

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages L040401–042626, and Part B pages 042801–049902(E).

PART A

LETTERS

Quantum information science

- System-environment quantum information flow (5 pages) L040401
Taysa M. Mendonça, Lucas C. Céleri, Mauro Paternostro, and Diogo O. Soares-Pinto
- Polarization-insensitive state preparation for trapped-ion hyperfine qubits (5 pages) L040402
A. D. Leu, M. C. Smith, M. F. Gely, and D. M. Lucas
- Stabilizer entropies are monotones for magic-state resource theory (6 pages) L040403
Lorenzo Leone and Lennart Bittel

Quantum technologies

- Realization of topological Thouless pumping in a synthetic Rydberg dimension (6 pages) L040601
Martin Trautmann, Inti Sodemann Villadiego, and Johannes Deiglmayr
-  Quantum optimal control robust to $1/f^\alpha$ noises using fractional calculus: Voltage-controlled exchange in semiconductor spin qubits (8 pages) L040602
Bohdan Khromets and Jonathan Baugh

Atomic and molecular structure and dynamics; high-precision experiments

- Dissociative recombination of CF^+ (6 pages) L040801
Joshua Forer, Jeffrey Boffelli, Mehdi Ayouz, Dávid Hvizdoš, Viatcheslav Kokouline, Ioan F. Schneider, and Chris H. Greene
- Enhancing density-functional theory for static correlation in large molecules (7 pages) L040802
Daniel Gibney, Jan-Niklas Boyn, and David A. Mazziotti

Light-induced processes in atomic-scale systems

- Laser-target symmetry breaking in high-order harmonic generation: From frequency shift to odd-even intensity modulation (7 pages) L041101
Doan-An Trieu, Van-Hoang Le, and Ngoc-Loan Phan



(Continued)



2469-9926(202410)110:4:A;1-#

Ultracold systems and matter waves

Entangled matter waves for quantum enhanced sensing (<i>6 pages</i>)	L041301
John Drew Wilson, Jarrod T. Reilly, Haoqing Zhang, Chengyi Luo, Anjun Chu, James K. Thompson, Ana Maria Rey, and Murray J. Holland	
Breaking of reciprocity and the Pancharatnam-Berry phase for light scattered by a disordered cold-atom cloud (<i>6 pages</i>)	L041302
P. H. N. Magnani, P. G. S. Dias, M. Frometa, M. A. Martins, N. Piovella, R. Kaiser, Ph. W. Courteille, M. Hugbart, R. Bachelard, and R. C. Teixeira	
Thermodynamic stability of a spin microemulsion in Rashba spin-orbit-coupled bosons (<i>7 pages</i>)	L041303
Ethan C. McGarrigle, Ron Nodel, Kris T. Delaney, Leon Balents, and Glenn H. Fredrickson	
Mott-glass phase induced by long-range correlated disorder in a one-dimensional Bose gas (<i>6 pages</i>)	L041304
Nicolas Dupuis and Andrei A. Fedorenko	
Fate of the Mollow triplet in strongly coupled atomic arrays (<i>6 pages</i>)	L041305
Orazio Scarlatella and Nigel R. Cooper	
Collisions of spin-polarized YO molecules for single partial waves (<i>6 pages</i>)	L041306
Justin J. Bureau, Kameron Mehling, Matthew D. Frye, Mengjie Chen, Parul Aggarwal, Jeremy M. Hutson, and Jun Ye	

Photonics, nonlinear optics, and optomechanics

Enhanced scattering from an almost-periodic optical temporal slab (<i>6 pages</i>)	L041501
Stefanos Fr. Koufidis, Theodoros T. Koutserimpas, Francesco Monticone, and Martin W. McCall	
Dynamical Casimir effects: The need for nonlocality in time-varying dispersive nanophotonics (<i>6 pages</i>)	L041502
S. Ali Hassani Gangaraj, George W. Hanson, and Francesco Monticone	

Quantum optics

Photon bound states in coupled waveguides (<i>6 pages</i>)	L041701
Björn Schränski, Johan A. Brimer, and Anders S. Sørensen	

ARTICLES**Fundamental concepts**

Spectral theory of non-Markovian dissipative phase transitions (<i>13 pages</i>)	042201
Baptiste Debecker, John Martin, and François Damanet	
Goos-Hänchen shift for relativistic particles based on Dirac's equation (<i>10 pages</i>)	042202
Jiang-Lin Zhou, Zhen-Xiao Zhang, Xing-Yan Fan, and Jing-Ling Chen	
Quantum synchronization through the interference blockade (<i>10 pages</i>)	042203
Tobias Kehr, Tobias Nadolny, and Christoph Bruder	
Evidence of genuine quantum effects in nonequilibrium entropy production via quantum photonics (<i>7 pages</i>)	042204
Qing-Feng Xue, Xu-Cai Zhuang, De-Yang Duan, Ying-Jie Zhang, Wei-Bin Yan, Yun-Jie Xia, Rosario Lo Franco, and Zhong-Xiao Man	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 110, NUMBER 4

