

# Possible microwave sources of type III storms on 10th April 2019



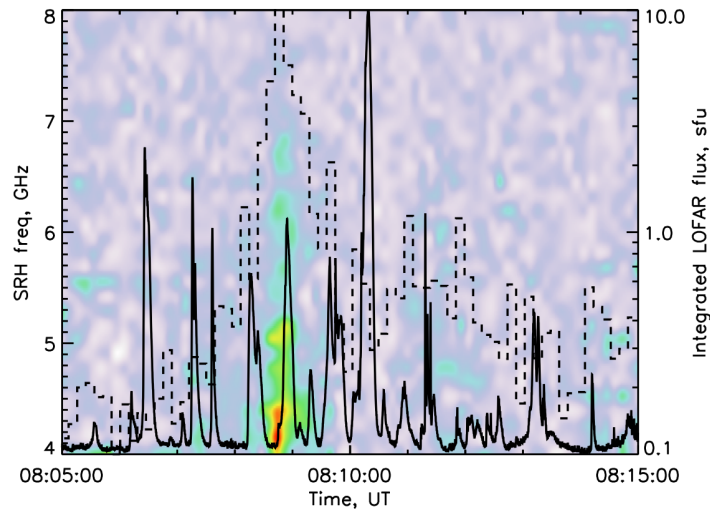
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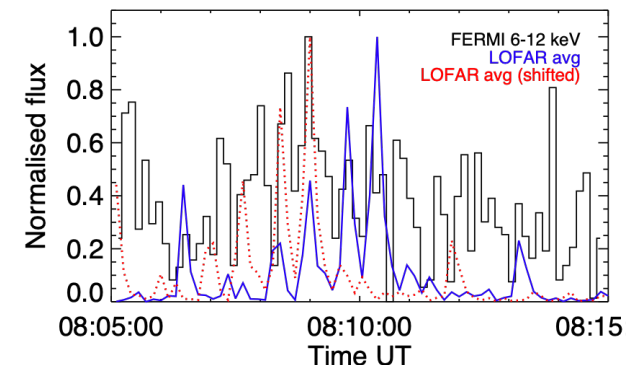
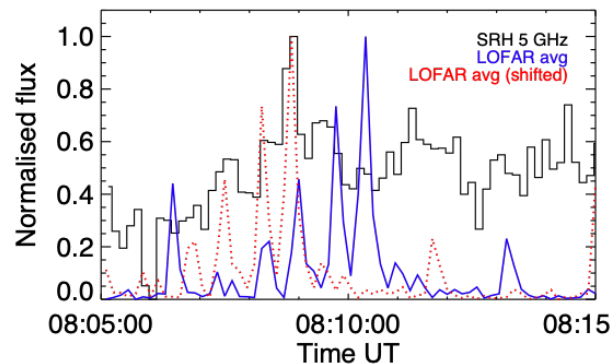
The type III storm observed by LOFAR on 10th April 2019 was followed by series of microflares detected within the 4-8 GHz range by Siberian Radioheliograph. We present the preliminary results of the study of the relationship between activity in microwave and radio ranges. We carried out the analysis of the quasiperiodicity observed in both frequency ranges and used data in MW and EUV for finding the possible source of the type III bursts.



The image is the dynamic spectrum synthesized from SRH correlation plots. The dashed line is SRH correlation at 4.38 GHz. The solid line is LOFAR flux integrated within 20-70 MHz

Data:

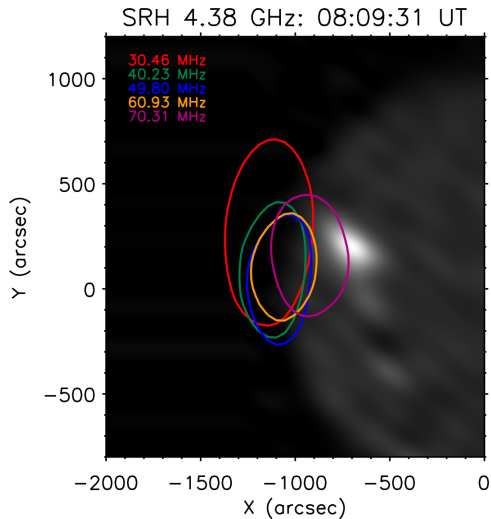
- The Low Frequency ARray (LOFAR) fluxes, averaged over 20-80 MHz
- Siberian Radioheliograph (SRH) correlation plots within 4-6 GHz
- FERMI/GBM -6 -12 keV



