PHYSICAL REVIEW E

For editorial and subscription correspondence, please see inside front cover
(ISSN: 1539-3755)

PERIODICALS
Postmaster send address changes to:
APS Subscription Services
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 79, NUMBER 5 *CONTENTS* **MAY 2009**

PART 2: NONLINEAR AND PLASMA PHYSICS, FLUID DYNAMICS, AND RELATED TOPICS

RAPID COMMUNICATIONS

Interdisciplinary physics

Diversity of rationality affects the evolution of cooperation *(4 pages)* . . . . . 055101(R)
Yu-Zhong Chen, Zi-Gang Huang, Sheng-Jun Wang, Yan Zhang, and Ying-Hai Wang

Chaos and pattern formation

Completely inelastic ball *(4 pages)* . . . . . 055201(R)
T. Gilet, N. Vandewalle, and S. Dorbolo

Experimental approach to the study of complex network synchronization using a single oscillator *(4 pages)* . . . . . 055202(R)
A. N. Pisarchik, R. Jaimes-Reátegui, R. Sevilla-Escoboza, and S. Boccaletti

Globally clustered chimera states in delay-coupled populations *(4 pages)* . . . . . 055203(R)
Jane H. Sheeba, V. K. Chandrasekar, and M. Lakshmanan

Fluid dynamics

Anomalous scaling of three-dimensional Rayleigh-Taylor turbulence *(4 pages)* . . . . . 055301(R)
Takeshi Matsumoto

Plasma physics

Dust-acoustic shock waves due to strong correlation among arbitrarily charged dust *(4 pages)* . . . . . 055401(R)
A. A. Mamun and R. A. Cairns

ARTICLES

Interdisciplinary physics

Master-equation analysis of accelerating networks *(6 pages)* 056101
David M. D. Smith, Jukka-Pekka Onnela, and Nick S. Jones

Maximizing influence propagation in networks with community structure *(7 pages)* 056102
Aram Galstyan, Vahe Musoyan, and Paul Cohen

Copyright 2009 by The American Physical Society

(Continued)

1539-3755(200905)79:5:2;1-1

PHYSICAL REVIEW E THIRD SERIES, VOLUME 79, NUMBER 5 MAY 2009

Diameter of basalt columns derived from fracture mechanics bifurcation analysis *(9 pages)* 056103
H.-A. Bahr, M. Hofmann, H.-J. Weiss, U. Bahr, G. Fischer, and H. Balke

Functional clustering algorithm for the analysis of dynamic network data *(9 pages)* 056104
S. Feldt, J. Waddell, V. L. Hetrick, J. D. Berke, and M. Żochowski

Queue-length synchronization in communication networks *(13 pages)* 056105
Satyam Mukherjee and Neelima Gupte

Emergence of loop structure in scale-free networks and dynamical consequences *(6 pages)* 056106
Xiaojuan Ma, Liang Huang, Ying-Cheng Lai, and Zhigang Zheng

Diversity-optimized cooperation on complex networks *(7 pages)* 056107
Han-Xin Yang, Wen-Xu Wang, Zhi-Xi Wu, Ying-Cheng Lai, and Bing-Hong Wang

Ultradiscrete optimal velocity model: A cellular-automaton model for traffic flow and linear instability of high-flux traffic *(8 pages)* 056108
Masahiro Kanai, Shin Isojima, Katsuhiro Nishinari, and Tetsuji Tokihiro

Statistical analysis of the overnight and daytime return *(7 pages)* 056109
Fengzhong Wang, Shwu-Jane Shieh, Shlomo Havlin, and H. Eugene Stanley

Waiting time dynamics of priority-queue networks *(5 pages)* 056110
Byungjoon Min, K.-I. Goh, and I.-M. Kim

Approximating the largest eigenvalue of the modified adjacency matrix of networks with heterogeneous node biases *(6 pages)* 056111
Edward Ott and Andrew Pomerance

Topological transition in dynamic complex networks *(8 pages)* 056112
Nobuharu Kami and Hideo Ikeda

Self-sustained nonlinear waves in traffic flow *(13 pages)* 056113
M. R. Flynn, A. R. Kasimov, J.-C. Nave, R. R. Rosales, and B. Seibold

Lévy-like diffusion in eye movements during spoken-language comprehension *(6 pages)* 056114
Damian G. Stephen, Daniel Mirman, James S. Magnuson, and James A. Dixon

Critical behavior of the contact process in annealed scale-free networks *(8 pages)* 056115
Jae Dong Noh and Hyunggyu Park

