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A-POSTERIORI ERROR ESTIMATION FOR LINEAR FUNCTIONALS OF SOLUTIONS COMPUTED WITH STABILIZED METHODS

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ABSTRACT

The variational multiscale method has been shown a very powerful paradigm to obtain representations of the subgrid scales. In this work, the subgrid scales are identified with the finite element solution error and explicit element-wise representations of the error have been derived for linear second-order partial differential equations.

The technology has been shown to produce efficiencies very close to one, uniformly from the the hyperbolic to the elliptic regime. The success of the method can be traced back to the method solving the dual problem a-priori analytically.

Furthermore, this explicit a-posteriori error estimator is simple and easy to implement, making the method very attractive and economical from the computational point of view.

The fact that the local efficiencies are close to unity in regions of high errors, is exploited here to estimate the error for linear functionals of the solution.

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