Physical Review A

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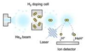
HIGHLIGHTED ARTICLES

FEATURED IN PHYSICS EDITORS' SUGGESTION

Laser-induced Coulomb explosion dynamics of H_2 molecules in helium nanodroplets

Zhengjun Ye, Jiaxuan Chen, Ruolin Gong, Menghang Shi, Zhejun Jiang, Chenxu Lu, Yue Hu, Xinglei Long, Wenbin Zhang, and Jian Wu

Phys. Rev. A **112**, 063118 (2025) - Published 23 December, 2025



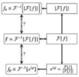
The authors report experimental results on the Coulomb explosion of H_2 molecules inside helium nanodroplets using ion-ion coincidence analysis. The study provides insights into the translation, dissociation, and solvation processes of light impurities in a quantum liquid, underscoring the critical role of droplet size in shaping fragment kinetics during these processes.

EDITORS' SUGGESTION

Interference in phase space and phase-only reconstruction

André Knoll, Leon Cohen, and Wolfgang P. Schleich

Phys. Rev. A **112**, 062210 (2025) - Published 8 December, 2025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$f = \mathcal{F}^{-1}[\mathcal{F}[f]]$
$\mathcal{F}[f]$
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$f_p = \mathcal{F}^{-1}[e^{i\varphi}]$
$e^{i\varphi} = \frac{\mathcal{F}[f]}{|\mathcal{F}[f]|}$

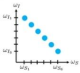
The authors look at phase-only reconstruction, a known signal-analysis method, in a quantum-mechanical scenario. Classically, the phase of a complex-valued Fourier transform of a signal encodes much more information than its amplitude, and they show that this fact is still true in the quantum case. Indeed, the phase of the momentum wave function contains almost all of the information of the underlying quantum state.

EDITORS' SUGGESTION

High-fidelity quasideterministic entanglement generation using phase-matched spectral islands in a zero-added-loss multiplexing architecture

Jeffrey H. Shapiro, Clark Embleton, Michael G. Raymer, and Brian J. Smith

Phys. Rev. A **112**, 062616 (2025) - Published 10 December, 2025



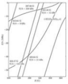
Photonic entanglement distribution is key for the emerging quantum internet. Here, the authors propose a spectral-multiplexing scheme that delivers favorable entanglement rates by combining domain-engineered crystals with zero-added-loss multiplexing. Their scheme uses a down-conversion crystal that can produce photon pairs in distinct, spectrally factorable "islands", and by combining same- and cross-island heralding, they dramatically reduce the number of required spectral channels.

EDITORS' SUGGESTION

Formation of ultracold ^{39}K ^{133}Cs Feshbach molecules

Charly Beulenkamp, Krzysztof P. Zamarski, Robert C. Bird, C. Ruth Le Sueur, Jeremy M. Hutson, Manuele Landini, and Hanns-Christoph Nägerl

Phys. Rev. A **112**, 062821 (2025) - Published 22 December, 2025



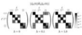
The authors report the creation of an ultracold gas of bosonic ^{39}K ^{133}Cs molecules via magnetoassociation across an interspecies Feshbach resonance, providing the necessary starting conditions for the creation of ground-state molecules. They also perform Feshbach spectroscopy to observe several new resonances.

EDITORS' SUGGESTION

Symmetry oscillation sensitivity to SU(2)-symmetry breaking in quantum mixtures

S. Musolino, M. Albert, P. Vignolo, and A. Minguzzi

Phys. Rev. A **112**, 063308 (2025) - Published 10 December, 2025



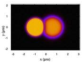
The authors study the time modulation of the momentum distributions of one-dimensional Bose-Bose mixtures with strong repulsive interactions, described via SU(2)-symmetry-breaking Hamiltonians. They show that the phenomenon of symmetry oscillations is not restricted to a specific model or fine-tuned parameters, but instead constitutes a robust and universal dynamical feature of multicomponent strongly interacting one-dimensional quantum mixtures.

EDITORS' SUGGESTION

Quantum diatomic chain: A supersolid structure in a three-component Bose mixture

Francesco Ancilotto

Phys. Rev. A **112**, 063317 (2025) - Published 18 December, 2025



The author theoretically studies the formation and properties of a supersolid structure in a three-component ultracold Bose gas mixture composed of ^{23}Na, ^{39}K, and ^{41}K atoms at zero temperature. An extended linear chain structure, made by periodic repetition of the basic building block represented by a "dimer" unit consisting of two weakly bound quantum droplets, is identified.

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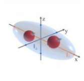
EDITORS' SUGGESTION

Effective interactions in quasi-one-dimensional dipolar quantum gases

Michał Zdziennicki, Mateusz Ślusarczyk, Krzysztof Pawłowski, and Krzysztof Jachymski

Phys. Rev. A **112**, 063318 (2025) - Published 19 December, 2025



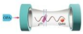
The authors theoretically study ultracold dipolar atoms in an elongated external trap and their mapping onto a strictly one-dimensional system. They show that a full three-dimensional treatment is necessary to capture the subtle influence of long-range dipole-dipole interactions, especially at short interatomic distances where coupling to excited transverse modes becomes significant.

EDITORS' SUGGESTION

Enhanced bundle emission of squeezed photons using parametric amplification

Zhicai Chen, Chengdeng Gou, Xiangming Hu, Deyi Kong, and Fei Wang

Phys. Rev. A **112**, 063703 (2025) - Published 3 December, 2025



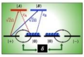
The authors discuss the possibility of generating squeezed photon bundles in cavity QED using parametric driving and a phase-matched squeezed reservoir. With their scheme, they show a substantial increase in the average two-photon bundle emission without compromising on purity.

EDITORS' SUGGESTION

Coherent phase control of orbital-angular-momentum light-induced torque in a double-tripod atom-light coupling scheme

Hamid R. Hamedi, Viačeslav Kudriašov, Mažena Mackoit Sinkevičienė, and Julius Ruseckas

Phys. Rev. A **112**, 063720 (2025) - Published 18 December, 2025



The manuscript proposes a method of controlling optical torque using the phase difference between different light fields. This could enable the manipulation of atomic currents in ring-shaped optical geometries.

LETTERS

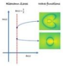
Fundamental concepts

LETTER

Hamiltonian with energy levels corresponding to Riemann zeros

Xingpao Suo

Phys. Rev. A **112**, L060201 (2025) - Published 18 December, 2025



The authors construct a two-dimensional quantum Hamiltonian describing a free particle with position-dependent mass, such that, under suitable boundary conditions, its energy eigenvalues are in one-to-one correspondence with the nontrivial zeros of the Riemann zeta function.

