PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Fabry-Perot microcavity for diamond-based photonics *(11 pages)* 043844
Erika Janitz, Maximilian Ruf, Mark Dimock, Alexandre Bourassa, Jack Sankey, and Lilian Childress

Quantum state transfer in cavity electro-optic modulators *(12 pages)* 043845
Sumei Huang

COMMENTS

Comment on "Bit-string oblivious transfer based on quantum state computational distinguishability" *(2 pages)* . . . 046301
Guang Ping He

Reply to "Comment on 'Bit-string oblivious transfer based on quantum state computational distinguishability' " *(4 pages)* 046302
A. Souto, P. Mateus, P. Adão, and N. Paunković

ERRATA

Erratum: Orientation dynamics of asymmetric rotors using random phase wave functions [Phys. Rev. A **91**, 063420 (2015)] *(1 page)* . . . . . 049901(E)
Shimshon Kallush and Sharly Fleischer

Erratum: Temporal dissipative solitons in a three-level atomic medium confined in a photonic-band-gap fiber [Phys. Rev. A **91**, 013828 (2015)] *(1 page)* . . . . . 049902(E)
M. Facão, S. Rodrigues, and M. I. Carvalho

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Coherence in a cold-atom photon switch *(6 pages)* 043828
Weibin Li and Igor Lesanovsky

Stabilization of flat-mirror vertical-external-cavity surface-emitting lasers by spatiotemporal modulation of the pump profile *(8 pages)* 043829
W. W. Ahmed, S. Kumar, R. Herrero, M. Botey, M. Radziunas, and K. Staliunas

Enhanced nonlinear optics in coupled optical microcavities with an unbroken and broken parity-time symmetry *(9 pages)* 043830
Jiahua Li, Xiaogui Zhan, Chunling Ding, Duo Zhang, and Ying Wu

Precision estimation of source dimensions from higher-order intensity correlations *(12 pages)* 043831
M. E. Pearce, T. Mehringer, J. von Zanthier, and P. Kok

Nonlinear coupling in discrete optical waveguide arrays with quadratic nonlinearity *(7 pages)* 043832
Frank Setzpfandt, Wolfgang Sohler, Roland Schiek, and Thomas Pertsch

Nonlinear mechanisms for multistability in microring lasers *(8 pages)* 043833
Guohui Yuan and Zhuoran Wang

Coupled-mode approach to square-gradient Bragg-reflection resonances in corrugated dielectric waveguides *(9 pages)* 043834
Otto Dietz, Günter Kewes, Oliver Neitzke, and Oliver Benson

Fundamental limitation of ultrastrong coupling between light and atoms *(6 pages)* 043835
András Vukics, Tobias Grießer, and Peter Domokos

Quantum-state purity of heralded single photons produced from frequency-anticorrelated biphotons *(5 pages)* . . . 043836
Shengwang Du

Comb generation using multiple compression points of Peregrine rogue waves in periodically modulated nonlinear Schrödinger equations *(6 pages)* 043837
C. G. L. Tiofack, S. Coulibaly, M. Taki, S. De Bièvre, and G. Dujardin

Zero to π continuously controllable cross-phase modulation in a Doppler-broadened N-type electromagnetically-induced-transparency medium *(5 pages)* 043838
R. B. Li, C. J. Zhu, L. Deng, and E. W. Hagley

Shaping finite-energy diffraction- and attenuation-resistant beams through Bessel-Gauss–beam superposition *(9 pages)* 043839
M. Zamboni-Rached and Mo Mojahedi

Relaxation oscillations in a semiconductor quantum-dot laser *(5 pages)* 043840
I. V. Koryukin

Quantum-optical nonlinearities induced by Rydberg-Rydberg interactions: A perturbative approach *(10 pages)* . . . 043841
A. Grankin, E. Brion, E. Bimbard, R. Boddeda, I. Usmani, A. Ourjoumtsev, and P. Grangier

Strong photon blockade with intracavity electromagnetically induced transparency in a blockaded Rydberg ensemble *(5 pages)* 043842
G. W. Lin, Y. H. Qi, X. M. Lin, Y. P. Niu, and S. Q. Gong

Optical torque: Electromagnetic spin and orbital-angular-momentum conservation laws and their significance *(18 pages)* 043843
Manuel Nieto-Vesperinas

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Twofold decoherence brought on by the phonon bath in a quantum-dot two-state system *(6 pages)* 043811
Zhi-De Chen

Remote macroscopic entanglement on a photonic crystal architecture *(9 pages)* 043812
H. Flayac, M. Minkov, and V. Savona

Realization of arbitrary discrete unitary transformations using spatial and internal modes of light *(8 pages)* 043813
Ish Dhand and Sandeep K. Goyal

Fano resonances and band structure of two-dimensional photonic structures *(6 pages)* 043814
Peter Markoš

Nonlinear absorption and phase shift in coupled optical cavities *(5 pages)* 043815
T. Hasegawa

