INTERACTION OF DUST PARTICLES IN NON-EQUILIBRIUM PLASMA

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Interaction between two dust particles in non-equilibrium plasma at elevated pressures is performed. On the basis of asymptotic shielding theory resulting in two-exponential shielding the electrostatic energy of two charged fine particles is determined. The electrostatic energy dependence on interparticle distance proves to have a minimum as in equilibrium plasma. The electrostatic interaction force of the particles is calculated. This force is proved to be non-symmetric: for different charges the force acting on one dust particle was not equal to the force acting on the other dust particle. This is due to non-symmetric charge separation in the vicinity of different charged dust particles. It is stated that likely charged particles repel each other and at the closest approach the attraction is only possible. Relationships to determine modified nonideality parameter for the interaction potential, which consisted of two exponents with different shielding lengths, were obtained.