

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages L050201–052608, and Part B pages 052801–059901(E).

PART A

LETTERS

Fundamental concepts

- Dissipative quantum dynamics, phase transitions, and non-Hermitian random matrices (7 pages) L050201
Mahaveer Prasad, Hari Kumar Yadalam, Camille Aron, and Manas Kulkarni

Quantum technologies

- State-dependent error bound for digital quantum simulation of driven systems (4 pages) L050601
Takuya Hatomura

Atomic and molecular structure and dynamics; high-precision experiments

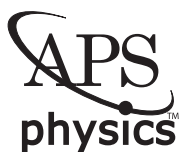
- Sensitivity of the YbOH molecule to $\mathcal{PT}$ -odd effects in an external electric field (5 pages) L050801
Alexander Petrov and Anna Zakharova

Light-induced processes in atomic-scale systems

- Ultrastable laser referenced on velocity-grating atom interferometry (5 pages) L051101
Haosen Shang, Duo Pan, Xiaogang Zhang, Xiaobo Xue, Tiantian Shi, and Jingbiao Chen
- Cutoff for continuum-continuum high-order harmonic generation (4 pages) L051102
F. Rodríguez-Hernández, F. Grossmann, and Jan M. Rost

Ultracold systems and matter waves

- Laser cooling scheme for the carbon dimer ($^{12}\text{C}_2$) (7 pages) L051301
Niccolò Bigagli, Daniel W. Savin, and Sebastian Will
- Eightfold way to dark states in SU(3) cold gases with two-body losses (6 pages) L051302
Lorenzo Rosso, Leonardo Mazza, and Alberto Biella
- Universal spin-mixing oscillations in a strongly interacting one-dimensional Fermi gas (6 pages) L051303
Giovanni Pecci, Patrizia Vignolo, and Anna Minguzzi



Photonics, nonlinear optics, and optomechanics

Temporal light control in complex media through the singular-value decomposition of the time-gated transmission matrix (<i>6 pages</i>)	L051501
Louisiane Devaud, Bernhard Rauer, Matthias Kühmayer, Jakob Melchard, Mickaël Mounaix, Stefan Rotter, and Sylvain Gigan	

ARTICLES**Fundamental concepts**

Dynamics of the spin-boson model at zero temperature and strong dissipation (<i>7 pages</i>)	052201
Jiushu Shao	
Compatibility of quantum instruments (<i>7 pages</i>)	052202
Arindam Mitra and Máté Farkas	
Harmonic oscillator kicked by spin measurements: A Floquet-like system without a classical analog (<i>11 pages</i>)	052203
Bento Montenegro, Nadja K. Bernardes, and Fernando Parisio	
Energy cat states induced by a parity-breaking excited-state quantum phase transition (<i>16 pages</i>)	052204
Ángel L. Corps and Armando Relaño	
Quantum transport in nonlinear Rudner-Levitov models (<i>8 pages</i>)	052205
Lei Du, Jin-Hui Wu, M. Artoni, and G. C. La Rocca	
Emulation of quantum measurements with mixtures of coherent states (<i>13 pages</i>)	052206
A. Mikhalychev, Y. S. Teo, H. Jeong, A. Stefanov, and D. Mogilevtsev	
Bipartite Leggett-Garg and macroscopic Bell-inequality violations using cat states: Distinguishing weak and deterministic macroscopic realism (<i>25 pages</i>)	052207
Manushan Thenabadu and M. D. Reid	
Universal Zeno competition in the dissipative Jaynes-Cummings model (<i>4 pages</i>)	052208
Hai-Chao Li, Wei Xiong, Guo-Qin Ge, and M. Suhail Zubairy	
Decay mechanisms of ensemble averages of nonlinear oscillators (<i>8 pages</i>)	052209
C. Gong, J. Bryan, Q. Su, and R. Grobe	
Internal nonlocality in generally dilated Hermiticity (<i>11 pages</i>)	052210
Minyi Huang and Ray-Kuang Lee	
Anatomy of the geometric phase for an optical vortex transiting a lens (<i>10 pages</i>)	052211
Mark T. Lusk, Andrew A. Voitiv, Chuanzhou Zhu, and Mark E. Siemens	
Generalized Bell-like inequality and maximum violation for multiparticle entangled Schrödinger cat states of spin s (<i>14 pages</i>)	052212
Yan Gu, Wei-Dong Li, Xiao-Lei Hao, Jiu-Qing Liang, and Lian-Fu Wei	
Missing quantum number of Floquet states (<i>9 pages</i>)	052213
Cristian M. Le, Ryosuke Akashi, and Shinji Tsuneyuki	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A	THIRD SERIES, VOLUME 105, NUMBER 5	MAY 2022
Topological exchange statistics in one dimension (<i>15 pages</i>)		052214
N. L. Harshman and A. C. Knapp		
Quantum theory of electronic friction (<i>20 pages</i>)		052215
Rocco Martinazzo and Irene Burghardt		
Open-system approach to nonequilibrium quantum thermodynamics at arbitrary coupling (<i>8 pages</i>)		052216
Alessandra Colla and Heinz-Peter Breuer		
Shortcut to adiabaticity in a cavity with a moving mirror (<i>6 pages</i>)		052217
Nicolás F. Del Grosso, Fernando C. Lombardo, Francisco D. Mazzitelli, and Paula I. Villar		
Quantum realism: Axiomatization and quantification (<i>15 pages</i>)		052218
Alexandre C. Orthey, Jr. and R. M. Angelo		
Geometric decomposition of geodesics and null-phase curves using Majorana star representation (<i>9 pages</i>)		052219
Vikash Mittal, Akhilesh K. S., and Sandeep K. Goyal		
Quantum mechanics of a fermion confined to a curved surface in Foldy-Wouthuysen representation (<i>6 pages</i>)		052220
Hao Zhao, Yong-Long Wang, Cheng-Zhi Ye, Run Cheng, Guo-Hua Liang, and Hui Liu		
Nonlocality sharing for a three-qubit system via multilateral sequential measurements (<i>7 pages</i>)		052221
Changliang Ren, Xiaowei Liu, Wenlin Hou, Tianfeng Feng, and Xiaoqi Zhou		
Shannon theory beyond quantum: Information content of a source (<i>13 pages</i>)		052222
Paolo Perinotti, Alessandro Tosini, and Leonardo Vaglini		
Decimation technique for open quantum systems: A case study with driven-dissipative bosonic chains (<i>14 pages</i>)		052223
Álvaro Gómez-León, Tomás Ramos, Diego Porras, and Alejandro González-Tudela		
Superoperator structures and no-go theorems for dissipative quantum phase transitions (<i>10 pages</i>)		052224
Thomas Barthel and Yikang Zhang		
Exploring the effect of decoherence in a two-dimensional Rydberg system: Application of the time-dependent variational principle (<i>9 pages</i>)		052225
Bo Yang, Bo Xiong, Zilong Liu, and Bo Zhang		
Steady-state susceptibility in continuous phase transitions of dissipative systems (<i>9 pages</i>)		052226
Xingli Li, Yan Li, and Jiasen Jin		
Self-testing quantum states via nonmaximal violation in Hardy's test of nonlocality (<i>8 pages</i>)		052227
Ashutosh Rai, Matej Pivoluska, Souradeep Sasmal, Manik Banik, Sibasish Ghosh, and Martin Plesch		
Error-disturbance uncertainty relations in Faraday measurements (<i>10 pages</i>)		052228
Le Bin Ho and Keiichi Edamatsu		
Continuous measurement of a qudit using dispersively coupled radiation (<i>12 pages</i>)		052229
John Steinmetz, Debmalaya Das, Irfan Siddiqi, and Andrew N. Jordan		
Third order modal exceptional degeneracy in waveguides with glide-time symmetry (<i>12 pages</i>)		052230
Farshad Yazdi, Tarek Mealy, Alireza Nikzamir, Robert Marosi, and Filippo Capolino		
Proposal to observe path superpositions in a double-slit setup (<i>10 pages</i>)		052231
Q. Duprey and A. Matzkin		

