

Abstract Submitted
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Advances in Predictive Capability of Pedestal Structure from FY11 Joint Research Target¹ R.J. GROEBNER, P.B. SNYDER, General Atomics, C.S. CHANG, Princeton Plasma Physics Laboratory, J.W. HUGHES, Massachusetts Institute of Technology, R. MAINGI, Princeton Plasma Physics Laboratory, X.Q. XU, Lawrence Livermore National Laboratory — Joint experiment/theory/modeling research, performed as part of a US DOE Joint Research Target in FY2011, has led to improved predictive capability of the H-mode pedestal structure. Comparisons of experiments in C-Mod, DIII-D and NSTX with ELITE and BOUT++ show that the pedestals in the three machines reach the predicted peeling/ballooning (PB) limit at the onset of Type-I ELMs. Studies in all three devices show that the pedestal width scales approximately as the square root of the pedestal beta poloidal. This is expected if the pedestal p' is limited by kinetic ballooning modes (KBMs). Coherent density fluctuations with characteristics expected for KBMs have been observed in some plasma conditions in DIII-D. The EPED model combines models for bootstrap current, PB modes and KBMs and predicts the pedestal pressure in DIII-D and C-Mod to within $\sim 20\%$.

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