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 5
PARTS A AND B

CONTENTS

MAY 2007

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 050101(R)-053201, and Part B pages 053401-059907(E).

PART A

RAPID COMMUNICATIONS

Fundamental concepts

Transverse entanglement migration in Hilbert space *(4 pages)* . . . . . 050101(R)
K. W. Chan, J. P. Torres, and J. H. Eberly

Quantum information

One-step preparation of cluster states in quantum-dot molecules *(4 pages)* . . . . . 050301(R)
Guo-Ping Guo, Hui Zhang, Tao Tu, and Guang-Can Guo

Experimentally feasible purification of continuous-variable entanglement *(4 pages)* . . . . . 050302(R)
Jaromír Fiurášek, Petr Marek, Radim Filip, and Roman Schnabel

Quantum state transfer in spin-1 chains *(4 pages)* . . . . . 050303(R)
O. Romero-Isart, K. Eckert, and A. Sanpera

Implementation scheme of controlled SWAP gates for quantum fingerprinting and photonic quantum computation *(4 pages)* . . . . . 050304(R)
B. Wang and L.-M. Duan

Quantum key distribution with passive decoy state selection *(4 pages)* . . . . . 050305(R)
Wolfgang Mauerer and Christine Silberhorn

Atomic and molecular structure and dynamics

Violation of the zero-force theorem in the time-dependent Krieger-Li-Iafrate approximation *(4 pages)* . . . . . 050501(R)
Michael Mundt, Stephan Kümmel, Robert van Leeuwen, and Paul-Gerhard Reinhard

Atomic and molecular collisions and interactions

Ultracold collisions between Li atoms and Li_2 diatoms in high vibrational states *(4 pages)* . . . . . 050701(R)
Goulven Quéméner, Jean-Michel Launay, and Pascal Honvault

Clusters (including fullerenes)

Even-odd effects in the ionization cross sections of $[C_{60}]_2$ and $[C_{60}C_{70}]$ dimers *(4 pages)* . . . . . 051201(R)
H. Zettergren, H. T. Schmidt, P. Reinhed, H. Cederquist, J. Jensen, P. Hvelplund, S. Tomita, B. Manil, J. Rangama, and B. A. Huber

Copyright 2007 by The American Physical Society

(Continued)

1050-2947(200705)75:5:2;1-G

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 5 MAY 2007

Atomic and molecular processes in external fields

Coherent control of ultracold collisions with chirped light: Direction matters *(4 pages)* . . . . . 051401(R)
M. J. Wright, J. A. Pechkis, J. L. Carini, S. Kallush, R. Kosloff, and P. L. Gould

X-ray-laser interaction with matter and the role of multiphoton ionization: Free-electron-laser studies on neon and helium *(4 pages)* . . . . . 051402(R)
A. A. Sorokin, M. Wellhöfer, S. V. Bobashev, K. Tiedtke, and M. Richter

Control of rotational wave-packet dynamics in asymmetric top molecules *(4 pages)* . . . . . 051403(R)
Lotte Holmegaard, Simon S. Viftrup, Vinod Kumarappan, Christer Z. Bisgaard, Henrik Stapelfeldt, Edward Hamilton, and Tamar Seideman

Two-photon and electromagnetically-induced-transparency-assisted Doppler cooling in a three-level cascade system *(4 pages)* . . . . . 051404(R)
Giovanna Morigi and Ennio Arimondo

External-feedback laser cooling of molecular gases *(4 pages)* . . . . . 051405(R)
Vladan Vuletić, James K. Thompson, Adam T. Black, and Jonathan Simon

Resonant two-photon absorption of extreme-ultraviolet free-electron-laser radiation in helium *(4 pages)* . . . . . 051406(R)
Mitsuru Nagasono, Edlira Suljoti, Annette Pietzsch, Franz Hennies, Michael Wellhöfer, Jon-Tobias Hoeft, Michael Martins, Wilfried Wurth, Rolf Treusch, Josef Feldhaus, Jochen R. Schneider, and Alexander Föhlisch

Synchronous optical pumping of quantum revival beats for atomic magnetometry *(4 pages)* . . . . . 051407(R)
S. J. Seltzer, P. J. Meares, and M. V. Romalis

Matter waves

Dark-soliton dynamics in Bose-Einstein condensates at finite temperature *(4 pages)* . . . . . 051601(R)
B. Jackson, N. P. Proukakis, and C. F. Barenghi

Evidence of Luttinger-liquid behavior in one-dimensional dipolar quantum gases *(4 pages)* . . . . . 051602(R)
R. Citro, E. Orignac, S. De Palo, and M. L. Chiofalo

