PHYSICAL REVIEW A

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

PERIODICALS
Postmaster send address changes to:
APS Subscription Services
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 77, NUMBER 1 *CONTENTS* **JANUARY 2008**
PARTS A AND B

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 010101(R)-012726, and Part B pages 013201-019904(E).

PART A

Physical Review A Editorial Policies iii
Physical Review A Information for Contributors vii
Guidelines for PRA Section Selection x

RAPID COMMUNICATIONS

Fundamental concepts

Coherent destruction of tunneling, dynamic localization, and the Landau-Zener formula *(4 pages)* . . . . . 010101(R)
Yosuke Kayanuma and Keiji Saito

Amplification of high-order harmonics using weak perturbative high-frequency radiation *(4 pages)* . . . . . 010102(R)
Avner Fleischer and Nimrod Moiseyev

Quantum information

Correctable noise of quantum-error-correcting codes under adaptive concatenation *(4 pages)* . . . . . 010301(R)
Jesse Fern

Robust creation of arbitrary-sized Dicke states of trapped ions by global addressing *(4 pages)* . . . . . 010302(R)
I. E. Linington and N. V. Vitanov

General scheme for construction of scalar separability criteria from positive maps *(4 pages)* . . . . . 010303(R)
Remigiusz Augusiak and Julia Stasińska

Atomic and molecular structure and dynamics

Dynamics of a Rabi oscillation under a pulsed perturbation *(4 pages)* . . . . . 010501(R)
Jai Min Choi, Gee-Na Kim, and D. Cho

Atomic and molecular collisions and interactions

Feshbach resonances in mixtures of ultracold ^{6}Li and ^{87}Rb gases *(4 pages)* . . . . . 010701(R)
B. Deh, C. Marzok, C. Zimmermann, and Ph. W. Courteille

Atomic and molecular processes in external fields, including interactions with strong fields and short pulses

Laser-assisted control of molecular orientation at high temperatures *(4 pages)* . . . . . 011401(R)
Dmitry V. Zhdanov and Victor N. Zadkov

Copyright 2008 by The American Physical Society

(Continued)

1050-2947(200801)77:1:A;1-J

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Matter waves

Superfuid-insulator transitions at noninteger filling in optical lattices of fermionic atoms *(4 pages)* . . . . . 011601(R)
Chih-Chun Chien, Yan He, Qijin Chen, and K. Levin

Radio-frequency spectroscopy of trapped Fermi gases with population imbalance *(4 pages)* . . . . . 011602(R)
Yan He, Chih-Chun Chien, Qijin Chen, and K. Levin

Degenerate Bose-Bose mixture in a three-dimensional optical lattice *(4 pages)* . . . . . 011603(R)
J. Catani, L. De Sarlo, G. Barontini, F. Minardi, and M. Inguscio

Quantum optics, physics of lasers, nonlinear optics, classical optics

Gap solitons in spatiotemporal photonic crystals *(4 pages)* . . . . . 011801(R)
Fabio Biancalana, Andreas Amann, and Eoin P. O'Reilly

Quasirelativistic behavior of cold atoms in light fields *(4 pages)* . . . . . 011802(R)
Gediminas Juzeliūnas, Julius Ruseckas, Markus Lindberg, Luis Santos, and Patrik Öhberg

Gain-assisted superluminal optical solitons at very low light intensity *(4 pages)* . . . . . 011803(R)
Guoxiang Huang, Chao Hang, and L. Deng

Self-cooling of a movable mirror to the ground state using radiation pressure *(4 pages)* . . . . . 011804(R)
A. Dantan, C. Genes, D. Vitali, and M. Pinard

ARTICLES

Fundamental concepts

Balanced homodyne detectors in quantum field theory *(7 pages)* 012101
Piotr Marecki

Rapid-purification protocols for optical homodyning *(6 pages)* 012102
Aravind Chiruvelli and Kurt Jacobs

Einstein-Podolsky-Rosen correlations of vector bosons *(10 pages)* 012103
Paweł Caban, Jakub Rembieliński, and Marta Włodarczyk

Entanglement of multiparty-stabilizer, symmetric, and antisymmetric states *(15 pages)* 012104
Masahito Hayashi, Damian Markham, Mio Murao, Masaki Owari, and Shashank Virmani

Bell-state diagonal entanglement witnesses for relativistic and nonrelativistic multispinor systems in arbitrary dimensions *(25 pages)* 012105
M. A. Jafarizadeh and R. Sufiani

Chiral entanglement in triangular lattice models *(9 pages)* 012106
Dimitris I. Tsomokos, Juan José García-Ripoll, Nigel R. Cooper, and Jiannis K. Pachos

Quantum Zeno effect in cavity quantum electrodynamics: Experimental proposal with nonideal cavities and detectors *(7 pages)* 012107
R. Rossi, Jr., A. R. Bosco de Magalhães, and M. C. Nemes

Entanglement-induced decoherence and energy eigenstates *(4 pages)* 012108
Wen-ge Wang, Jiangbin Gong, G. Casati, and Baowen Li

Restricted quantum-classical correspondence and counting statistics for a coherent transition *(6 pages)* 012109
Maya Chuchem and Doron Cohen

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Casimir-Polder forces on excited atoms in the strong atom-field coupling regime *(16 pages)* 012110
Stefan Yoshi Buhmann and Dirk-Gunnar Welsch

Decoherence of molecular vibrational wave packets: Oscillatory decay of purity *(6 pages)* 012111
M. Schlesinger and W. T. Strunz

