Abstract Submitted
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Changes to edge gyrokinetic stability with lithium coated PFCs in NSTX[1] J.M. CANIK, ORNL, W. GUTTENFELDER, R. MAINGI, R.E. BELL, B.P. LEBLANC, PPPL, T.H. OSBORNE, GA — The application of lithium coatings to the NSTX PFCs has been shown to eliminate ELMs and increase energy confinement. The linear microstability properties in the edge region of plasmas without and with lithium coatings have been examined with the GS2 code. In the far edge, outside $\psi_N \sim 0.95$, electron temperature gradient (ETG) modes are destabilized with lithium. Nonlinear simulations suggest that ETG transport may be large enough to prevent the electron temperature gradient from increasing, even as the density is reduced when lithium is introduced; experimentally, a clamping of the T_e profile is observed that contributes to the stabilization of ELMs by lithium coatings. Near the pedestal top, microtearing modes are unstable without lithium, and are stabilized by the locally increased density gradient with lithium; this stabilization may play a role in the reduced transport rate inferred in the same region and the increase in global energy confinement observed with lithium. These results point to the edge density profile as the controlling factor determining both ELM stability and energy confinement.

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