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Shear Layer Instability and Frequency Modes Inside an Open Cavity

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The dynamic behaviour of the vortex structures occurring in a cavity in interaction with an upstream boundary layer, drives the flow confinement inside the cavity. The vortex structures present small scales as well as large scales related to the instability of the shear layer which connects the main flow to the cavity flow. However, the frequency modes measured also depend on the characteristic sizes of the cavity. This presentation concerns the coupling between the mechanisms of shear instability and the mechanisms of frequency selection depending on the size of the cavity. The analysis is based on an experimental exploration of the flow (LDV, PIV) and on numerical simulations.

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