An adaptive DMP preserving finite element method for convection-dominated problems

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ABSTRACT

In this talk I will review some recent results on both the a priori and a posteriori error estimates for positivity preserving discretizations. The method of choice belongs to the family of Algebraic Flux Correction (AFC) schemes. We start by providing a rewriting of this method as a nonlinear edge-based diffusion method, and present a new definition of the limiters that allows us to prove convergence in general regular meshes. Later on, we derive and justify a fully computable a posteriori error bound for this discretization. Since the discretization presented is linearity preserving, then this a posteriori error estimator can be proved to be locally efficient. This is a feature that is generally absent from the a posteriori estimators for this type of discretizations. This talk gathers contributions written in collaboration with A. Allendes (UTFSM, Chile), E. Burman (UCL, UK), F. Karakatsani (Chester, Chile), and R. Rankin (UTFSM, Chile).

REFERENCES

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