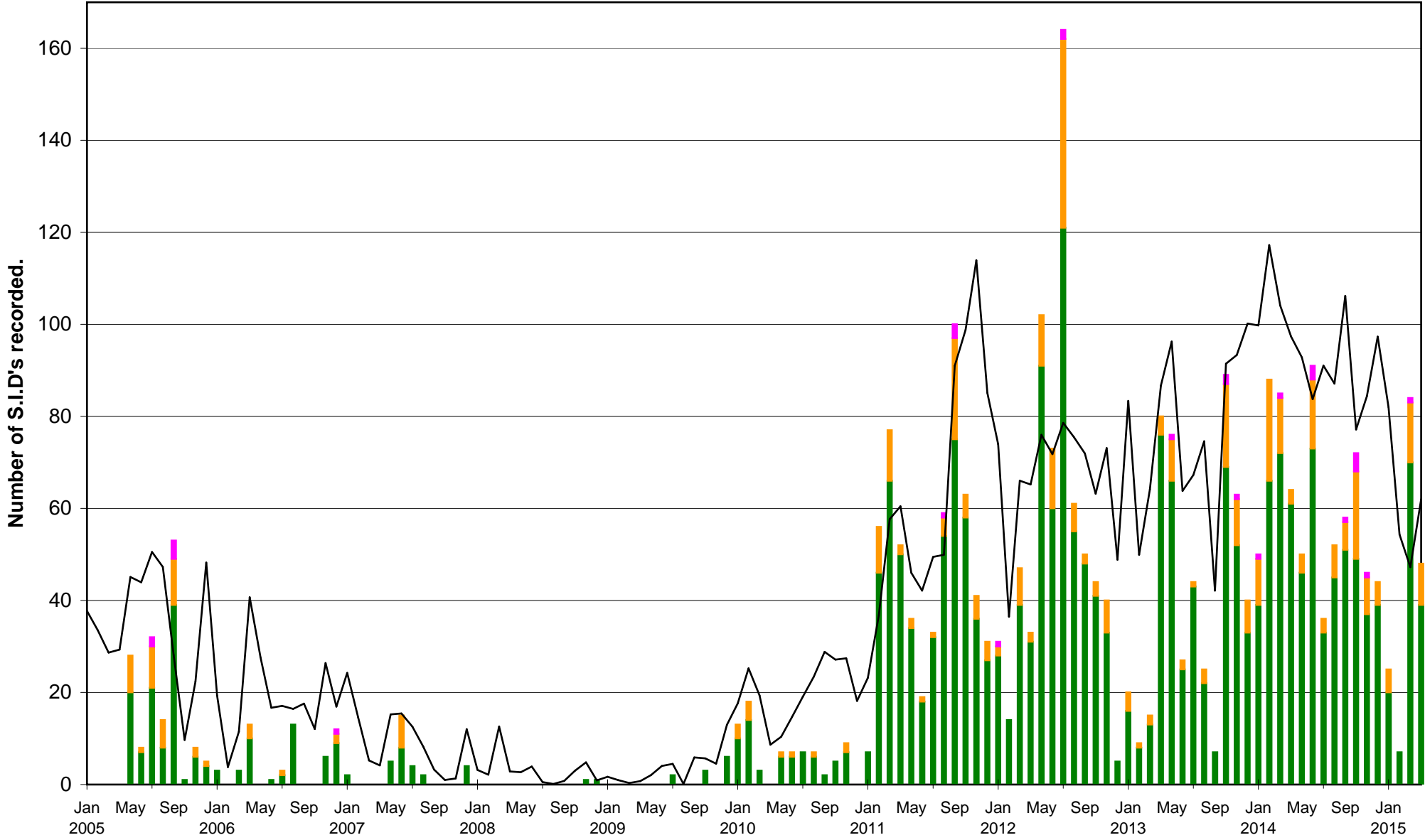
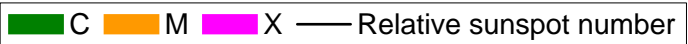


