

*The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 010101(R)–012518, and Part B pages 012701–019902(E).*

PART A

RAPID COMMUNICATIONS

Fundamental concepts

- Understanding detailed balance for an electron-radiation system through mixed quantum-classical electrodynamics (6 pages) 010101(R)
Hsing-Ta Chen, Tao E. Li, Abraham Nitzan, and Joseph E. Subotnik
- Eternal life of entropy in non-Hermitian quantum systems (7 pages) 010102(R)
Andreas Fring and Thomas Frith

Quantum information

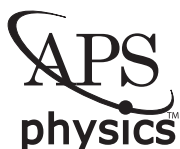
- Robust fault tolerance for continuous-variable cluster states with excess antisqueezing (5 pages) 010301(R)
Blayne W. Walshe, Lucas J. Mensen, Ben Q. Baragiola, and Nicolas C. Menicucci
- Experimental error mitigation via symmetry verification in a variational quantum eigensolver (6 pages) 010302(R)
R. Sagastizabal, X. Bonet-Monroig, M. Singh, M. A. Rol, C. C. Bultink, X. Fu, C. H. Price, V. P. Ostroukh, N. Muthusubramanian, A. Bruno, M. Beekman, N. Haider, T. E. O'Brien, and L. DiCarlo

Atomic and molecular structure and dynamics; high-precision measurements

- Dipolar and scalar ^3He - ^{129}Xe frequency shifts in stemless cells (5 pages) 010501(R)
M. E. Limes, N. Dural, M. V. Romalis, E. L. Foley, T. W. Kornack, A. Nelson, L. R. Grisham, and J. Vaara
- QED radiative corrections to the $^2P_{1/2}$ - $^2P_{3/2}$ fine structure in fluorinelike ions (5 pages) 010502(R)
A. V. Volotka, M. Bilal, R. Beerwerth, X. Ma, Th. Stöhlker, and S. Fritzsche

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

- Fluorescence polarization as a precise tool for understanding nonsequential many-photon ionization (6 pages) ... 011401(R)
J. Hofbrucker, A. V. Volotka, and S. Fritzsche
- Probing nonlocal spatial correlations in quantum gases with ultra-long-range Rydberg molecules (5 pages) 011402(R)
J. D. Whalen, S. K. Kanungo, R. Ding, M. Wagner, R. Schmidt, H. R. Sadeghpour, S. Yoshida, J. Burgdörfer, F. B. Dunning, and T. C. Killian



Copyright 2019 by American Physical Society

(Continued)



2469-9926(201907)100:1:B;1-Z

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).

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Time fractals and discrete scale invariance with trapped ions (<i>4 pages</i>)	011403(R)
Dean Lee, Jacob Watkins, Dillon Frame, Gabriel Given, Rongzheng He, Ning Li, Bing-Nan Lu, and Avik Sarkar	

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

Dual-frequency spin-resonance spectroscopy of diamond nitrogen-vacancy centers in zero magnetic field (<i>5 pages</i>)	011801(R)
A. K. Dmitriev, H. Y. Chen, G. D. Fuchs, and A. K. Vershovskii	
Effective breaking of the action-reaction principle using spatial solitons (<i>6 pages</i>)	011802(R)
Alessandro Alberucci, Chandroth P. Jisha, Ulf Peschel, and Stefan Nolte	
Resonant nonlinear refraction of 4.3- μm light in CO ₂ gas (<i>6 pages</i>)	011803(R)
J. J. Pigeon, D. Tovey, S. Ya. Tochitsky, G. J. Louwrens, I. Ben-Zvi, D. Martyshkin, V. Fedorov, K. Karki, S. Mirov, and C. Joshi	

