Abstract Submitted
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Study of a dual frequency capacitively coupled rf discharge in the background of multi-component plasma and its validation by a simple analytical sheath model[1] HEMAN BHUYAN, PARTHA SAIKIA, MARIO FAVRE, EDMUNDO WYNDHAM, FELIPE VELOSO, Faculty of Physics, Pontificia Universidad Catlica de Chile — The behavior of a phase-locked dual frequency capacitively coupled rf discharges (2f-CCRF) in the background of multi-component plasma is experimentally studied by rf current-voltage measurements and optical emission spectroscopy (OES). The multi-component plasma is produced by adding hydrogen to the argon CCRF discharge. Variation of experimental parameters, like working pressure, low frequency (LF) and high frequency (HF) rf power indicate significant changes in the electron density and temperature as well as the DC self-bias developed on the power electrode. It is observed that the electron density decreases as the percentage of hydrogen increases in the argon plasma while the electron temperature follows opposite trend. An analytical sheath model for the 2f-CCRF discharge in the background of multi-component plasma is developed and its prediction on the observed variation of DC self-bias is well agreed with the experimental observations.

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