PHYSICAL REVIEW E THIRD SERIES, VOLUME 80, NUMBER 4 OCTOBER 2009

**Polymers**

Microscopic density functional theory for dendrimers *(4 pages)* . . . . . 042801
Alexandr Malijevský

**Biological physics**

Cell adhesion: The effect of a surprising cohesive force *(4 pages)* . . . . . 042901
H. Vasseur

PHYSICAL REVIEW E THIRD SERIES, VOLUME 80, NUMBER 4 OCTOBER 2009

Traffic by multiple species of molecular motors *(9 pages)* . . . . . 041928
Yan Chai, Stefan Klumpp, Melanie J. I. Müller, and Reinhard Lipowsky

Mechanical properties of interacting lipopolysaccharide membranes from bacteria mutants studied by specular and off-specular neutron scattering *(9 pages)* . . . . . 041929
Emanuel Schneck, Rafael G. Oliveira, Florian Rehfeldt, Bruno Demé, Klaus Brandenburg, Ulrich Seydel, and Motomu Tanaka

Simple model for bursting dynamics of neurons *(5 pages)* . . . . . 041930
Anandamohan Ghosh, Dipanjan Roy, and Viktor K. Jirsa

Ubiquitous "glassy" relaxation in catalytic reaction networks *(7 pages)* . . . . . 041931
Akinori Awazu and Kunihiko Kaneko

## BRIEF REPORTS

### Statistical physics

Quantum Smoluchowski equation for driven systems *(4 pages)* . . . . . 042101
Raoul Dillenschneider and Eric Lutz

Emergence of stability in a stochastically driven pendulum: Beyond the Kapitsa pendulum *(4 pages)* . . . . . 042102
Yuval B. Simons and Baruch Meerson

Six-state clock model on the square lattice: Fisher zero approach with Wang-Landau sampling *(4 pages)* . . . . . 042103
Chi-Ok Hwang

Critical Binder cumulant in a two-dimensional anisotropic Ising model with competing interactions *(4 pages)* . . . . . 042104
W. Selke and L. N. Shchur

### Granular materials

Mixing and segregation rates in sheared granular materials *(4 pages)* . . . . . 042301
Laura A. Golick and Karen E. Daniels

### Films, interfaces, and crystal growth

Enhancement of charge inversion by multivalent interfacial groups *(4 pages)* . . . . . 042601
Carles Calero and Jordi Faraudo

### Liquid crystals

Light paths in a ferronematic cell *(4 pages)* . . . . . 042701
Caio Sátiro

Long-range elastic-mediated interaction between nanoparticles adsorbed on free-standing smectic films *(4 pages)* . . . . . 042702
I. N. de Oliveira, M. S. S. Pereira, M. L. Lyra, C. Filgueiras, C. Sátiro, and Fernando Moraes

Structural characteristics of the B6 phase for a bent-core molecular system observed through the B1-B6 transition *(4 pages)* . . . . . 042703
Sungmin Kang, Seng Kue Lee, Masatoshi Tokita, and Junji Watanabe

*(Continued)*

**PHYSICAL REVIEW E** **THIRD SERIES, VOLUME 80, NUMBER 4** **OCTOBER 2009**

Analytical description of Ogston-regime biomolecule separation using nanofilters and nanopores *(11 pages)* . . . . . 041911
Zi Rui Li, Gui Rong Liu, Jongyoon Han, Yuan Cheng, Yu Zong Chen, Jian-Sheng Wang, and Nicolas G. Hadjiconstantinou

Dynamics of driven recurrent networks of ON and OFF cells *(9 pages)* . . . . . 041912
Jérémie Lefebvre, André Longtin, and Victor G. LeBlanc

Kinetic overshoot in actin network assembly induced jointly by branching and capping proteins *(5 pages)* . . . . . 041913
Hyeran Kang, Anders E. Carlsson, and Jay X. Tang

Aggregation of fibrils and plaques in amyloid molecular systems *(4 pages)* . . . . . 041914
Mario Nicodemi, Antonio de Candia, and Antonio Coniglio

Effects of fluid flow on the oligonucleotide folding in single-walled carbon nanotubes *(8 pages)* . . . . . 041915
M C. G. Lim and Z. W. Zhong

Predictions from a stochastic polymer model for the MinDE protein dynamics in *Escherichia coli* *(14 pages)* . . . . . 041916
Peter Borowski and Eric N. Cytrynbaum

Finding human promoter groups based on DNA physical properties *(8 pages)* . . . . . 041917
Jia Zeng, Xiao-Qin Cao, Hongya Zhao, and Hong Yan

Parameter effects on binding chemistry in crowded media using a two-dimensional stochastic off-lattice model *(11 pages)* . . . . . 041918
Byoungkoo Lee, Philip R. LeDuc, and Russell Schwartz

