PHYSICAL REVIEW A **THIRD SERIES, VOLUME 91, NUMBER 6** **JUNE 2015**

ERRATA

Erratum: Locality of the Aharonov-Bohm-Casher effect [Phys. Rev. A **91**, 052116 (2015)] *(1 page)* . . . . . 069901(E)
Kicheon Kang

Erratum: Atomic photoionization in a changing plasma environment
[Phys. Rev. A **88**, 023406 (2013)] *(1 page)* . . . . . 069902(E)
T. N. Chang and T. K. Fang

Erratum: Speckle fluctuations resolve the interdistance between incoherent point sources in complex media
[Phys. Rev. A **91**, 023807 (2015)] *(1 page)* . . . . . 069903(E)
R. Carminati, G. Cwilich, L. S. Froufe-Pérez, and J. J. Sáenz

Erratum: Rates of convergence of the partial-wave expansion beyond the Kato cusp condition
[Phys. Rev. A **88**, 032511 (2013)] *(2 pages)* . . . . . 069904(E)
Cong Wang

Erratum: Precision measurements with photon-subtracted or photon-added Gaussian states
[Phys. Rev. A **90**, 013821 (2014)] *(1 page)* . . . . . 069905(E)
Daniel Braun, Pu Jian, Olivier Pinel, and Nicolas Treps

Erratum: Theoretical and experimental (e,2e) study of electron-impact ionization of laser-aligned Mg atoms
[Phys. Rev. A **90**, 062707 (2014)] *(2 pages)* . . . . . 069906(E)
Sadek Amami, Andrew Murray, Al Stauffer, Kate Nixon, Gregory Armstrong,
James Colgan, and Don Madison

Erratum: Calculation of photoelectron spectra within the time-dependent configuration-interaction singles scheme
[Phys. Rev. A **89**, 033415 (2014)] *(1 page)* . . . . . 069907(E)
Antonia Karamatskou, Stefan Pabst, Yi-Jen Chen, and Robin Santra

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 91, NUMBER 6** **JUNE 2015**

Controlling photon transport in the single-photon weak-coupling regime of cavity optomechanics *(9 pages)* 063836
Wen-Zhao Zhang, Jiong Cheng, Jing-Yi Liu, and Ling Zhou

Stability diagram of the collective atomic recoil laser with thermal atoms *(5 pages)* 063837
H. Tomczyk, D. Schmidt, C. Georges, S. Slama, and C. Zimmermann

Lossless Kerr-phase gate in a quantum-well system via tunneling interference effect for weak fields *(5 pages)* 063838
Y. L. Shi, Y. C. Huang, J. X. Wu, C. J. Zhu, J. P. Xu, and Y. P. Yang

Frequency comb generation in quadratic nonlinear media *(10 pages)* 063839
Iolanda Ricciardi, Simona Mosca, Maria Parisi, Pasquale Maddaloni, Luigi Santamaria, Paolo De Natale, and Maurizio De Rosa

Signatures of the A^2 term in ultrastrongly coupled oscillators *(11 pages)* 063840
Tommaso Tufarelli, K. R. McEnery, S. A. Maier, and M. S. Kim

Quantum theory of light scattering in a one-dimensional channel: Interaction effect on photon statistics and entanglement entropy *(21 pages)* 063841
Mikhail Pletyukhov and Vladimir Gritsev

Tight bound on the trace distance between a realistic device with partially indistinguishable bosons and the ideal BosonSampling *(7 pages)* 063842
V. S. Shchesnovich

Light scattering in pseudopassive media with uniformly balanced gain and loss *(5 pages)* 063843
A. Basiri, I. Vitebskiy, and T. Kottos

Nonadiabatic spectral redshift of high-order harmonics with the help of a VUV pulse *(5 pages)* 063844
Hongchuan Du, Shan Xue, Huiqiao Wang, Zhilei Zhang, and Bitao Hu

COMMENTS

Comment on "Stark effect in neutral hydrogen by direct integration of the Hamiltonian in parabolic coordinates" *(3 pages)* 066501
Francisco M. Fernández and Javier Garcia

Reply to "Comment on 'Stark effect in neutral hydrogen by direct integration of the Hamiltonian in parabolic coordinates' " *(2 pages)* 066502
L. Fernández-Menchero and H. P. Summers

Comment on "Test of the Stark-effect theory using photoionization microscopy" *(4 pages)* 067401
P. Giannakeas, F. Robicheaux, and Chris H. Greene

Reply to "Comment on 'Test of the Stark-effect theory using photoionization microscopy' " *(3 pages)* 067402
L. B. Zhao, I. I. Fabrikant, and M. L. Du

Comment on "Ramsey spectroscopy, matter-wave interferometry, and the microwave-lensing frequency shift" *(3 pages)* 067601
S. R. Jefferts, T. P. Heavner, S. E. Barlow, and N. Ashby

Reply to "Comment on 'Ramsey spectroscopy, matter-wave interferometry, and the microwave-lensing frequency shift' " *(3 pages)* 067602
Kurt Gibble

(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 91, NUMBER 6** **JUNE 2015**

