

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 1N01
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 78, NUMBER 3
PARTS A AND B

CONTENTS

SEPTEMBER 2008

*The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 030001-032906, and Part B pages 033401-039907(E).*

PART A

EDITORIALS AND ANNOUNCEMENTS

- Editorial: *Physics* - spotlighting exceptional research (1 page) 030001
Gene D. Sprouse

RAPID COMMUNICATIONS

Quantum information

- Simple implementation of a quantum search with trapped ions (4 pages) 030301(R)
Svetoslav S. Ivanov, Peter A. Ivanov, and Nikolay V. Vitanov
- Quantum state redistribution based on a generalized decoupling (4 pages) 030302(R)
Ming-Yong Ye, Yan-Kui Bai, and Z. D. Wang

Atomic and molecular collisions and interactions

- Efimov states near a Feshbach resonance (4 pages) 030701(R)
P. Massignan and H. T. C. Stoof
- Motional resonances in a molecular synchrotron (4 pages) 030702(R)
Cynthia E. Heiner, Gerard Meijer, and Hendrick L. Bethlem
- Strong resonances in low-energy electron elastic total and differential cross sections for Hf and Lu atoms
(4 pages) 030703(R)
Z. Felfli, A. Z. Msezane, and D. Sokolovski

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

- Light-shift tomography in an optical-dipole trap for neutral atoms (4 pages) 031401(R)
J. P. Brantut, J. F. Clément, M. Robert de Saint Vincent, G. Varoquaux, R. A. Nyman, A. Aspect,
T. Bourdel, and P. Bouyer

Matter waves

- Single-atom box: Bosonic staircase and effects of parity (4 pages) 031601(R)
D. V. Averin, T. Bergeman, P. R. Hosur, and C. Bruder



Copyright 2008 by The American Physical Society

(Continued)



1050-2947(200809)78:3:B;1-S

Spin polarons and molecules in strongly interacting atomic Fermi gases (<i>4 pages</i>)	031602(R)
P. Massignan, G. M. Bruun, and H. T. C. Stoof	

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

Observation of diffraction-managed discrete solitons in curved waveguide arrays (<i>4 pages</i>)	031801(R)
Alexander Szameit, Ivan L. Garanovich, Matthias Heinrich, Alexander Minovich, Felix Dreisow, Andrey A. Sukhorukov, Thomas Pertsch, Dragomir N. Neshev, Stefan Nolte, Wieslaw Krolikowski, Andreas Tünnermann, Arnan Mitchell, and Yuri S. Kivshar	
Random quasi-phase-matching in a nonlinear photonic crystal structure of strontium tetraborate (<i>4 pages</i>)	031802(R)
A. S. Aleksandrovsky, A. M. Vyunishev, I. E. Shakhura, A. I. Zaitsev, and A. V. Zamkov	
Gap-soliton trapping in random one-dimensional gratings (<i>4 pages</i>)	031803(R)
Eduard N. Tsoy, C. Martijn de Sterke, and Fatkhulla Kh. Abdullaev	

ARTICLES

Fundamental concepts

Partial separability and entanglement criteria for multiqubit quantum states (<i>21 pages</i>)	032101
Michael Seevinck and Jos Uffink	
Space and momentum representation analysis of Hartman's effect in wave packet transmission (<i>6 pages</i>)	032102
María F. González, Josep Maria Bofill, Xavier Giménez, and F. Borondo	
$O(m\alpha^6)$ corrections to energy levels of positronium with nonvanishing orbital angular momentum (<i>22 pages</i>)	032103
Jacek Zatorski	
Quaternions, octonions, and Bell-type inequalities (<i>5 pages</i>)	032104
E. Shchukin and W. Vogel	
Quantum dynamics in nonequilibrium environments (<i>12 pages</i>)	032105
Clive Emary	
Quantum limits of measurements induced by multiplicative conservation laws: Extension of the Wigner-Araki-Yanase theorem (<i>7 pages</i>)	032106
Gen Kimura, Bernhard K. Meister, and Masanao Ozawa	
Bell inequalities for three particles (<i>7 pages</i>)	032107
Jing-Ling Chen, Chunfeng Wu, L. C. Kwek, and C. H. Oh	
Dynamical Casimir-Polder force between an atom and a conducting wall (<i>4 pages</i>)	032108
R. Vasile and R. Passante	
Measurements of the Casimir-Lifshitz force in fluids: The effect of electrostatic forces and Debye screening (<i>8 pages</i>)	032109
J. N. Munday, Federico Capasso, V. Adrian Parsegian, and Sergey M. Bezrukov	
Singular inverse square potential in arbitrary dimensions with a minimal length: Application to the motion of a dipole in a cosmic string background (<i>8 pages</i>)	032110
Djamil Bouaziz and Michel Bawin	
Beyond the simple proximity force approximation: Geometrical effects on the nonretarded Casimir interaction (<i>14 pages</i>)	032111
Bo E. Sernelius and C. E. Román-Velázquez	

