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Electron Thermal Transport and Multi-scale Turbulence in Low Collisionality H-mode Plasmas[1] L. SCHMITZ, UCLA, C. HOLLAND, UCSD, T.L. RHODES, G. WANG, J.C. HILLESHEIM, L. ZENG, W.A. PEEBLES, E.J. DOYLE, UCLA, G.R. MCKEE, U. Wisc.-Madison, A.E. WHITE, MIT-PSFC, K.H. BURRELL, J.C. DEBOO, J.S. DEGRASSIE, C.C. PETTY, GA — Electron thermal transport and the role of local ITG/TEM/ETG-scale core turbulence are investigated in high temperature DIII-D H-mode/QH-mode plasmas at ITER-relevant electron to ion temperature ratio ($0.5 \leq T_e/T_i \leq 1.2$) and collisionality ($\nu_e^* \sim 0.05$). The T_e/T_i ratio is varied using central ECH ($P_{ECH} \leq 2.7\,\mathrm{MW}$). Experimentally determined H-mode electron transport fluxes and turbulence wavenumber spectra are directly contrasted with nonlinear gyrokinetic (GYRO) simulations results. The effects of $E \times B$ shear on core ITG/TEM-scale turbulence are studied at low and high rotation, with the latter leading to reduced electron thermal transport across the entire minor radius. GYRO simulations indicate that a significant portion of the remaining H-mode electron heat flux results directly from short-scale TEM/ETG turbulence.

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