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 75, NUMBER 6 *CONTENTS* **JUNE 2007**
PARTS A AND B

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 060001-063205, and Part B pages 063401-069910(E).

PART A

EDITORIALS AND ANNOUNCEMENTS

Announcement: New Prices and Payment Policy for Color Figures in the Print Journal *(1 page)* 060001

RAPID COMMUNICATIONS

Fundamental concepts

Nodal surfaces of helium atom eigenfunctions *(4 pages)* . . . . . 060101(R)
Tony C. Scott, Arne Lüchow, Dario Bressanini, and John D. Morgan, III

Precision measurement of the Casimir-Lifshitz force in a fluid *(4 pages)* . . . . . 060102(R)
J. N. Munday and Federico Capasso

Quantum information

Initializing a quantum register from Mott-insulator states in optical lattices *(4 pages)* . . . . . 060301(R)
Chuanwei Zhang, V. W. Scarola, and S. Das Sarma

Gaussian localizable entanglement *(4 pages)* . . . . . 060302(R)
Jaromír Fiurášek and Ladislav Mišta, Jr.

Coherent communication with continuous quantum variables *(4 pages)* . . . . . 060303(R)
Mark M. Wilde, Hari Krovi, and Todd A. Brun

Strong superadditivity conjecture holds for the quantum depolarizing channel in any dimension *(2 pages)* . . . . 060304(R)
Grigori G. Amosov

Hyperentangled Bell-state analysis *(4 pages)* . . . . . 060305(R)
Tzu-Chieh Wei, Julio T. Barreiro, and Paul G. Kwiat

Atomic and molecular processes in external fields

Beyond the single-atom response in isolated attosecond-pulse generation *(4 pages)* . . . . . 061401(R)
Carlo Altucci, Valer Tosa, and Raffaele Velotta

High-resolution electron-ion coincidence spectroscopy of ethanol in intense laser fields *(4 pages)* . . . . . 061402(R)
T. Hatamoto, G. Prümper, M. Okunishi, D. Mathur, and K. Ueda

Copyright 2007 by The American Physical Society

(Continued)

1050-2947(200706)75:6:1;1-D

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Electrically and magnetically controlled optical spanner based on the transfer of spin angular momentum of light in an optically active medium *(4 pages)* . . . . . 061403(R)
Lixiang Chen, Guoliang Zheng, and Weilong She

Dynamical interferences to probe short-pulse photoassociation of Rb atoms and stabilization of Rb_2 dimers *(4 pages)* . . . . . 061404(R)
Jordi Mur-Petit, Eliane Luc-Koenig, and Françoise Masnou-Seeuws

Matter waves

Atom-photon pair laser *(4 pages)* . . . . . 061601(R)
Thomas Salzburger and Helmut Ritsch

Guiding-center solitons in rotating potentials *(4 pages)* . . . . . 061602(R)
Yaroslav V. Kartashov, Boris A. Malomed, and Lluis Torner

Effect of interactions on the localization of a Bose-Einstein condensate in a quasiperiodic lattice *(4 pages)* . . . . . 061603(R)
J. E. Lye, L. Fallani, C. Fort, V. Guarrera, M. Modugno, D. S. Wiersma, and M. Inguscio

Versatile element for free-space dividing and redirecting neutral-atom clouds *(4 pages)* . . . . . 061604(R)
I. V. Arakelyan, N. Chattrapiban, S. Mitra, and W. T. Hill, III

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

Two-dimensional Laguerre-Gaussian soliton family in strongly nonlocal nonlinear media *(4 pages)* . . . . . 061801(R)
Weiping Zhong and Lin Yi

Self-stabilized spatiotemporal dynamics of dissipative light bullets generated from inputs without spherical symmetry in three-dimensional Ginzburg-Landau systems *(4 pages)* . . . . . 061802(R)
N. B. Aleksić, V. Skarka, D. V. Timotijević, and D. Gauthier

ARTICLES

Fundamental concepts

Parameter estimation for mixed states from a single copy *(9 pages)* 062101
Thomas Konrad, Otfried Gühne, Jürgen Audretsch, and Hans J. Briegel

Four-level entangled quantum heat engines *(6 pages)* 062102
Ting Zhang, Wei-Tao Liu, Ping-Xing Chen, and Cheng-Zu Li

Complete positivity of a spin-1/2 master equation with memory *(6 pages)* 062103
Sabrina Maniscalco

Ensemble-averaged entanglement of two-particle states in Fock space *(9 pages)* 062104
Jan Naudts and Tobias Verhulst

Trapped-ion realization of Einstein's recoiling-slit experiment *(8 pages)* 062105
Robert S. Utter and James M. Feagin

Phase-diffusion pattern in quantum-nondemolition systems *(12 pages)* 062106
Subhashish Banerjee, Joyee Ghosh, and R. Ghosh

Photon wave mechanics and position eigenvectors *(13 pages)* 062107
Margaret Hawton

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Lateral Casimir force beyond the proximity force approximation: A nontrivial interplay between geometry and quantum vacuum *(10 pages)* 062108
Robson B. Rodrigues, Paulo A. Maia Neto, Astrid Lambrecht, and Serge Reynaud

Electron capture by an electric dipole in two dimensions *(5 pages)* 062109
M. L. Glasser and L. M. Nieto

Quantum-classical transition for an analog of the double-slit experiment in complex collisions: Dynamical decoherence in quantum many-body systems *(5 pages)* 062110
L. Benet, L. T. Chadderton, S. Yu. Kun, and Wang Qi

