Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Full wave/Fokker-Planck analysis of driven current and hard X-ray emission profiles during lower hybrid experiments on Alcator C-Mod[1]
JOHN WRIGHT, PSFC-MIT, ERNEST VALEO, CYNTHIA PHILLIPS, PPPL, PAUL BONOLI, PSFC-MIT, RF-SCIDAC TEAM — Analysis of lower hybrid (LH) wave propagation in the past has been done using ray tracing and the WKB approximation. Advances in algorithms and parallel computer architectures has permitted the solving of the Maxwell-Vlasov system for wave propagation directly [Wright et al., Phys. Plasmas (2009), 16, July]. Self-consistent non-Maxwellian distribution functions are included by coupling the TORIC-LH full wave code with the CQL3D Fokker-Planck code via the export of the quasilinear diffusion coefficent from TORICLH and the use of the electron distribution function from CQL3D to evaluate the dielectric response in TORICLH following the technique implemented by Valeo [Valeo et al.,18th RF Power in Plasmas Proceedings (2007)]. Using the synthetic HXR diagnostic in CQL3D we will compare self-consistent LH simulations with LH experiments on Alcator C-Mod at several different waveguide phasings. Discussion will include comparisons with ray tracing the relative importance of full wave effects, relativistic effects, and reflections.

[1]Supported by USDoE award no. DE-FC02-01ER54648.

John Wright
PSFC-MIT

Date submitted: 17 Jul 2009 Electronic form version 1.4