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Plasma Dynamo Experiments DAVID WEISBERG, CAMI COLLINS, NOAM KATZ, JOHN WALLACE, IVAN KHALZOV, JONATHAN JARA-ALMONTE, CARY FOREST, University of Wisconsin-Madison — The Madison Plasma Dynamo Experiment (MPDX) is under construction to explore the self-excitation processes of a range of astrophysical dynamos. Numerical simulations of von Kármán flow have shown that a two-vortex flow can produce a dynamo when the magnetic Reynolds number is sufficiently high, which, for a plasma, requires a large, hot, flowing and unmagnetized plasma. This poster discusses experimental plans for von Kármán flow in MPDX as well as prototype experiments on the Plasma Couette Experiment (PCX). The PCX is a cylindrical plasma experiment currently being used to optimize a multi-cusp magnetic confinement scheme for experiments on the magnetorotational instability. It also provides a platform for prototyping two types of plasma sources (electron cyclotron heating and LaB6 cathode) as well as an ExB stirring mechanism, diagnostics, and future MPDX dynamo scenarios. This poster will review recent findings from PCX involving the fabrication and operation of a new LaB6 electron source and its use in driving Dean flow. While currently attainable densities ($n_e \approx 10^{17}$ m^{-3}, using electron cyclotron heating) require Hall MHD in calculating the plasma response to various flow profiles, the new LaB6 electron source may allow high enough densities to place the plasma in a purely MHD regime. Work supported by NSF.

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