ARTICLES

Fundamental concepts

Role of information backflow in the emergence of quantum Darwinism (<i>7 pages</i>)	012101
Nadia Milazzo, Salvatore Lorenzo, Mauro Paternostro, and G. Massimo Palma	
Nonlocality distillation and quantum voids (<i>8 pages</i>)	012102
S. G. A. Brito, M. G. M. Moreno, A. Rai, and R. Chaves	
Pulse engineering for population control under dephasing and dissipation (<i>7 pages</i>)	012103
I. Medina and F. L. Semião	
Threshold effects in electron-positron pair creation from the vacuum: Stabilization and longitudinal versus transverse momentum sharing (<i>10 pages</i>)	012104
K. Krajewska and J. Z. Kamiński	
Chirality from quantum walks without a quantum coin (<i>19 pages</i>)	012105
Giacomo Mauro D'Ariano, Marco Erba, and Paolo Perinotti	
Robustness of quantum-enhanced adaptive phase estimation (<i>17 pages</i>)	012106
Pantita Palittapongarnpim and Barry C. Sanders	
Open-quantum-system dynamics: Recovering positivity of the Redfield equation via the partial secular approximation (<i>14 pages</i>)	012107
Donato Farina and Vittorio Giovannetti	
Twisted localized solutions of the Dirac equation: Hopfionlike states of relativistic electrons (<i>5 pages</i>)	012108
Iwo Białynicki-Birula and Zofia Białynicka-Birula	
Toward ultrahigh sensitivity in weak-value amplification (<i>6 pages</i>)	012109
Jingzheng Huang, Yanjia Li, Chen Fang, Hongjing Li, and Guihua Zeng	
Optimal quantum optical control of spin in diamond (<i>12 pages</i>)	012110
Jiazhao Tian, Tianyi Du, Yu Liu, Haibin Liu, Fangzhou Jin, Ressa S. Said, and Jianming Cai	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Resonant shortcuts for adiabatic rapid passage with only z -field control (<i>12 pages</i>)	012111
Dionisis Stefanatos and Emmanuel Paspalakis	
Phase-dependent topological interface state and spatial adiabatic passage in a generalized Su-Schrieffer-Heeger model (<i>9 pages</i>)	012112
Lei Du, Jin-Hui Wu, M. Artoni, and G. C. La Rocca	
Single-world consistent interpretation of quantum mechanics from fundamental time and length uncertainties (<i>12 pages</i>)	012113
Rodolfo Gambini, Luis Pedro García-Pintos, and Jorge Pullin	
Compatibility of causal hidden-variable theories with a delayed-choice experiment (<i>7 pages</i>)	012114
He-Liang Huang, Yi-Han Luo, B. Bai, Y.-H. Deng, H. Wang, Q. Zhao, H.-S. Zhong, Y.-Q. Nie, W.-H. Jiang, X.-L. Wang, Jun Zhang, Li Li, Nai-Le Liu, Tim Byrnes, J. P. Dowling, Chao-Yang Lu, and Jian-Wei Pan	
Realization of a causal-modeled delayed-choice experiment using single photons (<i>7 pages</i>)	012115
Shang Yu, Yong-Nan Sun, Wei Liu, Zhao-Di Liu, Zhi-Jin Ke, Yi-Tao Wang, Jian-Shun Tang, Chuan-Feng Li, and Guang-Can Guo	
Binary discrimination in two-level quantum systems via hypothesis testing (<i>6 pages</i>)	012116
Beili Gong and Wei Cui	
Dynamical chaotic phases and constrained quantum dynamics (<i>10 pages</i>)	012117
André M. Timpanaro, Sascha Wald, Fernando Semião, and Gabriel T. Landi	
Synchronous measurement of inertial rotation and magnetic field using a K-Rb- ^{21}Ne comagnetometer (<i>7 pages</i>)	012118
Wei Quan, Kai Wei, Tian Zhao, Hairong Li, and Yueyang Zhai	
 Testing collapse models with levitated nanoparticles: Detection challenge (<i>13 pages</i>)	012119
A. Vinante, A. Pontin, M. Rashid, M. Toroš, P. F. Barker, and H. Ulbricht	
Non-Markovianity, information backflow, and system-environment correlation for open-quantum-system processes (<i>16 pages</i>)	012120
Yun-Yi Hsieh, Zheng-Yao Su, and Hsi-Sheng Goan	
Ruling out the class of statistical processes involving two noninteracting identical particles in two modes (<i>6 pages</i>)	012121
S. Aravinda	
Maxwell quantum mechanics (<i>8 pages</i>)	012122
Margaret Hawton	
Local measurement uncertainties impose a limit on nonlocal quantum correlations (<i>8 pages</i>)	012123
Holger F. Hofmann	
Wigner current for open quantum systems (<i>10 pages</i>)	012124
William F. Braasch, Jr., Oscar D. Friedman, Alexander J. Rimberg, and Miles P. Blencowe	
Weak value amplification for nonunitary evolution (<i>6 pages</i>)	012125
Wei-Tao Liu, Julián Martínez-Rincón, and John C. Howell	
Swift heat transfer by fast-forward driving in open quantum systems (<i>15 pages</i>)	012126
Tamiro Villazon, Anatoli Polkovnikov, and Anushya Chandran	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Non-Abelian geometric phases in periodically driven systems (<i>9 pages</i>)	012127
Viktor Novičenko and Gediminas Juzeliūnas	
All-creation and all-annihilation time-dependent $\mathcal{PT}$ -symmetric bosonic Hamiltonians: An infinite squeezing degree at a finite time (<i>11 pages</i>)	012128
M. A. de Ponte, F. S. Luiz, O. S. Duarte, and M. H. Y. Moussa	
Active energy transport and the role of symmetry breaking in microscopic power grids (<i>11 pages</i>)	012129
Julian Huber and Peter Rabl	
Dynamical model for positive-operator-valued measures (<i>9 pages</i>)	012130
A. De Pasquale, C. Foti, A. Cuccoli, V. Giovannetti, and P. Verrucchi	
