	BA	A Radi	o Astror	nomy G	roup.					:	2014 OC	TOBER										
	ŝ	ფ ყ John Cook (23.4kHz/22.1kHz					Rob	erto Batta	iola (20.9kH	z)	Paul	Hyde (2	2.1/23.4kH	lz)	Bob Middlefell (22.1kHz)	Mark Edwards (20.9/24.0/19.6kHz)						
	Xray class	Observers	Tuned	radio free	quency rec me aerial.				/SO receiver		Tuned r	radio frec	uency reco me aerial.		Tuned radio frequency receiver, 0.5m frame aerial.	Spectrum Lab / PC 2m loop aerial.						
DAY	×	ō			END (UT)		START	PEAK	END (UT)				END (UT)		START PEAK END (UT)	START	PEAK	END (UT)				
Ditt			01/111				01/401	1 2/00			onati	1 2/00				Onarti	1 2/00					
1 1	*	3 1	13:00	13:03	13:14	1-										12:59 13:39	13:06 13:52	? 14:06	- 1+			
1	*	1														14:43	14:55	15:06	1			
2	?	1														12:43	12:55	13:05	1			
2 2	? M1.5	1 1														12:46 17:14	13:12 17:45	13:51 18:31	2+ 2+			
2	M7.3	1									-					18:55	18:58	19:05	1-			
3 3	C9.0 C2.2	1 5	10:44	10:49	10:58	1-	06:39 10:42	07:00 10:50	07:30 10:56	2+ 1-	10:44	10:49	11:11	1+		10:44	10:50	10:59	1-			
3	C2.5	5	11:43	11:48	12:01	1-	11:41	11:50	12:06	1	11:43	11:49	12:39	2+		11:43	11:51	?	-			
3 6	? ?	1 1														12:01 13:13	12:07 13:16	12:34 13:21	2 1-			
8	C2.1	1														16:49	16:52	17:09	1			
9 9	M1.2 C2.7	2 1					06:49	07:02	07:20	1+						06:55 07:41	07:03 07:45	07:16 07:52	1 1-			
9	*	2	08:43	08:45	08:53	1-										08:42	08:47	08:53	1-			
9 9	C7.9	5 3	09:25	09:28	10:15	2+	09:20	09:27	09:32	1-						<i>09:25</i> 11:01	<i>09:</i> 33 11:04	10:23	2+ 1-			
9	C1.9	1														11.01	11.04	11:11	1-			
16	C7.7	4	07:34	07:38	08:00	1+	07:31	07:39	08:15	2	07:30	07:36	?	-		07:33	07:36	07:50	1-			
16 16	C6.4 ?	5 1	08:49	08:56	?	-	08:38	08:53	09:34	2+	08:44	08:55	09:52	2+		08:46	08:54	09:07	1			
16 16	? ?	2 1	09:11	09:15	09:50	2										12:17	12:18	12:24 <b>12:56</b>	1- 1-			
16 16	́ М4.3	1 5	13:01	13:05	14:14	2+					13:01	13:03	14:10	2+		<b>12:40</b> 13:01	<b>12:48</b> 13:05	1 <b>2:56</b> 14:28	1- 3			
17 17	C3.6	5	12:46	12:51 15:40	13:31 15:49	2 1-	15.07	16.44	15.50	1	12:44	12:52 15:41	13:43 16:12	2+		12:46	12:52	13:22	2			
17	C6.7 ?	6 1	15:38	15:40	15:48	1-	15:37	15:41	15:56	1	15:37	15:41	10:12	2		15:37 15:58	15:40 16:02	? 16:42	2			
18	M1.6 ?	2 1	07:29	07:42	07:57	1+	07:06	07:48	08:05	2+						00.00	09:26	09:31	4			
18 18	?	1														<i>09:23</i> 13:05	13:06	13:09	1- 1-			
18	C2.6	5	13:14	13:18	?	-	13:13	13:20	13:29	1-	13:12	13:18	13:49	2		13:13	13:18	13:38	1			
18 18	? C1.7	1 1														14:08 14:25	14:11 14:26	14:17 14:30	1- 1-			
18	C2.6	2	15:54	16:01	?	-										16:02	16:06	16:19	1-			
19 19	? C4.2	2 6	11:16	11:21	?	-	11:11	11:20	11:38	1+	11:07	11:21	?	-		11:09 11:16	11:11 11:21	11:14 11:40	1- 1			
19	C5.8	6	12:11	12:16	13:24	2+	12:11	12:14	12:20	1-	12:11	12:17	14:18	3+		12:11	12:18	12:56	2			
19 19	? C3.9	2 3	15:52	15:56	16:16	1	15:49	15:54	15:57	1-						14:27 15:53	14:42 15:58	14:57 16:24	1+ 1+			
19	C4.7	1														17:33	17:35	17:41	1-			
20 20	M3.9 ?	6 2	09:05 10:31	09:13 10:36	10:21 10:48	2+ 1-	09:00	09:14	09:48	2+	09:02	09:12	10:12	2+		09:05 10:34	09:10 <i>10:3</i> 9	09:44 11:01	2 1+			
20	*	1														10:49	10:53	11:05	1-			
20 20	C2.8 C8.6	5 1	11:22 15:00	11:28 <i>15:20</i>	11:49 <i>15:4</i> 3	1+ 2					11:22	11:29	12:26	2+		11:23	11:28	11:47	1			
20	M4.5	4	16:07	16:15	17:00	2+	15:42	16:08	16:15	2						16:06	16:15	16:40	2			
20 20	? C6.2	1														<b>16:29</b> 18:46	<b>16:33</b> 18:48	<b>16:43</b> 18:54	1- 1-			
20	M1.4	1														18:58	19:02	19:09	1-			
21 21	C3.1 ?	1 2	08:09 10:29	08:12 10:31	08:26 ?	1- -										10:31	10:33	10:36	1-			
21	C6.3	5	10:47	11:00	11:38	2+	10:49	10:57	11:14	1	10:49	11:00	?	-		10:51	11:02	11:17	1+			
21 21	C4.4 ?	4	12:25	12:29	12:46	1					12:26	12:30	13:04	2		12:27 13:19	12:30 13:23	12:45 13:34	1- 1-			
21	M1.2	5	13:35	13:38	14:15	2	13:38	13:40	13:48	1-	13:37	13:40	14:20	2		13:37	13:40	14:03	1+			
21 21	? ?	1 1														14:19 14:49	14:33 14:56	? 15:29	- 2			
22	C4.6	5	09:09	09:14	?	-	09:09	09:14	09:24	1-	09:08	09:14	09:52	2		09:10	09:12	09:18	1-			
22 22	? C3.2	2 5	09:27 12:02		09:50 12:30	1 1+					12:02	12:09	12:48	2+		09:28 12:01	<b>09:34</b> 12:07	<b>09:50</b> 12:20	1 1			
22	X1.6	6	14:04	14:25	?	-	14:06	14:13	15:12	2+	14:04	14:09		3+		14:04	14:12	15:50	3			
22 22	M1.4 C5.7	3 1					15:55	15:59	16:01	1-						15:52 16:54	15:58 17:00	16:21 17:09	1+ 1-			
22	?	1														18:15	18:17	18:20	1-			
23 23	M1.1 ?	6 1	09:47	09:52	10:51	2+	09:48	09:50	09:54	1-	09:46	09:52	10:48	2+		09:47 13:35	09:51 13:39	09:58 13:48	1- 1-			
23	C4.6	2	15:21	15:36	15:54	2										15:22	15:37	16:10	2+			
23 24	C5.9 M4.0		07.40	07:42	07:50	1-	07:40	07:44	07:51	1-	07:39	07:42	08:30	2+		17:54 07:39	18:01 <i>07:50</i>	18:12 08:12	1- 2			
24	C3.6	2					51. <del>4</del> 0		001		10:00	10:03		1-		10:01	10:03	10:12	1-			
24 24	C5.1 ?	3 1	14:50	14:58	15:16	1+										14:50 15:20	15:01 15:22	? 15:39	- 1			
24	?	1														15:47	15:48	15:55	1-			
25 25	C9.2 ?	1 1														<b>08:01</b> 09:11	<b>08:06</b> 09:16	<b>08:14</b> 09:19	<b>1-</b> 1-			
25	C4.6	6		09:50		1-	09:45	09:52	09:59	1-	09:41	09:51		2		09:41	09:53	10:01	1			
25 25	C3.2 ?	5 1	12:15	12:21	12:37	1					12:15	12:21	13:02	2+		12:16 12:30	12:22 12:34	? ?	-			
25	?	1														12:37	12:40	12:47	1-			
25 25	? ?	1 1														14:01 14:13	14:06 14:17	? 14:23	- 1-			
25	?	1														14:30	14:34	14:43	1-			
25 25	C5.1 C9.7	6 6		15:05 15:53		1- 1-	15:00 15:49	15:09 15:54	15:19 16:01	1 1-		15:06 15:51		1 1		14:59 15:47	15:06 15:54	15:23 16:27	1 2			
25	X1.0	1	10.47	10.00	10.04		10.40	10.04	10.01		10.40	10.01	10.00			16:36	17:07	18:17	2			
														_								

