Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Extension of Gkeyll Discontinuous Galerkin Kinetic Code to 2D[1]

E.L. SHI, Princeton University, A. HAKIM, G.W. HAMMETT, Princeton Plasma Physics Laboratory — Gkeyll is a discontinuous Galerkin (DG) code under development for modeling the edge plasma in fusion devices and basic plasma experiments. High-order accurate, energy-conserving numerical algorithms for general Hamiltonian systems are implemented in Gkeyll. Details of the recent extension of the code dimensionality to 2D2V will be presented. Since DG schemes allow for flexibility in the choice of basis functions, we will discuss how various types of basis functions affect code accuracy and efficiency. Test problems in 2D, such as toroidal ITG instabilities and turbulence in a local limit, will be presented. We will also show initial results from 2D kinetic simulations of transport in a scrape-off layer plasma, using a specified diffusion coefficient to model radial transport.

[1]This research was supported by U.S. DOE contract DE-AC02-09CH11466 and is part of the Max-Planck/Princeton Center for Plasma Physics.

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Date submitted: 11 Jul 2014 Electronic form version 1.4