

FDA Express Vol. 2, No. 5, Mar. 15, 2012

Editors: [W. Chen](#) [H.G. Sun](#) [X.D. Zhang](#) [S. Hu](#)

Institute of Soft Matter Mechanics, Hohai University

For contribution: fdaexpress@hhu.edu.cn

For subscription: <http://em.hhu.edu.cn/fda/subscription.htm>

Special Issue: Call for Papers

[Fractional Differential Equations \(2012\)](#)

Conferences

[The Extension of Early Registration -The Fifth IFAC Symposium on Fractional Differentiation and Its Applications](#)

[4th International Conference on Computational Methods \(ICCM2012\), November 25-27, 2012,](#)

[Gold Coast, Australia](#)

Books

[Electromagnetic Fields and Waves in Fractional Dimensional Space](#)

[Fractional Dynamics - Applications of Fractional Calculus to Dynamics of Particles, Fields and](#)

[Media](#)

Journals

[Fractals](#)

[Communications in Nonlinear Science and Numerical Simulation](#)

Classical Papers

[Chaos, fractional kinetics, and anomalous transport](#)

Researchers & Groups

[Bruce J. West](#)

Special Issue: Call for Papers

Fractional Differential Equations (2012)

(Update information by Prof. Fawang Liu)

Call for Papers

In recent years, a growing number of works by many authors from various fields of science and engineering deal with dynamical systems described by fractional differential equations. Fractional differential equations are generalization of ordinary differential equations to arbitrary (noninteger) order. Fractional differential equations capture nonlocal relations in space and time with power law memory kernels. Due to extensive applications in engineering and science, research in fractional differential equations has become intense around the world.

We invite authors to present original research articles as well as review articles in the area of fractional differential equations and their applications. This special issue will become an international forum for researchers to present the most recent developments and ideas in the field. Potential topics include, but are not limited to:

- **Mathematical modeling of fractional dynamic systems**
- **Analytical and numerical methods to solve these equations**
- **Fractional image processing**
- **Anomalous diffusion**
- **Theorem of fractional difference equations**
- **Fractional model of viscoelastic damping**
- **Fractional controller design and system identification**
- **Stability analysis of fractional systems**
- **Nonlinear and stochastic fractional dynamic systems**
- **Fractional models and their experimental verifications**
- **Applications of fractional models to engineering systems**
- **Fractional models in geophysics**
- **Fractional random fields**

- **Probabilistic solutions of FDE**
- **Fractional dynamics and control**

Before submission authors should carefully read over the journal's Author Guidelines, which are located at <http://www.hindawi.com/journals/ijde/guidelines/>. Prospective authors should submit an electronic copy of their complete manuscript through the journal Manuscript Tracking System at <http://mts.hindawi.com/> according to the following timetable:

Manuscript Due: Friday, 1 June 2012

First Round of Reviews: Friday, 24 August 2012

Publication Date: Friday, 19 October 2012

Lead Guest Editor

- Fawang Liu, School of Mathematical Sciences, Queensland University of Technology, P.O. Box 2434, Brisbane, QLD 4001, Australia

Guest Editors

- Om P. Agrawal, Department of Mechanical Engineering and Energy Processes, Southern Illinois University, Carbondale, IL 62901, USA
- Shaher Momani, Department of Mathematics, The University of Jordan, Amman 11942, Jordan
- Nikolai N. Leonenko, School of Mathematics, Cardiff University, Cardiff CF2 4YH, UK
- Wen Chen, Department of Engineering Mechanics, Hohai University, Xikang Road No. 1, Nanjing 210098, China

[\[Back\]](#)

Conferences

The Extension of Early Registration

-The Fifth IFAC Symposium on Fractional Differentiation and Its Applications

May 14-17 2012, Hohai University, Nanjing, China

Website : <http://em.hhu.edu.cn/fda12/>

Dear FDA Colleagues,

As you know, the deadline for full paper and early registration (Feb.15) has passed. However some colleagues who have already submitted abstracts have yet to email us registration form. If you have done it, please ignore this email.

Following suggestions from our colleagues, we have extended this early registration deadline to 31 March. All participants including plenary and semi-plenary speakers, Sino-German Workshop participants are required to send your registration form to us before the end of March. Your early action will help us a lot to arrange the hotel and to plan the program as well as the other logistic issues.

