

# PRESSURE ROBUST A POSTERIORI BOUNDS WITH ERROR-DOMINATED OSCILLATION

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## ABSTRACT

Pressure robust methods and estimates for the Stokes equation preserve the separation between the velocity and pressure variables imposed by the data, hence the velocity field is unaffected by pressure perturbations. This concept stimulated much research in the last decade. Recently, Verfürth and Zanotti developed new pressure robust quasi-optimal methods (e.g. [1]).

We shall present a pressure robust a posteriori estimator suited for these methods, which is also robust with respect to the natural data regularity: Building upon [2], the oscillation is dominated by the error, which prevents overestimation. If the data is evaluable on polynomials the estimator can be computed exactly. Therefore, the method as well as the a posteriori bounds prevent the danger of poor approximation or estimation properties because of pressure perturbations and missing regularity.

## REFERENCES

- [1] R. Verfürth and P. Zanotti. *A quasi-optimal Crouzeix-Raviart discretization of the Stokes equations*. SIAM J. Numer. Anal., 57(3):1082–1099, 2019.
- [2] Ch. Kreuzer and A. Veiser. *Oscillation in a posteriori error estimation*. Numer. Math., 148(1):43–78, 2021.

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