Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Modeling EHO Formation in QH-mode on DIII-D[1] XI CHEN, K.H. BURRELL, N.M. FERRARO, T.H. OSBORNE, A.M. GAROFALO, R.J. GROEBNER, L.L. LAO, P.B. SNYDER, GA, R. NAZIKIAN, W.M. SOLOMON, B.J. TOBIAS, PPPL, G.R. MCKEE, Z. YAN, U. Wisc., C.M. MUSCATELLO, UC-Davis
— The 3D MHD code M3D-C1 is being used to model the edge harmonic oscillation (EHO) in QH-mode plasmas. Preliminary simulations show unstable low-n modes in some reconstructed QH-mode equilibria with high edge density fluctuations similar to experiments. QH-mode is a stationary edge localized mode (ELM)-stable high confinement operation mode while EHO drives the additional particle transport allowing the edge plasma to reach a transport equilibrium just below the ELM limit [1]. Experiments and theory suggest that the EHO is a kink-peeling mode destabilized by edge rotational shear at edge conditions just below the ELM limit [1] and the essential rotation is the toroidal angular ExB drift frequency [2]. Detailed comparison of two-fluid M3D-C1 simulations and fluctuation measurements from multiple diagnostics on DIII-D will be presented, along with the EHO onset condition between experiment and simulation from various pedestal ExB shears.

[1] K.H. Burrell, et al., Nucl. Fusion **49**, 085024 (2009).
[2] A.M. Garofalo, et al., Nucl. Fusion **51**, 083018 (2011).

[1]Supported by US DOE under DE-FC02-04ER54698, DE-AC02-09CH11466, DE-FG02-89ER53296, DE-FG02-08ER54999 and DE-FG02-99ER54531.

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Date submitted: 11 Jul 2014 Electronic form version 1.4