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Testing predictions of electron scale turbulent transport in H-mode pedestals[1] WALTER GUTTENFELDER, Princeton Plasma Physics Laboratory, R.J. GROEBNER, GA, B.A. GRIERSON, PPPL, J.M. CANIK, ORNL, E.A. BELLI, J. CANDY, GA, A. ASHOURVAN, PPPL — Electron temperature profiles closely follow the electron-scale ETG instability threshold calculated by CGYRO in the pedestal of two DIII-D ELMy H-mode discharges. The two discharges with different divertor geometry were chosen to analyze the role of transport vs. sources in setting the pedestal density and temperature profiles. Nonlinear simulations predict ETG turbulence can produce significant electron heat flux in the sharp gradient region, comparable to the observed heat flux. Neoclassical transport calculated by NEO predicts a significant contribution to the electron particle flux inferred from SOLPS-ITER analysis. Additional nonlinear simulations are used to predict the sensitivity of ETG transport to variations in input gradients. A pedestal-ETG transport model is derived using an analytic fit to the simulation results, and is used in addition to NEO to predict both ne and Te pedestal profiles. Although ETG and neoclassical transport play important roles in setting these profiles, the modeling suggests an additional transport mechanism may be required to match experimental profiles.

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