PHYSICAL REVIEW B™

For editorial and subscription correspondence, please see inside front cover
(ISSN: 2469-9950)

PERIODICALS
Postmaster send address changes to:

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

THIRD SERIES, VOLUME 99, NUMBER 22 *CONTENTS* **JUNE 2019-1(II)**

RAPID COMMUNICATIONS

Structure, structural phase transitions, mechanical properties, defects

Reactivity of lithium and platinum at elevated densities *(5 pages)* . . . . . 220101(R)
Jack Binns, Miriam Marqués, Philip Dalladay-Simpson, Robin Turnbull, Mungo Frost, Eugene Gregoryanz, and Ross T. Howie

Flat lensing by graded line meta-arrays *(5 pages)* . . . . . 220102(R)
Gregory J. Chaplain and Richard V. Craster

Inhomogeneous, disordered, and partially ordered systems

Exact solution of a percolation analog for the many-body localization transition *(5 pages)* . . . . . 220201(R)
Sthitadhi Roy, David E. Logan, and J. T. Chalker

Dynamics, dynamical systems, lattice effects:

Active Willis metamaterials for ultracompact nonreciprocal linear acoustic devices *(6 pages)* . . . . . 220301(R)
Yuxin Zhai, Hyung-Suk Kwon, and Bogdan-Ioan Popa

Optical control of vibrational coherence triggered by an ultrafast phase transition *(5 pages)* . . . . . 220302(R)
M. J. Neugebauer, T. Huber, M. Savoini, E. Abreu, V. Esposito, M. Kubli, L. Rettig, E. Bothschafter, S. Grübel, T. Kubacka, J. Rittmann, G. Ingold, P. Beaud, D. Dominko, J. Demsar, and S. L. Johnson

℘ Discrete time quasicrystals *(6 pages)* . . . . . 220303(R)
Krzysztof Giergiel, Arkadiusz Kuroś, and Krzysztof Sacha

Multiphonon anharmonicity of MgO *(5 pages)* . . . . . 220304(R)
Paola Giura, Lorenzo Paulatto, Fei He, Ricardo P. S. M. Lobo, Alexei Bosak, Eugenio Calandrini, Luigi Paolasini, and Daniele Antonangeli

Magnetism

Theoretical prediction of Weyl fermions in the paramagnetic electride Y_2C *(6 pages)* . . . . . 220401(R)
Liangliang Liu, Chongze Wang, Seho Yi, Dou Kyun Kim, Chul Hong Park, and Jun-Hyung Cho

Incoherent spin pumping from YIG single crystals *(5 pages)* . . . . . 220402(R)
Y. S. Chen, J. G. Lin, S. Y. Huang, and C. L. Chien

Empirical way for finding new uranium-based heavy-fermion materials *(7 pages)* . . . . . 220403(R)
E. Svanidze, A. Amon, R. Borth, Y. Prots, M. Schmidt, M. Nicklas, A. Leithe-Jasper, and Yu. Grin

Copyright 2019 by American Physical Society

(Continued)

2469-9950(20190601)99:22;1-E

℘ The editors and referees of PRB find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. B 77, 130001 (2008).

PHYSICAL REVIEW B THIRD SERIES, VOLUME 99, NUMBER 22 JUNE 2019-1(II)

Two-dimensional ordering and collective magnetic excitations in the dilute ferromagnetic topological insulator $(Bi_{0.95}Mn_{0.05})_2Te_3$ *(5 pages)* . . . . . 220404(R)
David Vaknin, Daniel M. Pajerowski, Deborah L. Schlagel, Kevin W. Dennis, and Robert J. McQueeney

Intrinsic spin currents in ferromagnets *(5 pages)* . . . . . 220405(R)
V. P. Amin, Junwen Li, M. D. Stiles, and P. M. Haney

Itinerant ferromagnetism in *p*-doped monolayers of MoS_2 *(6 pages)* . . . . . 220406(R)
Yuqiang Gao, Nirmal Ganguli, and Paul J. Kelly

