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Microtearing instabilities driving anomalous heat loss in the pedestal region of DIII-D discharges[1] MICHAEL HALFMOON, DAVID HATCH, MIKE KOTSCHENREUTHER, SWADESH MAHAJAN, University of Texas at Austin, ANDREW NELSON, EGEMEN KOLEMEN, FLORIAN LAGGNER, AHMED DIALLO, Princeton Plasma Physics Laboratory, EHAB HASSAN, MAX CURIE, University of Texas at Austin, RICHARD GROEBNER, General Atomics — Advances in gyrokinetic codes, along with techniques for mode identification based on a "fingerprints" method have found the significance of microtearing Modes (MTM) and electron temperature gradient (ETG) modes in causing the energy losses within the pedestals of fusion experiments operating in the ELMy H-mode regime. Gyrokinetic simulations using the GENE code are performed, with equilibrium EFIT profiles constructed from DIII-D data. Nonlinear local simulations have shown that electron heat flux has only minor contributions from ETG turbulence, while MTM's and neoclassical effects account for significant electron and ion heat losses, respectively, in the pedestal. MTM's found in global simulations are consistent with observed magnetic fluctuations, having a frequency in the electron diamagnetic direction and in the expected range, given the equilibrium gradients. Classifying these modes using the physical characteristics of the resulting transport gives insight into the mechanisms driving pedestal transport. Simulations of kinetic ballooning modes are shown to have "fingerprints" inconsistent with observations, ruling them out as the main cause of observed transport.

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