Scalar and spinor particles with low binding energy in a strong stationary magnetic field in two and three dimensions *(8 pages)* 062111
V. N. Rodionov

Bounds to unitary evolution *(5 pages)* 062112
Mark Andrews

Simple renormalization-group approximation of the ground-state properties of interacting bosonic systems *(6 pages)* 062113
Roman Werpachowski and Jerzy Kijowski

Experimental approaches to the difference in the Casimir force due to modifications in the optical properties of the boundary surface *(13 pages)* 062114
R. Castillo-Garza, C.-C. Chang, D. Jimenez, G. L. Klimchitskaya, V. M. Mostepanenko, and U. Mohideen

Coordinate-dependent diffusion coefficients: Decay rate in open quantum systems *(7 pages)* 062115
V. V. Sargsyan, Yu. V. Palchikov, Z. Kanokov, G. G. Adamian, and N. V. Antonenko

Decoherence under many-body system-environment interactions: A stroboscopic representation based on a fictitiously homogenized interaction rate *(11 pages)* 062116
Gonzalo A. Álvarez, Ernesto P. Danieli, Patricia R. Levstein, and Horacio M. Pastawski

Constrained bounds on measures of entanglement *(15 pages)* 062117
Animesh Datta, Steven T. Flammia, Anil Shaji, and Carlton M. Caves

Maximally entangled mixed-state generation via local operations *(4 pages)* 062118
A. Aiello, G. Puentes, D. Voigt, and J. P. Woerdman

Entanglement oscillations in non-Markovian quantum channels *(5 pages)* 062119
Sabrina Maniscalco, Stefano Olivares, and Matteo G. A. Paris

Irreversible decay of nonlocal entanglement via a reservoir of a single degree of freedom *(6 pages)* 062120
A. Vaglica and G. Vetri

Non-Markovian coherence dynamics of a driven spin-boson model: Damped quantum-beat or large-amplitude coherence oscillation *(9 pages)* 062121
Xiufeng Cao and Hang Zheng

Quantum information

Dynamical decoupling-induced renormalization of non-Markovian dynamics *(12 pages)* 062301
Pochung Chen

Geometric phase gates based on stimulated Raman adiabatic passage in tripod systems *(6 pages)* 062302
Ditte Møller, Lars Bojer Madsen, and Klaus Mølmer

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 6** **JUNE 2007**

Factorizing numbers with the Gauss sum technique: NMR implementations *(4 pages)* 062303
T. S. Mahesh, Nageswaran Rajendran, Xinhua Peng, and Dieter Suter

SWAP operation in the two-qubit Heisenberg *XXZ* model: Effects of anisotropy and magnetic field *(4 pages)* 062304
Yue Zhou, Guo-Feng Zhang, Fu-Hua Yang, and Song-Lin Feng

Influence of pump-phase fluctuations on entanglement generation using a correlated spontaneous-emission laser *(10 pages)* 062305
Shahid Qamar, Han Xiong, and M. Suhail Zubairy

Discrimination between pure states and mixed states *(6 pages)* 062306
Chi Zhang, Guoming Wang, and Mingsheng Ying

Multipartite purification protocols: Upper and optimal bounds *(14 pages)* 062307
Alastair Kay and Jiannis K. Pachos

Monogamy inequality in terms of negativity for three-qubit states *(5 pages)* 062308
Yong-Cheng Ou and Heng Fan

Exciton entanglement in coupled quantum dots in a microcavity *(7 pages)* 062309
Chun-Hua Yuan, Ka-Di Zhu, and Xiao-Zhong Yuan

Performance of deterministic dynamical decoupling schemes: Concatenated and periodic pulse sequences *(16 pages)* 062310
Kaveh Khodjasteh and Daniel A. Lidar

Accidental cloning of a single-photon qubit in two-channel continuous-variable quantum teleportation *(7 pages)* 062311
Toshiki Ide and Holger F. Hofmann

Disentanglement in a quantum-critical environment *(7 pages)* 062312
Zhe Sun, Xiaoguang Wang, and C. P. Sun

Non-Markovian decoherence in the adiabatic quantum search algorithm *(5 pages)* 062313
Markus Tiersch and Ralf Schützhold

Distribution of interference in random quantum algorithms *(7 pages)* 062314
Ludovic Arnaud and Daniel Braun

Approximate quantum error correction, random codes, and quantum channel capacity *(13 pages)* 062315
Rochus Klesse

Entanglement generation by a dispersive vacuum *(6 pages)* 062316
Luis Roa, R. Pozo-González, Marius Schaefer, and P. Utreras-SM

Bipartite entanglement measure based on covariance *(6 pages)* 062317
Isabel Sainz Abascal and Gunnar Björk

Inseparability of photon-added Gaussian states *(9 pages)* 062318
Hong-rong Li, Fu-li Li, and Shi-yao Zhu

Sequential attack with intensity modulation on the differential-phase-shift quantum-key-distribution protocol *(6 pages)* 062319
Toyohiro Tsurumaru

Entangling two atoms in spatially separated cavities through both photon emission and absorption processes *(7 pages)* 062320
Peng Peng and Fu-li Li

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Quantum walks, quantum gates, and quantum computers *(13 pages)* 062321
Andrew P. Hines and P. C. E. Stamp

Mixed qubits cannot be universally broadcast *(5 pages)* 062322
Lin Chen and Yi-Xin Chen

Combined and controlled remote implementations of partially unknown quantum operations of multiqubits using Greenberger-Horne-Zeilinger states *(21 pages)* 062323
An Min Wang

Abrupt changes in the dynamics of quantum disentanglement *(4 pages)* 062324
F. Lastra, G. Romero, C. E. López, M. França Santos, and J. C. Retamal

