

Abstract Submitted  
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**Modifications in divertor and scrape-off layer conditions with lithium coatings in NSTX** V.A. SOUKHANOVSKII, LLNL, H.W. KUGEL, R. KAITA, R.E. BELL, D.A. GATES, J.E. MENARD, D. MUELLER, B.P. LEBLANC, S.F. PAUL, A.L. ROQUEMORE, D.P. STOTLER, PPPL, R. MAINGI, ORNL, R. RAMAN, U. Washington, A. YU. PIGAROV, R. SMIRNOV, UCSD — Two lithium evaporators were used in NSTX to deposit lithium coatings on graphite plasma-facing tiles in the lower divertor, enabling neutral deuterium pumping and resulting in reduced recycling. This was evident from the reduction by 50% – 80% in  $D_\alpha$  poloidal and divertor brightnesses, as well as the ion outfluxes, edge neutral pressure, core and divertor  $n_e$ . The two point and multi-fluid UEDGE code modeling suggested a shift of the outer divertor operating space toward the sheath-limited transport regime with lithium. Particle balance calculation showed that the deuteron inventory was well controlled and remained nearly constant in the long (1.2–1.4 s) ELM-free H-mode discharges with lithium coatings. However,  $n_e$  rose due to the increasing carbon inventory. The carbon source, estimated from C II and C III intensities and atomic S/XB factors, was reduced, suggesting that impurity accumulation was due to the improved particle confinement. Supported by the U.S. DOE under Contracts DE-AC52-07NA27344, DE-AC02-09CH11466, DE-AC05-00OR22725, DE-FG02-08ER54989, and W-7405-ENG-36.

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