Abstract Submitted
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**Accurate Experiment to Computation Coupling for Understanding QH-mode physics using NIMROD**[1] J.R. KING, Tech-X Corporation, K.H. BURRELL, A.M. GAROFALO, R.J. GROEBNER, GA, J.D. HANSON, J.D. HEBERT, Auburn Univ., S.R. HUDSON, PPPL, A.Y. PANKIN, S.E. KRUGER, Tech-X Corporation, P.B. SNYDER, GA — It is desirable to have an ITER H-mode regime that is quiescent to edge-localized modes (ELMs). The quiescent H-mode (QH-mode) with edge harmonic oscillations (EHO) [Garofalo et al, PoP (2015); Burrell et al., PoP (2012); Garofalo et al, NF (2011) and refs. within.] is one such regime. High quality equilibria are essential for accurate EHO simulations with initial-value codes such as NIMROD [Sovinec et al., JCP 195, 355 (2004)]. We include profiles outside the LCFS which generate associated currents when we solve the Grad-Shafranov equation with open-flux regions using the NIMEQ solver [Howell and Sovinec, CPC 185, 1415 (2014)]. The new solution is an equilibrium that closely resembles the original reconstruction (which does not contain open-flux currents). This regenerated equilibrium is consistent with the profiles that are measured by the high quality diagnostics on DIII-D. Results from nonlinear NIMROD simulations of the EHO are presented. The full measured rotation profiles are included in the simulation. The simulation develops into a saturated state. The saturation mechanism of the EHO is explored and simulation is compared to magnetic-coil measurements.

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