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**Experimental observation of dust ion acoustic wave propagation in a negative ion rich dusty plasma** NIRAB CHANDRA ADHIKARY, HEREMBA BAILUNG, Institute of Advanced Study in Science and Technology, PLASMA PHYSICS LABORATORY TEAM — In the present work nonlinear propagation of dust ion-acoustic (DIA) solitary waves (SWs) in a negative ion rich dusty plasma is experimentally investigated. The effect of negative ions on the formation of rarefactive solitary wave in a dusty double plasma device is observed and its characteristics are analyzed. The important observation in this work is that; for the present dusty plasma condition, the applied electric perturbation cannot form a train of rarefactive solitons while propagating, until a sufficient amount of negative ions is introduced into the dusty plasma. It is also observed that the viscosity in the dusty plasma plays a crucial role in the formation and dissipation of solitary waves. The velocity and width of the solitary waves are measured and compared with numerical results obtained from the Korteweg–de Vries (K-dV) Burgers equation.

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