Abstract Submitted
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Numerical simulation of two-phase flows in complex geometries by combining two different immersed-boundary methods BO YIN, HAOXIANG LUO, Vanderbilt University — Two-phase flows in various industrial applications often occur in complex geometries. To simulate this type of flows, we have combined two different immersed-boundary methods to handle the fluid-fluid and the fluid-solid interfaces separately. For the fluid-fluid interface, a diffuse-interface method is employed where the discontinuities of the material properties and the traction jump are all regularized using an approximate Dirac's Delta function. For the fluid-solid interface, ghost nodes and a local flow reconstruction are employed to complement the finite-difference discretization and to incorporate the boundary conditions. A single-block Cartesian mesh is used to discretize the entire domain. Both 2D and 3D codes have been implemented. Validation and code applications will be demonstrated at the conference. *Supported by the ACS Petroleum Research Fund.

Haoxiang Luo
Vanderbilt University

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