

Abstract Submitted
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Patterns of the turbulent Taylor-Couette flow¹ ARNAUD PRIGENT, ABDESSAMAD TALIOUA, INNOCENT MUTABAZI, LOMC - CNRS UMR 6294 — We are interested in the study of the transition to turbulence in the Taylor-Couette flow, the flow between two independently rotating coaxial cylinders. Once the geometry is fixed, the flow is controlled by the inner and outer Reynolds numbers and present a large variety of flow regimes. In counter-rotation, the transition is characterized by a succession of more or less turbulent flow regimes: intermittency with turbulent spots, spiral turbulence, featureless turbulence. For larger values of the inner Reynolds number, turbulent Taylor roll re-emerge from the featureless turbulence and remain for very large values of the Reynolds numbers. Bifurcations between different turbulent rolls states are even observed in the ultimate turbulence regime. Nevertheless the transition from the featureless turbulence to the turbulent rolls still requires a detailed study and the mechanism which causes and sustains turbulent spots or turbulent spirals remains unknown. In this study we present new experimental information on the organization of the flow for the different regimes with turbulence. The experiments are conducted in a Taylor-Couette flow with $\eta = 0.8$. Stereo-Particle Image Velocimetry measurements and visualizations of the different flow regimes are realized and discussed.

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