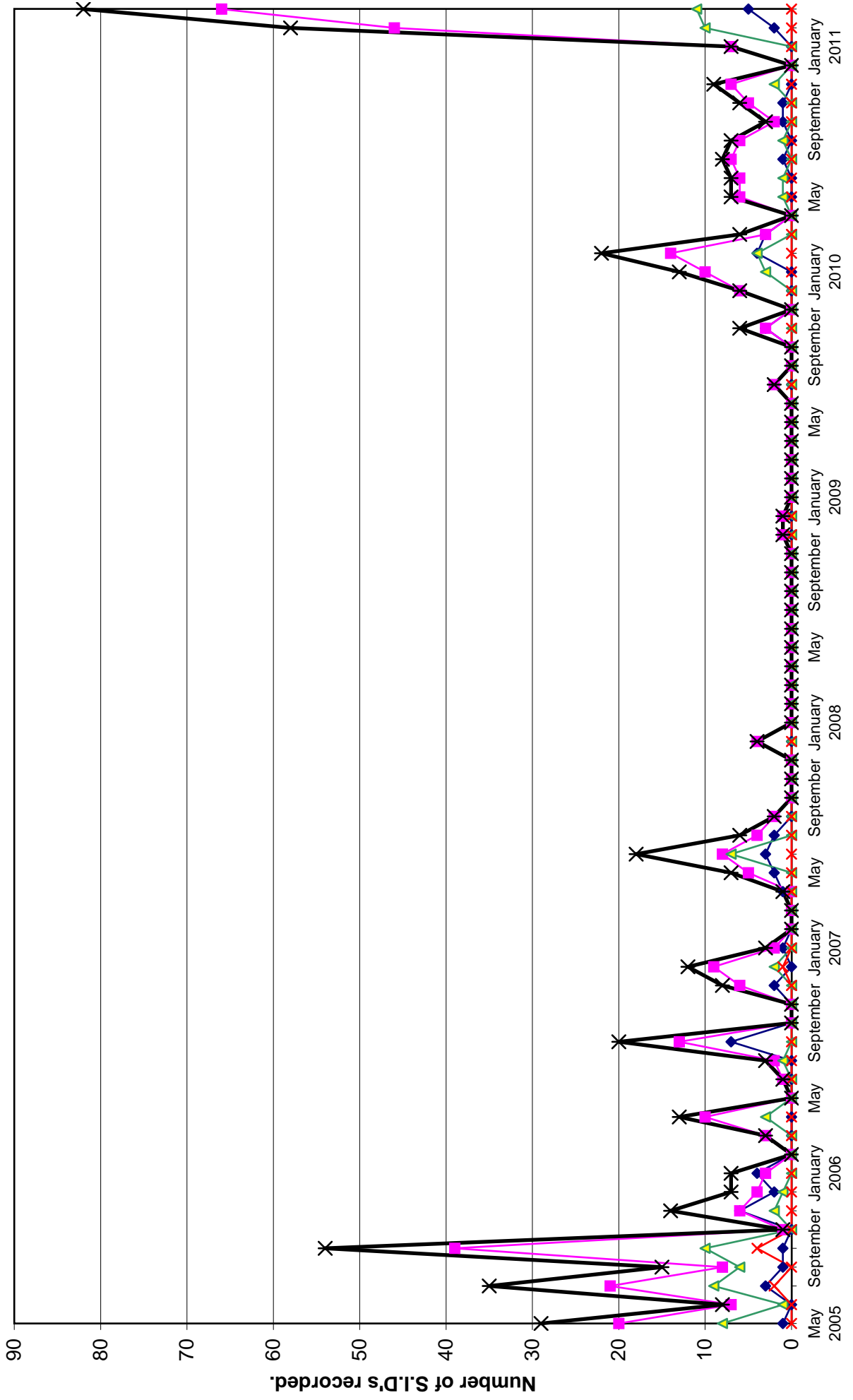


DAY		Paul Hyde (22.1kHz)				Gordon Fiander (23.4kHz)				John Elliott (21.75kHz)				Martyn Kinder (18.3kHz/22.1kHz)				Mark Horn (23.4kHz)				
		Tuned radio frequency receiver, 0.96m frame aerial.				PC sound card.				Tuned radio frequency receiver, 0.5m frame aerial.				Tuned radio frequency receiver, 0.58m frame aerial.				Tuned radio frequency receiver, 0.58m frame aerial.				
		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		
1	C2.9																					
1	C1.1																					
1	C1.0																					
2	C1.4																					
3	C1.2																13:12	13:20	13:29		1-	
3	C5.4	14:16	14:24	14:51		2										14:16	14:23	14:43			1+	
4	C1.7																					
5	C2.2	09:04	09:08	09:24			1															
5	C1.4	10:15	10:18	10:23			1-										10:13	10:19	10:27			1-
5	C1.6	11:44	11:50	?			-										11:44	11:50	12:00			1-
5	C1.2																12:04	12:09	12:15			1-
5	C1.0																12:24	?	13:49			2+
5	C1.3																13:30	13:35	13:49			1
5	C1.0																14:20	14:28	14:36			1-
6	C2.8																					
6	C1.6																					
6	C2.6	08:50	09:04	09:14			1										09:54	10:02	10:13			1
6	C3.1	09:57	10:02	10:12			1-	10:00	10:04	10:08							10:32	10:40	11:15			2
6	C7.5	10:33	10:39	11:13			2	10:33	10:41	11:08							11:58	12:10	12:37			2
6	C5.1	12:05	12:10	12:27			1	12:00	12:11	12:17							13:31	13:48	14:10			2
6	C6.0	13:33	13:47	?			-	13:38	13:52	14:05							14:42	14:45	14:58			1-
6	C8.6	14:42	14:46	15:11			1+	14:42	14:45	15:05							15:21	15:27	15:36			1-
6	C3.9	15:24	15:27	15:37			1-										16:03	16:08	16:12			1-
6	C4.7	16:04	16:11	?			-										16:22	16:26	16:32			1-
6	C6.9	16:28	16:31	16:38			1-															
7	C3.6																					
7	M1.5	07:52	07:53	?			-										07:52	07:53	07:55			1-
7	M1.4	08:02	08:11	08:40			2										08:01	08:06	08:11			1-
7	M1.8	09:17	09:21	09:56			2	09:16	09:28	10:02			2+	09:22	09:26	10:01			?			-
7	C4.9	10:17	10:24	10:43			1+	10:18	10:22	10:38			1				10:16	10:23	?			-
7	*																					
7	M1.9	13:46	14:31	15:47			3	13:46	14:03	14:16			1+	13:41	14:26	15:24						3
7	?																13:46	13:59	14:10			1
7	?																15:55	15:59	?			
7	C5.1	15:56	15:59	16:04			1-										16:06	16:10	16:15			1-
8	C4.7	09:34	09:37	09:44			1-										09:34	09:38	09:46			1-
8	M5.3	10:37	10:42	12:40			3										10:35	10:48	11:58			2+
8	*																10:37	10:42	10:48			1-
8	M4.4	14:30	14:33	14:39			1-															