Superfluidity and superconductivity

Vortex-induced quantum metallicity in the mono-unit-layer superconductor $NbSe_2$ *(7 pages)* . . . . . 220501(R)
Satoru Ichinokura, Yuki Nakata, Katsuaki Sugawara, Yukihiro Endo, Akari Takayama, Takashi Takahashi, and Shuji Hasegawa

Superconductivity in sodalite-like yttrium hydride clathrates *(6 pages)* . . . . . 220502(R)
Christoph Heil, Simone di Cataldo, Giovanni B. Bachelet, and Lilia Boeri

Superconductivity in the van der Waals layered compound PS_2 *(6 pages)* . . . . . 220503(R)
Yan-Ling Li, Elissaios Stavrou, Qiang Zhu, Samantha M. Clarke, Yunguo Li, and Hong-Mei Huang

Broadband microwave spectroscopy of semiconductor nanowire-based Cooper-pair transistors *(6 pages)* . . . . . 220504(R)
Alex Proutski, Dominique Laroche, Bas van 't Hooft, Peter Krogstrup, Jesper Nygård, Leo P. Kouwenhoven, and Attila Geresdi

Quantum dynamics of hydrogen in the iron-based superconductor $LaFeAsO_{0.9}D_{0.1}$ measured with inelastic neutron spectroscopy *(6 pages)* . . . . . 220505(R)
Jun-ichi Yamaura, Haruhiro Hiraka, Soshi Iimura, Yoshinori Muraba, Joonho Bang, Kazuhiko Ikeuchi, Mitsutaka Nakamura, Yasuhiro Inamura, Takashi Honda, Masatoshi Hiraishi, Kenji M. Kojima, Ryosuke Kadono, Yoshio Kuramoto, Youichi Murakami, Satoru Matsuishi, and Hideo Hosono

Topological superconductivity in planar Josephson junctions: Narrowing down to the nanowire limit *(7 pages)* . . . . . 220506(R)
F. Setiawan, Ady Stern, and Erez Berg

Identification of superconducting pairing symmetry in twisted bilayer graphene using in-plane magnetic field and strain *(6 pages)* . . . . . 220507(R)
Fengcheng Wu and Sankar Das Sarma

Antichiral and nematicity-wave superconductivity *(5 pages)* . . . . . 220508(R)
Mats Barkman, Alexander A. Zyuzin, and Egor Babaev

ARTICLES

Structure, structural phase transitions, mechanical properties, defects

Scale-invariant avalanche dynamics in the temperature-driven martensitic transition of a Cu-Al-Be single crystal *(7 pages)* 224101
Francisco Javier Romero, José-María Martín-Olalla, María Carmen Gallardo, Daniel Soto-Parra, Ekhard K. H. Salje, Eduard Vives, and Antoni Planes

(Continued)

The editors and referees of PRB find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. B 77, 130001 (2008).

PHYSICAL REVIEW B THIRD SERIES, VOLUME 99, NUMBER 22 JUNE 2019-1(II)

Elastic anisotropy and single-crystal moduli of solid argon up to 64 GPa from time-domain Brillouin scattering *(10 pages)* 224102
Samuel Raetz, Maju Kuriakose, Philippe Djemia, Sergey M. Nikitin, Nikolay Chigarev, Vincent Tournat, Alain Bulou, Alexey Lomonosov, Vitalyi E. Gusev, and Andreas Zerr

First-principles prediction of switchable metallic ferroelectricity in multiferroic tunnel junctions *(6 pages)* 224103
L. N. Jiang, W. Z. Chen, B. S. Yang, X.-G. Zhang, Yun-Peng Wang, and X. F. Han

Subwavelength multiple topological interface states in one-dimensional labyrinthine acoustic metamaterials *(9 pages)* 224104
Zhiwang Zhang, Ying Cheng, Xiaojun Liu, and Johan Christensen

Nature of the structural symmetries associated with hybrid improper ferroelectricity in $Ca_3X_2O_7$ (X = Mn and Ti) *(10 pages)* 224105
S. Liu, H. Zhang, S. Ghose, M. Balasubramanian, Zhenxian Liu, S. G. Wang, Y.-S. Chen, B. Gao, Jaewook Kim, S.-W. Cheong, and T. A. Tyson

