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Latest SCI Journal Papers on FDA

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- [An extension of the Gegenbauer pseudospectral method for the time fractional Fokker-Planck equation](#)

By: Izadkhah, Mohammad Mahdi; Saberi-Nadjafi, Jafar; Toutounian, Faezeh

MATHEMATICAL METHODS IN THE APPLIED SCIENCES Volume: 41 Issue: 4 Pages: 1301-1315 Published: MAR 15

2018

[Approximate solution of space and time fractional higher order phase field equation](#)

By: Shamseldeen, S.

PHYSICA A-STATISTICAL MECHANICS AND ITS APPLICATIONS Volume: 494 Pages: 308-316 Published: MAR 15 2018

[Spectral Methods for Substantial Fractional Differential Equations](#)

By: Huang, Can; Zhang, Zhimin; Song, Qingshuo

JOURNAL OF SCIENTIFIC COMPUTING Volume: 74 Issue: 3 Pages: 1554-1574 Published: MAR 2018

[Complex variable approach to the analysis of a fractional differential equation in the real line](#)

By: San, Mufit

COMPTES RENDUS MATHEMATIQUE Volume: 356 Issue: 3 Pages: 293-300 Published: MAR 2018

[Generalized Tikhonov methods for an inverse source problem of the time-fractional diffusion equation](#)

By: Ma, Yong-Ki; Prakash, P.; Deiveegan, A.

CHAOS SOLITONS & FRACTALS Volume: 108 Pages: 39-48 Published: MAR 2018

[Kalman filters for linear continuous-time fractional-order systems involving coloured noises using fractional-order average derivative](#)

By: Yang, Chao; Gao, Zhe; Liu, Fanghui

IET CONTROL THEORY AND APPLICATIONS Volume: 12 Issue: 4 Pages: 456-465 Published: MAR 6 2018

[Robust stability analysis of uncertain multiorder fractional systems: Young and Jensen inequalities approach](#)

By: Taghavian, Hamed; Tavazoei, Mohammad Saleh

INTERNATIONAL JOURNAL OF ROBUST AND NONLINEAR CONTROL Volume: 28 Issue: 4 Pages: 1127-1144
Published: MAR 10 2018

[Numerical solution of nonlinear stochastic Ito-Volterra integral equations driven by fractional Brownian motion](#)

By: Mirzaee, Farshid; Samadyar, Nasrin

MATHEMATICAL METHODS IN THE APPLIED SCIENCES Volume: 41 Issue: 4 Pages: 1410-1423 Published: MAR 15 2018

[A class of nonlinear non-instantaneous impulsive differential equations involving parameters and fractional order](#)

By: Yang, Dan; Wang, JinRong; O'Regan, D.

APPLIED MATHEMATICS AND COMPUTATION Volume: 321 Pages: 654-671 Published: MAR 15 2018

[An extension of the Gegenbauer pseudospectral method for the time fractional Fokker-Planck equation](#)

By: Izadkhah, Mohammad Mahdi; Saberi-Nadjafi, Jafar; Toutounian, Faezeh

MATHEMATICAL METHODS IN THE APPLIED SCIENCES Volume: 41 Issue: 4 Pages: 1301-1315 Published: MAR 15 2018

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Call for Papers

International Conference on Fractional Differentiation and its Applications

(16-18 July 2018, Amman, The Hashemite Kingdom of Jordan)

<http://conferences.ju.edu.jo/en/icfda2018/Home.aspx>

Description

The ICFDA '18 is a specialized conference on fractional-order calculus and its applications, an event of the biannual series of international conference ICFDA, <http://conferences.ju.edu.jo/en/icfda2018/Lists/PastConferences/PCList.aspx>.

This conference is organized under the Patronage of Her Royal Highness Princess Sumaya bint El Hassan, President of the El Hassan Science City and Royal Scientific Society, and sponsored by The University of Jordan and Scientific Research Support Fund, Jordan. Fractional Calculus is a generalization of the integer-order Calculus. The fractional-order differentiation of arbitrary orders takes into account the memory effect of many important systems. The order of the derivatives may also be variable, distributed or complex. Recently, fractional-order calculus became a more accurate tool to describe systems in various fields in mathematics, biology, chemistry, medicine, mechanics, electricity, control theory, economics, and signal and image processing. A wide range of topics on FDA are included. Prospective authors are invited to submit a full paper (4-6 pages) describing original work. All submissions should be made electronically through the conference website. Students are encouraged to participate on the best student paper award contest.

