

Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Electrode Impedance Effect on Electron Density in a CCP Reactor YOHEI YAMAZAWA, Tokyo Electron AT LTD. — The generation of harmonics is one of the major nonlinear phenomena in a capacitively coupled plasma. Recently, Mussenbrock and Brinkmann proposed nonlinear electron resonance heating (NERH) model that predict the enhanced Ohmic dissipation caused by the harmonics originated from the series resonance of the plasma bulk and the sheath[1]. In our previous study, we experimentally demonstrated the resonantly growth of the harmonics by tuning a variable capacitor attached to the electrode and clearly shows that the electrode reactance must be taking into account in the series resonance condition.[2] Here, we focus on the change in electron density caused by the growth of the harmonics. We observed significant increases in electron density as the amplitude of the harmonics grows. We compared the influence of the growth in 3rd and 4th harmonics and found that 4th harmonic has smaller effect on electron density than that of 3rd harmonic has.

[1] T.Mussenbrock and R.P. Brinkmann, Appl. Phys. Lett. 88, 151503, (2006)

[2]Y. Yamazawa, M. Nakaya, M. Iwata and A. Shimizu Jpn. J. Appl. Phys 33 (2007) 4335.

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Date submitted: 13 Jun 2008

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