PHYSICAL REVIEW E

For editorial and subscription correspondence, please see inside front cover
(ISSN: 1063-651X)

PERIODICALS
Postmaster send address changes to:
American Institute of Physics
500 Sunnyside Boulevard
Woodbury, NY 11797-2999

THIRD SERIES, VOLUME 58, NUMBER 5
PARTS A AND B

CONTENTS

NOVEMBER 1998

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages R5201–6002, and Part B pages 6003–6898.

PART A

Note to Reader i

RAPID COMMUNICATIONS

General methods of statistical physics

Spin-glass model with partially annealed asymmetric bonds R5201
A. E. Allahverdyan and D. B. Saakian

Probability distribution of the shortest path on the percolation cluster, its backbone, and skeleton R5205
Markus Porto, Shlomo Havlin, H. Eduardo Roman, and Armin Bunde

High dimensional behavior of the Kardar-Parisi-Zhang growth dynamics R5209
C. Castellano, A. Gabrielli, M. Marsili, M. A. Muñoz, and L. Pietronero

Elementary derivation of Spitzer's asymptotic law for Brownian windings and some of its physical applications . . R5213
Arkady L. Kholodenko

Disorder, order, and domain wall roughening in the two-dimensional random field Ising model R5217
E. T. Seppälä, V. Petäjä, and M. J. Alava

Chaos and nonlinear dynamical systems

Adaptive control of spatially extended systems: Targeting spatiotemporal patterns and chaos R5221
Sudeshna Sinha and Neelima Gupte

Localized structures embedded in the eigenfunctions of chaotic Hamiltonian systems R5225
E. Vergini and D. A. Wisniacki

Classical fluids

Studying random differential equations as a tool for turbulent diffusion R5229
E. Vanden Eijnden

Biorthogonal decomposition analysis and reconstruction of spatiotemporal chaos generated by coupled wakes R5233
J. F. Ravoux and P. Le Gal

Complex fluids, polymers, and granular materials

Shear-induced particle diffusion in inelastic hard sphere fluids R5237
Piroz Zamankhan, William Polashenski, Jr., Hooman Vahedi Tafreshi, Amir Shakib Manesh, and Pertti J. Sarkomaa

Copyright 1998 by The American Physical Society

(Continued)

1063-651X(199811)58:5:B;1-M

PHYSICAL REVIEW E THIRD SERIES, VOLUME 58, NUMBER 5 NOVEMBER 1998

Bethe approximation for a semiflexible polymer chain R5241
Stefano Lise, Amos Maritan, and Alessandro Pelizzola
Dynamics of wetting fronts in porous media R5245
Igor Mitkov, Daniel M. Tartakovsky, and C. Larrabee Winter

Biological physics

Monte Carlo procedure for protein design R5249
Anders Irbäck, Carsten Peterson, Frank Potthast, and Erik Sandelin

Plasma physics

Role of the plasma scale length in the harmonic generation from solid targets R5253
M. Zepf, G. D. Tsakiris, G. Pretzler, I. Watts, D. M. Chambers, P. A. Norreys, U. Andiel, A. E. Dangor, K. Eidmann, C. Gahn, A. Machacek, J. S. Wark, and K. Witte
Particle injection into the wave acceleration phase due to nonlinear wake wave breaking R5257
S. Bulanov, N. Naumova, F. Pegoraro, and J. Sakai

Classical physics, including nonlinear media

Electromagnetic standing wave resonances in a periodically corrugated waveguide R5261
V. A. Pogrebnyak
Generalized momentum method to describe high-frequency solitary wave propagation in systems with varying dispersion R5264
Sergei K. Turitsyn, Tobias Schaefer, and Vladimir K. Mezentsev

