

Abstract Submitted
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Numerical Modelling of Three-Fluid Flow Using The Level-set Method¹ HONGYING LI, JING LOU, ZHI SHANG, Institute of High Performance Computing, Agency for Science, Technology and Research — This work presents a numerical model for simulation of three-fluid flow involving two different moving interfaces. These interfaces are captured using the level-set method via two different level-set functions. A combined formulation with only one set of conservation equations for the whole physical domain, consisting of the three different immiscible fluids, is employed. Numerical solution is performed on a fixed mesh using the finite volume method. Surface tension effect is incorporated using the Continuum Surface Force model. Validation of the present model is made against available results for stratified flow and rising bubble in a container with a free surface. Applications of the present model are demonstrated by a variety of three-fluid flow systems including (1) three-fluid stratified flow, (2) two-fluid stratified flow carrying the third fluid in the form of drops and (3) simultaneous rising and settling of two drops in a stationary third fluid.

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