البحث الثالث

Title: Dust-ion-acoustic solitary waves in a dense pair-ion plasma
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Abstract. The nonlinear properties of the dust-ion-acoustic waves (DIAWs) are investigated by using the hydrodynamic equations together with the Poisson equation in a collisionless pair ion dense plasma containing positive and negative ions, fraction of stationary charged (positive or negative) dust grains and degenerate electrons. An energy balance-like equation involving a Sagdeev-type pseudo-potential is derived. Finite amplitude solutions are obtained numerically and their characteristics are discussed. The small-but finite-amplitude limit is also considered and an exact analytical solution is obtained. The present studies might be helpful to understand the excitation of nonlinear dust-ion-acoustic solitary waves in a dense plasma such as in superdense astrophysical objects.