PHYSICAL REVIEW A **THIRD SERIES, VOLUME 108, NUMBER 5** **NOVEMBER 2023**

$\mathcal{PT}$-symmetric quantum Rabi model *(11 pages)* 053712
Xilin Lu, Hui Li, Jia-Kai Shi, Li-Bao Fan, Vladimir Mangazeev, Zi-Min Li, and Murray T. Batchelor

Radiation of optical angular momentum from a dipole source in a magneto-birefringent disordered environment *(7 pages)* 053713
R. Le Fournis and B. A. van Tiggelen

Narrow-band photon pair generation through cavity-enhanced spontaneous parametric down-conversion *(8 pages)* 053714
Amideddin Mataji-Kojouri and Marco Liscidini

Nonclassical magnon pair generation and Cauchy-Schwarz inequality violation *(20 pages)* 053715
Yaqi Fan, Jiahua Li, and Ying Wu

Chiral phase modulation and a tunable broadband perfect absorber using a coherent cold atomic ensemble *(9 pages)* 053716
Yi-Xin Wang, Yan Zhang, Lei Du, and Jin-Hui Wu

Quantum light-matter interactions in structured waveguides *(16 pages)* 053717
Rupak Bag and Dibyendu Roy

Correlated two-photon scattering in a one-dimensional waveguide coupled to two- or three-level giant atoms *(14 pages)* 053718
Wenju Gu, He Huang, Zhen Yi, Lei Chen, Lihui Sun, and Huatang Tan

Matched optical vortices of slow light using a tripod coherently prepared scheme *(7 pages)* 053719
Hamid R. Hamedi, Ite A. Yu, and Emmanuel Paspalakis

COMMENTS

Comment on "Multitime quantum communication: Interesting but not counterfactual" *(2 pages)* 056201
Lev Vaidman

Reply to "Comment on 'Multitime quantum communication: Interesting but not counterfactual' " *(2 pages)* 056202
Robert B. Griffiths

ERRATA

Erratum: Dressing effects in the laser-assisted (e, $2e$) process in fast-electron–hydrogen-atom collisions in an asymmetric coplanar scattering geometry [Phys. Rev. A **106**, 022804 (2022)] *(1 page)* . . . . . 059901(E)
Gabriela Buică

Erratum: Hybrid completely positive Markovian quantum-classical dynamics [Phys. Rev. A **107**, 062206 (2023)] *(1 page)* . . . . . 059902(E)
Lajos Diósi

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Spatially resolved macroscopic near-threshold harmonics generated from harmoniclike and resonant transitions using an artificial neural network *(8 pages)* 053510
Bincheng Wang, Tianyu Wen, Yong Fu, Baochang Li, Kan Wang, and Cheng Jin

Control of quantum interference frequency combs: Multistable temporal cavity solitons *(10 pages)* 053511
Mansour Eslami, Maedeh Sadat Hashemi, David Grant, and Gian-Luca Oppo

Asymmetrical simultaneous squeezing of multiple mechanical oscillators via synthetic magnetism *(11 pages)* 053512
Qi Guo, Jinke Cao, Cheng-Hua Bai, Yuchi Zhang, Gang Li, and Tiancai Zhang

Virtual perfect absorption in resonant media and their $\mathcal{PT}$-symmetric generalizations *(9 pages)* 053513
Denis V. Novitsky and Alexander S. Shalin

Enhancement of quantum sensing in a cavity-optomechanical system around the quantum critical point *(9 pages)* 053514
Shao-Bo Tang, Hao Qin, Bing-Bing Liu, D.-Y. Wang, Kaifeng Cui, S.-L. Su, L.-L. Yan, and Gang Chen

Hybridization of electric and magnetic responses in the effective axion background *(7 pages)* 053515
Timur Z. Seidov and Maxim A. Gorlach

Quantum optics

Distinguishability and mixedness in quantum interference *(11 pages)* 053701
Alex E. Jones, Shreya Kumar, Simone D'Aurelio, Matthias Bayerbach, Adrian J. Menssen, and Stefanie Barz

Magnon blockade in magnon-qubit systems *(11 pages)* 053702
Zhu-yao Jin and Jun Jing

Analytical approach to higher-order correlation functions in U(1) symmetric systems *(20 pages)* 053703
Zhi-Guang Lu, Cheng Shang, Ying Wu, and Xin-You Lü

Nonclassical radiation from a nonlinear oscillator driven solely by classical $1/f$ noise *(11 pages)* 053704
Archak Purkayastha and Klaus Mølmer

Coherent states of photonic dimers *(36 pages)* 053705
Qihang Liu, Yao Zhou, and Jung-Tsung Shen

Unconventional saturation effects at intermediate drive in a lossy cavity coupled to few emitters *(24 pages)* 053706
Therese Karmstrand, Benjamin Rousseaux, Anton Frisk Kockum, Timur Shegai, and Göran Johansson

Decay and revival dynamics of a quantum state embedded in a regularly spaced band of states *(12 pages)* 053707
Jan Petter Hansen and Konrad Tywoniuk

