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 78, NUMBER 2
PARTS A AND B

CONTENTS

AUGUST 2008

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 020101(R)-022901, and Part B pages 023401-029907(E).

PART A

RAPID COMMUNICATIONS

Fundamental concepts

Anomalies in electrostatic calibrations for the measurement of the Casimir force in a sphere-plane geometry *(4 pages)* . . . . . 020101(R)
W. J. Kim, M. Brown-Hayes, D. A. R. Dalvit, J. H. Brownell, and R. Onofrio

Quantum information

Experimental quantum key distribution based on a Bell test *(4 pages)* . . . . . 020301(R)
Alexander Ling, Matthew P. Peloso, Ivan Marcikic, Valerio Scarani, Antía Lamas-Linares, and Christian Kurtsiefer

Dispersive coupling between the superconducting transmission line resonator and the double quantum dots *(4 pages)* . . . . . 020302(R)
Guo-Ping Guo, Hui Zhang, Yong Hu, Tao Tu, and Guang-Can Guo

Mutually unbiased bases for continuous variables *(4 pages)* . . . . . 020303(R)
Stefan Weigert and Michael Wilkinson

Separable operations on pure states *(4 pages)* . . . . . 020304(R)
Vlad Gheorghiu and Robert B. Griffiths

Atomic and molecular structure and dynamics

Universal properties of Efimov physics beyond the scattering length approximation *(4 pages)* . . . . . 020501(R)
M. Thøgersen, D. V. Fedorov, and A. S. Jensen

Atomic and molecular collisions and interactions

Efimov states embedded in the three-body continuum *(4 pages)* . . . . . 020701(R)
N. P. Mehta, Seth T. Rittenhouse, J. P. D'Incao, and Chris H. Greene

Clusters (including fullerenes)

From fission to explosion: Momentum-resolved survey over the Rayleigh instability barrier *(4 pages)* . . . . . 021201(R)
M. Hoener, C. Bostedt, S. Schorb, H. Thomas, L. Foucar, O. Jagutzki, H. Schmidt-Böcking, R. Dörner, and T. Möller

Copyright 2008 by The American Physical Society

(Continued)

1050-2947(200808)78:2:A;1-X

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

Light-induced collapse of metastable magnesium complexes formed in helium nanodroplets *(4 pages)* ..... 021202(R)
Andreas Przystawik, Sebastian Göde, Tilo Döppner, Josef Tiggesbäumker, and Karl-Heinz Meiwes-Broer

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

Explicit analysis of chaotic behavior in radial and angular motion in doubly excited helium *(4 pages)* ..... 021401(R)
Y. H. Jiang, R. Püttner, D. Delande, M. Martins, and G. Kaindl

Formation of deeply bound molecules via chainwise adiabatic passage *(4 pages)* ..... 021402(R)
Elena Kuznetsova, Philippe Pellegrini, Robin Côté, M. D. Lukin, and S. F. Yelin

Observation of above-threshold dissociation of Na_2^+ in intense laser fields *(4 pages)* ..... 021403(R)
Qun Zhang, John W. Hepburn, and Moshe Shapiro

Matter waves

Phonon background versus analog Hawking radiation in Bose-Einstein condensates *(4 pages)* ..... 021601(R)
S. Wüster

In situ Ramsey interferometry and diffraction echo with an atomic Fermi gas *(4 pages)* ..... 021602(R)
C. Marzok, B. Deh, S. Slama, C. Zimmermann, and Ph. W. Courteille

Nonlocal density correlations as a signature of Hawking radiation from acoustic black holes *(4 pages)* ..... 021603(R)
Roberto Balbinot, Alessandro Fabbri, Serena Fagnocchi, Alessio Recati, and Iacopo Carusotto

Vortex core states in superfluid Fermi-Fermi mixtures with unequal masses *(4 pages)* ..... 021604(R)
M. Iskin

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

Laser linewidth hazard in optomechanical cooling *(2 pages)* ..... 021801(R)
Lajos Diósi

Optimal light storage with full pulse-shape control *(4 pages)* ..... 021802(R)
Irina Novikova, Nathaniel B. Phillips, and Alexey V. Gorshkov

Chirped chiral solitons in the nonlinear Schrödinger equation with self-steepening and self-frequency shift *(4 pages)* ..... 021803(R)
Vivek M. Vyas, Pankaj Patel, Prasanta K. Panigrahi, Choragudi Nagaraja Kumar, and W. Greiner

Experimental determination of a nonclassical Glauber-Sudarshan P function *(4 pages)* ..... 021804(R)
T. Kiesel, W. Vogel, V. Parigi, A. Zavatta, and M. Bellini

Resonant transmission of electromagnetic fields through subwavelength zero-ϵ slits *(4 pages)* ..... 021805(R)
Klaus Halterman and Simin Feng

Exact solutions of the eikonal equations describing self-focusing in highly nonlinear geometrical optics *(4 pages)* ..... 021806(R)
Larisa L. Tatarinova and Martin E. Garcia

Nonlocal modulation of entangled photons *(4 pages)* ..... 021807(R)
S. E. Harris

