

An efficient solver for the isogeometric k-refinement

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ABSTRACT

The concept of k-refinement was proposed as one of the key features of isogeometric analysis, “a new, more efficient, higher-order concept”, in the seminal work [1]. The idea of using high-degree and continuity splines (or NURBS, etc.) as a basis for a new high-order method appeared very promising from the beginning, and received confirmations from the next developments. The k-refinement leads to several advantages: higher accuracy per degree-of-freedom, improved spectral accuracy, the possibility of structure-preserving smooth discretizations are the most interesting features that have been studied actively in the community. At the same time, the k-refinement brings significant challenges at the computational level: using standard finite element routines, its computational cost grows with respect to the degree, making degree raising computationally expensive. In his talk we present ideas that allow a computationally efficient k-refinement: [2].

REFERENCES

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- [2] G. Sangalli and M. Tani, Matrix-free isogeometric analysis: the computationally efficient *k*-method, *Comput. Methods Appl. Mech. Engrg.*, Vol. **338**, pp. 117–133 (2018).