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DIRECT NUMERICAL SIMULATION OF MOTION OF RISING BUBBLES UNDER MICROGRAVITY CONDITIONS

Abstract

The buoyancy-driven motion of gas bubbles in viscous liquid has been fully studied under gravity. However, with the change of gravity, the shapes and behavior of rising gas bubbles are different due to the varied *Bo* number. In this study, deformable gas bubbles rising in viscous liquids under microgravity conditions are researched by direct numerical simulation via an arbitrary-Lagrangian-Eulerian(ALE) method. We assume the flow field is axisymmetric and the motion of the gas inside the bubble is neglected. At first, the simulation results are validated by the ground experiments. Then, the bubble shapes and rising velocities are obtained with different *Bo* numbers. Interactions between bubbles with different radii are also investigated in two-dimensional space.