Micromagnetic insight into a magnetoreceptor in birds: Existence of magnetic field amplifiers in the beak *(10 pages)* . . . . . 041919
Ilia A. Solov'yov and Walter Greiner

Analysis and Monte Carlo simulations of a model for the spread of infectious diseases in heterogeneous metapopulations *(9 pages)* . . . . . 041920
David Juher, Jordi Ripoll, and Joan Saldaña

Spectral solutions to stochastic models of gene expression with bursts and regulation *(19 pages)* . . . . . 041921
Andrew Mugler, Aleksandra M. Walczak, and Chris H. Wiggins

Three-dimensional model for the effective viscosity of bacterial suspensions *(7 pages)* . . . . . 041922
Brian M. Haines, Andrey Sokolov, Igor S. Aranson, Leonid Berlyand, and Dmitry A. Karpeev

Force-velocity relations for multiple-molecular-motor transport *(4 pages)* . . . . . 041923
Ziqing Wang and Ming Li

Phase coexistence and line tension in ternary lipid systems *(9 pages)* . . . . . 041924
T. Idema, J. M. J. van Leeuwen, and C. Storm

Ionic conductivity on a wetting surface *(5 pages)* . . . . . 041925
Brian Skinner, M. S. Loth, and B. I. Shklovksii

Topological phase transition in a RNA model in the de Gennes regime *(7 pages)* . . . . . 041926
Matías G. dell'Erba and Guillermo R. Zemba

Self-assembly of polypeptides into left-handedly twisted fibril-like structures *(8 pages)* . . . . . 041927
Yan Mu and Yi Qin Gao

*(Continued)*

PHYSICAL REVIEW E THIRD SERIES, VOLUME 80, NUMBER 4 OCTOBER 2009

Grand-canonical and canonical solution of self-avoiding walks with up to three monomers per site on the Bethe lattice *(14 pages)* . . . . . 041804
Tiago J. Oliveira, Jürgen F. Stilck, and Pablo Serra

Characterization of the "simple-liquid" state in a polymeric system: Coherent and incoherent scattering functions *(13 pages)* . . . . . 041805
A. Arbe and J. Colmenero

Conformational free energy of melts of ring-linear polymer blends *(10 pages)* . . . . . 041806
Gopinath Subramanian and Sachin Shanbhag

Storage shear modulus of columnar structure formed in an immiscible polymer blend under electric fields *(5 pages)* . . . . . 041807
Kohei Aida, Yang Ho Na, Tomoyuki Nagaya, and Hiroshi Orihara

Entangled chain dynamics of polymer knots in extensional flow *(16 pages)* . . . . . 041808
Demosthenes Kivotides, S. Louise Wilkin, and Theo G. Theofanous

Renormalized field theory of collapsing directed randomly branched polymers *(17 pages)* . . . . . 041809
Hans-Karl Janssen, Frank Wevelsiep, and Olaf Stenull

**Biological physics**

Compartmentalization of second messengers in neurons: A mathematical analysis *(7 pages)* . . . . . 041901
Wen Chen, Herbert Levine, and Wouter-Jan Rappel

Morphogen profiles can be optimized to buffer against noise *(5 pages)* . . . . . 041902
Timothy E. Saunders and Martin Howard

Evolutionary dynamics on rugged fitness landscapes: Exact dynamics and information theoretical aspects *(12 pages)* . . . . . 041903
David B. Saakian and José F. Fontanari

Localized short impulses in a nerve model with self-excitable membrane *(8 pages)* . . . . . 041904
Alain M. Dikandé and Ga-Akeku Bartholomew

Computational analysis of the tether-pulling experiment to probe plasma membrane-cytoskeleton interaction in cells *(15 pages)* . . . . . 041905
Kristopher R. Schumacher, Aleksander S. Popel, Bahman Anvari, William E. Brownell, and Alexander A. Spector

Elongation dynamics of amyloid fibrils: A rugged energy landscape picture *(6 pages)* . . . . . 041906
Chiu Fan Lee (李超帆), James Loken, Létitia Jean, and David J. Vaux

Fluctuations and dispersal rates in population dynamics *(4 pages)* . . . . . 041907
David A. Kessler and Leonard M. Sander

Self-similarity and protein compactness *(4 pages)* . . . . . 041908
M. A. Moret, M. C. Santana, G. F. Zebende, and P. G. Pascutti

Simulations of impulsive laser scattering of biological protein assemblies: Application to M13 bacteriophage *(10 pages)* . . . . . 041909
Eric C. Dykeman, Daryn Benson, K.-T. Tsen, and Otto F. Sankey

Adsorption of a hydrophobic-polar-model heteropolymer in an attractive nanotube *(7 pages)* . . . . . 041910
Handan Arkin

