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**Physical Mechanisms of Fast-Ion Loss**[1] E.M. CAROLIPIO, W.W. HEIDBRINK, University of California, Irvine, R. WHITE, Princeton University — Theoretical analysis and simulations with a Hamiltonian guiding center code are used to understand fast-ion transport in several experiments. In one study, the stationary magnetic islands produced by large tearing modes reduce the neutral beam current drive efficiency and 2.5 MeV neutron emission by as much as 65%.[2] The losses are caused by intrinsic orbit stochasticity. In another study, the confinement of 1 MeV tritons is usually unaffected by externally-imposed helical fields, apparently because the rotating plasma reduces the amplitude of the perturbed field. In a third study, the measured magnetic fluctuations are too small to explain beam-ion losses during TAE activity; we speculate that parallel electric fields play a role in the observed transport.

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[2]C.B. Forest *et al.*, Phys. Rev. Lett. **79** (1997) 427.

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