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ETG-dominated transport regimes in near-edge DIII-D L-mode plasmas: Validation of multiscale gyrokinetic simulations[1] TOM NEISER, FRANK JENKO, LOTHAR SCHMITZ, DANIEL TOLD, ALEJANDRO BANON NAVARRO, TROY CARTER, UCLA, ZHENG YAN, GEORGE MCKEE, General Atomics — A prerequisite for the development of a self-consistent theoretical description of the L-H transition is the ability to quantitatively characterize near-edge L-mode plasmas. It is shown here for the first time that regimes exist in the L-mode near-edge that appear to be dominated by sub-ion-scale turbulence driven by electron temperature gradient (ETG) modes. These are results of gyrokinetic simulations of a DIII-D L-mode discharge in the near edge region (r/a = 0.8) with the GENE code (www.genecode.org). Instructed by a linear analysis, we performed nonlinear simulations of ITG and ETG turbulence, pointing to a dominance of ETG turbulence regarding the anomalous radial heat flux. Direct comparison with experimental data is encouraging. Respective multi-scale simulations, covering both ion and electron scales are underway and will be presented. Implications for L-H transition modeling will also be discussed.

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