Chaos and pattern formation

Behavior of the current in the asymmetric quantum multibaker map *(8 pages)* 056201
Leonardo Ermann, Gabriel G. Carlo, and Marcos Saraceno

Optimal Markov approximations and generalized embeddings *(11 pages)* 056202
Detlef Holstein and Holger Kantz

Stationary pattern formation in a discrete excitable system with strong inhibitory coupling *(5 pages)* 056203
Naoko Kurata, Hiroyuki Kitahata, Hitoshi Mahara, Atsushi Nomura, Hidetoshi Miike, and Tatsunari Sakurai

Intermittent outgassing through a non-Newtonian fluid *(10 pages)* 056204
Thibaut Divoux, Eric Bertin, Valérie Vidal, and Jean-Christophe Géminard

Nontrivial spontaneous synchronization *(9 pages)* 056205
R. Sumi, Z. Néda, A. Tunyagi, Sz. Boda, and Cs. Szász

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 79, NUMBER 5** **MAY 2009**

Anticipatory synchronization with variable time delay and reset *(11 pages)* 056206
G. Ambika and R. E. Amritkar

Synchronization of networks of chaotic units with time-delayed couplings *(4 pages)* 056207
W. Kinzel, A. Englert, G. Reents, M. Zigzag, and I. Kanter

Modeling dynamics from only output data *(12 pages)* 056208
Evan Monroig, Kazuyuki Aihara, and Yozo Fujino

Closer look at time averages of the logistic map at the edge of chaos *(6 pages)* 056209
Ugur Tirnakli, Constantino Tsallis, and Christian Beck

Onset of colored-noise-induced synchronization in chaotic systems *(8 pages)* 056210
Yan Wang, Ying-Cheng Lai, and Zhigang Zheng

Delocalization of wave packets in disordered nonlinear chains *(12 pages)* 056211
Ch. Skokos, D. O. Krimer, S. Komineas, and S. Flach

Dynamical properties of an harmonic oscillator impacting a vibrating wall *(6 pages)* 056212
O. F. de Alcantara Bonfim

Spontaneously periodic wave generation in coupled excitable media *(9 pages)* 056213
Lei Zhang, Shengli Zhang, Huimin Tong, Dongsheng Lei, and Bambi Hu

Transition zone in controlling spatiotemporal chaos *(4 pages)* 056214
Jihua Gao, Lingling Xie, Wei Zou, and Meng Zhan

Detection of barriers to cross-jet Lagrangian transport and its destruction in a meandering flow *(11 pages)* . . . 056215
M. V. Budyansky, M. Yu. Uleysky, and S. V. Prants

Galerkin analysis of light-induced patterns in the chlorine dioxide–iodine–malonic acid reaction-diffusion system *(6 pages)* 056216
Pushpita Ghosh, Shrabani Sen, Syed Shahed Riaz, and Deb Shankar Ray

Semiclassical theory of nonlocal statistical measures: Residual Coulomb interactions *(20 pages)* 056217
Denis Ullmo, Steven Tomsovic, and Arnd Bäcker

Monte Carlo method for adaptively estimating the unknown parameters and the dynamic state of chaotic systems *(9 pages)* 056218
Inés P. Mariño, Joaquín Míguez, and Riccardo Meucci

Traveling excitable waves successively generated in a nonlinear proliferation system *(13 pages)* 056219
Kenta Odagiri and Kazuo Takatsuka

Soliton dynamics at an interface between a uniform medium and a nonlinear optical lattice *(7 pages)* 056220
Fatkhulla Kh. Abdullaev, Ravil M. Galimzyanov, Marijana Brtka, and Lauro Tomio

Pressure oscillations in a chemical garden *(8 pages)* 056221
J. Pantaleone, A. Toth, D. Horvath, L. RoseFigura, W. Morgan, and J. Maselko

Deformed Gaussian-orthogonal-ensemble description of small-world networks *(5 pages)* 056222
J. X. de Carvalho, Sarika Jalan, and M. S. Hussein

Statistics of Schmidt coefficients and the simulability of complex quantum systems *(4 pages)* 056223
Hannah Venzl, Andrew J. Daley, Florian Mintert, and Andreas Buchleitner

Emergence of dissipative structures in current-carrying superconducting wires *(11 pages)* 056224
G. A. Levin, P. N. Barnes, J. P. Rodriguez, J. A. Connors, and J. S. Bulmer

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 79, NUMBER 5 MAY 2009

Anomalous scaling on a spatiotemporally chaotic attractor *(5 pages)* 056225
Ralf W. Wittenberg and Ka-Fai Poon

Wave propagation through Cantor-set media: Chaos, scaling, and fractal structures *(13 pages)* 056226
Kenta Esaki, Masatoshi Sato, and Mahito Kohmoto

