Movie 1

Visualisation of the nonswirling jet's 3DPS vortex shedding mode with $|f| = 0.144$ through one complete phase cycle at the critical point $(Re, d) = (344, 0.7)$. The animation shows 3D isocontours of the fluctuating axial velocity with an overlay of the steady 3DPS flow in the symmetry plane.

Movie 2

Visualisation of the nonswirling jet's 3DPS vortex shedding mode with $|f| = 0.390$ through one complete phase cycle at the critical point $(Re, d) = (483, 0.6)$. The animation shows 3D isocontours of the fluctuating axial velocity with an overlay of the steady 3DPS flow in the symmetry plane.

Movie 3

Visualisation of the nonswirling jet's 3DPA wake wobbling mode with $|f| = 0.001$ through one complete phase cycle at the critical point $(Re, d) = (475, 0.87)$. The animation shows 3D isocontours of the fluctuating axial velocity with an overlay of the steady 3DPS flow in the symmetry plane.

Movie 4

Meridional (left) and axial (right) planar visualisations of a single oscillation period of the $|m| = 1$ precessing wake limit cycle at $(Re, S, d) = (400, 0.1, 0.8)$ via instantaneous axial velocity contours and in-plane streamlines. Dotted lines show the planes' intersection and the dashed circles in the axial slice plane indicates the location of the pipe's inner and outer walls.

Movie 5

Meridional (left) and axial (right) planar visualisations of a single oscillation period of the $|m| = 1$ PVC limit cycle at $(Re, S, d) = (400, 0.88, 0.5)$ via instantaneous axial velocity contours and in-plane streamlines. Dotted lines show the planes' intersection and the dashed circles in the axial slice plane indicates the location of the pipe's inner and outer walls.