ARTICLES

General methods of statistical physics

Quantum plasmas with or without a uniform magnetic field. I. General formalism and algebraic tails of correlations 5268
F. Cornu
Quantum plasmas with or without a uniform magnetic field. II. Exact low-density free energy 5293
F. Cornu
Quantum plasmas with or without a uniform magnetic field. III. Exact low-density algebraic tails of correlations 5322
F. Cornu
Optical excitable waves 5347
P. Coullet, D. Daboussy, and J. R. Tredicce
Dissipation of energy and of information in nonequilibrium reaction-diffusion systems 5351
Bernard Gaveau, Michel Moreau, and Janos Toth
Quantum annealing in the transverse Ising model 5355
Tadashi Kadowaki and Hidetoshi Nishimori
Pattern dynamics of Rayleigh-Bénard convective rolls and weakly segregated diblock copolymers 5364
Jacob J. Christensen and Alan J. Bray
Modified Borel summation of divergent series and critical-exponent estimates for an N-vector cubic model in three dimensions from five-loop ϵ expansions 5371
A. I. Mudrov and K. B. Varnashev
Comparative study of self-avoiding trails and self-avoiding walks on a family of compact fractals 5376
Ivan Živić, Sava Milošević, and H. Eugene Stanley
Lévy random walks in finite systems 5382
P. M. Drysdale and P. A. Robinson

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 58, NUMBER 5** **NOVEMBER 1998**

Scaling exponents of sandpile-type models of self-organized criticality 5395
S. D. Edney, P. A. Robinson, and D. Chisholm
Correlation transitions in the Ising chain with competing short-range and long-range mirror interactions 5403
István Daruka and Zsolt Gulácsi
Overall time evolution in phase-ordering kinetics 5410
Claudio Castellano and Marco Zannetti
Solution of the static pair annihilation process in arbitrary dimension 5424
B. Bonnier
Analysis of optimal velocity model with explicit delay 5429
Masako Bando, Katsuya Hasebe, Ken Nakanishi, and Akihiro Nakayama
Semiclassical canonical rate theory 5436
Eli Pollak and Bruno Eckhardt
Dynamics of Eulerian walkers 5449
A. M. Povolotsky, V. B. Priezzhev, and R. R. Shcherbakov
Crossover behavior of a one-dimensional random energy model 5455
Matteo Campellone, Silvio Franz, and Giorgio Parisi
Role of the equilibrium size of Kadanoff blocks in the loop-expansion technique 5461
C. Degli Esposti Boschi, A. Rioli, L. Ferrari, and F. Dolcini
Effect of long-range interactions in the conserved Kardar-Parisi-Zhang equation 5467
Youngkyun Jung, In-mook Kim, and Jin Min Kim
Stochastic resonance via dynamical symmetry breaking in a modulated bistable potential 5471
Subir K. Sarkar and Debashish Bose
Thermal radiation from small particles 5477
K. Hansen and E. E. B. Campbell
Nonequilibrium stationary microstructures in surface chemical reactions 5483
M. Hildebrand, A. S. Mikhailov, and G. Ertl
Ballistic and diffusive corrections to front propagation in the presence of multiplicative noise 5494
J. Armero, J. Casademunt, L. Ramírez-Piscina, and J. M. Sancho
Universality and scaling for the structure factor in dynamic order-disorder transitions 5501
Gregory Brown, Per Arne Rikvold, and Martin Grant
Perturbative corrections to the Ohta-Jasnow-Kawasaki theory of phase-ordering dynamics 5508
C. L. Emmott
Spatiotemporal organization of coupled nonlinear pendula through impurities 5529
A. Gavrielides, T. Kottos, V. Kovanis, and G. P. Tsironis
Three ignored densities, frame-independent thermodynamics, and broken Galilean symmetry 5535
Peter Kostädt and Mario Liu
Stability of planar reactive fronts in external fields 5541
Arkady B. Rovinsky, Anatol M. Zhabotinsky, and Irving R. Epstein
Simulation of extensional clay fractures 5548
A. Malthe-Sørenssen, T. Walmann, J. Feder, T. Jøssang, P. Meakin, and H. H. Hardy
Quantum Monte Carlo simulations of driven spin-boson systems 5565
Arnim Lück, Manfred Winterstetter, Ulrich Weiss, and C. H. Mak
Nonlinear canonical quantum system of collectively interacting particles via an exclusion-inclusion principle 5574
G. Kaniadakis, P. Quarati, and A. M. Scarfone
Fronts in a bistable medium with two global constraints: Oscillatory instability and large-amplitude limit-cycle motion 5586
M. Meixner, P. Rodin, and E. Schöll
Improved discretization of the Kardar-Parisi-Zhang equation 5592
Chi-Hang Lam and F. G. Shin

