Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

Hybrid Fluid-Analytical Simulations of E to H Instability in Electronegative Discharges[1] E. KAWAMURA, A.J. LICHTENBERG, M.A. LIEBERMAN, D.B. GRAVES, University of California, Berkeley — The E to H instability in inductively driven electronegative plasmas has been previously observed experimentally [1] and explored theoretically [2]. A hybrid fluid-analytical code [3], which solves for both the inductive and capacitive coupling of the source coils to the plasma, is used to simulate a Cl_2 inductive reactor. Improvements were made to the code to allow simulations of highly electronegative gases. As the rf input current to the coils rises, the plasma transitions from a capacitive to an inductive mode. For a narrow range of input currents, the E to H transition is abrupt, exhibiting oscillations in electron, ion and neutral densities, electron temperature, power, etc.

[1] A.M. Marakhtanov, M. Tuszewski, M.A. Lieberman, A.J. Lichtenberg, J. Vac. Sci. Technol. A 21 (2003) 1849.
[2] P. Chabert, A.J. Lichtenberg, M.A. Lieberman, A.M. Marakhtanov, J. Appl. Phys. 94 (2003) 831.
[3] E. Kawamura, D.B. Graves, M.A. Lieberman, Plasma Sources Sci. Technol. 20 (2011) 035009.

[1]This work was supported by gifts from Lam Research Corp. and Micron Corp., the DOE Office of Fusion Energy Science Contract DE-SC0001939, and the UC Discovery Grant ele07-10283 under IMPACT.

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Date submitted: 18 Jul 2011 Electronic form version 1.4