

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Effects of particle dipole moments in a Coulomb Crystal KE QIAO, LORIN MATTHEWS, TRUPELL HYDE, CASPER - Baylor University — The study of interparticle forces and potentials within Coulomb crystals has long been an important and fundamental topic in the field of dusty (complex) plasma research. In a typical complex plasma experiment, the dust particles form a two-dimensional (2D) system having a single layer or a quasi-2D system with several layers due to the vertical gravitational confinement. It is generally agreed that particles within a layer interact through a Yukawa (screened Coulomb) potential. Interactions between particles within different layers are much more complex and not as well understood. One factor influencing such interactions is the possible formation of an effective dipole moment on the dust particles. Such a dipole moment can be induced either by anisotropic charging of the dust grain or the (re)distribution of plasma particles surrounding the grains. In this research a molecular dynamics (Box_Tree) simulation is employed to study the effect such a dipole –dipole interaction would have on a multilayer particle system. Simulation results will also be compared with recent experimental data.

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Date submitted: 02 Jul 2008

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