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 58, NUMBER 5 NOVEMBER 1998

Cluster distribution in mean-field percolation: Scaling and universality 5596
Joseph Rudnick, Paisan Nakmahachalasint, and George Gaspari
Noise-enhanced transmission of information in a bistable system 5602
M. Misono, T. Kohmoto, Y. Fukuda, and M. Kunitomo
Avalanches, transport, and local equilibrium in self-organized criticality 5608
Afshin Montakhab and J. M. Carlson

Chaos and nonlinear dynamical systems

Effect of parameter mismatch on the mechanism of chaos synchronization loss in coupled systems 5620
V. Astakhov, M. Hasler, T. Kapitaniak, A. Shabunin, and V. Anishchenko
Chaos thresholds in finite Fermi systems 5629
P. G. Silvestrov
Dynamics of dry friction: A numerical investigation 5637
Y. F. Lim and Kan Chen
Largest Lyapunov exponent in molecular systems: Linear molecules and application to nitrogen clusters 5643
F. Calvo
Is there memory in solar activity? 5650
R. Oliver and J. L. Ballester
Band Husimi distributions and the classical-quantum correspondence on the torus 5655
Itzhack Dana, Yaakov Rutman, and Mario Feingold
Time-reversed imaging as a diagnostic of wave and particle chaos 5668
R. K. Snieder and J. A. Scales
Delay time window and plateau onset of the correlation dimension for small data sets 5676
H. S. Kim, R. Eykholt, and J. D. Salas
Phase effect of two coupled periodically driven Duffing oscillators 5683
Hua-Wei Yin, Jian-Hua Dai, and Hong-Jun Zhang
Tunneling rate fluctuations induced by nonlinear resonances: A quantitative treatment based on semiclassical arguments 5689
Luca Bonci, Andrea Farusi, Paolo Grigolini, and Roberto Roncaglia
Semiclassical limit of universal parametric density correlations 5693
Alfredo M. Ozorio de Almeida, Caio H. Lewenkopf, and Eduardo R. Mucciolo
Critical slowing down in synchronizing nonlinear oscillators 5704
H. K. Leung
Role of invariant and minimal absorbing areas in chaos synchronization 5710
Gian-Italo Bischi and Laura Gardini
Integrability and level crossing manifolds in a quantum Hamiltonian system 5720
Vyacheslav V. Stepanov and Gerhard Müller
Electrodynamics of a two-electron atom with retardation and self-interaction 5727
Jayme De Luca
Clustering and phase resetting in a chain of bistable nonisochronous oscillators 5742
V. I. Nekorkin, V. A. Makarov, and M. G. Velarde

Classical fluids

Defect-unbinding transitions and inherent structures in two dimensions 5748
Frank L. Somer, Jr., G. S. Canright, and Theodore Kaplan
Simple passive scalar advection-diffusion model 5757
Scott Wunsch
Nonlinear Marangoni waves in multilayer systems 5765
Igor L. Kliakhandler, Alexander A. Nepomnyashchy, Ilya B. Simanovskii, and Michael A. Zaks

