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 78, NUMBER 6 *CONTENTS* DECEMBER 2008

PART 1: STATISTICAL, SOFT MATTER, AND BIOLOGICAL PHYSICS

RAPID COMMUNICATIONS

Statistical physics

Normal diffusion in crystal structures and higher-dimensional billiard models with gaps *(4 pages)* . . . . . 060101(R)
David P. Sanders

Continuous-time random walks with internal dynamics and subdiffusive reaction-diffusion equations *(4 pages)* . . . . . 060102(R)
S. Eule, R. Friedrich, F. Jenko, and I. M. Sokolov

Noise-driven unlimited population growth *(4 pages)* . . . . . 060103(R)
Baruch Meerson and Pavel V. Sasorov

Coherence versus reliability of stochastic oscillators with delayed feedback *(4 pages)* . . . . . 060104(R)
Denis S. Goldobin

Growth of spatial correlations in the aging of a simple structural glass *(4 pages)* . . . . . 060105(R)
Azita Parsaeian and Horacio E. Castillo

Colloidal dispersions, suspensions, and aggregates

Nonmonotonic density dependence of the diffusion of DNA fragments in low-salt suspensions *(4 pages)* . . . . . 060401(R)
Mathieu G. McPhie and Gerhard Nägele

Films, interfaces, and crystal growth

Understanding capillary condensation and hysteresis in porous silicon: Network effects within independent pores *(4 pages)* . . . . . 060601(R)
Sergej Naumov, Alexey Khokhlov, Rustem Valiullin, Jörg Kärger, and Peter A. Monson

Scaling of solvation force in two-dimensional Ising strips *(4 pages)* . . . . . 060602(R)
Piotr Nowakowski and Marek Napiórkowski

Theory of dendritic growth in the presence of lattice strain *(4 pages)* . . . . . 060603(R)
D. Pilipenko, E. A. Brener, and C. Hüter

Copyright 2008 by The American Physical Society

(Continued)

1539-3755(200812)78:6:1;1-D

PHYSICAL REVIEW E THIRD SERIES, VOLUME 78, NUMBER 6 DECEMBER 2008

Polymers

Homogenization of a phase-separated droplet in a polymer mixture caused by the dielectric effect of a laser *(4 pages)* . . . . . 060801(R)
Hirofumi Toyama, Kenichi Yoshikawa, and Hiroyuki Kitahata

Biological physics

Twist-stretch correlation of DNA *(4 pages)* . . . . . 060901(R)
Maryam Ghorbani and Farshid Mohammad-Rafiee

Population mixture model for nonlinear telomere dynamics *(4 pages)* . . . . . 060902(R)
Shalev Itzkovitz, Liran I. Shlush, Dan Gluck, and Karl Skorecki

ARTICLES

Statistical physics

Analytical approach to the time-dependent probability density function in tilted periodic potentials *(16 pages)* 061101
R. Salgado-García, F. Leyvraz, and G. Martínez-Mekler

Universal tree structures in directed polymers and models of evolving populations *(9 pages)* 061102
Éric Brunet, Bernard Derrida, and Damien Simon

Thermal conductivity of anharmonic lattices: Effective phonons and quantum corrections *(8 pages)* 061103
Dahai He, Sahin Buyukdagli, and Bambi Hu

Tricritical O(n) models in two dimensions *(10 pages)* 061104
Bernard Nienhuis, Wenan Guo (郭文安), and Henk W. J. Blöte

Weak- and strong-coupling electrostatic interactions between asymmetrically charged planar surfaces *(14 pages)* 061105
M. Kanduč, M. Trulsson, A. Naji, Y. Burak, J. Forsman, and R. Podgornik

Contest based on a directed polymer in a random medium *(7 pages)* 061106
Clément Sire

Subdiffusive motion in kinetically constrained models *(12 pages)* 061107
Robert L. Jack, Peter Sollich, and Peter Mayer

