PHYSICAL REVIEW A

For editorial and subscription correspondence, please see inside front cover
(ISSN: 1050-2947)

PERIODICALS
Postmaster send address changes to:
American Institute of Physics
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 69, NUMBER 5
PARTS A AND B

CONTENTS

MAY 2004

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 050101(R)–052511, and Part B pages 052701–059903(E).

PART A

RAPID COMMUNICATIONS

Fundamental concepts

Effects of confinement on the permanent electric-dipole moment of Xe atoms in liquid Xe *(4 pages)* . . . . . 050101(R)
Boris Ravaine and Andrei Derevianko

Quantum information

Geometric manipulation of the quantum states of two-level atoms *(4 pages)* . . . . . 050301(R)
Mingzhen Tian, Zeb W. Barber, Joe A. Fischer, and Wm. Randall Babbitt

Geometric phase gate without dynamical phases *(4 pages)* . . . . . 050302(R)
R. G. Unanyan and M. Fleischhauer

Entanglement-assisted alignment of reference frames using a dense covariant coding *(4 pages)* . . . . . 050303(R)
E. Bagan, M. Baig, and R. Muñoz-Tapia

Tailoring photonic entanglement in high-dimensional Hilbert spaces *(4 pages)* . . . . . 050304(R)
Hugues de Riedmatten, Ivan Marcikic, Valerio Scarani, Wolfgang Tittel, Hugo Zbinden, and Nicolas Gisin

Estimation of the local density of states on a quantum computer *(4 pages)* . . . . . 050305(R)
Joseph Emerson, Seth Lloyd, David Poulin, and David Cory

Experimental Hamiltonian identification for controlled two-level systems *(4 pages)* . . . . . 050306(R)
S. G. Schirmer, A. Kolli, and D. K. L. Oi

Condition for unambiguous state discrimination using local operations and classical communication *(4 pages)* . . . . . 050307(R)
Anthony Chefles

Atomic and molecular structure and dynamics

Feshbach resonances in inner-shell photodetachment: The case of Te^- *(4 pages)* . . . . . 050501(R)
H. Kjeldsen, F. Folkmann, T. S. Jacobsen, and J. B. West



Copyright 2004 by The American Physical Society



(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 69, NUMBER 5 MAY 2004

Atomic and molecular collisions and interactions

Convergent calculations of double ionization of helium: From $(\gamma,2e)$ to $(e,3e)$ processes *(4 pages)* . . . . . 050701(R)
A. S. Kheifets and Igor Bray

Photon, electron, atom, and molecule interactions with solids and surfaces

Dynamic dependence of interaction potentials for keV atoms at metal surfaces *(4 pages)* . . . . . 050901(R)
A. Schüller, G. Adamov, S. Wethekam, K. Maass, A. Mertens, and H. Winter

Atomic and molecular processes in external fields

Polarization effects in two-photon nonresonant ionization of argon with extreme-ultraviolet and infrared femtosecond pulses *(4 pages)* . . . . . 051401(R)
P. O'Keeffe, R. López-Martens, J. Mauritsson, A. Johansson, A. L'Huillier, V. Véniard, R. Taïeb, A. Maquet, and M. Meyer

Measurement of hydrogenic tunneling rates in a high-intensity laser focus *(4 pages)* . . . . . 051402(R)
B. Buerke and D. D. Meyerhofer

Matter waves

One particle in a box: The simplest model for a Fermi gas in the unitary limit *(4 pages)* . . . . . 051601(R)
Ludovic Pricoupenko and Yvan Castin

Fluctuations and flux: The limits of multistate atom lasers *(4 pages)* . . . . . 051602(R)
N. P. Robins, C. M. Savage, J. J. Hope, J. E. Lye, C. S. Fletcher, S. A. Haine, and J. D. Close

Quantum optics, physics of lasers, nonlinear optics

Observation and characterization of an optical spring *(4 pages)* . . . . . 051801(R)
Benjamin S. Sheard, Malcolm B. Gray, Conor M. Mow-Lowry, David E. McClelland, and Stanley E. Whitcomb

Group velocity of a probe light in an ensemble of Λ atoms under two-photon resonance *(4 pages)* . . . . . 051802(R)
Y. Li and C. P. Sun

