

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Excitation of slow waves in front of an ICRF antenna in a basic plasma experiment¹ KUNAL SONI, Ghent University, Belgium, BART VAN COMPERNOLLE, University of California, Los Angeles, KRISTEL CROMBE, Ghent University, Belgium, DIRK VAN EESTER, Royal Military Academy, Belgium — Recent results of ICRF experiments at the Large Plasma Device (LAPD) indicate parasitic coupling to the slow wave by the fast wave antenna. 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 $n_e \sim 10^{12} - 10^{13} \text{ cm}^{-3}$, $T_e \sim 1 - 10 \text{ eV}$ and $B_0 \sim 1000 \text{ G}$. It was found that coupling to the slow mode occurs when the plasma density in front of the antenna is low enough such that the lower hybrid resonance is present in the plasma. The radial density profile is tailored to allow for fast mode propagation in the high density core and slow mode propagation in the low density edge region. Measurements of the wave fields clearly show two distinct modes, one long wavelength $m=1$ fast wave mode in the core and a short wavelength backward propagating mode in the edge. Perpendicular wave numbers compare favorably to the predicted values. The experiment was done for varying frequencies, $\omega/\Omega_i = 25, 6$ and 1.5 . Future experiments will investigate the dependence on antenna tilt angle with respect to the magnetic field, with and without Faraday screen.

¹This work is performed at the Basic Plasma Science Facility, sponsored jointly by DOE and NSF.

Kunal Soni
Ghent University, Belgium

Date submitted: 14 Jul 2017

Electronic form version 1.4