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 76, NUMBER 5 *CONTENTS* **NOVEMBER 2007**

PART 1: STATISTICAL, SOFT MATTER, AND BIOLOGICAL PHYSICS

RAPID COMMUNICATIONS

Statistical physics

Work and heat probability distribution of an optically driven Brownian particle: Theory and experiments *(4 pages)* . . . . . 050101(R)
A. Imparato, L. Peliti, G. Pesce, G. Rusciano, and A. Sasso

Occupation times of random walks in confined geometries: From random trap model to diffusion-limited reactions *(4 pages)* . . . . . 050102(R)
S. Condamin, V. Tejedor, and O. Bénichou

Anisotropic model of kinetic roughening: The strong-coupling regime *(4 pages)* . . . . . 050103(R)
Amit K Chattopadhyay

Temperature of a Hamiltonian system given as the effective temperature of a nonequilibrium steady-state Langevin thermostat *(4 pages)* . . . . . 050104(R)
Kumiko Hayashi and Mitsunori Takano

Colloidal dispersions, suspensions, and aggregates

Layering transitions in confined colloidal crystals: The hcp-like phase *(4 pages)* . . . . . 050401(R)
F. Ramiro-Manzano, E. Bonet, I. Rodriguez, and F. Meseguer

Construction and stability of a close-packed structure observed in thin colloidal crystals *(4 pages)* . . . . . 050402(R)
Ana Barreira Fontecha, Thomas Palberg, and Hans Joachim Schöpe

State diagram for the electrostatic adsorption of charged colloids on confining walls: Simulation and theory *(4 pages)* . . . . . 050403(R)
J. J. Liétor-Santos, M. Chávez-Páez, M. Márquez, A. Fernández-Nieves, and M. Medina-Noyola

ARTICLES

Statistical physics

Effect of a cutoff on pushed and bistable fronts of the reaction-diffusion equation *(3 pages)* 051101
R. D. Benguria, M. C. Depassier, and V. Haikala

Nonequilibrium phase transition in negotiation dynamics *(4 pages)* 051102
Andrea Baronchelli, Luca Dall'Asta, Alain Barrat, and Vittorio Loreto

Copyright 2007 by The American Physical Society

(Continued)

1539-3755(200711)76:5:1;1-M

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 76, NUMBER 5** **NOVEMBER 2007**

Macroscopic equations for the adiabatic piston *(12 pages)* 051103
Massimo Cencini, Luigi Palatella, Simone Pigolotti, and Angelo Vulpiani

Phase-space formulation of the nonlinear longitudinal relaxation of the magnetization in quantum spin systems *(11 pages)* 051104
Yuri P. Kalmykov, William T. Coffey, and Serguey V. Titov

Power-law eigenvalue density, scaling, and critical random-matrix ensembles *(5 pages)* 051105
K. A. Muttalib and Mourad E. H. Ismail

Exactly solvable model of reversible adsorption on a disordered substrate *(6 pages)* 051106
J. Talbot, G. Tarjus, and P. Viot

Network of inherent structures in spin glasses: Scaling and scale-free distributions *(11 pages)* 051107
Z. Burda, A. Krzywicki, and O. C. Martin

Condensation phenomena with distinguishable particles *(6 pages)* 051108
Jun Ohkubo

Off-diagonal long-range order, cycle probabilities, and condensate fraction in the ideal Bose gas *(6 pages)* 051109
Maguelonne Chevallier and Werner Krauth

Transient chaos induces anomalous transport properties of an underdamped Brownian particle *(14 pages)* 051110
David Speer, Ralf Eichhorn, and Peter Reimann

Noise-induced phase transitions in field-dependent relaxational dynamics: The Gaussian ansatz *(9 pages)* 051111
Francisco J. Cao, Kevin Wood, and Katja Lindenberg

Phase transitions in two-dimensional model colloids in a one-dimensional external potential *(4 pages)* 051112
Florian Bürzle and Peter Nielaba

Inhomogeneous exclusion processes with extended objects: The effect of defect locations *(13 pages)* 051113
J. J. Dong, B. Schmittmann, and R. K. P. Zia

Subdiffusive target problem: Survival probability *(6 pages)* 051114
S. B. Yuste and Katja Lindenberg

Asymmetry in the percolation thresholds of fully penetrable disks with two different radii *(6 pages)* 051115
John A. Quintanilla and Robert M. Ziff

