

**Abstract Submitted for the 55th Annual Meeting  
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Category Number and Subject: 6.20 DIII-D Tokamak

Theory    Experiment

**Recycling Reduction and Density Control with Lithium Injection in DIII-D,\*** G.L. Jackson, C.P. Chrobak, *General Atomics*; R. Maingi, D. Mansfield, A. Roquemore, *PPPL*; A.G. McLean, *LLNL* – Lithium conditioning has been effective in tokamaks for reducing recycling and providing density control, particularly in NSTX and EAST. Since DIII-D has not injected lithium in more than a decade (and then in only very small amounts, 0.4 g total), a unique opportunity exists to extend this experience and examine the physical effects of lithium in a well-conditioned lithium-free machine. A lithium dropper, developed by PPPL, has recently been installed on DIII-D. By injecting 0.09 g of lithium we have observed reductions in recycling, density, and ELM frequency from the first discharge with significant lithium injection. Although modeling of individual 40  $\mu\text{m}$  diam. Li granules predicts virtually no penetration beyond the separatrix in auxiliary heated H-mode pulses,  $\text{Li}^{\text{III}}$  emission was detected in the core plasma, albeit with no increase in radiated power. On subsequent discharges without injection no core Li was detected, and only  $\text{Li}^{\text{I}}$  emission was observed in the SOL and divertor regions. We will present the effects of Li on recycling, ELM frequency, and the edge pedestal, and discuss the long-term observations of lithium on plasma facing components.

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