

Abstract Submitted
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A new experiment for the study of hydrodynamic waves and turbulence E. EDLUND, Princeton Plasma Physics Laboratory, P. HUMANIK, Bergen County Academics, A. ROACH, Princeton Plasma Physics Laboratory, E. SCHARTMAN, Nova Photonics, P. SLOBODA, E. SPENCE, H. JI, Princeton Plasma Physics Laboratory — As a complement to the existing Princeton MRI Experiment, which is used for studies of MHD waves in a rotating liquid metal, a new device is being constructed by modifying the existing Couette water experiment for the study of purely hydrodynamic waves and turbulence. A primary objective of this new device is the study of Rossby waves, which will be excited by forcing a potential vorticity gradient through surfaces which are inclined relative to the azimuthal plane. A modular design allows for change of these fluid interfaces to study of Rossby waves under different forcing conditions. The experiment will be equipped with a two dimensional laser Doppler velocimetry (LDV) system, which can measure correlated fluctuations of radial and azimuthal velocities to form a measure of the Reynolds stress. The additional use of an ultrasonic Doppler velocimetry (UDV) system will allow for instantaneous measurement of the azimuthal and radial velocity profile at multiple locations to identify bulk flow characteristics and low-order wave structures. These measurement techniques allow for detailed study of the interplay between large scale waves, turbulence and angular momentum transport.

Eric Edlund
PPPL

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