

Abstract Submitted
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Power balance of Lower Hybrid Current Drive in the SOL of High Density Plasmas on Alcator C-Mod Tokamak¹ I.C. FAUST, G.M. WALLACE, S.G. BAEK, D. BRUNNER, B. LABOMBARD, R.R. PARKER, Y. LIN, S. SHIRAIWA, J.L. TERRY, D.G. WHYTE, MIT PSFC, ALCATOR C-MOD TEAM — Lower Hybrid Current Drive (LHCD) on Alcator C-Mod exhibits low efficiency for densities $\sim \bar{n}_e > 1 \cdot 10^{20} \text{ m}^{-3}$ for diverted discharges. Emissivity profiles of Hydrogenic Ly $_{\alpha}$ and H $_{\alpha}$ show significant changes during the application of LH wave as high density, along with enhanced parametric decay instability (PDI) and the generation of thermoelectric scrape-off-layer (SOL) currents. A corresponding reduction in X-ray emission from fast electrons in the confined plasma suggest damping of the LH waves in the SOL. A wide-viewing, absolutely-calibrated Hydrogen Ly $_{\alpha}$ camera was installed to characterize fast timescale ($\sim .1 \text{ ms}$) poloidal dynamics of SOL during the application of LHCD. Analyses and results will be shown characterizing the absolute power deposition LHCD as it relates to various plasma null configurations. Ly $_{\alpha}$ emission is also correlated to various experimental parameters such as SOL electron density and temperature profiles and Lower Hybrid input power in order to elucidate possible damping mechanisms.

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