Quantum reciprocity relations for fluctuations of position and momentum (<i>7 pages</i>)	012131
Mahasweta Pandit, Anindita Bera, Aditi Sen(De), and Ujjwal Sen	
Analog of Hamilton-Jacobi theory for the time-evolution operator (<i>16 pages</i>)	012132
Michael Vogl, Pontus Laurell, Aaron D. Barr, and Gregory A. Fiete	
Quantum synchronization in a collision model (<i>11 pages</i>)	012133
G. Karpat, İ. Yalçinkaya, and B. Çakmak	
Excitation energy transfer with initial system-bath correlations for coherent initial conditions in a toy donor-acceptor model (<i>21 pages</i>)	012134
M. Qin, H. T. Cui, C. Y. Wang, Y. Q. Xu, and X. X. Yi	
Quantum information	
Operation and intrinsic error budget of a two-qubit cross-resonance gate (<i>21 pages</i>)	012301
Vinay Tripathi, Mostafa Khezri, and Alexander N. Korotkov	
One-out-of- m spacetime-constrained oblivious transfer (<i>20 pages</i>)	012302
Damián Pitalúa-García	
Engineering fidelity of the generalized Pauli channels via legitimate memory kernels (<i>10 pages</i>)	012303
Katarzyna Siudzińska and Dariusz Chruściński	
Quantum algorithms for training Gaussian processes (<i>5 pages</i>)	012304
Zhikuan Zhao, Jack K. Fitzsimons, Michael A. Osborne, Stephen J. Roberts, and Joseph F. Fitzsimons	
Experimental study of Shor's factoring algorithm using the IBM Q Experience (<i>9 pages</i>)	012305
Mirko Amico, Zain H. Saleem, and Muir Kumph	
Continuous-time quantum walks on dynamic graphs (<i>13 pages</i>)	012306
Rebekah Herrman and Travis S. Humble	
Microwave-to-optical conversion via four-wave mixing in a cold ytterbium ensemble (<i>9 pages</i>)	012307
Jacob P. Covey, Alp Sipahigil, and Mark Saffman	
Indistinguishability-enabled coherence for quantum metrology (<i>6 pages</i>)	012308
Alessia Castellini, Rosario Lo Franco, Ludovico Lami, Andreas Winter, Gerardo Adesso, and Giuseppe Compagno	
Description of composite bosons in discrete models (<i>9 pages</i>)	012309
Paula Céspedes, Elena Rufeil-Fiori, P. Alexander Bouvrie, Ana P. Majtey, and Cecilia Cormick	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A	THIRD SERIES, VOLUME 100, NUMBER 1	JULY 2019
Class of genuinely high-dimensionally-entangled states with a positive partial transpose (7 pages)		012310
Károly F. Pál and Tamás Vértesi		
Decoding the three-dimensional toric codes and welded codes on cubic lattices (18 pages)		012311
Abhishek Kulkarni and Pradeep Kiran Sarvepalli		
Three-dimensional surface codes: Transversal gates and fault-tolerant architectures (20 pages)		012312
Michael Vasmer and Dan E. Browne		
Practical security of continuous-variable quantum key distribution with reduced optical attenuation (9 pages)		012313
Yi Zheng, Peng Huang, Anqi Huang, Jinye Peng, and Guihua Zeng		
Discerning quantum memories based on electromagnetically-induced-transparency and Autler-Townes-splitting protocols (15 pages)		012314
Anindya Rastogi, Erhan Saglamyurek, Taras Hrushevskyi, Scott Hubele, and Lindsay J. LeBlanc		
l_1 -norm coherence of assistance (6 pages)		012315
Ming-Jing Zhao, Teng Ma, Quan Quan, Heng Fan, and Rajesh Pereira		
Quantum hacking of free-space continuous-variable quantum key distribution by using a machine-learning technique (11 pages)		012316
Wenti Huang, Yiyu Mao, Cailang Xie, and Duan Huang		
Entanglement fluctuation theorems (20 pages)		012317
Álvaro M. Alhambra, Lluís Masanes, Jonathan Oppenheim, and Christopher Perry		
Engineering asymmetric steady-state Einstein-Podolsky-Rosen steering in macroscopic hybrid systems (10 pages)		012318
Xinyao Huang, Emil Zeuthen, Qihuang Gong, and Qiongyi He		
Device-independent quantum secret sharing in arbitrary even dimensions (9 pages)		012319
Sarbani Roy and Sourav Mukhopadhyay		
Simulations of subatomic many-body physics on a quantum frequency processor (17 pages)		012320
Hsuan-Hao Lu, Natalie Klco, Joseph M. Lukens, Titus D. Morris, Aaina Bansal, Andreas Ekström, Gaute Hagen, Thomas Papenbrock, Andrew M. Weiner, Martin J. Savage, and Pavel Lougovski		
Continuous-variable entangled states of light carrying orbital angular momentum (7 pages)		012321
A. Pecoraro, F. Cardano, L. Marrucci, and A. Porzio		
Four-spin cross relaxation in a hybrid quantum device (7 pages)		012322
Cheng Ma, Zhiling Wang, Yukai Wu, Zenghui Bao, Yipu Song, Hongyi Zhang, and Luming Duan		
Optimal measurements for quantum fidelity between Gaussian states and its relevance to quantum metrology (10 pages)		012323
Changhun Oh, Changhyoup Lee, Leonardo Banchi, Su-Yong Lee, Carsten Rockstuhl, and Hyunseok Jeong		
Effects of decoherence on diabatic errors in Majorana braiding (7 pages)		012324
Zhen-Tao Zhang, Feng Mei, Xiang-Guo Meng, Bao-Long Liang, and Zhen-Shan Yang		
Free-space continuous-variable quantum key distribution of unidimensional Gaussian modulation using polarized coherent states in an urban environment (8 pages)		012325
Shi-Yang Shen, Ming-Wei Dai, Xue-Tao Zheng, Qi-Yao Sun, Guang-Can Guo, and Zheng-Fu Han		