Thermodynamics of a binary monolayer of Ising dipolar particles *(8 pages)* 051116
Masaru Suzuki, Ferenc Kun, Satoshi Yukawa, and Nobuyasu Ito

Symmetries of the ratchet current *(6 pages)* 051117
Wojciech De Roeck and Christian Maes

Heat conduction in simple networks: The effect of interchain coupling *(6 pages)* 051118
Zonghua Liu and Baowen Li

Phase transitions and topology in $2+k$ *XY* mean-field models *(7 pages)* 051119
L. Angelani and G. Ruocco

Extended Gibbs ensembles with flow *(8 pages)* 051120
M. J. Ison, F. Gulminelli, and C. O. Dorso

Pseudospectral versus finite-difference schemes in the numerical integration of stochastic models of surface growth *(9 pages)* 051121
Rafael Gallego, Mario Castro, and Juan M. López

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 76, NUMBER 5 NOVEMBER 2007

Unitarization of the classical statistical *s* matrix for systems with localization *(10 pages)* 051122
Richard L. Weaver

Nontrivial critical crossover between directed percolation models: Effect of infinitely many absorbing states *(8 pages)* 051123
Su-Chan Park and Hyunggyu Park

Complex systems with half-integer spins: Symplectic ensembles *(11 pages)* 051124
Rina Dutta and Pragya Shukla

Quantum transport on small-world networks: A continuous-time quantum walk approach *(8 pages)* 051125
Oliver Mülken, Volker Pernice, and Alexander Blumen

Model studies on the quantum Jarzynski relation *(6 pages)* 051126
Jens Teifel and Günter Mahler

Equilibrium and linear transport properties of fluids

Structure of the first- and second-neighbor shells of simulated water: Quantitative relation to translational and orientational order *(5 pages)* 051201
Zhenyu Yan, Sergey V. Buldyrev, Pradeep Kumar, Nicolas Giovambattista, Pablo G. Debenedetti, and H. Eugene Stanley

Structure of hard-hypersphere fluids in odd dimensions *(17 pages)* 051202
René D. Rohrmann and Andrés Santos

Viscosity of water measured to pressures of 6 GPa and temperatures of 300 °C *(6 pages)* 051203
Evan H. Abramson

Granular materials

Shear zones in granular media: Three-dimensional contact dynamics simulation *(9 pages)* 051301
Alexander Ries, Dietrich E. Wolf, and Tamás Unger

Collision dynamics of granular particles with adhesion *(12 pages)* 051302
Nikolai V. Brilliantov, Nicole Albers, Frank Spahn, and Thorsten Pöschel

Response to perturbations for granular flow in a hopper *(8 pages)* 051303
John F. Wambaugh, Robert P. Behringer, John V. Matthews, and Pierre A. Gremaud

Long-time tails in freely cooling granular gases *(14 pages)* 051304
Hisao Hayakawa and Michio Otsuki

Interplay of air and sand: Faraday heaping unravelled *(7 pages)* 051305
Henk Jan van Gerner, Martin A. van der Hoef, Devaraj van der Meer, and Ko van der Weele

Experiments and simulations of a gravitational granular flow instability *(13 pages)* 051306
Jan Ludvig Vinningland, Øistein Johnsen, Eirik G. Flekkøy, Renaud Toussaint, and Knut Jørgen Måløy

Depletion force in a bidisperse granular layer *(5 pages)* 051307
Paul Melby, Alexis Prevost, David A. Egolf, and Jeffrey S. Urbach

Colloidal dispersions, suspensions, and aggregates

Electroneutrality and phase behavior of colloidal suspensions *(11 pages)* 051401
A. R. Denton

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 76, NUMBER 5 NOVEMBER 2007

Geometrical percolation of hard-core ellipsoids of revolution in the continuum *(5 pages)* 051402
Shiho Akagawa and Takashi Odagaki

Scaling in the aggregation dynamics of a magnetorheological fluid *(13 pages)* 051403
P. Domínguez-García, Sonia Melle, J. M. Pastor, and M. A. Rubio

Investigation of q-dependent dynamical heterogeneity in a colloidal gel by x-ray photon correlation spectroscopy *(7 pages)* 051404
V. Trappe, E. Pitard, L. Ramos, A. Robert, H. Bissig, and L. Cipelletti

Asymptotic analysis of tracer diffusivity in nonadsorbing polymer solutions *(13 pages)* 051405
Tai-Hsi Fan, Bin Xie, and Remco Tuinier

