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Three-Dimensional Equilibrium Reconstruction: V3FIT J.D. HANSON, S.F. KNOWLTON, Auburn University, S.P. HIRSHMAN, E.A. LAZARUS, Oak Ridge National Laboratory, L.L. LAO, General Atomics — Axisymmetric equilibrium reconstruction has proven invaluable for equilibrium control, and for comparisons with MHD stability and confinement predictions. The V3FIT code, currently under construction, will perform fast, accurate reconstruction for stellarators. To be most useful for experiments, the V3FIT code will need to a) run rapidly, b) be flexible, and c) be extensible. V3FIT uses the VMEC three-dimensional equilibrium code to solve the forward problem: given parameters such as the current and pressure profile, find the expected signals from diagnostics like magnetic diagnostic loops and microwave interferometers. The reconstruction algorithm is tightly coupled to the VMEC force balance equilibration iterations. Preliminary results from V3FIT reconstructions will be shown, and potential improvements to the reconstruction algorithm will be presented.

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