Ghost imaging via optical parametric amplification *(7 pages)* 043816
Hong-Guo Li, De-Jian Zhang, De-Qin Xu, Qiu-Li Zhao, Sen Wang, Hai-Bo Wang, Jun Xiong, and Kaige Wang

Atom-based coherent quantum-noise cancellation in optomechanics *(6 pages)* 043817
F. Bariani, H. Seok, S. Singh, M. Vengalattore, and P. Meystre

Spatiotemporal dynamics of Kerr-Raman optical frequency combs *(4 pages)* 043818
Yanne K. Chembo, Ivan S. Grudinin, and Nan Yu

Directional spontaneous emission and lateral Casimir-Polder force on an atom close to a nanofiber *(8 pages)* 043819
Stefan Scheel, Stefan Yoshi Buhmann, Christoph Clausen, and Philipp Schneeweiss

Enhanced THz transmission and imaging of a subwavelength slit via light-induced diffraction *(7 pages)* 043820
R. I. Stantchev, S. M. Hornett, P. A. Hobson, and E. Hendry

Quantum correlation in degenerate optical parametric oscillators with mutual injections *(13 pages)* 043821
Kenta Takata, Alireza Marandi, and Yoshihisa Yamamoto

Suppression of Rabi oscillations in hybrid optomechanical systems *(8 pages)* 043822
Timo Holz, Ralf Betzholz, and Marc Bienert

Chiral route to pulling optical forces and left-handed optical torques *(9 pages)* 043823
Antoine Canaguier-Durand and Cyriaque Genet

Optical theorem for nonlinear media *(13 pages)* 043824
Wei Li and John C. Schotland

Application of the weak-measurement technique to study atom-vacuum interactions *(6 pages)* 043825
M. Zhang and S. Y. Zhu

Coherent optical control of polarization with a critical metasurface *(7 pages)* 043826
Ming Kang and Y. D. Chong

Circularly polarized high harmonics generated by a bicircular field from inert atomic gases in the p state: A tool for exploring chirality-sensitive processes *(9 pages)* 043827
D. B. Milošević

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Thermodynamics, density profiles, and correlation functions of the inhomogeneous one-dimensional spinor Bose gas *(19 pages)* 043631
Ovidiu I. Pâţu and Andreas Klümper

Quantum versus mean-field collapse in a many-body system *(7 pages)* 043632
G. E. Astrakharchik and B. A. Malomed

Multicriticality, metastability, and the roton feature in Bose-Einstein condensates with three-dimensional spin-orbit coupling *(5 pages)* 043633
Renyuan Liao, Oleksandr Fialko, Joachim Brand, and Ulrich Zülicke

Nonequilibrium dynamics of spin-orbit-coupled lattice bosons *(7 pages)* 043634
H. T. Ng

Variational Monte Carlo study of soliton excitations in hard-sphere Bose gases *(5 pages)* 043635
R. Rota and S. Giorgini

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

Universal form of the carrier frequency of scalar and vector paraxial X waves with orbital angular momentum and arbitrary frequency spectrum *(8 pages)* 043801
Marco Ornigotti, Claudio Conti, and Alexander Szameit

Propagation of a quantum fluid of light in a cavityless nonlinear optical medium: General theory and response to quantum quenches *(17 pages)* 043802
Pierre-Élie Larré and Iacopo Carusotto

Antirelaxation coatings in coherent spectroscopy: Theoretical investigation and experimental test *(10 pages)* 043803
K. Nasyrov, S. Gozzini, A. Lucchesini, C. Marinelli, S. Gateva, S. Cartaleva, and L. Marmugi

Optical force on toroidal nanostructures: Toroidal dipole versus renormalized electric dipole *(8 pages)* 043804
Xu-Lin Zhang, S. B. Wang, Zhifang Lin, Hong-Bo Sun, and C. T. Chan

First-principles variational formulation of polarization effects in geometrical optics *(8 pages)* 043805
D. E. Ruiz and I. Y. Dodin

Ladder-type electromagnetically induced transparency using nanofiber-guided light in a warm atomic vapor *(5 pages)* 043806
D. E. Jones, J. D. Franson, and T. B. Pittman

Polarization of amplified spontaneous emission in a plasma active medium *(7 pages)* 043807
C. M. Kim, H. Stiel, B. Matouš, M. Nishikino, N. Hasegawa, T. Kawachi, K. A. Tran, and K. A. Janulewicz

Conversion of recoilless γ radiation into a periodic sequence of short intense pulses in a set of several sequentially placed resonant absorbers *(13 pages)* 043808
Y. V. Radeonychev, V. A. Antonov, F. G. Vagizov, R. N. Shakhmuratov, and Olga Kocharovskaya

Nonlinear optical response induced by a second-harmonic electric-field component concomitant with optical near-field excitation *(9 pages)* 043809
Maiku Yamaguchi, Katsuyuki Nobusada, and Takashi Yatsui

Triangular and honeycomb lattices of cold atoms in optical cavities *(16 pages)* 043810
Shabnam Safaei, Christian Miniatura, and Benoît Grémaud