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

ARTICLES

Fundamental concepts

Geometric phase and quantum phase transition: Two-band model *(7 pages)* 022101
H. T. Cui (崔海涛) and Jie Yi (伊杰)

Cluster-expansion representation in quantum optics *(26 pages)* 022102
M. Kira and S. W. Koch

Complexity of thermal states in quantum spin chains *(5 pages)* 022103
Marko Žnidarič, Tomaž Prosen, and Iztok Pižorn

Casimir effect in a one-dimensional gas of free fermions *(11 pages)* 022104
Eugene B. Kolomeisky, Joseph P. Straley, and Michael Timmins

Initial-state randomness as a universal source of decoherence *(7 pages)* 022105
Marko Žnidarič

Preservation of positivity by dynamical coarse graining *(17 pages)* 022106
Gernot Schaller and Tobias Brandes

Stress tensor for quantized random field and wave-function collapse *(13 pages)* 022107
Philip Pearle

Nonthreshold anomalous time advance in multichannel scattering *(12 pages)* 022108
Wytse van Dijk, Kyle Spyksma, and Matthew West

Correspondence between quantum and classical descriptions for free particles *(7 pages)* 022109
X. Y. Huang

Bell theorem without inequalities for two particles. I. Efficient detectors *(7 pages)* 022110
Daniel M. Greenberger, Michael Horne, and Anton Zeilinger

Bell theorem without inequalities for two particles. II. Inefficient detectors *(12 pages)* 022111
Daniel M. Greenberger, Michael Horne, Anton Zeilinger, and Marek Żukowski

Non-Markovian dynamics for bipartite systems *(12 pages)* 022112
Bassano Vacchini

Quantum tunneling and the resonant states *(12 pages)* 022113
A. Rokhlenko

Quantum information

Entanglement of group-II-like atoms with fast measurement for quantum information processing *(5 pages)* 022301
R. Stock, N. S. Babcock, M. G. Raizen, and B. C. Sanders

Generating entangled photons from the vacuum by accelerated measurements: Quantum-information theory and the Unruh-Davies effect *(5 pages)* 022302
Muxin Han, S. Jay Olson, and Jonathan P. Dowling

Hybrid quantum computation in quantum optics *(5 pages)* 022303
P. van Loock, W. J. Munro, Kae Nemoto, T. P. Spiller, T. D. Ladd, Samuel L. Braunstein, and G. J. Milburn

Building all time evolutions with rotationally invariant Hamiltonians *(14 pages)* 022304
I. Marvian and R. B. Mann

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 78, NUMBER 2** **AUGUST 2008**

Entanglement growth in a weakly interacting Bose gas *(6 pages)* 022305
Gian Luca Giorgi and Ferdinando de Pasquale

Private classical capacity with a symmetric side channel and its application to quantum cryptography *(7 pages)* 022306
Graeme Smith

Entangled quantum-key-distribution randomness *(5 pages)* 022307
I. J. Owens, R. J. Hughes, and J. E. Nordholt

Scalable method to estimate experimentally the entanglement of multipartite systems *(4 pages)* 022308
Leandro Aolita, Andreas Buchleitner, and Florian Mintert

Suitability of the approximate superposition of squeezed coherent states for various quantum protocols *(6 pages)* 022309
Petr Marek and M. S. Kim

Extrema of discrete Wigner functions and applications *(6 pages)* 022310
Andrea Casaccino, Ernesto F. Galvão, and Simone Severini

Reexamination of quantum data compression and relative entropy *(5 pages)* 022311
Alexei Kaltchenko

Entanglement purification without controlled-NOT gates by using the natural dynamics of spin chains *(5 pages)* 022312
Koji Maruyama and Franco Nori

Transfer matrix solution of a model of qubit decoherence due to telegraph noise *(7 pages)* 022313
Bin Cheng, Qiang-Hua Wang, and Robert Joynt

Quantum phase transition using quantum walks in an optical lattice *(7 pages)* 022314
C. M. Chandrashekar and Raymond Laflamme

Numerical analysis of optimized coherent control pulses *(9 pages)* 022315
P. Karbach, S. Pasini, and G. S. Uhrig

Possibility, impossibility, and cheat sensitivity of quantum-bit string commitment *(10 pages)* 022316
Harry Buhrman, Matthias Christandl, Patrick Hayden, Hoi-Kwong Lo, and Stephanie Wehner

Thermal equilibrium as an initial state for quantum computation by NMR *(10 pages)* 022317
Amr F. Fahmy, Raimund Marx, Wolfgang Bermel, and Steffen J. Glaser

Rank-three bipartite entangled states are distillable *(6 pages)* 022318
Lin Chen and Yi-Xin Chen

Optical simulation of the Yang-Baxter equation *(10 pages)* 022319
Shuang-Wei Hu, Kang Xue, and Mo-Lin Ge

Discrimination of the binary coherent signal: Gaussian-operation limit and simple non-Gaussian near-optimal receivers *(7 pages)* 022320
Masahiro Takeoka and Masahide Sasaki