Asymmetric band diagrams in photonic crystals with a spontaneous nonreciprocal response *(13 pages)* 063821
Filipa R. Prudêncio, Sérgio A. Matos, and Carlos R. Paiva

Localization-length calculations in alternating metamaterial-birefringent disordered layered stacks *(6 pages)* 063822
O. del Barco, V. Gasparian, and Zh. Gevorkian

Strong nonlinearity-induced correlations for counterpropagating photons scattering on a two-level emitter *(9 pages)* 063823
Anders Nysteen, Dara P. S. McCutcheon, and Jesper Mørk

Switchable self-defocusing and focusing in nearly isotropic photonic crystals via enhanced inverse diffraction *(5 pages)* 063824
Zhixiang Tang, Lei Zhao, Zhan Sui, Yanhong Zou, Shuangchun Wen, Aaron Danner, and Chengwei Qiu

Dynamic versus Anderson wave-packet localization *(6 pages)* 063825
Olga V. Borovkova, Valery E. Lobanov, Yaroslav V. Kartashov, Victor A. Vysloukh, and Lluis Torner

Quantum spectra of Raman photon pairs from a mesoscopic particle *(12 pages)* 063826
C. H. Raymond Ooi, W. M. Edmund Loh, and C. H. Kam

Precision measurement of the environmental temperature by tunable double optomechanically induced transparency with a squeezed field *(7 pages)* 063827
Qiong Wang, Jian-Qi Zhang, Peng-Cheng Ma, Chun-Mei Yao, and Mang Feng

Photon-mediated qubit interactions in one-dimensional discrete and continuous models *(11 pages)* 063828
Guillermo Díaz-Camacho, Diego Porras, and Juan José García-Ripoll

Hong-Ou-Mandel interference between triggered and heralded single photons from separate atomic systems *(5 pages)* 063829
Victor Leong, Sandoko Kosen, Bharath Srivathsan, Gurpreet Kaur Gulati, Alessandro Cerè, and Christian Kurtsiefer

Optical pulling forces in hyperbolic metamaterials *(6 pages)* 063830
Alexander S. Shalin, Sergey V. Sukhov, Andrey A. Bogdanov, Pavel A. Belov, and Pavel Ginzburg

Polarization entanglement of sum-frequency photons: A tool to probe the Markovian limit *(7 pages)* 063831
Victor Volkov and Riccardo Chelli

Continuous-variable quantum teleportation with non-Gaussian entangled states generated via multiple-photon subtraction and addition *(12 pages)* 063832
Shuai Wang, Li-Li Hou, Xian-Feng Chen, and Xue-Fen Xu

Nonlinear synthesis of complex laser waveforms at remote distances *(8 pages)* 063833
Nicolas Berti, Wahb Ettoumi, Sylvain Hermelin, Jérôme Kasparian, and Jean-Pierre Wolf

All-optical control of optical frequency combs via quantum interference effects in a single-emitter-microcavity system *(11 pages)* 063834
Jiahua Li, Rong Yu, Jinyong Ma, and Ying Wu

Resonant interaction of trapped cold atoms with a magnetic cantilever tip *(5 pages)* 063835
Cris Montoya, Jose Valencia, Andrew A. Geraci, Matthew Eardley, John Moreland, Leo Hollberg, and John Kitching

(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 91, NUMBER 6** **JUNE 2015**

Collective effects between multiple nuclear ensembles in an x-ray cavity-QED setup *(16 pages)* 063803
Kilian P. Heeg and Jörg Evers

Coherent destruction of tunneling in a lattice array with a controllable boundary *(6 pages)* 063804
Liping Li, Xiaobing Luo, Xin-You Lü, Xiaoxue Yang, and Ying Wu

Blackbody aperture radiation: Effect of cavity wall *(6 pages)* 063805
Kasimir Blomstedt, Tero Setälä, and Ari T. Friberg

Ab initio multimode linewidth theory for arbitrary inhomogeneous laser cavities *(22 pages)* 063806
A. Pick, A. Cerjan, D. Liu, A. W. Rodriguez, A. D. Stone, Y. D. Chong, and S. G. Johnson

Control of the electromagnetic environment of a quantum emitter by shaping the vacuum field in a coupled-cavity system *(5 pages)* 063807
Robert Johne, Ron Schutjens, Sartoon Fattah poor, Chao-Yuan Jin, and Andrea Fiore

Tunable photon blockade in coupled semiconductor cavities *(8 pages)* 063808
H. Z. Shen, Y. H. Zhou, and X. X. Yi

Tunable dynamic Fano resonances in coupled-resonator optical waveguides *(5 pages)* 063809
Stefano Longhi

First-order correction to the Casimir force within an inhomogeneous medium *(7 pages)* 063810
Fanglin Bao, Bin Luo, and Sailing He

Sub-diffraction-limited microscopy via Rabi gradient excitation *(5 pages)* 063811
Xiaodong Zeng, Zeyang Liao, M. Al-Amri, and M. Suhail Zubairy

Active invisibility cloaks in one dimension *(6 pages)* 063812
Ali Mostafazadeh

First-order decomposition of thermal light in terms of a statistical mixture of single pulses *(10 pages)* 063813
Aurélia Chenu, Agata M. Brańczyk, and J. E. Sipe