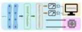
Quantum information science

LETTER

Beating the optimal verification of entangled states via collective strategies

Ye-Chao Liu and Jiangwei Shang

Phys. Rev. A **112**, L060401 (2025) - Published 4 December, 2025



This work presents a collective strategy for verifying entangled quantum states that can reach efficiencies beyond those obtainable with the standard global-measurement approach, while preserving unused copies. The protocol is scalable across various platforms and is able to provide information about noise in the system.

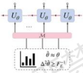
Quantum technologies

LETTER

Metrology of open quantum systems from emitted radiation

Siddhant Midha and Sarang Gopalakrishnan

Phys. Rev. A **112**, L060601 (2025) - Published 1 December, 2025


U_θ
U_θ
U_θ
$\mathcal{M}$
$\hat{\theta} \approx \theta$
$\Delta^2\hat{\theta} \geq F_E^{-1}$

In continuous quantum metrology, a sensor constantly emits quantum signals into its environment, and the goal is to infer an unknown parameter from this ongoing stream of radiation. Using a matrix-product-state description of the joint system–environment dynamics, the authors derive exact expressions for the evolution of the quantum Fisher information, characterizing the fundamental limits of information available to such continuous sensors.

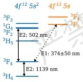
Light-induced processes in atomic-scale systems

LETTER

Optical transitions near the elusive $5s$–$4f$ level crossing in highly charged osmium with sensitivity to physics beyond the standard model

Nils-Holger Rehbehn, Lakshmi Priya Kozhiparambil Sajith, Michael K. Rosner, Charles Cheung, Sergey G. Porsev, Marianna S. Safronova, Steven Worm, Dmitry Budker, Thomas Pfeifer, José R. Crespo López-Urrutia, and Hendrik Bekker

Phys. Rev. A **112**, L061101 (2025) - Published 5 December, 2025



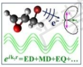
With highly charged ions, one can construct electronic configurations exceptionally well-suited for new-physics searches. Measurements of the Nd-like osmium spectrum in this work uncovered ultranarrow transitions ideal for high-precision applications while advanced atomic theory calculations revealed why the interconfiguration transitions remain elusive.

LETTER

Interplay between the electric-dipole and nondipole-induced forward-backward asymmetries in the inner-shell photoionization of chiral molecules

Nikolay M. Novikovskiy, Dmitrii V. Rezvan, Laura Sommerlad, Arno Ehresmann, Till Jahnke, Reinhard Dörner, Markus S. Schöffler, and Philipp V. Demekhin

Phys. Rev. A **112**, L061102 (2025) - Published 10 December, 2025



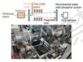
The authors demonstrate how helicity-independent nondipole effects, omnipresent in the x-ray regime, modify a helicity-dependent photoelectron circular dichroism effect in the inner-shell photoionization of chiral molecules.

LETTER

All-optical field-free molecular orientation with higher order parameters

Shinichirou Minemoto, Naoki Hara, Md. Maruf Hossain, and Hirofumi Sakai

Phys. Rev. A **112**, L061103 (2025) - Published 17 December, 2025



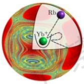
The authors have developed a plasma shutter applicable to intense 10-ns two-color laser pulses with the relative phase difference between the two wavelengths stabilized. They demonstrate the experimental feasibility of creating a molecular ensemble with high degrees of orientation in a field-free space after rapidly turning off the intense two-color laser pulses with the plasma shutter.

LETTER

Parallels between chaotic scattering and heating in cold ion-atom collisions

Saajid Chowdhury and Jesus Perez-Rios

Phys. Rev. A **112**, L061104 (2025) - Published 22 December, 2025



The authors study the nonhyperbolic chaotic dynamics of a Paul-trapped ion in a low-density bath of atoms above 1 μK. They find a power-law distribution for the complex lifetimes, an increase in complex formation for heavier, colder atoms, and a threshold collision energy for complex formation at approximately the trapped ion heating energy scale, establishing a connection between ion heating and chaos.

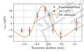
Ultracold systems and matter waves

LETTER

Probing the spatial distribution of k-vectors *in situ* with Bose-Einstein condensates

Samuel Gaudout, Rayan Si-Ahmed, Clément Debavelaere, Menno Door, Pierre Cladé, and Saïda Guellati-Khelifa

Phys. Rev. A **112**, L061301 (2025) - Published 9 December, 2025



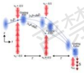
The authors present a method that uses a Bose–Einstein condensate as a local probe to map, in situ, the photon momentum across a laser beam, revealing a striking extra-recoil. This approach offers a powerful tool for evaluating systematics due to wavefront distortions in atom interferometry.

LETTER

Gravitational sensing in the frequency domain using an echo atom interferometer

Gehrig Carlse, Jaskaran Randhawa, Alex Pouliot, Eduardo Ramos, Thomas Vacheresse, and A. Kumarakrishnan

Phys. Rev. A **112**, L061302 (2025) - Published 15 December, 2025



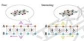
The authors demonstrate a frequency domain echo interferometer for measurements of gravitational acceleration. This technique relies on measurements of coherent scattering from a matter-wave lattice formed in a laser-cooled gas.

LETTER

Interaction-induced chiral-transport inversion

Li Pan, Qian Liang, Chang-An Yang, Yu Huang, Pengjie Liu, Fanying Xi, Wei Yi, Xiaofan Zhou, and Jian-Song Pan

Phys. Rev. A **112**, L061303 (2025) - Published 22 December, 2025



This Letter reports a phenomenon where simple on-site interactions between particles can reverse the direction of dynamical chiral transport in a quantum system. They demonstrate this interaction-induced inversion using an ultracold-atom-inspired model.

LETTER

Fast and direct preparation of a genuine lattice Bose-Einstein condensate via the quantum Mpemba effect

Philipp Westhoff, Sebastian Paeckel, and Mattia Moroder

Phys. Rev. A **112**, L061304 (2025) - Published 22 December, 2025

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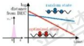


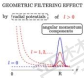
The authors show that weak symmetries can be harnessed to engineer the Mpemba effect in many-body dissipative quantum systems, enabling striking acceleration of relaxation dynamics. Exploiting this mechanism, they demonstrate substantial speedups in preparing a Bose-Einstein condensate in optical lattices from simple, experimentally accessible initial states.

LETTER

Geometric filtering effect in expanding Bose-Einstein condensate shells

A. Tononi, M. Lewenstein, and L. Santos

Phys. Rev. A **112**, L061305 (2025) - Published 22 December, 2025


GEOMETRIC FILTERING EFFECT
by radial potentials of $l > 0$
angular momentum components
$l = 1, 2, \dots$
$l = 0$
0
R
r

The authors study the expansion of shell-shaped Bose–Einstein condensates with externally or thermally imprinted phase. They observe a geometry-induced centrifugal filtering of high-angular-momentum modes, a phenomenon offering a practical method for thermometry.

