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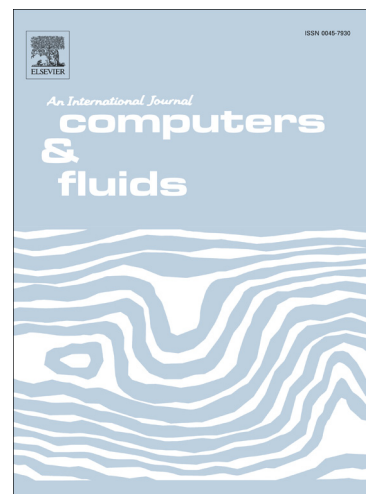
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Modified CIP-CSL/FV method for incompressible flows

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This paper presents a modified staggered-like CIP-CSL/FV (constrained interpolation profile-conservative semi-Lagrangian/finite volume) method for incompressible flows. In the present method, which is originated in VSIAM3 (volume/surface integrated average based multi-moment method), the surface-integrated values are employed as the major variables to increase the connectivity between the volume-integrated and surface-integrated values and between the collocated volume-integrated values. Resultingly, it changes the solution procedure by modifying the trajectory averaging process of all moments having been introduced in the original researches. To verify the staggered-like CIP-CSL/FV method, two phase benchmarking problems are tested with the THINC/WLIC (tangent of hyperbola for interface capturing/weighted line interface calculation) scheme capturing interfaces sharply and volume-conservatively.

Key Words: CIP; VSIAM3; two phase; FVM

1. Introduction

Since the less diffusive and less oscillating CIP method was introduced by Takewaki *et al.* [1] as one of the Hermitian interpolation methods, accurate and robust methods for the N-S (Navier-Stokes) equations based on the CIP concept, such as CCUP (CIP-combined unified procedure) [2], IDO (interpolated differential operator) [3], VSIAM3 [4] and so on, have been extensively researched. Contrary to the typical higher order interpolation functions, which utilize many stencils to achieve proper accuracy, the CIP method uses only two neighboring stencils, but maintains third-order accuracy. The information inside the discrete grid points is recovered well enough

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