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Criticality in the Bose-Hubbard model with three-body repulsion *(6 pages)* 043615
Tomasz Sowiński, Ravindra W. Chhajlany, Omjyoti Dutta, Luca Tagliacozzo, and Maciej Lewenstein

Few-boson processes in the presence of an attractive impurity under one-dimensional confinement *(6 pages)* 043616
N. P. Mehta and Connor D. Morehead

Asymptotic expressions for the hyperfine populations in the ground state of spin-1 condensates against a magnetic field *(7 pages)* 043617
Y. M. Liu, Y. Z. He, and C. G. Bao

Quantum phase transitions and Berezinskii-Kosterlitz-Thouless temperature in a two-dimensional spin-orbit-coupled Fermi gas *(15 pages)* 043618
Jeroen P. A. Devreese, Jacques Tempere, and Carlos A. R. Sá de Melo

Hybrid synchronization in coupled ultracold atomic gases *(11 pages)* 043619
Haibo Qiu, Roberta Zambrini, Artur Polls, Joan Martorell, and Bruno Juliá-Díaz

Geometric-phase atom optics and interferometry *(13 pages)* 043620
B. Zygelman

Multiphoton interband excitations of quantum gases in driven optical lattices *(10 pages)* 043621
M. Weinberg, C. Ölschläger, C. Sträter, S. Prelle, A. Eckardt, K. Sengstock, and J. Simonet

Quantum-enhanced interferometry and the structure of twisted states *(5 pages)* 043622
K. Gietka, P. Szańkowski, T. Wasak, and J. Chwedeńczuk

Effects of anisotropy in simple lattice geometries on many-body properties of ultracold fermions in optical lattices *(10 pages)* 043623
Anna Golubeva, Andrii Sotnikov, and Walter Hofstetter

Thermometry of ultracold fermions by (super)lattice modulation spectroscopy *(12 pages)* 043624
Karla Loida, Ameneh Sheikhan, and Corinna Kollath

Reversing the persistent current of particles in a driven optical ring lattice *(9 pages)* 043625
L. Morales-Molina and E. Arévalo

Ultracold atomic mode splitter for the entanglement of separated atomic samples *(5 pages)* 043626
C. V. Chianca and M. K. Olsen

Many-body tunneling dynamics of Bose-Einstein condensates and vortex states in two spatial dimensions *(10 pages)* 043627
Raphael Beinke, Shachar Klaiman, Lorenz S. Cederbaum, Alexej I. Streltsov, and Ofir E. Alon

Complex Langevin simulation of quantum vortices in a Bose-Einstein condensate *(6 pages)* 043628
Tomoya Hayata and Arata Yamamoto

Continuous-matrix-product-state solution for the mixing-demixing transition in one-dimensional quantum fields *(5 pages)* 043629
Fernando Quijandría and David Zueco

Criticality and spin squeezing in the rotational dynamics of a Bose-Einstein condensate on a ring lattice *(11 pages)* 043630
M. Kolář, T. Opatrný, and Kunal K. Das

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Application of norm-conserving pseudopotentials to intense laser-matter interactions *(9 pages)* 043422
Xiao-Min Tong, Georg Wachter, Shunsuke A. Sato, Christoph Lemell, Kazuhiro Yabana, and Joachim Burgdörfer

N_2^+ quadrupole transitions with small Zeeman shift *(6 pages)* 043423
Masatoshi Kajita

Matter waves and collective properties of cold atoms and molecules

Bifurcation and stability of single and multiple vortex rings in three-dimensional Bose-Einstein condensates *(13 pages)* 043601
R. N. Bisset, Wenlong Wang, C. Ticknor, R. Carretero-González, D. J. Frantzeskakis, L. A. Collins, and P. G. Kevrekidis

Dissipative fluid dynamics for the dilute Fermi gas at unitarity: Anisotropic fluid dynamics *(9 pages)* 043602
M. Bluhm and T. Schäfer

Optical manipulation of matter-wave vortices: An analog of circular dichroism *(5 pages)* 043603
Pradip Kumar Mondal, Bimalendu Deb, and Sonjoy Majumder

Degenerate Bose-Fermi mixtures of rubidium and ytterbium *(6 pages)* 043604
V. D. Vaidya, J. Tiamsuphat, S. L. Rolston, and J. V. Porto

Berry curvature of interacting bosons in a honeycomb lattice *(9 pages)* 043605
Yun Li, Pinaki Sengupta, George G. Batrouni, Christian Miniatura, and Benoît Grémaud

Atom-optics approach to studying transport phenomena *(9 pages)* 043606
Bryce Gadway

Density fluctuations in a quasi-one-dimensional Bose gas as observed in free expansion *(6 pages)* 043607
Krzysztof Gawryluk, Mariusz Gajda, and Mirosław Brewczyk

Phase-ordering percolation and an infinite domain wall in segregating binary Bose-Einstein condensates *(7 pages)* 043608
Hiromitsu Takeuchi, Yumiko Mizuno, and Kentaro Dehara