OCTOBER 2024

Exploring multifractal critical phases in two-dimensional quasiperiodic systems (7 pages)	042205
Chao Yang, Weizhe Yang, Yongjian Wang, and Yucheng Wang	
Nonprojective Bell-state measurements (8 pages)	042206
Amanda Wei, Gabriele Cobucci, and Armin Tavakoli	
Emergence of a quasiergodic steady state in a dissipative Tavis-Cummings array (22 pages)	042207
Debabrata Mondal, K. Sengupta, and S. Sinha	
Anomalous symmetry-protected blockade of the skin effect in one-dimensional non-Hermitian lattice systems (6 pages)	042208
Shuai Li, Min Liu, Yue Zhang, Rui Tian, Maksims Arzamasovs, and Bo Liu	
Exploring dynamical phase transitions in the XY chain through a linear quench: Early and long-term perspectives (12 pages)	042209
Kaiyuan Cao, Hongsheng Hou, and Peiqing Tong	
 Process tensor distinguishability measures (9 pages)	042210
Guilherme Zambon	
Quantum state exclusion through offset measurement (7 pages)	042211
Caleb McIrvin, Ankith Mohan, and Jamie Sikora	
Activation of postquantumness in bipartite generalized Einstein-Podolsky-Rosen scenarios (16 pages)	042212
Beata Zjawin, Matty J. Hoban, Paul Skrzypczyk, and Ana Belén Sainz	
Observational-interventional Bell inequalities (14 pages)	042213
Davide Poderini, Ranieri Nery, George Moreno, Santiago Zamora, Pedro Lauand, and Rafael Chaves	
Paradox with phase-coupled interferometers (6 pages)	042214
Saba Etezzad-Razavi and Lucien Hardy	
Testing the unified bounds of the quantum speed limit (15 pages)	042215
Yaozu Wu, Jiale Yuan, Chuanyu Zhang, Zitian Zhu, Jinfeng Deng, Xu Zhang, Pengfei Zhang, Qiujiang Guo, Zhen Wang, Jiehui Huang, Chao Song, Hekang Li, Da-Wei Wang, H. Wang, and Girish S. Agarwal	
Quantum control of heat current (9 pages)	042216
Gobinda Chakraborty, Subhadeep Chakraborty, Tanmoy Basu, and Manas Mukherjee	
Multipartite nonlocality spectrum and quantum criticality in one-dimensional quantum chains (9 pages)	042217
Fan-Qin Xu, Hui-Xin Wen, and Zhao-Yu Sun	
Speeding up quantum heat engines by the Mpemba effect (12 pages)	042218
Dehua Liu, Jiehong Yuan, Huilin Ruan, Yang Xu, Shaolin Luo, Jizhou He, Xian He, Yongli Ma, and Jianhui Wang	
Quantum and classical dynamics correspondence and the brachistochrone problem (8 pages)	042219
Huner Fanchiotti, Carlos A. García Canal, Miguel Mayosky, Armando Pérez, and Alejandro Veiga	
Identifying a possible mechanism for the quantum needle in chemical magnetoreception (10 pages)	042220
Xiaoyu Chen, Haibin Liu, and Jianming Cai	

(Continued)

 Universal limit on spatial quantum superpositions with massive objects due to phonons (<i>10 pages</i>)	042221
Carsten Henkel and Ron Folman	
Quantum information science	
Minimum-error quantum state discrimination: Extremely tight upper and lower bounds with application in digital quantum communication (<i>11 pages</i>)	042401
Amir Mohammad Yaghoobianzadeh and Jawad A. Salehi	
 Classical simulation of non-Gaussian bosonic circuits (<i>24 pages</i>)	042402
Beatriz Dias and Robert König	
Device-independent quantum secret sharing with noise preprocessing and postselection (<i>13 pages</i>)	042403
Qi Zhang, Wei Zhong, Ming-Ming Du, Shu-Ting Shen, Xi-Yun Li, An-Lei Zhang, Lan Zhou, and Yu-Bo Sheng	
Fast measurements and multiqubit gates in dual-species atomic arrays (<i>9 pages</i>)	042404
D. Petrosyan, S. Norrell, C. Poole, and M. Saffman	
Rate-fidelity tradeoff in cavity-based remote entanglement generation (<i>14 pages</i>)	042405
Kazufumi Tanji, Hiroki Takahashi, Wojciech Roga, and Masahiro Takeoka	
Locally distinguishing a maximally entangled basis using shared entanglement (<i>12 pages</i>)	042406
Somshubhro Bandyopadhyay and Vincent Russo	
Nondestructive discrimination of Bell states between distant parties (<i>7 pages</i>)	042407
Bohdan Bilash, Youngrong Lim, Hyukjoon Kwon, Yosep Kim, Hyang-Tag Lim, Wooyeong Song, and Yong-Su Kim	
Entanglement entropy in ground states of long-range fermionic systems (<i>11 pages</i>)	042408
Debarghya Chakraborty and Nikolaos Angelinos	
Post-training approach for mitigating overfitting in quantum convolutional neural networks (<i>9 pages</i>)	042409
Aakash Ravindra Shinde, Charu Jain, and Amir Kalev	
Global out-of-time-order correlators as a signature of scrambling dynamics of local observables (<i>14 pages</i>)	042410
Fabricio S. Lozano-Negro, Claudia M. Sánchez, Ana K. Chattah, Gonzalo A. Álvarez, and Horacio M. Pastawski	
Nonlinear dissipation in a driven superconducting circuit (<i>9 pages</i>)	042411
Jayameenakshi Venkatraman, Xu Xiao, Rodrigo G. Cortiñas, and Michel H. Devoret	
Genuine multipartite entanglement verification with convolutional neural networks (<i>9 pages</i>)	042412
Yi-Jun Luo, Xuan Leng, and Chengjie Zhang	
Coherence and entropy complementarity relations of generalized wave-particle duality (<i>8 pages</i>)	042413
Kang-Kang Yang, Zhi-Xi Wang, and Shao-Ming Fei	
Model for optimizing the visibility of time-bin entanglement (<i>11 pages</i>)	042414
Zhen-Qiu Zhong, Xiao-Hai Zhan, Shuang Wang, Zhen-Qiang Yin, De-Yong He, Wei Chen, Guang-Can Guo, and Zheng-Fu Han	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 110, NUMBER 4