(Continued)

Emergent decoherence induced by quantum chaos in a many-body system: A Loschmidt echo observation through NMR (<i>11 pages</i>)	052232
C. M. Sánchez, A. K. Chattah, and H. M. Pastawski	
Quantum information science	
Class of Bell-diagonal entanglement witnesses in $\mathbb{C}^4 \otimes \mathbb{C}^4$: Optimization and the spanning property (<i>13 pages</i>)	052401
Anindita Bera, Filip A. Wudarski, Gniewomir Sarbicki, and Dariusz Chruściński	
Complex natural gradient optimization for optical quantum circuit design (<i>8 pages</i>)	052402
Yuan Yao, Pierre Cussenot, Richard A. Wolf, and Filippo Miatto	
Accessible and inaccessible quantum coherence in relativistic quantum systems (<i>17 pages</i>)	052403
Saveetha Harikrishnan, Segar Jambulingam, Peter P. Rohde, and Chandrashekar Radhakrishnan	
Embedding classical dynamics in a quantum computer (<i>47 pages</i>)	052404
Dimitrios Giannakis, Abbas Ourmazd, Philipp Pfeffer, Jörg Schumacher, and Joanna Slawinska	
Bosonic field digitization for quantum computers (<i>28 pages</i>)	052405
Alexandru Macridin, Andy C. Y. Li, Stephen Mrenna, and Panagiotis Spentzouris	
Adaptive random quantum eigensolver (<i>11 pages</i>)	052406
N. Barraza, C.-Y. Pan, L. Lamata, E. Solano, and F. Albarrán-Arriagada	
Efficient frame synchronization using a weak coherent state for continuous-variable quantum key distribution (<i>9 pages</i>)	052407
Jing Dong, Tao Wang, Lang Li, Peng Huang, and Guihua Zeng	
Parametrized process characterization with reduced resource requirements (<i>10 pages</i>)	052408
Vicente Leyton-Ortega, Tyler Kharazi, and Raphael C. Pooser	
Entangling-gate error from coherently displaced motional modes of trapped ions (<i>7 pages</i>)	052409
B. P. Ruzic, T. A. Barrick, J. D. Hunker, R. J. Law, B. K. McFarland, H. J. McGuinness, L. P. Parazzoli, J. D. Sterk, J. W. Van Der Wall, and D. Stick	
High-fidelity magic-state preparation with a biased-noise architecture (<i>9 pages</i>)	052410
Shraddha Singh, Andrew S. Darmawan, Benjamin J. Brown, and Shruti Puri	
Finite-resolution ancilla-assisted measurements of quantum work distributions (<i>9 pages</i>)	052411
Shadi Ali Ahmad and Alexander R. H. Smith	
Efficient sampling from shallow Gaussian quantum-optical circuits with local interactions (<i>11 pages</i>)	052412
Haoyu Qi, Diego Cifuentes, Kamil Brádler, Robert Israel, Timjan Kalajdzievski, and Nicolás Quesada	
Dissipative entanglement generation between two qubits parametrically driven and coupled to a resonator (<i>11 pages</i>)	052413
Sebastián Luciano Gallardo, Daniel Domínguez, and María José Sánchez	
Robust resource-efficient quantum variational ansatz through an evolutionary algorithm (<i>14 pages</i>)	052414
Yuhan Huang, Qingyu Li, Xiaokai Hou, Rebing Wu, Man-Hong Yung, Abolfazl Bayat, and Xiaoting Wang	
Parent Hamiltonian as a benchmark problem for variational quantum eigensolvers (<i>7 pages</i>)	052415
Fumiyoshi Kobayashi, Kosuke Mitarai, and Keisuke Fujii	