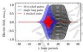
Photonics, nonlinear optics, and optomechanics

LETTER

Pulse-stacking technique for nonlinear Compton scattering: Compensation of nonlinear broadening and generation of multicolor gamma sources

Antonina Timoshenko, Maxim Malakhov, Alexander Fedotov, and Sergey Rykovanov

Phys. Rev. A **112**, L061501 (2025) - Published 5 December, 2025



The authors propose a pulse-stacking technique to generate near-rectangular high-intensity laser pulse envelopes, enhancing spectral brightness and narrowing linewidths, which is crucial for high-quality gamma-ray sources. The study includes a noise tolerance analysis and introduces a multicolor emission method with applications in advanced spectroscopy.

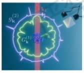
Quantum optics

LETTER

Light statistics from large ensembles of independent two-level emitters: Classical and nonclassical effects

M. Bojer, A. Cidrim, P. P. Abrantes, R. Bachelard, and J. von Zanthier

Phys. Rev. A **112**, L061701 (2025) - Published 4 December, 2025



The authors investigate the photon statistics of an ensemble of coherently driven noninteracting two-level atoms in the weakly driven regime. They find emission characteristics that are strongly in contrast to the emission of classical oscillating dipoles, ranging from strong antibunching to superbunching.

ARTICLES

Fundamental concepts

Continuous crossover from quantum-limit-bounded evolution to exponential delay

A. M. Zheltikov

Phys. Rev. A **112**, 062201 (2025) - Published 1 December, 2025

Superluminal signaling witness for quantum state reduction

Aritro Mukherjee, Lisa Lenstra, Lotte Mertens, and Jasper van Wezel

Phys. Rev. A **112**, 062202 (2025) - Published 1 December, 2025

Bulk-boundary correspondence and infernal points in the non-Hermitian trimer Su-Schrieffer-Heeger model

K. J. Tang, H. T. Cui, and H. F. Mu

Phys. Rev. A **112**, 062204 (2025) - Published 2 December, 2025

Maximal coin-position entanglement and non-Hermitian skin effect in discrete-time quantum walks

Ding Cheng, Yi Li, Hao Zhao, Haijun Kang, Cui Kong, Jiguo Wang, Feng Mei, Chuanjia Shan, and Jibing Liu

Phys. Rev. A **112**, 062205 (2025) - Published 2 December, 2025

Reducing circuit depth in Lindblad simulations via step-size extrapolation

Pegah Mohammadipour and Xiantao Li

Phys. Rev. A **112**, 062206 (2025) - Published 3 December, 2025

Wigner entropy conjecture and the interference formula in quantum phase space

Zacharie Van Herstraeten and Nicolas J. Cerf

Phys. Rev. A **112**, 062207 (2025) - Published 3 December, 2025

Necessary and sufficient condition for the quantum realizability of correlations for arbitrary normalized observables in the Clauser-Horne-Shimony-Holt setup

Ryosuke Nogami and Jaeha Lee

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Phys. Rev. A **112**, 062208 (2025) - Published 4 December, 2025

Exact quantum speed limits

Arun K. Pati, Brij Mohan, Sahil, and Samuel L. Braunstein

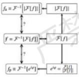
Phys. Rev. A **112**, 062209 (2025) - Published 5 December, 2025

EDITORS' SUGGESTION

Interference in phase space and phase-only reconstruction

André Knoll, Leon Cohen, and Wolfgang P. Schleich

Phys. Rev. A **112**, 062210 (2025) - Published 8 December, 2025


$f_A = \mathcal{F}^{-1}[|\mathcal{F}[f]|]$
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$\mathcal{F}[f]$
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$f_P = \mathcal{F}^{-1}[e^{i\varphi}]$
$e^{i\varphi} = \frac{\mathcal{F}[f]}{|\mathcal{F}[f]|}$

The authors look at phase-only reconstruction, a known signal-analysis method, in a quantum-mechanical scenario. Classically, the phase of a complex-valued Fourier transform of a signal encodes much more information than its amplitude, and they show that this fact is still true in the quantum case. Indeed, the phase of the momentum wave function contains almost all of the information of the underlying quantum state.

Quantum interferometry in external gravitational fields

Thomas B. Mieling, Thomas Morling, Christopher Hilweg, and Philip Walther

Phys. Rev. A **112**, 062211 (2025) - Published 8 December, 2025

Jaynes-Cummings model as an autonomous Maxwell demon

Yashovardhan Jha, Dragi Karevski, and Cyril Elouard

Phys. Rev. A **112**, 062212 (2025) - Published 10 December, 2025

Dependence of the recoherence times and recoherence increments on the state of phonon bath in a single-qubit dephasing model

V. V. Ignatyuk and Ch. Samorodov

Phys. Rev. A **112**, 062213 (2025) - Published 15 December, 2025

Non-Markovian quantum jump method for driven-dissipative two-level systems

Huanyuan Zhang and Jiasen Jin

Phys. Rev. A **112**, 062214 (2025) - Published 15 December, 2025

Mutually equibiased bases

Seyed Javad Akhtarshenas, Saman Karimi, and Mahdi Salehi

Phys. Rev. A **112**, 062215 (2025) - Published 15 December, 2025

Semi-device-independent self-testing of unitary operations

Rajdeep Paul, Prabuddha Roy, and A. K. Pan

Phys. Rev. A **112**, 062216 (2025) - Published 16 December, 2025

Absorbing detectors versus scattering theory

Will Cavendish and Siddhant Das

Phys. Rev. A **112**, 062217 (2025) - Published 16 December, 2025

Quantum correction to the Langevin cross section in resonant-exchange processes

I. Simbotin and R. Côté

Phys. Rev. A **112**, 062218 (2025) - Published 16 December, 2025

Topology of the Aharonov-Bohm effect in different reference frames

Hiram S. M. Rodrigues, Katson W. O. Arévola, and Pablo L. Saldanha

Phys. Rev. A **112**, 062219 (2025) - Published 16 December, 2025

Translating Bell nonlocality to prepare-and-measure scenarios under dimensional constraints

Matilde Baroni, Eleni Diamanti, Damian Markham, and Ivan Šupić

Phys. Rev. A **112**, 062220 (2025) - Published 17 December, 2025

Multipartite entanglement in a non-Hermitian quadruple-well potential with synthetic gauge fields

Yan-Qiong Ma, Ke-Wen Xiao, Cheng-Jie Wang, and Wen-Yuan Wang

Phys. Rev. A **112**, 062221 (2025) - Published 17 December, 2025

Interferometric and bipartite out-of-time-ordered correlators for non-Markovian open quantum spin chains and the Lipkin-Meshkov-Glick model

