

Abstract Submitted
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Neutral and ion dynamics at the plasma-surface interface region in inductively coupled plasmas¹ MARTIN BLAKE, York Plasma Institute, University of York, Heslington, York, YO10 5DD, ANDREW ROBERT GIBSON, 2LPP, Ecole Polytechnique-CNRS-Uni Paris-Sud-UPMC, 91128 Palaiseau, France, KARI NIEMI, DEBORAH O'CONNELL, TIMO GANS, York Plasma Institute, University of York, Heslington, York, YO10 5DD — Understanding the dynamics of the plasma-surface interface in low temperature, low pressure plasmas is critical for developing industrial processes. In this context atomic neutral species and ions both play an important role. Presented in this work is an experimental characterization of the plasma-surface interface region in plasmas produced in O₂/Ar and H₂/He, operated in capacitive and inductive modes in a gaseous electronics conference (GEC) reference cell. The industrially relevant pressure range of 1-10 Pa is investigated at varying powers and gas mixtures. The dissociation degree and mean electron energy are determined through comparing ratios of calculated excitation rates with those measured using phase resolved optical emission spectroscopy. Two excited states each for hydrogen and oxygen are compared with the rare gas admixture (either He or Ar) using the newly developed Energy Resolved Actinometry (ERA) technique. For the excitation dynamics both direct and dissociative electron impact excitation are accounted for. In addition, the ion energy distribution function at the surface has been measured using a retarding field energy analyzer.

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