Competition between vortex unbinding and tunneling in an optical lattice *(4 pages)* . . . . . 051603(R)
M. A. Cazalilla, A. Iucci, and T. Giamarchi

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

Preparation and determination of spin-polarized states in multi-Zeeman-sublevel atoms *(4 pages)* . . . . . 051801(R)
Bo Wang, Yanxu Han, Jintao Xiao, Xudong Yang, Chunhong Zhang, Hai Wang, Min Xiao, and Kunchi Peng

Temporal confinement and enhancement of high-order harmonic emission with a synthesized laser field *(4 pages)* . . . . . 051802(R)
Hui Xiong, Ruxin Li, Zhinan Zeng, Yinghui Zheng, Yan Peng, Xuan Yang, Xiaowei Chen, Heping Zeng, and Zhizhan Xu

ARTICLES

Fundamental concepts

Decoherent dynamics of two nonclassically correlated particles *(9 pages)* 052101
Michael Bußhardt and Matthias Freyberger

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 5** **MAY 2007**

Coherent states for the quantum mechanics on a torus *(7 pages)* 052102
K. Kowalski and J. Rembieliński

Equations for relativistic particles, binaries, and ternaries *(5 pages)* 052103
Hartmut Pilkuhn

Limits to differences in active and passive charges *(6 pages)* 052104
C. Lämmerzahl, A. Macias, and H. Müller

Violation of Bell's inequality using classical measurements and nonlinear local operations *(6 pages)* 052105
Magdalena Stobińska, Hyunseok Jeong, and Timothy C. Ralph

Experimental nonclassicality of single-photon-added thermal light states *(6 pages)* 052106
Alessandro Zavatta, Valentina Parigi, and Marco Bellini

Wigner functions of *s* waves *(21 pages)* 052107
J. P. Dahl, S. Varro, A. Wolf, and W. P. Schleich

Hierarchy of equations of multiple-time correlation functions *(16 pages)* 052108
Daniel Alonso and Inés de Vega

Evolution of a quantum spin system to its ground state: Role of entanglement and interaction symmetry *(10 pages)* 052109
Shengjun Yuan, Mikhail I. Katsnelson, and Hans De Raedt

Reversible and irreversible dynamics of a qubit interacting with a small environment *(6 pages)* 052110
Giuliano Benenti and G. Massimo Palma

Scattering of polarized laser light by an atomic gas in free space: A quantum stochastic differential equation approach *(8 pages)* 052111
Luc Bouten, John Stockton, Gopal Sarma, and Hideo Mabuchi

Hierarchy of inequalities for quantitative duality *(7 pages)* 052112
Jesús Martínez-Linares

Photon mass and quantum effects of the Aharonov-Bohm type *(4 pages)* 052113
G. Spavieri and M. Rodriguez

Violation of Bell's inequality with continuous spatial variables *(14 pages)* 052114
Ayman F. Abouraddy, Timothy Yarnall, Bahaa E. A. Saleh, and Malvin C. Teich

Quantum properties of exponential states *(6 pages)* 052115
Alfredo Luis

Unambiguous discriminator for unknown quantum states: An implementation *(7 pages)* 052116
Stefan T. Probst-Schendzielorz, Alexander Wolf, Matthias Freyberger, Igor Jex, Bing He, and János A. Bergou

van der Waals interactions in a magnetodielectric medium *(8 pages)* 052117
S. Spagnolo, D. A. R. Dalvit, and P. W. Milonni

Quantum information

Decoy-state quantum key distribution with large random errors of light intensity *(8 pages)* 052301
Xiang-Bin Wang

Concurrence via entanglement witnesses *(4 pages)* 052302
Florian Mintert

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 5** **MAY 2007**

Generation of high-fidelity controlled-NOT logic gates by coupled superconducting qubits *(9 pages)* 052303
Andrei Galiautdinov

Quantum key distribution with dual detectors *(10 pages)* 052304
Bing Qi, Yi Zhao, Xiongfeng Ma, Hoi-Kwong Lo, and Li Qian

Mesoscopic entanglement of atomic ensembles through nonresonant stimulated Raman scattering *(10 pages)* 052305
Wenhai Ji, Chunbai Wu, S. J. van Enk, and M. G. Raymer

Genuine multiqubit entanglement and controlled teleportation *(5 pages)* 052306
Zhong-Xiao Man, Yun-Jie Xia, and Nguyen Ba An

Long-range entanglement in the Dirac vacuum *(5 pages)* 052307
J. Silman and B. Reznik

Robust operation of a universal set of logic gates for quantum computation using adiabatic population transfer between molecular levels *(9 pages)* 052308
Cian Menzel-Jones and Moshe Shapiro