Dynamical Lamb effect in a tunable superconducting qubit-cavity system *(10 pages)* 063814
D. S. Shapiro, A. A. Zhukov, W. V. Pogosov, and Yu. E. Lozovik

Generating quadrature squeezed light with dissipative optomechanical coupling *(7 pages)* 063815
Kenan Qu and G. S. Agarwal

Importance of intensity-to-phase coupling for water-window high-order-harmonic generation with few-cycle pulses *(6 pages)* 063817
Stephan M. Teichmann, Francisco Silva, Seth L. Cousin, and Jens Biegert

Quantum theory for pulse propagation in electromagnetically-induced-transparency media beyond the adiabatic approximation *(8 pages)* 063818
You-Lin Chuang, Ite A. Yu, and Ray-Kuang Lee

Observation of surface dispersive shock waves in a self-defocusing medium *(6 pages)* 063819
Jing Wang, Juntao Li, Daquan Lu, Qi Guo, and Wei Hu

Bright cavity solitons in metamaterials with internal resonances *(14 pages)* 063820
A. V. Yulin, V. Kuzmiak, and S. Eyderman

(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 91, NUMBER 6** **JUNE 2015**

Finite-temperature effects on a triatomic Efimov resonance in ultracold cesium *(7 pages)* 063622
B. Huang (黃博), L. A. Sidorenkov, and R. Grimm

Emergent Fermi sea in a system of interacting bosons *(7 pages)* 063623
Ying-Hai Wu and J. K. Jain

Robust finite-temperature disordered Mott-insulating phases in inhomogeneous Fermi-Fermi mixtures with density and mass imbalance *(9 pages)* 063624
Anzi Hu, M. M. Maśka, Charles W. Clark, and J. K. Freericks

Persistent currents supported by solitary waves in toroidal Bose-Einstein condensates *(7 pages)* 063625
A. Muñoz Mateo, A. Gallemí, M. Guilleumas, and R. Mayol

Floquet Fulde-Ferrell-Larkin-Ovchinnikov superfluids and Majorana fermions in a shaken fermionic optical lattice *(9 pages)* 063626
Zhen Zheng, Chunlei Qu, Xubo Zou, and Chuanwei Zhang

Spin–orbital-angular-momentum coupling in Bose-Einstein condensates *(6 pages)* 063627
Kuei Sun, Chunlei Qu, and Chuanwei Zhang

Evolution of the Hofstadter butterfly in a tunable optical lattice *(10 pages)* 063628
F. Yılmaz, F. Nur Ünal, and M. Ö. Oktel

N-atom collective-state atomic clock with $\sqrt{N}$-fold increase in effective frequency and $\sqrt{N}$-fold reduction in fringe width *(13 pages)* 063629
May E. Kim, Resham Sarkar, Renpeng Fang, and Selim M. Shahriar

Route to non-Abelian quantum turbulence in spinor Bose-Einstein condensates *(11 pages)* 063630
Thomas Mawson, Gary Ruben, and Tapio Simula

Collective modes of a harmonically trapped one-dimensional Bose gas: The effects of finite particle number and nonzero temperature *(9 pages)* 063631
Xiao-Long Chen, Yun Li, and Hui Hu

Small quench dynamics as a probe for trapped ultracold atoms *(9 pages)* 063632
Sunil Yeshwanth, Marcos Rigol, Stephan Haas, and Lorenzo Campos Venuti

Spontaneous formation of a doubly quantized vortex in the anomalous component of a trapped Bose gas *(6 pages)* 063633
Abdelâali Boudjemâa

Strong correlation effects in a two-dimensional Bose gas with quartic dispersion *(10 pages)* 063634
Juraj Radić, Stefan S. Natu, and Victor Galitski

Rabi-coupled countersuperflow in binary Bose-Einstein condensates *(8 pages)* 063635
Ayaka Usui and Hiromitsu Takeuchi

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

Stabilization of a dynamically unstable opto-thermo-mechanical oscillator *(7 pages)* 063801
Wenle Weng, James D. Anstie, Paul Abbott, B. Fan, T. M. Stace, and Andre N. Luiten

Stability of optimal-wave-front-sample coupling under sample translation and rotation *(13 pages)* 063802
Benjamin R. Anderson, Ray Gunawidjaja, and Hergen Eilers

(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 91, NUMBER 6** **JUNE 2015**

Counterflow in a doubly superfluid mixture of bosons and fermions *(6 pages)* 063606
F. Chevy

Maximum group velocity in a one-dimensional model with a sinusoidally varying staggered potential *(8 pages)* 063607
Tanay Nag, Diptiman Sen, and Amit Dutta

Finding zeros of the Riemann zeta function by periodic driving of cold atoms *(6 pages)* 063608
C. E. Creffield and G. Sierra

Tuning the Chern number and Berry curvature with spin-orbit coupling and magnetic textures *(7 pages)* 063609
Timothy M. McCormick and Nandini Trivedi

