Abstract Submitted for the Forty-Ninth Annual Meeting
Division of Plasma Physics
November 12–16, 2007, Orlando, Florida

Category Number and Subject: 5.6.2. DIII-D Tokamak

[ ] Theory [X] Experiment

Effects of Toroidal Rotation on Edge Turbulence and the L-H Power Threshold,* D.J. Schlossberg, G.R. McKee, M.W. Shafer, *U. Wisc.-Madison*, K.H. Burrell, P. Gohil, R.J. Groebner, T.C. Luce, *GA*, G. Wang, *UCLA* – Edge turbulence dynamics, flows, and flow shear are found to depend strongly on the injected neutral beam torque in DIII-D plasmas. Likewise, the power threshold required to induce a transition from low- to high-confinement mode decreases by a factor of 2-3 as torque is varied from the co to counter current directions. Turbulence characteristics such as the poloidal shearing rates, correlation rates, and decorrelation times in the edge region are examined with the high-sensitivity 2D beam emission spectroscopy diagnostic on DIII-D. Poloidal flow shear in the turbulence is found to increase in all cases as the transition is approached. As the injected torque is varied from co-current to balanced, a bi-modal structure and strongly dispersive turbulence spectrum develops. At low-rotation this bi-modal structure consists of oppositely propagating flows that lead to flow shear rates increasing above the calculated decorrelation rates.

*Supported by the US DOE under DE-FG02-89ER53296, DE-FC02-04ER54698, and DE-FG03-01ER54615.