

Abstract

In this dissertation, we studied the characteristics of nonlinear ion acoustic solitary waves in ion beam cold and hot non-Maxwellian plasma. We used kappa distribution function to model the electrons and derived the KdV equation by considering the dynamics of ion beam and ions. In the case of Maxwellian plasma only positive potential structures can be found but in the case of kappa distributed plasma we obtain both positive and negative potential structures for different plasma parameters. Solitons change their polarity when the kappa index, beam velocity, phase velocity and ion to electron temperature ratio increase from a certain value for a particular set of other parameters. In general it is observed that the amplitude of positive potential structures remains higher than the negative potential structures for all cases.