Inhomogeneous, disordered, and partially ordered systems

Helical transport in coupled resonator waveguides *(13 pages)* 224201
JungYun Han, Clemens Gneiting, and Daniel Leykam

Energy level dynamics across the many-body localization transition *(12 pages)* 224202
Artur Maksymov, Piotr Sierant, and Jakub Zakrzewski

Many-body localization in the presence of long-range interactions and long-range hopping *(13 pages)* 224203
Sabyasachi Nag and Arti Garg

Transport, multifractality, and the breakdown of single-parameter scaling at the localization transition in quasiperiodic systems *(10 pages)* 224204
Jagannath Sutradhar, Subroto Mukerjee, Rahul Pandit, and Sumilan Banerjee

Renormalization-group study of the many-body localization transition in one dimension *(9 pages)* 224205
Alan Morningstar and David A. Huse

Relaxation dynamics induced in glasses by absorption of hard x-ray photons *(6 pages)* 224206
G. Pintori, G. Baldi, B. Ruta, and G. Monaco

Electrical and magnetic properties of thin films of the spin-filter material CrVTiAl *(8 pages)* 224207
Gregory M. Stephen, Christopher Lane, Gianina Buda, David Graf, Stanislaw Kaprzyk, Bernardo Barbiellini, Arun Bansil, and Don Heiman

Robustness of delocalization to the inclusion of soft constraints in long-range random models *(14 pages)* 224208
P. A. Nosov and I. M. Khaymovich

Mobility edge of two interacting particles in three-dimensional random potentials *(5 pages)* 224209
Filippo Stellin and Giuliano Orso

Dynamics, dynamical systems, lattice effects:

Incorporating decoherence into solid-state time-dependent density functional theory *(14 pages)* 224301
Isabella Floss, Christoph Lemell, Kazuhiro Yabana, and Joachim Burgdörfer

Mechanism of macroscopic equilibration of isolated quantum systems *(8 pages)* 224302
Anatoly Dymarsky

(Continued)

The editors and referees of PRB find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. B 77, 130001 (2008).

PHYSICAL REVIEW B THIRD SERIES, VOLUME 99, NUMBER 22 JUNE 2019-1(II)

Nonadiabatic molecular dynamics with decoherence and detailed balance under a density matrix ensemble formalism *(8 pages)* 224303
Jun Kang and Lin-Wang Wang

Lithium diffusion in Li_2X (X = O, S, and Se): *Ab initio* simulations and inelastic neutron scattering measurements *(13 pages)* 224304
M. K. Gupta, Baltej Singh, Prabhatasree Goel, R. Mittal, S. Rols, and S. L. Chaplot

Universal scrambling in gapless quantum spin chains *(11 pages)* 224305
Shunsuke Nakamura, Eiki Iyoda, Tetsuo Deguchi, and Takahiro Sagawa

Two-stroke optimization scheme for mesoscopic refrigerators *(16 pages)* 224306
Paul Menczel, Tuomas Pyhäranta, Christian Flindt, and Kay Brandner

Unitary-projective entanglement dynamics *(16 pages)* 224307
Amos Chan, Rahul M. Nandkishore, Michael Pretko, and Graeme Smith

Magnetism

Magnetic states of Ni-Mn-Sn based shape memory alloy: A combined muon spin relaxation and neutron diffraction study *(9 pages)* 224401
J. Sannigrahi, S. Pramanick, S. Chatterjee, J. S. Lord, D. Khalyavin, A. D. Hillier, D. T. Adroja, and S. Majumdar

Elementary excitations in the ordered phase of spin-$\frac{1}{2}$ J_1–J_2 model on square lattice *(8 pages)* 224402
A. V. Syromyatnikov and A. Yu. Aktersky

Towards artificial Ising spin glasses: Thermal ordering in randomized arrays of Ising-type nanomagnets *(7 pages)* 224403
Michael Saccone, Andreas Scholl, Sven Velten, Scott Dhuey, Kevin Hofhuis, Clemens Wuth, Yen-Lin Huang, Zuhuang Chen, Rajesh V. Chopdekar, and Alan Farhan

