

Abstract Submitted
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Collisionality dependence of density peaking in H-mode plasmas in Alcator C-Mod¹ D.R. MIKKELSEN, Princeton University, M. GREENWALD, MIT, J. CANDY, R. WALTZ, General Atomics — Recent results from Alcator C-Mod confirmed earlier AUG and JET findings that spontaneous peaking of the density profile in H-mode plasmas depends on collisionality. Quasi-linear transport estimates based on gyrokinetic stability calculations (C. Angioni, et al., Phys. Plasmas 12, (2005) 112310) found a pinch that was restricted to a range of collisionality completely outside the range of experimental data. We will present nonlinear, ‘full-radius’, gyrokinetic turbulence simulations with experimentally relevant levels of impurities to determine the degree to which these added levels of completeness can bring theory into harmony with experiment. Particular attention will be paid to the significance of including multiple impurity species and two hydrogenic species. We will also explore the sensitivity of the results to the detailed form of the collision operator, including one that is momentum conserving.

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