More efficient Bell inequalities for Werner states (6 pages)	032112
T. Vértesi	
Strong violations of Bell-type inequalities for Werner-like states (5 pages)	032113
Christoph F. Wildfeuer and Jonathan P. Dowling	
Hardy's test versus the Clauser-Horne-Shimony-Holt test of quantum nonlocality: Fundamental and practical aspects (11 pages)	032114
Daniel Braun and Mahn-Soo Choi	
Dynamical screening of the Coulomb interaction for two confined electrons in a magnetic field (10 pages) . . .	032115
N. S. Simonović and R. G. Nazmitdinov	
Local realism, detection efficiencies, and probability polytopes (8 pages)	032116
J. Wilms, Y. Disser, G. Alber, and I. C. Percival	
Casimir interactions for anisotropic magnetodielectric metamaterials (16 pages)	032117
F. S. S. Rosa, D. A. R. Dalvit, and P. W. Milonni	
Incomplete quantum process tomography and principle of maximal entropy (8 pages)	032118
Mário Ziman	
Quantum information	
Maximally entangled fermions (12 pages)	032301
Dirk-M. Schlingemann, Marco Cozzini, Michael Keyl, and Lorenzo Campos Venuti	
Security proof for quantum-key-distribution systems with threshold detectors (6 pages)	032302
Toyohiro Tsurumaru and Kiyoshi Tamaki	
Optimal estimation of entanglement (9 pages)	032303
Marco G. Genoni, Paolo Giorda, and Matteo G. A. Paris	
Geometric measure of entanglement and shared quantum states (8 pages)	032304
Levon Tamaryan, DaeKil Park, Jin-Woo Son, and Sayatnova Tamaryan	
Dispersive atom-field interaction scheme for three-dimensional entanglement between two spatially separated atoms (6 pages)	032305
Xin-You Lü, Ji-Bing Liu, Chun-Ling Ding, and J.-H. Li	
Recurrence properties of unbiased coined quantum walks on infinite d -dimensional lattices (12 pages)	032306
M. Štefaňák, T. Kiss, and I. Jex	
Dynamics of axialized laser-cooled ions in a Penning trap (7 pages)	032307
E. S. Phillips, R. J. Hendricks, A. M. Abdulla, H. Ohadi, D. R. Crick, K. Koo, D. M. Segal, and R. C. Thompson	
Geometry of depolarizing channels (8 pages)	032308
Kuldeep Dixit and E. C. G. Sudarshan	
Operator fidelity susceptibility, decoherence, and quantum criticality (7 pages)	032309
Xiao-Ming Lu (陆晓铭), Zhe Sun (孙哲), Xiaoguang Wang (王晓光), and Paolo Zanardi	
Closed formula for the relative entropy of entanglement (7 pages)	032310
Adam Miranowicz and Satoshi Ishizaka	
Hamiltonian quantum cellular automata in one dimension (14 pages)	032311
Daniel Nagaj and Pawel Wocjan	

One-way quantum computing in optical lattices with many-atom addressing (<i>12 pages</i>)	032312
Timothy P. Friesen and David L. Feder	
Investigating a class of $2 \otimes 2 \otimes d$ bound entangled density matrices via linear and nonlinear entanglement witnesses constructed by exact convex optimization (<i>14 pages</i>)	032313
M. A. Jafarizadeh, Y. Akbari, K. Aghayar, A. Heshmati, and M. Mahdian	
Entanglement-enhanced quantum key distribution (<i>6 pages</i>)	032314
Olli Ahonen, Mikko Möttönen, and Jeremy L. O'Brien	
Quantum filtering of optical coherent states (<i>6 pages</i>)	032315
C. Wittmann, D. Elser, U. L. Andersen, R. Filip, P. Marek, and G. Leuchs	
Robust entanglement of a micromechanical resonator with output optical fields (<i>14 pages</i>)	032316
C. Genes, A. Mari, P. Tombesi, and D. Vitali	
Linear optical Fredkin gate based on partial-SWAP gate (<i>5 pages</i>)	032317
Jaromír Fiurášek	
Deterministic optical quantum computer using photonic modules (<i>9 pages</i>)	032318
Ashley M. Stephens, Zachary W. E. Evans, Simon J. Devitt, Andrew D. Greentree, Austin G. Fowler, William J. Munro, Jeremy L. O'Brien, Kae Nemoto, and Lloyd C. L. Hollenberg	
Finite-size corrections to entanglement in quantum critical systems (<i>9 pages</i>)	032319
F. C. Alcaraz and M. S. Sarandy	
Optimum unambiguous identification of d unknown pure qudit states (<i>5 pages</i>)	032320
Ulrike Herzog and János A. Bergou	
Increasing singlet fraction with entanglement swapping (<i>5 pages</i>)	032321
Joanna Modławska and Andrzej Grudka	
Experimental realization of the optimal universal and phase-covariant quantum cloning machines (<i>4 pages</i>)	032322
Jin-Shi Xu, Chuan-Feng Li, Lei Chen, Xu-Bo Zou, and Guang-Can Guo	
Coherent-feedback quantum control with a dynamic compensator (<i>5 pages</i>)	032323
Hideo Mabuchi	
Exact convergence times for generation of random bipartite entanglement (<i>4 pages</i>)	032324
Marko Žnidarič	
Coupling charge qubits via Raman transitions in circuit QED (<i>5 pages</i>)	032325
Zhi-Bo Feng	
Iterations of nonlinear entanglement witnesses (<i>10 pages</i>)	032326
Tobias Moroder, Otfried Gühne, and Norbert Lütkenhaus	
Quantum control via geometry: An explicit example (<i>5 pages</i>)	032327
Mile Gu, Andrew Doherty, and Michael A. Nielsen	
Adiabatic preparation without quantum phase transitions (<i>8 pages</i>)	032328
Gernot Schaller	
Entanglement spectrum in one-dimensional systems (<i>4 pages</i>)	032329
Pasquale Calabrese and Alexandre Lefevre	

