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Axial velocimetry and torque scaling in turbulent Taylor-Couette flow with independently rotating cylinders HANSEN NORDSIEK, University of Maryland at College Park, MATTHEW PAOLETTI, University of Texas at Austin, DANIEL LATHROP, University of Maryland at College Park — We present experimental studies investigating axial flow velocities and torque scaling in the turbulent flow of water between two independently rotating cylinders. The Taylor-Couette system is capable of both strong turbulence ($Re > 2 \times 10^6$) and rapid rotation. The axial velocity profile near one end (via ultrasound doppler velocimetry), the torque required to rotate the inner cylinder, and the wall shear stress at one point on the outer cylinder are precisely measured as a function of the angular velocities of the two cylinders. We compare our measurements with previous experiments and discuss the potential relevance to angular momentum transport in astrophysical flows.

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