

A posteriori optimization of parameters in stabilized methods for convection-diffusion problems

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Stabilized finite element methods for convection-dominated problems require appropriate choices of stabilization parameters. Only asymptotic choices of these parameters are currently available in the numerical analysis literature. We present a general framework for optimizing the stabilization parameters with respect to the minimization of a target functional and apply this framework to the SUPG finite element method and the minimization of residual based error estimators and error indicators. We illustrate by numerical examples the benefits and the shortcomings of our approach.

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