

# INFORMATION-FLUX METHODS: STABLE SCHEMES FOR CONVECTION-DOMINATED PROBLEMS

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## ABSTRACT

Severe instabilities exhibited by standard Galerkin schemes for convection-dominated problems are well documented. For standard finite element methods, well-established stabilisation methods exist, which are however limited in their applicability to other methods. The proposed information-flux method incorporates a novel approach to stable methods. The key idea is to separately assign the two goals of accuracy and stability to solution and weighting functions, respectively. For accuracy, the solution functions fulfil the respective consistency conditions, as usual. However, the weighting functions, dedicated to the stability of the method, should represent the information flux of the underlying physical (adjoint) problem. Hence, it is constructed to resemble fundamental solutions of the adjoint problem. Such information-flux methods are *a priori* stable methods in general, which are applicable to a large variety of approximation schemes. In our presentation, we will show the information-flux approach applied to the convection-diffusion problem with maximum-entropy basis functions; see [1] for the maximum-entropy method in general and [2,3] for its application in information-flux methods to convection-diffusion problems.

## REFERENCES

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