Complementarity of private and correctable subsystems in quantum cryptography and error correction (5 pages)	032330
Dennis Kretschmann, David W. Kribs, and Robert W. Spekkens	
Quantum logic with quantized control fields beyond the $1/\bar{n}$ limit: Mathematically possible, physically unlikely (9 pages)	032331
Julio Gea-Banacloche and Mayo Miller	
Upper bound of the fully entangled fraction (4 pages)	032332
Ming Li, Shao-Ming Fei, and Zhi-Xi Wang	
Verification of the quantum-domain process using two nonorthogonal states (7 pages)	032333
Ryo Namiki	
Entanglement in a Raman-driven cascaded system (10 pages)	032334
C. Di Fidio and W. Vogel	
Physical underpinnings of privacy (12 pages)	032335
Joseph M. Renes and Jean-Christian Boileau	
Second-order shaped pulses for solid-state quantum computation (15 pages)	032336
Leonid P. Pryadko and Pinaki Sengupta	
Analytic treatment of controlled reversible inhomogeneous broadening quantum memories for light using two-level atoms (6 pages)	032337
J. J. Longdell, G. Hétet, P. K. Lam, and M. J. Sellars	
Atomic and molecular structure and dynamics	
Lifetime studies of Cs^*He_N exciplexes in solid ^4He (7 pages)	032501
P. Moroshkin, A. Hofer, V. Lebedev, and A. Weis	
Solution of the time-dependent Schrödinger equation using uniform complex scaling (17 pages)	032502
Jakob Bengtsson, Eva Lindroth, and Sølve Selstø	
Three-dimensional statistical reduction of the N -body Schrödinger equation for electrons with pairwise Coulomb interactions (5 pages)	032503
Boyan D. Obreshkov	
Measurement of the QED energy shift in the $1s^2 2p_{3/2} - 1s^2 2s_{1/2}$ x-ray transition in Li-like $^{208}\text{Pb}^{79+}$ (7 pages)	032504
Xuemei Zhang, Nobuyuki Nakamura, Chongyang Chen, Martin Andersson, Yong Liu, and Shunsuke Ohtani	
Ritz variational calculation for two-electron-one-photon transitions in helium (6 pages)	032505
S. Bhattacharyya, T. K. Mukherjee, J. K. Saha, and P. K. Mukherjee	
Analytic calculation of linear susceptibility in velocity-dependent pump-probe spectroscopy (7 pages)	032506
Geol Moon and Heung-Ryoul Noh	
Existence of a density functional for an intrinsic state (4 pages)	032507
B. G. Giraud, B. K. Jennings, and B. R. Barrett	
Determination of Sr properties for a high-accuracy optical clock (9 pages)	032508
S. G. Porsev, Andrew D. Ludlow, Martin M. Boyd, and Jun Ye	

Nonmonotonic behavior as a function of nuclear charge of the K -shell Auger and radiative rates and fluorescence yields along the $1s2s^22p^3$ isoelectronic sequence (6 pages)	032509
M. F. Hasoğlu, D. Nikolić, T. W. Gorczyca, S. T. Manson, M. H. Chen, and N. R. Badnell	
Variational reduced-density-matrix theory applied to the electronic structure of few-electron quantum dots (11 pages)	032510
Adam E. Rothman and David A. Mazziotti	
Frequency metrology on the $4s\ ^2S_{1/2}-4p\ ^2P_{1/2}$ transition in $^{40}\text{Ca}^+$ for a comparison with quasar data (6 pages)	032511
A. L. Wolf, S. A. van den Berg, C. Gohle, E. J. Salumbides, W. Ubachs, and K. S. E. Eikema	
Thermionic electron emission from SF_6^- (5 pages)	032512
Lars H. Andersen	
Ground-state hyperfine structure of the muonic helium atom (11 pages)	032513
A. A. Krutov and A. P. Martynenko	
Photoelectron satellite structure from the $3d$ and $4d$ inner-shell ionization of rubidium and cesium: Role of atomic relaxation (10 pages)	032514
S. Fritzsche, K. Jänkälä, M. Huttula, S. Urpelainen, and H. Aksela	
Hartree-Fock-Roothaan calculations for many-electron atoms and ions in neutron-star magnetic fields (11 pages)	032515
Dirk Engel and Günter Wunner	
Regularities in the behavior of dipole moment functions of diatomic molecules at very small internuclear separations (12 pages)	032516
M. A. Buldakov, E. V. Koryukina, V. N. Cherepanov, and Yu. N. Kalugina	
Laser-microwave double-resonance technique for g -factor measurements in highly charged ions (8 pages)	032517
W. Quint, D. L. Moskovkhin, V. M. Shabaev, and M. Vogel	
Fully relativistic density-functional-theory calculations of the electronic structures of MO_4 ($M=\text{Ru}$, Os , and element 108, Hs) and prediction of physisorption (5 pages)	032518
V. Pershina, J. Anton, and T. Jacob	
Second-order effects on the hyperfine structure of P states of alkali-metal atoms (7 pages)	032519
K. Beloy and A. Derevianko	
Nonrelativistic bound states at finite temperature: The hydrogen atom (13 pages)	032520
Miguel Ángel Escobedo and Joan Soto	
Dynamical Casimir effect for a massless scalar field between two concentric spherical shells (6 pages)	032521
F. Pascoal, L. C. Céleri, S. S. Mizrahi, and M. H. Y. Moussa	
Electric and magnetic susceptibilities of gaseous oxygen: Present data and modern theory compared (15 pages)	032522
Eric F. May, Michael R. Moldover, and James W. Schmidt	
Dynamical entanglement of vibrations in small molecules through an analytically algebraic approach (9 pages)	032523
Yan Liu, Yujun Zheng, Weiyi Ren, and Shiliang Ding	
Oscillator strength measurements of the $3p^5(^2P_{1/2})\ nd'[3/2]_2$ and $[5/2]_{2,3}$ autoionizing resonances in argon (9 pages)	032524
M. A. Baig, S. Mahmood, Rafia Mumtaz, M. Rafiq, M. A. Kalyar, S. Hussain, and R. Ali	

