STABILIZATION-FREE RELIABLE AND EFFICIENT A POSTERIORI ERROR CONTROL FOR HHO

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ABSTRACT

The established a posteriori error analysis of the hybrid high-order methods (HHO) in [4] treats the stabilization as part of the error and as part of the error estimator. But it follows from [3] that the stabilization is in fact efficient. This leads to reliable and efficient explicit residual-based a posteriori error estimates for the error in the piecewise energy norm (up to data oscillations).

This talk presents recent work [1], where we prove that the original and the VEM inspired stabilizations for HHO [2, 4] are locally equivalent and derive two classes of stabilization-free guaranteed upper bounds (GUB). Numerical evidence in a Poisson model problem supports that the GUB lead to realistic upper bounds and the associated adaptive mesh-refining algorithm recovers the optimal convergence rates in computational benchmarks. The presentation is based on joint ongoing work with Prof. C. Carstensen from Berlin and Dr. N. T. Tran from Jena.

References

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