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A LATTICE BOLTZMANN COUPLED TO FINITE VOLUMES METHOD FOR SOLVING PHASE CHANGE PROBLEMS

ABSTRACT

A numerical scheme coupling lattice Boltzmann and finite volumes approaches has been developed and qualified for test cases of phase change problems. In this work, the coupled partial differential equations of momentum conservation equations are solved with a non uniform lattice Boltzmann method. The energy equation is discretized by using a finite volume method. Simulations show the ability of this developed hybrid method to model the effects of convection, and to predict transfers. Benchmarking is operated both for conductive and convective situation dominating solid/liquid transition. Comparisons are achieved with respect to available analytical solutions and experimental results.

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