Improving the sensitivity of Kerr quantum nondemolition measurement via squeezed light *(8 pages)* 053708
Stepan Balybin, Dariya Salykina, and Farid Ya. Khalili

Deterministic generation of phononic Fock states via weak nonlinearities *(8 pages)* 053709
Yi-Xuan Ma and Peng-Bo Li

Bottom-up approach to room-temperature quantum systems *(12 pages)* 053710
Bochao Wei, Chao Li, Ce Pei, and Chandra Raman

Improving a quantum-dot-based single-photon source with continuous measurements *(9 pages)* 053711
Anirudh Lanka and Todd Brun

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).
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 108, NUMBER 5** **NOVEMBER 2023**

Two-dimensional supersolidity in a planar dipolar Bose gas *(10 pages)* 053321
B. T. E. Ripley, D. Baillie, and P. B. Blakie

Multicomponent states for trapped spin-1 Bose-Einstein condensates in the presence of a magnetic field *(18 pages)* 053322
Projjwal K. Kanjilal and A. Bhattacharyay

Spontaneous dipolar Bose-Einstein condensation on the surface of a cylinder *(7 pages)* 053323
Luis E. Young-S. and S. K. Adhikari

Cold atom-ion systems in radio-frequency multipole traps: Event-driven molecular dynamics and stochastic simulations *(11 pages)* 053324
Mateo Londoño, Javier Madroñero, and Jesús Pérez-Ríos

State-dependent potentials for the $^1S_0$ and $^3P_0$ clock states of neutral ytterbium atoms *(16 pages)* 053325
Tim O. Höhn, Etienne Staub, Guillaume Brochier, Nelson Darkwah Oppong, and Monika Aidelsburger

Random Kronig-Penney-type potentials for ultracold atoms using dark states *(11 pages)* 053326
Mateusz Łącki and Jakub Zakrzewski

Assisted metrology and preparation of macroscopic superpositions with split spin-squeezed states *(8 pages)* 053327
Jiajie Guo, Fengxiao Sun, Qiongyi He, and Matteo Fadel

Photonics, nonlinear optics, and optomechanics

Photon diffusion in space and time in a second-order-nonlinear disordered medium *(11 pages)* 053501
Rabisankar Samanta, Romain Pierrat, Rémi Carminati, and Sushil Mujumdar

Spatially resolving classical and quantum entanglement with structured photons *(8 pages)* 053502
Cade Peters, Pedro Ornelas, Isaac Nape, and Andrew Forbes

Out-of-phase solitons in multicore fibers of one-dimensional and square lattices of weakly coupled cores *(11 pages)* 053503
S. A. Skobelev, A. A. Balakin, and A. G. Litvak

Broadband and large-area optical chirality generated by an achiral metasurface under achiral excitation *(6 pages)* 053504
Shiqi Jia, Tong Fu, Jie Peng, and Shubo Wang

Transform-limited dissipative Kerr solitons with an ultraflat spectrum in a Fabry-Pérot microresonator with a spectral filter *(8 pages)* 053505
You Yu, Zhiqiang Wang, Zhen Fang, Yang Li, and Zuxing Zhang

Isolated spectrally discrete bound states in the continuum in an open system *(9 pages)* 053506
Samyobrata Mukherjee, Jordi Gomis-Bresco, David Artigas, and Lluis Torner

Enhanced optomechanical interaction in an unbalanced Michelson-Sagnac interferometer *(13 pages)* 053507
Alexandr Karpenko, Mikhail Korobko, and Sergey P. Vyatchanin

Guided modes in a $\mathcal{PT}$-symmetric waveguide: Real dispersion curves *(8 pages)* 053508
Nan Zhang and Ya Yan Lu

Nonperturbative transverse mode coupling in high-order harmonic generation *(9 pages)* 053509
Martin Luttmann, Mekha Vimal, Matthieu Guer, Titouan Gadeyne, Céline Chappuis, Jean-François Hergott, and Thierry Ruchon

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Particle dynamics and ergodicity breaking in twisted-bilayer optical lattices *(7 pages)* 053305
Ganesh C. Paul, Patrik Recher, and Luis Santos

Scattering of one-dimensional quantum droplets by a reflectionless potential well *(13 pages)* 053306
Xiaoxiao Hu, Zhiqiang Li, Yu Guo, Yajiang Chen, and Xiaobing Luo

Nonlinear multistate tunneling dynamics in a spinor Bose-Einstein condensate *(12 pages)* 053307
Z. N. Hardesty-Shaw, Q. Guan, J. O. Austin-Harris, D. Blume, R. J. Lewis-Swan, and Y. Liu

Thermal effects on the spin-domain phases of high spin-f Bose-Einstein condensates with rotational symmetries *(16 pages)* 053308
Eduardo Serrano-Ensástiga and Francisco Mireles

Rotating quantum droplets confined in a harmonic potential *(11 pages)* 053309
S. Nikolaou, G. M. Kavoulakis, and M. Ögren

