

## Comparison Of CFD Models For Multiphase Flow Evolution In Bridge Scour Processes

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### Abstract

*The present work presents a performance comparison between two widely-used CFD codes, namely: the open source platform OpenFOAM and the commercial software FLOW-3D, applied to hydraulic structure modeling. To do so, a case study, consisting of a rectangular channel with a cylindrical bridge pier attached to its rough bottom is modeled using both codes. The flow is assumed to be turbulent transient incompressible multiphase and viscous and is simulated using the finite volume method (FVM) and the volume of fluid approach (VOF). Turbulence is modeled by means of the RANS model RNG  $k-\epsilon$ . Two scenarios are considered: the initial situation, where the channel bottom is even, and the equilibrium situation, where it is eroded. The eroded streambed geometry is extracted from laboratory experiments using an open sediment transport channel. Several variables of interest, such as shear stresses and vortex shedding period, are estimated and compared among both numerical models and results available in the literature. The main purpose of this study is to assess the accuracy of these solvers when modeling the hydrodynamics of common sediment transport problems.*

### Pour citer cet article

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