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Initial predictions of linear TAE stability in NSTX-U[1] M. PODESTA, N.N. GORELENKOV, E.D. FREDRICKSON, S.P. GERHARDT, G.J. KRAMER, PPPL — A second Neutral Beam (NB) injection line is being installed on the NSTX Upgrade device, resulting in six NB sources with different tangency radii available for current profile control. Optimization of NSTX-U discharges toward high performance requires an accurate knowledge of the NB driven current, especially when the behavior of the injected NB fast ions deviates from classical predictions. In particular, Toroidal Alfven Eigenmodes (TAE) destabilized by fast ions are known to affect NB driven current by inducing fast ion redistribution and loss. This work explores the stability of TAE modes for NSTX-U scenarios with various NB injection geometries, from more perpendicular to more tangential. Initial predictions, based on linear stability analysis through the ideal MHD code NOVA-K, are presented. For the scenarios considered in this work, TAE are marginally stable, with continuum damping and ion/electron Landau damping representing the dominant damping mechanisms. Because of the higher magnetic field in NSTX-U (up to 1T) with respect to NSTX, the spectrum of less stable modes shifts to higher toroidal mode numbers, peaking at n=5-8. The sensitivity of these results to parameters such as toroidal field, plasma temperature and density, and safety factor profile is also discussed.

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