

**Abstract Submitted for the 51st Annual Meeting  
Division of Plasma Physics  
November 2–6, 2009, Atlanta, Georgia**

**Quiescent H-Mode Plasmas with Rotation Driven by Static Non-axisymmetric Fields,\*** A.M. Garofalo, K.H. Burrell, G.L. Jackson, *GA*; A. Cole, *U. Wisc.*; W.M. Solomon, *PPPL*; M. Lanctot, H. Reimerdes, *Columbia U.* — A quiescent H-mode (QH-mode) edge allows ELM-free operation of a plasma with good confinement and good particle exhaust. Until recently, QH-mode operation required rather strong plasma toroidal rotation in order for the edge velocity shear to exceed a minimum value [1]. However, rapid rotation may not be feasible in a self-heated burning plasma with little or no momentum injection from neutral beams. New DIII-D experiments in ITER-similar plasmas show that the neoclassical torque from static, nonresonant magnetic fields (NRMFs) provides a useful knob to change the edge rotation profile shear. NRMF application resulted in QH-mode operation with less than half the rotation (evaluated on top of the pedestal) of previous QH-mode without the NRMFs. At this low rotation, the NRMF torque may be amplified by entering the theoretically predicted  $1/\nu$  collisionality regime.

[1] K.H. Burrell, et al., *Phys. Rev. Lett.* **102**, 155003 (2009)

\*Work supported in part by the US DOE under DE-FC02-04ER54698, DE-FG02-89ER53296, DE-FG02-09ER54999, DE-AC02-09CH11466, and DE-FG02-89ER53297.