

2011 FEBRUARY

DAY	Xray class	Observers	John Cook (23.4kHz/22.1kHz)	Roberto Battaiola (21.75kHz)	Andrew Lutley (23.4kHz)	Bob Middlefell (22.1kHz)	Mark Edwards (20.27/24.0/37.5kHz)
			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.
			START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
4	B9.5	1					
10	C4.7	5	12:31 12:35 ? -	12:26 12:34 13:03 2			12:18 12:20 12:31 1- 12:31 12:35 13:01 1+ 13:44 13:53 14:15 1+ 14:57 15:02 15:18 1
10	C2.6	2					
12	C2.6	2					
13	B5.4	1					
13	C1.1	3					12:25 12:35 12:51 1+ 13:25 13:32 ? - ? 14:02 15:11 17:33 17:39 18:20 2+
13	?	2					
13	C4.7	5					
13	M6.6	1					
14	C1.8	1					
14	C1.7	3					? 12:07 12:41 12:44 12:55 13:44 2+ 13:51 14:31 15:46 3
14	C9.4	8	12:43 12:55 13:50 2+	12:41 12:53 13:06 1			
14	C7.0	6					
14	M2.2	1					
15	C1.0	2		10:01 10:07 10:14			
15	C4.8	8	14:38 14:43 14:54 1-	14:35 14:46 15:04 1+			14:35 14:44 15:28 2+
16	M1.1	2		07:38 07:44 08:00 1			07:37 07:45 08:44 2+ 09:07 09:13 09:26 1 10:29 10:33 10:53 1 12:01 12:03 12:12 1- 14:23 14:28 15:29 2+ 15:30 15:35 16:06 2
16	C9.9	10	09:03 09:09 09:21 1-	09:01 09:07 09:14 1-			
16	C3.2	10	10:28 10:33 10:55 1+	10:24 10:31 10:33 1-			
16	C1.0	6	12:00 12:03 12:13 1-				
16	M1.6	12	14:24 14:27 15:06 2	14:21 14:25 14:28 1-		14:34 14:34 15:28 2+	
16	C7.7	9	15:29 15:32 15:54 1	15:30 15:34 15:46 1-			
17	C1.9	3					
17	?	2					
17	C2.6	6	10:26 10:29 10:37 1-				10:03 10:04 10:12 1- 10:26 10:31 10:36 1- 10:40 10:46 11:03 1 11:06 11:10 11:18 1- 12:35 12:38 12:52 1- 15:52 15:55 16:10 1-
17	C2.2	5	10:37 10:44 10:55 1-				
17	*	1					
17	C2.4	7	12:34 12:39 12:48 1-				
17	C1.3	2					
18	C7.6	1		07:16 07:21 07:25 1-			
18	C4.2	7	09:07 09:11 09:26 1	09:03 09:12 09:26 1			
18	M6.6	10	09:58 10:10 11:15 2+	10:08 10:13 10:50 2			09:07 09:16 09:20 1- 09:59 10:03 ? - 10:26 10:33 10:48 1 11:24 11:27 ? - 11:56 12:00 12:07 1- 12:17 12:22 12:35 1- 13:00 13:06 ? - 14:06 14:11 ? - 14:28 14:33 14:39 1- 15:00 15:07 15:25 1 15:52 15:57 16:05 1-
18	M1.0	4					
18	?	3					
18	?	4	11:55 12:00 12:10 1-				
18	C3.0	8	12:18 12:23 12:34 1-				
18	M1.4	9	13:00 13:14 13:45 2	13:00 13:05 13:22 1			
18	M1.0	9	14:06 14:14 14:33 1+	14:02 14:06 14:10 1-			
18	C4.0	5	14:32 14:33 14:38 1-				
18	C5.0	9	14:58 15:05 15:15 1-	14:57 15:03 15:17 1			
18	C5.5	7	15:51 15:56 ? -	15:50 15:57 16:06 1-			
18	C2.1	1					
19	C8.5	4	08:03 08:07 08:18 1-	07:58 08:07 08:19 1			08:03 08:08 08:19 1- 12:23 12:30 12:40 1-
19	C1.1	3	12:23 12:26 12:35 1-				
19	C1.0	1					
19	C1.5	3		15:25 15:31 15:35 1-			15:28 15:33 15:44 1-
19	C1.9	2					
19	C6.1	4	16:42 16:44 16:50 1-				16:43 16:44 16:56 1-
21	C2.7	6	09:04 09:07 09:20 1-				09:05 09:08 09:13 1- 10:04 10:05 10:08 1- 10:11 10:13 10:32 1 15:43 15:48 16:04 1
21	C1.8	6	10:03 10:06 ? -				
21	C7.8	8	10:10 10:15 11:05 2+		10:10 10:23 11:30 2+		
21	C1.5	8	15:42 15:46 15:58 1-	15:41 15:46 15:56 1-			
23	C1.2	7	12:19 12:23 12:32 1-				12:23 12:26 12:32 1- 07:31 07:36 07:46 1- 13:50 13:54 14:08 1- 19:37 19:40 19:49 1- 17:33 17:35 17:48 1- 08:12 08:16 08:19 1-
24	M3.5	3	07:29 07:36 ? -	07:25 07:37 08:03 2			
24	C1.8	8	13:50 13:54 14:00 1-	13:47 13:52 14:04 1-			
24	C2.7	1					
25	C1.1	1					
26	C1.3	3					
28	C2.4	1					07:36 07:40 07:46 1- 09:50 10:01 10:20 1+ 12:04 12:07 12:27 1 12:48 12:53 13:14 1+ 15:51 15:52 15:58 1-
28	C1.5	6	09:45 09:47 09:51 1-				
28	C1.2	5	11:59 12:03 12:17 1-				
28	M1.1	11	12:39 12:49 13:20 2	12:45 12:54 13:09 1	12:43 12:54 13:52 2+		
28	C1.0	3					

