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Reliable a posteriori error control for nonconforming finite element approximation of Stokes flow

We derive computable a posteriori error estimates for the lowest order nonconforming Crouzeix--Raviart element applied to the approximation of ncompressible Stokes flow. The estimator provides an explicit upper bound that is free of any unknown constants, provided that a reasonable lower bound for the inf-sup constant of the underlying problem is available. In addition, it is shown that the estimator provides an equivalent lower bound on the error up to a generic constant.