Spectra and dynamics of quantum droplets in an optical lattice *(7 pages)* 053310
Yuhang Nie, Jun-Hui Zheng, and Tao Yang

Simulating the Berezinskii-Kosterlitz-Thouless transition with the complex Langevin algorithm *(16 pages)* 053311
Philipp Heinen and Thomas Gasenzer

Metal-insulator transition and magnetism of SU(3) fermions in the square lattice *(11 pages)* 053312
Eduardo Ibarra-García-Padilla, Chunhan Feng, Giulio Pasqualetti, Simon Fölling, Richard T. Scalettar, Ehsan Khatami, and Kaden R. A. Hazzard

Gap solitons and nonlinear Bloch states in Bose-Einstein condensates with current-dependent interactions *(8 pages)* 053313
Jintao Xu, Qian Jia, Haibo Qiu, and Antonio Muñoz Mateo

Order by disorder and an emergent Kosterlitz-Thouless phase in a triangular Rydberg array *(15 pages)* 053314
Sibo Guo, Juntao Huang, Jiangping Hu, and Zi-Xiang Li

Faraday waves on a bubble-trapped Bose-Einstein-condensed binary mixture *(17 pages)* 053315
Leonardo Brito, Lauro Tomio, and Arnaldo Gammal

Scissors modes of a Bose-Einstein condensate in a synthetic magnetic field *(8 pages)* 053316
Chunlei Qu, Chuan-Hsun Li, Yong P. Chen, and Sandro Stringari

Ultracold molecular collisions in magnetic fields: Efficient incorporation of hyperfine structure in the total rotational angular momentum representation *(15 pages)* 053317
Timur V. Tscherbul and Jose P. D'Incao

Quantum simulation of generic spin-exchange models in Floquet-engineered Rydberg-atom arrays *(18 pages)* . . . 053318
Naveen Nishad, Anna Keselman, Thierry Lahaye, Antoine Browaeys, and Shai Tsesses

Optimizing beam-splitter pulses for atom interferometry: A geometric approach *(12 pages)* 053319
Nikolaos Dedes, Jack Saywell, Max Carey, Ilya Kuprov, and Tim Freegarde

Trapping of Bose-Einstein condensates in a three-dimensional dark focus generated by conical refraction *(11 pages)* 053320
D. Pfeiffer, L. Lind, J. Küber, F. Schmaltz, A. Turpin, V. Ahufinger, J. Mompart, and G. Birkl

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Nuclear electric resonance for spatially resolved spin control via pulsed optical excitation in the UV-visible spectrum *(16 pages)* 053110
Johannes K. Krondorfer and Andreas W. Hauser

Os^{16+} and Ir^{17+} ions as candidates for accurate optical clocks sensitive to physics beyond the standard model *(9 pages)* 053111
V. A. Dzuba and V. V. Flambaum

Energetic, tunable, highly elliptically polarized higher harmonics generated by intense two-color counter-rotating laser fields *(11 pages)* 053112
Emmanouil Vassakis, Saibabu Madas, Leandros Spachis, Theocharis Lamprou, Ioannis Orfanos, Subhendu Kahaly, Mousumi Upadhyay Kahaly, Dimitris Charalambidis, and Emmanouil Skantzakis

Auger decay of $1s^{-1}3p^{-1}nln'l'$ doubly excited states in Ar *(11 pages)* 053113
M. Žitnik, M. Hrast, A. Mihelič, K. Bučar, J. Turnšek, R. Püttner, G. Goldsztejn, T. Marchenko, R. Guillemin, L. Journel, O. Travnikova, I. Ismail, M. N. Piancastelli, M. Simon, D. Ceolin, and M. Kavčič

Ultrafast switching of persistent electron and hole ring currents in a molecule *(8 pages)* 053114
Tennesse Joyce and Agnieszka Jaron

Angular and polarization properties of characteristic x-ray radiation following inner-shell $2p_{3/2}$ photoionization of high-Z atoms *(8 pages)* 053115
Z. W. Wu, W. Liu, and S. Fritzsche

Photodissociation via weak intersystem crossing: Incoherent versus coherent excited-state nonadiabatic dynamics in N_2 *(8 pages)* 053116
Natalia Gelfand, Ksenia Komarova, Francoise Remacle, and Raphael D. Levine

Unveiling Rabi dynamics through angle-resolved photoelectron momentum distributions using an ω-2ω pulse pair *(8 pages)* 053117
Yi-Jia Mao, Hong-Bin Yao, Mingrui He, Zhao-Han Zhang, Yang Li, and Feng He

Pauli principle in polaritonic chemistry *(7 pages)* 053118
Tamás Szidarovszky

Quantum radiation and absorption by current fluctuations of atoms in strong laser fields *(5 pages)* 053119
Zhaoyang Peng, Huayu Hu, Jianpeng Liu, Jinlei Liu, Zengxiu Zhao, and Jianmin Yuan

