$$\frac{\partial(\rho_F \vec{V})}{\partial t} + \vec{\nabla} \cdot (\rho_F \vec{V}\vec{V}) = -\vec{\nabla}P + \vec{\nabla} \cdot (\mu_F \vec{\nabla}\vec{V}) + \vec{F}_b$$

SimSlosh

SimSlosh is a software tool for simulating the fluid/structure interaction (sloshing) that occurs in liquid containers.

The program uses a coupling technique to separately model the dynamic motion and the fluid sloshing in the container.

SimSlosh can be used to determine forces and torques that are applied to container walls due to sloshing.

Applications & Features

➢ SimSlosh software is a tool for investigating the liquid sloshing inside stationary and moving containers, e.g. offshore structures, road tankers, and automobile fuel tanks.
➢ It gives a complete 3-D image of liquid waves inside the container, as well as all forces applied to the structures.
➢ It can be used to investigate the effectiveness of various baffle designs to reduce the sloshing effects.
➢ It can be used to design more effective control systems by simulating the sloshing conditions.

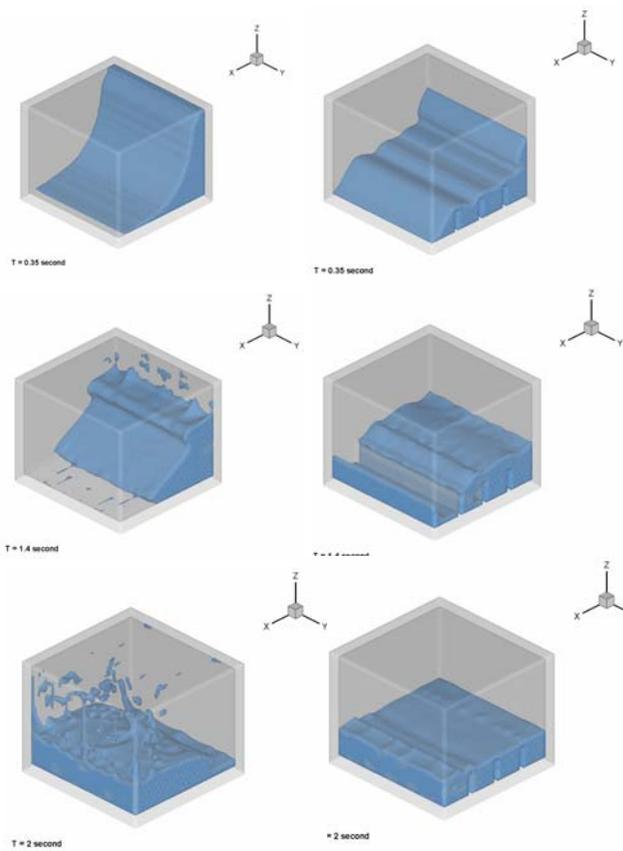*Sloshing occurs in offshore structures*

Sloshing occurs in road tankers
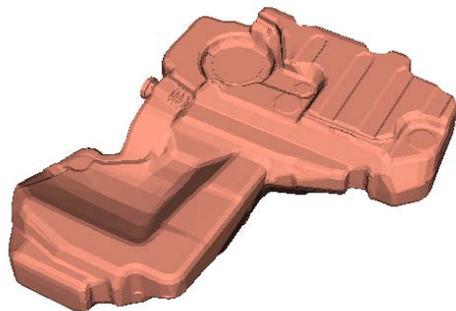
Sloshing occurs in fuel tanks

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Web: www.simulent.com

T = 0.35 second

T = 0.35 second

T = 1.4 second

T = 1.4 second

T = 2 second

= 2 second

No baffles   *With baffles*

Simulation of sloshing in a container undergoes translational acceleration of 9.8 m/s^2 in the x direction. The figure shows the results a tank, with and without the baffles at the same time.
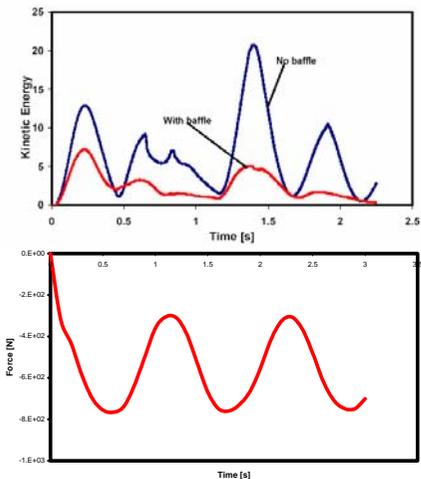

*Kinetic Energy and sloshing forces can be calculated with the software*

About Simulent

Simulent is the leading CFD software development, marketing and consulting company specializing in free surface flow simulation and analysis.

Benefits

➢ You can simulate liquid sloshing inside containers with any complicated shape and under various conditions.
➢ Simulent slosh uses a free surface flow algorithm with the capability of providing solutions in a moving system of reference.
➢ You can simulate the real road conditions using a dynamic module that can be coupled to the liquid module.
➢ This software package can be used to analyze and eliminate the "clinking" noises produced in vehicle fuel tanks due to the sloshing.
➢ You can save time and cost of prototyping & experimentation in design or application of moving containers.
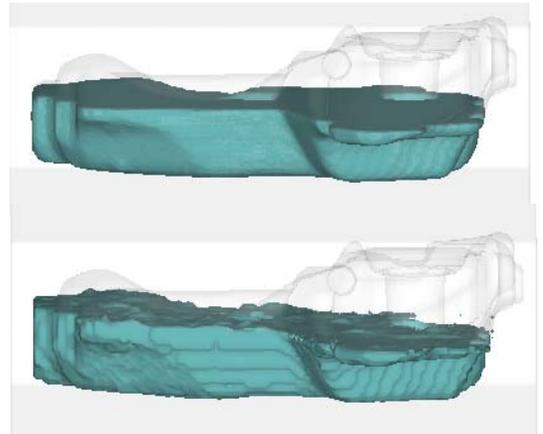
Simulation of fuel sloshing in an automobile fuel tank.

T = 0 s

T = 20 s
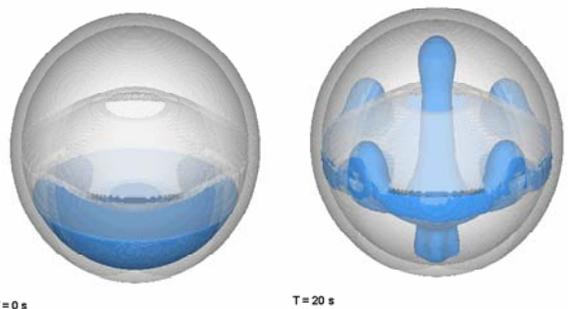
Simulation of the liquid sloshing under micro-gravity conditions. The spherical container undergoes a deceleration of 0.01 m/s^2.