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Arbitrary Amplitude Ion-Acoustic Solitary Waves in Electron-Ion-Positron Plasma with Nonthermal Electrons

Authors : Basudev Ghosh and Sreyasi Banerjee

Abstract : Using pseudo potential method arbitrary amplitude ion-acoustic solitary waves have been theoretically studied in a collisionless plasma consisting of warm drifting positive ions, Boltzmann positrons and nonthermal electrons. Ion-acoustic solitary wave solutions have been obtained and the dependence of the solitary wave profile on different plasma parameters has been studied numerically. Lower and higher order compressive and rarefactive solitary waves are observed in presence of positrons, nonthermal electrons, ion drift velocity and finite ion temperature. Inclusion of higher order nonlinearity is shown to have significant correction to the solitary wave profile for the same values of plasma parameters.

Keywords : Ion-acoustic waves, Nonthermal electrons, Sagdeev potential, Solitary waves
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