Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Studies of Rossby waves and hydrodynamic turbulence in a Taylor-Couette device ERIC EDLUND, Princeton Plasma Physics Laboratory, E. SCHARTMAN, Nova Photonics, E. SPENCE, A. ROACH, P. SLOBODA, H. JI, Princeton Plasma Physics Laboratory — We present the design of a new experiment at the Princeton Plasma Physics Laboratory with the mission of studying angular momentum transport in rotating incompressible fluids at $\mathrm{Re} > 10^6$. This hydrodynamic experiment supports and complements a similar device, the Princeton MRI experiment, which uses a liquid metal to study MHD effects [1]. The inner and outer cylinders may be separately driven; differentially rotating rings on the top and bottom boundaries between the cylinders allow the Ekman circulation to be greatly diminished while maintaining shear in the azimuthal flow close to the Rayleigh criterion. The top, fluid-facing boundary of the device can be outfitted with various surfaces or operated with a free surface to modify the Rossby wave characteristics. A set of ultrasonic transducers is used to measure the v_r and v_ϕ profiles at three distinct heights. A two component LDV system provides measurements of the local v_r and v_ϕ which will further constrain measurements of the turbulent angular momentum transport reported previously [2].

[1] E. Schartman *et al.*, RSI **80**, 024501 (2009).
[2] H. Ji *et al.*, Nature **444**, 343 (2006).

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Date submitted: 09 Aug 2010 Electronic form version 1.4