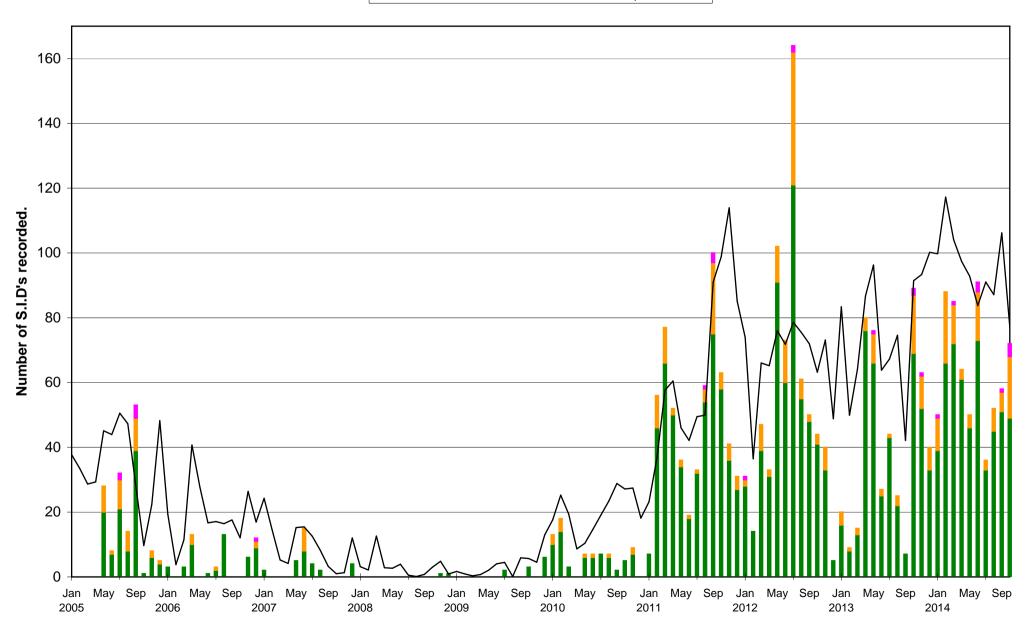
			nomy Gi	eup.						2014 00	TOBER						
*	1				1	1				1			1	09:18	09:21	09:26	1
?	1													09:28	09:31	09:29	1
?	1													09:43	09:45	09:48	1
?	2													09:53	09:55	10:01	1
?	2													10:05	10:07	10:09	1
?	4	10:15	10:20	10:32	1-									10:15	10:19	10:29	1
X2.0	6	10:36	10:55	?	-	10:07	10:56	11:50	3	10:05	10:54	12:50	3+	10:37	10:58	11:52	2
?	4	12:11	12:17	?	-									12:11	12:17	?	-
?	4	12:29	12:32	12:43	1-									12:29	12:33	12:42	1
C9.2	6	13:05	13:11	13:30	1	13:08	13:10	13:11	1-	13:05	13:10	13:43	2	13:05	13:10	?	-
?	1													13:28	13:31	13:47	1
?	3													14:06	14:13	14:33	1
?	2													14:43	14:47	14:58	1
C5.2	6	15:10	15:17	15:30	1	15:11	15:20	15:34	1	15:10	15:18	?	-	15:13	15:20	15:43	1
C3.5	1													15:53	15:59	16:04	1
C5.3	1													16:16	16:19	16:26	1
M1.0	2					17:07	17:19	17:25	1-					17:12	17:17	17:30	1
C9.6	2					06:59	07:04	07:10	1-					06:58	07:03	07:11	1
C9.6	2					07:14	07:19	07:26	1-					07:13	17:18	07:20	1
?	2					07:32	07:36	07:41	1-					07:31	07:37	07:42	1
?	1													07:55	08:00	?	-
?	2													08:02	08:03	08:07	
?	1													08:12	08:19	08:24	1
?	3													08:57	09:06	09:28	1
?	3					09:21	09:41	09:46	1					09:19	09:37	?	-
M6.7	6	08:57	10:09	13:22	3+	09:53	10:04	11:00	2+	10:01	10:09	?	-	09:59	10:17	10:57	2
?	4					11:14	11:25	11:55	2					11:12	11:25	?	
?	2													11:59	12:08	?	-
?	1													12:13	12:16	13:10	2
?	1													13:16	13:24	13:39	
X2.0	6	14:13	14:32	15:58	3	14:17	14:24	15:22	2+	14:09	14:23	?	-	 14:09	14:41	15:45	
C6.5	4	08:20	08:25	08:36	1-	08:20	08:24	08:29	1-	08:23	08:25	08:39	1-	08:22	08:23	08:27	
*	3	09:37	09:39	09:45	1-					09:39	09:41	09:53	1-	09:39	09:40	09:48	1
*	2	10:23	10:24	10:50	1+									10:24	10:30	10:47	
C5.3	6	11:03	11:06	11:21	1-	11:03	11:06	11:10	1-	11:05	11:09	11:25	1	11:05	11:09	11:23	1
*	4	11:30	11:35	11:43	1-									11:33	11:38	11:50	1
*	1													12:28	12:29	12:30	1
*	3	12:45	12:50	12:59	1-									12:49	12:54	13:00	1
?	2	13:04	13:10	13:28	1									13:07	13:17	?	-
*	3	13:34	13:36	13:41	1-									13:34	13:37	13:54	
M1.6	5	13:53	14:03	14:29	2					13:56	14:03	14:47	2+	13:56	14:04	?	-
?	2					15:17	15:20	15:23	1-					15:17	15:21	15:35	
*	1													15:46	15:51	?	
*	1													 16:08	16:22	16:33	
M1.0	3	08:13	08:18	08:31	1-					08:15	08:21	08:51	2	08:16	08:22	08:35	
M1.2	5	09:55	10:02	?	-					09:56	10:02	11:56	3	09:56	10:02	?	
?	3	10:16	10:22	10:57	2									10:15	10:23	?	
?	1													10:58	11:02	11:19	
?	4	11:33	11:38	12:02	1+									11:34	11:38	11:49	
?	1													12:17	12:24	13:10	
?	1													13:13	13:14	?	
?	1					1				1				13:21	13:26	13:35	
?	1													13:40	13:47	13:55	
?	1													13:48	13:50	13:53	
C5.5	5	13:57	14:01	14:06	1-	1				13:58	14:01	?	-	13:58	14:01	?	
?	2													14:09	14:22	?	
M1.4	6	14:18	14:35	14:58	2	14:23	14:36	14:49	1+	14:22	14:25	15:29	2+	14:25	14:36	15:21	
?	1					1				1				16:08	16:15	?	
M1.0	3									16:09	16:16	?	-	16:17	16:19	16:51	
?	1													17:09	17:11	17:13	
?	1					1				1				10:34	10:36	10:41	
?	1													12:13	12:16	12:18	
C2.9	5	12:39	12:44	12:58	1						12:45		1	12:42	12:46	13:01	
C6.9	5	13:07	13:14	13:31	1					13:07	13:14	13:44	2	13:08	13:15	13:38	
*	1					1				1				14:00	14:04	14:11	
	1													14:29	14:31	14:32	
?	4													15:09	15:10	15:14	
? C2.3	1									I				15:22	15:34	?	
	1													13.22	15.54	ſ	

