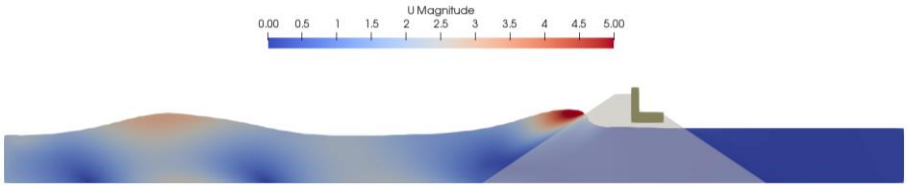
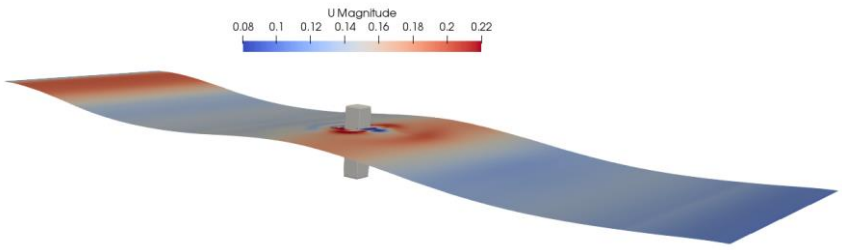
IHFOAM
APPLIED TO COASTAL ENGINEERING

IHFOAM is a newly developed three-dimensional numerical two-phase flow solver specially designed to simulate coastal, offshore and hydraulic engineering processes. Its core is based on OpenFOAM®, a very advanced multiphysics model, widely used in the industry. **IHFOAM** differs from the rest of solvers by the wide collection of implemented boundary conditions which handle wave generation and active absorption at the boundaries. **IHFOAM** has been validated for a large number of cases that include the most important processes in coastal engineering.

The first tutorial will be focused on modelling the interaction between waves and a coastal structure (like a rubble mound breakwater, vertical breakwater or submerged breakwater.). The two-phase flow within porous media will simulated using **IHFOAM**. Wave generation boundary conditions will be used linked to active wave absorption to generate the target waves while absorbing any reflected wave up to the generation boundary. A detailed description of the numerical setup will be presented.



A second tutorial will be focused on modelling floating structures (like wave energy converters, moored ships, floating offshore wind turbines, or movable platforms). These structures represent one of the biggest challenges for offshore and coastal engineering applications. In fact, in the last years, several studies have been carried out in the fields of renewable energy, naval engineering and oil-gas industry trying to resolve this type of structures accurately. Although deforming grid approaches are available, several instabilities can be observed when dealing with complex structures (real geometries). Therefore, the Overset Mesh technique is appearing as the most suitable technique for these applications. Again, wave generation will be simulated linked to active wave absorption to generate the target waves while absorbing the boundary incident waves. A detailed description of the numerical setup will be presented.



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