

AXIOMS OF ADAPTIVITY REVISITED: OPTIMAL ADAPTIVE IGAFEM

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ABSTRACT. The *axioms of adaptivity* from [1] analyze under which assumptions on the *a posteriori* error estimator and the mesh-refinement strategy, a mesh-refining adaptive algorithm yields convergence with optimal algebraic rates. In our talk, which is based on the recent work [2], we now address the question which properties of the FEM are sufficient to ensure that the usual weighted-residual error estimator is well-defined and satisfies the axioms of adaptivity. In particular, our analysis covers conforming FEM in the framework of isogeometric analysis with hierarchical splines.

Keywords: isogeometric analysis, hierarchical splines, finite element method, adaptive mesh-refinement, optimal convergence rates.

Mathematics Subject Classifications (2010): 41A15, 65D07, 65N12, 65N30.

REFERENCES

- [1] C. Carstensen, M. Feischl, M. Page, D. Praetorius. Axioms of adaptivity. *Computers & Mathematics with Applications*, 67, 1195–1253, 2014.
- [2] G. Gantner, D. Haberlik, D. Praetorius. Adaptive IGAFEM with optimal convergence rates: Hierarchical B-splines. *Mathematical Models and Methods in Applied Sciences*, 27, 2631–2674, 2017.

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