

Abstract Submitted
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A Study of Ion Drag for Ground and Microgravity Dusty Plasma Experiments TAYLOR HALL, EDWARD THOMAS, Auburn University — This presentation presents the results of a recent study of the interaction between charged dust particles and plasma ions through the ion drag force in a dc glow discharge plasma. Measurements of the dust particles motion are carried out using Particle Image Velocimetry (PIV). When an electrostatic perturbation is applied to the dust cloud, the particle motion, in response to the perturbation, is shown to reverse direction as the gas pressure is increased. An analysis of the dust particle motion and background plasma parameters suggests that there is a competition between the ion drag and electric forces on the particles. These forces are calculated for a range of pressures using detailed measurements of the plasma parameters carried out by a single Langmuir probe. The analysis of these measurements suggests that a change in the relative magnitude of the Coulomb collision ion drag compared to the electric force is a probable explanation for the observed reversal of direction of motion as the neutral gas pressure is increased. The application of these results to microgravity studies of dusty plasmas will be discussed. Support provided by NASA-JPL (JPL-RSA 1471384)

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