Optimum unambiguous discrimination of two mixed states and application to a class of similar states *(8 pages)* 052309
Ulrike Herzog

Demonstration of one-dimensional quantum random walks using orbital angular momentum of photons *(4 pages)* 052310
Pei Zhang, Xi-Feng Ren, Xu-Bo Zou, Bi-Heng Liu, Yun-Feng Huang, and Guang-Can Guo

Effects of imperfections for Shor's factorization algorithm *(10 pages)* 052311
Ignacio García-Mata, Klaus M. Frahm, and Dima L. Shepelyansky

Scheme for unconventional geometric quantum computation in cavity QED *(7 pages)* 052312
Xun-Li Feng, Zisheng Wang, Chunfeng Wu, L. C. Kwek, C. H. Lai, and C. H. Oh

Local distinguishability with preservation of entanglement *(19 pages)* 052313
Scott M. Cohen

Unambiguous discrimination of mixed states: A description based on system-ancilla coupling *(6 pages)* 052314
Xiang-Fa Zhou, Yong-Sheng Zhang, and Guang-Can Guo

Local measurement for a set of n-qubit maximally entangled states in cavity QED *(5 pages)* 052315
Chui-Ping Yang and Siyuan Han

Noise resilience and entanglement evolution in two nonequivalent classes of quantum algorithms *(9 pages)* 052316
C. Di Franco, M. Paternostro, and M. S. Kim

Indirect control with a quantum accessor: Coherent control of multilevel system via a qubit chain *(9 pages)* 052317
H. C. Fu, Hui Dong, X. F. Liu, and C. P. Sun

Experimental procedures for entanglement verification *(14 pages)* 052318
S. J. van Enk, N. Lütkenhaus, and H. J. Kimble

Efficient one-step generation of large cluster states with solid-state circuits *(5 pages)* 052319
J. Q. You, Xiang-bin Wang, Tetsufumi Tanamoto, and Franco Nori

Lower bounds on concurrence and separability conditions *(5 pages)* 052320
Julio I. de Vicente

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 5** **MAY 2007**

Entropy of entanglement and correlations induced by a quench: Dynamics of a quantum phase transition in the quantum Ising model *(12 pages)* 052321
Lukasz Cincio, Jacek Dziarmaga, Marek M. Rams, and Wojciech H. Zurek

Entanglement and quantum phase transitions in matrix-product spin-1 chains *(7 pages)* 052322
S. Alipour, V. Karimipour, and L. Memarzadeh

Probabilistic reversing operation with fidelity and purity gain for macroscopic quantum superposition *(8 pages)* 052323
Hiroaki Terashima and Masahito Ueda

Compatibility conditions from multipartite entanglement measures *(5 pages)* 052324
Jian-Ming Cai, Zheng-Wei Zhou, Shun Zhang, and Guang-Can Guo

Negativity as a distance from a separable state *(4 pages)* 052325
M. Khasin, R. Kosloff, and D. Steinitz

Manipulating multiqudit entanglement witnesses by using linear programming *(12 pages)* 052326
M. A. Jafarizadeh, G. Najarbashi, and H. Habibian

Decoherence of coupled Josephson charge qubits due to partially correlated low-frequency noise *(7 pages)* 052327
Yong Hu, Zheng-Wei Zhou, Jian-Ming Cai, and Guang-Can Guo

Efficient parity-encoded optical quantum computing *(5 pages)* 052328
Alexei Gilchrist, A. J. F. Hayes, and T. C. Ralph

Entanglement entropy in random quantum spin-S chains *(4 pages)* 052329
A. Saguia, M. S. Sarandy, B. Boechat, and M. A. Continentino

Quantum-information encoding in dressed qubits *(10 pages)* 052330
P. Machnikowski, V. M. Axt, and T. Kuhn

Controllability of the coupled spin-$\frac{1}{2}$ harmonic oscillator system *(6 pages)* 052331
Haidong Yuan and Seth Lloyd

Multipartite unlockable bound entanglement in the stabilizer formalism *(7 pages)* 052332
Guoming Wang and Mingsheng Ying

Determining the existence of the common entanglement witnesses for some entangled states *(5 pages)* 052333
Yu-Chun Wu and Guang-Can Guo

Generic framework for the secure Yuen 2000 quantum-encryption protocol employing the wire-tap channel approach *(5 pages)* 052334
Miodrag J. Mihaljević

Optimal multicopy asymmetric Gaussian cloning of coherent states *(6 pages)* 052335
Jaromír Fiurášek and Nicolas J. Cerf

