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Development of Numerical Method for Two-phase Flows on Three-dimensional Arbitrarily-shaped Polyhedral Meshes KOHEI SUZUKI, TAKESI OMORI, TAKEO KAJISHIMA, Department of Mechanical Engineering, Osaka University — Although the advantage of using arbitrarily-shaped polyhedral meshes for the industrial flow applications is clear, their employment to two-phase flows is rather limited due to the poor prediction accuracy of the existing numerical methods on such meshes. We present a numerical method based on VOF (Volume of Fluid) method which works on arbitrarily-shaped three-dimensional polyhedral meshes with little volume/shape error for the interface advection and with little curvature estimation error. To make the implementation in three-dimensional geometry feasible, we extend THINC (Tangent of Hyperbola Interface Capturing) method for polyhedral meshes which does not require laborious geometric arithmetics. In the oral presentation we will also show that the combination of RDF (Reconstructed Distance Function) algorithm and the carefully selected discretization procedure gives good performance in the interface curvature estimation.

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