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 58, NUMBER 5 NOVEMBER 1998

Instanton for the Kraichnan passive scalar problem 5776
E. Balkovsky and V. Lebedev
Lattice fluid dynamics from perfect discretizations of continuum flows 5796
E. Katz and U.-J. Wiese
Percolation in Yukawa fluids and clusters with a fractal structure 5808
Tetsuo Kaneko
Spatial structure of the viscous boundary layer in turbulent convection 5816
Xin-Liang Qiu and Ke-Qing Xia
Convection under rotation for Prandtl numbers near 1: Küppers-Lortz instability 5821
Yuchou Hu, Werner Pesch, Guenter Ahlers, and Robert E. Ecke
Simple model for linear and nonlinear mixing at unstable fluid interfaces with variable acceleration 5834
John D. Ramshaw
Effect of finite computational domain on turbulence scaling law in both physical and spectral spaces 5841
Thomas Y. Hou, Xiao-Hui Wu, Shiyi Chen, and Ye Zhou
Self-diffusion coefficients and shear viscosity of model nanocolloidal dispersions
by molecular dynamics simulation 5845
María J. Nuevo, Juan J. Morales, and David M. Heyes

Liquid crystals

Nonlinear Schrödinger equation in nematic liquid crystals 5855
J. A. Reyes and P. Palffy-Muhoray
Thermal conductivity and thermal diffusivity of the cyanobiphenyl (*n*CB) homologous series 5860
M. Marinelli, F. Mercuri, U. Zammit, and F. Scudieri
Phase diagrams of mixtures of flexible polymers and nematic liquid crystals in a field 5867
Zhiqun Lin, Hongdong Zhang, and Yuliang Yang
Phase diagram of Onsager crosses 5873
Ronald Blaak and Bela M. Mulder
Rayleigh-Bénard convection in a homeotropically aligned nematic liquid crystal 5885
Leif Thomas, Werner Pesch, and Guenter Ahlers
Thermal phase diagrams of columnar liquid crystals 5898
G. Lamoureux, A. Caillé, and D. Sénéchal
Theory on quench-induced pattern formation: Application to the isotropic to smectic-*A* phase transitions 5909
Zhou Haijun and Ou-Yang Zhong-can
Importance of rubbing-induced inclination of polyimide backbone structures for determination
of the pretilt angle of liquid crystals 5914
R. Arafune, K. Sakamoto, S. Ushioda, S. Tanioka, and S. Murata
Fréedericksz transition in antiferroelectric liquid crystals and cooperative motion of smectic layers 5919
X. Y. Wang, T. Kyu, A. M. Rudin, and P. L. Taylor
Edge dislocation in a vertical smectic-*A* film: Line tension versus film thickness and Burgers vector 5923
Jean-Christophe Géminard, Claude Laroche, and Patrick Oswald
Layer undulations in finite samples of smectic-*A* liquid crystals subjected to uniform pressure
and magnetic fields 5926
I. W. Stewart
Distribution functions for reversibly self-assembling spherocylinders 5934
Eric M. Kramer and Judith Herzfeld
Nonlinear elasticity of the sliding columnar phase 5948
C. S. O'Hern and T. C. Lubensky
Calorimetric and small angle x-ray scattering study of phase transitions in octylcyanobiphenyl-aerosil
dispersions 5966
G. S. Iannacchione, C. W. Garland, J. T. Mang, and T. P. Rieker

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 58, NUMBER 5 NOVEMBER 1998

Field-induced reorientation of nematic liquid crystals with twofold degenerate alignment on SiO_x surfaces 5982
P. Jägemalm, G. Barbero, L. Komitov, and A. K. Zvezdin
Director orientation and optical stripe texture in electroclinic liquid crystals 5990
F. J. Bartoli, J. R. Lindle, S. R. Flom, R. Shashidhar, G. Rubin, J. V. Selinger, and B. R. Ratna
Effect of chain flexibility on the nematic-smectic transition 5997
Alexei V. Tkachenko

