

Hybrid Discontinuous Galerkin Methods for Solid Mechanics and Fluid Dynamics

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ABSTRACT

We present Hybrid Discontinuous Galerkin (HDG) methods and outline their particular advantages. For solid mechanics, one can design robust anisotropic elements for thin structures and avoid shear locking. In fluid dynamics, one can design exactly divergence free elements to obtain stable discretizations for flows of high Reynolds numbers.

We present recent results on reduced-order facet approximation, hp-version preconditioning, and on the implementation of such methods.

REFERENCES

- [1] J. Schöberl and C. Lehrenfeld, “Domain Decomposition Preconditioning for High Order Hybrid Discontinuous Galerkin Methods on Tetrahedral Meshes”, pages 27-56, in *Advanced Finite Element Methods and Applications*, Lecture Notes in Applied and Computational Mechanics 66, Springer 2013