Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

STUDENT AWARD FINALIST: Role of additional inductive power on the electron energy distribution in Ar/O2 capacitively coupled plasma HYO-CHANG LEE, MIN-HYONG LEE, CHIN-WOOK CHUNG, Electrical Engineering, Hanyang University, Korea — Changes in the electron energy distributions (EEDs) by the additional inductive power and related electron heating mechanisms were studied in Ar/O_2 capacitively coupled plasma (CCP) [1-3]. In low pressure Ar CCP, collisionless heating of low energy electrons was observed when a little inductive power (<20 W) was applied to the CCP. This indicates that collisionless heating in the skin layer is an important electron heating mechanism of low pressure ICP even in E mode. We also studied effects of the additional inductive power in Ar/O_2 mixture CCP. As the O_2 mixing ratio was increased in low pressure Ar/O_2 CCP, smaller additional inductive power (a few Watts) was needed for the evolutions of the EEDs from the bi-Maxwellian to the Maxwellian distribution. This abrupt change in the EEDs with a very small inductive power appears to be attributed to a combined effect of collisionless heatings by capacitive and induced electric fields in electro-negative plasma. We also performed study on the controls of the EED and the electron temperature by the additional inductive power in the CCP and found that the EED and the electron temperature were dramatically controlled without changes in the plasma density. [1] Lee et al., Appl. Phys. Letts. **93**, 231503 (2008). [2] Lee et al., Phys. Rev. E. **81**, 046402 (2010). [3] Lee et al., Phys. Plasmas. **17**, 013501 (2010).

Hyo-Chang Lee
Electrical Engineering, Hanyang University, Korea

Date submitted: 22 Aug 2011 Electronic form version 1.4