All of registration form should be sent to email addresses: fda12@hhu.edu.cn or sun.fda2012@gmail.com. If you have not received acknowledgement after three days, please send email to the above-mentioned email-boxes again to avoid any temporary network problem.

We accept registration fee by bank transfer before the FDA12 and by credit card and cash on site during the FDA12.

If any further inquires, please feel free to contact us through the above email addresses.

Thanks again for your kind attention and participation!

Yours truly,

Prof. Wen Chen, Chair of Organization Committee

Prof. Dumitru Baleanu, Chair of Program Committee

Prof. Francesco Mainardi, Chair of Steering Committee

Prof. YangQuan Chen, Chair of Honors and Awards Committee

Prof. Ralf Metzler and Weihua Deng, Chairs of Sino-German Workshop on Fractional Dynamics

Website: <http://em.hhu.edu.cn/fda12/index.html>

[\[Back\]](#)

**4th International Conference on Computational Methods (ICCM2012), November
25-27, 2012, Gold Coast, Australia**

(Contributed by Prof. Fawang Liu)

Dear Colleagues:

I would like to draw your attention to a minisymposium on "Computational Methods for Fractional Differential Equations" which will take place at the 4th International Conference on Computational Methods (ICCM2012), November 25-27, 2012, Gold Coast, Australia (www.ICCM-2012.org).

As I will be chairing the minisymposium (MS-01), I am now soliciting papers to it. My goal is to make it as representative as possible of new computational methods and numerical analysis of fractional differential equations including finite difference method, finite element method, finite volume method, decomposition method, matrix method, meshless method, boundary element method, and their applications.

With interest I have seen some of your past work in this area. I would therefore be very happy if I could encourage you to take part in this symposium by submitting a paper.

All papers accepted for publication in the proceedings will be subject to a full peer review. Only paper registered and presented at the ICCM2012 will be included in the Proceedings. Selected papers presented in the Conference will be invited to be developed into a full journal paper for publication in a special issue of Applied Mathematical Modelling (SCI journal).

We are pleased to announce that ICCM2012 starts accepting submission of Abstract. Please find the details in the following website: http://www.iccm-2012.org/abstract_submissions.html . Please submit your abstract at your early convenience.

A complete 'Abstract Submission Form' should be also submitted together with your abstract. The Abstract template and Abstract submission form can be downloaded from the conference website. Hence, your Abstract submission should include:

1. Abstract (in PDF or WinWord format) (e.g., 'Gu_Abstract.pdf');
2. Completed 'Abstract_submission_form.xls' (e.g. 'Gu.xls'),.

Note: Our minisymposium ID is MS-01.

Submit the above two files to email: ICCM2012Au@gmail.com

Abstract submission deadline: April 30, 2012

Hoping for a positive answer, with best regards.

The 4th International Conference on Computational Methods (ICCM2012)

November 25-27, 2012, Gold Coast, Australia

www.ICCM-2012.org

Organizer

Queensland University of Technology

Deadlines*

Abstract submission due February 2012

Deadline for submitting abstracts April 30, 2012

Notification of acceptance of abstracts May 31, 2012

Registration Start July 1, 2012

Deadline for submitting full papers July 30, 2012

Notification of acceptance of full papers August 31, 2012

Early registration due September 9, 2012

Deadline for registration of authors October 15, 2012

Minisymposia

MS-01: Computational Methods of Fractional Differential Equations.

Track Chair:

Professor Fawang Liu, Emailbox: f.liu@qut.edu.au

Professor Ian Turner, Emailbox: i.turner@qut.edu.au

[\[Back\]](#)

Books

Electromagnetic Fields and Waves in Fractional Dimensional Space

Muhammad Zubair, Muhammad Junaid Mughal, Qaisar Abbas Naqvi

<http://www.springer.com/engineering/electronics/book/978-3-642-25357-7>

This book presents the concept of fractional dimensional space applied to the use of electromagnetic fields and waves. It demonstrates the advantages in studying the behavior of electromagnetic fields and waves in fractal media.

The book presents novel fractional space generalization of the differential electromagnetic equations as well as a new form of vector differential operators in fractional space. Using these modified vector differential operators, the classical Maxwell's electromagnetic equations are worked out. The Laplace's, Poisson's and Helmholtz's equations in fractional space are derived by using modified vector differential operators.

