

Simulations of the Interaction of Compressible Droplet Impaction on Walls based on the Two-Fluid Model

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The work here is proposed to solve non-equilibrium multi-equation two phase flow model and hybrid flow model for compressible liquid-gas flows based on the Godunov type approximated Riemann schemes. The aim of this study is to propose a conceptual framework for addressing prediction of multiphase flows. The requirement that follows is a well-posed formulation and a high-fidelity numerical treatment that allows capturing of shocks and contact discontinuities over all flow speeds, consistently with what is physically allowable according to the density ratios involved. Also, we would like to propose robust multi-fluid scheme to simulate the flow motions of gas and liquid fluids universally. In our approach, by defining the fluids in different region and introducing inter-phasic force on cell boundary, the proposed flow models will allow the conservation laws to be applied on each phase and, therefore, it is able to capture fluid discontinuities, such as the fluid interfaces and shock waves, accurately.

Keywords: Two-phase flow, Two-fluid model, Godunov solvers, Shock-bubble Interaction