

Dust plasma in the stratified discharge in moderate magnetic field

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An imposing of magnetic field gives new properties to dusty plasma. The Magnetic field effects on plasma components selectively (depending on the chosen range); it causes anisotropy of dust structure (it reduces cross diffusion and mobility); it creates heterogeneity and instability in the dust trap. A divide of rf discharge on separate vertical "threads" [1,2], an emergence of instability in the glow discharge [3] and also a change of properties of striations and emergence of "magnetic" striations are well known [4].

In our previous research [5] it was obtained for the first time the dusty plasma in the conditions of the glow discharge in magnetic field up to 1 T. In the present thesis we discuss in details the problems of the obtaining of steady dust structures in the trap in standing striation in the glow discharge at a partial magnetizing of the plasma component.

In the experiment the dusty plasma was created in striations in the long discharge tube placed in the magnetic field created by a superconducting magnet. The dynamics of rotation of dust structure at the chosen discharge parameters depending on magnetic induction is measured.

The action of the ion drag force on dust structure and also the action of kinetic and unstable effects of the gas discharge (eddy electric current and convective-current instability) are discussed in details.

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