

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Effect of Neutral Beam Parameters on Prompt Losses in Tokamaks¹ J. JUREWICZ, Massachusetts Institute of Technology, D.C. PACE, R.K. FISHER, M.A. VAN ZEELAND, General Atomics, C.T. HOLCOMB, LLNL — First orbit, or prompt losses occur when an injected neutral atom ionizes such that its first poloidal transit intersects a limiter surface. The heat load from these losses can affect diagnostic components near the first wall. We are developing a code that calculates where prompt losses reach the wall of the DIII-D tokamak as a function of plasma parameters including 3D beam geometry. This code also serves as a synthetic diagnostic for the Fast Ion Loss Detector system. Using magnetic equilibria and beam energies from DIII-D discharges, the pitch angle and density of neutral particles ionized along the beam path are determined and used to calculate ion trajectories, resulting in a map of prompt loss flux to the wall. A modeling study is performed to determine prompt loss versus beam energy. Initial results focus on whether it is possible to shift an existing prompt loss heat load away from a motional Stark effect diagnostic by increasing the energy of the source beam.

¹Work supported in part by the US Department of Energy under DE-FG02-94ER54235, DE-FC02-04ER54698 and the National Undergraduate Fellowship in Fusion Science and Engineering.

J. Jurewicz
Massachusetts Institute of Technology

Date submitted: 11 Jul 2012

Electronic form version 1.4