n	Colin Clements (23 4kHz/22 1kHz)							vo Dectri	000 11		Bishard Kaya (Variaua)		Cordon Electric (40.0/00.4111-)
		Colin Clements (23.4kHz/22.1kHz AAVSO receiver, 0.76m screene							son (Variou Juency rece		Richard Kaye (Various) Pre-amplifier + PC software	John Wardle (19.6/23.4kHz)	Gordon Fiander (19.6/22.1kHz)
			loop aerial.			or de li leu	runed	frame a		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	receiver.	PC soundcard, 0.7m frame aerial.	PC sound card.
DAY			START	PEAK	END (UT	Г)	START	PEAK	END (UT)		START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
1	*						12:55	13:05	13:30	2			
1	*									_			
1 2	?												
2	?												
2 2	M1.5 M7.3												
3 3	C9.0 C2.2						10:44	10:50	11:00	1-			
3	C2.5						11:43	11:50	12:20	2			
3 6	? ?												
8	C2.1												
9 9	M1.2 C2.7												
9	*					-							
9 9	C7.9		09:21 10:55	09:32 11:09	10:43 11:27	2+ 1+	09:22 11:03	09:30 11:08	10:10 11:30	2+ 1+			
9	C1.9						12:55	13:06	13:25	1+			
16 16	C7.7 C6.4						08:46	08:54	?	-			
16 16	? ?						09:11	09:22	09:40	1+			
16	?												
16 17	M4.3 C3.6		13:00 12:43		14:07 14:13	2+ 3	12:01 12:46	13:04 12:51	14:00 13:20	3 2			
17	C6.7		15:37	15:42		1-	15:38	15:41	15:55	1-			
<u>17</u> 18	? M1.6												
18 18	? ?												
18	C2.6						13:14	13:18	13:22	1-			
18 18	? C1.7												
18	C2.6												
19 19	? C4.2		11:15	11:20	12:10	2+	11:08 11:55	? 11:22	? ?	-			
19	C5.8			12:18		2+	12:11	12:19	12:55	2			
19 19	? C3.9						14:29	14:37	15:00	1+			
	C4.7 M3.9		09:04	00.12	10:29	2+	09:05	09:11	09:50	2			
20	?		09.04	09.12	10.29	27	09.00	09.11	09.30	2			
20 20	* C2.8		11:19	11:28	12:19	2+	11:22	11:29	11:50	1+			
20	C8.6												
20 20	M4.5 ?						16:08	16:16	?	-			
20 20	C6.2 M1.4												
21	C3.1												
21 21	? C6.3						10:50	11:00	11:20	1+			
21	C4.4						12:27	12:31	12:55	1+			
21 21	? M1.2						13:37	13:40	14:00	1			
21	?												
21 22	? C4.6	1					09:09	09:16	09:45	2			
22 22	? C3.2		12.00	12:08	13.04	2+	12:02	12:09	12:42	2			
22	X1.6			14:25		3	14:06	14:25	?	-			
22 22	M1.4 C5.7						15:54	?	?	-			
22	?		00:45	00.51	10:40	2+	00:47	09:52	10.20	2			
23 23	M1.1 ?		09.40	09:51	10.40	2+	09:47	09.02	10:30	2			
23 23	C4.6 C5.9												
24	M4.0												
24 24	C3.6 C5.1						14:50	14:59	15:14	1			
24	?												
24 25	? C9.2												
25 25	? C4.6		00.44	09:52	10.07	1	09:45	09:50	10:00	1-			
25	C3.2			12:19		1-	12:15	12:20	12:29	1-			
25 25	? ?												
25	?												
25 25	? ?												
25	C5.1			15:04		2+		15:05	15:15	1-			
25 25	C9.7 X1.0	L	15:46	15:55	10:15	1+	15:47	15:48	15:52	1-			
		-	-									-	•

