

Abstract Submitted
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Mode transition in an oxygen low-pressure, very high frequency (162MHz), multi-tile electrode capacitively coupled plasma NISHANT SIRSE, Institute of Science and Laboratory Education, IPS Academy, Indore-452012, India, CLEO HARVEY, ALBERT R ELLINGBOE, School of Physical Sciences and NCPST, Dublin City University, Dublin 9, Ireland — An experimental investigation of electrode voltage/discharge current, plasma density including negative ions and ion flux, and ion energy distributions (IEDs) is performed in a low-pressure oxygen discharge excited by a multi-tile electrode, very high frequency (162 MHz) capacitively coupled plasma system. The results show a mode transition versus RF power. An inflection point is observed in the measured electrode voltage and current near to the mode transition. The negative ion density inferred from measured electron density and ion flux using resonance hairpin probe and planar probe respectively shows an initial increase and then decrease after mode transition. The IED shows a symmetric narrow distribution and the mean energy first increases up to the transition point and then decreases with further increase in RF power. A change in the current coupling mechanism and variation in the discharge impedance due to the presence of negative ions are responsible for the observed mode transition.

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