Dust Acoustic Wave Experiments at the University of Iowa

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Summary

Dust acoustic waves are low frequency compressional disturbances that propagate in dusty plasmas. They were first predicted theoretically by Rao, Shukla and Yu [1], and subsequently observed in dusty plasma experiments [2, 3, 4]. DAWs can be observed visually by laser light scattering from the dust particles. They are a ubiquitous feature of dust embedded in gaseous discharge plasmas where they may be excited spontaneously by an instability [5,6], or driven by a modulation applied to the discharge current [7]. We will describe recent work in which the DAW dispersion relation was measured at frequencies up to 100 Hz [8], and compared with theoretical predictions of kinetic theory [9]. We will also present preliminary results on the scattering and diffraction of DAW from various objects in the dusty plasma.

Acknowledgments

This work was supported by the U. S. National Science Foundation and Department of Energy.

References