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The Effects of an External Perturbation on an Existing Dusty Plasma[1] JOSEPH SHAW, PATRICK DONNAN, EDWARD THOMAS, Auburn University — This project seeks to understand how the confinement and instabilities of an existing dusty plasma cloud are modified by the introduction of external perturbations. This external perturbation can come from one of two sources: the streaming of a secondary population of dust particles or the introduction of a quickly decaying secondary plasma population. In the first case, a streaming population of particles are gravitationally accelerated into the existing dust cloud. In the second case, secondary plasma is generated via additional electrodes that create a plasma shock which perturbs the existing dust cloud. High-speed imaging and Particle Image Velocimetry (PIV) techniques are used to measure and characterize the motion of the particles before and after the applied perturbations over a range of neutral pressures and electrode bias voltages. It is postulated that these processes may be analogous to phenomena that can occur in the space environment.

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