

BPX preconditioners for isogeometric analysis using analysis-suitable T-splines

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ABSTRACT

In this talk, we propose and analyze optimal additive multilevel solvers for isogeometric discretizations of scalar elliptic problems for locally refined T-meshes [2]. Applying the refinement strategy in [1] we can guarantee that the obtained T-meshes are \mathbf{p} -admissible, which implies that the associated T-splines are analysis suitable. Taking advantage of the multilevel structure of \mathbf{p} -admissible T-meshes, we develop a BPX preconditioner on the basis of local smoothing only for the functions affected by a newly added edge by bisection, and prove that our method has optimal complexity. Several numerical experiments confirm our theoretical result and also show the practical performance of the proposed preconditioner.

REFERENCES

- [1] P. Morgenstern and D. Peterseim. Analysis-suitable adaptive T-mesh refinement with linear complexity. *Comput. Aided Geom. Design*, **34**: 50–66, 2015.
- [2] D. Cho and R. Vázquez. BPX preconditioners for isogeometric analysis using analysis-suitable T-splines. *submitted for publication*.