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Simulations of ETG-driven turbulent transport in NSTX[1] D.R. MIKKELSEN, S.M. KAYE, Princeton University, J. CANDY, R.E. WALTZ, General Atomics — The gyrokinetic code GYRO [1] is used to simulate turbulent transport driven by ETG modes in two sets of conditions based on NSTX experiments. Many simulations are located at r/a=0.6 in a deuterium L-mode plasma with Te=1.1Ti, Zeff=1.5, q=1.3, and shear=1. We find that the experimentally determined ExB shearing rate controls the level of transport by limiting the size of the turbulent eddies. The ExB shearing rate removes the need to include modes with $k_\theta \rho_i < 1$ in the simulation, thereby reducing the cost of using a gyrokinetic treatment for both electrons and ions and allowing simulations with m_D/m_e up to 1600 that demonstrate convergence in this parameter. The ExB shear may also be responsible for the absence of runaway turbulence (previously reported by others for shear>0.4) in our simulations with adiabatic-ions. Preliminary work at r/a=0.34 in a helium L-mode plasma with Te=1.5Ti, Zeff=2.5, q=2.4, finds that the magnetic shear, $\hat{s}$=-0.3, has a strong stabilizing influence.
[1] J. Candy and R.E. Waltz, J. Comput. Phys. 186 (2003) 545

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