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Category Number and Subject: 5.6.2. DIII-D Tokamak

[ ] Theory [ ] Experiment [X] Combined/General

Simulation of Observed EGAM Induced Beam-ion Losses in DIII-D,* G.J. Kramer, G.Y. Fu, R. Nazikian, *PPPL*; M.A. Van Zeeland, R.K. Fisher, *GA*; W.W. Heidbrink, L. Chen, *UC-Irvine*; D.C. Pace, *ORISE* – In DIII-D a non-perturbative beam-driven 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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