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Overview of recent results from the Princeton MRI experiment ERIK SPENCE, AUSTIN ROACH, ERIC EDLUND, PETER SLOBODA, Princeton Plasma Physics Laboratory, ETHAN SCHARTMAN, Nova Photonics, MARK NORNBERG, University of Wisconsin-Madison, HANTAO JI, Princeton Plasma Physics Laboratory — The Princeton MRI experiment has been constructed to study the magnetorotational instability (MRI), the mechanism believed to be responsible for the transport of angular momentum in accretion disks. The MRI can be excited when a vertical magnetic field is applied to an electrically conducting fluid with a radially-decreasing azimuthal velocity profile. For this experiment, such a velocity field is generated in a Taylor-Couette apparatus with independently-rotating split endcaps. The working fluid is the gallium eutectic GaInSn. When an axial magnetic field is applied to the experiment, the hydrodynamic azimuthal velocity profile, as measured using an ultrasonic velocimetry system, is modified. The ability to fine-tune the resulting azimuthal profile, by modifying the end-cap ring speeds, and consequently achieve an ideal Couette azimuthal profile, is presented. Results from a global-mode MRI instability analysis, based on an ideal Couette azimuthal profile, is presented, indicating our operational proximity to instability. Magnetic perturbations are measured using an array of Mirnov Coils, from which the largescale structure of the induced magnetic field is reconstructed. The latest results from the search for the MRI will be presented.

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