Numerical Estimation of Shallow Water Resistance of a River-Sea Ship using CFD

Abstract

In recent years a great deal of research efforts in ship hydromechanics have been devoted to practical navigation problems in moving larger ships safely into existing harbours and inland waterways and to ease congestion in existing shipping routes. The starting point of any navigational or design analysis lies in the accurate determination of the hydrodynamic forces generated on the ship hull moving in confined waters. The analysis of such ship motion should include the effects of shallow water. An area of particular interest is the determination of ship resistance in shallow or restricted waters at different speeds, forming the basis for the power calculation and design of the propulsion system. The present work describes the implementation of CFD techniques for determining the shallow water resistance of a river-sea ship at different speeds. The ship hull flow is analysed for different ship speeds in shallow water conditions. The results obtained from CFD analysis are compared with available standard results.

References

- Anderson, J. D. Computational fluid dynamics: The basics with applications, McGraw
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Index Terms

Computer Science

Applied Sciences
Keywords

Restricted water  River-sea ship  mesh  domain  shallow water depth  surface wave pattern

hull drag