

Effective grain interactions and negative friction in dusty plasmas

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The kinetic equations describing plasma particle dynamics in dusty plasma are formulated on the basis of the appropriate Bogolyubov-Born-Green-Kirkwood-Yvon-hierarchy. The obtained equations are used to describe the effective grain potentials with regard to electron and ion absorption by grain, plasma particle collisions with neutral atoms and molecules and the presence of external electric field. The polarization forces acting on the grain in the plasma particle fluxes generated by the external electric field are calculated and the possibility of existence of the negative drag force is shown. The friction force in the case of the moving grain is also studied and the conditions of negative friction are established.