BAA Radio Astronomy Group. **2012 NOVEMBER**

			John Cook (23.4kHz/*22.1kHz*)				Roberto Battaiola (18.3kHz)				Andrew Lutley (23.4kHz)				Bob Middlefell (22.1kHz)				Mark Edwards (**18.3**/24.0/*19.6kHz*)			
	Xray class	Observers	Tuned radio frequency receiver, 0.58m frame aerial.				Modified AAVSO receiver.				Tuned radios frequency receiver, 0.5m frame aerial.				Tuned radio frequency receiver, 0.5m frame aerial.				Spectrum Lab / PC 2m loop aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
5	B6.6	1																	**11:58**	**12:03**	**12:11**	**1-**
10	C1.3	1					10:49	10:59	11:07	1-												
12	C2.9	3					10:15	10:22	10:58	2												
12	C2.1	3					11:48	12:12	12:23	2												
13	C3.5	1																				
13	**M6.0**	1																				
13	**M2.5**	1																				
13	C3.4	1																				
13	C3.1	5	10:09	10:12	10:18	1-													*10:08*	*10:13*	*10:20*	*1-*
14	C1.6	1																				
14	**M1.1**	1																				
14	C4.3	4																	13:38	13:50	14:26	2+
15	C6.3	1																				
15	C2.8	3					07:57	08:02	08:08	1-												
15	C3.2	4					12:41	12:51	13:11	1+									*12:43*	*12:51*	*13:14*	*1+*
15	C2.1	4					14:22	14:30	14:37	1-									**14:27**	**14:30**	**14:35**	**1-**
16	C8.4	4					15:36	15:39	15:42	1-									15:37	15:40	15:52	1-
18	C5.7	1																				
18	C4.3	8	13:06	13:07	13:13	1-	13:03	13:07	13:14	1-									13:06	13:08	13:12	1-
20	C3.0	1																				
20	C3.9	1																				
20	**M1.7**	9	12:38	12:42	13:01	1	12:37	12:41	13:21	2									12:39	12:44	13:17	2
20	C1.6	3					13:49	13:52	13:55	1-									**13:51**	**13:53**	**13:59**	**1-**
20	C3.1	2																	15:21	15:28	15:48	1+
21	**M1.4**	2																				
21	C4.1	4					09:20	09:41	09:53	2									*09:40*	*09:42*	*09:55*	*1-*
21	**M3.5**	5	15:22	15:31	15:51	1+													15:22	15:30	16:13	2+
23	C1.2	3	12:09	12:12	12:17	1-	12:07	12:12	12:24	1-												
24	C3.3	4					13:33	13:41	13:52	1									13:36	13:41	13:57	1
26	C1.8	3					11:40	11:44	11:59	1									*11:42*	*11:46*	*11:51*	*1-*
26	C1.9	2					12:02	12:15	12:22	1									**12:03**	**12:07**	**?**	**-**
26	?	2					12:31	12:39	12:47	1-									**12:10**	**12:15**	**12:33**	**1**
26	C1.9	1																	**12:34**	**12:39**	**12:47**	**1-**
27	C1.5	1																				
27	C1.6	3					11:23	11:32	11:42	1									11:30	11:35	11:43	1-
27	C1.9	4	13:28	13:32	13:40	1-	13:24	13:32	13:43	1									13:29	13:33	?	-
27	?	1																	13:41	13:46	13:54	1-
27	C1.1	1																	14:35	14:40	14:43	1-
27	**M1.6**	1																	15:55	15:59	16:44	2+
28	C4.8	6	12:20	12:26	12:36	1-	12:11	12:25	12:47	2									12:19	12:26	12:47	1+
29	C2.0	1																				
29		3	11:43	11:51	?	-													11:46	11:51	?	-
29	C5.8	6	11:56	12:03	12:30	2	11:39	12:04	12:19	2									11:59	12:04	12:20	1
30	C1.2	1																				

