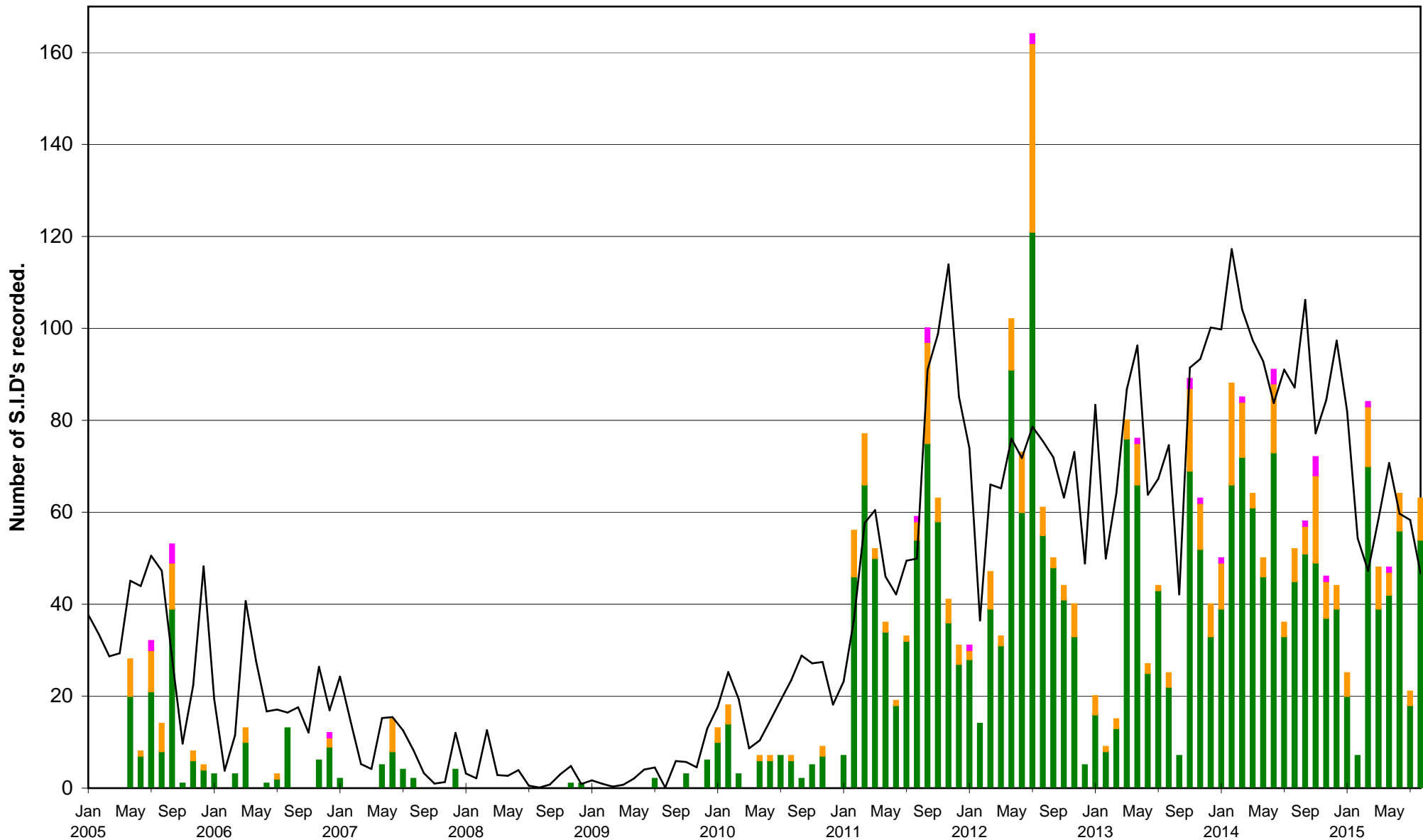
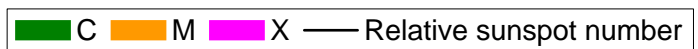
