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(G) (POS-15) Characterization of Capacitively-Coupled radio-frequency argon discharge: comparison between the pristine, dusty and misty plasma regimes

Tuesday 28 May 2024 17:45 (2 minutes)

In this poster, a newly built Capacitively-Coupled radio-frequency argon discharge is used to explore the behaviours of pristine plasma, dusty plasma, and misty plasma. The primary objective is to analyse the behaviour of the discharges in various regimes, including single-drop and burst liquid drops regimes. Ultimately, the project aims to advance our understanding of aerosol-assisted plasma processes and their broad applications in nanomaterial synthesis and thin film deposition.

The interactions between the plasma and microscopic liquid droplets ("misty plasma") is of particular interest. Indeed, the droplet charging mechanism and the trapping of the droplet are still open issues in misty plasmas. The project specifically focuses on examining the evolution of Capacitively-Coupled Plasma argon discharge under diverse conditions: pristine discharge, microdroplet injections using different liquids, nanoparticle injections and dust, including ZnO (6 nm) and SiO2 (20 nm). Essential parameters such as droplet size, quantity, and injected species will undergo systematic testing and comparison to understand their effects on the discharge behaviour. The characterization of the Capacitively Coupled Plasma will involve various techniques, including Microwave Interferometry, Optical Emission Spectroscopy, and electrical diagnostics measurements.

Keyword-1

Misty Plasma

Keyword-2

Nanomaterial

Keyword-3

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