

Abstract Submitted
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Progress Toward Off-Axis Current Drive Experiments in the Lower Hybrid Range of Frequencies on DIII-D¹ R.I. PINSKER, A.M. GAROFALO, C.P. MOELLER, M.W. BROOKMAN, General Atomics, S.J. WUKITCH, A.H. SELTZMAN, M. PORKOLAB, S. SHIRAIWA, MIT Plasma Science and Fusion Center — DIII-D is implementing systems to drive current non-inductively in the mid-radius region of the plasma. In addition to off-axis neutral beam injection and nearly-vertically launched electron cyclotron current drive, two systems each at the ~ 1 MW level with toroidally-directive waves in the Lower Hybrid Range of Frequencies are being prepared. In the first experiment, fast waves at 0.48 GHz ('helicons') will be launched with a 30-element traveling wave antenna of the comb-line type from the low-field side of the torus. The comb-line modules have been fabricated and are being tested with antenna installation scheduled for Fall 2019 and experiments to commence in 2020. In the second experiment, slow waves at 4.6 GHz ('lower hybrid waves') will be launched from the centerpost (high-field side) from a location near the midplane, using an active multijunction grill with 192 powered apertures arranged in 4 rows, powered by 8 x 0.25 MW klystrons. Installation is scheduled for 2020 with first experiments in 2021. Each system will drive 0.05-0.15 MA/MW at $0.5 < \rho < 0.85$ in advanced tokamak discharges, with the helicon system being more useful in the high density, low field part of the AT operating space and the HFS LH system being most effective in the high field, low density region.

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