Enhancing divalent optical atomic clocks with the $^1S_0 \leftrightarrow {}^3P_2$ transition *(11 pages)* 053120
Matthew A. Bohman, Sergey G. Porsev, David B. Hume, David R. Leibrandt, and Marianna S. Safronova

Ultracold systems and matter waves

Entanglement generation and detection in split exciton-polariton condensates *(9 pages)* 053301
Jingyan Feng, Hui Li, Zheng Sun, and Tim Byrnes

Chiral currents in Bose-Einstein condensates subject to current-density interactions *(8 pages)* 053302
Maria Arazo, Montserrat Guilleumas, Ricardo Mayol, Vicente Delgado, and Antonio Muñoz Mateo

Vortex structure and spectrum of an atomic Fermi superfluid in a spherical bubble trap *(9 pages)* 053303
Yan He and Chih-Chun Chien

Nonequilibrium dynamics in one-dimensional strongly interacting two-component gases *(27 pages)* 053304
Ovidiu I. Pâţu

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5 NOVEMBER 2023

Interspecies spin-noise correlations in hot atomic vapors *(22 pages)* 052822
K. Mouloudakis, F. Vouzinas, A. Margaritakis, A. Koutsimpela, G. Mouloudakis, V. Koutrouli, M. Skotiniotis, G. P. Tsironis, M. Loulakis, M. W. Mitchell, G. Vasilakis, and I. K. Kominis

Algebraically solvable model for electron-phonon interactions in cycloacene molecules *(13 pages)* 052823
D. Condado, E. Sadurní, and R. A. Méndez-Sánchez

QED calculations of the nuclear recoil effect in muonic atoms *(6 pages)* 052824
Vladimir A. Yerokhin and Natalia S. Oreshkina

Deuterium spectroscopy for enhanced bounds on physics beyond the standard model *(15 pages)* 052825
Robert M. Potvliege, Adair Nicolson, Matthew P. A. Jones, and Michael Spannowsky

Experimental determination of Sn *L*-shell atomic parameters *(8 pages)* 052826
F. Fernandez, A. Sepúlveda, S. Limandri, J. Trincavelli, and G. Castellano

Magnetic dipole transitions in the H_2^+ ion *(3 pages)* 052827
D. T. Aznabayev, A. K. Bekbaev, and Vladimir I. Korobov

PART B

Light-induced processes in atomic-scale systems

Imaging electron angular distributions to assess a full-power petawatt-class laser focus *(9 pages)* 053101
Smrithan Ravichandran, Marine Huault, Roberto Lera, Calvin Z. He, Andrew Longman, Robert Fedosejevs, Luis Roso, and Wendell T. Hill, III

Partial-wave decomposition of the Keldysh ionization amplitude *(16 pages)* 053102
S. Walker, B. Ghomashi, and A. Becker

Progress toward the $\mathcal{P}, \mathcal{T}$-odd Faraday effect: Light absorption by atoms briefly interacting with a laser beam *(8 pages)* 053103
D. V. Chubukov, I. A. Aleksandrov, L. V. Skripnikov, and A. N. Petrov

Laser-cluster interaction in an external magnetic field: Emergence of a nearly monoenergetic weakly relativistic electron beam *(12 pages)* 053104
Kalyani Swain, S. S. Mahalik, and M. Kundu

Three-pathway electromagnetically induced transparency and absorption based on coupled superconducting resonators *(6 pages)* 053105
Tianning Zheng, Pengqi Wang, Bin Wei, Boyu Lu, Bisong Cao, and Fuchuan Lei

Intensity-resolved measurement of above-threshold ionization of Ar-H_2O *(7 pages)* 053106
Adrian Platz, Sebastian Hell, Yinyu Zhang, Bo Ying, Gerhard G. Paulus, and Matthias Kübel

Fractional Chern insulator with Rydberg-dressed neutral atoms *(18 pages)* 053107
Yang Zhao and Xiao-Feng Shi

Tracking quantum-cloud expansion in tunneling ionization *(15 pages)* 053108
I. A. Ivanov, A. S. Kheifets, and Kyung Taec Kim

Spin polarization of electrons in a circularly polarized magnetic field *(9 pages)* 053109
Dejia Dai

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Dynamics of resonant low-energy electron attachment to ethanol-producing hydroxide anions *(10 pages)* 052806
Dipayan Chakraborty, Daniel S. Slaughter, and Sylwia Ptasinska

Casimir and Casimir-Polder interactions for magneto-dielectric materials: Surface scattering expansion *(23 pages)* 052807
Giuseppe Bimonte and Thorsten Emig

Relativistic calculation of nondipole effects in high-order harmonic generation *(14 pages)* 052808
I. A. Ivanov and Kyung Taec Kim

Scattering-angle dependence of doubly differential cross sections for ionization in proton collisions with molecular hydrogen *(13 pages)* 052809
C. T. Plowman, K. H. Spicer, M. Schulz, and A. S. Kadyrov

Enantiodetection via two-dimensional spectroscopy: Extending the methodology to general experimental conditions *(8 pages)* 052810
Mao-Rui Cai, Chong Ye, Yong Li, and Hui Dong

