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Solitary Wave Structures in Inhomogeneous Magnetized Plasma having Trapped Electrons and Dust Grains RAVINDER KUMAR, Indian Institute of Technology Delhi, AJAY SINGH, DCE Farrukhnagar, Haryana, HITENDRA MALIK, Indian Institute of Technology Delhi — An ordinary plasma which contains positive ions and electrons generally supports the propagation of compressive solitons (density hill type structure). However, if negative ions are also present in the plasma, rarefactive solitons (density dip type structure) can occur. The soliton structure can trap plasma particles and convect them over large distances. Hence, they can contribute to the transportation of anomalous particles and the energy from one region to another in laboratory, astrophysical and space related plasmas. In most of the real situations, some dust particles are always present in the plasma that may get negatively charged. Therefore, we investigate here the nonlinear solitary wave structure in an inhomogeneous magnetized plasma that has trapped electrons and negatively charged dust grains. Our calculations show that two types of modes are possible in the plasma which correspond to the propagation of solitary structures under certain conditions. These conditions are obtained and the propagation characteristics of the solitary waves are investigated under the effect of charge of dust grains, magnetic field, obliqueness of the wave propagation, etc.

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