Abstract Submitted
for the GEC09 Meeting of
The American Physical Society

Optical emission spectroscopy of a dynamic E-H transition in an inductively coupled plasma in Ar SATOSHI MORISHITA, Keio University, YUICHIRO HAYASHI, TOSHIAKI MAKABE — Inductively coupled plasmas (ICPs) are used as a high density plasma source in various applications. It is well-known that an ICP has two operating modes, E and H mode. The transition between both modes shows strong hysteresis behaviors in various characteristics. In our series of experiments, we have studied the E-H transition in Ar for 100 and 300 mTorr in an ICP driven by a single-turn coil around a quartz tube. In our recent research we investigate the dynamic optical characteristics of the E-H transition, in the form of the integrated signal along the axial direction, by using an ICCD camera. In the present study, the net excitation rate of Ar(2p9) mainly caused by two-step collisions of electrons with energy comparable to 1.5 eV is observed. The temporal change in the transition of Ar(2p9) is compared with that of previous measured Ar(2p1) caused by electrons with energy greater than 13.6 eV. Discussion will be focused on the influence of high- and low-energy electrons on the dynamic transition. This work is partly supported by Global COE program operated in Keio University.

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Date submitted: 11 Jun 2009 Electronic form version 1.4