Correspondence between nonrelativistic anti-de Sitter space and conformal field theory, and aging-gravity duality *(6 pages)* 061108
Djordje Minic and Michel Pleimling

Density of critical clusters in strips of strongly disordered systems *(9 pages)* 061109
M. Karsai, I. A. Kovács, J-Ch. Anglès d'Auriac, and F. Iglói

Brownian motion under annihilation dynamics *(12 pages)* 061110
María Isabel García de Soria, Pablo Maynar, and Emmanuel Trizac

Critical dynamics of self-gravitating Langevin particles and bacterial populations *(22 pages)* 061111
Clément Sire and Pierre-Henri Chavanis

Damped bounces of an isolated perfect quantum gas *(7 pages)* 061112
S. Camalet

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 78, NUMBER 6** **DECEMBER 2008**

Counterintuitive ground states in soft-core models *(7 pages)* 061113
Henry Cohn and Abhinav Kumar

Persistent random walk on a one-dimensional lattice with random asymmetric transmittances *(6 pages)* 061114
Zeinab Sadjadi and MirFaez Miri

Logarithmic current fluctuations in nonequilibrium quantum spin chains *(8 pages)* 061115
T. Antal, P. L. Krapivsky, and A. Rákos

Asymmetric exclusion processes with disorder: Effect of correlations *(10 pages)* 061116
M. Ebrahim Foulaadvand, Anatoly B. Kolomeisky, and H. Teymouri

Field theory of directed percolation with long-range spreading *(12 pages)* 061117
Hans-Karl Janssen and Olaf Stenull

Ballistic deposition on deterministic fractals: Observation of discrete scale invariance *(10 pages)* 061118
Claudio M. Horowitz, Federico Romá, and Ezequiel V. Albano

Tricritical point of the J_1-J_2 Ising model on a hyperbolic lattice *(6 pages)* 061119
R. Krcmar, T. Iharagi, A. Gendiar, and T. Nishino

Current inversion in the Lévy ratchet *(5 pages)* 061120
Bartłomiej Dybiec

Reaching the ground state of a quantum spin glass using a zero-temperature quantum Monte Carlo method *(6 pages)* 061121
Arnab Das and Bikas K. Chakrabarti

Dynamic stability versus thermodynamic performance in a simple model for a Brownian motor *(7 pages)* 061122
Moisés Santillán and Michael C. Mackey

Self-trapping at the liquid-vapor critical point: A path-integral study *(10 pages)* 061123
Bruce N. Miller and Terrence L. Reese

Universality class of replica symmetry breaking, scaling behavior, and the low-temperature fixed-point order function of the Sherrington-Kirkpatrick model *(13 pages)* 061124
R. Oppermann and M. J. Schmidt

Approaching the thermodynamic limit in equilibrated scale-free networks *(9 pages)* 061125
B. Waclaw, L. Bogacz, and W. Janke

Percolative properties of hard oblate ellipsoids of revolution with a soft shell *(11 pages)* 061126
Gianluca Ambrosetti, Niklaus Johner, Claudio Grimaldi, Andrea Danani, and Peter Ryser

Systems with two symmetric absorbing states: Relating the microscopic dynamics with the macroscopic behavior *(5 pages)* 061127
Federico Vazquez and Cristóbal López

Statistical mechanics of the quantum *K*-satisfiability problem *(23 pages)* 061128
Sergey Knysh and Vadim N. Smelyanskiy

Thermodynamics of trapped gases: Generalized mechanical variables, equation of state, and heat capacity *(10 pages)* 061129
Nadia Sandoval-Figueroa and Víctor Romero-Rochín

Scaling and the thermal conductivity of the Frenkel-Kontorova model *(6 pages)* 061130
Zhi-Gang Shao, Lei Yang, Wei-Rong Zhong, Da-Hai He, and Bambi Hu

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 78, NUMBER 6** **DECEMBER 2008**

