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Abstract: *This work presents an implementation of the Unstructured Multi-dimensional THINC (UMTHINC), volume of fluid, scheme for the multi-phase solution of free surface flow on unstructured mesh. This work investigates the applicability of the UMTHINC to practical engineering problems with interfacial multiphase flow. The UMTHINC is integrated into an in-house unstructured incompressible flow solver and used as an engine to capture the interface. The well-known dam break problem with and without an obstacle is used to evaluate the accuracy and performance of the scheme. This work is limited to two dimensional cases with no turbulence modeling. The solver is tested for some specific aspects: the gradient method used to evaluate the interface normal, the sharpness parameter (β), and CFL number. The results are well analyzed and compared experimental data. The results show the importance of accurate interface normal and its effect on mass conservation and stability of the solver.*

Keywords: Multi-phase fluid dynamics; THINC method; Unstructured grid; Moving interfaces.