



Three dimensional, two phases flow simulation around a cylinder

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Fishways are facilities build on the obstacles in river, as dams, to allow the free circulation of migratory fishes. This study focuses on "natural fishpasses" which are high slopes channels composed of blocks rows arranged in staggered. The characterization of the flow structure in this kind of fishways is the aim of the study even if the present first approach is achieved on a single block to validate the model. On one hand, three dimensional simulations are carried with several turbulence closure ($k-\varepsilon$, $k-\omega$, RNG- $k-\varepsilon$). The VOF model is used to track the free surface. The computation run by the software OpenFOAM which enables to do massively parallel computing. On the other hand, experiments are conducted on a flume in the lab in order to compare the results. The tested configurations are, an emerged cylinder, no slope (i.e 0%) and flows of 10 and 20L/s. The objectif is the comparison of the free surface flow between experiments and simulation results at high Froude number. The results show a good agreement between the experiments and the simulations. The perspective is the simulation of a full fishpasse.