Quantum trajectory approach to circuit QED: Quantum jumps and the Zeno effect *(18 pages)* 012112
Jay Gambetta, Alexandre Blais, M. Boissonneault, A. A. Houck, D. I. Schuster, and S. M. Girvin

No-signaling bound on quantum state discrimination *(5 pages)* 012113
Sarah Croke, Erika Andersson, and Stephen M. Barnett

Holonomy for quantum channels *(12 pages)* 012114
David Kult, Johan Åberg, and Erik Sjöqvist

Boson-fermion pairing in Bose-Fermi mixtures on one-dimensional optical lattices *(5 pages)* 012115
X. Barillier-Pertuisel, S. Pittel, L. Pollet, and P. Schuck

Foldy-Wouthyusen transformation and semiclassical limit for relativistic particles in strong external fields *(7 pages)* 012116
Alexander J. Silenko

Sudden death of entanglement at finite temperature *(4 pages)* 012117
Asma Al-Qasimi and Daniel F. V. James

Quantum information

Graph states as ground states of many-body spin-1/2 Hamiltonians *(10 pages)* 012301
M. Van den Nest, K. Luttmer, W. Dür, and H. J. Briegel

Manipulation of single-photon states encoded in transverse spatial modes: Possible and impossible tasks *(7 pages)* 012302
Gabriel F. Calvo and Antonio Picón

Adiabatic quantum transport in a spin chain with a moving potential *(9 pages)* 012303
Vinitha Balachandran and Jiangbin Gong

Understanding entanglement as resource: Locally distinguishing unextendible product bases *(19 pages)* 012304
Scott M. Cohen

Measurable concurrence of mixed states *(3 pages)* 012305
Chang-shui Yu, C. Li, and He-shan Song

Decoherence of encoded quantum registers *(12 pages)* 012306
Stefan Borghoff and Rochus Klesse

Randomized benchmarking of quantum gates *(7 pages)* 012307
E. Knill, D. Leibfried, R. Reichle, J. Britton, R. B. Blakestad, J. D. Jost, C. Langer, R. Ozeri, S. Seidelin, and D. J. Wineland

Quantum generalized Reed-Solomon codes: Unified framework for quantum maximum-distance-separable codes *(4 pages)* 012308
Zhuo Li, Li-Juan Xing, and Xin-Mei Wang

Entanglement measures and approximate quantum error correction *(7 pages)* 012309
Francesco Buscemi

Loss-tolerant operations in parity-code linear optics quantum computing *(8 pages)* 012310
A. J. F. Hayes, A. Gilchrist, and T. C. Ralph

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 77, NUMBER 1** **JANUARY 2008**

Scaling properties of fidelity in the spin-1 anisotropic model *(4 pages)* 012311
Yu-Chin Tzeng and Min-Fong Yang

Quantum-classical correspondence in entanglement production: Entropy and classical tori *(9 pages)* 012312
Shi-hui Zhang and Quan-lin Jie

Accuracy matrix in a generalized simultaneous measurement of a qubit system *(14 pages)* 012313
Takahiro Sagawa and Masahito Ueda

Methods for producing decoherence-free states and noiseless subsystems using photonic qutrits *(14 pages)* . . . 012314
C. Allen Bishop and Mark S. Byrd

Local distinguishability of orthogonal $2 \otimes 3$ pure states *(10 pages)* 012315
Yu Xin and Runyao Duan

Tensor-product versus geometric-product coding *(7 pages)* 012316
Diederik Aerts and Marek Czachor

Quantum-limited metrology with product states *(15 pages)* 012317
Sergio Boixo, Animesh Datta, Steven T. Flammia, Anil Shaji, Emilio Bagan, and Carlton M. Caves

Squeezed generalized amplitude damping channel *(9 pages)* 012318
R. Srikanth and Subhashish Banerjee

Determination of ground-state properties in quantum spin systems by single-qubit unitary operations and entanglement excitation energies *(6 pages)* 012319
S. M. Giampaolo, F. Illuminati, P. Verrucchi, and S. De Siena

Structured near-optimal channel-adapted quantum error correction *(16 pages)* 012320
Andrew S. Fletcher, Peter W. Shor, and Moe Z. Win

Influence of the thermal environment on entanglement dynamics in small rings of qubits *(10 pages)* 012321
Nikola Burić

Quantum entanglement capacity with classical feedback *(12 pages)* 012322
Alan W. Leung

Characterization of electromagnetically-induced-transparency-based continuous-variable quantum memories *(16 pages)* 012323
G. Hétet, A. Peng, M. T. Johnsson, J. J. Hope, and P. K. Lam

Experimental sub-Rayleigh resolution by an unseeded high-gain optical parametric amplifier for quantum lithography *(5 pages)* 012324
Fabio Sciarrino, Chiara Vitelli, Francesco De Martini, Ryan Glasser, Hugo Cable, and Jonathan P. Dowling

Suppression of the heating effect in a geometric logic gating in a strong-driving-assisted cavity QED scheme *(4 pages)* 012325
Chang-Yong Chen and Mang Feng

Quantum computational method of finding the ground-state energy and expectation values *(5 pages)* 012326
Sangchul Oh

Controlled-NOT gate for multiparticle qubits and topological quantum computation based on parity measurements *(8 pages)* 012327
Oded Zilberberg, Bernd Braunecker, and Daniel Loss

