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Investigation of an RF ICP J. WIECHULA, M. IBERLER, J. JA-COBY, C. TESKE, University of Frankfurt, Institute for Applied Physics — In the present study, an experiment with an electrode less inductively coupled plasma (ICP) is under investigation. The main section of the experimental setup is a discharge tube of glass wrapped with a cylindrical induction coil. The RF power is coupled into the plasma by transformer action. Driven at a fixed frequency of 13.56MHz the generator used in this experiment can deliver up to 10kW of RF power. For diagnostic purposes Ar and He is used as a working gas. A main interest of this experiment is the influence of the coil geometry on the coupling efficiency between the external circuitry and the plasma. Therefore, measurements of the electrical parameters are performed to determine the coupling efficiency and monitor the capacitive-toinductive transition, which occurs at higher power levels. The electron temperature of the discharge plasma is measured by spectroscopic means where else the electron density is determined using a langmuir probe. Comparing these results with the electrical measurements will enable us to achieve further insights into the relation between plasma parameters and the electrical characteristics of the driving circuitry.

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