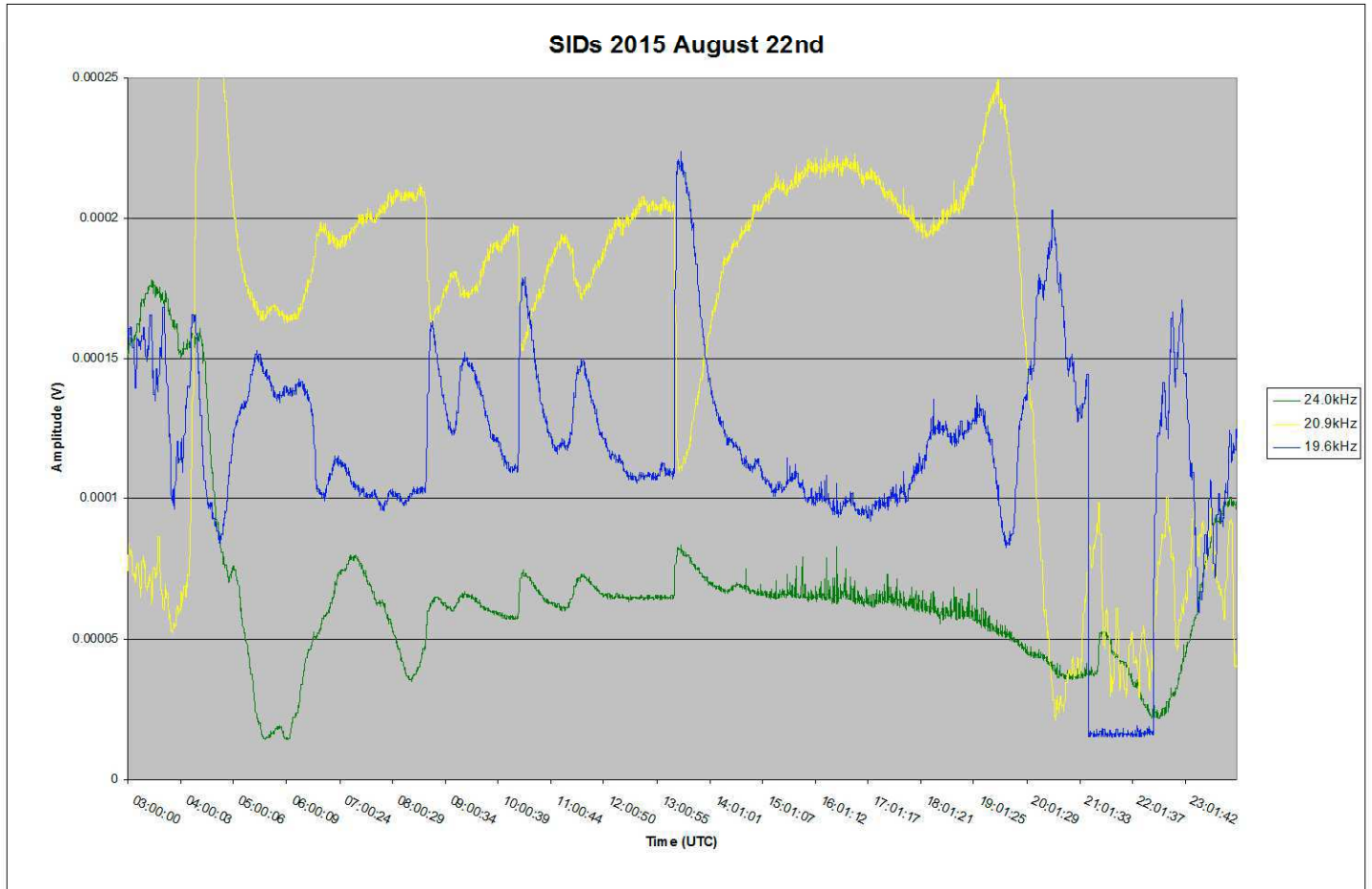