Minimum-error discrimination between mixed quantum states *(12 pages)* 012328
Daowen Qiu

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Three-qubit phase gate based on cavity quantum electrodynamics *(8 pages)* 012329
Jun-Tao Chang and M. Suhail Zubairy

Soft-pulse dynamical decoupling in a cavity *(9 pages)* 012330
Leonid P. Pryadko and Gregory Quiroz

Effect of the Dzyaloshinski-Moriya term in the quantum $(\mathrm{SWAP})^{\alpha}$ gate produced with exchange coupling *(9 pages)* 012331
Roberto J. Guerrero and F. Rojas

Convertibility between two-qubit states using stochastic local quantum operations assisted by classical communication *(9 pages)* 012332
Yeong-Cherng Liang, Lluís Masanes, and Andrew C. Doherty

Beyond the standard entropic inequalities: Stronger scalar separability criteria and their applications *(14 pages)* 012333
Remigiusz Augusiak, Julia Stasińska, and Paweł Horodecki

Quantum Cayley networks of the hypercube *(6 pages)* 012334
Christopher Facer, Jason Twamley, and James Cresser

Synthesis of arbitrary unitary transformations of collective states of trapped ions by quantum Householder reflections *(7 pages)* 012335
Peter A. Ivanov and Nikolay V. Vitanov

Entanglement of subspaces in terms of entanglement of superpositions *(7 pages)* 012336
Gilad Gour and Aidan Roy

Teleportation of two-mode squeezed states *(5 pages)* 012337
Satyabrata Adhikari, A. S. Majumdar, and N. Nayak

Coherent and optimal control of adiabatic motion of ions in a trap *(5 pages)* 012338
Meiyu Zhao and Dmitri Babikov

Steady atomic entanglement with different quantum feedbacks *(7 pages)* 012339
Jun-Gang Li, Jian Zou, Bin Shao, and Jin-Fang Cai

Atomic and molecular structure and dynamics

Stark widths, shifts, and regularities for Kr II visible spectral lines *(7 pages)* 012501
J. A. del Val, R. J. Peláez, S. Mar, F. Rodríguez, V. R. González, A. B. Gonzalo, A. del Castro, and J. A. Aparicio

Calculation of the forbidden electric tensor polarizabilities of free Cs atoms and of Cs atoms trapped in a solid ^{4}He matrix *(10 pages)* 012502
A. Hofer, P. Moroshkin, S. Ulzega, and A. Weis

Theoretical study of molecular electronic excitations and optical transitions of C_{60} *(7 pages)* 012503
A. V. Nikolaev, I. V. Bodrenko, and E. V. Tkalya

Embedding a multideterminantal wave function in an orbital-free environment *(9 pages)* 012504
Tomasz A. Wesołowski

Calculations of Nd^- binding energies and photodetachment partial cross sections *(6 pages)* 012505
Steven M. O'Malley and Donald R. Beck

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Two-electron QED contributions to the ground-state binding energy in He-like Kr^{34+} ions *(8 pages)* 012506
P. H. Mokler, J. R. Crespo López-Urrutia, F. J. Currell, N. Nakamura, S. Ohtani, C. J. Osborne, H. Tawara, J. Ullrich, and H. Watanabe

Geminal-based statistics for the energies of many-electron molecular systems *(8 pages)* 012507
Adam E. Rothman and David A. Mazziotti

Stimulated Raman spectroscopy and the determination of the *D*-fine-structure level separation in $^{40}Ca^{+}$ *(5 pages)* 012508
Rekishu Yamazaki, Hideyuki Sawamura, Kenji Toyoda, and Shinji Urabe

Exact-exchange energy density in the gauge of a semilocal density-functional approximation *(9 pages)* 012509
Jianmin Tao, Viktor N. Staroverov, Gustavo E. Scuseria, and John P. Perdew

Double excitations and state-to-state transition dipoles in π-π^* excited singlet states of linear polyenes: Time-dependent density-functional theory versus multiconfigurational methods *(11 pages)* 012510
Ivan A. Mikhailov, Sergio Tafur, and Artëm E. Masunov

Prospects of detecting m_e/m_p variance using vibrational transition frequencies of $^2\Sigma$-state molecules *(11 pages)* 012511
Masatoshi Kajita

Hyperfine structure of the metastable $^3P_2$ state of alkaline-earth-metal atoms as an accurate probe of nuclear magnetic octupole moments *(10 pages)* 012512
K. Beloy, A. Derevianko, and W. R. Johnson

Radiative decay spectra of selected doubly excited states in helium *(7 pages)* 012513
Johan Söderström, Marcus Agåker, Anna Zimina, Raimund Feifel, Stefan Eisebitt, Rolf Follath, Gerd Reichardt, Olaf Schwarzkopf, Wolfgang Eberhardt, Andrej Mihelič, Matjaž Žitnik, and Jan-Erik Rubensson

Relativistic corrections to transition frequencies of Fe I and search for variation of the fine-structure constant *(6 pages)* 012514
V. A. Dzuba and V. V. Flambaum

Relativistic corrections to transition frequencies of Ag I, Dy I, Ho I, Yb II, Yb III, Au I, and Hg II and search for variation of the fine-structure constant *(6 pages)* 012515
V. A. Dzuba and V. V. Flambaum

Vibrations of acrylonitrile in N 1*s* excited states *(9 pages)* 012516
V. Ilakovac, S. Carniato, J.-J. Gallet, E. Kukk, D. Horvatić, and A. Ilakovac