Associative ionization in collisions of $H^+ + H^-$ and $H(1s) + H(ns)$ *(10 pages)* 052811
Johan Hörnquist, Patrik Hedvall, Ann E. Orel, and Åsa Larson

Mean-field approach to Rydberg facilitation in a gas of atoms at high and low temperatures *(7 pages)* 052812
Daniel Brady and Michael Fleischhauer

Doubly excited autodissociating resonant states of positronium hydride *(7 pages)* 052813
Yi Zhang, Meng-Shan Wu, Guo-An Yan, Kalman Varga, Zong-Chao Yan, and Jun-Yi Zhang

Ultrafast molecular dissociation induced by intermolecular Coulombic decay in water clusters *(9 pages)* 052814
Xueguang Ren, Enliang Wang, Jiaqi Zhou, Shaokui Jia, Xing Wang, Xiaorui Xue, and Alexander Dorn

Nuclear magnetic quadrupole moment of ^{175}Lu and parity-violating polarization degree of levels in ^{175}Lu OH^+ *(7 pages)* 052815
Igor Kurchavov, Daniel Maison, Leonid Skripnikov, Matt Grau, and Alexander Petrov

Hyperfine structure of low-lying triplet states in ^{45}Sc II *(6 pages)* 052816
A. Dockery, K. König, J. Lantis, Y. Liu, K. Minamisono, S. Pineda, and R. Powel

Understanding the electron capture mechanisms during heavy-ion collisions *(8 pages)* 052817
Manpreet Kaur, Sanjeev Kumar, and T. Nandi

Self-consistent-field method for correlation calculation within density-matrix-functional theory *(8 pages)* 052818
Marinela Irimia, Yu Wang, Yifan Fei, and Jian Wang

Possible experiment on the observation of the $\mathcal{P}, \mathcal{T}$-odd Faraday effect in intracavity absorption spectroscopy: Statistics and systematic errors *(9 pages)* 052819
S. D. Chekhovskoi, D. V. Chubukov, L. V. Skripnikov, A. N. Petrov, and L. N. Labzowsky

Nonlocal resonant inelastic x-ray scattering *(10 pages)* 052820
Faris Gel'mukhanov, Ji-Cai Liu, Pavel Krasnov, Nina Ignatova, Jan-Erik Rubensson, and Victor Kimberg

Ab initio potential-energy curves, scattering lengths, and rovibrational levels of the He_2^+ molecular ion in excited electronic states *(18 pages)* 052821
Jacek Gębala, Michał Przybytek, Marcin Gronowski, and Michał Tomza

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Experimental analysis of image resolution of quantum imaging with undetected light through position correlations *(12 pages)* 052610
Marta Gilaberte Basset, René Sondenheimer, Jorge Fuenzalida, Andres Vega, Sebastian Töpfer, Elkin A. Santos, Sina Saravi, Frank Setzpfandt, Fabian Steinlechner, and Markus Gräfe

Optimized detector tomography for photon-number-resolving detectors with hundreds of pixels *(8 pages)* 052611
Dong-Sheng Liu, Jia-Qi Wang, Chang-Ling Zou, Xi-Feng Ren, and Guang-Can Guo

Quantum communication networks with optical vortices *(10 pages)* 052612
Şerban Suciu, George Andrei Bulzan, Tudor-Alexandru Isdrailă, Alexandra Maria Pălici, Stefan Ataman, Cristian Kusko, and Radu Ionicioiu

Linear cross-entropy benchmarking with Clifford circuits *(18 pages)* 052613
Jianxin Chen, Dawei Ding, Cupjin Huang, and Linghang Kong

Multinucleon structure and dynamics via quantum computing *(24 pages)* 052614
Weijie Du and James P. Vary

Performance metrics for the continuous distribution of entanglement in multiuser quantum networks *(21 pages)* 052615
Álvaro G. Iñesta and Stephanie Wehner

Defending against a laser-seeding attack on continuous-variable quantum key distribution using an improved optical power limiter *(11 pages)* 052616
Qingquan Peng, Binwu Gao, Dongyang Wang, Qin Liao, Zhiyue Zuo, Hai Zhong, Anqi Huang, and Ying Guo

Average-value estimation in nonadiabatic holonomic quantum computation *(6 pages)* 052617
Guo-Fu Xu and P. Z. Zhao

Quantum simulation of the central spin model with a Rydberg atom and polar molecules in optical tweezers *(23 pages)* 052618
Jacek Dobrzyniecki and Michał Tomza

Fast quantum gates based on Landau-Zener-Stückelberg-Majorana transitions *(14 pages)* 052619
Joan J. Cáceres, Daniel Domínguez, and María José Sánchez

Atomic and molecular structure and dynamics; high-precision experiments

Progress toward a formal functional theory of strongly correlated systems *(6 pages)* 052801
Ting Zhang and Neil Qiang Su

Hyperfine splitting in $^{6,7}Li^{+}$ *(13 pages)* 052802
Krzysztof Pachucki, Vojtěch Patkóš, and Vladimir A. Yerokhin