			Colin Clements (23.4kHz)				Peter Meadows (23.4kHz)				Mike King (20.9kHz)				John Wardle (19.6/23.4kHz)				Peter King (18.3kHz)			
			AAVSO receiver, 0.76m screened loop aerial.				Tuned radio frequency receiver, 0.58m frame aerial.				AAVSO receiver. Tuned loop aerial.				PC soundcard, long wire aerial.				Own designed receiver, 1.4m loop aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
5	B6.6																					
10	C1.3																					
12	C2.9																					
12	C2.1																					
13	C3.5																					
13	**M6.0**																					
13	**M2.5**																					
13	C3.4																					
13	C3.1																					
14	C1.6																					
14	**M1.1**																					
14	C4.3														13:37	13:45	13:56	1				
15	C6.3																					
15	C2.8														08:04	08:06	08:08	1-				
15	C3.2														12:45	12:52	13:05	1				
15	C2.1														14:28	14:31	14:34	1-				
16	C8.4																					
18	C5.7																					
18	C4.3		13:04	13:08	13:37	2									13:06	13:10	13:16	1-				
20	C3.0																					
20	C3.9																					
20	**M1.7**		12:38	12:44	12:54	1-									12:38	12:42	13:00	1				
20	C1.6																					
20	C3.1																					
21	**M1.4**														06:57	07:02	07:09	1-				
21	C4.1														09:36	09:43	09:55	1				
21	**M3.5**														15:25	15:32	15:47	1				
23	C1.2																					
24	C3.3														13:34	13:43	13:56	1				
26	C1.8																					
26	C1.9																					
26	?																					
26	C1.9																					
27	C1.5																					
27	C1.6																					
27	C1.9																					
27	?																					
27	C1.1																					
27	**M1.6**																					
28	C4.8																					
29	C2.0																					
29																						
29	C5.8																					
30	C1.2																					