*(Continued)*

PHYSICAL REVIEW E THIRD SERIES, VOLUME 80, NUMBER 4 OCTOBER 2009

**Films, interfaces, and crystal growth**

Experimental validation of the Helmoltz equation for the surface potential of Langmuir monolayers *(6 pages)* . . . . . 041601
Abdel I. El Abed

Island-size distribution and capture numbers in three-dimensonal nucleation: Dependence on island morphology *(9 pages)* . . . . . 041602
John Royston and Jacques G. Amar

Theory of rotating electrohydrodynamic flows in a liquid film *(15 pages)* . . . . . 041603
E. V. Shiryaeva, V. A. Vladimirov, and M. Yu. Zhukov

Reducing the surface roughness beyond the pulsed-laser-deposition limit *(10 pages)* . . . . . 041604
E. Vasco, C. Polop, and J. L. Sacedón

**Liquid crystals**

Symmetry-dependent defect structures in soft-mode turbulence *(4 pages)* . . . . . 041701
Rinto Anugraha, Yoshiki Hidaka, Tatsuhiro Ueki, and Shoichi Kai

Reorientation effect and electrical current in a weakly anchored nematic cell *(7 pages)* . . . . . 041702
R. Teixeira de Souza, M. M. A. de Jesus, J. C. Dias, and L. R. Evangelista

Concentration, temperature, and *p*H dependence of sunset-yellow aggregates in aqueous solutions: An x-ray investigation *(8 pages)* . . . . . 041703
Leela Joshi, Shin-Woong Kang, Dena Mae Agra-Kooijman, and Satyendra Kumar

Stable smectic phase in suspensions of polydisperse colloidal platelets with identical thickness *(6 pages)* . . . . 041704
Dazhi Sun, Hung-Jue Sue, Zhengdong Cheng, Yuri Martínez-Ratón, and Enrique Velasco

Biaxiality at the isotropic-nematic interface with planar anchoring *(5 pages)* . . . . . 041705
S. M. Kamil, A. K. Bhattacharjee, R. Adhikari, and Gautam I. Menon

Flow-driven transition and associated velocity profiles in a nematic liquid-crystal cell *(5 pages)* . . . . . 041706
S. A. Jewell, S. L. Cornford, F. Yang, P. S. Cann, and J. R. Sambles

Unwinding of the uniform lying helix structure in cholesteric liquid crystals next to a spatially uniform aligning surface *(7 pages)* . . . . . 041707
Patrick S. Salter, Giovanni Carbone, Sharon A. Jewell, Steve J. Elston, and Peter Raynes

Modeling dipolar and quadrupolar defect structures generated by chiral islands in freely suspended liquid crystal films *(8 pages)* . . . . . 041708
N. M. Silvestre, P. Patrício, M. M. Telo da Gama, A. Pattanaporkratana, C. S. Park, J. E. Maclennan, and N. A. Clark

**Polymers**

Microphase separation of comb copolymers with two different lengths of side chains *(8 pages)* . . . . . 041801
M. A. Aliev and N. Yu. Kuzminyh

Polymer chains in confined geometries: Massive field theory approach *(14 pages)* . . . . . 041802
D. Romeis and Z. Usatenko

Detailed scaling analysis of low-force polyelectrolyte elasticity *(7 pages)* . . . . . 041803
D. B. McIntosh, N. Ribeck, and O. A. Saleh

*(Continued)*

PHYSICAL REVIEW E THIRD SERIES, VOLUME 80, NUMBER 4 OCTOBER 2009

Planar bifurcation subject to multiplicative noise: Role of symmetry *(9 pages)* . . . . . 041134
Alexandros Alexakis and François Pétrélis

**Equilibrium and linear transport properties of fluids**

Linear transport equations valid for arbitrary collisionality: Comparison with the Chapman-Enskog expansion *(11 pages)* . . . . . 041201
A. Bendib, K. Bendib-Kalache, and M.-M. Gombert

**Granular materials**

Towards precise prediction of transport properties from synthetic computer tomography of reconstructed porous media *(13 pages)* . . . . . 041301
B. Biswal, R. J. Held, V. Khanna, J. Wang, and R. Hilfer

Compaction dynamics of a magnetized powder *(6 pages)* . . . . . 041302
G. Lumay, S. Dorbolo, and N. Vandewalle

Partitioning of energy in highly polydisperse granular gases *(10 pages)* . . . . . 041303
H. Uecker, W. T. Kranz, T. Aspelmeier, and A. Zippelius

Long-wavelength structural anomalies in jammed systems *(7 pages)* . . . . . 041304
Leonardo E. Silbert and Moises Silbert

Effect of noise on solid-to-liquid transition in small granular systems under shear *(7 pages)* . . . . . 041305
Martin F. Melhus, Igor S. Aranson, Dmitri Volfson, and Lev S. Tsimring