Keywords: Helmholtz equations - Laplace equation - Maxwell equations - Poisson equations - radiation by a Hertzian dipole - radiation in fractal structures - scattering in fractal structures - vector wave equation in fractional space

Related subjects: Electronics & Electrical Engineering - Optics & Lasers - Theoretical, Mathematical & Computational Physics

Table of contents

- Introduction

- Differential Electromagnetic Equations in Fractional Space Potentials for Static and Time-Varying Fields in Fractional Space
- Electromagnetic Wave Propagation in Fractional Space
- Electromagnetic Radiations from Sources in Fractional Space
- Conclusions

[\[Back\]](#)

Fractional Dynamics

- Applications of Fractional Calculus to Dynamics of Particles, Fields and Media

Vasily E. Tarasov

- Describes modern approaches and new results in fractional dynamics
- Both self-contained and can be used as a teaching resource in fractional calculus and theory of fractals
- Describes some modern applications of fractional calculus to complex physical systems and new results of recent years

"Fractional Dynamics: Applications of Fractional Calculus to Dynamics of Particles, Fields and Media" presents applications of fractional calculus, integral and differential equations of non-integer orders in describing systems with long-time memory, non-local spatial and fractal properties. Mathematical models of fractal media and distributions, generalized dynamical systems and discrete maps, non-local statistical mechanics and kinetics, dynamics of open quantum systems, the hydrodynamics and electrodynamics of complex media with non-local properties and memory are considered. This book is intended to meet the needs of scientists and graduate students in physics, mechanics and applied mathematics who are interested in electrodynamics, statistical and condensed matter physics, quantum dynamics, complex media theories and kinetics, discrete maps and lattice models, and nonlinear dynamics and chaos. Dr. Vasily E. Tarasov is a Senior Research Associate at Nuclear Physics Institute of Moscow State University and an Associate Professor at Applied Mathematics and Physics Department of Moscow Aviation Institute.

Keywords: Fractional Calculus - Fractional Dynamics - Long-range Dynamical Systems

Related subjects: Applications - Complexity - Computational Intelligence and Complexity - Mathematics - Theoretical, Mathematical & Computational Physics

Contents:

- Fractional Models of Fractal Distributions of Particles
- Fractional Dynamics and Long-Range Interactions
- Fractional Dynamics of Particles and Fields
- Fractional Temporal Dynamics
- Fractional Quantum Dynamics

[\[Back\]](#)

Journals

Fractals

Volume 20, Issue 1 (2012)

THE EMERGENCE OF AFTER-SALES SPARE PARTS SUPPLY CHAIN VARIABILITY IN A TELECOM FIRM — A COMPLEX SYSTEM APPROACH

Mauricio Flores-Cadena, Oswaldo Morales-Matamoros, Ricardo Tejeida-Padilla, Isaías Badillo-Piña and Juan De La Cruz Mejía -Téllez

NONLINEARITY AND CHAOS IN 8B SOLAR NEUTRINO FLUX SIGNALS FROM SUDBURY NEUTRINO OBSERVATORY

Mofazzal H. Khondekar, Dipendra N. Ghosh, Koushik Ghosh and Anup Kumar Bhattacharya

MULTIFRACTALITY OF RADON CONCENTRATION FLUCTUATION IN EARTHQUAKE RELATED SIGNAL

Dipak Ghosh, Argha Deb, Srimonti Dutta, Rosalima Sengupta and Shukla Samanta

CRYPTANALYSIS ON SECURE FRACTAL IMAGE CODING BASED ON FRACTAL PARAMETER ENCRYPTION

Ching-Hung Yuen and Kwok-Wo Wong

COLORFUL SYMMETRIC IMAGES IN THREE-DIMENSIONAL SPACE FROM DYNAMICAL SYSTEMS

Jian Lu, Yuru Zou, Zeyi Liu and Wenxia Li

EXAMPLES OF USING BINARY CANTOR SETS TO STUDY THE CONNECTIVITY OF SIERPIŃSKI RELATIVES

T. D. Taylor, C. Hudson and A. Anderson

HAUSDORFF MEASURE OF CARTESIAN PRODUCT OF THE TERNARY CANTOR SET

Juan Deng, Huirao and Zhi-Ying Wen

SELF-SIMILAR BEHAVIOR IN SEMICONDUCTOR SUPERLATTICES

Juan C. Castro-Palacio, Francisco R. Villatoro, Omel Memdoza-Yero, Luisberis Velázquez-Abad and Juan A. Monsoriu

