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# The British Astronomical Association

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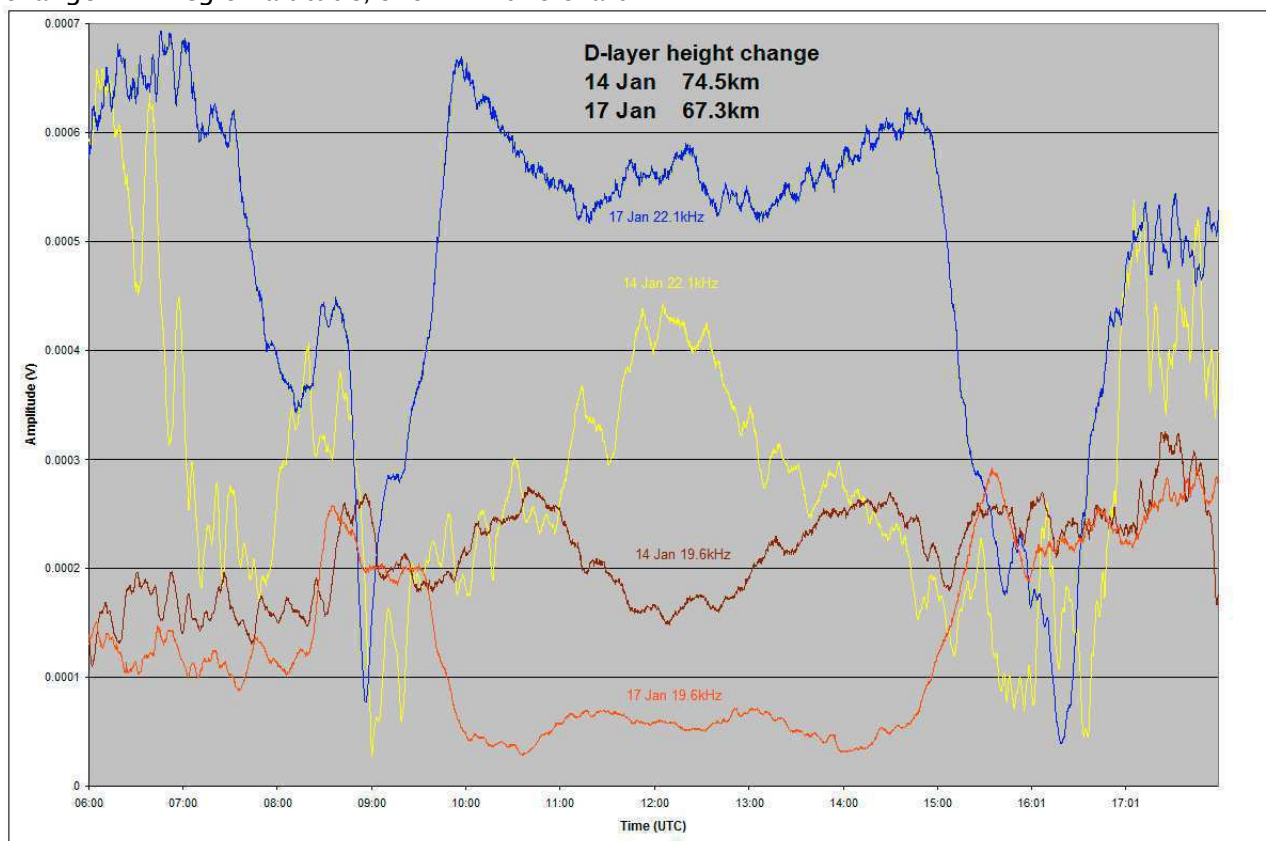
Please send all reports and observations to [jacook@jacook.plus.com](mailto:jacook@jacook.plus.com)

## BAA Radio Astronomy Section.

2020 JANUARY.

The year has started with another month of very low solar activity, with the X-ray flux measured by GOES15 remaining nearly flat. The SWPC bulletins show a few B1.1 flares, and a B1.3 on January 24<sup>th</sup>.

