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Diagnostics and Plasma Wave Modeling of a High Power Helicon Plasma with Magnetic Nozzle[1] MATT WIEBOLD, C. MARK DENNING, JOHN E. SCHARER, University of Wisconsin - Madison — A flowing argon helicon plasma is formed with an axial magnetic field in nozzle or flat configuration, variable up to 1kG in the source region. Experimental upgrades have allowed for operation at high pulsed rf powers (up to 10 kW at 13.56 MHz) and low flow rates and pressures (as low as 10 sccm and 10^{-5} Torr). A five-turn diamagnetic loop is used to measure plasma beta and perpendicular electron temperature during turn-off, and line-averaged electron density is found using 105 GHz microwave interferometry. ANTENA2 and MAXEB plasma wave codes are used to determine wave coupling effects and power deposition fractions for wave propagation with and against the direction of the static magnetic field.

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