# Nonuniformity of structural and dynamic properties of a dusty plasma monolayer

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Dusty plasma systems have been long considered as a toy model for ordinary condensed matter. Experimentally observed structures of dust particles in a gas discharge plasma are employed to study phase transitions, transport processes and wave phenomena with the methods of video microscopy. At the same time, a set of unique properties makes dusty plasma not just a toy model but an independent object of research [1]. These properties are dissipativity, thermodynamic openness, nonreciprocal character of particle interactions etc. [2]

In the present work, we consider a commonly observed case of a dusty plasma system: a monolayer structure in conditions close to typical experimental ones. Behavior of dust particles in the monolayer is studied by solving their motion equations numerically. We show that the action of the horizontal parabolic confinement leads to a nonuniform spatial distribution of structural and dynamic properties of the monolayer [3,4]. For the first time, we demonstrate that anomalously high kinetic energy of dust particles also has a principally nonuniform spatial distribution in the system and decays with radial distance. Effect of the observed nonuniformity on the scenario of phase transitions is discussed.

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