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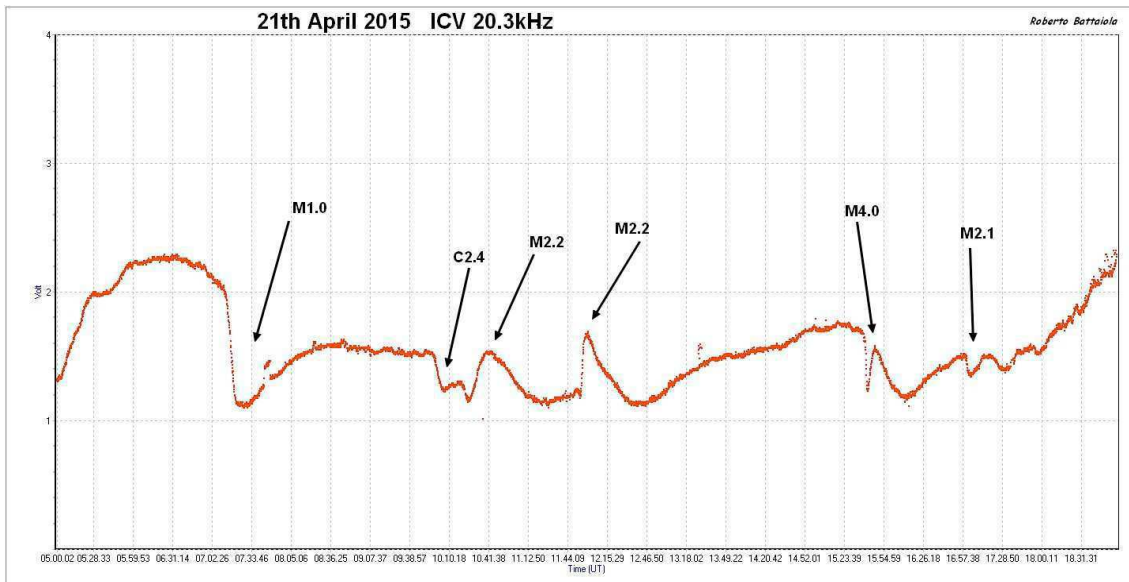
2015 APRIL

