

Abstract Submitted  
for the DPP10 Meeting of  
The American Physical Society

**Study of Angular Momentum Transport in Hydrodynamic and Magnetohydrodynamic Experiments** H. JI, E. EDLUND, E. SPENCE, A. ROACH, PPPL — Rapid angular momentum transport has been observed to occur in both laboratory fusion plasmas and astrophysical plasmas, but its physical mechanisms still remain illusive. In this paper, we describe a series of laboratory fluid experiments in order to investigate a variety of the proposed mechanisms either in hydrodynamics or magnetohydrodynamics (MHD). They include (1) hydrodynamic turbulence for Keplerian flows<sup>1</sup>, (2) Magnetocoriolis (MC) waves<sup>2</sup>, (3) Magnetorotational Instability (MRI), (4) Rossby waves, and (5) Magneto-Rossby waves. The first three mechanisms have been or are being investigated on the ongoing Princeton MRI experiment (<http://mri.pppl.gov>) while the last two mechanisms will be investigated on a newly built experiment<sup>3</sup> and on a further modified Princeton MRI experiments. Implications of these experimental results for the astrophysical problems will be discussed.

<sup>1</sup>H. Ji, M. Burin, E. Schartman, and J. Goodman, *Nature* **444**, 343 (2006)

<sup>2</sup>M. Nornberg, H. Ji, E. Schartman, A. Roach, and J. Goodman, *Phys. Rev. Lett.* **104**, 074501 (2010)

<sup>3</sup>E. Edlund et al., this mini-conference

Hantao Ji

Date submitted: 16 Jul 2010

Electronic form version 1.4