

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Phase Transitions in a Capacitively Coupled Dusty Plasma with Conducting Dust JORGE CARMONA-REYES, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — Complex plasma is present in a variety of environments including planetary rings, cometary tails, interplanetary clouds and semiconductor manufacturing and fusion environments. Understanding the physics behind such complex plasmas, particularly those comprised of conducting dust, is not well understood. In this work, a GEC reference cell is employed to examine the translational and orientational order of conducting dust contained within crystal lattice structures formed in a complex plasma. The Pair Correlation function, bond orientation function and Voronoi and polygon construction diagrams are used to measure dislocations and disclinations, yielding a quantitative measure of the overall phase of the structure. The role this phase transition process plays in the melting of conducting and non-conducting 2D structures will be discussed.

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Date submitted: 14 Jul 2011

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