Efficient quantum key distribution over a collective noise channel *(6 pages)* 022321
Xi-Han Li, Fu-Guo Deng, and Hong-Yu Zhou

Experimental investigation of the dynamics of entanglement: Sudden death, complementarity, and continuous monitoring of the environment *(15 pages)* 022322
A. Salles, F. de Melo, M. P. Almeida, M. Hor-Meyll, S. P. Walborn, P. H. Souto Ribeiro, and L. Davidovich

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

Heralded generation of entanglement with coupled cavities *(4 pages)* 022323
Jaeyoon Cho, Dimitris G. Angelakis, and Sougato Bose

Hitting time for the continuous quantum walk *(12 pages)* 022324
Martin Varbanov, Hari Krovi, and Todd A. Brun

Perfect state transfer in long-range interacting spin chains *(5 pages)* 022325
Giulia Gualdi, Vojtech Kostak, Irene Marzoli, and Paolo Tombesi

Loss in hybrid qubit-bus couplings and gates *(9 pages)* 022326
Sebastien G. R. Louis, W. J. Munro, T. P. Spiller, and Kae Nemoto

Induced entanglement enhanced by quantum criticality *(6 pages)* 022327
Qing Ai, Tao Shi, Guilu Long, and C. P. Sun

Efficient generation of random multipartite entangled states using time-optimal unitary operations *(5 pages)* 022328
A. Borras, A. P. Majtey, and M. Casas

Three fermions with six single-particle states can be entangled in two inequivalent ways *(10 pages)* 022329
Péter Lévay and Péter Vrana

Analog Grover search by adiabatic passage in a cavity-laser-atom system *(8 pages)* 022330
D. Daems and S. Guérin

Geometric phases and Bloch-sphere constructions for SU(N) groups with a complete description of the SU(4) group *(10 pages)* 022331
D. Uskov and A. R. P. Rau

Quantum computers can search rapidly by using almost any selective transformation *(7 pages)* 022332
Avatar Tulsi

Operator quantum error correction for continuous dynamics *(10 pages)* 022333
Ognyan Oreshkov, Daniel A. Lidar, and Todd A. Brun

Local noise can enhance two-qubit teleportation *(7 pages)* 022334
Ye Yeo

Optimality of minimum-error discrimination by the no-signaling condition *(4 pages)* 022335
Joonwoo Bae, Jae-Weon Lee, Jaewan Kim, and Won-Young Hwang

Teleportation in the presence of common bath decoherence at the transmitting station *(5 pages)* 022336
D. D. Bhaktavatsala Rao, P. K. Panigrahi, and Chiranjib Mitra

Phase estimation procedure to solve quantum-mechanical eigenvalue problems *(5 pages)* 022337
Péter Varga and Barnabás Apagyi

Atomic and molecular structure and dynamics

Multicomponent density-functional theory for electrons and nuclei *(22 pages)* 022501
Thomas Kreibich, Robert van Leeuwen, and E. K. U. Gross

Efficient discretization of the continuum through complex contour deformation *(7 pages)* 022502
Neil Shenvi, J. R. Schmidt, Stephen T. Edwards, and John C. Tully

Spin effects in $(6s_{1/2}+6p_{1/2})0_u^+$ $^{133}Cs_2$ weakly bound molecules analyzed by using the Lu-Fano method coupled to the improved LeRoy-Bernstein formula *(8 pages)* 022503
Haikel Jelassi, Bruno Viaris de Lesegno, Laurence Pruvost, Marin Pichler, and William C. Stwalley

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 78, NUMBER 2** **AUGUST 2008**

Self-consistent many-body perturbation theory in range-separated density-functional theory: A one-electron reduced-density-matrix-based formulation *(14 pages)* 022504
Emmanuel Fromager and Hans Jørgen Aa. Jensen

Lifetime and Landé factor measurements of $5p7p$ levels of Sn I by time-resolved laser spectroscopy *(6 pages)* 022505
Ying Zhang, Jiaxin Xu, Wei Zhang, Shuai You, Zhiguo Ma, Lili Han, Pengfei Li, Guijuan Sun, Zhankui Jiang, S. Enzonga Yoca, P. Quinet, É. Biémont, and Zhenwen Dai

Experimental evidence of antiproton reflection by a solid surface *(4 pages)* 022506
A. Bianconi, M. Corradini, A. Cristiano, M. Leali, E. Lodi Rizzini, L. Venturelli, N. Zurlo, and R. Donà

Calculations of the spectra of superheavy elements $Z=119$ and $Z=120^+$ *(7 pages)* 022507
T. H. Dinh, V. A. Dzuba, V. V. Flambaum, and J. S. M. Ginges

Dissociative recombination of HF^+ *(12 pages)* 022508
J. B. Roos, Å. Larson, and A. E. Orel

Autoionizing Rydberg series (np', nf') of Ar investigated by stepwise excitations with lasers and synchrotron radiation *(16 pages)* 022509
Yin-Yu Lee, Tzan-Yi Dung, Re-Ming Hsieh, Jih-Young Yuh, Yen-Fang Song, Grace H. Ho, Tzu-Ping Huang, Wan-Chun Pan, I-Chia Chen, Shih-Yu Tu, A. H. Kung, and L. C. Lee

