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# Stabilized mixed methods for convection-diffusion problems

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## SUMMARY

We are interested in the numerical approximation of the solution to the scalar convection-diffusion equation in mixed form. This problem was previously analyzed by Douglas and Roberts [1], Jaffre [4] and Thomas [5]. One of the difficulties that arise is the need that the discrete subspaces satisfy the discrete inf-sup condition. We will present stabilized dual-mixed finite element methods that allow to avoid this requirement. We will explore the existence and uniqueness of a solution to the stabilized mixed formulation, and the derivation of a priori and a posteriori error estimates. Numerical experiments illustrating the performance of the method will be shown.

**Keywords:** convection-diffusion, mixed finite element, stabilization, a posteriori error estimates

**AMS Classification:** 65N30, 65N12, 65N15

## References

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