

PHYSICAL REVIEW A

For editorial and subscription correspondence,
please see inside front cover
(ISSN: 1050-2947)

PERIODICALS
Postmaster send address changes to:
American Institute of Physics
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 62, NUMBER 2

CONTENTS

AUGUST 2000

RAPID COMMUNICATIONS

Atomic and molecular structure and dynamics

- Observation of the $^2S_{1/2}$ - $^2F_{7/2}$ electric octupole transition in a single $^{171}\text{Yb}^+$ ion (4 pages) 020501(R)
M. Roberts, P. Taylor, G. P. Barwood, W. R. C. Rowley, and P. Gill

Atomic and molecular collisions and interactions

- Time-dependent wave-packet study of the direct low-energy dissociative recombination of HD^+
(4 pages) 020701(R)
A. E. Orel
- Absolute photoionization cross sections of I^+ and I^{2+} in the 4d ionization region (4 pages) 020702(R)
H. Kjeldsen, P. Andersen, F. Folkmann, H. Knudsen, B. Kristensen, J. B. West, and T. Andersen

Clusters (including fullerenes)

- Anomalously strong screening effect in collisions between noble-gas ions and carbon in C_{60} (4 pages) 021201(R)
T. Miura, I. Arai, M. Imanaka, H. Sasaki, S. Tomita, and S. M. Lee

Atomic and molecular processes in external fields

- Manipulating motional states by selective vibronic interaction in two trapped ions (4 pages) 021401(R)
E. Solano, P. Milman, R. L. de Matos Filho, and N. Zagury

Matter waves

- Multifrequency evaporative cooling to Bose-Einstein condensation in a high magnetic field (4 pages) 021601(R)
V. Boyer, S. Murdoch, Y. Le Coq, G. Delannoy, P. Bouyer, and A. Aspect

Quantum optics, physics of lasers, nonlinear optics

- Resonance fluorescence of a two-level atom in a colored vacuum (4 pages) 021801(R)
Hyunchul Nha, Young-Tak Chough, and Kyungwon An



ARTICLES

Fundamental concepts

Time of arrival through interacting environments: Tunneling processes (9 pages)	022101
Ken-Ichi Aoki, Atsushi Horikoshi, and Etsuko Nakamura	
Analytical investigation of revival phenomena in the finite square-well potential (9 pages)	022102
David L. Aronstein and C. R. Stroud, Jr.	
Information and noise in quantum measurement (9 pages)	022103
Holger F. Hofmann	
Sturmian basis functions for the harmonic oscillator (6 pages)	022104
Radosław Szmytkowski and Bożena Żywicka-Możejko	
Direct trajectory method for semiclassical wave functions (5 pages)	022105
Shuangbo Yang and Michael E. Kellman	
Nonspreading coherent states for the hydrogen atom (4 pages)	022106
Bo-Wei Xu, Guo-Hui Ding, and Fan-Mei Kong	
Functional approach to quantum decoherence and the classical final limit (16 pages)	022107
Mario Castagnino and Roberto Laura	
Coherent quantum feedback (12 pages)	022108
Seth Lloyd	
Geometric phase for entangled spin pairs (6 pages)	022109
Erik Sjöqvist	
Violations of Bell inequalities for measurements with macroscopic uncertainties: What it means to violate macroscopic local realism (10 pages)	022110
M. D. Reid	
Space-time description of photon emission from an atom (22 pages)	022111
Ole Keller	
High-precision calculation of the parity-nonconserving amplitude in francium (5 pages)	022112
M. S. Safronova and W. R. Johnson	
Radiative properties of an atom in the vicinity of a mirror (7 pages)	022113
Reza Matloob	
Quantum noise and superluminal propagation (15 pages)	022114
Bilha Segev, Peter W. Milonni, James F. Babb, and Raymond Y. Chiao	
Testing the symmetrization postulate on molecules with three identical nuclei (8 pages)	022115
Giovanni Modugno and Michele Modugno	
Vacuum-polarization screening corrections to the energy levels of heliumlike ions (8 pages)	022116
A. N. Artemyev, T. Beier, G. Plunien, V. M. Shabaev, G. Soff, and V. A. Yerokhin	
Effective theoretical approach to back reaction of the dynamical Casimir effect in 1 + 1 dimensions (9 pages)	022117
Yukinori Nagatani and Kei Shigetomi	
Propagation of local decohering action in distributed quantum systems (6 pages)	022118
M. I. Katsnelson, V. V. Dobrovitski, and B. N. Harmon	