Single-photon quantum key distribution in the presence of loss *(13 pages)* 052336
Marcos Curty and Tobias Moroder

Universal quantum computation in decoherence-free subspaces with hot trapped ions *(8 pages)* 052337
Leandro Aolita, Luiz Davidovich, Kihwan Kim, and Hartmut Häffner

Decoherence of two-electron spin states in quantum dots *(12 pages)* 052338
D. D. Bhaktavatsala Rao, V. Ravishankar, and V. Subrahmanyam

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 5 MAY 2007

Photon-loss-tolerant Zeno controlled-SIGN gate *(5 pages)* 052339
Casey R. Myers and Alexei Gilchrist

Atomic and molecular structure and dynamics

Reexamination of the 0_g^- pure long-range state of Cs_2: Prediction of missing levels in the photoassociation spectrum *(8 pages)* 052501
Nadia Bouloufa, Anne Crubellier, and Olivier Dulieu

Two-parameter partially correlated ground-state electron density of some light spherical atoms from Hartree-Fock theory with nonintegral nuclear charge *(6 pages)* 052502
Nicolás A. Cordero, Norman H. March, and Julio A. Alonso

Ionization energy of ^{6,7}Li determined by triple-resonance laser spectroscopy *(8 pages)* 052503
B. A. Bushaw, W. Nörtershäuser, G. W. F. Drake, and H.-J. Kluge

Core-valence correlations for atoms with open shells *(13 pages)* 052504
V. A. Dzuba and V. V. Flambaum

Energy levels of a polarizable linear polar molecule in a dc electric field obtained by analogy with the nonrelativistic hydrogen atom *(5 pages)* 052505
S. K. Sekatskii

Laser-probing measurements and calculations of lifetimes of the $5d\,^2D_{3/2}$ and $5d\,^2D_{5/2}$ metastable levels in Ba II *(6 pages)* 052506
J. Gurell, E. Biémont, K. Blagoev, V. Fivet, P. Lundin, S. Mannervik, L.-O. Norlin, P. Quinet, D. Rostohar, P. Royen, and P. Schef

Theory of magnetically induced anions *(15 pages)* 052507
Victor G. Bezchastnov, Peter Schmelcher, and Lorenz S. Cederbaum

Absolute frequency measurement of the lithium *D* lines: Precise determination of isotope shifts and fine-structure intervals *(9 pages)* 052508
Dipankar Das and Vasant Natarajan

Fermionic density functional at a Feshbach resonance *(5 pages)* 052509
Michael Seidl and Rajat K. Bhaduri

Ionization potential of ^{9}Be calculated including nuclear motion and relativistic corrections *(5 pages)* 052510
Monika Stanke, Dariusz Kędziera, Sergiy Bubin, and Ludwik Adamowicz

Atomic and molecular collisions and interactions

Two-step mechanisms in ionization-excitation of He studied by binary $(e,2e)$ experiments and second-Born-approximation calculations *(8 pages)* 052701
N. Watanabe, M. Takahashi, Y. Udagawa, K. A. Kouzakov, and Yu. V. Popov

Water-molecule fragmentation induced by charge exchange in slow collisions with He^+ and He^{2+} ions in the keV-energy region *(13 pages)* 052702
R. Cabrera-Trujillo, E. Deumens, Y. Öhrn, O. Quinet, J. R. Sabin, and N. Stolterfoht

Merged-beam measurements of absolute cross sections for electron-impact excitation of S^{4+} $(3s^2\,^1S \rightarrow 3s3p\,^1P)$ and S^{5+} $(3s\,^2S \rightarrow 3p\,^2P)$ *(6 pages)* 052703
B. Wallbank, M. E. Bannister, H. F. Krause, Y.-S. Chung, A. C. H. Smith, N. Djurić, and G. H. Dunn

Angular correlation between photoelectrons and Auger electrons within scattering theory *(10 pages)* 052704
F. Da Pieve, S. Di Matteo, D. Sébilleau, R. Gunnella, G. Stefani, and C. R. Natoli

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 5** **MAY 2007**

Pseudopotential treatment of two aligned dipoles under external harmonic confinement *(9 pages)* 052705
K. Kanjilal, John L. Bohn, and D. Blume

Resonant dissociative excitation and vibrational excitation of He_2^+ *(6 pages)* 052706
J. Royal and A. E. Orel

Excitation into $3p^5 5p$ levels from the metastable levels of Ar *(13 pages)* 052707
R. O. Jung, John B. Boffard, L. W. Anderson, and Chun C. Lin

Multiple electron emission from noble gases colliding with proton beams, including postcollisional effects *(7 pages)* 052708
M. E. Galassi, R. D. Rivarola, and P. D. Fainstein

