

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Recycling Reduction and Density Control with Lithium Injection in DIII-D¹ 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 μm diam. Li granules predicts virtually no penetration beyond the separatrix in auxiliary heated H-mode pulses, Li^{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 Li^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.

¹Work supported by the US Department of Energy under DE-FC02-04ER54698, DE-AC02-09CH11466, and DE-AC52-07NA27344

Gary Jackson
General Atomics

Date submitted: 12 Jul 2013

Electronic form version 1.4