PHYSICAL REVIEW A **THIRD SERIES, VOLUME 98, NUMBER 3** **SEPTEMBER 2018**

Design for a hybrid scanning microscope based on a quantum spin sensor *(11 pages)* 033823
Tianyi Du, Jianming Cai, and Haibin Liu

Chiral microresonator assisted by Rydberg-atom ensembles *(8 pages)* 033824
Xiao-Fei Liu, Tie-Jun Wang, Yong-Pan Gao, Cong Cao, and Chuan Wang

Mechanically modulated emission spectra and blockade of polaritons in a hybrid semiconductor-optomechanical system *(16 pages)* 033825
Sai-Nan Huai, Yu-Long Liu, Yunbo Zhang, and Yu-xi Liu

Modification of polarization through de-Gaussification *(9 pages)* 033826
Iulia Ghiu, Paulina Marian, and Tudor A. Marian

Three-dimensional solitons in Bose-Einstein condensates with spin-orbit coupling and Bessel optical lattices *(8 pages)* 033827
Hong Li, Si-Liu Xu, Milivoj R. Belić, and Jia-Xi Cheng

Electromagnetic control and improvement of nonclassicality in a strongly coupled single-atom cavity-QED system *(7 pages)* 033828
Y. F. Han, C. J. Zhu, X. S. Huang, and Y. P. Yang

Limits to atom-vapor-based room-temperature photon-number-resolving detection *(6 pages)* 033829
Elisha S. Matekole, Hwang Lee, and Jonathan P. Dowling

Topological phase transition in a stretchable photonic crystal *(9 pages)* 033830
Ehsan Saei Ghareh Naz, Ion Cosma Fulga, Libo Ma, Oliver G. Schmidt, and Jeroen van den Brink

Self-Q-switch regime based on a beat effect with a dual-frequency microchip laser *(6 pages)* 033831
Zilong Zhang, Kun Gui, Changming Zhao, Haiyang Zhang, Siqi Chen, and Guocheng Zhou

Double optomechanically induced transparency and absorption in parity-time-symmetric optomechanical systems *(8 pages)* 033832
X. Y. Zhang, Y. H. Zhou, Y. Q. Guo, and X. X. Yi

Nonlinear circuit quantum electrodynamics based on the charge-qubit–resonator interface *(7 pages)* 033833
Deshui Yu, Leong Chuan Kwek, Luigi Amico, and Rainer Dumke

All-optical active control of photon correlations: Dressed-state-assisted quantum interference effects *(7 pages)* . . . 033834
Dongxing Zhao

Exactly solvable time-dependent pseudo-Hermitian su(1,1) Hamiltonian models *(8 pages)* 033835
R. Grimaudo, A. S. M. de Castro, M. Kuś, and A. Messina

Enhanced nonlinear interaction effects in a four-mode optomechanical ring *(16 pages)* 033836
Li-Jing Jin, Jing Qiu, Stefano Chesi, and Ying-Dan Wang

This paper was highlighted in the APS publication *Physics* (physics.aps.org).
The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 98, NUMBER 3** **SEPTEMBER 2018**

Collective phases of identical particles interfering on linear multiports *(12 pages)* 033805
V. S. Shchesnovich and M. E. O. Bezerra

Collision-mediated radiation due to Airy-soliton interaction in a nonlinear Kerr medium *(9 pages)* 033806
Aritra Banerjee and Samudra Roy

Bulk and edge-state arcs in non-Hermitian coupled-resonator arrays *(10 pages)* 033807
Simon Malzard and Henning Schomerus

Observation of Bessel-beam self-trapping *(8 pages)* 033808
Mariano Flammini, Giuseppe Di Domenico, Davide Pierangeli, Fabrizio Di Mei, Aharon J. Agranat, and Eugenio DelRe

Understanding the electromagnetic 4-potential in the tetrad bundle *(6 pages)* 033809
Yufang Hao, Jiayin Shen, and Jianhong Ruan

Hybrid exceptional point and its dynamical encircling in a two-state system *(8 pages)* 033810
Xu-Lin Zhang and C. T. Chan

Bending of light in a Coulomb gas *(4 pages)* 033811
Taekoon Lee

Measurement of the two-time intensity-correlation function of arbitrary states *(8 pages)* 033812
Katarina Stensson and Gunnar Björk

Mass-polariton theory of sharing the total angular momentum of light between the field and matter *(12 pages)* . . . 033813
Mikko Partanen and Jukka Tulkki

