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Understanding pedestal transport via combined gyrokinetic and edge modeling DAVID HATCH, M. KOTSCHENREUTHER, S. MAHAJAN, M. HALFMOON, E. HASSAN, G. MERLO, C. MICHOSKI, UT Austin, J. CANIK, ORNL, I. JOSEPH, M. UMANSKY, LLNL, W. GUTTENFELDER, A. DIALLO, PPPL, R. GROEBNER, General Atomics, A. NELSON, F. LAGGNER, PPPL, J. HUGHES, MIT, S. MORDIJCK, William and Mary — This presentation will report on the FY19 theory performance target (TPT), whose goal is to identify the turbulent transport mechanisms that affect pedestal dynamics. This is achieved via two sets of computational tools: (1) gyrokinetic codes (GENE and CGYRO), which can analyze the instabilities and resulting transport in the pedestal, and (2) edge codes (SOLPS and UEDGE), which, when operated in interpretive mode, can provide the best possible estimate of particle and heat sources–e.g., the ionization density source and the atomic energy loss channels due to ionization, charge exchange, and radiation. Such information, in combination with available fluctuation data and observed inter-ELM profile evolution, provides powerful constraints on the candidate instabilities that may govern pedestal transport. Comparisons will be made with discharges spanning multiple devices, large ranges in dimensionless parameters, multiple modes of operation (e.g., ELMy H-mode, I-mode, QH mode, etc.), wall materials, and fueling levels.

David Hatch
University of Texas at Austin

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