

Abstract Submitted
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Observations of dust acoustic waves driven at high frequencies¹

ROSS FISHER, ROBERT MERLINO, University of Iowa, EDWARD THOMAS, Auburn University — Previous measurements of the dispersion relation of dust acoustic waves (DAW) have been restricted to frequencies less than 35 Hz. We report new measurements of the DAW dispersion relation with driving frequencies up to 200 Hz. The experiments were performed in a dusty plasma produced in a argon DC glow discharge. Although DAWs are spontaneously excited in the dusty plasma, a sinusoidal modulation of the discharge current allows the DAW to be synchronized at the applied driving frequency. For each driving frequency, the average wavelengths of the DAW were determined by recording video images of the scattered light intensity. A comparison of the measured dispersion relation with the theoretical DAW dispersion relation indicates that finite dust temperature effects must be taken into account. A new interesting feature revealed in the experiment is the modulation of the ‘naturally’ excited DAW by the high frequency driven DAW, which appears as a fine structure in the video images of the waves.

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