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Mimicking fish-like kinematics using fluid-structure interactions

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a clamped-free elastic slender plate under local harmonic forcing. In air, the solu-
tion consists in a sum of standing waves, whose frequencies, wavelengths and mode
shapes are given by the Young modulus and the geometry. In more dense fluid, as
water, and for specific parameters of the experiment, the solution switch from this
standing waves solution to a pure propagating behavior leading to a fish-like kine-
matics. The existence of this regime allows to simply generate a propagating wave
in a finite elastic medium avoiding a complex implementation of synchronized local
perturbations all along the body. We show that the triggering of the propagating
solution is due to the nonlinear nature of the fluid damping.

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