

On some aspects of the discontinuous Galerkin method for the solution of convection-diffusion problems

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The paper will be concerned with the analysis of the discontinuous Galerkin finite element method applied to the numerical solution of nonstationary convection-diffusion problems. The attention will be paid to the derivation of the method and the investigation of error estimates for schemes with a symmetric as well as nonsymmetric discretization of diffusion terms and with the interior and boundary penalty. Moreover, we shall be concerned with the effect of nonconformity of the triangulation and the possibility to use nonconvex elements. The last subject will be the complete space-time discontinuous Galerkin discretization. Theoretical results will be illustrated by numerical experiments.