Magnetic structure and high-field magnetization of the distorted kagome lattice antiferromagnet $Cs_2Cu_3SnF_{12}$ *(12 pages)* 224404
K. Matan, T. Ono, G. Gitgeatpong, K. de Roos, P. Miao, S. Torii, T. Kamiyama, A. Miyata, A. Matsuo, K. Kindo, S. Takeyama, Y. Nambu, P. Piyawongwatthana, T. J. Sato, and H. Tanaka

Magnetism tailored by mechanical strain engineering in $PrVO_3$ thin films *(11 pages)* 224405
D. Kumar, A. David, A. Fouchet, A. Pautrat, J. Varignon, C. U. Jung, U. Lüders, B. Domengès, O. Copie, P. Ghosez, and W. Prellier

Dynamics of bimeron skyrmions in easy-plane magnets induced by a spin supercurrent *(7 pages)* 224406
Se Kwon Kim

Upper branch magnetism in quantum magnets: Collapses of excited levels and emergent selection rules *(9 pages)* 224407
Changle Liu, Fei-Ye Li, and Gang Chen

Thermally induced monochromatic microwave generation in magnon polaritons *(8 pages)* 224408
Vahram L. Grigoryan and Ke Xia

Impact of off-diagonal exchange interactions on the Kitaev spin-liquid state of α-$RuCl_3$ *(8 pages)* 224409
Daichi Takikawa and Satoshi Fujimoto

(Continued)

The editors and referees of PRB find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. B 77, 130001 (2008).

PHYSICAL REVIEW B **THIRD SERIES, VOLUME 99, NUMBER 22** **JUNE 2019-1(II)**

Interfacial spin Seebeck effect in noncollinear magnetic systems *(5 pages)* 224410
Benedetta Flebus, Yaroslav Tserkovnyak, and Gregory A. Fiete

Comprehensive magnetic phase diagrams of the polar metal $Ca_3(Ru_{0.95}Fe_{0.05})_2O_7$ *(9 pages)* 224411
Shiming Lei, Shalinee Chikara, Danilo Puggioni, Jin Peng, Mengze Zhu, Mingqiang Gu, Weiwei Zhao, Yu Wang, Yakun Yuan, Hirofumi Akamatsu, Moses H. W. Chan, Xianglin Ke, Zhiqiang Mao, James M. Rondinelli, Marcelo Jaime, John Singleton, Franziska Weickert, Vivien S. Zapf, and Venkatraman Gopalan

Exchange interactions from a nonorthogonal basis set: From bulk ferromagnets to the magnetism in low-dimensional graphene systems *(12 pages)* 224412
László Oroszlány, Jaime Ferrer, András Deák, László Udvardi, and László Szunyogh

Magnetoplasmonic properties of Ag-Co composite nanohole arrays *(8 pages)* 224413
Hoang Mai Luong, Minh Thien Pham, Bin Ai, Tho Duc Nguyen, and Yiping Zhao

Spirit: Multifunctional framework for atomistic spin simulations *(16 pages)* 224414
Gideon P. Müller, Markus Hoffmann, Constantin Dißelkamp, Daniel Schürhoff, Stefanos Mavros, Moritz Sallermann, Nikolai S. Kiselev, Hannes Jónsson, and Stefan Blügel

Spin transparency for the interface of an ultrathin magnet within the spin dephasing length *(9 pages)* 224415
Kyoung-Whan Kim

Charge-induced ferromagnetic phase transition and anomalous Hall effect in full d-band nonmagnetic metals *(6 pages)* 224416
Lei Wang (王蕾), X. R. Wang, Tai Min, and Ke Xia

Sign change of polarization rotation under time or space inversion in magnetoelectric $YbAl_3(BO_3)_4$ *(10 pages)* 224417
A. M. Kuzmenko, V. Dziom, A. Shuvaev, Anna Pimenov, D. Szaller, A. A. Mukhin, V. Yu. Ivanov, and A. Pimenov

