

عنوان مقاله:

Numerical study on the necking of a cavitation bubble; Part ۲: Necking of a cavitation bubble near a concave rigid boundary

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خلاصه مقاله:

Investigation on the dynamics of a vapor bubble near different surfaces is of important problems for understanding of mechanisms of the cavitation damage. Necking of a cavitation bubble during its pulsations occur when neither the buoyancy forces nor the Bjerknes attraction forces through the rigid boundary dominate the bubble's dynamic behavior. In this paper, a Boundary Integral Equation Method is employed to simulate the dynamic behavior of the cavitation bubble near a concave rigid boundary until the necking phenomenon. Effects of magnitude of the buoyancy forces, stand-off parameter, i.e. distance of the bubble centroid from the rigid surface and concavity of the rigid surface on the dynamic behavior of the bubble during the bubble necking have been sought through computational simulation of this phenomenon. Numerical results of the time dependent profiles of the bubble during its growth and collapse phases, the movement of the bubble centroid, the variation of the pressure inside the bubble against the non-dimensional time and the variation of the bubble volume against the non-dimensional time have been illustrated under different circumstances.

کلمات کلیدی:

Cavitation bubble, Concave boundary, Necking phenomenon, Simulation, Boundary Integral Equation Method

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