8	*																					
9	C9.4	08:53	08:57	09:11			1-	08:46	08:51	09:08			1				08:53	08:58	09:16			1
9	M1.7	10:59	11:09	11:44			1	10:35	11:01	11:15			2	10:58	11:07	11:48						2+
9	*																10:34	11:08	11:33			2+
9	M1.7	13:19	13:24	?			-										13:18	13:20	13:50			1+
9	M1.7							13:19	14:15	15:00			3	14:00	14:05	14:46						2+
9	*																14:05	14:10	14:13			1-
9	C2.6	15:43	15:46	15:51			1-										15:42	15:48	15:57			1-
9	C2.7	16:36	16:44	16:48			1-										16:44	16:47	16:50			1-
10	C6.2																					
10	C2.4	09:08	09:13	09:33			1															
10	C4.2	13:22	13:27	?			-										13:21	13:27	13:43			1
10	C4.7	13:43	13:49	14:03			1										13:43	13:49	14:00			1-
10	C2.0	14:23	14:26	14:35			1-										14:22	14:26	14:36			1-
11	C3.0																					
11	C4.3	07:24	07:28	07:37			1-										11:12	11:17	11:27			1-
11	C2.0	11:13	11:17	11:26			1-															
11	C3.6	11:46	11:49	12:03			1-										11:46	11:48	13:00			2+
11	*																					
11	*																					
11	C1.1	16:06	16:08	16:13			1-															
12	B9.3	09:06	09:08	09:12			1-															
12	C2.2	10:23	10:28	10:37			1-										10:24	10:29	10:38			1-
12	C2.2	12:23	12:31	12:43			1										12:24	12:30	12:45			1
12	C7.0	12:55	13:02	13:33			2										12:54	12:59	13:23			1+
12	C9.6	15:22	15:30	16:00			2										15:24	15:28	?			-
12	*																?	16:33	16:37			
13	C6.7	13:29	13:35	14:04			2										13:28	13:35	13:57			1+
13	C6.4	14:39	14:43	15:12			2										14:31	14:39	14:58			1+
14	C1.4																					
14	B9.7																					
14	C2.2	16:04	16:10	16:22			1-										16:06	16:11	16:20			1-
14	M4.2																					
15	C1.5	08:48	08:54	09:02			1-															
15	C2.6	09:26	09:43	10:12			2+										09:33	09:42	09:56			1
15	C1.1	11:23	11:26	11:30			1-										11:24	11:27	11:32			1-
15	C2.9																17:33	17:34	17:44			1-
16	C1.3	08:41	08:47	08:57			1-															
16	C1.4	13:50	13:54	14:04			1-										13:49	13:53	13:59			1-
21	?																09:52	10:01	10:08			1-
21	C2.6																11:46	11:48	11:56			1-
21	C4.2																					
22	C2.5	15:46	15:51	16:10			1										15:45	15:51	16:27			2
23	B5.7																15:47	15:53	15:56			
23	C1.1	17:09	17:11	?			-															
24	M1.0	12:04	12:09	12:58			2+										12:01	12:05	12:48			2+
24	C1.6	15:35	15:39	15:49			1-										15:32	15:39	15:46			1-
24	B6.6	16:56	16:56	16:57			1-															
24	C9.1	17:03	17:05	?			-										17:03	17:09	17:21			1-

