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Upgrade of the Magnetorotational Instability Experiment Apparatus E. SCHARTMAN, Nova Photonics, Inc, E.P. GILSON, E. EDLUND, Princeton Plasma Physics Laboratory, J. GOODMAN, Princeton University, H. JI, P. SLOBODA, Princeton Plasma Physics Laboratory, X. WEI, Princeton University — The Princeton MagnetoRotational Instability (MRI) Experiment was designed to investigate the MRI in a liquid gallium alloy Taylor-Couette flow generated between concentric spinning cylinders. To achieve magnetic Reynolds numbers sufficiently large to excite the MRI, flow velocities of order 20m/s are required. Experimental operation at such velocities has been hampered by mechanical limitations of the apparatus. Dynamic pressures generated by the alloy cause distortion and binding, which is laborious to correct. High surface speeds lead to excessive seal wear. Modifications to the apparatus were implemented to enable extended operation at full design speed. The inner cylinder was also modified to carry diagnostics such as Doppler ultrasound, torque and magnetic field sensors. Details of the modifications will be presented. This work is supported by U.S. DOE, NASA and NSF.

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