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Discrete Stochastic Charging of Dust Aggregates Immersed in Plasma ABBEY HAINES, LORIN MATTHEWS, CASPER, Baylor University, BABAK SHOTORBAN, University of Alabama-Huntsville, TRUELL HYDE, CASPER, Baylor University — Numerical simulations treating the charge as a continuous variable have been used to model stochastic charge fluctuations on dust aggregates. These stochastic fluctuations in turn lead to differences in the interactions and dynamics of charged dust aggregates [Matthews et al., ApJ, 2013]. The continuity assumption is strictly valid when the overall charge collected on the grain is substantially larger than the elementary charge. However, small grains (with radii less than $1 \mu\text{m}$) or grains in a tenuous plasma environment are sensitive to single additions of electrons or ions, as their overall gained charge is comparable in magnitude to the elementary charge. In this work, a discrete stochastic method is employed to allow for integer increments of fluctuations of elementary charges collected on dust grains. Dynamic charging calculations during particle interactions are used to resolve the effects of the changing charge distribution due to stochastic charging effects.

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