										EUT4 OUTOBER		
26	*				I						1	1 1
26												
26	?											
26	?											
26	?					09:52	09:54	10:00	1-			
26	?					10:05	10:08	?	-			
26	?	10:14	10:18	10:34	1	10:15	10:20	?	-			
26	X2.0	10:34	10:54	12:08	3	10:36	10:45	?	-			
26	?	12:08	12:16	12:27	1	12:11	12:17	?	-			
26	?	12:27		12:48	1	12:29	12:32	12:50	1			
26	C9.2	13:03	13:10	13:42	2	13:05	13:10	13:28	1			
26	?											
	?	12.11	14.11	14.26	2	14:04	14.10	14.20	1			
26		13:44	14:11	14.20	2	14:04	14:12	14:20	1-			
26	?					14:44	14:46	14:50	1-			
26	C5.2	15:09	15:17	16:05	2+	15:13	15:18	15:25	1-			
26	C3.5											
26	C5.3											
26	M1.0											
27	C9.6											
27	C9.6											
27	?										1	
27	?										1	
27	?	08:05	08:06	08:18	1-							
27	?											
	?	00.00	00.07	00.16	4	00.50	00.00	2				
27		09:00	09:07	09:16	1-	08:58	09:08	?	-			
27	?					09:22	09:34	?	-		1	
27	M6.7	09:16	10:07	11:08	3	09:56	10:07	?	-		1	
27	?				2+				2+			
		11:08	11:23			11:15	11:24	12:10	2+			
27	?	12:03	12:06	13:03	2+							
27	?											
27	?											
27	X2.0	14.12	14.20	15.20	2.	14.10	14.05	15.20	2.			
		 14.13	14:39	15.50	2+	14:13	14.25	15:30	2+			
28	C6.5											
28	*											
28	*											
	05.0	44.04	44.00	44.00	4.	11.01	44.00	44.00	4			
28	C5.3		11:08		1+	11:04	11:08	11:20	1-			
28	*	11:30	11:35	11:44	1-	11:33	11:36	11:45	1-			
28	*											
28	*					12:48	12:51	13:00	1-			
	~					12.40	12.01	15.00	1-			
28	?											
28	*					13:35	13:37	13:42	1-			
28	M1.6	13:56	14:04	14:32	2	13:57	14:06	14:40	2			
28	?											
	*											
28												
28	*											
29	M1.0											
29	M1.2	09:58	10:02	10.00	1-	09:57	10:03	?	-			
						00.01	10.00	•	-			
29	?	10:14	10:21	10:56	2						1	
29	?										1	
29	?	11:31	11:38	11:47	1-	11:32	11:39	12:00	1+		1	
29	?										1	
	?										1	
29											1	
29	?											
29	?											
29	?										1	
		14.00	14.00	14.40		12.50	14.00	2			1	
29	C5.5		14:08		1-	13:58	14:00	?	-		1	
29	?	14:13	14:21		1-						1	
29	M1.4	14:23	14:34		2	14:10	14:35	?	-			
29	?				-							
							40.1-					
	M1.0					16:10	16:16	?	-			
29	?											
30	?											
30	?											
		40		10.5-	.		40				1	
	C2.9		12:44		1+			?	-		1	
30	C6.9	13:05	13:13	13:33	1+	13:07	13:14	13:41	2		1	
30	*										1	
											1	
30	?										1	
	C2.3										1	
30	?											
30	C9.7					15:29	15:33	?	-			
00	00.1					10.20	10.00	•	-			
											1	

# VLF flare activity 2005/14.

C M X — Relative sunspot number

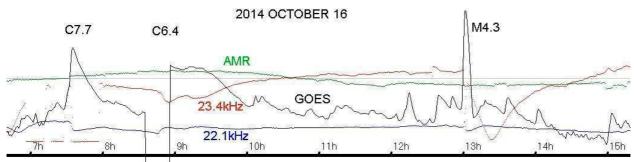


## 2014 OCTOBER.

Active region 192 (AR12192) made itself known with an M-class flare while still behind the eastern limb of the sun. As it came into view on the 17<sup>th</sup> it released a rapid-fire barrage of M and X-class flares that continued right through until the end of the month. This was by far the largest and most active sunspot region of cycle 24, and has dominated the month's activity. The tables show a total of four X-class flares recorded as SIDs, the highest number since 2005 September as cycle 23 faded. We were unable to record two further Xclass flares, occurring during our night time. Its position on the Sun was close to that of AR12172/3, seen during September, and may well have developed from them while out of view on the far side. Many of the flares were complex and multiple peaked, creating different SID responses at different observing locations. I have tried to collate all of this data into a meaningful table, not an easy task this month!