Impact of fiber loss on two-soliton states: Substantial changes in eigenvalue spectrum *(9 pages)* 033814
Alexander Hause, Christoph Mahnke, and Fedor Mitschke

Population mixing due to dipole-dipole interactions in a one-dimensional array of multilevel atoms *(8 pages)* 033815
E. Munro, A. Asenjo-Garcia, Y. Lin, L. C. Kwek, C. A. Regal, and D. E. Chang

Interferometric and Uhlmann phases of mixed polarization states *(18 pages)* 033816
Alexei D. Kiselev and Vladimir V. Kesaev

Synthesizing exceptional points with three resonators *(10 pages)* 033817
Re-Bing Wu, Yu Zheng, Qi-Ming Chen, and Yu-xi Liu

Reduced decoherence using squeezing, amplification, and antisqueezing *(11 pages)* 033818
R. A. Brewster, T. B. Pittman, and J. D. Franson

Theoretical and experimental analysis of staircase pulses in passive mode-locked fiber lasers *(7 pages)* 033819
Georges Semaan, Andrey Komarov, Alioune Niang, Yichang Meng, Meriem Kemel, Mohamed Salhi, and François Sanchez

Resonant-state expansion of three-dimensional open optical systems: Light scattering *(17 pages)* 033820
S. V. Lobanov, W. Langbein, and E. A. Muljarov

Dicke phase transition in a disordered emitter–graphene-plasmon system *(12 pages)* 033821
Yu-Xiang Zhang, Yuan Zhang, and Klaus Mølmer

Many-particle interferometry and entanglement by path identity *(7 pages)* 033822
Mayukh Lahiri

(Continued)

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

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A THIRD SERIES, VOLUME 98, NUMBER 3 SEPTEMBER 2018

Matter waves and collective properties of cold atoms and molecules

Charge density wave and charge pump of interacting fermions in circularly shaken hexagonal optical lattices *(11 pages)* 033601
Tao Qin, Alexander Schnell, Klaus Sengstock, Christof Weitenberg, André Eckardt, and Walter Hofstetter

Strong quenches in the one-dimensional Fermi-Hubbard model *(15 pages)* 033602
Philip Bleicker and Götz S. Uhrig

Multiparameter estimation via an ensemble of spinor atoms *(9 pages)* 033603
Min Zhuang, Jiahao Huang, and Chaohong Lee

Implementing Majorana fermions in a cold-atom honeycomb lattice with textured pairings *(8 pages)* 033604
Ruizhi Pan and Charles W. Clark

Accessing finite-momentum excitations of the one-dimensional Bose-Hubbard model using superlattice-modulation spectroscopy *(9 pages)* 033605
Karla Loida, Jean-Sébastien Bernier, Roberta Citro, Edmond Orignac, and Corinna Kollath

Field-induced topological pair-density wave states in a multilayer optical lattice *(6 pages)* 033606
Zhen-Fei Zheng, Guang-Can Guo, Han Pu, and Xu-Bo Zou

Cooling fermions in an optical lattice by adiabatic demagnetization *(8 pages)* 033607
Anthony E. Mirasola, Michael L. Wall, and Kaden R. A. Hazzard

Characterizing twin-particle entanglement in double-well potentials *(9 pages)* 033608
Marie Bonneau, William J. Munro, Kae Nemoto, and Jörg Schmiedmayer

Spectral and dynamical analysis of a single vortex ring in anisotropic harmonically trapped three-dimensional Bose-Einstein condensates *(9 pages)* 033609
Christopher Ticknor, Wenlong Wang, and P. G. Kevrekidis

Analytical study of static beyond-Fröhlich Bose polarons in one dimension *(12 pages)* 033610
Ben Kain and Hong Y. Ling

Generalized Josephson relation for conserved charges in multicomponent bosons *(14 pages)* 033611
Yi-Cai Zhang

Fluctuations and quantum self-bound droplets in a dipolar Bose-Bose mixture *(10 pages)* 033612
Abdelâali Boudjemâa

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

Unbound-to-bound transition of two-atom polaritons in an optical cavity *(8 pages)* 033801
Qing Sun, Jie Hu, Lin Wen, Han Pu, and An-Chun Ji

High-contrast transparency comb of the electromagnetically-induced-transparency memory *(5 pages)* 033802
Sheng-Jun Yang, Jun Rui, Han-Ning Dai, Xian-Min Jin, Shuai Chen, and Jian-Wei Pan