Baibhab Bose, Devvrat Tiwari, and Subhashish Banerjee

Phys. Rev. A **112**, 062222 (2025) - Published 17 December, 2025

Neural network approach to Dirac quantum field theory

M. Jiang, B. P. Czajka, E. B. James, A. J. Hardaway, C. D. Achammer, Q. Su, and R. Grobe

Phys. Rev. A **112**, 062223 (2025) - Published 18 December, 2025

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Nonresonant quantum dynamics of a relativistic electron in counterpropagating laser beams

E. Raicher and Q. Z. Lv

Phys. Rev. A **112**, 062224 (2025) - Published 18 December, 2025

Direct measurement of the quantum geometric tensor in pseudo-Hermitian systems

Ze-Hao Huang, Hai-Tao Ding, and Li-Jun Lang

Phys. Rev. A **112**, 062225 (2025) - Published 18 December, 2025

Separation of relaxation timescales via strong system-bath coupling: Dissipative three-level system as a case study

Brett Min, Matthew Gerry, and Dvira Segal

Phys. Rev. A **112**, 062226 (2025) - Published 18 December, 2025

Information thermodynamics of non-Hermitian quantum systems

Kui Cao, Qian Du, and Su-Peng Kou

Phys. Rev. A **112**, 062227 (2025) - Published 19 December, 2025

Comparing quantum incompatibility of device sets from an operational perspective

Kensei Torii, Ryo Takakura, and Ryotaro Imamura

Phys. Rev. A **112**, 062228 (2025) - Published 19 December, 2025

Nonequilibrium quantum thermometry with noncommutative system-bath couplings

Youssef Aiache, Abderrahim El Allati, İlkay Demir, and Khadija El Anouz

Phys. Rev. A **112**, 062229 (2025) - Published 19 December, 2025

Verification of contextuality by noncontextual experiments

Jonathan J. Thio, Wilfred Salmon, Crispin H. W. Barnes, Stephan De Bièvre, and David R. M. Arvidsson-Shukur

Phys. Rev. A **112**, 062230 (2025) - Published 19 December, 2025

Geometric control of Bell correlations in path-entangled systems

H. O. Cildiroglu

Phys. Rev. A **112**, 062231 (2025) - Published 22 December, 2025

Superactivation of Bell nonlocality in pure anyonic states

Cheng-Qian Xu, Wenhao Ye, and Li You

Phys. Rev. A **112**, 062232 (2025) - Published 23 December, 2025

Distance-based measures and epsilon measures for measurement-based quantum resources

Arindam Mitra, Sumit Mukherjee, and Changhyoup Lee

Phys. Rev. A **112**, 062233 (2025) - Published 22 December, 2025

Geometric phase in dissipative quantum batteries

Camila Cristiano, Ludmila Viotti, and Paula I. Villar

Phys. Rev. A **112**, 062234 (2025) - Published 24 December, 2025

Quantum information science

Multiparameter quantum metrology at Heisenberg scaling for an arbitrary two-channel linear interferometer with squeezed light

Atmadev Rai, Danilo Triggiani, Paolo Facchi, and Vincenzo Tamma

Phys. Rev. A **112**, 062401 (2025) - Published 1 December, 2025

Quantum-enhanced distributed sensing using nonlinear optical networks

Zhongjian Zhang, Ben Wang, Kaimin Zheng, and Lijian Zhang

Phys. Rev. A **112**, 062403 (2025) - Published 1 December, 2025

Algorithm for multireference unitary coupled-cluster quantum computations of molecule systems

Di Wu, C. L. Bai, H. Sagawa, and H. Q. Zhang

Phys. Rev. A **112**, 062404 (2025) - Published 2 December, 2025

Bending hyperplanes: Nonlinear entanglement witnesses via envelopes of linear witnesses

AmirHossein Tangestaninejad and Vahid Karimipour

Phys. Rev. A **112**, 062405 (2025) - Published 2 December, 2025

Dynamic circuit for the honeycomb Floquet code

Jahan Claes

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Phys. Rev. A **112**, 062406 (2025) - Published 3 December, 2025

Sequential sharing of entanglement via probabilistic projective measurements

Yan-Ling Wang, Shi-Min Ye, Wei Chen, Zhi-Xiang Jin, and Mao-Sheng Li

Phys. Rev. A **112**, 062407 (2025) - Published 3 December, 2025

Weight-based measure of quantum memory as a universal and operational benchmark

Jinghang Zhang and Yu Luo

Phys. Rev. A **112**, 062408 (2025) - Published 5 December, 2025

Vortex detection from quantum data

Chelsea A. Williams, Annie E. Paine, Antonio A. Gentile, Daniel Berger, and Oleksandr Kyriienko

Phys. Rev. A **112**, 062409 (2025) - Published 5 December, 2025

Adaptive interpolating quantum transform: A quantum-native framework for efficient transform learning

Gekko Budiutama, Shunsuke Daimon, Hirofumi Nishi, Ryui Kaneko, Tomi Ohtsuki, and Yu-ichiro Matsushita

Phys. Rev. A **112**, 062410 (2025) - Published 5 December, 2025

Heralded qudit-based high-dimensional entanglement generation for hybrid photon-emitter system by waveguide-mediated scattering

Fang-Fang Du, Ling-Hui Li, Qiu-Lin Tan, and Zhuo-Ya Bai

Phys. Rev. A **112**, 062411 (2025) - Published 8 December, 2025

Estimation of nonlinear physical quantities by measuring ancillas

Nhat A. Nghiem and Tzu-Chieh Wei

Phys. Rev. A **112**, 062412 (2025) - Published 8 December, 2025

Logical channels in approximate Gottesman-Kitaev-Preskill error correction

Mahnaz Jafarzadeh, Jonathan Conrad, Rafael N. Alexander, and Ben Q. Baragiola

Phys. Rev. A **112**, 062413 (2025) - Published 8 December, 2025

Synthesis of single-qutrit circuits from Clifford$+R$ gates

Erik J. Gustafson, Henry Lamm, Diyi Liu, Edison M. Murairi, and Shuchen Zhu

Phys. Rev. A **112**, 062414 (2025) - Published 8 December, 2025

Resource theory of nonrevivals with applications to quantum many-body scars

Roy J. Garcia, Kaifeng Bu, Liyuan Chen, and Anton M. Graf

Phys. Rev. A **112**, 062415 (2025) - Published 8 December, 2025

Quantum optimization on Rydberg-atom arrays with arbitrary connectivity: Gadget limitations and a heuristic approach

Pierre Cazals, Amalia Sorondo, Victor Onofre, Constantin Dalyac, Wesley Coelho, and Vittorio Vitale

Phys. Rev. A **112**, 062416 (2025) - Published 8 December, 2025

Sachdev-Ye-Kitaev-model–based β-regime-dependent two-qubit dynamical wormhole-inspired teleportation protocol simulation

