Fast Ion Profiles in Plasmas With Alfvén Instabilities,* W.W. Heidbrink, Y. Luo, E. Ruskov, U. California-Irvine, G.J. Kramer, N.N. Gorelenkov, R. Nazikian, R. White, Princeton Plasma Physics Laboratory, M.A. Van Zeeland, Oak Ridge Institute for Science Education – Fast-ion redistribution is observed in plasmas with many different types of Alfvén eigenmode (AE) activity: toroidicity-induced (TAE), reversed shear (RSAE), elongation induced (EAE), and beta-induced (BAE). AE wave fields calculated by the NOVA code and benchmarked against experimental measurements are used to predict the modification of the fast-ion distribution function. These predictions are compared with profiles measured by the fast-ion Dα diagnostic, as well as fast-ion profiles inferred from the equilibrium. Neutron, neutral particle, and beam-ion loss detector diagnostics are also employed. In cases with strong AE activity, the central fast-ion profile is often flat.

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