Rayleigh-Schrödinger many-body perturbation theory for density functionals: A unified treatment of one- and two-electron perturbations *(15 pages)* 022510
János G. Ángyán

Formalism of the displaced squeezed Fock states for variational calculations of highly excited ro-vibrational levels: Diatomic molecules *(14 pages)* 022511
M. Rey, F. Michelot, and Vl. G. Tyuterev

Radiative characteristics of quasimolecular state interactions *(5 pages)* 022512
A. Devdariani and E. Dalimier

Simple charge-transfer model to explain the electrical response of hydrogen chains *(8 pages)* 022513
Adrienn Ruzsinszky, John P. Perdew, and Gábor I. Csonka

Electric quadrupole moments of metastable states of Ca^+, Sr^+, and Ba^+ *(6 pages)* 022514
Dansha Jiang, Bindiya Arora, and M. S. Safronova

Calculation of radiative corrections to hyperfine splitting in $p_{3/2}$ states *(8 pages)* 022515
J. Sapirstein and K. T. Cheng (鄭國錚)

Symmetry-resolved x-ray absorption fine structure and resonant Auger-spectator-electron decay study of O $1s \rightarrow$ Rydberg resonances in O_2 *(11 pages)* 022516
T. Tanaka, R. Feifel, M. Kitajima, H. Tanaka, S. L. Sorensen, R. Sankari, A. De Fanis, M.-N. Piancastelli, L. Karlsson, and K. Ueda

Proton structure corrections to electronic and muonic hydrogen hyperfine splitting *(9 pages)* 022517
Carl E. Carlson, Vahagn Nazaryan, and Keith Griffioen

Structure of the Pb, Bi, Th, and U *M* x-ray spectra *(10 pages)* 022518
Silvina P. Limandri, Jorge C. Trincavelli, Rita D. Bonetto, and Alejo C. Carreras

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

Atomic and molecular collisions and interactions

Prospects for producing ultracold NH_3 molecules by sympathetic cooling: A survey of interaction potentials *(9 pages)* 022701
Piotr S. Żuchowski and Jeremy M. Hutson

Temporary negative-ion effects on photon emission from free zinc atoms excited by electron impact *(9 pages)* 022702
S. A. Napier, D. Cvejanović, J. F. Williams, and L. Pravica

Low-energy positron scattering from methanol and ethanol: Total cross sections *(5 pages)* 022703
Antonio Zecca, Luca Chiari, A. Sarkar, Kate L. Nixon, and Michael J. Brunger

Near-threshold absolute *M*-shell x-ray production cross sections of Au and Bi by electron impact *(7 pages)* 022704
C. Merlet, X. Llovet, and F. Salvat

Formation of slow molecules in chemical reactions in crossed molecular beams *(7 pages)* 022705
T. V. Tscherbul, Ğ Barinovs, J. Kłos, and R. V. Krems

Formation of antihydrogen in three-body antiproton-positron collisions *(7 pages)* 022706
S. Roy, S. Ghosh Deb, and C. Sinha

Quantization function for deep potentials with attractive tails *(13 pages)* 022707
Patrick Raab and Harald Friedrich

State selection of molecular oxygen ($^3\Sigma_g^-$) by a hexapole magnet and the inversion of population for the spin-rotational states *(6 pages)* 022708
Mitsunori Kurahashi and Yasushi Yamauchi

Resonance electron-impact excitation and polarization of the magnetic quadrupole line of neonlike Ba^{46+} ions *(6 pages)* 022709
Jun Jiang, Chen-Zhong Dong, Lu-You Xie, and Jian-Guo Wang

Feshbach resonances in ultracold ^{85}Rb-^{87}Rb and ^{6}Li-^{87}Rb mixtures *(8 pages)* 022710
Z. Li, S. Singh, T. V. Tscherbul, and K. W. Madison

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

Influence of the polarization in grazing scattering of fast helium atoms from LiF(001) surfaces *(7 pages)* 022901
M. S. Gravielle and J. E. Miraglia

PART B

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

Motional spin relaxation in large electric fields *(5 pages)* 023401
Riccardo Schmid, B. Plaster, and B. W. Filippone

Evaporation of trapped anions studied with a 22-pole ion trap in tandem time-of-flight configuration *(13 pages)* 023402
J. Mikosch, U. Frühling, S. Trippel, R. Otto, P. Hlavenka, D. Schwalm, M. Weidemüller, and R. Wester

Time-resolved subcycle dynamics: Importance of physical fields and gauge invariance *(6 pages)* 023403
L. B. Madsen and D. Dimitrovski

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

Quantum control of the hyperfine-coupled electron and nuclear spins in alkali-metal atoms *(12 pages)* 023404
Seth T. Merkel, Poul S. Jessen, and Ivan H. Deutsch

Hybrid Gaussian–discrete-variable representation approach to molecular continuum processes: Application to photoionization of diatomic Li_2^+ *(12 pages)* 023405
F. L. Yip, C. W. McCurdy, and T. N. Rescigno

