

On error estimation in finite element methods without having Galerkin orthogonality

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In this talk we present computable bounds to estimate the distance of finite element approximations to the solution of the Poisson equation. If the finite element approximation is a Galerkin solution, the derived error estimator coincides with the standard element and edge based estimator. If Galerkin orthogonality is not satisfied, the discrete residual additionally appears in terms of the BPX preconditioner. A consequence of the present analysis is the proof of the reliability and efficiency of hierarchical error estimation.

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