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Discontinuous mixed penalty-free Galerkin method for second-order quasilinear elliptic equations

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Abstract

Discrete schemes for finding an approximate solution of the Dirichlet problem for a second-order quasilinear elliptic equation in conservative form are investigated. The schemes are based on the discontinuous Galerkin method (DG schemes) in a mixed formulation and do not involve internal penalty parameters. Error estimates typical of DG schemes with internal penalty are obtained. A new result in the analysis of the schemes is that they are proved to satisfy the Ladyzhenskaya-Babuska-Brezzi condition (inf-sup) condition. © 2013 Pleiades Publishing, Ltd.

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Keywords

discontinuous Galerkin method, error estimate, LBB condition, mixed method, quasilinear elliptic equations