Abstract Submitted
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Integrated Modeling of Time Evolving 3D Kinetic MHD Equilibria and NTV Torque[1] N.C. LOGAN, J.-K. PARK, B.A. GRIERSON, S.R. HASKEY, R. NAZIKIAN, L. CUI, PPPL, S.P. SMITH, O. MENEGHINI, GA — New analysis tools and integrated modeling of plasma dynamics developed in the OMFIT framework are used to study kinetic MHD equilibria evolution on the transport time scale. The experimentally observed profile dynamics following the application of 3D error fields are described using a new OMFITprofiles workflow that directly addresses the need for rapid and comprehensive analysis of dynamic equilibria for next-step theory validation. The workflow treats all diagnostic data as fundamentally time dependent, provides physics-based manipulations such as ELM phase data selection, and is consistent across multiple machines - including DIII-D and NSTX-U. The seamless integration of tokamak data and simulation is demonstrated by using the self-consistent kinetic EFIT equilibria and profiles as input into 2D particle, momentum and energy transport calculations using TRANSP as well as 3D kinetic MHD equilibrium stability and neoclassical transport modeling using General Perturbed Equilibrium Code (GPEC). The result is a smooth kinetic stability and NTV torque evolution over transport time scales.

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