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Instabilities in a Taylor–Dean Open Flow

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The flow studied hereafter is produced in a system of two coaxial circular cylinders azimuthally opened. It is a combination of the inner cylinder rotation and a flow provided in the gap by external pumping. Our observations, however, indicate that the flow possesses certain distinctive features not present in the pure rotation of closed cylinders (Taylor-Couette flow) neither in the pure pumping (Dean flow). During the laminar-turbulent transition, for a wide range of τ, the ratio of pumping and rotation flow rates, the flow undergoes a series of instabilities giving rise for local or global patterns. These new regimes will be presented.

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