Quantum optics in Maxwell's fish eye lens with single atoms and photons *(17 pages)* 033803
J. Perczel, P. Kómár, and M. D. Lukin

Modifications of filament spectra by shaped octave-spanning laser pulses *(6 pages)* 033804
A. Patas, M. Matthews, S. Hermelin, J. Gateau, J. Kasparian, J. P. Wolf, and A. Lindinger

(Continued)

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

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 98, NUMBER 3** **SEPTEMBER 2018**

Control of the helicity of high-order harmonics generated by bicircular laser fields *(7 pages)* 033405
D. B. Milošević

Multistage Zeeman deceleration of atomic and molecular oxygen *(6 pages)* 033406
Theo Cremers, Simon Chefdeville, Vikram Plomp, Niek Janssen, Edwin Sweers, and Sebastiaan Y. T. van de Meerakker

Ion-trap analog of particle creation in cosmology *(8 pages)* 033407
Christian Fey, Tobias Schaetz, and Ralf Schützhold

Signatures of autoionization in the angular electron distribution in two-photon double ionization of Ar *(7 pages)* 033408
S. Augustin, M. Schulz, G. Schmid, K. Schnorr, E. V. Gryzlova, H. Lindenblatt, S. Meister, Y. F. Liu, F. Trost, L. Fechner, A. N. Grum-Grzhimailo, S. M. Burkov, M. Braune, R. Treusch, M. Gisselbrecht, C. D. Schröter, T. Pfeifer, and R. Moshammer

Identifying and decoupling many-body interactions in spin ensembles in diamond *(10 pages)* 033409
D. Farfurnik, Y. Horowicz, and N. Bar-Gill

Absolute total, partial, and differential cross sections for photodetachment of O^- *(14 pages)* 033410
Matthieu Génévriez, Kevin M. Dunseath, Mariko Terao-Dunseath, Alan Hibbert, Arnaud Dochain, Raphaël Marion, and Xavier Urbain

Long-lived coherence between ground and Rydberg levels in a magic-wavelength lattice *(10 pages)* 033411
J. Lampen, H. Nguyen, L. Li, P. R. Berman, and A. Kuzmich

Phase reconstruction of a strong-laser-field-excited complex molecular system *(7 pages)* 033412
Yanghua Zhang, Zhenhao Wang, Quanjun Wang, Jingjie Ding, Shaohua Sun, Zuoye Liu, and Bitao Hu

Partial cross sections and interfering resonances in photoionization of molecular nitrogen *(9 pages)* 033413
Markus Klinker, Carlos Marante, Luca Argenti, Jesús González-Vázquez, and Fernando Martín

Determination of the spectral variation origin in high-order harmonic generation in noble gases *(10 pages)* 033414
V. E. Nefedova, M. F. Ciappina, O. Finke, M. Albrecht, J. Vábek, M. Kozlová, N. Suárez, E. Pisanty, M. Lewenstein, and J. Nejdl

Dependence of Rydberg-state creation by strong-field ionization on laser intensity *(6 pages)* 033415
L. Ortmann, C. Hofmann, and A. S. Landsman

Photoionization of metastable heliumlike $C^{4+}(1s2s\ ^3S_1)$ ions: Precision study of intermediate doubly excited states *(16 pages)* 033416
A. Müller, E. Lindroth, S. Bari, A. Borovik Jr., P.-M. Hillenbrand, K. Holste, P. Indelicato, A. L. D. Kilcoyne, S. Klumpp, M. Martins, J. Viefhaus, P. Wilhelm, and S. Schippers

Exit-channel recoil resonances by imaging the photodissociation of single quantum-state-selected OCS molecules *(11 pages)* 033417
Dimitris Sofikitis, Jaime Suarez, Johan A. Schmidt, T. Peter Rakitzis, Stavros C. Farantos, and Maurice H. M. Janssen

Strong-field photoionization in two-center atomic systems *(9 pages)* 033418
J. Fedyk, A. B. Voitkiv, and C. Müller

Λ-enhanced gray-molasses cooling of cesium atoms on the D_2 line *(6 pages)* 033419
Ya-Fen Hsiao, Yu-Ju Lin, and Ying-Cheng Chen

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).
The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A THIRD SERIES, VOLUME 98, NUMBER 3 SEPTEMBER 2018