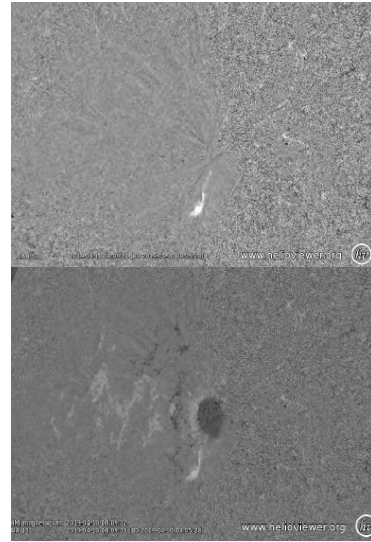
This event was followed by the type III storm, observed by LOFAR, with the delay 81 s (SHR) and 72 s (FERMI/GBM). All time profiles interposed to 9 s time bin.

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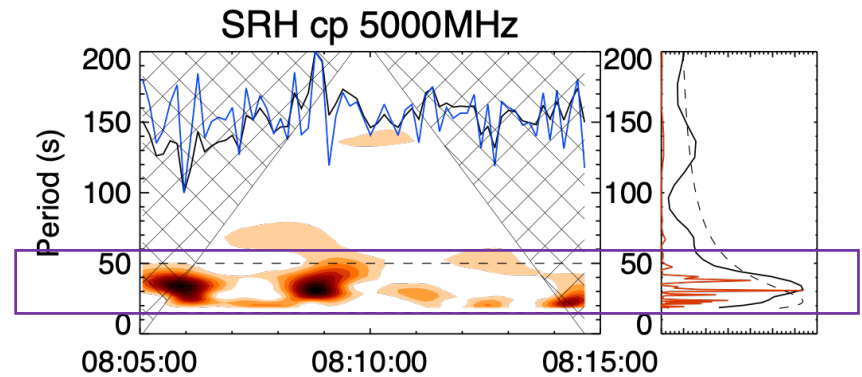
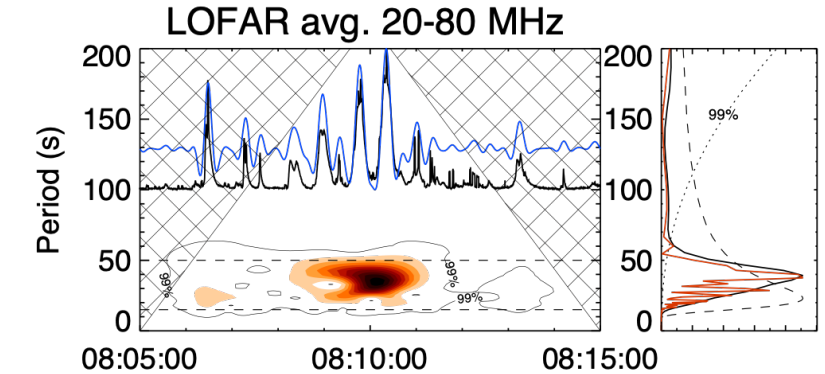
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The background is MW image 4.38GHz by SRH at moment of maximal burst. The contours is LOFAR images at moment of the maximal burst (08:10:20 UT)



Jet started at 08:06 UT has triggered the microflare emission enhancement at 4-6 GHz, observed by SRH.



Quasi-periodic pulses with  $P \sim 30-40$ s were found both in the LOFAR data and in SRH data (at the very limit of the wavelet and Fourier periodogram methods).

