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Latest SCI Journal Papers on FDA

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(Searched on 15th June 2014)

Principal resonance responses of SDOF systems with small fractional derivative damping under narrow-band random parametric excitation
By: Liu, Di; Li, Jing; Xu, Yong
COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 19 Issue: 10 Pages: 3642-3652 Published: OCT 2014

Fault detection based on fractional order models: Application to diagnosis of thermal systems
By: Aribi, Asma; Farges, Christophe; Aoun, Mohamed; et al.
COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 19 Issue: 10 Pages: 3679-3693 Published: OCT 2014

Image encryption based on synchronization of fractional chaotic systems
By: Xu, Yong; Wang, Hua; Li, Yongge; et al.
COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 19 Issue: 10 Pages: 3735-3744 Published: OCT 2014

Analytic study on a state observer synchronizing a class of linear fractional differential systems
By: Zhou, Xian-Feng; Huang, Qun; Jiang, Wei; et al.
COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 19 Issue: 10 Pages: 3808-3819 Published: OCT 2014

Positive solutions to integral systems with weight and Bessel potentials
By: Yin, Hui; Lu, Zhongxue
JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS Volume: 418 Issue: 1 Pages: 264-282 Published: OCT 1 2014

[Back]

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Books

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The Realization Problem for Positive and Fractional Systems

Kaczorek, Tadeusz, Sajewski, Lukasz

Book Description

Random walk is a stochastic process that has proven to be a useful model in understanding discrete-state discrete-time processes across a wide spectrum of scientific disciplines. Elements of Random Walk and Diffusion ProThis book addresses the realization problem of positive and fractional continuous-time and discrete-time linear systems. Roughly speaking the essence of the realization problem can be stated as follows: Find the matrices of the state space equations of linear systems for given their transfer matrices. This first book on this topic shows how many well-known classical approaches have been extended to the new classes of positive and fractional linear systems. The modified Gilbert method for multi-input multi-output linear systems, the method for determination of realizations in the controller canonical forms and in observer canonical forms are presented. The realization problem for linear systems described by differential operators, the realization problem in the Weierstrass canonical forms and of the descriptor linear systems for given Markov parameters are addressed. The book also presents a method for the determination of minimal realizations of descriptor linear systems and an extension for cone linear systems. This monographs summarizes recent original investigations of the authors in the new field of the positive and fractional linear systems.

More information on this book can be found by the following link:
http://www.springer.com/engineering/control/book/978-3-319-04833-8

[Back]

Fractional Derivatives for Physicists and Engineers

Uchaikin Vladimir V

Book Description

The first derivative of a particle coordinate means its velocity, the second means its acceleration, but what does a fractional order derivative mean? Where does it come from, how does it work, where does it lead to? The two-volume book written on high didactic level answers these questions. Fractional Derivatives for Physicists and Engineers— The first volume contains a clear introduction into such a modern branch of analysis as the fractional calculus. The second develops a wide panorama of applications of the fractional calculus to various physical problems. This book recovers new perspectives in front of the reader dealing with turbulence and semiconductors, plasma and thermodynamics, mechanics and quantum optics, nanophysics and astrophysics.

The book is addressed to students, engineers and physicists, specialists in theory of probability and statistics, in mathematical modeling and numerical simulations, to everybody who doesn't wish to stay apart from the new mathematical methods becoming more and more popular.

More information on this book can be found by the following link:
http://www.springer.com/physics/theoretical,+mathematical+&+computational+physics/book/978-3-642-33910-3

[Back]]

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Journals

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Entropy

Volume 16, Issue 6

Entropy Content During Nanometric Stick-Slip Motion

Paul Creeger and Fredy Zypman

Information-Geometric Markov Chain Monte Carlo Methods Using Diffusions

Samuel Livingstone and Mark Girolami

Analysis and Optimization of a Compressed Air Energy Storage—Combined Cycle System

Wenyi Liu, Linzhi Liu, Luyao Zhou, Jian Huang, Yuwen Zhang, Gang Xu and Yongping Yang

Quantum Flows for Secret Key Distribution in the Presence of the Photon Number Splitting Attack

Luis A. Lizama-Pérez, J. Mauricio López, Eduardo De Carlos-López and Salvador E. Venegas-Andraca

Minimum Entropy-Based Cascade Control for Governing Hydroelectric Turbines

Mifeng Ren, Di Wu, Jianhua Zhang and Man Jiang

A Derivation of a Microscopic Entropy and Time Irreversibility From the Discreteness of Time

Roland Riek

Relative Entropy, Interaction Energy and the Nature of Dissipation

Bernard Gaveau, Léo Granger, Michel Moreau and Lawrence S. Schulman

On the Fisher Metric of Conditional Probability Polytopes

Guido Montúfar, Johannes Rauh and Nihat Ay

On Spatial Covariance, Second Law of Thermodynamics and Configurational Forces in Continua

Vassilis P. Panoskaltsis and Dimitris Soldatos

Density Reconstructions with Errors in the Data

Erika Gomes-Gonçalves, Henryk Gzyl and Silvia Mayoral

[Back]

Nonlinear dynamics

Volume 76, Issue 4

[Back]

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Paper Highlight

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Nondiffusive Transport in Plasma Turbulence: A Fractional Diffusion Approach

Nondiffusive Transport in Plasma Turbulence: A Fractional Diffusion Approach

Publication information: D. del-Castillo-Negrete, B. A. Carreras, and V. E. Lynch. Nondiffusive Transport in Plasma Turbulence: A Fractional Diffusion Approach. Physical Review Letters, 94, 065003 (2005).

http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.94.065003

Abstract
Numerical evidence of nondiffusive transport in three-dimensional, resistive pressure-gradient-driven plasma turbulence is presented. It is shown that the probability density function (pdf) of tracer particles' radial displacements is strongly non-Gaussian and exhibits algebraic decaying tails. To model these results we propose a macroscopic transport model for the pdf based on the use of fractional derivatives in space and time that incorporate in a unified way space-time nonlocality (non-Fickian transport), non-Gaussianity, and nondiffusive scaling. The fractional diffusion model reproduces the shape and space time scaling of the non-Gaussian pdf of turbulent transport calculations. The model also reproduces the observed superdiffusive scaling.

[Back]

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Multifractality of the Feigenbaum Attractor and Fractional Derivatives

U. Frisch, K. Khanin and T. Matsumoto

Publication information: U. Frisch, K. Khanin and T. Matsumoto. Multifractality of the Feigenbaum Attractor and Fractional Derivatives. Journal of Statistical Physics, 2005, 121(5/6), 671-695.

http://link.springer.com/article/10.1007/s10955-005-7011-4

Abstract
It is shown that fractional derivatives of the (integrated) invariant measure of the Feigenbaum map at the onset of chaos have power-law tails in their cumulative distributions, whose exponents can be related to the spectrum of singularities (f(α). This is a new way of characterizing multifractality in dynamical systems, so far applied only to multifractal random functions [Frisch and Matsumoto, J. Stat. Phys. 108:1181, 2002]. The relation between the thermodynamic approach [Vul, Sinai and Khanin, Russian Math. Surveys 39:1, 1984] and that based on singularities of the invariant measures is also examined. The theory for fractional derivatives is developed from a heuristic point view and tested by very accurate simulations.

[Back]

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