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The continuous improvement of H-mode discharge performance with progressively increasing lithium coatings in NSTX R. MAINGI, ORNL, S.M. KAYE, C.H. SKINNER, PPPL, D.P. BOYLE, Princeton U., J.M. CANIK, ORNL, NSTX TEAM — Lithium wall coatings have been shown to reduce recycling, improve energy confinement [1,2], and suppress edge localized modes [3,4] in the NSTX. Here we show that these effects depend nearly *continuously* on the amount of pre-discharge lithium evaporation. We observed a nearly monotonic reduction in recycling and a decrease in edge electron transport [5] with increasing lithium. Moreover we see a reduction in the electron temperature and profile peaking factors, as well as an improvement in ELM stability [6] with increasing lithium. These correlations challenge basic expectations, given that even the smallest coatings provided a nominal minimum lithium coating thickness of 30 nm, and an average of 60 nm near the outer divertor strike point; the maximum coating thickness was 8x higher. In comparison, the nominal implantation range, which is the relevant scale length for recycling and pumping, was < 10 nm. *Supported in part by U.S. DoE contracts DE-AC05-00OR22725 and DE-AC02-09CH11466.
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