

# Effects of the profile of a supercavitating vehicle' s front-end on supercavity generation(PDF)

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Title: Effects of the profile of a supercavitating vehicle' s front-end on supercavity generation

作者: -

Author(s): ZHANG Bo\*; ZHANG Yu-wen and YUAN Xu-long  
College of Marine Engineering, Northwestern Polytechnical University, Xi' an 710072, China

关键词: cavitation; supercavitating vehicle; volumetric gas flow rate; front profile; supercavitation generation speed

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摘要: The authors designed three different front profiles for supercavitating vehicles based on cavity theory and the Granville streamlined equation are designed. Experiments were done using these front profiles in the Northwestern Polytechnical University high-speed water tunnel. The experiments indicated that the critical volume of gas required for supercavitation is affected by the axial distribution of the front-end' s slope. The experimental data showed critical gas flow rates required for the three designs were less than mod-1, with the greatest decrease 24%. The experimental results also showed the supercavitation generation speeds of the models were faster than mod-1 by up to 32.4%. This verifies that the front profile of a supercavitating vehicle effects supercavity generation speed and critical gas flow rates. The smaller the changes in axial distribution of pressure, the higher the supercavity generation speed. The smaller the changes in curvature distribution of axial, the smaller the critical gas flow rates.

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