DAY		Steve Parkinson (23.4kHz)				Simon Dawes (various)										
		Tuned radio frequency receiver, 0.96m frame aerial.														
		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)
1	C2.9															
1	C1.1															
1	C1.0															
2	C1.4															
3	C1.2															
3	C5.4	14:17	14:21	14:54	2											
4	C1.7															
5	C2.2															
5	C1.4															
5	C1.6															
5	C1.2															
5	C1.0															
5	C1.0															
5	C1.3															
5	C1.0															
6	C2.8															
6	C1.6															
6	C2.6															
6	C3.1	09:58	10:03	?	-											
6	C7.5	10:34	10:42	?	-	10:34	10:44	11:11	2							
6	C5.1	12:06	12:10	12:33	1+	12:07	12:13	12:22	1-							
6	C6.0															
6	C8.6	14:43	14:46	15:00	1-											
6	C3.9															
6	C4.7															
6	C6.9															
7	C3.6															
7	M1.5															
7	M1.4															
7	M1.8	09:18	09:22	10:12	2+	09:20	09:23	09:43	1							
7	C4.9	10:20	10:22	11:00	2											
7	*															
7	M1.9					14:23	14:29	15:06	2							
7	?															
7	C5.1															
8	C4.7															
8	M5.3	10:39	?	12:09	3	10:39	10:48	12:43	3							
8	*															
8	*															
8	M4.4															
9	*															
9	C9.4					08:53	08:56	09:11	1-							
9	M1.7	10:42	11:09	12:18	3	11:01	11:10	12:00	2+							
9	*					11:59	12:06	12:18	1							
9	M1.7	13:20	?	?	-	13:55	14:03	?	-							
9	M1.7	?	?	14:48		14:08	14:11	14:32	1							
9	*															
9	C2.6															
9	C2.7															
10	C6.2															
10	C2.4															
10	C4.2					13:23	13:27	?	-							
10	C4.7					13:43	13:49	14:23	2							
10	C2.0					14:23	14:26	14:35	1-							
11	C3.0															
11	C4.3															
11	C2.0	11:14	11:16	11:24	1-	11:14	11:16	11:27	1-							
11	C3.6	11:48	11:50	12:06	1-	11:48	11:50	11:59	1-							
11	*															
11	*															
11	C1.1															
12	B9.3															
12	C2.2	10:26	10:27	?	-	10:26	10:28	10:43	1-							
12	C2.2					12:24	12:31	12:47	1							
12	C7.0	12:57	13:01	13:36	2	12:58	13:02	13:14	1-							
12	C9.6	15:26	15:30	15:42	1-	15:25	15:30	15:45	1							
12	*															
13	C6.7	13:32	13:36	14:06	2	13:30	13:34	?	-							
13	C6.4	14:40	14:42	15:06	1+	14:39	14:43	15:27	2+							
14	C1.4															
14	B9.7															
14	C2.2					16:06	16:11	16:28	1							
14	M4.2															
15	C1.5															
15	C2.6	?	09:44	?	-	09:35	09:42	10:05	1+							
15	C1.1															
15	C2.9															
16	C1.3															
16	C1.4	13:52	13:54	14:00	1-	13:50	13:54	14:05	1-							
21	?	09:59	10:01	10:15	1-	09:53	10:00	10:10	1-							
21	C2.6					11:47	11:48	11:54	1-							
21	C4.2															
22	C2.5															
23	B5.7															
23	C1.1															
24	M1.0	12:05	12:09	12:51	2+	12:04	12:08	12:54	2+							
24	C1.6															
24	B6.6															
24	C9.1					17:02	17:05	?	-							
24	B9.6					17:08	17:11	17:26	1-							
25	C1.0															
27	C1.1															
28	C1.4	?	11:42	?	-	11:36	11:42	11:54	1-							
31	C2.6	?	15:21	?	-	15:30	15:37	16:04	2							