DAY	X-ray class	Observers	John Cook (23.4kHz/22.1kHz)				Roberto Battaiola (20.3kHz)				Paul Hyde (22.1/23.4kHz)				Bob Middlefell (22.1kHz)			Mark Edwards (20.9/24.0/18.3kHz)			
			Tuned radio frequency receiver, 0.58m frame aerial.				Modified AAVSO receiver.				Tuned radio frequency receiver, 0.96m frame aerial.				Tuned radio frequency receiver, 0.5m frame aerial.			Spectrum Lab / PC 2m loop aerial.			
			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	START	PEAK	END (UT)	
8	M1.4	7	14:40	14:45	15:43	2+		14:41	14:44	14:46	1-	14:41	14:45	16:19	3		14:41	14:45	15:39	2+	
9	C5.4	2											06:31	06:37	07:05	2		06:30	06:38	06:59	1+
9	C1.6	1																07:26	07:33	07:33	1-
9	C5.9	4	17:17	17:27	17:39	1							17:16	17:28	17:52	2		17:16	17:32	18:08	2+
9	C6.2	1																18:56	19:02	19:20	1
10	C7.9	5	08:01	08:06	08:58	2+							08:00	08:07	?	-		08:01	08:05	?	-
10	C2.9	3											08:14	08:17	08:38	1		08:15	08:16	08:32	1-
10	?	2											09:36	09:45	?	-		09:38	09:45	?	-
10	C2.8	5	09:38	09:56	10:35	2+							09:48	09:54	10:35	2+		09:48	09:54	10:02	1-
10	C2.7	1																19:23	19:26	19:31	1-
11	C1.4	1																16:21	16:27	16:48	1+
12	C2.9	6	08:13	08:20	08:51	2	08:14	08:20	08:48	2	08:13	08:20	08:50	2			08:14	08:17	08:26	1-	
12	M1.1	7	09:20	09:37	12:00	3+	09:13	09:46	11:02	3	09:18	09:38	12:00	3+			09:19	09:52	11:14	3	
12	?	1																12:01	12:07	12:13	1-
12	?	1																12:15	12:18	?	-
12	?	1																12:32	12:37	13:18	2+
12	C1.7	6	14:42	14:48	15:09	1+					14:42	14:48	14:56	1-			14:43	14:49	15:09	1+	
12	C1.3	4											15:12	15:16	15:29	1-		15:13	15:17	15:34	1
12	?	1																16:18	16:20	16:27	1-
12	?	1																16:33	16:39	16:52	1
12	?	1																17:03	17:05	?	-
12	C2.2	1																17:09	17:20	17:31	1
12	C9.0	5	18:02	18:08	?	-												18:01	18:08	18:38	2
13	C4.7	6	08:25	08:28	08:51	1+	08:25	08:31	08:41	1-	08:23	08:28	09:00	2			08:24	08:30	08:42	1-	
13	C1.9	5	10:08	10:13	10:23	1-					10:09	10:14	10:28	1			10:11	10:13	10:24	1-	
13	C2.3	5	11:32	11:35	11:41	1-					11:30	11:37	11:57	1+			11:32	11:36	11:45	1-	
14	?	1																15:38	15:44	15:52	1-
15	C1.5	4	11:38	11:40	12:06	1+												11:39	11:42	11:51	1-
15	*	1																12:57	13:02	13:17	1
16	C5.7	7	09:03	09:08	09:38	2	09:04	09:10	09:31	1+	09:03	09:10	09:41	2			09:03	09:09	09:30	1+	
16	C2.3	6	11:20	11:22	11:29	1-	11:18	11:27	11:35	1-	11:20	11:22	11:42	1			11:19	11:24	11:58	2	
16	?	1																13:05	13:07	13:17	1-
16	C2.0	1																16:21	16:25	16:43	1
16	C1.8	1																19:12	19:19	19:32	1
16	C3.3	1																			
17	C1.1	2					09:31	09:36	09:42	1-	09:30	09:37	09:43	1-							
18	C2.3	6	13:33	13:38	13:45	1-	13:27	13:40	13:56	1+	13:35	13:39	13:54	1			13:34	13:39	13:51	1-	
18	C5.2	6	14:08	14:18	14:50	2	14:05	14:17	14:28	1	14:07	14:19	15:40	3			14:09	14:21	15:18	2+	
18	C2.9	1																18:15	18:22	18:42	1+
21	M1.0	6	07:11	07:21	08:04	2+	07:09	07:27	07:42	2	07:12	07:22	08:19	2+			07:12	07:21	07:47	2	
21	C2.4	6	09:57	10:02	?	-	09:57	10:04	10:12	1-	09:55	10:04	?	-			09:58	10:04	?	-	
21	M2.2	7	10:18	10:38	?	-	10:18	10:41	11:19	2+	10:19	10:38	11:39	2+			10:18	10:40	11:39	2+	
21	M2.2	7	11:51	11:57	13:17	3	11:51	11:59	12:34	2	11:52	11:56	12:55	2+			11:51	11:58	13:12	2+	
21	*	1																15:27	15:30	?	-
21	M4.0	8	15:38	15:46	?	-	15:34	15:47	16:04	1+	15:34	15:44	16:49	2+			15:34	15:48	16:47	2+	
21	M2.1	7	16:58	17:01	17:54	2+	16:59	17:03	17:14	1-	16:57	17:03	18:04	2+			16:57	17:02	17:34	2	
22	C2.3	1					06:05	06:13	06:24	1											
22	C3.8	6	08:00	08:06	?	-	08:02	08:10	08:23	1	08:00	08:08	?	-			08:02	08:09	?	-	
22	M1.1	7	08:32	08:44	09:41	2+	08:32	08:42	09:00	1+	08:31	08:45	10:04	3			08:40	08:47	09:49	2+	
22	C1.4	6	12:12	12:15	12:33	1	12:13	12:17	12:23	1-	12:13	12:17	12:36	1			12:14	12:17	12:33	1	
23	C1.5	1	06:29	06:34	06:50	1															
23	C1.4	1																			
23	M1.1	6	09:16	10:12	?	-	09:16	09:58	10:42	3	08:58	09:43	?	-			09:18	10:15	?	-	
23	C7.3	7	12:01	12:05	12:42	2	11:59	12:08	12:25	1+	12:01	12:06	12:21	1			12:00	12:06	12:43	2	
23	C3.1	2																15:14	15:22	15:36	1
23	?	1																16:09	16:12	16:18	1-
23	?	1																16:40	16:47	16:55	1-
23	C2.6	1																17:44	17:48	18:11	1+
24	C2.1	5	08:42	08:44	08:51	1-					08:42	08:45	09:01	1			08:43	08:45	08:58	1-	
25	C1.9	1																18:09	18:21	18:43	2
26	C1.0	1																11:49	11:50	12:04	1-