Precision stabilization of femtosecond lasers to high-finesse optical cavities *(4 pages)* . . . . . 051803(R)
R. Jason Jones, Isabell Thomann, and Jun Ye

Cavity QED with optically transported atoms *(4 pages)* . . . . . 051804(R)
J. A. Sauer, K. M. Fortier, M. S. Chang, C. D. Hamley, and M. S. Chapman

Single sub-50-attosecond pulse generation from chirp-compensated harmonic radiation using material dispersion *(4 pages)* . . . . . 051805(R)
Kyung Taec Kim, Chul Min Kim, Moon-Gu Baik, G. Umesh, and Chang Hee Nam

ARTICLES

Fundamental concepts

Simulating quantum Brownian motion with single trapped ions *(8 pages)* 052101
S. Maniscalco, J. Piilo, F. Intravaia, F. Petruccione, and A. Messina

Bitwise Bell-inequality violations for an entangled state involving $2N$ ions *(11 pages)* 052102
D. T. Pope and G. J. Milburn

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 69, NUMBER 5** **MAY 2004**

Tests for nonrandomness in quantum jumps *(4 pages)* 052103
D. J. Berkeland, D. A. Raymondson, and V. M. Tassin

Jumplike unravelings for non-Markovian open quantum systems *(11 pages)* 052104
Jay Gambetta, T. Askerud, and H. M. Wiseman

Disentanglement and decoherence by open system dynamics *(6 pages)* 052105
P. J. Dodd and J. J. Halliwell

Disentanglement by dissipative open system dynamics *(10 pages)* 052106
P. J. Dodd

Quantum-information entropies of the eigenstates and the coherent state of the Pöschl-Teller potential *(6 pages)* 052107
Rajneesh Atre, Anil Kumar, Nagaraja Kumar, and Prasanta K. Panigrahi

Quantum tunneling time *(5 pages)* 052108
Z. S. Wang, L. C. Kwek, C. H. Lai, and C. H. Oh

Is the dynamics of open quantum systems always linear? *(8 pages)* 052109
Karen M. Fonseca Romero, Peter Talkner, and Peter Hänggi

Electromagnetic field quantization in a linear isotropic dielectric *(8 pages)* 052110
Reza Matloob

Action scales for quantum decoherence and their relation to structures in phase space *(10 pages)* 052111
Daniel Alonso, S. Brouard, José P. Palao, and R. Sala Mayato

Quantum phase space points for Wigner functions in finite-dimensional spaces *(5 pages)* 052112
Alfredo Luis

Prior information: How to circumvent the standard joint-measurement uncertainty relation *(12 pages)* 052113
Michael J. W. Hall

Impossibility of distant indirect measurement of the quantum Zeno effect *(7 pages)* 052114
M. Hotta and M. Morikawa

Convolutionless Non-Markovian master equations and quantum trajectories: Brownian motion *(14 pages)* 052115
Walter T. Strunz and Ting Yu

Transition to classical chaos in a coupled quantum system through continuous measurement *(8 pages)* 052116
Shohini Ghose, Paul Alsing, Ivan Deutsch, Tanmoy Bhattacharya, and Salman Habib

Packet narrowing and quantum entanglement in photoionization and photodissociation *(10 pages)* 052117
M. V. Fedorov, M. A. Efremov, A. E. Kazakov, K. W. Chan, C. K. Law, and J. H. Eberly

Self-energy correction to the two-photon decay width in hydrogenlike atoms *(8 pages)* 052118
Ulrich D. Jentschura

Quantum information

Quantum partial teleportation as optimal cloning at a distance *(4 pages)* 052301
Radim Filip

State interrogation in nuclear magnetic resonance quantum-information processing *(9 pages)* 052302
Garett M. Leskowitz and Leonard J. Mueller

Parallel quantum computing in a single ensemble quantum computer *(7 pages)* 052303
Gui Lu Long and L. Xiao

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 69, NUMBER 5** **MAY 2004**

Measuring polynomial invariants of multiparty quantum states *(8 pages)* 052304
M. S. Leifer, N. Linden, and A. Winter