OCTOBER 2024

Variational quantum Crank-Nicolson and method-of-lines schemes for the solution of initial value problems (<i>12 pages</i>)	042415
Francisco Guzman-Cajica and Francisco S. Guzmán	
Frequency- and dissipation-dependent entanglement advantage in spin-network quantum reservoir computing (<i>11 pages</i>)	042416
Youssef Kora, Hadi Zadeh-Haghighi, Terrence C. Stewart, Khabat Heshami, and Christoph Simon	
Searching weighted barbell graphs with Laplacian and adjacency quantum walks (<i>15 pages</i>)	042417
Jonas Duda and Thomas G. Wong	
Dirac quantum walk on tetrahedra (<i>15 pages</i>)	042418
Ugo Nsongani, Nathanaël Eon, Iván Márquez-Martín, Armando Pérez, Giuseppe Di Molfetta, and Pablo Arrighi	
Deep strong charging in a multiphoton anisotropic Dicke quantum battery (<i>13 pages</i>)	042419
Lu Wang, Shu-Qian Liu, Feng-lin Wu, Hao Fan, and Si-Yuan Liu	
Assessment of quantum phase estimation protocols for early fault-tolerant quantum computers (<i>15 pages</i>)	042420
Jacob S. Nelson and Andrew D. Baczewski	
Generating Fock-state superpositions from coherent states by selective measurement (<i>12 pages</i>)	042421
Chen-yi Zhang and Jun Jing	
Storage and retrieval of von Neumann measurements via indefinite causal order structures (<i>6 pages</i>)	042422
Paulina Lewandowska and Ryszard Kukulski	
Quantum channels that destroy negative conditional entropy (<i>13 pages</i>)	042423
P. V. Srinidhi, Indranil Chakrabarty, Samyadeb Bhattacharya, and Nirman Ganguly	
Exploring strong locality: Quantum-state-discrimination regime and beyond (<i>13 pages</i>)	042424
Subrata Bera, Atanu Bhunia, Indranil Biswas, Indrani Chattopadhyay, and Debasis Sarkar	
Quantum speed limit in terms of coherence variations (<i>9 pages</i>)	042425
Zi-yi Mai and Chang-shui Yu	
Block encoding of matrix product operators (<i>14 pages</i>)	042427
Martina Nibbi and Christian B. Mendl	
Dynamics of the nonequilibrium spin-boson model: A benchmark of master equations and their validity (<i>18 pages</i>)	042428
Gerardo Suárez, Marcin Łobejko, and Michał Horodecki	
Linking quantum discord with Bayesian game theory (<i>8 pages</i>)	042429
Adam Lowe	
Majorization theoretical approach to entanglement enhancement via local filtration (<i>13 pages</i>)	042430
Zacharie Van Herstraeten, Nicolas J. Cerf, Saikat Guha, and Christos N. Gatsos	
Role of time-frequency correlations in two-photon–two-atom resonance energy transfer (<i>8 pages</i>)	042431
Roberto de J. León-Montiel, Arturo Pedroza-Rojas, and Jorge A. Peralta-Ángeles	

(Continued)

Quantum technologies

Optimized continuous dynamical decoupling via differential geometry and machine learning (<i>14 pages</i>)	042601
Nicolas André da Costa Morazotti, Adonai Hilário da Silva, Gabriel Audi, Felipe Fernandes Fanchini, and Reginaldo de Jesus Napolitano	
Quantifying nonclassicality of mixed Fock states (<i>13 pages</i>)	042602
Spencer Rogers, Tommy Muth, and Wenchao Ge	
Digital-analog quantum genetic algorithm using Rydberg-atom arrays (<i>12 pages</i>)	042603
Aleix Llenas and Lucas Lamata	
Hysteresis and self-oscillations in an artificial memristive quantum neuron (<i>14 pages</i>)	042604
Finlay Potter, Alexandre Zagoskin, Sergey Savel'ev, and Alexander G. Balanov	
Quantum key distribution with a borosilicate-glass-matrix integrated photonic receiver (<i>6 pages</i>)	042605
Giulia Guarda, Domenico Ribezzo, Tommaso Occhipinti, Alessandro Zavatta, and Davide Bacco	
Robust finite-temperature many-body scarring on a quantum computer (<i>15 pages</i>)	042606
Jean-Yves Desaulles, Erik J. Gustafson, Andy C. Y. Li, Zlatko Papić, and Jad C. Halimeh	
Ergodic and mixing quantum channels: From two-qubit to many-body quantum systems (<i>12 pages</i>)	042607
S. Aravinda, Shilpak Banerjee, and Ranjan Modak	
Effects of XX catalysts on quantum annealing spectra with perturbative crossings (<i>17 pages</i>)	042609
Natasha Feinstein, Louis Fry-Bouriaux, Sougato Bose, and P. A. Warburton	
Fast ground-state-to-ground-state separation of small ion crystals (<i>13 pages</i>)	042610
Tyler H. Guglielmo, Dietrich Leibfried, Stephen B. Libby, and Daniel H. Slichter	
Quantum speed limits for implementation of unitary transformations (<i>9 pages</i>)	042611
Abolfazl Farmanian and Vahid Karimipour	
Programming higher-order interactions of Rydberg atoms (<i>9 pages</i>)	042612
Andrew Byun, Seokho Jeong, and Jaewook Ahn	
Fragment-based initialization for quantum subspace methods (<i>14 pages</i>)	042613
Ruhee D'Cunha, Cristian L. Cortes, Laura Gagliardi, and Stephen K. Gray	
Phonon-induced contrast in a matter-wave interferometer (<i>14 pages</i>)	042614
Qian Xiang, Run Zhou, Sougato Bose, and Anupam Mazumdar	
Efficient, high-fidelity single-photon switch based on waveguide-coupled cavities (<i>19 pages</i>)	042615
Mateusz Duda, Luke Brunswick, Luke R. Wilson, and Pieter Kok	
Quantum topological data analysis via the estimation of the density of states (<i>14 pages</i>)	042616
Stefano Scali, Chukwudubem Umeano, and Oleksandr Kyriienko	
Quantum steering of a pulse-driven two-qubit system (<i>9 pages</i>)	042617
N. Metwally	
Quantum optimal control of the driven dissipative two-level system (<i>9 pages</i>)	042618
H. Jirari and H. Rabitz	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 110, NUMBER 4