VLF flare activity 2005/15.



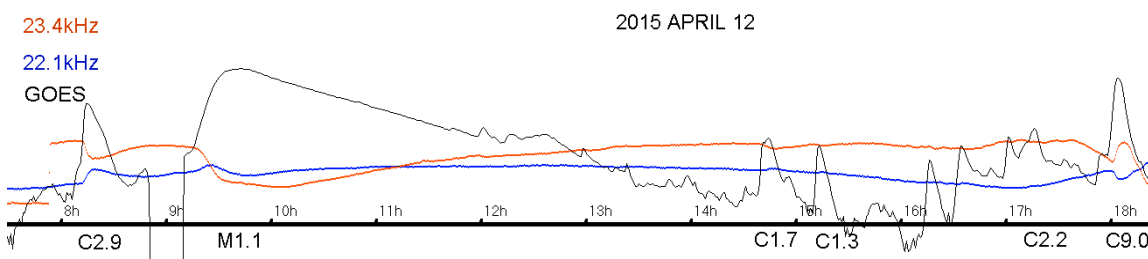
The SID count is back to its average level over the last year after its surge last month. There were no X-class flares but there were plenty of M-class flares, the strongest being the M4.0 on the 21st. This was preceded by a pair of M2.2 flares and an M1.0 flare early in the morning. They were all produced by AR12322, a fairly small active region close to the western limb of the sun. Roberto Battaiola included a chart of the day's activity:



Roberto was monitoring ICV at 20.3kHz, a signal from Isola Di Tavolara, a small island off the coast of Sardinia.

