Abstract Submitted
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The relationships between ELM suppression, pedestal profiles, and lithium wall coatings in NSTX[1] D.P. BOYLE[2], Princeton Plasma Physics Laboratory, R. MAINGI, Oak Ridge National Laboratory, P.B. SNYDER, T.H. OSBORNE, General Atomics, J. MANICKAM, PPPL — Recently in the National Spherical Torus Experiment (NSTX), increasing lithium wall coatings suppressed edge localized modes (ELMs), gradually but not quite monotonically. While the quantity of Li deposited did not uniquely determine the presence of ELMs, profile analysis demonstrated that Li was correlated to wider density and pressure pedestals with peak gradients farther from the separatrix. Ultimately, ELMs were suppressed *only* when lithium caused the n_e pedestal to widen and shift inward. This supports the theory that ELMs in NSTX are caused by kink/peeling modes, which are stabilized when the edge current and pressure gradient follow the the n_e gradient and shift away from the separatrix. Edge stability analysis using ELITE corroborated this picture, as reconstructed equilibria from ELM-free discharges were generally farther from their kink/peeling stability boundaries than ELMy discharges. We conclude that density profile control provided by Li is the key first step to ELM suppression in NSTX.

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