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Out of the Water: Wakes, Entrainment and Free-Surface Dynamics in Water-Exit Flows

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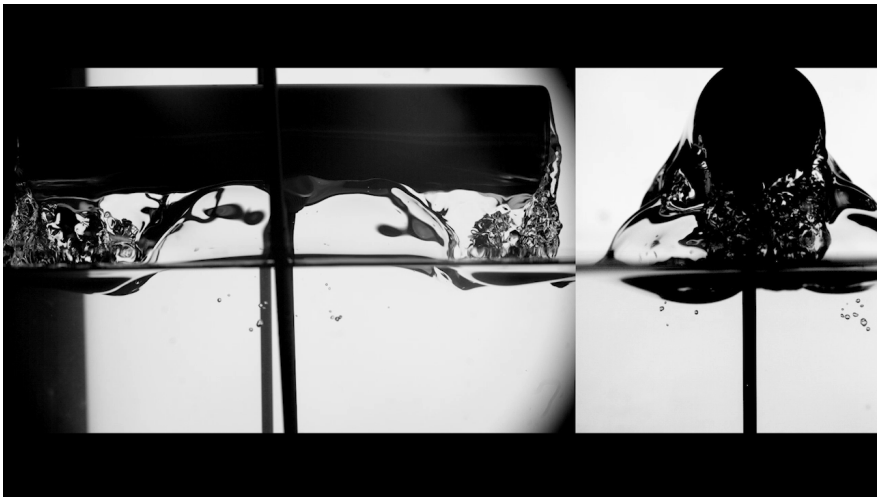
Thursday, October 22nd (2026), 16:30 Paris Time
LMFL Fluid Mechanics Webinar Link

Abstract

When a solid object moves out of water, it deforms the water surface, carries some water with it, and experiences changes in force. While water entry has been widely studied, the process of water exit is still not fully understood.

In this seminar, I will present our experimental and numerical studies on the water exit of circular and square cylinders, smooth and dimpled spheres, and porous-coated cylinders. We use high-speed cameras, force measurements, and particle image velocimetry (PIV) to study the flow around these objects as they move through the water surface. The results show how the shape and surface of an object affect water entrainment, surface deformation, and the vortices formed behind it. We also examine how changing the speed of the object during its upward motion affects vortex development.

These studies show that the flow behind a rising object plays an important role in how water behaves during exit and helps us better understand the forces and water carried out of the liquid.



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