Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Parasitic excitation of the slow mode by an ICRH antenna in the LAPD[1] BART VAN COMPERNOLLE, UCLA, now at General Atomics, DIRK VAN EESTER, Royal Military Academy, Belgium, KRISTEL CROMBE, Ghent University, Belgium — Recent work on ICRF physics at the Large Plasma Device (LAPD) at UCLA has focused on deleterious near-field antenna effects, such as RF rectification, sputtering, convective cells and power lost to the plasma edge. Plasma parameters in LAPD are similar to the scrape-off layer of current fusion devices. The machine has a 17 m long, 60 cm diameter magnetized plasma column with typical plasma parameters $n_{e,core} \sim 10^{12} - 10^{13}\text{cm}^{-3}, T_e \sim 1 - 10$ eV and $B_0 \sim 1 - 2$ kG. A single-strap fast wave antenna has been developed for LAPD, with the ability to rotate the angle of the strap with respect to the background field. This poster will focus on low power experiments, in which the parasitic coupling to slow waves in the low density region in front of the antenna is being studied. Detailed wave field measurements show coupling to both the short wavelength slow wave and the long wavelength fast wave if the density at the antenna is low enough. Coupling to lower hybrid waves was demonstrated for a range of normalized frequencies, from $1 < f/f_{ci} < 30$. The coupling was studied both with and without Faraday screen, as well as the dependence of the coupling on the angle of the antenna.

[1]Performed at the Basic Plasma Science Facility at UCLA, funded jointly by the Department of Energy (Grant No. DE-FC02-07ER54918) and the National Science Foundation (Grant No. PHY 1036140)

Bart Van Compernolle
UCLA, now at General Atomics

Date submitted: 03 Jul 2019 Electronic form version 1.4