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[Fractal derivative and operators and their applications](#)

[Fractional Calculus & Applied Analysis](#)

Latest SCI Journal Papers on FDA

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[Numerical solution of a time-space fractional Fokker Planck equation with variable force field and diffusion](#)

By: Pinto, Luis; Sousa, Ercília

COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 50 Pages: 211-228 Published: SEP 2017

[Existence of positive periodic solutions of some nonlinear fractional differential equations](#)

By: Cabada, Alberto; Kisela, Tomas

COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 50 Pages: 51-67 Published: SEP 2017

[A Modeling and Analysis Method for Fractional-Order DC-DC Converters](#)

By: Chen, Xi; Chen, Yanfeng; Zhang, Bo; et al.

IEEE TRANSACTIONS ON POWER ELECTRONICS Volume: 32 Issue: 9 Pages: 7034-7044 Published: SEP 2017

[Numerical solution of stochastic fractional integro-differential equation by the spectral collocation method](#)

By: Taheri, Z.; Javadi, S.; Babolian, E.

JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS Volume: 321 Pages: 336-347 Published: SEP 2017

[Models of space-fractional diffusion: A critical review](#)

By: Izsak, Ferenc; Szekeres, Bela J.

APPLIED MATHEMATICS LETTERS Volume: 71 Pages: 38-43 Published: SEP 2017

[Fractional-space neutron point kinetics \(F-SNPK\) equations for nuclear reactor dynamics](#)

By: Espinosa-Paredes, Gilberto

ANNALS OF NUCLEAR ENERGY Volume: 107 Pages: 136-143 Published: SEP 2017

[Large time decay of solutions to the Boussinesq system with fractional dissipation](#)

By: Yang, Jiaqi

JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS Volume: 453 Issue: 1 Pages: 607-619 Published: SEP 1 2017

[Implementation of fractional order filters discretized by modified Fractional Order Darwinian Particle Swarm Optimization](#)

By: Ates, Abdullah; Alagoz, Baris Baykant; Kavuran, Gurkan; et al.

MEASUREMENT Volume: 107 Pages: 153-164 Published: SEP 2017

[Properties and Hurst exponent estimation of the circularly-symmetric fractional Brownian motion](#)

By: Coeurjolly, Jean-Francois; Porcu, Emilio

STATISTICS & PROBABILITY LETTERS Volume: 128 Pages: 21-27 Published: SEP 2017

[Local discontinuous Galerkin method for a nonlinear time-fractional fourth-order partial differential equation](#)

By: Du, Yanwei; Liu, Yang; Li, Hong; et al.

JOURNAL OF COMPUTATIONAL PHYSICS Volume: 344 Pages: 108-126 Published: SEP 1 2017

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Call for Papers

The 3rd IFAC Conference on Advances in Proportional-Integral Derivative Control

<http://www.pid18.ugent.be>

Description

The 3rd IFAC Conference on Advances in Proportional-Integral Derivative Control (PID 2018) will be held Wednesday through Friday, May 9-11, at the Het Pand Convent and Meeting Centre in the heart of Ghent, Belgium – unanimously declared as the most pleasant city of Belgium. The conference venue is near cultural heritage places, historical monuments, restaurants, shopping, and entertainment, just a walk to all of Ghent's known sights.

Proportional-Integral-Derivative (PID) controllers are undoubtedly the most employed controllers in industry. The PID 2018 is the sequel of PID 2000 in Terassa, Spain and PID 2012 in Brescia, Italy. These last two meetings proved to be great successes and have given a significant impulse in research direction of PID controllers, as seen in the last decade in literature reports. The PID2018 conference is a timely and necessary event fueled by the challenges and perspectives of Industry 4.0 context and the renewed role of the PID controller in this new environment. In addition to

provide the current state-of-art in the field, the meeting aims at providing a perspective of the future requirements for PID controllers within Industry 4.0.