Reversible transport of interacting Brownian ratchets *(7 pages)* 061131
Rogério M. da Silva, Clécio C. de Souza Silva, and Sérgio Coutinho

Exact solution of a stochastic susceptible-infectious-recovered model *(8 pages)* 061132
Gunter M. Schütz, Marian Brandaut, and Steffen Trimper

Systems with negative specific heat in thermal contact: Violation of the zeroth law *(8 pages)* 061133
A. Ramírez-Hernández, H. Larralde, and F. Leyvraz

Cluster-algorithm renormalization-group study of universal fluctuations in the two-dimensional Ising model *(6 pages)* 061134
G. Palma and D. Zambrano

Invasion of a sticky random solid: Self-established potential gradient, phase separation, and criticality *(8 pages)* 061135
S. B. Santra, Santanu Sinha, and Jahir Abbas Ahmed

Heat conduction in the disordered Fermi-Pasta-Ulam chain *(4 pages)* 061136
Abhishek Dhar and Keiji Saito

Modified Chapman-Enskog moment approach to diffusive phonon heat transport *(18 pages)* 061137
Zbigniew Banach and Wieslaw Larecki

Granular materials

Segregation induced by phase synchronization in a bidisperse granular layer *(5 pages)* 061301
Tai-Yuan Wang and T. M. Hong

Controlled flow of smart powders *(4 pages)* 061302
G. Lumay and N. Vandewalle

Colloidal dispersions, suspensions, and aggregates

Aggregation of magnetic holes in a rotating magnetic field *(6 pages)* 061401
Jozef Černák and Geir Helgesen

High-bandwidth viscoelastic properties of aging colloidal glasses and gels *(10 pages)* 061402
S. Jabbari-Farouji, M. Atakhorrami, D. Mizuno, E. Eiser, G. H. Wegdam, F. C. MacKintosh, Daniel Bonn, and C. F. Schmidt

Unaffected microscopic dynamics of macroscopically arrested water in dilute clay gels *(6 pages)* 061403
Tilo Seydel, Lutz Wiegart, Fanni Juranyi, Bernd Struth, and Helmut Schober

Tangential-force model for interactions between bonded colloidal particles *(9 pages)* 061404
Volker Becker and Heiko Briesen

Multiple nonergodic disordered states in Laponite suspensions: A phase diagram *(10 pages)* 061405
S. Jabbari-Farouji, Hajime Tanaka, G. H. Wegdam, and Daniel Bonn

Structured and complex fluids

Drainage of a nanoconfined simple fluid: Rate effects on squeeze-out dynamics *(11 pages)* 061501
Lionel Bureau and Arnaud Arvengas

Fluctuation-dissipation-relation-preserving field theory of the glass transition in terms of fluctuating hydrodynamics *(11 pages)* 061502
Taka H. Nishino and Hisao Hayakawa

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 78, NUMBER 6** **DECEMBER 2008**

Role of slip between a probe particle and a gel in microrheology *(14 pages)* 061503
Henry C. Fu, Vivek B. Shenoy, and Thomas R. Powers

Theory of specific heat in glass-forming systems *(13 pages)* 061504
H. G. E. Hentschel, Valery Ilyin, Itamar Procaccia, and Nurith Schupper

Universal sequence of ordered structures obtained from mesoscopic description of self-assembly *(15 pages)* 061505
A. Ciach

Generalized Poisson-Fermi formalism for investigating size correlation effects with multiple ions *(9 pages)* 061506
Guillaume Tresset

Role of surfactant molecules in magnetic fluid: Comparison of Monte Carlo simulation and electron magnetic resonance *(11 pages)* 061507
L. L. Castro, G. R. R. Gonçalves, K. Skeff Neto, P. C. Morais, A. F. Bakuzis, and R. Miotto

Films, interfaces, and crystal growth

Nonmonotonic crossover from adsorption to desorption in supercritical fluid near a weakly attractive surface *(11 pages)* 061601
Alla Oleinikova and Ivan Brovchenko

