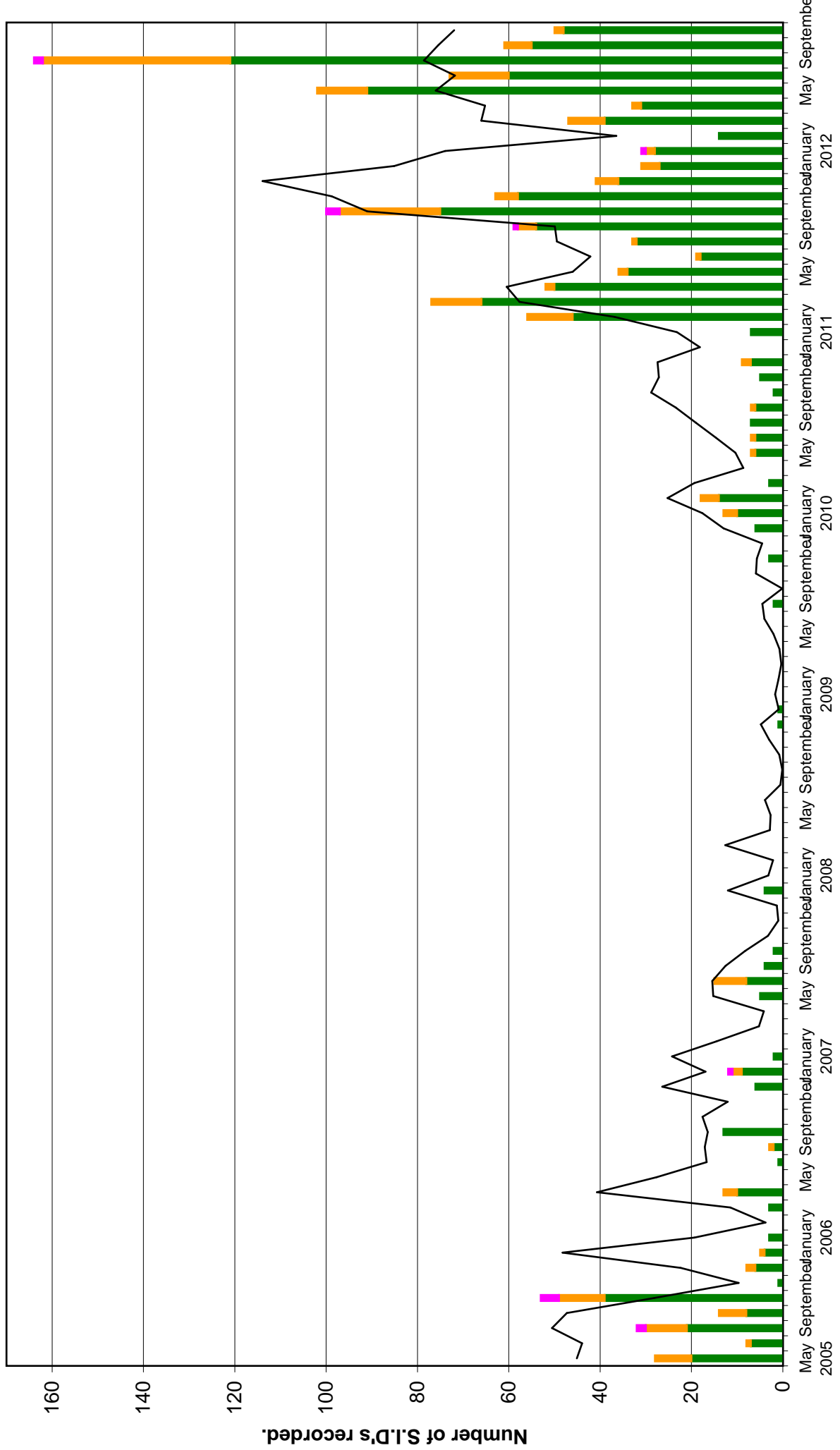


BAA Radio Astronomy Group.

