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Numerical Methods for Real-Geometry Simulation in SUMMIT/PG3EQ_NC[1] D.E. SHUMAKER, A.M. DIMITS, Lawrence Livermore National Laboratory, J.N. LEBOEUF, University of California, Los Angeles — SUMMIT/PG3EQ_NC is a nonlinear gyrokinetic δf-PIC code for turbulence simulations in realistic axisymmetric geometry, which uses the quasiballooning representation for the field quantities. The key algorithms, their motivation, properties, and implemention are summarized. Sample code results, both using real DIII-D equilibria, as specified by EFIT, ONETWO, and PLOTEQ analyses, and using simplified noncircular equilibria will be shown. A central component of PG3EQ_NC is the field solver. This uses a first order Pade representation of the multispecies quasineutrality equation to enable it to work with spatially dependent equilibrium coefficients as occur in global simulations. Optimization of (the coefficients in) the Pade fit makes it highly accurate for the wavenumber range of interest over a wide range of species concentrations and temperatures. Our graphical package, including recent real-geometry upgrades, for plotting PG3EQ_NC field quantities on sections in real space will be described, and sample plots will be shown.

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