar feature in the recording from Roger Blackwell:



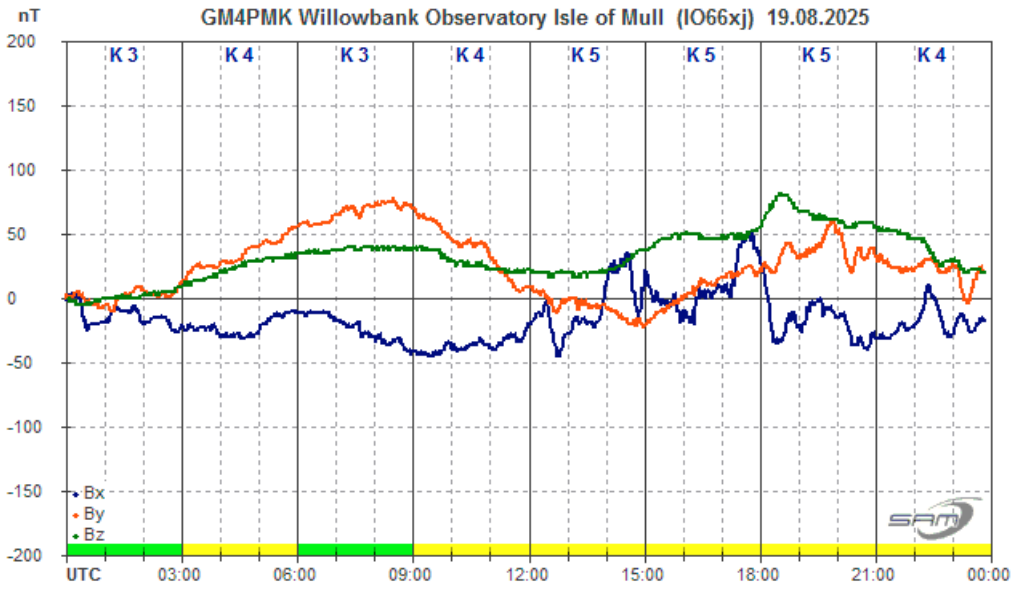
The vertical scale of this chart covers about twice the range, and so the spike does look much smaller. It is easiest to see in the Bx (blue) trace. It may be related to a CME impact, but it is not clear. Activity continued overnight, increasing again in the late afternoon of the 9th. Disturbance continued on the 10th, although much weaker, shown in Nick Quinn's recording:

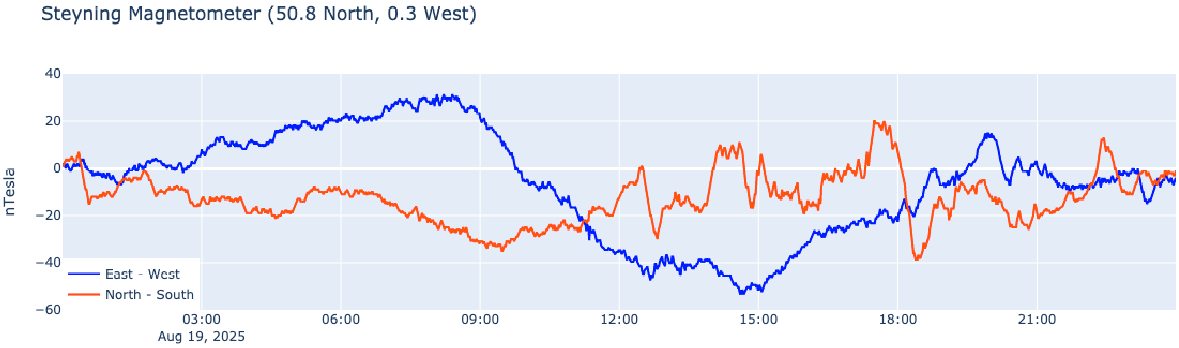




Thomas Mazzi also made a recording of activity on the 8th and 9th, although it appears much weaker from his location in Italy.

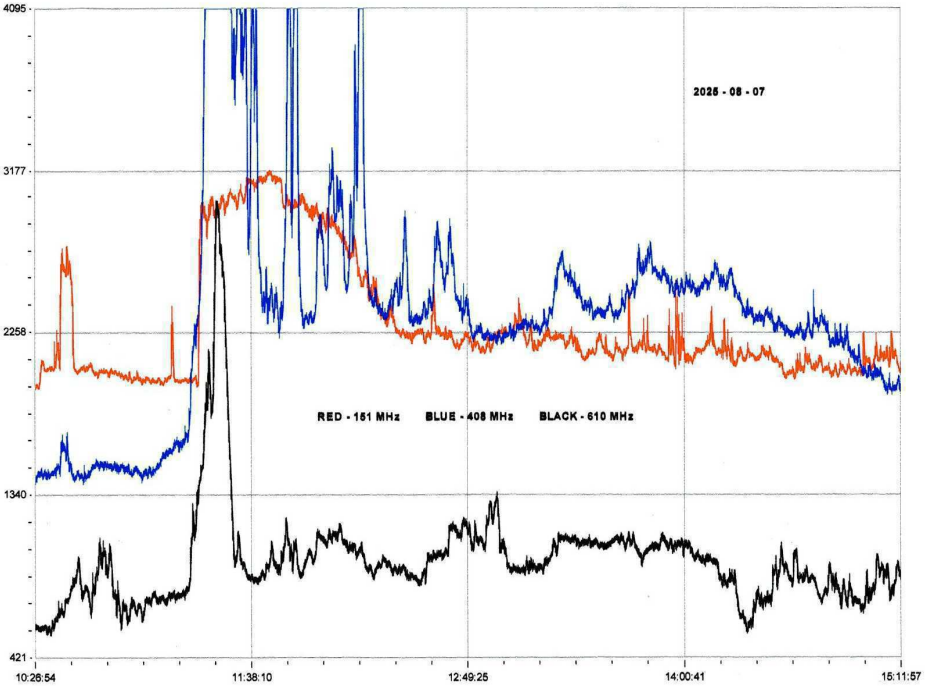
Further periods of activity were recorded on the 11th to 14th, mostly fairly weak as the solar wind speed decayed. The solar wind speed increased again on the 19th with a small disturbance over the next few days. The recordings from Roger Blackwell and Nick Quinn show very similar activity, although a little weaker at Nick's location near the south coast.