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Production of photonic universal quantum gates enhanced by machine learning (<i>10 pages</i>)	012326
Krishna Kumar Sabapathy, Haoyu Qi, Josh Izaac, and Christian Weedbrook	
 Maximum advantage of quantum illumination (<i>5 pages</i>)	012327
Shannon Ray, James Schneeloch, Christopher C. Tison, and Paul M. Alsing	
Optimal measurement strategies for fast entanglement detection (<i>12 pages</i>)	012328
N. Milazzo, D. Braun, and O. Giraud	
Searching nonadiabatic holonomic quantum gates via an optimization algorithm (<i>12 pages</i>)	012329
Feihao Zhang, Jiang Zhang, Pan Gao, and Guilu Long	
Modified belief propagation decoders for quantum low-density parity-check codes (<i>21 pages</i>)	012330
Alex Rigby, J. C. Olivier, and Peter Jarvis	
Error reduction of quantum algorithms (<i>6 pages</i>)	012331
Debajyoti Bera and Tharmashastha P.V.	
Deterministic conversions between Greenberger-Horne-Zeilinger states and W states of spin qubits via Lie-transform-based inverse Hamiltonian engineering (<i>12 pages</i>)	012332
Yi-Hao Kang, Zhi-Cheng Shi, Bi-Hua Huang, Jie Song, and Yan Xia	
Faithful measure of quantum non-Gaussianity via quantum relative entropy (<i>5 pages</i>)	012333
Jiyong Park, Jaehak Lee, Kyunghyun Baek, Se-Wan Ji, and Hyunchul Nha	
Building quantum neural networks based on a swap test (<i>9 pages</i>)	012334
Jian Zhao, Yuan-Hang Zhang, Chang-Peng Shao, Yu-Chun Wu, Guang-Can Guo, and Guo-Ping Guo	
Measure of not-completely-positive qubit maps: The general case (<i>5 pages</i>)	012336
Vinayak Jagadish, R. Srikanth, and Francesco Petruccione	
Entropy, purity, and fidelity in Majorana phase space (<i>11 pages</i>)	012337
Ria Rushin Joseph, Laura E. C. Rosales-Zárate, and Peter D. Drummond	
Universal quantum computation in the surface code using non-Abelian islands (<i>13 pages</i>)	012338
Katharina Laubscher, Daniel Loss, and James R. Wootton	
Fast and high-fidelity generation of steady-state entanglement using pulse modulation and parametric amplification (<i>11 pages</i>)	012339
Ye-Hong Chen, Wei Qin, and Franco Nori	
Noise in boson sampling and the threshold of efficient classical simulatability (<i>14 pages</i>)	012340
V. S. Shchesnovich	
Floquet-engineered quantum state manipulation in a noisy qubit (<i>10 pages</i>)	012341
Eric Boyers, Mohit Pandey, David K. Campbell, Anatoli Polkovnikov, Dries Sels, and Alexander O. Sushkov	
Multiplexed spin-wave-photon entanglement source using temporal multimode memories and feedforward-controlled readout (<i>8 pages</i>)	012342
Yafei Wen, Pai Zhou, Zhongxiao Xu, Liang Yuan, Haoyi Zhang, Shengzhi Wang, Long Tian, Shujing Li, and Hai Wang	
Protocol of a quantum walk in circuit QED (<i>6 pages</i>)	012343
Jia-Qi Zhou, Ling Cai, Qi-Ping Su, and Chui-Ping Yang	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Superunsteerability as a quantifiable resource for random access codes assisted by Bell-diagonal states (<i>10 pages</i>)	012344
C. Jebarathinam, Debarshi Das, Som Kanjilal, R. Srikanth, Debasis Sarkar, Indrani Chattopadhyay, and A. S. Majumdar	
Efficient Bayesian credible-region certification for quantum-state tomography (<i>18 pages</i>)	012345
Changhun Oh, Yong Siah Teo, and Hyunseok Jeong	
Adaptive compressive tomography: A numerical study (<i>11 pages</i>)	012346
D. Ahn, Y. S. Teo, H. Jeong, D. Koutný, J. Řeháček, Z. Hradil, G. Leuchs, and L. L. Sánchez-Soto	
Einstein-Podolsky-Rosen entanglement between separated atomic ensembles (<i>8 pages</i>)	012347
Wei Zhang, Ming-Xin Dong, Dong-Sheng Ding, Shuai Shi, Kai Wang, Shi-Long Liu, Zhi-Yuan Zhou, Guang-Can Guo, and Bao-Sen Shi	
Local equivalence of qudit color codes and toric codes (<i>21 pages</i>)	012348
Arun B. Alosious and Pradeep Kiran Sarvepalli	
Operator coherence dynamics in Grover's quantum search algorithm (<i>10 pages</i>)	012349
Minghua Pan and Daowen Qiu	
Quantum process tomography via optimal design of experiments (<i>16 pages</i>)	012350
Yonatan Gazit, Hui Khoon Ng, and Jun Suzuki	
Simulating all quantum measurements using only projective measurements and postselection (<i>11 pages</i>)	012351
Michał Oszmaniec, Filip B. Maciejewski, and Zbigniew Puchała	
Atomic and molecular structure and dynamics; high-precision measurements	
Precision measurement of the ionization energy and quantum defects of $^{39}\text{K I}$ (<i>12 pages</i>)	012501
Michael Peper, Felix Helmrich, Jonas Butscher, Josef Anton Agner, Hansjürg Schmutz, Frédéric Merkt, and Johannes Deiglmayr	
Frequency shifts in noble-gas comagnetometers (<i>6 pages</i>)	012502
W. A. Terrano, J. Meinel, N. Sachdeva, T. E. Chupp, S. Degenkolb, P. Fierlinger, F. Kuchler, and J. T. Singh	
Isotopic variation of parity violation in atomic ytterbium: Description of the measurement method and analysis of systematic effects (<i>22 pages</i>)	012503
D. Antypas, A. M. Fabricant, J. E. Stalnaker, K. Tsigutkin, V. V. Flambaum, and D. Budker	
Reevaluation of the nuclear electric quadrupole moment for ^{87}Sr by hyperfine structures and relativistic atomic theory (<i>8 pages</i>)	012504
Benquan Lu, Tingxian Zhang, Hong Chang, Jiguang Li, Yong Wu, and Jianguo Wang	
Self-interaction-free electric dipole polarizabilities for atoms and their ions using the Fermi-Löwdin self-interaction correction (<i>7 pages</i>)	012505
Kushantha P. K. Withanage, Sharmin Akter, Chandra Shahi, Rajendra P. Joshi, Carlos Diaz, Yoh Yamamoto, Rajendra Zope, Tunna Baruah, John P. Perdew, Juan E. Peralta, and Koblar A. Jackson	
Recombination process for the hydrogen atom in the presence of blackbody radiation (<i>7 pages</i>)	012506
D. Solov'yev, T. Zaliutdinov, A. Anikin, J. Triaskin, and L. Labzowsky	
Double-minimum $3^1\Sigma_u^+$ state in Rb_2 : Spectroscopic study and possible applications for cold-physics experiments (<i>7 pages</i>)	012507
A. Pashov, P. Kowalczyk, and W. Jastrzebski	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Existence of the finite hydrogenic molecular chain H_3 and ion H_2^- in a strong magnetic field (5 pages)	012508
D. J. Nader, J. C. López Vieyra, and A. V. Turbiner	
Approximating one-matrix functionals without generalized Pauli constraints (6 pages)	012509
Oleg V. Gritsenko and Katarzyna Pernal	
 QED theory of the specific mass shift in few-electron atoms (12 pages)	012510
A. V. Malyshev, I. S. Anisimova, D. V. Mironova, V. M. Shabaev, and G. Plunien	
High-resolution measurements of Cl^{15+} line shifts in hot, solid-density plasmas (5 pages)	012511
P. Beiersdorfer, G. V. Brown, A. McKelvey, R. Shepherd, D. J. Hoarty, C. R. D. Brown, M. P. Hill, L. M. R. Hobbs, S. F. James, J. Morton, and L. Wilson	
 Effect of vibrational excitation and spin-rotation coupling on Stern-Gerlach experiments: A detailed case study on $GdSn_{15}$ as an asymmetric rotor (10 pages)	012512
Thomas M. Fuchs and Rolf Schäfer	
Nonrelativistic quantum electrodynamic Hamiltonian and photon-exchange interaction up to $m\alpha^8$ order (11 pages)	012513
Wanping Zhou, Xuesong Mei, and Haoxue Qiao	
Maxwell eigenmode approach to the Casimir-Lifshitz torque (15 pages)	012514
Wijnand Broer, John Yuh Han Liow, and Bing-Sui Lu	
Autoionization rates of core-excited magnesium Rydberg atoms in electric fields using the core fluorescence as a reference (8 pages)	012515
D. Wehrli, M. Génévriez, and F. Merkt	
(Spin-)density-functional theory for open-shell systems: Exact magnetization density functional for the half-filled Hubbard trimer (10 pages)	012516
Carsten A. Ullrich	
Bethe logarithm for the helium atom (6 pages)	012517
Vladimir I. Korobov	
Optimal supercritical potentials for the electron-positron pair-creation rate (9 pages)	012518
J. Unger, S. Dong, Q. Su, and R. Grobe	

