Abstract Submitted
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Understanding the Physics of EHO Generation in DIII-D Including the Role of Rotational Shear[1] K.H. BURRELL, A.M. GAROFALO, P.B. SNYDER, General Atomics, W.M. SOLOMON, Princeton Plasma Physics Laboratory — The key to QH-mode operation is an edge electromagnetic mode, the edge harmonic oscillation (EHO), which provides the extra transport to allow the edge plasma to reach a transport equilibrium with edge pressure gradient and current density just below the edge localized mode (ELM) limit [1]. Experimental results are consistent with the theoretical prediction that the EHO is a kink-peeling mode destabilized by edge rotational shear at edge conditions just below the ELM limit [1]. Theory suggests that the essential rotation speed is E_r/RB_θ; initial analysis of experimental data is consistent with this expectation [2,3]. Recent results show that the change in shear between QH-mode and ELMing H-mode occurs in the small radius side of the edge E_r well near the top of the edge pedestal. Experiments have been carried out to test the whether E_r/RB_θ is the essential shear and, if so, how that critical shear varies with ν^*.

[1] K.H. Burrell, et al., Nucl. Fusion **49**, 085024 (2009).
[2] A.M. Garofalo, et al., Nucl. Fusion **51**, 083018 (2011).
[3] K.H. Burrell, et al., Phys. Plasmas **19**, 056117 (2012).

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