VLF flare activity 2005/15.

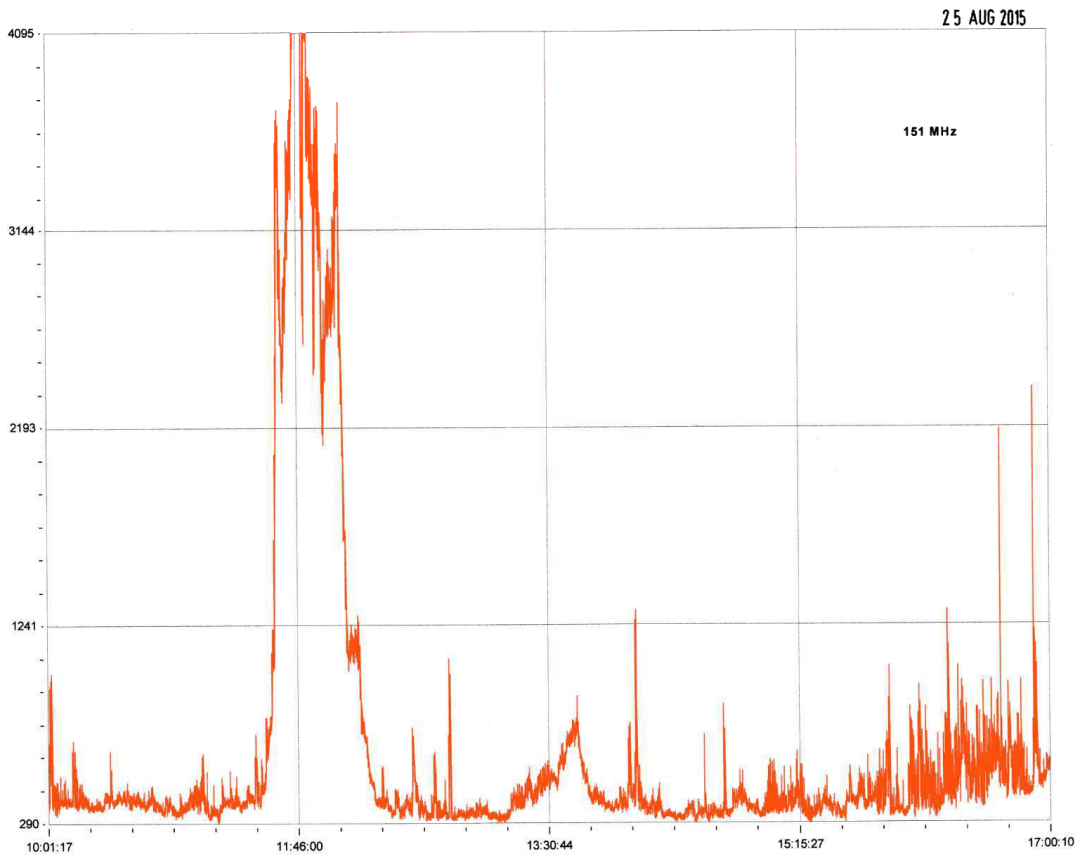
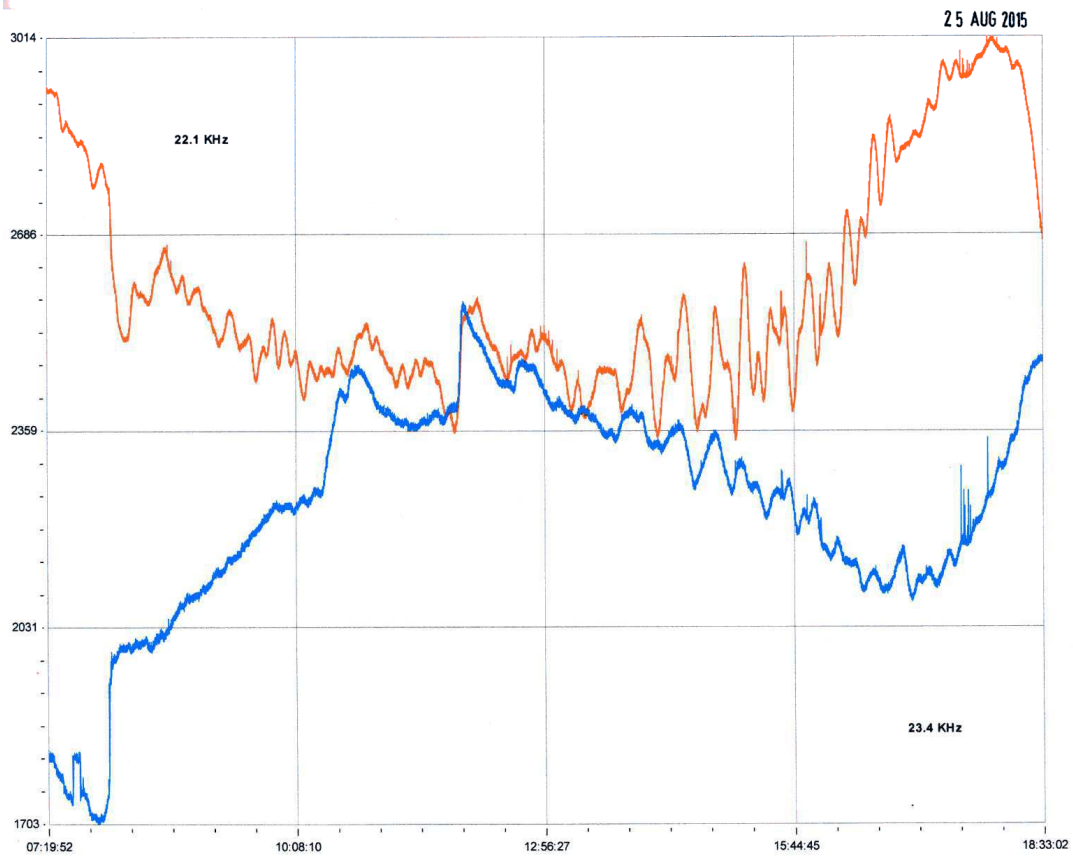


