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End-effects versus stratification in quasi-Keplerian Taylor–Couette flow COLIN LECLERCQ, RICH KERSWELL, University of Bristol — There has been much controversy in the past decade over the impact of end-wall boundary conditions on transition to turbulence in centrifugally stable Taylor–Couette experiments, e.g. Paoletti & Lathrop, PRL (2011); Ji *et al.*, Nature (2006); Balbus, Nature (2011). In this configuration, the meridional flow driven by the axial boundaries is no longer confined to their vicinity, potentially leading to turbulence through a classical supercritical route at high rotation rates (Avila *et al.*, POF (2008); Avila, PRL (2012)). But the question of subcritical transition in the limit of infinite cylinders remains of fundamental importance to the theory of weakly ionised accretion disks, as it may help to understand the inferred existence of turbulence there. We investigate theoretically the effect of stratification on azimuthally symmetric quasi-Keplerian base flows in the finite-length Taylor–Couette system. The challenge is to find a practical way to suppress the meridional flow, while not triggering the stratorotational instability. Different strategies will be discussed, including layered density profiles obtained with a stratifying agent of variable concentration and linear density profiles caused by a temperature difference between the top and bottom boundaries.

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