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Modeling and simulation of primary atomization with phase transition PENG ZENG, BERND BINNINGER, NORBERT PETERS, HEINZ PITSCH, RWTH Aachen University, MARCUS HERRMANN, Arizona State University — This paper is intended to demonstrate the capability of a numerical approach to investigate the primary atomization process. The evaporation on the interface of two–phase flow is computationally studied within the context of a hydrodynamic theory. A level-set method is used to track down the phase interface, which is treated as a free boundary surface. The flow field is described by the incompressible Navier-Stokes equations, with different densities and viscosities for the liquid and gaseous phases, supplemented by singular source terms that properly account for thermal expansion effects. The numerical scheme has been tested on several benchmark problems and was shown to be stable and accurate.

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