

论文

# FINITE ELEMENT EXPANSION FOR VARIABLE COEFFICIENT ELLIPTIC PROBLEMS

Ding Yanheng(1), Lin Qun(2)

(1)Department of Mathematics, Yunnan University, Kunming, China; (2)Institute of Systems Science, Academia Sinica, Beijing, China

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摘要 The Ritz projections of the elliptic problem

$-\partial_i(a_{ij})\partial_j u + c_0 u = f$  in  $\Omega$ ,  $u=0$  on  $\partial\Omega$ ,

and the quasilinear elliptic problem

$-\partial_i(a_i(x,Du)) + a_0(x,Du) = 0$  in  $\Omega$ ,  $u=0$  on  $\partial\Omega$

with linear finite elements admit an asymptotic error expansion, respectively, for certain classes of “uniform” meshes. This provides the theoretical justification for the use of Richardson extrapolation for increasing the accuracy of the scheme from  $O(h^{-2})$  to  $O(h^{-4} |\ln h|)$ .

关键词 [finites elements, asymptotic error expansion](#)

分类号

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(1)Department of Mathematics, Yunnan University, Kunming, China; (2)Institute of Systems Science, Academia Sinica, Beijing, China

**Abstract** The Ritz projections of the elliptic problem  $-\partial_i(a_{ij})\partial_j u + c_0 u = f$  in  $\Omega$ ,  $u=0$  on  $\partial\Omega$ , and the quasilinear elliptic problem  $-\partial_i(a_i(x,Du)) + a_0(x,Du) = 0$  in  $\Omega$ ,  $u=0$  on  $\partial\Omega$  with linear finite elements admit an asymptotic error expansion, respectively, for certain classes of “uniform” meshes. This provides the theoretical justification for the use of Richardson extrapolation for increasing the accuracy of the scheme from  $O(h^{-2})$  to  $O(h^{-4} |\ln h|)$ .

**Key words** [finites elements](#) [asymptotic error expansion](#) [variable coefficient elliptic operator](#) [quasilinear el](#)

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