ANNIHILATIVE FRACTALS FORMED IN RAYLEIGH-TAYLOR INSTABILITY

Michiko Shimokawa and Shonosuke Ohta

INTERSECTIONS OF CERTAIN DELETED DIGITS SETS

Steen Pedersen and Jason D. Phillips

[\[Back\]](#)

Communications in Nonlinear Science and Numerical Simulation

Volume 17, Issue 8, (April 2012)

Global asymptotic stability of a stochastic Lotka–Volterra model with infinite delays

Meng Liu, Ke Wang

Note on unsteady viscous flow on the outside of an expanding or contracting cylinder

Tiegang Fang, Ji Zhang, Yongfang Zhong

[Analysis of nonlinear integral equations with Erdélyi–Kober fractional operator](#)

JinRong Wang, XiWang Dong, Yong Zhou

[Ibragimov-type invariants for a system of two linear parabolic equations](#)

F.M. Mahomed, M. Safdar, J. Zama

[Positive solutions of singular Caputo fractional differential equations with integral boundary conditions](#)

Zhongli Wei, Changci Pang, Youzheng Ding

[A fourth-order split-step pseudospectral scheme for the Kuramoto–Tsuzuki equation](#)

Xuanchun Dong

[On the existence of maximal \$\omega\$ -limit sets for dendrite maps](#)

Zdeněk Kočan, Veronika Kurková, Michal Málek

[Conditional symmetries and exact solutions of nonlinear reaction–diffusion systems with non-constant diffusivities](#)

Roman Cherniha, Vasyl' Davydovych

[Integrability aspects and soliton solutions for an inhomogeneous nonlinear system with symbolic computation](#)

Rui Guo, Bo Tian

[Interaction of solitary waves for the generalized KdV equation](#)

Martin G. Garcia Alvarado, Georgii A. Omel'yanov

[Flow through an oscillating rectangular duct for generalized Maxwell fluid with fractional derivatives](#)

Mudassar Nazar, Muhammad Zulqarnain, Muhammad Saeed Akram, Muhammad Asif

[Analytical solutions of laminar swirl decay in a straight pipe](#)

Shanshan Yao, Tiegang Fang

[Conservation laws, bright matter wave solitons and modulational instability of nonlinear Schrödinger equation with time-dependent nonlinearity](#)

Shou-Fu Tian, Li Zou, Qi Ding, Hong-Qing Zhang

[Almost periodic solutions of shunting inhibitory cellular neural networks on time scales](#)

Yongkun Li, Chao Wang

[Design and statistical analysis of a new chaotic block cipher for Wireless Sensor Networks](#)

Yanbing Liu, Simei Tian, Wenping Hu, Congcong Xing

[Effect of the phase on the dynamics of a perturbed bouncing ball system](#)

Sijo K. Joseph, Inés P. Mariño, Miguel A.F. Sanjuán

[Steganographic algorithm based on a chaotic map](#)

Ali Kanso, Hala S. Own

[On the security analysis of an image scrambling encryption of pixel bit and its improved scheme based on self-correlation encryption](#)

Liang Zhao, Avishek Adhikari, Di Xiao, Kouichi Sakurai

[Symbolic computation of normal form for Hopf bifurcation in a retarded functional differential equation with unknown parameters](#)

Li Zhang, Huailei Wang, Haiyan Hu

[Dynamic soft variable structure control of singular systems](#)

Yunlong Liu, Caihong Zhang, Cunchen Gao

[Adaptive open-plus-closed-loop method of projective synchronization in drive-response dynamical networks](#)

Hongyue Du

[Existence of periodic solutions for a predator–prey system with sparse effect and functional response on time scales](#)

Yu Tong, Zhenjie Liu, Zhiying Gao, Yonghong Wang

[Adaptive control of uncertain nonlinear systems using mixed backstepping and Lyapunov redesign techniques](#)

Ghazal Montaseri, Mohammad Javad Yazdanpanah

[Stochastic equilibria control and chaos suppression for 3D systems via stochastic sensitivity synthesis](#)

