

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Magnetic liquids under high electric fields as broadband optical diodes (<i>6 pages</i>)	043852
Jonas P. Pereira, Igor I. Smolyaninov, and Vera N. Smolyaninova	
Nonlinear currents in a ring-shaped waveguide with balanced gain and dissipation (<i>10 pages</i>)	043853
Dmitry A. Zezyulin and Vladimir V. Konotop	
Mechanical effects on atoms interacting with highly twisted Laguerre-Gaussian light (<i>5 pages</i>)	043854
V. E. Lembessis and M. Babiker	
Classical analog of Stückelberg interferometry in a two-coupled-cantilever-based optomechanical system (<i>8 pages</i>)	043855
Hao Fu, Zhi-cheng Gong, Tian-hua Mao, Chang-pu Sun, Su Yi, Yong Li, and Geng-yu Cao	

ERRATA

Erratum: Narrow dip inside a natural linewidth absorption profile in a system of two atoms [Phys. Rev. A 92 , 053840 (2015)] (<i>1 page</i>)	049901(E)
A. A. Makarov	
Publisher's Note: Optically defined mechanical geometry [Phys. Rev. A 93 , 053811 (2016)] (<i>1 page</i>)	049902(E)
Abeer Z. Barasheed, Tina Müller, and Jack C. Sankey	
Erratum: Experimental determination of <i>p</i> -wave scattering parameters in ultracold ⁶ Li atoms [Phys. Rev. A 88 , 012710 (2013)] (<i>1 page</i>)	049903(E)
Takuya Nakasuji, Jun Yoshida, and Takashi Mukaiyama	
Publisher's Note: Transversal Clifford gates on folded surface codes [Phys. Rev. A 94 , 042316 (2016)] (<i>1 page</i>)	049904(E)
Jonathan E. Moussa	
Erratum: Coherent control of collective atom phase for ultralong, inversion-free photon echoes [Phys. Rev. A 85 , 031402(R) (2012)] (<i>1 page</i>)	049905(E)
Byoung S. Ham	
Publisher's Note: Line shapes and time dynamics of the Förster resonances between two Rydberg atoms in a time-varying electric field [Phys. Rev. A 94 , 043417 (2016)] (<i>1 page</i>)	049906(E)
E. A. Yakshina, D. B. Tretyakov, I. I. Beterov, V. M. Entin, C. Andreeva, A. Cinins, A. Markovski, Z. Iftikhar, A. Ekers, and I. I. Ryabtsev	