Control of population transfer in a multilevel Li_2 molecule by stimulated hyper-Raman nonadiabatic passage with chirped laser pulses *(10 pages)* 023406
Chitrakshya Sarkar, Rangana Bhattacharya, S. S. Bhattacharyya, and Samir Saha

Threshold effects on plateau electron angular distributions in above-threshold detachment *(15 pages)* 023407
K. Krajewska, Ilya I. Fabrikant, and Anthony F. Starace

Monotonically convergent optimal control theory of quantum systems under a nonlinear interaction with the control field *(12 pages)* 023408
M. Lapert, R. Tehini, G. Turinici, and D. Sugny

Single-photon core-valence double ionization of molecular oxygen *(5 pages)* 023409
E. Andersson, M. Stenrup, J. H. D. Eland, L. Hedin, M. Berglund, L. Karlsson, Å. Larson, H. Ågren, J.-E. Rubensson, and R. Feifel

Nuclear kinetic energy spectra of D_2^+ in an intense laser field: Beyond the Born-Oppenheimer approximation *(5 pages)* 023410
Mohsen Vafaee

Recoil collisions as a portal to field-assisted ionization at near-uv frequencies in the strong-field double ionization of helium *(4 pages)* 023411
A. Emmanouilidou

Atom Fock-state preparation by trap reduction *(6 pages)* 023412
A. del Campo and J. G. Muga

Attosecond-pulse-controlled high-order harmonic generation in ultrashort laser fields *(6 pages)* 023413
Bingbing Wang, J. Chen, Jie Liu, Zong-Chao Yan, and Panming Fu

Strong-field ionization of water by intense few-cycle laser pulses *(6 pages)* 023414
D. Mathur, F. A. Rajgara, A. K. Dharmadhikari, and J. A. Dharmadhikari

Two-photon double ionization of helium: An experimental lower bound of the total cross section *(11 pages)* 023415
Philippe Antoine, Emmanuel Foumouo, Bernard Piraux, Toshihiko Shimizu, Hirokazu Hasegawa, Yasuo Nabekawa, and Katsumi Midorikawa

Matter waves

Finite-temperature phase diagram of a spin-polarized ultracold Fermi gas in a highly elongated harmonic trap *(8 pages)* 023601
Xia-Ji Liu, Hui Hu, and Peter D. Drummond

Quasiparticles, coherence, and nonlinearity: Exact simulations of rf spectroscopy of strongly interacting one-dimensional Fermi gases *(4 pages)* 023602
M. J. Leskinen, V. Apaja, J. Kajala, and P. Törmä

Magnetism of cold fermionic atoms on the *p* band of an optical lattice *(5 pages)* 023603
Lei Wang, Xi Dai, Shu Chen, and X. C. Xie

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

Annihilation of quantized vorticity in a trapped Bose-Einstein condensate via the scattering of density perturbations *(6 pages)* 023604
P. Capuzzi, F. Federici, and M. P. Tosi

Influence of the trap shape on the detection of the superfluid—Mott-insulator transition *(5 pages)* 023605
Ping Nang Ma, Kai Yu Yang, Lode Pollet, J. V. Porto, Matthias Troyer, and Fu Chun Zhang

Number squeezing, quantum fluctuations, and oscillations in mesoscopic Bose Josephson junctions *(5 pages)* 023606
G. Ferrini, A. Minguzzi, and F. W. J. Hekking

Interband physics in an ultracold Fermi gas in an optical lattice *(5 pages)* 023607
J.-P. Martikainen, E. Lundh, and T. Paananen

Solitons in Bose-Einstein condensates with time-dependent atomic scattering length in an expulsive parabolic and complex potential *(6 pages)* 023608
Biao Li, Xiao-Fei Zhang, Yu-Qi Li, Yong Chen, and W. M. Liu

Dynamical symmetry in spinor Bose-Einstein condensates *(11 pages)* 023609
Shun Uchino, Takaharu Otsuka, and Masahito Ueda

Single-atom-aided probe of the decoherence of a Bose-Einstein condensate *(7 pages)* 023610
H. T. Ng and S. Bose

Fock-space WKB method for the boson Josephson model describing a Bose-Einstein condensate trapped in a double-well potential *(11 pages)* 023611
V. S. Shchesnovich and M. Trippenbach

Theory of near-field matter-wave interference beyond the eikonal approximation *(18 pages)* 023612
Stefan Nimmrichter and Klaus Hornberger

Nonlinear correction to the boson Josephson-junction model *(7 pages)* 023613
XinYan Jia, WeiDong Li, and J. Q. Liang

Resonant transmission and beaming of cold atoms assisted by surface matter waves *(10 pages)* 023614
A. I. Fernández-Domínguez, D. Martín-Cano, E. Moreno, L. Martín-Moreno, and F. J. García-Vidal

Reduced density matrices and coherence of trapped interacting bosons *(17 pages)* 023615
Kaspar Sakmann, Alexej I. Streltsov, Ofir E. Alon, and Lorenz S. Cederbaum