Quantum magnetism of spinor bosons in optical lattices with synthetic non-Abelian gauge fields *(16 pages)* 043609
Fadi Sun, Jinwu Ye, and Wu-Ming Liu

Fano resonance through Higgs bound states in tunneling of Nambu-Goldstone modes *(19 pages)* 043610
Takeru Nakayama, Ippei Danshita, Tetsuro Nikuni, and Shunji Tsuchiya

Propagation of collective pair excitations in disordered Bose superfluids *(9 pages)* 043611
Samuel Lellouch, Lih-King Lim, and Laurent Sanchez-Palencia

Fluctuating hydrodynamics for a discrete Gross-Pitaevskii equation: Mapping onto the Kardar-Parisi-Zhang universality class *(5 pages)* 043612
Manas Kulkarni, David A. Huse, and Herbert Spohn

Bose-Einstein condensation and critical behavior of two-component bosonic gases *(12 pages)* 043613
Giacomo Ceccarelli, Jacopo Nespolo, Andrea Pelissetto, and Ettore Vicari

Long-time nonlinear dynamical evolution for P-band ultracold atoms in an optical lattice *(8 pages)* 043614
Dong Hu, Linxiao Niu, Baoguo Yang, Xuzong Chen, Biao Wu, Hongwei Xiong, and Xiaoji Zhou

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Fast quasiadiabatic dynamics *(6 pages)* 043406
S. Martínez-Garaot, A. Ruschhaupt, J. Gillet, Th. Busch, and J. G. Muga

Influence of the Coulomb potential on above-threshold ionization: A quantum-orbit analysis beyond the strong-field approximation *(12 pages)* 043407
X.-Y. Lai, C. Poli, H. Schomerus, and C. Figueira de Morisson Faria

Nonlinear effects in optical pumping of a cold and slow atomic beam *(11 pages)* 043408
N. Porfido, N. N. Bezuglov, M. Bruvelis, G. Shayeganrad, S. Birindelli, F. Tantussi, I. Guerri, M. Viteau, A. Fioretti, D. Ciampini, M. Allegrini, D. Comparat, E. Arimondo, A. Ekers, and F. Fuso

Detection of a weak magnetic field via cavity-enhanced Faraday rotation *(8 pages)* 043409
Keyu Xia, Nan Zhao, and Jason Twamley (EQuS Collaboration)

Fast and optimal transport of atoms with nonharmonic traps *(7 pages)* 043410
Qi Zhang, Xi Chen, and David Guéry-Odelin

Retrieving the ionization dynamics of high-energy photoelectrons in elliptically polarized laser fields *(6 pages)* 043411
Jizhou Yu, Xufei Sun, Yun Shao, Min Li, Qihuang Gong, and Yunquan Liu

Quantum interference in the field ionization of Rydberg atoms *(8 pages)* 043412
Rachel Feynman, Jacob Hollingsworth, Michael Vennettilli, Tamas Budner, Ryan Zmiewski, Donald P. Fahey, Thomas J. Carroll, and Michael W. Noel

Coherent control of multiphoton resonance dynamics in high-order-harmonic generation driven by two frequency-comb fields *(8 pages)* 043413
Di Zhao, Chen-Wei Jiang, and Fu-li Li

Dissociative ionization of $H_2{}^+$: Few-cycle effect in the joint electron-ion energy spectrum *(8 pages)* 043414
V. Mosert and D. Bauer

Ionization of H_2^+ molecular ions by twisted Bessel light *(7 pages)* 043415
A. A. Peshkov, S. Fritzsche, and A. Surzhykov

Fast and efficient transport of large ion clouds *(9 pages)* 043416
M. R. Kamsap, J. Pedregosa-Gutierrez, C. Champenois, D. Guyomarc'h, M. Houssin, and M. Knoop

Discrete-valued-pulse optimal control algorithms: Application to spin systems *(8 pages)* 043417
G. Dridi, M. Lapert, J. Salomon, S. J. Glaser, and D. Sugny

Enhanced magnetic trap loading for atomic strontium *(8 pages)* 043418
D. S. Barker, B. J. Reschovsky, N. C. Pisenti, and G. K. Campbell

Radiation pressure in strong-field-approximation theory: Retardation and recoil corrections *(10 pages)* 043419
K. Krajewska and J. Z. Kamiński

Quantum-beat Auger spectroscopy *(10 pages)* 043420
Song Bin Zhang and Nina Rohringer

Ion-trajectory analysis for micromotion minimization and the measurement of small forces *(12 pages)* 043421
Timm F. Gloger, Peter Kaufmann, Delia Kaufmann, M. Tanveer Baig, Thomas Collath, Michael Johanning, and Christof Wunderlich

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Extension of charge-state-distribution calculations for ion-solid collisions towards low velocities and many-electron ions *(11 pages)* 042703
E. Lamour, P. D. Fainstein, M. Galassi, C. Prigent, C. A. Ramirez, R. D. Rivarola, J.-P. Rozet, M. Trassinelli, and D. Vernhet