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Implications of a zero-nonlinearity wavelength in photonic crystal fibers doped with silver nanoparticles (<i>8 pages</i>)	043835
Surajit Bose, Ambaresh Sahoo, Rik Chattopadhyay, Samudra Roy, Shyamal K. Bhadra, and Govind P. Agrawal	
Optical-reciprocity-induced symmetry in photonic heterostructures and its manifestation in scattering $\mathcal{PT}$ -symmetry breaking (<i>5 pages</i>)	043836
Li Ge and Liang Feng	
Nonclassicality criteria: Quasiprobability distributions and correlation functions (<i>7 pages</i>)	043837
Moorad Alexanian	
Non-Hermiticity-induced wave confinement and guiding in loss-gain-loss three-layer systems (<i>10 pages</i>)	043838
Silvio Savoia, Giuseppe Castaldi, and Vincenzo Galdi	
Bound states and entanglement generation in waveguide quantum electrodynamics (<i>10 pages</i>)	043839
Paolo Facchi, M. S. Kim, Saverio Pascazio, Francesco V. Pepe, Domenico Pomarico, and Tommaso Tufarelli	
Applications of the Fokker-Planck equation in circuit quantum electrodynamics (<i>13 pages</i>)	043840
Matthew Elliott and Eran Ginossar	
Synchronization of active atomic clocks via quantum and classical channels (<i>11 pages</i>)	043841
Alexander Roth and Klemens Hammerer	
Extended Bose-Hubbard model with pair hopping induced by a quadratically coupled optomechanical system (<i>8 pages</i>)	043842
Yue-Xin Huang, Xiang-Fa Zhou, Guang-Can Guo, and Yong-Sheng Zhang	
Superluminal light propagation via quantum interference in decay channels (<i>8 pages</i>)	043843
R. Arun	
Cooperative eigenmodes and scattering in one-dimensional atomic arrays (<i>15 pages</i>)	043844
Robert J. Bettles, Simon A. Gardiner, and Charles S. Adams	
Light deflection by light: Effect of incidence angle and inhomogeneity (<i>8 pages</i>)	043845
Pardeep Kumar and Shubhrangshu Dasgupta	
Diffusive light transport in semitransparent media (<i>6 pages</i>)	043846
Lorenzo Pattelli, Giacomo Mazzamuto, Diederik S. Wiersma, and Costanza Toninelli	
Strong coupling between phonons and optical beating in backward Brillouin scattering (<i>11 pages</i>)	043847
Kien Phan Huy, Jean-Charles Beugnot, Joël-Cabrel Tchahame, and Thibaut Sylvestre	
Nonlinear combining and compression in multicore fibers (<i>10 pages</i>)	043848
I. S. Chekhovskoy, A. M. Rubenchik, O. V. Shtyrina, M. P. Fedoruk, and S. K. Turitsyn	
Application of the low-finesse γ -ray frequency comb for high-resolution spectroscopy (<i>8 pages</i>)	043849
R. N. Shakhmurov, F. G. Vagizov, Marlan O. Scully, and Olga Kocharovskaya	
Perturbation theory for asymmetric deformed microdisk cavities (<i>11 pages</i>)	043850
Julius Kullig and Jan Wiersig	
Analysis of the Pancharatnam-Berry phase of vector vortex states using the Hamiltonian based on the Maxwell-Schrödinger equation (<i>7 pages</i>)	043851
Masato Suzuki, Keisaku Yamane, Kazuhiko Oka, Yasunori Toda, and Ryuji Morita	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Localized modes in $\chi^{(2)}$ media with non- $\mathcal{PT}$ -symmetric complex localized potentials (6 pages)	043818
F. C. Moreira and S. B. Cavalcanti	
Quantum analysis of plasmonic coupling between quantum dots and nanoparticles (12 pages)	043819
SalmanOgli Ahmad	
Excitable-like chaotic pulses in the bounded-phase regime of an opto-rf oscillator (8 pages)	043820
M. Romanelli, A. Thorette, M. Brunel, T. Erneux, and M. Vallet	
Asymptotically optimal probes for noisy interferometry via quantum annealing to criticality (14 pages)	043821
Gabriel A. Durkin	
Polarization spectra of Zeeman sublevels in Rydberg electromagnetically induced transparency (6 pages)	043822
Shanxia Bao, Hao Zhang, Jian Zhou, Linjie Zhang, Jianming Zhao, Liantuan Xiao, and Suotang Jia	
Parametric amplification of light in a cavity with a moving dielectric membrane: Landau-Zener problem for the Maxwell field (24 pages)	043823
F. Hasan and D. H. J. O'Dell	
Lasing dynamics of neutral nitrogen molecules in femtosecond filaments (6 pages)	043824
Pengji Ding, Eduardo Oliva, Aurélien Houard, André Mysyrowicz, and Yi Liu	
Complementary weak-value amplification with concatenated postselections (7 pages)	043825
Gerardo I. Viza, Julián Martínez-Rincón, Wei-Tao Liu, and John C. Howell	
Fano interference in two-photon transport (10 pages)	043826
Shanshan Xu and Shanhui Fan	
Spectral-doublet rectangular pulses in passive mode-locked fiber lasers with anomalous dispersion (5 pages)	043827
Andrey Komarov, Alexander Dmitriev, Konstantin Komarov, Dmitry Meshcheriakov, and François Sanchez	
Exact control of parity-time symmetry in periodically modulated nonlinear optical couplers (7 pages)	043828
Baiyuan Yang, Xiaobing Luo, QiangLin Hu, and XiaoGuang Yu	
Giant nonreciprocity near exceptional-point degeneracies (7 pages)	043829
Roney Thomas, Huanan Li, F. M. Ellis, and Tsampikos Kottos	
☞ Enhanced nonlinear imaging through scattering media using transmission-matrix-based wave-front shaping (8 pages)	043830
Hilton B. de Aguiar, Sylvain Gigan, and Sophie Brasselet	
Simple method to construct flat-band lattices (10 pages)	043831
Luis Morales-Inostroza and Rodrigo A. Vicencio	
Fluctuations of the electromagnetic local density of states as a probe for structural phase switching (6 pages)	043832
N. de Sousa, J. J. Sáenz, F. Scheffold, A. García-Martín, and L. S. Froufe-Pérez	
☞ Stationary light pulses and narrowband light storage in a laser-cooled ensemble loaded into a hollow-core fiber (9 pages)	043833
Frank Blatt, Lachezar S. Simeonov, Thomas Halfmann, and Thorsten Peters	
Controlling the intensity of light in large areas at the interfaces of a scattering medium (9 pages)	043834
Oluwafemi S. Ojambati, John T. Hosmer-Quint, Klaas-Jan Gorter, Allard P. Mosk, and Willem L. Vos	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Magnetic-field-mediated coupling and control in hybrid atomic-nanomechanical systems (<i>8 pages</i>)	043802
A. Tretiakov and L. J. LeBlanc	
Structural sensitivity of x-ray Bragg projection ptychography to domain patterns in epitaxial thin films (<i>6 pages</i>)	043803
S. O. Hruszkewycz, Q. Zhang, M. V. Holt, M. J. Highland, P. G. Evans, and P. H. Fuoss	
Spatially coherent high-order harmonics generated at optimal high gas pressure with high-intensity one- or two-color laser pulses (<i>6 pages</i>)	043804
Cheng Jin and C. D. Lin	
Negative refraction in Möbius molecules (<i>14 pages</i>)	043805
Y. N. Fang (房一楠), Yao Shen (沈尧), Qing Ai (艾清), and C. P. Sun (孙昌璞)	
Spectral shift and dephasing of electromagnetically induced transparency in an interacting Rydberg gas (<i>6 pages</i>)	043806
Jingshan Han, Thibault Vogt, and Wenhui Li	
Nondestructive photon detection using a single rare-earth ion coupled to a photonic cavity (<i>7 pages</i>)	043807
Chris O'Brien, Tian Zhong, Andrei Faraon, and Christoph Simon	
Dual-scale turbulence in filamenting laser beams at high average power (<i>5 pages</i>)	043808
Elise Schubert, Lorena de la Cruz, Denis Mongin, Sandro Klingebiel, Marcel Schultze, Thomas Metzger, Knut Michel, Jérôme Kasparian, and Jean-Pierre Wolf	
Quantum effects in the interference of photon number states (<i>11 pages</i>)	043809
Holger F. Hofmann, Keito Hibino, Kazuya Fujiwara, and Jun-Yi Wu	
Multiplexed entangled photon-pair sources for all-fiber quantum networks (<i>7 pages</i>)	043810
Yin-Hai Li, Zhi-Yuan Zhou, Zhao-Huai Xu, Li-Xin Xu, Bao-Sen Shi, and Guang-Can Guo	
Modeling of space-time focusing of localized nondiffracting pulses (<i>9 pages</i>)	043811
Michel Zamboni-Rached and Ioannis M. Besieris	
Extreme self-compression of laser pulses in the self-focusing mode resistant to transverse instability (<i>5 pages</i>) . . .	043812
A. A. Balakin, A. V. Kim, A. G. Litvak, V. A. Mironov, and S. A. Skobelev	
Prospects of charged-oscillator quantum-state generation with Rydberg atoms (<i>11 pages</i>)	043813
Robin Stevenson, Jiří Minář, Sebastian Hofferberth, and Igor Lesanovsky	
Effect of direct dissipative coupling of two competing modes on intensity fluctuations in a quantum-dot-microcavity laser (<i>8 pages</i>)	043814
M. Fanaei, A. Foerster, H. A. M. Leymann, and J. Wiersig	
Tamm-Langmuir surface waves (<i>6 pages</i>)	043815
K. Yu. Golenitskii, K. L. Koshelev, and A. A. Bogdanov	
Heterodyne photodetection measurements on cavity optomechanical systems: Interpretation of sideband asymmetry and limits to a classical explanation (<i>21 pages</i>)	043816
Kjetil Børkje	
Optical transmission matrix as a probe of the photonic strength (<i>8 pages</i>)	043817
Duygu Akbulut, Tom Strudley, Jacopo Bertolotti, Erik P. A. M. Bakkers, Ad Lagendijk, Otto L. Muskens, Willem L. Vos, and Allard P. Mosk	

