Modification of Basis Functions in High Order Discontinuous Galerkin Schemes for Advection Equation

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Abstract

High order Discontinuous Galerkin (DG) discretization schemes are considered for an advection boundary-value problem on 2-D unstructured grids with arbitrary geometry of grid cells. A number of test cases are developed to study the sensitivity of a high order DG scheme to local grid distortion. It will be demonstrated how to modify the formulation of a DG discretization for the advection equation. Our approach allows one to maintain the required accuracy on distorted grids while using a fewer number of basis functions for the solution approximation in order to save computational resources.

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