

Abstract Submitted
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An Improved Advection Scheme for Implicit Interfaces on Cartesian Grids ZHIPENG QIN, University of Maryland, KEEGAN DELANEY, George Washington University, AMIR RIAZ, University of Maryland, ELIAS BALARAS, George Washington University — Existing methods for the advection of implicit interfaces on Cartesian grids employ a reconfiguration of the contours of the phase function in the neighborhood of the interface to facilitate the implementation of interfacial jump conditions. This is achieved with either the classical redistance techniques, within the context of the level set approach, or the more recent interface recompression methods that attempt to maintain interface width during advection. While the latter approach performs much better with respect to mass conservation we show that the associated interface topology suffers as a result. A new approach is presented to recreate interface topology in the neighborhood of the interface based on local curvature smoothing. With the help of canonical examples the approach is shown to both conserve mass and maintain topology during advection.

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