PART B

Atomic and molecular collisions and interactions

s-wave contacts of quantum gases in quasi-one-dimensional and quasi-two-dimensional traps (5 pages)	012701
Mingyuan He and Qi Zhou	
Effect of cascade transitions on the polarization of light emitted after electron-impact excitation of Zn by spin-polarized electrons (7 pages)	012702
K. Bartschat, O. Zatsarinny, C. J. Bostock, D. V. Fursa, I. Bray, and A. N. Grum-Grzhimailo	
Bare-carbon-ion-impact electron emission from adenine molecules: Differential and total cross-section measurements (10 pages)	012703
Shamik Bhattacharjee, Chandan Bagdia, Madhusree Roy Chowdhury, Anuvab Mandal, J. M. Monti, Roberto D. Rivarola, and Lokesh C. Tribedi	
Quasi-one-dimensional ultracold rigid-rotor collisions: Reactive and nonreactive cases (10 pages)	012704
R. Vexiau, J.-M. Launay, and A. Simoni	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Model for investigating quantum reflection and quantum coherence in ultracold molecular collisions (<i>10 pages</i>)	012705
Yan-Peng Bai, Jing-Lun Li, Gao-Ren Wang, and Shu-Lin Cong	
Two-center dielectronic recombination in slow atomic collisions (<i>8 pages</i>)	012706
A. Jacob, C. Müller, and A. B. Voitkiv	
Spin asymmetry in electron-impact ionization (<i>5 pages</i>)	012707
I. Bray, D. V. Fursa, A. S. Kadyrov, A. Müller, A. Borovik, Jr., and S. Schippers	
Resonance electron interaction with five-membered heterocyclic compounds: Vibrational Feshbach resonances and hydrogen-atom stripping (<i>14 pages</i>)	012708
Stanislav A. Pshenichnyuk, Ilya I. Fabrikant, Alberto Modelli, Sylwia Ptasińska, and Alexei S. Komolov	
Universality in a one-dimensional three-body system (<i>14 pages</i>)	012709
Lucas Happ, Matthias Zimmermann, Santiago I. Betelu, Wolfgang P. Schleich, and Maxim A. Efremov	
Comparative experimental and theoretical study on electron scattering by propane (<i>9 pages</i>)	012710
W. Y. Baek, T. Braunroth, M. U. Bug, F. Heimbach, H. Nettelbeck, and H. Rabus	
Low-energy scattering properties of ground-state and excited-state positronium collisions (<i>10 pages</i>)	012711
Michael D. Higgins, Kevin M. Daily, and Chris H. Greene	
Multicenter distorted-wave approach for electron-impact ionization of molecules (<i>8 pages</i>)	012712
Esam Ali and Don Madison	
Atomic and molecular processes in external fields, including interactions with strong fields and short pulses	
Cold, dense, atomic ion clouds produced by cryogenic buffer-gas cooling (<i>3 pages</i>)	013401
Nishant Bhatt, Kosuke Kato, and Amar C. Vutha	
Theoretical evidence for the sensitivity of charge-rearrangement-enhanced x-ray ionization to molecular size (<i>9 pages</i>)	013402
Yajiang Hao (郝亚江), Ludger Inhester, Sang-Kil Son (손상길), and Robin Santra	
Charge dynamics of a molecular ion immersed in a Rydberg-dressed atomic lattice gas (<i>8 pages</i>)	013403
Rick Mukherjee	
Correlation enhancement of high-order harmonic generation in Xe (<i>6 pages</i>)	013404
Alexander W. Bray, David Freeman, Sebastian Eckart, and Anatoli S. Kheifets	
Three-dimensional spin-dependent dynamics in linearly polarized standing-wave fields (<i>9 pages</i>)	013405
Yongsheng Fu, Yu Liu, Chunhui Wang, Jiaolong Zeng, and Jianmin Yuan	
Short- and long-term gain dynamics in N_2^+ air lasing (<i>8 pages</i>)	013406
Mathew Britton, Marianna Lytova, Patrick Laferrière, Peng Peng, Felipe Morales, Dong Hyuk Ko, Maria Richter, Pavel Polynkin, D. M. Villeneuve, Chunmei Zhang, Misha Ivanov, Michael Spanner, Ladan Arissian, and P. B. Corkum	
Time-resolved buildup of two-slit-type interference from a single atom (<i>10 pages</i>)	013407
Jonas Wätzel, Andrew James Murray, and Jamal Berakdar	
High-intensity two-frequency photoassociation spectroscopy of a weakly bound molecular state: Theory and experiment (<i>11 pages</i>)	013408
W. Y. Kon, J. A. Aman, J. C. Hill, T. C. Killian, and Kaden R. A. Hazzard	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Measurements of $^{27}\text{Al}^+$ and $^{25}\text{Mg}^+$ magnetic constants for improved ion-clock accuracy (7 pages)	013409
S. M. Brewer, J.-S. Chen, K. Beloy, A. M. Hankin, E. R. Clements, C. W. Chou, W. F. McGrew, X. Zhang, R. J. Fasano, D. Nicolodi, H. Leopardi, T. M. Fortier, S. A. Diddams, A. D. Ludlow, D. J. Wineland, D. R. Leibrandt, and D. B. Hume	
Multiring electrostatic guide for Rydberg positronium (12 pages)	013410
M. H. Rayment, L. Gurung, R. E. Sheldon, S. D. Hogan, and D. B. Cassidy	
Controllable chip-based beam splitter for cold polar molecules (5 pages)	013411
Xueyan Xu, Tao Yang, Shunyong Hou, and Jianping Yin	
Contribution of Floquet-Bloch states to high-order harmonic generation in solids (11 pages)	013412
Jian-Zhao Jin, Hao Liang, Xiang-Ru Xiao, Mu-Xue Wang, Si-Ge Chen, Xiao-Yuan Wu, Qihuang Gong, and Liang-You Peng	
Tuning nonthermal distributions to thermal ones in time-dependent Paul traps (18 pages)	013413
H. Landa	
Strong-field ionization of Ar atoms with a 45° cross-linearly-polarized two-color laser field (6 pages)	013414
Yiqi Fang, Chaoxiong He, Meng Han, Peipei Ge, Xiaoyang Yu, Xueyan Ma, Yongkai Deng, and Yunquan Liu	
Multiorbital and excitation effects on dissociative double ionization of CO molecules in strong circularly polarized laser fields (8 pages)	013415
Xiaokai Li, Jiaqi Yu, Huiying Xu, Xitao Yu, Yizhang Yang, Zhenzhen Wang, Pan Ma, Chuncheng Wang, Fuming Guo, Yujun Yang, Sizuo Luo, and Dajun Ding	
Evidence for cooling in an optical lattice by amplitude modulation (5 pages)	013416
M. Arnal, V. Brunaud, G. Chatelain, C. Cabrera-Gutiérrez, E. Michon, P. Cheiney, J. Billy, and D. Guéry-Odelin	
 Relativistic effects in the multiphoton ionization of hydrogenlike ions by ultrashort infrared laser pulses (8 pages)	013417
Charles J. Joachain and Niels J. Kylstra	
Near-threshold photodetachment microscopy in the presence of a transverse magnetic field (13 pages)	013418
K. Titimbo, X. J. Chen, and M. L. Du	
Application of the time-dependent surface flux method to the time-dependent multiconfiguration self-consistent-field method (8 pages)	013419
Yuki Orimo, Takeshi Sato, and Kenichi L. Ishikawa	
Atomic measurements of high-intensity VHF-band radio-frequency fields with a Rydberg vapor-cell detector (8 pages)	013420
Eric Paradis, Georg Raithel, and David A. Anderson	
Entanglement and coherence in photoionization of H_2 by an ultrashort XUV laser pulse (12 pages)	013421
Takanori Nishi, Erik Lötstedt, and Kaoru Yamanouchi	
Coherence control in high-order harmonic generation with Laguerre-Gaussian beams (9 pages)	013422
Willi Paufler, Birger Böning, and Stephan Fritzsche	
Matter waves and collective properties of cold atoms and molecules	
Interaction-driven topological switch in a P -band honeycomb lattice (8 pages)	013601
Hua Chen and X. C. Xie	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