Hydrodynamic character of the nonequipartition of kinetic energy in binary granular gases *(4 pages)* . . . . . 041306
J. Javier Brey and M. J. Ruiz-Montero

**Colloidal dispersions, suspensions, and aggregates**

Experimental evidence for reversible zippering of chains in magnetic nanofluids under external magnetic fields *(8 pages)* . . . . . 041401
Junaid M. Laskar, John Philip, and Baldev Raj

Poisson-Boltzmann cell model for heterogeneously charged colloids *(10 pages)* . . . . . 041402
Eelco Eggen and René van Roij

**Structured and complex fluids**

Tracking gas-liquid coexistence in fluids of charged soft dumbbells *(9 pages)* . . . . . 041501
Heiko Braun and Reinhard Hentschke

Hidden scale invariance in molecular van der Waals liquids: A simulation study *(6 pages)* . . . . . 041502
Thomas B. Schrøder, Ulf R. Pedersen, Nicholas P. Bailey, Søren Toxvaerd, and Jeppe C. Dyre

Unconstrained motions, dynamic heterogeneities, and relaxation in disordered solids *(11 pages)* . . . . . 041503
Vanessa K. de Souza and Peter Harrowell

Rotational dynamics and aging in a magnetic colloidal glass *(12 pages)* . . . . . 041504
E. Wandersman, V. Dupuis, E. Dubois, and R. Perzynski

Dynamical heterogeneity in binary mixtures of low-molecular-weight glass formers *(8 pages)* . . . . . 041505
Daniele Cangialosi, Angel Alegría, and Juan Colmenero

*(Continued)*

**PHYSICAL REVIEW E** **THIRD SERIES, VOLUME 80, NUMBER 4** **OCTOBER 2009**

Minimum action method for the Kardar-Parisi-Zhang equation *(17 pages)* . . . . . 041116
Hans C. Fogedby and Weiqing Ren

Structure of physical crystalline membranes within the self-consistent screening approximation *(6 pages)* . . . . 041117
Doron Gazit

Critical percolation phase and thermal Berezinskii-Kosterlitz-Thouless transition in a scale-free network with short-range and long-range random bonds *(4 pages)* . . . . . 041118
A. Nihat Berker, Michael Hinczewski, and Roland R. Netz

Quantum heat engines and nonequilibrium temperature *(5 pages)* . . . . . 041119
Ramandeep S. Johal

Reaction under vacancy-assisted diffusion at high quencher concentration *(10 pages)* . . . . . 041120
Kazuhiko Seki and M. Tachiya

Persistence effects in deterministic diffusion *(7 pages)* . . . . . 041121
Thomas Gilbert and David P. Sanders

Investigation of film surface roughness and porosity dependence on lattice size in a porous thin film deposition process *(12 pages)* . . . . . 041122
Gangshi Hu, Jianqiao Huang, Gerassimos Orkoulas, and Panagiotis D. Christofides

Scaling behavior of the contact process in networks with long-range connections *(8 pages)* . . . . . 041123
Róbert Juhász and Géza Ódor

Improving fast-switching free energy estimates by dynamical freezing *(6 pages)* . . . . . 041124
Paolo Nicolini and Riccardo Chelli

Field-driven transition in an Ising magnet with mixed interactions *(6 pages)* . . . . . 041125
S. L. A. de Queiroz

Nonequilibrium Monte Carlo simulation for a driven Brownian particle *(7 pages)* . . . . . 041126
Phil Attard

Quantum transport in a periodic symmetric potential of a driven quantum system *(14 pages)* . . . . . 041127
Satyabrata Bhattacharya, Pinaki Chaudhury, Sudip Chattopadhyay, and Jyotipratim Ray Chaudhuri

Understanding totally asymmetric simple-exclusion-process transport on networks: Generic analysis via effective rates and explicit vertices *(22 pages)* . . . . . 041128
Ben Embley, Andrea Parmeggiani, and Norbert Kern

Nonlinear $q$-voter model *(8 pages)* . . . . . 041129
Claudio Castellano, Miguel A. Muñoz, and Romualdo Pastor-Satorras

WKB theory of epidemic fade-out in stochastic populations *(4 pages)* . . . . . 041130
Baruch Meerson and Pavel V. Sasorov

Exact results for the Barabási queuing model *(7 pages)* . . . . . 041131
C. Anteneodo

Strong field line shapes and photon statistics from a single molecule under anomalous noise *(7 pages)* . . . . . 041132
František Šanda

Kinetic equation approach to the description of quantum surface diffusion: Non-Markovian effects versus jump dynamics *(13 pages)* . . . . . 041133
V. V. Ignatyuk

*(Continued)*