SYSTEMATIC, EXPLICIT AND EFFICIENT ERROR ESTIMATION FOR CONVEX MINIMIZATION PROBLEMS

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ABSTRACT

We combine a systematic approach of S. I. Repin, cf. [1], for deriving general a posteriori error estimates for convex minimization problems on the basis of convex duality relations with a recently derived generalized Marini formula. The resulting a posteriori error estimates are constant-free and apply to a large class of variational problems including the p–Laplace problem, as well as degenerate minimization, obstacle and image de-noising problems. In addition, these a posteriori error estimates are based on a comparison to a given non-conforming finite element solution. For the p–Laplace problem, the a posteriori error bounds are globally equivalent to classical residual type a posteriori error bounds and, hence, globally reliable and efficient.

References

[1] S. I. Repin, *A posteriori estimates for partial differential equations*, *Radon Series on Computational and Applied Mathematics* **4**, Walter de Gruyter GmbH & Co. KG, Berlin, 2008.

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