Fluid dynamics

Lagrangian studies in convective turbulence *(13 pages)* 056301
Jörg Schumacher

Monte Carlo simulation of thermal fluctuations below the onset of Rayleigh-Bénard convection *(5 pages)* 056302
Jun Zhang and Jing Fan

Anomalous scaling and anisotropy in models of passively advected vector fields *(14 pages)* 056303
Heikki Arponen

Cascades, thermalization, and eddy viscosity in helical Galerkin truncated Euler flows *(5 pages)* 056304
G. Krstulovic, P. D. Mininni, M. E. Brachet, and A. Pouquet

Inclined layer Soret instabilities *(6 pages)* 056305
A. Zebib and M. M. Bou-Ali

Intermittent dynamics in transient polymer networks under shear: Signs of self-organized criticality *(5 pages)* 056306
Joris Sprakel, Evan Spruijt, Martien A. Cohen Stuart, Matthias A. J. Michels, and Jasper van der Gucht

Chiral sedimentation of extended objects in viscous media *(14 pages)* 056307
Nathan W. Krapf, Thomas A. Witten, and Nathan C. Keim

Number of degrees of freedom of two-dimensional turbulence *(7 pages)* 056308
Chuong V. Tran and Luke Blackbourn

Elemental transport coefficients in viscous plasma flows near local thermodynamic equilibrium *(9 pages)* 056309
Alessio Orsini and Elena V. Kustova

Suppression of instabilities in multiphase flow by geometric confinement *(5 pages)* 056310
Katherine J. Humphry, Armand Ajdari, Alberto Fernández-Nieves, Howard A. Stone, and David A. Weitz

Friction factor for turbulent flow in rough pipes from Heisenberg's closure hypothesis *(7 pages)* 056311
Esteban Calzetta

Time correlation functions in a similarity approximation for one-dimensional turbulence *(7 pages)* 056312
Makoto Okamura and Hazime Mori

Nonlinear traveling waves in a multilayer system *(7 pages)* 056313
Ilya B. Simanovskii

Stochastic dynamics of micron-scale doubly clamped beams in a viscous fluid *(8 pages)* 056314
M. M. Villa and M. R. Paul

Plasma physics

Pattern dynamics and spatiotemporal chaos in the quantum Zakharov equations *(6 pages)* 056401
A. P. Misra and P. K. Shukla

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 79, NUMBER 5 MAY 2009

Cylindrical and spherical ion-acoustic envelope solitons in multicomponent plasmas with positrons *(6 pages)* 056402
R. Sabry, W. M. Moslem, P. K. Shukla, and H. Saleem

Correlation effects on the temperature-relaxation rates in dense plasmas *(14 pages)* 056403
Jérôme Daligault and Guy Dimonte

Implosion dynamics and x-ray generation in small-diameter wire-array *Z* pinches *(13 pages)* 056404
V. V. Ivanov, V. I. Sotnikov, J. M. Kindel, P. Hakel, R. C. Mancini, A. L. Astanovitskiy, A. Haboub, S. D. Altemara, A. P. Shevelko, E. D. Kazakov, and P. V. Sasorov

Tracking propagation of ultrashort intense laser pulses in gases via probing of ionization *(6 pages)* 056405
L. A. Gizzi, S. Betti, M. Galimberti, A. Giulietti, D. Giulietti, L. Labate, T. Levato, P. Tomassini, P. Monot, T. Ceccotti, P. De Oliveira, and Ph. Martin

Wave-breaking limits for nonquasistatic oscillations in a warm one-dimensional electron plasma *(4 pages)* 056406
R. M. G. M. Trines

Classical physics

Strain waves, earthquakes, slow earthquakes, and afterslip in the framework of the Frenkel-Kontorova model *(13 pages)* 056601
N. I. Gershenzon, V. G. Bykov, and G. Bambakidis

Darboux transformation for a generalized Hirota-Satsuma coupled Korteweg–de Vries equation *(9 pages)* 056602
Xianguo Geng, Hongfeng Ren, and Guoliang He

Generalized optical theorem for surface waves and layered media *(10 pages)* 056603
David Halliday and Andrew Curtis

Collapse and folding of pressurized rings in two dimensions *(17 pages)* 056604
Eleni Katifori, Silas Alben, and David R. Nelson

Painlevé-integrability of a (2+1)-dimensional reaction-diffusion equation: Exact solutions and their interactions *(10 pages)* 056605
Kuetche Kamgang Victor, Bouetou Bouetou Thomas, and Timoleon Crepin Kofane