(Continued)

CONTENTS - Continued

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 105, NUMBER 5

MAY 2022

Coherent manipulation of graph states composed of finite-energy Gottesman-Kitaev-Preskill-encoded qubits (<i>16 pages</i>)	052416
Kaushik P. Seshadreesan, Prajit Dhara, Ashlesha Patil, Liang Jiang, and Saikat Guha	
Control power of high-dimensional controlled dense coding (<i>8 pages</i>)	052417
Wen-Xin Duan and Tie-Jun Wang	
Topological quantum interference in a pumped Su-Schrieffer-Heeger lattice (<i>21 pages</i>)	052418
Zeng-Zhao Li, Juan Atalaya, and K. Birgitta Whaley	
Quantum mean-value approximator for hard integer-value problems (<i>8 pages</i>)	052419
David Joseph, Antonio J. Martinez, Cong Ling, and Florian Mintert	
Verification of graph states in an untrusted network (<i>22 pages</i>)	052420
Anupama Unnikrishnan and Damian Markham	
Distinguishing phases via non-Markovian dynamics of entanglement in topological quantum codes under parallel magnetic field (<i>22 pages</i>)	052421
Harikrishnan K. J. and Amit Kumar Pal	
Counterdiabatic transfer of a quantum state in a tunable Heisenberg spin chain via the variational principle (<i>10 pages</i>)	052422
Yunlan Ji, Feifei Zhou, Xi Chen, Ran Liu, Zhaokai Li, Hui Zhou, and Xinhua Peng	
SU(<i>N</i>) toric code and non-Abelian anyons (<i>10 pages</i>)	052423
Manu Mathur and Atul Rathor	
Clustering using matrix product states (<i>8 pages</i>)	052424
Xiao Shi, Yun Shang, and Chu Guo	
Optimal-speed unitary quantum time evolutions and propagation of light with maximal degree of coherence (<i>18 pages</i>)	052425
Carlo Cafaro, Shannon Ray, and Paul M. Alsing	
☞ Controlling long ion strings for quantum simulation and precision measurements (<i>13 pages</i>)	052426
Florian Kranzl, Manoj K. Joshi, Christine Maier, Tiff Brydges, Johannes Franke, Rainer Blatt, and Christian F. Roos	
Learnable antinoise-receiver algorithm based on a quantum feedforward neural network in optical quantum communication (<i>12 pages</i>)	052427
Zhiguo Qu, Xinzhu Liu, and Le Sun	
Unveiling topological order through multipartite entanglement (<i>15 pages</i>)	052428
Siddhartha Patra, Somnath Basu, and Siddhartha Lal	
Time and frequency as quantum continuous variables (<i>12 pages</i>)	052429
Nicolas Fabre, Arne Keller, and Pérola Milman	
Irreversible entropy production rate in a parametrically driven-dissipative system: The role of self-correlation between noncommuting observables (<i>8 pages</i>)	052430
Sareh Shahidani and Morteza Rafiee	
Entanglement dynamics between Ising spins and a central ancilla (<i>15 pages</i>)	052431
Joseph C. Szabo and Nandini Trivedi	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A	THIRD SERIES, VOLUME 105, NUMBER 5	MAY 2022
On-demand multimode optical storage in a laser-written on-chip waveguide (7 pages)		052432
Ming-Xu Su, Tian-Xiang Zhu, Chao Liu, Zong-Quan Zhou, Chuan-Feng Li, and Guang-Can Guo		
Robust population transfer of spin states by geometric formalism (9 pages)		052433
K. Z. Li and G. F. Xu		
Quantum state discrimination circuits inspired by Deutschian closed timelike curves (11 pages)		052434
Christopher Vairogs, Vishal Katariya, and Mark M. Wilde		
Quantum regression beyond the Born-Markov approximation for generalized spin-boson models (8 pages)		052435
Davide Lonigro and Dariusz Chruściński		
Halving the width of Toffoli-based constant modular addition to $n + 3$ qubits (5 pages)		052436
Oumarou Oumarou, Alexandru Paler, and Robert Basmadjian		
Realistic non-Gaussian-operation scheme in parity-detection-based Mach-Zehnder quantum interferometry (14 pages)		052437
Chandan Kumar, Rishabh, and Shikhar Arora		
Analyzing the Rydberg-based optical-metastable-ground architecture for ^{171}Yb nuclear spins (20 pages)		052438
Neville Chen, Lintao Li, William Huie, Mingkun Zhao, Ian Vetter, Chris H. Greene, and Jacob P. Covey		
Multipartite stationary entanglement generation in the presence of dipole-dipole interaction in an optical cavity (8 pages)		052439
Azar Vafafard, Alireza Nourmandipour, and Roberto Franzosi		
Generalized entanglement measure for continuous-variable systems (10 pages)		052441
S. Nibedita Swain, Vineeth S. Bhaskara, and Prasanta K. Panigrahi		
Assessing the performance of quantum annealing with nonlinear driving (9 pages)		052442
Artur Soriani, Pierre Nazé, Marcus V. S. Bonança, Bartłomiej Gardas, and Sebastian Deffner		
Quantum decoherence of a two-level system in colored environments (10 pages)		052443
Longli Zheng and Yonggang Peng		
Wavelength conversion for single-photon polarization qubits through continuous-variable quantum teleportation (8 pages)		052444
Xi-Wang Luo, Chuanwei Zhang, Irina Novikova, Chen Qian, and Shengwang Du		
Noisy intermediate-scale quantum algorithm for semidefinite programming (13 pages)		052445
Kishor Bharti, Tobias Haug, Vlatko Vedral, and Leong-Chuan Kwek		
Parallel decoding of multiple logical qubits in tensor-network codes (12 pages)		052446
Terry Farrelly, Nicholas Milicevic, Robert J. Harris, Nathan A. McMahon, and Thomas M. Stace		
Quantum technologies		
Quantum Computing by Coherent Cooling (11 pages)		052601
Jia-Jin Feng (冯嘉进), Biao Wu (吴飙), and Frank Wilczek		
Universality verification for a set of quantum gates (6 pages)		052602
Adam Sawicki, Lorenzo Mattioli, and Zoltán Zimborás		