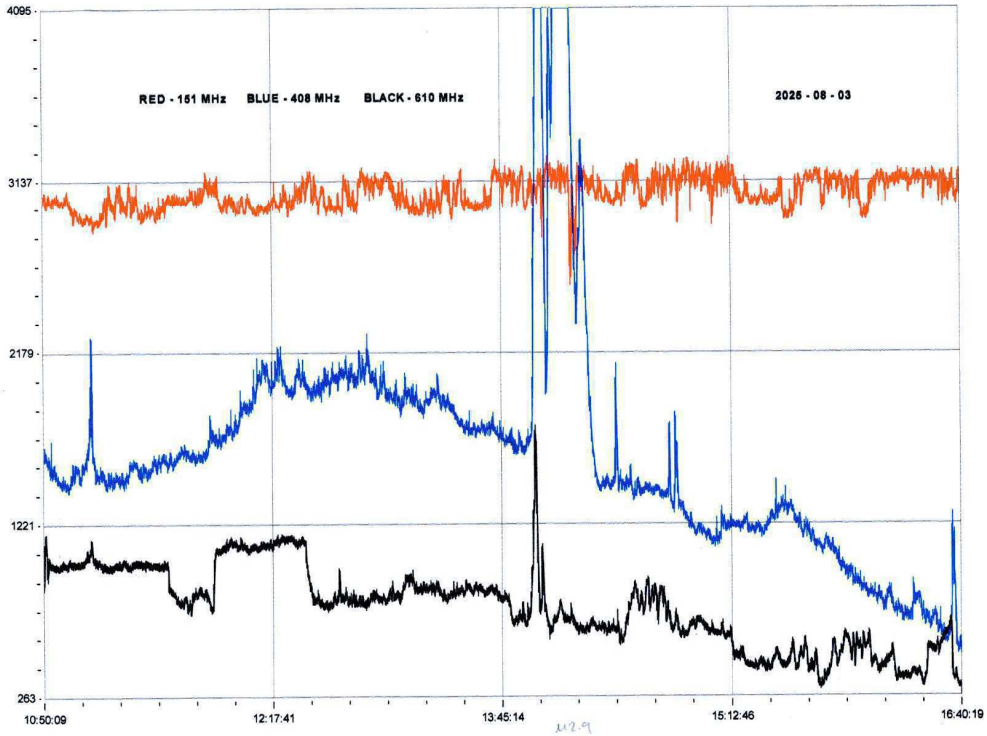


Magnetic observations received from Roger Blackwell, Stuart Green, Thomas Mazzi, Nick Quinn and John Cook.

SOLAR EMISSIONS

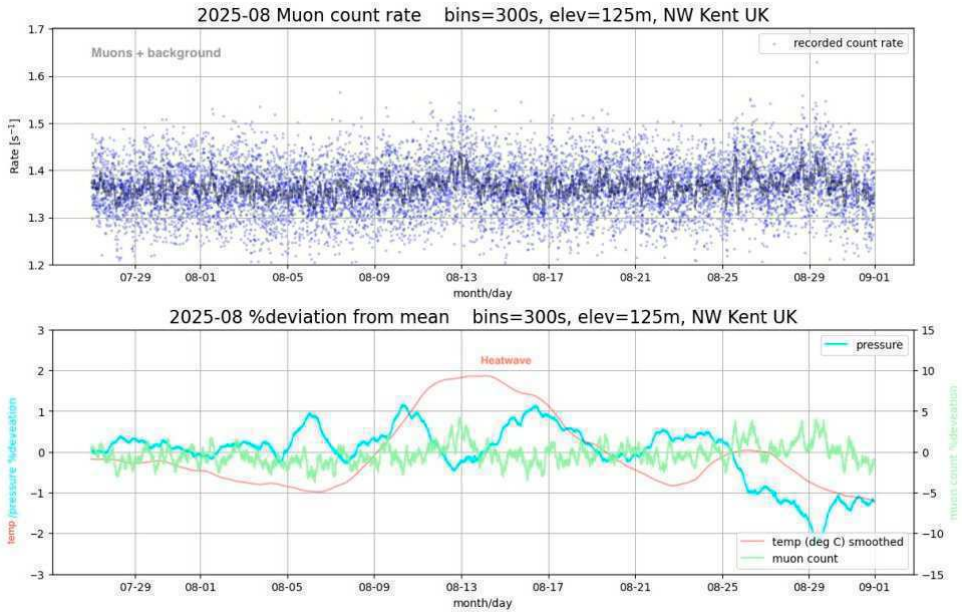


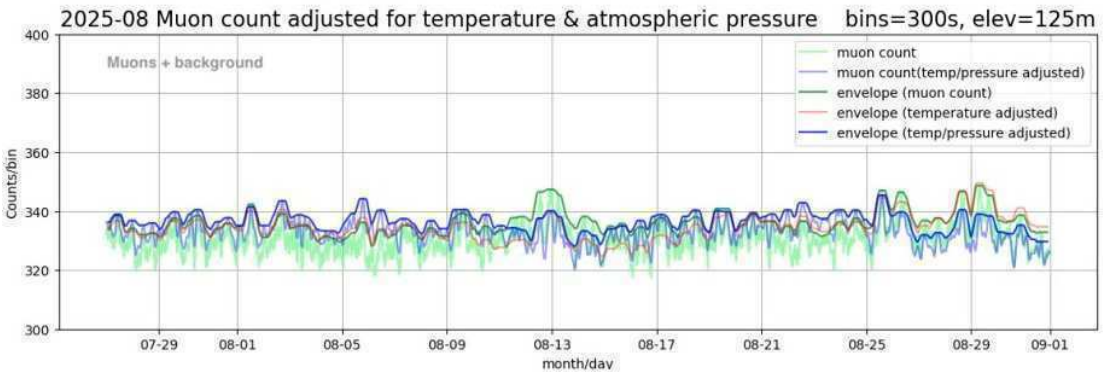
Colin Clements' VHF/UHF recording from the 7th shows very strong 408MHz and 151MHz emissions matching the M3.9 flare on the 7th. The 408MHz signal (blue) has gone off-scale with several peaks lasting about 90 minutes in total. 151MHz (red) has a more gentle signal, its peak being about 15 minutes after the flare's peak. 610MHz (black) shows a short sharp spike right at the start of the flare. All three frequencies appear to start at the same time.

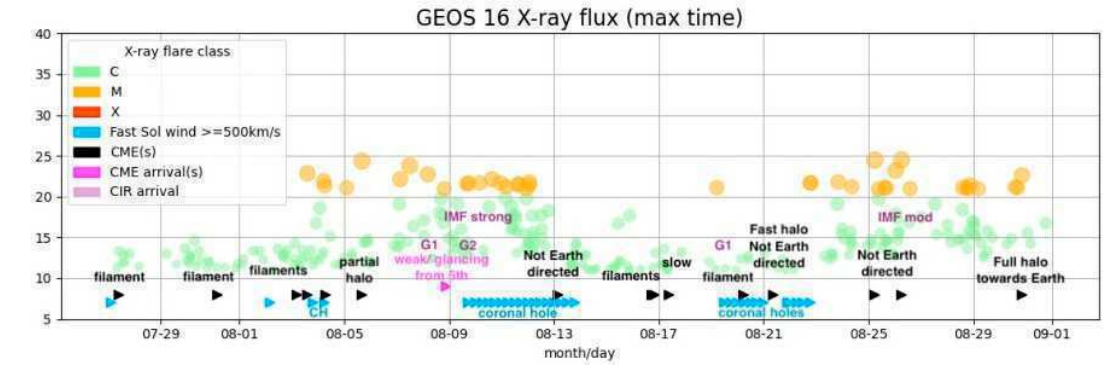


Colin's recording from the 3rd shows another very strong emission at 408MHz from the M2.9 flare at about 14:00UT. There is a very short 610MHz spike at the start of the flare, but 151MHz seems to show a small drop in signal level, probably not related to the flare. Colin also recorded emissions from the M4.4 flare on the 5th.

