

Coupling of Continuous and HDG methods[★]

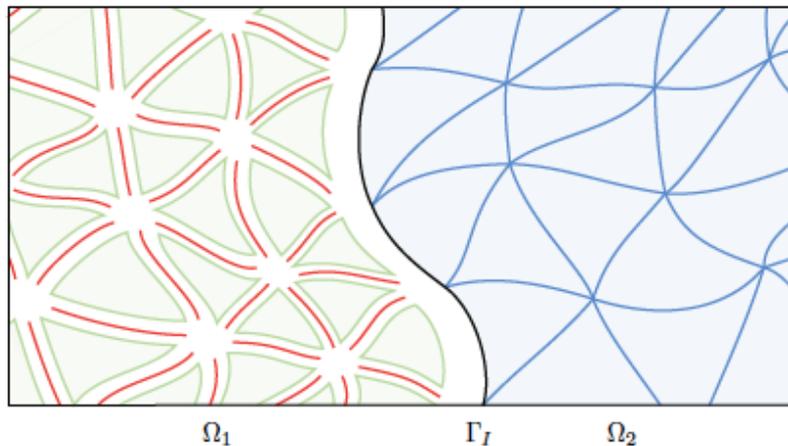
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A coupled Continuous Galerkin (CG)-Hybridizable Discontinuous Galerkin (HDG) formulation for the solution of elliptic problems is proposed. The domain is assumed to be split in two subdomains, with a CG and an HDG approximation in each one, as represented in the figure. The HDG local problem is modified in the elements with a face on the interface, with proper projection operators, to account for the CG approximation on the interface. On the other hand, the CG weak form accounts for the fluxes on the interface given by the HDG approximation. Numerical experiments show optimal convergence rate, taking full benefit of the HDG superconvergence properties if the degree of approximation for CG is $k+1$, being k the degree for the HDG domain.



Representation of the HDG (left) and CG (right) approximation spaces.

REFERENCES

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- [2] M. Paipuri, C. Tiago, S. Fernández-Méndez, Coupling of continuous and hybridizable discontinuous Galerkin methods: Application to conjugate heat transfer problem. *Submitted for publication*

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