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CFD verification and validation of added resistance in oblique waves[1] HENRIK MIKKELSEN, YANLIN SHAO, Technical University of Denmark, JENS HONOR WALTHER, Technical University of Denmark and Swiss Federal Institute of Technology Zurich — Today, almost all ship hulls are optimized to sail in calm water. In a realistic seagoing condition, the ship will be exposed to added resistance caused by the waves, which will influence the ships performance and fuel consumption. Physical towing tank testing of a broad spectrum of wavelengths, wave heights and headings is extremely expensive. CFD simulations offer the opportunity to include the performance in waves into the ship design phase. However, before trusting CFD results, it is very important to verify and validate the CFD model to ensure accuracy. The present study both verifies and validates the CFD model with towing tank results from the literature. The validated CFD model is used to study the added resistance in oblique waves with varying wavelength. Added resistance in head waves has been studies intensively, but only very few studies are conducted in oblique waves. The present study includes both a container ship and a tanker. The conducted verification and validation study shows that the discrepancy between the CFD results and towing tank results are within the towing tank uncertainty for most of the conditions.

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