Exchange energies and density functionals for systems of fermions of arbitrary spin *(6 pages)* 052803
Ivan P. Bosko and Viktor N. Staroverov

Hydrogen and hydrogenlike-ion bound states and hyperfine splittings: Finite-nuclear-size effects *(25 pages)* 052804
Igor Kuzmenko, Tetyana Kuzmenko, Y. Avishai, and Y. B. Band

Role of the different electron capture processes in the molecular fragmentation dynamics in an Ar^{8+}-N_2 collision system *(16 pages)* 052805
Md Abul Kalam Azad Siddiki, Kamal Kumar, Jibak Mukherjee, Lokesh C. Tribedi, and Deepankar Misra

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Detecting genuine multipartite entanglement via machine learning *(9 pages)* 052424
Yi-Jun Luo, Jin-Ming Liu, and Chengjie Zhang

Limits of fault tolerance on resource-constrained quantum circuits for classical problems *(14 pages)* 052425
Uthirakalyani G., Anuj K. Nayak, Avhishek Chatterjee, and Lav R. Varshney

Closing loopholes of measurement-device-independent nonlinear entanglement witnesses *(8 pages)* 052426
Kornikar Sen, Chirag Srivastava, and Ujjwal Sen

Exploring quantumness in quantum reservoir computing *(9 pages)* 052427
Niclas Götting, Frederik Lohof, and Christopher Gies

Biased Gottesman-Kitaev-Preskill repetition code *(16 pages)* 052428
Matthew P. Stafford and Nicolas C. Menicucci

Entanglement-based approach to quantum coherence, path information, and uncertainty *(9 pages)* 052429
A. D. Kodukhov and D. A. Kronberg

Advantage of Hardy's nonlocal correlation in reverse zero-error channel coding *(9 pages)* 052430
Mir Alimuddin, Ananya Chakraborty, Govind Lal Sidhardh, Ram Krishna Patra, Samrat Sen, Snehasish Roy Chowdhury, Sahil Gopalkrishna Naik, and Manik Banik

Quantum technologies

Conditional phase gate between two photons through control of the interaction time with a single atom in a cavity *(13 pages)* 052601
Arkan Hassan and Julio Gea-Banacloche

Numerically assisted determination of local models in network scenarios *(10 pages)* 052602
José Mário da Silva and Fernando Parisio

Accelerating quantum optimal control through iterative gradient-ascent pulse engineering *(13 pages)* 052603
Yuquan Chen, Yajie Hao, Ze Wu, Bi-Ying Wang, Ran Liu, Yanjun Hou, Jiangyu Cui, Man-Hong Yung, and Xinhua Peng

Simulating lossy Gaussian boson sampling with matrix-product operators *(16 pages)* 052604
Minzhao Liu, Changhun Oh, Junyu Liu, Liang Jiang, and Yuri Alexeev

Optimizing resetting of superconducting qubits *(8 pages)* 052605
Ciro Micheletti Diniz, Rogério Jorge de Assis, Norton G. de Almeida, and Celso J. Villas-Boas

Precision estimation of time delay based on weak measurement with real weak value *(7 pages)* 052606
Weining Liu, Yisen Wang, and Hailu Luo

Near-optimal quantum circuit construction via Cartan decomposition *(9 pages)* 052607
Maximilian Balthasar Mansky, Santiago Londoño Castillo, Victor Ramos Puigvert, and Claudia Linnhoff-Popien

Truncated phase-based quantum arithmetic: Error propagation and resource reduction *(25 pages)* 052608
G. A. L. White, C. D. Hill, and L. C. L. Hollenberg

Verifying quantum phase estimation using an expressive theorem-proving assistant *(35 pages)* 052609
Wayne M. Witzel, Warren D. Craft, Robert Carr, and Deepak Kapur

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Quantum multiplication algorithm based on the convolution theorem *(10 pages)* 052405
Mehdi Ramezani, Morteza Nikaeen, Farnaz Farman, Seyed Mahmoud Ashrafi, and Alireza Bahrampour

Average coherence and entropy *(13 pages)* 052406
Yajing Fan, Nan Li, and Shunlong Luo

Tensor-network-assisted variational quantum algorithm *(11 pages)* 052407
Junxiang Huang, Wenhao He, Yukun Zhang, Yusen Wu, Bujiao Wu, and Xiao Yuan

Optimal qubit circuits for quantum-enhanced telescopes *(13 pages)* 052408
Robert Czupryniak, John Steinmetz, Paul G. Kwiat, and Andrew N. Jordan

Observation of the knot topology of non-Hermitian systems in a single spin *(10 pages)* 052409
Yang Wu, Yunhan Wang, Xiangyu Ye, Wenquan Liu, Chang-Kui Duan, Ya Wang, Xing Rong, and Jiangfeng Du

Single-qubit measurement of two-qubit entanglement in generalized Werner states *(13 pages)* 052410
Salini Rajeev and Mayukh Lahiri

