Abstract Submitted for the Forty-Eighth Annual Meeting
Division of Plasma Physics
October 30th-November 3, 2006, Philadelphia, Pennsylvania

Category Number and Subject: 5.6.2. DIII-D Tokamak

[ ] Theory [X] Experiment

Turbulence Dynamics During Internal Transport Barrier Formation Via Beam Emission Spectroscopy on DIII-D,* M.W. Shafer, R.J. Fonck, G.R. McKee D.J. Schlossberg, *U. Wisconsin-Madison*, M.E. Austin, *U. Texas-Austin*, R.E. Waltz, J. Candy, *GA* – The formation of localized internal transport barriers (ITBs) is observed at the appearance of low order values of q_{min} surfaces in negative central shear L-mode discharges on DIII-D. Related GYRO simulations suggest that increased zonal flows may be responsible for such ITBs [1]. Newly expanded high-sensitivity 2D beam emission spectroscopy (BES) fluctuation and flow measurements will be utilized to quantitatively examine turbulence dynamics and test this prediction of a zonal flow-driven ITB trigger mechanism. Time delay estimation via dynamic programming is applied to the fluctuation data to measure high-frequency poloidal velocity fluctuations to search for increased zonal flow activity during q-triggered ITB formation. In addition, newly implemented rotation control capability via co and counter neutral beam injection on DIII-D will be exploited to study ITB formation with varying momentum input.

[1] R.E. Waltz, et al., Phys. Plasmas **10**, 052301 (2006).

*Supported by US DOE under DE-FG03-96ER54373, DE-FG03-97ER54415, and DE-FG03-95ER54309.