

ARTICLES

Structure, structural phase transitions, mechanical properties, defects

- Dynamic and structural stability of cubic vanadium nitride (*11 pages*) 054101
A. B. Mei, O. Hellman, N. Wireklint, C. M. Schlepütz, D. G. Sangiovanni, B. Alling, A. Rockett, L. Hultman, I. Petrov, and J. E. Greene
- Identification and mechanical control of ferroelastic domain structure in rhombohedral $\text{CaMn}_7\text{O}_{12}$ (*6 pages*) 054102
Renliang Yuan, Lian Duan, Xinyu Du, and Yuan Li
- Low-energy behavior of strongly interacting bosons on a flat-band lattice above the critical filling factor (*5 pages*) 054103
L. G. Phillips, G. De Chiara, P. Öhberg, and M. Valiente
- Velocity of domain-wall motion during polarization reversal in ferroelectric thin films:
Beyond Merz's Law (*7 pages*) 054104
Qingping Meng, Myung-Geun Han, Jing Tao, Guangyong Xu, David O. Welch, and Yimei Zhu
- Predicting low-thermal-conductivity Si-Ge nanowires with a modified cluster expansion method (*8 pages*) 054105
Jesper Kristensen and Nicholas J. Zabarar
- Plastic strain is a mixture of avalanches and quasireversible deformations: Study of various sizes (*7 pages*) 054106
Péter Szabó, Péter Dusán Ispánovity, and István Groma
- Phase stability and transition of BaSi_2 -type disilicides and digermanides (*5 pages*) 054107
Jian-Tao Wang, Changfeng Chen, and Yoshiyuki Kawazoe
- Slow relaxation of cascade-induced defects in Fe (*8 pages*) 054108
Laurent Karim Béland, Yuri N. Osetsky, Roger E. Stoller, and Haixuan Xu
- Reduced tight-binding models for elemental Si and N, and ordered binary Si-N systems (*18 pages*) 054109
J. Gehrman, D. G. Pettifor, A. N. Kolmogorov, M. Reese, M. Mrovec, C. Elsässer, and R. Drautz
- Anomalous temperature-induced volume contraction in GeTe (*8 pages*) 054110
Tapan Chatterji, C. M. N. Kumar, and Urszula D. Wdowik
- Measurement of the acoustic-to-optical phonon coupling in multicomponent systems (*6 pages*) 054111
Antonio Caretta, Michiel C. Donker, Diederik W. Perdok, Davood Abbaszadeh, Alexey O. Polyakov, Remco W. A. Havenith, Thomas T. M. Palstra, and Paul H. M. van Loosdrecht
- Structural and electronic properties of sodium clusters under confinement (*8 pages*) 054112
Balasaheb J. Nagare, Dilip G. Kanhere, and Sajeew Chacko



CONTENTS - *Continued*

PHYSICAL REVIEW B

THIRD SERIES, VOLUME 91, NUMBER 5

FEBRUARY 2015-1(I)

Thermal and nonthermal melting of silicon under femtosecond x-ray irradiation (<i>10 pages</i>)	054113
Nikita Medvedev, Zheng Li, and Beata Ziaja	
Inhomogeneous, disordered, and partially ordered systems	
Nonlinear XY and p -clock models on sparse random graphs: Mode-locking transition of localized waves (<i>12 pages</i>)	054201
Alessia Marruzzo and Luca Leuzzi	
Dynamics, dynamical systems, lattice effects:	
Nitrogen vacancy, self-interstitial diffusion, and Frenkel-pair formation/dissociation in $B1$ TiN studied by <i>ab initio</i> and classical molecular dynamics with optimized potentials (<i>17 pages</i>)	054301
D. G. Sangiovanni, B. Alling, P. Steneteg, L. Hultman, and I. A. Abrikosov	
 Enhanced performance of joint cooling and energy production (<i>8 pages</i>)	054302
O. Entin-Wohlman, Y. Imry, and A. Aharony	
Chimeras in SQUID metamaterials (<i>8 pages</i>)	054303
N. Lazarides, G. Neofotistos, and G. P. Tsironis	
First-principles calculations of phonon frequencies, lifetimes, and spectral functions from weak to strong anharmonicity: The example of palladium hydrides (<i>11 pages</i>)	054304
Lorenzo Paulatto, Ion Errea, Matteo Calandra, and Francesco Mauri	
Model for thermal conductivity in nanoporous silicon from atomistic simulations (<i>10 pages</i>)	054305
Riccardo Dettori, Claudio Melis, Xavier Cartoixa, Riccardo Rurali, and Luciano Colombo	
Dynamic trapping near a quantum critical point (<i>11 pages</i>)	054306
Michael Kolodrubetz, Emanuel Katz, and Anatoli Polkovnikov	
Magnetism	
Density-matrix renormalization group study of the extended Kitaev-Heisenberg model (<i>10 pages</i>)	054401
Kazuya Shinjo, Shigetoshi Sota, and Takami Tohyama	
Nonmagnetic ions enhance magnetic order in the ludwigite $\text{Co}_5\text{Sn}(\text{O}_2\text{BO}_3)_2$ (<i>8 pages</i>)	054402
Cynthia P. Contreras Medrano, D. C. Freitas, D. R. Sanchez, C. B. Pinheiro, G. G. Eslava, L. Ghivelder, and M. A. Continentino	
Phonon–spin scattering and magnetic heat transport in the quasi-one-dimensional spin- $\frac{1}{2}$ antiferromagnetic chain compound CuSb_2O_6 (<i>6 pages</i>)	054403
N. Prasai, A. Rebello, A. B. Christian, J. J. Neumeier, and J. L. Cohn	
Third-order effect in magnetic small-angle neutron scattering by a spatially inhomogeneous medium (<i>9 pages</i>)	054404
Konstantin L. Metlov and Andreas Michels	
Spin dynamics of the anisotropic spin-1 antiferromagnetic chain at finite magnetic fields (<i>7 pages</i>)	054405
Yousef Rahnavard and Wolfram Brenig	
Bosonic short-range entangled states beyond group cohomology classification (<i>7 pages</i>)	054406
Cenke Xu and Yi-Zhuang You	