Accepted papers will be published in the conference proceedings subject to advance registration of at least one of the authors. Additionally, extended versions of selected papers will be published in special issues of international journals.

All details on committees, keynote and invited speakers, registration fees, instructions to authors, etc., can be found at the conference website.

Important Deadlines :

- Submission of tutorials and special sessions proposals: Feb. 15, 2018;
- Submission of regular and student papers: March 1, 2018;
- Notification of acceptance: May 2, 2018;
- Submission of cameraready papers: May 25, 2018.

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Books

Fractional statistics and quantum theory

A Khare

Book Description

This book explains the subtleties of quantum statistical mechanics in lower dimensions and their possible ramifications in quantum theory. The discussion is at a pedagogical level and is addressed to both graduate students and advanced research workers with a reasonable background in quantum and statistical mechanics. The main emphasis will be on explaining new concepts. Topics in the first part of the book includes the flux tube model of anyons, the braid group and quantum and statistical mechanics of noninteracting anyon gas. The second part of the book provides a detailed discussion about fractional statistics from the point of view of Chern-Simons theories. Topics covered here includes Chern-Simons field theories, charged vortices, anyon superconductivity and the fractional quantum Hall effect. A chapter will also be devoted to

the recent topic of fractional exclusion statistics and the concepts will be illustrated with the example of the Calogero-Sutherland model.

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

<https://www.worldscientific.com/worldscibooks/10.1142/2988>

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Fractional Order Signal Processing: Introductory Concepts and Applications

S Das , I Pan

Book Description

The book tries to briefly introduce the diverse literatures in the field of fractional order signal processing which is becoming an emerging topic among an interdisciplinary community of researchers. This book is aimed at postgraduate and beginning level research scholars who would like to work in the field of Fractional Order Signal processing (FOSP). The readers should have preliminary knowledge about basic signal processing techniques. Prerequisite knowledge of fractional calculus is not essential and is expositied at relevant places in connection to the appropriate signal processing topics. Basic signal processing techniques like filtering, estimation, system identification, etc. in the light of fractional order calculus are presented along with relevant application areas. The readers can easily extend these concepts to varied disciplines like image or speech processing, pattern recognition, time series forecasting, financial data analysis and modeling, traffic modeling in communication channels, optics, biomedical signal processing, electrochemical applications and many more. Adequate references are provided in each category so that the researchers can delve deeper into each area and broaden their horizon of understanding. Available MATLAB tools to simulate FOSP theories are also introduced so that the readers can apply the theoretical concepts right-away and gain practical insight in the specific domain.

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

<http://link.springer.com/10.1007/978-3-642-23117-9>

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Journals

Applied Mathematics and Computation

(selected)

[Fractional-order Legendre-collocation method for solving fractional initial value problems](#)

Qasem M. Al-Mdallal, Ahmed S. Abu Omer

[Time-fractional diffusion equation for signal smoothing](#)

Yuanlu Li, Fawang Liu, Ian W. Turner, Tao Li

[Simultaneous inversion of the fractional order and the space-dependent source term for the time-fractional diffusion equation](#)

Zhousheng Ruan, Wen Zhang, Zewen Wang

[Fractional-order Legendre operational matrix of fractional integration for solving the Riccati equation with fractional order](#)

Bothayna S.H. Kashkari, Muhammed I. Syam

[Analysis of a quintic system with fractional damping in the presence of vibrational resonance](#)

Zhi Yan, Wei Wang, Xianbin Liu

[Robust disturbance rejection for uncertain fractional-order systems](#)

Rui-Juan Liu, Zhuo-Yun Nie, Min Wu, Jinhua She

[Analysis of the damped nonlinear space-fractional Schrödinger equation](#)

Jiarui Liang, Songhe Song, Weien Zhou, Hao Fu

[Approximate solution of fractional vibration equation using Jacobi polynomials](#)

Harendra Singh

[Lyapunov functions for Riemann–Liouville-like fractional difference equations](#)

Guo-Cheng Wu, Dumitru Baleanu, Wei-Hua Luo

[Study on fractional order gradient methods](#)

