

1 Software Lab: Computation of the ship with account of the free surface using OpenFOAM

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The aim of the work is to simulate a Wigley ship with free surface into consideration at a particular Froude number.

1.1 Tasks

The work consists of the following steps

- Selection of a particular profile for a Wigley hull and experimental test case based on some preliminary research survey.
- Modeling of the geometry using any suitable CAD software.
- Computation of the mesh using proper meshing tools.
- Case setup in OpenFOAM and calculation of turbulence properties for the initial condition.
- Numerical simulation using OpenFOAM with the application of various turbulence models for steady and transient case.
- Post-processing of the results with ParaView for different parameters like dynamics pressure contours, graphical representation for resistances, wave patterns, wave profiles etc.
- Validation of simulation results with the experimental data obtained from the research survey.

1.2 Report

The possible content of the report is

- Introduction. Motivation of the work.
- Research survey
- Theoretical background. Governing equations.
- Numerical Methods.
- Results and their Analysis.
- Conclusion
- References.

The report in hard copy form should be submitted at least one week before the defending.