(Continued)

Phase coherence and fragmentation of two-component Bose-Einstein condensates loaded in state-dependent optical lattices (<i>10 pages</i>)	043631
Hyunoo Shim and Thomas Bergeman	
Triplet pair amplitude in a trapped <i>s</i> -wave superfluid Fermi gas with broken spin rotation symmetry. II. Three-dimensional continuum case (<i>9 pages</i>)	043632
Daisuke Inotani, Ryo Hanai, and Yoji Ohashi	
Twisted spin vortices in a spin-1 Bose-Einstein condensate with Rashba spin-orbit coupling and dipole-dipole interaction (<i>6 pages</i>)	043633
Masaya Kato, Xiao-Fei Zhang, Daichi Sasaki, and Hiroki Saito	
Synthetic-gauge-field-induced resonances and Fulde-Ferrell-Larkin-Ovchinnikov states in a one-dimensional optical lattice (<i>11 pages</i>)	043634
Sudeep Kumar Ghosh and Umesh K. Yadav	
Nonadiabatic quantum phase transition in a trapped spinor condensate (<i>8 pages</i>)	043635
Tomasz Świsłocki, Emilia Witkowska, and Michał Matuszewski	
Universal one-dimensional atomic gases near odd-wave resonance (<i>9 pages</i>)	043636
Xiaoling Cui	
Multiphoton absorption in optical gratings for matter waves (<i>12 pages</i>)	043637
Kai Walter, Stefan Nimmrichter, and Klaus Hornberger	
Supersolid phases of dipolar fermions in a two-dimensional-lattice bilayer array (<i>7 pages</i>)	043638
A. Camacho-Guardian and R. Paredes	
Dynamics of small trapped one-dimensional Fermi gas under oscillating magnetic fields (<i>10 pages</i>)	043639
X. Y. Yin, Yangqian Yan, and D. Hudson Smith	
☞ Collapse and revival of the monopole mode of a degenerate Bose gas in an isotropic harmonic trap (<i>13 pages</i>)	043640
C. J. E. Straatsma, V. E. Colussi, M. J. Davis, D. S. Lobser, M. J. Holland, D. Z. Anderson, H. J. Lewandowski, and E. A. Cornell	
Fractional quantum Hall states of dipolar fermions in a strained optical lattice (<i>12 pages</i>)	043641
Hiroyuki Fujita, Yuya O. Nakagawa, Yuto Ashida, and Shunsuke Furukawa	
Long-range ordering of topological excitations in a two-dimensional superfluid far from equilibrium (<i>10 pages</i>)	043642
Hayder Salman and Davide Maestrini	
Boltzmann equation with double-well potentials (<i>15 pages</i>)	043643
Silvia Chiacchiera, Tommaso Macrì, and Andrea Trombettoni	
Generalized theory of diffusion based on kinetic theory (<i>12 pages</i>)	043644
T. Schäfer	
Exact results for polaron and molecule in one-dimensional spin-1/2 Fermi gas (<i>10 pages</i>)	043645
Runxin Mao (毛润欣), X. W. Guan (管习文), and Biao Wu (吴飙)	
Quantum optics, physics of lasers, nonlinear optics, classical optics	
Simultaneous slow and fast light involving the Faraday effect (<i>6 pages</i>)	043801
Bruno Macke and Bernard Ségard	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Operator product expansion beyond leading order for two-component fermions (<i>12 pages</i>)	043615
Samuel B. Emmons, Daekyoung Kang, and Lucas Platter	
Time-dependent study of a black-hole laser in a flowing atomic condensate (<i>15 pages</i>)	043616
J. R. M. de Nova, S. Finazzi, and I. Carusotto	
Dynamics of Weyl quasiparticles in an optical lattice (<i>7 pages</i>)	043617
Zhi Li, Huai-Qiang Wang, Dan-Wei Zhang, Shi-Liang Zhu, and Ding-Yu Xing	
Ground-state properties and elementary excitations of quantum droplets in dipolar Bose-Einstein condensates (<i>7 pages</i>)	043618
F. Wächtler and L. Santos	
Bose-Einstein condensate in an optical lattice with Raman-assisted two-dimensional spin-orbit coupling (<i>8 pages</i>)	043619
Jian-Song Pan, Wei Zhang, Wei Yi, and Guang-Can Guo	
Initial-state dependence of a quantum resonance ratchet (<i>6 pages</i>)	043620
Jiating Ni, Wa Kun Lam, Siamak Dadras, Mario F. Borunda, Sandro Wimberger, and Gil S. Summy	
Routes towards the experimental observation of the large fluctuations due to chaos-assisted tunneling effects with cold atoms (<i>18 pages</i>)	043621
R. Dubertrand, J. Billy, D. Guéry-Odelin, B. Georgeot, and G. Lemarié	
Noise spectroscopy with large clouds of cold atoms (<i>8 pages</i>)	043622
Samir Vartabi Kashanian, Aurélien Eloy, William Guerin, Michel Lintz, Mathilde Fouché, and Robin Kaiser	
Shortcut to adiabaticity in spinor condensates (<i>9 pages</i>)	043623
Arnau Sala, David López Núñez, Joan Martorell, Luigi De Sarlo, Tilman Zibold, Fabrice Gerbier, Artur Polls, and Bruno Juliá-Díaz	
Strongly correlated Fermi superfluid near an orbital Feshbach resonance: Stability, equation of state, and Leggett mode (<i>10 pages</i>)	043624
Lianyi He, Jia Wang, Shi-Guo Peng, Xia-Ji Liu, and Hui Hu	
Phase-tunable Josephson junction and spontaneous mass current in a spin-orbit-coupled Fermi superfluid (<i>5 pages</i>)	043625
Lei Jiang, Yong Xu, and Chuanwei Zhang	
Stationary and traveling solitons via local dissipation in Bose-Einstein condensates in ring optical lattices (<i>9 pages</i>)	043626
Russell Campbell and Gian-Luca Oppo	
Dynamical structure factor of one-dimensional hard rods (<i>12 pages</i>)	043627
M. Motta, E. Vitali, M. Rossi, D. E. Galli, and G. Bertaina	
Exact quantum field mappings between different experiments on quantum gases (<i>8 pages</i>)	043628
Etienne Wamba, Axel Pelster, and James R. Anglin	
Optical-lattice-assisted magnetic phase transition in a spin-orbit-coupled Bose-Einstein condensate (<i>9 pages</i>)	043629
Giovanni I. Martone, Tomoki Ozawa, Chunlei Qu, and Sandro Stringari	
Mott-insulator state of cold atoms in tilted optical lattices: Doublon dynamics and multilevel Landau-Zener tunneling (<i>9 pages</i>)	043630
Andrey R. Kolovsky and Dmitrii N. Maksimov	

