Abstract Submitted
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Modeling MHD Equilibrium and Dynamics with Non-Axisymmetric Resistive Walls in LTX and HBT-EP[1] C. HANSEN, University of Washington, J. LEVESQUE, J. BIALEK, Columbia University, D.P. BOYLE, PPPL, J. SCHMITT, Auburn University — In experimental magnetized plasmas, currents in the first wall, vacuum vessel, and other conducting structures can have a strong influence on plasma shape and dynamics. These effects are complicated by the 3D nature of these structures, which dictate available current paths. Results from simulations to study the effect of external currents on plasmas in two different experiments will be presented: 1) The arbitrary geometry, 3D extended MHD code PSI-Tet is applied to study linear and non-linear plasma dynamics in the High Beta Tokamak (HBT-EP) focusing on toroidal asymmetries in the adjustable conducting wall. 2) Equilibrium reconstructions of the Lithium Tokamak eXperiment (LTX) in the presence of non-axisymmetric eddy currents. An axisymmetric model is used to reconstruct the plasma equilibrium, using the PSI-Tri code, along with a set of fixed eddy current distributions. Current distributions are generated using 3D time-dependent, thin-wall, eddy current simulations using VALEN or PSI-Tet. Simulations of detailed experimental geometries are enabled by use of the PSI-Tet code, which employs a high order finite element method on unstructured tetrahedral grids that are generated directly from CAD models. Further development of PSI-Tet will also be presented.

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