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Dynamics of Dust Aggregates in a Complex Plasma ALLEN DAVIS, JORGE CARMONA REYES, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — Charged dust aggregates play an important role in many astrophysical phenomena, such as early stages of protostellar and protoplanetary growth, the dynamics of planetary rings and cometary tails, and the formation of noctilucent clouds in earth's upper atmosphere. Dust is also expected to be an unwanted byproduct in the operation of plasma fusion devices, such as ITER. In all of these environments, direct study of the dust aggregates in their *in situ* environment is extremely difficult, if not impossible. As a model for these complex plasma environments, dust aggregates are formed in a laboratory plasma as monodisperse spheres are accelerated in a self-excited dust density wave. Individual dust particles are perturbed using a diode pumped solid state laser (Coherent VERDI) with their motions recorded by a high-speed camera at 1000 fps. Analysis of the particle motion allows determination of the aggregate characteristics which determine the grain dynamics, such as charge, mass, and gas drag.

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