Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Overview of High Field Side Lower Hybrid Current Drive for Off-axis Current Drive Experiment in DIII-D[1] S.J. WUKITCH, A. SELTZMAN, Y. LIN, MIT PSFC, C. HOLCOMB, LLNL, R.I. PINSKER, GA — A key enabling technology for economical, steady state tokamak is developing efficient, robust off axis current drive compatible with the harsh reactor environment. DIII-D provides an opportunity to investigate high field side launch lower hybrid waves (HFS LHCD) for off axis current drive. The HFS launch position was selected to balance the effects of toroidicity and poloidal field up/down shift to improve wave penetration and allow single pass absorption in region ρ 0.6-0.8 with peak current density approaching 0.4 MA/m^2. Simulations indicate wave penetration will be strongly influenced by local q value. In AT discharges, the wave penetration is dominated by the poloidal upshift resulting in good wave penetration. Several technical challenges needed to be addressed to implement HFS LHCD coupler in DIII-D. The center post tile thickness needed to be increased to accommodate the coupler. The waveguide routing required a minimal number of flanges and flanges that were both vacuum tight and have good RF contacts. The latest simulations, design and system status will be presented.

[1]Work supported by the U.S. Department of Energy, Office of Science, Office of Fusion Energy Sciences, using User Facility DIII-D, under Award Number DE-FC02-04ER54698 and by US DoE Contract No. DE-FC02-01ER54648 under a Scientific Discovery through Advanced Computing Initiative.

Stephen Wukitch
Massachusetts Institute of Technology

Date submitted: 02 Jul 2019 Electronic form version 1.4