

1 Movie 1

2 Meridional (left) and $x = 1$ (right) slice plane visualisations of a single period of the $|m| = 1$
3 limit cycle oscillation at $(Re, S) = (150, 2.000)$ via instantaneous axial velocity contours and
4 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-1, 5] \times [0, 3] \times [0, 2\pi]$. Dotted
5 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
6 location of the pipe wall.

7 Movie 2

8 Meridional (left) and $x = 1$ (right) slice plane visualisations of a single period of the $|m| = 2$
9 limit cycle oscillation at $(Re, S) = (150, 2.000)$ via instantaneous axial velocity contours
10 and in-plane streamlines extracted from the volume $(x, r, \theta) \in [-1, 5] \times [0, 3] \times [0, 2\pi]$.
11 Dotted lines show the planes' intersection and the dashed circle in the axial slice plane
12 indicates the location of the pipe wall.

13 Movie 3

14 Meridional (left) and $x = 1$ (right) slice plane visualisations of a single period of the $m = 0$
15 limit cycle oscillation at $(Re, S) = (300, 1.987)$ via instantaneous axial velocity contours and
16 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-1, 5] \times [0, 3] \times [0, 2\pi]$. Dotted
17 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
18 location of the pipe wall.

19 Movie 4

20 Meridional (left) and $x = 1$ (right) slice plane visualisations of a single period of the $|m| = 3$
21 limit cycle oscillation at $(Re, S) = (300, 1.367)$ via instantaneous axial velocity contours and
22 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-1, 5] \times [0, 3] \times [0, 2\pi]$. Dotted
23 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
24 location of the pipe wall.

25 Movie 5

26 Meridional (left) and $x = 2$ (right) slice plane visualisations of a single period of an $|m| = 2$
27 limit cycle oscillation at $(Re, S) = (200, 2.000)$ via instantaneous axial velocity contours and
28 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-2, 10] \times [0, 6] \times [0, 2\pi]$. Dotted
29 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
30 location of the pipe wall.

31 Movie 6

32 Meridional (left) and $x = 2$ (right) slice plane visualisations of a single period of an $|m| = 1$
33 limit cycle oscillation at $(Re, S) = (200, 2.050)$ via instantaneous axial velocity contours and
34 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-2, 10] \times [0, 6] \times [0, 2\pi]$. Dotted
35 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
36 location of the pipe wall.

37 Movie 7

38 Meridional (left) and $x = 2$ (right) slice plane visualisations of a single period of an $|m| = 2$
39 limit cycle oscillation at $(Re, S) = (200, 2.075)$ via instantaneous axial velocity contours and
40 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-2, 10] \times [0, 6] \times [0, 2\pi]$. Dotted
41 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
42 location of the pipe wall.

43 Movie 8

44 Meridional (left) and $x = 2$ (right) slice plane visualisations of a single period of an $|m| = 2$
45 limit cycle oscillation at $(Re, S) = (200, 2.073)$ via instantaneous axial velocity contours and
46 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-2, 10] \times [0, 6] \times [0, 2\pi]$. Dotted
47 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
48 location of the pipe wall.

49 Movie 9

50 Meridional (left) and $x = 4$ (right) slice plane visualisations of a single period of an $|m| = 2$
51 limit cycle oscillation at $(Re, S) = (200, 2.036)$ via instantaneous axial velocity contours and
52 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-4, 20] \times [0, 12] \times [0, 2\pi]$. Dotted
53 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
54 location of the pipe wall.

55 1. *Movie 10

56 Meridional (left) and $x = 0.5$ (right) slice plane visualisations of a single period of the $|m| = 1$
57 limit cycle oscillation at $(Re, S) = (300, 2.766)$ via instantaneous axial velocity contours and
58 in-plane streamlines extracted from the volume $(x, r, \theta) \in [-1, 5] \times [0, 3] \times [0, 2\pi]$. Dotted
59 lines show the planes' intersection and the dashed circle in the axial slice plane indicates the
60 location of the pipe wall.