Photon-number-resolving detector with 10 bits of resolution *(5 pages)* 062325
Leaf A. Jiang, Eric A. Dauler, and Joshua T. Chang

Shaped pulses for quantum computing *(4 pages)* 062326
Matthias Steffen and Roger H. Koch

Optimal quantum-chain communication by end gates *(5 pages)* 062327
Daniel Burgarth, Vittorio Giovannetti, and Sougato Bose

Quantum communication via a continuously monitored dual spin chain *(6 pages)* 062328
Kosuke Shizume, Kurt Jacobs, Daniel Burgarth, and Sougato Bose

Quantification of quantum correlation of ensembles of states *(6 pages)* 062329
Michał Horodecki, Aditi Sen(De), and Ujjwal Sen

Entangled states close to the maximally mixed state *(10 pages)* 062330
Roland Hildebrand

Direct characterization of quantum dynamics: General theory *(15 pages)* 062331
M. Mohseni and D. A. Lidar

Quantum walks on quotient graphs *(14 pages)* 062332
Hari Krovi and Todd A. Brun

Nonlinear optical Galton board *(7 pages)* 062333
C. Navarrete-Benlloch, A. Pérez, and Eugenio Roldán

Meaner king uses biased bases *(4 pages)* 062334
Michael Reimpell and Reinhard F. Werner

Statistical bounds on the dynamical production of entanglement *(6 pages)* 062335
Rômulo F. Abreu and Raúl O. Vallejos

Disentanglement in a two-qubit system subjected to dissipation environments *(9 pages)* 062336
Manzoor Ikram, Fu-li Li, and M. Suhail Zubairy

Adiabatic rotation, quantum search, and preparation of superposition states *(5 pages)* 062337
M. Stewart Siu

Universal distortion-free entanglement concentration *(13 pages)* 062338
Keiji Matsumoto and Masahito Hayashi

Atomic and molecular structure and dynamics

QED treatment of electron correlation in Li-like ions *(21 pages)* 062501
V. A. Yerokhin, A. N. Artemyev, and V. M. Shabaev

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Effects of configuration interaction on the radiative rates of Li- and Be-like ions *(6 pages)* 062502
L. Natarajan and Anuradha Natarajan

$3p$ photoabsorption spectra of Mn^{2+} and Mn^{3+} *(5 pages)* 062503
D. Kilbane, R. Mayo, P. van Kampen, J.-P. Mosnier, E. T. Kennedy, and J. T. Costello

Relativistic corrections to the ground-state energy of the positronium molecule *(9 pages)* 062504
Sergiy Bubin, Monika Stanke, Dariusz Kędziera, and Ludwik Adamowicz

Positronic complexes with unnatural parity *(10 pages)* 062505
M. W. J. Bromley, J. Mitroy, and K. Varga

Adiabatic connection in density-functional theory: Two electrons on the surface of a sphere *(11 pages)* 062506
Michael Seidl

Density-functional calculation for the tunnel ionization rate of hydrocarbon molecules *(8 pages)* 062507
T. Otobe and K. Yabana

Relativistic R-matrix close-coupling method based on the effective Hamiltonian in many-body perturbation theory *(12 pages)* 062508
Marius J. Vilkas and Yasuyuki Ishikawa

Bound states and resonance states of the plasma-embedded $pp\mu$ molecular ion *(7 pages)* 062509
Sabyasachi Kar and Y. K. Ho

Polarizabilities of the Ps negative ion *(3 pages)* 062510
A. K. Bhatia and Richard J. Drachman

Role of spins in molecular photoionization: Spectroscopy and dynamics of autoionizing Rydberg states of ortho-H_2 *(13 pages)* 062511
H. J. Wörner, S. Mollet, Ch. Jungen, and F. Merkt

Higher-order contributions to fine structure in high-L Rydberg states of Si^{2+} *(6 pages)* 062512
E. L. Snow and S. R. Lundeen

Atomic and molecular collisions and interactions

Single-photon double ionization of negative hydrogen ions in the presence of a dc electric field *(6 pages)* 062701
I. A. Ivanov and A. S. Kheifets

Resonances in low-energy electron scattering from $HCNH^+$ *(8 pages)* 062702
V. Ngassam and A. E. Orel

Octupole contributions to the generalized oscillator strengths of discrete dipole transitions in noble-gas atoms *(10 pages)* 062703
M. Ya. Amusia, L. V. Chernysheva, Z. Felfli, and A. Z. Msezane

Siegert pseudostate formulation of scattering theory: Nonzero angular momenta in the one-channel case *(17 pages)* 062704
Pavel A. Batishchev and Oleg I. Tolstikhin

Electron and positron scattering from the benzene derivative: Toluene *(7 pages)* 062705
H. Kato, C. Makochekanwa, Y. Shiroyama, M. Hoshino, N. Shinohara, O. Sueoka, M. Kimura, and H. Tanaka

Cold ^{52}Cr elastic and inelastic collision-rate determination using evaporative cooling analysis *(6 pages)* 062706
Scott V. Nguyen, Robert deCarvalho, and John M. Doyle

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Angular distributions from photoionization of H_2^+ *(5 pages)* 062707
M. Foster, J. Colgan, O. Al-Hagan, J. L. Peacher, D. H. Madison, and M. S. Pindzola

Analysis of experimental data for ion-impact single ionization of helium with Monte Carlo event generators based on quantum theory *(14 pages)* 062708
M. Dürr, B. Najjari, M. Schulz, A. Dorn, R. Moshammer, A. B. Voitkiv, and J. Ullrich