OCTOBER 2024

Quantum metrology with partially concurrent twisting and sensing (<i>16 pages</i>)	042619
Yi Shen, Jungeng Zhou, Jiahao Huang, and Chaohong Lee	
Quantum-limited superresolution of two arbitrary incoherent point sources: Beating the resurgence of Rayleigh's curse (<i>20 pages</i>)	042620
Junyan Li and Shengshi Pang	
Uniformly decaying subspaces for error-mitigated quantum computation (<i>12 pages</i>)	042621
Nishchay Suri, Jason Saied, and Davide Venturelli	
Creation of coherent superpositions of Raman qubits by using dissipation (<i>6 pages</i>)	042622
Andon A. Rangelov, Boyan T. Torosov, Benedetto Militello, and Nikolay V. Vitanov	
Quantum-enhanced Green's function Monte Carlo algorithm for excited states of the nuclear shell model (<i>9 pages</i>)	042623
Yongdan Yang, Ruyu Yang, and Xiaosi Xu	
Interplay between the Hilbert-space dimension of a control system and the memory induced by a quantum switch (<i>15 pages</i>)	042624
Saheli Mukherjee, Bivas Mallick, Sravani Yanamandra, Samyadeb Bhattacharya, and Ananda G. Maity	
Inverted-circuit zero-noise extrapolation for quantum-gate error mitigation (<i>14 pages</i>)	042625
Kathrin F. Koenig, Finn Reinecke, Walter Hahn, and Thomas Wellens	
Modified general individual attack against differential-phase-shift quantum key distribution (<i>5 pages</i>)	042626
Kyo Inoue and Toshimori Honjo	

PART B

Atomic and molecular structure and dynamics; high-precision experiments

Electron-electron-ion triple-coincidence experiment of electron-initiated valence ionization of small water clusters (<i>7 pages</i>)	042801
Xueguang Ren, Khokon Hossen, Shaokui Jia, Jiaqi Zhou, Xiaorui Xue, Thomas Pfeifer, and Alexander Dorn	
Combining laser cooling and Zeeman deceleration for precision spectroscopy in supersonic beams (<i>12 pages</i>) . . .	042802
Gloria Clausen, Laura Gabriel, Josef A. Agner, Hansjürg Schmutz, Tobias Thiele, Andreas Wallraff, and Frédéric Merkt	
Confinement-induced unatomic trimer states (<i>9 pages</i>)	042803
D. S. Rosa, R. M. Francisco, T. Frederico, G. Krein, and M. T. Yamashita	
Impact of the nuclear motion on the interparticle Coulombic electron capture (<i>7 pages</i>)	042804
Federico M. Pont, Annika Bande, Elke Fasshauer, Axel Molle, Daniel Peláez, and Nicolas Sisourat	
Relativistic and electron-correlation effects in static dipole polarizabilities for main-group elements (<i>20 pages</i>)	042805
YingXing Cheng	
Enhanced parity and time-reversal-symmetry violation in diatomic molecules: LaO, LaS, and LuO (<i>12 pages</i>)	042806
Yuly Chamorro, Victor V. Flambaum, Ronald F. Garcia Ruiz, Anastasia Borschevsky, and Lukáš F. Pašteka	

(Continued)

Optical cycling and sensitivity to the electron's electric dipole moment in gold-containing molecules (<i>11 pages</i>)	042807
K. Cooper Stuntz, Kendall L. Rice, Lan Cheng, and Benjamin L. Augenbraun	
Rotational and near-infrared spectra of PbF: Characterization of the coupled $X_1^2\Pi_{1/2}$ and $X_2^2\Pi_{3/2}$ states (<i>16 pages</i>)	042808
Sean Jackson, Luke Kim, Andreas Biekert, Alex Nguyen, Richard J. Mawhorter, Trevor J. Sears, Leonid V. Skripnikov, Vera V. Baturo, Alexander N. Petrov, and Jens-Uwe Grabow	
Single-ion spectroscopy of four metastable-state clear-out transitions in Yb^+ : Isotope shifts and hyperfine structure (<i>7 pages</i>)	042809
N. A. Diepeveen, C. Robalo Pereira, M. Mazzanti, Z. E. D. Ackerman, L. P. H. Gallagher, T. Timmerman, R. Gerritsma, and R. X. Schüssler	
Transition of dimuonium through foil (<i>16 pages</i>)	042810
Abdaljalel Alizzi, Artem Uskov, and Z. K. Silagadze	
Tracking conical intersection passage with time-resolved resonant Auger scattering (<i>13 pages</i>)	042811
Chao Wang, Victor Kimberg, Maomao Gong, Yongjun Cheng, Xiao-Jing Liu, Oriol Vendrell, Kiyoshi Ueda, and Song Bin Zhang	
Genetics-based deperturbation analysis for the spin-orbit-coupled $A^1\Sigma^+$ and $b^3\Pi_{0+}$ states of LiRb (<i>13 pages</i>) . . .	042812
Yide Yin, Xuhui Bai, Xuechun Li, Jie Yu, Gaoren Wang, Yongchang Han, and Xin-Yu Luo	
Casimir-Lifshitz formula for rectangular dielectric waveguide (<i>11 pages</i>)	042813
E. Arias, G. O. Heymans, and N. F. Svaiter	
Quantum self-propulsion of an inhomogeneous object out of thermal equilibrium (<i>18 pages</i>)	042814
Kimball A. Milton, Nima Pourtolami, and Gerard Kennedy	
Measurements of the hyperfine structure of nP_J Rydberg states by microwave spectroscopy in Cs atoms (<i>8 pages</i>)	042815
Rong Song, Jingxu Bai, Zhenhua Li, Yuechun Jiao, Suotang Jia, and Jianming Zhao	
Absolute frequency measurements of the $6s6p\ ^3P_0-5d6s\ ^3D_1$ transitions in $^{170,171,172,173,174,176}\text{Yb}$ by modulation transfer spectroscopy (<i>7 pages</i>)	042816
Chengcheng Zhao, Qichao Qi, Changyue Sun, Chengquan Peng, Taoyun Jin, Tao Zhang, Shuai Lei, Yan Xia, Suzhen Feng, and Xinye Xu	
Cavity-enhanced absorption and dispersion spectroscopy of the 1238-nm line of H_2 (<i>8 pages</i>)	042817
H. Liang (梁慧), Y. Tan (谈艳), C.-L. Hu (胡常乐), Z.-L. Nie (聂中梁), A.-W. Liu (刘安雯), Y. R. Sun (孙羽), J. Wang (王进), and S.-M. Hu (胡水明)	
Neural-network approach to running high-precision atomic computations (<i>10 pages</i>)	042818
Pavlo Bilous, Charles Cheung, and Marianna Safronova	
Quantum-information-theoretic analysis of Zee systems under pressure confinement (<i>23 pages</i>)	042819
Koustav D. Chakladar, Santanu Mondal, Kalidas Sen, and Jayanta K. Saha	
Re-evaluation of the nuclear electric quadrupole moment and mean-square charge radii of $^{175,176}\text{Lu}^+$ isotopes (<i>9 pages</i>)	042820
Benquan Lu and Hong Chang	

