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 81, NUMBER 3 *CONTENTS* **MARCH 2010**

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

RAPID COMMUNICATIONS

Interdisciplinary physics

Dynamical and bursty interactions in social networks *(4 pages)* . . . . . 035101(R)
Juliette Stehlé, Alain Barrat, and Ginestra Bianconi

Cascade of elimination and emergence of pure cooperation in coevolutionary games on networks *(4 pages)* . . . . . 035102(R)
Wen-Xu Wang, Rui Yang, and Ying-Cheng Lai

Fluid dynamics

Turbulent spot evolution in spatially invariant boundary layers *(4 pages)* . . . . . 035301(R)
Jens H. M. Fransson

Laser-induced onset of electrospinning *(3 pages)* . . . . . 035302(R)
R. Sahay, C. J. Teo, and S. T. Thoroddsen

Aggregation–fragmentation processes and decaying three-wave turbulence *(4 pages)* . . . . . 035303(R)
Colm Connaughton and P. L. Krapivsky

Extreme fluctuations and the finite lifetime of the turbulent state *(3 pages)* . . . . . 035304(R)
Nigel Goldenfeld, Nicholas Guttenberg, and Gustavo Gioia

Plasma physics

Contour dynamics model for electric discharges *(4 pages)* . . . . . 035401(R)
M. Arrayás, M. A. Fontelos, and C. Jiménez

ARTICLES

Interdisciplinary physics

Structure and control of self-sustained target waves in excitable small-world networks *(8 pages)* 036101
Yu Qian, Xiaodong Huang, Gang Hu, and Xuhong Liao

Perturbation theory in a pure-exchange nonequilibrium economy *(7 pages)* 036102
Samuel E. Vázquez and Simone Severini

Copyright 2010 by The American Physical Society

(Continued)

1539-3755(201003)81:3:2;1-3

PHYSICAL REVIEW E THIRD SERIES, VOLUME 81, NUMBER 3 MARCH 2010

Modeling discrete combinatorial systems as alphabetic bipartite networks: Theory and applications *(12 pages)* 036103
Monojit Choudhury, Niloy Ganguly, Abyayananda Maiti, Animesh Mukherjee, Lutz Brusch, Andreas Deutsch, and Fernando Peruani

Reconstructing the Hopfield network as an inverse Ising problem *(7 pages)* 036104
Haiping Huang

Spanning traceroutes over modular networks and general scaling degree distributions *(5 pages)* 036105
Alberto Lovison, Gianmarco Manzini, Amos Maritan, Mario Putti, and Andrea Rinaldo

Modeling the morphogenesis of brine channels in sea ice *(10 pages)* 036106
B. Kutschan, K. Morawetz, and S. Gemming

Crystallization of classical multicomponent plasmas *(13 pages)* 036107
Zach Medin and Andrew Cumming

Role of adaptive migration in promoting cooperation in spatial games *(6 pages)* 036108
Luo-Luo Jiang, Wen-Xu Wang, Ying-Cheng Lai, and Bing-Hong Wang

Kinetic model for multidimensional opinion formation *(9 pages)* 036109
Laurent Boudin, Roberto Monaco, and Francesco Salvarani

Explosive percolation: A numerical analysis *(10 pages)* 036110
Filippo Radicchi and Santo Fortunato

Globally coupled chaotic maps and demographic stochasticity *(7 pages)* 036111
David A. Kessler and Nadav M. Shnerb

Effective usage of credit records promotes cooperation on weighted networks *(6 pages)* 036112
Chao Zhai, Hai-Tao Zhang, Yang Zhao, Michael Z. Q. Chen, Zhi-Hai Rong, and Bing-Hong Wang

Generalized connectivity between any two nodes in a complex network *(10 pages)* 036113
Francisco Aparecido Rodrigues and Luciano da Fontoura Costa

Methods for measuring the citations and productivity of scientists across time and discipline *(9 pages)* 036114
Alexander M. Petersen, Fengzhong Wang, and H. Eugene Stanley

Distinguishing the opponents promotes cooperation in well-mixed populations *(7 pages)* 036115
Lucas Wardil and Jafferson K. L. da Silva

