Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Charged Dust Aggregate Interactions[1] LORIN MATTHEWS, TRUELL HYDE, CASPER, Baylor University — A proper understanding of the behavior of dust particle aggregates immersed in a complex plasma first requires a knowledge of the basic properties of the system. Among the most important of these are the net electrostatic charge and higher multipole moments on the dust aggregate as well as the manner in which the aggregate interacts with the local electrostatic fields. The formation of elongated, fractal-like aggregates levitating in the sheath electric field of a weakly ionized RF generated plasma discharge has recently been observed experimentally. The resulting data has shown that as aggregates approach one another, they can both accelerate and rotate. At equilibrium, aggregates are observed to levitate with regular spacing, rotating about their long axis aligned parallel to the sheath electric field. Since gas drag tends to slow any such rotation, energy must be constantly fed into the system in order to sustain it. A numerical model designed to analyze this motion provides both the electrostatic charge and higher multipole moments of the aggregate while including the forces due to thermophoresis, neutral gas drag, and the ion wakefield. This model will be used to investigate the ambient conditions leading to the observed interactions.

[1]This research is funded by NSF Grant 1414523

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Date submitted: 24 Jul 2015 Electronic form version 1.4