(Continued)

Engineering Rydberg-pair interactions in divalent atoms with hyperfine-split ionization thresholds (<i>11 pages</i>)	042821
Frederic Hummel, Sebastian Weber, Johannes Mögerle, Henri Menke, Jonathan King, Benjamin Bloom, Sebastian Hofferberth, and Ming Li	
Muonium-muonium interactions: Binding and scattering (<i>6 pages</i>)	042822
M.-S. Wu, Y. Zhang, J.-Y. Zhang, K. Varga, and Z.-C. Yan	
Pr^{10+} as a candidate for a high-accuracy optical clock for tests of fundamental physics (<i>8 pages</i>)	042823
S. G. Porsev, C. Cheung, M. S. Safronova, H. Bekker, N.-H. Rehbehn, J. R. Crespo López-Urrutia, and S. M. Brewer	
Multipolar polarizabilities and hyperpolarizabilities for alkaline-earth-metal ions (<i>12 pages</i>)	042824
Shan-Shan Lu, Fang-Fei Wu, Ting-Yun Shi, and Li-Yan Tang	
Application of the variational R -matrix method for the Dirac equation to the Be atom (<i>11 pages</i>)	042825
Miguel A. Alarcón and Chris H. Greene	
Pathwise differentiation of worldline path integrals (<i>15 pages</i>)	042826
Jonathan B. Mackrory, He Zheng, and Daniel A. Steck	
Measurement of differential collisional excitation cross sections for the $K\alpha$ emission of He-like oxygen (<i>11 pages</i>)	042827
Filipe Grilo, Chintan Shah, José Marques, José Paulo Santos, José R. Crespo López-Urrutia, and Pedro Amaro	
 Unimolecular processes in diatomic carbon anions at high rotational excitation (<i>27 pages</i>)	042828
Viviane C. Schmidt, Roman Čurík, Milan Ončák, Klaus Blaum, Sebastian George, Jürgen Göck, Manfred Grieser, Florian Grussie, Robert von Hahn, Claude Krantz, Holger Kreckel, Oldřich Novotný, Kaija Spruck, and Andreas Wolf	
Light-induced processes in atomic-scale systems	
Interaction of vector light beams with atoms exposed to a time-dependent magnetic field (<i>10 pages</i>)	043101
S. Ramakrishna, R. P. Schmidt, A. A. Peshkov, S. Franke-Arnold, A. Surzhykov, and S. Fritzsche	
Stroboscopic microwave spectroscopy of Voigt-based optically pumped magnetometers (<i>12 pages</i>)	043102
Hans Marin Florez, Tadas Pyragius, and Thomas Fernholz	
$\mathcal{PT}$ -symmetry-breaking transition in a chain of trapped interacting ions (<i>7 pages</i>)	043103
Zhenxin Hu and Zhenhua Yu	
Tunneling displacement of electron-hole pairs in high-order harmonic generation for monolayer hexagonal boron nitride (<i>11 pages</i>)	043104
Fulong Dong, Jiayu Yan, and Xinru Song	
Alignment and optimization of optical tweezers on trapped ions (<i>8 pages</i>)	043105
M. Mazzanti, C. Robalo Pereira, N. A. Diepeveen, B. Gerritsen, Z. Wu, Z. E. D. Ackerman, L. P. H. Gallagher, A. Safavi-Naini, R. Gerritsma, and R. X. Schüssler	
Ultrafast dynamics of the Rydberg states of CO_2 : Autoionization and dissociation lifetimes (<i>8 pages</i>)	043106
D. Biswas, J. K. Wood, I. Shalaby, and A. Sandhu	
Fano-line-shape metamorphosis in resonant two-photon ionization (<i>6 pages</i>)	043107
Vladislav V. Serov and Anatoli S. Kheifets	

(Continued)

