

## **Laboratory Measurements of Dust Charging in Flowing Plasmas**

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The coupling of macroscopic charge carriers (dust) in plasmas to electric and magnetic fields plays a critical role in shaping the size and spatial distribution of these particles. Planetary rings, noctilucent clouds, and comets are all examples where dusty plasma effects have been suggested to explain a number of observations. In all of these environments, the charging of the dust particles plays a crucial role. Charging of dust particles in thermal plasmas has been studied both theoretically and experimentally. Here we describe a new experimental setup for the investigation of dust charging in both non-flowing and flowing plasmas, and present preliminary results. Dust particles with diameters of 100-120  $\mu\text{m}$  are released via a dust dropper and exposed to plasma before being collected in a Faraday cup, where the charges of individual grains are measured. A new design in the non-flowing plasma experiment is applied to minimize sheath effects on the charge measurements at the chamber wall. Charging of dust particles in flowing plasma is carried out at the Colorado Solar Wind Experiment (CSWE) facility, which creates simulated solar wind flow with ion energies up to 1 keV. The effect of dust size, plasma composition, and flow speed will be discussed.