Sudhanva Joshi and Sunil Kumar Mishra

Phys. Rev. A **112**, 062417 (2025) - Published 8 December, 2025

Family of two-parameter multipartite entanglement measures

Yu Luo, Zhihua Guo, Fanxu Meng, and Chen-Ming Bai

Phys. Rev. A **112**, 062418 (2025) - Published 8 December, 2025

Effect of multiqubit correlated noise on surface-code thresholds

SiYing Wang, Yue Yan, ZhiXin Xia, and Xiang-Bin Wang

Phys. Rev. A **112**, 062419 (2025) - Published 8 December, 2025

Two variations of quantum phase estimation for reducing circuit error rates: Application to the Harrow-Hassidim-Lloyd algorithm

Yonghae Lee, Minjin Choi, Youngho Min, Eunok Bae, and Sunghyun Bae

Phys. Rev. A **112**, 062420 (2025) - Published 8 December, 2025

Investigating pure state uniqueness in tomography via optimization

Jiahui Wu, Zheng An, Chao Zhang, Xuanran Zhu, Shilin Huang, and Bei Zeng

Phys. Rev. A **112**, 062421 (2025) - Published 9 December, 2025

Dynamical properties and applications of discrete time nonunitary quantum walks

Lihao Xu, Meng Li, and Xiaoming Sun

Phys. Rev. A **112**, 062422 (2025) - Published 9 December, 2025

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Interpretable representation learning of quantum data enabled by probabilistic variational autoencoders

Paulin de Schoulepnikoff, Gorka Muñoz-Gil, Hendrik Poulsen Nautrup, and Hans J. Briegel

Phys. Rev. A **112**, 062423 (2025) - Published 10 December, 2025

Quantum separability criteria based on symmetric measurements

Yu Lu, Wen Zhou, Meng Su, Hong-Xing Wu, Shao-Ming Fei, and Zhi-Xi Wang

Phys. Rev. A **112**, 062424 (2025) - Published 10 December, 2025

Inference of response functions with the help of machine-learning algorithms

Doga Murat Kurkcuoglu, Gabriel N. Perdue, Alessandro Roggero, and Rajan Gupta

Phys. Rev. A **112**, 062425 (2025) - Published 11 December, 2025

Suboptimality of parity for distilling correlations with nontrivial marginals

Syed Affan Aslam, Areej Ilyas, and Jibran Rashid

Phys. Rev. A **112**, 062426 (2025) - Published 15 December, 2025

Distribution of nonlocality on quantum random circuits

Andrés Camilo Granda Arango, Federico Hernán Holik, Roberto Giuntini, Hector Freytes, and Giuseppe Sergioli

Phys. Rev. A **112**, 062427 (2025) - Published 15 December, 2025

Detecting genuine multipartite entanglement using moments of positive maps

Saheli Mukherjee, Bivas Mallick, Sahil Gopalkrishna Naik, Ananda G. Maity, and A. S. Majumdar

Phys. Rev. A **112**, 062428 (2025) - Published 15 December, 2025

Device-independent verification of controlled quantum controlled-NOT-gate teleportation

Yi-Ning Li, Neng-Fei Gong, Ru-Qing Zhang, Jing-Wei Wen, and Tie-Jun Wang

Phys. Rev. A **112**, 062429 (2025) - Published 15 December, 2025

Beyond integral-domain stabilizer codes

Lane G. Gunderman

Phys. Rev. A **112**, 062430 (2025) - Published 16 December, 2025

Adaptive random compiler for Hamiltonian simulation

Yun-Zhuo Fan, Yu-Xia Wu, and Dan-Bo Zhang

Phys. Rev. A **112**, 062431 (2025) - Published 16 December, 2025

Dynamics of quantum information and entanglement in two qubits coupled to a Bose-Einstein condensate of microwave-shielded polar molecules

Abdelâali Boudjemâa and Qing-Shou Tan

Phys. Rev. A **112**, 062432 (2025) - Published 16 December, 2025

Qubit-channel metrology with highly noisy initial states and additional undesirable noisy evolution

David Collins and Taylor Larrechea

Phys. Rev. A **112**, 062433 (2025) - Published 17 December, 2025

Measurement-device-independent Schmidt number certification of all entangled states

Saheli Mukherjee, Bivas Mallick, Arun Kumar Das, Amit Kundu, and Pratik Ghosal

Phys. Rev. A **112**, 062434 (2025) - Published 17 December, 2025

Estimation of multivariate traces of states given partial classical information

Kyrylo Simonov, Rafael Wagner, and Ernesto F. Galvão

Phys. Rev. A **112**, 062435 (2025) - Published 17 December, 2025

Single-site entanglement as a marker for quantum phase transitions at nonzero temperatures

Willdauany C. de Freitas da Silva, Andressa R. Medeiros-Silva, Rubem Mondaini, Vivian V. França, and Thereza Paiva

Phys. Rev. A **112**, 062436 (2025) - Published 17 December, 2025

Phases of Floquet code under local decoherence

Yuchen Tang and Yimu Bao

Phys. Rev. A **112**, 062437 (2025) - Published 18 December, 2025

Variational-quantum-eigensolver solution for Lindblad-driven nonequilibrium electron-transport problems

Yi Liu, Zixuan Hu, Xiao Zheng, and Zhenyu Li

Phys. Rev. A **112**, 062438 (2025) - Published 18 December, 2025

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Multiplayer conflict avoidance through entangled quantum walks

Honoka Shiratori, Tomoki Yamagami, Etsuo Segawa, Takatomo Mihana, André Röhm, and Ryoichi Horisaki

Phys. Rev. A **112**, 062439 (2025) - Published 19 December, 2025

Quantifying information loss of quantum channels

Yuan Li, Shunlong Luo, Yuan Sun, and Shuaijie Wang

Phys. Rev. A **112**, 062440 (2025) - Published 19 December, 2025

Minimal-error quantum state discrimination versus robustness of entanglement: More indistinguishability with less entanglement

Debarupa Saha, Kornikar Sen, Chirag Srivastava, and Ujjwal Sen

Phys. Rev. A **112**, 062441 (2025) - Published 22 December, 2025

Towards improved quantum machine learning for molecular force fields

Yannick Couzinié, Shunsuke Daimon, Hirofumi Nishi, Natsuki Ito, Yusuke Harazono, and Yu-ichiro Matsushita

Phys. Rev. A **112**, 062442 (2025) - Published 22 December, 2025

Linking barren plateaus to effective parameters in deep rotation-gate-based parameterized quantum circuits

Yuhan Yao and Yoshihiko Hasegawa

Phys. Rev. A **112**, 062443 (2025) - Published 22 December, 2025

Quantum technologies

Optimal strategies for transient and equilibrium quantum thermometry using Gaussian and non-Gaussian probes

Asghar Ullah, M. Tahir Naseem, and Özgür E. Müstecaplıoğlu

Phys. Rev. A **112**, 062601 (2025) - Published 1 December, 2025

Quantum entanglement in the C band coexisting with data transmission in the L band

