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Instabilities in an Inductive Coupled Plasma Source With Magnetic Confinement JAIME ARANCIBIA MONREAL, PASCAL CHABERT, Laboratoire de Physique des Plasmas, CNRS-Ecole Polytechnique, Palaiseau, France, VALERY GODYAK, Brookline, RF Plasma Consulting, Massachussetts, USA — An ICP excitation with internal antenna and a magnetic confinement with a single permanent magnet has been characterized. The plasma is produced by an internal coil powered by a radiofrequency generator around 6 MHz[1]. Experiments have been carried out for RF powers up to 100 watts and in the pressure range 1-100 mTorr. Instability regimes were identified for certain values of the parameters: pressure range of 1 to 50 mTorr and power range of 20-100 Watts. These regimes were investigated by measuring the fluctuations of floating potential using a Langmuir probe. The study was done with and without permanent magnetic field. Three regimes were found: (i) Stable regime (ii) Quasi sinusoidal variations of floating potential (iii) Chaotic regime. The formation of plasmoids, which have an azimuthal drift around the coil, seem to explain the sinusoidal variation of floating potential. The chaotic regime has not yet been explained. The phenomenon also exhibits hysteresis behaviour.

[1] V. A. Godyak, 63rd Gaseous Electronics Conference, Paris, October 4-8, 2010.

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