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Proof of principle experiments for helicon discharges in hydrogen STEFAN BRIEFI, URSEL FANTZ, Max-Planck-Institut für Plasmaphysik, EURATOM-Assoziation, Boltzmannstr. 2, 85748 Garching, Germany — In order to reduce the amount of power required for generating CW hydrogen discharges with high electron densities and a high degree of dissociation via RF coupling, the helicon concept is investigated. For this purpose a small laboratory experiment (length of the discharge vessel 40 cm, diameter 10 cm) has been built up. The RF generator has a maximum power of 600 W (frequency 13.56 MHz) and a Nagoya type III antenna is applied. As water cooling was avoided in constructing the experiment for simplicity, the induction coils can only generate a rather low magnetic field up to 14 mT. The performed investigations cover a variation of the RF power and the magnetic field in a pressure range between 0.3 and 10 Pa. Around a magnetic field of 3 mT the low field peak which is typical for helicon discharges could be observed. As the high density mode of helicon discharges has not yet been reached, a different RF generator (2 MHz, 2 KW) and water cooled induction coils will be applied in a next step in order to increase the available power and the magnetic field.

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