

Adaptive control of local errors for elliptic problems using weighted Sobolev norms

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Abstract

We develop an a posteriori error estimator which focuses on the local H^1 error on a region of interest. The estimator bounds a weighted Sobolev norm of the error and is efficient up to oscillation terms. The new idea is very simple and applies to a large class of problems. An adaptive method guided by this estimator is implemented and compared to other local estimators, showing an excellent performance.

Keywords: elliptic problems, point sources, a posteriori error estimates, finite elements, local estimates, weighted Sobolev spaces