

Abstract Submitted
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Development of Unstructured MARS: Multi-interface Advection & Reconstruction Solver TAKU NAGATAKE, TOMOAKI KUNUGI, Kyoto University — The MARS was originally developed as a direct numerical simulation (DNS) for multiphase flows (MF) including large free-surface deformation on a staggered structured grid system. The usage of an unstructured grid in the computational fluid dynamics (CFD) areas is now to be popular manner for handling the complex geometry of the computational domain. However, majority of unstructured CFD codes is focused on single phase flows and/or simple two-phase flows. In the present study, we are developing an unstructured DNS-MF solver based on the MARS. We choose the collocated grid system for all variables to fit the unstructured grid system and then the Poisson solver for the pressure equation derived by the fractional-step algorithm is modified by the Rhie-Chow method. We carry out the comparison study of a ‘Dam breaking problem’ between the staggered MARS and collocated MARS in order to investigate the effect of the grid systems on the free surface tracking. This computation requires a high accuracy, so that we use the structured grid system in this case. Finally, we will show the difference between them, and will discuss the manner of the surface tracking.

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