(Continued)

Photoelectron momentum distributions of the hydrogen molecular ion driven by multicycle near-infrared laser pulses (<i>8 pages</i>)	043425
Mitsuko Murakami and Shih-I Chu	
Matter waves and collective properties of cold atoms and molecules	
Stability of emergent kinetics in optical lattices with artificial spin-orbit coupling (<i>8 pages</i>)	043601
Mengsu Chen and V. W. Scarola	
Tunable spin-orbit-coupled Bose-Einstein condensates in deep optical lattices (<i>11 pages</i>)	043602
M. Salerno, F. Kh. Abdullaev, A. Gammal, and Lauro Tomio	
Center-of-mass motion as a sensitive convergence test for variational multimode quantum dynamics (<i>10 pages</i>)	043603
Jayson G. Cosme, Christoph Weiss, and Joachim Brand	
Quantum correlations in pumped and damped Bose-Hubbard dimers (<i>7 pages</i>)	043604
M. K. Olsen, C. V. Chianca, and K. Dechoum	
Helicity, topology, and Kelvin waves in reconnecting quantum knots (<i>7 pages</i>)	043605
P. Clark di Leoni, P. D. Mininni, and M. E. Brachet	
Universal spatiotemporal dynamics of spontaneous superfluidity breakdown in the presence of synthetic gauge fields (<i>6 pages</i>)	043606
Shuyuan Wu (吴淑媛), Xizhou Qin (秦锡洲), Jun Xu (徐军), and Chaohong Lee (李朝红)	
Atomic momentum patterns with narrower intervals (<i>6 pages</i>)	043607
Baoguo Yang (杨保国), Shengjie Jin (金圣杰), Xiangyu Dong (董翔宇), Zhe Liu (刘喆), Lan Yin (尹澜), and Xiaoji Zhou (周小计)	
Trapped-atom interferometer with ultracold Sr atoms (<i>8 pages</i>)	043608
Xian Zhang, Ruben Pablo del Aguila, Tommaso Mazzoni, Nicola Poli, and Guglielmo M. Tino	
Dissipative time evolution of a chiral state after a quantum quench (<i>11 pages</i>)	043609
Stefan Wolff, Ameneh Sheikhan, and Corinna Kollath	
Creating fractional quantum Hall states with atomic clusters using light-assisted insertion of angular momentum (<i>8 pages</i>)	043610
Junyi Zhang, Jérôme Beugnon, and Sylvain Nascimbene	
Creating topological interfaces and detecting chiral edge modes in a two-dimensional optical lattice (<i>18 pages</i>)	043611
N. Goldman, G. Jotzu, M. Messer, F. Görg, R. Desbuquois, and T. Esslinger	
Effects of higher-order energy bands and temperature on the bosonic Mott insulator in a periodically modulated lattice (<i>9 pages</i>)	043612
A. S. Sajna	
Multicriticality and interaction-induced first-order phase transitions in mixtures of ultracold bosons in an optical lattice (<i>7 pages</i>)	043613
S. Anufriiev and T. A. Zaleski	
Density-functional theory for resonantly interacting fermions with effective range and neutron matter (<i>5 pages</i>)	043614
Denis Lacroix	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Controlling vibrational cooling with zero-width resonances: An adiabatic Floquet approach (<i>14 pages</i>)	043409
Arnaud Leclerc, David Viennot, Georges Jolicard, Roland Lefebvre, and Osman Atabek	
Rapid crystallization of externally produced ions in a Penning trap (<i>10 pages</i>)	043410
T. Murböck, S. Schmidt, G. Birkel, W. Nörtershäuser, R. C. Thompson, and M. Vogel	
Spatiotemporal interference of photoelectron wave packets and the time scale of nonadiabatic transitions in the high-frequency regime (<i>11 pages</i>)	043411
Koudai Toyota (豊田 大)	
Keldysh parameter, photoionization adiabaticity, and the tunneling time (<i>6 pages</i>)	043412
A. M. Zheltikov	
Liquid-state paramagnetic relaxation from first principles (<i>10 pages</i>)	043413
Jyrki Rantaharju and Juha Vaara	
Attosecond transient-absorption spectroscopy on aligned molecules (<i>6 pages</i>)	043414
Jens E. Bækhoj and Lars Bojer Madsen	
Core-polarization-corrected random-phase approximation with exact exchange for dipole surface plasmons in silver clusters (<i>8 pages</i>)	043415
Fengyuan Xuan and Claude Guet	
Efficient polarization of high-angular-momentum systems (<i>12 pages</i>)	043416
Simon M. Rochester, Konrad Szymański, Mark Raizen, Szymon Pustelny, Marcis Auzinsh, and Dmitry Budker	
Line shapes and time dynamics of the Förster resonances between two Rydberg atoms in a time-varying electric field (<i>14 pages</i>)	043417
E. A. Yakshina, D. B. Tretyakov, I. I. Beterov, V. M. Entin, C. Andreeva, A. Cinins, A. Markovski, Z. Iftikhar, A. Ekers, and I. I. Ryabtsev	
Nonsequential two-photon absorption from the <i>K</i> shell in solid zirconium (<i>6 pages</i>)	043418
Shambhu Ghimire, Matthias Fuchs, Jerry Hastings, Sven C. Herrmann, Yuichi Inubushi, Jack Pines, Sharon Shwartz, Makina Yabashi, and David A. Reis	
Momentum mapping of continuum-electron wave-packet interference (<i>8 pages</i>)	043419
Weifeng Yang, Huatang Zhang, Cheng Lin, Jingwen Xu, Zhihao Sheng, Xiaohong Song, Shilin Hu, and Jing Chen	
Sympathetic laser cooling of graphene with Casimir-Polder forces (<i>9 pages</i>)	043420
Sofia Ribeiro and Hugo Terças	
Normal Auger processes with ultrashort x-ray pulses in neon (<i>8 pages</i>)	043421
Raymond Sullivan, Junteng Jia, Álvaro Vázquez-Mayagoitia, and Antonio Picón	
Measurement of dichroism in aligned molecules (<i>6 pages</i>)	043422
B. Lavorel, Ph. Babilotte, G. Karras, F. Billard, E. Hertz, and O. Faucher	
Above-threshold ionization and laser-induced electron diffraction in diatomic molecules (<i>19 pages</i>)	043423
Noslen Suárez, Alexis Chacón, Marcelo F. Ciappina, Benjamin Wolter, Jens Biegert, and Maciej Lewenstein	
Control of Rydberg-atom blockade by dc electric-field orientation in a quasi-one-dimensional sample (<i>5 pages</i>)	043424
Luís Felipe Gonçalves and Luis Gustavo Marcassa	

