

**Abstract Submitted for the 56th Annual Meeting
Division of Plasma Physics**

Category Number and Subject: 5.6.2. DIII-D Tokamak

Theory Experiment

Measurements of Fast Ion Transport Due to $n=3$ Magnetic Perturbations on DIII-D,* M.A. Van Zeeland, T.E. Evans, N.M. Ferraro, M.J. Lanctot, D.C. Pace, *General Atomics*; C. Collins, W.W. Heidbrink, *UCI*; M. Garcia-Munoz, *IPP-Garching*; J.M. Hanson, *Columbia U.*; B.A. Grierson, G.J. Kramer, R. Nazikian, *PPPL*; S.L. Allen, C.J. Lasnier, W.H. Meyer, *LLNL* – Measurements of fast ion (FI) transport due to applied $n=3$ magnetic perturbations on DIII-D have been made in both ELM suppressed H-mode as well as L-mode discharges. FIDA measurements probe the confined FI profile in the edge and losses to the wall are obtained with scintillator detectors as well as an infrared periscope. In ELM suppressed plasmas FIDA data show a significant depletion of the edge FI profile during application of $n=3$ fields. IR imaging of the beam ion prompt loss footprint shows a difference in wall heating depending on phase of the $n=3$ perturbation. Measurements of both the impact on the confined FI profile and prompt losses will be compared to full-orbit modeling which predicts up to 10-15% of the injected beam ions are lost before thermalization. Orbit following simulations also predict an increase in losses due to resonance between the FI drift orbits and the applied $n=3$ fields. Measurements during L-mode current ramp plasmas used to scan for signatures of these resonances will be discussed.

*Work supported in part by the US DOE under DE-FC02-04ER54698, SC-G903402, DE-FG02-04ER54761, DE-AC02-09CH11466, DE-AC52-07NA27344.