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**Studying Angular Momentum Transport in Discs Using a Rotating Gas Experiment** KYLE KREMER, HANTAO JI, Princeton Plasma Physics Laboratory — The physics of the accretion process in astrophysical discs surrounding bodies such as black holes and protostars is not well-understoood. Specifically, the cause of the turbulent outflux of angular momentum necessary for accretion to occur remains a mystery. It is suspected magnetohydrodynamic (MHD) instabilities may be responsible for the turbulence in magnetized discs. The magnetorotational instability (MRI), in particular, has received acceptance as a viable accretion mechanism, but direct evidence of the MRI has yet to be realized observationally or experimentally. Experimentalists have recently used rotating liquid metals, which can be described using resistive MHD, to study the MRI. However, this approximation is limited because effects beyond resistive MHD are likely important in real astrophysical discs. Namely, kinetic effects and the Hall effect are not accounted for by liquid metal experiments. In order to achieve a better representation of a realistic accretion disc, we propose an experiment using rotating gas. The experimental set-up is explained and preliminary rotational profile results are presented. This experiment will help shed light on how the MRI behaves under departures from MHD which are present in a rotating gaseous disc.

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