Double ionization of helium by proton impact: A generalized-Sturmian approach *(10 pages)* 042704
M. J. Ambrosio, D. M. Mitnik, L. U. Ancarani, G. Gasaneo, and E. L. Gaggioli

Intercombination effects in resonant energy transfer *(6 pages)* 042705
C. L. Vaillant, R. M. Potvliege, and M. P. A. Jones

Dynamics of ultracold dipolar particles in a confined geometry and tilted fields *(12 pages)* 042706
Goulven Quéméner, Maxence Lepers, and Olivier Dulieu

Effect of electron-nuclei interaction on internuclear motions in slow ion-atom collisions *(5 pages)* 042707
Inga Yu. Tolstikhina and Oleg I. Tolstikhin

Target effects in negative-continuum-assisted dielectronic recombination *(7 pages)* 042708
V. A. Yerokhin, A. N. Artemyev, V. M. Shabaev, Th. Stöhlker, A. Surzhykov, and S. Fritzsche

Electron elastic scattering off $A@C_{60}$: The role of atomic polarization under confinement *(7 pages)* 042709
V. K. Dolmatov, M. Ya. Amusia, and L. V. Chernysheva

Rydberg blockade, Förster resonances, and quantum state measurements with different atomic species *(10 pages)* 042710
I. I. Beterov and M. Saffman

Comparison of experimental and theoretical electron-impact-ionization triple-differential cross sections for ethane *(6 pages)* 042711
Esam Ali, Kate Nixon, Andrew Murray, Chuangang Ning, James Colgan, and Don Madison

PART B

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

Orbital-resolved strong-field single ionization of acetylene *(4 pages)* 043401
Qinying Ji, Sen Cui, Xinyuan You, Xiaochun Gong, Qiying Song, Kang Lin, Haifeng Pan, Jingxin Ding, Heping Zeng, Feng He, and Jian Wu

Analysis of a shift of the maximum of photoelectron momentum distributions generated by intense circularly polarized pulses *(15 pages)* 043402
Masataka Ohmi, Oleg I. Tolstikhin, and Toru Morishita

Spectrally resolved spatiotemporal features of quantum paths in high-order-harmonic generation *(9 pages)* 043403
Lixin He, Pengfei Lan, Qingbin Zhang, Chunyang Zhai, Feng Wang, Wenjing Shi, and Peixiang Lu

Exact solution of the Bloch equations for the nonresonant exponential model in the presence of dephasing *(7 pages)* 043404
K. N. Zlatanov, G. S. Vasilev, P. A. Ivanov, and N. V. Vitanov

Theoretical basis for quantum simulation with a planar ionic crystal in a Penning trap using a triangular rotating wall *(11 pages)* 043405
A. Khan, B. Yoshimura, and J. K. Freericks

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Probing electronic states of TaC and observation of a stable excited state of TaC^- by anion-photoelectron spectroscopy *(5 pages)* 042503
G. Aravind, M. Nrisimhamurty, Rupali G. Mane, A. K. Gupta, and E. Krishnakumar

Quantum interference in two-photon spectroscopy for laser stabilization and cesium-cell comparison *(7 pages)* 042504
Chien-Ming Wu, Tze-Wei Liu, and Wang-Yau Cheng

Resonances in two-electron atoms below the critical charge *(4 pages)* 042505
Jean-Philippe Karr

Dynamics of the C $1s \rightarrow \pi^*$ excitation and decay in CO_2 probed by vibrationally and angularly resolved Auger spectroscopy *(9 pages)* 042506
E. Antonsson, M. Patanen, C. Nicolas, S. Benkoula, J. J. Neville, V. L. Sukhorukov, J. D. Bozek, Ph. V. Demekhin, and C. Miron

Magic wavelength for the hydrogen $1S$-$2S$ transition *(5 pages)* 042507
Akio Kawasaki

Correlation, Breit, and QED effects in spectra of Mg-like ions *(7 pages)* 042508
E. A. Konovalova and M. G. Kozlov

Rubidium D_1 collision shift by heavy noble gases *(7 pages)* 042509
N. P. Wells, T. U. Driskell, and J. C. Camparo

QED corrections to radiative recombination and radiative decay of heavy hydrogenlike ions *(10 pages)* 042510
J. Holmberg, A. N. Artemyev, A. Surzhykov, V. A. Yerokhin, and Th. Stöhlker

Observation of the $5p_{3/2} \rightarrow 6p_{3/2}$ electric-dipole-forbidden transition in atomic rubidium using optical-optical double-resonance spectroscopy *(6 pages)* 042511
F. Ponciano-Ojeda, S. Hernández-Gómez, O. López-Hernández, C. Mojica-Casique, R. Colín-Rodríguez, F. Ramírez-Martínez, J. Flores-Mijangos, D. Sahagún, R. Jáuregui, and J. Jiménez-Mier

Angular Fock coefficients: Refinement and further development *(21 pages)* 042512
Evgeny Z. Liverts and Nir Barnea

Statistical approach to Casimir-Polder potentials in heterogeneous media *(7 pages)* 042513
Nicolas Cherroret, Romain Guérout, Astrid Lambrecht, and Serge Reynaud