Kinetic energy distributions in ion-induced CO fragmentation: Signature of shallow states in multiply charged CO *(6 pages)* 062709
Jyoti Rajput and C. P. Safvan

Elastic- and inelastic-scattering collision strengths between magnetic sublevels for electron impact on He-like Cu ions *(7 pages)* 062710
Takeshi Kai, Shinobu Nakazaki, Tohru Kawamura, Hiroaki Nishimura, and Kunioki Mima

Relativistic scattering with a spatially dependent effective mass in the Dirac equation *(14 pages)* 062711
A. D. Alhaidari, H. Bahlouli, A. Al-Hasan, and M. S. Abdelmonem

Photoionization and electron-impact ionization of Ar^{5+} *(8 pages)* 062712
Jing Cheng Wang, M. Lu, D. Esteves, M. Habibi, G. Alna'washi, R. A. Phaneuf, and A. L. D. Kilcoyne

Calculations of recombination rates for cold ^{4}He atoms from atom-dimer phase shifts and determination of universal scaling functions *(7 pages)* 062713
J. R. Shepard

Ramsauer-Townsend effect for electron scattering from gaseous CF_4 molecules *(7 pages)* 062714
F. A. Gianturco and K. Willner

Heteronuclear ionizing collisions between laser-cooled metastable helium atoms *(7 pages)* 062715
J. M. McNamara, R. J. W. Stas, W. Hogervorst, and W. Vassen

Excitation of heavy hydrogenlike ions in relativistic collisions *(11 pages)* 062716
A. B. Voitkiv, B. Najjari, and J. Ullrich

Superelastic electron scattering from laser-excited cesium atoms *(4 pages)* 062717
D. S. Slaughter, V. Karaganov, M. J. Brunger, P. J. O. Teubner, I. Bray, and K. Bartschat

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

X-ray emission in collisions of highly charged I, Pr, Ho, and Bi ions with a W surface *(5 pages)* 062901
H. Watanabe, J. Sun, M. Tona, N. Nakamura, M. Sakurai, C. Yamada, N. Yoshiyasu, and S. Ohtani

Two-dimensional quantum-reflection traps *(5 pages)* 062902
Javier Madroñero and Harald Friedrich

Measuring electric fields from surface contaminants with neutral atoms *(7 pages)* 062903
J. M. Obrecht, R. J. Wild, and E. A. Cornell

Phonon-mediated decay of an atom in a surface-induced potential *(13 pages)* 062904
Fam Le Kien, S. Dutta Gupta, and K. Hakuta

Trapping cold atoms near carbon nanotubes: Thermal spin flips and Casimir-Polder potential *(7 pages)* 062905
R. Fermani, S. Scheel, and P. L. Knight

Clusters (including fullerenes)

Structural, electronic, and magnetic properties of MB_n (M=Cr,Mn,Fe,Co,Ni, $n \leqslant 7$) clusters *(6 pages)* 063201
Xia Liu, Gao-feng Zhao, Ling-ju Guo, Qun Jing, and You-hua Luo

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Transfer of signatures from the vibrational spectrum of benzene to a silicon complex *(4 pages)* 063202
Jorge M. Seminario and Carolina Herrera

Impact-parameter-dependent multifragmentation of C_{60} in charge-changing collisions with 2-MeV C^+ ions *(5 pages)* 063203
T. Mizuno, D. Okamoto, T. Majima, Y. Nakai, H. Tsuchida, and A. Itoh

Unexpected magnetism of small silver clusters *(6 pages)* 063204
M. Pereiro, D. Baldomir, and J. E. Arias

Geometric and electronic structure of closed-shell bimetallic A_4B_{12} clusters *(9 pages)* 063205
Yan Sun and René Fournier

PART B

Atomic and molecular processes in external fields

Transition from weak- to strong-field coherent control *(8 pages)* 063401
Carlos Trallero-Herrero and Thomas C. Weinacht

Phase determination of harmonics by three-color photoionization of aligned molecules: The H_2^+ system *(9 pages)* 063402
Shinnosuke Kawai and André D. Bandrauk

Quasistatic limit of the strong-field approximation describing atoms and molecules in intense laser fields *(11 pages)* 063403
Yulian V. Vanne and Alejandro Saenz

Mobility edges in bichromatic optical lattices *(6 pages)* 063404
Dave J. Boers, Benjamin Goedeke, Dennis Hinrichs, and Martin Holthaus

Quantum-state-selective two-photon excitation of multilevel systems assisted by the Stark shift *(10 pages)* . . . 063405
Bo Y. Chang, Hyeonho Choi, Seokmin Shin, and Ignacio R. Sola

Dynamically controlled toroidal and ring-shaped magnetic traps *(6 pages)* 063406
T. Fernholz, R. Gerritsma, P. Krüger, and R. J. C. Spreeuw

Description of harmonic generation in terms of the complex quasienergy. I. General formulation *(14 pages)* 063407
M. V. Frolov, A. V. Flegel, N. L. Manakov, and Anthony F. Starace

Description of harmonic generation in terms of the complex quasienergy. II. Application to time-dependent effective range theory *(19 pages)* 063408
M. V. Frolov, A. V. Flegel, N. L. Manakov, and Anthony F. Starace

Orbital motion of spherical microparticles trapped in diffraction patterns of circularly polarized light *(5 pages)* 063409
Hiroto Adachi, Shin Akahoshi, and Kenji Miyakawa

Investigating excited electronic states of I_2^+ and I_2^{2+} produced by strong-field ionization using vibrational wave packets *(10 pages)* 063410
L. Fang and G. N. Gibson