Irina Bashkirtseva, Guanrong Chen, Lev Ryashko

[Projective lag synchronization of spatiotemporal chaos via active sliding mode control](#)

Yuan Chai, Li-Qun Chen

[An improved robust delay-dependent stability criterion for genetic regulatory networks with interval time delays](#)

J.H. Koo, D.H. Ji, S.C. Won, Ju H. Park

[High order sliding-mode control for uncertain nonlinear systems with relative degree three](#)

Rui Ling, Meirong Wu, Yan Dong, Yi Chai

[Synchronization control for the competitive complex networks with time delay and stochastic effects](#)

Wuneng Zhou, Tianbo Wang, Jinping Mou

[Numerical bifurcation analysis of static stall of airfoil and dynamic stall under unsteady perturbation](#)

Yan Liu, Kailun Li, Jiazhong Zhang, Hang Wang, Liguang Liu

[Vibrational resonance in biological nonlinear maps](#)

S. Rajasekar, Javier Used, Alexandre Wagemakers, M.A.F. Sanjuan

[Modeling and passivity analysis of nonholonomic Hamiltonian systems with rheonomous affine constraints](#)

Tatsuya Kai

[Comment on: "Topology identification and adaptive synchronization of uncertain complex networks with adaptive double scaling functions" \[Commun Nonlinear Sci Numer Simul 2011;16:3337-43\]](#)

Zhiyong Sun, Gangquan Si

[\[Back\]](#)

Classical Papers

Chaos, fractional kinetics, and anomalous transport

G.M. Zaslavsky

Publication information: G.M. Zaslavsky. Chaos, fractional kinetics, and anomalous transport. Physics Reports 371 (2002) 461-580.

Chaotic dynamics can be considered as a physical phenomenon that bridges the regular evolution of systems with the random one. These two alternative states of physical processes are, typically, described by the corresponding alternative methods: quasiperiodic or other regular functions in the first case, and kinetic or other probabilistic equations in the second case. What kind of kinetics should be for chaotic dynamics that is intermediate between completely regular (integrable) and completely random (noisy) cases? What features of the dynamics and in what way should they be represented in the kinetics of chaos? These are the subjects of this paper, where the new concept of fractional kinetics is reviewed for systems with Hamiltonian chaos. Particularly, we show how the notions of dynamical quasi-traps, Poincaré recurrences, Levy flights, exit time distributions, phase space topology prove to be important in the construction of kinetics. The concept of fractional kinetics enters a different area of applications, such as particle dynamics in different potentials, particle advection in fluids, plasma physics and fusion devices, quantum optics, and many others. New characteristics of the kinetics are involved to fractional kinetics and the most important are anomalous transport, superdiffusion, weak mixing, and others. The fractional kinetics does not look as the usual one since some moments of the distribution function are infinite and fluctuations from the equilibrium state do not have any finite time of relaxation. Different important physical phenomena: cooling of particles and signals, particle and wave traps, Maxwell's Demon, etc. represent some domains where fractional kinetics proves to be valuable.

[\[Back\]](#)

Researchers & Groups

Bruce J. West

Chief Scientist Mathematical & Information Science, U.S. Army Research Office

(Part of information comes from Website:
<http://www.frontiersin.org/people/brucewest/10027/profile>)

Dr. Bruce J. West graduated SUNY at Buffalo with a B.A. in Physics in 1965 and the University of Rochester with a Ph D in physics in 1970; was Associate Director and later Director of a small private research institute (La Jolla Institute) for almost twenty years; a university professor for a decade and department chair for four of those (University of North Texas); and finally Chief Scientist in Mathematics at the Army Research Office for the past twelve years. Dr. West has over 350 publications of various kinds including 12 books with over 10,000 citations; has an h-factor of 45; and has received multiple academic and government awards for his research and publications.

Contact Information

U.S. Army Research Office, Research Triangle Park, Mathematical & Information Sciences, USA,
bruce.j.west@us.army.mil

Duke University Physics Durham, NC, USA,
bwest@nc.rr.com

Professional Expertise: mathematical modeling, fractals, fractional calculus, stochastic processes, psychophysics, biophysics, physics, nonlinear dynamics, chaos, data processing

Research Interests

The mathematical and physical modeling of complex adaptive phenomena, from physical processes whose evolution cannot be described by differential equations of motion, to biomedical phenomena.