(Continued)

CONTENTS - Continued

PHYSICAL REVIEW B

THIRD SERIES, VOLUME 91, NUMBER 5

FEBRUARY 2015-1(I)

Head-to-head domain wall structures in wide permalloy strips (5 pages)	054407
Virginia Estévez and Lasse Laurson	
Random dilution effects in the frustrated spin chain β -CaCr _{2-x} Sc _x O ₄ (9 pages)	054408
M. Songvilay, S. Petit, V. Hardy, J. P. Castellan, G. André, C. Martin, and F. Damay	
Quasi-two-dimensional $S = \frac{1}{2}$ magnetism of Cu[C ₆ H ₂ (COO) ₄][C ₂ H ₅ NH ₃] ₂ (9 pages)	054409
R. Nath, M. Padmanabhan, S. Baby, A. Thirumurugan, D. Ehlers, M. Hemmida, H.-A. Krug von Nidda, and A. A. Tsirlin	
Capturing of a magnetic skyrmion with a hole (10 pages)	054410
Jan Müller and Achim Rosch	
Variation of skyrmion forms and their stability in MnSi thin plates (7 pages)	054411
Xiuzhen Yu, Akiko Kikkawa, Daisuke Morikawa, Kiyoh Shibata, Yusuke Tokunaga, Yasujiro Taguchi, and Yoshinori Tokura	
Novel magnetic state in d^4 Mott insulators (8 pages)	054412
O. Nganba Meetei, William S. Cole, Mohit Randeria, and Nandini Trivedi	
Marshall-positive SU(N) quantum spin systems and classical loop models: A practical strategy to design sign-problem-free spin Hamiltonians (7 pages)	054413
Ribhu K. Kaul	
Magnetic field induced switching of the antiferromagnetic order parameter in thin films of magnetoelectric chromia (7 pages)	054414
Lorenzo Fallarino, Andreas Berger, and Christian Binek	
Diffuse magnetic neutron scattering in the highly frustrated double perovskite Ba ₂ YRuO ₆ (10 pages)	054415
Gøran. J. Nilsen, Corey M. Thompson, Georg Ehlers, Casey A. Marjerrison, and John E. Greedan	
Irreversible transformation of ferromagnetic ordered stripe domains in single-shot infrared-pump/resonant-x-ray-scattering-probe experiments (8 pages)	054416
Nicolas Bergeard, Stefan Schaffert, Víctor López-Flores, Nicolas Jaouen, Jan Geilhufe, Christian M. Günther, Michael Schneider, Catherine Graves, Tianhan Wang, Benny Wu, Andreas Scherz, Cédric Baumier, Renaud Delaunay, Franck Fortuna, Marina Tortarolo, Bharati Tudu, Oleg Krupin, Michael P. Minitti, Joe Robinson, William F. Schlotter, Joshua J. Turner, Jan Lüning, Stefan Eisebitt, and Christine Boeglin	
Large magnetochromism in multiferroic MnWO ₄ (4 pages)	054417
S. Toyoda, N. Abe, T. Arima, and S. Kimura	
Enhanced ferrimagnetism in auxetic NiFe ₂ O ₄ in the crossover to the ultrathin-film limit (7 pages)	054418
Michael Hoppe, Sven Döring, Mihaela Gorgoi, Stefan Cramm, and Martina Müller	
Simultaneous enhancements of polarization and magnetization in epitaxial Pb(Zr _{0.52} Ti _{0.48})O ₃ /La _{0.7} Sr _{0.3} MnO ₃ multiferroic heterostructures enabled by ultrathin CoFe ₂ O ₄ sandwich layers (13 pages)	054419
Devajyoti Mukherjee, Mahesh Hordagoda, Paula Lampen, Manh-Huong Phan, Hariharan Srikanth, Sarath Witanachchi, and Pritish Mukherjee	
Constrained density functional for noncollinear magnetism (11 pages)	054420
Pui-Wai Ma and S. L. Dudarev	
Synthesis and magnetic properties of double-perovskite oxide La ₂ MnFeO ₆ thin films (6 pages)	054421
K. Yoshimatsu, K. Nogami, K. Watarai, K. Horiba, H. Kumigashira, O. Sakata, T. Oshima, and A. Ohtomo	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW B

