

Abstract Submitted  
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**Effect of Stochastic Charge Fluctuations on Dust Dynamics<sup>1</sup>**

LORIN MATTHEWS, CASPER, Baylor University, BABAK SHOTORBAN, The University of Alabama in Huntsville, TRUELL HYDE, CASPER, Baylor University — The charging of particles in a plasma environment occurs through the collection of electrons and ions on the particle surface. Depending on the particle size and the plasma density, the standard deviation of the number of collected elementary charges, which fluctuates due to the randomness in times of collisions with electrons or ions, may be a significant fraction of the equilibrium charge. We use a discrete stochastic charging model to simulate the variations in charge across the dust surface as well as in time. The resultant asymmetric particle potentials, even for spherical grains, has a significant impact on the particle coagulation rate as well as the structure of the resulting aggregates. We compare the effects on particle collisions and growth in typical laboratory and astrophysical plasma environments.

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