Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Nonlinear Full-f Edge Gyrokinetic Turbulence Simulations[1] X.Q. XU, A.M. DIMITS, M.V. UMANSKY, LLNL — TEMPEST is a nonlinear full-f 5D electrostatic gyrokinetic code for simulations of neoclassical and turbulent transport for tokamak plasmas. Given an initial density perturbation, 4D TEMPEST simulations show that the kinetic GAM exists in the edge in the form of outgoing waves [1], its radial scale is set by plasma profiles, and the ion temperature inhomogeneity is necessary for GAM radial propagation. From an initial Maxwellian distribution with uniform poloidal profiles on flux surfaces, the 5D TEMPEST simulations in a flux coordinates with Boltzmann electron model in a circular geometry show the development of neoclassical equilibrium, the generation of the neoclassical electric field due to neoclassical polarization, and followed by a growth of instability due to the spatial gradients. 5D TEMPEST simulations of kinetic GAM turbulent generation, radial propagation, and its impact on transport will be reported.
[1] X. Q. Xu, Phys. Rev. E., 78 (2008).

[1]Work performed for U.S. DOE by U.C. LLNL under Contract DE-AC52-07NA27344.

X.Q. Xu
LLNL

Date submitted: 20 Jul 2008 Electronic form version 1.4