

Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Measurement of space and time resolved E-H and H-E transition in inductively coupled plasma in O₂/Ar YUICHIRO HAYASHI, YO MITSUI, Keio University, TETSUYA TATSUMI, Sony corp., TOSHIAKI MAKABE, Keio University — Inductively coupled plasma (ICP) has been widely used in the industry. ICP in oxygen or in a form diluted by rare gases is applied for various oxidation processes. Plasma in a mixture of oxygen and rare gases has different nature from plasma in rare gases due to the presence of massive electronegative ions. It is well known that ICP has two operating modes (capacitive (E-) and inductive (H-) mode) and there is a transition between these modes depending on the external plasma condition. In this work we have measured the transient image of the E-to-H and H-to-E transition in an inductively coupled radio frequency plasma in mixtures of oxygen and argon by using intensified charge coupled device camera. It is observed that higher coil current is required to sustain the plasma in oxygen/argon mixture and the hysteresis loop is smaller than that in pure Ar. Due to the loss of electron by negative ion formation of oxygen molecules, the asymmetric profile of the 2D net excitation rate is more pronounced.

Yuichiro Hayashi
Keio University

Date submitted: 11 Jun 2010

Electronic form version 1.4