The technical program will comprise several types of presentations in regular and invited sessions, tutorial sessions, and special sessions along with workshops and exhibits. This event will feature a parallel track on Internet Based control Education workshop (more details on conference website).

Topics: emphasis will be put on current challenges and new directions in PID control in the context of Industry 4.0. Below you can find a list of preferred topics, not limited to. Contributions with both theoretical and practical relevance are encouraged. Study cases from industry and challenges thereof are welcome.

PID tuning and automatic tuning methodologies

PID-based control structures

Applications of PID control

Industrial products for PID control design

Adaptive and robust

PID control Multivariable

PID control

Identification methods for PID control design

Stabilizing PID parameters

Event-based PID control

Fractional-order PID controllers

PID control performance assessment

Control education

CACSD tools for PID control design

Fault detection techniques for PID control

Nonlinear PID control

Simple alternatives to PID controllers

Important Dates:

Initial paper: 20 December 2017

Final Paper and Registration: 01 March 2018

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Books

Stochastic Models for Fractional Calculus

Meerschaert, Mark M / Sikorskii, Alla

Book Description

The book is devoted to fractional diffusion models. Such diffusion model can appear, for example, as the limit of a random walk with infinite variance. In order to introduce fractional diffusion, mathematical techniques for dealing with fractional derivatives are presented, and time-fractional diffusion equations are introduced. To continue, stable distributions are considered as limits of random walks. Continuous time random walks (CTRW) are described. Regular variation is introduced as a technical tool to describe the full range of random walks attracted to a normal or stable limit. This shows that fractional diffusion is a robust model. The space-time fractional diffusion equations are developed to govern CTRW scaling limits. Vector fractional diffusion is studied as well as various applications and extensions of the principal models. The book is useful for graduate, postgraduate and PhD students as well as for teachers and those who wish to study modern diffusion models with long-range dependence.

More information on this book can be found by the following links:

<http://www.degruyter.com/view/product/129781>

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Universal formulas in integral and fractional differential calculus

Khavtgai Namsrai

Book Description

This reference book presents unique and traditional analytic calculations, and features more than a hundred universal formulas where one can calculate by hand enormous numbers of definite integrals, fractional derivatives and inverse operators. Despite the great success of numerical calculations due to computer technology, analytical calculations still play a vital role in the study of new, as yet unexplored, areas of mathematics, physics and other branches of sciences. Readers, including non-specialists, can obtain themselves universal formulas and define new special functions in integral and series representations by using the methods expounded in this book. This applies to anyone utilizing analytical calculations in their studies.

More information on this book can be found by the following links:

<http://www.worldscientific.com/worldscibooks/10.1142/9585>

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Journals

Chaos, Solitons & Fractals

(Selected)

[A fractional Gauss–Jacobi quadrature rule for approximating fractional integrals and derivatives](#)

S. Jahanshahi, E. Babolian, D.F.M. Torres, A.R. Vahidi

[Time fractional quantum mechanics](#)

Nick Laskin

[Restricted fractional differential transform for solving irrational order fractional differential equations](#)

Ayad R. Khudair, S.A.M. Haddad, Sanaa L. Khalaf

[On disappearance of chaos in fractional systems](#)

Amey S. Deshpande, Varsha Daftardar-Gejji

[A search for a spectral technique to solve nonlinear fractional differential equations](#)

Malgorzata Turalska, Bruce J. West

[Conditions for continuity of fractional velocity and existence of fractional Taylor expansions](#)

Dimitar Prodanov

[Fractal-fractional differentiation and integration: Connecting fractal calculus and fractional calculus to predict complex system](#)

Abdon Atangana

[Time fractional equations and probabilistic representation](#)

Zhen-Qing Chen

[A review of applications of fractional calculus in Earth system dynamics](#)

Yong Zhang, HongGuang Sun, Harold H. Stowell, Mohsen Zayernouri, Samantha E. Hansen

[On generalized fractional vibration equation](#)

Hongzhe Dai, Zhibao Zheng, Wei Wang

[Chaos suppression in fractional systems using adaptive fractional state feedback control](#)

