Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Scattering effects on lower hybrid wave propagation[1] N. BERTELLI, C.K. PHILLIPS, E.J. VALEO, J.R. WILSON, PPPL, S.G. BAEK, P.T. BONOLI, R.R. PARKER, G. WALLACE, J.C. WRIGHT, PSFC-MIT, R.W. HARVEY, CompX, A.P. SMIRNOV, Lomonosov Moscow State University — The effects of edge plasma density fluctuations on the scattering of lower hybrid (LH) waves are studied. Scattering can improve the penetration of LH waves into the plasma core due to the $k_{\|}$ upshift that occurs through the poloidal field (because the rotation of $k_{\perp}$ induces a finite poloidal mode number). Scattering can also inhibit wave penetration depending on the density fluctuation levels, resulting in enhanced collisional absorption of the waves in the SOL at high density. These two effects might contribute, respectively, to resolving the "spectral gap" problem [Bonoli P. T. and R. C. Englade, Phys. Fluids 9 (1986) 2937] and the "density limit" in the efficiency of LHCD [Wallace G. et al., Phys. Plasmas 17 (2010) 082508]. The scattering model used is based on the work of Bonoli and Ott [Phys. Fluids 25 (1982) 361] that introduces an electromagnetic wave kinetic equation solved by a Monte Carlo technique. This equation has been implemented in the ray tracing code GENRAY, which explicitly includes the SOL region. A detailed analysis of this scattering model will be presented in comparison with the experimental observations of LHCD for Alcator C-Mod tokamak.

[1]Work supported by US DOE Contract #DE-FC02-99ER54512.

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Date submitted: 11 Jul 2012 Electronic form version 1.4