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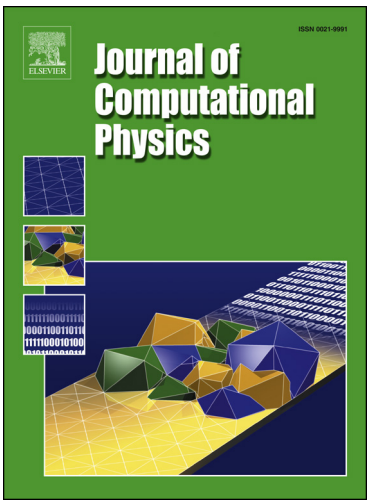

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A conservative finite volume method for incompressible Navier-Stokes equations on locally refined nested Cartesian grids

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Abstract

A second-order-accurate finite-volume method is developed for the solution of incompressible Navier-Stokes equations on locally refined nested Cartesian grids. Numerical accuracy and stability on locally refined nested Cartesian grids are achieved using a finite-volume discretization of the incompressible Navier-Stokes equations based on higher-order conservation principles - *i.e.*, in addition to mass and momentum conservation, kinetic energy conservation in the inviscid limit is used to guide the selection of the discrete operators and solution algorithms. Hanging nodes at the interface are *virtually slanted* to improve the pressure-velocity projection, while the other parts of the grid maintain an orthogonal Cartesian grid topology. The present method is straight-forward to implement and shows superior conservation of

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