Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Experimental results on the structure of hydronamic turbulence in accretion disks ELI CHERTKOV, Princeton University, E.M. EDLUND, H. JI, Princeton Plasma Physics Laboratory — The Princeton Hydrodynamic Turbulence Experiment (HTX) is a Taylor-Couette device with a variable speed rings at the axial boundaries and the ability to perturb quiescent flow regimes via a pump system. The experiment is designed to quantify purely hydrodynamic effects present in accretion disks, as well as study boundary effects, such as Ekman circulation and Stewartson layers, in Taylor-Couette systems. The results of this experiment supplement those of the Princeton MRI experiment, a Taylor-Couette device filled with a GaInSn fluid, which was designed to study the magnetorotational instability (MRI), the current explanation for observed accretion rates in accretion disks. The main diagnostic in HTX is a laser doppler velocimetry (LDV) system capable of correlating azimuthal and radial velocity measurements. We present recent experimental results on the lifetimes of turbulence forced by direct perturbations as a function of dimensionless rotational shear (q) as well as an autocorrelation analysis of the azimuthal velocity fluctuations in the quasi-Keplerian regime.

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Date submitted: 12 Jul 2013 Electronic form version 1.4