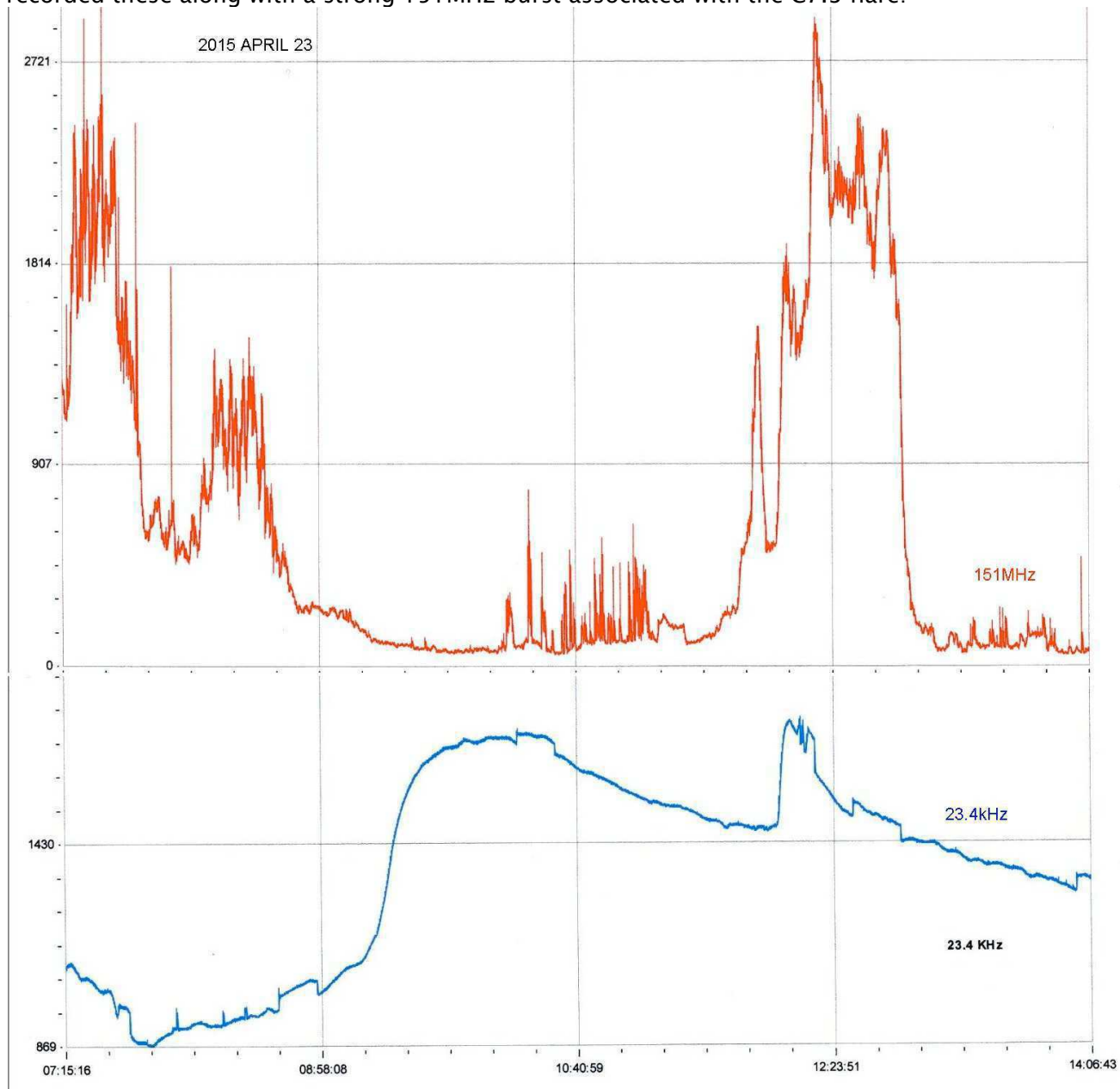
Colin Clements reported sustained 151MHz activity throughout the 21st, with a particularly strong signal following the M1.0 flare at 07:30.

The 12th was the busiest day of the month, with a total of 12 SIDs recorded. The M1.1 flare in the morning was a difficult one to time for some observers. It was a very long, slow flare that lasted most of the day. I have added the GOES X-ray data to my recording:



In addition to the classified flares listed, there are numerous small sub-peaks in the X-ray flux that have not been listed in the SWPC bulletin. Most of the activity seems to be from AR12321, a very large and complex region in the northern hemisphere. The very flat nature of the M1.1 SID peak shows at 23.4kHz, which seems to last from about 9:30 to 10:00. Likewise, the end time of the SID is open to question without the help of the X-ray data. The C9.0 flare was quite late in the afternoon, but did produce a nice inverted SID on both signals.

