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Interface Retaining Coarsening for Multiphase Flows XIANYANG CHEN, JIACAI LU, GRETAR TRYGGVASON, Johns Hopkins University Department of Mechanical Engineering — Multiphase flows are characterized by sharp moving phase boundaries, separating different fluids or phases. In many cases the dynamics of the interfaces determines the behavior of the flow. In a coarse, or reduced order model, either an averaged two-fluid model or a large-eddy-simulation like one, it is therefore critical to retain a sharp interface for the resolved scales. The point particle model for disperse flows is a widely used limiting case. Different strategies to retain sharp interfaces are possible. In the simplest case the indicator function identifying the different fluids is filtered and the sharp interface restored by nonlinear post-processing, consisting either of identifying the interface location from the filtered field, or let the interface "flow to its new location. Another approach is to work directly with Lagrangian marker points identifying the interface and average their coordinates, or evolve the interface based on curvature or other measures. The different approaches are discussed and compared, the relationship with image processing in computer graphics pointed out, and implications for the flow field are studied. Modeling approaches for the unresolved scales are briefly reviewed.

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