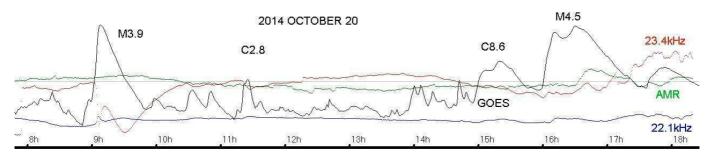
During much of this period, the background non-flare level was at about C1 or C2, so the ionosphere remained disturbed throughout the day. This has added to the difficulty of identifying SIDs from our recordings. Looking at the activity chart, the overall SID count is not that much higher than previous months, but the proportion of M and X events is much higher. The shorter daytime during October also reduces the apparent activity.

The first major flares from this group came on the 16<sup>th</sup>, before it was really visible to optical instruments. Unfortunately there was a data drop-out from GOES15 as the C6.4 flare started, but a second slightly smaller peak can be clearly seen. My own recording shows SIDs at 23.4kHz and 22.1kHz:

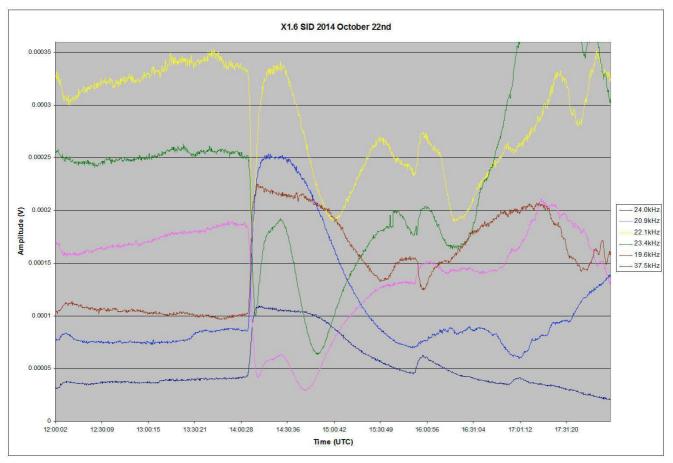


The M4.3 flare is very short with rapid rise and fall times, creating a 'spike and wave' type SID as the interference pattern moved rapidly past the receiver.

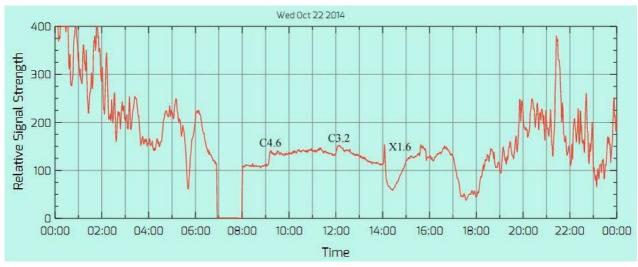
The M1.6 flare at 07:52 on the 18<sup>th</sup> was too early in the morning to produce a clear SID in the UK, although I found that it did have an effect at 22.1kHz. This was a very slow flare, lasting for three hours.



Activity continued on the 20<sup>th</sup> with another fast M3.9 flare, recorded as a 'spike and wave' SID on my recording, shown above. SIDs later in the afternoon are less well defined, although the GOES X-ray signal makes them easier to see. The C6.2 and M1.4 flares were well after local sunset here in the UK, but were recorded by Mark Edwards on the 24kHz trans-Atlantic path.

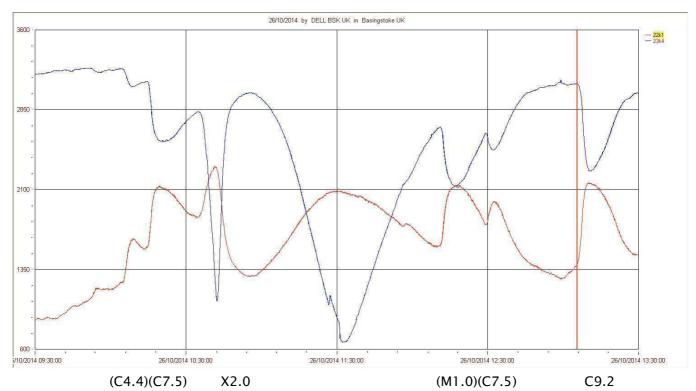


The first of the big X-class flares peaked around 14:15UT on the 22<sup>nd</sup>, as shown in Mark's chart, above. The exact time of the peak varies with frequency used: 19.6kHz 14:11, 20.27kHz 14:28, 20.9kHz 14:26, 22.1kHz 14:26, 23.4kHz 14:26, 24.0kHz 14:12, 37.5kHz 14:19. The SWPC timings for the flare were start 14:02, peak 14:06, end 22:30UT. Colin Clements has been developing a 151MHz Solar radiometer, and detected a significant VHF noise burst associated with this flare.

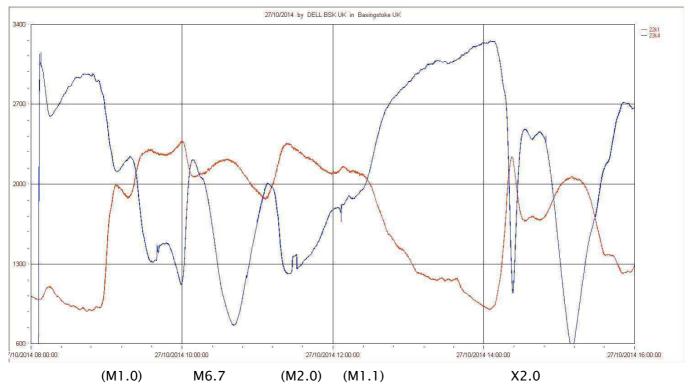


This chart by Peter Meadows shows SIDs from the two earlier flares, marked C4.6 and C3.2, as well as a hint of the M1.4 flare at 16:00.

The 23<sup>rd</sup> and 24<sup>th</sup> were relatively quiet with just a few day-time flares. An X3.1 flare, the most energetic of the month, occurred at 21:15UT on the 24<sup>th</sup>, far too late to be recorded as a SID.

