

A priori and a posteriori analyses of DPG methods

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The discontinuous Petrov Galerkin (DPG) method can be interpreted as three apparently different, but equivalent methods: a method with a test space computed on the fly, a method that minimizes a residual in a dual norm, and a mixed method with nonstandard but stable pair of spaces. After an introduction of the DPG method, the talk presents an error analysis of the method under an assumption that can be verified in many applications. Under the same assumption, an a posteriori error analysis is also presented. It is possible to prove that a locally computable residual norm of any discrete function is a lower and an upper error bound up to explicit data approximation errors. Since the error control does not rely on the discrete equations, it applies to inexactly computed or otherwise perturbed solutions.