August was remarkable due to the activity of a single active region on the sun, AR12403. This first rotated into view on the 18th as a collection of small spots, but rapidly grew into a large and complex region by the 21st, reaching the central meridian by the 23rd. It started producing B-class flares on the 19th although none of these were recorded as SIDs. All of the SIDs recorded from the 20th to the 29th were from this active region, 81% of the month's total.



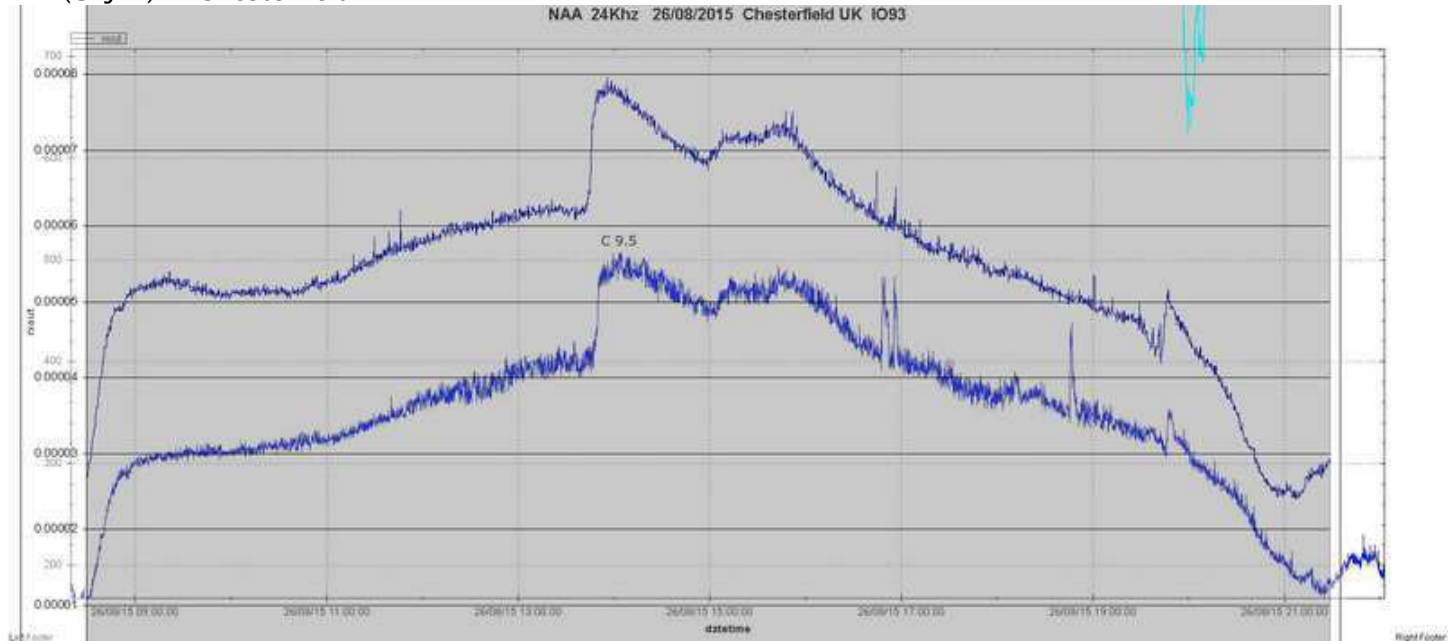
This chart by Mark Edwards shows strong activity on the 22nd. 19.6kHz (blue) and 20.9kHz (yellow) show a nice set of mirror-image shark fin SIDs through the day, with a very strong response to the C2.2 flare at 13:25UT. 24kHz (green) just catches a SID from the M3.5 flare at 21:29UT before local sunset occurs. Sunset for the other two signals was of course much earlier.

The C2.3 flare at 12:00 on the 25th also produced a strong SID for some observers. Colin Clements recorded the SID amongst some very strong oscillations, as shown in his chart on the next page. He also