Discontinuity of the exchange-correlation potential: Support for assumptions used to find it *(11 pages)* 012517
Espen Sagvolden and John P. Perdew

Atomic and molecular collisions and interactions

State-selective electron capture by O^{3+} ions from atomic and molecular targets *(6 pages)* 012701
E. Y. Kamber, O. Abu-Haija, and J. A. Wardwell

Cooling and slowing in high-pressure jet expansions *(5 pages)* 012702
Wolfgang Christen and Klaus Rademann

Near-threshold quantization and scattering lengths *(5 pages)* 012703
Harald Friedrich and Patrick Raab

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Electron-impact excitation of $X\ ^1\Sigma_g^+(v''=0)$ to the $a''\ ^1\Sigma_g^+$, $b\ ^1\Pi_u$, $c_3\ ^1\Pi_u$, $o_3\ ^1\Pi_u$, $b'\ ^1\Sigma_u^+$, $c_4'\ ^1\Sigma_u^+$, $G\ ^3\Pi_u$, and $F\ ^3\Pi_u$ states of molecular nitrogen *(20 pages)* 012704
M. A. Khakoo, C. P. Malone, P. V. Johnson, B. R. Lewis, R. Laher, S. Wang, V. Swaminathan, D. Nuyujukian, and I. Kanik

Use of double-bound three-body Coulomb distorted-wave-like basis sets for two-electron wave functions *(8 pages)* 012705
G. Gasaneo and L. U. Ancarani

Ab initio calculation of charge-transfer and excitation cross sections in $Li^+ + H(1s)$ collisions *(7 pages)* 012706
L. F. Errea, F. Guzmán, L. Méndez, B. Pons, and A. Riera

Integrals of the two-body T matrix in configuration space *(7 pages)* 012707
George Rawitscher and Walter Glöckle

Asymptotic transitions around conical intersections in ion-diatom collisions *(9 pages)* 012708
J. Suárez, L. F. Errea, C. Illescas, A. Macías, L. Méndez, B. Pons, I. Rabadán, and A. Riera

Vibration-induced suppression of valence-Rydberg mixing in the O $1s \rightarrow ns\sigma$ Rydberg series in N_2O *(4 pages)* 012709
T. Tanaka, M. Hoshino, H. Kato, M. Ehara, N. Yamada, R. Fukuda, H. Nakatsuji, Y. Tamenori, J. R. Harries, G. Prümper, H. Tanaka, and K. Ueda

Probing the nonlocal approximation to resonant collisions of electrons with diatomic molecules *(14 pages)* . . . 012710
Karel Houfek, T. N. Rescigno, and C. W. McCurdy

Energy-dependent Ps-He momentum-transfer cross section at low energies *(4 pages)* 012711
J. J. Engbrecht, M. J. Erickson, C. P. Johnson, A. J. Kolan, A. E. Legard, S. P. Lund, M. J. Nyflot, and J. D. Paulsen

Dynamical instabilities of Bose-Einstein condensates at the band edge in one-dimensional optical lattices *(15 pages)* 012712
Andrew J. Ferris, Matthew J. Davis, Reece W. Geursen, P. Blair Blakie, and Andrew C. Wilson

Excitation of the $C\ ^1\Sigma^+ + c\ ^3\Pi$ and $E\ ^1\Pi$ electronic states of carbon monoxide by electron impact *(7 pages)* 012713
H. Kawahara, H. Kato, M. Hoshino, H. Tanaka, and M. J. Brunger

Cross sections for 11–14-eV e-H_2 resonant collisions: Vibrational excitation *(10 pages)* 012714
R. Celiberto, R. K. Janev, J. M. Wadehra, and A. Laricchiuta

Photoionization accompanied by excitation at intermediate photon energies *(11 pages)* 012715
E. G. Drukarev, E. Z. Liverts, M. Ya. Amusia, R. Krivec, and V. B. Mandelzweig

Effects of nonintegrability on stabilization of Feshbach molecules in atom waveguides *(5 pages)* 012716
V. A. Yurovsky

Polarization effects on electronic excitation of molecules by low-energy electron impact: Study on e^--furan scattering *(4 pages)* 012717
Romarly F. da Costa, Márcio H. F. Bettega, and Marco A. P. Lima

Ab initio relativistic many-body calculation of hyperfine splittings of $^{113}Cd^+$ *(4 pages)* 012718
Gopal Dixit, H. S. Nataraj, B. K. Sahoo, R. K. Chaudhuri, and Sonjoy Majumder

Two-color photoassociation spectroscopy of ytterbium atoms and the precise determinations of s-wave scattering lengths *(8 pages)* 012719
Masaaki Kitagawa, Katsunari Enomoto, Kentaro Kasa, Yoshiro Takahashi, Roman Ciuryło, Pascal Naidon, and Paul S. Julienne

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Projectile angular-differential cross sections for transfer and transfer excitation in proton collisions with helium *(9 pages)* 012720
M. Zapukhlyak, T. Kirchner, A. Hasan, B. Tooke, and M. Schulz

S-wave resonances in positron-sodium scattering *(8 pages)* 012721
Huili Han, Zhenxiang Zhong, Xianzhou Zhang, and Tingyun Shi

Electron detachment of negative ions: The influence of the outermost electron and its neutral core atom in collision with He, Ne, and Ar *(8 pages)* 012722
Ginette Jalbert, W. Wolff, S. D. Magalhães, and N. V. de Castro Faria

