

Abstract Submitted
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Convective and absolute instabilities in Taylor-Couette system with axial and radial through-flows DENIS MARTINAND, Universite Aix-Marseille III, ERIC SERRE, CNRS, RICHARD LUEPTOW, Northwestern University — Imposing axial and/or radial flow in a Taylor-Couette system alters its stability. In the framework of linear convective and absolute stability analysis, analytical methods and numerical simulations are used to determine this impact on the destabilization of the laminar state. Although axisymmetric modes are selected for limited axial flows, non-axisymmetric modes are then found to become the most convectively unstable ones as the axial flow increases and the most absolutely unstable ones when axial and outward radial flows are combined. Non-axisymmetric convective and absolute modes exhibit opposite threads. These analytical predictions in terms of critical conditions and patterns are confirmed by numerical simulations using spectral methods and help to clarify previous experimental results.

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