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Transitions and Reynolds number scaling in quasi-Keplerian Taylor-Couette flow HANSEN NORDSIEK, DANIEL LATHROP, University of Maryland at College Park — Experimental investigations of the Reynolds number dependence of the torque and wallshear stress for Taylor-Couette flow in the quasi-Keplerian regime (Rayleigh stable anticyclonic flow) are presented in the range of $300 < Re < 10^5$. The Taylor-Couette experiment has independently rotating inner and outer cylinders, a radius ratio of 0.724, an aspect ratio of 11.42, and axial boundaries that rotate with the outer cylinder. The torque required to rotate the inner cylinder at a constant angular velocity, and the wall shear stress at the outer boundary are precisely measured as a function of the Reynolds number for several values of the Rossby number, which compares shear to global rotation. We compare our measurements with previous experiments and simulations, and discuss potential implications for the hydrodynamic contribution to angular momentum transport in astrophysical flows.

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