Exchange effects in elastic collisions of spin-polarized electrons with open-shell molecules with $^3\Sigma_g^-$ symmetry *(9 pages)* 012723
Motomichi Tashiro

Exactly solvable coupled-channel potential models of atom-atom magnetic Feshbach resonances from supersymmetric quantum mechanics *(14 pages)* 012724
Andrey M. Pupasov, Boris F. Samsonov, and Jean-Marc Sparenberg

Elastic electron scattering by a Pb atom *(7 pages)* 012725
S. D. Tošić, M. S. Rabasović, D. Šević, V. Pejčev, D. M. Filipović, Lalita Sharma, A. N. Tripathi, Rajesh Srivastava, and B. P. Marinković

Analytic Born completion in the calculation of differential cross sections for electron scattering from a linear molecule *(12 pages)* 012726
Andrew N. Feldt and Michael A. Morrison

PART B

Clusters (including fullerenes)

Structure, stability, dipole polarizability and differential polarizability in small gallium arsenide clusters from all-electron *ab initio* and density-functional-theory calculations *(7 pages)* 013201
Panaghiotis Karamanis, Claude Pouchan, and George Maroulis

Structure, stability, and magnetism of Sc_nAl ($n=1-8,12$) clusters: Density-functional theory investigations *(8 pages)* 013202
Fu-Yang Tian, Qun Jing, and Yuan-Xu Wang

Atomic and molecular processes in external fields, including interactions with strong fields and short pulses

Coulomb-Volkov approximation for near-threshold ionization by short laser pulses *(8 pages)* 013401
Diego G. Arbó, Jorge E. Miraglia, María Silvia Gravielle, Klaus Schiessl, Emil Persson, and Joachim Burgdörfer

Rosen-Zener transition in a nonlinear two-level system *(7 pages)* 013402
Di-Fa Ye, Li-Bin Fu, and Jie Liu

Classical trajectory perspective on double-ionization dynamics of diatomic molecules irradiated by ultrashort intense laser pulses *(10 pages)* 013403
D. F. Ye, J. Chen, and J. Liu

Super-Tonks-Girardeau regime in trapped one-dimensional dipolar gases *(7 pages)* 013404
G. E. Astrakharchik and Yu. E. Lozovik

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Method to image high-order harmonic generation and quantum trajectories in the real-time–frequency domain *(5 pages)* 013405
Pengfei Lan and Peixiang Lu

Dynamics of periodic anticrossings: Decoherence, pointer states, and hysteresis curves *(10 pages)* 013406
Péter Földi, Mihály G. Benedict, and F. M. Peeters

Controlled vibrational quenching of nuclear wave packets in D_2^+ *(7 pages)* 013407
Thomas Niederhausen and Uwe Thumm

Phase dependence of high-order above-threshold ionization in asymmetric molecules *(6 pages)* 013408
Qing Liao, Peixiang Lu, Pengfei Lan, Wei Cao, and Yuhua Li

Theoretical modeling of resonant laser excitation of atoms in a magnetic field *(12 pages)* 013409
Andrew James Murray, William MacGillivray, and Martyn Hussey

High-order harmonic generation from diatomic molecules with large internuclear distance: The effect of two-center interference *(5 pages)* 013410
Y. J. Chen and J. Liu

Transferring Rydberg wave packets between islands across the chaotic sea *(9 pages)* 013411
S. Yoshida, C. O. Reinhold, J. Burgdörfer, J. J. Mestayer, J. C. Lancaster, and F. B. Dunning

Ab initio calculation of time-dependent control dynamics in polyelectronic systems involving bound and resonance states: Application to a quartet spectrum of He^- *(10 pages)* 013412
Yannis Komninos, Theodoros Mercouris, and Cleanthes A. Nicolaides

Theory of x-ray absorption by laser-aligned symmetric-top molecules *(13 pages)* 013413
Christian Buth and Robin Santra

Parallel solver for the three-dimensional Cartesian-grid-based time-dependent Schrödinger equation and its applications in laser-H_2^+ interaction studies *(10 pages)* 013414
Y.-M. Lee, J.-S. Wu, T.-F. Jiang, and Y.-S. Chen

Matter waves

Focusing of atomic beams by near-field atom microlenses: The Bethe-type and the Fresnel-type microlenses *(13 pages)* 013601
V. I. Balykin and V. G. Minogin

Self-trapping of Bose-Einstein condensates in optical lattices: The effect of the lattice dimension *(7 pages)* 013602
Ju-Kui Xue, Ai-Xia Zhang, and Jie Liu

Manipulating atoms in an optical lattice: Fractional fermion number and its optical quantum measurement *(18 pages)* 013603
J. Ruostekoski, J. Javanainen, and G. V. Dunne

Splitting dynamics of doubly quantized vortices in Bose-Einstein condensates *(13 pages)* 013604
Halvor M. Nilsen and Emil Lundh

Trap-imbalanced fermion mixtures *(4 pages)* 013605
M. Iskin and C. J. Williams

Many-body Landau-Zener tunneling in the Bose-Hubbard model *(9 pages)* 013606
Andrea Tomadin, Riccardo Mannella, and Sandro Wimberger

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 77, NUMBER 1** **JANUARY 2008**

Spin-charge separation in two-component Bose gases *(6 pages)* 013607
A. Kleine, C. Kollath, I. P. McCulloch, T. Giamarchi, and U. Schollwöck

