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Improved Shell models for screened Coulomb balls[1] M. BONITZ, H. KAEHLERT, C. HENNING, H. BAUMGARTNER, A. FILINOV, Inst. Theoretical Physics and Astrophysics, University Kiel, Germany — Spherical Coulomb crystals in dusty plasmas [1] are well described by an isotropic Yukawa-type pair interaction and an external parabolic confinement as was shown by extensive molecular dynamics simulations [2]. A much simpler description is possible with analytical shell models which have been derived for Yukawas plasmas in [3,4]. Here we analyze improved Yukawa shell models which include correlations along the lines proposed for Coulomb crystals in [5]. The shell configurations are efficiently evaluated using a Monte Carlo procedure. [1] O. Arp, A. Piel and A. Melzer, Phys. Rev. Lett. 93, 165004 (2004). [2] M. Bonitz, D. Block, O. Arp, V. Golunychiy, H. Baumgartner, P. Ludwig, A. Piel and A. Filinov, Phys. Rev. Lett. 96, 075001 (2006). [3] H. Totsuji, C. Totsuji, T. Ogawa, and K. Tsuruta, Phys. Rev. E 71, 045401 (2005). [4] C. Henning, M. Bonitz, A. Piel, P. Ludwig, H. Baumgartner, V. Golubnichiy, and D. Block, submitted to Phys. Rev. E [5] W.D. Kraeft and M. Bonitz, J. Phys. Conf. Ser. 35, 94 (2006).

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