Doubly differential single and multiple ionization of krypton by electron impact *(6 pages)* 052709
O. G. de Lucio, J. Gavin, and R. D. DuBois

Resonant dimer relaxation in cold atoms with a large scattering length *(4 pages)* 052710
Eric Braaten and H.-W. Hammer

Time-dependent approach to three-body rearrangement collisions: Application to the capture of heavy negatively charged particles by hydrogen atoms *(7 pages)* 052711
X. M. Tong, T. Shirahama, K. Hino, and N. Toshima

Angular distribution of low-energy electron emission in collisions of 6-MeV/u bare carbon ions with molecular hydrogen: Two-center mechanism and interference effect *(9 pages)* 052712
Deepankar Misra, A. Kelkar, U. Kadhane, Ajay Kumar, Y. P. Singh, Lokesh C. Tribedi, and P. D. Fainstein

Electron-impact excitation of the $6p7s\ ^3P_1$ state of Pb atom at small scattering angles *(6 pages)* 052713
S. Milisavljević, M. S. Rabasović, D. Šević, V. Pejčev, D. M. Filipović, Lalita Sharma, Rajesh Srivastava, A. D. Stauffer, and B. P. Marinković

Universality constraints on three-body recombination for cold atoms: From ^{4}He to ^{133}Cs *(9 pages)* 052714
Eric Braaten, Daekyoung Kang, and Lucas Platter

Electron-impact dissociation of CH_2^+ ions: Measurement of CH^+ and C^+ fragment ions *(8 pages)* 052715
C. R. Vane, E. M. Bahati, M. E. Bannister, and R. D. Thomas

Four-body continuum-distorted-wave model for charge exchange between hydrogenlike projectiles and atoms *(8 pages)* 052716
Ivan Mančev

^{87}Rb hyperfine-transition dephasing in mixed buffer-gas systems *(8 pages)* 052717
M. Huang, J. G. Coffer, and J. C. Camparo

Photoemission in the NO molecular frame induced by soft-x-ray elliptically polarized light above the $N(1s)^{-1}$ and $O(1s)^{-1}$ ionization thresholds *(17 pages)* 052718
W. B. Li, R. Montuoro, J. C. Houver, L. Journel, A. Haouas, M. Simon, R. R. Lucchese, and D. Dowek

C 1*s* and N 1*s* core excitation of aniline: Experiment by electron impact and *ab initio* calculations *(12 pages)* 052719
D. Duflot, J.-P. Flament, A. Giuliani, J. Heinesch, M. Grogna, and M.-J. Hubin-Franskin

Ionization of sodium and rubidium *nS*, *nP*, and *nD* Rydberg atoms by blackbody radiation *(13 pages)* 052720
I. I. Beterov, D. B. Tretyakov, I. I. Ryabtsev, A. Ekers, and N. N. Bezuglov

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 5 MAY 2007

Collisions of electrons with trimethylamine $N(CH_3)_3$ molecules *(7 pages)* 052721
Czesław Szmytkowski, Alicja Domaracka, Paweł Możejko, and Elżbieta Ptasińska-Denga

Spin-rotation interaction in cold and ultracold collisions of $N_2^+(^2\Sigma^+)$ with ^{3}He and ^{4}He *(6 pages)* 052722
G. Guillon, T. Stoecklin, and A. Voronin

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

Spontaneous emission of an atom placed near a nanobelt of elliptical cross section *(13 pages)* 052901
D. V. Guzatov and V. V. Klimov

Clusters (including fullerenes)

Interplay of electronic and geometry shell effects in properties of neutral and charged Sr clusters *(13 pages)* 053201
Andrey Lyalin, Ilia A. Solov'yov, Andrey V. Solov'yov, and Walter Greiner

PART B

Atomic and molecular processes in external fields

Multipole transitions of Rydberg atoms in modulated ponderomotive potentials *(6 pages)* 053401
B. Knuffman and G. Raithel

Probing strong-field electron-nuclear dynamics of polyatomic molecules using proton motion *(11 pages)* 053402
Alexei N. Markevitch, Dmitri A. Romanov, Stanley M. Smith, and Robert J. Levis

Suppression of reabsorption in ultracold gases via modulation of light *(8 pages)* 053403
Anthony R. Gorges, Ansel J. Foxley, David M. French, Christopher M. Ryan, and Jacob L. Roberts

Photoionization and photoelectric loading of barium ion traps *(5 pages)* 053404
A. V. Steele, L. R. Churchill, P. F. Griffin, and M. S. Chapman

