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Computable error bounds for the Fortin–Soulie and Stabilized finite element methods of the Stokes problem. *

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Abstract

We propose computable a posteriori error estimates for stabilization of lower–order mixed finite elements and the Fortin–Soulie finite element approximations of the Stokes problem. The estimator is completely free of unknown constants and gives a guaranteed numerical upper bound on the error, in terms of a lower bound for the inf-sup constant of the underlying continuous problem. The estimator is also shown to provide a lower bound on the error up to a constant and higher order data oscillation terms. Numerical results are presented illustrating the theory and the performance of the estimator.

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