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 105, NUMBER 5

MAY 2022

Formation of two-ion crystals by injection from a Paul-trap source into a high-magnetic-field Penning trap (<i>11 pages</i>)	052603
J. Berrocal, E. Altozano, F. Domínguez, M. J. Gutiérrez, J. Cerrillo, F. J. Fernández, M. Block, C. Ospelkaus, and D. Rodríguez	
Efficient exciton generation in a semiconductor quantum-dot–metal-nanoparticle composite structure using conventional chirped pulses (<i>7 pages</i>)	052604
Dionisis Stefanatos, Athanasios Smonias, Ioannis Thanopoulos, and Emmanuel Paspalakis	
Entanglement-enhanced quantum rectification (<i>12 pages</i>)	052605
Kasper Poulsen, Alan C. Santos, Lasse B. Kristensen, and Nikolaj T. Zinner	
Quantum frequency conversion with coherent transfer of time-bin encoding (<i>7 pages</i>)	052606
Shushan Petrosyan and Yuri Malakyan	
Simultaneous cooling by measuring one ancillary system (<i>10 pages</i>)	052607
Jia-shun Yan and Jun Jing	
Mitigating errors by quantum verification and postselection (<i>13 pages</i>)	052608
Rawad Mezher, James Mills, and Elham Kashefi	

PART B

Atomic and molecular structure and dynamics; high-precision experiments

Solution of the two-center Dirac equation with 20-digit precision using the finite-element technique (<i>11 pages</i>)	052801
O. Kullie and S. Schiller	
Bohr-Weisskopf effect: From hydrogenlike-ion experiments to heavy-atom calculations of the hyperfine structure (<i>8 pages</i>)	052802
B. M. Roberts, P. G. Ranclaud, and J. S. M. Ginges	
Screening effects in the electron bremsstrahlung from heavy ions (<i>10 pages</i>)	052803
M. E. Groshev, V. A. Zaytsev, V. A. Yerokhin, P.-M. Hillenbrand, Yu. A. Litvinov, and V. M. Shabaev	
X-ray emission associated with radiative recombination for Pb^{82+} ions at threshold energies (<i>13 pages</i>)	052804
B. Zhu, A. Gumberidze, T. Over, G. Weber, Z. Andelkovic, A. Bräuning-Demian, R. J. Chen, D. Dmytriiev, O. Forstner, C. Hahn, F. Herfurth, M. O. Herdrich, P.-M. Hillenbrand, A. Kalinin, F. M. Kröger, M. Lestinsky, Yu. A. Litvinov, E. B. Menz, W. Middents, T. Morgenroth, N. Petridis, Ph. Pfäfflein, M. S. Sanjari, R. S. Sidhu, U. Spillmann, R. Schuch, S. Schippers, S. Trotsenko, L. Varga, G. Vorobyev, and Th. Stöhlker	
Combination of perturbation theory with the configuration-interaction method (<i>10 pages</i>)	052805
M. G. Kozlov, I. I. Tupitsyn, A. I. Bondarev, and D. V. Mironova	
Bound and resonance states near the critical charge region in two-electron atoms (<i>11 pages</i>)	052806
Li Guang Jiao, Ruo Yu Zheng, Aihua Liu, H. E. Montgomery, Jr., and Yew Kam Ho	
Experimental determination of atomic alignment of ^{42}Mo , ^{48}Cd , and ^{49}In with differential x-ray intensity ratios by 100–250-keV proton impact (<i>8 pages</i>)	052807
Xing Wang, Xuan Liu, Zhongfeng Xu, Jieru Ren, Yongtao Zhao, Rui Cheng, Yu Lei, Yanhong Chen, Yu Liu, Xianming Zhou, and Xiaolan Zhang	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 105, NUMBER 5

