Abstract Submitted
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Automating kinetic equilibrium reconstruction for tokamak stability analysis[1] Z.A. XING, Princeton University, D. ELDON, General Atomics, A.O. NELSON, W.J. EGGERT, Princeton University, M.A. ROELOFS, Eindhoven University of Technology, O. IZACARD, A.S. GLASSER, Princeton University, N.C. LOGAN, R. NAZIKIAN, Princeton Plasma Physics Laboratory, D.A. HUMPHREYS, O. MENEGHINI, S.P. SMITH, General Atomics, E. KOLEMEN, Princeton University — An automatic tool for producing consistent kinetic equilibrium reconstructions has been developed to facilitate large scale studies of plasma stability. Kinetically constrained MHD equilibrium reconstructions provide useful information about pressure and current density distributions within the plasma which can be used for further calculations essential for stability analysis. Properly transforming experimental data into the constraint profiles needed to form a kinetic equilibrium reconstruction used to be a time intensive, manual process and lacked a consistent standard. Through OMFIT, capabilities for user-created kinetic equilibria and best practices emerged on the path towards full automation, while retaining user interaction and best judgement, but challenges for complete automation remained. The Consistent Automatic Kinetic Equilibria generator tool (CAKE) has been developed to overcome these challenges and produce kinetic equilibrium through a r obust and automatic routine. Techniques are developed to account for varying data quality and availability, as well as for tuning parameters affecting fit quality.

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