Speed and Shape of Electrostatic Waves in Dust-Ion Plasma

Prasanta Chatterjee and Bholanath Sen

Department of Mathematics, Siksha Bhavana, Visva Bharati, Santiniketan, India

Reprint requests to P. C.; E-mail: prasantachatterjee1@rediffmail.com

Z. Naturforsch. **61a,** 661 – 666 (2006); received August 28, 2006

Nonlinear dust acoustic waves are studied in a magnetized plasma. Quasineutrality is considered. The existence of a soliton solution is determined by a pseudo-potential approach. Sagdeev's potential is obtained in terms of $U(=\alpha u_{\mathrm{dx}}+\gamma u_{\mathrm{dz}})$, the component of the dust-ion velocity in the direction of the propagation of the wave. It is shown that there exists a critical value of U, beyond which the solitary waves cease to exist.

Key words: Electrostatic Waves; Soliton; Pseudopotential; Dusty Plasma.