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Neutral Beam Ion Loss Accompanying Bursting MHD in NSTX Plasmas¹ DOUGLASS DARROW, ERIC FREDRICKSON, Princeton Plasma Physics Laboratory, NEAL CROCKER, UCLA, NIKOLAI GORELENKOV, LANE ROQUEMORE, Princeton Plasma Physics Laboratory, KOUJI SHINOHARA, Japan Atomic Energy Agency — 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 80-90 kV D beam ions. Loss of fast ions is observed during EPM bursts and during 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, beam ion loss is also seen, but over only a limited pitch angle range, in contrast to the EPM bursts. Fast ion loss is also seen during TAE avalanches or concurrent multiple-n TAEs, but this loss also is seen over a limited range in pitch angle, again suggesting the loss mechanism differs from that in the EPM bursts.

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