Abstract Submitted
for the GEC06 Meeting of
The American Physical Society

**Diagnostics for an inductively coupled plasma in highly Ar-diluted oxygen** ZHANG YONG[1], SATOSHI HIRAO, TAKESHI OHMORI, Keio University, TAKESHI KITAJIMA, National Defence Academy, TOSHIAKI MAKABE, Keio University — Oxygen plasma has been widely used in microelectronics fabrications. It is known that the growth rate of $SiO_2$ in Si-wafer is enhanced in Ar-diluted $O_2$ plasma. One of the key reactions in the surface is caused by the oxygen metastable atom $O(^1D_2)$, which has the potential for the surface activation. The work [1] shows that Ar metastable $Ar(1s_5)$ contributes greatly to the production of $O(^1D_2)$ in a CCP in highly Ar-diluted oxygen. In this paper, we have studied the influence of the Ar metastables on the production of $O(^1D_2)$ in an inductively coupled plasma (ICP) in $O_2$(0-20%)/Ar. ICP was sustained by a single turn current coil driven at 13.56 MHz. Space-resolved 3D density profiles of $O(^3p)$, $Ar(2p_1)$, and $Ar(2p_9)$ were observed by Radon inversion of the line integrated optical emissions. And Ar metastable density was measured by laser absorption spectroscopy. The experimental result would be useful for the understanding of the mechanism of the production of $O(^1D_2)$.
[1] T. Kitajima, T. Nakano, T. Makabe, Appl. Phys. Lett. 88, 091501 (2006).

[1]Also Xi'an Jiaotong University.

Zhang Yong
Keio University

Date submitted: 16 Jun 2006 Electronic form version 1.4