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Two-fluid Compressible Flows with Multiresolution-based Mesh Adaptation

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The study of two-phase boiling flows is of considerable interest due to its crucial role in optimizing thermal performance across various industrial applications. However, the accurate numerical simulation of such flows remains challenging. In this work, we present a two-phase compressible solver based on the finite volume method, which maintains good accuracy in the low Mach regime. A sharp-interface phase change model enables precise prediction of heat transfer between liquid and vapor. The solver is coupled with a multiresolution-based mesh adaptation (MR) strategy to reduce the computational cost. Different benchmark tests for interface deformation, low Mach behavior, and boiling heat transfer are performed on fixed meshes and adaptive meshes.

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