Electron correlation trends in the permanent electric dipole moments of alkaline-earth-metal monohydrides *(6 pages)* 032511
N. M. Fazil, V. S. Prasannaa, K. V. P. Latha, M. Abe, and B. P. Das

Nuclear recoil effect on the *g* factor of highly charged Li-like ions *(5 pages)* 032512
V. M. Shabaev, D. A. Glazov, A. V. Malyshev, and I. I. Tupitsyn

Orientation-dependent hyperfine structure of polar molecules in a rare-gas matrix: A scheme for measuring the electron electric dipole moment *(8 pages)* 032513
A. C. Vutha, M. Horbatsch, and E. A. Hessels

Oscillating-magnetic-field effects in high-precision metrology *(9 pages)* 032514
H. C. J. Gan, G. Maslennikov, K.-W. Tseng, T. R. Tan, R. Kaewuam, K. J. Arnold, D. Matsukevich, and M. D. Barrett

PART B

Atomic and molecular collisions and interactions

Electron-impact dissociative excitation cross sections for singlet states of molecular hydrogen *(10 pages)* 032701
Jonathan K. Tapley, Liam H. Scarlett, Jeremy S. Savage, Dmitry V. Fursa, Mark C. Zammit, and Igor Bray

Quantum-state-controlled reactions between molecular radicals and ions *(5 pages)* 032702
James Greenberg, Philipp C. Schmid, Mikhail Miller, John F. Stanton, and H. J. Lewandowski

Catalysis of Stark-tuned interactions between ultracold Rydberg atoms *(6 pages)* 032703
A. L. Win, W. D. Williams, T. J. Carroll, and C. I. Sukenik

Magnetically tunable Feshbach resonances in ultracold gases of europium atoms and mixtures of europium and alkali-metal atoms *(12 pages)* 032704
Klaudia Zaremba-Kopczyk, Piotr S. Żuchowski, and Michał Tomza

Scattering of cold ^{4}He on ^{4}He ^{6,7}Li and ^{4}He ^{23}Na molecules *(9 pages)* 032705
M. A. Shalchi, A. Delfino, T. Frederico, and Lauro Tomio

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

Weak-field asymptotic theory of tunneling ionization from nearly degenerate states *(15 pages)* 033401
Pavel K. Samygin, Toru Morishita, and Oleg I. Tolstikhin

Stimulated-Raman-scattering-assisted superfluorescence enhancement from ionized nitrogen molecules in 800-nm femtosecond laser fields *(6 pages)* 033402
Zhiming Miao, Xunqi Zhong, Linlin Zhang, Wei Zheng, Yunan Gao, Yunquan Liu, Hongbing Jiang, Qihuang Gong, and Chengyin Wu

Atomic-orbital-dependent photoelectron momentum distributions for F^- ions by orthogonal two-color laser fields *(8 pages)* 033403
Jian-Hong Chen, Meng Han, Xiang-Ru Xiao, Liang-You Peng, and Yunquan Liu

Core-resonant ionization of helium by intense XUV pulses: Analytical and numerical studies on channel-resolved spectral features *(9 pages)* 033404
Chuan Yu and Lars Bojer Madsen

(Continued)

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

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 98, NUMBER 3** **SEPTEMBER 2018**

Adaptive quantum tomography of high-dimensional bipartite systems *(13 pages)* 032330
G. I. Struchalin, E. V. Kovlakov, S. S. Straupe, and S. P. Kulik

Quantum-classical computation of Schwinger model dynamics using quantum computers *(16 pages)* 032331
N. Klco, E. F. Dumitrescu, A. J. McCaskey, T. D. Morris, R. C. Pooser, M. Sanz, E. Solano, P. Lougovski, and M. J. Savage

Security-proof framework for two-way Gaussian quantum-key-distribution protocols *(19 pages)* 032332
Quntao Zhuang, Zheshen Zhang, Norbert Lütkenhaus, and Jeffrey H. Shapiro

Electromagnetic lattice gauge invariance in two-dimensional discrete-time quantum walks *(8 pages)* 032333
Iván Márquez-Martín, Pablo Arnault, Giuseppe Di Molfetta, and Armando Pérez

Tunable charge qubit based on barrier-controlled triple quantum dots *(8 pages)* 032334
Xu-Chen Yang, Guo Xuan Chan, and Xin Wang

Repeaters for continuous-variable quantum communication *(12 pages)* 032335
Fabian Furrer and William J. Munro