(Continued)

Alternative treatment for the energy-transfer and transport cross section in dressed electron-ion binary collisions (7 pages)	042704
P. L. Grande	
Single-photon emission associated with double electron capture in $F^{9+} + C$ collisions (8 pages)	042705
T. Elkafrawy, A. Simon, J. A. Tanis, and A. Warczak	
Electron scattering from 2-methyl-1,3-butadiene, C_5H_8 , molecules: Role of methylation (9 pages)	042706
Czesław Szmytkowski, Sylwia Stefanowska, Mateusz Zawadzki, Elżbieta Ptasńska-Denga, and Paweł Możejko	
<i>B</i> -spline <i>R</i> -matrix-with-pseudostates approach for excitation and ionization of atomic oxygen by electron collisions (15 pages)	042707
S. S. Tayal and Oleg Zatsarinny	
Determination of the exchange interaction energy from the polarization expansion of the wave function (6 pages)	042708
Piotr Gniewek and Bogumił Jeziorski	
Forward electron emission in collisions of He^{2+} ions with Ar atoms with simultaneous capture of two electrons (5 pages)	042709
L. Sarkadi and D. Nagy	

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

Wigner photoemission time delay from endohedral anions (9 pages)	043401
Ashish Kumar, Hari R. Varma, Pranawa C. Deshmukh, Steven T. Manson, Valeriy K. Dolmatov, and Anatoli Kheifets	
Nonadiabatic tunnel ionization of current-carrying orbitals of prealigned linear molecules in strong circularly polarized laser fields (8 pages)	043402
Kunlong Liu and Ingo Barth	
Observation of the field-free orientation of a symmetric-top molecule by terahertz laser pulses at high temperature (7 pages)	043403
P. Babilotte, K. Hamraoui, F. Billard, E. Hertz, B. Lavorel, O. Faucher, and D. Sugny	
Optimizing laser pulses to control photoinduced states of matter (7 pages)	043404
Bin Hwang and P. M. Duxbury	
Imaging of the umbrella motion and tunneling in ammonia molecules by strong-field ionization (10 pages)	043405
Johann Förster, Etienne Plésiat, Álvaro Magaña, and Alejandro Saenz	
Superelastic rescattering in single ionization of helium in strong laser fields (5 pages)	043406
Zhi-Chao Li, Agnieszka Jaron-Becker, and Feng He	
Double-electron recombination in high-order-harmonic generation driven by spatially inhomogeneous fields (8 pages)	043407
Alexis Chacón, Marcelo F. Ciappina, and Maciej Lewenstein	
Frustrated double ionization in two-electron triatomic molecules (5 pages)	043408
A. Chen, H. Price, A. Staudte, and A. Emmanouilidou	

(Continued)

CONTENTS - Continued

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Quantum molecular master equations (31 pages)	042505
Sylvain D. Brechet, Francois A. Reuse, Klaus Maschke, and Jean-Philippe Ansermet	
$K\alpha_{1,2}$ x-ray linewidths, asymmetry indices, and $[KM]$ shake probabilities in elements Ca to Ge and comparison with theory for Ca, Ti, and Ge (11 pages)	042506
Y. Ito, T. Tochio, H. Ohashi, M. Yamashita, S. Fukushima, M. Polasik, K. Słabkowska, Ł. Syrocki, E. Szymańska, J. Rządkiwicz, P. Indelicato, J. P. Marques, M. C. Martins, J. P. Santos, and F. Parente	
Precision measurement of the $3d^2D_{3/2}$ -state lifetime in a single trapped $^{40}\text{Ca}^+$ (6 pages)	042507
H. Shao, Y. Huang, H. Guan, Y. Qian, and K. Gao	
Worldline approach for numerical computation of electromagnetic Casimir energies: Scalar field coupled to magnetodielectric media (20 pages)	042508
Jonathan B. Mackrory, Tanmoy Bhattacharya, and Daniel A. Steck	
Dynamic polarizability of tungsten atoms reconstructed from fast electrical explosion of fine wires in vacuum (5 pages)	042509
G. S. Sarkisov, S. E. Rosenthal, and K. W. Struve	
Twofold diabaticization of the $\text{KRb}(1-2)^1\Pi$ complex in the framework of <i>ab initio</i> and deperturbation approaches (11 pages)	042510
S. V. Kozlov, E. A. Pazyuk, and A. V. Stolyarov	
Dynamical Casimir-Polder force between an excited atom and a conducting wall (8 pages)	042511
Federico Armata, Ruggero Vasile, Pablo Barcellona, Stefan Yoshi Buhmann, Lucia Rizzuto, and Roberto Passante	
Quantum effects of nuclear motion in three-particle diatomic ions (9 pages)	042512
Adam L. Baskerville, Andrew W. King, and Hazel Cox	
Calculation of differential cross section for dielectronic recombination with two-electron uranium (12 pages)	042513
K. N. Lyashchenko and O. Yu. Andreev	
Lifetimes and wave functions of ozone metastable vibrational states near the dissociation limit in a full-symmetry approach (15 pages)	042514
David Lapierre, Alexander Alijah, Roman Kochanov, Viatcheslav Kokoouline, and Vladimir Tyuterev	
Theoretical study on the spin state and open-shell character dependences of the second hyperpolarizability in hydrogen chain models (7 pages)	042515
Hiroshi Matsui, Masayoshi Nakano, and Benoît Champagne	
Atomic and molecular collisions and interactions	
Systematics of shape resonances in reactive collisions (12 pages)	042701
Kazuhiro Sakimoto	
Effects of radiation damping on photorecombination of C^{4+} ions for the <i>KLL</i> resonance (7 pages)	042702
Chuan-Ying Li, Yong Wu, Yi-Zhi Qu, and Jian-Guo Wang	
Measurements of optical Feshbach resonances of ^{174}Yb atoms (5 pages)	042703
Min-Seok Kim, Jeongwon Lee, Jae Hoon Lee, Y. Shin, and Jongchul Mun	