PART B

Note to Reader i

Complex fluids, polymers, and granular materials

Magnetic susceptibility of ferrocolloids with frozen texture 6003
Andrej Yu. Zubarev and Larisa Yu. Iskakova
Chiral patterns arising from electrostatic growth models 6015
Ilya M. Sandler, Geoffrey S. Canright, Hongjun Gao, Shijin Pang, Zengquan Xue, and Zhenyu Zhang
Directional solidification under stress 6027
Isabelle Cantat, Klaus Kassner, Chaouqi Misbah, and Heiner Müller-Krumbhaar
Influence of a modulated surface on the properties of liquid-liquid interfaces 6041
O. Pecina and J. P. Badiali
Insights in erosion instabilities in nonconsolidated porous media 6051
P. Cerasi and P. Mills
Granular dynamics in a swirled annulus 6061
Michael A. Scherer, Thomas Mahr, Andreas Engel, and Ingo Rehberg
Measurement of the self-intermediate scattering function of suspensions of hard spherical particles near the glass transition 6073
W. van Megen, T. C. Mortensen, S. R. Williams, and J. Müller
Surface freezing in chain molecules. II. Neat and hydrated alcohols 6086
O. Gang, X. Z. Wu, B. M. Ocko, E. B. Sirota, and M. Deutsch
Transition from dendritic to planar growth and banded structure formation in rapidly solidified alloys 6101
Massimo Conti
Brillouin light scattering studies of the mechanical properties of thin freely standing polystyrene films 6109
J. A. Forrest, K. Dalnoki-Veress, and J. R. Dutcher
Dynamics of granular segregation patterns in a long drum mixer 6115
Kiam Choo, Michael W. Baker, T. C. A. Molteno, and Stephen W. Morris
Ground state of a dipolar fluid film 6124
Mark Gross
Kinetics of anchoring of polymer chains on substrates with chemically active sites 6134
G. Oshanin, S. Nechaev, A. M. Cazabat, and M. Moreau
Swelling mechanism unique to charged gels: Primary formulation of the free energy 6145
Hiroshi Frusawa and Reinosuke Hayakawa
Concentration-induced growth of polymerlike micelles 6155
Yannick Rouault
Domain patterns in copolymer-homopolymer mixtures 6158
Aya Ito
Heat diffusion and banding in rapid solidification 6166
Massimo Conti
Poisson ratio in composites of auxetics 6173
Gaoyuan Wei and S. F. Edwards

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 58, NUMBER 5** **NOVEMBER 1998**

Noncircular converging flows in viscous gravity currents 6182
J. A. Diez, L. P. Thomas, S. Betelú, R. Gratton, B. Marino, J. Gratton, D. G. Aronson, and S. B. Angenent
Mode-coupling theory for molecular liquids based on the interaction-site model 6188
Song-Ho Chong and Fumio Hirata
Parametrically driven surface waves on viscous ferrofluids 6199
Hanns Walter Müller
Spatial correlations and dispersion for fluid transport through packed glass beads studied by pulsed field-gradient NMR 6206
S. Stapf, K. J. Packer, R. G. Graham, J.-F. Thovert, and P. M. Adler
First-order phase transition in unfolding a collapsed polymer: A histogram Monte Carlo simulation 6222
Pik-Yin Lai
Structural properties of methanol-polyamidoamine dendrimer solutions 6229
Norberto Micali, Luigi Monsu' Scolaro, Andrea Romeo, Domenico Lombardo, Pierre Lesieur, and Francesco Mallamace
Effect of the anisotropic surface tension, crystallization kinetics, and heat diffusion on nonequilibrium growth of liquid crystals 6236
T. Börzsönyi, Á. Buka, and L. Kramer
Critical dynamics in mixtures 6246
R. Folk and G. Moser
Measurement of anisotropic Brownian motion near an interface by evanescent light-scattering spectroscopy 6275
M. Hosoda, K. Sakai, and K. Takagi
Charge oscillations and many-body effects in bundles of like-charged rods 6281
B.-Y. Ha and Andrea J. Liu
Experiments on negative and positive magnetoviscosity in an alternating magnetic field 6287
A. Zeuner, R. Richter, and I. Rehberg
Rheological behavior of a solution of particles aggregating on the containing walls 6294
Armand Ajdari
Ordering phenomena of star polymer solutions approaching the Θ state 6299
C. N. Likos, H. Löwen, A. Poppe, L. Willner, J. Roovers, B. Cubitt, and D. Richter
Reactive flow of molten Pb(Sn) alloys in Si grooves coated with Cu film 6308
C. Y. Liu and K. N. Tu

