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Optimization of Trimaran Design Configuration in Calm and Deep Water

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The field of a sea based modern shipping activities is constantly seeking for its improvements in order to achieve the economically justified operational patterns. In the same time, the sea transportation activities also need to satisfy currently imposed and, as well as, upcoming in the near future, safety and ecologically friendly footprint characteristics when it comes to the emission of the green house gasses and hard particles (IMO, 2015). Fulfilment of the stated requirements consequently asks for the determination of certain vessels operational parameters such is the total resistance of a vessel which estimation is frequently carried out for predefined calm and deep water environmental scenario. Current work is dealing with investigation of the total resistance parameter in calm and deep water for the preselected types of the trimaran ship hull configurations. The total resistance is estimated according to ITTC recommended procedure. through applicability of the robust and reliable method which is capable to address the problem of wave resistance prediction in calm and deep water. The method has origin in ordinary and modified Michell thin-ship wave theory by taking into account the viscous effects (Skejic and Jullumstrø, 2012). The differences between the utilized theories are discussed from the qualitative and quantitative point of view of the obtained results in comparison to the open source available theoretical experimental data and from the perspective of common engineering practice. Finally, based on the above description, the performed total resistance studies are used as a base for formulation of the optimization procedure which may be used in the trimaran vessel preliminary designs in the range of the forward speeds commonly expected during the normal operational life of the investigated trimaran vessel.

Skejic, R. and Jullumstrø, E. (2012) Power Performance and Environmental Footprint of High-Speed Vessels in Calm Deep Water. OMAE 2012, Brazil.

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