Abstract Submitted
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Effect of Collisionality on H-mode Pedestal Structure[1] T.H. OSBORNE, R.J. GROEBNER, S.P. SMITH, P.B. SNYDER, D.M. THOMAS, General Atomics, Z. YAN, U. Wisc-Madison — Variations in the H mode pedestal pressure, p_{PED}, by a factor of 1.5 are observed in ITER baseline scenario demonstration discharges on the DIII-D tokamak. Higher p_{PED} occurs when the pressure increase between ELMs is primarily due to an increase in density. The variation in p_{PED} can be understood through the effect of collsionality, $\nu \propto n/T^2$, under the EPED model [1]. In this model, the pedestal pressure gradient, p', grows until it triggers a peeling-ballooning mode, PBM, which results in the ELM. Since, in these discharges, ELMs are triggered at the current driven peeling limit, higher p' is achieved at higher collisionality where the associated bootstrap current is reduced. Under EPED, p' between ELMs is constrained by the kinetic ballooning mode, KBM, for which the critical p' increases with pedestal width. The KBM critical p' for a given pedestal width is reduced at increased collisionality, resulting in the p' required to trigger the PBM being reached only at larger width and so larger pressure.

[1] P.B. Snyder et al., Phys. Plasmas **16**, 054118 (2009).

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