POLYNOMIAL-DEGREE-ROBUST A POSTERIORI ESTIMATES FOR ELLIPTIC PDES

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Abstract. We present equilibrated flux a posteriori error estimates in a unified setting for conforming, nonconforming, discontinuous Galerkin, and mixed finite element discretizations of the Poisson problem. Relying on the equilibration by mixed finite element solution of patchwise Neumann problems, the estimates are guaranteed, locally computable, locally efficient, and robust with respect to polynomial degree. Maximal local overestimation is guaranteed as well. More details can be found in [1].

Keywords: a posteriori error estimate, equilibrated flux, unified framework, robustness, polynomial degree, conforming finite element method, nonconforming finite element method, discontinuous Galerkin method, mixed finite element method

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References

[1] A. Ern and M. Vohralík, Polynomial-degree-robust a posteriori estimates in a unified setting for conforming, nonconforming, discontinuous Galerkin, and mixed discretizations, *SIAM J. Numer. Anal.*, 53:2, 1058–1081 (2015).

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