Magnetism in the three-dimensional layered Lieb lattice: Enhanced transition temperature via flat-band and Van Hove singularities *(7 pages)* 063610
Kazuto Noda, Kensuke Inaba, and Makoto Yamashita

Population dynamics in a Floquet realization of the Harper-Hofstadter Hamiltonian *(8 pages)* 063611
Thomas Bilitewski and Nigel R. Cooper

Synthetic magnetic fluxes and topological order in one-dimensional spin systems *(8 pages)* 063612
Tobias Graß, Christine Muschik, Alessio Celi, Ravindra W. Chhajlany, and Maciej Lewenstein

Variance as a sensitive probe of correlations *(9 pages)* 063613
Shachar Klaiman and Ofir E. Alon

Wave-packet dynamics of noninteracting ultracold bosons in an amplitude-modulated parabolic optical lattice *(8 pages)* 063614
Tomotake Yamakoshi and Shinichi Watanabe

Differential phase extraction in an atom gradiometer *(5 pages)* 063615
F. Pereira Dos Santos

From short-time diffusive to long-time ballistic dynamics: The unusual center-of-mass motion of quantum bright solitons *(8 pages)* 063616
Christoph Weiss, Simon A. Gardiner, and Heinz-Peter Breuer

Vector solitons in a spin-orbit-coupled spin-2 Bose-Einstein condensate *(8 pages)* 063617
Sandeep Gautam and S. K. Adhikari

Quantum simulations of a freely rotating ring of ultracold and identical bosonic ions *(8 pages)* 063618
F. Robicheaux and K. Niffenegger

Dynamic structure factor and drag force in a one-dimensional strongly interacting Bose gas at finite temperature *(11 pages)* 063619
Guillaume Lang, Frank Hekking, and Anna Minguzzi

Relaxation of a Goldstino-like mode due to supersymmetry breaking in Bose-Fermi mixtures *(11 pages)* 063620
Hsin-Hua Lai and Kun Yang

Condensate fragmentation as a sensitive measure of the quantum many-body behavior of bosons with long-range interactions *(8 pages)* 063621
Uwe R. Fischer, Axel U. J. Lode, and Budhaditya Chatterjee

(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 91, NUMBER 6** **JUNE 2015**

Photoelectron momentum distributions of atomic and molecular systems in strong circularly or elliptically polarized laser fields *(10 pages)* 063413
Pei-Lun He, Norio Takemoto, and Feng He

Site-resolved imaging of ytterbium atoms in a two-dimensional optical lattice *(6 pages)* 063414
Martin Miranda, Ryotaro Inoue, Yuki Okuyama, Akimasa Nakamoto, and Mikio Kozuma

Attosecond time delay in valence photoionization and photorecombination of argon: A time-dependent local-density-approximation study *(7 pages)* 063415
Maia Magrakvelidze, Mohamed El-Amine Madjet, Gopal Dixit, Misha Ivanov, and Himadri S. Chakraborty

Isotope-selective ionization utilizing field-free alignment of isotopologues with a train of femtosecond laser pulses *(7 pages)* 063416
Hiroshi Akagi, Tatsuya Kasajima, Takayuki Kumada, Ryuji Itakura, Atsushi Yokoyama, Hirokazu Hasegawa, and Yasuhiro Ohshima

Intensity-dependent two-electron emission dynamics with orthogonally polarized two-color laser fields *(6 pages)* 063417
Zongqiang Yuan, Difa Ye, Qinzhi Xia, Jie Liu, and Libin Fu

Interfering one-photon and two-photon ionization by femtosecond VUV pulses in the region of an intermediate resonance *(9 pages)* 063418
Alexei N. Grum-Grzhimailo, Elena V. Gryzlova, Ekaterina I. Staroselskaya, Joel Venzke, and Klaus Bartschat

Role of the nitrogen atom in double photoionization of monocyclic hydrocarbons *(4 pages)* 063419
T. Hartman and R. Wehlitz

Orientation dynamics of asymmetric rotors using random phase wave functions *(6 pages)* 063420
Shimshon Kallush and Sharly Fleischer

Contribution of multiple electron trajectories to high-harmonic generation in the few-cycle regime *(8 pages)* 063421
A. Yu. Naumov, D. M. Villeneuve, and Hiromichi Niikura

Redshift of the Lyman-α emission line of H-like ions in a plasma environment *(5 pages)* 063422
T. N. Chang, T. K. Fang, and X. Gao

Matter waves and collective properties of cold atoms and molecules

Prethermalization and glassiness in the bosonic Hubbard model *(9 pages)* 063601
I. Salazar Landea and N. Nessi

Nonadiabatic multichannel dynamics of a spin-orbit-coupled condensate *(9 pages)* 063602
Bo Xiong, Jun-hui Zheng, and Daw-wei Wang

Fragmented many-body states of a spin-2 Bose gas *(10 pages)* 063603
H. H. Jen and S.-K. Yip

Equilibration and approximate conservation laws: Dipole oscillations and perfect drag of ultracold atoms in a harmonic trap *(13 pages)* 063604
Robert Bamler and Achim Rosch

Topological states with broken translational and time-reversal symmetries in a honeycomb-triangular lattice *(8 pages)* 063605
R. Sarjonen and P. Törmä