2011 FEBRUARY

DAY		Colin Clements (23.4kHz/37.5kHz)				Peter Meadows (23.4kHz)				Mike King (20.9kHz)				John Wardle (23.4kHz)				Peter King (20.9kHz)				
		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		
4	B9.5																					
10	C4.7	12:31	12:35	12:46	1-																	
10	C2.6																	14:30	15:05	15:20	2+	
12	C2.6																					
13	B5.4																					
13	C1.1																	12:30	12:35	12:40	1-	
13	?																					
13	C4.7	13:31	13:49	14:49	2+	13:43	13:57	14:14	1+									13:30	13:50	14:05	2	
13	M6.6																					
14	C1.8																	08:30	08:50	09:05	2	
14	C1.7					11:51	12:01	12:21	1+									11:50	12:00	12:25	2	
14	C9.4	12:44	12:47	12:54	1-	12:41	12:48	13:25	2									12:40	12:50	13:00	1	
14	C7.0	14:11	14:31	14:38	1+	13:49	14:27	14:46	2+									13:50	14:25	14:45	2+	
14	M2.2																					
15	C1.0																	10:00	10:05	10:15	1-	
15	C4.8					14:32	14:44	15:01	1+					14:37	14:44	15:00	1	14:30	14:45	14:50	1	
16	M1.1																					
16	C9.9	09:03	09:13	09:19	1-	09:02	09:13	09:28	1+					09:04	09:14	09:31	1+	09:05	09:10	09:20	1-	
16	C3.2	10:27	10:33	10:46	1	10:25	10:33	10:50	1					10:28	10:33	10:51	1	10:25	10:35	10:40	1-	
16	C1.0					11:59	12:02	12:13	1-									12:00	12:05	12:10	1-	
16	M1.6	14:23	14:29	14:40	1-	14:22	14:27	14:55	2	14:28	14:31	14:42	1-	14:23	14:31	15:02	2	14:20	14:25	14:30	1-	
16	C7.7	15:29	15:34	15:42	1-	15:27	15:33	15:46	1	15:35	15:37	15:47	1-					15:30	15:35	15:40	1-	
17	C1.9																		09:25	09:30	09:35	1-
17	?	10:00	10:07	10:19	1																	
17	C2.6	10:26	10:31	10:37	1-													10:25	10:30	10:35	1-	
17	C2.2																	10:40	10:45	10:50	1-	
17	*																					
17	C2.4	12:36	12:38	12:54	1-	12:33	12:36	12:45	1-									12:35	12:40	12:45	1-	
17	C1.3																	15:50	15:55	16:05	1-	
18	C7.6					09:04	09:11	09:24	1													
18	C4.2					09:56	10:09	10:18	1									09:05	09:10	09:20	1-	
18	M6.6	09:55	10:15	10:53	2+					10:10	10:13	11:22	2+					09:55	10:10	10:20	1	
18	M1.0									14:05	14:09	14:27	1					10:25	10:35	10:40	1-	
18	?	11:24	11:28	11:37	1-																	
18	?	11:53	12:00	12:13	1																	
18	C3.0	12:20	12:23	12:40	1	12:18	12:21	12:28	1-									12:15	12:20	12:25	1-	
18	M1.4	13:03	13:06	13:24	1	12:59	13:02	13:23	1									13:00	13:05	13:10	1-	
18	M1.0	14:02	14:12	14:28	1+	14:05	14:10	14:23	1-									14:00	14:10	14:15	1-	
18	C4.0																	14:30	14:35	14:40	1-	
18	C5.0	14:59	15:06	15:15	1-	14:58	15:04	15:11	1-									14:45	15:05	15:10	1	
18	C5.5					15:46	15:56	16:04	1-													
18	C2.1																					
19	C8.5																		08:00	08:05	08:15	1-
19	C1.1																	12:20	12:25	12:35	1-	
19	C1.0																	14:50	14:55	15:00	1-	
19	C1.5																	15:25	15:30	15:40	1-	
19	C1.9																	16:25	16:30	16:35	1-	
19	C6.1																	16:40	16:45	16:50	1-	
21	C2.7					09:03	09:07	09:14	1-										09:00	09:05	09:10	1-
21	C1.8					10:02	10:11	10:33	1+										10:00	10:05	10:10	1-
21	C7.8	10:12	10:13	10:36	1																	
21	C1.5					15:42	15:45	15:57	1-										15:40	15:45	15:55	1-
23	C1.2					12:19	12:23	12:29	1-										12:15	12:25	12:30	1-
24	M3.5																					
24	C1.8	13:49	13:54	14:02	1-	13:50	13:55	13:58	1-										13:50	13:55	14:00	1-
24	C2.7																					
25	C1.1																					
26	C1.3																		08:05	08:10	08:15	1-
28	C2.4																					
28	C1.5									09:39	09:56	10:11	1+					09:40	09:50	10:05	1	
28	C1.2																	12:00	12:05	12:20	1	
28	M1.1	12:41	12:53	13:11	1+	12:41	12:47	13:16	2	12:38	12:48	13:02	1					12:40	12:50	13:05	1	
28	C1.0																	15:45	15:50	16:00	1-	

