

Levitation of dust particles trapped in the narrowing area of the current channel

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Stable dust traps exist in both capacitive and induction RF discharges, as well as in direct current discharges; but volumetric dust structures are observed only in RFI and direct current discharges. In experiments with dust traps in an external strong magnetic field, the most stable trap was found to be in a glow discharge in the area of narrowing of the current channel caused by placing a dielectric insert (stabilizing the discharge) in the discharge. The research carried out with this trap in a strong magnetic field and the model describing the behavior of dust particles require understanding the correct size of the levitating particles.

The work is devoted to determining the size of dust particles levitating in this trap in helium. The size was determined using a patented method of extracting particles from a discharge tube and processing the obtained samples using a microscope. As a result, particle size distributions were obtained depending on the discharge conditions in the discharge.

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