(Continued)

Converting separable conditions to entanglement-breaking conditions (<i>5 pages</i>)	042331
Ryo Namiki	
Quantum error correction against photon loss using multicomponent cat states (<i>20 pages</i>)	042332
Marcel Bergmann and Peter van Loock	
Entanglement depth for symmetric states (<i>6 pages</i>)	042333
Ji-Yao Chen, Zhengfeng Ji, Nengkun Yu, and Bei Zeng	
Quantum teleportation with continuous measurements (<i>9 pages</i>)	042334
Eliska Greplova, Klaus Mølmer, and Christian Kraglund Andersen	
Factorization in spin systems under general fields and separable ground-state engineering (<i>10 pages</i>)	042335
M. Cerezo, R. Rossignoli, and N. Canosa	
Correlation transfer in large-spin chains (<i>5 pages</i>)	042336
I. F. Valtierra, J. L. Romero, and A. B. Klimov	
Wire recycling for quantum circuit optimization (<i>8 pages</i>)	042337
Alexandru Paler, Robert Wille, and Simon J. Devitt	
Errors and pseudothresholds for incoherent and coherent noise (<i>14 pages</i>)	042338
Mauricio Gutiérrez, Conor Smith, Livia Lulushi, Smitha Janardan, and Kenneth R. Brown	
Scaling of boson sampling experiments (<i>8 pages</i>)	042339
P. D. Drummond, B. Opanchuk, L. Rosales-Zárate, M. D. Reid, and P. J. Forrester	
Simultaneous classical communication and quantum key distribution using continuous variables (<i>6 pages</i>)	042340
Bing Qi	
Quantum-state anomaly detection for arbitrary errors using a machine-learning technique (<i>6 pages</i>)	042341
Satoshi Hara, Takafumi Ono, Ryo Okamoto, Takashi Washio, and Shigeki Takeuchi	
Gaussian systems for quantum-enhanced multiple phase estimation (<i>10 pages</i>)	042342
Christos N. Gagatsos, Dominic Branford, and Animesh Datta	
Partial transpose criteria for symmetric states (<i>7 pages</i>)	042343
F. Bohnet-Waldraff, D. Braun, and O. Giraud	
Atomic and molecular structure and dynamics	
Nernst heat theorem for the thermal Casimir interaction between two graphene sheets (<i>13 pages</i>)	042501
V. B. Bezerra, G. L. Klimchitskaya, V. M. Mostepanenko, and C. Romero	
Effect of realistic nuclear charge distributions on isotope shifts and progress towards the extraction of higher-order nuclear radial moments (<i>14 pages</i>)	042502
A. Papoulia, B. G. Carlsson, and J. Ekman	
Ionization potentials of superheavy elements No, Lr, and Rf and their ions (<i>5 pages</i>)	042503
V. A. Dzuba, M. S. Safronova, U. I. Safronova, and A. Kramida	
Ground-state Landé g factors for selected ions along the boron isoelectronic sequence (<i>5 pages</i>)	042504
J. P. Marques, P. Indelicato, F. Parente, J. M. Sampaio, and J. P. Santos	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Quantum random oracle model for quantum digital signature (7 pages)	042314
Tao Shang, Qi Lei, and Jianwei Liu	
One-body information loss in fermion systems (10 pages)	042315
N. Gigena and R. Rossignoli	
Transversal Clifford gates on folded surface codes (14 pages)	042316
Jonathan E. Moussa	
Dynamic decoupling in the presence of colored control noise (7 pages)	042317
Ido Almog, Gil Loewenthal, Jonathan Coslovsky, Yoav Sagi, and Nir Davidson	
Adiabatic optimization versus diffusion Monte Carlo methods (9 pages)	042318
Michael Jarret, Stephen P. Jordan, and Brad Lackey	
Constructing entanglement measures for fermions (20 pages)	042319
Markus Johansson and Zahra Raissi	
Amplification of the quantum superposition macroscopicity of a flux qubit by a magnetized Bose gas (10 pages)	042320
T. J. Volkoff and Uwe R. Fischer	
Preparation of four-photon polarization-entangled decoherence-free states employing weak cross-Kerr nonlinearities (10 pages)	042321
Xiao-Ming Xiu, Qing-Yang Li, Yan-Fang Lin, Hai-Kuan Dong, Li Dong, and Ya-Jun Gao	
Fisher information from stochastic quantum measurements (7 pages)	042322
Matthias M. Müller, Stefano Gherardini, Augusto Smerzi, and Filippo Caruso	
Benchmarking of dynamically corrected gates for the exchange-only spin qubit in a $1/f$ noise environment (9 pages)	042323
Chengxian Zhang, Xu-Chen Yang, and Xin Wang	
Tensor eigenvalues and entanglement of symmetric states (8 pages)	042324
F. Bohnet-Waldraff, D. Braun, and O. Giraud	
Evaluation of entanglement measures by a single observable (10 pages)	042325
Chengjie Zhang, Sixia Yu, Qing Chen, Haidong Yuan, and C. H. Oh	
Quantum Bayesian approach to circuit QED measurement with moderate bandwidth (24 pages)	042326
Alexander N. Korotkov	
Optimal and near-optimal probe states for quantum metrology of number-conserving two-mode bosonic Hamiltonians (11 pages)	042327
T. J. Volkoff	
Tomographic reconstruction of time-bin-entangled qudits (6 pages)	042328
Samantha J. Nowierski, Neal N. Oza, Prem Kumar, and Gregory S. Kanter	
Remote preparation of three-photon entangled states via single-photon measurement (5 pages)	042329
Young-Sik Ra, Hyang-Tag Lim, and Yoon-Ho Kim	
Testing the monogamy relations via rank-2 mixtures (10 pages)	042330
Eylee Jung and DaeKil Park	

