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GYRO Simulations of Turbulently Driven Density Peaking in C-Mod Plasmas[1] D.R. MIKKELSEN, M. BITTER, L. DELGADO-APARICIO, K.W. HILL, PPPL, M. GREENWALD, J.W. HUGHES, Y. MA, Y. PODPALY, J.E. RICE, MIT, J. CANDY, R.E. WALTZ, General Atomics — In turbulence simulations with H & D mixtures the deuterium density profile is slightly more peaked than hydrogen, while electron density peaking is insensitive to H/D. Adding a low-Z impurity has no effect on density peaking. Density peaking is weakly affected when the Ti profile is varied to align the predicted heat flux to the experimental transport analysis. Robust predictions of peaking are obtained with a novel simulation procedure: each hydrogenic species is represented by two ions in the simulations (e.g. two D and two H); they differ only by having different density gradients, but these offset each other so the total R/Lni for each species matches the electron R/Lne. Linear interpolation of the predicted particle fluxes determines the individual R/Lni that meet the null-flux condition required for each hydrogenic species; integrating the R/Lni profiles gives the predicted density peaking. Studies of the density peaking of low-, medium-, and high-Z impurities are planned.

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