Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Gyrokinetic Transport Stiffness Calculations on Stellarator Geometries[1] B.J. FABER, Princeton University, H. MYNICK, Princeton Plasma Physics Laboratory, G.M. WEIR, K.M. LIKIN, J.N. TALMADGE, University of Wisconsin-Madison — A significant, unanswered question in plasma physics is the difference in transport "stiffness" between tokamaks and stellarators. In an effort to shed light on this issue, presented are nonlinear gyrokinetic calculations on various machine geometries: the Helically Symmetric Experiment, the National Compact Stellarator Experiment and an equivalent tokamak configuration. Nonlinear gyrokinetic fluxes have been compared directly to experimental fluxes observed in HSX power modulation experiments. Linear calculations on HSX reveal large growth rates due to both ion temperature gradient and trapped electron turbulence, necessitating a kinetic treatment of electrons; one of the first calculations of its kind for stellarators. A comparison of transport stiffness profiles computed through nonlinear gyrokinetic calculations of ion temperature gradient turbulence for the different machine configurations will be presented.

[1]Work supported by U.S. DOE Contract No. DE-AC02-09CH11466.

Benjamin Faber
Princeton University

Date submitted: 18 Jul 2012 Electronic form version 1.4