Yuquan Chen, Qing Gao, Yiheng Wei, Yong Wang

[A second order Crank–Nicolson scheme for fractional Cattaneo equation based on new fractional derivative](#)

Zhengguang Liu, Aijie Cheng, Xiaoli Li

[Moment stability via resolvent operators of fractional stochastic differential inclusions driven by fractional Brownian motion](#)

P. Tamilalagan, P. Balasubramaniam

[Hilfer fractional stochastic integro-differential equations](#)

Hamdy M. Ahmed, Mahmoud M. El-Borai

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Journal of Computational and Applied Mathematics

(Selected)

[Boundary conditions for fractional diffusion](#)

Boris Baeumer, Mihály Kovács, Mark M. Meerschaert, Harish Sankaranarayanan

[The fractional Sturm–Liouville problem—Numerical approximation and application in fractional diffusion](#)

Mariusz Ciesielski, Malgorzata Klimek, Tomasz Blaszczyk

[Mixed fractional Heston model and the pricing of American options](#)

F. Mehrdoust, A.R. Najafi, S. Fallah, O. Samimi

[A generalized fractional-order Legendre wavelet Tau method for solving fractional differential equations](#)

Fakhroddin Mohammadi, Carlo Cattani

[On time-optimal control of fractional-order systems](#)

Ivan Matychyn, Viktoriia Onyshchenko

[Fractional Newton mechanics with conformable fractional derivative](#)

Won Sang Chung

[A novel chaotification scheme for fractional system and its application](#)

Huijian Zhu, Caibin Zeng

[Numerical analysis of behaviour of the Cucker–Smale type models with fractional operators](#)

Ewa Girejko, Dorota Mozyrska, Małgorzata Wyrwas

[Optimal variable-order fractional PID controllers for dynamical systems](#)

A. Dabiri, B.P. Moghaddam, J.A. Tenreiro Machado

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Paper Highlight

Fractional order plasticity modelling of state-dependent behaviour of granular soils without using plastic potential

Yifei Sun, Yufeng Gao, Qizhi Zhu

Publication information: International Journal of Plasticity, Volume 102, March 2018, Pages 53-69

<https://www.sciencedirect.com/science/article/pii/S0749641917304163>

Abstract

The strength and deformation behaviour of granular soil is strongly dependent on its stress state and loading history. Due to the change of soil state, the plastic flow direction and loading direction are usually non-coaxial and a plastic potential different from the plastic loading function is generally mandatory for capturing correctly volumetric deformation. For that, some state variables have been involved phenomenologically in plastic equations, bringing about some complexity in model formulations and physically meaninglessness of certain parameters. This paper presents a new approach to describing the state-dependent stress-dilatancy behaviour of granular soil using fractional order derivations. Unlike integer-order derivative in the classical plasticity theory, the fractional order derivative is defined in an integral form. Originally, we relate the description of soil state to the definition of the integral lower and upper limits respectively as the current and critical stress states. By performing a fractional order derivative of the plastic yield function, a state-dependent stress-dilatancy equation is set up without additional state variables. As the integration range increases, the flow direction deviates gradually from the loading direction. However, they coincide with each other when critical state is reached where the lower and upper limits merge. For validation, an elastoplastic constitutive model is developed by incorporating the fractional equation into the modified Cam-clay model. A series of drained and undrained triaxial test results for different granular soils are simulated, and the issue of plastic energy dissipation in each simulation is also addressed.

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Application of scaling transformation to characterizing complex rheological behaviors and

fractal derivative modeling

Cai, Wei; Chen, Wen

Publication information: RHEOLOGICA ACTA Volume: 57 Issue: 1 Pages: 43-50 Published: JAN 2018

<http://link.springer.com/10.1007/s00397-017-1054-8>

Abstract

It has been long observed that cumbersome parameters are required for the traditional viscoelastic models to describe complex rheological behaviors. Inspired by the relationship between normal and anomalous diffusions, this paper tentatively employs t_α to replace t , called as the scaling transformation, in the traditional creep compliance and relaxation modulus. With this methodology, the relaxation modulus is found to agree with the well-known Kohlrausch-Williams-Watts (KWW) stretched exponential function. The fitting results confirm that the proposed models accurately characterize rheological behaviors only with one more parameter α . Moreover, it is noted that the present formulations are directly related to the fractal derivative viscoelastic models and the index α is actually the order of the fractal derivative.

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