

Abstract Submitted
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Observations of Lower Hybrid Wave Interactions in the Scrape-Off-Layer of a Diverted Tokamak¹ G.M. WALLACE, R.R. PARKER, P.T. BONOLI, O. MENEGHINI, A.E. SCHMIDT, S. SHIRAIWA, D.G. WHYTE, J.C. WRIGHT, S.J. WUKITCH, MIT Plasma Science and Fusion Center, R.W. HARVEY, A.P. SMIRNOV, CompX, J.R. WILSON, Princeton Plasma Physics Laboratory, AND THE ALCATOR C-MOD TEAM — Experiments with LHCD on Alcator C-Mod indicate that, at high density, significant power is deposited directly in the SOL, thereby reducing the effective current drive efficiency. This phenomenon is observed in plasmas which are accessible to LH waves and below the density limit attributed to parametric decay as $\omega \rightarrow 2\omega_{LH}$. Current densities of ~ 500 kA/m² are measured just outside the separatrix during high power LH operation above $\bar{n}_e \sim 1 \times 10^{20}$ m⁻³. Line integrated hard X-ray emission also drops sharply above $\bar{n}_e \sim 1 \times 10^{20}$ m⁻³. Ray tracing/Fokker-Planck simulations over-estimate the line integrated X-ray emissivity by a factor of ~ 500 at $\bar{n}_e = 1.4 \times 10^{20}$ m⁻³ as compared to a factor of 3-4 at $\bar{n}_e = 0.6 \times 10^{20}$ m⁻³. Simulations including a realistic SOL with collisional damping show substantial improvement in agreement with experiment.

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