Abstract Submitted
for the MAS14 Meeting of
The American Physical Society

Computational Study of Neoclassical Transport in NSTX using GTC-NEO[1] MATTHEW PARSONS, Undergraduate Physics, Drexel University, Philadelphia, PA, STÉPHANE ETHIER, STANLEY KAYE, WEIXING WANG, Princeton Plasma Physics Laboratory, Princeton, NJ — The stability of a plasma within a magnetic confinement device is subject to the transport of particles and energy across the magnetic field lines. Neoclassical transport theory, describing the motion of charged particles in non-uniform magnetic and electric fields, is often considered the baseline for comparison to experiments. It has previously been noticed that in the National Spherical Torus Experiment (NSTX) device the level of ion thermal diffusion is inversely correlated with the plasma collisionality, such that at low collisionality the level of transport is greater than the neoclassical limit. Three specific NSTX shots at varying collisionality are being studied using the GTC-NEO code to simulate the neoclassical equilibrium and make an accurate calculation of the transport levels during those shots to verify the transport/collisionality correlation and characterize any anomalous transport present. Here is presented preliminary results from this study.

[1]This work is supported by USDOE Contract No. DE-AC02-09CH11466.

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Date submitted: 20 Aug 2014 Electronic form version 1.4