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A UNIFIED A POSTERIORI ERROR ANALYSIS FOR DISCONTINUOUS GALERKIN APPROXIMATIONS OF REACTIVE TRANSPORT EQUATIONS

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摘要
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A UNIFIED A POSTERIORI ERROR ANALYSIS FOR DISCONTINUOUS GALERKIN APPROXIMATIONS OF REACTIVE TRANSPORT EQUATIONS

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Abstract Four primal discontinuous Galerkin methods are applied to solve reactive transport problems, namely, Oden-Babu$\check{s}$ka-Baumann DG (OBB-DG), non-symmetric interior penalty Galerkin (NIPG), symmetric interior penalty Galerkin (SIPG), and incomplete interior penalty Galerkin (IIPG). A unified a posteriori residual-type error estimation is derived explicitly for these methods. From the computed solution and given data, explicit estimators can be computed efficiently and directly, which can be used as error indicators for adaptation. Unlike in the reference \cite{p10}, we obtain the error estimators in $L^{2}(L^{2})$ norm by using duality techniques instead of in $L^{2}(H^{1})$ norm.

Key words A posteriori error estimates Duality techniques Discontinuous Galerkin methods.

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通讯作者