Effects of periodic perturbations on the oscillatory behavior in the $NO+H_2$ reaction on Pt(100) *(11 pages)* . . . 036116
M. C. Lemos, A. Córdoba, and J. A. de la Torre

Scale-free models for the structure of business firm networks *(9 pages)* 036117
Maksim Kitsak, Massimo Riccaboni, Shlomo Havlin, Fabio Pammolli, and H. Eugene Stanley

Interacting epidemics on overlay networks *(10 pages)* 036118
Sebastian Funk and Vincent A. A. Jansen

Chaos and pattern formation

Route to noise-induced synchronization in an ensemble of uncoupled chaotic systems *(7 pages)* 036201
Yan Wang, Ying-Cheng Lai, and Zhigang Zheng

Correlated Wishart ensembles and chaotic time series *(17 pages)* 036202
Vinayak and Akhilesh Pandey

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 81, NUMBER 3** **MARCH 2010**

Modeling noise-induced resonance in an excitable system: An alternative approach *(5 pages)* 036203
Md. Nurujjaman

Excitation regeneration in delay-coupled oscillators *(5 pages)* 036204
B. Kelleher, C. Bonatto, P. Skoda, S. P. Hegarty, and G. Huyet

Quantum chaotic scattering in microwave resonators *(18 pages)* 036205
B. Dietz, T. Friedrich, H. L. Harney, M. Miski-Oglu, A. Richter, F. Schäfer, and H. A. Weidenmüller

Onset of quantum chaos in one-dimensional bosonic and fermionic systems and its relation to thermalization *(10 pages)* 036206
Lea F. Santos and Marcos Rigol

Detecting couplings between interacting oscillators with time-varying basic frequencies: Instantaneous wavelet bispectrum and information theoretic approach *(10 pages)* 036207
Janez Jamšek, Milan Paluš, and Aneta Stefanovska

Order and chaos in the rotation and revolution of a line segment and a point mass *(10 pages)* 036208
John F. Lindner, Jacob Lynn, Frank W. King, and Amanda Logue

Theoretical analysis of defect-mediated turbulence in a catalytic surface reaction *(7 pages)* 036209
Dagmar Krefting and Carsten Beta

Statistical approach to quantum chaotic ratchets *(6 pages)* 036210
Itzhack Dana

Taming turbulence in the complex Ginzburg-Landau equation *(5 pages)* 036211
Meng Zhan, Wei Zou, and Xu Liu

Transitions in eigenvalue and wavefunction structure in (1+2)-body random matrix ensembles with spin *(17 pages)* 036212
Manan Vyas, V. K. B. Kota, and N. D. Chavda

Google matrix, dynamical attractors, and Ulam networks *(9 pages)* 036213
D. L. Shepelyansky and O. V. Zhirov

Strict and fussy mode splitting in the tangent space of the Ginzburg-Landau equation *(6 pages)* 036214
Pavel V. Kuptsov and Ulrich Parlitz

Zero-lag synchronization and multiple time delays in two coupled chaotic systems *(12 pages)* 036215
Meital Zigzag, Maria Butkovski, Anja Englert, Wolfgang Kinzel, and Ido Kanter

Competition between suppression and production of Fermi acceleration *(5 pages)* 036216
Denis Gouvêa Ladeira and Edson D. Leonel

Biological algorithm for data reconstruction *(8 pages)* 036217
Daniel J. Cross, Ryan Michaluk, and Robert Gilmore

Nearest-neighbor distributions and tunneling splittings in interacting many-body two-level boson systems *(12 pages)* 036218
Saúl Hernández-Quiroz and Luis Benet

Anomalous decay of a prepared state due to non-Ohmic coupling to the continuum *(13 pages)* 036219
Itamar Sela, James Aisenberg, Tsampikos Kottos, Alex Elgart, and Doron Cohen

Nikolaevskiy equation with dispersion *(11 pages)* 036220
Eman Simbawa, Paul C. Matthews, and Stephen M. Cox

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 81, NUMBER 3 MARCH 2010

Google matrix and Ulam networks of intermittency maps *(7 pages)* 036221
L. Ermann and D. L. Shepelyansky