Quantum information

Cloning and quantum computation (5 pages)	022301
Ernesto F. Galvão and Lucien Hardy	
Activating bound entanglement in multiparticle systems (8 pages)	022302
W. Dür and J. I. Cirac	
Optimal manipulations with qubits: Universal quantum entanglers (11 pages)	022303
Vladimír Bužek and Mark Hillery	

NMR quantum computation with indirectly coupled gates (4 pages)	022304
David Collins, K. W. Kim, W. C. Holton, H. Sierzputowska-Gracz, and E. O. Stejskal	
Authority-based user authentication in quantum key distribution (7 pages)	022305
Daniel Ljunggren, Mohamed Bourennane, and Anders Karlsson	
Unambiguous state discrimination in quantum cryptography with weak coherent states (9 pages)	022306
Miloslav Dušek, Mika Jahma, and Norbert Lütkenhaus	
Quantum teleportation of an entangled state (9 pages)	022307
Manzoor Ikram, Shi-Yao Zhu, and M. Suhail Zubairy	
Concatenated coding in the presence of dephasing (9 pages)	022308
Iain Gourlay and John F. Snowdon	
Broadband teleportation (18 pages)	022309
P. van Loock, Samuel L. Braunstein, and H. J. Kimble	
Maximally entangled mixed states under nonlocal unitary operations in two qubits (4 pages)	022310
Satoshi Ishizaka and Tohya Hiroshima	
Entanglement and quantum computation with ions in thermal motion (11 pages)	022311
Anders Sørensen and Klaus Mølmer	
Implementation of the refined Deutsch-Jozsa algorithm on a three-bit NMR quantum computer (4 pages) . . .	022312
Jaehyun Kim, Jae-Seung Lee, Soonchil Lee, and Chaejoon Cheong	
Retrodiction for quantum optical communications (4 pages)	022313
Stephen M. Barnett, David T. Pegg, John Jeffers, Ottavia Jedrkiewicz, and Rodney Loudon	

Atomic and molecular structure and dynamics

Measurements of $2s^2S_{1/2}-2p^2P_{1/2}$ transition energies in lithiumlike heavy ions. III. Experimental results for Sn^{47+} and Xe^{51+} (6 pages)	022501
D. Feili, Ph. Bosselmann, K.-H. Schartner, F. Folkmann, A. E. Livingston, E. Träbert, X. Ma, and P. H. Mokler	
Wavelength measurements of heliumlike $1s2s^3S_1-1s2p^3P_{0,2}$ transitions in Ne^{8+} , Na^{9+} , Mg^{10+} , and Si^{12+} emitted by solar flare plasmas (7 pages)	022502
W. Curdt, E. Landi, K. Wilhelm, and U. Feldman	
Measurement of the electron affinity of potassium (5 pages)	022503
Karin T. Andersson, Joakim Sandström, Igor Yu. Kiyan, Dag Hanstorp, and David J. Pegg	
Theoretical treatment of channel mixing in excited Rb_2 and Cs_2 ultracold molecules: Perturbations in 0_u^+ photoassociation and fluorescence spectra (10 pages)	022504
V. Kokoouline, O. Dulieu, and F. Masnou-Seeuws	
Accurate transition rates for the $5p-5s$ transitions in Kr I (9 pages)	022505
Krzysztof Dzierżęga, Udo Volz, Gillian Nave, and Ulf Griesmann	
Double-resonance measurements of isotope shifts and hyperfine structure in Gd I with hyperfine-state selection in an intermediate level (4 pages)	022506
W. Nörtershäuser, B. A. Bushaw, and K. Blaum	
Intercombination and forbidden transition rates in C- and N-like ions (O^{2+} , F^{3+} , and S^{9+}) measured at a heavy-ion storage ring (8 pages)	022507
E. Träbert, A. G. Calamai, J. D. Gillaspay, G. Gwinner, X. Tordoir, and A. Wolf	
Rayleigh-Ritz approximation of the Dirac operator in atomic and molecular physics (14 pages)	022508
I. P. Grant and H. M. Quiney	
Dynamical calculation of direct muon-transfer rates from thermalized muonic hydrogen to C^{6+} and O^{8+} (6 pages)	022509
Renat A. Sultanov and Sadhan K. Adhikari	

