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Transient Turbulence in Taylor-Couette Flow: Co/Counter Rotation and Aspect Ratio Effects DANIEL BORRERO-ECHEVERRY, Center for Nonlinear Science and School of Physics, Georgia Institute of Technology, RANDALL TAGG, Department of Physics, University of Colorado at Denver, MICHAEL SCHATZ, Center for Nonlinear Science and School of Physics, Georgia Institute of Technology — Wall-bounded shear flows typically make the transition to turbulence through a subcritical bifurcation that requires a finite amplitude perturbation. At low Reynolds numbers the lifetime of the turbulent state is finite and increases with increasing Reynolds number. Recent studies have challenged the view that there is a critical Reynolds number above which turbulence becomes sustained. The issue has been further complicated by recent numerical studies that suggest that even if turbulence decays locally, it may become sustained globally if the system is sufficiently large. We address this issue and present lifetime measurements in linearly stable Taylor-Couette flow at various aspect ratios. We also discuss the effects of various boundary conditions and weak counter/co-rotation on the observed lifetimes.

Daniel Borrero-Echeverry
Georgia Institute of Technology

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