Atomic and molecular collisions and interactions

Absolute cross sections for dissociative electron attachment to HCl, HBr, and their deuterated analogs (6 pages)	032701
J. Fedor, O. May, and M. Allan	
Feshbach-resonance-mediated positron annihilation in small molecules (14 pages)	032702
J. A. Young and C. M. Surko	
Angular distribution of the dielectronic satellite lines from relativistic high-Z ions: Multipole-mixing effects (9 pages)	032703
Stephan Fritzsche, Nikolay M. Kabachnik, and Andrey Surzhykov	
Time-dependent density-functional-theory calculation of the van der Waals coefficient C_6 of alkali-metal atoms Li, Na, K; alkali-metal dimers Li_2 , Na_2 , K_2 ; sodium clusters Na_n ; and fullerene C_{60} (9 pages)	032704
Arup Banerjee, Jochen Autschbach, and Aparna Chakrabarti	
Energy dependence of angular momentum capture states in charge exchange collisions between slow highly charged argon ions and argon neutrals (7 pages)	032705
F. I. Allen, C. Biedermann, R. Radtke, G. Fussmann, and S. Fritzsche	
Effect of electron correlations on the excitation of neutral states of zinc in the autoionizing region: A photon emission study (10 pages)	032706
S. A. Napier, D. Cvejanović, J. F. Williams, and L. Pravica	
Cryogenic buffer-gas loading and magnetic trapping of CrH and MnH molecules (8 pages)	032707
Michael Stoll, Joost M. Bakker, Timothy C. Steimle, Gerard Meijer, and Achim Peters	
Antiproton collisions with molecular hydrogen (10 pages)	032708
Armin Lühr and Alejandro Saenz	
Measurements of the total charge-changing cross sections for collisions of target gases with a 1-MeV K^+ -ion beam (5 pages)	032709
Michel Kireeff Covo, Igor D. Kaganovich, Ariel Shnidman, Arthur W. Molvik, and Jasmina L. Vujic	
Absolute cross sections for the ionization-excitation of helium by electron impact (11 pages)	032710
S. Bellm, J. Lower, E. Weigold, I. Bray, D. V. Fursa, K. Bartschat, A. L. Harris, and D. H. Madison	
Tunneling of a diatomic molecule with many bound states (8 pages)	032711
Jeff Hnybida and Mark R. A. Shegelski	

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

Energy loss versus exit angle for H^+ and He^+ ions channeled in Au $\langle 100 \rangle$ at very low energies, and observation of a molecular effect for incident H_2^+ (9 pages)	032901
E. A. Figueroa, E. D. Cantero, J. C. Eckardt, G. H. Lantschner, M. L. Martiarena, and N. R. Arista	
Electronic density corrugation and crystal azimuthal orientation effects on energy losses of hydrogen ions in grazing scattering on a Ag(110) surface (15 pages)	032902
J. E. Valdés, P. Vargas, C. Celedón, E. Sánchez, L. Guillemot, and V. A. Esaulov	
Theory for time-resolved measurements of laser-induced electron emission from metal surfaces (7 pages)	032903
J. C. Baggesen and L. B. Madsen	
Energy-loss straggling of helium projectiles at low kinetic energies: Deconvolution of concentration depth profiles of inorganic salt solutes in aqueous solutions (8 pages)	032904
Gunther Andersson, Harald Morgner, and Hartwig Pohl	

(Continued)

Ground-state energy shift of He close to a surface and its relation with the scattering potential: A confinement model (9 pages)	032905
S. A. Cruz, E. Ley-Koo, and R. Cabrera-Trujillo	
Quantum reflection: The invisible quantum barrier (6 pages)	032906
J. X. de Carvalho, M. S. Hussein, and Weibin Li	

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

Triple photoionization of lithium up to 650 eV photon energy (4 pages)	033401
P. N. Juranić and R. Wehlitz	
Analytic model for electrostatic fields in surface-electrode ion traps (8 pages)	033402
M. G. House	
Anisotropy-dependent circular polarization spectroscopy (8 pages)	033403
S. B. Bayram and R. Marhatta	
Low-frequency atomic stabilization and dichotomy in superintense laser fields from the high-intensity high-frequency Floquet theory (12 pages)	033404
M. Gavrilă, I. Simbotin, and M. Stroe	
Low-frequency atomic stabilization and dichotomy in superintense laser fields: Full Floquet results (11 pages)	033405
M. Stroe, I. Simbotin, and M. Gavrilă	
Theory of Raman transitions in cavity QED (14 pages)	033406
A. D. Boozer	
Laser-assisted orientation-dependent selection of molecules as a tool of symmetry breaking in isotropic molecular ensembles (9 pages)	033407
Dmitry V. Zhdanov and Victor N. Zadkov	
Muon pair creation from positronium in a linearly polarized laser field (19 pages)	033408
Carsten Müller, Karen Z. Hatsagortsyan, and Christoph H. Keitel	
Stark-chirped rapid adiabatic passage among a three-state molecular system: Experimental and numerical investigations (13 pages)	033409
Martin Oberst, Holger Münch, Gayane Grigoryan, and Thomas Halfmann	
Molecular orbital tomography using short laser pulses (5 pages)	033410
Elmar V. van der Zwan, Ciprian C. Chirilă, and Manfred Lein	
Numerical study on high-order harmonic generation by a Bessel-Gauss laser beam (11 pages)	033411
T. Augustine, O. Gobert, and B. Carré	
Strong-field approximation for ionization of a diatomic molecule by a strong laser field. II. The role of electron rescattering off the molecular centers (11 pages)	033412
M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker	
Recollision-induced plasmon excitation in strong laser fields (9 pages)	033413
M. Ruggenthaler, S. V. Popruzhenko, and D. Bauer	
Quantum Pareto optimal control (15 pages)	033414
Raj Chakrabarti, Rebing Wu, and Herschel Rabitz	