Biological physics

Analysis of correlations between sites in models of protein sequences 6312
B. G. Giraud, Alan Lapedes, and Lon Chang Liu
Enhancement in the dynamic response of a viscoelastic fluid flowing in a tube 6323
J. A. del Río, M. López de Haro, and S. Whitaker
Destabilization of cell aggregation under nonstationary conditions 6328
A. A. Polezhaev, V. S. Zykov, and S. C. Müller
Mössbauer effect as a possible tool in detecting nonlinear excitations in microtubules 6333
M. V. Satarić, S. Zeković, J. A. Tuszyński, and J. Pokorny
Adhesion-induced reorganization of charged fluid membranes 6340
J. Nardi, R. Bruinsma, and E. Sackmann
Dynamics of reentry around a circular obstacle in cardiac tissue 6355
Fagen Xie, Zhilin Qu, and Alan Garfinkel
Cooperative dynamics in auditory brain response 6359
J. Kwapień, S. Drożdż, L.C. Liu, and A.A. Ioannides
Two-dimensional froths and the dynamics of biological tissues 6368
B. Dubertret, T. Aste, H. M. Ohlenbusch, and N. Rivier

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 58, NUMBER 5 NOVEMBER 1998

Analysis of on-line training with optimal learning rates 6379
Magnus Rattray and David Saad
Phase space embedding of electrocardiograms 6392
Marcus Richter and Thomas Schreiber
Cooperative model of bacterial sensing 6399
Yu Shi and Thomas Duke
Davydov soliton and polarons in molecular chains: Partial Hamiltonian diagonalization 6407
A. M. Clogston, H. K. McDowell, Peter Tsai, and Jay Hanssen
Computer simulations of stimulus dependent state switching in basic circuits of bursting neurons 6418
Mikhail Rabinovich, Ramón Huerta, Maxim Bazhenov, Alexander K. Kozlov, and Henry D. I. Abarbanel
Statistics of the depth probed by cw measurements of photons in a turbid medium 6431
George H. Weiss, Josep M. Porrà, and Jaume Masoliver
Detection of anomalous diffusion using confidence intervals of the scaling exponent with application to preterm neonatal heart rate variability 6440
David R. Bickel, M. Terese Verklan, and Jon Moon
Quantification of cancellous bone structure using symbolic dynamics and measures of complexity 6449
Peter I. Saparin, Wolfgang Gowin, Jürgen Kurths, and Dieter Felsenberg

Plasma physics

Ultrashort pulse laser ionization of ions in a plasma 6460
Burke Ritchie and Paul R. Bolton
Thermal radiation of a semibounded medium with a transition layer 6465
Alexander S. Usenko
Nonlinear surface heating of a plane sample and modes of current transfer to hot arc cathodes 6480
M. S. Benilov
Diagnostics of microwave plasmas of C_2H_2: Mass spectrometric investigations of ionic and neutral species 6495
Toshihiro Fujii
Vlasov simulations of strongly nonlinear electrostatic oscillations in a one-dimensional electron-ion plasma 6503
Francesco Califano and Maurizio Lontano
Theory of magnetohydrodynamic and shock waves in neutron matter 6512
A. I. Akhiezer, N. V. Laskin, and S. V. Peletminskii
Modulational instability of dust-acoustic and dust-ion-acoustic waves 6517
M. R. Amin, G. E. Morfill, and P. K. Shukla
Experimental Stark widths of Kr III 6524
I. Ahmad, S. Büscher, Th. Wrubel, and H.-J. Kunze
Heavy-ion-beam-induced laser scheme in hydrogenlike He^+ 6531
M. Salvermoser, A. Ulrich, and J. Wieser
Energy balance of the bulk, Maxwellian electrons in spatially inhomogeneous negative-glow plasmas 6539
Robert R. Arslanbekov and Anatoly A. Kudryavtsev
Model for the boring of ultraintense lasers into overdense plasmas 6553
Wei Yu, M. Y. Yu, J. Zhang, and Z. Xu
Measurements of electrical conductivity and the mean ionization state of nonideal aluminum plasmas 6557
I. Krisch and H.-J. Kunze

