

Abstract Submitted  
for the DPP13 Meeting of  
The American Physical Society

**Neutral Excitation, Ionization and SOL Power Loss of Lower Hybrid Waves in the Alcator C-Mod Tokamak** I.C. FAUST, G.M. WALLACE, S. SHIRAIWA, M.L. REINKE, R.R. PARKER, B.L. LABOMBARD, S.G. BAEK, J.W. HUGHES, J.L. TERRY, D.G. WHYTE, MIT PSFC, ALCATOR C-MOD TEAM — The efficiency of Lower Hybrid Current Drive (LHCD) in Alcator C-Mod discharges diminishes precipitously in high density (line-averaged  $\bar{n}_e > 10^{20}[m^{-3}]$ ), diverted plasmas as seen by the lack of indicative hard X-ray (HXR) bremsstrahlung and reduction in loop voltage. VUV, Visible and infrared light, as well as measurements of  $n_e, T_e$  in the SOL show significant change in the high density regime with the application of Lower Hybrid power. Poloidal dependence of LHCD-induced hydrogen Lyman-alpha emission in high density plasmas was investigated using a filtered poloidally-viewing pinhole camera. Due to limitations in the camera radial resolution, *a priori* assumptions of the emission region were used to extract global emission values. Estimations are made of the electron cooling rate utilizing the Lyman-alpha emission and S/XB coefficients and are correlated to various experimental parameters for the dependency of power loss. The measurements indicate that Lyman-alpha power is enhanced globally by LHCD. Work supported by USDOE awards DE-FC02-99ER54512 and DE-AC02-76CH03073.

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Date submitted: 12 Jul 2013

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