

Abstract

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Simulation of ship maneuvering behavior based on the modular mathematical model

With the rapid development of the computer technology and its successful application in ship engineering, the method of computer simulation based on the mathematical models became more and more popular it provides a convenient tool for predicting ship maneuverability. One of the preconditions for applying that is the modeling of the dynamic differential equations that represent the ship dynamics in three degrees of freedom. The effectiveness of simulation is guaranteed by how accurate the model is. There are different types of ship mathematical modeling. In this work, the ship modular mathematical model was investigated. Simulink software was utilized to develop the ship subsystems as individual modules. Modules hydrodynamic forces, and moments were implemented in simulating the ship maneuvering behaviors of the ESSO OSAKA tanker class ship. Moreover, different types of maneuvering are tested in particular, turning and zigzag motion.