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An adaptive finite element method with asymptotic saturation for eigenvalue problems

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This talk discusses adaptive finite element methods for the solution of elliptic eigenvalue problems associated with partial differential operators. An adaptive method based on nodal-patch refinement leads to an asymptotic error reduction property for the computed sequence of simple eigenvalues and eigenfunctions. This justifies the use of the proven saturation property for a class of reliable and efficient hierarchical a posteriori error estimators. Numerical experiments confirm that the saturation property is present even for very coarse meshes for many examples; in other cases the smallness assumption on the initial mesh may be severe. This work has been published in [1].

REFERENCES

[1] C. Carstensen, J. Gedicke, V. Mehrmann, and A. Międlar, *An adaptive finite element method with asymptotic saturation for eigenvalue problems*, Numer. Math., 128(4):615-634, 2014