Quantum beating in Rb at 18.3 THz (608 cm^{-1}) detected by parametric six-wave mixing and sum-frequency generation in $LiIO_3$ *(5 pages)* 053405
C.-J. Zhu, Y. Xiao, A. A. Senin, J. Gao, J. G. Eden, T. S. Varzhapetyan, and D. H. Sarkisyan

Symmetry and transport in a cold atom ratchet with multifrequency driving *(6 pages)* 053406
R. Gommers, M. Brown, and F. Renzoni

Absorbing boundaries in numerical solutions of the time-dependent Schrödinger equation on a grid using exterior complex scaling *(7 pages)* 053407
F. He, C. Ruiz, and A. Becker

H_3^+ molecular ion in a magnetic field: Linear parallel configuration *(11 pages)* 053408
A. V. Turbiner, N. L. Guevara, and J. C. López Vieyra

Above-threshold ionization by chirped laser pulses *(5 pages)* 053409
Takashi Nakajima

Piecewise time-independent procedure to control two-level systems *(10 pages)* 053410
J. Kuhn and M. G. E. da Luz

Semiclassical theory of sub-Doppler forces in an asymmetric magneto-optical trap with unequal laser detunings *(9 pages)* 053411
Heung-Ryoul Noh and Wonho Jhe

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 5** **MAY 2007**

Laser-assisted bremsstrahlung for circular and linear polarization *(12 pages)* 053412
Stephan Schnez, Erik Lötstedt, Ulrich D. Jentschura, and Christoph H. Keitel

Superradiance and multiple scattering of photons in atomic gases *(11 pages)* 053413
A. Gero and E. Akkermans

Parametric excitation of ^{87}Rb atoms in a quadrupole-Ioffe-configuration trap *(5 pages)* 053414
Shuyu Zhou, Zhen Xu, Shanyu Zhou, Liang Liu, and Yuzhu Wang

Magnetic resonance reversals in optically pumped alkali-metal vapor *(6 pages)* 053415
F. Gong, Y.-Y. Jau, and W. Happer

Dipole-dipole instability of atom clouds in a far-detuned optical dipole trap *(8 pages)* 053416
D. Nagy and P. Domokos

Classical phase locking in adiabatic rapid passage *(5 pages)* 053417
H. Maeda, J. Nunkaew, and T. F. Gallagher

Model-independent measurement of the excited fraction in a magneto-optical trap *(6 pages)* 053418
M. H. Shah, H. A. Camp, M. L. Trachy, G. Veshapidze, M. A. Gearba, and B. D. DePaola

Matter waves

Multiscale quantum-defect theory for two interacting atoms in a symmetric harmonic trap *(9 pages)* 053601
Yujun Chen and Bo Gao

Investigation and comparison of multistate and two-state atom laser-output couplers *(8 pages)* 053602
J. Dugué, N. P. Robins, C. Figl, M. Jeppesen, P. Summers, M. T. Johnsson, J. J. Hope, and J. D. Close

Mixing-demixing transition and collapse of a vortex state in a quasi-two-dimensional boson-fermion mixture *(9 pages)* 053603
Sadhan K. Adhikari and Luca Salasnich

Ground-state structure and stability of dipolar condensates in anisotropic traps *(4 pages)* 053604
O. Dutta and P. Meystre

Quantum top inside a Bose-Einstein-condensate Josephson junction *(4 pages)* 053605
Ingrid Bausmerth, Uwe R. Fischer, and Anna Posazhennikova

Spinor condensates with a laser-induced quadratic Zeeman effect *(4 pages)* 053606
L. Santos, M. Fattori, J. Stuhler, and T. Pfau

Coupling of hydrodynamics and quasiparticle motion in collective modes of superfluid trapped Fermi gases *(13 pages)* 053607
Michael Urban

Collective modes in a uniform Fermi gas with Feshbach resonances *(7 pages)* 053608
Beibing Huang and Shaolong Wan

Breathing modes of a fast rotating Fermi gas *(5 pages)* 053609
Mauro Antezza, Marco Cozzini, and Sandro Stringari

Nonclassical dynamics of Bose-Einstein condensates in an optical lattice in the superfluid regime *(5 pages)* 053610
Roberto Franzosi

Pfaffian-like ground state for three-body hard-core bosons in one-dimensional lattices *(5 pages)* 053611
B. Paredes, T. Keilmann, and J. I. Cirac

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 5** **MAY 2007**

Species-specific optical lattices *(9 pages)* 053612
L. J. LeBlanc and J. H. Thywissen

Mott-insulator phases of nonlocally coupled one-dimensional dipolar Bose gases *(5 pages)* 053613
A. Argüelles and L. Santos