Detecting quantum entanglement by means of local operations and classical communication *(4 pages)* 052305
Yan-Kui Bai, Shu-Shen Li, and Hou-Zhi Zheng

Separability conditions and limit temperatures for entanglement detection in two-qubit Heisenberg *XYZ* models *(7 pages)* 052306
N. Canosa and R. Rossignoli

Efficient multiparty quantum-secret-sharing schemes *(5 pages)* 052307
Li Xiao, Gui Lu Long, Fu-Guo Deng, and Jian-Wei Pan

Universality of entanglement and quantum-computation complexity *(13 pages)* 052308
Román Orús and José I. Latorre

Decoherence of two Josephson charge qubits coupled via $\sigma_x\sigma_x$-type coupling and exposed to σ_x noise *(6 pages)* 052309
Ahmad Abliz, Shu-Shen Li, Lian-Liang Sun, Song-Lin Feng, and Hou-Zhi Zheng

Information rate of a waveguide *(5 pages)* 052310
Vittorio Giovannetti, Seth Lloyd, Lorenzo Maccone, and Jeffrey H. Shapiro

Entanglement with classical fields *(14 pages)* 052311
K. F. Lee and J. E. Thomas

Local cloning of Bell states and distillable entanglement *(5 pages)* 052312
Sibasish Ghosh, Guruprasad Kar, and Anirban Roy

Continuous-variable quantum nondemolishing interaction at a distance *(4 pages)* 052313
Radim Filip

Quantum entanglement of four distant atoms trapped in different optical cavities *(7 pages)* 052314
XuBo Zou, K. Pahlke, and W. Mathis

Propagation of quantum information through a spin system *(6 pages)* 052315
Tobias J. Osborne and Noah Linden

Frustration, interaction strength, and ground-state entanglement in complex quantum systems *(11 pages)* 052316
Christopher M. Dawson and Michael A. Nielsen

Entanglement echoes in quantum computation *(5 pages)* 052317
Davide Rossini, Giuliano Benenti, and Giulio Casati

Entanglement preparation and quantum communication with atoms in optical cavities *(6 pages)* 052318
Peng Xue, Chao Han, Bo Yu, Xiu-Min Lin, and Guang-Can Guo

Secure direct communication with a quantum one-time pad *(4 pages)* 052319
Fu-Guo Deng and Gui Lu Long

Gaussian entanglement of formation *(8 pages)* 052320
M. M. Wolf, G. Giedke, O. Krüger, R. F. Werner, and J. I. Cirac

Experimental realization of a programmable quantum-state discriminator and a phase-covariant quantum multimeter *(7 pages)* 052321
Jan Soubusta, Antonín Černoch, Jaromír Fiurášek, and Miloslav Dušek

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 69, NUMBER 5** **MAY 2004**

Effect of ancilla's structure on quantum error correction using the seven-qubit Calderbank-Shor-Steane code *(11 pages)* 052322
P. J. Salas and A. L. Sanz

Localization of two-dimensional quantum walks *(9 pages)* 052323
Norio Inui, Yoshinao Konishi, and Norio Konno

Practical scheme for error control using feedback *(11 pages)* 052324
Mohan Sarovar, Charlene Ahn, Kurt Jacobs, and Gerard J. Milburn

Stochastic Liouville equation approach for the effect of noise in quantum computations *(15 pages)* 052325
Y. C. Cheng and R. J. Silbey

Superselection rules and quantum protocols *(20 pages)* 052326
Alexei Kitaev, Dominic Mayers, and John Preskill

Entanglement detection in optical lattices of bosonic atoms with collective measurements *(4 pages)* 052327
Géza Tóth

Generation of entangled ancilla states for use in linear optics quantum computing *(7 pages)* 052328
J. D. Franson, M. M. Donegan, and B. C. Jacobs

Implementation of generalized quantum measurements: Superadditive quantum coding, accessible information extraction, and classical capacity limit *(14 pages)* 052329
Masahiro Takeoka, Mikio Fujiwara, Jun Mizuno, and Masahide Sasaki

Multipartite entanglement, quantum-error-correcting codes, and entangling power of quantum evolutions *(10 pages)* 052330
A. J. Scott