recorded a strong 151MHz noise burst associated with this flare. The oscillations are particularly strong at 22.1kHz (red) during the afternoon, but also appear at 23.4kHz. The earlier unclassified flare has produced a strong SID at 23.4kHz (blue trace), although less clear at 22.1kHz (red). The SWPC bulletin does not classify this flare, but the GOES15 data shows a peak of C2.3 at 10:47UT. There does not appear to be a VHF noise burst associated with this flare.



Charts by Colin Clements (Lisburn). Note that the time scales are different on these two charts.

Another strange non-flare SID was recorded on the 26th at 24kHz. Mark Edwards reported a series of peaks at 19:39, 19:43 and 19:48UT, the last being the strongest. His recording has been matched with one by Phil (G4JVF) in Chesterfield:

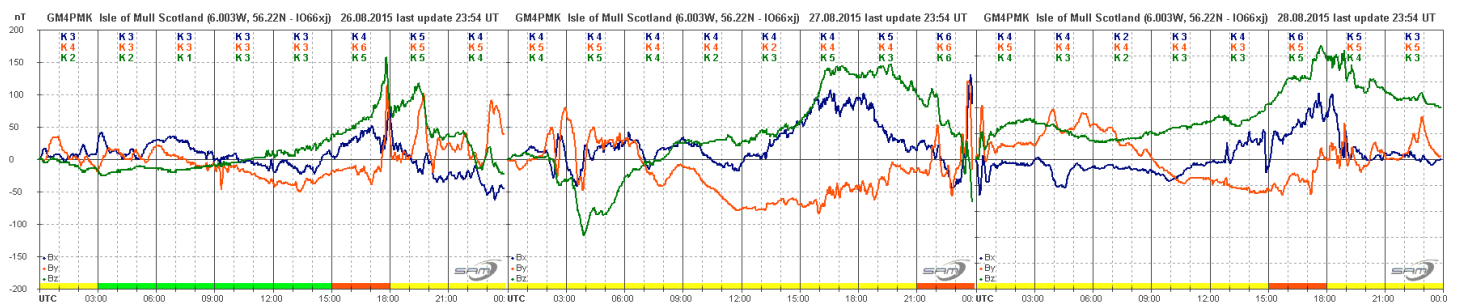


Mark's is the upper trace, Phil's is the lower trace. The genuine flare SID is in the centre of the chart, while the non-flare peaks are towards the right. There was some magnetic activity around this time, but the association is not clear.

