

عنوان مقاله:

Low relativistic effects on the modulational instability of rogue waves in electronegative plasmas

محل انتشار:

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خلاصه مقاله:

Abstract Relativistic ion-acoustic waves are investigated in an electronegative plasma. The use of the reductive perturbation method summarizes the hydrodynamic model to a nonlinear Schrödinger equation which supports the occurrence of modulational instability (MI). From the MI criterion, we derive a critical value for the relativistic parameter α , below which MI may develop in the system. The MI analysis is then conducted considering the presence and absence of negative ions, coupled to effects of relativistic parameter and the electron-to-negative ion temperature ratio. Under high values of the latter, additional regions of instability are detected, and their spatial expansion is very sensitive to the change in α and may support the appearance of rogue waves whose behaviors are discussed. The parametric analysis of super-rogue wave amplitude is performed, where its enhancement is debated relatively to changes in α , in the presence and absence of negative ions.

کلمات کلیدی:

Relativistic electronegative plasma, Rogue waves, Modulational instability

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