

Discontinuous Galerkin methods for solving elliptic and parabolic equations: theory and implementation

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Abstrak

Discontinuous Galerkin (DG) methods for solving partial differential equations, developed in the late 1990s, have become popular among computational scientists. This book covers both theory and computation as it focuses on three primal DG methods -- the symmetric interior penalty Galerkin, incomplete interior penalty Galerkin, and nonsymmetric interior penalty Galerkin which are variations of interior penalty methods. The author provides the basic tools for analysis and discusses coding issues, including data structure, construction of local matrices, and assembling of the global matrix. Computational examples and applications to important engineering problems are also included.