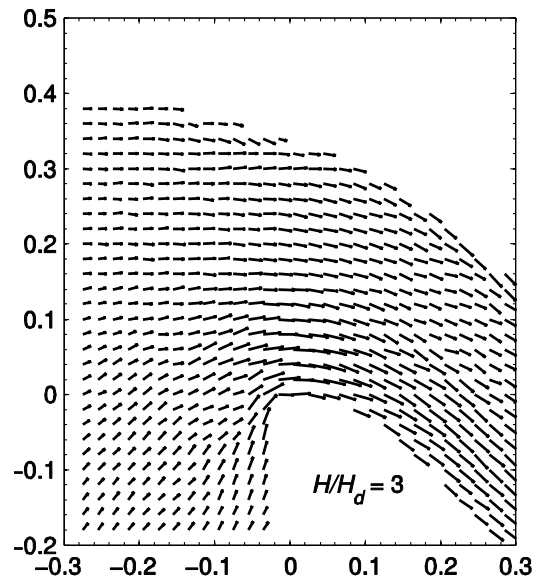


Experimental analysis of the velocity field in a sloshing tank

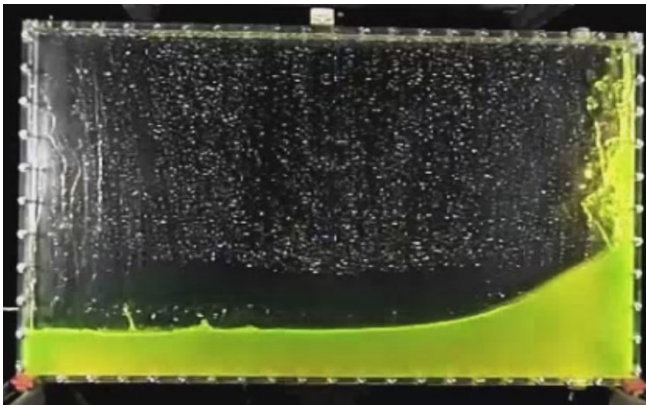
The validation of numerical solutions often relies on the availability of good quality experimental data, especially in the framework of complex problems in fluid mechanics. These data can be obtained thanks to experimental modeling, i.e. the reproduction of the physical phenomenon of interest in a controlled environment. Nonetheless it is not possible, in general, to obtain a measure of every quantity, everywhere in the model or with the same degree of accuracy. The design and the exploitation of a physical model must then result from an accurate choice of the objectives and from the selection and realization of a suitable experimental setup.

In this context, the purpose of the present work is to design and exploit an experimental setup to collect data on the velocity field (in the vertical plane) of a free-surface water flow in a 2D sloshing tank. If the quality of the collected data is satisfactory, they will be used for the validation of numerical simulation codes developed by the Argenco and A&M departments.

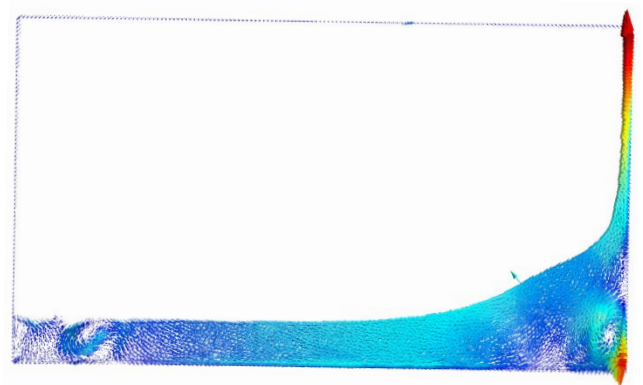
This work will be performed in the “Laboratoire d’hydraulique des constructions” lab. The techniques envisaged for the experimental analyses are the PTV (Particle Tracking Velocimetry) or the LSPIV (Large Scale Particle Image Velocimetry). The necessary equipment (hi-speed camera, light ...) and post-processing routines (in-house Matlab codes) are already available in the lab.



Example of experimental results –
Velocity field in the vertical plane of the
flow over a spillway



Sloshing example – Experimental free
surface shape



Sloshing example – Numerical free
surface shape and velocity field

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