 Squeezed-field path-integral description of second sound in Bose-Einstein condensates (9 pages)	013602
Ilias M. H. Seifie, Vijay Pal Singh, and L. Mathey	
Few-boson localization in a continuum with speckle disorder (10 pages)	013603
Pere Mujal, Artur Polls, Sebastiano Pilati, and Bruno Juliá-Díaz	
Finite-duration interaction quench in dilute attractively interacting Fermi gases: Emergence of preformed pairs (5 pages)	013604
Johannes Kombe, Jean-Sébastien Bernier, Michael Köhl, and Corinna Kollath	
Anyon optics with time-of-flight two-particle interference of double-well-trapped interacting ultracold atoms (9 pages)	013605
Constantine Yannouleas and Uzi Landman	
Recurrence times of the small-size Lieb-Liniger Bose gas in the weak- and strong-coupling regimes (8 pages) . . .	013606
Eriko Kaminishi and Takashi Mori	
Simulation of the quantum dynamics of indistinguishable bosons with the method of coupled coherent states (15 pages)	013607
James A. Green and Dmitrii V. Shalashilin	
 Stable production of a strongly interacting Bose-Einstein condensate via mode matching (7 pages)	013608
E. J. Halperin, M. W. C. Sze, J. P. Corson, and J. L. Bohn	
Pathway toward the formation of supermixed states in ultracold boson mixtures loaded in ring lattices (11 pages)	013609
Andrea Richaud and Vittorio Penna	
Probing quantum chaos in many-body quantum systems by the induced dissipation (5 pages)	013610
Anna A. Bychek, Pavel S. Muraev, and Andrey R. Kolovsky	
Superfluid–Mott-insulator transition of ultracold superradiant bosons in a cavity (15 pages)	013611
Rui Lin, Luca Papariello, Paolo Mognini, R. Chitra, and Axel U. J. Lode	
Pair formation in quenched unitary Bose gases (9 pages)	013612
S. Musolino, V. E. Colussi, and S. J. J. M. F. Kokkelmans	
Nonequilibrium time evolution and rephasing in the quantum sine-Gordon model (21 pages)	013613
D. X. Horváth, I. Lovas, M. Kormos, G. Takács, and G. Zaránd	
Three-body repulsive forces among identical bosons in one dimension (8 pages)	013614
M. Valiente	
Light propagation in systems involving two-dimensional atomic lattices (19 pages)	013616
Juha Javanainen and Renuka Rajapakse	
Two-component lattice bosons with cavity-mediated long-range interaction (9 pages)	013617
Xin Guan, Jingtao Fan, Xiaofan Zhou, Gang Chen, and Suotang Jia	
Parallel multicomponent interferometer with a spinor Bose-Einstein condensate (8 pages)	013618
Pengju Tang, Peng Peng, Zhihan Li, Xuzong Chen, Xiaopeng Li, and Xiaoji Zhou	
Effective approach to impurity dynamics in one-dimensional trapped Bose gases (12 pages)	013619
S. I. Mistakidis, A. G. Volosniev, N. T. Zinner, and P. Schmelcher	

(Continued)

