

Abstract Submitted
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An improved connectivity-free point set method to simulate multiphase flow CHU WANG, LUCY ZHANG, Rensselaer Polytechnic Institute — An improved connectivity-free point set method is presented to simulate the multiphase flow. Similar to the front tracking method, the point-set method tracks the interface explicitly. However, it does not require any logical connectivity among interface markers, which provides the flexibility in modeling large morphological changes such as bubble merging and breaking up. The topology changes are handled automatically by proper interface reconstruction scheme and also conveniently ease the small interface undulation due to advection. A meshfree RKPM interpolation method is employed to improve the algorithm which can handle non-uniform meshes and provide boundary corrections for free surface flows in situations when interface markers end at walls. Great accuracy is achieved for both the unit normal and curvature calculation. The incompressible two-phase flow is simulated using stabilized finite element method. Several test cases are performed to validate the improved method and show its capability in simulating multiphase type of flows successfully.

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