Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Simulations of drift-Alfven turbulence in LAPD using BOUT PAVEL POPOVICH, UCLA, CMPD, MAXIM UMANSKY, LLNL, TROY CARTER, STEVE COWLEY, UCLA, CMPD — The LArge Plasma Device (LAPD) at UCLA is a 17 m long, 60 cm diameter magnetized plasma column with typical plasma parameters $n_e \sim 1 \times 10^{12}\text{cm}^{-3}$, $T_e \sim 10\text{eV}$, and $B \sim 1\text{kG}$. The simple geometry and extensive measurement capability on LAPD allows for detailed comparison with and validation of numerical simulations of turbulence and transport. We analyse the LAPD results using simulations with the boundary plasma turbulence code BOUT. BOUT models the 3D electromagnetic plasma turbulence solving a system of fluid moment equations in a general tokamak geometry near the boundary. We will discuss the physical model and modifications of the BOUT code required for the LAPD configuration, and present the first results of the simulations and comparison to experimental measurements. In particular, a confinement transition is observed in LAPD under the application of bias-driven rotation.[1] Also, intermittent generation and convection of filamentary structures ("blobs" and "holes") is observed in the LAPD edge.[2] Application of BOUT to modeling of these two phenomena will be discussed.

[1]E. Maggs, T.A. Carter, and R.J. Taylor, Phys. Plasmas 14, (2007)
[2]T.A. Carter, Phys. Plasmas 13, (2006)

Pavel Popovich
UCLA, CMPD

Date submitted: 20 Jul 2008 Electronic form version 1.4