Static-response theory and the roton-maxon spectrum of a flattened dipolar Bose-Einstein condensate (6 pages)	013620
R. N. Bisset, P. B. Blakie, and S. Stringari	
Monitoring currents in cold-atom circuits (8 pages)	013621
S. Safaei, L.-C. Kwek, R. Dumke, and L. Amico	
Observation of dynamical quantum phase transitions in a spinor condensate (6 pages)	013622
H.-X. Yang, T. Tian, Y.-B. Yang, L.-Y. Qiu, H.-Y. Liang, A.-J. Chu, C. B. Dağ, Y. Xu, Y. Liu, and L.-M. Duan	
Exploring quantum signatures of chaos on a Floquet synthetic lattice (9 pages)	013623
Eric J. Meier, Jackson Ang'ong'a, Fangzhao Alex An, and Bryce Gadway	
Towards a measurement of the Debye length in very large magneto-optical traps (11 pages)	013624
J. Barré, R. Kaiser, G. Labeyrie, B. Marcos, and D. Métivier	
Quantum chaos in a Bose-Hubbard dimer with modulated tunneling (9 pages)	013625
R. A. Kidd, M. K. Olsen, and J. F. Corney	
Controlled generation of dark-bright soliton complexes in two-component and spinor Bose-Einstein condensates (17 pages)	013626
A. Romero-Ros, G. C. Katsimiga, P. G. Kevrekidis, and P. Schmelcher	
Three-body constrained bosons in a double-well optical lattice (9 pages)	013627
Suman Mondal, Sebastian Greschner, and Tapan Mishra	
Many-body localization in continuum systems: Two-dimensional bosons (7 pages)	013628
G. Bertoli, B. L. Altshuler, and G. V. Shlyapnikov	
Glassy dynamics from quark confinement: Atomic quantum simulation of the gauge-Higgs model on a lattice (12 pages)	013629
Jonghoon Park, Yoshihito Kuno, and Ikuo Ichinose	
Transverse instability and disintegration of a domain wall of a relative phase in coherently coupled two-component Bose-Einstein condensates (8 pages)	013630
Kousuke Ihara and Kenichi Kasamatsu	
Quantum optics, physics of lasers, nonlinear optics, classical optics	
Mahaux-Weidenmüller approach to cavity quantum electrodynamics and complete resonant down-conversion of the single-photon frequency (15 pages)	013801
M. Sumetsky	
Spatial control of spontaneous parametric down-conversion photon pairs through the use of apertured Bessel-Gauss pump beams (8 pages)	013802
Dalia Gutiérrez-López, Mónica Maldonado-Terrón, R. Josué Hernández, Verónica Vicuña-Hernández, Roberto Ramírez-Alarcón, Héctor Cruz-Ramírez, Rocío Jáuregui, and Alfred B. U'Ren	
Perfect localization on flat-band binary one-dimensional photonic lattices (7 pages)	013803
Gabriel Cáceres-Aravena and Rodrigo A. Vicencio	
Temporal coherence of a photon condensate: A quantum trajectory description (12 pages)	013804
Wouter Verstraelen and Michiel Wouters	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Theory for cavity cooling of levitated nanoparticles via coherent scattering: Master equation approach (25 pages)	013805
C. Gonzalez-Ballester, P. Maurer, D. Windey, L. Novotny, R. Reimann, and O. Romero-Isart	
Optical spatial dispersion in terms of Jones calculus (17 pages)	013806
S. Yu. Nastyshyn, I. M. Bolesta, S. A. Tsybulia, E. Lychkovskyy, Z. Ya. Fedorovych, D. Ye. Khaustov, Ye. Ryzhov, P. I. Vankevych, and Yu. A. Nastishin	
Generation and dynamics of solitonic pulses due to pump amplitude modulation at normal group-velocity dispersion (10 pages)	013807
Valery E. Lobanov, Nikita M. Kondratiev, Artem E. Shitikov, Ramzil R. Galiev, and Igor A. Bilenko	
☞ Probing photon statistics of coherent states by continuous wave mixing on a two-level system (5 pages)	013808
A. Yu. Dmitriev, R. Shaikhaidarov, T. Hönigl-Decrinis, S. E. de Graaf, V. N. Antonov, and O. V. Astafiev	
Influence of higher-order stimulated Brillouin scattering on the occurrence of extreme events in self-pulsing fiber lasers (7 pages)	013809
Djamila Boukhaoui, Djouher Mallek, Abdelhamid Kellou, Hervé Leblond, François Sanchez, Thomas Godin, and Ammar Hideur	
Magnon heralding in cavity optomagnonics (15 pages)	013810
Victor A. S. V. Bittencourt, Verena Feulner, and Silvia Viola Kusminski	
Squeezed displaced entangled states in the quantum Rabi model (6 pages)	013811
F. H. Maldonado-Villamizar, C. Huerta Alderete, and B. M. Rodríguez-Lara	
Multiple Fano interferences due to waveguide-mediated phase coupling between atoms (12 pages)	013812
Debsuvra Mukhopadhyay and Girish S. Agarwal	
Selective and switchable optical amplification with mechanical driven oscillators (10 pages)	013813
Tian-Xiang Lu, Ya-Feng Jiao, Hui-Lai Zhang, Farhan Saif, and Hui Jing	
Quantum enhancement of sensitivity achieved by photon-number-resolving detection in the dark port of a two-path interferometer operating at high intensities (13 pages)	013814
Jun-Yi Wu, Norifumi Toda, and Holger F. Hofmann	
Effect of laser-frequency fluctuation on the decay rate of Rydberg coherence (9 pages)	013815
Bongjune Kim, Ko-Tang Chen, Chia-Yu Hsu, Shih-Si Hsiao, Yu-Chih Tseng, Chin-Yuan Lee, Shih-Lun Liang, Yi-Hua Lai, Julius Ruseckas, Gediminas Juzeliūnas, and Ite A. Yu	
Two-mode Dicke model from nondegenerate polarization modes (7 pages)	013816
Andrea Morales, Davide Dreon, Xiangliang Li, Alexander Baumgärtner, Philip Zupancic, Tobias Donner, and Tilman Esslinger	
Modification of a plasmonic nanoparticle lifetime by coupled quantum dots (8 pages)	013817
Ahmad Salmanogli	
Stabilization of localized structures by inhomogeneous injection in Kerr resonators (9 pages)	013818
Felix Tabbert, Tobias Frohoff-Hülsmann, Krassimir Panajotov, Mustapha Tlidi, and Svetlana V. Gurevich	
Quantum-induced birefringence in nonlinear optical materials (6 pages)	013819
V. A. De Lorenci and L. H. Ford	
Quantum properties of light propagating in a coherent-population-oscillation storage medium (9 pages)	013820
P. Neveu, F. Bretenaker, F. Goldfarb, and E. Brion	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A	THIRD SERIES, VOLUME 100, NUMBER 1	JULY 2019
Transport of light through a dense ensemble of cold atoms in a static electric field (9 pages)		013821
S. E. Skipetrov and I. M. Sokolov		
Transfer of orbital angular momentum of light using electromagnetically induced transparency (5 pages)		013822
Hai-Hua Wang, Jing Wang, Zhi-Hui Kang, Lei Wang, Jin-Yue Gao, Yi Chen, and Xiao-Jun Zhang		
Role of generalized parity in the symmetry of the fluorescence spectrum from two-level systems under periodic frequency modulation (14 pages)		013823
Yiying Yan, Zhiguo Lü, JunYan Luo, and Hang Zheng		
Coupling quasi-phase-matching: Entanglement buildup in $\chi^{(2)}$ nonlinear-waveguide arrays (8 pages)		013824
David Barral, Nadia Belabas, Kamel Bencheikh, and Juan Ariel Levenson		
Quantum phase transition and interference trapping of populations in a coupled-resonator waveguide (9 pages)		013825
Lei Qiao, Ya-Ju Song, and Chang-Pu Sun		
Optomechanical heat transfer between molecules in a nanoplasmonic cavity (9 pages)		013826
S. Mahmoud Ashrafi, R. Malekfar, A. R. Bahrapour, and Johannes Feist		
Stern-Gerlach deflection of optical Thirring solitons in a coherent atomic system (8 pages)		013827
Zhiming Chen, Hongqiang Xie, Qun Li, and Guoxiang Huang		
Rapid cooling of a strain-coupled oscillator by an optical phase-shift measurement (7 pages)		013828
Signe Seidelin, Yann Le Coq, and Klaus Mølmer		
Optical-frequency-comb generation with collinear acousto-optic diffraction: Theory and simulations (14 pages)		013829
Sergey N. Mantsevich, Andrey S. Voloshin, and Konstantin B. Yushkov		
Multiple-wavelength conversion based on the anomalous Doppler effect induced by dynamic tuning in a self-collimation photonic crystal (5 pages)		013830
Xingping Zhou, Samit Kumar Gupta, Guangxu Su, Peng Zhan, Minghui Lu, and Zhenlin Wang		
Linear and quadratic reservoir engineering of non-Gaussian states (17 pages)		013831
Matteo Brunelli and Oussama Houhou		
All-optical spin-orbit coupling of light using electromagnetically induced transparency (8 pages)		013832
Lu Zhao		
Multiplexing heralded single photons in orbital-angular-momentum space (8 pages)		013833
Shi-long Liu, Qiang Zhou, Zhi-yuan Zhou, Shi-kai Liu, Yan Li, Yin-hai Li, Chen Yang, Zhao-huai Xu, Guang-can Guo, and Bao-sen Shi		
Generic singularities of scattering coefficients and a paradox of resonant wave scattering (7 pages)		013834
Yaroslav A. Brynkin and Michael I. Tribelsky		
Optical-force laws for guided light in linear media (7 pages)		013835
Thales Fernando Damasceno Fernandes and Pierre-Louis de Assis		
Self-focusing of multiple interacting Laguerre-Gauss beams in Kerr media (9 pages)		013836
Lucas Sá and Jorge Vieira		