Decoherence reduction via continuous dynamical decoupling: Analytical study of the role of the noise spectrum *(9 pages)* 052412
J. M. Gomez Llorente, I. Gomez-Ojeda, and J. Plata

Analysis of loss correction with the Gottesman-Kitaev-Preskill code *(9 pages)* 052413
Jacob Hastrup and Ulrik Lund Andersen

Investigating the effect of noise channels on the quality of unitary t-designs *(12 pages)* 052414
Conrad Strydom and Mark Tame

Quantum limit to subdiffraction incoherent optical imaging. III. Numerical analysis *(8 pages)* 052416
Xiao-Jie Tan and Mankei Tsang

Optimal quantum resource generation by coupled transmons immersed in Markovian baths *(12 pages)* 052417
Tanaya Ray, Ahana Ghoshal, Debraj Rakshit, and Ujjwal Sen

Enhanced quantum state preparation via stochastic predictions of neural networks *(8 pages)* 052418
Chao-Chao Li, Run-Hong He, and Zhao-Ming Wang

Information-theoretic approach to readout-error mitigation for quantum computers *(6 pages)* 052419
Hai-Chau Nguyen

Strong quantum entanglement based on two-mode photon-subtracted squeezed vacuum states *(11 pages)* 052420
Hongbin Song, Guofeng Zhang, and Hidehiro Yonezawa

Closed systems refuting quantum-speed-limit hypotheses *(5 pages)* 052421
Niklas Hörnedal and Ole Sönnerborn

Fermionic adaptive sampling theory for variational quantum eigensolvers *(8 pages)* 052422
Marco Majland, Patrick Ettenhuber, and Nikolaj Thomas Zinner

Exploring the impact of graph locality for the resolution of the maximum-independent-set problem with neutral atom devices *(7 pages)* 052423
Constantin Dalyac, Louis-Paul Henry, Minhyuk Kim, Jaewook Ahn, and Loïc Henriet

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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 108, NUMBER 5** **NOVEMBER 2023**

Quantum measurement-feedback models of friction beyond the diffusive limit and their connection to collapse models *(15 pages)* 052209
Michael Gaida and Stefan Nimmrichter

Detachment between edge and skin states in a non-Hermitian lattice *(7 pages)* 052210
Zhi-Xu Zhang, Ji Cao, Wen-Xue Cui, Yu Zhang, Shou Zhang, and Hong-Fu Wang

Ratchet current in a $\mathcal{PT}$-symmetric Floquet quantum system with symmetric sinusoidal driving *(13 pages)* 052211
Zhiqiang Li, Xiaoxiao Hu, Jinpeng Xiao, Yajiang Chen, and Xiaobing Luo

Generalized dynamical theories in phase space and the hydrogen atom *(17 pages)* 052212
Martin Plávala and Matthias Kleinmann

Charging batteries with quantum squeezing *(9 pages)* 052213
Federico Centrone, Luca Mancino, and Mauro Paternostro

Resonance of geometric quantities and hidden symmetry in the asymmetric Rabi model *(15 pages)* 052214
Qinjing Yu and Zhiguo Lü

Quantum coherence and the principle of microscopic reversibility *(10 pages)* 052215
K. Khan, W. F. Magalhães, J. S. Araújo, B. de Lima Bernardo, and G. H. Aguilar

Efficiency bounds for testing a multiparticle Bell inequality in an asymmetric configuration *(8 pages)* 052216
Wenchao Ma

Separability discrimination and decomposition of quantum mixed states based on the Broyden-Fletcher-Goldfarb-Shanno algorithm *(10 pages)* 052217
Bo Yang, Ying Li, and Guyan Ni

Cooperative isentropic charging of hybrid quantum batteries *(8 pages)* 052218
Yohan Vianna de Almeida, Tiago F. F. Santos, and Marcelo F. Santos

Bell nonlocality in two-mode Gaussian states revealed via local squeezing *(6 pages)* 052219
A. Lezama and A. Auyuanet

Tight Bell inequalities from polytope slices *(6 pages)* 052220
José Jesus and Emmanuel Zambrini Cruzeiro

Topological correlation in anyonic states constrained by anyonic superselection rules *(7 pages)* 052221
Cheng-Qian Xu and D. L. Zhou

Quantum information science

Approximate and ensemble local entanglement transformations for multipartite states *(21 pages)* 052401
David Gunn, Martin Hebenstreit, Cornelia Spee, Julio I. de Vicente, and Barbara Kraus

Quantum mutual information redistribution in a pure tripartite state by a number partitioning algorithm *(13 pages)* 052402
Muchun Yang, Cheng-Qian Xu, and D. L. Zhou

Exact and lower bounds for the quantum speed limit in finite-dimensional systems *(14 pages)* 052403
Mattias T. Johnsson, Lauritz van Luijk, and Daniel Burgarth

Using random coherent states to mimic quantum illumination *(12 pages)* 052404
Thomas Brougham, Nigam Samantaray, and John Jeffers