Measurement of the electronic momentum distributions of Rydberg Stark states *(6 pages)* 063411
J. Murray-Krezan and R. R. Jones

Gauge-equivalent intense-field approximations in velocity and length gauges to all orders *(7 pages)* 063412
F. H. M. Faisal

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Fully relativistic laser-induced ionization and recollision processes *(19 pages)* 063413
Michael Klaiber, Karen Z. Hatsagortsyan, and Christoph H. Keitel

Two-level systems driven by large-amplitude fields *(9 pages)* 063414
S. Ashhab, J. R. Johansson, A. M. Zagoskin, and Franco Nori

Photodetachment in a strong laser field: An experimental test of Keldysh-like theories *(11 pages)* 063415
Boris Bergues, Zunaira Ansari, Dag Hanstorp, and Igor Yu. Kiyan

Electron electric-dipole-moment experiment using electric-field quantized slow cesium atoms *(8 pages)* 063416
Jason M. Amini, Charles T. Munger, Jr., and Harvey Gould

Analytical control of small molecules by intense laser pulses in an algebraic model *(12 pages)* 063417
Hairan Feng, Yan Liu, Yujun Zheng, Shiliang Ding, and Weiyi Ren

Sympathetic cooling of laser-produced doubly charged ions in a few-ion crystal *(6 pages)* 063418
T. Kwapień, U. Eichmann, and W. Sandner

Frequency-domain theory of high-order above-threshold ionization based on nonperturbative quantum electrodynamics *(10 pages)* 063419
Bingbing Wang, Lianghui Gao, Xiaofeng Li, Dong-Sheng Guo, and Panming Fu

Determining laser-induced dissociation pathways of multielectron diatomic molecules: Application to the dissociation of O_2^+ by high-intensity ultrashort pulses *(9 pages)* 063420
A. M. Sayler, P. Q. Wang, K. D. Carnes, B. D. Esry, and I. Ben-Itzhak

Interacting bosons in a nearly resonant potential well *(5 pages)* 063421
Joseph P. Straley and Eugene B. Kolomeisky

Nonadiabatic transitions in finite-time adiabatic rapid passage *(5 pages)* 063422
T. Lu, X. Miao, and H. Metcalf

Control of the launch of attosecond pulses *(4 pages)* 063423
Wei Cao, Peixiang Lu, Pengfei Lan, Xinlin Wang, and Yuhua Li

Periodically driven quantum ratchets: Symmetries and resonances *(10 pages)* 063424
S. Denisov, L. Morales-Molina, S. Flach, and P. Hänggi

Zero-point cooling and heating-rate measurements of a single $^{88}Sr^+$ ion *(4 pages)* 063425
V. Letchumanan, G. Wilpers, M. Brownnutt, P. Gill, and A. G. Sinclair

Spectral and partial-wave decomposition of time-dependent wave functions on a grid: Photoelectron spectra of H and H_2^+ in electromagnetic fields *(9 pages)* 063426
L. A. A. Nikolopoulos, T. K. Kjeldsen, and L. B. Madsen

Solving the *m*-mixing problem for the three-dimensional time-dependent Schrödinger equation by rotations: Application to strong-field ionization of H_2^+ *(5 pages)* 063427
T. K. Kjeldsen, L. A. A. Nikolopoulos, and L. B. Madsen

Theory of chaotic atomic transport in an optical lattice *(12 pages)* 063428
V. Yu. Argonov and S. V. Prants

Matter waves

Larkin-Ovchinnikov state in resonant Fermi gas *(6 pages)* 063601
Nobukatsu Yoshida and S.-K. Yip

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 6** **JUNE 2007**

Symmetric and asymmetric solitons in linearly coupled Bose-Einstein condensates trapped in optical lattices *(16 pages)* 063602
Arthur Gubeskys and Boris A. Malomed

Increasing the coherence time of Bose-Einstein-condensate interferometers with optical control of dynamics *(12 pages)* 063603
James A. Stickney, Dana Z. Anderson, and Alex A. Zozulya

Designing potentials by sculpturing wires *(6 pages)* 063604
Leonardo Della Pietra, Simon Aigner, Christoph vom Hagen, Sönke Groth, Israel Bar-Joseph, Henri J. Lezec, and Jörg Schmiedmayer

Spatially resolved photoionization of ultracold atoms on an atom chip *(5 pages)* 063605
S. Kraft, A. Günther, J. Fortágh, and C. Zimmermann

Characteristic frequency of the magnetic radiation of spinor condensates *(5 pages)* 063606
Zhibing Li and Chengguang Bao

Precision measurement with an optical Josephson junction *(5 pages)* 063607
H. T. Ng, K. Burnett, and J. A. Dunningham

From optical lattice clocks to the measurement of forces in the Casimir regime *(11 pages)* 063608
Peter Wolf, Pierre Lemonde, Astrid Lambrecht, Sébastien Bize, Arnaud Landragin, and André Clairon

Degenerate Fermi gas in a combined harmonic-lattice potential *(10 pages)* 063609
P. B. Blakie, A. Bezett, and P. Buonsante

Ground-state properties of trapped Bose-Einstein condensates: Extension of the Thomas-Fermi approximation *(9 pages)* 063610
A. Muñoz Mateo and V. Delgado

Density correlations in ultracold atomic Fermi gases *(5 pages)* 063611
W. Belzig, C. Schroll, and C. Bruder

Probing the superfluid–Mott-insulating shell structure of cold atoms by parametric excitations *(5 pages)* 063612
Lilach Goren, Eros Mariani, and Ady Stern

