

Abstract Submitted
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Studies of Turbulence and Transport in Alcator C-Mod H-Mode Plasmas with Phase Contrast Imaging and Comparisons with GYRO¹

M. PORKOLAB, L. LIN, E.M. EDLUND, J.C. ROST, C.L. FIORE, M. GREENWALD, MIT PSFC, D. MIKKELSEN, PPPL — We present recent experimental measurements of turbulence and transport in C-Mod H-Mode plasmas with and without internal transport barriers (ITB)² using the phase contrast imaging (PCI) diagnostic³ and compare the results with GYRO predictions.⁴ In plasmas without ITB, the fluctuation above 300 kHz observed by PCI agrees with ITG in GYRO simulation, including the direction of propagation, wavenumber spectrum, and absolute intensity within experimental uncertainty (+/-75%). After transition to ITBs, the observed overall fluctuation intensity increases. GYRO simulation in the core shows that ITG dominates in ITBs but its intensity is lower than the overall experimental measurements which may also include contributions from the plasma edge. These results, as well as the impact of varying ∇T_i , ∇n , and ExB shear on turbulence will be discussed.

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²C.L. Fiore et al., Fusion Sci. Technol., **51**, 303 (2007).

³M. Porkolab et al., IEEE Trans. Plasma Sci. **34**, 229 (2006).

⁴J. Candy et al., Phys. Rev. Lett., **91**, 045001 (2003).

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