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Lattice Boltzmann Simulation of Thermal Multiphase Flows with Dynamic Wall Interactions MICHAEL IKEDA, LAURA SCHAEFER, University of Pittsburgh — As energy densities in electronic devices rapidly increase, improved two-phase microchannel heat exchanger designs are of great interest. However, a better understanding of flow boiling in these regimes is required. The lattice Boltzmann method (LBM) has shown great promise in the simulation of multiphase flows due to its ability to easily capture interfacial dynamics. Although there have been many recent developments to the standard thermal, multiphase LBM, wall interactions are typically oversimplified. These simplifications lead to interactions which are only appropriate for isothermal, static simulations. In this work, we extend wall interactions based on the pseudopotential multiphase approach to include the variable wetting behavior that occurs with changing temperatures. This will enable the future modeling of the flow boiling process with temperature-dependent wetting characteristics.

Michael Ikeda
University of Pittsburgh

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