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).
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 108, NUMBER 5 NOVEMBER 2023

Ultracold systems and matter waves

Effective mass and interaction energy of heavy Bose polarons at unitarity *(5 pages)* L051301
Nikolay Yegovtsev and Victor Gurarie

Instability and momentum bifurcation of a molecular Bose-Einstein condensate in a shaken lattice with exotic dispersion *(6 pages)* L051302
Kaiyue Wang (王凯越), Feng Xiong (熊风), Yun Long (龙云), Yun Ma (马芸), and Colin V. Parker

Photonics, nonlinear optics, and optomechanics

Microscopic origin of polarization-entangled Stokes–anti-Stokes photons in diamond *(5 pages)* L051501
Tiago A. Freitas, Paula Machado, Lucas Valente, Diego Sier, Raul Corrêa, Riichiro Saito, Christophe Galland, Marcelo F. Santos, Carlos H. Monken, and Ado Jorio

Quantum optics

Nonperturbative effects of deep strong light-matter interaction in a mesoscopic cavity-QED system *(6 pages)* L051701
A. Kudlis, D. Novokreschenov, I. Iorsh, and I. V. Tokatly

Dispersionless subradiant photon storage in one-dimensional emitter chains *(6 pages)* L051702
Marcel Cech, Igor Lesanovsky, and Beatriz Olmos

ARTICLES

Fundamental concepts

Mass of a weakly measured photon *(8 pages)* 052201
Yakov Bloch and Joshua Foo

$\alpha_>(\epsilon) = \alpha_<(\epsilon)$ for the Margolus-Levitin quantum speed limit bound *(7 pages)* 052202
H. F. Chau

Modulation-agnostic single-shot estimation of quantum measurement confidence *(8 pages)* 052203
M. V. Jabir, N. Fajar R. Annafianto, A. Battou, I. A. Burenkov, and Sergey V. Polyakov

Filling an empty lattice by local injection of quantum particles *(19 pages)* 052204
Akash Trivedi, Sparsh Gupta, Bijay Kumar Agarwalla, Abhishek Dhar, Manas Kulkarni, Anupam Kundu, and Sanjib Sabhapandit

Dynamics in non-Hermitian systems with nonreciprocal coupling *(8 pages)* 052205
Jung-Wan Ryu

Continuous-radiative-loss model for electron-spin dynamics in the radiation-dominated regime *(13 pages)* 052206
I. I. Artemenko and I. Yu. Kostyukov

Tight and attainable quantum speed limit for open systems *(9 pages)* 052207
Zi-yi Mai and Chang-shui Yu

Wave operator representation of quantum and classical dynamics *(10 pages)* 052208
Gerard McCaul, Dmitry V. Zhdanov, and Denys I. Bondar

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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: 2469-9926)

PERIODICALS
Postmaster send address changes to:

APS Subscription Services
P.O. Box 41
Annapolis Junction, MD 20701

THIRD SERIES, VOLUME 108, NUMBER 5
PARTS A AND B

CONTENTS

NOVEMBER 2023

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages L050201–052827, and Part B pages 053101–059902(E).

PART A

LETTERS

Fundamental concepts

Rydberg-ion flywheel for quantum work storage *(7 pages)* L050201
Wilson S. Martins, Federico Carollo, Weibin Li, Kay Brandner, and Igor Lesanovsky

Experimental investigation of conditional majorization uncertainty relations in the presence of quantum memory *(6 pages)* L050202
Gaoyan Zhu, Aoxiang Liu, Lei Xiao, Kunkun Wang, Dengke Qu, Junli Li, Congfeng Qiao, and Peng Xue

Detailed fluctuation theorem from the one-time measurement scheme *(7 pages)* L050203
Kenji Maeda, Tharon Holdsworth, Sebastian Deffner, and Akira Sone

Quantum information science

Variational quantum eigensolvers in the era of distributed quantum computers *(6 pages)* L050401
Ilia Khait, Edwin Tham, Dvira Segal, and Aharon Brodutch

Quantum technologies

Experimental storage of photonic polarization entanglement in a broadband loop-based quantum memory *(6 pages)* L050601
C. J. Evans, C. M. Nunn, S. W. L. Cheng, J. D. Franson, and T. B. Pittman

Light-induced processes in atomic-scale systems

Contribution of negative-energy states to the $E2$-$M1$ polarizability of optical clocks *(7 pages)* L051101
Fang-Fei Wu, Ting-Yun Shi, Wei-Tou Ni, and Li-Yan Tang

Contribution of negative-energy states to multipolar polarizabilities of the Sr optical lattice clock *(5 pages)* L051102
S. G. Porsev, M. G. Kozlov, and M. S. Safronova

Microscopic mechanisms of high-order wave mixing in solids *(6 pages)* L051103
David N. Purschke, Álvaro Jiménez-Galán, Thomas Brabec, Andrei Yu. Naumov, André Staudte, David M. Villeneuve, and Giulio Vampa

(Continued)

2469-9926(202311)108:5:B;1-T

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

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).