

Spatial Transport of Fast Ions by Alfvén Eigenmodes in DIII-D*

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New fluctuation and fast-ion diagnostics provide a wealth of data about fast-ion instabilities during neutral beam injection into DIII-D. In plasmas with reversed shear, the radial profiles of coherent fluctuations in the electron temperature and electron density agree well with the predictions of linear MHD for both toroidicity-induced Alfvén eigenmodes (TAE) and reversed-shear induced Alfvén eigenmodes (RSAE). During the TAE and RSAE activity, evidence of strong fast ion redistribution is observed by neutron, fast-ion D_α (FIDA), and equilibrium diagnostics. The inferred TAE and RSAE field perturbations are included in the drift-orbit code ORBIT to compute the expected fast-ion transport. When the measured mode amplitudes are employed, the predicted transport is much smaller than the observed flattening of the fast-ion profile.

*Supported by the U.S. Department of Energy under SC-G903402, DE-FG03-97ER54415, DE-FC02-04ER54698, and DE-AC02-76CH03073.