VLF flare activity 2005/11.



2011 March.

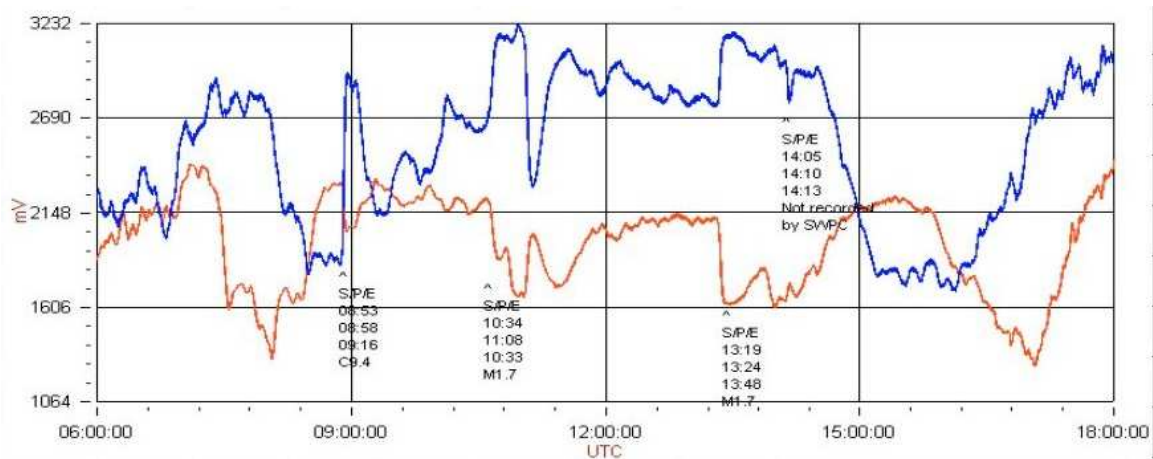
Recording the largest number of SIDs since I started my observations, March has been a marathon of cross-checking and typing. I hope that I have correctly interpreted everyone's data, but in places the Space Weather Prediction Centre data is not complete, and does not always correspond with what we record at VLF. Their data is the X-ray flux seen by the various GOES craft, while we are seeing its effect on terrestrial radio propagation. As usual I have put '*' where no flare classification is given in the GOES data, and '?' marks events seen by several observers that is not included in the GOES data.