Acceleration and localization of matter in a ring trap *(6 pages)* 053614
Yu. V. Bludov and V. V. Konotop

Collective modes and stability of Bose-Fermi mixtures with a BCS-BEC crossover *(8 pages)* 053615
Hiroyuki Shibata, Nobuhiko Yokoshi, and Susumu Kurihara

Interacting bosons in an optical lattice: Bose-Einstein condensates and Mott insulator *(8 pages)* 053616
O. Fialko, Ch. Moseley, and K. Ziegler

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

Coupled-mode theory for general free-space resonant scattering of waves *(5 pages)* 053801
Rafif E. Hamam, Aristeidis Karalis, J. D. Joannopoulos, and Marin Soljačić

Trapping of light pulses in ensembles of stationary Λ atoms *(8 pages)* 053802
Kristian Rymann Hansen and Klaus Mølmer

Delay-bandwidth product of electromagnetically induced transparency media *(11 pages)* 053803
Jonas Tidström, Peter Jänes, and L. Mauritz Andersson

Theory of fourfold interference with photon pairs from spatially separated sources *(6 pages)* 053804
Hui Rong Zhang and Ruo Peng Wang

Loss-induced limits to phase measurement precision with maximally entangled states *(6 pages)* 053805
Mark A. Rubin and Sumanth Kaushik

Degree of polarization of type-II unpolarized light *(5 pages)* 053806
Alfredo Luis

Ultrahigh enhancement in absolute and relative rotation sensing using fast and slow light *(10 pages)* 053807
M. S. Shahriar, G. S. Pati, R. Tripathi, V. Gopal, M. Messall, and K. Salit

Quantum theory of dynamic multiple light scattering in fluctuating disordered media *(5 pages)* 053808
S. E. Skipetrov

Atom localization and center-of-mass wave-function determination via multiple simultaneous quadrature measurements *(10 pages)* 053809
Jörg Evers, Shahid Qamar, and M. Suhail Zubairy

Reversal of wave momentum in isotropic left-handed media *(9 pages)* 053810
Brandon A. Kemp, Jin Au Kong, and Tomasz M. Grzegorczyk

Long-wavelength instability in broad-area semiconductor lasers *(6 pages)* 053811
F. Prati and L. Columbo

Excitation of backward Tamm states at an interface between a periodic photonic crystal and a left-handed metamaterial *(4 pages)* 053812
Abdolrahman Namdar, Ilya V. Shadrivov, and Yuri S. Kivshar

Unified approach to QED in arbitrary linear media *(22 pages)* 053813
Christian Raabe, Stefan Scheel, and Dirk-Gunnar Welsch

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 5 MAY 2007

Light evolution in arbitrary two-dimensional waveguide arrays *(14 pages)* 053814
Alexander Szameit, Thomas Pertsch, Felix Dreisow, Stefan Nolte, Andreas Tünnermann, Ulf Peschel, and Falk Lederer

Correlations of light in the deep Fresnel region: An extended Van Cittert and Zernike theorem *(4 pages)* 053815
Roberto Cerbino

Transient population and polarization gratings induced by (1+1)-dimensional ultrashort dipole soliton *(5 pages)* 053816
Keyu Xia, Yueping Niu, Ruxin Li, Shiqi Jin, and Shangqing Gong

Velocity half-sphere model for multiple scattering in a semi-infinite medium *(11 pages)* 053817
S. Menon, Q. Su, and R. Grobe

Noise-induced perturbations of dispersion-managed solitons *(13 pages)* 053818
Jinglai Li, Elaine Spiller, and Gino Biondini

Modulational instability in nonlocal Kerr-type media with random parameters *(6 pages)* 053819
E. V. Doktorov and M. A. Molchan

Cold three-level atom micromaser in the far-detuning regime *(9 pages)* 053820
John Martin and Thierry Bastin

Non-Abelian evolution of electromagnetic waves in a weakly anisotropic inhomogeneous medium *(11 pages)* 053821
K. Yu. Bliokh, D. Yu. Frolov, and Yu. A. Kravtsov

Role of noise operators on two-photon correlations in an extended coherent Raman medium *(15 pages)* 053822
C. H. Raymond Ooi and M. Suhail Zubairy

Giant optical nonlinearity induced by a single two-level system interacting with a cavity in the Purcell regime *(16 pages)* 053823
Alexia Auffèves-Garnier, Christoph Simon, Jean-Michel Gérard, and Jean-Philippe Poizat

BRIEF REPORTS

Quantum information

How many ebits can be unlocked with one classical bit? *(2 pages)* 054301
Gilad Gour

