

Abstract Submitted  
for the DPP06 Meeting of  
The American Physical Society

**Measurements and Modeling of X-Ray and ECE Spectra During C-Mod Lower Hybrid Current Drive Experiments** A.E. SCHMIDT, P.T. BONOLI, A.E. HUBBARD, J.E. LIPTAC, R.R. PARKER, MIT PSFC, J.R. WILSON, PPPL, R.W. HARVEY, A.P. SMIRNOV, CompX — Lower Hybrid Current Drive (LHCD) has been demonstrated on Alcator C-Mod. The lower hybrid waves generate non-thermal electrons, which can be detected through hard x-ray Bremsstrahlung emission as well as relativistically downshifted electron cyclotron emission (ECE). C-Mod has a hard x-ray diagnostic with 32 chords, designed to detect Bremsstrahlung radiation from LH-driven nonthermal electrons<sup>1</sup>, as well as several outboard midplane ECE diagnostics, normally used to measure electron temperature in Maxwellian plasmas. CQL3D/GENRAY<sup>2</sup> is a modeling package that employs a 3-D Fokker-Planck solver to compute steady-state distribution functions for a given LH  $N_{||}$  spectrum and plasma. It also can perform self-consistent synthetic diagnostic calculations. LH phase and power scans have been carried out. Experimental measurements will be compared with synthetic diagnostic modeling to see how changes in phasing and power affect current profile control and to benchmark CQL3D in ITER-relevant regimes. This work is supported by the US DOE grants #DE-FC02-99ER54512 and #DE-AC02-76CH03073.

<sup>1</sup>J.E. Liptac, to be published in RSI

<sup>2</sup>R. W. Harvey and M. G. McCoy, General Atomics Report GA-A20978, [www.compxco.com](http://www.compxco.com)

Andrea Schmidt  
MIT PSFC

Date submitted: 31 Jul 2006

Electronic form version 1.4