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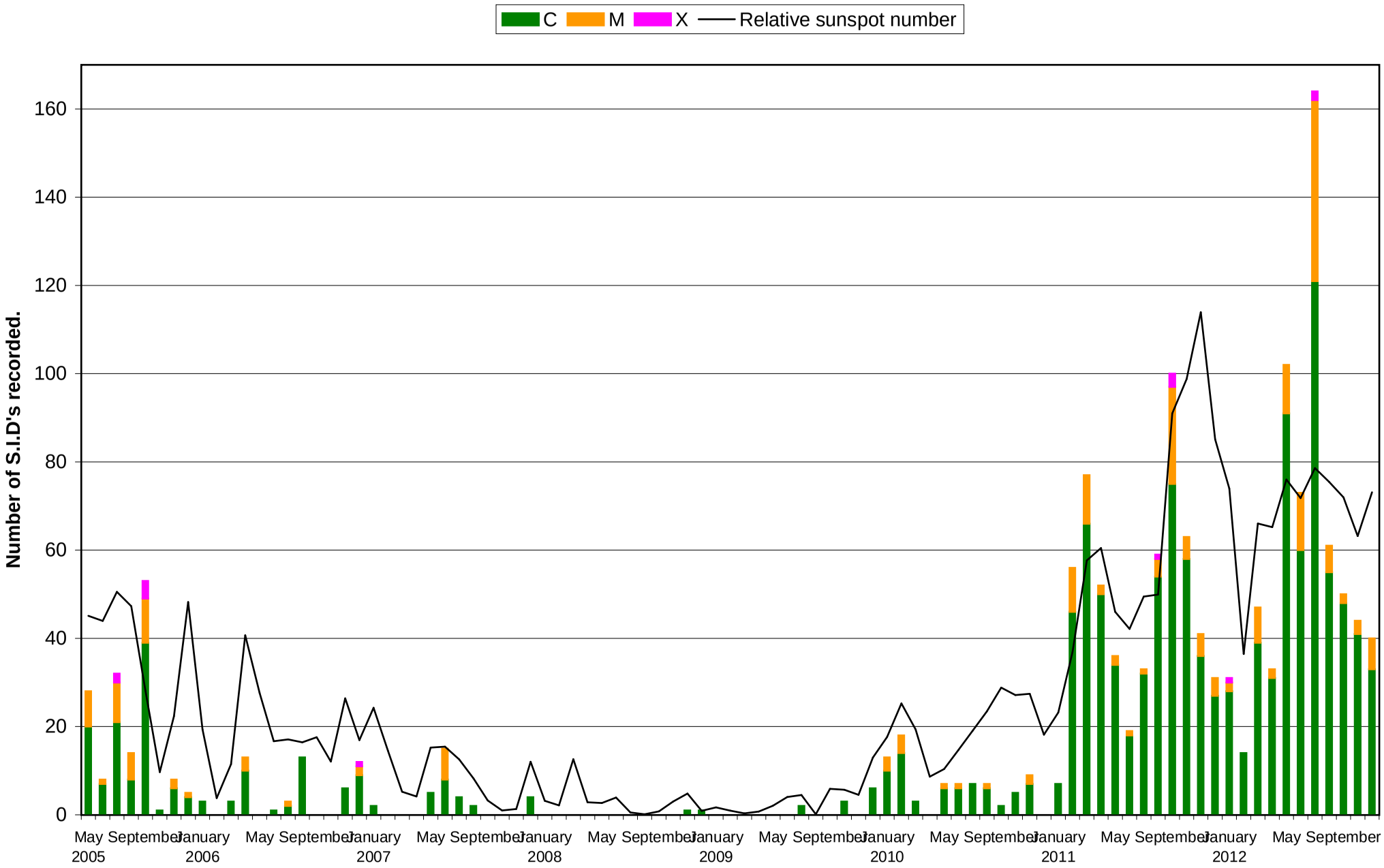
			Paul Hyde (22.1kHz)				Gordon Fiander (19.6/22.1kHz)				John Elliott (18.3kHz)				Martyn Kinder (19.6kHz/*22.1khz*)				Mark Horn (23.4kHz)			
			Tuned radio frequency receiver, 0.96m frame aerial.				PC sound card.				Tuned radio frequency receiver, 0.5m frame aerial.				Tuned radio frequency receiver, 0.58m frame aerial.				Tuned radio frequency receiver, 0.58m frame aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
5	B6.6																					
10	C1.3																					
12	C2.9		10:20	10:23	10:32	1-									10:19	10:23	10:26	1-				
12	C2.1		11:52	11:53	?	-									11:51	12:14	12:24	2				
13	C3.5																					
13	**M6.0**																					
13	**M2.5**																					
13	C3.4																					
13	C3.1		10:10	10:13	10:34	1									10:08	10:13	10:16	1-				
14	C1.6																					
14	**M1.1**																					
14	C4.3		13:39	13:42	14:00	1																
15	C6.3																					
15	C2.8																					
15	C3.2		12:43	12:54	13:12	1+																
15	C2.1														*14:25*	*14:30*	*14:37*	*1-*				
16	C8.4		15:37	15:41	?	-									15:36	15:40	15:45	1-				
18	C5.7																					
18	C4.3		13:07	13:08	13:18	1-									13:04	13:08	13:14	1-				
20	C3.0																					
20	C3.9																					
20	**M1.7**		12:39	12:43	13:09	1+					12:40	12:46	13:01	1	12:36	12:42	12:47	1-				
20	C1.6														*13:48*	*13:51*	*13:57*	*1-*				
20	C3.1														*15:18*	*15:31*	*15:42*	*1*				
21	**M1.4**																					
21	C4.1		09:20	09:42	10:04	2																
21	**M3.5**		15:23	15:26	15:37	1-									*15:21*	*15:31*	*15:44*	*1*				
23	C1.2														12:08	12:12	12:24	1-				
24	C3.3		13:37	13:42	13:55	1-																
26	C1.8														11:37	11:41	11:44	1-				
26	C1.9																					
26	?																					
26	C1.9																					
27	C1.5														09:13	09:15	09:23	1-				
27	C1.6		11:30	11:34	11:46	1-																
27	C1.9		13:28	13:31	13:41	1-																
27	?																					
27	C1.1																					
27	**M1.6**																					
28	C4.8		12:16	12:27	12:51	2									12:14	12:26	12:36	1				
29	C2.0														11:16	11:19	11:24	1-				
29			11:44	11:52	?	-																
29	C5.8		11:58	12:04	12:40	2									11:42	12:05	12:23	2				
30	C1.2														08:41	09:21	09:45	2+				

