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Decimetric Fine Structures as Signatures of Plasma Emission Mechanism and Magnetic Morphology of Flaring Loops

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Fernandes, Francisco; Sawant, Hanumant; Dutra, José; Cecatto, José

The Brazilian Solar Spectroscop (BSS), regularly operating in the frequency range of 1000 - 2500 MHz, since 1998, have recorded many radio bursts showing various types of fine structures, including type III, type III-RS (reverse slope), type U and type J bursts. Those radio emissions have been classified according to their morphological aspects in the recorded radio dynamic spectra. Such emissions, recorded as well as in metric or decimeter frequency ranges, show positive and/or negative frequency drift rates, and have been interpreted as signatures of electron beams traveling along to the magnetic structures and interacting with the ambient plasma, generating electromagnetic emissions (radio emissions) at the local electron plasma frequency and its harmonics, by plasma emission mechanism. In this case, the characteristics of the radio emission present in the dynamic spectra reveal the aspects of the magnetic morphology of the loops. Here, we present the results of the analysis of a sample of decimeter fine structures (type III, III-RS, U and J bursts) recorded by BSS, as evidence of the plasma emission from propagating electron beams traveling along the closed or open magnetic lines in a flaring scenario. Details of the high resolution observations, the determined parameters of the bursts, as frequency drift rates, and starting and ending frequency and turning frequency and also the estimated physical parameters of the sources, as estimated magnetic field in the loop, will be presented and discussed.

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