Disjoining pressure for nonuniform thin films *(9 pages)* 061602
Bing Dai, L. Gary Leal, and Antonio Redondo

Random sequential adsorption of polydisperse mixtures on discrete substrates *(7 pages)* 061603
Lj. Budinski-Petković, S. B. Vrhovac, and I. Lončarević

Dispersion relation of capillary waves on ionic liquids: Observation of the fast overdamped mode *(8 pages)* 061604
T. Hoshino, Y. Ohmasa, R. Osada, and M. Yao

From density to interface fluctuations: The origin of wavelength dependence in surface tension *(7 pages)* 061605
Thorsten Hiester

Liquid crystals

Polarization dependence of optically driven polydomain elastomer mechanics *(13 pages)* 061701
D. Corbett and M. Warner

Shear-induced mesostructures in biaxial liquid crystals *(4 pages)* 061702
Sarthok Sircar and Qi Wang

Generalized nematohydrodynamic boundary conditions with application to bistable twisted nematic liquid-crystal displays *(7 pages)* 061703
Angbo Fang, Tiezheng Qian, and Ping Sheng

Surface-frustrated periodic textures of smectic-*A* liquid crystals on crystalline surfaces *(9 pages)* 061704
Bruno Zappone and Emmanuelle Lacaze

Ambidextrous bend patterns in free-standing polar smectic-CP_F films *(11 pages)* 061705
Alexey Eremin, Alexandru Nemeş, Ralf Stannarius, and Wolfgang Weissflog

Surface-induced nonlinearities of liquid crystals driven by an electric field *(8 pages)* 061706
L. Lucchetti, M. Gentili, F. Simoni, S. Pavliuchenko, S. Subota, and V. Reshetnyak

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 78, NUMBER 6 DECEMBER 2008

Polymers

Self-consistent field theory for obligatory coassembly *(15 pages)* 061801
I. K. Voets and F. A. M. Leermakers

Dynamics of a self-avoiding polymer chain in slit, tube, and cube confinements *(7 pages)* 061802
Ting Cui, Jiandong Ding, and Jeff Z. Y. Chen

Critical evaluation of the computational methods used in the forced polymer translocation *(8 pages)* 061803
V. V. Lehtola, R. P. Linna, and K. Kaski

Rippling of polymer nanofibers *(8 pages)* 061804
Xiang-Fa Wu, Yulia Y. Kostogorova-Beller, Alexander V. Goponenko, Haoqing Hou, and Yuris A. Dzenis

Biological physics

Dynamical transition, hydrophobic interface, and the temperature dependence of electrostatic fluctuations in proteins *(9 pages)* 061901
David N. LeBard and Dmitry V. Matyushov

Dynamics and evolution of stochastic bistable gene networks with sensing in fluctuating environments *(9 pages)* 061902
Andre S. Ribeiro

Cooperation of sperm in two dimensions: Synchronization, attraction, and aggregation through hydrodynamic interactions *(9 pages)* 061903
Yingzi Yang, Jens Elgeti, and Gerhard Gompper

Macroscopic dynamics of biological cells interacting via chemotaxis and direct contact *(12 pages)* 061904
Pavel M. Lushnikov, Nan Chen, and Mark Alber

Folding proteins by first-passage-times-optimized replica exchange *(4 pages)* 061905
Walter Nadler, Jan H. Meinke, and Ulrich H. E. Hansmann

Influence of synaptic interaction on firing synchronization and spike death in excitatory neuronal networks *(7 pages)* 061906
Sheng-Jun Wang, Xin-Jian Xu, Zhi-Xi Wu, Zi-Gang Huang, and Ying-Hai Wang

Flapping motion and force generation in a viscoelastic fluid *(9 pages)* 061907
Thibaud Normand and Eric Lauga

