

Grid-transparent numerical method for compressible viscous flows on mixed unstructured grids

-- A finite volume solver for viscous turbulent flows on mixed element unstructured meshes



Description: -

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The discontinuous Galerkin spectral element methods for compressible flows on two

The scheme is demonstrated using selected one-dimensional initial value problems for which exact solutions are derived, a two-dimensional void collapse, and a three-dimensional simulation of a confined explosion. Cut-cell methods for unsteady flow problems can greatly simplify the grid generation process and allow for high-fidelity simulations on complex geometries.

Numerical Analysis for Compressible Viscous Isothermal Stationary Flows

The required reconstruction of mixed cell volume fractions and cut cell geometries is presented in detail using the level-set fields. However, on the cells which are intersected by the embedded boundaries a direct forcing approach is adopted lacking discrete conservation. Results obtained with the SD method for both inviscid and viscous compressible flows compare well with analytical solutions and other published results.

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Computational Physics 227, 2008, 7246-7263. The flow is computed on a fixed Cartesian mesh and the solid boundaries are allowed to move freely through the mesh.

Numerical Methods for Compressible Flow

Two-phase flows with a high density ratio show a distinct compensating behaviour, while the introduction of flux or wetted volume correction practices leads to notable improvements for single-phase flows in both homogeneous and heterogeneous resolution conditions.

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