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Tests of General Geometry Capabilities in the Summit Gyrokinetic Framework*

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Abstract

Rapid progress[1] is being made in including electrons and electromagnetic effects in the Summit gyrokinetic framework[2]. In parallel, general geometry, realistic equilibria capabilities are also in the process of being incorporated in the Summit gyrokinetic framework through the pg3eq_nc module, itself an extension of the circular geometry pg3eq module[3]. These modules use quasi-ballooning coordinates to solve the three-dimensional, toroidal, delta-f, gyrokinetic equations for ions in order to model ion temperature gradient driven turbulence. Realistic geometry is introduced through an interface to data from the EFIT equilibrium code[4]. Massively parallel implementation has been effected using MPI. Linear and nonlinear tests are currently under way between the general geometry and circular geometry modules. These tests are being performed with a circular equilibrium which can be accommodated in both modules. Results from these tests will be reported.

[1] Yang Chen and Scott E. Parker, "Simulations of Electromagnetic Microtubulence with Kinetic Electrons", This meeting.
[2] http://www.nersc.gov/scidac/summit/
[3] A. M. Dimits, T. J. Williams, J. A. Byers, and B. I. Cohen, "Scalings of Ion-Temperature-Gradient-Driven Anomalous Transport in Tokamaks", Phys. Rev. Letts. **77**, 71-74 (1996).
[4] http://fusion.gat.com/efit/

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