

Abstract Submitted
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Large-Eddy Simulation of a Ducted Propeller in Crashback Mode of Operation¹ THOMAS KROLL, WYATT HORNE, KRISHNAN MAHESH, University of Minnesota — We discuss LES of flow around a ducted, marine propeller in the off-design mode of operation known as crashback. In crashback, the propeller rotates in the reverse direction while the vessel moves in the forward direction yielding highly unsteady loads. The simulations use a novel, unstructured grid methodology, developed by Horne & Mahesh [J. Comput. Phys (2019) 376:585-596]. Experiments and previous LES studies have shown that the addition of a duct exacerbates side-forces to about three times the magnitude of the case without a duct. The results are compared to available experimental data and previous LES studies. Details of the flow field and the mechanisms behind the high side-forces are discussed.

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