

Petrov-discontinuous Galerkin finite element method for solving diffusion-convection problems

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Abstract. In this paper, we present a new modification of the discontinuous Galerkin Finite element method (DGFEM). The proposed modification is considered when the symmetric interior penalty Galerkin scheme involves only space variables by using the Petrov discontinuous Galerkin Finite element method (PDGFEM), while the time in the linear diffusion-convection problem remains continuous. We prove the properties of the bi-linear form (V-elliptic, continuity and stability), and we show that the error estimate is of second order with respect to the space. We also present some numerical

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