			Steve Parkinson (various)				Simon Dawes (various)				Gonzalo Vargas (Various)				Tarif Rashid Santo (19.8kHz)							
			Tuned radio frequency receiver, 0.58m frame aerial.				PC soundcard and TRF receiver with 1m loop aerial.				Spectrum Lab.				Spectrum Lab, Half-wave dipole.			15m				
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
5	B6.6																					
10	C1.3																					
12	C2.9																					
12	C2.1																					
13	C3.5														01:16	01:24	01:48	1+				
13	**M6.0**														02:00	02:06	02:56	2+				
13	**M2.5**														05:44	05:54	06:40	2+				
13	C3.4														06:54	07:00	07:36	2				
13	C3.1		10:10	10:13	10:18	1-																
14	C1.6														02:18	02:24	02:52	2				
14	**M1.1**														04:01	04:08	04:44	2				
14	C4.3		13:38	13:45	14:00	1																
15	C6.3														04:27	04:36	05:32	2+				
15	C2.8														07:58	08:02	08:28	1+				
15	C3.2																					
15	C2.1																					
16	C8.4																					
18	C5.7														03:55	04:08	04:44	2+				
18	C4.3		13:06	13:08	13:13	1-																
20	C3.0														01:38	02:00	03:00	2+				
20	C3.9														06:29	06:32	07:00	1+				
20	**M1.7**		12:38	12:43	13:06	1+																
20	C1.6																					
20	C3.1																					
21	**M1.4**														06:48	06:56	07:52	2+				
21	C4.1																					
21	**M3.5**																					
23	C1.2																					
24	C3.3																					
26	C1.8																					
26	C1.9																					
26	?																					
26	C1.9																					
27	C1.5																					
27	C1.6																					
27	C1.9																					
27	?																					
27	C1.1																					
27	**M1.6**																					
28	C4.8		12:18	12:25	12:40	1																
29	C2.0																					
29																						
29	C5.8		11:43	11:50	12:23	2																
30	C1.2																					


VLF flare activity 2005/12.
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
0
20
40
60
80
100
120
140
160
May September January
2005
May September January
2006
May September January
2007
May September January
2008
May September January
2009
May September January
2010
May September January
2011
May September January
2012
May September

