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Institute of Soft Matter Mechanics, Hohai University

For contribution: fdaexpress@163.com, hushuaihhu@gmail.com

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◆ Call for Paper

Special Issue on "Dynamical Systems" in the journal “Entropy (ISSN 1099-4300)”

Special Issue on Analytical and Numerical Methods for Fractional Differential Equations in the journal “Discrete Dynamics in Nature and Society”

◆ Books

Mathematical Modeling with Multidisciplinary Applications

◆ Journals

Communications in Nonlinear Science and Numerical Simulation

Chaos

International Journal of Bifurcation and Chaos

◆ Paper Highlight

Local fractional Fokker-Planck equation

On calculus of local fractional derivatives

Anomalous diffusion modeling by fractal and fractional derivatives

◆ Websites of Interest

Fractional Calculus & Applied Analysis, Volume 16, No 1, 2013

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Call for Paper

Special Issue on "Dynamical Systems" in the journal “Entropy (ISSN 1099-4300)”

(Contributed by Prof. J. A. Tenreiro Machado)
http://www.mdpi.com/journal/entropy/special_issues/dynamical_systems

Call for Papers

Complex systems are pervasive in many area of science and we find them everyday and everywhere. Examples include financial markets, highway transportation networks, telecommunication networks, world and country economies, social networks, immunological systems, living organisms, computational systems and electrical and mechanical structures. Complex systems are often composed of large number of interconnected and interacting entities exhibiting much richer global scale dynamics than they could be inferred from the properties and behaviour of individual entities. Complex systems are studied in many areas of natural sciences, social sciences, engineering and mathematical sciences.
The special issue focuses on original and new research results on systems dynamics in science and engineering. Manuscripts in complex dynamical systems, nonlinearity, chaos and fractional dynamics in the thermodynamics or information processing perspectives are solicited. We welcome submissions addressing novel issues as well as those on more specific topics illustrating the broad impact of entropy-based techniques in complexity, nonlinearity and fractionality.

Specific topics of interest include (but are not limited to):
- Complex dynamics
- Nonlinear dynamical systems
- Advanced control systems
- Fractional calculus and its applications
- Chemical dynamics
- Economical dynamics and predictions
- Dynamical systems synchronization
- Biological systems and bioinformatics
- Nonlinear waves and acoustics
- Image and signal processing

Guest Editor: J. A. Tenreiro Machado

Submission
Manuscripts should be submitted online at www.mdpi.com by registering and logging in to this website. Once you are registered, click here to go to the submission form. Manuscripts can be

submitted until the deadline. Papers will be published continuously (as soon as accepted) and will be listed together on the special issue website. Research articles, review articles as well as communications are invited. For planned papers, a title and short abstract (about 100 words) can be sent to the Editorial Office for announcement on this website.

Submitted manuscripts should not have been published previously, nor be under consideration for publication elsewhere (except conference proceedings papers). All manuscripts are refereed through a peer-review process. A guide for authors and other relevant information for submission of manuscripts are available on the Instructions for Authors page. Entropy is an international peer-reviewed Open Access monthly journal published by MDPI.

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[Back]

Special Issue on Analytical and Numerical Methods for Fractional Differential Equations

In the journal “Discrete Dynamics in Nature and Society”

(Contributed by Prof. Ferhan M. Atici)

http://mts.hindawi.com/submit/journals/ddns/anmfd/

Call for Papers

The origin of derivatives of fractional order goes back to Leibnitz (1695) when he replied to a letter from L'Hopital asking "what is the meaning of dny/dxn when n =1/2?". Since then many renowned mathematicians contributed to the development of the theory of Fractional Calculus, which should be understood as the study of differential equations depending on derivatives of arbitrary order. Nowadays this theory is no longer regarded as a mathematical curiosity. Perhaps the main reason for that is the fact that many researchers started to model real-world phenomena using fractional derivatives, mainly, problems that have memory.

The difficulty that one faces when trying to solve differential equations explicitly is well known. Unfortunately things do not get better when we use fractional derivatives instead of classical derivatives on an equation. Moreover, the nonlocal character of fractional derivatives imposes new challenges for numerical analysts working within this field.

We invite scientists to contribute original research articles that seek to explore differential or difference equations of fractional order. Equations that can be applied to some real world problems are particularly welcome. Potential topics include, but are not limited to:

• Existence and uniqueness results for fractional differential/difference equations

• Qualitative properties for solutions of fractional differential/difference equations

• Modeling with discrete or continuous fractional derivatives
• Numerical methods for ordinary or partial fractional differential equations

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Manuscript Due: Friday, 7 June 2013
First Round of Reviews: Friday, 30 August 2013
Publication Date: Friday, 25 October 2013

Lead Guest Editor
Rui A. C. Ferreira, Department of Mathematics, Lusophone University of Humanities and Technologies, Lisbon, Portugal; ruiacferreira@ulusofona.pt