Quantum size effect and biased diffusion of gravitationally bound neutrons in a rough waveguide *(12 pages)* 063613
R. Adhikari, Y. Cheng, A. E. Meyerovich, and V. V. Nesvizhevsky

Cranked Hartree-Fock-Bogoliubov calculation for rotating Bose-Einstein condensates *(8 pages)* 063614
Nobukuni Hamamoto, Makito Oi, and Naoki Onishi

Bose-Einstein condensates relative phase measurements through atomic homodyne detection *(8 pages)* 063615
B. R. da Cunha and M. C. de Oliveira

Entanglement and the Mott transition in a rotating bosonic ring lattice *(10 pages)* 063616
Ana Maria Rey, Keith Burnett, Indubala I. Satija, and Charles W. Clark

Fermi gas near unitarity around four and two spatial dimensions *(22 pages)* 063617
Yusuke Nishida and Dam Thanh Son

Unitary Fermi gas at finite temperature in the ϵ expansion *(11 pages)* 063618
Yusuke Nishida

Thermodynamics of a Bose-Einstein condensate with weak disorder *(11 pages)* 063619
G. M. Falco, A. Pelster, and R. Graham

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Cavity-enhanced superradiant Rayleigh scattering with ultracold and Bose-Einstein condensed atoms *(10 pages)* 063620
Sebastian Slama, Gordon Krenz, Simone Bux, Claus Zimmermann, and Philippe W. Courteille

Spontaneous symmetry breaking of solitons trapped in a double-channel potential *(6 pages)* 063621
M. Matuszewski, B. A. Malomed, and M. Trippenbach

Coexistence of superfluid and Mott phases of lattice bosons *(5 pages)* 063622
R. A. Barankov, C. Lannert, and S. Vishveshwara

Quantum dynamics of Raman-coupled Bose-Einstein condensates using Laguerre-Gaussian beams *(9 pages)* 063623
Rina Kanamoto, Ewan M. Wright, and Pierre Meystre

Condensates of strongly interacting atoms and dynamically generated dimers *(18 pages)* 063624
Eric Braaten and Dongqing Zhang

Bose-Fermi mixtures in an optical lattice *(12 pages)* 063625
K. Sengupta, N. Dupuis, and P. Majumdar

Oscillation bands of Bose-Einstein condensates on a ring: Beyond the mean-field theory *(6 pages)* 063626
C. G. Bao

Photonic band gap in the triangular lattice of Bose-Einstein-condensate vortices *(8 pages)* 063627
M. E. Taşgın, Ö. E. Müstecaplıoğlu, and M. Ö. Oktel

Nonlinear tunneling of Bose-Einstein condensates in an optical lattice: Signatures of quantum collapse and revival *(9 pages)* 063628
V. S. Shchesnovich and V. V. Konotop

Bogoliubov excitations of trapped superfluid Fermi gases in a BCS-BEC crossover beyond the Thomas-Fermi limit *(10 pages)* 063629
Yong-li Ma and Guoxiang Huang

Weakly interacting two-dimensional system of dipoles: Limitations of the mean-field theory *(4 pages)* 063630
G. E. Astrakharchik, J. Boronat, J. Casulleras, I. L. Kurbakov, and Yu. E. Lozovik

Quantum Monte Carlo study of a one-dimensional phase-fluctuating condensate in a harmonic trap *(4 pages)* 063631
C. Gils, L. Pollet, A. Vernier, F. Hebert, G. G. Batrouni, and M. Troyer

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

Coherent effects on two-photon correlation and directional emission of two two-level atoms *(14 pages)* 063801
C. H. Raymond Ooi, Byung-Gyu Kim, and Hai-Woong Lee

Theory of quantum fluctuations of optical dissipative structures and its application to the squeezing properties of bright cavity solitons *(15 pages)* 063802
Isabel Pérez-Arjona, Eugenio Roldán, and Germán J. de Valcárcel

Conditional generation of path-entangled optical $|N,0\rangle+|0,N\rangle$ states *(7 pages)* 063803
Anne E. B. Nielsen and Klaus Mølmer

Modulational instability in nonlinearity-managed optical media *(12 pages)* 063804
Martin Centurion, Mason A. Porter, Ye Pu, P. G. Kevrekidis, D. J. Frantzeskakis, and Demetri Psaltis

Annular gap solitons in Kerr media with circular gratings *(6 pages)* 063805
Jacob Scheuer and Boris Malomed

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 6** **JUNE 2007**

Systematic investigation of resonance-induced single-harmonic enhancement in the extreme-ultraviolet range *(10 pages)* 063806
R. A. Ganeev, L. B. Elouga Bom, J.-C. Kieffer, and T. Ozaki

Transitional behavior between self-Kerr and cross-Kerr effects by two photons *(5 pages)* 063807
Kazuki Koshino

Optical nonlinear waves in semiconductor quantum dots: Solitons and breathers *(11 pages)* 063808
Guram T. Adamashvili, Carsten Weber, Andreas Knorr, and Nugzar T. Adamashvili

Decoherence of quantum-enhanced timing accuracy *(12 pages)* 063809
Mankei Tsang

Coexistence and competition between different soliton-shaping mechanisms in a laser *(5 pages)* 063810
D. Y. Tang, L. M. Zhao, G. Q. Xie, and L. J. Qian

Slow-light solitons in two-level media generated by evanescent fields *(9 pages)* 063811
Jérôme Leon

Impact of nonlocal interactions in dissipative systems: Towards minimal-sized localized structures *(4 pages)* 063812
Lendert Gelens, Guy Van der Sande, Philippe Tassin, Mustapha Tlidi, Pascal Kockaert, Damia Gomila, Irina Veretennicoff, and Jan Danckaert