Spin-orbit coupled Bose-Einstein condensates *(10 pages)* 023616
Tudor D. Stanescu, Brandon Anderson, and Victor Galitski

Two-channel Feshbach physics in a structured continuum *(16 pages)* 023617
N. Nygaard, R. Piil, and K. Mølmer

Technique for measuring correlation functions in interacting gases *(4 pages)* 023618
C. Lobo and S. D. Gensemer

Confinement effects in a guided-wave atom interferometer with millimeter-scale arm separation *(9 pages)* 023619
J. H. T. Burke, B. Deissler, K. J. Hughes, and C. A. Sackett

Second-order quantum phase transition of a homogeneous Bose gas with attractive interactions *(7 pages)* 023620
P. Ziń, B. Oleś, M. Trippenbach, and K. Sacha

Magnetic ordering and quantum statistical effects in strongly repulsive Fermi-Fermi and Bose-Fermi mixtures *(10 pages)* 023621
X.-W. Guan, M. T. Batchelor, and J.-Y. Lee

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

Sound speed of a Bose-Einstein condensate in an optical lattice *(16 pages)* 023622
Z. X. Liang (梁兆新), Xi Dong (董希), Z. D. Zhang (张志东), and Biao Wu (吴飙)

Breathing mode frequencies of a rotating Fermi gas in the BCS-BEC crossover region *(6 pages)* 023623
Theja N. De Silva

Interface tension of Bose-Einstein condensates *(9 pages)* 023624
Bert Van Schaeybroeck

Quantum Monte Carlo simulations of the BCS-BEC crossover at finite temperature *(17 pages)* 023625
Aurel Bulgac, Joaquín E. Drut, and Piotr Magierski

Phase separation in imbalanced fermion superfluids beyond the mean-field approximation *(5 pages)* 023626
J. Tempere, S. N. Klimin, and J. T. Devreese

Canonical trajectories and critical coupling of the Bose-Hubbard Hamiltonian in a harmonic trap *(4 pages)* 023627
G. G. Batrouni, H. R. Krishnamurthy, K. W. Mahmud, V. G. Rousseau, and R. T. Scalettar

Quasiperiodic Bose-Hubbard model and localization in one-dimensional cold atomic gases *(18 pages)* 023628
G. Roux, T. Barthel, I. P. McCulloch, C. Kollath, U. Schollwöck, and T. Giamarchi

Band structures of a dipolar Bose-Einstein condensate in one-dimensional lattices *(8 pages)* 023629
YuanYao Lin, Ray-Kuang Lee, Yee-Mou Kao, and Tsin-Fu Jiang

Quantum fluctuations in the image of a Bose gas *(13 pages)* 023630
Antonio Negretti, Carsten Henkel, and Klaus Mølmer

Ground-state properties of one-dimensional anyon gases *(6 pages)* 023631
Yajiang Hao, Yunbo Zhang, and Shu Chen

Spin-domain formation in antiferromagnetic condensates *(5 pages)* 023632
Michal Matuszewski, Tristram J. Alexander, and Yuri S. Kivshar

Role of interactions in spin-polarized atomic Fermi gases at unitarity *(6 pages)* 023633
A. Recati, C. Lobo, and S. Stringari

Exotic quantum phase transitions in a Bose-Einstein condensate coupled to an optical cavity *(5 pages)* 023634
Gang Chen, Xiaoguang Wang, J.-Q. Liang, and Z. D. Wang

Rabi switch of condensate wave functions in a multicomponent Bose gas *(16 pages)* 023635
H. E. Nistazakis, Z. Rapti, D. J. Frantzeskakis, P. G. Kevrekidis, P. Sodano, and A. Trombettoni

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

Optimal light storage in atomic vapor *(9 pages)* 023801
Nathaniel B. Phillips, Alexey V. Gorshkov, and Irina Novikova

Torque and longitudinal force exerted by eigenmodes on circular waveguides *(6 pages)* 023802
Amit Mizrahi, Moshe Horowitz, and Levi Schächter

Efficiency and fidelity of photon-echo quantum memory in an atomic system with longitudinal inhomogeneous broadening *(14 pages)* 023803
S. A. Moiseev and N. M. Arslanov

Compact optical one-way waveguide isolators for photonic-band-gap microchips *(15 pages)* 023804
Hiroyuki Takeda and Sajeev John

(Continued)

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 78, NUMBER 2** **AUGUST 2008**

Continuous-variable versus electromagnetically-induced-transparency-based quantum memories *(12 pages)* . . . 023805
Z. Kurucz and M. Fleischhauer

Finite-size corrections to the blackbody radiation laws *(5 pages)* 023806
Antonio M. García-García

Observation of three-mode parametric interactions in long optical cavities *(6 pages)* 023807
C. Zhao, L. Ju, Y. Fan, S. Gras, B. J. J. Slagmolen, H. Miao, P. Barriga, D. G. Blair, D. J. Hosken, A. F. Brooks, P. J. Veitch, D. Mudge, and J. Munch

