

Abstract Submitted
for the OSS11 Meeting of
The American Physical Society

Structural transitions in an anisotropic dusty plasma T.E. SHERIDAN, Ohio Northern University — Dusty (complex) plasma is a system of charged dust particles floating in an electron-ion plasma. Under appropriate circumstances, the particles can be confined in a two-dimensional potential well. For a biharmonic well, dust particle configurations range from straight lines, to ellipses, to circles. For highly anisotropic wells, the particles form a straight line, which becomes unstable to the zigzag as the well anisotropy is reduced. The zigzag configuration corresponds to a 2-chain in long systems. It is predicted that the 2-chain next makes a transition to a 4-chain. We have experimentally investigated this transition in a dusty plasma cluster with $n = 14$ monodisperse particles confined in a variable biharmonic potential well. For high well anisotropies the configuration is a “capped” zigzag. As the well anisotropy is reduced the zigzag units tilt until the local lattice is rectangular and then transition to the finite equivalent of a 4-chain. Other structural transitions are also observed, and will be discussed.

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Date submitted: 11 Mar 2011

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