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Rotation Profile Measurements in the Plasma Couette Experiment[1] C. COLLINS, N. KATZ, D. WEISBERG, J. WALLACE, M. CLARK, C.B. FOREST, University of Wisconsin - Madison — The goal of the Plasma Couette Experiment (PCX) is to create a differentially rotating plasma with a parameter range (Re$\sim$500, Rm$\sim$200, Pm$\sim$0.1-20) relevant for studying a host of astrophysically motivated processes, including the magnetorotational instability, a mechanism that may account for outward transport of angular momentum in accretion disks. In PCX, plasma is produced by 5 kW of 2.45 GHz electron cyclotron heating power and confined at the edge by a cylindrical, axisymmetric ring cusp magnetic field. To generate rotation, hot filaments are installed between the magnets and biased with respect to cold anodes to drive JxB torque. Taylor-Couette type flow profiles can be generated through biased filament arrays on the inner and outer boundaries. Helium flow speeds of 5 km/s at the edge have been show to viscously couple inward to the bulk, unmagnetized region. Mach probe measurements of the resulting azimuthal velocity profiles will be presented. The velocity profiles in the bulk are determined by viscosity and ion-neutral drag. The dependence of rotation on density, neutral density, and temperature will be discussed.

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