(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 91, NUMBER 6 JUNE 2015

Ultracold three-body recombination in two dimensions *(10 pages)* 062710
J. P. D'Incao, Fatima Anis, and B. D. Esry

Ab initio interaction potentials and scattering lengths for ultracold mixtures of metastable helium and alkali-metal atoms *(8 pages)* 062711
Dariusz Kędziera, Łukasz Mentel, Piotr S. Żuchowski, and Steven Knoop

PART B

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

Variational analysis of driven-dissipative Rydberg gases *(7 pages)* 063401
Hendrik Weimer

Traces in ion yields and electron spectra of the formation of Ar inner-shell hollow states by free-electron lasers *(5 pages)* 063402
A. O. G. Wallis, H. I. B. Banks, and A. Emmanouilidou

Anisotropic negative-ion emission from cluster nanoplasmas *(5 pages)* 063403
R. Rajeev, Malay Dalui, T. Madhu Trivikram, K. P. M. Rishad, and M. Krishnamurthy

Endpoint contribution to the instantaneous ionization rate for tunneling ionization *(7 pages)* 063404
I. A. Ivanov, Chang Hee Nam, and Kyung Taec Kim

Electron-atom scattering resonances: Complex-scaled multiconfigurational spin-tensor electron propagator method for B^- shape resonances *(7 pages)* 063405
Tsogbayar Tsednee and Danny L. Yeager

Anisotropic emission in quantum-beat spectroscopy of helium excited states *(8 pages)* 063406
M. Lucchini, A. Ludwig, T. Zimmermann, L. Kasmi, J. Herrmann, A. Scrinzi, A. S. Landsman, L. Gallmann, and U. Keller

Above-threshold ionization with highly charged ions in superstrong laser fields. III. Spin effects and their dependence on laser polarization *(20 pages)* 063407
Enderalp Yakaboylu, Michael Klaiber, and Karen Z. Hatsagortsyan

Optimal control of high-order harmonics for the generation of an isolated ultrashort attosecond pulse with two-color midinfrared laser fields *(5 pages)* 063408
Yi Chou, Peng-Cheng Li, Tak-San Ho, and Shih-I Chu

Two-photon excitation to autoionizing states of He detected via radiative cascades to the metastable states *(13 pages)* 063409
Andrej Mihelič and Matjaž Žitnik

Weak-field asymptotic theory of tunneling ionization including the first-order correction terms: Application to molecules *(18 pages)* 063410
Vinh H. Trinh, Vinh N. T. Pham, Oleg I. Tolstikhin, and Toru Morishita

Probing photoelectron angular distributions in molecules with polarization-controlled two-color above-threshold ionization *(7 pages)* 063411
Torsten Leitner, Richard Taïeb, Michael Meyer, and Philippe Wernet

Exploration of the subcycle multiphoton ionization dynamics and transient electron density structures with Bohmian trajectories *(7 pages)* 063412
Hossein Z. Jooya, Dmitry A. Telnov, Peng-Cheng Li, and Shih-I Chu

(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 91, NUMBER 6 JUNE 2015

Configuration interaction with antisymmetrized geminal powers *(6 pages)* 062504
Wataru Uemura, Shusuke Kasamatsu, and Osamu Sugino

Hyperfine structure in the $6\,^2D_{3/2}$ and $6\,^2D_{5/2}$ states of ^{87}Rb and ^{85}Rb *(6 pages)* 062505
J. R. Brandenberger and R. E. Lindley

Quantum interference effects in saturated absorption spectroscopy of $n = 2$ triplet-helium fine structure *(5 pages)* 062506
A. Marsman, M. Horbatsch, and E. A. Hessels

Dielectronic recombination of Zn-like W^{44+} from Cu-like W^{45+} *(17 pages)* 062507
U. I. Safronova, A. S. Safronova, and P. Beiersdorfer

S-matrix calculations of energy levels of sodiumlike ions *(17 pages)* 062508
J. Sapirstein and K. T. Cheng (鄭國錚)

ac Stark effect in ThO $H^3\Delta_1$ for the electron electric-dipole-moment search *(5 pages)* 062509
A. N. Petrov

Enhanced near-field thermal radiation and reduced Casimir stiction between doped-Si gratings *(9 pages)* 062510
Xianglei Liu, Bo Zhao, and Zhuomin M. Zhang

Lamb shift for states with $j = 1/2$ *(6 pages)* 062511
V. Patkóš and J. Zamastil

Quantum interference phenomena in the Casimir effect *(8 pages)* 062512
Andrew A. Allocca, Justin H. Wilson, and Victor M. Galitski

Atomic and molecular collisions and interactions

Positron scattering on molecular hydrogen: Analysis of experimental and theoretical uncertainties *(10 pages)* 062701
Kamil Fedus, Jan Franz, and Grzegorz P. Karwasz

Imaging the dipole-dipole energy exchange between ultracold rubidium Rydberg atoms *(9 pages)* 062702
Donald P. Fahey, Thomas J. Carroll, and Michael W. Noel

