

(B) Characterization of DC glow discharge in Dusty Plasma Experimental (DPEX) Device

Abstract

A versatile π shaped Dusty Plasma Experimental (DPEX) device is built at Institute for Plasma Research (IPR) to conduct flow related experiments in dusty plasmas. It has several axial and radial ports used for different purposes. The complete description of geometry of this experimental setup and configuration of electrodes are described in [1]. A high voltage DC glow discharge plasma is produced in between disc shaped anode and tray shaped grounded cathode in the background of Argon gas. This experimental project aims for measuring various plasma parameters using different electrical probes. First a single Langmuir probe will be designed and used to estimate the plasma parameters like density, temperature, floating and plasma potentials. Later an Emissive probe will be developed and used to measure plasma potential and floating potential along the radial and the axial directions. It can also be used to estimate the sheath electric field, which helps the particle to levitate in the sheath. A Double Langmuir probe will also be used to measure instantaneous temperatures in the bulk plasmas. Lastly, a Mach probe will be used to measure directed velocity of ions during the generation of plasma flow. The results obtained by using different diagnostics will be compared and estimated some of the important dusty plasma parameters.

Reference

S. Jaiswal, P. Bandyopadhyay, and A. Sen, Review of Scientific Instruments 86, 113503 (2015)

Eligibility: Only students of M. Sc Physics branch can submit their application at

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