

Dynamic draft study with constant environmental variables

ShipFEM Code

H2020 SOCIETAL CHALLENGES: Climate action, environment, resource efficiency and raw materials

PRODUCTIVE SECTOR: Logistics and transport

PROBLEM DESCRIPTION

Development of a vessel draft prediction tool for the optimization of port management.

CHALLENGES AND GOALS

Identification of the most relevant hydrodynamic phenomena under constant environmental conditions.

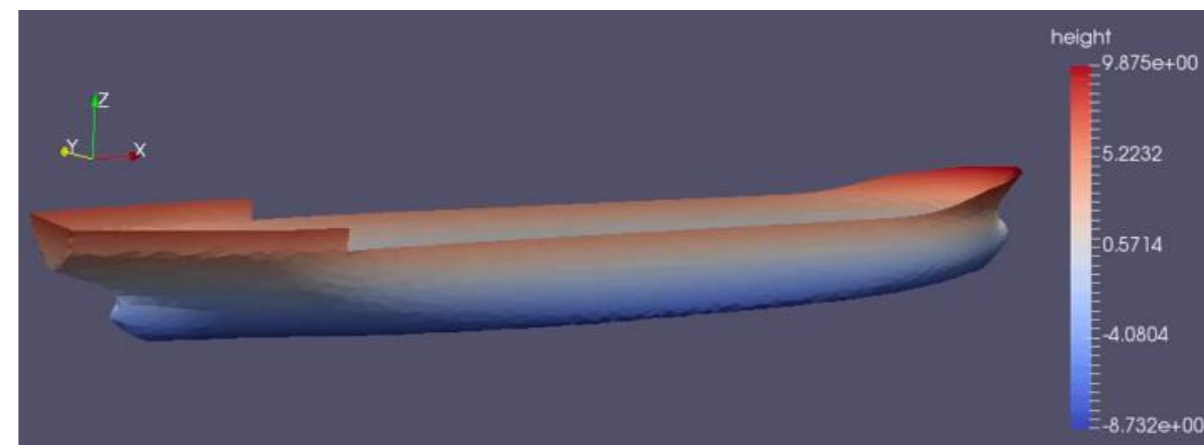
Mathematical modelling of the hydrostatic and hydrodynamic problems and its numerical resolution to obtain the dynamic draft of a ship.

MATHEMATICAL AND COMPUTATIONAL METHODS

Hydrodynamic model: linear, incompressible fluids and use of velocity potentials.

Physical problem with unbounded domain: PML technique (Perfectly Matched Layers).

Computational domain: Automatic generation of geometries and meshes.



Height with respect to the sea free surface at the hydrostatic equilibrium position, plotted on the vessel hull

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Results and Benefits

The computation of the dynamic draft using the ShipFEM code is efficient and accurate.

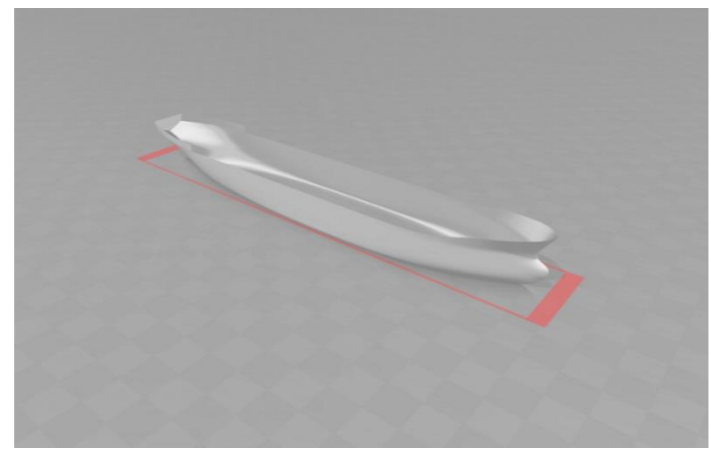
This code has been included in the port consulting tool: i4cast.

Its integration leads to a more complete and competitive tool in the market.

An intelligent system that helps in making decisions through monitoring.

Prediction of oceanic and climatic conditions.

Simulation of the influence of environmental conditions on port operations in each vessel.



CAD model: geometry of the vessel hull

ShipFEM is an intelligent system that helps in making decisions through monitoring: prediction of the influence of environmental conditions on port operations in each vessel through simulation.



Spanish Network for Mathematics & Industry (math-in)

