A Saturated-Interface-Volume Phase Change Model for Simulating Flow Boiling
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Objective

- Develop a physics-based numerical model to study two-phase flow in a microchannel
- Develop expense-saving features to enable cost-effective simulation of 3D channels with complex geometric features

Approach

- Volume of fluid-based model to ensure mass conservation
- A novel saturated-interface-volume model is proposed to calculate phase change accurately and effectively
- The near-interface velocity is artificially increased to suppress unphysical spurious currents

Impact

- Two-phase flow and phase change can be simulated in 3D microchannels at significantly reduced computational expense
- Physical details are captured and important transport mechanisms can be revealed

Selected Publications