

# Large amplitude ion-acoustic solitary waves in degenerate relativistic quantum plasmas with warm and cold ions

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**Abstract :** A large amplitude ion-acoustic solitary waves have been investigated in an degenerate relativistic quantum plasma consisting relativistically degenerate light ion species, non-degenerate warm heavy ion species and relativistically degenerate electrons. The energy integral balance equation is derived from the fluid dynamical equations by using the well-known Sagdeev pseudo-potential method. The upper limit and lower limit of Mach number determined numerically for existence of solitary waves. The effect of relativistic parameter on the propagation of solitary waves has been examined. The corresponding phase trajectory of solitary wave has drawn for the existing domain. The influence of various plasmas parameters such electrons density, temperature ratio, Mach number on formation of soliton has been studied. The basic properties of large amplitude solitary waves, that may propagated in some realistic astrophysical plasma systems (e.g., in white dwarfs), are briefly discussed.