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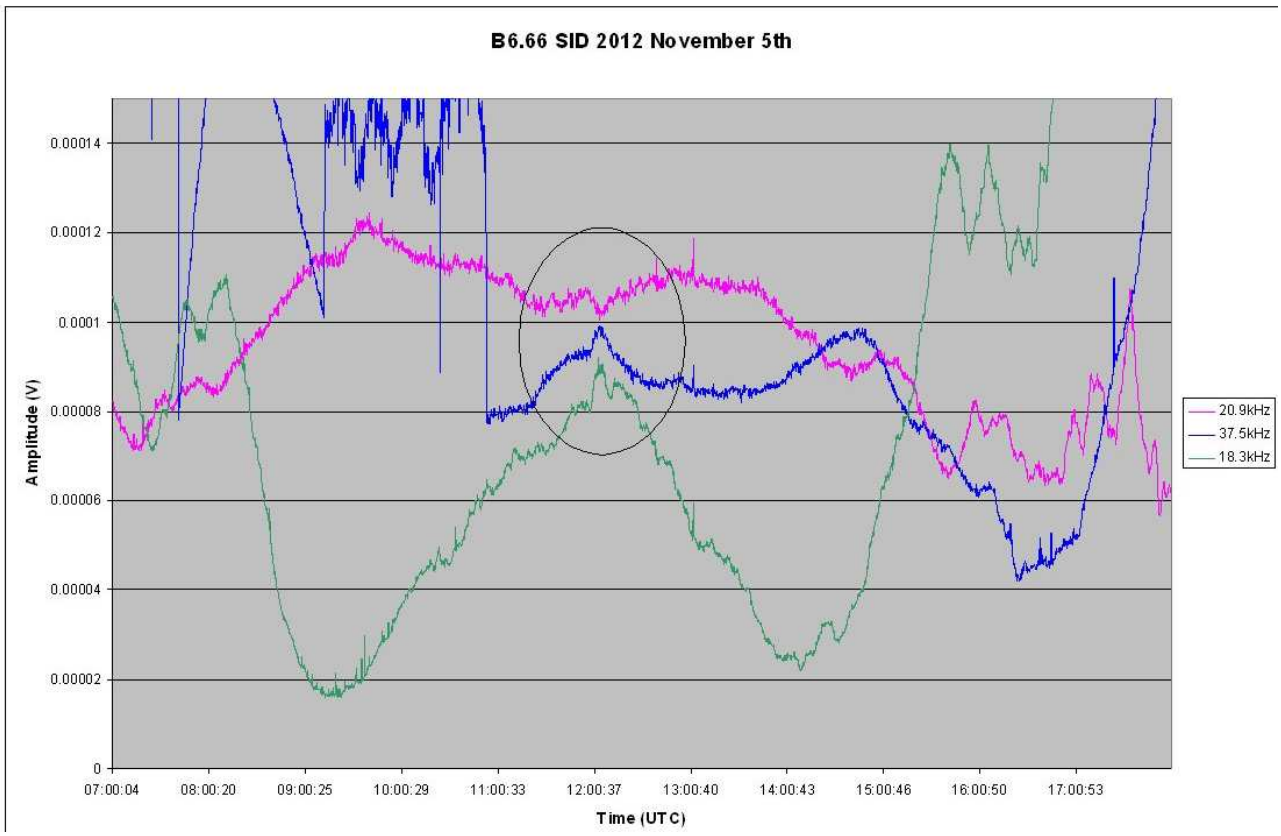
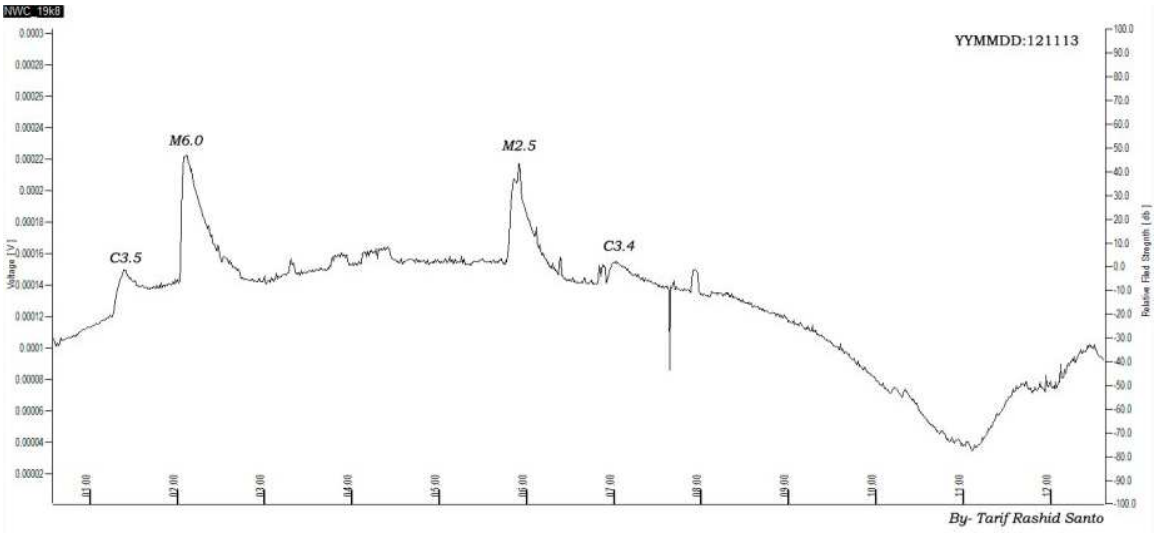
First I must apologise for including the wrong activity chart last month. Both October and November are shown this time. Activity is down again, having peaked back in July. The forecast peak of cycle 24 is early in 2013, so it will be interesting to record what happens.

The B6.6 flare on the 5th is amongst the weakest that we have detected as a SID. Mark has included a chart to prove his claim:

