Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

**Discharge dynamics in a helium capacitively coupled plasma with variable oxygen admixture** ARTHUR GREB, KARI NIEMI, DEBORAH O'CONNELL, TIMO GANS — The discharge dynamics in a helium capacitively coupled plasma with variable oxygen admixture are investigated by means of a one-dimensional numerical fluid model with semi-kinetic treatment of electrons and accompanying phase and space resolved measurements. The discharge is operated at 40 Pa with a sinusoidal driving voltage at a frequency of 13.56 MHz and is solved self-consistently in the model for each individual RF-cycle. Spatial profiles of dominant charged particles (O2+, O-, e) in the gas mixture exhibit a distribution change under variation of the oxygen admixture. Discharge excitation dynamics, in particular of the atomic oxygen line $\lambda = 844$ nm (3P -3S) are investigated and compared to those observed from experiments. The simulations show and experiments confirm that additional oxygen in the helium discharge significantly changes the excitation mechanisms and promotes the excitation from secondary electrons.

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Date submitted: 15 Jul 2011 Electronic form version 1.4