Abstract Submitted
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High Field Side Lower Hybrid Current Drive Launcher Design for DIII-D[1] G.M. WALLACE, R. LECCACORI, J. DOODY, R. VIEIRA, S. SHIRAIWA, S.J. WUKITCH, MIT PSFC, C. HOLCOMB, LLNL, R.I. PINSKER, GA — Efficient off-axis current drive scalable to reactors is a key enabling technology for a steady-state tokamak. Simulations of DIII-D discharges have identified high performance scenarios with excellent lower hybrid (LH) wave penetration, single pass absorption and high current drive efficiency. The strategy was to adapt known launching technology utilized in previous experiments on C-Mod (poloidal splitter) and Tore Supra (bi-junction) and remain within power density limits established in JET and Tore Supra. For a 2 MW source power antenna, the launcher consists of 32 toroidal apertures and 4 poloidal rows. The aperture is 60 mm x 5 mm with 1 mm septa and the peak $n_{||}$ is 2.7+/-0.2 for 90 phasing. Eight WR187 waveguides are routed from the R-1 port down under the lower cryopump, under the existing divertor, and up the central column with the long waveguide dimension along the vacuum vessel. Above the inner strike point region, each waveguide is twisted to orient the long dimension perpendicular to the vacuum vessel and splits into 4 toroidal apertures via bi-junctions. To protect the waveguide, the inner wall radius will need to increase by 2.5 cm. RF, disruption, and thermal analysis of the latest design will be presented.

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