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A ship energy efficiency analysis by considering trim influence and waste recycling

The paper presents an experimental analysis of the trim influence on an existing and operating ship, in order to assess possible fuel consumption reductions. The investigation is based on model tests performed at the towing tank of Genoa University, where the trim influence on the hydrodynamic resistances of a high-speed vessel and a slower mini-cruiser is investigated for various operating conditions. The purpose of this work is to provide possible indications for the operating trim of passenger and/or naval vessels. In this regard, the experimental results of the faster model are compared with the full-scale data of a Ro-Ro Passenger ship, assuming a similar behavior for the two applications. The consistency of the achieved results is shown in the perspective of the different examined hull geometries. To further improve the ship energy efficiency, a particular waste recycling technology, aimed at obtaining biofuel from sludge, is also considered in the final part of the article. The main idea is to produce biofuel for the ship engines through a pyrolysis process to be carried out directly onboard, in order to obtain further fuel savings from waste products of the vessel.

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