(Continued)

Optically induced fictitious magnetic trap on an atom chip (5 pages)	033415
G. Q. Yang (杨国卿), H. Yan (颜辉), T. Shi (石涛), J. Wang (王谨), and M. S. Zhan (詹明生)	
Experimental investigations of stimulated Raman adiabatic passage in a doped solid (9 pages)	033416
Jens Klein, Fabian Beil, and Thomas Halfmann	
Optimized adiabatic passage with dephasing (7 pages)	033417
X. Lacour, S. Guérin, and H. R. Jauslin	
Properties of magnetic sublevel coherences for precision measurements (13 pages)	033418
I. Chan, A. Andreyuk, S. Beattie, B. Barrett, C. Mok, M. Weel, and A. Kumarakrishnan	
Azimuthal-angle dependence of L x-ray intensity following photoionization of Pb, Au, and W atoms by a linearly polarized photon (8 pages)	033419
Y. Namito, S. Ban, and H. Hirayama	
Light-assisted collisional loss in a $^{85/87}\text{Rb}$ ultracold optical trap (7 pages)	033420
Anthony R. Gorges, Nicholas S. Bingham, Michael K. DeAngelo, Mathew S. Hamilton, and Jacob L. Roberts	
Stark deceleration of OH radicals in low-field-seeking and high-field-seeking quantum states (8 pages)	033421
Kirstin Wohlfart, Frank Filsinger, Fabian Grätz, Jochen Küpper, and Gerard Meijer	
Angle-resolved photoion yield and resonant Auger spectroscopy for the doubly excited Rydberg states above the C 1s threshold of CO (10 pages)	033422
M. Kitajima, R. Püttner, S. L. Sorensen, T. Tanaka, M. Hoshino, H. Fukuzawa, A. De Fanis, Y. Tamenori, R. Sankari, M. N. Piancastelli, H. Tanaka, and K. Ueda	
Influence of orbital symmetry on high-order-harmonic generation and quantum tomography (10 pages)	033423
G. N. Gibson and J. Biegert	
Theoretical optimization and prediction in the experimental search space for vibrational quantum processes (10 pages)	033424
C. Gollub and R. de Vivie-Riedle	
Energy distribution and cooling of a single atom in an optical tweezer (9 pages)	033425
C. Tuchendler, A. M. Lance, A. Browaeys, Y. R. P. Sortais, and P. Grangier	
Controllable electrostatic guiding for cold polar molecules on the surface of a chip (10 pages)	033426
Min Sun and Jianping Yin	
Effect of the geometric phase on the possible measurement of the electron's electric dipole moment using molecules confined by a Stark gravitational trap (10 pages)	033427
Milinda Rupasinghe and N. E. Shafer-Ray	
Double photoionization of magnesium from threshold to 54 eV photon energy (5 pages)	033428
R. Wehlitz, P. N. Juranić, and D. V. Lukić	
Trapping of ultracold atoms in a hollow-core photonic crystal fiber (4 pages)	033429
Caleb A. Christensen, Sebastian Will, Michele Saba, Gyu-Boong Jo, Yong-Il Shin, Wolfgang Ketterle, and David Pritchard	
High kinetic energy release upon dissociation and ionization of an N_2^+ beam by intense few-cycle laser pulses (9 pages)	033430
B. Gaire, J. McKenna, A. M. Sayler, Nora G. Johnson, E. Parke, K. D. Carnes, B. D. Esry, and I. Ben-Itzhak	

