

Abstract Submitted
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Multi-species particle transport in GYRO simulations of low-collisionality, peaked-density H-mode plasmas in C-Mod¹ D.R. MIKKELSEN, Princeton University, M. GREENWALD, MIT, R. WALTZ, J. CANDY, General Atomics — Experimental results from Alcator C-Mod have confirmed earlier AUG and JET findings that spontaneous peaking of the density profile in H-mode plasmas depends on collisionality. Previously reported nonlinear, 'full-radius' GYRO simulations [1] of low-collisionality, peaked-density H-mode plasmas in C-Mod generated a particle pinch that was produced exclusively by higher-k modes. Nonlinear simulations of AUG have a similar character [2], and recent detailed linear analyses [2,3] suggest that density peaking may be common in low collisionality plasmas. Here we increase the number of ion species in the simulations to determine whether impurity pinches are also expected, and whether the degree of density peaking is predicted to differ for the three hydrogen isotopes. These simulations include experimentally relevant levels of several impurities, and a range of H/D and D/T mixes.

- [1] D.R. Mikkelsen, et al., Bull. Am. Phys. Soc. 52, (2007) No. 16, 221, NP8.71
- [2] C. Angioni, et al., Phys. Plasmas 16 (2009) 060702
- [3] M. Maslov, et al., Nucl. Fusion 49 (2009) 075037

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