Abstract Submitted
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Search of the MRI Through Magnetic Field Measurement Using a Hall Probe Array [1] JACOB LYNN, ETHAN PETERSON, KEN FLANAGAN, CARY FOREST, Univ of Wisconsin, Madison — The Plasma Couette Experiment Upgrade (PCX-U) is capable of producing plasma with parameters ideal for the observation of a magnetorotational instability (MRI). PCX-U allows for the generation of plasma with Keplerian-like flow profiles, sufficiently weak magnetic fields, and suitable fluid and magnetic Reynolds numbers. Numerical simulations show that plasma with these parameters should excite the MRI. When the MRI is achieved, the plasma is expected to develop a poloidal field structure. To detect this field structure, an axial magnetic probe has been constructed. The probe consists of a 1 ft. long PCB containing a two-axis, 15 position hall probe array that can be inserted through the entire axial length of PCX-U. The hall probes used have a magnetic sensitivity of 28 mV/G and a bandwidth of 100kHz, which is sufficient to measure the predicted saturated state of the MRI. Initial magnetic results as well as details of the probe construction, calibration and implementation will be shown.

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Jacob Lynn
Univ of Wisconsin, Madison

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