

## Adaptive hierarchical isogeometric finite element methods

Vuong, Anh-Vu, author

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### Abstrak

Isogeometric finite elements combine the numerical solution of partial differential equations and the description of the computational domain given by rational splines from computer aided geometric design. This work gives a well-founded introduction to this topic and then extends isogeometric finite elements by a local refinement technique, which is essential for an efficient adaptive simulation. There by a hierarchical approach is adapted to the numerical requirements and the relevant theoretical properties of the basis are ensured. The computational results suggest the increased efficiency and the potential of this local refinement method.