Yue Luo, Yun-Ru Fan, Kai Guo, Jun-Tao Zhang, Hao Li, Guang-Wei Deng, You Wang, Hai-Zhi Song, Li-Xing You, Guang-Can Guo, and Qiang Zhou

Phys. Rev. A **112**, 062602 (2025) - Published 1 December, 2025

Reinforcement learning for optimal control of spin magnetometers

Logan W. Cooke and Stefanie Czischek

Phys. Rev. A **112**, 062603 (2025) - Published 1 December, 2025

Reducing depth and measurement weights in Pauli-based computation

Filipa C. R. Peres and Ernesto F. Galvão

Phys. Rev. A **112**, 062604 (2025) - Published 1 December, 2025

Penalty-free approach to accelerating constrained quantum optimization

David Bucher, Jonas Stein, Sebastian Feld, and Claudia Linnhoff-Popien

Phys. Rev. A **112**, 062605 (2025) - Published 2 December, 2025

Non-Gaussian dissipative quantum thermometry beyond Gaussian bounds

Pritam Chattopadhyay

Phys. Rev. A **112**, 062606 (2025) - Published 1 December, 2025

Tunable non-Gaussianity and exact higher-order coherences for quantum advantage

Arash Azizi

Phys. Rev. A **112**, 062607 (2025) - Published 4 December, 2025

Resource-efficient loss-aware photonic-graph-state preparation using atomic emitters

Eneet Kaur, Ashlesha Patil, and Saikat Guha

Phys. Rev. A **112**, 062608 (2025) - Published 5 December, 2025

Loss-tolerant parallelized Bell-state generation with a hybrid cat qudit

Z. M. McIntyre and W. A. Coish

Phys. Rev. A **112**, 062609 (2025) - Published 5 December, 2025

Single-copy-based hyperentanglement purification using high-dimensional positive-operator-valued measures

Peng Wang, Zi-Hao Wei, Zhe Yang, Chun-Yan Li, Rui-Yang Yuan, and Bao-Cang Ren

Phys. Rev. A **112**, 062610 (2025) - Published 8 December, 2025

Energy-embedded neural solvers for one-dimensional quantum systems

Yi-Qiang Wu, Xuan Liu, Hanlin Li, and Fuqiang Wang

Phys. Rev. A **112**, 062611 (2025) - Published 9 December, 2025

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Time evolution of controlled many-body quantum systems with matrix product operators

Llorenç Balada Gaggioli and Jakub Mareček

Phys. Rev. A **112**, 062612 (2025) - Published 9 December, 2025

Information reconciliation for phase shift keying discrete modulation continuous-variable quantum key distribution

Zhenguo Lu, Weilin Liu, Yu Zhang, Zengliang Bai, and Yongmin Li

Phys. Rev. A **112**, 062613 (2025) - Published 9 December, 2025

Single-qudit control in $^{87}\mathrm{Sr}$ via optical nuclear electric resonance

Johannes K. Krondorfer, Matthias Diez, and Andreas W. Hauser

Phys. Rev. A **112**, 062614 (2025) - Published 10 December, 2025

Multiple-noise-resilient nonadiabatic geometric quantum control of solid-state spins in diamond

Si-Qi Chen, Qi-Tao Duan, Chengxian Zhang, and He Lu

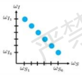
Phys. Rev. A **112**, 062615 (2025) - Published 10 December, 2025

EDITORS' SUGGESTION

High-fidelity quasideterministic entanglement generation using phase-matched spectral islands in a zero-added-loss multiplexing architecture

Jeffrey H. Shapiro, Clark Embleton, Michael G. Raymer, and Brian J. Smith

Phys. Rev. A **112**, 062616 (2025) - Published 10 December, 2025



Photonic entanglement distribution is key for the emerging quantum internet. Here, the authors propose a spectral-multiplexing scheme that delivers favorable entanglement rates by combining domain-engineered crystals with zero-added-loss multiplexing. Their scheme uses a down-conversion crystal that can produce photon pairs in distinct, spectrally factorable “islands”, and by combining same- and cross-island heralding, they dramatically reduce the number of required spectral channels.

Observation of power superbroadening of spectral line profiles on an IBM quantum processor

Ivo S. Mihov and Nikolay V. Vitanov

Phys. Rev. A **112**, 062617 (2025) - Published 10 December, 2025

Discovering autonomous quantum error correction via deep reinforcement learning

Yue Yin, Tailong Xiao, Xiaoyang Deng, Ming He, Jianping Fan, and Guihua Zeng

Phys. Rev. A **112**, 062618 (2025) - Published 11 December, 2025

Exact spectral gaps of random one-dimensional quantum circuits

Andrew E. Deneris, Pablo Bermejo, Paolo Braccia, Lukasz Cincio, and M. Cerezo

Phys. Rev. A **112**, 062619 (2025) - Published 18 December, 2025

Quantum-classical computing for time-dependent ion-atom collision dynamics: Applications to charge-transfer cross-section simulations

Minchen Qiao and Yu-xi Liu

Phys. Rev. A **112**, 062620 (2025) - Published 18 December, 2025

Rotation errors due to field quantization for simultaneously driven atoms

Hunter Lindemann, Shanon Vuglar, and Julio Gea-Banacloche

Phys. Rev. A **112**, 062621 (2025) - Published 18 December, 2025

Supersensitive noise sensing based on high-spin systems

Yangyang Lv, Wen Yang, and Qijun Zhi

Phys. Rev. A **112**, 062622 (2025) - Published 19 December, 2025

Atomic and molecular structure and dynamics; high-precision experiments

Test of charge-conjugation symmetry via microwave spectroscopy of positronium

R. J. Daly, K. P. Habdas, D. M. Newson, J. Pérez-Ríos, R. E. Sheldon, and D. B. Cassidy

Phys. Rev. A **112**, 062801 (2025) - Published 1 December, 2025

Ab initio multiconfigurational calculations of experimentally significant energy levels and transition rates in Lr I $(Z = 103)$

Joseph S. Andrews, Andrey I. Bondarev, Per Jönsson, Jon Grumer, Sebastian Raeder, Stephan Fritzsche, and Jacek Bieroń

Phys. Rev. A **112**, 062802 (2025) - Published 1 December, 2025

Extension of the simplified model and its application to mutual neutralization processes in collisions with oxygen cations

Ya. V. Voronov, S. A. Yakovleva, and A. K. Belyaev

Phys. Rev. A **112**, 062803 (2025) - Published 1 December, 2025

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Variational studies of the rovibrational spectra of DT^+ and T_2^+ ions