MAY 2022

Coherent multichannel optical theorem: Quantum control of the total scattering cross section (<i>10 pages</i>)	052808
Adrien Devolder, Timur V. Tscherbul, and Paul Brumer	
Non-Born-Oppenheimer confined variational calculation of low-energy Ps-H ₂ scattering (<i>7 pages</i>)	052809
W. Du, M.-S. Wu, J.-Y. Zhang, Y. Qian, K. Varga, and Z.-C. Yan	
Broadband optical two-dimensional coherent spectroscopy of a rubidium atomic vapor (<i>10 pages</i>)	052810
Jieli Yan, Stephen Revesz, Danfu Liang, and Hebin Li	
Benchmarking of the Fock-space coupled-cluster method and uncertainty estimation: Magnetic hyperfine interaction in the excited state of BaF (<i>10 pages</i>)	052811
Malika Denis, Pi A. B. Haase, Maarten C. Mooij, Yuly Chamorro, Parul Aggarwal, Hendrick L. Bethlem, Alexander Boeschoten, Anastasia Borschevsky, Kevin Esajas, Yongliang Hao, Steven Hoekstra, Joost W. F. van Hofslot, Virginia R. Marshall, Thomas B. Meijknecht, Rob G. E. Timmermans, Anno Touwen, Wim Ubachs, Lorenz Willmann, and Yanning Yin (NL- <i>e</i> EDM Collaboration)	
☞ Near-threshold behavior of positronium-antihydrogen scattering cross sections (<i>21 pages</i>)	052812
Takuma Yamashita, Yasushi Kino, Emiko Hiyama, Svante Jonsell, and Piotr Froelich	
Direct and precise mapping of intramolecular H-atom motion in H ₂ by an electron-atom Compton scattering experiment (<i>4 pages</i>)	052813
Yuichi Tachibana, Yuuki Onitsuka, Hirohiko Kono, and Masahiko Takahashi	
Light-induced processes in atomic-scale systems	
Analysis of RABITT time delays using the stationary multiphoton molecular <i>R</i> -matrix approach (<i>19 pages</i>)	053101
J. Benda, Z. Mašín, and J. D. Gorfinkiel	
Resonance-enhanced x-ray multiple ionization of a polyatomic molecule (<i>7 pages</i>)	053102
X. Li <i>et al.</i>	
Demonstration of nonperturbative and perturbative third-harmonic generation in MgO by altering the electronic structure (<i>8 pages</i>)	053103
Mukhtar Hussain, Fernando Lima, Willem Boutu, Hamed Merdji, Marta Fajardo, and Gareth O. Williams	
Dipole-induced processes in HeH ⁺ produced by an excited Li(2 <i>p</i>) neighbor: From charge transfer to virtual photon dissociation, and formation of LiH and LiHe (<i>11 pages</i>)	053104
R. Cabrera-Trujillo, O. Vendrell, and L. S. Cederbaum	
Pulse shaping in strong-field ionization: Theory and experiments (<i>9 pages</i>)	053105
Shuai Li, Bethany Jochim, Jacob Stamm, Dian Peng, Hua-Chieh Shao, Jean Marcel Ngoko Djiokap, and Marcos Dantus	
Transition from correlated to single-active-electron excitation in strontium nonlinear ionization (<i>12 pages</i>)	053106
A. Dimitriou, V. Lorient, A. Marciniak, T. Barillot, S. Danakas, F. Lépine, C. Bordas, and S. Cohen	
Subcycle time-resolved nondipole dynamics in tunneling ionization (<i>13 pages</i>)	053107
Michael Klaiber, Karen Z. Hatsagortsyan, and Christoph H. Keitel	
Controllable three-dimensional electrostatic lattices for manipulation of cold polar molecules (<i>7 pages</i>)	053108
Hengjiao Guo, Yabing Ji, Qing Liu, Tao Yang, Shunyong Hou, and Jianping Yin	
Alignment dependence of photoelectron angular distributions in the few-photon ionization of molecules by ultraviolet pulses (<i>12 pages</i>)	053109
Huyh Van Sa Lam, Tomthin Nghanba Wangjam, and Vinod Kumarappan	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 105, NUMBER 5

