

# Discontinuous Galerkin Methods For Solving Elliptic And Parabolic Equations Theory And Implementation Frontiers In Applied Mathematics

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## [DOC] Discontinuous Galerkin Methods For Solving Elliptic And Parabolic Equations Theory And Implementation Frontiers In Applied Mathematics

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#### Discontinuous Galerkin methods for solving the Signorini ...

DISCONTINUOUS GALERKIN METHODS FOR SOLVING THE SIGNORINI PROBLEM 1757 22 Notation and DG formulations For definiteness, in the following, we only consider the case  $d = 2$ , although the discussion can be adapted to the three-dimensional case Given a bounded domain  $D \subset \mathbb{R}^2$  and a positive integer  $m$ ,

#### The Unfitted Discontinuous Galerkin Method for Solving the ...

The Unfitted Discontinuous Galerkin Method for Solving the EEG Forward Problem Andreas Nußing, Carsten H Wolters, Heinrich Brinck, Christian Engwer” Abstract— Objective: The purpose of this study is to introduce and evaluate the unfitted discontinuous Galerkin finite element method (UDG-FEM) for solving the electroencephalography

#### Discontinuous Galerkin Methods for Solving Elliptic ...

Discontinuous Galerkin Methods for Solving Elliptic Variational Inequalities Fei Wang,<sup>1</sup> Weimin Han,<sup>2</sup> and Xiao-liang Cheng<sup>3</sup> Abstract We study discontinuous Galerkin methods for solving elliptic variational inequalities, of both the first and second kinds Analysis of numerous discontinuous Galerkin schemes for elliptic boundary value problems

**Discontinuous Galerkin Methods for Solving a Frictional ...**

Discontinuous Galerkin Methods for Solving a Frictional Contact Problem with Normal Compliance Wenqiang Xiaoa, Fei Wang<sup>a</sup>, and Weimin Hana,<sup>b</sup>  
<sup>a</sup>School of Mathematics and Statistics, Xi'an Jiaotong University, Xi'an, Shaanxi, China; <sup>b</sup>Department of Mathematics, University of Iowa, Iowa City, Iowa, USA  
 ABSTRACT Several discontinuous Galerkin (DG) methods are introduced

**Discontinuous Galerkin Methods for Solving a Hyperbolic ...**

Discontinuous Galerkin methods for solving a hyperbolic inequality Fei Wang<sup>1</sup> Weimin Han<sup>2</sup>  
<sup>1</sup>School of Mathematics and Statistics, Xi'an Jiaotong University, Xi'an, Shaanxi, China <sup>2</sup>Department of Mathematics & Program in Applied Mathematical and Computational Sciences, University of Iowa, Iowa City, Iowa, USA  
 Correspondence

**The Entropy Satisfying Discontinuous Galerkin Method for ...**

As for the configurational discretization, we explore higher order discontinuous Galerkin (DG) methods based on formulation (16), while the finite volume method introduced in [44], satisfying all three desired properties, may be viewed as a first order DG method The DG method is a finite element method using a completely discontinuous

**Discontinuous Galerkin Methods: General Approach and Stability**

Discontinuous Galerkin (DG) methods are a class of finite element methods using completely discontinuous basis functions, which are usually chosen as piecewise polynomials Since the basis functions can be completely discontinuous, these methods have the flexibility which is not shared by typical finite element methods, such as the

**Locally divergence-free discontinuous Galerkin methods for ...**

In this paper, we develop the locally divergence-free discontinuous Galerkin methods equipped with TVD Runge-Kutta time discretization (RKDG) [8,11,13] for solving two-dimensional Maxwell equations, as our starting point to explore the effective treatment of the divergence-free condition with discontinuous Galerkin methods

**A New Discontinuous Galerkin Finite Element Method for ...**

A New Discontinuous Galerkin Finite Element Method for Directly Solving the Hamilton-Jacobi Equations Yingda Cheng<sup>y</sup> Zixuan Wang<sup>z</sup>  
 March 19, 2014  
 Abstract In this paper, we improve upon the discontinuous Galerkin (DG) method for Hamilton-