Bound-free e^+e^- pair creation with a linearly polarized laser field and a nuclear field (10 pages)	033431
C. Deneke and C. Müller	
Interference substructure of above-threshold ionization peaks in the stabilization regime (8 pages)	033432
Koudai Toyota, Oleg I. Tolstikhin, Toru Morishita, and Shinichi Watanabe	
Loss of molecules in magneto-electrostatic traps due to nonadiabatic transitions (11 pages)	033433
Manuel Lara, Benjamin L. Lev, and John L. Bohn	
Hyperfine energy levels of alkali-metal dimers: Ground-state polar molecules in electric and magnetic fields (8 pages)	033434
J. Aldegunde, Ben A. Rivington, Piotr S. Żuchowski, and Jeremy M. Hutson	
Matter waves	
Bose-Fermi pair correlations in attractively interacting Bose-Fermi atomic mixtures (13 pages)	033601
Takayuki Watanabe, Toru Suzuki, and Peter Schuck	
p band in a rotating optical lattice (7 pages)	033602
R. O. Umucalılar and M. Ö. Oktel	
Stable three-dimensional spatially modulated vortex solitons in Bose-Einstein condensates (4 pages)	033603
Volodymyr M. Lashkin	
Effect of fluctuations on the superfluid-supersolid phase transition on the lattice (5 pages)	033604
Ralf Schützhold, Michael Uhlmann, and Uwe R. Fischer	
Dynamical Casimir effect for magnons in a spinor Bose-Einstein condensate (7 pages)	033605
Hiroki Saito and Hiroyuki Hyuga	
Subdiffractive solitons of Bose-Einstein condensates in time-dependent optical lattices (5 pages)	033606
K. Staliunas and S. Longhi	
Quantum Monte Carlo study of one-dimensional trapped fermions with attractive contact interactions (10 pages)	033607
Michele Casula, D. M. Ceperley, and Erich J. Mueller	
Probing local relaxation of cold atoms in optical superlattices (17 pages)	033608
A. Flesch, M. Cramer, I. P. McCulloch, U. Schollwöck, and J. Eisert	
Anisotropic instabilities in trapped spinor Bose-Einstein condensates (8 pages)	033609
M. Baraban, H. F. Song, S. M. Girvin, and L. I. Glazman	
Bright solitary waves in a Bose-Einstein condensate and their interactions (5 pages)	033610
K. Kärkkäinen, A. D. Jackson, and G. M. Kavoulakis	
Scattering and binding of different atomic species in a one-dimensional optical lattice (4 pages)	033611
Rune T. Piil, Nicolai Nygaard, and Klaus Mølmer	
Two-component repulsive Fermi gases with population imbalance in elongated harmonic traps (5 pages)	033612
M. Colomé-Tatché	
Phase diagram of a cold polarized Fermi gas in two dimensions (11 pages)	033613
Lianyi He and Pengfei Zhuang	
Radio-frequency spectroscopy of a strongly imbalanced Feshbach-resonant Fermi gas (9 pages)	033614
Martin Veillette, Eun Gook Moon, Austen Lamacraft, Leo Radzihovsky, Subir Sachdev, and D. E. Sheehy	

Phase diagram, extended domain walls, and soft collective modes in a three-component fermionic superfluid (15 pages)	033615
G. Catelani and E. A. Yuzbashyan	
Centrifugal quantum states of neutrons (9 pages)	033616
V. V. Nesvizhevsky, A. K. Petukhov, K. V. Protasov, and A. Yu. Voronin	
Adiabatic condition for coherent atom-heteronuclear-molecule conversion (8 pages)	033617
H. Jing, F. Zheng, Y. Jiang, and Z. Geng	
Origin of macroscopic single-particle quantum behavior in Bose-Einstein-condensed systems (12 pages)	033618
J. Mayers	
Superfluid and Mott-insulator phases of one-dimensional Bose-Fermi mixtures (8 pages)	033619
A. Zujev, A. Baldwin, R. T. Scalettar, V. G. Rousseau, P. J. H. Denteneer, and M. Rigol	
Superfluid pairing between fermions with unequal masses (16 pages)	033620
M. A. Baranov, C. Lobo, and G. V. Shlyapnikov	
Quantum optics, physics of lasers, nonlinear optics, classical optics	
Two-photon beating experiment using biphotons generated from a two-level system (5 pages)	033801
Jianming Wen, Shengwang Du, Morton H. Rubin, and Eun Oh	
Solitons and vortices in honeycomb defocusing photonic lattices (13 pages)	033802
K. J. H. Law, H. Susanto, and P. G. Kevrekidis	
Two-pulse propagation in a partially phase-coherent medium (13 pages)	033803
B. D. Clader and J. H. Eberly	
Femtosecond filamentation in turbulent air (9 pages)	033804
A. Houard, M. Franco, B. Prade, A. Durécu, L. Lombard, P. Bourdon, O. Vasseur, B. Fleury, C. Robert, V. Michau, A. Couairon, and A. Mysyrowicz	
Rotational Doppler effect in left-handed materials (6 pages)	033805
Hailu Luo, Shuangchun Wen, Weixing Shu, Zhixiang Tang, Yanhong Zou, and Dianyuan Fan	
Efficient spatially resolved multimode quantum memory (9 pages)	033806
K. Surmacz, J. Nunn, K. Reim, K. C. Lee, V. O. Lorenz, B. Sussman, I. A. Walmsley, and D. Jaksch	
Low-light-level all-optical switching based on stored light pulses (7 pages)	033807
Wei-Hsun Lin, Wen-Te Liao, Chang-Yi Wang, Yen-Feng Lee, and Ite A. Yu	
Effective single-photon generator via entanglement between emitter and field of a photonic-crystal reservoir near the band edge (5 pages)	033808
D. Mogilevtsev and S. Kilin	
Toward quantum frequency combs: Boosting the generation of highly nonclassical light states by cavity-enhanced parametric down-conversion at high repetition rates (4 pages)	033809
Alessandro Zavatta, Valentina Parigi, and Marco Bellini	
Composition law for polarizers (14 pages)	033810
J. Lages, R. Giust, and J.-M. Vigoureux	
Two-channel interaction of squeeze-transformed modes with dressed atoms: Entanglement enhancement in four-wave mixing in three-level systems (9 pages)	033811
Guangling Cheng, Xiangming Hu, Wenxue Zhong, and Qian Li	