An even slower M1.1 flare was recorded on April 23rd. This started around 09:15 and peaked about 10:00. The subsequent decay lasted until 14:50, with a C7.3 flare superimposed at 12UT. Colin Clements recorded these along with a strong 151MHz burst associated with the C7.3 flare:



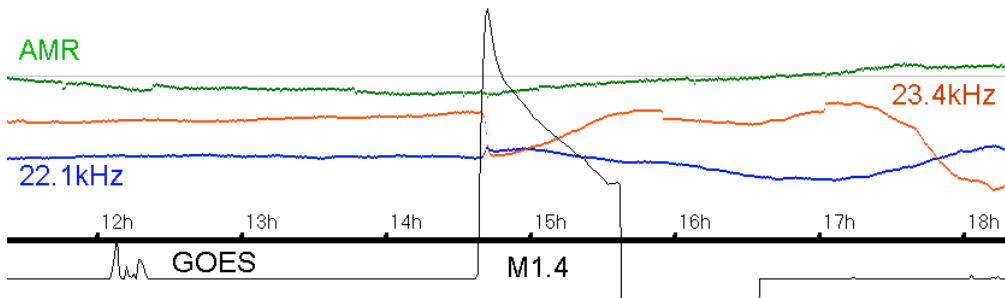
Separate active regions were responsible for these flares, although both were fairly small and were right on the western limb almost out of view.

Colin noted some strong oscillations on the 22.1kHz signal on the 3rd. These were present throughout the day with periods varying from 6.5 to 9.5 minutes. A similar pattern was seen on the much longer 23.4kHz path, although not quite as strong. The mid-point at 22.1kHz is roughly over the Isle of Man, and over the North Sea at 23.4kHz. The background X-ray flux was below the B4 level, with no significant flares present. No other reports of oscillations were received.

The last few days of April were very quiet with a background X-ray flux at the B3 level. There were just a few minor B-class flares, none of which were recorded as SIDs.

MAGNETIC OBSERVATIONS.

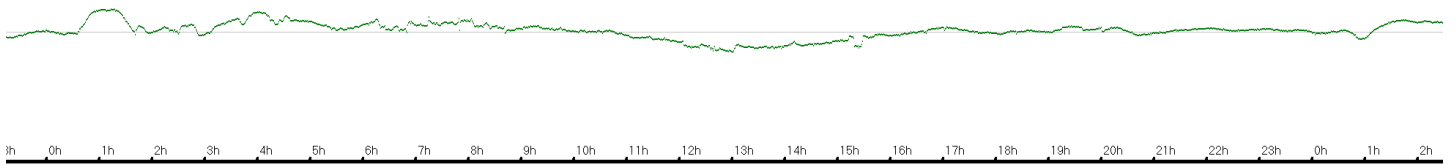
A very small SFE was recorded on April 8th. It measures no more than 4nT on my recording:
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The background X-ray flux was at a very low level before the M1.4 flare, which had a rise time of just over 1 minute. Note that there is a one hour gap in the GOES data after 15:30. There does not appear to be any associated CME. The active region responsible for this SFE (AR12320) may well be a return of that responsible for the two SFEs in March (AR12297). Both were at 15 degrees south, and close to longitude 200 degrees.

