

Abstract Submitted
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Study of beam-ion confinement in MHD-quiescent NSTX plasmas¹ D. LIU, W.W. HEIDBRINK, University of California, Irvine, D.S. DARROW, S.S. MEDLEY, A.L. ROQUEMORE, Princeton Plasma Physics Laboratory — The NSTX with its extensive set of fast-ion diagnostic (neutron detectors, E||B-type neutral particle analyzer, scintillator-based beam ion loss probe and newly developed solid state neutral particle array) provides a good test-bed to study the confinement of beam ions in quiet spherical tokamak plasmas. Ten ms pulses (“beam blips”) of 90keV deuterium neutrals are injected into helium plasmas with plasma current between 0.5 and 1.0 MA, and toroidal fields between 3.0 and 4.5 kG. Pitch angle scattering and slowing down of beam ions are studied by measuring the decay of the neutron and charge-exchange neutral particle signals following the “beam blip” and they are in good agreement with the expectations of TRANSP simulation, which includes beam deposition calculations, Coulomb collisions and charge exchange loss. Examples of deviations from classical behavior during instabilities are also given.

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