Atomic and molecular structure and dynamics; high-precision measurements

Lifetime of the metastable $^2P_{1/2}$ state of F-like Ar^{9+} isolated in a compact Penning trap *(5 pages)* 032501
Samuel M. Brewer, Joan M. Dreiling, Nicholas D. Guise, Shannon F. Hoogerheide, Aung S. Naing, and Joseph N. Tan

Spin-averaged effective Hamiltonian of orders $m\alpha^6$ and $m\alpha^6(m/M)$ for hydrogen molecular ions *(13 pages)* 032502
Zhen-Xiang Zhong, Wan-Ping Zhou, and Xue-Song Mei

Relativistic corrections to the Bethe logarithm for the $2\,^3S$ and $2\,^3P$ states of He *(12 pages)* 032503
Vladimir A. Yerokhin, Vojtěch Patkóš, and Krzysztof Pachucki

Testing atomic wave functions in the nuclear vicinity: The hyperfine structure with empirically deduced nuclear and quantum electrodynamic effects *(6 pages)* 032504
J. S. M. Ginges and A. V. Volotka

Four-photon Kapitza-Dirac effect as an electron spin filter *(7 pages)* 032505
Asma Ebadati, Mohsen Vafaee, and Babak Shokri

Low-temperature behavior of the Casimir-Polder free energy and entropy for an atom interacting with graphene *(9 pages)* 032506
G. L. Klimchitskaya and V. M. Mostepanenko

Casimir forces and quantum friction of finite-size atoms in relativistic trajectories *(26 pages)* 032507
Pablo Rodriguez-Lopez and Eduardo Martín-Martínez

Gravitational effects in g-factor measurements and high-precision spectroscopy: Limits of Einstein's equivalence principle *(17 pages)* 032508
U. D. Jentschura

Casimir force for magnetodielectric media *(12 pages)* 032509
Iver Brevik, Prachi Parashar, and K. V. Shajesh

Nuclear anapole moment interaction in BaF from relativistic coupled-cluster theory *(8 pages)* 032510
Yongliang Hao, Miroslav Iliaš, Ephraim Eliav, Peter Schwerdtfeger, Victor V. Flambaum, and Anastasia Borschevsky

(Continued)

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

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 98, NUMBER 3** **SEPTEMBER 2018**

Nonadiabatic holonomic quantum computation with Rydberg superatoms *(8 pages)* 032313
P. Z. Zhao, X. Wu, T. H. Xing, G. F. Xu, and D. M. Tong

Gaussian one-way thermal quantum cryptography with finite-size effects *(9 pages)* 032314
Panagiotis Papanastasiou, Carlo Ottaviani, and Stefano Pirandola

Optimally band-limited spectroscopy of control noise using a qubit sensor *(23 pages)* 032315
Leigh M. Norris, Dennis Lucarelli, Virginia M. Frey, Sandeep Mavadia, Michael J. Biercuk, and Lorenza Viola

Implementing quantum algorithms on temporal photonic cluster states *(20 pages)* 032316
Daiqin Su, Krishna Kumar Sabapathy, Casey R. Myers, Haoyu Qi, Christian Weedbrook, and Kamil Brádler

Hierarchy of the nonlocal advantage of quantum coherence and Bell nonlocality *(8 pages)* 032317
Ming-Liang Hu, Xiao-Min Wang, and Heng Fan

Entangling an arbitrary pair of qubits in a long ion crystal *(6 pages)* 032318
Pak Hong Leung and Kenneth R. Brown

Initial-state-dependent thermalization in open qubits *(7 pages)* 032319
Andrés Vallejo, Alejandro Romanelli, and Raúl Donangelo

Quantum states with equal unlockable correlations and quantum discord *(7 pages)* 032320
M. Nikaeen, A. Mani, and A. Bahrampour

Unidimensional continuous-variable quantum key distribution using squeezed states *(7 pages)* 032321
Vladyslav C. Usenko

Stable quantum memories with limited measurement *(11 pages)* 032322
C. Daniel Freeman, Mohan Sarovar, C. M. Herdman, and K. B. Whaley

Topology-dependent quantum dynamics and entanglement-dependent topological pumping in superconducting qubit chains *(7 pages)* 032323
Feng Mei, Gang Chen, Lin Tian, Shi-Liang Zhu, and Suotang Jia

Family of coherence measures and duality between quantum coherence and path distinguishability *(11 pages)* . . . 032324
Chunhe Xiong, Asutosh Kumar, and Junde Wu