**Discontinuous Galerkin method for hyperbolic equations ...**

• Li, Discontinuous Finite Elements in Fluid Dynamics and Heat Transfer, Birkhauser 2006 • Kanschä, Discontinuous Galerkin Methods for Viscous Flow, Deutscher Universitätsverlag, Wiesbaden 2007 • Hesthaven and Warburton, Nodal Discontinuous Galerkin Methods, Springer 2008 • Riviere, Discontinuous Galerkin methods for solving

**Discontinuous Galerkin methods for short pulse type ...**

Discontinuous Galerkin methods for short pulse type equations via hodograph transformations Qian Zhang Yinhua Xiay  
 Abstract In the present paper, we consider the discontinuous Galerkin (DG) methods for solving short pulse (SP) type equations The short pulse equation has been shown to

**Discontinuous Galerkin methods for the Stokes equations ...**

Discontinuous Galerkin methods for the Stokes equations using More recently, several authors have focused their attention in Discontinuous Galerkin (DG) formulations for computational fluid dynamics [4], and in particular for the Stokes equations (ie solving a system

**Discontinuous Galerkin Methods for Ordinary Differential ...**

Discontinuous Galerkin Methods for Ordinary Differential Equations\* By M Delfour, W Hager and F Trochu Abstract A class of Galerkin methods derived from discontinuous piecewise polynomial spaces is analyzed For polynomials of degree  $k$ , these methods lead to a family of one-step

### **Local discontinuous Galerkin methods for the Cahn-Hilliard ...**

Local discontinuous Galerkin methods for the Cahn-Hilliard type equations Yinhua Xia\*, Yan Xu † and Chi-Wang Shu ‡ Abstract In this paper we develop local discontinuous Galerkin (LDG) methods for the fourth-order nonlinear Cahn-Hilliard equation and system The energy stability of the LDG methods is proved for the general nonlinear case Nu-

### **Discontinuous Galerkin Finite Element Method for Solving ...**

Discontinuous Galerkin Finite Element method for solving Equations in Ocean Circulation Research Report in Mathematics, Number 12, 2017 Mathias Nthiani Muia I56/82837/2015 August 2017 Submitted to the School of Mathematics in partial fulfillment for a degree in Master of Science in Applied Mathematics

### **The Unfitted Discontinuous Galerkin Method for Solving the ...**

and evaluate the unfitted discontinuous Galerkin finite element method (UDG-FEM) for solving the electroencephalography (EEG) forward problem Methods: This new approach for source analysis does not use a geometry conforming volume triangulation, but instead uses a structured mesh that does not resolve the geometry

### **A Second Order Discontinuous Galerkin Fast Sweeping ...**

developed recently [Y Cheng and C-W Shu, A discontinuous Galerkin finite element method for directly solving the Hamilton-Jacobi equations, Journal of Computational Physics, 223 (2007), 398-415] for the time-dependent Hamilton-Jacobi equations The causality property of Eikonal equations is incorporated into the design of this solver

### **TVB Runge-Kutta Local Projection Discontinuous Galerkin ...**

class of TVB (total variation bounded) discontinuous Galerkin finite element methods for solving conservation laws  $u_t + J^x = f(u)$  In this paper we present a general framework of the methods, up to any order of formal accuracy, using scalar one-dimensional initial ...

### **Reconstructed Discontinuous Galerkin Methods for ...**

Reconstructed Discontinuous Galerkin (rDG) methods are presented for solving diffusion equations based on a first-order hyperbolic system (FOHS) formulation The idea is to combine the advantages of the FOHS formulation and the rDG methods in an effort to develop a more reliable, accurate, efficient, and robust method for solving the diffusion equations

### **Discontinuous Galerkin method for multifluid Euler equations**

methods It is, therefore, a convenient method for parallel architectures and implementable on unstructured grids The dg method has been successfully adapted to solving time-dependent hyperbolic partial differential equations through the Runge-Kutta dg method 1-5 Since the flow solution is allowed to be discontinuous