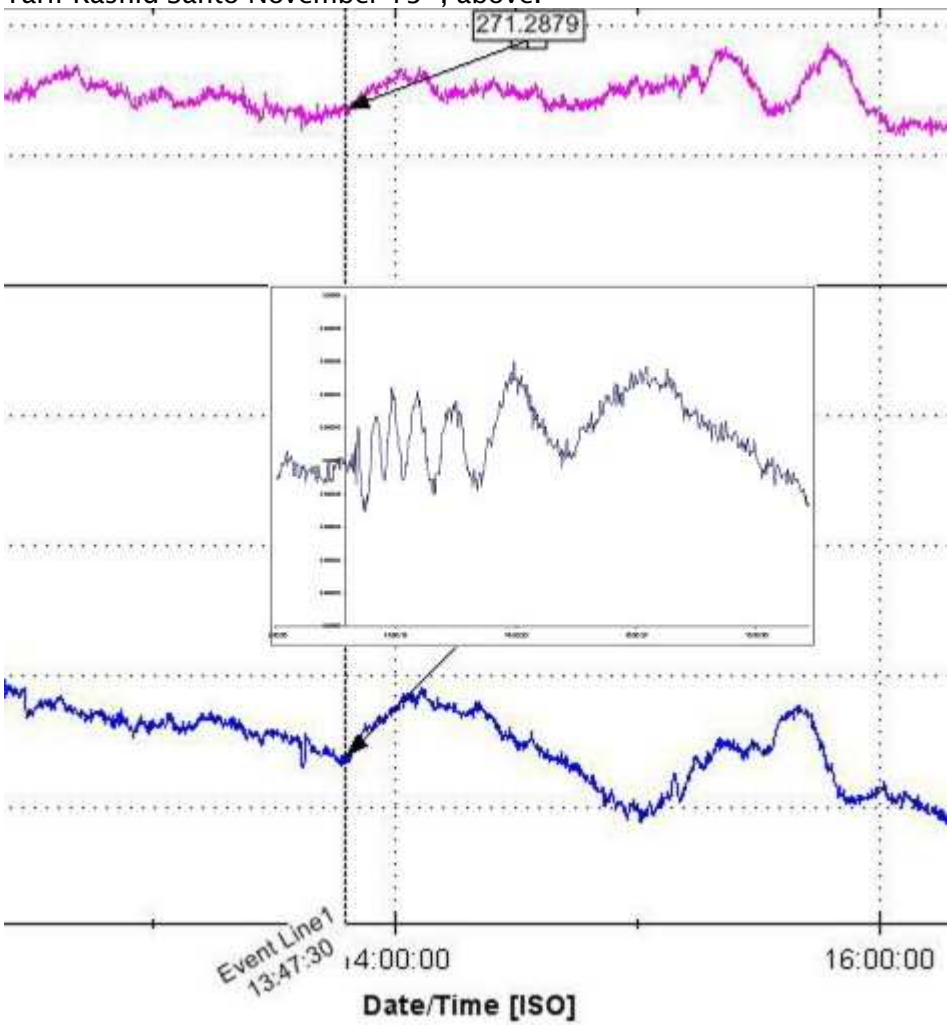


It has clearly recorded at all three frequencies. The timing close to local midday helps, but it is interesting to see the strength of response at 37.5kHz from Keflavik in Iceland at about 64 degrees north.

The most energetic flare recorded was the M6.0 early in the morning on the 13th. This was also the largest event in the SWPC lists for November. The recording by Tarif Rashid Santo is on the next page. At this time of year we often experience noisy VLF signals, but Mark Edwards has again reported an unusual oscillation, also on the 13th. He has matched the start of the oscillation to a magnetic event at 13:47UT recorded by David Farn. He has superimposed the two charts to the same scale to show the apparent connection. In the past we have also considered solar proton events as a cause of VLF oscillations. Although there was a proton event in progress at the time, it started some 15 hours earlier and is unlikely to be connected.



