Title	Envelope solitons in three-component degenerate relativistic quantum plasmas.
Author(s) Name	S. Islam, S. Sultana, A. A. Mamun
Contact Email(s)	sislam@aiub.edu, ssultana@juniv.edu, mamun_phy@juniv.edu
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Abstract

The criteria for the formation of envelope solitons and their basic features in a three-component degenerate relativistic quantum plasma (DRQP) system (containing relativistically degenerate elec trons, non-degenerate inertial light nuclei, and stationary heavy nuclei) are theoretically investigated. The nonlinear Schrödinger equation is derived by employing the multi-scale perturbation

technique. The envelope solitons are found to be associated with the modified ion-acoustic waves in which the inertia (restoring force) is provided by the mass density of light nuclei (degenerate pressure of cold electrons). The basic features of these envelope solitons, which are found to formed in such a DRQP system, and their modulational instability criteria (on the basis of the plasma parameters associated with the degenerate pressure of electrons, number densities of degenerate electrons, inertial light nuclei, and stationary heavy nuclei) are identified. The numerical simulations are also performed to confirm the stability of the envelope solitons predicted here by analytical analysis. Published by AIP Publishing.