A POSTERIORI ERROR ESTIMATES FOR HIERARCHICAL FINITE ELEMENTS

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Abstract

Hierarchical finite element bases are widely used for preconditioning large systems solving elliptic partial differential equations. The a posteriori energy based error estimates have been developed for multilevel function spaces, e.g. [2].

There are two main objectives in our presentation. We have derived new types of the estimates, that exploit the quantities which are easily computed when using iterative multilevel methods [1]. As the second result, we compute the constants in the strengthened Cauchy - Bunyakowski - Schwarz inequality for the hierarchical finite element functions on rectangles. We study both of the h [3] and p hierarchical refinement and we compare the accuracy of the introduced error estimates for these cases. Several numerical examples are included.

References

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