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Accurate VoF based curvature evaluation method for low-resolution interface geometries MARK OWKES, Montana State University, MARCUS HERRMANN, Arizona State University, OLIVIER DESJARDINS, Cornell University — The height function method is a common approach to compute the curvature of a gas-liquid interface in the context of the volume-of-fluid method. While the approach has been shown to produce second-order curvature estimates for many interfaces, the height function method deteriorates when the curvature becomes large and the interface becomes under-resolved by the computational mesh. In this work, we propose a modification to the height function method that improves the curvature calculation for under-resolved structures. The proposed scheme computes heights within columns that are not aligned with the underlying computational mesh but rather the interface normal vector which are found to be more robust for under-resolved interfaces. A computational geometry toolbox is used to compute the heights in the complex geometry that is formed at the intersection of the computational mesh and the columns. The resulting scheme has significantly reduced curvature errors for under-resolved interfaces and recovers the second-order convergence of the standard height function method for well-resolved interfaces.

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