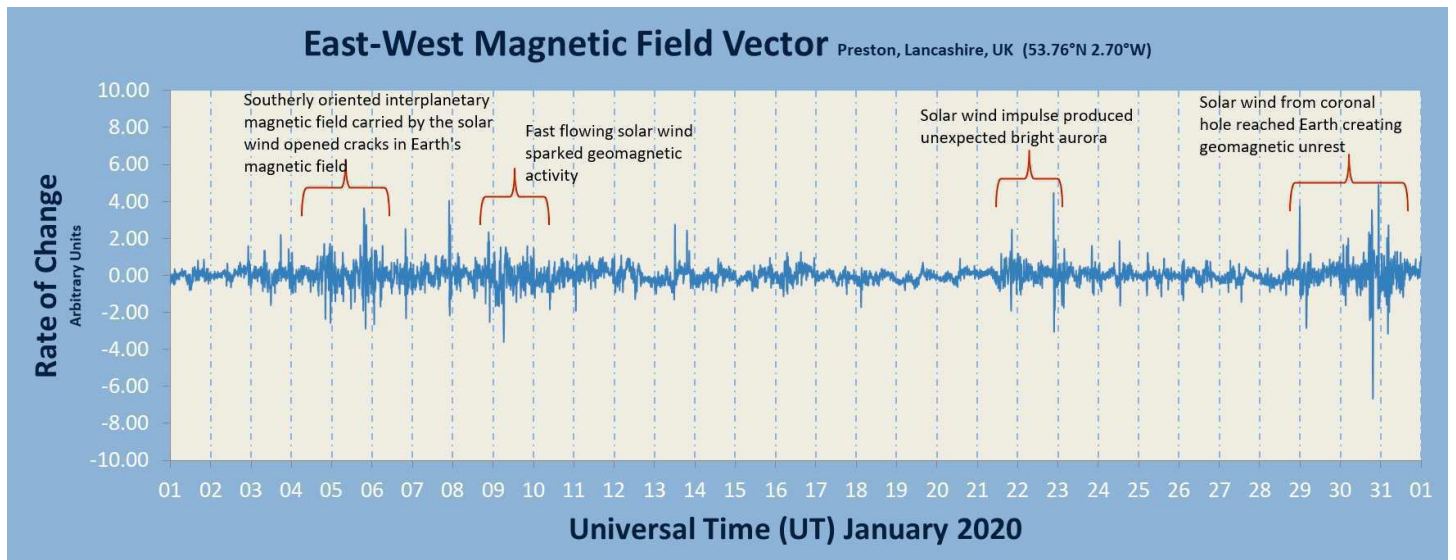
In the 2019 December summary I made the misleading statement that the jet stream was higher than the D-region. This is of course wrong. The jet stream runs at about 10km altitude, but does affect the weather patterns and distribution of high/low pressure regions. The rapid movement of these could cause turbulence at the base of the D-region when solar effects are low during the winter. In the UK we had a very high pressure region (1050mb measured here) during January, and Mark Edwards has noted a possible link to a very large change in D-region altitude, shown in this chart.



