Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Control of electron energy distribution by the power balance of the combined inductively and capacitively coupled RF plasmas JIN SEOK KIM, HO-JUN LEE, HAE JUNE LEE, Pusan National University — The control of electron energy probability function (EEPF) is important to control discharge characteristics in materials processing. For example, O radical density increases by changing the EEPF in O_2 plasma, which provides high etching efficiency [1]. The effect of the power balance between the capacitively coupled plasma (CCP) and the inductively coupled plasma (ICP) on the EEPF in Ar and O_2 plasmas is investigated with a 1d3v (one-dimensional space and three-dimensional velocity domain) particle-in-cell (PIC) simulation for the combined inductively and capacitively coupled plasmas. The combined effects of the transverse electromagnetic and the longitudinal electrostatic fields are solved in PIC simulation at the same time. In a pressure range of a few mTorr, high energy electrons (>5 eV) are heated by the capacitive power in the sheath while low energy electrons (<5 eV) are heated by the inductive power in the bulk region. The EEPF has bi-Maxwellian distribution when the CCP power is dominant, but it changes to Maxwellian-like distribution with increasing inductive power. Finally, the EEPF changes to Druyvesteyn-like distribution when the inductive power is dominant. [1] H. C. Lee and C. W. Chung, Plasma Sources Sci. and Technol. **24**, 024001 (2015)

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Date submitted: 10 Jun 2016 Electronic form version 1.4