Abstract Submitted
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Computations of Vertical Displacement Events with Toroidal Asymmetry[1] C. R. SOVINEC, K. J. BUNKERS, University of Wisconsin-Madison — Nonlinear numerical MHD modeling with the NIMROD code [https://nimrodteam.org] is being developed to investigate asymmetry during vertical displacement events. We start from idealized up/down symmetric tokamak equilibria with small levels of imposed toroidally asymmetric field errors. Vertical displacement results when removing current from one of the two divertor coils. The Eulerian reference-frame modeling uses temperature-dependent resistivity and anisotropic thermal conduction to distinguish the hot plasma region from surrounding cold, low-density conditions. Diffusion through a resistive wall is slow relative to Alfvenic scales but much faster than resistive plasma diffusion. Loss of the initial edge pressure and current distributions leads to a narrow layer of parallel current, which drives low-n modes that may be related to peeling-dominated ELMs. These modes induce toroidal asymmetry in the conduction current, which connects the simulated plasma to the wall.

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