Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Investigating Ion Drag In Perturbed Dusty Plasmas[1] TAYLOR HALL, EDWARD THOMAS, UWE KONOPKA, Auburn University — Complex, or dusty, plasmas are plasmas which contain charged microparticles, for example small silicon dust grains. In this study, we are particularly interested in the interaction between the charged dust particles and plasma ions through the ion drag force in a dc glow discharge plasma. Measurements of the dust particles are carried out through a technique called Particle Image Velocimetry (PIV) which calculates the average velocity field based on small particle groups. As an electrostatic perturbation is applied to the dust cloud, the particle motion is observed to change its direction of motion as the gas pressure is increased. Density and temperature measurements on the background plasma are conducted for both low and high voltage states of the perturbation. An analysis of the dust particle motion and background plasma parameters suggests that there is a competition between the electrostatic force and the ion drag force on the particles. This presentation will discuss techniques and results of the calculations as well as the implications for future work on microgravity experiments.

[1]This work is supported by funding from NASA/JPL

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Date submitted: 11 Jul 2014 Electronic form version 1.4