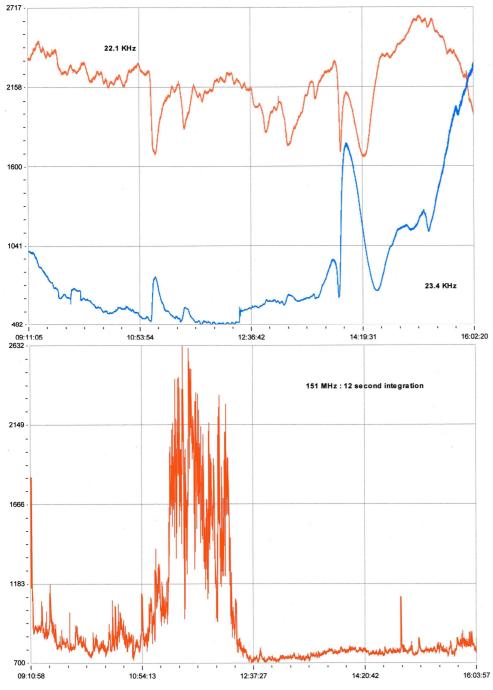


Sorting out SIDs on the 26<sup>th</sup> was much more difficult. This recording by Paul Hyde shows 22.1kHz (red) and 23.4kHz (blue), including some of the SIDs from flares that are unlisted in the SWPC bulletin. I have indicated these in brackets, with magnitudes taken from the GOES15 data file.



The 27<sup>th</sup> was just as difficult to interpret, as Paul's chart (above) shows. The M6.7 flare was quite slow with several small sub-peaks before the main event. The X2.0 flare was much faster, and gives a fairly clear SID, although apparently with two peaks just 15 minutes apart. A total of 17 SIDs were reported for the day.

The 28<sup>th</sup> was again very active, with 13 SIDs recorded. Colin Clements made an interesting recording with his 151MHz radiometer:

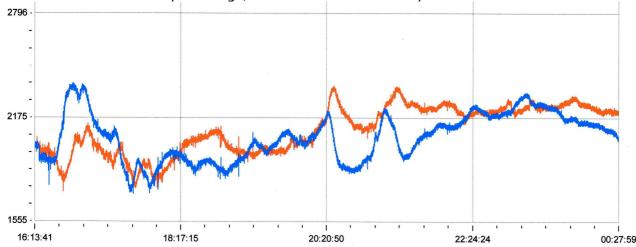


The C5.3 flare at 11:08UT has produced a clear SID at both 22.1 and 23.4kHz, with a significant 151MHz noise burst lasting for about an hour. The M1.6 flare at 14:04UT shows a much larger SID as expected, but there is no associated VHF noise burst recorded. A 12 second integration period was used on the VHF receiver to produce a smoother recording. Colin is still working on the VHF system, but it is clearly producing some useful results.

By the 29<sup>th</sup>, AR12192 was rotating off the visible disc, but was still producing flares with plenty more SIDs recorded. An M3.5 flare at 01:35 on the 30<sup>th</sup> was the last significant event, far too early in the morning for us to record. The background X-ray flux returned back below the C1 level during the 31<sup>st</sup>, but no day-time flares were produced. My own recordings show a very noisy signal at 23.4kHz throughout the last three days of October, unrelated to the X-ray activity. These are just a few of the month's highlights, meanwhile the possible return of this active region will be eagerly awaited!

# MAGNETIC OBSERVATIONS.

Despite all of this flare activity from AR12192 there were very few CMEs produced. A filament eruption on the 10<sup>th</sup> produced an active period in the evening of the 14<sup>th</sup>. CHHSS effects were also present, responsible for earlier minor disturbances. The M4.3 flare at 13:00 on the 16<sup>th</sup> produced a very small SFE (approx. 8nT) that can just be seen in my chart shown previously. A more significant disturbance over the 18<sup>th</sup> and 19<sup>th</sup> was from solar sector boundary crossings, shown well in this chart by Colin Clements:



Red is the X-field, Blue is the Y-field. My own recording shows a peak disturbance of about 60nT.

Coronal holes were again responsible for disturbances over the 20<sup>th</sup> and 21<sup>st</sup>, and again early on the 22<sup>nd</sup>. Short periods of minor disturbance were seen until the 29<sup>th</sup>, again due to CHHSS effects. The presence of coronal holes for such an extended period, overlapping with strong flares from a large active region seems rather unusual, as does the lack of any substantial coronal mass ejection from these flares.

ROTATION	KEY:		DISTU	RBED.		ACTIVE				SFE B, C, M, X = FLARE MAGNITUDE.							Synodic rotation start (carrington's).										
2423	24 F MCC	25 C	26 C	27	28 MC	2011 M 1 CCC	arch 2 C	3 CC	4 C			7 CMMM	8 CMM	9 CMMM	10 CCCC	11 CCC	12 BCCC	13 CC	14 CBCM	15 CCCC		17	18	19	20	21 CC	22 C
2424	23 F BC	24 MCB	25 C	26	27	28 C	29 C	30	31	2011 A 1	pril 2	3	4	5	6 CC	7 C	8	9 C	10	11 BC	2109 12 C	13 CCCC	14 CCCC	15 CCCM	16 CBCC	17 CB	18 B
2425	19 F B	20 BBC	21 CCC	22 CCMCC	23 CC	24	25 B	26	27	28 CCCC	29	30 CCCC	2011 M 1 CB	ay 2 C	3 C	4	5	6	7	8	2110 9 C	10	11	12 C	13	14	15 C
2426	16 F	17	18 CCC	19	20	21	22	23	24	25	26	27 BCCC	28 CCCM	29 CBCM	30 CCC	31	2011 Ju 1	ne 2	3	4	5	2111 6	7	8	9	10	11
2427	12 F	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	2011 Ju 1	lly 2	2112 3 C	4	5	6	7	8 CCCC
2428	9 F	10	11 C	12 C	13	14	15	16	17	18 C	19	20	21	22	23	24	25	26	27 CCCM	28 CCBCC	29 : CCCB	2113 30 CCCC	31 CBCC	2011 Ai 1 CCCC	igust 2 MCCB	3 MCCM	4 CCCC
2429	F CCCB	6 CCCC	7 CCC	8 CMC	9 CMXC	10 CCCC	11 CC	12	13	14	15 CB	16	17 CC	18 BC	19	<b>20</b> BB	21 BC	22 C	23	24 C	25 BC	26 C	2114 27	28	29 CCC	30 CBC	31 C
2430	2011 S 1 F CCC	eptembe 2 C	3 CCCC	4 CMCC	5 M	6	7 X	8 CMC	9 C	10 MC	11 CCB	12 C	13 C	14 CCCC	15 CCC	16 CCCC	17 CC	18 CCC	19 CC	20 CCCC	21 CMCC	22 CMXC		24 CXMM	25 MMCM	26 CCMC	27 CCCC
2431	28 F CCM	29 CC	30 M	2011 O 1 MC	tober 2 CCMC	3	4 C	5 CCCB	6 C	7	8	9 C	10 CCC	11	12 CCCC	13 CCC	14 CCC	15 CCCC	16 CCCC	17 CC	18	19 CC	2116 20 C	21 CMC	22 MC	23 C	24
2432	25 F	26 C	27	28 C	29 CCCC	<b>30</b> CCC	31 M	2011 N 1 C	ovember 2 CCCC	З ССМ	4 C	5 CMCC	6 CC	7	8	9 M	10	11 C	12 C	13 CC	14 CCC	15 MM	16 C	2117 17 CCC	18	19	20 CCCC
2433	21 F	22 C	23 C	24	25	26	27 C	28 C	29 C	30	2011 D 1 C	ecember 2	3	4	5 C	6	7	8	9 C	10	11	12 B	13 C	2118 14 CCC	15	16	17
2434	18 F B	19	20 C	21 CCCC	22	23 C	24	25 CCM	26 CC	27 C	28 CCC	29 M	30 CCC	31 MBM	2012 Ja 1	nuary 2 C	3	4 CC	5 C	6 C	7	8 CC	9 CC	2119 10	11 C	12 CC	13

