Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Computational Diagnostics for Extreme Scale Toroidal Gyrokinetic Particle Simulations YUAN SHI, Princeton Plasma Physics Laboratory, BEI WANG, Princeton Institute of Computational Science and Engineering, BRUCE SCOTT, Max-Planck-Institut für Plasmaphysik, WILLIAM TANG, Princeton Plasma Physics Laboratory, PRINCETON UNIVERSITY TEAM, MAX-PLANCK-INSTITUT COLLABORATION — The capability of monitoring processes in extreme scale simulation is crucial for extracting information about global and non-linear dynamics, as well as checking the integrity of the simulation. A set of post-processing computational diagnostics for toroidal gyrokinetic particle simulations is developed and optimized for efficient performance on multi- and many-core modern computational platforms. These diagnostics track the time evolution of parallel mode structure, radial profile, toroidal/poloidal spectra, and nonlinear energy transfer spectra. To demonstrate the performance of this diagnostic tool set, diagnosis results for drift wave turbulence with numerical dissipation are presented.

Yuan Shi
Princeton Plasma Physics Laboratory

Date submitted: 21 Jul 2014 Electronic form version 1.4