Quantum corrections to fidelity decay in chaotic systems *(14 pages)* 036222
Boris Gutkin, Daniel Waltner, Martha Gutiérrez, Jack Kuipers, and Klaus Richter

Fluid dynamics

High-speed rotary microvalves in water using hydrodynamic force due to induced-charge electrophoresis *(15 pages)* 036301
Hideyuki Sugioka

Waves in liquid films on vibrating substrates *(15 pages)* 036302
E. S. Benilov and M. Chugunova

Dynamical scaling and the finite-capacity anomaly in three-wave turbulence *(6 pages)* 036303
Colm Connaughton and Alan C. Newell

Minimal two-sphere model of the generation of fluid flow at low Reynolds numbers *(4 pages)* 036304
M. Leoni, B. Bassetti, J. Kotar, P. Cicuta, and M. Cosentino Lagomarsino

Secondary vortex street in the wake of two tandem circular cylinders at low Reynolds number *(9 pages)* 036305
Si-ying Wang, Fang-bao Tian, Lai-bing Jia, Xi-yun Lu, and Xie-zhen Yin

Chaotic mixer using electro-osmosis at finite Péclet number *(9 pages)* 036306
Hideyuki Sugioka

Numerical solutions of a generalized theory for macroscopic capillarity *(13 pages)* 036307
F. Doster, P. A. Zegeling, and R. Hilfer

Multiscale modeling and simulation for polymer melt flows between parallel plates *(13 pages)* 036308
Shugo Yasuda and Ryoichi Yamamoto

Bifurcation analysis in a vortex flow generated by an oscillatory magnetic obstacle *(7 pages)* 036309
Alberto Beltrán, Eduardo Ramos, Sergio Cuevas, and Morten Brøns

Low Reynolds number turbulence in nonlinear Maxwell-model fluids *(10 pages)* 036310
Chris Goddard, Ortwin Hess, and Siegfried Hess

Generation of ribbons, helicoids, and complex Scherk surfaces in laser-matter interactions *(11 pages)* 036311
S. Lugomer and Y. Fukumoto

Pumping by flapping in a viscoelastic fluid *(10 pages)* 036312
On Shun Pak, Thibaud Normand, and Eric Lauga

Two-dimensional point singularity model of a low-Reynolds-number swimmer near a wall *(7 pages)* 036313
Darren G. Crowdy and Yizhar Or

Steric effects of ions in the charge-related wetting phenomena *(10 pages)* 036314
C. K. Hua, I. S. Kang, K. H. Kang, and H. A. Stone

Droplet displacements and oscillations induced by ultrasonic surface acoustic waves: A quantitative study *(8 pages)* 036315
P. Brunet, M. Baudoin, O. Bou Matar, and F. Zoueshtiagh

Instability growth rates of crossing sea states *(7 pages)* 036316
F. E. Laine-Pearson

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 81, NUMBER 3 MARCH 2010

Dynamo onset as a first-order transition: Lessons from a shell model for magnetohydrodynamics *(8 pages)* 036317
Ganapati Sahoo, Dhrubaditya Mitra, and Rahul Pandit

Stability of evaporating water when heated through the vapor and the liquid phases *(14 pages)* 036318
Kausik S. Das, Brendan D. MacDonald, and C. A. Ward

Stress hysteresis as the cause of persistent holes in particulate suspensions *(7 pages)* 036319
Robert D. Deegan

Extreme multiplicity in cylindrical Rayleigh-Bénard convection. I. Time dependence and oscillations *(13 pages)* 036320
Katarzyna Borońska and Laurette S. Tuckerman

Extreme multiplicity in cylindrical Rayleigh-Bénard convection. II. Bifurcation diagram and symmetry classification *(18 pages)* 036321
Katarzyna Borońska and Laurette S. Tuckerman

Influence of counter-rotating von Kármán flow on cylindrical Rayleigh-Bénard convection *(16 pages)* 036322
Lyes Bordja, Laurette S. Tuckerman, Laurent Martin Witkowski, María Cruz Navarro, Dwight Barkley, and Rachid Bessaih

