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Numerical simulations of coronal type III solar radio bursts

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For type III solar radio bursts, plasma emission is generally accepted as the main emission mechanism. This mechanism consists of several steps that involve quasi-linear electron beam-Langmuir wave interactions, and nonlinear interactions among Langmuir waves, ion-sound waves, and electromagnetic waves. We report here new numerical simulations for coronal type III radio emission, including the dynamics of electron beams, Langmuir waves, ion-sound waves, and electromagnetic radiation. Dynamic spectra for radiation reaching a remote observer are presented, and compared quantitatively with observations at Earth. The consistency of the numerical results with observed type III characteristics (e.g., radiation flux intensity and frequency drift rate) are demonstrated. The implications of simulation results on beam parameters in the acceleration region are commented on.