Two-dimensional dipolar nematic colloidal crystals *(8 pages)* 051406
M. Škarabot, M. Ravnik, S. Žumer, U. Tkalec, I. Poberaj, D. Babič, N. Osterman, and I. Muševič

Field-induced columnar structures in a quasi-two-dimensional system of dipolar particles *(7 pages)* 051407
Shin-Shing Yeh, Ching Hsueh, Peilong Chen, and Jorge Viñals

Transition from a simple yield-stress fluid to a thixotropic material *(5 pages)* 051408
A. Ragouilliaux, G. Ovarlez, N. Shahidzadeh-Bonn, Benjamin Herzhaft, T. Palermo, and P. Coussot

Microscopic structure and collapse of depletion-induced gels in vesicle-polymer mixtures *(8 pages)* 051409
Ji Yeon Huh, Matthew L. Lynch, and Eric M. Furst

Structured and complex fluids

Evidence of the ambipolar diffusion in the impedance spectroscopy of an electrolytic cell *(9 pages)* 051501
G. Barbero and I. Lelidis

Films, interfaces, and crystal growth

Roughness of moving elastic lines: Crack and wetting fronts *(12 pages)* 051601
E. Katzav, M. Adda-Bedia, M. Ben Amar, and A. Boudaoud

Effective exponents in the long-range critical wetting of alkanes on aqueous substrates *(9 pages)* 051602
Volker C. Weiss, Emanuel Bertrand, Salima Rafaï, Joseph O. Indekeu, and Daniel Bonn

Small-angle scattering model for multilamellar vesicles *(8 pages)* 051603
Henrich Frielinghaus

Monte Carlo study of crystalline order and defects on weakly curved surfaces *(12 pages)* 051604
A. Hexemer, V. Vitelli, E. J. Kramer, and G. H. Fredrickson

Liquid crystals

Effective free-energy method for nematic liquid crystals in contact with structured substrates *(9 pages)* 051701
L. Harnau, S. Kondrat, and A. Poniewierski

Effect of nonmesogenic impurities on the liquid crystalline phase transitions of octylcyanobiphenyl *(9 pages)* 051702
Katleen Denolf, George Cordoyiannis, Christ Glorieux, and Jan Thoen

Emission characteristics of a homologous series of bimesogenic liquid-crystal lasers *(9 pages)* 051703
A. D. Ford, S. M. Morris, M. N. Pivnenko, C. Gillespie, and H. J. Coles

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 76, NUMBER 5 NOVEMBER 2007

Investigation into liquid crystalline smectic-C^* subphase stability using chiral and achiral dopants *(6 pages)* 051704
J. Kirchhoff and L. S. Hirst

Emergence of periodic order in electric-field-driven planar nematic liquid crystals: An exclusive ac effect absent in static fields *(8 pages)* 051705
K. S. Krishnamurthy and Pramoda Kumar

Order-disorder molecular model of the smectic-*A*–smectic-*C* phase transition in materials with conventional and anomalously weak layer contraction *(16 pages)* 051706
M. V. Gorkunov, M. A. Osipov, J. P. F. Lagerwall, and F. Giesselmann

Molecular orientational properties of a high-tilt chiral smectic liquid crystal determined from its infrared dichroism *(13 pages)* 051707
A. A. Sigarev, J. K. Vij, A. W. Hall, S. J. Cowling, and J. W. Goodby

Liquid crystal 8CB in random porous glass: NMR relaxometry study of molecular diffusion and director fluctuations *(15 pages)* 051708
M. Vilfan, T. Apih, P. J. Sebastião, G. Lahajnar, and S. Žumer

Polymers

Theoretical coarse-graining approach to bridge length scales in diblock copolymer liquids *(18 pages)* 051801
E. J. Sambriski and M. G. Guenza

Polymer scaling and dynamics in steady-state sedimentation at infinite Péclet number *(7 pages)* 051802
V. Lehtola, O. Punkkinen, and T. Ala-Nissila

Barrier crossing by a star polymer *(9 pages)* 051803
Ananya Debnath and K. L. Sebastian

Knot localization in adsorbing polymer rings *(10 pages)* 051804
B. Marcone, E. Orlandini, and A. L. Stella

Random loop model for long polymers *(8 pages)* 051805
Manfred Bohn, Dieter W. Heermann, and Roel van Driel