Blackbody-radiation Zeeman shifts in optical clocks: The role of fine-structure intramanifold resonances (13 pages)	043108
Zhi-Ming Tang, Yuan-Fei Wei, B. K. Sahoo, Cheng-Bin Li, Yang Yang, Yaming Zou, and Xue-Ren Huang	
Synthesizing quantum Hall systems with multiple optical clock transition couplings (7 pages)	043109
Changyue Sun and Xinye Xu	
Simulating vibrationally resolved x-ray photoelectron spectra of flexible molecules: Linear alkanes C_nH_{2n+2} ($n = 1-8$) (12 pages)	043110
Xiao Cheng, Minrui Wei, Guangjun Tian, and Weijie Hua	
Subcycle dynamics of temporal double-slit interference in strong-field tunneling ionization of H_2^+ (9 pages)	043111
Jia Tan, Yijing Min, Haiyang Lian, Che Liu, Xiang Hao, and Mingrui He	
Laser-assisted radiative recombination beyond the dipole approximation (15 pages)	043112
Deeksha Kanti, M. M. Majczak, J. Z. Kamiński, Liang-You Peng, and K. Krajewska	
Impact of laser focusing and radiation reaction on particle spectra from nonlinear Breit-Wheeler pair production in the nonperturbative regime (11 pages)	043113
A. Eckey, A. Golub, F. C. Salgado, S. Villalba-Chávez, A. B. Voitkiv, M. Zepf, and C. Müller	
Double, triple, and quadruple magic wavelengths for cesium ground, excited, and Rydberg states (19 pages)	043114
A. Bhowmik, M. Gaudesius, G. Biedermann, and D. Blume	
Quantum-optical radiative recombination between electrons and ions analyzed with a semiclassical picture (11 pages)	043115
Je-Hoi Mun, Sung-Ho Jang, and Sang Ki Nam	
Generalized theory for optical cooling of a trapped atom with spin (20 pages)	043116
Saumitra S. Phatak, Karl N. Blodgett, David Peana, Meng Raymond Chen, and Jonathan D. Hood	
Radiative stabilization of C_2^- against electron detachment (6 pages)	043117
S. Iida, S. Kuma, S. Masuda, H. Tanuma, M. Baba, H. Shiromaru, and T. Azuma	
Dual-species optical tweezer for Rb and K atoms (6 pages)	043118
Yangbo Wei, Kedi Wei, Shangjin Li, and Bo Yan	
Description of the hydrogen atom and the He^+ ion in an optical cavity using the Pauli-Fierz Hamiltonian (11 pages)	043119
Yetmgeta S. Aklilu and Kálmán Varga	
Ultracold systems and matter waves	
Path-integral ground state and optical response of the charged Bose polaron (9 pages)	043301
Laurent H. A. Simons, Michiel Wouters, and Jacques Tempere	
Rapidly rotating quantum droplets confined in a harmonic potential (11 pages)	043302
S. Nikolaou, G. M. Kavoulakis, and M. Ögren	
Effect of trap imperfections on the density of a quasi-two-dimensional uniform dipolar quantum Bose gas (11 pages)	043303
Thibault Bourgeois and Lauriane Chomaz	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 110, NUMBER 4

OCTOBER 2024

Rydberg atomtronic devices (8 pages)	043304
Philip Kitson, Tobias Haug, Antonino La Magna, Oliver Morsch, and Luigi Amico	
Exact diagonalization using hierarchical wave functions and calculation of topological entanglement entropy (14 pages)	043305
Deepak Gaur, Hrushikesh Sable, and D. Angom	
Optimization of Bragg scattering from atomic gratings for echo interferometry (13 pages)	043306
Gehrig Carlse, Jaskaran Randhawa, Eduardo Ramos, Thomas Vacheresse, Alex Pouliot, Adam C. Carew, A. Kumarakrishnan, and Brynle Barrett	
Expansion dynamics of Bose-Einstein condensates in a synthetic magnetic field (8 pages)	043307
Juan Wang, Hongguang Liang, Yan Li, Chuan-Hsun Li, and Chunlei Qu	
Tweezer interferometry with NOON states (13 pages)	043308
Yehoshua Winsten, Doron Cohen, and Yoav Sagi	
Simulations of evaporation to deep Fermi degeneracy in microwave-shielded molecules (11 pages)	043309
Reuben R. W. Wang, Shrestha Biswas, Sebastian Eppelt, Fulin Deng, Xin-Yu Luo, and John L. Bohn	
Gauge potentials and vortices in the Fock space of a pair of periodically driven Bose-Einstein condensates (12 pages)	043310
J. Mumford, D. Kamp, and D. H. J. O'Dell	
Antichiral and trap-skin dynamics in a nonreciprocal bosonic two-leg ladder with artificial magnetic flux (8 pages)	043311
Rui-Jie Chen, Guo-Qing Zhang, Zhi Li, and Dan-Wei Zhang	
Proposal for simulating quantum spin models with the Dzyaloshinskii-Moriya interaction using Rydberg atoms and the construction of asymptotic quantum many-body scar states (18 pages)	043312
Masaya Kunimi, Takafumi Tomita, Hosho Katsura, and Yusuke Kato	
Uhlmann phase winding in Bose-Einstein condensates at finite temperature (11 pages)	043313
Chang-Yan Wang and Yan He	
Tunable nonlinear Landau-Zener tunnelings in a spin-orbit-coupled spinor Bose-Einstein condensate (9 pages)	043314
Zhiqian Gui, Jin Su, Hao Lyu, and Yongping Zhang	
Loss-induced collective mode in one-dimensional Bose gases (11 pages)	043315
Jeff Maki, Lorenzo Rosso, Leonardo Mazza, and Alberto Biella	
Ultracold-atom quantum tunneling through single and double optical barriers (6 pages)	043316
R. Eid, A. Hammond, L. Lavoine, and T. Bourdel	
Transport through a lattice with local loss: From quantum dots to lattice gases (15 pages)	043317
J. R. Anglin	
Cornwall-Jackiw-Tomboulis effective field theory and the nonuniversal equation of state of an ultracold Bose gas (13 pages)	043318
Yi Zhang and Zhaoxin Liang	
Orbital phases of p -band ultracold fermions in a frustrated triangular lattice (8 pages)	043319
Jiaqi Wu, Hui Tan, Rui Cao, Jianmin Yuan, and Yongqiang Li	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 110, NUMBER 4