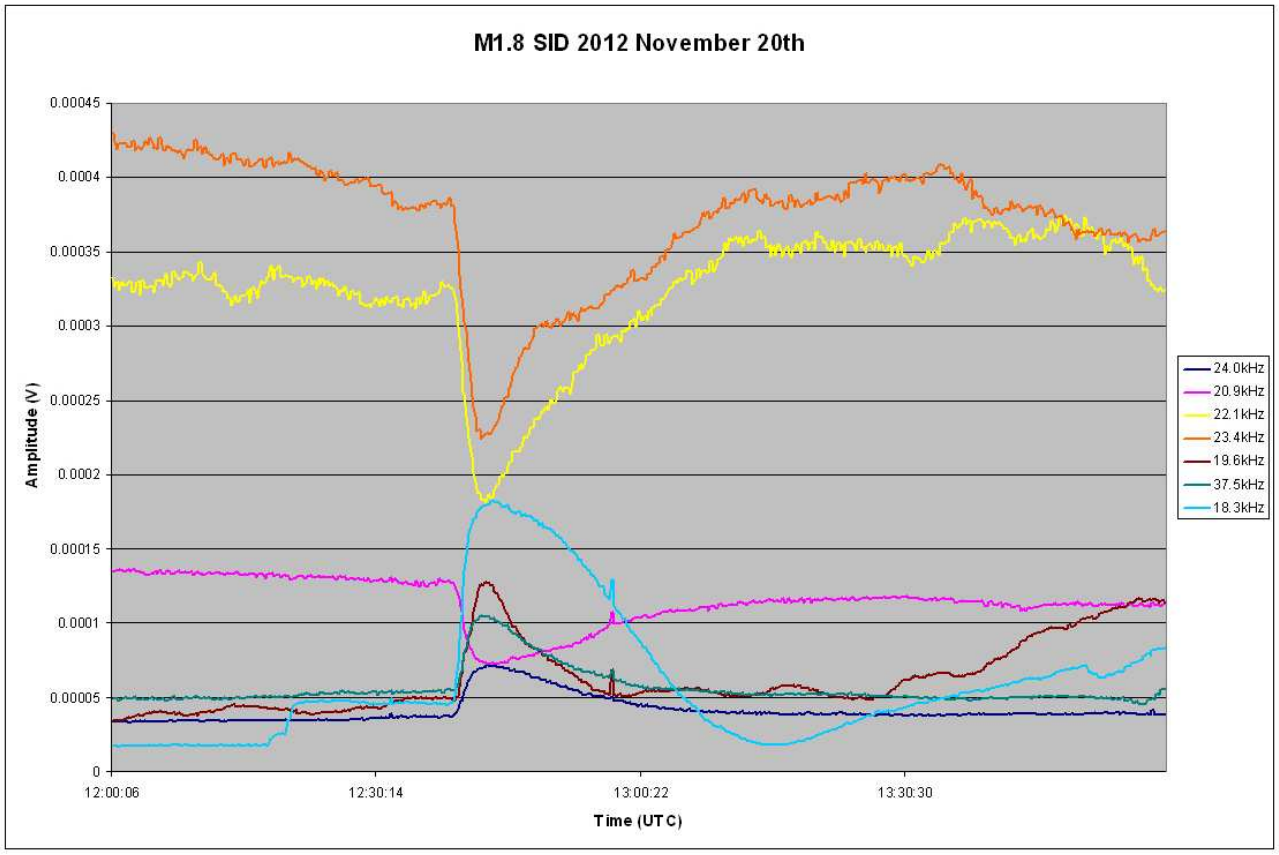
Tarif Rashid Santo November 13th, above.



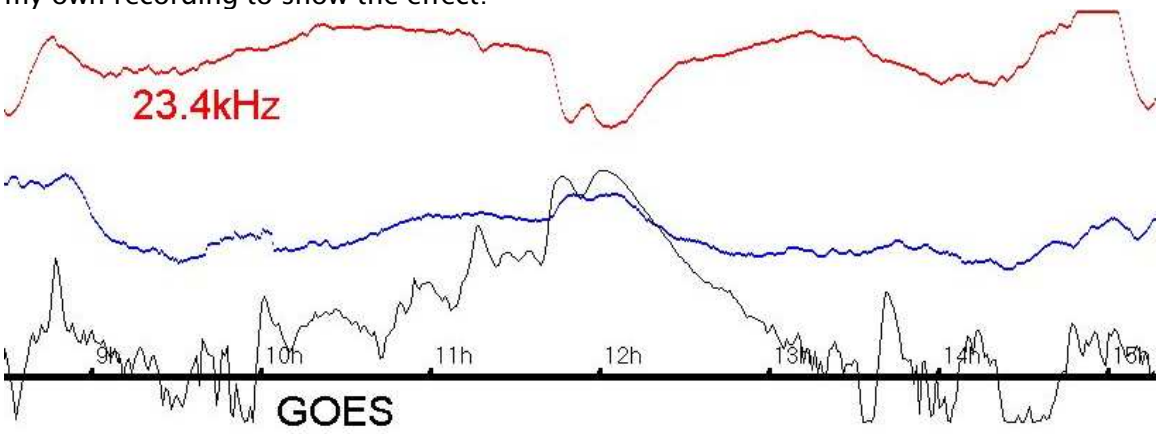
David Farn (Magnetic blue & magenta), Mark Edwards (23.4kHz oscillation). No other observers have reported a magnetic event at this time, and so it remains unexplained at the moment.

There was also a solar eclipse visible only in the Pacific, and much later in the evening of the 13th.

