

UNCERTAINTIES OF SHIP SPEED LOSS EVALUATION UNDER REAL WEATHER CONDITIONS

A correct assessment of the ship speed loss in conditions of exploitation is becoming increasingly important for ship owners as well as ship designers. We are witnessing the increasing concern for the environment and awareness of the necessity to preserve it as much as we could. The ship speed drop in the real environmental conditions can cause the increased fuel consumption as well as increased emissions of CO₂ and other GHG (greenhouse gases) from ships. Decrease of the ship speed in real conditions is a consequence of the added resistance due to the impact of weather conditions, i.e. waves and wind, and due to aggravated working conditions of propeller, i.e. engine system. Moreover, the solution estimation of this problem is very affected by human factors. Ship master, concerning for safety, can make a judgment that, under certain adverse weather loads, it is necessary to slow down or change ship's course to moderate or bypass the worst condition. In addition, the loading condition of the ship is constantly changing which govern the basic parameters of the ship: the mass and mass moment of inertia, draft and trim and, consequently, the ship behavior at sea.

Team

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Research Areas

Voluntary speed reduction
Environment Modelling
Uncertainty and Reliability
Measurement

Current Activities

Wave Spectrum Modeling
from Measurements

Uncertainty and Sensitivity of
Speed Loss Model

All these parameters affect the assessment of ship speed and it is necessary to be conscious of the intensity of their impact on the final value. At the same time, they cannot be predicted with absolute certainty so the purpose of this analysis is to estimate the impact of weather and operational uncertainties on the actual speed of the ship in real operating conditions.

Project lead and team members are from the Faculty of Engineering, University of Rijeka and from the Graduate School of Maritime Studies, University of Kobe, Japan. There are also three PhD students enrolled in postgraduate doctoral studies of Faculty of Engineering Rijeka. One of them works at University of Rijeka, and the other two at University of Trieste and Bureau Veritas. Hence, it is important to point out the initiative that the proposed research would further have in strengthening the scientific and professional co-operation and linking of these institutions, as well as wider dissemination and the possible applications of research results in the industry.

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