CONVERGENCE OF ADAPTIVE MIXED FEM FOR SECOND ORDER ELLIPTIC PROBLEMS

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The convergence of an adaptive mixed finite element method for second order elliptic problems defined on simply connected bounded polygonal domains is analyzed in this talk. The main difficulties in the analysis are posed by the non-symmetric and indefinite form of the problem along with the lack of the orthogonality property in mixed finite element methods. The important tools in the analysis are *a posteriori* error estimators, quasi-orthogonality property and quasi-discrete reliability established using representation formula for the lowest-order Raviart-Thomas solution in terms of the Crouzeix-Raviart solution of the problem. An adaptive marking in each step for the local refinement is based on the edge residual and volume residual terms of the *a posteriori* estimator. Numerical experiments confirm the theoretical analysis.

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