Nuclear-spin optical rotation in xenon *(6 pages)* 042514
I. Savukov

Field-dressed orbitals in strong-field molecular ionization *(5 pages)* 042515
Robert Siemering, Oumarou Njoya, Thomas Weinacht, and Regina de Vivie-Riedle

Atomic and molecular collisions and interactions

Dynamical adiabatic theory of atomic collisions: Charge exchange in collisions of He^{2+} with $H(1s)$ *(10 pages)* 042701
T. P. Grozdanov and E. A. Solov'ev

Polarization measurement of dielectronic recombination transitions in highly charged krypton ions *(10 pages)* . . . 042702
Chintan Shah, Holger Jörg, Sven Bernitt, Stepan Dobrodey, René Steinbrügge, Christian Beilmann, Pedro Amaro, Zhimin Hu, Sebastian Weber, Stephan Fritzsche, Andrey Surzhykov, José R. Crespo López-Urrutia, and Stanislav Tashenov

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Local discrimination of qudit lattice states via commutativity *(4 pages)* 042320
Guojing Tian, Sixia Yu, Fei Gao, Qiaoyan Wen, and C. H. Oh

Fidelity of recovery, squashed entanglement, and measurement recoverability *(23 pages)* 042321
Kaushik P. Seshadreesan and Mark M. Wilde

Essentially entangled component of multipartite mixed quantum states, its properties, and an efficient algorithm for its extraction *(9 pages)* 042322
V. M. Akulin, G. A. Kabatiansky, and A. Mandilara

Measures of electronic-vibrational entanglement and quantum coherence in a molecular system *(14 pages)* 042323
Mihaela Vatasescu

Two-dimensional quantum walk under artificial magnetic field *(7 pages)* 042324
İ. Yalçınkaya and Z. Gedik

Probing for quantum speedup in spin-glass problems with planted solutions *(24 pages)* 042325
Itay Hen, Joshua Job, Tameem Albash, Troels F. Rønnow, Matthias Troyer, and Daniel A. Lidar

Entanglement in fermion systems *(9 pages)* 042326
N. Gigena and R. Rossignoli

Entanglement distribution over quantum code-division multiple-access networks *(9 pages)* 042327
Chang-long Zhu, Nan Yang, Yu-xi Liu, Franco Nori, and Jing Zhang

Generalized conditions for genuine multipartite continuous-variable entanglement *(10 pages)* 042328
E. Shchukin and P. van Loock

Multipartite entanglement measures *(34 pages)* 042329
Szilárd Szalay

Multimode analysis of a conditional phase gate based on second-order nonlinearity *(9 pages)* 042330
Balakrishnan Viswanathan and Julio Gea-Banacloche

Gaussian discriminating strength *(15 pages)* 042331
L. Rigovacca, A. Farace, A. De Pasquale, and V. Giovannetti

Separability criteria based on the realignment of density matrices and reduced density matrices *(5 pages)* 042332
Shu-Qian Shen, Meng-Yuan Wang, Ming Li, and Shao-Ming Fei

Complete randomized benchmarking protocol accounting for leakage errors *(7 pages)* 042333
T. Chasseur and F. K. Wilhelm

Entanglement in fermionic chains with finite-range coupling and broken symmetries *(11 pages)* 042334
Filiberto Ares, José G. Esteve, Fernando Falceto, and Amilcar R. de Queiroz

Atomic and molecular structure and dynamics

Direct observation of up-conversion via femtosecond photoelectron imaging *(5 pages)* 042501
Yuzhu Liu, Gregor Knopp, and Thomas Gerber

Damping of confined excitation modes of one-dimensional condensates in an optical lattice *(8 pages)* 042502
C. Trallero-Giner, Darío G. Santiago-Pérez, Ming-Chiang Chung, G. E. Marques, and R. Cipolatti

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Quantum Byzantine agreement via Hardy correlations and entanglement swapping *(6 pages)* 042302
Ramij Rahaman, Marcin Wieśniak, and Marek Żukowski

Progress towards practical quantum variational algorithms *(10 pages)* 042303
Dave Wecker, Matthew B. Hastings, and Matthias Troyer

Robust dynamical decoupling sequences for individual-nuclear-spin addressing *(7 pages)* 042304
J. Casanova, Z.-Y. Wang, J. F. Haase, and M. B. Plenio

Parity measurement of remote qubits using dispersive coupling and photodetection *(9 pages)* 042305
J. Govenius, Y. Matsuzaki, I. G. Savenko, and M. Möttönen

Visualizing extremal positive maps in unital and trace-preserving form *(15 pages)* 042306
Leif Ove Hansen and Jan Myrheim

Negativity and strong monogamy of multiparty quantum entanglement beyond qubits *(8 pages)* 042307
Jin Hyuk Choi and Jeong San Kim

Entanglement and the sign structure of quantum states *(7 pages)* 042308
Tarun Grover and Matthew P. A. Fisher