Entangled subspaces and quantum symmetries *(7 pages)* 052331
A. J. Bracken

Atomic and molecular structure and dynamics

Assessment of density-functional approximations: Long-range correlations and self-interaction effects *(7 pages)* 052501
J. Jung, P. García-González, J. E. Alvarellos, and R. W. Godby

Long-wavelength quantum electrodynamics *(10 pages)* 052502
Krzysztof Pachucki

Evaluation of the self-energy correction to the g factor of S states in H-like ions *(14 pages)* 052503
V. A. Yerokhin, P. Indelicato, and V. M. Shabaev

Thomas-Fermi model: Nonextensive statistical mechanics approach *(5 pages)* 052504
Evgeny Martinenko and Bhimsen K. Shivamoggi

Experimental investigation of the origin of the Ti $K\alpha''$ satellites *(5 pages)* 052505
N. Shigeoka, H. Oohashi, T. Tochio, Y. Ito, T. Mukoyama, A. M. Vlaicu, and S. Fukushima

S-wave Ps-Li and Ps-Na scattering *(7 pages)* 052506
Sumana Chakraborty, Prabal K. Sinha, and A. S. Ghosh

General complex rotated finite-element method for predissociation studies of diatomic molecules: An application on the $(1–6)^1\Sigma_g^+$ states of H_2 *(21 pages)* 052507
Stefan Andersson and Nils Elander

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 69, NUMBER 5 MAY 2004

Time-dependent density-functional calculations with asymptotically correct exchange-correlation potentials *(10 pages)* 052508
Igor Vasiliev and Richard M. Martin

Relativistic Dirac-Fock exchange and Breit interaction energy functionals based on the local-density approximation and the self-consistent multiplicative constant method *(11 pages)* 052509
Valentin V. Karasiev, Eduardo V. Ludeña, and Olga A. Shukruto

Adiabatic connection for near degenerate excited states *(6 pages)* 052510
Fan Zhang and Kieron Burke

Excitation energies, oscillator strengths, and lifetimes of levels along the gold isoelectronic sequence *(9 pages)* 052511
U. I. Safronova and W. R. Johnson

PART B

Atomic and molecular collisions and interactions

Reexamining if long-lived N^- anions are produced in fast dissociative electron-capture collisions *(5 pages)* . . 052701
I. Ben-Itzhak, O. Heber, I. Gertner, A. Bar-David, and B. Rosner

Positron scattering and annihilation from hydrogenlike ions *(15 pages)* 052702
S. A. Novikov, M. W. J. Bromley, and J. Mitroy

Isotope shifts of double-excitation resonances in helium *(7 pages)* 052703
Y. H. Jiang, R. Püttner, M. Martins, R. Follath, J. M. Rost, and G. Kaindl

Electron capture by Ne^{3+} ions from atomic hydrogen *(7 pages)* 052704
R. Rejoub, M. E. Bannister, C. C. Havener, D. W. Savin, C. J. Verzani, J. G. Wang, and P. C. Stancil

Cold collisions involving rotationally hot oxygen molecules *(7 pages)* 052705
K. Tilford, M. Hoster, P. M. Florian, and R. C. Forrey

Elastic cross sections for electron-ketenylidene (C_2O) collisions *(6 pages)* 052706
M. M. Fujimoto, M.-T. Lee, and S. E. Michelin

Convergence of the method of the hyperspherical $\mathcal{R}$ matrix with semiclassical outgoing waves *(10 pages)* . . . 052707
P. Selles, L. Malegat, A. Huetz, A. K. Kazansky, S. A. Collins, D. P. Seccombe, and T. J. Reddish

Wave-packet dynamics for general contact interactions on a circular setup: Revivals, bouncing, and trapping *(8 pages)* 052708
Alexandre G. M. Schmidt and M. G. E. da Luz

Supplementary absolute differential cross sections for the excitation of atomic hydrogen's $n=3$ and 4 levels by electron impact *(4 pages)* 052709
Christopher J. Sweeney, Alan Grafe, and Tong W. Shyn

Neutron scattering in the magnetic field of a linear current: Exact S matrix and cross section *(5 pages)* 052710
V. I. Osherov and V. G. Ushakov

