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Structural Properties of Yukawa Tubes[1] K. TIERNEY, Boston College, H. BAUMGARTNER, C. HENNING, M. BONITZ, Universitaet zu Kiel — Due to the highly charged dust particles, complex plasma systems become strongly correlated and often arrange in interesting structures [1]. Direct measurements of plasma parameters are difficult [2], but simulations have been proven to work as a diagnostic tool for the plasma crystals being studied. Here, we investigate a one component Yukawa plasma limited in radial movement by a confining potential but unrestricted in the lateral direction. We performed extensive Monte Carlo simulations for different densities in a system with periodic boundary conditions and compared the results with an analytic theory. The dust particles are found to arrange in particularly interesting structures, which can be compared to 2D plasma crystals [3] in the radial direction, but unique in the chains created laterally which were found to be dependent on the density, the screening parameter in the Yukawa interaction, and the temperature.

[1] O. Arp et al., Phys. Rev.Lett. 93, 165004 (2004)
[2] M. Bonitz et al. Phys.Rev. Lett. 96, 075001 (2006)
[3] V.M. Bedanov et al., Phys. Rev. B 49, 2667 (1994)

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Kevin Tierney
Boston College

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