2012 OCTOBER

DAY	Xray class	Observers	John Cook (23.4kHz/22.1kHz)				Roberto Battaiola (21.75kHz)				Andrew Lutley (23.4kHz)			Bob Middlefell (22.1kHz)			Mark Edwards (19.6/24.0/21.75kHz)			
			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)	
1	C2.6	1																		
1	C4.8	8	13:01	13:15	13:44	2		13:02	13:12	13:31	1+				12:58	13:15	15:04	3+		
1	?	1													13:50	13:52	14:38	2+		
1	C2.3	5	15:18	15:22	15:40	1									15:19	15:23	15:31	1-		
2	C1.1	1																		
2	?	1													11:39	11:51	12:21	2		
2	?	2													12:41	13:02	13:53	2+		
2	?	1													13:57	14:04	14:15	1-		
8	C1.2	2																		
8	C2.2	1																		
8	M2.3	7	11:09	11:19	13:12	3		11:12	11:21	12:05	2+				11:11	11:19	12:50	3		
8	C1.0	5	13:53	13:57	?	-									13:54	13:56	14:35	2		
9	C1.2	2													08:47	08:52	09:28	2		
9	C1.0	1													11:47	11:52	11:59	1-		
9	C1.9	4													14:52	14:59	?	-		
9	C5.9	6	15:20	15:25	15:42	1						15:16	15:20	15:36	1		15:19	15:27	16:17	2+
10	?	1																		
10	C5.1	1																		
10	M1.0	1																		
10	C2.1	2	14:30	14:34	14:48	1-														
10	C4.6	1																		
10	B9.0	1																		
10	B8.6	1																		
10	C1.1	1																		
10	C2.1	4													14:31	14:35	14:43	1-		
11	C4.6	3	08:02	08:04	08:08	1-									08:02	08:06	08:13	1-		
11	C1.2	2																		
11	C1.3	3	10:19	10:22	10:30	1-														
12	C9.0	6	08:15	08:23	08:58	2									08:10	08:21	08:45	2		
12	B9.9	1													09:03	09:07	09:17	1-		
13	B8.2	1																		
16	C3.3	2																		
17	C7.4	4	?	08:02	08:20	-									07:54	08:04	08:21	1+		
17	C1.3	5	12:18	12:22	12:30	1-									12:18	12:31	12:52	2		
17	C2.0	5	14:29	14:34	14:39	1-									14:29	14:37	14:44	1-		
17	C1.0	1																		
20	C1.8	2													14:41	14:47	15:15	2		
20	M9.0	1													18:09	18:14	19:05	2+		
21	C1.1	1													11:09	11:18	11:29	1		
21	*	1													13:03	13:07	?	-		
21	C1.8	3													13:12	13:16	13:28	1-		
21	C1.1	1																		
22	?	3	13:07	13:10	13:17	1-									13:08	13:10	13:15	1-		
22	C6.3	5						15:59	16:05	16:09	1-				15:58	16:02	16:24	1+		
23	C3.0	1																		
23	C2.3	3	13:13	13:36	13:25	1-									13:14	13:18	13:25	1-		
23	C2.8	4	14:59	15:01	15:20	1									14:59	15:02	15:28	1+		
24	C4.2	1																		
24	*	4	09:10	09:13	09:19	1-									09:09	09:16	?	-		
24	C2.9	4	09:25	09:29	09:39	1-									09:24	09:30	09:44	1		
24	C1.3	2													13:22	13:24	13:40	1-		
24	C1.4	2													14:17	14:21	14:43	1+		
24	?	1													14:54	14:57	15:18	1		
24	C1.0	1													15:26	15:28	15:36	1-		
26	C1.5	1																		
26	C1.8	1																		
31	C1.1	3	11:38	11:40	11:44	1-									11:38	11:40	11:53	1-		

