Improved volume of fluid method based on polyhedral stream-tubes and embedded height functions[1] CHRISTOPHER IVEY, PARVIZ MOIN, Stanford University, Center for Turbulence Research — A conservative advection scheme based on the use of edge-matched flux polyhedra to integrate the volume fraction evolution equation on general grids is presented. The algorithm prevents the formation of over/undershoots of the volume fraction by enforcing that the flux polyhedra do not over/underlap, removing the need for unphysical and inaccurate redistribution algorithms. Accuracy of the method derives from the edge-matched flux polyhedra's approximation of the local stream tube. Integrity of the interface representation is maintained by the use of height functions over a local cartesian stencil embedded in the mesh. Three-dimensional tests demonstrate the conservation and accuracy of the new volume of fluid method for interface tracking in general topologies.

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