

Abstract Submitted
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Ion loss during TAE avalanches in NSTX¹ E.D. FREDRICKSON, D. DARROW, G. KRAMER, N.N. GORELENKOV, S.S. MEDLEY, B. LEBLANC, R.E. BELL, PPPL, W.W. HEIDBRINK, D. LIU, M. PODESTA, UC Irvine, N.A. CROCKER, S. KUBOTA, UCLA, F.M. LEVINTON, H. YUH, Nova Photonics — Non-linear interactions of multiple Toroidal Alfvén Eigenmodes (TAE) can result in explosive mode growth and enhanced losses of fast ions in a repetitive cycle of TAE bursts called avalanches. The mode structure and mode amplitudes are measured with arrays of reflectometers and Mirnov coils. The amplitude of individual modes, and rms amplitude of all TAEs are found to increase by an order of magnitude, coupled with strong downward frequency chirps in the final burst. Fast ion redistribution is seen for the energies > 30 keV with a Neutral Particle Analyzer diagnostic. The plasma equilibrium is reconstructed using Thomson scattering profile and multi-channel Motional Stark Effect data. The NOVA-k code has been used to simulate the eigenmode structures, matched to the measured radial profiles and mode frequencies and are used to simulate the effect of the TAE on fast ion transport with ORBIT.

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