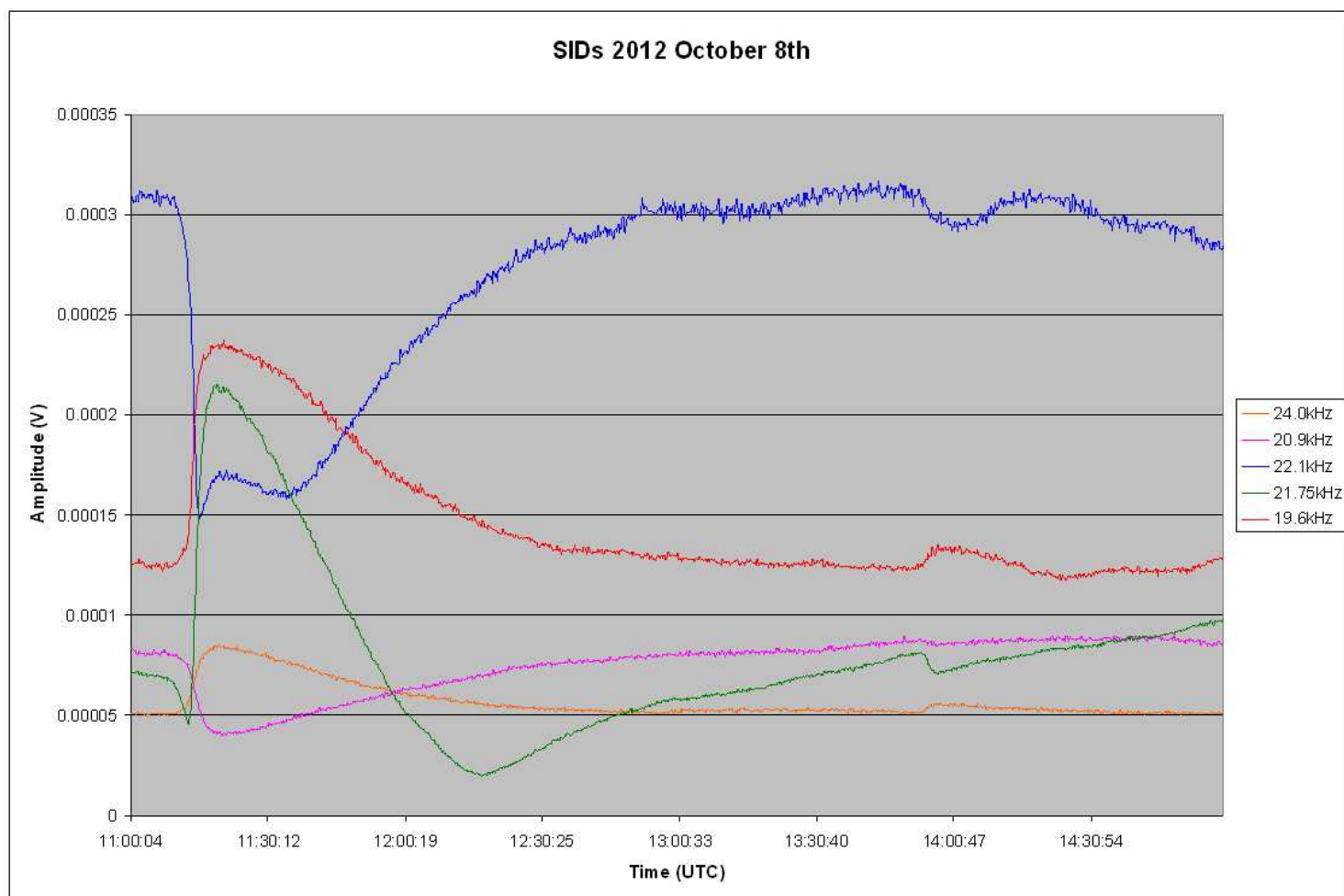
VLF flare activity 2005/12.



2012 OCTOBER.

General solar activity has decreased compared to September, with just 48 SIDs that correlate with flares classified by SWPC. This is the same as March this year, although back in March there were more M-class and fewer C-class flares making the total. This month also includes four B-class flares. There was an X1.8 flare at 03:17UT on the 23rd, but sadly not recorded as a SID.

