

Hydrodynamic characteristics of the surface-piercing propellers for the planing craft (PDF)

《船舶与海洋工程学报》 [ISSN:1002-2848/CN:61-1400/f] 期数: 2008年01 页码: 267--274 栏目: 出版日期: 2008-03-25

Title: Hydrodynamic characteristics of the surface-piercing propellers for the planing craft

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关键词: [surface piercing propeller](#); [boundary element method](#); [hydrodynamic characteristics](#)

分类号: -

DOI: -

文献标识码: A

摘要: Demand for high-speed marine vehicles (HSMVs) is high among both commercial and naval users. It is the duty of the marine vessel's designer to provide a hull and propulsion system that diminishes drag, improves propulsive efficiency, increases safety and improves maneuverability. From the propulsor side, surface piercing propellers (SPPs) should improve performance. Unlike immersed propellers, behavior of the SPP is affected by depth of immersion, Weber number and shaft inclination angle. This paper uses a practical numerical method to predict the hydrodynamic characteristics of an SPP. The critical advance velocity ratio is derived using the Weber number and pitch ratio in the transition mode, then the potential based boundary element method (BEM) is used on the engaged surfaces. Two models of three and six-bladed SPPs (SPP-1 and SPP-2) were selected and some results are shown.

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备注/Memo: -

更新日期/Last Update: 2010-05-25