Quantum matter-wave dynamics with moving mirrors *(5 pages)* 013608
A. del Campo, J. G. Muga, and M. Kleber

Quantum phases of mixtures of atoms and molecules on optical lattices *(7 pages)* 013609
V. G. Rousseau and P. J. H. Denteneer

Influence of spontaneous emission on a single-state atom interferometer *(13 pages)* 013610
S. Beattie, B. Barrett, M. Weel, I. Chan, C. Mok, S. B. Cahn, and A. Kumarakrishnan

Bose-Einstein condensates on a ring with periodic scattering length: Spontaneous symmetry breaking and entanglement *(7 pages)* 013611
Lisa C. Qian, Michael L. Wall, Shaoliang Zhang, Zhengwei Zhou, and Han Pu

Density correlations in ultracold Fermi systems within the exact Richardson solution *(8 pages)* 013612
Simon Staudenmayer, Wolfgang Belzig, and C. Bruder

Interference of an array of atom lasers *(5 pages)* 013613
Giovanni Cennini, Carsten Geckeler, Gunnar Ritt, and Martin Weitz

Nonlinear intraband tunneling of a Bose-Einstein condensate in a cubic three-dimensional lattice *(12 pages)* 013614
V. S. Shchesnovich and V. V. Konotop

Squeezing and entanglement of a Bose-Einstein condensate in optical lattices *(10 pages)* 013615
X. P. Liu and P. T. Leung

Conversion efficiencies of heteronuclear Feshbach molecules *(20 pages)* 013616
Shohei Watabe and Tetsuro Nikuni

Effective mean-field equations for cigar-shaped and disk-shaped Bose-Einstein condensates *(10 pages)* 013617
A. Muñoz Mateo and V. Delgado

Discovery of exceptional points in the Bose-Einstein condensation of gases with attractive $1/r$ interaction *(9 pages)* 013618
Holger Cartarius, Jörg Main, and Günter Wunner

Quality factor of a matter-wave beam *(4 pages)* 013619
F. Impens

Bright solitary-matter-wave collisions in a harmonic trap: Regimes of solitonlike behavior *(15 pages)* 013620
A. D. Martin, C. S. Adams, and S. A. Gardiner

Index of refraction of gases for matter waves: Effect of the motion of the gas particles on the calculation of the index *(6 pages)* 013621
Caroline Champenois, Marion Jacquey, Steven Lepoutre, Matthias Büchner, Gérard Trénec, and Jacques Vigué

Multicomponent strongly attractive Fermi gas: A color superconductor in a one-dimensional harmonic trap *(14 pages)* 013622
Xia-Ji Liu, Hui Hu, and Peter D. Drummond

Dimer states in atomic mixtures *(7 pages)* 013623
K. Ziegler

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Molecular superfluid phase in systems of one-dimensional multicomponent fermionic cold atoms *(4 pages)* 013624
S. Capponi, G. Roux, P. Lecheminant, P. Azaria, E. Boulat, and S. R. White

Fermi-Fermi mixtures in the strong-attraction limit *(12 pages)* 013625
M. Iskin and C. A. R. Sá de Melo

Quantum optics, physics of lasers, nonlinear optics, classical optics

Cooperative enhancement of channeling of emission from atoms into a nanofiber *(6 pages)* 013801
Fam Le Kien and K. Hakuta

Ultrafast transient ring-shaped population grating *(3 pages)* 013802
Keyu Xia, Yueping Niu, Ni Cui, and Shangqing Gong

Quantum properties of counterpropagating two-photon states generated in a planar waveguide *(14 pages)* 013803
Jan Peřina, Jr.

Circular dielectric cavity and its deformations *(16 pages)* 013804
R. Dubertrand, E. Bogomolny, N. Djellali, M. Lebental, and C. Schmit

Backward surface electromagnetic waves in semi-infinite one-dimensional photonic crystals containing left-handed materials *(5 pages)* 013805
J. Barvestani, M. Kalafi, A. Soltani-Vala, and A. Namdar

Numerical investigation of the quantum fluctuations of optical fields transmitted through an atomic medium *(11 pages)* 013806
A. Lezama, P. Valente, H. Failache, M. Martinelli, and P. Nussenzveig

Spatial dispersion in negative-index composite metamaterials *(11 pages)* 013807
A. I. Căbuz, D. Felbacq, and D. Cassagne

Effects of self-phase-modulation on weak nonlinear optical quantum gates *(7 pages)* 013808
Pieter Kok

Second-harmonic generation from metallodielectric multilayer photonic-band-gap structures *(9 pages)* 013809
M. C. Larciprete, A. Belardini, M. G. Cappeddu, D. de Ceglia, M. Centini, E. Fazio, C. Sibilia, M. J. Bloemer, and M. Scalora

Imbert-Fedorov shift at metamaterial interfaces *(7 pages)* 013810
C. Menzel, C. Rockstuhl, T. Paul, S. Fahr, and F. Lederer

Influence of slab thickness on the Casimir force *(8 pages)* 013811
I. Pirozhenko and A. Lambrecht

Laser multiple filamentation control in air using a smooth phase mask *(5 pages)* 013812
P. Rohwetter, M. Queißer, K. Stelmaszczyk, M. Fechner, and L. Wöste

Observation of enhanced optical spring damping in a macroscopic mechanical resonator and application for parametric instability control in advanced gravitational-wave detectors *(5 pages)* 013813
S. W. Schediwy, C. Zhao, L. Ju, D. G. Blair, and P. Willems

