

عنوان مقاله:

An iterative algorithm based on vapor phase's artificial viscosity for simulating natural supercavitation

محل انتشار:

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خلاصه مقاله:

In this paper the numerical simulation of supercavitating flow was performed. The flow was assumed isothermal and consists of two phases, liquid and its vapor. A transport equation based cavitation model was used for the numerical simulation of the flow field including natural supercavitation. A mass transfer between the phases is treated as a source and sink terms in vapor transport equation. The numerical method is used for different geometries in a wide range of cavitation numbers. The cavity parameters such as cavity length and cavity width were compared with experimental data and agreed very closely. In order to reach in max cavity length in spite of divergency problems the iterative algorithm is introduced. This algorithm uses the high artificial vapor's viscosity which after each converged solution the vapor viscosity is decreased until the desired cavity length obtained consequently. The use of this algorithm in compared with direct solution for high cavitation numbers has less iteration so the CPU time for convergence is less than direct solution. in this algorithm the high viscosity selected for vapor and then the iterations began after that the solution was converged the cavity length is longer than real cavity length compared to experimental data and the cavity width is thinner so the vapor's viscosity decreased and the iteration is started based on pervious solution's data therefore the cavity length is decreased. This procedure is applied continuously till the . desired cavitation number and pressure flow field was reached

کلمات کلیدی:

CFD, supercavitation, iterative algorithm, vapor phase's artificial viscosity, two phase flow, mixture model

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