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Modulational Instability of Ion-Acoustic Waves in a Warm Plasma with a Relativistic Electron Beam

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Abstract: The modulational instability of ion-acoustic wave in a collisionless, unmagnetized plasma consisting of warm ions, hot isothermal electrons, and relativistic electron beam is studied. A modified nonlinear Schrödinger equation including one additional term that comes from the effect of relativistic electron beam is derived. It is found that the inclusion of a relativistic electron beam would modify the modulational instability of the wave packet and could not admit any stationary soliton waves.

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Key words: warm plasma, relativistic electron beam, ion-acoustic waves, modulational instability

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