Extremal transmission at the Dirac point of a photonic band structure *(5 pages)* 063813
R. A. Sepkhanov, Ya. B. Bazaliy, and C. W. J. Beenakker

Optimizing the performance of nickel-like collisionally pumped x-ray lasers. III. Exploding foil lasers for the wavelength range below 50 Å *(9 pages)* 063814
G. J. Pert

Macroscopic three-mode squeezed and fully inseparable entangled beams from triply coupled intracavity Kerr nonlinearities *(8 pages)* 063815
Hua-tang Tan, Gao-xiang Li, and Shi-yao Zhu

Curvature-induced radiation of surface plasmon polaritons propagating around bends *(9 pages)* 063816
Keisuke Hasegawa, Jens U. Nöckel, and Miriam Deutsch

Explicitly solvable models of a two-mode coupler in Kerr media *(10 pages)* 063817
Agnieszka Tereszkiewicz, Anatol Odzijewicz, Maciej Horowski, Igor Jex, and Goce Chadzitaskos

Control of photon propagation via electromagnetically induced transparency in lossless media *(10 pages)* 063818
Liang He, Yu-xi Liu, S. Yi, C. P. Sun, and Franco Nori

Atomic detection in microwave cavity experiments: A dynamical model *(8 pages)* 063819
R. Rossi, Jr., M. C. Nemes, and J. G. Peixoto de Faria

Statistical regimes of random laser fluctuations *(7 pages)* 063820
Stefano Lepri, Stefano Cavalieri, Gian-Luca Oppo, and Diederik S. Wiersma

Pump pulse-width dependence of grazing-incidence pumped transient collisional soft-x-ray lasers *(7 pages)* 063821
M. Berrill, Y. Wang, M. A. Larotonda, B. M. Luther, V. N. Shlyaptsev, and J. J. Rocca

Internal excitation and superfocusing of surface plasmon polaritons on a silver-coated optical fiber tip *(10 pages)* 063822
W. Ding, S. R. Andrews, and S. A. Maier

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Quadrature and polarization squeezing in a dispersive optical bistability model *(11 pages)* 063823
Ferran V. Garcia-Ferrer, Isabel Pérez-Arjona, Germán J. de Valcárcel, and Eugenio Roldán

Counterpropagating reflection grating dark solitons in Kerr media *(7 pages)* 063824
C. Rizza, A. Ciattoni, E. DelRe, and E. Palange

Channel-guided light bullets *(8 pages)* 063825
Hidetsugu Sakaguchi and Boris A. Malomed

Quantitative method for measurement of the Goos-Hanchen effect based on source divergence considerations *(8 pages)* 063826
Jeffrey F. Gray and Ashok Puri

Spin noise measurement with diamagnetic atoms *(4 pages)* 063827
M. Takeuchi, S. Ichihara, T. Takano, M. Kumakura, and Y. Takahashi

Symmetry-breaking instabilities in perturbed optical lattices: Nonlinear nonreciprocity and macroscopic self-trapping *(5 pages)* 063828
Andrea Fratalocchi and Gaetano Assanto

Purely loss-coupled distributed feedback lasers based on electromagnetically induced absorption in active photonic band gaps *(5 pages)* 063829
S. M. Sadeghi, W. Li, X. Li, and W.-P. Huang

Confining light with negative refraction in checkerboard metamaterials and photonic crystals *(6 pages)* 063830
S. Anantha Ramakrishna, S. Guenneau, S. Enoch, G. Tayeb, and B. Gralak

Creation of a photonic time-bin qubit via parametric interaction of photons in a driven resonant medium *(8 pages)* 063831
N. Sisakyan and Yu. Malakyan

Optical gain properties in a coherently prepared four-level cold atomic system *(5 pages)* 063832
Yan Xue, Gang Wang, Jin-Hui Wu, and Jin-Yue Gao

Analog to multiple electromagnetically induced transparency in all-optical drop-filter systems *(4 pages)* 063833
Yun-Feng Xiao, Xu-Bo Zou, Wei Jiang, You-Ling Chen, and Guang-Can Guo

Roles of resonance and dark irradiance for infrared photorefractive self-focusing and solitons in bipolar InP:Fe *(6 pages)* 063834
N. Fressengeas, N. Khelfaoui, C. Dan, D. Wolfersberger, G. Montemezzani, H. Leblond, and M. Chauvet

Nonlinear management of the angular momentum of soliton clusters: Theory and experiment *(6 pages)* 063835
Andrea Fratalocchi, Armando Piccardi, Marco Peccianti, and Gaetano Assanto

Phase structure of soliton molecules *(7 pages)* 063836
A. Hause, H. Hartwig, B. Seifert, H. Stolz, M. Böhm, and F. Mitschke

BRIEF REPORTS

Quantum information

Quantum phase gate through a dispersive atom-field interaction *(4 pages)* 064301
Xu-Bo Zou, Yun-Feng Xiao, Shang-Bin Li, Yong Yang, and Guang-Can Guo

Conditional generation of an arbitrary superposition of coherent states *(4 pages)* 064302
Masahiro Takeoka and Masahide Sasaki

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 6 JUNE 2007

Simple unconventional geometric scenario of one-way quantum computation with superconducting qubits inside a cavity *(4 pages)* 064303
Zheng-Yuan Xue and Z. D. Wang

Algebraic and information-theoretic conditions for operator quantum error correction *(4 pages)* 064304
Michael A. Nielsen and David Poulin