Symmetry criteria for quantum simulability of effective interactions *(8 pages)* 042309
Zoltán Zimborás, Robert Zeier, Thomas Schulte-Herbrüggen, and Daniel Burgarth

Quantum annealing correction with minor embedding *(30 pages)* 042310
Walter Vinci, Tameem Albash, Gerardo Paz-Silva, Itay Hen, and Daniel A. Lidar

Practical implementation and evaluation of a quantum-key-distribution scheme based on the time-frequency uncertainty *(9 pages)* 042311
Matthias Leifgen, Robert Elschner, Nicolas Perlot, Carl Weinert, Colja Schubert, and Oliver Benson

Detecting correlated errors in state-preparation-and-measurement tomography *(6 pages)* 042312
Christopher Jackson and S. J. van Enk

Tuned oscillatory behavior in discrete quantum walks on star clusters *(8 pages)* 042313
R. F. S. Andrade and A. M. C. Souza

Complete logic Bell-state analysis assisted with photonic Faraday rotation *(8 pages)* 042314
Lan Zhou and Yu-Bo Sheng

Process estimation in the presence of time-invariant memory effects *(7 pages)* 042315
Tomáš Rybár and Mário Ziman

Localized state in a two-dimensional quantum walk on a disordered lattice *(7 pages)* 042316
Peng Xue, Rong Zhang, Zhihao Bian, Xiang Zhan, Hao Qin, and Barry C. Sanders

Stronger steerability criterion for more uncertain continuous-variable systems *(5 pages)* 042317
Priyanka Chowdhury, Tanumoy Pramanik, and A. S. Majumdar

Classifying entanglement in the superposition of Greenberger-Horne-Zeilinger and W states *(4 pages)* 042318
Xuan Wang and Xian Shi

Reference-frame-independent quantum key distribution with source flaws *(7 pages)* 042319
Can Wang, Shi-Hai Sun, Xiang-Chun Ma, Guang-Zhao Tang, and Lin-Mei Liang

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 92, NUMBER 4** **OCTOBER 2015**

Casimir free energy of metallic films: Discriminating between Drude and plasma model approaches *(11 pages)* 042109
G. L. Klimchitskaya and V. M. Mostepanenko

Dynamics of noisy quantum systems in the Heisenberg picture: Application to the stability of fractional charge *(7 pages)* 042110
Armin Rahmani

Dissipation and decoherence by a homogeneous ideal gas *(11 pages)* 042111
Janos Polonyi

Calculable *R*-matrix method for the Dirac equation *(14 pages)* 042112
Daniel Baye

Characterization of measurement uncertainties using the correlations between local outcomes obtained from maximally entangled pairs *(8 pages)* 042113
Shota Kino, Taiki Nii, and Holger F. Hofmann

Detector dependency of diffusive quantum monitorings *(11 pages)* 042114
Shakib Daryanoosh, Howard M. Wiseman, and Jay M. Gambetta

Two-mode bosonic quantum metrology with number fluctuations *(11 pages)* 042115
Antonella De Pasquale, Paolo Facchi, Giuseppe Florio, Vittorio Giovannetti, Koji Matsuoka, and Kazuya Yuasa

Bloch oscillations in non-Hermitian lattices with trajectories in the complex plane *(8 pages)* 042116
Stefano Longhi

Characterizing finite-dimensional quantum behavior *(15 pages)* 042117
Miguel Navascués, Adrien Feix, Mateus Araújo, and Tamás Vértesi

Algebraic and algorithmic frameworks for optimized quantum measurements *(14 pages)* 042118
Amine Laghaout and Ulrik L. Andersen

$^{88}Sr^{+}$ single-ion optical clock with a stability approaching the quantum projection noise limit *(8 pages)* 042119
Pierre Dubé, Alan A. Madej, Andrew Shiner, and Bin Jian

Adiabaticity in a time-dependent trap: The passage near a continuum threshold *(11 pages)* 042121
D. Sokolovski and M. Pons

Efficient method to generate time evolution of the Wigner function for open quantum systems *(10 pages)* 042122
Renan Cabrera, Denys I. Bondar, Kurt Jacobs, and Herschel A. Rabitz

Spin effects in Kapitza-Dirac scattering at light with elliptical polarization *(11 pages)* 042123
Rico Erhard and Heiko Bauke

Information-theoretic constraints on correlations with indefinite causal order *(7 pages)* 042124
Issam Ibnouhsein and Alexei Grinbaum

Quantum information

Analytical formulas for the performance scaling of quantum processors with a large number of defective gates *(18 pages)* 042301
Y. S. Nam and R. Blümel

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A THIRD SERIES, VOLUME 92, NUMBER 4 OCTOBER 2015

Adiabatic cooling of bosons in lattices to magnetically ordered quantum states *(6 pages)* . . . . . 041602(R)
Johannes Schachenmayer, David M. Weld, Hirokazu Miyake, Georgios A. Siviloglou, Wolfgang Ketterle, and Andrew J. Daley

Protected quasilocality in quantum systems with long-range interactions *(5 pages)* . . . . . 041603(R)
Lorenzo Cevolani, Giuseppe Carleo, and Laurent Sanchez-Palencia