Role of transverse magnetic fields in electromagnetically induced absorption for elliptically polarized light *(12 pages)* 013814
J. Dimitrijević, A. Krmpot, M. Mijailović, D. Arsenović, B. Panić, Z. Grujić, and B. M. Jelenković

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 77, NUMBER 1** **JANUARY 2008**

Effect of biased noise fluctuations on entanglement and statistical properties in a two-photon phase-sensitive laser *(10 pages)* 013815
Sintayehu Tesfa

Upper bound for the success probability of cavity-mediated adiabatic transfer in the presence of dissipation *(5 pages)* 013816
Hayato Goto and Kouichi Ichimura

Two-color vector-soliton interactions in nematic liquid crystals in the local response regime *(8 pages)* 013817
Benjamin D. Skuse and Noel F. Smyth

Spectroscopy of nonlinear band structures of one-dimensional photonic crystals *(10 pages)* 013818
Christian E. Rüter and Detlef Kip

Broadband optical coupling between microstructured fibers and photonic band gap circuits: Two-dimensional paradigms *(14 pages)* 013819
James Bauer and Sajeev John

Bright-dark solitons and their collisions in mixed *N*-coupled nonlinear Schrödinger equations *(18 pages)* 013820
M. Vijayajayanthi, T. Kanna, and M. Lakshmanan

Two-photon detuning and decoherence in cavity electromagnetically induced transparency for quantized fields *(7 pages)* 013821
P. Barberis-Blostein

Dipole-dipole interaction between orthogonal dipole moments in time-dependent geometries *(10 pages)* 013822
Sandra Isabelle Schmid and Jörg Evers

Dark-state polaritons in single- and double-Λ media *(7 pages)* 013823
Y. D. Chong and Marin Soljačić

Dynamic properties and optical phase conjugation of two-photon pumped ultrashort blue stimulated emission in a chromophore solution *(10 pages)* 013824
Guang S. He, Hai-Yan Qin, Qingdong Zheng, Paras N. Prasad, Steffen Jockusch, Nicholas J. Turro, Marlin Halim, Dalibor Sames, Hans Ågren, and Sailing He

Material parameter equation for elliptical cylindrical cloaks *(4 pages)* 013825
Hua Ma, Shaobo Qu, Zhuo Xu, Jieqiu Zhang, Biwu Chen, and Jiafu Wang

Three-dimensional theory for light-matter interaction *(29 pages)* 013826
Martin W. Sørensen and Anders S. Sørensen

Entanglement of a Laguerre-Gaussian cavity mode with a rotating mirror *(8 pages)* 013827
M. Bhattacharya, P.-L. Giscard, and P. Meystre

Spatial morphology of macroscopic superposition of three-dimensional coherent laser waves in degenerate cavities *(5 pages)* 013828
T. H. Lu, Y. F. Chen, and K. F. Huang

Temporal shaping of a heralded single-photon wave packet *(5 pages)* 013829
So-Young Baek, Osung Kwon, and Yoon-Ho Kim

Photon conversion processes in dispersive microcavities: Quantum-field model *(9 pages)* 013830
Alex Hayat and Meir Orenstein

Coherent output of photons from coupled superconducting transmission line resonators controlled by charge qubits *(7 pages)* 013831
Lan Zhou, Y. B. Gao, Z. Song, and C. P. Sun

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Statistical studies of random-lasing modes and amplified spontaneous-emission spikes in weakly scattering systems *(10 pages)* 013832
X. Wu and H. Cao

All-optical switching with transverse optical patterns *(8 pages)* 013833
Andrew M. C. Dawes, Lucas Illing, Joel A. Greenberg, and Daniel J. Gauthier

Model for chaotic dielectric microresonators *(9 pages)* 013834
J. P. Keating, M. Novaes, and H. Schomerus

BRIEF REPORTS

Fundamental concepts

Reexamination of the Schiff theorem *(3 pages)* 014101
R. A. Sen'kov, N. Auerbach, V. V. Flambaum, and V. G. Zelevinsky

Time of arrival of electrons in the double-slit experiment *(4 pages)* 014102
Hideo Nitta and Tomoshige Kudo

Quantum brachistochrone problem for a spin-1 system in a magnetic field *(4 pages)* 014103
A. M. Frydryszak and V. M. Tkachuk

Local vertical measurements and violation of the Bell inequality *(4 pages)* 014104
Yang Xiang and Shi-Jie Xiong

Quantum information

Optimal state in the Knill-Laflamme-Milburn scheme of linear optical teleportation *(4 pages)* 014301
Andrzej Grudka and Joanna Modławska

Consistency of shared reference frames should be reexamined *(3 pages)* 014302
Fei Gao, Fen-Zhuo Guo, Qiao-Yan Wen, and Fu-Chen Zhu

Deterministic generation of three-dimensional entanglement for two atoms separately trapped in two optical cavities *(4 pages)* 014303
Sai-Yun Ye, Zhi-Rong Zhong, and Shi-Biao Zheng

One-step generation of cluster states in microwave cavity QED *(2 pages)* 014304
Jun-Qi Li, Gang Chen, and J.-Q. Liang

Weak measurement and control of entanglement generation *(4 pages)* 014305
Charles Hill and Jason Ralph

General relation between the transformation operator and an invariant under stochastic local operations and classical communication in quantum teleportation *(4 pages)* 014306
Xin-Wei Zha and Kuan Fang Ren