Structural and conformational dynamics of supercooled polymer melts: Insights from first-principles theory and simulations *(22 pages)* 051806
Song-Ho Chong, Martin Aichele, Hendrik Meyer, Matthias Fuchs, and Jörg Baschnagel

Biological physics

Modeling electrocortical activity through improved local approximations of integral neural field equations *(8 pages)* 051901
S. Coombes, N. A. Venkov, L. Shiau, I. Bojak, D. T. J. Liley, and C. R. Laing

Numerical study of the effect of the noseleaf on biosonar beamforming in a horseshoe bat *(11 pages)* 051902
Qiao Zhuang and Rolf Müller

Mapping and assessment of epileptogenic foci using frequency-entropy templates *(8 pages)* 051903
Eshel Ben-Jacob, Itai Doron, Tomer Gazit, Eden Rephaeli, Oren Sagher, and Vernon L. Towle

Lattice model for parallel and orthogonal β sheets using hydrogenlike bonding *(5 pages)* 051904
J. Krawczyk, A. L. Owczarek, T. Prellberg, and A. Rechnitzer

Interactions of semiflexible filaments and molecular motors *(12 pages)* 051905
Dmitry Karpeev, Igor S. Aranson, Lev S. Tsimring, and Hans G. Kaper

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 76, NUMBER 5** **NOVEMBER 2007**

Fragility and mechanosensing in a thermalized cytoskeleton model with forced protein unfolding *(6 pages)* 051906
Brenton D. Hoffman, Gladys Massiera, and John C. Crocker

Towards a thermodynamically consistent picture of the phase-field model of vesicles: Local membrane incompressibility *(7 pages)* 051907
D. Jamet and C. Misbah

Reverberating activity in a neural network with distributed signal transmission delays *(7 pages)* 051908
Takahiro Omi and Shigeru Shinomoto

How a protein searches for its specific site on DNA: The role of intersegment transfer *(8 pages)* 051909
Tao Hu and B. I. Shklovskii

Fluctuations of coupled fluid and solid membranes with application to red blood cells *(18 pages)* 051910
Thorsten Auth, S. A. Safran, and Nir S. Gov

Amplitude equation approach to spatiotemporal dynamics of cardiac alternans *(23 pages)* 051911
Blas Echebarria and Alain Karma

Temporal evolution of self-organization of gelatin molecules and clusters on quartz surface *(6 pages)* 051912
Amar Nath Gupta and H. B. Bohidar

Modeling photon propagation in biological tissues using a generalized Delta-Eddington phase function *(5 pages)* 051913
W. Cong, H. Shen, A. Cong, Y. Wang, and G. Wang

Alternative hydrogen bond implementations produce opposite effects on collapse cooperativity of lattice homopolypeptide models *(11 pages)* 051914
Gustavo M. N. Fleury, Marco A. A. Barbosa, and Antônio F. Pereira de Araújo

Dynamics of a two-dimensional model of cell tissues with coupled stochastic gene networks *(14 pages)* 051915
Andre S. Ribeiro

Stability domains of actin genes and genomic evolution *(9 pages)* 051916
E. Carlon, A. Dkhissi, M. Lejard Malki, and R. Blossey

Stochastic simulations of the repressilator circuit *(9 pages)* 051917
Adiel Loinger and Ofer Biham

Dynamics of essential collective motions in proteins: Theory *(16 pages)* 051918
Maria Stepanova

Versatile biologically inspired electronic neuron *(8 pages)* 051919
Jacobo D. Sitt and J. Aliaga

Macroscopic consequences of calcium signaling in microdomains: A first-passage-time approach *(5 pages)* 051920
Robert Rovetti, Kunal K. Das, Alan Garfinkel, and Yohannes Shiferaw

Segregation process and phase transition in cyclic predator-prey models with an even number of species *(5 pages)* 051921
György Szabó, Attila Szolnoki, and Gustavo Ariel Sznaider

Moment analysis of near-equilibrium binding interactions during electrophoresis *(13 pages)* 051922
Yousef Daneshbod, James D. Sterling, and Ali Nadim

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 76, NUMBER 5 NOVEMBER 2007

BRIEF REPORTS

Colloidal dispersions, suspensions, and aggregates

Mechanical properties of glass forming systems *(4 pages)* 052401
Valery Ilyin, Nataliya Makedonska, Itamar Procaccia, and Nurith Schupper

Biological physics

Optimal evaluation of single-molecule force spectroscopy experiments *(4 pages)* 052901
Sebastian Getfert and Peter Reimann