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ANALYSIS OF THE DGFEM FOR NONLINEAR CONVECTION-DIFFUSION PROBLEMS*

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Abstract. The paper is concerned with the analysis of error estimates of the discontinuous Galerkin finite element method (DGFEM) for the numerical solution of nonstationary nonlinear convection-diffusion problems equipped with Dirichlet boundary conditions. First, the case of nonlinear diffusion as well as nonlinear convection is considered. Then, the optimal $L^\infty(L^2)$-error estimate is discussed in the case of nonlinear convection and linear diffusion.

Key words. nonlinear nonstationary convection-diffusion problems, nonlinear convection, nonlinear diffusion, discontinuous Galerkin finite element method, NIPG, SIPG and IIPG versions, optimal error estimates

AMS subject classifications. 65M60, 76M10

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