

Abstract Submitted
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Modeling of Neutral Beam Ion Prompt Loss from NSTX Plasmas¹ R.C. NORA, Colorado School of Mines, D.S. DARROW, Princeton Plasma Physics Laboratory — Neutral beam injection is a frequently used and effective means of heating magnetically confined fusion plasmas. While most of the injected neutrals are ionized and captured within the plasma, a fraction can be lost immediately to the wall due to being born on unconfined orbits, termed prompt loss. To minimize the computation time of calculating these prompt loss ions, the neutral beam ion phase space is reduced to two dimensions by coupling a simple beam deposition model with a constants of motion (COM) approach. In particular, we work with the magnetic moment and the canonical toroidal angular momentum. This approach allows easy visualization of the fast ion population in phase space and rapid calculation and display of the boundary between confined and lost particles. Since NSTX is equipped with a scintillator type fast loss ion probe, we are also evaluating whether this method can be used to predict the pitch angle profile of the prompt loss signal in the probe. In principle, this representation of the particle phase space might also be useful for simulation of other fast ion diagnostic signals. Example calculations and status of this work will be presented.

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