Electron elastic scattering and low-frequency bremsstrahlung on $A@C_{60}$: A model static-exchange approximation *(12 pages)* 062703
V. K. Dolmatov, C. Bayens, M. B. Cooper, and M. E. Hunter

$4\,^1P_1$ Zn excitation by 80-eV electrons *(5 pages)* 062704
Mariusz Piwiński, Łukasz Kłosowski, Dariusz Dziczek, Stanisław Chwirot, Dmitry V. Fursa, and Igor Bray

Boundary-corrected four-body continuum-intermediate-state method: Single-electron capture from heliumlike atomic systems by fast nuclei *(20 pages)* 062705
Ivan Mančev, Nenad Milojević, and Dževad Belkić

Low-energy positron–nitrogen-molecule scattering: A rovibrational close-coupling study *(8 pages)* 062706
T. Mukherjee and M. Mukherjee

Influence of excitations to high-*nl* shells for the ionization process in the W^{26+} ion *(6 pages)* 062707
A. Kynienė, Š. Masys, and V. Jonauskas

Excitation cross sections in low-energy hydrogen-helium collisions *(4 pages)* 062709
Andrey K. Belyaev

(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 91, NUMBER 6** **JUNE 2015**

Robust entanglement with a thermal mechanical oscillator *(8 pages)* 062317
Andrey A. Rakhubovsky and Radim Filip

Optimal mode transformations for linear-optical cluster-state generation *(5 pages)* 062318
D. B. Uskov, P. Lougovski, P. M. Alsing, M. L. Fanto, L. Kaplan, and A. Matthew Smith

Breakdown of local convertibility through Majorana modes in a quantum quench *(8 pages)* 062319
Li Dai and Ming-Chiang Chung

Decoherence in adiabatic quantum computation *(19 pages)* 062320
Tameem Albash and Daniel A. Lidar

Generation and complete nondestructive analysis of hyperentanglement assisted by nitrogen-vacancy centers in resonators *(9 pages)* 062321
Qian Liu and Mei Zhang

Quantum computation speedup limits from quantum metrological precision bounds *(5 pages)* 062322
Rafał Demkowicz-Dobrzański and Marcin Markiewicz

Quantum walks and quantum search on graphene lattices *(15 pages)* 062323
Iain Foulger, Sven Gnutzmann, and Gregor Tanner

Passive correction of quantum logical errors in a driven, dissipative system: A blueprint for an analog quantum code fabric *(18 pages)* 062324
Eliot Kapit, John T. Chalker, and Steven H. Simon

Quantum-information processing on nitrogen-vacancy ensembles with the local resonance assisted by circuit QED *(9 pages)* 062325
Ming-Jie Tao (陶明杰), Ming Hua (华明), Qing Ai (艾清), and Fu-Guo Deng (邓富国)

Remote one-qubit-state control using the pure initial state of a two-qubit sender: Selective-region and eigenvalue creation *(11 pages)* 062326
G. A. Bochkin and A. I. Zenchuk

Photon doughnut-shaped pair for easy production of entangled photon pairs *(4 pages)* 062327
Hsin-Pin Lo, Atsushi Yabushita, and Takayoshi Kobayashi

Quantum information processing by weaving quantum Talbot carpets *(10 pages)* 062328
Osvaldo Jiménez Farías, Fernando de Melo, Pérola Milman, and Stephen P. Walborn

Atomic and molecular structure and dynamics

Tungsten spectroscopy in the EUV range observed at a high-temperature superconducting electron-beam ion trap *(6 pages)* 062501
Wenxian Li, Zhan Shi, Yang Yang, Jun Xiao, Tomas Brage, Roger Hutton, and Yaming Zou

Qualitative failure of a multiconfiguration method in prolate spheroidal coordinates in calculating dissociative photoionization of H_2^+ *(8 pages)* 062502
Daniel J. Haxton, Keith V. Lawler, and C. William McCurdy

Adiabatic and nonadiabatic static polarizabilities of H and H_2 *(5 pages)* 062503
Juha Tiihonen, Ilkka Kylänpää, and Tapio T. Rantala

(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 91, NUMBER 6 JUNE 2015

Quantum information

Security loophole in free-space quantum key distribution due to spatial-mode detector-efficiency mismatch *(6 pages)* 062301
Shihan Sajeed, Poompong Chaiwongkhot, Jean-Philippe Bourgoin, Thomas Jennewein, Norbert Lütkenhaus, and Vadim Makarov

Hyperentanglement concentration for time-bin and polarization hyperentangled photons *(7 pages)* 062302
Xi-Han Li and Shohini Ghose

Entanglement of polarization and orbital angular momentum *(6 pages)* 062303
D. Bhatti, J. von Zanthier, and G. S. Agarwal

Continuous limit of discrete quantum walks *(6 pages)* 062304
Dheeraj M N and Todd A. Brun

Heralded noiseless linear amplification and quantum channels *(8 pages)* 062305
Rémi Blandino, Marco Barbieri, Philippe Grangier, and Rosa Tualle-Brouri

Optimizing for an arbitrary perfect entangler. I. Functionals *(9 pages)* 062306
Paul Watts, Jiří Vala, Matthias M. Müller, Tommaso Calarco, K. Birgitta Whaley, Daniel M. Reich, Michael H. Goerz, and Christiane P. Koch