Atomic and molecular structure and dynamics

Muonic atoms with extreme nuclear charge *(2 pages)* 014501
V. V. Flambaum and W. R. Johnson

Determination of resonance parameters for the e^+-H system in Debye plasma environments using the complex-coordinate-rotation method *(4 pages)* 014502
Sumana Chakraborty and Y. K. Ho

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 77, NUMBER 1 JANUARY 2008

Atomic and molecular collisions and interactions

Time-dependent lattice methods for ion-atom collisions in Cartesian and cylindrical coordinate systems *(4 pages)* 014701
M. S. Pindzola and D. R. Schultz

Projectile charge-state dependence of methane fragmentation *(2 pages)* 014702
Jyoti Rajput and C. P. Safvan

Atomic and molecular processes in external fields, including interactions with strong fields and short pulses

Angular momentum exchange between coherent light and matter fields *(4 pages)* 015401
T. P. Simula, N. Nygaard, S. X. Hu, L. A. Collins, B. I. Schneider, and K. Mølmer

Suppression of correlated electron escape in double ionization in strong laser fields *(4 pages)* 015402
Bruno Eckhardt, Jakub S. Prauzner-Bechcicki, Krzysztof Sacha, and Jakub Zakrzewski

Dynamic method to distinguish between left- and right-handed chiral molecules *(4 pages)* 015403
Yong Li and C. Bruder

Field ionization of the frozen Rydberg gas *(4 pages)* 015404
Jianing Han and T. F. Gallagher

Three-dimensional analysis of the magneto-optical trap for (1+3)-level atoms *(4 pages)* 015405
Sang-Kyung Choi, Sang Eon Park, Jingbiao Chen, and Vladimir G. Minogin

Matter waves

Collective excitations of trapped one-dimensional dipolar quantum gases *(4 pages)* 015601
P. Pedri, S. De Palo, E. Orignac, R. Citro, and M. L. Chiofalo

Monte Carlo study of the two-dimensional Bose-Hubbard model *(4 pages)* 015602
Barbara Capogrosso-Sansone, Şebnem Güneş Söyler, Nikolay Prokof'ev, and Boris Svistunov

Quantum optics, physics of lasers, nonlinear optics, classical optics

Effect of correlated noises in an optical bistable system *(4 pages)* 015801
Li Zhang, Li Cao, and Da-jin Wu

Generation of qudits and entangled qudits *(4 pages)* 015802
Yongmin Li, Kuanshou Zhang, and Kunchi Peng

Casimir force between left-handed-material slabs *(4 pages)* 015803
Yaping Yang, Ran Zeng, Jingping Xu, and Shutian Liu

Nonclassical photon statistics in cavity QED with an inhomogeneous medium *(4 pages)* 015804
Hayato Goto and Kouichi Ichimura

Tailoring polarization entanglement in anisotropy-compensated spontaneous parametric down-conversion *(4 pages)* 015805
Giorgio Brida, Marco Genovese, Maria V. Chekhova, and Leonid A. Krivitsky

Spontaneous emission properties of a quantum dot in an ultrahigh-Q cavity: Crossover from weak- to strong-coupling states and robust quantum interference *(4 pages)* 015806
Jun-ichi Inoue, Tetsuyuki Ochiai, and Kazuaki Sakoda

Metal-insulator transition in the spectrum of a frequency-modulation mode-locked laser *(4 pages)* 015807
Stefano Longhi

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 77, NUMBER 1** **JANUARY 2008**

Energy density and particle creation inside an oscillating cavity with mixed boundary conditions *(4 pages)* 015808
Danilo T. Alves and Edney R. Granhen

Generation of two-mode field squeezing through selective dynamics in cavity QED *(4 pages)* 015809
Pengbo Li

Correlations in orbital angular momentum of spatially entangled paired photons generated in parametric down-conversion *(4 pages)* 015810
Clara I. Osorio, Gabriel Molina-Terriza, and Juan P. Torres

Incoherently coupled two-color Manakov vector solitons in nonlocal media *(4 pages)* 015811
Ming Shen, Qian Kong, Jielong Shi, and Qi Wang

Direct determination of the wave field of an x-ray nanobeam *(4 pages)* 015812
Hidekazu Mimura, Hirokatsu Yumoto, Satoshi Matsuyama, Soichiro Handa, Takashi Kimura, Yasuhisa Sano, Makina Yabashi, Yoshinori Nishino, Kenji Tamasaku, Tetsuya Ishikawa, and Kazuto Yamauchi

ERRATA

Erratum: Local-field corrections to the decay rate of excited molecules in absorbing cavities: The Onsager model [Phys. Rev. A **63**, 053811 (2001)] *(1 page)* . . . . . 019901(E)
M. S. Tomaš

Publisher's Note: Manipulating atoms in an optical lattice: Fractional fermion number and its optical quantum measurement [Phys. Rev. A **77**, 013603 (2008)] *(1 page)* . . . . . 019902(E)
J. Ruostekoski, J. Javanainen, and G. V. Dunne

Erratum: Hellmann-Feynman theorem in a mixed ensemble [Phys. Rev. A **75**, 032514 (2007)] *(1 page)* . . . . . 019903(E)
Dhurba Rai

Erratum: Security of quantum bit-string generation [Phys. Rev. A **70**, 052310 (2004)] *(1 page)* . . . . . 019904(E)
Jonathan Barrett and Serge Massar