D. T. Aznabayev, D. B. Zhomartova, A. K. Bekbaev, and Vladimir I. Korobov

Phys. Rev. A **112**, 062804 (2025) - Published 2 December, 2025

Resonance transitions in electron-impact ionization of CF_4 studied by angle-resolved $(e, e + \mathrm{ion})$ spectroscopy

Noboru Watanabe and Masahiko Takahashi

Phys. Rev. A **112**, 062805 (2025) - Published 2 December, 2025

Two-loop electron self-energy in the bound-electron factor: Diagrams in momentum-coordinate representation

V. A. Yerokhin, B. Sikora, Z. Harman, and C. H. Keitel

Phys. Rev. A **112**, 062806 (2025) - Published 2 December, 2025

Modulation transfer spectroscopy and isotope shifts of the transition of ytterbium

Meng Gu, Konrad Koenigsmann, Jin Yang, and Peter Schauss

Phys. Rev. A **112**, 062807 (2025) - Published 3 December, 2025

Confined variational method applied to low-energy electron-lithium collisions

Xian-Jun Li, Deng-Xin Zhao, Meng-Shan Wu, Jun Jiang, Zong-Chao Yan, Kalman Varga, and Jun-Yi Zhang

Phys. Rev. A **112**, 062808 (2025) - Published 4 December, 2025

Triplet-state transitions in beryllium: Accurate energies and oscillator strengths

Saeed Nasiri, Ludwik Adamowicz, and Sergiy Bubin

Phys. Rev. A **112**, 062809 (2025) - Published 4 December, 2025

Calculation of cross sections for electron scattering on Li_2

Haadi Umer, Liam H. Scarlett, Adam J. C. Singor, Igor Bray, Mark C. Zammit, and Dmitry V. Fursa

Phys. Rev. A **112**, 062810 (2025) - Published 8 December, 2025

QED calculations of intra-L-shell doubly excited states in Be-like ions

A. V. Malyshev, Y. S. Kozhedub, V. M. Shabaev, and I. I. Tupitsyn

Phys. Rev. A **112**, 062811 (2025) - Published 9 December, 2025

Comparative classical and quantal study of the HeNa^+ and HeK^+ three-body association

Ricardo Manuel García-Vázquez, Thierry Stoecklin, and Philippe Halvick

Phys. Rev. A **112**, 062812 (2025) - Published 12 December, 2025

Two-loop vacuum polarization in a Coulomb field

S. A. Volkov, V. A. Yerokhin, Z. Harman, and C. H. Keitel

Phys. Rev. A **112**, 062814 (2025) - Published 15 December, 2025

High-precision EUV spectroscopy of the $2s2p\ {}^1P_1 - 2s^2\ {}^1S_0$ transition in Be-like S^{12+} and Cl^{13+}: Test of QED effects

X. P. Zhou, X. Liu, W. Q. Wen, Y. Yuan, H. K. Huang, Z. K. Huang, H. B. Wang, M. Y. Wan, J. Xiao, Y. S. Kozhedub, A. V. Malyshev, V. M. Shabaev, J. G. Li, S. F. Zhang, and X. Ma

Phys. Rev. A **112**, 062815 (2025) - Published 15 December, 2025

Experimental observation of quantum interferences in $\mathrm{CO{-}H}_2$ rotational energy transfer at room temperature

Hamza Labiad, Alexandre Faure, and Ian R. Sims

Phys. Rev. A **112**, 062816 (2025) - Published 15 December, 2025

Electron-impact fragmentation dynamics of carbonyl sulfide: A combined experimental and theoretical study

Soumya Ghosh, Narayan Kundu, Aryya Ghosh, and Dhananjay Nandi

Phys. Rev. A **112**, 062817 (2025) - Published 15 December, 2025

Elastic and spin-changing cross sections of spin-polarized atomic tritium

M. G. Elliott and B. J. P. Jones

Phys. Rev. A **112**, 062818 (2025) - Published 17 December, 2025

Ab initio correlated calculations without finite-basis-set error: Numerically precise all-electron random-phase-approximation correlation energies for diatomic molecules

Hao Peng and Xinguo Ren

Phys. Rev. A **112**, 062819 (2025) - Published 17 December, 2025

Feshbach resonances in predissociated states of excited ozone

V. Tyuterev, V. Kokoouline, O. Egorov, S. Vasilchenko, A. Solodov, T. Rigault, D. Mondelain, and A. Campargue

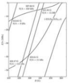
Phys. Rev. A **112**, 062820 (2025) - Published 17 December, 2025

EDITORS' SUGGESTION

Formation of ultracold $^{39}\mathrm{K}\,^{133}\mathrm{Cs}$ Feshbach molecules

Charly Beulenkamp, Krzysztof P. Zamarski, Robert C. Bird, C. Ruth Le Sueur, Jeremy M. Hutson, Manuele Landini, and Hanns-Christoph Nägerl

Phys. Rev. A **112**, 062821 (2025) - Published 22 December, 2025



The authors report the creation of an ultracold gas of bosonic $^{39}\mathrm{K}\,^{133}\mathrm{Cs}$ molecules via magnetoassociation across an interspecies Feshbach resonance, providing the necessary starting conditions for the creation of ground-state molecules. They also perform Feshbach spectroscopy to observe several new resonances.

Fragmentation of $\mathrm{CO_2}^{2+}$ into $\mathrm{C}^+ + \mathrm{O}^+ + \mathrm{O}$ in collisions with 1 MeV/u C^{4+} ions

Mingliang Duan, Zhencen He, Zhuohang He, Baoren Wei, and Zhimin Hu

Phys. Rev. A **112**, 062822 (2025) - Published 23 December, 2025

Diffraction by circular and triangular apertures as a diagnostic tool of twisted matter waves

M. Maksimov, N. Borodin, D. Kargina, D. Naumov, and D. Karlovets

Phys. Rev. A **112**, 062823 (2025) - Published 23 December, 2025

Light-induced processes in atomic-scale systems

Microscopic analysis of above-threshold ionization driven by squeezed light

J. Rivera-Dean, P. Stammer, C. Figueira de Morisson Faria, and M. Lewenstein

Phys. Rev. A **112**, 063101 (2025) - Published 1 December, 2025

Impact of electron correlation on photoelectron angular distributions in sequential double photoionization of Ne^+

Holly Lavery, Andrew C. Brown, and Hugo W. van der Hart

Phys. Rev. A **112**, 063102 (2025) - Published 1 December, 2025

High-fidelity individual addressing of single atoms in quantum registers at three-photon laser excitation of Rydberg states

N. N. Bezuglov, I. I. Beterov, A. Cinins, K. Miculis, V. M. Entin, P. I. Betleni, G. Suliman, V. V. Gromyko, D. B. Tretyakov, E. A. Yakshina, and I. I. Ryabtsev

Phys. Rev. A **112**, 063103 (2025) - Published 1 December, 2025

Attosecond time delays at Cooper minima in valence-shell photoionization of alkali-metal and alkaline-earth-metal atoms