Physics of beams

Analytical expressions for the coupling impedance of a long narrow slot in a coaxial beam pipe 6565
S. De Santis, A. Mostacci, L. Palumbo, and B. Spataro
Storage-ring free-electron-laser dynamics and head-tail instability 6570
G. Dattoli, L. Mezi, A. Renieri, M. Migliorati, M. E. Couprie, R. Roux, D. Nutarelli, and M. Billardon

(Continued)

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 58, NUMBER 5** **NOVEMBER 1998**

Electron capture and violent acceleration by an extra-intense laser beam 6575
J. X. Wang, Y. K. Ho, Q. Kong, L. J. Zhu, L. Feng, S. Scheid, and H. Hora
Diagnostic criterion for crystallized beams 6578
Harel Primack and Reinhold Blümel
High current operation of a storage-ring free-electron laser 6584
R. Roux, M. E. Couprie, R. J. Bakker, D. Garzella, D. Nutarelli, L. Nahon, and M. Billardon
Excitation of backward waves in forward wave amplifiers 6594
G. S. Nusinovich, M. Walter, and J. Zhao

Classical physics, including nonlinear media

Coalescence and instability of copropagating nonlinear waves 6606
Luc Bergé
Group velocity of acoustic waves in strongly scattering media: Dependence on the volume fraction of scatterers 6626
M. L. Cowan, K. Beaty, J. H. Page, Zhengyou Liu, and Ping Sheng
Validation of the variational approach for chirped pulses in fibers with periodic dispersion 6637
F. Kh. Abdullaev and J. G. Caputo
Stationary mixed-polarization spatial solitons and their stability in semiconductor waveguides 6649
D. C. Hutchings, J. M. Arnold, and D. F. Parker
Generation of focused, nonspherically decaying pulses of electromagnetic radiation 6659
H. Ardavan
Electromagnetic force in dispersive and transparent media 6685
Yimin Jiang and Mario Liu
Soliton motion in a parametrically ac-driven damped Toda lattice 6695
K. Ø. Rasmussen, Boris A. Malomed, A. R. Bishop, and Niels Grønbech-Jensen
Solitary waves for two and three coupled nonlinear Schrödinger equations 6700
F. T. Hioe
Three-wave gap solitons in waveguides with quadratic nonlinearity 6708
William C. K. Mak, Boris A. Malomed, and P. L. Chu
Moving fronts for complex Ginzburg-Landau equation with Raman term 6723
Adrian Ankiewicz and Nail Akhmediev
Hermite-Gaussian expansion for pulse propagation in strongly dispersion managed fibers 6728
T. I. Lakoba and D. J. Kaup
Possibility of superluminal behaviors for *X*-like and Zenneck waves 6742
A. Ranfagni and D. Mugnai
Conservation laws in higher-order nonlinear Schrödinger equations 6746
Jongbae Kim, Q-Han Park, and H. J. Shin
State transformations of colliding optical solitons and possible application to computation in bulk media 6752
Mariusz H. Jakubowski, Ken Steiglitz, and Richard Squier

Computational physics

Direct signal recovery from threshold crossings 6759
May Lim and Caesar Saloma
Efficient stress relaxation in molecular dynamics simulations of semiflexible *n*-alkanes 6766
T. Mülders, S. Toxvaerd, and G. R. Kneller
Evaluation of some three-body variational integrals 6781
José Caro
Test for random number generators: Schwinger-Dyson equations for the Ising model 6787
H. G. Ballesteros and V. Martín-Mayor

