

Instabilities in Ionospheric Dusty Plasmas

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Abstract

Dust can occur in various regions of the ionosphere including polar mesospheric clouds, dusty meteor trails, and expanding gas-dust clouds from rocket exhaust. The dust grains can be electrically charged since they are immersed in a plasma and radiative environment. Instabilities in ionospheric dusty plasmas may arise due to relative drifts between the charged dust and the background electrons and/or ions. Recent work on several possible instabilities is discussed. These include an ion acoustic instability in a dusty meteor trail [1] and a lower hybrid instability driven by charged streaming dust associated with rocket exhaust [2]. Implications of the instabilities for radar scattering are considered.

[1] M. Rosenberg and R. L. Merlino, *Planet. Space Sci.* **55**, 1464 (2007).

[2] M. Rosenberg and G. Sorasio, *J. Spacecr. Rockets* **43**, 245 (2006).