Optimizing for an arbitrary perfect entangler. II. Application *(11 pages)* 062307
Michael H. Goerz, Giulia Gualdi, Daniel M. Reich, Christiane P. Koch, Felix Motzoi, K. Birgitta Whaley, Jiří Vala, Matthias M. Müller, Simone Montangero, and Tommaso Calarco

Universal simulation of Markovian open quantum systems *(13 pages)* 062308
Ryan Sweke, Ilya Sinayskiy, Denis Bernard, and Francesco Petruccione

Universal quantum simulation with prethreshold superconducting qubits: Single-excitation subspace method *(23 pages)* 062309
Michael R. Geller, John M. Martinis, Andrew T. Sornborger, Phillip C. Stancil, Emily J. Pritchett, Hao You, and Andrei Galiautdinov

Simple quantum password checking *(6 pages)* 062310
Juan Carlos Garcia-Escartin and Pedro Chamorro-Posada

Complementarity of quantum correlations in cloning and deleting of quantum states *(11 pages)* 062311
Sk Sazim, Indranil Chakrabarty, Annwesha Datta, and Arun K. Pati

Analysis of optimal unambiguous discrimination of three pure quantum states *(7 pages)* 062312
Donghoon Ha and Younghun Kwon

Gaussian intrinsic entanglement: An entanglement quantifier based on secret correlations *(21 pages)* 062313
Ladislav Mišta, Jr. and Richard Tatham

Switching quantum dynamics for fast stabilization *(13 pages)* 062314
Pierre Scaramuzza and Francesco Ticozzi

Single- and two-mode quantumness at a beam splitter *(11 pages)* 062315
Matteo Brunelli, Claudia Benedetti, Stefano Olivares, Alessandro Ferraro, and Matteo G. A. Paris

Randomness generation based on spontaneous emissions of lasers *(7 pages)* 062316
Hongyi Zhou, Xiao Yuan, and Xiongfeng Ma

(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 91, NUMBER 6** **JUNE 2015**

Implications and applications of the variance-based uncertainty equalities *(8 pages)* 062113
Yao Yao, Xing Xiao, Xiaoguang Wang, and C. P. Sun

Positive-operator-valued measures in the Hamiltonian formulation of quantum mechanics *(9 pages)* 062114
D. Arsenović, N. Burić, D. B. Popović, M. Radonjić, and S. Prvanović

Detection of a quantum particle on a lattice under repeated projective measurements *(10 pages)* 062115
Shrabanti Dhar, Subinay Dasgupta, Abhishek Dhar, and Diptiman Sen

Forward-backward analysis of the photon-number evolution in a cavity *(9 pages)* 062116
T. Rybarczyk, B. Peaudecerf, M. Penasa, S. Gerlich, B. Julsgaard, K. Mølmer, S. Gleyzes, M. Brune, J. M. Raimond, S. Haroche, and I. Dotsenko

Bell measurements as a witness of a dualism in entanglement *(5 pages)* 062117
E. Moreva, G. Brida, M. Gramegna, S. Bose, D. Home, and M. Genovese

Observation of nonlinear variations in a three-vertex geometric phase in a two-photon polarization qutrit *(6 pages)* 062118
Kazuhisa Ogawa, Shuhei Tamate, Hirokazu Kobayashi, Toshihiro Nakanishi, and Masao Kitano

Freezing of quantum correlations under local decoherence *(14 pages)* 062119
Titas Chanda, Amit Kumar Pal, Anindya Biswas, Aditi Sen(De), and Ujjwal Sen

Disturbance in weak measurements and the difference between quantum and classical weak values *(11 pages)* . . . 062120
Asger C. Ipsen

Waveguide-QED-based measurement of a reservoir spectral density *(6 pages)* 062121
Francesco Ciccarello

Heisenberg-like and Fisher-information-based uncertainty relations for N-electron d-dimensional systems *(8 pages)* 062122
I. V. Toranzo, S. López-Rosa, R. O. Esquivel, and J. S. Dehesa

Quantum paradoxes originating from the nonclassical statistics of physical properties related to each other by half-periodic transformations *(11 pages)* 062123
Holger F. Hofmann

Measurement incompatibility and channel steering *(4 pages)* 062124
Manik Banik, Subhadipa Das, and A. S. Majumdar

Extended necessary condition for local operations and classical communication: Tight bound for all measurements *(10 pages)* 062125
Scott M. Cohen

Casimir force between parallel plates separated by anisotropic media *(7 pages)* 062126
Gang Deng, Bao-Hua Tan, Ling Pei, Ni Hu, and Jin-Rong Zhu

Quantum tomography via nonorthogonal basis and weak values *(5 pages)* 062127
J. J. Díaz, I. Sainz, and A. B. Klimov

Practical variational tomography for critical one-dimensional systems *(16 pages)* 062128
Jong Yeon Lee and Olivier Landon-Cardinal

(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 91, NUMBER 6 JUNE 2015

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

Optical tractor beam with chiral light *(6 pages)* . . . . . 061801(R)
David E. Fernandes and Mário G. Silveirinha

