

Analysis of narrowband dm-spikes observed during the august 5,2003 flare.

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Groups of narrowband dm-spikes superimposed on broadband pulsations, observed in the 1-2 GHz frequency range, simultaneously by the Brazilian Solar Spectroscope and Ondrejov radiospectrograph during the August 5, 2003 flare are presented. Two methods of an analysis of these spikes were used: a) The Fourier method searching frequency structures in time integrated data, and b) detailed analysis of the distribution of frequency and time structures using multiresolution wavelet analysis. While the first approach is conceptually connected with an expectation that the narrowband dm-spikes are generated in the MHD plasma turbulence without any preferential spatial scales, the wavelet analysis is searching for the preferential scales. Using the Fourier method the power spectra with the power-law indices in the range (-0.90 - -1.26) were found. On the other hand, the wavelet analysis revealed three significant frequency sizes: 1) wideband pulses (about 0.5 GHz), 2) narrowband pulses (0.12 and 0.04 GHz) and 3) small scale pulses (0.01 GHz). Moreover, the wavelet analysis shows a splitting and drifting of specific harmonics, an increase of significant periods of the narrowband pulses (e.g. from 3s to 7s, and from 9s to 19s), and simultaneous decrease of significant periods of broadband pulses (4.2s, 7.8s, 17.1s). But generally the significant periods of the narrowband pulses coincide with those of the broadband pulses. The results are interpreted within the model of spikes generated in a non-stationary MHD plasma turbulence.

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