THIRD SERIES, VOLUME 91, NUMBER 5

FEBRUARY 2015-1(I)

Axial current driven by magnetization dynamics in Dirac semimetals (<i>5 pages</i>)	054422
Katsuhisa Taguchi and Yukio Tanaka	
Spin freezing in the spin-liquid compound FeAl_2O_4 (<i>5 pages</i>)	054423
Harikrishnan S. Nair, Ramesh Kumar K., and André M. Strydom	
Disorder from order among anisotropic next-nearest-neighbor Ising spin chains in SrHo_2O_4 (<i>9 pages</i>)	054424
J.-J. Wen, W. Tian, V. O. Garlea, S. M. Koohpayeh, T. M. McQueen, H.-F. Li, J.-Q. Yan, J. A. Rodriguez-Rivera, D. Vaknin, and C. L. Broholm	
Energy dissipation in single-domain ferromagnetic nanoparticles: Dynamical approach (<i>8 pages</i>)	054425
T. V. Lyutyy, S. I. Denisov, A. Yu. Peletskyi, and C. Binns	
Very large magnetoresistance in $\text{Fe}_{0.28}\text{TaS}_2$ single crystals (<i>7 pages</i>)	054426
Will J. Hardy, Chih-Wei Chen, A. Marcinkova, Heng Ji, Jairo Sinova, D. Natelson, and E. Morosan	
Superfluidity and superconductivity	
Pair breaking due to orbital magnetism in iron-based superconductors (<i>11 pages</i>)	054501
M. Hoyer, M. S. Scheurer, S. V. Syzranov, and J. Schmalian	
Emergent loop current order from pair density wave superconductivity (<i>10 pages</i>)	054502
D. F. Agterberg, Drew S. Melchert, and M. K. Kashyap	
Superfluidity of strongly correlated bosons in two- and three-dimensional traps (<i>7 pages</i>)	054503
T. Dornheim, A. Filinov, and M. Bonitz	
Chiral superconductivity in nematic states (<i>11 pages</i>)	054504
Shuhei Takamatsu and Youichi Yanase	
Measurement of the penetration depth and coherence length of MgB_2 in all directions using transmission electron microscopy (<i>10 pages</i>)	054505
J. C. Loudon, S. Yazdi, T. Kasama, N. D. Zhigadlo, and J. Karpinski	
Disordered graphene Josephson junctions (<i>9 pages</i>)	054506
W. A. Muñoz, L. Covaci, and F. M. Peeters	
Surface Majorana fermions and bulk collective modes in superfluid $^3\text{He-B}$ (<i>14 pages</i>)	054507
YeJe Park, Suk Bum Chung, and Joseph Maciejko	
Superconductivity in intercalated group-IV honeycomb structures (<i>6 pages</i>)	054508
José A. Flores-Livas and Antonio Sanna	
Pairing effects in the normal phase of a two-dimensional Fermi gas (<i>10 pages</i>)	054509
F. Marsiglio, P. Pieri, A. Perali, F. Palestini, and G. C. Strinati	
Exceptional suppression of flux-flow resistivity in $\text{FeSe}_{0.4}\text{Te}_{0.6}$ by back-flow from excess Fe atoms and Se/Te substitutions (<i>6 pages</i>)	054510
Tatsunori Okada, Fuyuki Nabeshima, Hideyuki Takahashi, Yoshinori Imai, and Atsutaka Maeda	
Universal V-shaped temperature-pressure phase diagram in the iron-based superconductors KFe_2As_2 , RbFe_2As_2 , and CsFe_2As_2 (<i>8 pages</i>)	054511
F. F. Tafti, A. Ouellet, A. Juneau-Fecteau, S. Faucher, M. Lapointe-Major, N. Doiron-Leyraud, A. F. Wang, X.-G. Luo, X. H. Chen, and Louis Taillefer	

