

Abstract Submitted
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Experimental Study of Kink-like Modes in NSTX Plasmas¹ GE DONG, MARIO PODESTA, Princeton Plasma Physics Laboratory — Internal kink modes destabilized by energetic trapped particles can cause particle losses and deteriorate plasma performance in toroidal fusion devices . In this study, we characterized the main properties of kink-link instabilities in National Spherical Torus Experiment (NSTX) plasmas, including the wave number spectrum, effective mode growth rate and real frequency, as a function of the thermal plasma, fast ion and magnetic field parameters, which is re-constructed using LRDfit and TRANSP, utilizing experimental data from motional Stark effect(MSE) diagnostic for direct measurements of the q profiles. Results indicate that the bursting fishbone modes are unstable at preferentially higher fast ion beta regime, while the long-lived non-resonant kink (NRK) modes are unstable at lower and higher fast ion beta values. Both the fishbones and the NRK tend to be stable with q_{\min} above around 1.5.

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Ge Dong
Princeton Plasma Physics Laboratory

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