Optimality of Gaussian receivers for practical Gaussian distributed sensing *(9 pages)* 032325
T. J. Volkoff and Mohan Sarovar

Universal and distortion-free entanglement concentration of multiqubit quantum states in the W class *(11 pages)* 032326
Alonso Botero and José Mejía

Practical and unconditionally secure spacetime-constrained oblivious transfer *(9 pages)* 032327
Damián Pitalúa-García and Iordanis Kerenidis

Non-Markovian dephasing and depolarizing channels *(7 pages)* 032328
U. Shrikant, R. Srikanth, and Subhashish Banerjee

Uncertainty relations in the presence of quantum memory for mutually unbiased measurements *(7 pages)* 032329
Kun Wang, Nan Wu, and Fangmin Song

(Continued)

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

The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 98, NUMBER 3** **SEPTEMBER 2018**

Entropy production and asymptotic factorization via thermalization: A collisional model approach *(9 pages)* 032119
Stefano Cusumano, Vasco Cavina, Maximilian Keck, Antonella De Pasquale, and Vittorio Giovannetti

Stabilizable Gaussian states *(7 pages)* 032120
Łukasz Rudnicki and Clemens Gneiting

Phase control of Schwinger pair production by colliding laser pulses *(8 pages)* 032121
Chitradip Banerjee, Manoranjan P. Singh, and Alexander M. Fedotov

Derivation of Maxwell-type equations for open systems *(3 pages)* 032122
A. V. Khugaev, G. G. Adamian, and N. V. Antonenko

Mutual uncertainty, conditional uncertainty, and strong subadditivity *(8 pages)* 032123
Sk Sazim, Satyabrata Adhikari, Arun K. Pati, and Pankaj Agrawal

Quantum information

Experimental classification of entanglement in arbitrary three-qubit pure states on an NMR quantum information processor *(9 pages)* 032301
Amandeep Singh, Harpreet Singh, Kavita Dorai, and Arvind

Imbalance entanglement: Symmetry decomposition of negativity *(10 pages)* 032302
Eyal Cornfeld, Moshe Goldstein, and Eran Sela

Efficient measurement-device-independent quantum key distribution without vacuum sources *(10 pages)* 032303
Xiao-Long Hu, Zong-Wen Yu, and Xiang-Bin Wang

Normal form for single-qutrit Clifford+T operators and synthesis of single-qutrit gates *(9 pages)* 032304
Shiroman Prakash, Akalank Jain, Bhakti Kapur, and Shubangi Seth

Local equivalence of complete bipartite and repeater graph states *(8 pages)* 032305
Ilan Tzitrin

One-step construction of the multiple-qubit Rydberg controlled-PHASE gate *(11 pages)* 032306
S. L. Su, H. Z. Shen, Erjun Liang, and Shou Zhang

Experimental measurement of a nonlinear entanglement witness by hyperentangling two-qubit states *(6 pages)* 032307
Vojtěch Trávníček, Karol Bartkiewicz, Antonín Černoch, and Karel Lemr

Quantum Zeno effect in correlated qubits *(5 pages)* 032308
Dominik Šafránek and Sebastian Deffner

Quantum circuit learning *(6 pages)* 032309
K. Mitarai, M. Negoro, M. Kitagawa, and K. Fujii

Gaussian boson sampling for perfect matchings of arbitrary graphs *(15 pages)* 032310
Kamil Brádler, Pierre-Luc Dallaire-Demers, Patrick Rebentrost, Daiqin Su, and Christian Weedbrook

Generation and stabilization of entangled coherent states for the vibrational modes of a trapped ion *(6 pages)* 032311
Zhi-Rong Zhong, Xin-Jie Huang, Zhen-Biao Yang, Li-Tuo Shen, and Shi-Biao Zheng

Entangled histories versus the two-state-vector formalism: Towards a better understanding of quantum temporal correlations *(7 pages)* 032312
Marcin Nowakowski, Eliahu Cohen, and Pawel Horodecki

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).
The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A **THIRD SERIES, VOLUME 98, NUMBER 3** **SEPTEMBER 2018**

Method for the construction of the Lewis-Riesenfeld time-dependent invariants and their eigenvalue equations *(5 pages)* 032102
M. A. de Ponte, P. M. Cônsoli, and M. H. Y. Moussa

Objectivity (or lack thereof): Comparison between predictions of quantum Darwinism and spectrum broadcast structure *(12 pages)* 032103
Thao P. Le and Alexandra Olaya-Castro