MUONS

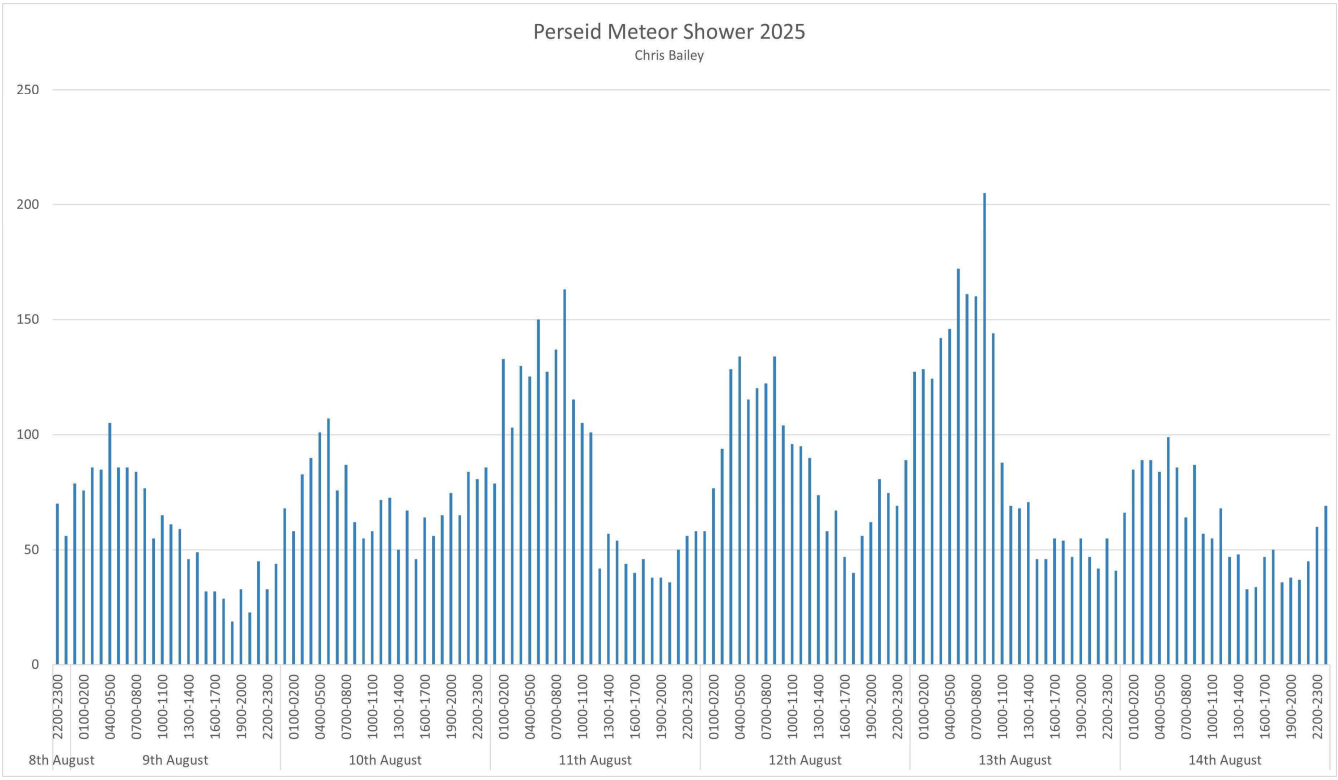




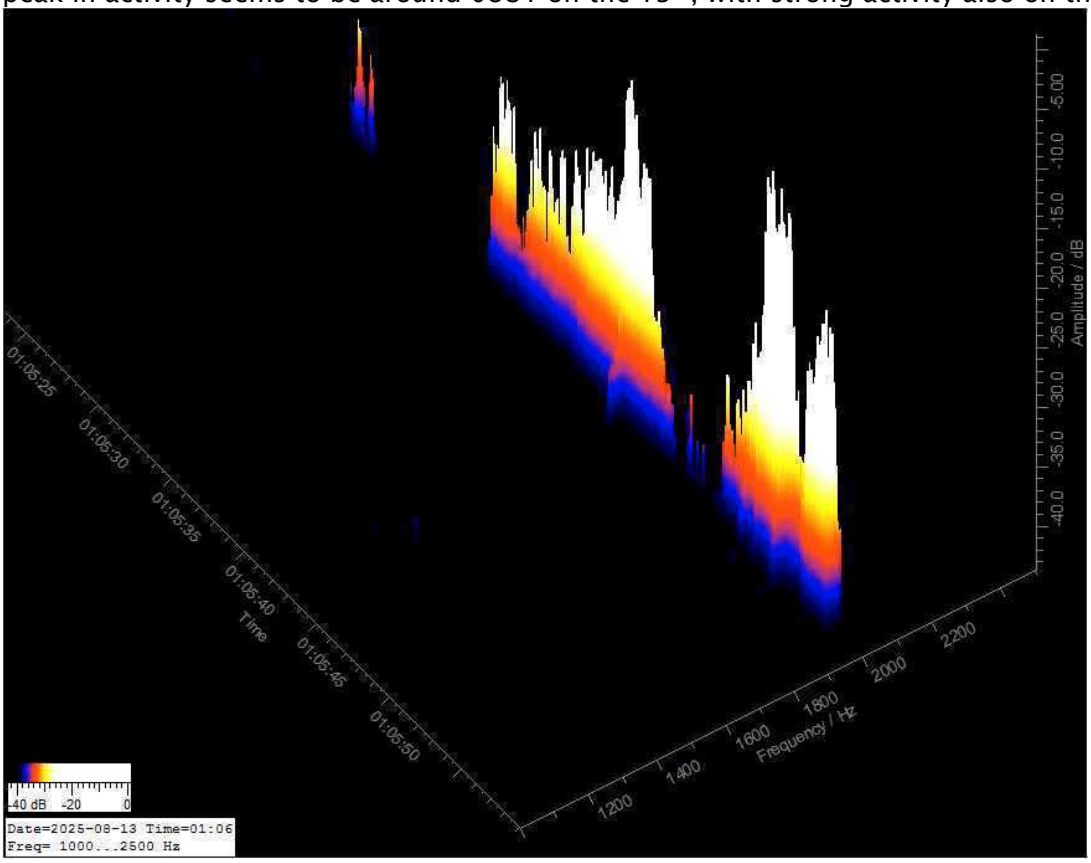


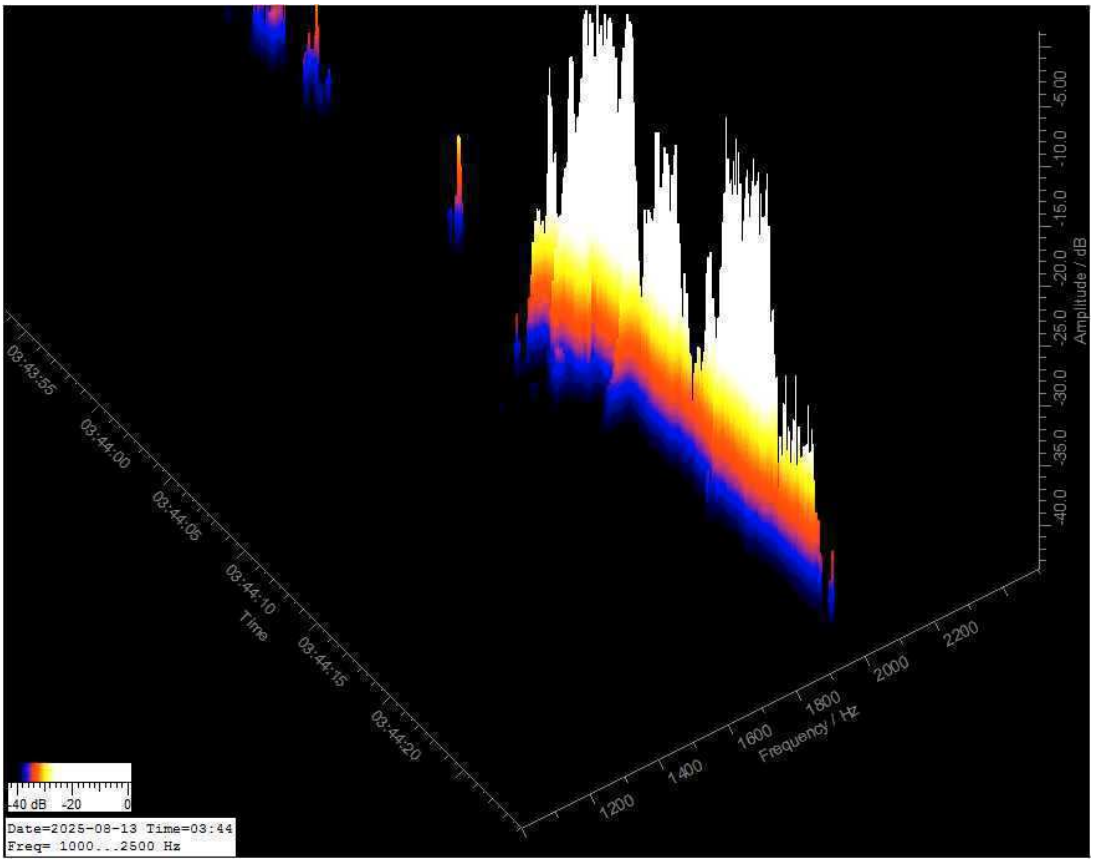
Mark Prescott has provided the usual charts of Muon activity in August, mostly fairly quiet. The weak CME on the 8th has not had any impact on the muon flux, while the faster solar wind between the 9th and 12th has produced a very small drop in the flux. Solar activity was very low from the 13th, with a steady rise in muon flux up to the 23rd when activity picked up again. The change in behaviour after the 25th may be due to the increasing flare strength, but there may also be a link to the very low atmospheric pressure over this period.

PERSEIDS



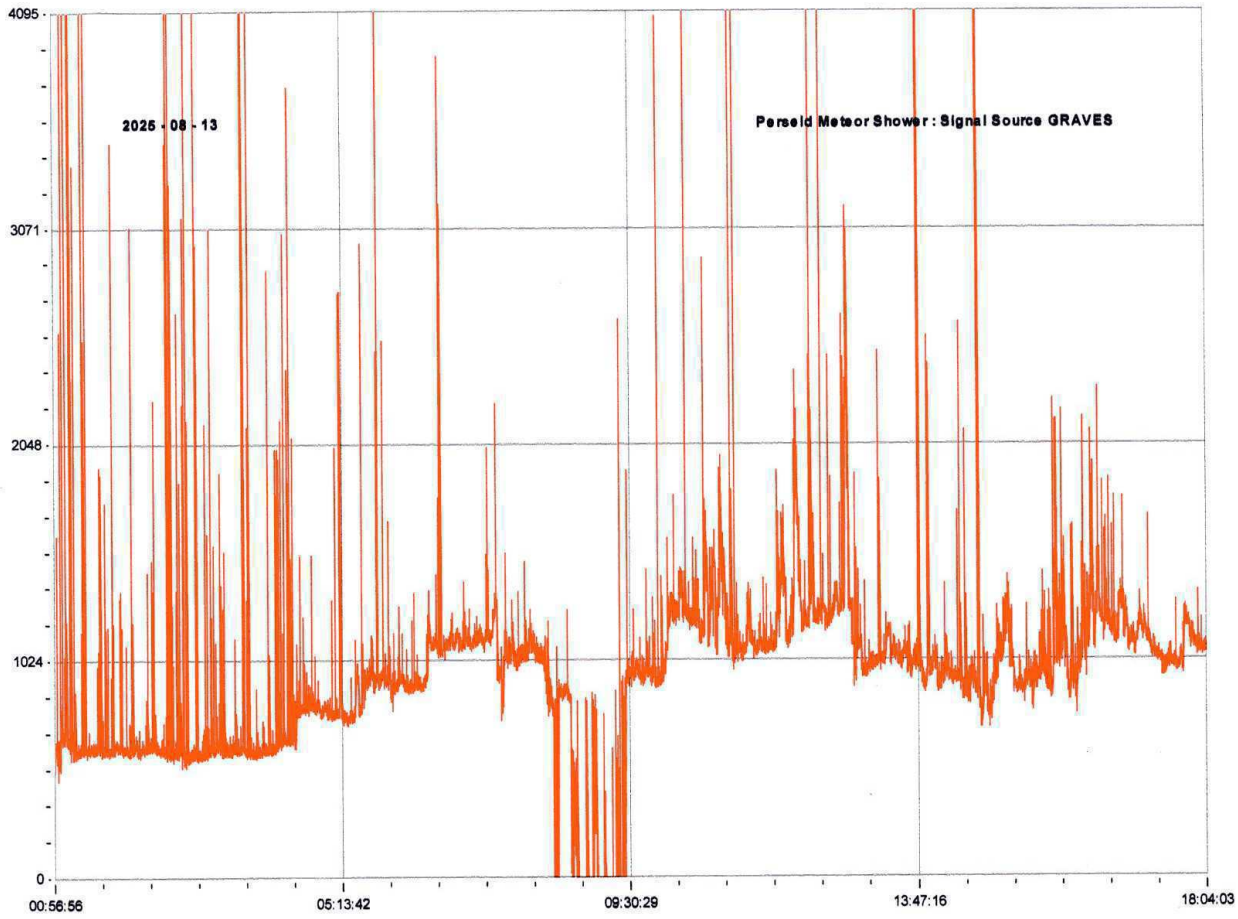
Chris Bailey made Perseid observations from the 8th to the 14th, using the GRAVES radio source. Each day shows the expected dip in counts in the afternoon and early evening, with peaks around 04 to 08UT. The peak in activity seems to be around 08UT on the 13th, with strong activity also on the 11th and 12th.





Chris has also included some sample echoes from his recordings. The first one is timed at 01:06 on the 13th, and appears to last about 20 seconds. The second image is at 03:44 on the 13th, lasting nearer 40 seconds with the earlier echoes at the upper left of the chart. Chris noted that the later echoes were generally stronger than the earlier ones.

Colin Clements also made Perseid recordings, this chart showing activity from 01 to 18UT on the 13th:



Colin also used the GRAVES radio source, but in a different direction compared with Chris Bailey. The highest activity is again seen in the morning, with lower counts in the afternoon. The dip in the centre of the chart is probably due to a temporary loss of the GRAVES signal.

EUCARA.

EUCARA held its first UK meeting at the Rutherford Appleton Laboratory near Oxford. In the past, meetings have been either in Germany or the Netherlands, so it was an excellent opportunity for the Radio Astronomy community to meet in the UK. The group photograph was taken on the Saturday, quite a struggle to get everyone in the frame! Our speakers included amateurs as well as professionals, with Prof. Jocelyn Bell Burnell giving a very interesting talk on her work with pulsar detection. Peter East followed this with a talk on amateur pulsar detection. Other subjects included Meteor scatter, Radar, cosmic radiation, the SKA and Hydrogen line detection. We were also treated to visits to some of the RAL facilities.

