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Progress in Understanding the Enhanced Pedestal H-mode in NSTX S. GERHARDT, D. BATTAGLIA, R.E. BELL, A. DIALLO, W. GUTTENFELDER, B.P. LEBLANC, R. MAINGI, Y. REN, PPPL, J.M. CANIK, ORNL, P. SNYDER, General Atomics, S. KUBOTA, UCLA, D.R. SMITH, UW-Madison — The enhanced pedestal H-mode (EP H-mode) is a high performance regime in NSTX, characterized by very steep ion temperature gradients and large edge flow shear. Recent research shows that the edge ion temperature shapes can very widely, from cases with the steep gradient region near the separatrix, to cases where the gradient is shifted inward by up to 10 cm. In all cases, however, the region of good confinement is coincident with a region of large toroidal flow shear. Typically 75% of the stored energy increase following the EP H-mode transition is through the ion channel, with the remaining 25% in the electron channel. While most EP H-mode examples are quite short, a number of quite quiescent long-pulse examples have been found in the NSTX database. Edge fluctuations in this regime have been assessed. There are some hints of an increase in magnetic fluctuations measured at the vessel wall, but no profound modifications in the turbulence measured by BES; reflectometer analysis is ongoing. Results of transport assessments with TRANSP and XGC-0, microstability calculations with GS-2, and edge macrostability with ELITE will be presented. This work was sponsored by the U.S. Department of Energy.

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