The applications of discontinuous statistical processes (Levy distributions) to all manner of phenomena including quantum chaos, non-equilibrium statistical physics and the statistics of biomedical time series.

The development of the fractional calculus for the study of stochastic processes for which the evolution of the probability density cannot be described by a partial differential equation, but requires a fractional propagation-transport equation.

Positions

Jun 1999 - Current Senior Scientist, U.S. Army Research Office (Research) Durham, USA

Sep 1989 - Jun 1999 Professor of Physics/Department Chair, University of North Texas (Educational Services), Physics Department Denton, USA

Jan 1976 - Sep 1989 Research Scientist, Associate Director, Director, The La Jolla Institute (Research) Division for Studies of Nonlinear Dynamics, La Jolla, USA

Honors & Awards

Army Research and Development Achievement Award 2010, Awarding Authority: Department of the Army

For initiating and developing the Army wide program in Network Science

Army Research Laboratory Publication Award 2010, Awarding Authority: Department of the Army
For innovative research on Network Science and the publication of a seminal paper on the Principle of Complexity Matching

Professional of the Year in Applied Physical Science & Mathematics Industry 2009, Awarding Authority: Cambridge Publishing

Chair of the Army ST Corps 2009, Awarding Authority: Department of the Army
Elected chair of the prestigious group of senior Army scientists and engineers

Outstanding Referee Award 2009, Awarding Authority: American Physical Society

Army Research Laboratory Publication Award 2003, Awarding Authority: Department of the Army
For his groundbreaking book Physics of Fractal Operators

Commendation for excellence in research 2000, Awarding Authority: Department of the Army

Decker Scholar Award 1994, Awarding Authority: University of North Texas
For excellence in research

President's Award 1993, Awarding Authority: University of North Texas
For leading the scientific development of the University of North Texas campus

Journal Editorship

Editor-in-Chief of Nonlinear Physical Phenomena in the Life Sciences 1990-present
Associated Editor of the international journal Fractals 1990 – present

Books

Bruce J. West, Where Medicine Went Wrong: Rediscovering the Path to Complexity. World Scientific, Singapore, 2006

Bruce J. West & L. Griffin, Biodynamics; why the wirewalker doesn't fall, Wiley & Sons, New York 2004

Bruce J. West, M. Bologna and P. Grigolini, *The Physics of Fractal Operators*, Springer-Verlag, New York 2003

Selected Publications

B.J. West, E.L. Geneston and P. Grigolini, “Maximizing information exchange between complex networks”, to appear in *Physics Reports* (2008).

B.J. West, “Fractal physiology and the fractional calculus: a perspective”, *Frontiers in physiology* (2010)

B.J. West, M. Latka, “Fractional Langevin model of gait variability”, *Journal of neuroengineering and rehabilitation*, 10.1186/1743-0003-2-24, Aug (2005)

B.J. West and P. Grigolini, “Sun-climate complexity linking”, *Phys. Rev. Lett.* 100, 088501 (2008).

N. Scafetta and B.J. West, “Is climate sensitive to solar variability?”, *Phys. Today*, March, pg.50 (2008).

Bruce J. West, A. Maciejewski, M. Latka, T. Sebzda and Z. Swierczynski, “Wavelet analysis of scaling properties of gastric electrical activity”, *J. Applied Physiol.* 101, 1425-1431, 2006

N. Scafetta and Bruce J. West, “Phenomenological soar contribution to the 1900-2000 global surface warming”, *Geophysical Research Letters* **33**, L05708, 10.1029/2005GL025539, 2006.

Bruce J. West and M. Latka, “Fractional Langevin Model of Gait Variability”, *J. Neuroengineering and Rehabilitation* 2:24, 2005

Bruce J. West, L.A. Griffin, H.J. Frederick, and R.E. Moon, “The Independently Fractal Nature of Respiration and Heart Rate During Exercise Under Normobaric and Hyperbaric Conditions”, *Respiratory Physiology & Neurobiology* 145, 219-233, 2005

N. Scafetta and Bruce J. West, “Multiscaling Comparative Analysis of Time Series and Geophysical Phenomena”, *Complexity* 10, 1-5, 2005

[\[Back\]](#)