Partial wave analysis of scattering with the nonlocal Aharonov-Bohm effect and the anomalous cross section induced by quantum interference *(8 pages)* 052711
De-Hone Lin

Protonium formation in the $\overline{p}$-H collision at low energies by a diabatic approach *(7 pages)* 052712
M. Hesse, A. T. Le, and C. D. Lin

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 69, NUMBER 5 MAY 2004

Electron-impact ionization of Be-like ions *(8 pages)* 052713
J.-C. Chang, H.-L. Sun, W.-Y. Cheng, and K.-N. Huang

Cold-target recoil-ion momentum spectroscopy studies of capture from atomic and molecular hydrogen by O^{8+} and Ar^{8+} *(9 pages)* 052714
E. Edgu-Fry, A. Wech, J. Stuhlman, T. G. Lee, C. D. Lin, and C. L. Cocke

Single- and double-electron-capture collision of C^{q+} ($q=3,4$) with CO at keV energies *(6 pages)* 052715
Hui Gao and Victor H. S. Kwong

Cold electron scattering in SF_6 and C_6F_6: Bound and virtual state channels *(11 pages)* 052716
D. Field, N. C. Jones, and J.-P. Ziesel

Positronium formation in the ground and excited states ($n=2$ levels) in a positron-negative hydrogen-ion collision *(8 pages)* 052717
D. Ghosh and C. Sinha

Elastic resonant and nonresonant differential scattering of quasifree electrons from $B^{4+}(1s)$ and $B^{3+}(1s^2)$ ions *(20 pages)* 052718
E. P. Benis, T. J. M. Zouros, T. W. Gorczyca, A. D. González, and P. Richard

Photon, electron, atom, and molecule interactions with solids and surfaces

Effects of the surface Miller index on the resonant neutralization of hydrogen anions near Ag surfaces *(8 pages)* 052901
Himadri Chakraborty, Thomas Niederhausen, and Uwe Thumm

Clusters (including fullerenes)

Time-dependent spectrum of thermionic emission from hot clusters: Model and example of C_{60} *(9 pages)* 053201
F. Lépine and C. Bordas

Modified genetic algorithms to model cluster structures in medium-size silicon clusters *(7 pages)* 053202
Victor E. Bazterra, Ofelia Oña, María C. Caputo, Marta B. Ferraro, Patricio Fuentealba, and Julio C. Facelli

Ionization of C_{70} and C_{60} molecules by slow highly charged ions: A comparison *(10 pages)* 053203
J. Jensen, H. Zettergren, H. T. Schmidt, H. Cederquist, S. Tomita, S. B. Nielsen, J. Rangama, P. Hvelplund, B. Manil, and B. A. Huber

Atomic and molecular processes in external fields

Blackbody radiation shift of the ^{133}Cs hyperfine transition frequency *(8 pages)* 053401
Salvatore Micalizio, Aldo Godone, Davide Calonico, Filippo Levi, and Luca Lorini

Ionization by short uv laser pulses: Secondary above-threshold-ionization peaks of the electron spectrum investigated through a modified Coulomb-Volkov approach *(8 pages)* 053402
V. D. Rodríguez, E. Cormier, and R. Gayet

Quantum erasure within the optical Stern-Gerlach model *(6 pages)* 053403
M. Chianello, M. Tumminello, A. Vaglica, and G. Vetri

First-principles calculations for the tunnel ionization rate of atoms and molecules *(11 pages)* 053404
T. Otobe, K. Yabana, and J.-I. Iwata

Electronic structure of atoms in magnetic quadrupole traps *(13 pages)* 053405
Igor Lesanovsky, Jörg Schmiedmayer, and Peter Schmelcher

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 69, NUMBER 5** **MAY 2004**

Interactions of a two-level atom and a field with a time-varying frequency *(6 pages)* 053406
Yaping Yang, Jingping Xu, Gaoxiang Li, and Hong Chen

vuv fluorescence from selective high-order multiphoton excitation of N_2 *(8 pages)* 053407
Ryan N. Coffee and George N. Gibson