Various items of observing equipment were on display, with guidance on how to use them and make observations. There were also display boards including observing results and an interesting history of Ruby Payne-Scott, the world's first female Radio Astronomer. Thanks go to Paul Hearn and Andrew Thomas for their hard work in putting this all together, along with those who helped to make the meeting run smoothly. The group picture is by John Thain.

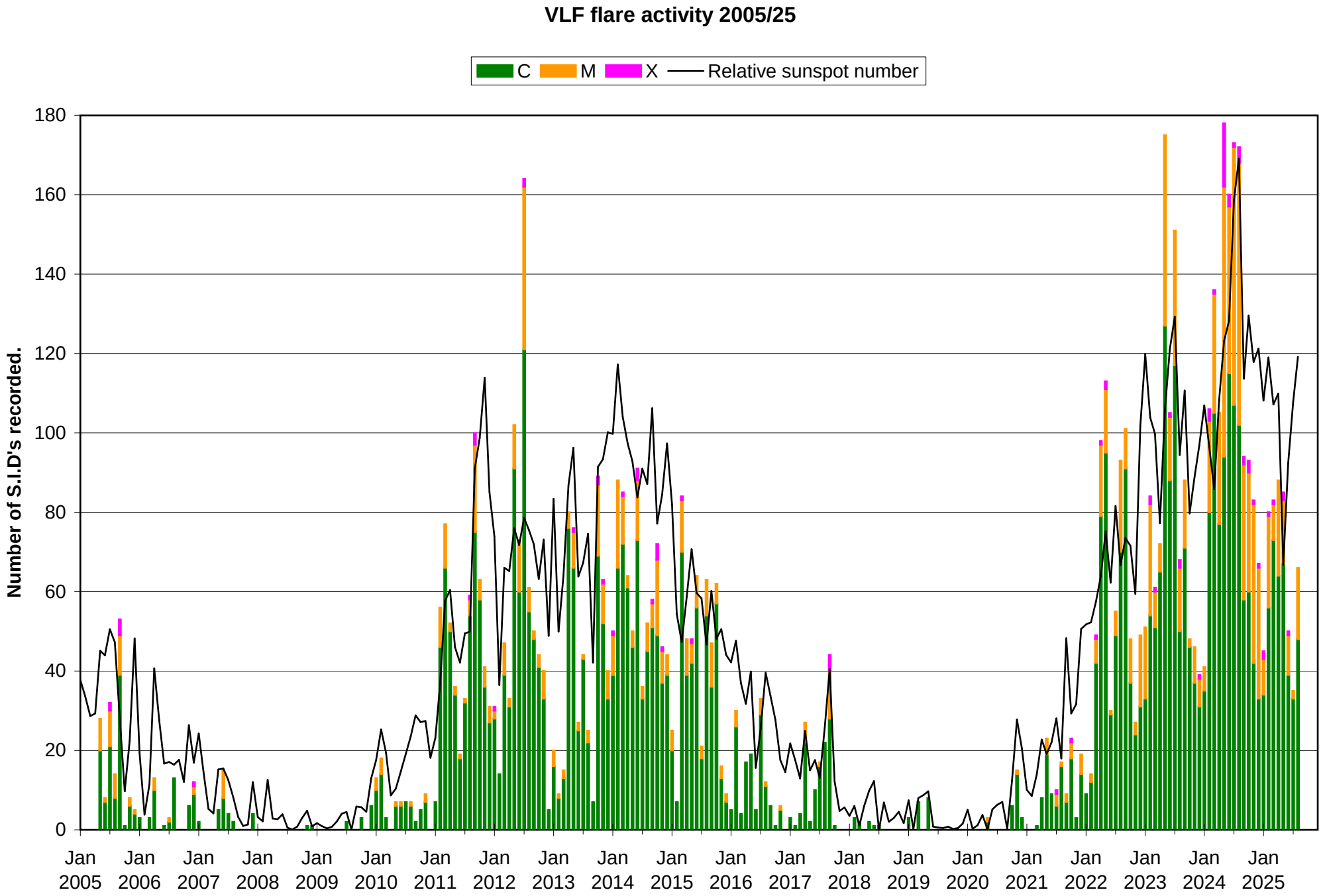
Several new names have been added to the distribution list for Radio Sky News, so if you have any observations then please do send them in.

