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Poster

STATISTICAL ANALYSIS OF LANGMUIR WAVES ASSOCIATED WITH TYPE III RADIO BURSTS: II SIMULATION AND INTERPRETATION OF THE WAVE ENERGY DISTRIBUTIONS

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We have modeled electrostatic Langmuir waves by an electric field, $E(t)$, consisting of superposition of Gaussian wave packets with several probability distributions of amplitudes, $\log(A^2)$, and with several Poisson distributions of number of wave packets in 1 s. The outcome of the model and the simulations is that the plane of WIND observations, specially for low frequency receivers within WAVES experiment, can be covered by a combination of following assumptions: (1) from WIND observations is not possible to conclude whether the input wave amplitudes distributions are closer to log-normal than to Pearsons type I, or uniform; (2) the average number of wave packets in 1 s is between 0.1 and 50. Therefore, there is a clear need to measure Langmuir waves energy distributions directly at the waveform level and not a posteriori in the spectral domain. This is what is planned to be implemented on the RPW (Radio and Plasma Wave Analyzer) instrument on Solar Orbiter.