Abstract Submitted for the Forty-Seventh Annual Meeting
Division of Plasma Physics
October 24–28, 2005, Denver, Colorado

Category Number and Subject: 562 (DIII-D Tokamak, Confinement and transport)

[ ] Theory [X] Experiment

Core Turbulence Structures and ρ* Scaling Properties in H-Mode Plasmas,* G.R. McKee, R.J. Fonck, D.K. Gupta, D.J. Schlossberg, M.W. Shafer, *Univ. Wisc-Madison*, J. Candy, C.C. Petty, M.R. Wade, R.E. Waltz, *GA* – The characteristics of long-wavelength density fluctuations ($k_{\perp}\rho_i < 1$) are examined in the core region ($0.5 < r/a < 0.9$) of H-mode discharges and compared to turbulence in L-mode discharges. Measurements are obtained with the upgraded 16-channel (4-radial x 4-poloidal), high-sensitivity beam emission spectroscopy system at DIII-D. The ρ* scaling of turbulence structures in hybrid scenario H-mode plasmas demonstrates that the radial correlation lengths scale closely with the local ion gyroradius, as predicted theoretically and observed in L-mode plasmas. Eddy spatial structures, in contrast, differ dramatically between L and H-mode plasmas, with H-mode turbulence exhibiting a highly tilted structure in the radial-poloidal plane, as measured via 2D spatiotemporal correlations. Whether this difference results from flow-shear, radial propagation, or inherent turbulence dynamics will be investigated via comparison to measured flow shear, as well as with comparisons of GYRO simulations.

*Work supported by US DOE under DE-FG03-96ER54373 and DE-FG02-04ER54758.

[ ] Oral [ ] Poster