Approaching the west limb of the Sun by the 27th, AR12403 continued flaring until the end of the month, although with mostly lower-energy events.

MAGNETIC OBSERVATIONS.

The magnetic activity mentioned above was a combination of CME and CHSS effects. The M1.2 flare recorded at 06:50UT on the 22nd produced a weak CME which added to the already present CHSS to produce a fairly active period late on the 26th, continuing on the 27th and 28th.

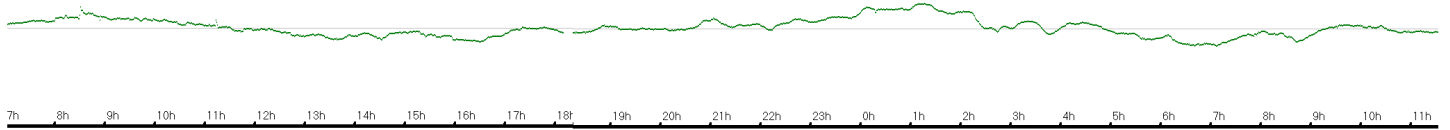


I have combined all three days from Roger Blackwell's magnetometer (above) to show the activity. The CME arrival time is not clear, although there is a possible SSC at 09:20 on the 26th. These figures give a transit time of nearly 100 hours. This was the only Earth-directed CME from AR12403, despite the large number of flares that it produced.

A large filament eruption on the 12th produced a CME that arrived on the 15th. The 13 degree long filament erupted at about 13:30UT from satellite images. Our magnetic recordings show an SSC at 08:30 on

the 15th, followed by a mild disturbance until mid-morning of the 16th.

2015 August 16



The SSC measures about 47nT on my chart (above), with a maximum disturbance of 120nT on the 16th.

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

ROTATION	KEY:	DISTURBED.	ACTIVE	SFE	B, C, M, X = FLARE MAGNITUDE.	Synodic rotation start (earrington's).
2454	F BC	10 11 12 13 14 15 16 17 18 19	20 21 22 23 24 25 26	27 28 29 30 31	2013 July	1 2 3 4 5 6
2455	F CB	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	1 2	
2456	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	2013 September	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	
2457	F	26 27 28 29 30 31	2013 October	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22		
2458	F	23 24 25 26 27 28 29 30 31	2013 November	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18		
2459	F	19 20 21 22 23 24 25 26 27 28 29 30	2013 December	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15		
2460	F	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2014 January	1 2 3 4 5 6 7 8 9 10 11		
2461	F	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2014 February	1 2 3 4 5 6 7		
2462	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	2014 March	1 2 3 4 5 6		
2463	F	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	1 2		
2464	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	2014 May	30 31		
2465	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 28 29	2014 June	30 31		
2466	F	27 28 29 30 31	2014 July	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19		
2467	F	23 24 25 26 27 28 29 30 31	2014 August	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15		
2468	F	20 21 22 23 24 25 26 27 28 29 30 31	2014 September	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15		
2469	F	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2014 October	1 2 3 4 5 6 7 8		
2470	F	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2014 November	1 2 3 4		
2471	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	2014 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 27 28		
2472	F	29 30 31	2015 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		
2473	F	25 26 27 28 29 30 31	2015 February	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20		
2474	F	21 22 23 24 25 26 27 28 29 30 31	2015 March	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19		
2475	F	20 21 22 23 24 25 26 27 28 29 30 31	2015 April	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15		
2476	F	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2015 May	1 2 3 4 5 6 7 8 9 10 11 12		
2477	F	13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2015 June	1 2 3 4 5 6 7 8		
2478	F	9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	2015 July	1 2 3 4 5		
2479	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	2015 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		
2480	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 29	2015 September	30 31		
2481	F	26 30 31	2015 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		