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Multidipole Confinement of a High-Beta, Flowing Plasma J. JARA-ALMONTE, C.B. FOREST, R. KENDRICK, C. COLLINS, University of Wisconsin - Madison — The Plasma Couette Experiment has been designed and constructed to investigate the magnetorotational instability in a plasma. The plasma is produced by a lanthanum hexaboride cathode in a 1 m diameter, cylindrical vacuum chamber. Confinement is provided by a high-order, axisymmetric multicusp magnetic field localized at the chamber walls; the magnets are located inside the vessel and positioned in a ring cusp geometry. Electrodes located between the cusp lines create an electric field which induces plasma rotation in the magnetized region via ExB drift. These flows are expected to viscously couple to the unmagnetized region in the center of the experiment. Energy and particle confinement in both non-confined and magnetically confined geometries are characterized by temperature and density profiles measured with a single tip swept Langmuir probe. Confinement times will be established by comparing stored energy to input power. Magnetostatic simulations and hall probe mappings of the magnet assembly will be compared, and the effectiveness of the axisymmetric multicusp confinement will be discussed.

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