Optimal control of quantum dissipative dynamics: Analytic solution for cooling the three-level Λ system *(9 pages)* 053408
Shlomo E. Sklarz, David J. Tannor, and Navin Khaneja

Simple soluble molecular ionization model *(14 pages)* 053409
Gerald V. Dunne and Christopher S. Gauthier

Above-threshold ionization of xenon atoms in a bichromatic phase-controlled laser field of linear and circular polarizations *(6 pages)* 053410
Jingtao Zhang, Shaohui Li, and Zhizhan Xu

Absolute Rb one-color two-photon ionization cross-section measurement near a quantum interference *(6 pages)* 053411
T. Takekoshi, G. M. Brooke, B. M. Patterson, and R. J. Knize

Laser sideband cooling with positive detuning *(5 pages)* 053412
Ch. Schwedes, Th. Becker, J. von Zanthier, H. Walther, and E. Peik

H_2^+ ion in a strong magnetic field: Lowest excited states *(10 pages)* 053413
A. V. Turbiner and J. C. López Vieyra

Matter waves

Interactions of vortices with rarefaction solitary waves in a Bose-Einstein condensate and their role in the decay of superfluid turbulence *(7 pages)* 053601
Natalia G. Berloff

Oscillations of Bose-Einstein condensates with vortex lattices: Finite temperatures *(14 pages)* 053602
Armen Sedrakian and Ira Wasserman

Resonant formation of strongly correlated paired states in rotating Bose gases *(4 pages)* 053603
S. G. Bhongale, J. N. Milstein, and M. J. Holland

Creation and mobility of discrete solitons in Bose-Einstein condensates *(7 pages)* 053604
V. Ahufinger, A. Sanpera, P. Pedri, L. Santos, and M. Lewenstein

Generating macroscopic-quantum-superposition states in momentum and internal-state space from Bose-Einstein condensates with repulsive interactions *(7 pages)* 053605
J. Higbie and D. M. Stamper-Kurn

Phonon evaporation in freely expanding Bose-Einstein condensates *(12 pages)* 053606
C. Tozzo and F. Dalfovo

Collapse of a Bose-Einstein condensate induced by fluctuations of the laser intensity *(10 pages)* 053607
J. Garnier, F. Kh. Abdullaev, and B. B. Baizakov

Quantum entanglement of many atoms in spinor Bose-Einstein condensates *(5 pages)* 053608
XuBo Zou, K. Pahlke, and W. Mathis

Magnetic solitons of spinor Bose-Einstein condensates in an optical lattice *(5 pages)* 053609
Zheng-Wei Xie, Weiping Zhang, S. T. Chui, and W. M. Liu

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 69, NUMBER 5** **MAY 2004**

Transverse laser modes in Bose-Einstein condensates *(8 pages)* 053610
Graeme Whyte, Patrik Öhberg, and Johannes Courtial

Beyond-mean-field results for atomic Bose-Einstein condensates at interaction strengths near Feshbach resonances: A many-body dimensional perturbation-theory calculation *(15 pages)* 053611
B. A. McKinney, M. Dunn, and D. K. Watson

Quantum Monte Carlo study of confined fermions in one-dimensional optical lattices *(13 pages)* 053612
Marcos Rigol and Alejandro Muramatsu

Excitations of Bose-Einstein condensates in optical lattices *(4 pages)* 053613
K. Braun-Munzinger, J. A. Dunningham, and K. Burnett

Raman photoassociation of Bose-Fermi mixtures and the subsequent prospects for atom-molecule Cooper pairing *(4 pages)* 053614
Matt Mackie, Olavi Dannenberg, Jyrki Piilo, Kalle-Antti Suominen, and Juha Javanainen

Collisional oscillations of trapped boson-fermion mixtures in the approach to the collapse instability *(7 pages)* 053615
P. Capuzzi, A. Minguzzi, and M. P. Tosi

Quench dynamics across quantum critical points *(10 pages)* 053616
K. Sengupta, Stephen Powell, and Subir Sachdev

Quantum theory of a vortex line in an optical lattice *(15 pages)* 053617
J.-P. Martikainen and H. T. C. Stoof

Interference of small and of large quantum particles behind an asymmetric grating *(9 pages)* 053618
Mirjana Božić, Dušan Arsenović, and Leposava Vušković

