

## RESEARCH ON CAVITY FLOW AROUND UNDERWATER 3D VEHICLE BASED ON POTENTIAL FLOW THEORY

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**ABSTRACT:** On the basis of the potential flow theory, the paper establishes mathematical calculations of the cavity flow around underwater 3D vehicle. The problems of partial cavity and no cavity flow around underwater vehicle were researched. And its validity was demonstrated with the comparisons between the calculation results and experiments. On the basis of it, the paper analyzed the effects of different head shape and different cavitation number to the characteristics of flow around underwater vehicle. Some laws of flow were obtained: the normal force and pressure center coefficient wasn't be in singular proportion to cone angle. The cone angle and cavitation number had a strong influence on the cavity shape and the hydrodynamic loads. The results would play a guide role in the hydrodynamic force design.

**Key Words:** *Cavity, Underwater Vehicle, Around Flow, Potential Flow Theory.*

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