Abstract Submitted
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Interaction of dust particles in a plasma with an external source of gas ionization[1] ANDREY STAROSTIN, ANATOLY FILIPPOV, ALEXANDER PAL, ANATOLY ZAGORODNY — The interaction of two dust particles in no equilibrium plasma at elevated pressures has been studied. An asymptotic theory of screening, which leads to a two-exponential dependence of the dust particle potential on distance with different shielding lengths, is used to determine the electrostatic energy of the system of charges associated with the two dust particles. The dependence of the electrostatic energy on interparticle distance has been found to have a minimum, as in equilibrium plasma. The interaction force between the dust particles has been determined. It turned out to be asymmetric - for different charges the forces acting on the first and second dust particles are not equal. The force equality takes place only for the sinks of plasma particles proportional to the dust particle charge. This is the result of an asymmetric charge separation near dust particles with different charges and indicates that the interaction force in no equilibrium plasma is no potential in the common case. The potential energy of the interaction between the dust particles has been determined for the case of equal forces. Attraction between likely charged particles with different (in magnitude) charges has been found to be possible only when they come very close to each other. Relations for modified coupling parameter of an interaction potential that consists of two exponential terms with different shielding lengths were derived.

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