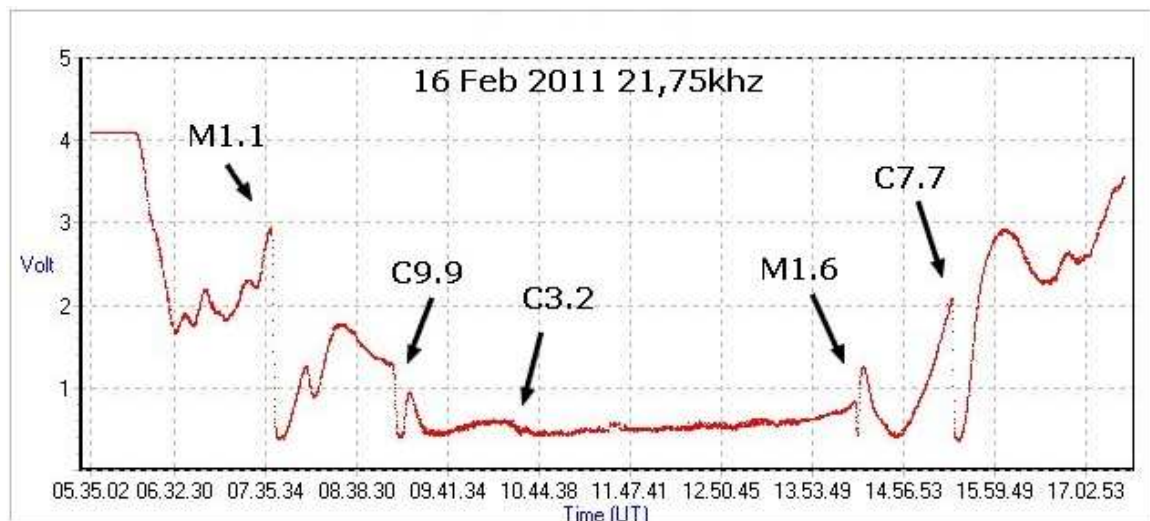
2011 FEBRUARY

DAY		Paul Hyde (22.1kHz)				Gordon Fiander (23.4kHz)				John Elliott (21.75kHz)				Martyn Kinder (18.3kHz)				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.			
		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
4	B9.5																				
10	C4.7	12:31	12:36	13:00	1+																
10	C2.6	13:45	13:51	14:07	1																
12	C2.6																				
13	B5.4													11:48	11:54	12:03	1-				
13	C1.1													12:30	12:34	12:46	1-				
13	?													13:26	13:33	13:40	1-				
13	C4.7													13:43	13:59	14:29	2+				
13	M6.6																				
14	C1.8																				
14	C1.7																				
14	C9.4	12:44	12:55	13:47	2+									12:44	12:50	13:06	1				
14	C7.0	13:47	14:30	14:52	2+									13:47	14:27	14:54	2+				
14	M2.2													17:22	17:25	17:29	1-				
15	C1.0																				
15	C4.8	14:34	14:45	15:08	2									14:34	14:45	15:02	1+				
16	M1.1																				
16	C9.9	09:03	09:14	09:30	1+	09:03	09:09	09:12	1-					09:02	09:08	09:21	1				
16	C3.2	10:28	10:34	10:59	1+	10:27	10:34	10:47	1					10:25	10:33	10:54	1+				
16	C1.0	12:00	12:04	12:17	1-									11:59	12:04	12:18	1				
16	M1.6	14:22	14:29	15:07	2	14:23	14:32	14:45	1					14:21	14:28	14:59	2				
16	C7.7	15:30	15:34	16:07	2									15:30	15:34	15:41	1-				
17	C1.9	09:25	09:31	09:37	1-									09:24	09:31	09:39	1-				
17	?																				
17	C2.6	10:26	10:30	10:38	1-									10:26	10:30	10:37	1-				
17	C2.2	10:38	10:45	?	-									10:38	10:47	10:59	1				
17	*																				
17	C2.4	12:34	12:38	12:55	1									12:34	12:38	12:51	1-				
17	C1.3																				
18	C7.6																				
18	C4.2	09:05	09:13	09:27	1	09:04	09:13	09:21	1-												
