Cao, W.; **Demkowicz, L.**
Optimal error estimate of a projection based interpolation for the p-version approximation in three dimensions. (English) ❘ Zbl 1092.65095
Comput. Math. Appl. 50, No. 3-4, 359-366 (2005).

The energy norm of the error of a conforming finite-element solution to an elliptic boundary value problem can be bounded by the distance from the exact solution to the approximation subspace of piecewise polynomials. This distance can be estimated by the difference between the exact solution and a suitable member from the subspace. For the h-version of the error estimate one typically constructs a finite-element approximation by Lagrange interpolation. However, for the p-version Lagrange interpolation yields a far from optimal estimate.

The authors derive an optimal p-interpolation error estimate using a local projection based interpolation for H^1-conforming elements in three space dimensions. They discuss two different procedures that lead to the same logarithmic term $(\log p)^{3/2}$ in the estimate.

Reviewer: Jan Maes (Leuven)

MSC:

65N15	Error bounds for boundary value problems involving PDEs
65N30	Finite element, Rayleigh-Ritz and Galerkin methods for boundary value problems involving PDEs
35J25	Boundary value problems for second-order elliptic equations

Cited in **1** Review
Cited in **6** Documents

Keywords:

p-version of the finite-element method; error estimate; elliptic boundary value problem

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