Although there were no X-class flares, the barrage of M-class flares over the 7th to 9th was quite spectacular. There were also a number of very slow SIDs making identification very tricky. The M1.7 flare on the 9th shown in red is listed by SWPC as a single event thus:

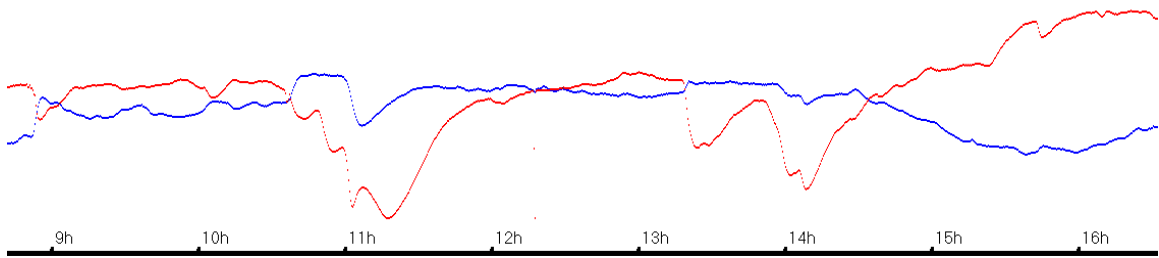
Begin 13:17
Maximum 14:02
End 14:13UT

With a 45 minute rise-time, this was seen by some as a double SID, while others saw a single SID. Both interpretations are valid, as we all monitor different parts of the D-layer.

