

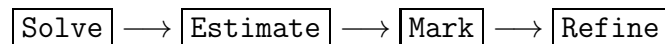
# A POSTERIORI ERROR ESTIMATION FOR ADAPTIVE IGA BOUNDARY ELEMENT METHODS

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A posteriori error estimation and adaptive mesh-refinement are well-established and important tools for standard boundary element methods (BEM) for polygonal boundaries and piecewise polynomial ansatz functions (see e.g. the seminal work [1] for the derivation of the weighted-residual error estimator and [2] for convergence even with optimal rates). In contrast, mathematically reliable a posteriori error estimation for isogeometric BEM (IGABEM) has not been considered, yet. In our talk, we aim to shed some light on this gap and to transfer known results on reliable a posteriori error estimation from standard BEM to IGABEM, where both Galerkin IGABEM as well as collocation IGABEM is considered. The results apply for adaptive algorithms of the form



which automatically detect singularities of the solution and adapt the mesh accordingly. If compared to uniform mesh refinement, this dramatically reduces the storage requirements as well as the computing time needed to achieve a certain accuracy.

## REFERENCES

- [1] C. Carstensen, M. Maischak, E. P. Stephan. *A posteriori error estimate and h-adaptive algorithm on surfaces for Symm's integral equation*. *Numer. Math.*, Vol. **20**, 197–213, 2001.
- [2] M. Feischl, M. Karkulik, J. M. Melenk, D. Praetorius. *Quasi-optimal convergence rate for an adaptive boundary element method*. *SIAM J. Numer. Anal.*, Vol. **51**, 1327–1348, 2013.