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The Runge-Kutta local projection discontinuous Galerkin finite element method for conservation laws. IV: The multidimensional case. (English) [Zbl 0695.65066](#)

Math. Comput. 54, No. 190, 545-581 (1990).

Summary: [For part III see *J. Comput. Phys.* 84, No.1, 90-113 (1989; [Zbl 0677.65093](#)).]

We study the two-dimensional version of the Runge-Kutta local projection discontinuous Galerkin methods, already defined and analyzed in the one-dimensional case. These schemes are defined on general triangulations. They can easily handle the boundary conditions, verify maximum principles, and are formally uniformly high-order accurate. Preliminary numerical results showing the performance of the schemes on a variety of initial-boundary value problems are shown.

MSC:

- [65N30](#) Finite element, Rayleigh-Ritz and Galerkin methods for boundary value problems involving PDEs
- [65M60](#) Finite element, Rayleigh-Ritz and Galerkin methods for initial value and initial-boundary value problems involving PDEs
- [35L65](#) Hyperbolic conservation laws

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Keywords:

conservation laws; two-dimensional; Runge-Kutta local projection discontinuous Galerkin methods; general triangulations; maximum principles; numerical results

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