Guest Editors
Pedro R. S. Antunes, Department of Mathematics, Lusophone University of Humanities and Technologies, Lisbon, Portugal; pant@cii.fc.ul.pt
Ferhan Atici, Department of Mathematics, Western Kentucky University, Bowling Green, KY, USA; ferhan.atici@wku.edu
Cecile Piret, Applied Mechanics Division, Universit é Catholique de Louvain, Louvain, Belgium; cecile.piret@uclouvain.be

[Back]

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Books

Mathematical Modeling with Multidisciplinary Applications

Xin-She Yang

Book Description

Features mathematical modeling techniques and real-world processes with applications in diverse fields. **Mathematical Modeling with Multidisciplinary Applications** details the interdisciplinary nature of mathematical modeling and numerical algorithms. The book combines a variety of applications from diverse fields to illustrate how the methods can be used to model physical processes, design new products, find solutions to challenging problems, and increase competitiveness in international markets.

Written by leading scholars and international experts in the field, the book presents new and emerging topics in areas including finance and economics, theoretical and applied mathematics, engineering and machine learning, physics, chemistry, ecology, and social science. In addition, the book thoroughly summarizes widely used mathematical and numerical methods in mathematical modeling and features:

• Diverse topics such as partial differential equations (PDEs), fractional calculus, inverse problems by ordinary differential equations (ODEs), semigroups, decision theory, risk analysis, Bayesian estimation, nonlinear PDEs in financial engineering, perturbation analysis, and dynamic system modeling
• Case studies and real-world applications that are widely used for current mathematical modeling courses, such as the green house effect and Stokes flow estimation
• Comprehensive coverage of a wide range of contemporary topics, such as game theory, statistical models, and analytical solutions to numerical methods
• Examples, exercises with select solutions, and detailed references to the latest literature to solidify comprehensive learning
• New techniques and applications with balanced coverage of PDEs, discrete models, statistics, fractional calculus, and more

[Back]

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Journals

Communications in Nonlinear Science and Numerical Simulation

Volume 18, Issue 6

Articles

Mathematical Methods

A new numerical algorithm to solve fractional differential equations based on operational matrix of generalized hat functions
Manoj P. Tripathi, Vipul K. Baranwal, Ram K. Pandey, Om P. Singh

Group classification for equations of thermodiffusion in binary mixture
Irina V. Stepanova

A composite Chebyshev finite difference method for nonlinear optimal control problems
H.R. Marzban, S.M. Hoseini

Existence and uniqueness of solutions for the nonlinear impulsive fractional differential equations
Zhenhai Liu, Xiuwen Li

Algebraic operator method for the construction of solitary solutions to nonlinear differential equations
Zenonas Navickas, Liepa Bikulciene, Maido Rahula, Minvydas Ragulskis

Direct linearization of the nonisospectral Kadomtsev–Petviashvili equation
Wei Feng, Songlin Zhao, Jianbing Zhang

The uniqueness of positive solution for a singular fractional differential system involving derivatives
Xinguang Zhang, Lishan Liu, Yonghong Wu

Nonlinear Waves and Solitons
Observation of two soliton propagation in an erbium doped inhomogeneous lossy fiber with phase modulation
M.S. Mani Rajan, A. Mahalingam, A. Uthayakumar, K. Porsezian

Chaos and Complexity
Chaotic maps-based password-authenticated key agreement using smart cards
Cheng Guo, Chin-Chen Chang

Time domain simulation of Li-ion batteries using non-integer order equivalent electrical circuit
D. Riu, M. Montaru, Y. Bultel

[Back]

Chaos

Volume 23, Issue 1

REGULAR ARTICLES

Chaotic dynamics of a frequency-modulated microwave oscillator with time-delayed feedback
Hien Dao, John C. Rodgers, and Thomas E. Murphy

Controlling phase multistability in coupled period-doubling oscillators
A. V. Shabunin

Influence of chaotic synchronization on mixing in the phase space of interacting systems
Sergey V. Astakhov, Anton Dvorak, and Vadim S. Anishchenko

Spectral coarse graining for random walks in bipartite networks
Yang Wang, An Zeng, Zengru Di, and Ying Fan

On the existence and multiplicity of one-dimensional solid particle attractors in time-dependent Rayleigh-Bénard convection
Marcello Lappa

Topological field theory of dynamical systems. II
Igor V. Ovchinnikov

The estimation of neurotransmitter release probability in feedforward neuronal network based on adaptive synchronization
Ming Xue, Jiang Wang, Chenhui Jia, Haitao Yu, Bin Deng, Xile Wei, and Yanqiu Che

Lévy noise induced switch in the gene transcriptional regulatory system
Yong Xu, Jing Feng, JuanJuan Li, and Huiqing Zhang

[Back]