Ground state and low-energy excitations of the Kitaev-Heisenberg two-leg ladder *(11 pages)* 224418
Cliò Efthimia Agrapidis, Jeroen van den Brink, and Satoshi Nishimoto

Measurements related to the magnetism of curium metal *(8 pages)* 224419
G. H. Lander, J.-C. Griveau, R. Eloirdi, N. Magnani, E. Colineau, F. Wilhelm, S. D. Brown, D. Wermeille, A. Rogalev, R. G. Haire, and R. Caciuffo

Chemical composition induced quantum phase transition in $Cs_{1-x}Rb_xFeCl_3$ *(6 pages)* 224420
S. Hayashida, L. Stoppel, Z. Yan, S. Gvasaliya, A. Podlesnyak, and A. Zheludev

Off-resonant all-optical switching dynamics in a ferromagnetic model system *(11 pages)* 224421
Christiane Scholl, Svenja Vollmar, and Hans Christian Schneider

Microscopic spinon-chargon theory of magnetic polarons in the t-J model *(14 pages)* 224422
Fabian Grusdt, Annabelle Bohrdt, and Eugene Demler

Field-induced incommensurate ordering in Heisenberg chains coupled by Ising interaction: Model for ytterbium aluminum perovskite $YbAlO_3$ *(9 pages)* 224423
Cliò Efthimia Agrapidis, Jeroen van den Brink, and Satoshi Nishimoto

Quantum Griffiths phase near an antiferromagnetic quantum critical point: Muon spin relaxation study of $Ce(Cu_{1-x}Co_x)_2Ge_2$ *(8 pages)* 224424
Rajesh Tripathi, Debarchan Das, P. K. Biswas, D. T. Adroja, A. D. Hillier, and Z. Hossain

(Continued)

The editors and referees of PRB find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. B 77, 130001 (2008).

PHYSICAL REVIEW B THIRD SERIES, VOLUME 99, NUMBER 22 JUNE 2019-1(II)

Multiple symmetry sustaining phase transitions in spin ice *(14 pages)* 224425
V. Raban, C. T. Suen, L. Berthier, and P. C. W. Holdsworth

Spin injection and pumping generated by a direct current flowing through a magnetic tunnel junction *(10 pages)* 224426
A. I. Nikitchenko and N. A. Pertsev

Tunnel spin polarization of Fe/MgO/Si contacts reaching 90% with increasing MgO thickness *(11 pages)* 224427
A. Spiesser, H. Saito, S. Yuasa, and R. Jansen

Low-temperature thermal conductivity and magnetic transitions of the kagome-staircase compound $Ni_3V_2O_8$ *(8 pages)* 224428
Z. Y. Zhao, Q. J. Li, X. G. Liu, X. Rao, H. L. Che, L. G. Chu, Z. Z. He, X. Zhao, and X. F. Sun

Order and disorder in the magnetization of the chiral crystal $CrNb_3S_6$ *(11 pages)* 224429
Gary W. Paterson, Tsukasa Koyama, Misako Shinozaki, Yusuke Masaki, Francisco J. T. Goncalves, Yusuke Shimamoto, Tadayuki Sogo, Magnus Nord, Yusuke Kousaka, Yusuke Kato, Stephen McVitie, and Yoshihiko Togawa

Orientation-dependent current-induced motion of skyrmions with various topologies *(6 pages)* 224430
Markus Weißenhofer and Ulrich Nowak

Magnetoelastic excitation spectrum in the rare-earth pyrochlore $Tb_2Ti_2O_7$ *(14 pages)* 224431
M. Ruminy, S. Guitteny, J. Robert, L.-P. Regnault, M. Boehm, P. Steffens, H. Mutka, J. Ollivier, U. Stuhr, J. S. White, B. Roessli, L. Bovo, C. Decorse, M. K. Haas, R. J. Cava, I. Mirebeau, M. Kenzelmann, S. Petit, and T. Fennell

Dissipative quantum Ising chain as a non-Hermitian Ashkin-Teller model *(8 pages)* 224432
Naoyuki Shibata and Hosho Katsura