Magnetic observations received from Colin Clements, Gonzalo Vargas, Roger Blackwell and John Cook. Reports and observations to jacook@jacook.plus.com.

2435	14	15	16	17	18	19	20	- 21	22	23	24	25	26	27	28	29	ЗU	31	2012 Fe	ebruary 2	3	4	5	б	2120	8	а
2436	F CMC	11	<u>CC</u> 12	13	CC 14	CM 15	16	C 17	CC 18	19	C 20	21	с 22	CCX 23	C 24	25	26	27	28	29	2012 M	2	3	4	C 2121 5	6	<u>с</u> 7
2437	F CC	0000 9 000	C 10 CCM	11	12 C	13 M	14 M	15 MC	16 CC	C 17	C 18	C 19 C	20	21 BCCC	22 CCC	23 C	C 24 C	25	26	27	с 28	М 29 СССС	30		2012 Aj 1	MCMC pril 2	3
2438	F C	5 BC	6	7 C	8	9 C	10 B	11	12	13	14	15	16 M	17	18 CCBCC	19 C	20 CCC	21 CB	22 CC	23 C	24 CC	25 C	26	27 MCC	2123 28 C	29 CC	30 CCCC
2439	2012 May 1 F	2 CBCC	3 CC	4 CC	5 CCMC(	6 C MCMC	7	8 CCMC	9 CBMM	10 MCCC	11 CCCC	12 CCCC	13 CC	14 CCCC	15 CBC	16 CC	17 M	18 CCCC	19 C	20	21	22	23	24 CBBC	25 CC	2124 26 CC	27
2440	28 F BB	29	30 C	31 CCCC	2012 J 1 C	une 2	3 C	4 M	5 CC	6 CCM	7 CCCC	8 CCMCN	9 /CMCMC	10 M	11 CCCC	12 CCCC	13 CMCC	14 CCCM	15 CC	16 C	17 CC	18	19 CC	20 CC	21	2125 22	23
2441	24 F	- 25	26 C	27 CCCC	28 CMC	29 CCMC	30	2012 Ju 1 CCCM	2	3 CCCC	4 MMMM		6 I MMMX	7 MMMC	8 MMMM	9 0000	10 MMCC	11 CCCC	12 CX	13 CCCC	14 MCCC	15 C	16 CCC	17 M	18 C	2126 19 M	20
2442	21 F	22	23 CB	24 CCCC	25	26 C	27 CCCM	28 CCM	29 MCC	30 CCCM	31 CCCC	2012 A 1 CCCC	ugust 2 C	3 CCC	4 C	5			8 CCCC	9 CCC	10 CC	11 MC	12	13 CCC	14 C	2127 15	16 C
2443	17 F CMCM	18 I MCCM	19	20	21	22	23	24	25	26	27	28	29 C	30 CCM	31 CCCC	1 CCC	eptembe 2 CCC	3 CCC	4 C 2012 O	5 CCC	6 MCCC	7 C	8 M	9 CC	10 CCC	11 СВ	2128 12 CC 2129
2444	13 F CCC	14	15	16	17 CCC	18 CC	19 CC	20	21	22	23	24 C	25 CC	26	27 C	28	29 CCCC	- 30	1 00000	2 C	3	4	5 2012 Ni	6 wember	7	8 CCMC	9
2445	F CMBC	11 CCC	12 CB	13 B	14	15	16 C	17 CCCC	18	19	20 CM	21 CCC	22 C	23 CCC	24 CCCC	25	26 CC	27	28	29	30	31 C	1	2	3	4 2012 De	5 B
2446	6 F 2131	7	8	9	10 C	11	12 CC	13 CMMC	14 CMC	15 CCCC	16 C	17	18 CC	19	20 CCMC	21 MCM	22	23 C	24 C	25	26 CCC	27 CCCM	28 C	29 CC	30 C	1 CC	2
2447	3 F 2132	4	5 2013 Ja	6 anuary	7	8	9	10	11	12 C	13	14 C	15	16	17	18	19	20	21	22	23	24	25 C	26	27	28	29
2448	30 F 2133		1	2	3	4	5 MC 2013 Fe	6 CC ebruary	7 C	8	9 CC	10 CC	11 MM	12 MCCC	13	14 C	15 C	16	17	18 CC	19	20 C	21	22	23	24	25
2449 2450	26 F 2134		28	29	30	31	1	2 2013 M	3 arch	4	5 C	6	7	7	9	10	11	12	13	14	15	16	17 CM	18	19 C	20 CC	21 B
2450	F C 2135 21	23 C 5	24 C	25	26 25	27	20	28	2 C 29	30	4	5 M 2013 A 1	6 pril 2	<u>с</u> з	4	5	6	7	12 CC 8	13 <u>C</u> 9	14	MC 11	10	17 C	18 C	19 CC 15	16
2452	F C 2136 17	CBC 5 18	19	20	20	20	23	24	25	26	27	28	<u>B</u> 29	CBC	C 2013 Ma	M	<u>ccc</u> 3	<u>cc</u> 4	с 5	<u>cccc</u>	<u>ccc</u>	MCCC 8	<u>СМ</u> 9	<u>с</u> 10	11	12	13
2453	F	C 2137 15	C 16	CC 17	18	M 19	CCCC 20	CCCC 21	22	23	24	<u>cccc</u> 25	CC 26	CCC 27	28	МС 29		CCCC 31	СССМ 2013 Ju 1	ine 2	CBC 3	4	CCC 5		CCCC 7	8	CCMX 9
