POSTER

High-order discontinuous Galerkin method on curved boundaries

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Abstract

One of the major difficulties when dealing with curved domains is the boundary treatment. In this work, we present a strategy that preserves the optimal convergence order of the discontinuous Galerkin (DG) method [1] in curved domains without relying on curved meshes. The proposed approach is based on the reconstruction for off-site data (ROD) method developed originally within the finite volume framework [2]. The DG–ROD method consists in splitting the boundary conditions treatment and the leading discrete equations from a classical DG formulation into two independent solvers coupled in a simple and efficient iterative procedure. Numerical tests with Dirichlet and Neumann boundary conditions prescribed on curved boundaries show that the optimal convergence order is effectively achieved.

Keywords Arbitrary curved boundaries, Discontinuous Galerkin method, Reconstruction for off-site data method, Very high-order of convergence

References

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