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Simulation of Observed EGAM Induced Beam-ion Losses in DIII-

 \mathbf{D}^1 G.J. KRAMER, G.Y. FU, R. NAZIKIAN, Princeton Plasma Physics Laboratory, M.A. VAN ZEELAND, R.K. FISHER, General Atomics, W.W. HEIDBRINK, L. CHEN, UC-Irvine, D.C. PACE, ORISE — In DIII-D a non-perturbative beamdriven instability, the energetic particle geodesic acoustic mode (EGAM) is often observed when counter-going beams are injected in the current ramp-up phase of the discharge. The EGAM is an n=0 mode in the plasma core with a frequency about 50% below the ideal GAM and it is an excellent mode to validate codes that are used to predict fast-ion losses in burning plasmas. When the EGAM appears the 2.5 MeV neutron emission drops 10% to 15%. This signal is dominated by beam-ion collisions with the thermal plasma and indicates a decrease in the fast-ion population. Recently, accurate measurements have been made of EGAM induced losses with a fast-ion loss detector (FILD) mounted below the mid-plane in DIII-D. We report on state-of-the-art full-orbit following fast-ion loss simulations for the first 50 ms of beam injection using the 3-D beam birth deposition from TRANSP. A very good qualitative agreement between simulation and experiment was found.

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