(Continued)

Proposal for a quantum delayed-choice experiment with a spin-mechanical setup (<i>6 pages</i>)	042130
Peng-Bo Li and Fu-Li Li	
Eigenstate tracking in open quantum systems (<i>13 pages</i>)	042131
Jun Jing, Marcelo S. Sarandy, Daniel A. Lidar, Da-Wei Luo, and Lian-Ao Wu	
Cost of counterdiabatic driving and work output (<i>9 pages</i>)	042132
Yuanjian Zheng, Steve Campbell, Gabriele De Chiara, and Dario Poletti	
Long-range entangled zero-mode state in a non-Hermitian lattice (<i>6 pages</i>)	042133
S. Lin, X. Z. Zhang, C. Li, and Z. Song	
Quantum information	
Measurement-only verifiable blind quantum computing with quantum input verification (<i>6 pages</i>)	042301
Tomoyuki Morimae	
Correlations between outcomes of random measurements (<i>9 pages</i>)	042302
Minh Cong Tran, Borivoje Dakić, Wiesław Laskowski, and Tomasz Paterek	
Hierarchical surface code for network quantum computing with modules of arbitrary size (<i>12 pages</i>)	042303
Ying Li and Simon C. Benjamin	
Optimal quantum cloning based on the maximin principle by using <i>a priori</i> information (<i>10 pages</i>)	042304
Peng Kang, Hong-Yi Dai, Jia-Hua Wei, and Ming Zhang	
Work distribution in a photonic system (<i>10 pages</i>)	042305
M. A. A. Talarico, P. B. Monteiro, E. C. Mattei, E. I. Duzzioni, P. H. Souto Ribeiro, and L. C. Céleri	
Entanglement detection and parameter estimation of quantum channels (<i>15 pages</i>)	042306
Jun Suzuki	
Quantum phase estimation and quantum counting with qudits (<i>7 pages</i>)	042307
Hristo S. Tonchev and Nikolay V. Vitanov	
Engineering large Stark shifts for control of individual clock state qubits (<i>7 pages</i>)	042308
A. C. Lee, J. Smith, P. Richerme, B. Neyenhuis, P. W. Hess, J. Zhang, and C. Monroe	
Experimental multiparty sequential state discrimination (<i>6 pages</i>)	042309
M. A. Solís-Prosser, P. González, J. Fuenzalida, S. Gómez, G. B. Xavier, A. Delgado, and G. Lima	
Static and dynamical quantum correlations in phases of an alternating-field <i>XY</i> model (<i>19 pages</i>)	042310
Titas Chanda, Tamoghna Das, Debasis Sadhukhan, Amit Kumar Pal, Aditi Sen(De), and Ujjwal Sen	
Quantum algorithm for association rules mining (<i>8 pages</i>)	042311
Chao-Hua Yu, Fei Gao, Qing-Le Wang, and Qiao-Yan Wen	
Remote creation of quantum coherence (<i>5 pages</i>)	042312
Teng Ma, Ming-Jing Zhao, Shao-Ming Fei, and Gui-Lu Long	
Quantifying the coherence of pure quantum states (<i>10 pages</i>)	042313
Jianxin Chen, Shane Grogan, Nathaniel Johnston, Chi-Kwong Li, and Sarah Plosker	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Inability of the entropy vector method to certify nonclassicality in linelike causal structures (<i>9 pages</i>)	042112
Mirjam Weilenmann and Roger Colbeck	
Entropies in general probabilistic theories and their application to the Holevo bound (<i>5 pages</i>)	042113
Gen Kimura, Junji Ishiguro, and Makoto Fukui	
Non-Markovianity in atom-surface dispersion forces (<i>16 pages</i>)	042114
F. Intravaia, R. O. Behunin, C. Henkel, K. Busch, and D. A. R. Dalvit	
Detecting dimensional crossover and finite Hilbert space through entanglement entropies (<i>11 pages</i>)	042115
Mariano Garagiola, Eloisa Cuestas, Federico M. Pont, Pablo Serra, and Omar Osenda	
Nonideal quantum measurement effects on the switching-current distribution of Josephson junctions (<i>9 pages</i>) . . .	042116
Vincenzo Pierro and Giovanni Filatrella	
Lindblad decoherence in atomic clocks (<i>3 pages</i>)	042117
Steven Weinberg	
Few strongly interacting ultracold fermions in one-dimensional traps of different shapes (<i>10 pages</i>)	042118
Daniel Pęczak and Tomasz Sowiński	
Signifying the nonlocality of NOON states using Einstein-Podolsky-Rosen steering inequalities (<i>14 pages</i>)	042119
R. Y. Teh, L. Rosales-Zárate, B. Opanchuk, and M. D. Reid	
Special relativity in a discrete quantum universe (<i>10 pages</i>)	042120
Alessandro Bisio, Giacomo Mauro D'Ariano, and Paolo Perinotti	
Achieving sub-shot-noise sensing at finite temperatures (<i>7 pages</i>)	042121
Mohammad Mehboudi, Luis A. Correa, and Anna Sanpera	
Criticality of environmental information obtainable by dynamically controlled quantum probes (<i>9 pages</i>)	042122
Analia Zwick, Gonzalo A. Álvarez, and Gershon Kurizki	
Lindblad model of quantum Brownian motion (<i>13 pages</i>)	042123
Aniello Lampo, Soon Hoe Lim, Jan Wehr, Pietro Massignan, and Maciej Lewenstein	
Reality of the quantum state: Towards a stronger ψ -ontology theorem (<i>8 pages</i>)	042124
Shane Mansfield	
Device-independent dimension tests in the prepare-and-measure scenario (<i>4 pages</i>)	042125
Jamie Sikora, Antonios Varvitsiotis, and Zhaohui Wei	
Tight detection efficiency bounds of Bell tests in no-signaling theories (<i>6 pages</i>)	042126
Zhu Cao and Tianyi Peng	
Indistinguishability of causal relations from limited marginals (<i>14 pages</i>)	042127
Costantino Budroni, Nikolai Miklin, and Rafael Chaves	
Non-Hermitian Swanson model with a time-dependent metric (<i>7 pages</i>)	042128
Andreas Fring and Miled H. Y. Moussa	
Characterization of qubit chains by Feynman probes (<i>8 pages</i>)	042129
Dario Tamascelli, Claudia Benedetti, Stefano Olivares, and Matteo G. A. Paris	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 94, NUMBER 4

