

DE058767290

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Sharp a posteriori error estimate for elliptic equation with singular data

Front. Math. China 6, No. 1, 177-202 (2011).

MSC Classification: 65N30 65N15

Keywords: second order elliptic equation; two dimensions; finite element method, sharp a posteriori error estimate; singular data

Review text:

The authors consider the finite element approximation of the Laplace equation, in two dimensions, with right-hand side in L^p space with $1 < p \leq 2$. The authors derived two a posteriori error estimators. The first estimator is a residual-based a posteriori error estimator, including both the bulk residual and the edge residual. The second one consists of only the edge residual in terms of the solution of the local residual problem. Both estimators are proved to be the global upper and local lower bounds on the error in $W^{1,p}$ -seminorm. It is proved numerically that the estimators lead to optimal convergence orders.

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