

Neutral Beam Ion Loss During EPMs and RSAEs in NSTX Plasmas*

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NSTX plasmas exhibit a variety of fast particle driven MHD instabilities, including bursts of Energetic Particle Modes (EPMs), Reverse Shear Alfvén Eigenmodes (RSAEs), and Beta-induced Alfvén Acoustic Eigenmodes (BAAEs). These are all driven by the 80 kV D beam ions. Loss of the fast ions is observed during the EPM bursts and during the RSAEs. The EPMs rapidly develop into multiple toroidal mode numbers present concurrently, and loss of beam ions over a wide range of pitch angles is observed. This loss is interpreted as a stochastization of the particle phase space by the modes. During the RSAE upward frequency sweep, a loss of beam ions is also seen. Fast ion loss due to BAAEs is small in the cases studied so far. Observations and interpretations of the existing data from NSTX will be presented, along with plans for future experiments.

*This work supported by US DoE contract DE-AC02-76-CH03073.