18	M6.6	09:58	10:12	11:16	2+	09:57	10:12	10:16	1					09:56	10:11	10:15	1				
18	M1.0																				
18	?													?	10:37	10:57					
18	?													11:16	11:27	11:36	1				
18	C3.0	12:18	12:22	12:34	1-	12:17	12:21	12:32	1-					11:55	12:00	12:04	1-				
18	M1.4	13:01	13:05	13:46	2	13:01	13:05	13:16	1-					12:17	12:22	12:29	1-				
18	M1.0	14:05	14:11	?	-	14:01	14:10	14:18	1-					13:02	13:04	?	-				
18	C4.0	14:28	14:33	14:41	1-									14:04	14:11	14:28	1				
18	C5.0	14:59	15:06	15:20	1	14:59	15:15	15:16	1-					14:28	14:33	?	-				
18	C5.5	15:51	15:57	?	-	15:53	15:56	16:01	1-					14:58	15:06	15:15	1-				
18	C2.1					16:42	16:47	16:55	1-					?	15:51	15:57					
19	C8.5																				
19	C1.1																				
19	C1.0																				
19	C1.5																				
19	C1.9	16:28	16:29	?	-																
19	C6.1	16:42	16:44	16:48	1-																
21	C2.7	09:03	09:07	09:22	1	09:03	09:09	09:11	1-												
21	C1.8	10:03	10:05	?	-									10:02	10:05	?	-				
21	C7.8	10:11	10:22	10:49	2	10:09	10:19	10:45	2	10:12	10:15	10:39	1+	10:10	10:14	10:36	1+				
21	C1.5	15:41	15:47	16:09	1+	15:39	15:48	15:55	1-					15:43	15:46	15:54	1-				
23	C1.2	12:20	12:24	12:31	1-	12:16	12:26	12:31	1-												
24	M3.5																				
24	C1.8	13:50	13:55	14:00	1-									12:15	12:25	12:31	1-				
24	C2.7													13:47	13:53	?	-				
25	C1.1																				
26	C1.3	08:11	08:17	08:27	1-																
28	C2.4																				
28	C1.5	09:49	09:53	10:05	1-									09:38	09:41	09:51	1-				
28	C1.2	12:03	12:06	12:24	1									12:05	12:11	12:28	1				
28	M1.1	12:40	12:53	14:13	3					12:39	12:50	13:26	2+	12:41	12:51	13:33	2+				
28	C1.0													15:46	15:52	16:00	1-				

