

**Abstract Submitted for the 54th Annual Meeting  
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Category Number and Subject: 5.6.2. DIII-D Tokamak

Theory  Experiment

**Neutral Beam-ion Prompt Loss Induced by Alfvén Eigenmodes in DIII-D,\*** X. Chen, W.W. Heidbrink, *University of California-Irvine*; R.K. Fisher, D.C. Pace, C.C. Petty, M.A. Van Zeeland, *General Atomics*; G.J. Kramer, R. Nazikian, *Princeton Plasma Physics Laboratory* – Prompt beam-ion loss driven by toroidal and reversed shear Alfvén eigenmodes (TAE/RSAEs) have been observed on fast ion loss detectors (FIELDS) in DIII-D. The losses, modulated at the TAE/RSAE frequencies, emerge quickly following beam turn on ( $<0.1$  ms, consistent with a single poloidal transit period) and are correlated with different beams as the  $q$ -profile evolves during the discharge, indicating that those losses occur on the first drift orbit. Full orbit simulations with the SPIRAL code indicate that the observed losses are dominated by barely-confined trapped ions that are scattered by TAEs and RSAEs onto lost orbits that can intersect the FILD. Simulations show that the relative changes in pitch due to the modes being are larger than the changes in energy. In addition, losses at the beat frequencies between the TAEs and RSAEs are observed. Possible nonlinear interactions between the modes and fast ions are investigated in order to explain the losses at the beat frequencies.

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