Laboratory plasma with nanoparticles\textsuperscript{1} SCOTT ROBERTSON, University of Colorado, G. BANO, W. HANDLEY, X. WANG — An experiment has been constructed that creates dusty plasma with nanometer-sized particles that is similar to the ionosphere in which there are smoke particles from the ablation of meteoroids. A Zn vapor source is used to create a smoky gas of particles that are up to 100 nanometers in diameter. These are seen both by laser scattering and by electron microscopy. The Zn is evaporated into 5 Torr of argon and the DC discharge is run at 500 mTorr. The plasma density is $10^8 - 10^9 \text{ cm}^{-3}$ and the electron temperature is 1 eV. Plasma oscillations near 1 kHz, possibly dust acoustic waves, are detected by a probe when the oven is at 460 C when nanoparticles are present, but these oscillations are absent at 380 C when particles are absent. Analysis is complicated by the presence of variable amounts of Zn vapor. An afterglow plasma is created by interrupting the discharge periodically. Particles diffusing toward the wall are collected by a plate behind a screen mesh. The arrival time of these particles is $10 - 30 \text{ ms}$ after the disappearance of the electron signal. The particles arrive more quickly if the bias on the collector is increased, which supports the interpretation that this signal is from the nanoparticles.

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