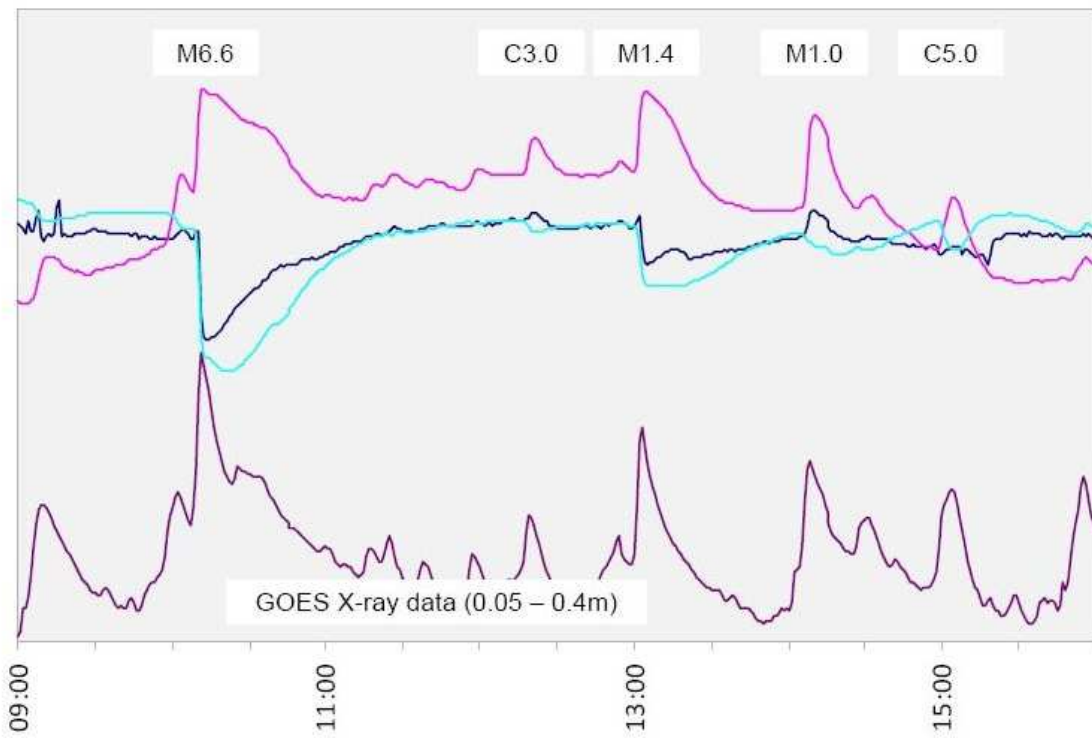
2011 February.

The first week of February followed on from the activity levels in January with mostly B-class flares and just 3 small C-class. An M1.9 at 01:31 on the 9th from region 1153 was just a clue to what followed. The second week remained at low levels, with the M6.6 on the 13th (region 1158) better timed for us to record. Activity from region 1158 dominated the 14th, followed by an X2.2 flare at 01:56 on the 15th. This was the first X-class flare since 2006 December at the end of cycle 23. Region 1158 continued its high levels of activity right through to the 21st, joined by regions 1161 and 1162. Region 1163 produced a series of smaller flares on the 24th and 25th, with region 1164 active from the 25th. The result is the highest monthly total in the 6 years covered by the chart. The event marked '*' is not classified in the SWPC reports. Events marked '?' are not listed by the SWPC, but appear in more than a single observer's report.

