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Computation of Two-Phase Flows with an Interface-Capturing Method on Arbitrarily-Shaped Polygonal Meshes HIROSHI OTAKE, TAKESHI OMORI, TAKEO KAJISHIMA, Department of Mechanical Engineering, Osaka University — Arbitrarily-shaped polyhedral meshes are convenient for the computation of industrial flow systems which often have complex geometries. In two-phase flow problems, however, the employment of such meshes is rather challenging due to a poor accuracy of the existing methods based on the VOF (Volume of Fluid) method. In the previous work, we proposed an advection scheme for the interface indicator function on three-dimensional polyhedral meshes using the THINC (Tangent of Hyperbola Interface Capturing) method and a procedure to estimate interface curvatures on these meshes with the accuracy comparable to the conventional methods which employ structured meshes. To incorporate these schemes into the calculation of the Navier-Stokes equation, it is further required to eliminate the local numerical oscillation of the indicator function. In the present study, we discuss our recent improvement in the way to integrate the flux of the indicator function on cell faces and demonstrate its effectiveness in the calculation of two-phase flows performed on two-dimensional polygonal meshes.

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