

**OBSERVATION OF ARBITRARY AMPLITUDE DUST  
ION- ACOUSTIC SOLITARY WAVES/ DOUBLE  
LAYERS IN A NON- MAXWELLIAN PLASMA**

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Interaction between dust particles and plasmas produce interesting results, both in laboratory and space environments. Nonthermal electrons<sub>1</sub> are the energetic electrons present in a variety of astrophysical plasma environments. The natural space environment, planetary magnetospheres and astrophysical plasmas are generally seems to have a non-Maxwellian high energy tail. Kappa distribution<sub>2</sub> is useful to model such plasmas. In this paper, two models are considered with inertial warm ions, static dust, along with nonthermal electrons and kappa distributed electrons. Dust-ion acoustic solitary waves/ double layers are observed with Sagdeev's pseudopotential<sub>3</sub> approach. Exact analytical expressions are obtained for the Sagdeev potential and also calculated numerically. Comparison of results obtained here for the two plasma models has been done. Model with nonthermal electrons gives the existence of both solitary waves and double layers. Whereas model with kappa distributed electrons shows only the existence of solitary waves. A parametric range of different plasma parameters is investigated in some details for the existence of nonlinear wave structures.

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