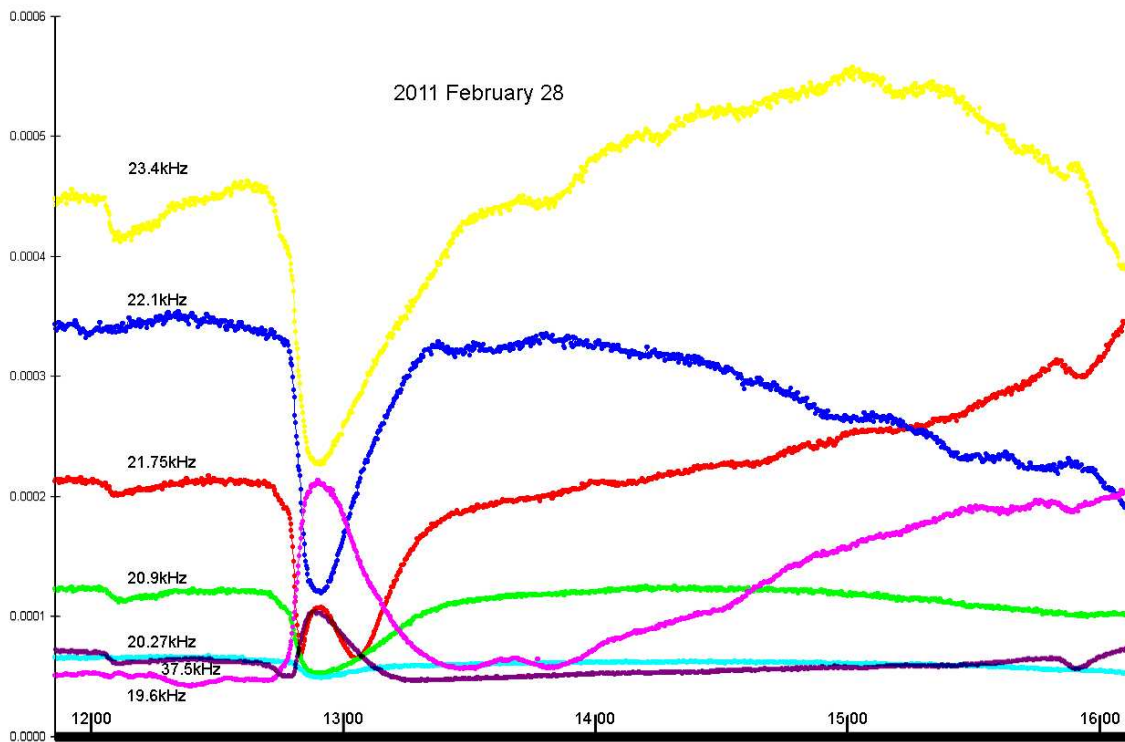
Events on the 16th are well shown in the chart by Roberto Battaiola:



Paul Hyde has produced the following chart for the 18th, comparing the X-ray intensity directly with his SID recording. This shows the SID produced by the double flares M6.6 and M1.0 barely 15 minutes apart, as well as the two events not listed by the SWPC but clearly recorded and reported by several observers. With 13 SIDs, this was the busiest day of the month.



