

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**Dust particles as probe in a complex plasma**<sup>1</sup> RAZIYEH YOUSEFI, ALLEN DAVIS, JORGE CARMONA-REYES, LORIN MATTHEWS, TRUELL HYDE, CASPER, Baylor University — Understanding the behavior of dust particles in a complex plasma requires a knowledge of the basic properties such as the net electrostatic charge and dipole moment of the dust as well as the local electrostatic fields. In this study, dust aggregates are formed from gold coated monodisperse spherical melamine-formaldehyde monomers in a radio-frequency (rf) argon discharge plasma. The behavior of observed dust aggregates is analyzed both by studying the particle trajectories and by employing computer models examining 3D structures of aggregates and their interactions and rotations as induced by torques arising from their dipole moments. These allow the basic characteristics of the dust aggregates, such as the electrostatic charge and dipole moment, and local electrostatic fields to be determined from the behavior of particles. It is shown that the experimental results agree with predicted values from computer models for aggregates in these environments.

<sup>1</sup>This work was supported by the National Science foundation under Grant No. 0847127.

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Date submitted: 07 Jul 2014

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