Building a reduced model for nonlinear dynamics in Rayleigh-Bénard convection with counter-rotating disks *(12 pages)* 036323
M. C. Navarro, L. Martin Witkowski, L. S. Tuckerman, and P. Le Quéré

Effect of volume ratio on thermocapillary flow in liquid bridges of high-Prandtl-number fluids *(7 pages)* 036324
Bo Xun, Kai Li, and Wen-Rui Hu

Steady-state existence of passive vector fields under the Kraichnan model *(8 pages)* 036325
Heikki Arponen

Role of long waves in the stability of the plane wake *(9 pages)* 036326
Stefania Scarsoglio, Daniela Tordella, and William O. Criminale

Kinetic Bhatnagar-Gross-Krook model for fast reactive mixtures and its hydrodynamic limit *(9 pages)* 036327
M. Bisi, M. Groppi, and G. Spiga

Extensional instability in electro-osmotic microflows of polymer solutions *(8 pages)* 036328
R. M. Bryce and M. R. Freeman

Plasma physics

Magnetic-field decay of three interlocked flux rings with zero linking number *(7 pages)* 036401
Fabio Del Sordo, Simon Candelaresi, and Axel Brandenburg

Exact relativistic kinetic theory of the full unstable spectrum of an electron-beam–plasma system with Maxwell-Jüttner distribution functions *(14 pages)* 036402
A. Bret, L. Gremillet, and D. Bénisti

X-ray Thomson scattering in warm dense matter at low frequencies *(15 pages)* 036403
Michael S. Murillo

Negative effective mass of wave-driven classical particles in dielectric media *(9 pages)* 036404
A. I. Zhmoginov, I. Y. Dodin, and N. J. Fisch

Dependence on pulse duration and foil thickness in high-contrast-laser proton acceleration *(5 pages)* 036405
A. Flacco, F. Sylla, M. Veltcheva, M. Carrié, R. Nuter, E. Lefebvre, D. Batani, and V. Malka

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 81, NUMBER 3 MARCH 2010

Relativistic quantum corrections to laser wakefield acceleration *(7 pages)* 036406
Jun Zhu and Peiyong Ji

Nonlinear wave propagation in strongly coupled dusty plasmas *(10 pages)* 036407
B. M. Veeresha, S. K. Tiwari, A. Sen, P. K. Kaw, and A. Das

Collimation of dense plasma jets created by low-energy laser pulses and studied with soft x-ray laser interferometry *(7 pages)* 036408
Michael A. Purvis, Jonathan Grava, Jorge Filevich, Duncan P. Ryan, Stephen J. Moon, James Dunn, Vyacheslav N. Shlyaptsev, and Jorge J. Rocca

Application of linear response theory to magnetotransport properties of dense plasmas *(8 pages)* 036409
J. R. Adams, H. Reinholz, and R. Redmer

X-ray polarization spectroscopy to study anisotropic velocity distribution of hot electrons produced by an ultra-high-intensity laser *(4 pages)* 036410
Y. Inubushi, Y. Okano, H. Nishimura, H. Cai, H. Nagatomo, T. Kai, T. Kawamura, D. Batani, A. Morace, R. Redaelli, C. Fourment, J. J. Santos, G. Malka, A. Boscheron, O. Bonville, J. Grenier, Ph. Canal, B. Lacoste, C. Lepage, L. Marmande, E. Mazataud, A. Casner, M. Koenig, S. Fujioka, T. Nakamura, T. Johzaki, and K. Mima

Fully relativistic form factor for Thomson scattering *(13 pages)* 036411
J. P. Palastro, J. S. Ross, B. Pollock, L. Divol, D. H. Froula, and S. H. Glenzer

Emission and its back-reaction accompanying electron motion in relativistically strong and QED-strong pulsed laser fields *(13 pages)* 036412
Igor V. Sokolov, John A. Nees, Victor P. Yanovsky, Natalia M. Naumova, and Gérard A. Mourou

Abel solution to a bremmstrahlung inverse problem *(3 pages)* 036413
Cliff A. Thomas

Rank-ordered multifractal analysis for intermittent fluctuations with global crossover behavior *(11 pages)* 036414
Sunny W. Y. Tam, Tom Chang, Paul M. Kintner, and Eric M. Klatt

