The Effects on the Operating Condition of a Passenger Ship Retro-fitted with a Composite Superstructure - DTU Orbit (09/11/2017)

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As sustainability and climate change have come on the politi-cal agenda, the shipping industry will have to be operating energy efficient ships. An appealing step to achieve this goal is by designing superstructures made out of Fiber Reinforced Plastics (FRP) aiming at the reduction of the ship's lightship weight. The benefits of a light superstructure become most prominent in large passenger ships, as the superstructures constitute a significant percentage of the lightship. Additionally, depending on the size of the ship, the superstructure may tower several decks above the weather deck, affecting the stability of the ship. In this work, the superstructure of a RoPax ferry has been redesigned using composite materials emphasizing the effects on the ship from an operational per-spective. The weight reduction has been calculated for a realistic average operating condition quantifying the effects on the stability and the fuel consumption of the retrofitted ship com-pared to the original design.

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