Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Design of a Compact Antenna for High Field Side Reflectometry on DIII-D[1] E. C. LEPPINK, MIT PSFC, C. LAU, ORNL, A. SELTZMAN, Y. LIN, S. J. WUKITCH, MIT PSFC — The coupling of lower hybrid waves to the plasma for non-inductive current drive in tokamaks has been shown to be dependent on the scrape off layer density profile in front of the lower hybrid launcher. The measurement of this density profile is critical for understanding the coupling mechanism and for code validation. Reflectometry allows for high spatial and temporal resolution measurements of the scrape off layer density profile and is planned to support the upcoming high field side lower hybrid current drive experiments on DIII-D. The reflectometry system will utilize the O-mode cutoff frequency in the range of 6-27 GHz using frequency sources from an existing, unused reflectometer. However, due to limited space on the high field side, a new compact antenna will be required for the reflectometer to fit in the available space. This work outlines the design of a compact, ultrawide bandwidth antenna for the reflectometry measurement. The details of the optimization process using COMSOL and the current antenna design 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 US DoE award SC0014264.

Evan Leppink
Massachusetts Institute of Technology

Date submitted: 02 Jul 2019 Electronic form version 1.4