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## Erosion of a sediment bed by a stirring grid

**Location:** LEGI – UMR 5519 - Grenoble

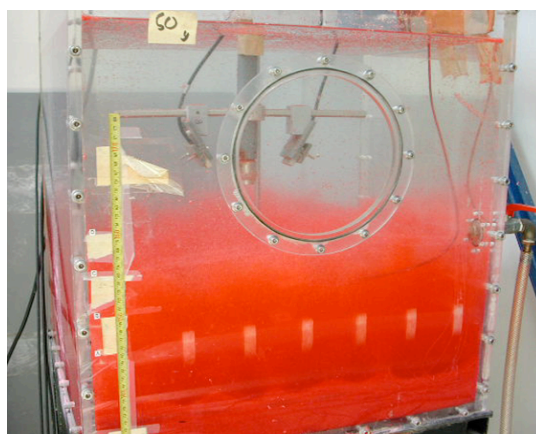
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Sediment or « particule » beds are present everywhere under the sea, in lakes, on snow slopes etc... As the fluid close to these particules begin to move (waves, avalanches, flows...), the deposited particules may be entrained, carried away, eroded by the mean flow and/or turbulence before probably being redeposited farther on. Whether you study an avalanche, a current under the sea or any water flow you may be very interested in knowing where the sediments have been picked up, how they have been carried away and where they have been deposited, it is for example one of the key problem when considering turbidity currents or powder-snow avalanches.

At LEGI we have a nice setup so called a stirring or oscillating grid that enables us to study the erosion of a sediment bed by diffusive turbulence pretty easily. The tank is filled with water, with a bed of particules deposited on the bottom. A grid is mounted on an oscillating device that makes it comes regularly up and down pushing the fluid in both directions. Not too close to the grid diffusive turbulence is generated by this stirring motion.

The internship topic is first to completely characterise the flow in the tank using doppler velocimeters and/or PIV. As soon as the flow is well known and the region where turbulence with zero-mean flow is present is determined we will work with a sediment bed at the bottom. Different sediments can be and will be used (monodisperse or bidisperse mix of PMMA of different sizes, sawdust...). The way turbulence is modified by the presence of the particules will be quantified, especially the reflection of the energy on the bed. The erosion and particules' concentration within the tank will then be investigated using OBS devices and/or visualisation with image treatment.



Stirring grid device - fluid: water - bed and suspension: PMMA

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