Robust generation of superposition states *(6 pages)* 023808
Rekishu Yamazaki, Ken-ichi Kanda, Fumihiko Inoue, Kenji Toyoda, and Shinji Urabe

Continuum effects on the temporal evolution of anharmonic coherent molecular vibrations *(8 pages)* 023809
J. A. Castañeda, M. A. Hernández, and R. Jáuregui

Characteristics of cavity solitons and drifting excitations in broad-area vertical-cavity surface-emitting lasers with frequency-selective feedback *(10 pages)* 023810
Y. Tanguy, N. Radwell, T. Ackemann, and R. Jäger

Dynamics of Bragg diffraction in a stored light grating in cold atoms *(8 pages)* 023811
D. Moretti, N. Gonzalez, D. Felinto, and J. W. R. Tabosa

Statistics of quality factors in three-dimensional disordered magneto-optical systems and its applications to random lasers *(8 pages)* 023812
F. A. Pinheiro

Transparent structure consisting of metamaterial layers and matching layers *(6 pages)* 023813
Yuntuan Fang and Sailing He

Extraction of the species-dependent dipole amplitude and phase from high-order harmonic spectra in rare-gas atoms *(6 pages)* 023814
Anh-Thu Le, Toru Morishita, and C. D. Lin

Cold Fermi atomic gases in a pumped optical resonator *(8 pages)* 023815
Jonas Larson, Giovanna Morigi, and Maciej Lewenstein

Nonlinear surface waves in one-dimensional photonic crystals containing left-handed metamaterials *(5 pages)* 023816
S. Roshan Entezar, A. Namdar, Z. Eyni, and H. Tajalli

Phase retrieval in x-ray imaging based on using structured illumination *(5 pages)* 023817
Y. J. Liu, B. Chen, E. R. Li, J. Y. Wang, A. Marcelli, S. W. Wilkins, H. Ming, Y. C. Tian, K. A. Nugent, P. P. Zhu, and Z. Y. Wu

Collision-assisted electromagnetically induced control of coherent population transfer *(6 pages)* 023818
Xihua Yang and Shiyao Zhu

Efficient conversion between photons and between photon and atom by stimulated emission *(6 pages)* 023819
Z. Y. Ou

Multiphoton wave function after Kerr interaction *(5 pages)* 023820
Kazuki Koshino

Exact spatial soliton solutions of the two-dimensional generalized nonlinear Schrödinger equation with distributed coefficients *(6 pages)* 023821
Wei-Ping Zhong, Rui-Hua Xie, Milivoj Belić, Nikola Petrović, and Goong Chen

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

High-order nonlinear Schrödinger equation and superluminal optical solitons in room-temperature active-Raman-gain media *(8 pages)* 023822
Hui-jun Li, Chao Hang, Guoxiang Huang, and L. Deng

Resonant light transport through Mie modes in photonic glasses *(11 pages)* 023823
P. D. García, R. Sapienza, J. Bertolotti, M. D. Martín, Á Blanco, A. Altube, L. Viña, D. S. Wiersma, and C. López

Crescent vortex solitons in strongly nonlocal nonlinear media *(5 pages)* 023824
Y. J. He, Boris A. Malomed, Dumitru Mihalache, and H. Z. Wang

Light trapping and absorption optimization in certain thin-film photonic crystal architectures *(15 pages)* 023825
Alongkarn Chutinan and Sajeev John

Enhanced transmission of light through subwavelength nanoapertures by far-field multiple-beam interference *(6 pages)* 023826
S. V. Kukhlevsky

Nonclassical light generation by a photonic-crystal one-atom laser *(11 pages)* 023827
Lucia Florescu

Transmission spectrum of Doppler-broadened two-level atoms in a cavity in the strong-coupling regime *(8 pages)* 023828
J. Gea-Banacloche, Haibin Wu, and Min Xiao

Fundamental photophysics and optical loss processes in Si-nanocrystal-doped microdisk resonators *(13 pages)* 023829
Rohan D. Kekatpure and Mark L. Brongersma

Dissipative soliton resonances *(9 pages)* 023830
W. Chang, A. Ankiewicz, J. M. Soto-Crespo, and N. Akhmediev

Simulations and experiments on polarization squeezing in optical fiber *(18 pages)* 023831
Joel F. Corney, Joel Heersink, Ruifang Dong, Vincent Josse, Peter D. Drummond, Gerd Leuchs, and Ulrik L. Andersen

Back-action limit of linewidth in an optomechanical oscillator *(4 pages)* 023832
Kerry J. Vahala

Squeezed single-atom laser in a photonic crystal *(11 pages)* 023833
Rong Tan, Gao-xiang Li, and Zbigniew Ficek

Casimir force on a thin slab: The influence of surrounding media and the role of surface polaritons *(9 pages)* 023834
Z. Lenac and M. S. Tomaš

Gaussian-state theory of two-photon imaging *(13 pages)* 023835
Baris I. Erkmen and Jeffrey H. Shapiro

Generation of intense extreme supercontinuum radiation via resonant propagation effects *(5 pages)* 023836
Weifeng Yang, Xiaohong Song, Ruxin Li, and Zhizhan Xu

