Probability of metastable states in Yukawa clusters[1] PATRICK LUDWIG, HANNO KAEHLERT, HENNING BAUMGARTNER, MICHAEL BONITZ, Christian-Albrechts Universitaet zu Kiel — Finite strongly coupled systems of charged particles in external traps are of high interest in many fields. Here we analyze the occurrence probabilities of ground- and metastable states of spherical, three-dimensional Yukawa clusters by means of molecular dynamics and Monte Carlo simulations and an analytical method. We find that metastable states can occur with a higher probability than the ground state, thus confirming recent dusty plasma experiments with so-called Yukawa balls [1]. The analytical method [2], based on the harmonic approximation of the potential energy, allows for a very intuitive explanation of the probabilities when combined with the simulation results [3].
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