

Abstract Submitted  
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**Studies of Mode Transitions in Inductively Coupled Plasma Reactors** ANDRE DALTRINI, STANISLAV MOSHKALEV, Universidade Estadual de Campinas, Unicamp, Center for Semiconductor Components, Campinas, SP, Brazil, THOMAS MORGAN, Department of Physics, Wesleyan University, Middletown, CT 06457 USA, WILLIAM GRAHAM, Physics and Astronomy, Queens University Belfast, BT7 1NN, Northern Ireland — Optical emission spectroscopy and Langmuir probe measurements have been used to study mode transitions and hysteresis in a GEC Inductively Coupled Plasma reactor operating in both Ar and Ar/O<sub>2</sub> mixtures over a range of pressures. Ar emission line ratios have been used to monitor the variations of the electron temperature and the influence of the metastable Ar atoms in both discharge modes [1]. The first results show a smooth decrease of the electron temperature with power, followed by an abrupt transition when the plasma jumps to the H mode, with a clear reduction in electron temperature. Similar results are obtained with a Langmuir probe. Also, a strong variation of the metastable density with the transition was observed. Its influence on the transition and associated hysteresis will be discussed.

[1] S. A. Moshkalyov, P. G. Steen, S. Gomez, and W. G. Graham, *Appl. Phys. Lett.*, **75**, 328 (1999).

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