BRIEF REPORTS

Fundamental concepts

Combination of accurate atomic and molecular transition frequencies for sensitive detection of the m_p/m_e variance *(3 pages)* 024101
Masatoshi Kajita

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

Quantum information

Generation and discrimination of a type of four-partite entangled state *(4 pages)* 024301
Xin-Wen Wang and Guo-Jian Yang

Quantum nodes for W-state generation in noisy channels *(4 pages)* 024302
Jie Song, Yan Xia, and He-Shan Song

Classical states versus separable states *(4 pages)* 024303
Nan Li and Shunlong Luo

Schmidt measure is not fully additive for pure states *(3 pages)* 024304
W. Huang and Zhaohui Wei

Atomic and molecular collisions and interactions

Dissociative recombination of BH_2^+: The dominance of two-body breakup and an understanding of the fragmentation *(4 pages)* 024701
V. Zhaunerchyk, E. Vigren, W. D. Geppert, M. Hamberg, M. Danielsson, M. Kamińska, M. Larsson, R. D. Thomas, E. Bahati, and C. R. Vane

$(e,2e)$ study of Ca in coplanar symmetric geometry *(4 pages)* 024702
Y. Khajuria and P. C. Deshmukh

Charge transfer and excitation in slow proton collisions with sodium *(4 pages)* 024703
C. H. Liu, Y. Z. Qu, L. Liu, J. G. Wang, Y. Li, H.-P. Liebermann, P. Funke, and R. J. Buenker

Matter waves

Virial theorems for trapped cold atoms *(4 pages)* 025601
Félix Werner

Symplectic tomography of ultracold gases in tight waveguides *(4 pages)* 025602
A. del Campo, V. I. Man'ko, and G. Marmo

Splitting of doubly quantized vortices in dilute Bose-Einstein condensates *(2 pages)* 025603
K. Gawryluk, T. Karpiuk, M. Brewczyk, and K. Rzążewski

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

Quantum stochastic calculus approach to modeling double-pass atom-field coupling *(4 pages)* 025801
Gopal Sarma, Andrew Silberfarb, and Hideo Mabuchi

Quantum-classical correspondence for visibility, coherence, and relative phase for multidimensional systems *(4 pages)* 025802
Alfredo Luis

Entanglement criteria and classical correlations in parametric amplifiers *(4 pages)* 025803
Luciano Fonseca da Silva, Antonio Zelaquett Khoury, and Kaled Dechoum

High-efficiency photon-number-resolving multichannel detector *(4 pages)* 025804
Michal Mičuda, Ondřej Haderka, and Miroslav Ježek

Averaging of nonlinearity management with dissipation *(4 pages)* 025805
S. Beheshti, K. J. H. Law, P. G. Kevrekidis, and Mason A. Porter

(Continued)

PHYSICAL REVIEW A THIRD SERIES, VOLUME 78, NUMBER 2 AUGUST 2008

COMMENTS

Comment on "Electron-impact excitation of the $B\ ^1\Sigma_u^+$ and $C\ ^1\Pi_u$ electronic states of H_2" *(2 pages)* 026701
B. R. Lewis

ERRATA

Publisher's Note: Theory of correlations between ultracold bosons released from an optical lattice [Phys. Rev. A **78**, 013627 (2008)] *(1 page)* . . . . . 029901(E)
E. Toth, A. M. Rey, and P. B. Blakie

Erratum: Multislit interference patterns in high-order harmonic generation in C_{60} [Phys. Rev. A **76**, 063406 (2007)] *(1 page)* . . . . . 029902(E)
M. F. Ciappina, A. Becker, and A. Jaroń-Becker

Erratum: Photoassociation adiabatic passage of ultracold Rb atoms to form ultracold Rb_2 molecules [Phys. Rev. A **75**, 013405 (2007)] *(1 page)* . . . . . 029903(E)
Evgeny A. Shapiro, Moshe Shapiro, Avi Pe'er, and Jun Ye

Erratum: Vortex lattice stability and phase coherence in three-dimensional rapidly rotating Bose-Einstein condensates [Phys. Rev. A **70**, 033602 (2004)] *(2 pages)* . . . . . 029904(E)
S. Andrew Gifford and Gordon Baym

Publisher's Note: Exact spatial soliton solutions of the two-dimensional generalized nonlinear Schrödinger equation with distributed coefficients [Phys. Rev. A **78**, 023821 (2008)] *(1 page)* . . . . . 029905(E)
Wei-Ping Zhong, Rui-Hua Xie, Milivoj Belić, Nikola Petrović, and Goong Chen

Erratum: Torque on birefrigent plates induced by quantum fluctuations [Phys. Rev. A **71**, 042102 (2005)] *(1 page)* . . . . . 029906(E)
Jeremy N. Munday, Davide Iannuzzi, Yuri Barash, and Federico Capasso

Erratum: Corrections to the *ns* levels of the hydrogen atom in deformed space with minimal length [Phys. Rev. A **74**, 062105 (2006)] *(1 page)* . . . . . 029907(E)
M. M. Stetsko