

Flow conditions on highly structured fixed beds

Due to the canalisation works carried out in the last century, several rivers now have a marked erosion trend. A lot of current projects aim to stabilize the riverbed and stop or at least diminish this trend. In order to avoid the construction of transverses – which would on the one hand stabilize the riverbed but on the other would create a longitudinal discontinuity and thus represent an obstacle for fish migration – solutions are sought that make the riverbed highly structured. In this way, bed shear stresses decrease, the riverbed is reinforced and the conditions for fish migration are improved.

To investigate the flow conditions and the bed roughness of such highly structured beds, physical experiments will be carried out in an experimental flume with fixed bed (Fig. 1).



Fig. 1: Two views of the experimental flume at Laboratorium^{3D} in Biasca. In this case, the bed roughness is given by semi-spheres placed with a density of approximately 25%.

The aim of this Bachelor's thesis is to measure the hydraulic conditions in the highly structured fixed beds. The structure of the bed will be varied and the effect of different parameters will be measured and analysed. The results will help to better understand the flow structures occurring on such heterogeneous beds and to define the bed roughness.

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Remarks:

Bachelor's thesis to be assigned once. The experiments will be carried out at the laboratory of Laboratorium^{3D} in Biasca (TI). The language of the Bachelor thesis will be German or English.