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Effects of toroidal rotation shear on TAE dynamics in NSTX¹ M. PODESTA, R.E. BELL, E.D. FREDRICKSON, N.N. GORELENKOV, B.P. LEBLANC, PPPL, W.W. HEIDBRINK, UCI, N.A. CROCKER, S. KUBOTA, UCLA, H. YUH, Nova Photonics — The effects of a sheared toroidal rotation on the dynamics of bursting toroidicity-induced Alfvén eigenmodes (TAEs) are investigated experimentally in neutral beam heated plasmas on the National Spherical Torus Experiment. The modes extend over most of the minor radius across a region where a strong toroidal rotation shear of up to 200 kHz/m is measured. Contrary to results from other devices, no clear evidence of increased damping is found. Instead, experiments indicate a strong correlation between the TAE dynamics and the instability drive. For instance, the amplitude of the bursts increases as the fast ion population builds up and otherwise stable TAEs can be promptly destabilized by auxiliary rf heating, due to modifications of the fast ion distribution. It is argued that kinetic effects involving changes in the mode drive and damping mechanisms other than rotation shear, such as continuum damping, are mostly responsible for the bursting dynamics of the modes.

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