MAY 2022

Many-electron dynamics in high-order harmonic generation of niobium: A time-dependent density-functional-theory study (7 pages)	053110
Xi Chu and Gerrit C. Groenenboom	
High-order above-threshold ionization by a few-cycle laser pulse in the presence of a terahertz pulse (10 pages)	053111
D. B. Milošević	
Two-body dissociation of formic acid following double ionization by ultrafast laser pulses (10 pages)	053112
T. Severt, Darwin R. Daugaard, Tiana Townsend, F. Ziaee, K. Borne, S. Bhattacharyya, K. D. Carnes, D. Rolles, A. Rudenko, E. Wells, and I. Ben-Itzhak	
Determination of atomic multiphoton-ionization phases by trichromatic multichannel wave-packet interferometry (16 pages)	053113
K. Eickhoff, D. Köhnke, L. Feld, T. Bayer, and M. Wollenhaupt	
Control of the laser-induced vacuum decay by electronic phases (5 pages)	053114
D. D. Su, C. K. Li, Q. Su, and R. Grobe	
Semiclassical trajectory perspective of glory rescattering in strong-field photoelectron holography (9 pages)	053115
L. G. Liao, Q. Z. Xia, J. Cai, and J. Liu	
Improved absolute clock stability by the joint interrogation of two atomic ensembles (15 pages)	053116
Weidong Li, Shuyuan Wu, Augusto Smerzi, and Luca Pezzè	
Laser-atom interaction simulator derived from quantum electrodynamics (14 pages)	053117
Manish Patel, Matthew Harvey, and Andrew James Murray	
Correlation effects in high-order harmonic generation from finite systems (9 pages)	053118
Thomas Hansen, Simon Vendelbo Bylling Jensen, and Lars Bojer Madsen	
Dalitz plots as a tool to resolve nonsequential paths in strong-field triple ionization (10 pages)	053119
Hui Jiang, Dmitry Efimov, Feng He, and Jakub S. Prauzner-Bechcicki	
Quantum control of two critically dressed spin-1/2 species in magnetic fluctuations (18 pages)	053120
Raymond Tat and C. M. Swank	
Extracting photoelectron spectra from the time-dependent wave function. II. Validation of two methods: Projection on plane waves and time-dependent surface flux (10 pages)	053121
B. Fetić, M. Tunja, W. Becker, and D. B. Milošević	
Beam focus and longitudinal polarization influence on spin dynamics in the Kapitza-Dirac effect (14 pages)	053123
Sven Ahrens, Ziling Guan, and Baifei Shen	
Rapid ground-state cooling of a solid-state nanoparticle assisted by a magnetic-field gradient (12 pages)	053124
Lv-Yun Wang, Fu-Qiang Guo, S.-L. Su, Chong-Xin Shan, M. Feng, E.-J. Liang, and L.-L. Yan	
Temperature-induced dephasing in high-order harmonic generation from solids (8 pages)	053125
Tao-Yuan Du and Chao Ma	
Electro-optical trap for polar molecules (16 pages)	053126
Bretislav Friedrich	

(Continued)

Suppression of potential roughness in atom-chip ac Zeeman traps (<i>16 pages</i>)	053127
S. Du, A. R. Ziltz, W. Miyahira, and S. Aubin	
Dynamic Stark shift in Doppler-broadened four-wave mixing (<i>10 pages</i>)	053128
M. P. M. de Souza, A. A. C. de Almeida, and S. S. Vianna	
Ultracold systems and matter waves	
Dipolar Bose-Hubbard model in finite-size real-space cylindrical lattices (<i>13 pages</i>)	053301
Michael Hughes and Dieter Jaksch	
 Bose polaron and the Efimov effect: A Gaussian-state approach (<i>18 pages</i>)	053302
Arthur Christianen, J. Ignacio Cirac, and Richard Schmidt	
Existence, stability, and dynamics of monopole and Alice ring solutions in antiferromagnetic spinor condensates (<i>16 pages</i>)	053303
Thudiyangal Mithun, R. Carretero-González, E. G. Charalampidis, D. S. Hall, and P. G. Kevrekidis	
Efimov resonance position near a narrow Feshbach resonance in a ${}^6\text{Li}$ - ${}^{133}\text{Cs}$ mixture (<i>8 pages</i>)	053304
Ang Li, Yaakov Yudkin, Paul S. Julienne, and Lev Khaykovich	
Effective single-mode model of a binary boson mixture in the quantum droplet region (<i>8 pages</i>)	053305
Yuncheng Xiong and Lan Yin	
Theoretical and numerical evidence for the potential realization of the Peregrine soliton in repulsive two-component Bose-Einstein condensates (<i>13 pages</i>)	053306
A. Romero-Ros, G. C. Katsimiga, S. I. Mistakidis, B. Prinari, G. Biondini, P. Schmelcher, and P. G. Kevrekidis	
Formation of local and global currents in a toroidal Bose-Einstein condensate via an inhomogeneous artificial gauge field (<i>10 pages</i>)	053307
S. Sahar S. Hejazi, Juan Polo, and Makoto Tsubota	
Interaction effects of pseudospin-based magnetic monopoles and kinks in a doped dipolar superlattice gas (<i>10 pages</i>)	053308
Xiang Gao, Shao-Jun Li, Shou-Long Chen, Xue-Ting Fang, Qian-Ru Zhu, Xing Deng, Lushuai Cao, Peter Schmelcher, and Zhong-Kun Hu	
Interface potential and line tension for Bose-Einstein condensate mixtures near a hard wall (<i>17 pages</i>)	053309
Bert Van Schaeybroeck, Patrick Navez, and Joseph O. Indekeu	
Two-particle states in one-dimensional coupled Bose-Hubbard models (<i>19 pages</i>)	053310
Yabo Li, Dominik Schneble, and Tzu-Chieh Wei	
Emergent phase transitions in a cluster Ising model with dissipation (<i>8 pages</i>)	053311
Zheng-Xin Guo, Xue-Jia Yu, Xi-Dan Hu, and Zhi Li	
Itinerant ferromagnetism of a dipolar Fermi gas with Raman-induced spin-orbit coupling (<i>8 pages</i>)	053312
Xue-Jing Feng, Xing-Dong Zhao, Lu Qin, Ying-Ying Zhang, Zunlue Zhu, Hong-Juan Tian, Lin Zhuang, and Wu-Ming Liu	
Direct reconstruction of the band structure of a one-dimensional optical lattice with thermal atoms (<i>6 pages</i>)	053313
Arnaud Courvoisier, Amruta Gadge, and Nir Davidson	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 105, NUMBER 5