International Journal of Bifurcation and Chaos

Volume: 22, Number: 12

Tutorials and Reviews

CHAOTIC ORBITS IN A PLANAR THREE-CENTER PROBLEM OF SLIGHTLY NEGATIVE ENERGY
Li-Chin Yeh, Yi-Chiuan Chen, Ing-Guey Jiang

CUTTING AND SHUFFLING A LINE SEGMENT: MIXING BY INTERVAL EXCHANGE TRANSFORMATIONS
Marissa K. Krotter, Ivan C. Christov, Julio M. Ottino, Richard M. Lueptow

ANALYSIS OF GRAIN-SCALE MEASUREMENTS OF SAND USING KINEMATICAL COMPLEX NETWORKS
David M. Walker, Antoinette Tordesillas, Sebastian Pucilowski, Qun Lin, Amy L. Rechenmacher,Sara Abedi

CONVENTIONAL AND EXTENDED TIME-DELAYED FEEDBACK CONTROLLED ZERO-CROSSING DIGITAL PHASE LOCKED LOOP
Tanmoy Banerjee, B. C. Sarkar

Papers

STEADY-STATE, HOPF AND STEADY-STATE-HOPF BIFURCATIONS IN DELAY DIFFERENTIAL EQUATIONS WITH APPLICATIONS TO A DAMPED HARMONIC OSCILLATOR WITH DELAY FEEDBACK
Yongli Song, Jiao Jiang

GENERATION OF AN EIGHT-WING CHAOTIC ATTRACTOR FROM QI 3-D FOUR-WING CHAOTIC SYSTEM
Guoyuan Qi, Zhonglin Wang, Yanling Guo

GEOMETRIC LIFT OF PATHS OF HAMILTONIAN EQUILIBRIA AND HOMOCLINIC BIFURCATION
THOMAS J. BRIDGES

BIFURCATIONS AND EXACT TRAVELING WAVE SOLUTIONS OF THE GENERALIZED TWO-COMPONENT CAMASSA–HOLM EQUATION
Jibin Li, Zhijun Qiao

BIFURCATION ANALYSIS OF THE QUASI-PERIODIC SOLUTION WITH THREE-PHASE SYNCHRONIZED ENVELOPES IN A RING OF THREE-COUPLED, BISTABLE OSCILLATORS
Kyohei Kamiyama, Motomasa Komuro, Tetsuro Endo

SUPERCRITICAL PITCHFORK BIFURCATION OF THE QUASI-PERIODIC SWITCHING SOLUTION IN A RING OF SIX-COUPLED, BISTABLE OSCILLATORS
Kyohei Kamiyama, Motomasa Komuro, Tetsuro Endo

[Back]

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Paper Highlight

Local fractional Fokker-Planck equation

Kiran M. Kolwankar and Anil D. Gangal

Publication information: Kiran M. Kolwankar and Anil D. Gangal. Local fractional Fokker-Planck equation, Phys. Rev. Lett. 80, 214-217 (1998).
http://link.springer.com/article/10.1023%2FA%3A1013378221617?LI=true

Abstract
We propose a new class of differential equations, which we call local fractional differential equations. They involve local fractional derivatives and appear to be suitable to deal with phenomena taking place in fractal space and time. A local fractional analog of the Fokker-Planck equation has been derived starting from the Chapman-Kolmogorov condition. We solve the equation with a specific choice of the transition probability and show how subdiffusive behavior can arise.

[Back]

On calculus of local fractional derivatives

A. Babakhani, Varsha Daftardar-Gejji

Publication information: A. Babakhani, Varsha Daftardar-Gejji. On calculus of local fractional derivatives, Journal of Mathematical Analysis and Applications, 270 (1), 66–79 (2002).
http://www.sciencedirect.com/science/article/pii/S0022247X02000483

Abstract
Local fractional derivative (LFD) operators have been introduced in the recent literature (Chaos 6 (1996) 505–513). Being local in nature these derivatives have proven useful in studying fractional differentiability properties of highly irregular and nowhere differentiable functions. In the present paper we prove Leibniz rule, chain rule for LFD operators. Generalization of directional LFD and multivariable fractional Taylor series to higher orders have been presented.

[Back]

Anomalous diffusion modeling by fractal and fractional derivatives

Wen Chen, HongGuang Sun, Xiaodi Zhang, Dean Korosak

Publication information: Wen Chen, HongGuang Sun, Xiaodi Zhang, Dean Korosak. Anomalous diffusion modeling by fractal and fractional derivatives. Computers and Mathematics with Applications，2010, 59 (5): 1754-1758.
http://www.sciencedirect.com/science/article/pii/S0898122109005525

Abstract
This paper makes an attempt to develop a fractal derivative model of anomalous diffusion. We also derive the fundamental solution of the fractal derivative equation for anomalous diffusion, which characterizes a clear power law. This new model is compared with the corresponding fractional derivative model in terms of computational efficiency, diffusion velocity, and heavy tail property. The merits and distinctions of these two models of anomalous diffusion are then summarized.

[Back]

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The End of This Issue

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