Seyed Mehdi Abedi Pahnghkolaei, Alireza Alfi, J.A. Tenreiro Machado

[Fractional derivatives on cosmic scales](#)

V.V. Uchaikin, R.T. Sibatov

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Physica A: Statistical Mechanics and its Applications

(Selected)

[A fractional model with parallel fractional Maxwell elements for amorphous thermoplastics](#)

Dong Lei, Yingjie Liang, Rui Xiao

[A fractional-order Maxwell model for non-Newtonian fluids](#)

Y. Carrera, G. Avila-de la Rosa, E.J. Vernon-Carter, J. Alvarez-Ramirez

[Group analysis of the time fractional generalized diffusion equation](#)

Elham Lashkarian, S. Reza Hejazi

[New approach for exact solutions of time fractional Cahn–Allen equation and time fractional Phi-4 equation](#)

Hira Tariq, Ghazala Akram

[Fractional derivative models for atmospheric dispersion of pollutants](#)

A.G.O. Goulart, M.J. Lazo, J.M.S. Suarez, D.M. Moreira

[Fractional randomness](#)

Charles S. Tapiero, Pierre Vallois

[Arbitrage with fractional Gaussian processes](#)

Xili Zhang, Weilin Xiao

[Synchronization-based parameter estimation of fractional-order neural networks](#)

Yajuan Gu, Yongguang Yu, Hu Wang

[Time fractional capital-induced labor migration model](#)

Mehmet Ali Balci

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Paper Highlight

FINITE DIFFERENCE SCHEMES FOR VARIABLE-ORDER TIME FRACTIONAL DIFFUSION EQUATION

Sun, Hongguang; Chen, Wen; Li, Changpin; et al.

Publication information: INTERNATIONAL JOURNAL OF BIFURCATION AND CHAOS Volume: 22 Issue: 4 Article Number: 1250085
Published: APR 2012

<http://www.worldscientific.com/doi/abs/10.1142/S021812741250085X>

Abstract

Variable-order fractional diffusion equation model is a recently developed and promising approach to characterize time-dependent or concentration-dependent anomalous diffusion, or diffusion process in inhomogeneous porous media. To further study the properties of variable-order time fractional subdiffusion equation models, the efficient numerical schemes are urgently needed. This paper investigates numerical schemes for variable-order time fractional diffusion equations in a finite domain. Three finite difference schemes including the explicit scheme, the implicit scheme and the Crank-Nicolson scheme are studied. Stability conditions for these three schemes are provided and proved via the Fourier method, rigorous convergence analysis is also performed. Two numerical examples are offered to verify the theoretical analysis of the above three schemes and illustrate the effectiveness of suggested schemes. The numerical results illustrate that, the implicit scheme and the Crank-Nicolson scheme can achieve high accuracy compared with the explicit scheme, and the Crank-Nicolson scheme claims highest accuracy in most situations. Moreover, some properties of variable-order time fractional diffusion equation model are also shown by numerical simulations.

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A FOUNDATIONAL APPROACH TO THE LIE THEORY FOR FRACTIONAL ORDER PARTIAL DIFFERENTIAL EQUATIONS

Leo, Rosario Antonio; Sicuro, Gabriele; Tempesta, Piergiulio

Publication information: FRACTIONAL CALCULUS AND APPLIED ANALYSIS Volume: 20 Issue: 1 Pages: 212-231 Published: FEB 2017

<http://www.degruyter.com/view/j/fca.2017.20.issue-1/fca-2017-0011/fca-2017-0011.xml>

Abstract

We provide a general theoretical framework allowing us to extend the classical Lie theory for partial differential equations to the case of equations of fractional order. We propose a general prolongation formula for the study of Lie symmetries in the case of an arbitrary finite number of independent variables. We also prove the Lie theorem in the case of fractional differential equations, showing that the proper space for the analysis

of these symmetries is the infinite dimensional jet space.

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