Generating multiphoton Greenberger-Horne-Zeilinger states with weak cross-Kerr nonlinearity *(4 pages)* 054302
Guang-Sheng Jin, Yuan Lin, and Biao Wu

One-step implementation of an *N*-qubit controlled-phase gate with neutral atoms trapped in an optical cavity *(4 pages)* 054303
Yun-Feng Xiao, Xu-Bo Zou, and Guang-Can Guo

Generation of maximally entangled mixed states of two atoms via on-resonance asymmetric atom-cavity couplings *(4 pages)* 054304
Shang-Bin Li

Atomic and molecular structure and dynamics

Measurement of the magnetic moment of the negative muon bound in heavy atoms *(3 pages)* 054501
T. N. Mamedov, K. I. Gritsay, A. V. Stoykov, D. Herlach, R. Scheuermann, and U. Zimmermann

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 75, NUMBER 5 MAY 2007

Atomic and molecular collisions and interactions

Low-energy electron capture by Ne^{2+} ions from H(D) *(4 pages)* 054701
B. Seredyuk, H. Bruhns, D. W. Savin, D. Seely, H. Aliabadi, E. Galutschek, and C. C. Havener

Atomic and molecular processes in external fields

Efficient coherent population transfer between the $a\ ^3\Sigma$ and the $X\ ^1\Sigma$ states of $^{39}K^{85}Rb$ *(4 pages)* 055401
M. Tscherneck and N. P. Bigelow

Deexcitation of high-Rydberg-state atoms with a chirped train of half-cycle pulses *(4 pages)* 055402
T. Kopyciuk and R. Parzyński

Matter waves

Čerenkov-like radiation in a binary superfluid flow past an obstacle *(4 pages)* 055601
H. Susanto, P. G. Kevrekidis, R. Carretero-González, B. A. Malomed,
D. J. Frantzeskakis, and A. R. Bishop

Reduced coherence in double-slit diffraction of neutrons *(4 pages)* 055602
R. Tumulka, A. Viale, and N. Zanghì

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

Particle-optical self-trapping *(4 pages)* 055801
R. Gordon, J. T. Blakely, and D. Sinton

Motion-induced radiation in a cavity with conducting and permeable plates *(4 pages)* 055802
Jalal Sarabadani and MirFaez Miri

ERRATA

Erratum: Observation of two different types of optical supercontinua: Structured and structureless [Phys. Rev. A **74**, 053819 (2006)] *(1 page)* . . . . . 059901(E)
I. G. Koprinkov, Akira Suda, M. Narhuda, P. Wang, and Katsumi Midorikawa

Publisher's Note: Water-molecule dissociation by proton and hydrogen impact [Phys. Rev. A **75**, 042711 (2007)] *(1 page)* . . . . . 059902(E)
H. Luna, A. L. F. de Barros, J. A. Wyer, S. W. J. Scully, J. Lecointre, P. M. Y. Garcia, G. M. Sigaud,
A. C. F. Santos, V. Senthil, M. B. Shah, C. J. Latimer, and E. C. Montenegro

Erratum: Infrared frequency standard based on magnetically trapped NH molecules [Phys. Rev. A **74**, 035403 (2006)] *(1 page)* . . . . . 059903(E)
Masatoshi Kajita

Publisher's Note: Oscillating Casimir force between impurities in one-dimensional Fermi liquids [Phys. Rev. A **75**, 043615 (2007)] *(1 page)* . . . . . 059904(E)
J. N. Fuchs, A. Recati, and W. Zwerger

Erratum: Non-Markovian dynamics of a qubit [Phys. Rev. A **73**, 012111 (2006)] *(1 page)* . . . . . 059905(E)
Sabrina Maniscalco and Francesco Petruccione

Publisher's Note: Angular distributions of molecular Auger electrons: The case of C 1*s* Auger emission in CO [Phys. Rev. A **75**, 032707 (2007)] *(1 page)* . . . . . 059906(E)
S. K. Semenov, V. V. Kuznetsov, N. A. Cherepkov, P. Bolognesi, V. Feyer, A. Lahmam-Bennani,
M. E. Staicu Casagrande, and L. Avaldi

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 75, NUMBER 5** **MAY 2007**

Publisher's Note: Deperturbation treatment of the $A\,^1\Sigma^+ - b\,^3\Pi$ complex of NaRb and prospects for ultracold molecule formation in $X\,^1\Sigma^+(v=0;J=0)$ [Phys. Rev. A **75**, 042503 (2007)] *(1 page)* . . . . . 059907(E)

O. Docenko, M. Tamanis, R. Ferber, E. A. Pazyuk, A. Zaitsevskii, A. V. Stolyarov, A. Pashov, H. Knöckel, and E. Tiemann