BAA Radio Astronomy Section. **2025 AUGUST.**

	Xray class	Observers	John Cook (23.4kHz/*22.1kHz*) Tuned radio frequency receiver, 0.58m frame aerial.				Roberto Battaiola 20.3kHz Modified AAVSO receiver.				Paul Hyde (22.1kHz/*24kHz*) Spectrum Lab / PC 1.5m frame aerial.				Mark Edwards Spectrum Lab / PC 2m loop aerial.			Colin Clements (23.4kHz/*21.75kHz*) 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)	
1	C3.4	3																12:11	12:41	13:13	2+
2	C3.6	5	11:07	11:10	11:28	1					11:04	11:11	11:42	2				11:02	11:14	11:54	2+
3	C3.5	2	09:16	09:30	09:38	1															
3	**M2.9**	8	13:54	13:59	14:52	2+	13:51	13:56	14:21	1+	13:54	14:00	15:12	2+				13:56	14:02	15:01	2+
3	C3.5	1	17:11	17:14	17:29	1-															
4	C5.1	6	10:43	10:52	11:49	2+					10:38	10:51	11:45	2+				10:43	10:59	11:44	2+
5	**M4.4**	7	15:50	15:56	16:47	2+	15:49	15:50	15:54	1-	15:49	15:56	17:12	2+				15:52	15:58	17:00	2+
6	C6.0	4	*07:48*	*07:56*	*08:09*	*1*	07:36	07:42	07:55	1	07:49	07:58	08:36	2+							
6	C4.3	3	*10:42*	*10:49*	*11:09*	*1+*					10:43	10:47	11:43	2+				11:00	11:04	11:17	1-
6	C8.5	8	11:46	11:52	13:00	2+	11:41	11:49	12:08	1+	11:46	11:56	13:01	2+				11:47	11:58	12:36	2+
6	C9.6	7	13:27	13:30	14:10	2	13:21	13:29	13:49	1+	13:27	13:34	?	-				13:28	13:36	14:20	2+
6	C2.9	3	*14:50*	*14:54*	*15:00*	*1-*					14:49	14:52	15:14	1							
6	C3.7	3	*15:58*	*16:04*	*16:42*	*2*					15:55	16:02	16:44	2+							
6	**M1.0**	5	*17:01*	*17:04*	*18:02*	*2+*					17:00	17:06	17:41	2				17:01	17:06	17:33	1+
7	C4.6	2	09:54	09:59	10:13	1					09:52	09:57	10:27	2							
7	**M3.9**	7	10:41	11:29	13:20	3+	10:36	11:32	12:59	3+	10:34	11:24	13:26	3+				10:43	11:33	14:46	3+
7	C6.5	7	14:44	14:47	15:35	2+	14:29	14:51	15:12	2	14:40	14:50	15:40	2+				14:46	14:54	15:43	2+
8	C2.4	3	08:38	08:50	09:23	2					08:34	08:52	09:27	2+							
8	C8.1	6	14:21	14:38	15:17	2+					14:20	14:37	15:41	2+				14:20	14:46	15:46	3
8	?	1									14:48	15:00	15:40	2+							
8	C9.8	4	*16:46*	*16:57*	*17:33*	*2+*	16:42	16:57	17:22	2											
9	C9.2	3	*07:00*	*07:06*	*07:32*	*1+*					07:00	07:08	07:39	2							
9	?	1									09:01	09:10	09:44	2							
9	C6.1	3	10:46	10:50	10:57	1-					10:44	10:52	11:25	2				10:43	11:00	11:28	2
9	C3.3	2	11:44	11:47	11:56	1-					11:38	11:46	12:12	2							
9	C4.1	3	13:11	13:17	13:23	1-					13:10	13:18	13:41	1+				13:02	13:22	14:04	2+
9	C4.6	2	15:50	15:57	?	-					15:49	15:57	?	-							
9	**M1.6**	7	16:17	16:22	?	-					16:13	16:25	?	-				16:20	16:26	16:37	1-
9	**M1.7**	5	16:34	16:43	17:25	2+					16:35	16:40	18:09	3				16:37	16:45	17:13	2
10	C8.8	7	12:02	12:12	13:00	2+					12:01	12:12	13:11	2+				12:04	12:15	13:08	2+
10	**M2.2**	7	15:05	15:08	16:01	2+					15:04	15:09	16:38	3				15:07	15:16	17:03	3
11	C8.9	6	08:37	08:43	09:29	2+					08:36	08:45	09:39	2+				08:39	08:49	09:55	2+
11	C6.1	5	10:29	10:40	?	-					10:29	10:41	?	-				10:16	10:47	10:55	2
11	C7.6	3	10:52	10:55	11:26	2					10:52	10:57	11:25	2				10:55	10:59	11:46	2+
11	C7.9	7	11:44	11:46	12:10	1+					11:43	11:47	12:23	2				11:46	11:49	12:33	2+
11	C7.2	7	12:32	12:40	13:25	2+					12:30	12:41	13:43	2+				12:33	12:43	13:57	2+
11	C5.9	4	13:55	13:58	14:09	1-					13:55	14:00	?	-				13:57	14:01	14:20	1
11	**M1.5**	7	14:26	14:34	?	-					14:23	14:34	?	-				14:20	14:40	15:25	2+
11	**M1.6**	7	15:23	15:35	16:18	2+					15:22	15:35	16:47	2+				15:25	15:39	16:36	2+
12	C4	1																			
12	C7.7	4	11:51	11:54	?	-					11:51	11:53	?	-				11:53	11:57	12:07	1-
12	C6.1	7	12:06	12:16	12:44	2					12:05	12:16	?	-				12:07	12:21	12:56	2+
12	C5.0	3	12:54	12:56	13:11	1-					12:52	12:58	13:13	1				12:56	13:01	14:40	3
12	?	1									15:46	15:55	?	-							
12	C4.0	4	*16:16*	*16:24*	*16:47*	*1+*					16:16	16:26	17:09	2+							
13	C2.6	1	10:35	10:42	11:23	2+															
15	C1.8	1									09:34	09:45	09:57	1							
15	C6.8	6	10:35	10:42	11:23	2+					10:30	10:41	11:43	2+				10:32	10:44	12:14	3
15	C2.1	1																			
23	C3.2	3	13:25	13:30	14:04	2															
24	C5.7	1									07:01	07:07	07:31	1+							
24	**M1.3**	8	08:28	08:37	09:45	2+	08:18	08:36	09:13	2+	08:33	08:37	09:16	2				08:31	08:42	09:06	2
25	C9.9	1	08:51	08:56	?	-															
25	**M1.0**	7	09:04	09:07	09:33	1+					08:51	09:02	10:05	2+				08:54	09:02	10:19	2+
25	C5.5	4	10:38	10:43	?	-					10:40	10:45	11:56	2+				10:43	10:48	11:04	1
25	C4.5	1																*15:01*	*15:03*	*15:11*	*1-*
25	**M1.2**	8	15:09	15:21	?	-	15:07	15:16	15:34	1+	15:10	15:18	16:22	2+				15:08	15:24	15:36	1+
25	**M1.1**	3	15:32	15:35	16:24	2+												15:36	15:42	16:42	2+
25	C4.6	1	16:48	16:59	17:02	1-															
26	?	1																			
26	C6.9	4	13:05	13:13	13:20	1-					13:04	13:13	13:45	2				13:05	13:23	13:46	2
26	**M1.0**	3																13:46	14:03	15:16	3
27	C9.2	8	12:33	12:51	13:56	2+	12:26	12:45	13:17	2+	12:33	12:53	14:18	3				12:37	13:00	14:15	3
27	C5.4	2									14:28	14:36	15:05	2				14:32	14:38	14:57	1
28	C8.5	3	14:04	14:09	?	-					14:04	14:09	?	-							
28	**M1.1**	6	14:13	14:17	14:38	1					14:13	14:18	14:45	1+				14:06	14:20	15:48	3
28	**M1.2**	3									17:07	17:12	17:53	2+				17:11	17:21	18:31	2+
29	C5.9	1	12:43	12:44	12:56	1-															
30	C4.9	2	10:36	10:39	?	-					10:35	10:39	10:59	1							
30	**M1.3**	8	14:08	14:19	15:12	2+	14:03	14:18	15:17	2+	14:08	14:21	15:15	2+				14:10	14:22	15:35	2+
30	**M1.2**	8	15:54	16:01	16:41	2+	15:50	16:02	16:37	2+	15:55	16:03	16:41	2+				15:57	16:05	17:21	2+

