Recent EFIT Developments and 3D Extension,[1] L.L. LAO, M.S. CHU, H.E. ST. JOHN, E.J. STRAIT, GA, A.L. MONTGOMERY, Butler University, F.W. PERKINS, PPPL — Recent developments of the equilibrium reconstruction code EFIT and its 3D extension to model toroidally asymmetric effects due to error and externally applied perturbation magnetic fields are presented. These include a new more complete uncertainty matrix for magnetic diagnostics based on detailed knowledge about their fabrication, installation, calibration, and operation. A new algorithm to efficiently compute high bootstrap-fraction equilibria that explicitly separates out the Pfirsch-Schluter and bootstrap contributions to the poloidal current stream function is also being developed. Other on-going and planned developments include a new computational structure based on Fortran 90/95 with a unified interface that can conveniently accommodate different tokamak devices and grid sizes, as well as a computational link that allows easy integration with transport and stability physics modules for integrated modeling. EFIT reconstruction capability is also being extended to 3D based on perturbation solutions to the 3D Grad-Shafranov equilibrium equation.

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