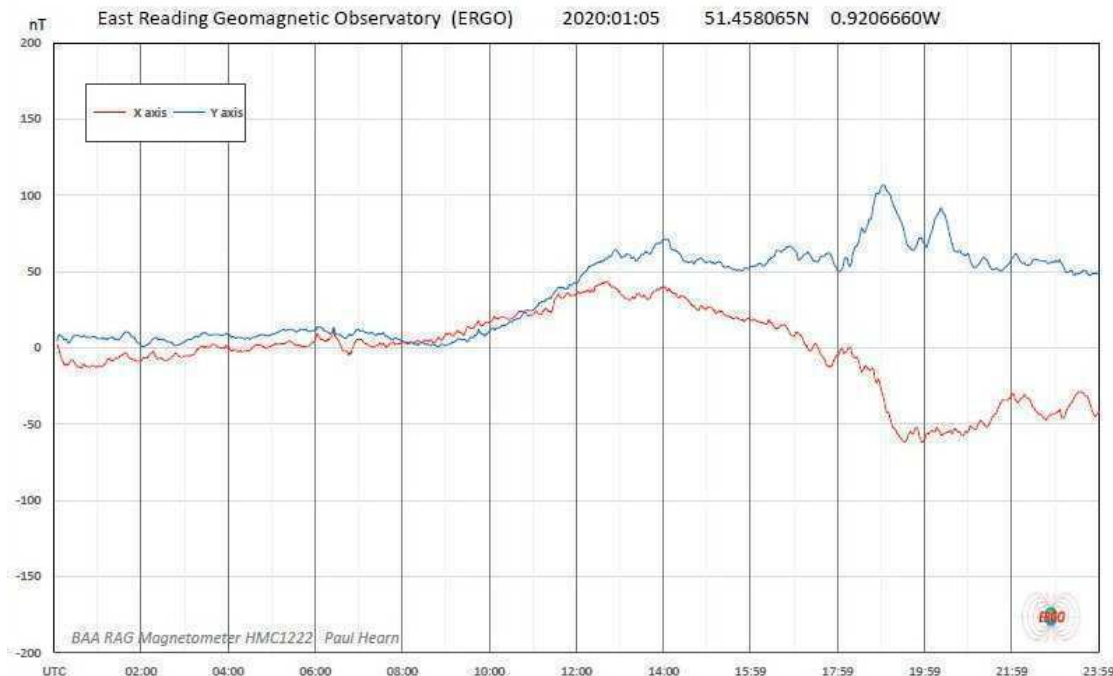
On the 14<sup>th</sup> the pressure was fairly low, but had risen significantly by the 17<sup>th</sup>. The difference in diurnal signal strength behaviour is clear, particularly at 22.1kHz. The small difference in path lengths between the two signals has allowed the 22.1kHz signal to pass through its in-phase state and back again, while 19.6kHz has passed through its out-of-phase state and back again, producing opposite curves in signal strength. Whether this is entirely due to strong weather patterns is not clear, so worth watching as winter progresses. Several observers also commented on the rapid changes in diurnal curves recorded.

## MAGNETIC OBSERVATIONS.

Magnetic activity through the month of January is neatly shown in this recording by Stuart Green:



The graph shows the rate of change of the magnetic field over the entire month, and was made using a fluxgate sensor buried underground to keep the temperature stable. Samples are taken at 2.5 minute intervals, and the rate of change is recorded. Stuart has highlighted the active periods along with the source of the activity. There were no Earth-directed CMEs shown in the satellite images, all of the activity being from increased wind speeds. A south polar coronal hole produced some mild activity on the 5<sup>th</sup>, shown in this recording by Paul Hearn:

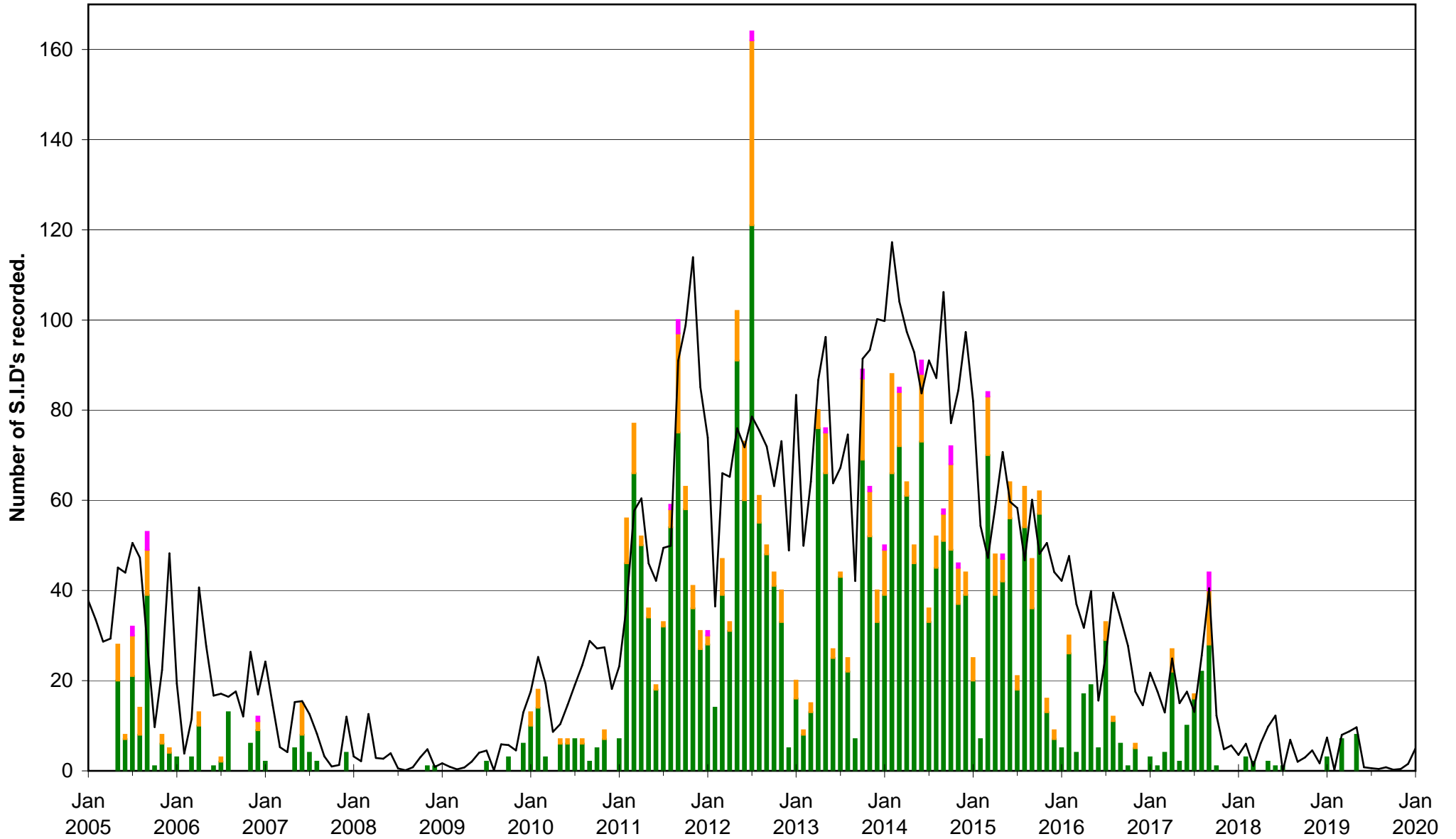
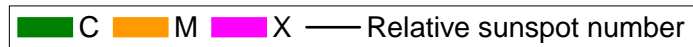


This hole made a repeat appearance at the end of the month with a further period of mild disturbance on the 30<sup>th</sup> and 31<sup>st</sup>. The repeating coronal hole seen last year has now dissipated after making seven returns, leaving a few much smaller holes with much reduced solar winds.

Magnetic observations received from Colin Clements, Roger Blackwell, Stuart Green, Paul Hearn and John cook.



### VLF flare activity 2005/20



BARTELS DIAGRAM

2502	F	27	28	29	30	31	2017 January	1	2	3	4	5	6	7	8	9	10	2186	11	12	13	14	15	16	17	18	19	20	21	22																							
2503	F	23	24	25	26	27	28	29	30	31	2017 February	1	2	3	4	5	6	2187	7	8	9	10	11	12	13	14	15	16	17	18																							
2504	F	19	20	21	22	23	24	25	26	27	28	29	30	31	2017 March	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17																					
2505	F	18	19	20	21	22	23	24	25	26	27	28	29	30	31	2017 April	1	2	3	4	5	6	7	8	9	10	11	12	13	2189																							
2506	F	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	2190	2017 May	1	2	3	4	5	6	7	8	9	10																							
2507	F	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	2191	2017 June	27	28	29	30	31	1	2	3	4	5	6																							
2508	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	2192	2017 July	1	2	3	M																					
2509	F	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	2193	20	21	22	23	24	25	26	27	28	29	30																								
2510	F	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2194	17	18	19	20	21	22	23	24	25	26																								
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2512	F	23	24	25	26	27	28	29	30	31	2017 October	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19																							
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2516	F	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	2200	2018 February	27	28	29	30	31	1	2	3	4																							
2517	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	2201	2018 March	1	2	3																				
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2521	F	24	25	26	27	28	29	30	31	2018 August	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	2205	2018 September	13	14	15	16	17	18	19															
2522	F	20	21	22	23	24	25	26	27	28	29	30	2018 September	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2206																							
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