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Theory Experiment

Bifurcation to Expanded H-mode Pedestal Width and Height with Lithium Dust Injection in DIII-D,* R. Maingi, D.K. Mansfield, D.J. Battaglia, B.A. Grierson, R. Nazikian, A.L. Roquemore, *PPPL*; G.L. Jackson, T.H. Osborne, C. Chrobak, J.S. deGrassie, R.J. Groebner, P.B. Snyder, *GA*; Z. Yan, G.R. McKee, *U Wisc*; A.G. McLean, *LLNL*; DIII-D Team – Lithium (Li) aerosol injection into the SOL of the DIII-D tokamak has facilitated a rapid ~100% expansion of the H-mode pedestal width in a class of ELMy discharges. ELM-free H-modes with τ_E increasing by $\leq 60\%$ are observed; the radiated power held steady during ELM-free periods. The pedestal T_e and P_e doubled, while the T_i increased by $\sim 20\%$. Substantial Li density was observed in the core, reaching up to 15% at the top of the pedestal. The onset of a continuous pedestal-localized instability measured on beam emission spectroscopy correlated with the pedestal expansion, which can occur on a < 10 ms timescale. These enhanced pedestals are limited by onset of giant ELMs, which appear to be consistent with ideal stability calculations.

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