MAY 2022

Counterflow dynamics of two correlated impurities immersed in a bosonic gas (<i>17 pages</i>)	053314
Friethjof Theel, Simeon I. Mistakidis, Kevin Keiler, and Peter Schmelcher	
Photonics, nonlinear optics, and optomechanics	
Inhibition of the phase conjugation of orbital angular momentum superpositions in cylindrical vector beams during stimulated Brillouin scattering (<i>8 pages</i>)	053501
Jean-François Bisson	
Effects of a three-level laser on mechanical squeezing in a doubly resonant optomechanical cavity coupled to biased noise fluctuations (<i>9 pages</i>)	053502
Mekonnen Bekele, Tewodros Yirgashewa, and Sintayehu Tesfa	
Broadband ultrawide-angle laser-plasma microwave antennas (<i>12 pages</i>)	053503
A. V. Mitrofanov, D. A. Sidorov-Biryukov, M. V. Rozhko, N. V. Erukhimova, A. A. Voronin, M. M. Nazarov, A. B. Fedotov, and A. M. Zheltikov	
Optimal orientation detection of an anisotropic dipolar scatterer (<i>8 pages</i>)	053504
Felix Tebbenjohanns, Andrei Militaru, Andreas Norrman, Fons van der Laan, Lukas Novotny, and Martin Frimmer	
Analytical solutions for the mean-square displacement derived from transport theory (<i>6 pages</i>)	053505
André Liemert, Fabrizio Martelli, and Alwin Kienle	
Random lasing from Anderson attractors (<i>5 pages</i>)	053506
Guillaume Rollin, José Lages, and Dima L. Shepelyansky	
Dynamical emission of phonon pairs in optomechanical systems (<i>9 pages</i>)	053507
Fen Zou, Jie-Qiao Liao, and Yong Li	
Tailoring propagation of light via spin-orbit interactions in correlated disorder (<i>7 pages</i>)	053508
Federico Carlini and Nicolas Cherroret	
Deep-learning-based recognition of fractional <i>C</i> -point indices in polarization singularities (<i>6 pages</i>)	053509
Yidan Cai, Shaochen Fang, Haoxu Guo, Diefei Xu, Guoyu Yang, Wuhong Zhang, and Lixiang Chen	
Topological phase transition induced by gain and loss in a photonic Chern insulator (<i>5 pages</i>)	053510
Hau Tian Teo, Haoran Xue, and Baile Zhang	
Optical transport lengths quantifying depolarization in experiments on random media (<i>9 pages</i>)	053511
Maximilian Gill, Bruno Gompf, Martin Dressel, and Gabriel Schnoering	
Trapping and self-assembly of particles by photonic chiral surface waves (<i>9 pages</i>)	053512
Liyong Cui and Neng Wang	
Influence of random media on orbital angular momentum quantum states of optical vortex beams (<i>8 pages</i>)	053513
Donghui Yang, Zheng-Da Hu, Shuailing Wang, and Yun Zhu	
Spiraling light: Generating optical tornados (<i>7 pages</i>)	053514
Dimitris Mansour, Apostolos Brimis, Konstantinos G. Makris, and Dimitris G. Papazoglou	
Reflection, transmission, and surface susceptibility tensor of two-dimensional materials (<i>7 pages</i>)	053515
Luca Dell'Anna, Yu He, and Michele Merano	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 105, NUMBER 5

MAY 2022

Experimental observation of partial parity-time symmetry and its phase transition with a laser-driven cesium atomic gas (<i>11 pages</i>)	053516
Yongmei Xue, Chao Hang, Yunhui He, Zhengyang Bai, Yuechun Jiao, Guoxiang Huang, Jianming Zhao, and Suotang Jia	
Isolation of optomechanical nonlinearities in nanomechanical cantilevers (<i>20 pages</i>)	053517
Jocelyn N. Westwood-Bachman, Tayyaba Firdous, Alexander E. Kobryn, Miro Belov, and Wayne K. Hiebert	
Ground-state cooling of multiple near-degenerate mechanical modes (<i>9 pages</i>)	053518
Jin-Yu Liu, Wenjing Liu, Da Xu, Jia-Chen Shi, Haitan Xu, Qihuang Gong, and Yun-Feng Xiao	
 Topologically protected frequency control of broadband signals in dynamically modulated waveguide arrays (<i>9 pages</i>)	053519
Francesco S. Piccioli, Alexander Szameit, and Iacopo Carusotto	
Multigrating design for integrated single-atom trapping, manipulation, and readout (<i>7 pages</i>)	053520
Aiping Liu, Jiawei Liu, Wei Peng, Xin-Biao Xu, Guang-Jie Chen, Xifeng Ren, Qin Wang, and Chang-Ling Zou	
Wannier-function methods for topological modes in one-dimensional photonic crystals (<i>16 pages</i>)	053521
Vaibhav Gupta and Barry Bradlyn	
Chirp effects and retrieval of Raman spectra in femtosecond stimulated Raman scattering (<i>12 pages</i>)	053522
M. Marrocco	
Metasurface-enhanced spatial mode decomposition (<i>6 pages</i>)	053523
Aaron W. Jones, Mengyao Wang, Xuecai Zhang, Samuel J. Cooper, Shumei Chen, Conor M. Mow-Lowry, and Andreas Freise	
Nonlinear harmonics of a seeded free-electron laser as a coherent and ultrafast probe to investigate matter at the water window and beyond (<i>14 pages</i>)	053524
G. Penco <i>et al.</i>	
Heteronuclear soliton molecules with two frequencies (<i>12 pages</i>)	053525
Stephanie Willms, Oliver Melchert, Surajit Bose, Alexey Yulin, Ivan Oreshnikov, Uwe Morgner, Ihar Babushkin, and Ayhan Demircan	
Nonlinear interference between solitons and nonstationary dispersive waves in a passively mode-locked fiber laser (<i>14 pages</i>)	053526
Jin Jer Huang, Zi Lin Jia, and Xin Lu Zhang	
Fundamental issues with light propagation through $\mathcal{PT}$ -symmetric systems (<i>8 pages</i>)	053527
F. A. Shuklin, C. Tserkezis, N. Asger Mortensen, and C. Wolff	
Propagation dynamics of optically generated unipolar electromagnetic pulses (<i>6 pages</i>)	053528
S. A. Sychugin, A. L. Novokovskaya, and M. I. Bakunov	
Revisiting nonlinear optical trapping of a single nanoparticle using generalized Lorentz-Mie theory (<i>9 pages</i>)	053529
Anita Devi, Bhaswardeep Sikdar, and Arijit K. De	
Quantum dynamics of dissipative Kerr solitons (<i>12 pages</i>)	053530
Kilian Seibold, Riccardo Rota, Fabrizio Minganti, and Vincenzo Savona	

