

Abstract Submitted
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Modeling Error Fields and Disruptions in NSTX-U¹ N.M. FERRARO, C.E. MYERS, J.-K. PARK, D. PFEFFERLE, S.C. JARDIN, PPPL, M.T. BEIDLER, U. Wisconsin, Madison, M.L. REINKE, ORNL — Error field penetration and mode locking are among the most common sources of disruptions in tokamaks, and may also play an important role in the suppression of edge-localized modes (ELMs). Results from NSTX-U operations suggest that error fields may have had a considerable impact on plasma stability and transport, with locked modes commonly observed in L-mode discharges. We present models of error fields due to imperfections in the toroidal and poloidal field coils in NSTX-U, and consider the impact of these fields on the plasma equilibrium, including the impact on the magnetic pitch angle and heat flux at the divertor targets in high-performance NSTX-U model equilibria. Furthermore, we report on progress on modeling the nonlinear processes of error field penetration and disruptions with the extended-MHD code M3D-C1, with the goal developing predictive models of the processes by which error field penetration leads to disruptions or ELM suppression.

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