

DUST TRAP IN A GLOW DISCHARGE IN THE REGION OF A STRONGLY INHOMOGENEOUS MAGNETIC FIELD

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The study of dusty plasma in striations in a strong magnetic field is hampered by the effects of discharge instability and distortion of the dust trap when a magnetic induction achieved some value. Attempts to stabilize the discharge lead to a narrowing of the range of observation conditions. In our previous experiments carried out in cryomagnet it was found that near the upper end of the solenoid in the strong magnetic field the stable dust trap is formed. The dusty structure here has an elongated shape and rotates not uniformly in height in the direction opposite to the magnetic induction vector. Possible causes of rotation and quantitative assessments are discussed in this paper. First, this is the ion drag force in strata at radial ion flow in the longitudinal magnetic field. Second, this is the dragging by the rotating gas in striation. This mechanism causes the rotation of another sign than the observed one. Third, it is possible to consider the gradient drift of plasma (primarily ions) in a non-uniform magnetic field. But, according to the measurements made, the radial gradient of the longitudinal component of the field is extremely small. A feature of the dust trap being studied is the highly non-uniform magnetic field in which the discharge current channel expands and its radial component appears. The Ampere force here is possible because of the radial component of the current and the longitudinal component of the magnetic field.

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