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Optimal Spatial Scale for Curvature Calculations in Multiphase Flows JACOB SENECAL, MARK OWKES, Montana State University — In gas-liquid flows, the surface tension force often controls the dynamics of the flow and an accurate calculation of this force is necessary for predictive simulations. The surface tension force is directly proportional to the curvature of the gas-liquid interface, making accurate curvature calculations an essential consideration. Multiple methods have been developed to calculate the curvature of volume of fluid (VoF) interface capturing schemes, such as the height function method. These methods have been extensively tested. However, the impact of the scale or size of computational stencil on which the curvature is computed, has not been correlated with the rate at which interface perturbations relax under the surface tension force. In this work, the effect of varying the scale on which the curvature is computed has been tested and quantified. An optimal curvature scale is identified that leads to accurate and converging curvatures, and accurate timescales for surface tension induced, interface dynamics.

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