Phase diagram of a rotating Bose-Einstein condensate with anharmonic confinement *(7 pages)* 053619
A. D. Jackson, G. M. Kavoulakis, and E. Lundh

Classical aspects of ultracold atom wave packet motion through microstructured waveguide bends *(10 pages)* 053620
M. W. J. Bromley and B. D. Esry

Phase dynamics of a multimode Bose-Einstein condensate controlled by decay *(12 pages)* 053621
H. L. Haroutyunyan and G. Nienhuis

Vortex line in a neutral finite-temperature superfluid Fermi gas *(9 pages)* 053622
N. Nygaard, G. M. Bruun, B. I. Schneider, C. W. Clark, and D. L. Feder

Noisy dynamics of a vortex in a partially Bose-Einstein condensed gas *(5 pages)* 053623
R. A. Duine, B. W. A. Leurs, and H. T. C. Stoof

Improved optimization of perturbation theory: Applications to the oscillator energy levels and Bose-Einstein condensate critical temperature *(8 pages)* 053624
Jean-Loïc Kneur, André Neveu, and Marcus B. Pinto

Weakly interacting Bose gas in the vicinity of the normal-fluid–superfluid transition *(11 pages)* 053625
Nikolay Prokof'ev, Oliver Ruebenacker, and Boris Svistunov

Quantum optics, physics of lasers, nonlinear optics

Nonlocal modulations on the temporal and spectral profiles of an entangled photon pair *(9 pages)* 053801
Silvia Viciani, Alessandro Zavatta, and Marco Bellini

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 69, NUMBER 5** **MAY 2004**

Optical bistability in sideband output modes induced by a squeezed vacuum *(7 pages)* 053802
L. P. Maia, G. P. Prataviera, and S. S. Mizrahi

Analytical treatment of self-phase-modulation beyond the slowly varying envelope approximation *(6 pages)* . . 053803
M. S. Syrchin, A. M. Zheltikov, and M. Scalora

Phase transitions in generalized spin-boson (Dicke) models *(7 pages)* 053804
Clive Emary and Tobias Brandes

Effect of vacuum-induced coherence on single- and two-photon absorption in a four-level Y-type atomic system *(6 pages)* 053805
B. P. Hou, S. J. Wang, W. L. Yu, and W. L. Sun

Optical phase conjugation in third-order nonlinear photonic crystals *(5 pages)* 053806
Ping Xie and Zhao-Qing Zhang

Wave representation of geometrical laser beam trajectories in a hemiconfocal cavity *(6 pages)* 053807
Y. F. Chen, C. H. Jiang, Y. P. Lan, and K. F. Huang

Mechanocaloric and thermomechanical effects in Bose-Einstein-condensed systems *(8 pages)* 053808
G. C. Marques, V. S. Bagnato, S. R. Muniz, and D. Spehler

Probing the atom-field bound state *(5 pages)* 053809
D. Mogilevtsev and S. Kilin

Resonance fluorescence in photonic band gap waveguide architectures: Engineering the vacuum for all-optical switching *(21 pages)* 053810
Marian Florescu and Sajeev John

Time-resolved ellipticity gating of high-order harmonic emission *(4 pages)* 053811
R. López-Martens, J. Mauritsson, P. Johnsson, A. L'Huillier, O. Tcherbakoff, A. Zaïr, E. Mével, and E. Constant

Cascaded second-order contribution to the third-order nonlinear susceptibility *(5 pages)* 053812
Christian Kolleck

Nonlinear optical measurements using a $4f$ coherent imaging system with phase objects *(6 pages)* 053813
G. Boudebs and S. Cherukulappurath

Continuous-variable entanglement of phase-locked light beams *(11 pages)* 053814
H. H. Adamyan and G. Yu. Kryuchkyan

Antiphase state in passively *Q*-switched Yb:YAG microchip multimode lasers with a saturable absorber GaAs *(6 pages)* 053815
Qiulin Zhang, Baohua Feng, Dongxiang Zhang, Panming Fu, Zhiguo Zhang, Zhiwei Zhao, Peizhen Deng, Jun Xu, Xiaodong Xu, Yonggang Wang, and Xiaoyu Ma

