Abstract Submitted
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Axially localized states in Taylor Couette flows[1] JOSE M. LOPEZ, FRANCISCO MARQUES, Univ Politecnica de Catalunya — We present numerical simulations of the flow in a Taylor Couette system with the inner cylinder rotating and aspect ratio Γ restricted to $0.86 < \frac{\Gamma}{N} < 0.95$, being N the number of Taylor vortices. For these values a complex experimental bifurcation scenario has been reported. The transition from wavy vortex flow (WVF) to a very low frequency mode *VLF* happens via an axisymmetric eigenfunction. The *VLF* plays an essential role in the dynamics, leading to chaos through a two-tori period-doubling route. This chaotic regime vanishes with further increase in Re and gives rise to a new flow regime *ALS* characterized by the existence of large jet oscillations localized in some pairs of vortices. The aim of this numerical study is to extend the available information on *ALS* by means of a detailed exploration of the parameter space in which it occurs. Frequency analysis from time series simultaneously recorded at several points of the domain has been applied to identify the different transitions taking place. The *VLF* occurs in a wide range of control parameters and its interaction with the axially localized states is crucial is most transitions, either between different *ALS* or to the chaotic regime.

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