Circuits for light in holographically defined photonic-band-gap materials (<i>13 pages</i>)	033812
Timothy Y. M. Chan and Sajeew John	
Dynamical constants for electromagnetic fields with elliptic-cylindrical symmetry (<i>7 pages</i>)	033813
B. M. Rodríguez-Lara and R. Jáuregui	
Harmonic generation: Quantum-electrodynamical theory of the harmonic photon-number spectrum (<i>4 pages</i>)	033814
D. J. Diestler	
Polarization-resolved angular patterns of nematic liquid crystal cells: Topological events driven by incident light polarization (<i>16 pages</i>)	033815
Alexei D. Kiselev, Roman G. Vovk, Roman I. Egorov, and Vladimir G. Chigrinov	
Theory of the unknown boundary electro-optical effect in near-field optics (<i>7 pages</i>)	033816
I. Banno and K. Fujima	
Polarization time and length for random optical beams (<i>6 pages</i>)	033817
Tero Setälä, Andriy Shevchenko, Matti Kaivola, and Ari T. Friberg	
Spatiotemporal quasisolitons and resonant radiation in arrays of silicon-on-insulator photonic wires (<i>8 pages</i>)	033818
C. J. Benton, A. V. Gorbach, and D. V. Skryabin	
Experimental high-intensity three-photon entangled source (<i>4 pages</i>)	033819
Huai-Xin Lu, Jun Zhang, Xiao-Qin Wang, Ying-De Li, and Chun-Yan Wang	
Generation of decoherence-free displaced squeezed states of radiation fields and a squeezed reservoir for atoms in cavity QED (<i>7 pages</i>)	033820
T. Werlang, R. Guzmán, F. O. Prado, and C. J. Villas-Bôas	
Pulse shaping to generate an xuv supercontinuum in the high-order harmonic plateau region (<i>6 pages</i>)	033821
Yan Peng and Heping Zeng	
Thermal phonon resonance in nitrogen gas observed by Brillouin scattering (<i>4 pages</i>)	033822
Yasuo Minami, Takeshi Yogi, and Keiji Sakai	
Modification of the absorption spectrum by stochastic-noise-induced quantum interference (<i>6 pages</i>)	033823
Qing Xu	
Quasichaotic optical multipass cell (<i>7 pages</i>)	033824
Dongxia Qu and Claire Gmachl	
Generation and control of extreme blueshifted continuum peaks in optical Kerr media (<i>6 pages</i>)	033825
D. Faccio, A. Averchi, A. Lotti, M. Kolesik, J. V. Moloney, A. Couairon, and P. Di Trapani	
Few-cycle laser-pulse collapse in Kerr media: The role of group-velocity dispersion and X-wave formation (<i>7 pages</i>)	033826
Daniele Faccio, Matteo Clerici, Alessandro Averchi, Antonio Lotti, Ottavia Jedrkiewicz, Audrius Dubietis, Gintaras Tamosauskas, Arnaud Couairon, Francesca Bragheri, Dimitris Papazoglou, Stelios Tzortzakis, and Paolo Di Trapani	
Generalized reflection and transmission of beams (<i>8 pages</i>)	033827
Hui Yu, Xiaoqing Jiang, Jianyi Yang, Wei Qi, and Minghua Wang	
Analysis of the polarization dynamics in a multitransverse-mode vertical-cavity surface-emitting laser with isotropic optical feedback (<i>11 pages</i>)	033828
Angel Valle, Hong Lin, Zachary J. Lapin, and Binit Malla	

Conditional Talbot effect using a quantum two-photon state (<i>4 pages</i>)	033829
I. Vidal, S. B. Cavalcanti, E. J. S. Fonseca, and J. M. Hickmann	
Absolute frequency measurement of the magnesium intercombination transition $^1S_0 \rightarrow ^3P_1$ (<i>7 pages</i>)	033830
Jan Friebe, André Pape, Matthias Riedmann, Karsten Moldenhauer, Tanja Mehlstäubler, Nils Rehbein, Christian Lisdat, Ernst M. Rasel, Wolfgang Ertmer, Harald Schnatz, Burghard Lipphardt, and Gesine Grosche	
Statistics of multiphoton events in spontaneous parametric down-conversion (<i>8 pages</i>)	033831
Wojciech Wasilewski, Czesław Radzewicz, Robert Frankowski, and Konrad Banaszek	
Detecting hidden differences via permutation symmetries (<i>10 pages</i>)	033832
R. B. A. Adamson, P. S. Turner, M. W. Mitchell, and A. M. Steinberg	
Jahn-Teller systems from a cavity QED perspective (<i>10 pages</i>)	033833
Jonas Larson	
Analogs of quantum-Hall-effect edge states in photonic crystals (<i>21 pages</i>)	033834
S. Raghu and F. D. M. Haldane	
Robust pedestal-free pulse compression in cubic-quintic nonlinear media (<i>12 pages</i>)	033835
K. Senthilnathan, Qian Li, K. Nakkeeran, and P. K. A. Wai	
Resolution of ghost imaging for nondegenerate spontaneous parametric down-conversion (<i>7 pages</i>)	033836
Morton H. Rubin and Yanhua Shih	
Propagation of nonclassical optical radiation through a semiconductor slab (<i>8 pages</i>)	033837
D. Yu. Vasylyev, W. Vogel, K. Henneberger, T. Schmielau, and D.-G. Welsch	
Two-color interband and intraband quantum well heterolaser (<i>9 pages</i>)	033838
V. A. Kukushkin	
Investigations of a coherently driven semiconductor optical cavity QED system (<i>18 pages</i>)	033839
Kartik Srinivasan, Christopher P. Michael, Raviv Perahia, and Oskar Painter	
Probing electron transfer within alkali-metal halides via high-order harmonic generation (<i>5 pages</i>)	033840
Michael Spanner and Paul Brumer	
Fine interference fringes formed in high-order harmonic spectra generated by infrared driving laser pulses (<i>4 pages</i>)	033841
Han Xu, Hui Xiong, Zhinan Zeng, Yuxi Fu, Jinping Yao, Ruxin Li, Ya Cheng, and Zhizhan Xu	

