

Contribution submission to the conference Düsseldorf 2007

Normal modes of spherical dust clusters — •YURIY IVANOV¹, PATRICK LUDWIG², ANDRE MELZER¹, ALEXEI FILINOV², and MICHAEL BONITZ² — ¹Inst. für Physik der EMAU Greifswald, Felix-Hausdorff-Str. 6, 17489 Greifswald — ²ITPA der CAU Kiel, Leibnizstrasse 15, 24098 Kiel

Finite dust clusters are strongly coupled systems which allow to investigate small scale dynamics similar to the phonons in solid state. Finite systems make it possible to investigate the dynamics of individual particles on kinetic level with very high precision. We investigate the dynamics of spherical dust clusters, so-called *Yukawa Balls*, from experiment and from simulation. The experimental Yukawa Balls have been created in an argon rf-discharge in a confinement potential, created by an upward thermophoretic force and a horizontal force due to dielectric glass walls. Simulations have been performed in the frame of the molecular dynamics with a symmetrical confinement potential. To extract the dynamical features of experimental and simulated systems Normal Mode Analysis has been implemented. The experimental and simulation results yield the most important parameters of finite crystals, like the particle charge and the confinement potential, which have been compared between each other.

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Email: ivanov@physik.uni-greifswald.de