

Abstract Submitted
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Evidence of Spectral Control over Lower Hybrid Power Deposition on Alcator C-Mod A.E. SCHMIDT, P.T. BONOLI, R.R. PARKER, M. PORKOLAB, G. WALLACE, J.C. WRIGHT, MIT PSFC, J.R. WILSON, PPPL, R.W. HARVEY, A.P. SMIRNOV, CompX — The Lower Hybrid Current Drive (LHCD) system on Alcator C-Mod can produce spectra with a wide range of peak parallel refractive index ($n_{||}$). Theory predicts that LH power deposition location is strongly dependent on $n_{||}$. An experiment in which LH power is square-wave modulated on a time scale much faster than the current relaxation time does not significantly alter the poloidal magnetic field inside the plasma and thus allows for realistic modeling and consistent plasma conditions for different $n_{||}$ spectra. Inverted hard x-ray profiles show clear changes in LH-driven fast electron location with differing $n_{||}$. Boxcar binning of hard x-rays during LH power modulation allows for ~ 1 ms time resolution, which is sufficient to resolve the build-up, steady-state, and slowing-down of fast electrons. Ray-tracing/Fokker-Plank modeling in combination with a synthetic hard x-ray diagnostic has been used to determine a fast electron diffusion coefficient for various plasma conditions. This work is supported by the US DOE awards DE-FC02-99ER54512 and DE-AC02-76CH03073.

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