

Movie Captions

- Movie 1

Spiral turbulence in the full orthogonal domain. Radial vorticity $\omega_r \in [-4000, 4000]$ colourmaps on unrolled constant radius sections in the middle of the centrifugally unstable region $r = r_{\text{cu}} = (r_i + r_n)/2 = 7.705$ (left) and at the mid-gap radius $r_m = (r_i + r_o)/2 \approx 8.05$ (right).

- Movie 2

Spiral turbulence in the long and narrow parallelogram domain. Top: Inner τ_i vs outer τ_o normalised torque phase map trajectory (left) and normalised kinetic energy κ time series (right). Bottom: Radial vorticity $\omega_r \in [-4000, 4000]$ colourmaps on unrolled constant radius sections in the middle of the centrifugally unstable region $r = r_{\text{cu}} = (r_i + r_n)/2 = 7.705$ (top) and at the mid-gap radius $r_m = (r_i + r_o)/2 \approx 8.05$ (bottom).

- Movie 3

Turbulent bursts in the short and narrow parallelogram domain. Top: Inner τ_i vs outer τ_o normalised torque phase map trajectory (left) and normalised kinetic energy κ time series (right). Bottom: Radial vorticity $\omega_r \in [-4000, 4000]$ colourmaps on unrolled constant radius sections in the middle of the centrifugally unstable region $r = r_{\text{cu}} = (r_i + r_n)/2 = 7.705$ (left) and at the mid-gap radius $r_m = (r_i + r_o)/2 \approx 8.05$ (right), and azimuthal vorticity $\omega_\theta \in [-1500, 1500]$ on a θ -constant plane at $\theta = 0$.

- Movie 4

Evolution from a regular train of drifting rotating waves to spiral turbulence. Top: Inner τ_i vs outer τ_o normalised torque phase map trajectory (left) and normalised kinetic energy κ time series (right). Bottom: Radial vorticity $\omega_r \in [-4000, 4000]$ colourmaps on unrolled constant radius sections at the mid-gap radius $r_m = (r_i + r_o)/2 \approx 8.05$.

- Movie 5

Cross-sectional sweep of an instantaneous flow field of spiral turbulence along the full perimeter of the Taylor-Couette apparatus. Left: Azimuthal vorticity $\omega_\theta \in [-1500, 1500]$ colourmaps on θ -section. Right: Radial vorticity $\omega_r \in [-4000, 4000]$ colourmaps on unrolled constant radius sections in the middle of the centrifugally unstable region $r = r_{\text{cu}} = (r_i + r_n)/2 = 7.705$ (top) and at the mid-gap radius $r_m = (r_i + r_o)/2 \approx 8.05$ (bottom).

- Movie 6

Under-resolved spiral turbulence in the long and narrow parallelogram domain ($N = 15$). Top: Inner τ_i vs outer τ_o normalised torque phase map trajectory (left) and normalised kinetic energy κ time series (right). Bottom: Radial vorticity $\omega_r \in [-4000, 4000]$ colourmaps on unrolled constant radius sections in the middle of the centrifugally unstable region $r = r_{\text{cu}} = (r_i + r_n)/2 = 7.705$ (top) and at the mid-gap radius $r_m = (r_i + r_o)/2 \approx 8.05$ (bottom).

- Movie 7

Under-resolved turbulence in the long and narrow parallelogram domain ($N = 30$). Top: Inner τ_i vs outer τ_o normalised torque phase map trajectory (left) and normalised kinetic energy κ time series (right). Bottom: Radial vorticity $\omega_r \in [-4000, 4000]$ colourmaps on unrolled constant radius sections in the middle of the centrifugally unstable region

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$r = r_{\text{cu}} = (r_i + r_n)/2 = 7.705$ (top) and at the mid-gap radius $r_m = (r_i + r_o)/2 \approx 8.05$ (bottom).