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UTILIZATION OF BEND-TWIST COUPLING TO IMPROVE THE PERFORMANCE OF HYBRID MARINE COMPOSITE PROPELLER

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Abstract

Composite materials possess unique coupling effects when compared to monolithic materials. These coupling effects make a composite propeller shape adaptive or flexible in nature. The flexible marine propellers have number of advantages when compared to conventional rigid metallic propellers. Bend-twist coupling when linked to flexible behaviour will lead to performance improvement. In this work systematically designed hybrid composite propeller made of R glass roving UD/epoxy, S2 glass fabric/epoxy and Carbon UD/epoxy is analyzed for various stacking sequences and blade setting angles using fluid-structure interaction and response, performance curves are plotted between the rigid propeller and propeller made with different ply sequences. The effect of blade setting angle on the performance is also investigated. The results showed that well designed composite propeller will outperform the metallic propeller.

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Bend-Twist Coupling, Hybrid Marine, Composite Material

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