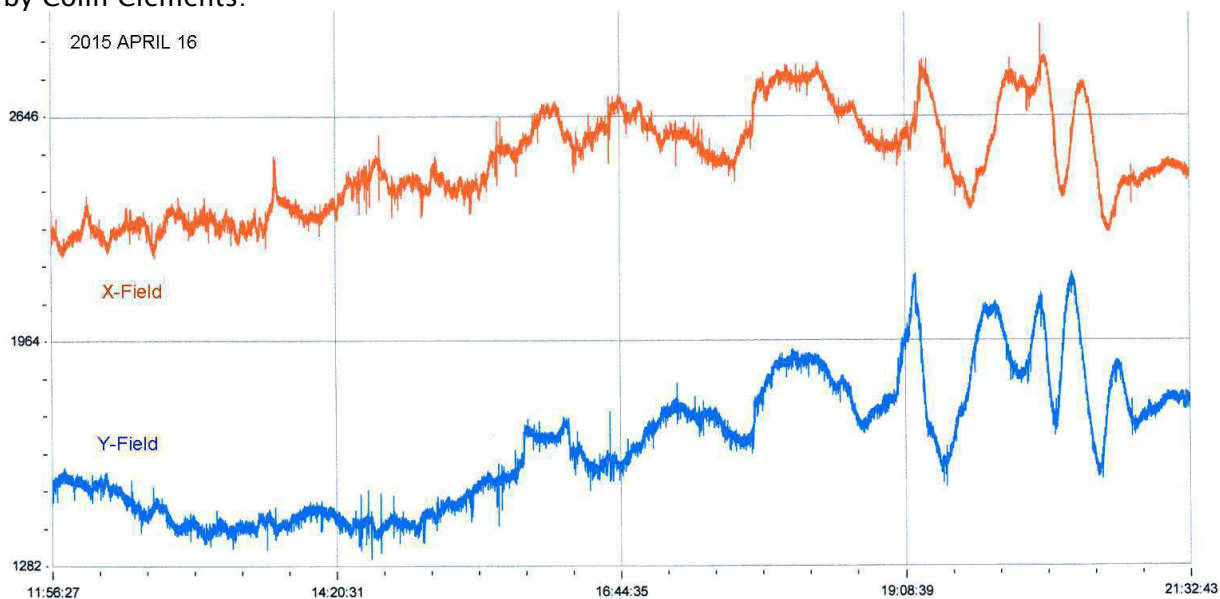
The disturbance on the 10th and 11th is linked to a C3.0 flare at 19:06 on the 6th, not recorded as a SID. This was quite a slow CME with a transit time of just over four days.

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My chart, above, shows the disturbance starting around 00:30, and continuing into the 11th.

Another strong disturbance was recorded starting at 18:00 on the 15th. This was from a CHSS, and its effects continued through the 16th up to 02:00 on the 17th. Part of the disturbance is shown in this recording by Colin Clements:



Magnetic observations received from Colin Clements, Gonzalo Vargas, John Cook, Roger Blackwell.

BARTELS DIAGRAM

ROTATION	KEY:	DISTURBED.	ACTIVE	SFE	B, C, M, X = FLARE MAGNITUDE.	Synodic rotation start (carrington's).
2440	F	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 23	2012 June		2125
2441	F	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 20	2012 July		2126
2442	F	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 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2012 August		2127
2443	F	17 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 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2012 September		2128
2444	F	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 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2012 October		2129
2445	F	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 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	2012 November		2130
2446	F	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 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 29 30 31	2012 December		2131
2447	F	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	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 27 28 29			
2448	F	2132 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	2013 January		
2449	F	2133 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 22 23 24 25 26 27 28 29 30 31	2013 February		
2450	F	2134 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 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2013 March		
2451	F	2135 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 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2013 April		
2452	F	2136 17 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 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2013 May		
2453	F	2137 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 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2013 June		
2454	F	2138 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 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	2013 July		
2455	F	2139 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 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 30 31	2013 August		
2456	F	2140 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	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 27 28 29			
2457	F	2141 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	2013 September		
2458	F	2142 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	2013 October		
2459	F	2143 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	2013 November		
2460	F	2144 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 15	2013 December		
2461	F	2145 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 10 11	2014 January		
2462	F	2146 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 6 7	2014 February		
2463	F	2147 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 3 4 5 6	2014 March		
2464	F	2148 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 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 30 31	2014 April		
2465	F	2149 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	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 27 28 29			
2466	F	2150 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 26	2014 May		
2467	F	2151 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	2014 June		
2468	F	2152 23 24 25 26 27	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	2014 July		
2469	F	2153 20 21 22 23 24	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	2014 August		
2470	F	2154 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 10 11	2014 September		
2471	F	2155 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 7 8	2014 October		
2472	F	2156 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	2014 November		
2473	F	2157 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 31	1			
2474	F	2158 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	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 27 28	2014 December		
2475	F	2159 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	2015 January		
2476	F	2160 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 19 20	2015 February		
2477	F	2161 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 17 18 19	2015 March		
2478	F	2162 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	2015 April		
2479	F	2163 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	2015 May		