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**RF discharge under the influence of a magnetic field** ED BARNAT, PAUL MILLER, Sandia National Laboratories, ALEX PATERSON, Applied Materials — We examined the effects of an externally applied magnetic field (0 to 150 Gauss) on a capacitive 13.56 MHz argon discharge in a Gaseous Electronics Conference (GEC) reference cell. The electrical characteristics of the discharge were measured as functions of applied magnetic field and rf power. At fixed power the rf voltage decreased with increasing magnetic field. The discharge impedance was predominantly capacitive and became more resistive as the electron mobility decreased with increasing magnetic field. We also measured the effect that the magnetic field had on the spatial distribution of the plasma in vertical planes parallel and perpendicular to the direction of the magnetic field using Langmuir probes, optical emission, and laser induced fluorescence. Due to ExB forces, the distribution of excited states in the plasma remained radially symmetric in the plane parallel to the magnetic field and became skewed in the plane perpendicular to the magnetic field. The degree of skew depended on the state probed. Finally, we examined the temporal evolution of the electric fields in the plasma. In the presence of magnetic field, the sheath thickness decreased and most of the voltage drop was contained within the sheath. Consistent with dc voltage trends, there was no significant sheath reversal observed at higher magnetic fields.

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