The first seven days of October produced mostly B and small C-class flares, the most energetic being the C4.8 peaking about 13:15UT on the 1st. Activity increased over the following week with three M-class flares. The M2.3 flare on the 8th was well recorded, as was the much weaker C1.0 shortly afterwards. Mark Edwards has included a chart:

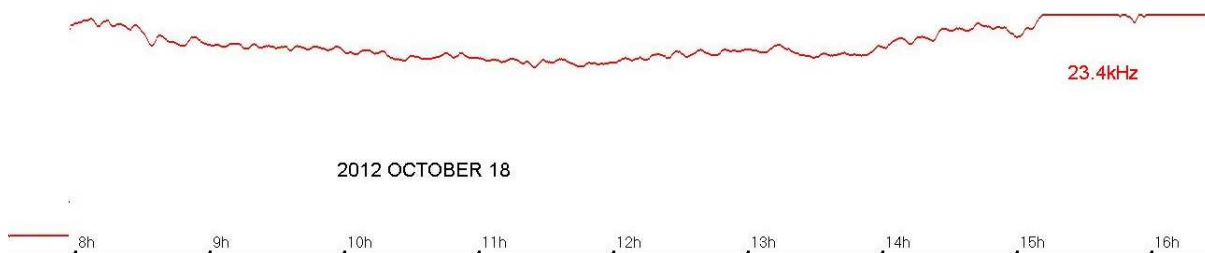


Flares remained mostly C-class through the third week, with two M-class events shown in the GOES record. The M9.0 peaking at 18:14UT on the 20th was rather late in the day at this time of year, but Mark recorded it at 24kHz on the Atlantic path from NAA in Maine.

There have been discussions regarding departures from the normal diurnal curves recorded during these quieter periods. In particular, a comparison has been made between recordings on October 15th and those from March 7th. On that occasion there had been two large X-class flares overnight, with an associated proton event continuing through the day. That was not the case this time. There may be a seasonal effect however, as March

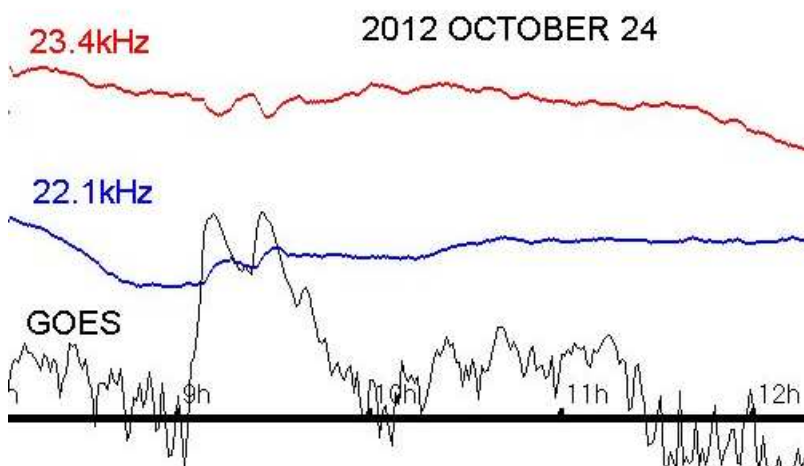
7th was just before the spring equinox, whilst October 15th is just after the autumn equinox. Steve Parkinson has been looking at this effect, and would welcome any observations of unusual behaviour over this period.

I have also noticed the return of noisy oscillations during an otherwise quiet day. They were particularly strong on the 18th and 19th, accompanied by a generally strong signal.



My recording above appears to show numerous small SIDs, although there was no significant flare activity. This also appears to be a seasonal effect, presumably due to the low angle of the sun in the sky.

The C2.9 flare on October 24th was recorded by most observers as a double SID. The GOES data clearly shows a double peaked flare, although the timings listed in the SWPC bulletin are: start 09:06UT, peak 09:28UT, end 09:34UT. I have added the GOES X-ray flux to my own recording:



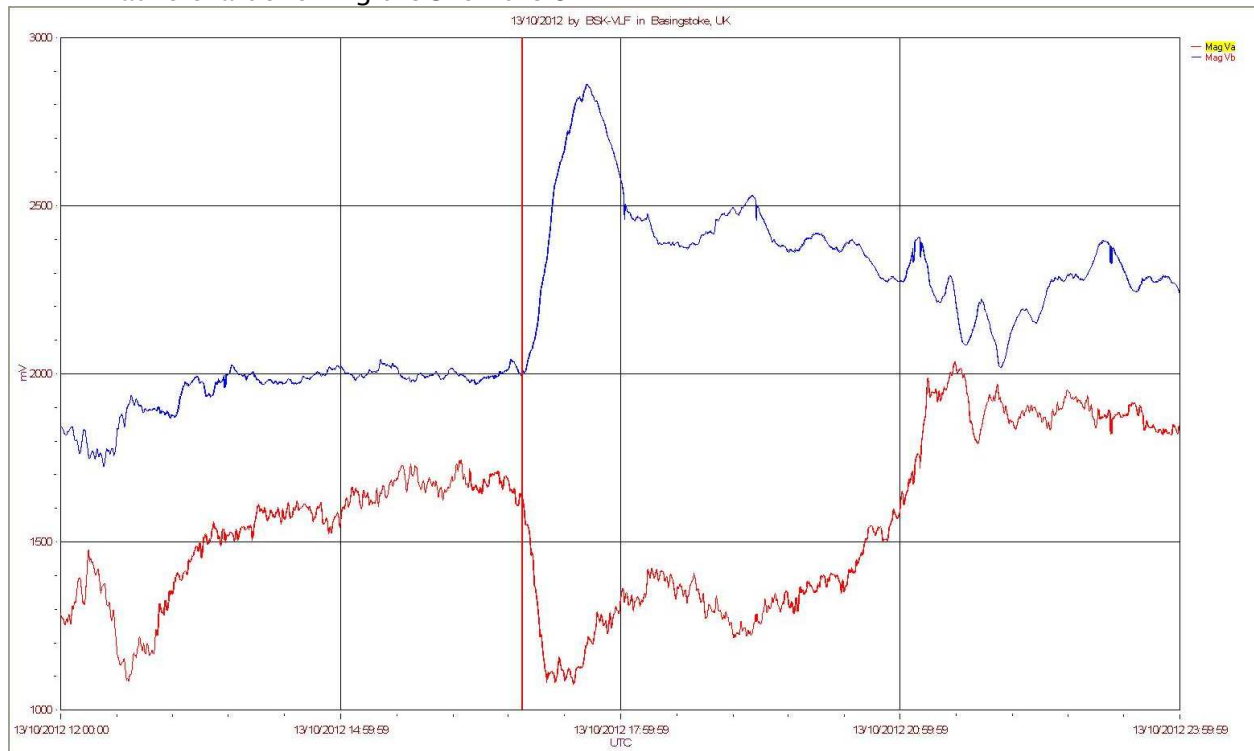
MAGNETIC DATA

Two CMEs were recorded as magnetic disturbances. The first appears to be associated with a B7.8 flare at 07:30UT on the 5th. Both Paul Hyde and myself recorded the SI marking the CME arrival at 05:15UT on the 8th. Colin Clements' chart appears to show the SI at 05:20UT. A mild disturbance continued through the rest of day before a more active period starting shortly after 20UT. The flare is listed by SWPC as "unusually long", and lasted nearly 7½ hours. There does not appear to have been a filament eruption, but the CME was earth-directed, and so struck the magnetosphere with maximum impact.

Returning to magnetic events in August this year, we recorded an event that did not easily fit into the category of SI or SFE from a CME. The CME associated with this recording also seemed to be from either a B-class

or small C-class flare. I made enquiries with the British Geological Survey (BGS) to try and clarify matters. They had seen the event as an SFE from a long duration C3.6 flare. The International Service for Geomagnetic Indices has now produced its report for August, and remains split with some observatories reporting an SI and others reporting an SFE. These long duration flares are strange beasts! My thanks to Orsi Baillie at the BGS for responding to my enquiry and supplying plenty of supporting details.

Paul's chart showing the SI on the 8th:



Blue is the east/west component, red is the north/south.

The second CME was associated with a B9.7 flare and a filament eruption at 12:35UT on the 27th. The SWPC indicates that there were two CMEs produced from the same flare, but they appear as a single event in our recordings. Paul Hyde and myself timed the SI at 15:40UT on the 31st. This was a very mild SI, and is only just identified from the noise in my recording. The magnetic field remained fairly stable for the rest of the day, becoming rather more disturbed in the late afternoon of November 1st.