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 100, NUMBER 1

JULY 2019

Bloch-Messiah reduction for twin beams of light (17 pages)	013837
D. B. Horoshko, L. La Volpe, F. Arzani, N. Treps, C. Fabre, and M. I. Kolobov	
Simulating frustrated antiferromagnets with quadratically driven QED cavities (7 pages)	013838
Riccardo Rota and Vincenzo Savona	
Near-100% two-photon-like coincidence-visibility dip with classical light and the role of complementarity (10 pages)	013839
Simanraj Sadana, Debadrita Ghosh, Kaushik Joarder, A. Naga Lakshmi, Barry C. Sanders, and Urbasi Sinha	
Transport and entanglement for single photons in optical waveguide ladders (13 pages)	013840
Junhua Dong, Qian Jiang, Qingmei Hu, Bingsuo Zou, and Yongyou Zhang	
Dynamical Lamb effect in a superconducting circuit (8 pages)	013841
Mirko Amico, Oleg L. Berman, and Roman Ya. Kezerashvili	
Robustness of distributed nonclassicality against local Gaussian noise (10 pages)	013842
Sagnik Garai and J. Solomon Ivan	
Steady-state population inversion of multiple Ξ -type atoms by the squeezed vacuum in a waveguide (10 pages)	013843
Jieyu You, Zeyang Liao, and M. Suhail Zubairy	
Coherent generation and manipulation of stationary light pulses encoded in degrees of freedom of polarization and orbital angular momentum (8 pages)	013844
Tianhui Qiu, Hui Li, and Min Xie	
Stochastic numerical simulations of a fully spatiotemporal Hong-Ou-Mandel dip (9 pages)	013845
Fabrice Devaux, Alexis Mosset, and Eric Lantz	
Second-order Talbot self-imaging effect in the time domain (7 pages)	013846
Hong-Guo Li, Rui-Xue Zhang, Zhan-Dong Liu, and Zong-Guo Li	
☞ Optimal pulse propagation in an inhomogeneously gas-filled hollow-core fiber (13 pages)	013847
Roman Sulzbach, Thorsten Peters, and Reinhold Walser	
Heat-induced soliton self-frequency redshift in the ultrafast nonlinear dynamics of active plasmonic waveguides (6 pages)	013848
Ambaresh Sahoo, Andrea Marini, and Samudra Roy	
Energy-flow velocities of nondiffracting localized waves (10 pages)	013849
Peeter Saari, Ott Rebane, and Ioannis Besieris	
☞ Optical attenuation without absorption (8 pages)	013850
I. C. Nodurft, R. A. Brewster, T. B. Pittman, and J. D. Franson	
Single-step quantum state engineering in traveling optical fields (9 pages)	013851
Gabor Mogyorosi, Peter Adam, Emese Molnar, and Matyas Mechler	
Multiphoton resonances in nitrogen-vacancy defects in diamond (8 pages)	013852
Sergei Masis, Nir Alfasi, Roei Levi, Oleg Shtempluck, and Eyal Buks	
Sub-hertz optomechanically induced transparency with a kilogram-scale mechanical oscillator (9 pages)	013853
T. Bodiya, V. Sudhir, C. Wipf, N. Smith, A. Buikema, A. Kontos, H. Yu, and N. Mavalvala	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A	THIRD SERIES, VOLUME 100, NUMBER 1	JULY 2019
Information-theoretical approach to the many-particle hierarchy problem (<i>5 pages</i>)		013854
Boris Melcher, Boris Gulyak, and Jan Wiersig		
Critical phenomena and nonlinear dynamics in a spin ensemble strongly coupled to a cavity. I. Semiclassical approach (<i>10 pages</i>)		013855
Dmitry O. Krimer, Matthias Zens, and Stefan Rotter		
Critical phenomena and nonlinear dynamics in a spin ensemble strongly coupled to a cavity. II. Semiclassical-to-quantum boundary (<i>11 pages</i>)		013856
Matthias Zens, Dmitry O. Krimer, and Stefan Rotter		
Solenoidal optical forces from a plasmonic Archimedean spiral (<i>8 pages</i>)		013857
Mohammad Asif Zaman, Punng Padhy, and Lambertus Hesselink		
COMMENTS		
Comment on “Analysis of recent interpretations of the Abraham-Minkowski problem” (<i>5 pages</i>)		017801
Mikko Partanen and Jukka Tulkki		
Reply to “Comment on ‘Analysis of recent interpretations of the Abraham-Minkowski problem’ ” (<i>2 pages</i>)		017802
Iver Brevik		
ERRATA		
Erratum: Memory effect and non-Markovian dynamics in an open quantum system [Phys. Rev. A 99 , 052119 (2019)] (<i>1 page</i>)		019901(E)
Fujing Liu, Xing-Xiang Zhou, and Zheng-Wei Zhou		
Erratum: Electron correlations in the antiproton energy-loss distribution in He [Phys. Rev. A 98 , 012707 (2018)] (<i>2 pages</i>)		019902(E)
S. Borbély, X.-M. Tong, S. Nagele, J. Feist, I. Březinová, F. Lackner, L. Nagy, K. Tókési, and J. Burgdörfer		