Adam J. C. Singor, Dmitry V. Fursa, Igor Bray, and Anatoli S. Kheifets

Phys. Rev. A **112**, 063104 (2025) - Published 1 December, 2025

Influence of electron-wave-packet amplitude and phase modulations on photoelectron angular distributions in strong-field ionization

Zheming Zhou, Yongkun Chen, Yang Li, Yidian Tian, Peipei Ge, Yueming Zhou, and Peixiang Lu

Phys. Rev. A **112**, 063105 (2025) - Published 2 December, 2025

Magic wavelengths for optical clock transitions in $^{85}\mathrm{Rb}$, $^{133}\mathrm{Cs}$, and $^{223}\mathrm{Fr}$ in visible-near-infrared spectrum

Jyoti, Mandeep Kaur, Tiantian Shi, and Jingbiao Chen

Phys. Rev. A **112**, 063106 (2025) - Published 3 December, 2025

Long-wavelength reshaping of the high-order harmonic spectrum generated by an intense multicycle near-IR field in gas

B. V. Rumiantsev, A. V. Pushkin, P. A. Shulyndin, E. A. Migal, and F. V. Potemkin

Phys. Rev. A **112**, 063107 (2025) - Published 5 December, 2025

Splitting of the three-body Förster resonance in Rb Rydberg atoms as a measure of the dipole-dipole interaction strength

I. I. Ryabtsev, I. N. Ashkarin, I. I. Beterov, D. B. Tretyakov, E. A. Yakshina, V. M. Entin, and P. Cheinet

Phys. Rev. A **112**, 063108 (2025) - Published 8 December, 2025

High-order harmonic generation with orbital angular momentum beams: Beyond-dipole corrections

Esra Ilke Albar, Valeriia P. Kosheleva, Heiko Appel, Angel Rubio, and Franco P. Bonafé

Phys. Rev. A **112**, 063109 (2025) - Published 10 December, 2025

Adiabatic cooling of planar motion in a Penning-trap ion crystal to sub-millikelvin temperatures

Wes Johnson, Bryce Bullock, Athreya Shankar, John Zaris, John J. Bollinger, and Scott E. Parker

Phys. Rev. A **112**, 063110 (2025) - Published 11 December, 2025

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Asymmetric dissociation of ammonia molecules in a phase-controlled two-color laser field

Yupeng Liu, Peipei Ge, Yang Liu, Xueqing Duan, Zichen Li, Weibin Liu, Qinxian Su, Min Li, and Peixiang Lu

Phys. Rev. A **112**, 063111 (2025) - Published 12 December, 2025

Chirped magneto-optical trap of molybdenum

Sai Naga Manoj Paladugu, Nickolas Pilgram, Stephen Eckel, and Eric Norrgard

Phys. Rev. A **112**, 063112 (2025) - Published 12 December, 2025

Quantitative fine-structure-level study of direct-double-Auger-decay effects on level population evolution in krypton under ultrafast x-ray irradiation

Jie Yan, Cheng Gao, Yongjun Li, Chongyang Chen, Jiaolong Zeng, and Jianmin Yuan

Phys. Rev. A **112**, 063113 (2025) - Published 15 December, 2025

Nondissociative and dissociative ionization of CO^+ in intense ultrashort laser pulses

B. Gaire, K. J. Betsch, Nora G. Kling, M. Zohrabi, Bethany Jochim, T. Severt, S. Roland, K. D. Carnes, and I. Ben-Itzhak

Phys. Rev. A **112**, 063114 (2025) - Published 18 December, 2025

Coulomb crystallization of highly charged Ni^{12+} ions in a linear Paul trap

Shao-Long Chen, Zhi-qiang Zhou, Guo-sheng Zhang, Jun Xiao, Yao Huang, Ke-Lin Gao, and Hua Guan

Phys. Rev. A **112**, 063115 (2025) - Published 19 December, 2025

Complete suppression of the nondipole drift effect in high-order harmonic generation

Hailang Wei, Xiaosong Zhu, Pengfei Lan, and Peixiang Lu

Phys. Rev. A **112**, 063116 (2025) - Published 19 December, 2025

Ultrafast dynamics of O_2^+ in the $\mathrm{a}^4\Pi_u$ and $3^2\Pi_u$ states by pump-probe measurements using few-cycle near-infrared laser pulses and high-order harmonics

Kana Yamada, Toshiaki Ando, Atsushi Iwasaki, and Kaoru Yamanouchi

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FEATURED IN PHYSICS EDITORS' SUGGESTION

Laser-induced Coulomb explosion dynamics of H_2 molecules in helium nanodroplets

Zhengjun Ye, Jiaxuan Chen, Ruolin Gong, Menghang Shi, Zhejun Jiang, Chenxu Lu, Yue Hu, Xinglei Long, Wenbin Zhang, and Jian Wu

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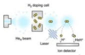

The authors report experimental results on the Coulomb explosion of H_2 molecules inside helium nanodroplets using ion-ion coincidence analysis. The study provides insights into the translation, dissociation, and solvation processes of light impurities in a quantum liquid, underscoring the critical role of droplet size in shaping fragment kinetics during these processes.

Ultracold systems and matter waves

Observable Efimov resonances in light-light-heavy systems

Karim I. Elghazawy and Chris H. Greene

Phys. Rev. A **112**, 063301 (2025) - Published 1 December, 2025

Refermionized theory of the edge modes of a fractional quantum Hall cloud

Alberto Nardin and Iacopo Carusotto

Phys. Rev. A **112**, 063302 (2025) - Published 1 December, 2025

Parametric excitations in a harmonically trapped binary Bose-Einstein condensate

Meiling Wang, Juan Wang, Yan Li, Franco Dalfovo, and Chunlei Qu

Phys. Rev. A **112**, 063303 (2025) - Published 1 December, 2025

Dynamics of vortices in uniform Bose quantum liquids

Shiyi Wang, Liang Duan, Liangwei Dong, and Zhan-Ying Yang

Phys. Rev. A **112**, 063304 (2025) - Published 2 December, 2025

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Sebastian Wüster, Joy Cree, and Matthew J. Davis

Phys. Rev. A **112**, 063305 (2025) - Published 4 December, 2025

Magneto-optical trap of silver and potassium atoms

Michael Vayninger, Angela Xiang, Nachiket D. Bhanushali, Xiaoyu Chen, Mohit Verma, Shaozhen Yang, Rohan T. Kapur, David DeMille, and Zoe Z. Yan

Phys. Rev. A **112**, 063306 (2025) - Published 8 December, 2025

Critical exponent of dynamical quantum phase transitions in the one-dimensional Bose-Hubbard model in the strongly interacting limit

Jia Li (李佳) and Yajiang Hao (郝亚江)

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