

# A posteriori error estimations for mixed finite-element approximations to the Navier-Stokes equations

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A posteriori estimates for mixed finite element discretizations of the Navier-Stokes equations are derived. We show that the task of estimating the error in the evolutionary Navier-Stokes equations can be reduced to the estimation of the error in a steady Stokes problem. As a consequence, any available procedure to estimate the error in a Stokes problem can be used to estimate the error in the nonlinear evolutionary problem. A practical procedure to estimate the error based on the so-called postprocessed approximation is also considered. Both the semidiscrete (in space) and the fully discrete cases are analyzed. Some numerical experiments are provided.

Subjects: **Numerical Analysis (math.NA)**; Analysis of PDEs (math.AP)

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