OCTOBER 2024

BCS-BEC crossover of the strongly interacting ${}^6\text{Li}$ - ${}^{40}\text{K}$ mixture (8 pages)	043320
Stefano Gandolfi, Ryan Curry, and Alexandros Gezerlis	
Quantum tricriticality of bosonic atomic-molecular mixtures with Feshbach coupling (8 pages)	043321
Yuan-Hong Chen, Dong-Chen Zheng, and Renyuan Liao	
Constraining the spin-gravity coupling effects to the 10^{-10} level with dual-species atom interferometers (9 pages)	043322
Dongfeng Gao, Lin Zhou, Jin Wang, and Mingsheng Zhan	
Photonics, nonlinear optics, and optomechanics	
Airy-gas plasmons (11 pages)	043501
Lucian A. Constantin and Fabio Della Sala	
Quantum entanglement assisted via Duffing nonlinearity (8 pages)	043502
D. R. Kenigoule Massembele, P. Djorwé, Amarendra K. Sarma, A.-H. Abdel-Aty, and S. G. Nana Engo	
Impact of high-order interactions on the fundamental dynamics of four-wave mixing (10 pages)	043503
Anastasiia Sheveleva, Pierre Colman, John M. Dudley, and Christophe Finot	
Parabolic-like motion of an optical pulse modulated by a temporal boundary in highly noninstantaneous Kerr media (5 pages)	043504
Manlin Liu, Fu Deng, and Weiyi Hong	
Broadband dynamic nonreciprocity based on a nonlinear Mach-Zehnder interferometer (8 pages)	043505
Rui-Kai Pan (潘瑞恺), Lei Tang (唐磊), and Keyu Xia (夏可宇)	
Quantum plasmonics model of refractive index sensing using photon correlations (14 pages)	043506
Luke C. Ugwuoke, Tjaart P. J. Krüger, and Mark S. Tame	
Linking high-order harmonic generation and radial distribution function in liquids (7 pages)	043507
Zheng-Liang Li, Jia-Xiang Chen, Zhuang-Wei Ding, Jia-Qi Liu, Yi-Ben Wang, and Xue-Bin Bian	
Coherence effects in nonlinear Thomson scattering by electrons born from the same atom (11 pages)	043508
Nuno Barros e Sá, Yance Sun, and Justin Peatross	
 Superspontaneous four-wave mixing in a sequence of lossy ring resonators (9 pages)	043509
Amideddin Mataji-Kojouri and Marco Liscidini	
Shortcut engineering for accelerating topological quantum state transfers in optomechanical lattices (13 pages)	043510
Jin-Kang Guo, Jin-Lei Wu, Ji Cao, Shou Zhang, and Shi-Lei Su	
Elimination of chromatic aberration in high-order harmonic generation using a plasma-induced flat-top beam in a gas medium (12 pages)	043511
Baochang Li, Kan Wang, Xiangyu Tang, Chi Zhang, Bincheng Wang, and Cheng Jin	
Hybrid rotational cavity optomechanics using an atomic superfluid in a ring (15 pages)	043512
Sanket Das, Pardeep Kumar, M. Bhattacharya, and Tarak N. Dey	
Spontaneous symmetry breaking in nonlinear binary periodic systems (9 pages)	043513
Ruihan Peng, Qidong Fu, Yejia Chen, Weidong Luo, Changming Huang, and Fangwei Ye	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 110, NUMBER 4

OCTOBER 2024

Canonical quantum plasmonics for finite nanostructures: Exact solution in one dimension (23 pages)	043514
Georgii Semin, Hans-Rudolf Jauslin, and Stéphane Guérin	
Probing non-Hermitian zero modes in a nanophotonic trimer: From nonuniform to twisted coupling (11 pages)	043515
Melissa Hedir, Kaiwen Ji, Juan Ariel Levenson, Ramy El-Ganainy, Li Ge, and Alejandro M. Yacomotti	
Tensor product space for studying the interaction of bipartite states of light with nanostructures (17 pages)	043516
Lukas Freter, Benedikt Zerulla, Marjan Krstić, Christof Holzer, Carsten Rockstuhl, and Ivan Fernandez-Corbaton	
Dissipatively stabilized squeezed-cat qubits and their application in thermometry (10 pages)	043517
Chengsong Zhao, Wenlin Li, Biao Xiong, Wei-jiang Gong, and Ling Zhou	
Numerical investigation of solitary-wave solutions for the nonlinear Schrödinger equation perturbed by third-order and negative fourth-order dispersion (11 pages)	043518
Oliver Melchert and Ayhan Demircan	
Generalized linear response theory for pumped systems and its application to transient optical properties (23 pages)	043520
Amir Eskandari-asl and Adolfo Avella	
Generation principle for robust and regularly spaced resonant modes in a nontopological photonic crystal ring resonator (11 pages)	043521
Rui Ge, Dengke Xing, and Xiaoling Tian	
Synthesis and observation of optical skyrmionic structure in free space (10 pages)	043522
Jie Zhu, Sheng Liu, Yong-Sheng Zhang, Chuan-Feng Li, and Guang-Can Guo	
Transverse spin and orbital angular momenta in rotating-wave structured light (6 pages)	043523
Zhen-Lai Wang	
Sensing force gradients with cavity optomechanics while evading backaction (12 pages)	043524
Elisabet K. Arvidsson, Ermes Scarano, August K. Roos, Sofia Qvarfort, and David B. Haviland	
Spatial distribution of gamma rays produced by axially symmetric polarized and optical vortex lasers (9 pages)	043525
Yoshitaka Taira	
Conservation law for electromagnetic fields in a space-time-varying medium and its implications (12 pages)	043526
Junchi Zhang, William Donaldson, and Govind P. Agrawal	
Quantum optics	
Local discrimination of orbital angular momentum in entangled states (5 pages)	043701
Simone Cialdi, Edoardo Suerra, Samuele Altiglia, Stefano Olivares, Bruno Paroli, Marco A. C. Potenza, Mirko Siano, and Matteo G. A. Paris	
Production of entangled x rays through nonlinear double Compton scattering (15 pages)	043702
T. D. C. de Vos, J. J. Postema, B. H. Schaap, A. Di Piazza, and O. J. Luiten	
Spectral response of a nonlinear Jaynes-Cummings model (13 pages)	043703
L. Medina-Dozal, A. R. Urzúa, D. Aranda-Lozano, C. A. González-Gutiérrez, J. Récamier, and R. Román-Ancheyta	