OCTOBER 2016

Sticking transition in a minimal model for the collisions of active particles in quantum fluids (<i>5 pages</i>)	041602(R)
Vishwanath Shukla, Marc Brachet, and Rahul Pandit	
Inevitable power-law behavior of isolated many-body quantum systems and how it anticipates thermalization (<i>5 pages</i>)	041603(R)
Marco Távora, E. J. Torres-Herrera, and Lea F. Santos	
Quantum optics, physics of lasers, nonlinear optics, classical optics	
Supercontinuum of a 3.9- μ m filament in air: Formation of a two-octave plateau and nonlinearly enhanced linear absorption (<i>6 pages</i>)	041801(R)
Nikolay A. Panov, Daniil E. Shipilo, Vera A. Andreeva, Olga G. Kosareva, Alexander M. Saletsky, Huailiang Xu, and Pavel Polynkin	
Deterministic light focusing in space and time through multiple scattering media with a time-resolved transmission matrix approach (<i>5 pages</i>)	041802(R)
Mickael Mounaix, Hugo Defienne, and Sylvain Gigan	

ARTICLES

Fundamental concepts

Practical quantum metrology in noisy environments (<i>10 pages</i>)	042101
Rosanna Nichols, Thomas R. Bromley, Luis A. Correa, and Gerardo Adesso	
Quantum imaging as an ancilla-assisted process tomography (<i>9 pages</i>)	042102
M. Ghalaii, M. Afsary, S. Alipour, and A. T. Rezakhani	
Generalized effective operator formalism for decaying systems (<i>10 pages</i>)	042103
Marius Paraschiv, Sabine Wölk, Thomas Mannel, and Otfried Gühne	
Uncertainty relations for general unitary operators (<i>11 pages</i>)	042104
Shrobona Bagchi and Arun Kumar Pati	
Volume monogamy of quantum steering ellipsoids for multiqubit systems (<i>7 pages</i>)	042105
Shuming Cheng, Antony Milne, Michael J. W. Hall, and Howard M. Wiseman	
Quantum mechanics: The Bayesian theory generalized to the space of Hermitian matrices (<i>27 pages</i>)	042106
Alessio Benavoli, Alessandro Facchini, and Marco Zaffalon	
Discrimination of correlated and entangling quantum channels with selective process tomography (<i>12 pages</i>)	042107
Eugene Dumitrescu and Travis S. Humble	
All measurements in a probabilistic theory are compatible if and only if the state space is a simplex (<i>7 pages</i>)	042108
Martin Plávala	
Landau-Zener transitions in an open multilevel quantum system (<i>9 pages</i>)	042109
S. Ashhab	
Decoherence induced by non-Markovian noise in a nonequilibrium environment (<i>5 pages</i>)	042110
Xiangji Cai (蔡祥吉) and Yujun Zheng (郑雨军)	
Master equation for high-precision spectroscopy (<i>8 pages</i>)	042111
Andreas Alexander Buchheit and Giovanna Morigi	

(Continued)

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages 040101(R)–042709, and Part B pages 043401–049906(E).

PART A

RAPID COMMUNICATIONS

Fundamental concepts

- $\mathcal{PT}$ -symmetric slowing down of decoherence (5 pages) 040101(R)
Bartłomiej Gardas, Sebastian Deffner, and Avadh Saxena

Quantum information

- Nonconvexity of private capacity and classical environment-assisted capacity of a quantum channel (5 pages) 040301(R)
David Elkouss and Sergii Strelchuk
- Measuring the scrambling of quantum information (6 pages) 040302(R)
Brian Swingle, Gregory Bentsen, Monika Schleier-Smith, and Patrick Hayden

Atomic and molecular collisions and interactions

- ☞ Floquet engineering from long-range to short-range interactions (6 pages) 040701(R)
Tony E. Lee

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

- ☞ Prominent role of multielectron processes in K -shell double and triple photodetachment of oxygen anions (5 pages) 041401(R)
S. Schippers, R. Beerwerth, L. Abrok, S. Bari, T. Buhr, M. Martins, S. Ricz, J. Viefhaus, S. Fritzsche, and A. Müller

- Photoionization of neutral atoms by X waves carrying orbital angular momentum (5 pages) 041402(R)
Robert A. Müller, Daniel Seipt, Randolph Beerwerth, Marco Ornigotti, Alexander Szameit, Stephan Fritzsche, and Andrey Surzhykov

- Controlling the rotational and hyperfine state of ultracold $^{87}\text{Rb}^{133}\text{Cs}$ molecules (5 pages) 041403(R)
Philip D. Gregory, Jesus Aldegunde, Jeremy M. Hutson, and Simon L. Cornish

Matter waves and collective properties of cold atoms and molecules

- Rotation of cold molecular ions inside a Bose-Einstein condensate (7 pages) 041601(R)
Bikashkali Midya, Michał Tomza, Richard Schmidt, and Mikhail Lemeshko

