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Short-time behavior of a spherically trapped Yukawa plasma[1]
HANNO KAEHLERT, MICHAEL BONITZ, ITAP, University of Kiel — The formation of correlations in non-ideal plasmas and the associated heating or cooling effects have attracted considerable attention in recent years [1-4]. These results were obtained for macroscopic plasmas. Here, this question is reconsidered for charged particles confined by a spherical trap. Langevin dynamics simulations are used to study the correlation buildup and the formation of a strongly correlated Coulomb liquid when starting from a completely uncorrelated state. We observe an oscillatory behavior of the potential energy with the signature of a breathing oscillation of the whole cluster and a strong dependence of the maximal heating effect on the initial density profile. Results are also presented for the temperature relaxation to equilibrium.

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[4] D. Semkat et al., Progress in Nonequilibrium Green's functions II, p. 83, M. Bonitz and D. Semkat (Eds.), World Scientific Publ. (2003)

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