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Phase Transition Studies for Conducting Dust in a GEC Reference Cell JORGE CARMONA REYES, TRUELL HYDE, LORIN MATTHEWS, DAVID GEORGE, MIKE COOK, CASPER - Baylor University, JIMMY SCHMOKE, CASPER-Baylor University — Dust particles immersed in plasma typically acquire a negative charge. The resulting Yukawa interaction between grains in a two-dimensional horizontal layer leads to the formation of disordered or ordered structures depending on whether short or long range ordering dominates, as determined by the ratio of the particle's interparticle potential energy to its average kinetic energy. Various stable crystalline phases have been observed experimentally for dust particles residing within such two-dimensionally extended lattice planes with system dynamics driven in large part by particle charge. Although the charging process for insulating materials has been examined in some detail, conducting materials have not yet been fully investigated. This work experimentally examines the phases and phase transitions for both conductive (gold coated) and nonconductive (melamine formaldehyde) particles. Phase maps for each type of particle are obtained using data from pair correlation functions and voronoi diagrams for dust structures formed over a range of pressures and powers within a standard GEC reference cell.

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