A DG-based stabilized residual minimization technique

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Starting from a stabilized DG method for approaching the solution of a given PDE, we devise and analyze a residual minimization method by restricting the trial space to be globally continuous (while keeping the discontinuous test space of the original DG formulation). The residual is minimized in the sense of a discrete dual norm.

This residual minimization leads to a guaranteed stable saddle-point problem which delivers a (continuous) discrete solution as well as an error representation function that can be used to perform adaptive refinements.

In this talk, I will show in detail the proofs of well-posedness of the underlying residual minimization problem, together with the a priori and a posteriori error analysis. The performance of the method will be illustrated on the advection-reaction problem.