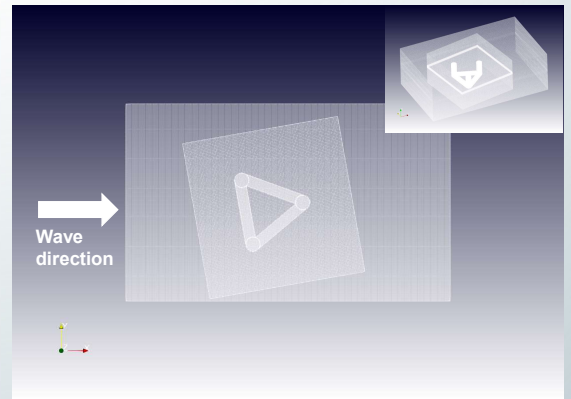
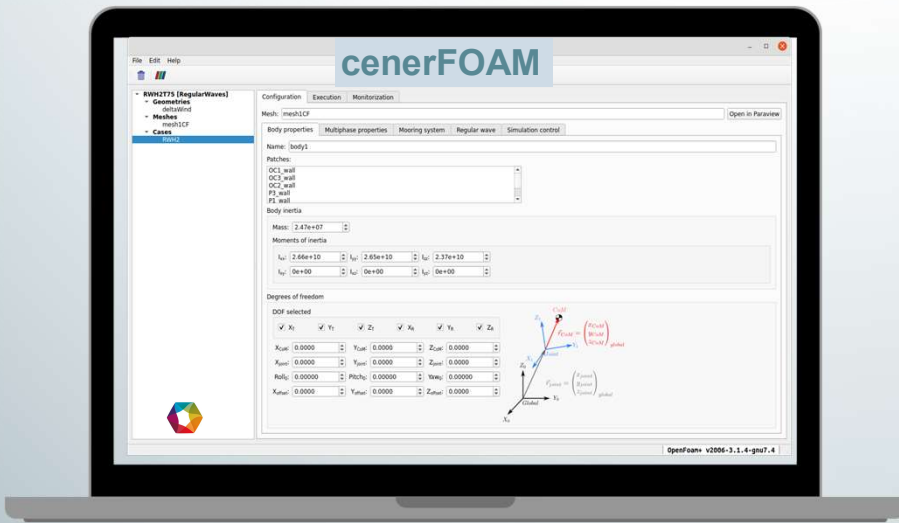


## DeltaWind & cenerFOAM

High fidelity simulations of CENER's DeltaWind [1] platform are performed using OpenFOAM CFD (Computational Fluid Dynamics) simulations. The simulated cases have been configured under the OpenFOAM environment (version v22.12) and using the utility **cenerFoam** (developed by CENER) that helps the user to mesh the geometry, configure the cases, run simulations and post process the results.

**cenerFoam** is a graphic user interface (GUI) created to help the user to define, run and post process hydrodynamic simulations of floating platforms. The mesh characteristics, boundary conditions and numerical settings are specified for each simulation using cenerFoam without the necessity of the knowledge of an expert user in computational fluid dynamics and OpenFOAM environment. Body properties can be easily specified and movements accounting up to six degrees of freedom are allowed. Forced displacement, free decay, regular and irregular wave tests can be configured with cenerFoam **creating automatically dynamic or overSet meshes**. In addition, the weathervaning cases for single point mooring concepts are also supported. Mooring lines can be modelled in the simulation using springs and/or Moody [2] and MoorDyn [3]. Residuals and body forces are a direct output of the simulation as well as **water surface elevation and pressure** at the platform surface.

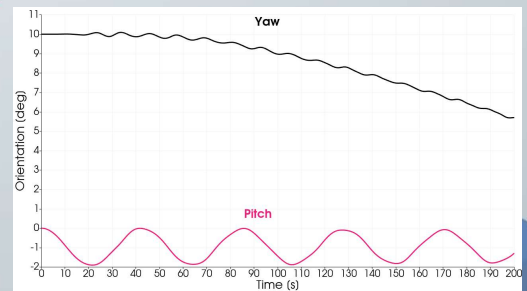
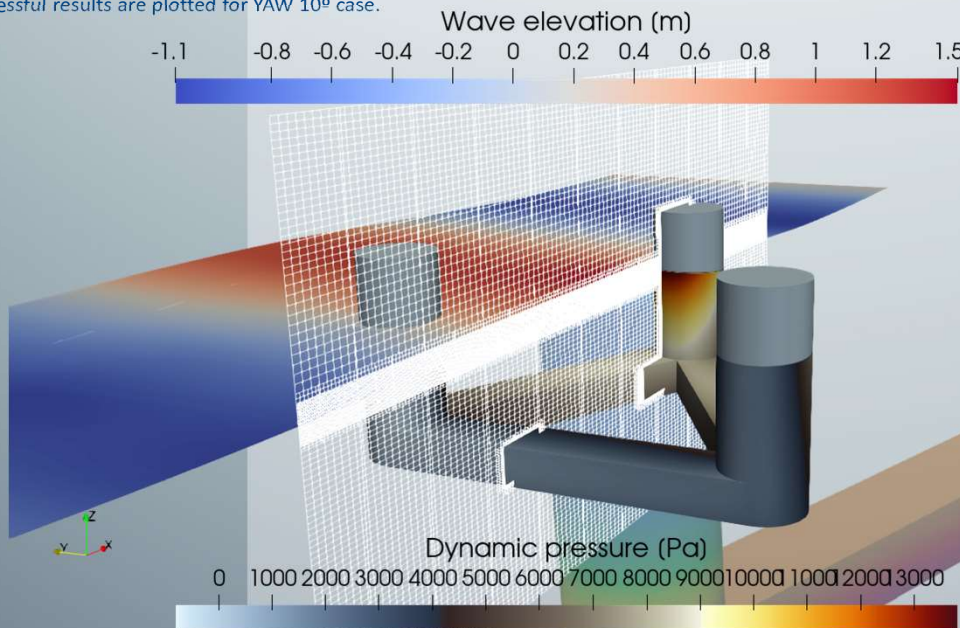


OverSet Mesh for the yaw=10° case.

*cenerFoam* generates automatically **Dynamic and OverSet Meshes**

## Case study (PLATFORM YAW MISALIGNMENT WITH REGARD WAVE DIRECTION 10 DEGREES)

Weathervaning cases have been simulated. A regular Wave H=2m and T=12 s impacts the platform with several misalignment angles: 0, 5, 10 and 30 degrees. Some successful results are plotted for YAW 10° case.



Yaw 10° case. DeltaWind Platform orientation achieved and simulated with cenerFOAM.

## References

- Sander F, V. S. N. A., Azcona J, "Deliverable D4.3.3 Innovative Concepts for Floating structures," Innwind, EU project public deliverables, 2017.
- Palm, J., and Eskilsson, C., "MOODY USER MANUAL version 1.0.0," 2018.
- M. Hall, "MoorDyn User's Guide," 2017.