One-electron linear systems in a strong magnetic field (7 pages)	022510
J. C. López V. and A. Turbiner	
Supershell quantization of staggering patterns in the rotational bands of the iodine molecule (12 pages)	022511
Jean Maruani, Svetla Drenska, Alexandar Kuleff, Peter Raychev, and Peter Terziev	
Multielectron effects in capture of antiprotons and muons by helium and neon (14 pages)	022512
James S. Cohen	
Analysis of uv-visible fluorescence following inner-shell excitation of N ₂ molecules (11 pages)	022513
A. Marquette, M. Gisselbrecht, W. Benten, and M. Meyer	
Spin dynamics of wave packets evolving with the Dirac Hamiltonian in atoms with high atomic number Z (8 pages)	022514
R. Arvieu, P. Rozmej, and M. Turek	

Atomic and molecular collisions and interactions

Theoretical calculation of single ionization in collisions between protons and low-Z molecules at intermediate and high energies (6 pages)	022701
M. E. Galassi, R. D. Rivarola, M. Beuve, G. H. Olivera, and P. D. Fainstein	
Origin of structures in the low-energy single-electron continuum in calculations for ion collisions from argon (5 pages)	022702
L. Gulyás, T. Kirchner, T. Shirai, and M. Horbatsch	
Time-dependent many-electron approach to slow ion-atom collisions for systems with several active electrons (10 pages)	022703
Keith Runge and David A. Micha	
Formation of the hollow 1s ^o 1S state of Ne ²⁺ by electron impact: Observation by means of an Auger hypersatellite (6 pages)	022704
P. Pelicon, I. Cadež, M. Zitnik, Z. Smit, S. Dolenc, A. Mühleisen, and R. I. Hall	
Electronic excitation in H ⁺ -C ₆₀ collisions: Evaporation and ionization (10 pages)	022705
J. Opitz, H. Lebius, S. Tomita, B. A. Huber, P. Moretto Capelle, D. Bordenave Montesquieu, A. Bordenave Montesquieu, A. Reinköster, U. Werner, H. O. Lutz, A. Niehaus, M. Benndorf, K. Haghighat, H. T. Schmidt, and H. Cederquist	
Photorecombination of C ⁴⁺ ions in low-lying resonance energy regions (8 pages)	022706
Li-Bo Zhao, Akira Ichihara, and Toshizo Shirai	
Excitation and fragmentation of C ₆₀ ^{r+} (r=3-9) in Xe ³⁰⁺ -C ₆₀ collisions (5 pages)	022707
S. Martin, L. Chen, A. Denis, R. Bredy, J. Bernard, and J. Désesquelles	
Dielectronic recombination of lithiumlike Ni ²⁵⁺ ions: High-resolution rate coefficients and influence of external crossed electric and magnetic fields (12 pages)	022708
S. Schippers, T. Bartsch, C. Brandau, A. Müller, G. Gwinner, G. Wissler, M. Beutelspacher, M. Grieser, A. Wolf, and R. A. Phaneuf	
Scattering properties of an open quantum system (8 pages)	022709
Agapi Emmanouilidou and L. E. Reichl	
Analytic properties of three-body continuum Coulomb wave functions (8 pages)	022710
C. R. Garibotti, G. Gasaneo, and F. D. Colavecchia	
Measurement of absolute differential excitation cross sections of molecular oxygen by electron impact: Decomposition of the Herzberg pseudocontinuum (6 pages)	022711
Tong W. Shyn and Christopher J. Sweeney	
Emission-line polarization degrees and n ℓ m ℓ distributions produced by state-selective electron capture in slow Kr ⁸⁺ -Li(2s) collisions (14 pages)	022712
E. Jacquet, H. Kucal, V. Bazin, P. Boduch, M. Chantepie, G. Cremer, C. Laulhé, D. Lecler, and J. Pascale	
Photodetachments of the metastable nsnp ² ⁴ P states of Be ⁻ , Mg ⁻ , and Ca ⁻ ions (8 pages)	022713
Jiaolong Zeng, Jianmin Yuan, and Qisheng Lu	

