A method based on potential theory for calculating air cavity formation of an air cavity resistance reduction ship(PDF)

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Title: A method based on potential theory for calculating air cavity formation of an air cavity resistance reduction ship

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摘要: This research is intended to provide academic reference and design guidance for further studies to determine the most effective means to reduce a ship’s resistance through an air-cavity.On the basis of potential theory and on the assumption of an ideal and irrotational fluid,this paper drives a method for calculating air cavity formation using slender ship theory then points out the parameters directly related to the formation of air cavities and their interrelationships.Simulations showed that the formation of an air cavity is affected by cavitation number,velocity,groove geometry and groove size.When the ship’s velocity and groove structure are given,the cavitation number must be within range to form a steady air cavity.The interface between air and water forms a wave shape and could be adjustedby an air injection system.

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