DYNAMICS OF A MODULATED ELECTRON BEAM IN HOMOGENEOUS PLASMA: 2D SIMULATION

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S u m m a r y

The interaction of a thin modulated electron beam with homogeneous plasma in a 2D planar geometry is investigated by the PIC method. The cases of subcritical and supercritical plasmas and the resonance interaction ($\omega_0 = \omega_p$) are considered separately. Effects of beam focusing and defocusing both in the longitudinal and transversal directions are observed. It is shown that a Langmuir wave is excited in the system due to the Cherenkov resonance. The influence of this wave on the beam dynamics is analyzed. The rapid excitation of an electrostatic wave with large amplitude and the nonlinear bounce oscillations of beam electrons in the potential minima of this wave are observed in the case of resonance interaction.