State-selective K - K electron transfer and K ionization cross sections for Ar and Kr in collisions with highly charged C, O, F, S, and Cl ions at intermediate velocities (9 pages)	022714
B. B. Dhal, Lokesh C. Tribedi, U. Tiwari, K. V. Thulasiram, P. N. Tandon, T. G. Lee, C. D. Lin, and L. Gulyás	
Theoretical study of dielectronic recombination between electrons and heliumlike carbon ions (7 pages)	022715
Ya-Qiong Xu, Yi-Zhi Qu, Xiang-Hui Zhang, and Jia-Ming Li	
Ionization of multielectron atoms using Slater-type wave functions (8 pages)	022716
S. Sahoo, R. Das, N. C. Sil, S. C. Mukherjee, and K. Roy	
Optical potential study of positron-hydrogen-atom scattering at intermediate energies (9 pages)	022717
Kalai Kumar Rajagopal and Kuru Ratnavelu	
Kinetic energy release distributions in the Coulomb explosion of N_2 molecules induced by fast, highly-charged-ion impact (10 pages)	022718
B. Siegmann, U. Werner, R. Mann, N. M. Kabachnik, and H. O. Lutz	
Analytical accurate Regge-trajectory calculation for singular potentials (10 pages)	022719
D. Vrinceanu, A. Z. Msezane, and D. Bessis	
Excitation transfer between the rubidium 5^2D fine-structure levels in collisions with ground-state rubidium atoms: Experiment and theory (5 pages)	022720
B. Bieniak, K. Fronc, S. Gateva-Kostova, M. Głodź, V. Grushevsky, J. Klavins, K. Kowalski, A. Rucińska, and J. Szonert	
Clusters (including fullerenes)	
Stable structures for Si_{20} clusters (5 pages)	023201
Bao-xing Li and Pei-lin Cao	
Electron capture by fluorinated fullerene anions in collisions with Xe atoms (7 pages)	023202
O. V. Boltalina, P. Hvelplund, T. J. D. Jørgensen, M. C. Larsen, M. O. Larsson, and D. A. Sharoitchenko	
Atomic and molecular processes in external fields	
Tunneling through light-induced molecular potentials in Ar_2^+ (14 pages)	023401
Christof Wunderlich, Hartmut Figger, and Theodor W. Hänsch	
Light-force-induced fluorescence line-center shifts in high-precision optical spectroscopy: Simple model and experiment (13 pages)	023402
M. Artoni, I. Carusotto, and F. Minardi	
Nonsequential double ionization of small molecules induced by a femtosecond laser field (13 pages)	023403
C. Cornaggia and Ph. Hering	
Direct measurement of oscillations between degenerate two-electron bound-state configurations in a rapidly autoionizing system (5 pages)	023404
Heider N. Ereifej and J. G. Story	
Simulation of a method for forming a laser-cooled positron plasma (10 pages)	023405
A. S. Newbury, B. M. Jelenković, J. J. Bollinger, and D. J. Wineland	
Dark region observed in fluorescence under the condition of a quadrupole magnetic field (17 pages)	023406
Quan Long, Shuyu Zhou, Shanyu Zhou, and Yuzhu Wang	
Fringe-field effects on the time evolution of pendular states (7 pages)	023407
Rafael Escribano, Belén Maté, Félix Ortigoso, and Juan Ortigoso	
Exponential and nonexponential localization of the one-dimensional periodically kicked Rydberg atom (14 pages)	023408
S. Yoshida, C. O. Reinhold, P. Kristöfel, and J. Burgdörfer	

