

# Turbulent bifurcations, multistability and slow-dynamics in high-Reynolds-number von Kármán flows

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Experimental observations of highly turbulent von Kármán flows are presented. We report the dynamics of “turbulent bifurcations”, i.e. transitions between flows with different (time-averaged) symmetries. Turbulent bifurcations may be supercritical or subcritical. They may also occur sequentially in time, leading to slow-dynamics temporal-patterns.

For  $Re > 10^4$ , we also report examples of multistability of flow patterns of different symmetry and related memory effect.

Do such phenomena illustrate “phase transitions” between “states” of a highly fluctuating complex system driven very far from equilibrium?