Experimental route to chaos of an external-cavity semiconductor laser *(4 pages)* . . . . . 061802(R)
Byungchil Kim, Alexandre Locquet, Daeyoung Choi, and D. S. Citrin

Sub-Poissonian phonon lasing in three-mode optomechanics *(6 pages)* . . . . . 061803(R)
Niels Lörch and Klemens Hammerer

Photon antibunching from few quantum dots in a cavity *(5 pages)* . . . . . 061804(R)
Christopher Gies, Frank Jahnke, and Weng W. Chow

ARTICLES

Fundamental concepts

Coupled oscillator systems having partial $\mathcal{PT}$ symmetry *(11 pages)* 062101
Alireza Beygi, S. P. Klevansky, and Carl M. Bender

Kapitza-Dirac scattering of electrons from a bichromatic standing laser wave *(7 pages)* 062102
Matthias M. Dellweg and Carsten Müller

Necessary and sufficient conditions for macroscopic realism from quantum mechanics *(9 pages)* 062103
Lucas Clemente and Johannes Kofler

Generation of Bell, W, and Greenberger-Horne-Zeilinger states via exceptional points in non-Hermitian quantum spin systems *(7 pages)* 062104
C. Li and Z. Song

Modified weak measurements for the detection of the photonic spin Hall effect *(10 pages)* 062105
Shizhen Chen, Xinxing Zhou, Chengquan Mi, Hailu Luo, and Shuangchun Wen

Generalized Klein-Nishina formula *(9 pages)* 062106
K. Krajewska, F. Cajiao Vélez, and J. Z. Kamiński

Weak-value amplification as an optimal metrological protocol *(10 pages)* 062107
G. Bié Alves, B. M. Escher, R. L. de Matos Filho, N. Zagury, and L. Davidovich

Time correlation functions for non-Hermitian quantum systems *(9 pages)* 062108
Alessandro Sergi and Konstantin G. Zloshchastiev

Double bremsstrahlung from high-energy electrons in an atomic field *(8 pages)* 062109
P. A. Krachkov, R. N. Lee, and A. I. Milstein

Resonance of the exchange amplitude of a photon by an electron scattering in a pulsed laser field *(9 pages)* 062110
V. N. Nedoreshta, S. P. Roshchupkin, and A. I. Voroshilo

Detecting the presence of weak magnetic fields using nitrogen-vacancy centers *(9 pages)* 062111
Adam Zaman Chaudhry

Energy range for quantum coherence *(14 pages)* 062112
Filippo Giraldi

(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 91, NUMBER 6 **PARTS A AND B**

CONTENTS

JUNE 2015

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 060301(R)–062711, and Part B pages 063401–069907(E).

PART A

RAPID COMMUNICATIONS

Quantum information

Mutually unbiased bases as minimal Clifford covariant 2-designs *(5 pages)* . . . . . 060301(R)
Huangjun Zhu

Atomic and molecular structure and dynamics

Determination of transition frequencies in a single $^{138}Ba^{+}$ ion *(5 pages)* . . . . . 060501(R)
E. A. Dijck, M. Nuñez Portela, A. T. Grier, K. Jungmann, A. Mohanty, N. Valappol, and L. Willmann

Dual Fano and Lorentzian line profile properties of autoionizing states *(5 pages)* . . . . . 060502(R)
B. Tu, J. Xiao, K. Yao, Y. Shen, Y. Yang, D. Lu, W. X. Li, M. L. Qiu, X. Wang, C. Y. Chen, Y. Fu, B. Wei, C. Zheng, L. Y. Huang, B. H. Zhang, Y. J. Tang, R. Hutton, and Y. Zou

Atomic and molecular collisions and interactions

Anion emission from water molecules colliding with positive ions: Identification of binary and many-body processes *(5 pages)* . . . . . 060701(R)
J.-Y. Chesnel, Z. Juhász, E. Lattouf, J. A. Tanis, B. A. Huber, E. Bene, S. T. S. Kovács, P. Herczku, A. Méry, J.-C. Poully, J. Rangama, and B. Sulik

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

Spin correlations as a probe of quantum synchronization in trapped-ion phonon lasers *(6 pages)* . . . . . 061401(R)
Michael R. Hush, Weibin Li, Sam Genway, Igor Lesanovsky, and Andrew D. Armour

Fast production of Bose-Einstein condensates of metastable helium *(5 pages)* . . . . . 061402(R)
Q. Bouton, R. Chang, A. L. Hoendervanger, F. Nogrette, A. Aspect, C. I. Westbrook, and D. Clément

Dressing effects in the attosecond transient absorption spectra of doubly excited states in helium *(6 pages)* . . . . . 061403(R)
L. Argenti, Á. Jiménez-Galán, C. Marante, C. Ott, T. Pfeifer, and F. Martín

Matter waves and collective properties of cold atoms and molecules

Anderson localization of matter waves in quantum-chaos theory *(6 pages)* . . . . . 061601(R)
E. Fratini and S. Pilati

Copyright 2015 by American Physical Society

(Continued)

1050-2947(201506)91:6:A;1-7

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).