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 58, NUMBER 5 NOVEMBER 1998

Computations of spheroidal harmonics with complex arguments: A review with an algorithm 6792
Le-Wei Li, Mook-Seng Leong, Tat-Soon Yeo, Pang-Shyan Kooi, and Kian-Yong Tan

BRIEF REPORTS

General methods of statistical physics

Wave function of a Brownian particle 6807
R. M. Cavalcanti
Wave instabilities in an excitable electrochemical system 6810
R. D. Otterstedt, N. I. Jaeger, P. J. Plath, and J. L. Hudson
Measurement of critical exponents of diamond films by atomic force microscopy imaging 6814
M. C. Salvadori, M. G. Silveira, and M. Cattani
Estimation of connective constants for two-dimensional lattices from self-avoiding walks in the two-dimensional continuum 6817
Gustavo A. Arteca and Shuangxi Zhang
Nearest-neighbor distance at a single mobile trap 6821
Zbigniew Koza, Tomer Yanir, and Haim Taitelbaum
Self-organized states in cellular automata: Exact solution 6824
M. V. Medvedev and P. H. Diamond
Mesoscopic description of the annealed Ising model, and multiplicative noise 6828
Walter Genovese, Miguel A. Muñoz, and P. L. Garrido
Crossing of two mobile averages: A method for measuring the roughness exponent 6832
N. Vandewalle and M. Ausloos

Chaos and nonlinear dynamical systems

Chaotic Wannier-Bloch resonance states 6835
M. Glück, A. R. Kolovsky, and H. J. Korsch
Probability distribution characteristics of chaos in a simple population model and the Bonhoeffer–van der Pol oscillator 6839
S. Parthasarathy and S. Rajasekar
Simple example of partial synchronization of chaotic systems 6843
M. Hasler, Yu. Maistrenko, and O. Popovych
Hopf bifurcation and quasiperiodicy in a simulation model of the leaky faucet 6847
A. D'Innocenzo and L. Renna
Quantum chaos in a double square well: An approach based on Bohm's view of quantum mechanics 6851
O. F. de Alcantara Bonfim, J. Florencio, and F. C. Sá Barreto

Classical fluids

Evaluation of the external force term in the discrete Boltzmann equation 6855
Nicos S. Martys, Xiaowen Shan, and Hudong Chen
Exact solutions for ***N*** steady fingers in a Hele-Shaw cell 6858
Giovani L. Vasconcelos
Lattice Boltzmann simulation of the two-dimensional Rayleigh-Taylor instability 6861
Xiaobo Nie, Yue-Hong Qian, Gary D. Doolen, and Shiyi Chen
Linear stability analysis of convective chemical fronts in a vertical slab 6865
Desiderio A. Vasquez and Casey Lengacher

(Continued)

PHYSICAL REVIEW E THIRD SERIES, VOLUME 58, NUMBER 5 NOVEMBER 1998

Liquid crystals

Light scattering study of the smectic-C_α^* phase of a chiral liquid crystal 6869
D. Konovalov and S. Sprunt

Complex fluids, polymers, and granular materials

Numerical computation of two-dimensional viscous fingering by a conformal mapping method 6873
Huidan Yu and Zhen Han

Biological physics

Mirroring of environmental colored noise in species extinction statistics 6877
F. V. De Blasio

Physics of beams

Time-frequency analysis of modulation of high-power microwaves by electron-beam voltage fluctuations 6880
C. W. Peters, R. L. Jaynes, Y. Y. Lau, R. M. Gilgenbach, W. J. Williams, J. M. Hochman, W. E. Cohen, J. I. Rintamaki, D. E. Vollers, and T. A. Spencer

COMMENTS

Comment on ‘‘Kink switching in ferroelectric free-standing films with high spontaneous polarization’’ 6884
R. Stannarius, N. Klöpper, Th. Fischer, and F. Kremer

Cumulative Author Index 6888