The remainder of the magnetic activity was from Coronal Hole High Speed Streams, with a particularly active period on the 13th. From my own recordings, the disturbance began gently at about 00:00UT on the 13th with a magnitude of 30..40nT. Then at 17:00UT the field shifted rapidly by about 100nT before settling back to its more gentle variation. This lasted until about 04UT on the 14th. Paul Hyde reported the rapid shift starting at 16:57UT, and Colin Clements gives 16:59UT.

There were no SFEs reported during October.

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

ROTATION	KEY:	DISTURBED	ACTIVE	SFE	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 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	20 CCMC MCMCC			2093 2010 February 1 2 3 4 5 6 7 8 9 C C M C M C 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 C BB			2094 2010 March 1 2 3 4 5 6 7 8 C C C C C C C
2410	F	9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26	B			2095 2010 April 27 28 29 30 31 C C C C C
2411	F	5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22		14 15		2096 2010 May 23 24 25 26 27 28 29 30 1 C C C C C C C 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				2097 20 21 22 23 24 25 26 27 28 C C C C C C C C C
2413	F	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				2098 2010 June 15 16 17 18 19 20 21 22 23 24 C C C C C C C C C
2414	F	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				2099 14 15 16 17 18 19 20 21 C C C C C C C C C
2415	F	22 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				2100 2010 August 1 2 3 4 5 6 7 8 9 10 11 12 13 14 C C C C C C C C C
2416	F	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				2101 2010 September 6 7 8 9 10 11 12 13 14 C C C C C C C C C
2417	F	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 10 11				2102 2010 October 1 2 3 4 5 6 7 8 9 10 11 C C C C C C C C C
2418	F	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				2103 2010 November 1 2 3 4 5 6 7 C C C C C C C C C
2419	F	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 3 4				2104 2010 December 27 28 29 30 1 2 3 4 C C C C C C C C C
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				2105 25 26 27 28 29 30 31 C C C C C C C C C
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				2106 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 C C C C C C C
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				2107 2011 February 16 17 18 19 20 21 22 23 C C C C C C C C C
2423	F	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				2108 2011 March 17 18 19 20 21 22 23 C C C C C C C C C
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				2109 2011 April 12 13 14 15 16 17 18 C C C C C C C C C
2425	F	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				2110 2011 May 9 10 11 12 13 14 15 C C C C C C C C C
2426	F	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				2111 2011 June 4 5 6 7 8 9 10 11 C C C C C C C C C
2427	F	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				2112 2011 July 3 4 5 6 7 8 C C C C C C C C C
2428	F	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				2113 2011 August 30 31 1 2 3 4 C C C C C C C C C
2429	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				2114 26 27 28 29 30 31 C C C C C C C C C
2430	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				2115 2011 September 23 24 25 26 27 C C C C C C C C C
2431	F	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 23 24				2116 2011 October 20 21 22 23 24 C C C C C C C C C
2432	F	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				2117 2011 November 17 18 19 20 C C C C C C C C C
2433	F	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 16 17				2118 2011 December 13 14 15 16 17 C C C C C C C C C
2434	F	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				2119 2012 January 10 11 12 13 C C C C C C C C C
2435	F	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				2120 2012 February 1 2 3 4 5 6 7 8 9 C C C C C C C C C
2436	F	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 7				2121 2012 March 1 2 3 4 5 6 7 C C C C C C C C C
2437	F	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				2122 2012 April 1 2 3 C C C C C C C C C
2438	F	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				2123 2012 May 28 29 30 C C C C C C C C C
2439	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				2124 2012 June 25 26 27 C C C C C C C C C
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				2125 2012 July 21 22 23 24 C C C C C C C C C
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				2126 2012 August 18 19 20 C C C C C C C C C
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				2127 2012 September 15 16 C C C C C C C C C
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				2128 2012 October 11 12 C C C C C C C C C
2444	F	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				2129 2012 November 8 9 C C C C C C C C C
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				2130 2012 December 1 2 3 4 5 C C C C C C C C C