The most widely recorded flare of the month was the M1.7 on the 20th. This was also close to local midday and so produced a nice clear SID. Mark has again provided a chart of this, with a good selection of signals, some inverted.



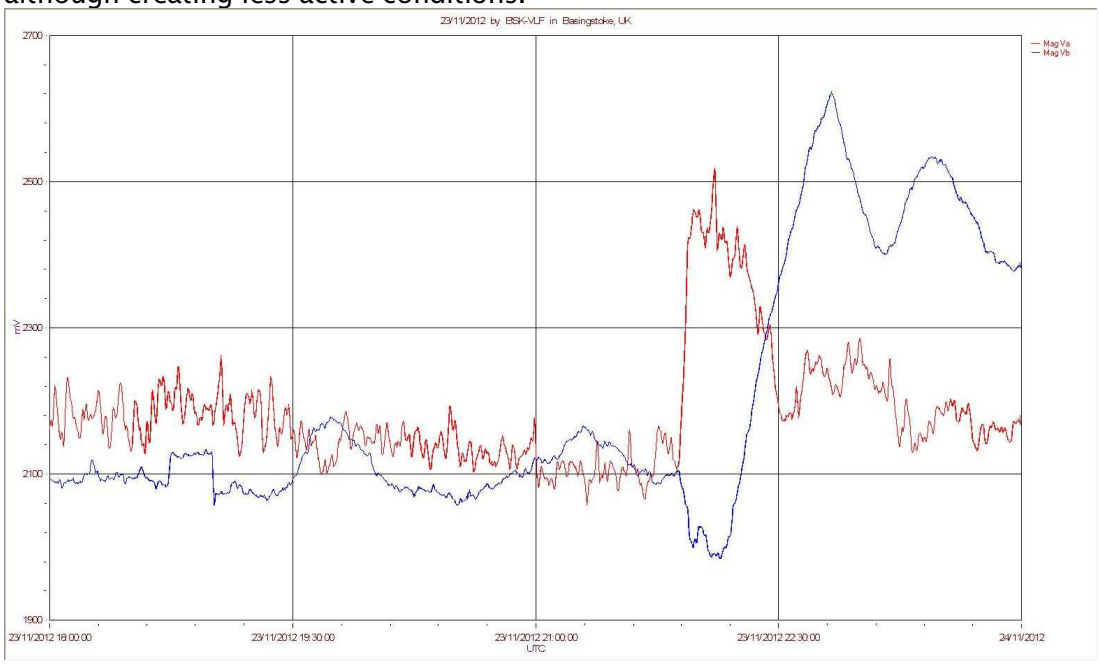
There were double peaked flares on the 26th, 27th and 29th. That on the 29th was recorded by some as a single SID, while others reported a double SID. I have added the GOES X-ray flux to my own recording to show the effect:



MAGNETIC DATA

The most active period in November was recorded over the 13th and 14th. This appears to be due to the combined effects of a filament eruption at 12:30UT on the 9th, and the CME from a long duration C2 flare at 05:04UT on the 10th. The BGS Hartland observatory lists a SI at 23:11UT on the 12th. Paul Hyde has recorded this at 23:13, and Colin Clements shows it at about 23:09UT. It does not appear as a significant disturbance in my own single-axis recording. A short disturbance followed until about 02:30 on the 13th. A further disturbance started around 18:30 on the 13th, becoming very active around midnight until 05UT on the 14th. A mild disturbance continued through to midday. From the C2 flare, the CME transit time was just over 66 hours.

The M1.7 flare on the 20th also generated a CME that was well recorded on the 23rd, although creating less active conditions.



This chart from Paul shows the SI at 21:53 on the 23rd. Our recorded SID time of 12:43 gives a CME transit time of 81hours 10minutes. Disturbed conditions continued until about 04UT on the morning of the 24th.

A weak interplanetary shock is recorded in the SWPC bulletin recorded at Boulder at 05:14 on the 26th. BGS Hartland list an SI at 05:12. My own recording shows a 6nT shift at 05:13, only recognisable as a true disturbance with prior knowledge from the professional observatories.

Magnetic reports received from Paul Hyde, Colin Clements, Gonzalo Vargas and John Cook.


ROTATION
KEY:
DISTURBED.
ACTIVE
SFE
B, C, M, X = FLARE MAGNITUDE.
Synodic rotation start (carrington's).
2407
2408
2409
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