COLLECTIVE PARTICLE DYNAMICS IN ONE-COMPONENT CLASSICAL COULOMB PLASMA: SELF-CONSISTENT RELAXATION THEORY

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In this work the self-consistent relaxation theory of the collective ion dynamics in strongly coupled Coulomb classical one-component plasmas is presented. The information about the structure and the non-ideality parameter of the system is sufficient to describe collective dynamics over a wide range of spatial ranges. The main characteristic of the equilibrium collective dynamics of ions: the dynamic structure factor, the dispersion parameters are determined within the framework of the theory without using any adjustable parameters. The results demonstrate agreement with molecular dynamics simulation results.

This work was supported by the Russian Science Foundation (Project No. 19-12-00022).