Dynamics of multimode semiconductor lasers *(9 pages)* 053816
A. M. Yacomotti, L. Furfaro, X. Hachair, F. Pedaci, M. Giudici, J. Tredicce, J. Javaloyes, S. Balle, E. A. Viktorov, and Paul Mandel

Time control of two-photon interference *(5 pages)* 053817
M. A. Sagioro, C. Olindo, C. H. Monken, and S. Pádua

Atomic four-level *N* systems *(10 pages)* 053818
C. Goren, A. D. Wilson-Gordon, M. Rosenbluh, and H. Friedmann

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 69, NUMBER 5 MAY 2004

BRIEF REPORTS

Fundamental concepts

Entanglement in a first-order quantum phase transition *(4 pages)* 054101
Julien Vidal, Rémy Mosseri, and Jorge Dukelsky

Operator-sum representation of time-dependent density operators and its applications *(4 pages)* 054102
D. M. Tong, L. C. Kwek, C. H. Oh, Jing-Ling Chen, and L. Ma

Quantum information

Improving the capacity of the Boström-Felbinger protocol *(3 pages)* 054301
Qing-yu Cai and Bai-wen Li

Quantum information: Jaynes and Shannon entropies in a two-electron entangled artificial atom *(4 pages)* 054302
Claudio Amovilli and Norman H. March

Mode entanglement of electrons in the one-dimensional Frenkel-Kontorova model *(4 pages)* 054303
Xiaoguang Wang, Haibin Li, and Bambi Hu

Phase-space approach to continuous variable quantum teleportation *(4 pages)* 054304
Masashi Ban

Entanglement of electron spins of noninteracting electron gases *(4 pages)* 054305
Sangchul Oh and Jaewan Kim

Atomic and molecular structure and dynamics

Bethe logarithm for the helium atom *(3 pages)* 054501
Vladimir I. Korobov

Relaxation effect and radiative corrections in many-electron atoms *(4 pages)* 054502
Andrei Derevianko, Boris Ravaine, and W. R. Johnson

Atomic and molecular collisions and interactions

Atomic resonance interaction in dielectric media *(2 pages)* 054701
Mathias Boström and Barry W. Ninham

Atomic and molecular processes in external fields

Two-color magneto-optical trap for metastable helium *(4 pages)* 055401
A. S. Tychkov, J. C. J. Koelemeij, T. Jeltes, W. Hogervorst, and W. Vassen

Matter waves

Integral equation for inhomogeneous condensed bosons generalizing the Gross-Pitaevskii differential equation *(4 pages)* 055601
G. G. N. Angilella, N. H. March, and R. Pucci

Quantum optics, physics of lasers, nonlinear optics

High-speed generation of macroscopic quantum-interference states for the motion of a trapped ion *(4 pages)* . . 055801
Shi-Biao Zheng

Entanglement between two atoms in an overdamped cavity injected with squeezed vacuum *(4 pages)* 055802
Gao-xiang Li, K. Allaart, and D. Lenstra

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 69, NUMBER 5** **MAY 2004**

COMMENTS

Comment on "Grover search with pairs of trapped ions" *(3 pages)* 056301
Charles D. Hill and Hsi-Sheng Goan

Comment on "Analytic value of the atomic three-electron correlation integral with Slater wave functions" *(2 pages)* 056501
Frank E. Harris, Alexei M. Frolov, and Vedene H. Smith, Jr.

ERRATA

Erratum: Optimal control theory for unitary transformations [Phys. Rev. A **68**, 062308 (2003)] *(1 page)* . . . . . 059901(E)
José P. Palao and Ronnie Kosloff

Erratum: Model calculation for energy loss in ion-surface collisions [Phys. Rev. A **67**, 062901 (2003)] *(1 page)* . . . . . 059902(E)
J. E. Miraglia and M. S. Gravielle

Erratum: Decay rates of excited muonic molecular ions [Phys. Rev. A **68**, 032502 (2003)] *(2 pages)* . . . . . 059903(E)
E. Lindroth, J. Wallenius, and S. Jonsell

Cumulative Author Index i