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Interface and surface tension in incompressible lattice Boltzmann multiphase model. (English) [Zbl 0990.76073](#)

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Summary: This paper studies the interfacial dynamics and surface tension in an incompressible lattice Boltzmann multiphase model. The model tracks different phases and interface between them using an index fluid with molecular interaction. When the molecular interaction is strong enough, the index fluid automatically segregates into two different phases. The surface tension is implemented in the model using a function of the gradient of index fluid density. The strength of the surface tension depends on molecular interaction, and can be adjusted conveniently by a free parameter. Numerical simulations for a variety of flow conditions with surface tension are carried out to demonstrate the capability of the model.

MSC:

76M28 Particle methods and lattice-gas methods

76T10 Liquid-gas two-phase flows, bubbly flows

Cited in **19** Documents

Keywords:

Carnahan-Starling fluid; Laplace law; incompressible lattice Boltzmann multiphase model; index fluid; molecular interaction; surface tension; index fluid density

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