Supplementary Information

Effect of actuation method on hydrodynamics of elastic plates oscillating at resonance

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Movie 1. Externally actuated elastic plate driven at the root by harmonic oscillations. The plate aspect ratio is $\mathcal{A}_\mathcal{R} = 2$, the mass ratio is $\chi = 5$, and the Reynolds number is $\mathrm{Re} = 1000$. Surfaces of constant vorticity magnitude are plotted for $\omega\tau = 20$.

Movie 2. Externally actuated elastic plate driven at the root by harmonic oscillations. The plate aspect ratio is $\mathcal{A}_\mathcal{R} = 4$, the mass ratio is $\chi = 5$, and the Reynolds number is $\mathrm{Re} = 1000$. Surfaces of constant vorticity magnitude are plotted for $\omega\tau = 20$.

Movie 3. Internally actuated elastic plate driven by a time-dependent distributed internal bending moment. The plate aspect ratio is $\mathcal{A}_\mathcal{R} = 2$, the mass ratio is $\chi = 5$, and the Reynolds number is $\mathrm{Re} = 1000$. Surfaces of constant vorticity magnitude are plotted for $\omega\tau = 20$.

Movie 4. Internally actuated elastic plate driven by a time-dependent distributed internal bending moment. The plate aspect ratio is $\mathcal{A}_\mathcal{R} = 4$, the mass ratio is $\chi = 5$, and the Reynolds number is $\mathrm{Re} = 1000$. Surfaces of constant vorticity magnitude are plotted for $\omega\tau = 20$.

Figure 1. Externally actuated plate driven at the root by harmonic oscillations. The plate aspect ratio is $\mathcal{A}_\mathcal{R} = 2$, the mass ratio is $\chi = 5$, and the Reynolds number is $\mathrm{Re} = 1000$. Pressure distribution on the plate.

Figure 2. Externally actuated plate driven at the root by harmonic oscillations. The plate aspect ratio is $\mathcal{A}_\mathcal{R} = 2$, the mass ratio is $\chi = 5$, and the

Reynolds number is $\mathrm{Re} = 1000$. Pressure contour around the plate.

Figure 3. Externally actuated plate driven at the root by harmonic oscillations. The plate aspect ratio is $\mathcal{A}_{\mathcal{R}} = 2$, the mass ratio is $\chi = 5$, and the Reynolds number is $\mathrm{Re} = 1000$. Streamlines emanating at $x = L$.