Analysis of body(sphere) falling in liquid(water)

We usually observe bodies falling in the water. It is an important thing to analyse forces on these kinds of bodies. This generally includes lifeboats, body physics of divers, etc. This case study is prepared to explore the capabilities of OpenFOAM to solve this particular case. Case intends to spread knowledge about 6 DOF dynamics and overset.

After going through this report, the reader is expected to be able to use overset grid method in his/her further simulations. Before overset grid method, people used to use dynamic mesh approach in which mesh used to get deformed. When mesh deforms it increases skewness and as it increases, result gets worse. To avoid these kinds of problems due to mesh deformation, overset grid method was developed. The power inherent in the simple concept of disconnecting domain connectivity from grid construction cannot be overstated. In addition to simplifying the grid generation process, component grids can now be tailored to the local geometry, physics, and even solution model. Time and time again, compromises in grid quality to facilitate domain connectivity have been shown to reduce simulation accuracy and robustness. By using overset grid technology, such problems can be mitigated. Overset mesh generation is then conceptually split into off-body or background grids and near-body grids which resolve geometry and viscous effects. Often structured hexahedral component grids are used for their efficiency and accuracy. However, the overset technique is routinely applied using hybrid unstructured grids for highly automated meshing of complex configurations.

Solver used : overInterDyMFoam