

# Two-fluid Compressible Flows with Multiresolution Adaptive Mesh Refinement

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The study of boiling flow is of considerable interest as it plays a crucial role in optimizing thermal performance in various industrial scenarios. Diverse approaches have been proposed to simulate nucleate boiling in the framework of the interface tracking method. However, accurately predicting boiling heat transfer remains challenging due to the involvement of multiscale phenomena. To better understand the contribution of interfacial heat transfer to the overall heat-transfer mechanism, we follow the work of [Z. Zou et al., 2020] on the two-fluid simulations in the low Mach regime. The liquid-vapor interface is captured by the level set method. Our work sets out to couple the sharp-interface heat transfer and phase change modelling with adaptive mesh refinement techniques. An effective adaptive mesh refinement strategy will improve computational efficiency and flexibility without degrading the quality and accuracy of capturing the interface motion and heat flux at the interface. We focus on the multiresolution (MR) adaptive method, which is based on a rigorous mathematical analysis of wavelet theory.

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