(Continued)

Quantum optics

Manipulating thermal light via displaced-photon subtraction (<i>10 pages</i>)	053701
G. Tatti, D. W. Canning, U. Zanforlin, L. Mazzarella, J. Jeffers, and G. S. Buller	
Characteristics of superradiant optical phases occurring in the system of nondegenerate Λ atoms and radiation that are interacting inside a nonlinear quantum cavity (<i>9 pages</i>)	053702
S. Samimi and M. M. Golshan	
Coherent interaction of a quantum emitter and the edge states in two-dimensional optical topological insulators (<i>9 pages</i>)	053703
Haoyang Zhang, Jun Li, Hanwen Jiang, Na Li, Jianshan Wang, Jingping Xu, Chengjie Zhu, and Yaping Yang	
Duality, decay rates, and local-field models in macroscopic QED (<i>12 pages</i>)	053704
Niclas Westerberg, Anette Messinger, and Stephen M. Barnett	
$\mathcal{PT}$ -symmetric magnon laser in cavity optomagnonics (<i>9 pages</i>)	053705
Bao Wang, Xiao Jia, Xiao-Hu Lu, and Hao Xiong	
Tunable non-Markovian dynamics with a three-level atom mediated by the classical laser in a semi-infinite photonic waveguide (<i>16 pages</i>)	053706
Li Xin, Shuang Xu, X. X. Yi, and H. Z. Shen	
Universal model of strong coupling at the nonlinear resonance in open cavity-QED systems (<i>17 pages</i>)	053707
Mikhail Tokman, Maria Erukhimova, Qianfan Chen, and Alexey Belyanin	
Collection efficiency of optical photons generated from microwave excitations of a Bose-Einstein condensate (<i>10 pages</i>)	053708
Árpád Kurkó, Peter Domokos, David Petrosyan, and András Vukics	
Spontaneous parametric down-conversion: Revisiting the parameters of transverse entanglement outside the near zone (<i>11 pages</i>)	053709
M. V. Fedorov, S. S. Mernova, and K. V. Sliporod	
Accelerated adiabatic passage in cavity magnomechanics (<i>12 pages</i>)	053710
Shi-fan Qi and Jun Jing	
Enantiomer-discriminating sensing using optical cavities at exceptional points (<i>6 pages</i>)	053711
Mikayel Khanbekyan and Stefan Scheel	
Effects of quantum interference in multiwaveguide systems bridged by Jaynes-Cummings emitters (<i>10 pages</i>)	053712
Zhen-Rui Li, Junhua Dong, Yafang Xu, Bingsuo Zou, and Yongyou Zhang	
Perturbation approach in Heisenberg equations for lasers (<i>13 pages</i>)	053713
Igor E. Protsenko and Alexander V. Uskov	
Rydberg electromagnetically induced transparency and absorption of strontium triplet states in a weak microwave field (<i>10 pages</i>)	053714
Yan-Li Zhou, Dong Yan, and Weibin Li	
Generating long-lived entangled states with free-space collective spontaneous emission (<i>6 pages</i>)	053715
Alan C. Santos, André Cidrim, Celso Jorge Villas-Boas, Robin Kaiser, and Romain Bachelard	
Interferometric signature of different spectral symmetries of biphoton states (<i>13 pages</i>)	053716
N. Fabre	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A	THIRD SERIES, VOLUME 105, NUMBER 5	MAY 2022
Floquet analysis of extended Rabi models based on high-frequency expansion (<i>11 pages</i>)		053717
Yibo Liu, Lijun Mao, and Yunbo Zhang		
Photon and phonon statistics in a qubit-plasmon-phonon ultrastrong-coupling system (<i>8 pages</i>)		053718
Ting-ting Ma, Dmitri B. Horoshko, Chang-shui Yu, and Sergei Ya. Kilin		
COMMENTS		
Comment on “Quantum coherence measures based on Fisher information with applications” (<i>3 pages</i>)		056401
Jianwei Xu		
Comment on “Stark shift and width of x-ray lines from highly charged ions in dense plasmas” (<i>3 pages</i>)		056801
T. N. Chang and Xiang Gao		
Comment on “Bulk and surface plasmons: Wave-mechanical and second-quantized theories” (<i>3 pages</i>)		057501
Li Ge		
ERRATA		
Erratum: Generating and detecting topological phases with higher Chern number [Phys. Rev. A 103 , 053305 (2021)] (<i>1 page</i>)		059901(E)
Abhijeet Alase and David L. Feder		