Matter waves

Dynamics of an atomic Bose-Einstein condensation interacting with a laser field in a double-well potential (7 pages)	023601
Hai-jun Wang, Xue-xi Yi, and Xin-wu Ba	
Identical particle scattering from a weakly coupled Bose-Einstein condensed gas (8 pages)	023602
A. Wynveen, A. Setty, A. Howard, J. W. Halley, and C. E. Campbell	
³ He impurity in a Bose-Einstein condensate (6 pages)	023603
P. Capuzzi, E. S. Hernández, and M. Barranco	
Momentum distribution of an interacting Bose-Einstein condensed gas at finite temperature (4 pages)	023604
Anna Minguzzi, Patrizia Vignolo, and Mario P. Tosi	
Higher-order mutual coherence of optical and matter waves (8 pages)	023605
G. A. Pratavia, J. Zapata, and P. Meystre	
Matter waves in time-modulated complex light potentials (20 pages)	023606
S. Bernet, R. Abfalterer, C. Keller, M. K. Oberthaler, J. Schmiedmayer, and A. Zeilinger	
Stability criterion for attractive Bose-Einstein condensates (6 pages)	023607
Luc Bergé, Tristram J. Alexander, and Yuri S. Kivshar	
Theory of four-wave mixing of matter waves from a Bose-Einstein condensate (13 pages)	023608
Marek Trippenbach, Y. B. Band, and P. S. Julienne	
Condensate fluctuations in finite Bose-Einstein condensates at finite temperature (23 pages)	023609
Robert Graham	
Tunneling dynamics of Bose-Einstein condensates with Feshbach resonances (7 pages)	023610
Bambi Hu and Le-Man Kuang	
Condensation of a hard-core Bose gas (7 pages)	023611
K. Ziegler	
Nonlinear matter wave dynamics with a chaotic potential (21 pages)	023612
S. A. Gardiner, D. Jaksch, R. Dum, J. I. Cirac, and P. Zoller	
Coherent atomic oscillations and resonances between coupled Bose-Einstein condensates with time-dependent trapping potential (9 pages)	023613
F. Kh. Abdullaev and R. A. Kraenkel	

Quantum optics, physics of lasers, nonlinear optics

Generation and propagation of high-order harmonics in high-pressure gases (6 pages)	023801
Nguyen Hong Shon, Akira Suda, and Katsumi Midorikawa	
Quantum-nondemolition criteria in traveling-wave second-harmonic generation (7 pages)	023802
M. K. Olsen, L. I. Plimak, M. J. Collett, and D. F. Walls	
Linewidth narrowing in Brillouin lasers: Theoretical analysis (4 pages)	023803
Alexis Debut, Stéphane Randoux, and Jaouad Zemmouri	
Spontaneous emission and lifetime modification caused by an intense electromagnetic field (14 pages)	023804
P. Facchi and S. Pascazio	
Robust unravelings for resonance fluorescence (12 pages)	023805
H. M. Wiseman and Zoe Brady	
Inverse problems of nonlinear dynamics of vector class-A lasers with anisotropic Kerr-type material (10 pages)	023806
A. Kul'minskii	
Quantum-electrodynamical treatment of second-harmonic generation through phase-conjugate six-wave mixing: Temporal analysis (18 pages)	023807
Ian D. Hands, Shujie Lin, Stephen R. Meech, and David L. Andrews	
Time dependence of evanescent quantum waves (13 pages)	023808
J. G. Muga and M. Büttiker	

