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Theory Experiment

H-mode Pedestal Enhancement and Improved Confinement in DIII-D with Lithium Injection* G.L. Jackson, T.H. Osborne, *GA*; R. Maingi, D.J. Battaglia, D.K. Mansfield, A.L. Roquemore, B.A. Grierson, *PPPL*; C.P. Chrobak, *UCSD*; A.G. McLean, *LLNL*; G.R. McKee, Z. Yan, *U. Wisc.*— Lithium has been injected into DIII-D discharges leading to larger density and temperature pedestal widths and pedestal pressure increases. The lithium injection allowed transitions from ELMing to ELM free H-mode with energy confinement improvements up to 70%, compared to similar discharges without lithium. Lithium was injected directly into the plasma and SOL as an aerosol (44 μm dia particles) using a “lithium dropper” with no increase in radiated power. The lithium injection also led to density fluctuations of up to 8% in the pedestal region in the frequency range $\approx 40 - 150$ kHz, measured by the BES diagnostic [1].

We will discuss experiments to obtain ELM-free performance and enhanced pedestals with lithium, EPED modeling to determine proximity to the peeling-ballooning boundary, and conditions for obtaining reduced recycling.

[1] Z. Yan, et al., these proceedings

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