Abstract Submitted
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Effects of Magnetic Measurement Uncertainty and Non-axisymmetry on Tokamak Equilibrium Reconstruction[1] D.P. FLANAGAN, D.P. BRENNAN, U. of Tulsa, L.L. LAO, E.J. STRAIT, GA, A.L. MONTGOMERY, U. Wisc.-Madison — Constraints must be imposed on the pressure and current profiles to solve the Grad-Shafranov equation during equilibrium reconstruction of tokamak plasmas. Rigorous consideration of magnetic measurement uncertainty is necessary to impose physically consistent constraints, yielding the best solution. Discharges from DIII-D are analyzed with two versions of EFIT. The first is the currently public version. The second utilizes a newly added magnetic uncertainty matrix based on detailed estimates of uncertainty in magnetic measurements of DIII-D expected to improve the accuracy of reconstruction and of estimates of error in reconstruction. Reconstructions using these methods are compared to determine the effects of the uncertainty matrix. Preliminary results indicate the new EFIT returns similar values for global plasma parameters such as β_p, l_i, and shape with a more realistic χ^2 than the public version. Furthermore, the effects of non-axisymmetry on reconstructions are explored.

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