

Time-periodic solutions for fluid-solid interactions

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I will discuss several recent analytic discoveries and numerical experiments about the appearance of time-periodic motions when fluids interact with solids. On one hand, I will present abstract results on the existence and uniqueness of solutions when a parabolic PDE interacts with a hyperbolic PDE. In this setting, geometric conditions will be explored that allow for unique solutions and, as such, exclude hyperbolic resonances. Additionally, I will discuss some results for deformable shells interacting with fluids. On the other hand, I will show numerical experiments related to the appearance of bifurcations in the Navier-Stokes equations, known as the von Karman vortex street.

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