

# RESIDUAL-BASED A POSTERIORI ERROR ESTIMATORS FOR THE STOKES EQUATION

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## ABSTRACT

In this talk we discuss and compare two a posteriori error estimators for finite element approximations of the Stokes equation. Both of these error estimators are composed of the norms of strong residuals related to the Stokes equation with proper weights. The first estimator is based on the primal form of the Stokes equation, where the pseudo-stress tensor approximation is obtained by a direct differentiation, and dates back to as early as late 1980s. This estimator has a lower computation cost and is less accurate than the second one, but still can be used as local error indicators to perform adaptive mesh refinements. The second estimator is based on the dual form of the Stokes equation and requires recovery of the pseudo-stress tensor approximation whose normal components are continuous across edges of the underlying triangulation. The recent and sophisticated analysis has revealed that this estimator is fully reliable because it guarantees upper bounds on the numerical errors whenever the continuous inf-sup constants (or their lower bounds) on subdomains are known. Some numerical results are presented to demonstrate and compare the performance of the error estimators.

## REFERENCES

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