Dynamique de déformation d'un réservoir de liquide servant à la stabilisation d'une structure flottante en mouvement complexe

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Date de la soutenance
02/06/2025 à 10:00

Lieu de la soutenance
Université de Bejaia, Algérie

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Abstract
The sloshing is a phenomenon appears inside partially filled tanks, it refers to the oscillatory movement of the free surface of the liquid. When these tanks are carried by floating systems, used for their stabilization, the sloshing becomes more complex. The objective of this thesis is to model the dynamics of liquid sloshing in floating tanks with a deformable wall into IFS, under pitch and heave motion. An experimental scheme has been implemented to build up an experimental database. The device is designed to study and analyze the sloshing under the effets of pitch motion. The obtained results were exploited to validate a numerical model developed. The numerical model is implemented taking into account the FSI effects. A partitioned coupling is used and the evolution of the free surface is treated by the VOF method. This model is validated in the case of the horizontal harmonic excitation, and in the case of a pitch excitation. The model is then applied to studying sloshing in a partially filled deformable tank, once subjected to garvitational effects and another subject to pitch and heave motions.