BAA Radio Astronomy Section. **2025 AUGUST.**

	Xray class		Steve Parkinson (Various)				Andrew Thomas (18.3kHz)				Phil Rourke (23.4kHz)				Mark Prescott (19.6/*20.9*/**22.1kHz**)				John Elliott (19.6kHz)			
			Tuned radio frequency receiver, frame aerials.				Tuned radio frequency receiver, 0.6m frame aerial.				Spectrum Lab, 0.6m frame aerial.				SpectrumLab/Starbase, Active mini-whip aerial.				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)	
1	C3.4		12:15	12:40	13:22	2+									12:24	12:44	13:12	2+				
2	C3.6		11:00	11:15	12:10	2+									*11:07*	*11:21*	*11:47*	*2*				
3	C3.5														*09:26*	*09:33*	*10:05*	*2*				
3	**M2.9**		13:54	14:02	15:15	2+					13:53	13:58	15:30	3	13:57	14:02	15:05	2+	13:53	14:00	15:00	2+
3	C3.5																					
4	C5.1		10:40	11:03	12:18	3									10:42	11:05	12:04	2+	10:40	10:58	12:00	2+
5	**M4.4**		15:50	15:57	16:50	2+					15:49	15:55	17:21	3	15:54	15:58	16:50	2+				
6	C6.0		07:49	08:01	08:26	2																
6	C4.3																					
6	C8.5		11:46	11:58	12:40	2+					11:47	11:52	13:05	2+	11:51	11:59	12:35	2	11:45	11:55	13:03	2+
6	C9.6		13:26	13:30	13:51	1									13:30	13:35	14:35	2+	13:27	13:38	14:30	2+
6	C2.9		14:49	14:54	15:15	1+																
6	C3.7		15:59	16:05	16:18	1																
6	**M1.0**		17:01	17:05	17:40	2													17:01	17:05	17:50	2+
7	C4.6																					
7	**M3.9**		10:37	11:35	13:27	3+					10:48	11:28	13:36	3+	**11:08**	**11:14**	**?**	**-**				
7	C6.5		14:42	14:50	15:27	2									14:48	14:54	15:46	2+	14:45	14:50	15:20	2
8	C2.4		08:38	09:00	09:28	2+																
8	C8.1		14:24	14:40	15:20	2+									14:28	14:41	15:33	2+	14:25	14:43	15:30	2+
8	?																					
8	C9.8		16:48	16:58	17:34	2+									**16:50**	**17:00**	**17:34**	**2**				
9	C9.2		07:01	07:08	07:44	2																
9	?																					
9	C6.1																					
9	C3.3																					
9	C4.1																					
9	C4.6																					
9	**M1.6**		15:51	16:23	17:14	2+					16:15	16:22	?	-	16:19	16:25	?	-	16:15	16:22	17:30	2+
9	**M1.7**										?	16:39	17:34	-	16:40	16:46	17:15	2				
10	C8.8		12:02	12:14	13:15	2+					12:04	12:13	12:48	2	12:06	12:16	13:15	2+	12:03	12:13	13:10	2+
10	**M2.2**		15:05	15:11	16:40	3					15:05	15:11	15:40	2	15:09	15:14	16:30	2+	15:05	15:13	16:50	3
11	C8.9		08:37	08:47	09:48	2+					08:37	08:44	09:02	1	08:41	08:51	09:20	2				
11	C6.1		10:30	10:57	11:27	2+													10:30	10:40	11:35	2+
11	C7.6																					
11	C7.9		11:43	11:47	12:17	2					11:42	11:45	12:07	1	11:47	11:49	12:12	1	11:44	11:47	12:15	1+
11	C7.2		12:31	12:40	13:14	2					12:30	12:39	13:17	2+	12:38	12:47	13:31	2+	12:30	12:48	13:20	2+
11	C5.9		13:55	13:58	14:15	1																
11	**M1.5**		14:25	14:31	14:57	1+					14:25	14:37	15:16	2+	14:29	14:42	?	-	14:25	14:37	15:20	2+
11	**M1.6**		15:23	15:32	16:05	2					15:21	15:36	16:22	2+	15:30	15:39	16:32	2+	15:23	15:35	16:10	2+
12	C4																		08:42	08:48	09:20	2
12	C7.7														11:54	11:58	?	-				
12	C6.1		11:50	12:17	13:15	2+					12:05	12:16	12:50	2	12:12	12:23	12:45	2	11:50	12:15	13:50	3
12	C5.0																					
12	?																					
12	C4.0		16:16	16:25	16:50	2									**16:20**	**16:30**	**?**	**-**				
13	C2.6																					
15	C1.8																					
15	C6.8		10:33	10:42	11:40	2+									10:38	10:44	11:30	2+	10:39	10:48	12:00	2+
15	C2.1		12:44	12:47	13:00	1-																
23	C3.2		13:25	13:33	14:20	2+													13:25	13:37	14:10	2
24	C5.7																					
24	**M1.3**		08:17	08:40	09:31	2+					08:29	08:37	09:33	2+	08:33	08:40	09:12	2	08:28	08:37	09:10	2
25	C9.9																					
25	**M1.0**		08:51	09:08	10:00	2+					08:52	09:00	09:36	2	08:55	09:11	09:51	2+	08:50	08:58	10:15	2+
25	C5.5		10:40	10:44	11:03	1																
25	C4.5																					
25	**M1.2**		15:11	15:20	16:14	2+					15:10	15:22	?	-	15:14	15:26	16:10	2+	15:10	15:20	16:30	2+
25	**M1.1**										?	15:38	16:14	-								
25	C4.6																					
26	?										10:30	10:41	10:51	1								
26	C6.9														13:09	13:16	?	-				
26	**M1.0**										13:46	14:07	15:09	2+	13:47	14:09	14:50	2+				
27	C9.2		12:34	12:50	13:52	2+					12:35	12:53	13:31	2+	12:38	12:54	14:00	2+	12:37	12:50	14:10	3
27	C5.4																					
28	C8.5														14:08	14:13	?	-				
28	**M1.1**		14:04	14:17	15:00	2+					14:04	14:19	14:57	2+	14:17	14:21	14:50	2				
28	**M1.2**		17:09	17:13	17:39	1+																
29	C5.9																					
30	C4.9																					
30	**M1.3**		14:08	14:20	15:17	2+					14:06	14:20	15:14	2+	14:10	14:23	15:08	2+	14:07	14:20	15:40	3
30	**M1.2**		15:54	16:04	16:45	2+					15:55	16:02	16:43	2+	15:57	16:05	16:47	2+	15:53	16:03	16:50	2+


VLF flare activity 2005/25
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
180
160
140
120
100
80
60
40
20
0
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
Jan 2023
Jan 2024
Jan 2025

BAA Radio Astronomy Section.

BARTELS DIAGRAM

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

2575

	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
F	CCC	CC	CC	CC	CCM	CC	CC	CC												CC	CCMC	C		C	CCCC		C

2576

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13
F	CCCC	CCC	C	CC	C	CC	CC	C	C								BC	C	CC		M	CCCC	CCCC	CM	CCCC	CCC	

2577

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
F	CMCM	CCC	MCM	CCCC		C	CCCC			CCCC	C		C	C						CC	C			CC			

2578

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5
F		C	CC	CCCC	C	CMMM	MCC	CCMM	CMMM	MCCC		C	C			CCCM	CMMM	CCMM	CMMM	CCCM	C		CC	CCCC	CCCC	CCCC	CCMC

2579

	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2
F	CC				C	CCCC	CCCC	CCCC	MCCC		MM	M	CC	C	MCCC	M	CCCC	CCCM	CCCC		CCC	CCCC			CCMM	CC	CMMC

2580

	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	28	29
F	CMMM	M	C		CM	C	CCCC	CM	MMCC	CC	C	M	C	C		C		CC		CB		CC	C	C			

2581

	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
F								C	C			C	MCCM	CC	C	C	CCC	CC	CC	CCC	M			CCC			

2582

	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
F				C		C	M					C				C			MMMM	CMCM	MMMC		CC	CCC	M	C	C

2583

	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F	CC	C		CCC	CM		CM	CCCM	C							CC	MCCM	MM	MCMM	MC	MCMC	MC	CCC	CM	C		MC

2584

	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14
F	MMC	CC	CC	CMCM	C	CCC	MCM	CMCC			C	C	CC		C		C	C	C	CC	CM	MMMM	MCCM	MMXM	MMMM	CCCM	CCM

2585

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13
F	CCCC	C	CX	C	CC	CMCC	MCCM	CCCM	CMCC	CCM	CCMM	CC	CC		CC	CCCC	MCCX	CMMC	CCMC	MCCC	C	MC	CCC	CCCC	C		

2586

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
F	C		C	CCCM	C	CCC	C	C			C		CC	CCC	CC	MC	M	CC					CCC	MC		CC	CCCC

2587

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6
F	MCCC	MC	CCC	CCCC	CCMC	CCCC	C	CC	CCC	CCC	CCCC	M	CC		CC		C	M	CC	CCCC	CCM	CCMM	CCCC	MMM	MCCC	CMM	CC

