Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

Soliton Reflection in a Magnetized Cold Plasma having Dust Grains and Trapped Electrons HITENDRA K. MALIK, OMVEER SINGH, RAJ P. DAHIYA, Indian Institute of Techology Delhi — A solitary wave is said to be a soliton if it retains its shape after collision with another solitary wave. The solitons get reflected from a boundary or the density gradient present in the plasma. In the present work, the reflection of a soliton is studied in a magnetized cold plasma having dust grains and trapped electrons. Considering the density inhomogeneity in the plasma, we derive relevant modified Korteweg-deVries (mKdV) equations for the right and left going solitary waves and then after coupling these equations at the point of reflection we solve the coupled equation for obtaining the expression for the reflection coefficient based on which the soliton reflection is examined under the effect of magnetic field, dust grain density, and the temperature of trapped electrons. Specifically the role of trapped electrons and dust grains is uncovered for the excitation of solitary waves and their reflection.

Hitendra K. Malik
Indian Institute of Techology Delhi

Date submitted: 18 Jun 2012 Electronic form version 1.4