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

Sensitivity of high-order-harmonic generation to aromaticity *(6 pages)* . . . . . 041801(R)
A. F. Alharbi, A. E. Boguslavskiy, N. Thiré, B. E. Schmidt, F. Légaré, T. Brabec, M. Spanner, and V. R. Bhardwaj

Proposal for observing intensity-intensity–correlation speckle patterns with thermal light via phase conjugation *(5 pages)* . . . . . 041802(R)
Li-Gang Wang, M. Al-Amri, and M. Suhail Zubairy

Wave-packet self-imaging and giant recombinations via stable Bloch-Zener oscillations in photonic lattices with local $\mathcal{PT}$ symmetry *(5 pages)* . . . . . 041803(R)
N. Bender, H. Li, F. M. Ellis, and T. Kottos

Fractional averaging of repetitive waveforms induced by self-imaging effects *(5 pages)* . . . . . 041804(R)
Luis Romero Cortés, Reza Maram, and José Azaña

Simulation and detection of photonic Chern insulators in a one-dimensional circuit-QED lattice *(5 pages)* . . . . . 041805(R)
Feng Mei, Jia-Bin You, Wei Nie, Rosario Fazio, Shi-Liang Zhu, and L. C. Kwek

ARTICLES

Fundamental concepts

Complementarity relations for quantum coherence *(8 pages)* 042101
Shuming Cheng and Michael J. W. Hall

Demonstration of open-quantum-system optimal control in dynamic nuclear polarization *(11 pages)* 042102
S. Sheldon and D. G. Cory

$\mathcal{PT}$-symmetric Rabi model: Perturbation theory *(7 pages)* 042103
Tony E. Lee and Yogesh N. Joglekar

Mesoscopic mechanical resonators as quantum noninertial reference frames *(8 pages)* 042104
B. N. Katz, M. P. Blencowe, and K. C. Schwab

Hierarchy of non-Markovianity and k-divisibility phase diagram of quantum processes in open systems *(9 pages)* 042105
Hong-Bin Chen, Jiun-Yi Lien, Guang-Yin Chen, and Yueh-Nan Chen

Quantum speed limit for a relativistic electron in a uniform magnetic field *(6 pages)* 042106
D. V. Villamizar and E. I. Duzzioni

Generation of quantum steering and interferometric power in the dynamical Casimir effect *(4 pages)* 042107
Carlos Sabín and Gerardo Adesso

Generalized trace-distance measure connecting quantum and classical non-Markovianity *(10 pages)* 042108
Steffen Wißmann, Heinz-Peter Breuer, and Bassano Vacchini

(Continued)

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

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
P.O. Box 41
Annapolis Junction, MD 20701

THIRD SERIES, VOLUME 92, NUMBER 4
PARTS A AND B

CONTENTS

OCTOBER 2015

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 040101(R)–042711, and Part B pages 043401–049902(E).

PART A

RAPID COMMUNICATIONS

Fundamental concepts

Effects of Lorentz-symmetry violation on the spectra of rare-earth ions in a crystal field *(6 pages)* . . . . . 040101(R)
C. Harabati, V. A. Dzuba, V. V. Flambaum, and M. A. Hohensee

Quantum information

Classical-quantum mixing in the random 2-satisfiability problem *(5 pages)* . . . . . 040301(R)
Ionut-Dragos Potirniche, C. R. Laumann, and S. L. Sondhi

Implementation of multidimensional quantum walks using linear optics and classical light *(5 pages)* . . . . . 040302(R)
Sandeep K. Goyal, Filippus S. Roux, Andrew Forbes, and Thomas Konrad

Universal control of an oscillator with dispersive coupling to a qubit *(5 pages)* . . . . . 040303(R)
Stefan Krastanov, Victor V. Albert, Chao Shen, Chang-Ling Zou, Reinier W. Heeres, Brian Vlastakis, Robert J. Schoelkopf, and Liang Jiang

Atomic and molecular structure and dynamics

Extracting transition rates from zero-polarizability spectroscopy *(5 pages)* . . . . . 040501(R)
M. S. Safronova, Z. Zuhrianda, U. I. Safronova, and Charles W. Clark

Electron dynamics following photoionization: Decoherence due to the nuclear-wave-packet width *(6 pages)* . . . . . 040502(R)
Morgane Vacher, Lee Steinberg, Andrew J. Jenkins, Michael J. Bearpark, and Michael A. Robb

Atomic and molecular collisions and interactions

Measurement of the van der Waals interaction by atom trajectory imaging *(5 pages)* . . . . . 040701(R)
N. Thaicharoen, A. Schwarzkopf, and G. Raithel

Matter waves and collective properties of cold atoms and molecules

Many-body localization and thermalization in disordered Hubbard chains *(5 pages)* . . . . . 041601(R)
Rubem Mondaini and Marcos Rigol

Copyright 2015 by American Physical Society

(Continued)

1050-2947(201510)92:4:A;1-P

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).