Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Core Turbulence and Transport Response to Increasing Toroidal Rotation and Shear in Advanced-Inductive Plasmas[1] G. MCKEE, Z. YAN, U. Wisc., C. HOLLAND, UCSD, T. LUCE, C. PETTY, GA, T. RHODES, L. SCHMITZ, UCLA, W. SOLOMON, PPPL — Multi-scale turbulence properties are altered as core toroidal rotation and ExB shearing rates are systematically varied in relatively high-beta, advanced-inductive H-mode plasmas on DIII-D. The energy confinement time increases by 50% as the toroidal rotation is increased by a factor of 2.5 (to Mo=0.5), while core turbulence, measured with BES, DBS and PCI, decreases in dimensionlessly matched plasmas ($\beta \approx 2.7, q_{95} = 5.1$). Low-wavenumber ($k_\perp \rho_< 1$) density fluctuations obtained with BES near mid-radius exhibit significant amplitude reduction along with a slight reduction in radial correlation length at higher rotation, while fluctuations in the outer region of the plasma, $\rho > 0.6$, exhibit, but little change in amplitude. Fluctuation measurements and transport behavior will be quantitatively compared with nonlinear simulations. The resulting reduction in confinement will need to be ascertained for low-rotating plasmas such as ITER and FNSF.

[1]Work supported by the US DOE under DE-FG02-08ER54999, DE-FG02-07ER54917, DE-FC02-04ER54698, DE-FG02-08ER54984 and DE-AC02-09CH11466

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Date submitted: 11 Jul 2014 Electronic form version 1.4