2454	F C	2138 11	CC 12	M 13	C 14	00000 15	CCCM 16	17	18	19	20	C 21	C 22	23	24	25	26	M 27	28	29	30	2013 Ju 1	2	3	4	C 5	6
2455	F BC 7 F CB	2139 8	9	10	11 CC	12	13	14	15 CC	16	17	00 18 00	C 19	M 20	21 CC	В 22	C 23	CBC 24	C 25	26	27 C	28 28	29	<u>мссс</u> 30	31	2013 Au 1	igust 2
2456	- CD - 3	2140 4	C 1 5	с 6	7	<u>с</u> 8	<u>с</u> 9	C 10	11 CCC	С 12 М	C 13 CCCCC	14 CCC	15 CC	16 CC	17 CMM	18 C	19 C	20 C	21 CC	22 C	23	24	С 25	26	27	28	29
2457	- 30 F	31 C	2013 S 1 C	eptembe 2	r 3 BC	4 C	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 CCCC	21	22	23	24	25
2458	26 F	27	2142 28	29	30	2013 O 1	ctober 2	3	4	5	6 C	7 C	8	9 C	10 CCCC	11 MCCC	12 CCC	13 C	14 C	15 CMCC	16 CCC	17	18 CCCC	19 CCC	20 CC	21	22 CCCM
2459	23 F CCCC	24 CMMC		26 MMMM	27 CCMC	28 MMMM	29 CCCC	30 C	31 MCC	2013 Ni 1 C	ovember 2 CCC	3 C			6 CCCM	7 CCMC	8 M	9 CC	<b>10</b> CCC	11 CMC	12 CC	13 CCCM	14 CCC	15 C	16 MCC	17 CCC	18 CCC
2460	19 F X	20 CC	2144 21 M	22 C	23 CCM	24 CC	25	26	27	28	- 29	30	2013 D 1 C	ecember 2 C	3	4	5 C	6 C	7	8 C	9 CCC	10	11 CC	12 C	13	14 CC	15 CC
2461	16 F C	17	18	2145 19 C 2146	20 СМСС	21 C	22 MMMM	23 M	24	25 C	26	27 CC	28 CC	29 MCCC	30 C	31 C	2014 Ja 1 C	nuary 2 C	3 CCMC	4 CCMC	5 C 2014 Fe	6 C	7 CMCX	8 CCCC	9	10	11 CCC
2462	F 12	13 CC	14 C	15	16 C 2147	17 CCCC	18 CC	19	20	21	22	23	24	25	26 C	27 C	28 MMMM	29 CCC	30 MCC	31	1	2		4 MCCM	5 CCCM	6 CCC	7 CCMC
2463	F CCC	9 M	10 CC	11 CM	12	13 MCCM	14 CMMM	15	16 MCC	17 CCC	18 CC	19 C	20 M	21 CC	22 C	23 CC	24 MMC	25 C	26 CCM	27 CCCC	28 CCC	1 MC	2	3 CCCM		5 C 2014 Ar	6 oril
2464	7 F	8	9 CCMM	10 CCCM	11	12 CMC	13 CCM	14 C	15 CCC	16 CC	17 CCC	18 C	19 CCCC	20 CC	21 C	22 MCC	23 CC	24 CC	25	26 CC	27	28 CM	29 CCCX	30 M	31 MC	1	2 CCM
2465	3 F CC	4 CCC 2014 M	lay	6	7 CC	8 2150	9	10 C	11 CCC	12 C	13 C	14 CCCC	15 CCCC	16 CCCM	17 CC	18 CM	19 CCCC	20 CCCC	21 C	22 CCCC	23 CCCC	24 C	25 CC	26 C	27	28 BC	29 B
2466	30 F B	1		3 CCCC		2014 Ju		7 CMC		9 0000	10 CCC	11 0000	12	13 C	14 CCC	15 C	16 CCC	17	18	19	20 B	21 C	22 C	23	24 M	25 C	26 CCC
2467	27 F C	28	29	30	31 B	1 C 2152			4 2014 Ju		6	7 CC	8 CC	9 CCC			12 MMMM		14 <u>CCM</u>		16 CCCC		18 CC	19 C	20 CC	21 C	22 B
2468 2469	23 F	24 BBB	25	26	27	2153		30 CC 27	1 <u>CCCM</u>	2 C	3	4 C	5 2014 Ai	6 CC Igust	7 CC	8 CM	9 C	10 CC	7	12 CCC	13 <u>CCCC</u>	14	15	16	17	18	19
2469	20 F 16	21 B	22	23	24	25 C	26 CCCB 2154 22	27 CC 23	28	29 CC 25	30 CC 26	31 CMCC 27	1 CMM 28	2 CC 29	3 C 30	4	CCC	6 eptember 2	7 r		9 C 5	10	7	8	13 9	14	15 CC 11
2470	F C	17	10 C	15		21 CMCC 17		CCCC	24 CMC 20	20 MM 21	20 C 22	27	20 CB 24	25 C 25		27	СС 28	2 CC 29	<u>ССМ</u> 30	2014 0	CC	CCMC	<u>CCC</u>	0 C 5	C G	7	CCM B
2472	F CCCC		14	13	CC 13	14	CMC 2156 15	C 16	20 CC 17	18	19	20	24 CC 21	2.3 C 22	20	24	20 CCMM 25	20 C 26	27	28	2 MM 29	<u> </u>	31	2014 No 1	ivember 2		C 4
	F MCCC		-					ССМ	CC	MCCC	CCCC	MCMM	CCCM	CCXM	MCC	MCC	CCCX	XCCM	ССМХ	ССМ	MMMM						