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Fluid model for a Cl_2/Ar inductively coupled discharge EMILIE DESPIAU-PUJO, PASCAL CHABERT, LPTP, Ecole polytechnique, France, DAVID B. GRAVES, Dept of Chemical Engineering, University of California, Berkeley, USA — III-V compounds such as GaAs, InP or GaN-based materials are widely used for photonics and optoelectronic applications, especially in the telecommunications and light detection industries. Although many problems remain to be understood, inductively coupled discharges seem to be very promising to etch such materials, using Cl_2/Ar, Cl_2/N_2 and Cl_2/H_2 gas chemistries. Hsu et al. [1] developed a 2D-fluid model to calculate the plasma parameters along with the neutral radical densities and profiles for purely inductive discharges in Ar/O_2 and Ar/O_2/Cl_2 mixtures. The model couples plasma electrodynamics to neutral chemistry and transport, under the assumption of quasi-neutrality. Power deposited into electrons comes from inductive coupling from an external coil. We have used this model to investigate Cl_2/Ar chemistries and get information about the electron density and temperature, composition of the ion wall flux and radical densities. Some comparisons with experimental measurements are reported. The addition of capacitive coupling and the study, in the presence of negative ions, of the transitions from E to H modes are under investigation. [1] Hsu et al, J. Phys. D: Appl. Phys. 39 (2006) 3272-3284

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