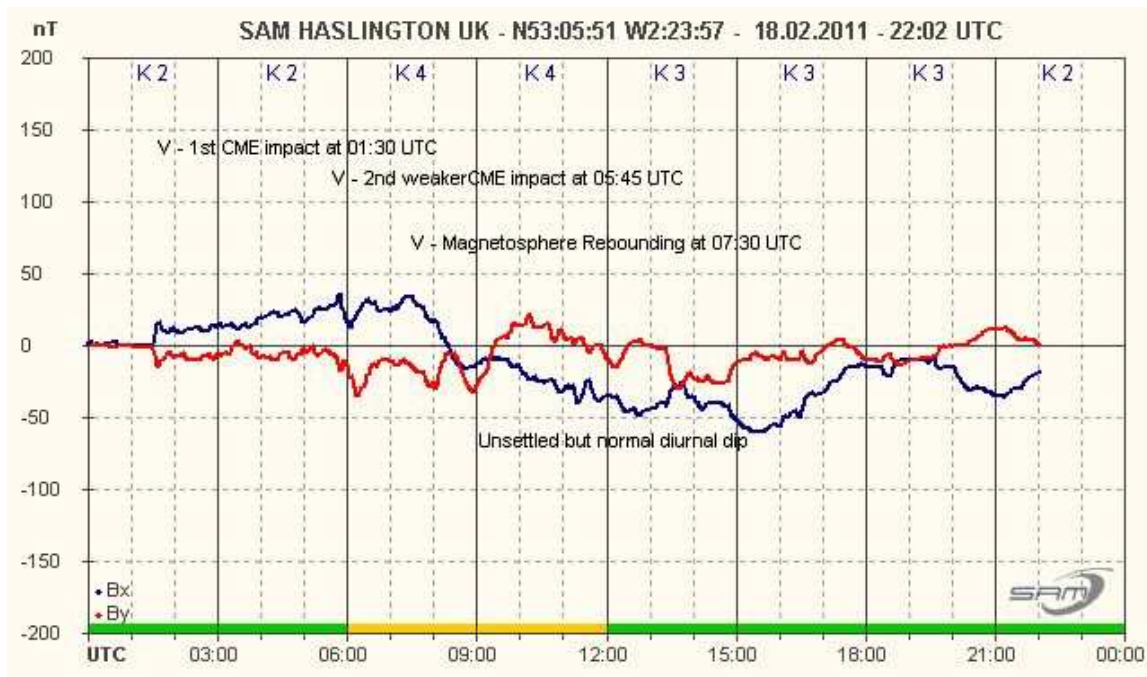
Paul Hyde.



This chart from Mark Edwards shows the M1.1 flare on the 28th. Note the minimal response at 37.5kHz compared to the text-book SIDs at 23.4 and 22.1 kHz, and the double peaked dip at 21.75kHz.

Magnetic data.

My own magnetic recording showed very little activity, despite the large number of flares. The most interesting event recorded by Martyn Kinder is shown below:



This appears to show the Coronal Mass Ejection shocks early on the 18th, followed by turbulence and a gentle recovery to the normal diurnal pattern. My own recording shows a very similar response, but is spoilt by interference.

Bartel chart:

ROTATION	KEY	DISTURBED	ACTIVE	B, C, M, X - FLARE MAGNITUDE	Synodic rotation start (arrington's)
2407	F	18 19 20 21 22 23 24 25 26 27 28 29 30 31		2010 January 1 2 3 C	2092 4 5 6 7 8 9 10 11 12 13
2408	F	14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		CCMC MCMCC C	2093 2010 February 1 2 3 4 5 6 7 8 9 CC MCMCCI C
2409	F	10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28		CCM CBM CC BB	2094 2010 March 1 2 3 4 5 6 7 8 C
2410	F	9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26		B BB	2095 2010 April 1 2 3 4 CC
2411	F	5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22			2096 23 24 25 26 27 28 29 30 C
2412	F	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		C CCM	2097 20 21 22 23 24 25 26 27 28
2413	F	29 30 31		2010 June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	2098 17 18 19 20 21 22 23 24
2414	F	25 26 27 28 29 30		2010 July 1 2 3 4 5 6 7 8 9 10 11 12 13 14	2099 14 15 16 17 18 19 20 21 CC C C
2415	F	22 23 24 25 26 27 28 29 30		2010 August 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	2100 11 12 13 14 15 16 17 18 CC C C
2416	F	19 20 21 22 23 24 25 26 27 28 29 30 31		2010 September 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	2101 7 8 9 10 11 12 13 14 C
2417	F	15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		2010 October 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	2102 4 5 6 7 8 9 10 11 C C
2418	F	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		2010 November 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	2103 1 2 3 4 5 6 7 CC M CM
2419	F	8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26		2010 December 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	2104 27 28 29 30 C
2420	F	5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24		2011 January 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	2105 25 26 27 28 29 30 31
2421	F	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19		2011 February 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	2106 20 21 22 23 24 25 26 27 CC C
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