Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Investigating electromagnetic effects on core transport in Alcator C-Mod H-mode discharges W. GUTTENFELDER, PPPL, N.T. HOWARD, ORISE, J. IRBY, PSFC, MIT, F.M. POLI, PPPL, A.E. WHITE, PSFC, MIT, W.F. BERGERSON, Lincoln Labs, MIT, D.L. BROWER, W.X. DING, UCLA, C.E. KESSEL, PPPL, C. SUNG, S.M. WOLFE, P. XU, PSFC, MIT — Understanding the importance of electromagnetic effects on core turbulence and transport is being pursued at Alcator C-Mod, especially for higher performance H-mode plasmas at increasing beta. Previously reported measurements from a line-integrated polarimeter diagnostic reveal broadband, high frequency fluctuations [1]. The presence of these features, absent in core and edge density fluctuation measurements from phase contrast imaging, suggest they may be related to fluctuations in the magnetic field. Such features were observed in a number of H-mode plasmas over a range of normalized beta ($\beta_N \sim$ 1-2) and Greenwald fraction ($f_{GW} \sim$ 0.45-0.85). To investigate the possible influence of electromagnetic effects on core transport and turbulence, gyrokinetic simulations are used to predict microinstability of these discharges, the corresponding relative amplitude of the magnetic fluctuations in comparison to density fluctuations, and the sensitivity of these predictions to variations in beta. Results of both linear and nonlinear simulations and their comparison with transport and turbulence measurements will be presented. This work is supported by US DOE contracts DE-AC02-09CH11466 and DE-FC02-99ER54512.

[1] W.F. Bergerson et al., RSI 83, 10E316 (2012); APS-DPP 2012.

W. Guttenfelder
PPPL

Date submitted: 11 Jul 2014 Electronic form version 1.4