(Continued)

CONTENTS - Continued

PHYSICAL REVIEW B

THIRD SERIES, VOLUME 91, NUMBER 5

FEBRUARY 2015-1(I)

Magnetotransport of proton-irradiated BaFe_2As_2 and $\text{BaFe}_{1.985}\text{Co}_{0.015}\text{As}_2$ single crystals (8 pages)	054512
D. A. Moseley, K. A. Yates, N. Peng, D. Mandrus, A. S. Sefat, W. R. Branford, and L. F. Cohen	
Symmetry classification of bond order parameters in cuprates (8 pages)	054513
Roland Zeyher	
Slowing down of vortex motion at the Berezinskii-Kosterlitz-Thouless transition in ultrathin NbN films (9 pages)	054514
Rini Ganguly, Dipanjan Chaudhuri, Pratap Raychaudhuri, and Lara Benfatto	
Sitewise manipulations and Mott insulator-superfluid transition of interacting photons using superconducting circuit simulators (11 pages)	054515
Xiuhao Deng, Chunjing Jia, and Chih-Chun Chien	
Valence bond supersolid in a bilayer extended Bose-Hubbard model (4 pages)	054516
Kwai-Kong Ng	
Photoinduced superconductivity in semiconductors (13 pages)	054517
Garry Goldstein, Camille Aron, and Claudio Chamon	
Odd-frequency pairing in topological superconductivity in a one-dimensional magnetic chain (15 pages)	054518
Hiromi Ebisu, Keiji Yada, Hideaki Kasai, and Yukio Tanaka	
Admittance of a long diffusive SNS junction (8 pages)	054519
K. S. Tikhonov and M. V. Feigel'man	
Chiral Mott insulators, Meissner effect, and Laughlin states in quantum ladders (26 pages)	054520
Alexandru Petrescu and Karyn Le Hur	
Reconciliation of local and long-range tilt correlations in underdoped $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$ ($0 \leq x \leq 0.155$) (13 pages)	054521
Emil S. Bozin, Ruidan Zhong, Kevin R. Knox, Genda Gu, John P. Hill, John M. Tranquada, and Simon J. L. Billinge	
Low-energy phonons and superconductivity in $\text{Sn}_{0.8}\text{In}_{0.2}\text{Te}$ (5 pages)	054522
Zhijun Xu, J. A. Schneeloch, R. D. Zhong, J. A. Rodriguez-Rivera, L. W. Harriger, R. J. Birgeneau, G. D. Gu, J. M. Tranquada, and Guangyong Xu	
Multiphoton dressing of an anharmonic superconducting many-level quantum circuit (9 pages)	054523
Jochen Braumüller, Joel Cramer, Steffen Schlör, Hannes Rotzinger, Lucas Radtke, Alexander Lukashenko, Ping Yang, Sebastian T. Skacel, Sebastian Probst, Michael Marthaler, Lingzhen Guo, Alexey V. Ustinov, and Martin Weides	

ERRATA

Publisher's Note: Two distinct kinetic regimes for the relaxation of light-induced superconductivity in $\text{La}_{1.675}\text{Eu}_{0.2}\text{Sr}_{0.125}\text{CuO}_4$ [Phys. Rev. B 91 , 020505(R) (2015)] (1 page)	059901(E)
C. R. Hunt, D. Nicoletti, S. Kaiser, T. Takayama, H. Takagi, and A. Cavalleri	
Erratum: Density functional theory study of $\text{La}_2\text{Ce}_2\text{O}_7$: Disordered fluorite versus pyrochlore structure [Phys. Rev. B 84 , 054110 (2011)] (1 page)	059902(E)
D. E. P. Vanpoucke, P. Bultinck, S. Cottenier, V. Van Speybroeck, and I. Van Driessche	
Publisher's Note: Anomalously thick domain walls in ferroelectrics [Phys. Rev. B 91 , 060102(R) (2015)] (1 page)	059903(E)
P. V. Yudin, M. Y. Gureev, T. Sluka, A. K. Tagantsev, and N. Setter	