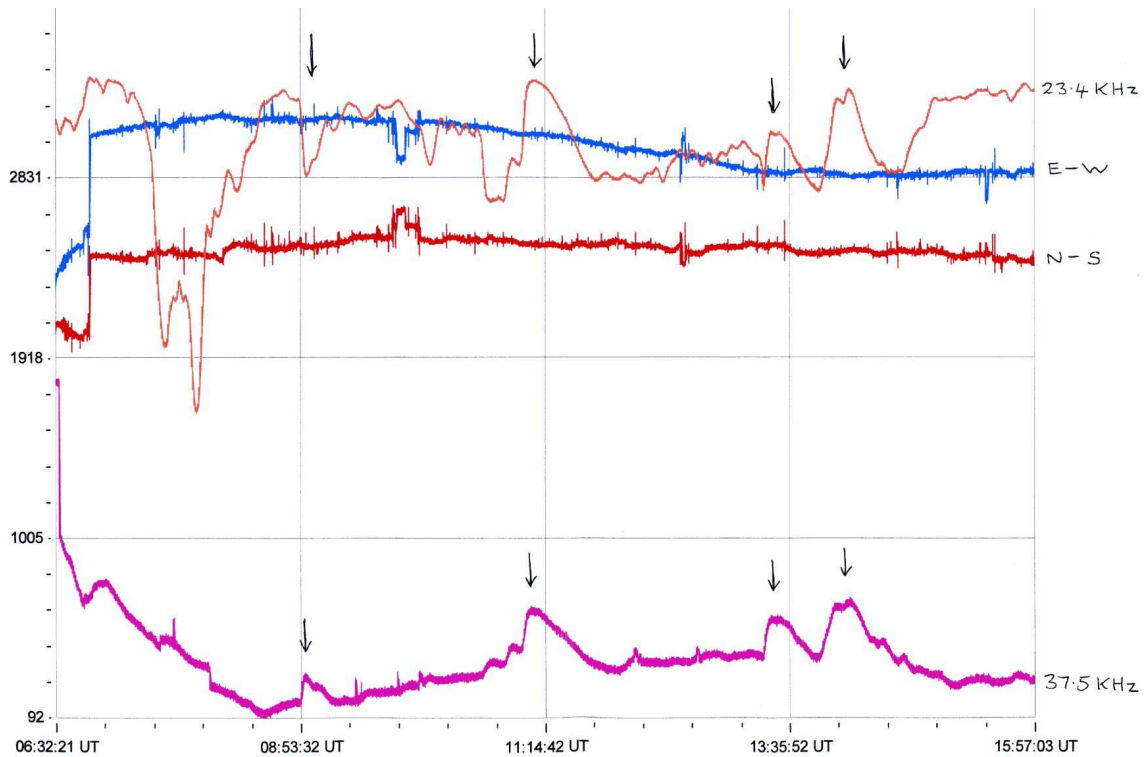
While at the Winchester meeting I had the opportunity to see an H-alpha recording of a limb flare on the 8th. This was classified as a slow flare (as were many this month), and the recording showed bright material re-circulating in the coronal loops above the sunspots. This sort of activity, easily seen with amateur telescopes, may give an insight into why some SIDs have long rise-times.



This chart from Martyn Kinder shows events on the 9th (red = 22.1, blue = 18.3kHz)



My own chart (above, red = 23.4kHz blue = 22.1kHz) shows the M1.7 as clearly double, with very little response from the 22.1kHz signal.



Colin Clements' chart for the 9th also includes magnetic data (red & blue traces), and again shows the complex nature of the M1.7 flare(s)

I would finally like to draw your attention to a new paper "Modelling the ionosphere" on the radio group website by Mark Edwards. It gives a lot of detail as to why our SIDs are sometimes so difficult to interpret. Well worth reading.

ROTATION	KEY:	DISTURBED.	ACTIVE	B, C, M, X = FLARE MAGNITUDE.	Synodic rotation start (carrington's).
2407	F	18 19 20 21 22 23 24 25 26 27 28 29 30 31			2010 January 1 2 3 C
2408	F	14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	20 23	CCMC MCMCC C	2092 2093 2010 February 1 2 3 4 5 6 7 8 9 CC MCCMMCI C
2409	F	10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	14 15 16 17	CC 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	10 11 12 13 14 15 16 17 18 19	B	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	11 12 13 14 15		2096 2010 May 1 CC
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	3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	C CCM C CC	2097
2413	F	29 30 31	1 2 3 4	2010 June 1 2 3 4 C MCCC	2098
2414	F	25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13	2010 July 1 2 3 4 5 6 7 8 9 10 11 12 13 C	2099
2415	F	22 23 24 25 26 27 28 29 30	27 28 29 30	2010 August 1 2 3 4 5 6 7 8 9 10 11 12 13 C M	2100
2416	F	19 20 21 22 23 24 25 26 27 28 29 30 31	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 C	2101
2417	F	15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	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 C B	2102
2418	F	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	C CC	2103 2010 November 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	10 11 12 13 14 15 16	C CC C	2104 2010 December 1 2 3 4 CC
2420	F	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	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
2421	F	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	6 7 8 9 10 11 12 13	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 C C	2106
2422	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	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 B CC BCM CM CC MCM CCC MMCC CCC CCC	2107
2423	F	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	2011 March 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 MCC C C MC CCC C CC C CCCC CCCC CMMM CMM CMMM CCCC CCC BCCC CC CBCC CCCC	2108
2424	F	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	2011 April 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 BC MCB C C	2109