(Continued)

Nonreciprocal quantum phase transition in cavity magnonics (<i>10 pages</i>)	043704
Ye-Jun Xu, Long-Hua Zhai, Peng Fu, Shou-Jing Cheng, and Guo-Qiang Zhang	
Numerical study of the spatial coherence of light in collective spontaneous emission (<i>12 pages</i>)	043705
D. D. Yavuz, A. Yadav, D. C. Gold, T. G. Walker, and M. Saffman	
Non-Markovian frequency conversion between optical and microwave photons with magnetomechanical transduction (<i>24 pages</i>)	043706
Jia Tang and H. Z. Shen	
Exploring photon blockade in a two-photon Jaynes-Cummings model with atom and cavity drivings (<i>11 pages</i>)	043707
Hai-Ji Li, Li-Bao Fan, Shan Ma, Jie-Qiao Liao, and Chuan-Cun Shu	
Light with even Fock states from interference of Kerr-squeezed light (<i>4 pages</i>)	043708
Ziv Abelson and Shimshon Bar-Ad	
Temporal quantum eraser: Fusion gates with distinguishable photons (<i>11 pages</i>)	043709
Ziv Aqua and Barak Dayan	
Role of chirping in pulsed single-photon spectroscopy (<i>15 pages</i>)	043710
Elnaz Darsheshdar, Aiman Khan, Francesco Albarelli, and Animesh Datta	
Generating three-photon Rabi oscillations without a large-detuning condition (<i>10 pages</i>)	043711
Ke-Xiong Yan, Yuan Qiu, Yang Xiao, Ye-Hong Chen, and Yan Xia	
Nonequilibrium energy transport and nonclassical correlations of photons in a two-mode circuit quantum electrodynamic system (<i>9 pages</i>)	043712
Xu-Min Chen, You-Tao Xu, and Chen Wang	
 Predicting correlations in superradiant emission from a cascaded quantum system (<i>12 pages</i>)	043713
Felix Tebbenjohanns, Christopher D. Mink, Constanze Bach, Arno Rauschenbeutel, and Michael Fleischhauer	
Universal and robust dynamic decoupling controls for zero-field magnetometry by using molecular clock sensors (<i>10 pages</i>)	043714
Jiawen Jiang and Q. Chen	
Realistic photon-number resolution in Gaussian boson sampling (<i>13 pages</i>)	043715
I. S. Yeremenko, M. A. Dmytruk, and A. A. Semenov	
Purely quantum nonreciprocity by a spatially separated transmission scheme (<i>11 pages</i>)	043716
Zhi-Hao Liu, Guang-Yu Zhang, and Xun-Wei Xu	
Engineering entangled Schrödinger cat states of separated cavity modes in cavity QED (<i>17 pages</i>)	043717
Abdul Q. Batin, Suranjana Ghosh, Utpal Roy, and David Vitali	
Quantization of optical quasinormal modes for spatially separated cavity systems with finite retardation (<i>17 pages</i>)	043718
Robert Fuchs, Juanjuan Ren, Sebastian Franke, Stephen Hughes, and Marten Richter	
Quantum synchronization of qubits via the dynamical Casimir effect (<i>13 pages</i>)	043719
Haruki Mitarai and Yoshihiko Hasegawa	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 110, NUMBER 4

OCTOBER 2024

Dipole-dipole-interacting two-level emitters in a moderately intense laser field (<i>9 pages</i>)	043720
Profiric Bardetski and Mihai A. Macovei	
Signal-to-noise-ratio amplification based on symmetry breaking induced by the Sagnac effect (<i>13 pages</i>)	043721
Wen-Zhao Zhang, Wen-Quan Yang, Jiong Cheng, and Cheng-Jie Zhang	

COMMENTS

Comment on “Recovering noise-free quantum observables” (<i>5 pages</i>)	046401
Josu Etxezarreta Martinez, Olatz Sanz Larrarte, Javier Oliva del Moral, Reza Dastbasteh, and Ruben M. Otxoa	

ERRATA

Erratum: Generalized Wigner-Yanase skew information and the affiliated inequality [Phys. Rev. A 106 , 052401 (2022)] (<i>1 page</i>)	049901(E)
Ma-Cheng Yang and Cong-Feng Qiao	
Erratum: Near-threshold qudit stabilizer codes with efficient encoding circuits for magic-state distillation [Phys. Rev. A 109 , 062426 (2024)] (<i>6 pages</i>)	049902(E)
Abhi Kumar Sharma and Shayan Srinivasa Garani	