Quantum walks over a square lattice *(8 pages)* 032104
Arkaprabha Ghosal and Prasenjit Deb

Comparing experiments on quantum traversal time with the predictions of a space-time-symmetric formalism *(6 pages)* 032105
Ricardo Ximenes, Fernando Parisio, and Eduardo O. Dias

Quantum uncertainty relation based on the mean deviation *(9 pages)* 032106
Gautam Sharma, Chiranjib Mukhopadhyay, Sk Sazim, and Arun Kumar Pati

Not-quite-free shortcuts to adiabaticity *(10 pages)* 032107
Esteban Calzetta

History states of systems and operators *(10 pages)* 032108
A. Boette and R. Rossignoli

Complex symmetric Hamiltonians and exceptional points of order four and five *(11 pages)* 032109
Miloslav Znojil

Optimal quantum preparation contextuality in an n-bit parity-oblivious multiplexing task *(8 pages)* 032110
Shouvik Ghorai and A. K. Pan

Implementation of multimode Gaussian unitaries using primitive components *(8 pages)* 032111
Gianfranco Cariolaro and Gianfranco Pierobon

Quantum theories from principles without assuming a definite causal structure *(9 pages)* 032112
Ding Jia (贾丁)

Quantum-limited Euler angle measurements using anticoherent states *(9 pages)* 032113
Aaron Z. Goldberg and Daniel F. V. James

Estimation of general Hamiltonian parameters via controlled energy measurements *(12 pages)* 032114
Luigi Seveso and Matteo G. A. Paris

Simulation of quantum walks and fast mixing with classical processes *(14 pages)* 032115
Simon Apers, Alain Sarlette, and Francesco Ticozzi

Stochastic decoupling approach to the spin-boson dynamics: Perturbative and nonperturbative treatments *(11 pages)* 032116
Wei Wu

Bell measurement ruling out supraquantum correlations *(7 pages)* 032117
L. Czekaj, M. Horodecki, and T. Tylec

Experimental test of a stronger multiobservable uncertainty relation *(6 pages)* 032118
Bowen Fan, Kunkun Wang, Lei Xiao, and Peng Xue

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).
The editors and referees of PRA find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. A 88, 020001 (2013).

PHYSICAL REVIEW A™

For editorial and subscription correspondence, please see inside front cover
(ISSN: 2469-9926)

PERIODICALS
Postmaster send address changes to:

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

THIRD SERIES, VOLUME 98, NUMBER 3
PARTS A AND B

CONTENTS

SEPTEMBER 2018

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 030001–032514, and Part B pages 032701–033836.

PART A

EDITORIALS AND ANNOUNCEMENTS

Editorial: *Physical Review A*: An evolving and leading-edge journal with a rich history *(2 pages)* 030001

RAPID COMMUNICATIONS

Quantum information

Microwave-activated controlled-Z gate for fixed-frequency fluxonium qubits *(5 pages)* . . . . . 030301(R)
Konstantin N. Nesterov, Ivan V. Pechenezhskiy, Chen Wang, Vladimir E. Manucharyan, and Maxim G. Vavilov

Deterministic quantum network for distributed entanglement and quantum computation *(5 pages)* . . . . . 030302(R)
I. Cohen and K. Mølmer

Using interaction-based readouts to approach the ultimate limit of detection-noise robustness for quantum-enhanced metrology in collective spin systems *(7 pages)* . . . . . 030303(R)
Simon A. Haine

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

Ab initio study of time-dependent dynamics in strong-field triple ionization *(5 pages)* . . . . . 031401(R)
Jan H. Thiede, Bruno Eckhardt, Dmitry K. Efimov, Jakub S. Prauzner-Bechcicki, and Jakub Zakrzewski

Matter waves and collective properties of cold atoms and molecules

Staircase in magnetization and entanglement entropy of spinor condensates *(5 pages)* . . . . . 031601(R)
H. M. Bharath, M. S. Chapman, and C. A. R. Sá de Melo

ARTICLES

Fundamental concepts

Coherence orders, decoherence, and quantum metrology *(13 pages)* 032101
Diego P. Pires, Isabela A. Silva, Eduardo R. deAzevedo, Diogo O. Soares-Pinto, and Jefferson G. Filgueiras

Copyright 2018 by American Physical Society

(Continued)

2469-9926(201809)98:3:A;1-4

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).