Classical physics

Normal-incidence left-handed metamaterials based on symmetrically connected split-ring resonators *(6 pages)* 036601
Jiafu Wang, Shaobo Qu, Zhuo Xu, Hua Ma, Song Xia, Yiming Yang, Xiang Wu, Qian Wang, and Chunhui Chen

Polarization of an electromagnetic wave in a randomly birefringent medium: A stochastic theory of the Stokes parameters *(9 pages)* 036602
Robert Botet and Hiroshi Kuratsuji

Retrieving the impulse response of the Earth due to random electromagnetic forcing *(5 pages)* 036603
Sharmin Shamsalsadati and Chester J. Weiss

Properties of the Shapiro steps in the ac driven Frenkel-Kontorova model with deformable substrate potential *(9 pages)* 036604
Jasmina Tekić and Bambi Hu

Analytic expressions for the constitutive parameters of magnetoelectric metamaterials *(17 pages)* 036605
D. R. Smith

Theory of a curved planar waveguide with Robin boundary conditions *(14 pages)* 036606
O. Olendski and L. Mikhailovska

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 81, NUMBER 3 MARCH 2010

Slow optical soliton pairs via electron spin coherence in a quantum well waveguide *(8 pages)* 036607
Ji-Bing Liu, Na Liu, Chuan-Jia Shan, Tang-Kun Liu, and Yan-Xia Huang

Soliton propagation through a disordered system: Statistics of the transmission delay *(14 pages)* 036608
Sergey A. Gredeskul, Stanislav A. Derevyanko, Alexander S. Kovalev, and Jaroslaw E. Prilepsky

Computational physics

Estimating generalized Lyapunov exponents for products of random matrices *(12 pages)* 036701
J. Vanneste

General solution of lattices for Cartesian lattice Bhatanagar-Gross-Krook models *(7 pages)* 036702
Xiaowen Shan (单肖文)

Alternative boundary conditions for Monte Carlo simulations based on self-consistent correlations: Application to the two- and three-dimensional Ising models *(6 pages)* 036703
I. Etxebarria, C. Capillas, and L. Elcoro

Comparison between different Gaussian series representations of the imaginary time propagator *(8 pages)* 036704
Riccardo Conte and Eli Pollak

Bulgac-Kusnezov-Nosé-Hoover thermostats *(14 pages)* 036705
Alessandro Sergi and Gregory S. Ezra

Lattice Boltzmann method for oscillatory Stokes flow with applications to micro- and nanodevices *(14 pages)* 036706
Yong Shi and John E. Sader

Phase-field modeling by the method of lattice Boltzmann equations *(16 pages)* 036707
Abbas Fakhari and Mohammad H. Rahimian

BRIEF REPORTS

Interdisciplinary physics

Optimizing transport efficiency on scale-free networks through assortative or dissortative topology *(4 pages)* 037101
Yu-hua Xue, Jian Wang, Liang Li, Daren He, and Bambi Hu

Chaos and pattern formation

Redundant variables and Granger causality *(4 pages)* 037201
L. Angelini, M. de Tommaso, D. Marinazzo, L. Nitti, M. Pellicoro, and S. Stramaglia

Monochromatic waves induced by large-scale parametric forcing *(4 pages)* 037202
A. Nepomnyashchy and S. I. Abarzhi

Classical physics

Spatial shift of lattice soliton scattering in the Fermi-Pasta-Ulam model *(4 pages)* 037601
Tao Jin, Hong Zhao, and Bambi Hu

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 81, NUMBER 3 MARCH 2010

COMMENTS

Chaos and pattern formation

Comment on "Adaptive steady-state stabilization for nonlinear dynamical systems" *(3 pages)* 038201
Wei Lin

Reply to "Comment on 'Adaptive steady-state stabilization for nonlinear dynamical systems' " *(4 pages)* 038202
David J. Braun

ERRATA

Errata

Retraction: Geometric Ginzburg-Landau theory for faceted crystals in one dimension: From coarsening to chaos through a driving force [Phys. Rev. E **79**, 011115 (2009)] *(1 page)* . . . . . 039901(E)
Frank Haußer and Axel Voigt