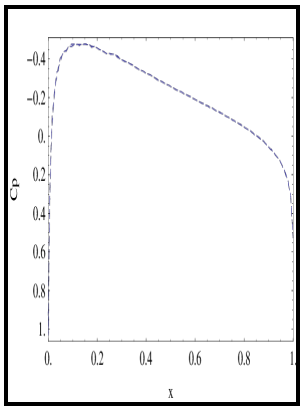
Grid-transparent numerical method for compressible viscous flows on mixed unstructured grids

- - Central Station



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Spectral difference method for compressible flow on unstructured grids with mixed elements

Modern computers allow us to use more and more complex models. It is able to compute very strong shock waves pressure ratio up to 105.

The discontinuous Galerkin spectral element methods for compressible flows on two

Agglomeration is here considered as an effective mean to decouple the geometry representation from the solution approximation being alternative to standard isoparametric or breakthrough isogeometric discretizations. In the present study, the small cut-cells are unmodified and due to the use of an implicit time integration no instabilities occur during the computations.

The discontinuous Galerkin spectral element methods for compressible flows on two

Several test problems are presented in one, two, and three dimensions. For complex applications and massively parallel computations, even minor load imbalances can have a severe impact on the overall performance and resource usage.

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

In contrast to previous implementations, the governing equations are entirely rediscretised on the coarse grid levels.

Spectral difference method for compressible flow on unstructured grids with mixed elements

A number of numerical methods exist for solving the interface problems: interface capturing methods mixed cell methods , level set methods, volume of fluid and interface reconstruction methods, interface tracking methods, free-Lagrange methods. The goal of the present work is the development of a numerical method for compressible viscous flows on mixed unstructured grids. A large class of scientific and engineering applications may be classified as irregular and loosely synchronous from the perspective of parallel processing.

High

A grid-transparent method does not require information on the cell types. . A Cartesian grid method has been developed for simulating two-dimensional unsteady, viscous, incompressible flows with complex immersed boundaries.

An ALE method for compressible multi

This is done for both explicit and compact finite differences and is accomplished without any geometric transformations or artificial stabilization procedures. Numerical methods of the second category rely on a discrete representation of the embedded boundaries without modifying the continuous governing equations. The discretization near the fluid-body interface is based on a volume-of-fluid approach with a redistribution procedure to maintain conservation while avoiding time step restrictions arising from small cells where the boundary intersects the mesh.

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