Topological spin Hall effects and tunable skyrmion Hall effects in uniaxial antiferromagnetic insulators *(10 pages)* 224433
Matthew W. Daniels, Weichao Yu (余伟超), Ran Cheng, Jiang Xiao (萧江), and Di Xiao

Quasidegenerate ice manifold in a purely two-dimensional square array of nanomagnets *(8 pages)* 224434
Yann Perrin, Benjamin Canals, and Nicolas Rougemaille

Superfluidity and superconductivity

Inviscid diffusion of vorticity in low-temperature superfluid helium *(6 pages)* 224501
E. Rickinson, N. G. Parker, A. W. Baggaley, and C. F. Barenghi

Reduced density matrix functional theory for superconductors *(16 pages)* 224502
Jonathan Schmidt, Carlos L. Benavides-Riveros, and Miguel A. L. Marques

Optical conductivity of granular aluminum films near the Mott metal-to-insulator transition *(7 pages)* 224503
Aviv Glezer Moshe, Eli Farber, and Guy Deutscher

Synthesis and stability of tantalum hydride at high pressures *(6 pages)* 224504
Jianjun Ying, Xue Li, Eran Greenberg, Vitali B. Prakapenka, Hanyu Liu, and Viktor V. Struzhkin

Superconductivity in monocrystalline $YNiSi_3$ and $LuNiSi_3$ *(14 pages)* 224505
Fabiana R. Arantes, Deisy Aristizábal-Giraldo, Daniel A. Mayoh, Yu Yamane, Chongli Yang, Martin R. Lees, Jorge M. Osorio-Guillén, Toshiro Takabatake, and Marcos A. Avila

(Continued)

The editors and referees of PRB find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. B 77, 130001 (2008).

PHYSICAL REVIEW B **THIRD SERIES, VOLUME 99, NUMBER 22** **JUNE 2019-1(II)**

Topological states in A15 superconductors *(5 pages)* 224506
Minsung Kim, Cai-Zhuang Wang, and Kai-Ming Ho

Magnetoelectric effects and spin switching phenomena at the interface of chiral domains in spin-triplet superconductors *(8 pages)* 224507
Alfonso Romano, Canio Noce, and Mario Cuoco

Singular ground state of multiband inhomogeneous superconductors *(5 pages)* 224508
Yu. N. Ovchinnikov and D. V. Efremov

Band structure of overdoped cuprate superconductors: Density functional theory matching experiments *(8 pages)* 224509
K. P. Kramer, M. Horio, S. S. Tsirkin, Y. Sassa, K. Hauser, C. E. Matt, D. Sutter, A. Chikina, N. B. M. Schröter, J. A. Krieger, T. Schmitt, V. N. Strocov, N. C. Plumb, M. Shi, S. Pyon, T. Takayama, H. Takagi, T. Adachi, T. Ohgi, T. Kawamata, Y. Koike, T. Kondo, O. J. Lipscombe, S. M. Hayden, M. Ishikado, H. Eisaki, T. Neupert, and J. Chang

Nonlinear optical response of collective modes in multiband superconductors assisted by nonmagnetic impurities *(15 pages)* 224510
Yuta Murotani and Ryo Shimano

Nonlinear electromagnetic response and Higgs-mode excitation in BCS superconductors with impurities *(16 pages)* 224511
Mikhail Silaev

Signatures of nonadiabatic superconductivity in lithium-decorated graphene *(7 pages)* 224512
Dominik Szczęśniak and Radosław Szczęśniak

Ferromagnetic resonance and magnetic precessions in φ_0 junctions *(8 pages)* 224513
Yu. M. Shukrinov, I. R. Rahmonov, and K. Sengupta

Influence of the symmetry of hybridization on the critical temperature of multiband superconductors *(10 pages)* 224514
Daniel Reyes, Nei Lopes, Mucio A. Continentino, and Christopher Thomas

Two pairing domes as Cu^{2+} varies to Cu^{3+} *(4 pages)* 224515
Thomas Maier, T. Berlijn, and D. J. Scalapino

Pseudogap and Fermi arcs in underdoped cuprates *(12 pages)* 224516
Chandra M. Varma

The editors and referees of PRB find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. B 77, 130001 (2008).