BRIEF REPORTS

Fundamental concepts

Entanglement-induced sub-Planck phase-space structures (<i>4 pages</i>)	034101
Jitesh R. Bhatt, Prasanta K. Panigrahi, and Manan Vyas	

Quantum information

Local complementation rule for continuous-variable four-mode unweighted graph states (<i>4 pages</i>)	034301
Jing Zhang	
Negativity and momentum entanglement in Bardeen-Cooper-Schrieffer states at finite temperature (<i>4 pages</i>)	034302
Chun Kit Chung and C. K. Law	

Classification of depolarized maps (<i>4 pages</i>)	034303
Haidong Yuan and Lluís Masanes	
Quantum gates with atomic ensembles on an atom chip (<i>4 pages</i>)	034304
Hui Yan, Guoqing Yang, Tao Shi, Jin Wang, and Mingsheng Zhan	
Atomic and molecular collisions and interactions	
High-precision calculation of the dispersion coefficients of ground-state hydrogen using a variationally stable approach (<i>4 pages</i>)	034701
Mauro Masili and R. J. Gentil	
Elastic electron scattering from neon at backward angles (<i>4 pages</i>)	034702
H. Cho, R. P. McEachran, S. J. Buckman, and H. Tanaka	
Photon, electron, atom, and molecule interactions with solids and surfaces	
Method for measuring surface-interaction parameters of spin-polarized Rb atoms on coated Pyrex glass surfaces using edge enhancement (<i>4 pages</i>)	034901
K. F. Zhao, M. Schaden, and Z. Wu	
Atomic and molecular processes in external fields, including interactions with strong fields and short pulses	
Strong-field impulsive alignment in the presence of high temperatures and large centrifugal distortion (<i>3 pages</i>)	035401
D. W. Broege, R. N. Coffee, and P. H. Bucksbaum	
Matter waves	
Spin collective modes of two-species Fermi liquids: ^3He and atomic gases near the Feshbach resonance (<i>4 pages</i>)	035601
H. P. Dahal, S. Gaudio, J. D. Feldmann, and K. S. Bedell	
Cooper problem in a lattice (<i>4 pages</i>)	035602
J.-P. Martikainen	
Criterion for Bose-Einstein condensation in traps and self-bound systems (<i>4 pages</i>)	035603
T. Yamada, Y. Funaki, H. Horiuchi, G. Röpke, P. Schuck, and A. Tohsaki	
Quantum optics, physics of lasers, nonlinear optics, classical optics	
Band edge states of the $\langle n \rangle = 0$ gap of Fibonacci photonic lattices (<i>4 pages</i>)	035801
A. Bruno-Alfonso, E. Reyes-Gómez, S. B. Cavalcanti, and L. E. Oliveira	
Labyrinthine patterns on an inhomogeneous background in a nonlinear optical system (<i>4 pages</i>)	035802
J. Schüttler, I. Babushkin, and W. Lange	

COMMENTS

Comment on “SO(4) symmetry in the relativistic hydrogen atom” (<i>1 page</i>)	036101
A. A. Stahlhofen	

(Continued)

Comment on “Electron structure of a dipole-bound anion confined in a spherical box” and “Addendum to ‘Electron structure of a dipole-bound anion confined in a spherical Box’: The case of a finite dipole” (2 pages)	036102
E. Ley-Koo	
Comment on “Observation of higher-order diffraction features in self-assembled photonic crystals” (2 pages)	037801
Luis A. Dorado, Ricardo A. Depine, and Hernán Míguez	
Reply to “Comment on ‘Observation of higher-order diffraction features in self-assembled photonic crystals’ ” (2 pages)	037802
Rajesh V. Nair and R. Vijaya	

ERRATA

Erratum: Atomic electric-dipole moments from Higgs-boson-mediated interactions [Phys. Rev. A 78 , 010501 (2008)] (1 page)	039901(E)
B. K. Sahoo, B. P. Das, Rajat K. Chaudhuri, Debashis Mukherjee, and E. P. Venugopal	
Publisher’s Note: Experimental high-intensity three-photon entangled source [Phys. Rev. A 78 , 033819 (2008)] (1 page)	039902(E)
Huai-Xin Lu, Jun Zhang, Xiao-Qin Wang, Ying-De Li, and Chun-Yan Wang	
Publisher’s Note: Thermal phonon resonance in nitrogen gas observed by Brillouin scattering [Phys. Rev. A 78 , 033822 (2008)] (1 page)	039903(E)
Yasuo Minami, Takeshi Yogi, and Keiji Sakai	
Publisher’s Note: Entanglement-enhanced quantum key distribution [Phys. Rev. A 78 , 032314 (2008)] (1 page)	039904(E)
Olli Ahonen, Mikko Möttönen, and Jeremy L. O’Brien	
Publisher’s Note: Two-dimensional Whittaker solitons in nonlocal nonlinear media [Phys. Rev. A 78 , 013826 (2008)] (1 page)	039905(E)
Wei-Ping Zhong, Milivoj Belić, Rui-Hua Xie, and Goong Chen	
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)	039906(E)
Wei-Ping Zhong, Rui-Hua Xie, Milivoj Belić, Nikola Petrović, and Goong Chen	
Publisher’s Note: Ground-state reference systems for expanding correlated fermions in one dimension [Phys. Rev. A 78 , 013620 (2008)] (1 page)	039907(E)
F. Heidrich-Meisner, M. Rigol, A. Muramatsu, A. E. Feiguin, and E. Dagotto	