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Deuterium Neutral Beam Orbits In NSTX-U Nonaxisymmetric Vacuum Magnetic Fields JONAH PHILION, Harvard University/Princeton Plasma Phys Lab, DOUGLASS DARROW, Princeton Plasma Phys Lab — Axisymmetry of the tokamak magnetic field provides good fast ion radial confinement. Perturbations from this symmetry could induce fast ion radial diffusion and loss. A nonaxisymmetric perturbation was chosen to model the effect of this symmetry loss on NSTX-U deuterium neutral beam ions. Passing and banana orbits in the perturbed field were simulated by integrating the Lorentz force over a duration shorter than the collision time of ions. Upon comparison with analogous orbits in the unperturbed field, the perturbation is shown to have a dispersive effect on the magnetic moment of particle orbit guiding centers. In particular, banana orbits acquire oscillating magnetic moments when subject to the nonaxisymmetric field. The behavior is modeled as a diffusion coefficient which varies with the magnetic moment and canonical angular momentum of the orbit.

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