Nonlinear layered lattice model and generalized solitary waves in imperfectly bonded structures *(14 pages)* 056606
Karima R. Khusnutdinova, Alexander M. Samsonov, and Alexey S. Zakharov

Bi-Hamiltonian representation of Stäckel systems *(9 pages)* 056607
Maciej Błaszak

Enhancement of nonlinear effects at the degenerate band edge of two-dimensional photonic crystals *(10 pages)* 056608
M. Astic, Ph. Delaye, R. Frey, and G. Roosen

Longitudinal oscillations and flights of the string pendulum driven by a periodic force *(7 pages)* 056609
A. Arinstein

Engineering integrable nonautonomous nonlinear Schrödinger equations *(9 pages)* 056610
Xu-Gang He, Dun Zhao, Lin Li, and Hong-Gang Luo

Discrete Lange-Newell criterion for dissipative systems *(7 pages)* 056611
Fabien II Ndzana, Alidou Mohamadou, and Timoleon Crépin Kofané

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 79, NUMBER 5 MAY 2009

Computational physics

Theoretical considerations on the free-surface role in the smoothed-particle-hydrodynamics model *(13 pages)* 056701
Andrea Colagrossi, Matteo Antuono, and David Le Touzé

Computation of the response functions of spiral waves in active media *(10 pages)* 056702
I. V. Biktasheva, D. Barkley, V. N. Biktashev, G. V. Bordyugov, and A. J. Foulkes

Two-fluid approach for direct numerical simulation of particle-laden turbulent flows at small Stokes numbers *(8 pages)* 056703
Babak Shotorban and S. Balachandar

Acceleration of quantum optimal control theory algorithms with mixing strategies *(7 pages)* 056704
Alberto Castro and E. K. U. Gross

Numerical solutions of the time-dependent Schrödinger equation: Reduction of the error due to space discretization *(6 pages)* 056705
Hezhu Shao (邵和助) and Zhongcheng Wang (汪仲诚)

Rupture of a ferrofluid droplet in external magnetic fields using a single-component lattice Boltzmann model for nonideal fluids *(5 pages)* 056706
G. Falcucci, G. Chiatti, S. Succi, A. A. Mohamad, and A. Kuzmin

Smoothed particle hydrodynamic model for viscoelastic fluids with thermal fluctuations *(17 pages)* 056707
Adolfo Vázquez-Quesada, Marco Ellero, and Pep Español

Lattice Uehling-Uhlenbeck Boltzmann-Bhatnagar-Gross-Krook hydrodynamics of quantum gases *(7 pages)* 056708
Jaw-Yen Yang and Li-Hsin Hung

Radiation boundary conditions for the numerical solution of the three-dimensional time-dependent Schrödinger equation with a localized interaction *(10 pages)* 056709
M. Heinen and H.-J. Kull

Enslaved phase-separation fronts in one-dimensional binary mixtures *(15 pages)* 056710
E. M. Foard and A. J. Wagner

Variance-reduced particle simulation of the Boltzmann transport equation in the relaxation-time approximation *(9 pages)* 056711
Gregg A. Radtke and Nicolas G. Hadjiconstantinou

BRIEF REPORTS

Interdisciplinary physics

Secant-hyperbolic instability in a reaction-diffusion system *(4 pages)* 057101
Shrabani Sen and Deb Shankar Ray

Phase reversal in the Selkov model with inhomogeneous influx *(4 pages)* 057102
A. I. Lavrova, L. Schimansky-Geier, and E. B. Postnikov

Chaos and pattern formation

Proposed central limit behavior in deterministic dynamical systems *(3 pages)* 057201
Peter Grassberger

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 79, NUMBER 5 MAY 2009

Using detrended fluctuation analysis for lagged correlation analysis of nonstationary signals *(4 pages)* 057202
Jose Alvarez-Ramirez, Eduardo Rodriguez, and Juan Carlos Echeverria

Plasma physics

Positive and negative streamers in air: Velocity-diameter relation *(4 pages)* 057401
G. V. Naidis

Computational physics

Relationship between Hirsch-Fye and weak-coupling diagrammatic quantum Monte Carlo methods *(4 pages)* 057701
K. Mikelsons, A. Macridin, and M. Jarrell

Distance of closest approach of two arbitrary hard ellipsoids *(4 pages)* 057702
Xiaoyu Zheng, Wilder Iglesias, and Peter Palffy-Muhoray

ERRATA

Erratum: Nanorheology of viscoelastic shells: Applications to viral capsids [Phys. Rev. E. **77**, 031921 (2008)] *(1 page)* . . . . . 059901(E)
Tatiana Kuriabova and Alex J. Levine