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An h/p adaptive Discontinuous Galerkin method for Three-Dimensional Compressible Flows JOHN EKATERINARIS, Embry-Riddle Aeronautical University, KONSTANTINOS PANOURGIAS, University of Patras — High order discontinuous Galerkin (DG) discretizations possess features making them attractive for computations of three-dimensional complex, compressible flows with discontinuities. Development of unified limiting procedures for the DG method that ensure accurate capturing of discontinuities for unstructured meshes, required for simulations in domains with nontrivial geometry, is needed. A TVB limiter is used and applied in the canonical computational space. It results into a unified limiting procedure for DG discretizations with any type of elements. The performance of the unified limiting approach is shown for different types of elements employed in mixed-type meshes and for a number of standard test problems including strong shocks to demonstrate the potential of the method. Furthermore, hierarchical higher-order limiting with the proposed approach is demonstrated. Increased order of expansion and adaptive mesh refinement is introduced in the context of h/p- adaptivity in order to locally enhance resolution of three-dimensional flow simulations that include discontinuities and complex flow features.

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