Investigation of a dust trap within an electric double layer formed by a varying cross-section of a current channel

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The paper presents experimental studies of a dust trap in a glow discharge in a double electric layer.
Studies of dusty plasma in a strong magnetic field have revealed a stable plasma dust trap in a double electric layer for a volumetric dust structure in fields up to 2.5 T in all working gases He, Ne, Ar. To describe the dynamics of dusty plasma under these conditions, it is essential to know the precise size of the dust particles levitating within the trap. This work examines the characteristics of the dust trap in the region where the current channel narrows.
Using the dust particle collection method, particle size distributions were obtained. Numerical estimates of the vertical force balance were performed using literature data on plasma parameters in a narrow discharge layer. The obtained results provide an idea of the magnitude of the potential jump in the layer and its distribution along the dust trap.
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