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

Feasibility of studying vortex noise in two-dimensional superconductors with cold atoms *(4 pages)* 064901
Stefan Scheel, Rachele Fermani, and E. A. Hinds

Threshold effect in the energy-loss straggling of protons channeled in Au⟨100⟩ at very low velocities *(3 pages)* 064902
E. A. Figueroa, E. D. Cantero, J. C. Eckardt, G. H. Lantschner, and N. R. Arista

Clusters (including fullerenes)

Effect of symmetry on the electronic structure of spheroidal fullerenes in a weak uniform magnetic field *(4 pages)* 065201
M. Pudlak, R. Pincak, and V. A. Osipov

Matter waves

Expansion of a mesoscopic Fermi system from a harmonic trap *(4 pages)* 065601
Pavel Nagornykh and Victor Galitski

Transmission and reflection of Bose-Einstein condensates incident on a Gaussian tunnel barrier *(4 pages)* 065602
A. M. Martin, R. G. Scott, and T. M. Fromhold

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

Speckle random pattern laser: Self-formation of looped lasing paths and dynamic effects in a wide-aperture thin-slice solid-state laser *(4 pages)* 065801
Kenju Otsuka, Yoshihiko Miyasaka, and Kana Nemoto

Strong correlation and anticorrelation via quantum coherence in a cascade atom with split metastable states *(4 pages)* 065802
Xiang-ming Hu and Fei Wang

Quantum lithography with classical light: Generation of arbitrary patterns *(4 pages)* 065803
Qingqing Sun, Philip R. Hemmer, and M. Suhail Zubairy

Stationary light pulses in ultracold atomic gases *(4 pages)* 065804
Kristian Rymann Hansen and Klaus Mølmer

COMMENTS

Comment on "Symplectic quantization, inequivalent quantum theories, and Heisenberg's principle of uncertainty" *(5 pages)* 066101
D. C. Latimer

Reply to "Comment on 'Symplectic quantization, inequivalent quantum theories, and Heisenberg's principle of uncertainty' " *(2 pages)* 066102
Merced Montesinos and G. F. Torres del Castillo

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 6** **JUNE 2007**

Comment on "Generalized Smolin states and their properties" *(2 pages)* 066301
Yafei Yu

Comment on "Direct observation of the $^2D_{3/2}-{}^2D_{5/2}$ ground-state splitting in Xe^{9+}" *(2 pages)* 066501
C. Biedermann and R. Radtke

Comment on "Measurement of the lifetimes of S and D states below $n=31$ using cold Rydberg gas" *(3 pages)* 066502
D. A. Tate

Reply to "Comment on 'Measurement of the lifetimes of S and D states below $n=31$ using cold Rydberg gas"' *(2 pages)* 066503
L. L. Caliri and L. G. Marcassa

Comment on "Bound-state eigenenergy outside and inside the continuum for unstable multilevel systems" *(3 pages)* 067401
E. N. Bulgakov, I. Rotter, and A. F. Sadreev

ERRATA

Erratum: Quantum communication in spin systems with long-range interactions [Phys. Rev. A **74**, 012321 (2006)] *(1 page)* . . . . . 069901(E)
M. Avellino, A. J. Fisher, and S. Bose

Erratum: Communication cost of breaking the Bell barrier [Phys. Rev. A **72**, 050302 (2005)] *(1 page)* . . . . . 069902(E)
Karl Svozil

Erratum: Optimal real state cloning in d dimensions [Phys Rev. A **75**, 044303 (2007)] *(1 page)* . . . . . 069903(E)
Wen-Hai Zhang, Tao Wu, Liu Ye, and Jie-Lin Dai

Publisher's Note: Description of harmonic generation in terms of the complex quasienergy. II. Application to time-dependent effective range theory [Phys. Rev. A **75**, 063408 (2007)] *(1 page)* . . . . . 069904(E)
M. V. Frolov, A. V. Flegel, N. L. Manakov, and Anthony F. Starace

Erratum: Quantum theory of an atom laser originating from a Bose-Einstein condensate or a Fermi gas in the presence of gravity [Phys. Rev. A **74**, 013611 (2006)] *(1 page)* . . . . . 069905(E)
Tobias Kramer and Mirta Rodríguez

Publisher's Note: Optical nonlinear waves in semiconductor quantum dots: Solitons and breathers [Phys. Rev. A **75**, 063808 (2007)] *(1 page)* . . . . . 069906(E)
Guram T. Adamashvili, Carsten Weber, Andreas Knorr, and Nugzar T. Adamashvili

Erratum: State estimation from a pair of conjugate qudits [Phys. Rev. A **74**, 042324 (2006)] *(1 page)* . . . . . 069907(E)
Xiang-Fa Zhou, Yong-Sheng Zhang, and Guang-Can Guo

Erratum: Homonuclear ionizing collisions of laser-cooled metastable helium atoms [Phys. Rev. A **73**, 032713 (2006)] *(1 page)* . . . . . 069908(E)
R. J. W. Stas, J. M. McNamara, W. Hogervorst, and W. Vassen

Publisher's Note: Quantum theory of dynamic multiple light scattering in fluctuating disordered media [Phys. Rev. A **75**, 053808 (2007)] *(1 page)* . . . . . 069909(E)
S. E. Skipetrov

Erratum: Quantum dynamics of Bose-Hubbard Hamiltonians beyond the Hartree-Fock-Bogoliubov approximation: The Bogoliubov back-reaction approximation [Phys. Rev. A **75**, 013613 (2007)] *(2 pages)* . . . . . 069910(E)
I. Tikhonenkov, J. R. Anglin, and A. Vardi