APPROXIMATION OF WEAKLY DAMPED COLLECTIVE EXCITATIONS FOR YUKAWA ONE-COMPONENT PLASMAS

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One of the models of the strongly coupled plasma is the Yukawa liquid model: disordered one-component system of particles that interact with each other through the Yukawa (Debye-Hückel) potential [1–4]. In this paper, based on the self-consistent relaxation theory [2,3], the approximation of weakly damped collective excitations in the Yukawa liquid is considered. For the range of wave numbers corresponding to the generalized hydrodynamics regime, analytical expressions for the dynamic structure factor, dispersions of acoustic-like collective excitations and their damping decrement are obtained. The comparison of the theoretical results for different coupled and screening parameters with the corresponding simulation data reveals their agreement.

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