Subthreshold dynamics of a single neuron from a Hamiltonian perspective *(14 pages)* 061908
M. T. Wilson and D. A. Steyn-Ross

Amide-I lifetime-limited vibrational energy flow in a one-dimensional lattice of hydrogen-bonded peptide units *(13 pages)* 061909
Vincent Pouthier

Atomic hydrodynamics of DNA: Coil-uncoil-coil transitions in a wall-bounded shear flow *(12 pages)* 061910
William C. Sandberg and Guan M. Wang

Dynamics of DNA translocation through an attractive nanopore *(7 pages)* 061911
Kaifu Luo, Tapio Ala-Nissila, See-Chen Ying, and Aniket Bhattacharya

Duplication count distributions in DNA sequences *(11 pages)* 061912
Suzanne S. Sindi, Brian R. Hunt, and James A. Yorke

Strength limit of entropic elasticity in beta-sheet protein domains *(7 pages)* 061913
Sinan Keten and Markus J. Buehler

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 78, NUMBER 6** **DECEMBER 2008**

Size and shape effects on diffusion and absorption of colloidal particles near a partially absorbing sphere: Implications for uptake of nanoparticles in animal cells *(11 pages)* 061914
Wendong Shi, Jizeng Wang, Xiaojun Fan, and Huajian Gao

Position-dependent stochastic diffusion model of ion channel gating *(4 pages)* 061915
S. R. Vaccaro

Simulation analysis of intermodal sodium channel function *(5 pages)* 061916
Shangyou Zeng and Peter Jung

Multistability in networks of Hindmarsh-Rose neurons *(6 pages)* 061917
R. Erichsen, Jr. and L. G. Brunnet

Translocation dynamics with attractive nanopore-polymer interactions *(8 pages)* 061918
Kaifu Luo, Tapio Ala-Nissila, See-Chen Ying, and Aniket Bhattacharya

Monte Carlo study on ultrasound backscattering by three-dimensional distributions of red blood cells *(9 pages)* 061919
Ratan K. Saha and Guy Cloutier

Evolution models with base substitutions, insertions, deletions, and selection *(6 pages)* 061920
D. B. Saakian

Quasispecies theory for horizontal gene transfer and recombination *(37 pages)* 061921
Enrique Muñoz, Jeong-Man Park, and Michael W. Deem

Enhancement of transport in DNA-like systems induced by backbone disorder *(5 pages)* 061922
Ai-Min Guo, Shi-Jie Xiong, Zhi Yang, and Hong-Jun Zhu

Calculation of the hole mobilities of the three homopolynucleotides, poly(guanilic acid), poly(adenilic acid), and polythymidine in the presence of water and Na^+ ions *(6 pages)* 061923
Attila Bende, Ferenc Bogár, Ferenc Beleznay, and János Ladik

Modulation of intermembrane interaction and bending rigidity of biomembrane models via carbohydrates investigated by specular and off-specular neutron scattering *(9 pages)* 061924
Emanuel Schneck, Florian Rehfeldt, Rafael G. Oliveira, Christian Gege, Bruno Demé, and Motomu Tanaka

Force-induced misfolding in RNA *(12 pages)* 061925
M. Manosas, I. Junier, and F. Ritort

BRIEF REPORTS

Statistical physics

First-passage-time distribution for diffusion through a planar wedge *(4 pages)* 062101
Diandrew Lexter L. Dy and J. P. Esguerra

Structured and complex fluids

Two factors governing fragility: Stretching exponent and configurational entropy *(3 pages)* 062501
Prabhat K. Gupta and John C. Mauro

Liquid crystals

Simple experimental assessment of smectic translational order parameters *(3 pages)* 062701
Nadia Kapernaum and Frank Giesselmann

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 78, NUMBER 6 DECEMBER 2008

COMMENTS

Comment on "Asymptotic time dependence in the fractal pharmacokinetics of a two-compartment model" *(1 page)* 063901
Luis M. Pereira