2588

	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2
F	C	CCCM	MCMM	MCCC	MCCM	CCCC	CCCC	C	C	CCCM	CCCC	MMMM	MCCM	MMMM	CCCM	CCMC	CCMC	MCCM	CCMC	CCC	CCC	MC	C	MMMC	CMCM	CCCC	CC

2589

	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	28	29
F	CC	CCCC	C	CCCC	CMCC	CC	CM	C		CCCC	CCCC	CC	CC	MCMM	CC	M	MC	CCMX	CMMC	CMCC	C	CCMC	CCCC	CCMC	CMCC	MCC	CCCM

2590

	30	1	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
F	CCCC	CCCC	CCCC	MCCC	MC	CCCM	CCM	MC	C	CCC	CCCC	MMMM	MMCC	CCCC	MCCC	MMMC	MCMM	CCC	MMMM	CMCM	C	C	CC	CC	C	CCCM	CMCM

2591

	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
F	CMCC	CMCC	CCCM	MC	CMCC	MMMM	MMMM	CMCC	CC	MMCX	CM	CMMX	MC	C		CCCC	CCCC	C			CC	C		C	CC	CC	

2592

	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F	CCC	C	C	C				C			MC	MCC	CC	MCC	CCCC	CCM	CCC	C	C	CCCM	MCCC	C	CCM	C	CC	C	C

2593

	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F	MCCC	CMCC	M	CCMM	CCCC	CCMC	C	CC		MCC	CCC	CCCM	CCCC	CCM	CCC	C	C	CC	CC	CCC	CMCC	CMCC	CC			C	C

2594

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12
F	CCC			C	C					CC	CC			CCCC		MCM	CCM			MCM	C		C	C	C	CCC	

2595

	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9
F	C	CCCC	C			CM	CC	MCCC	CCCC		CCMC	MC		C			C		CC				CCC	C			MCM

2596

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5
F	CCC	CCCC	CC	C	MMX	MCCM	CC	C	C						MM						C	CCCC	M				

2597

	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
F	C		CC		CM	CCM	C		CC						C	CCC	C	CMMM	CCC	CCCC			CCC	CCC	C	C	CC

2598

	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	28
F	CCCC	CCCC	MMMM	CC	CC	CCM	MMMM	CXM	C	C	CMCM	CC	MCCC	CCCM	XCC	C	C	CC	CC	CCCC	XCCM	CMMM	MMMM	CM	C	C	CC

2599

	29	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	CCMC	18	19	20	21	22	23	24	25	26
F			CCC		C	CC	C	CCCC	C		CMCC	CC	CCCC		MCC				CCMC	CCCC	CCCC	CCCC	MCCC	CC	CCCM	MMMM	MMMM	MCCC	MMMM

2600

	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
F	MCCC	MMMX	CCCC	CCCC	CCCC					C					CCCC	CCCM	CCCC	MCCC	CCCC	CMMM	CCCC	CMCC	CMCC	MCCC	MCCC	MMM	MMMM

2601

	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
F	MCCM	CCMC	CMCM	CC	MC	CC	CCC	CCMM	MC	CCCM	CMCC	MMCM	XMXM	MXMC	MMMM	XMMX	MXMX	XMMM	MXMM	MMMX	XCXM	CMMX	M	CCC			MM

2602

	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F		CCCM	CM	CMMM	MCCC	C	CCCC	XCC	CCCC	MMXM	CM	CMCX	XCXM	CMCC	MMMM	MMCC	MMCC	CCMC	CMCM	MMMC	MMCM	MMXM	CC	CC	CCMC	CCCC	MCCC

2603

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12
F	CCCC	MCMM	CMMC	MCCC	CMCC	CCCC	MMCC	MMMC	MMCM	MC	C	CC	CC	CC	CCCC	MC		MCC	CCMM	CCCC	CMCC	CCCC	CCMM	CMCC	MMMM	CMCC	CCC

2604

	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8
F	MMMM	MCCM	MMCC	MCXM	MMMM	MMCC	CMCM	MCCM	MCCM	MCMC	CM	MCMC	CCM	MCC	MMMM	MMMM	MMMM	MMMM	MMMM	MMMM	MMMM	MMMM	MMMM	MMXX	CCCC	CCMM	MMMX

2605

	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4
F	MMMM	CCMM	MCCM	MC	CCCM	XMMC	CCCC	CMC	MM	MCM	MCCC	CCM	MCCC	CCMC	CCMM	CCCC	CMC	CMCC	CCC	CMCC	MCMC	MCCC	MCM	MCCC	CMCC	MCCM	CCMC

2606

	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	30	1
F	MMMC	CCCC	MCCC	M	MMMM	CMC	MMMM	MXMM	MMMM	MCX	CC	C	C	C	C	C		C	M	C	C	C	CC	C	MMM	C	CCC

2607

	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	28
F	CCMC	MXM	MC	MMCC	CMM	C	MCC	CCX	CMMC	CCMM	C		MC	MCCM	MCM	C	CCC	MCM	C		CCC	CCCC	MC	MCC	XMMM	CCCC	CCMM

2608

	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
F	CM	CC	CMMM	MCMM	MM	MCMM	MMMM	MMMM	MMMM	MMMX	CCCC	CCCC	M	C	C	CC	CCC	M		CC	MMMM			CC	M	M	

2609

	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
F	MC	CC	CCCM			CC	CC	C		MC	MMC	MCC	CCM	XCCM	C	MCM	MCCM	CCM	MCM		CCCC				MCCM	CCM	

2610

	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
F	CM	M	MCMC	C		M	MM	MMMM	MMMM		C	C	X	CCX	MM									CC			MMMC

2611

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13
F	CCCC	CC	CC	M	MC	CC	CCC		CC	M	CC		CC	CCMC	CCCM	MCCC	CMCM	CCMC	CCCC	MCCC	MC	MCCC	C	CC	CC	C	CMCC

2612

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12
F	MC	C	C	CCMC		CC	C	CMMC	C	MMMX	MCC	M	CCC	C	CCC	CCCC	C	CC	CCC	M			CC			MC	CCCC

2613

	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8
F	CC	CCCC	CC	C	CCCC	C	CC	C	M	C	CCC	CC	CC	MCCC	CCC	CXMM	CCCC	CCMM	CMCC	MCCC	CCCC	CCC	CCC	C	C	CCCC	

2614

	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5
F	CCC	CCC	CCCM	MMMM	MMMM	MMCC	CMCM	C	CCC		C	CMC	M	M	C	CC			C		MMMC	CMC			CCCC	CCCC	C

2615

	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
F	CCCC	CCCC	CCCC	C	CC	CCCC	CC	CX	MXMM	CM				M	CCCC	C			CCCM	MCMM	CMM	C	CCCC	C	MCCM	MMCM	CC

2616

	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	28
F	MC	M		CC	CC	CC	C		C	CCCC	C	C	CCM	MMCM	CCMM	CX	CCCC	CCCC	CM			C			CCC		

2617

	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
F					C							CCCC	CC	MMCC		CCC			CC	C	C	CCCC		CC	C	CCC	

2618

	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
F	C	C			CC		C	C	CMC	C	M	CCCM	CMC	CCC	CCMM	CM	CCMM	CCCC	C		CCC						

2619

	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
F		C	CM	MCMM	CM	CC	CMM	C	CMM																		