Mazer action in a bimodal cavity (<i>12 pages</i>)	023809
R. Arun, G. S. Agarwal, M. O. Scully, and H. Walther	
Enhancement of magneto-optic effects via large atomic coherence in optically dense media (<i>4 pages</i>)	023810
V. A. Sautenkov, M. D. Lukin, C. J. Bednar, I. Novikova, E. Mikhailov, M. Fleischhauer, V. L. Velichansky, G. R. Welch, and M. O. Scully	
Propagation of transverse optical coherence in random multiple-scattering media (<i>12 pages</i>)	023811
Chung-Chieh Cheng and M. G. Raymer	
Photoelectron spectroscopic determination of the energy bandwidths of high-order harmonics (7th–55th) produced by an ultrafast laser in neon (<i>8 pages</i>)	023812
Lora Nugent-Glandorf, Michael Scheer, M. Krishnamurthy, Jennifer W. Odom, and Stephen R. Leone	
Experimental generation of bright two-mode quadrature squeezed light from a narrow-band nondegenerate optical parametric amplifier (<i>4 pages</i>)	023813
Yun Zhang, Hai Wang, Xiaoying Li, Jietai Jing, Changde Xie, and Kunchi Peng	
Two-mode laser with excess noise (<i>10 pages</i>)	023814
P. J. Bardroff and S. Stenholm	
Parameter estimation in quantum optics (<i>7 pages</i>)	023815
G. Mauro D'Ariano, Matteo G. A. Paris, and Massimiliano F. Sacchi	
Generation of high-order spatially coherent harmonics from solid targets by femtosecond laser pulses (<i>6 pages</i>)	023816
A. Tarasevitch, A. Orisch, D. von der Linde, Ph. Balcou, G. Rey, J.-P. Chambaret, U. Teubner, D. Klöpfel, and W. Theobald	
Visibility is not a good measure of a well-defined relative phase (<i>8 pages</i>)	023817
Gunnar Björk, Shuichiro Inoue, and Jonas Söderholm	
Three-level atoms inside a degenerate optical parametric oscillator: Steady-state behaviors (<i>7 pages</i>)	023818
F. A. Montes and Min Xiao	
Doppler-induced spatially uniform atom-cavity coupling in a standing-wave cavity and the unidirectional momentum transfer on a moving atom (<i>6 pages</i>)	023819
Kyungwon An, Young-Tak Chough, and Sun-Hyun Youn	

BRIEF REPORTS

Fundamental concepts

Linear entropy and Bell inequalities (<i>2 pages</i>)	024101
E. Santos and M. Ferrero	

Quantum information

Optimal quantum teleportation with an arbitrary pure state (<i>4 pages</i>)	024301
Konrad Banaszek	
Positive maps that are not completely positive (<i>4 pages</i>)	024302
Sixia Yu	

Atomic and molecular collisions and interactions

Low-energy electron scattering by boron trihalides (<i>3 pages</i>)	024701
Márcio H. F. Bettge	

CONTENTS - *Continued*

PHYSICAL REVIEW A

THIRD SERIES, VOLUME 62, NUMBER 2

AUGUST 2000

Complex-angular-momentum analysis of atom-diatom angular scattering: Zeros and poles of the S matrix (4 pages)	024702
D. Sokolovski	

Clusters (including fullerenes)

Gap to hinder the rotational excitation of the ground state of a 13-boson system (4 pages)	025201
C. G. Bao and X. G. Li	

Atomic and molecular processes in external fields

Matter-field entropy transfer in stimulated photoassociation (4 pages)	025401
Amichay Vardi and Moshe Shapiro	
Atomic dynamics in evaporative cooling of trapped alkali-metal atoms in strong magnetic fields (4 pages)	025402
O. H. Pakarinen and K.-A. Suominen	

Quantum optics, physics of lasers, nonlinear optics

Enhanced four-wave mixing via elimination of inhomogeneous broadening by coherent driving of quantum transitions with control fields (4 pages)	025801
A. K. Popov and Alexander S. Bayev	

COMMENTS

Comment on “Casimir-Polder long-range interaction potentials between alkali-metal atoms” (2 pages)	026701
A. Salam	

Selected Abstracts From Other Physical Review Journals	i
--	---

Cumulative Author Index	ii
-----------------------------------	----