

Seminar

Institute for Plasma Research

Title : Experimental Study and Analytical Modeling of the Geometrically Asymmetric Dual Frequency Capacitively Coupled Plasmas

Speaker: Dr. Partha Saikia
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Date : 20th December 2018 (Thursday)

Time : 3.00 PM

Venue : Seminar Hall, IPR

Abstract :

We investigate the discharge behavior of dual frequency capacitively coupled plasmas driven at 2.26 and 13.56 MHz experimentally and by a non-linear global model. In the experiment, the pressure is varied from 1 mtorr to 60 mtorr. The electron density, electron temperature as well as the ion current are measured as a function of the low frequency power at fixed values of the high frequency power for different pressures. It is found that the frequency coupling and the secondary electrons have profound effects on the discharge dynamics, thus limiting the separate control of the mean ion energy and the flux. The plasma parameters are then incorporated as inputs of the numerical model and the model outputs are compared with the measured value of the DC self-bias, a quantity that determines the mean ion energy. A good quantitative correspondence between them is obtained. We predict the excitation of the Plasma series resonance (PSR) effect using the numerical model and the influence of the operating pressure on the excitation of the PSR is also studied using this model.
