

Abstract Submitted
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Direct laminar-turbulent transition in Taylor-Couette flow: Experiments and simulations¹ CHRISTOPHER J. CROWLEY, MICHAEL KRYGIER, SAMUEL G. RABEN, DANIEL BORRERO, ROMAN O. GRIGORIEV, MICHAEL F. SCHATZ, Georgia Institute of Technology — The transition to turbulence in Taylor-Couette flow is frequently mediated by stable flow states (e.g. interpenetrating spirals). We describe a direct laminar-turbulent transition in a system with counterrotating cylinders and small aspect ratio of 5.26. In experiments probed using tomographic PIV and direct numerical simulations with realistic boundary conditions, we find the transition is hysteretic, yet highly reproducible with turbulence triggered by the growth of weak spiral flows.

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