

KINETIC ENERGY OF A MONOLAYER OF DUST PARTICLES IN GAS DISCHARGE PLASMA

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S u m m a r y

The phenomenon of the abnormal heating of oscillations of dust particles in a gas discharge plasma is studied. Equations of motion of dust particles with allowance for charge fluctuations and the structural features of a near-electrode layer are formulated. The molecular dynamics simulation of the system of dust particles is performed. The mechanism of increase of the average kinetic energy of dust particles in a gas-discharge plasma is proposed. It is shown that charge fluctuations cause forced oscillations, which tend to the warming up of vertical oscillations of dust particles. The combination of parametric and forced resonances can explain the anomalously high values of the kinetic energy of dust particles. The estimated frequency, amplitude, and kinetic energy of oscillations of dust particles are close to the experimental values.