

## Numerical Study of Sloshing in a Flexible Tank

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**Abstract :** The numerical study of the Fluid-Structure Interaction (FSI) in a partially filled flexible tank submitted to a horizontal harmonic excitation motion. It is investigated by using two-way Fluid-Structure Interaction (FSI) in a flexible tank by Coupling between the Transient Structural (Mechanical) and Fluid Flow (Fluent) in ANSYS-Workbench Student version. The Arbitrary Lagrangian-Eulerian (ALE) formulation is adopted to solve with the finite volume method, the Navier-Stokes equations in two phases in a moving domain. The Volume of Fluid (VOF) method is applied to track the free surface. However, the equations of the dynamics of the structure are solved with the finite element method assuming a linear elastic behavior. To conclude, the Fluid-Structure Interaction (IFS) has a vital role in the analysis of the dynamic behavior of the rectangular tank. The results indicate that the flexibility of the tank walls has a significant impact on the amplitude of tank sloshing and the deformation of the free surface as well as the effect of liquid sloshing on wall deformation.

**Keywords :** arbitrary lagrangian-eulerian, fluid-structure interaction, sloshing, volume of fluid

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