HYDRODYNAMIC APPROACH TO GRAIN CHARGING IN WEAKLY IONIZED PLASMAS

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S u m m a r y

Influence of the presence of a collisionless (Knudsen) layer around a dust grain in plasma and the electron emission from the grain surface on its charge and screening are investigated. It is assumed that no ionization and recombination occur in the vicinity of the grain. The criterion of the grain charge sign change is obtained. It is shown that, at asymptotically large distances, the electrostatic potential behaves as the Coulomb one with effective charge $Z_{\rm eff}$ which is always negative independently of the sign of the actual charge Z_d. Hence, for $Z_d > 0$, the electrostatic potential changes sign and has a minimum. This indicates the possibility of the existence of the electrostatic attraction between positively charged dust particles.