

LETTERS

Structure, structural phase transitions, mechanical properties, defects

- Measurements of nonequilibrium interatomic forces using time-domain x-ray scattering (6 pages) L180101
Samuel W. Teitelbaum, Thomas C. Henighan, Hanzhe Liu, Mason P. Jiang, Diling Zhu, Matthieu Chollet,
Takahiro Sato, Éamonn D. Murray, Stephen Fahy, Shane O'Mahony, Trevor P. Bailey, Ctirad Uher,
Mariano Trigo, and David A. Reis

- M* center in 4*H*-SiC is a carbon self-interstitial (5 pages) L180102
J. Coutinho, J. D. Gouveia, T. Makino, T. Ohshima, Ž. Pastuović, L. Bakrač, T. Brodar, and I. Capan

Dynamics, dynamical systems, lattice effects:

- Time glass: A fractional calculus approach (6 pages) L180301
R. C. Verstraten, R. F. Ozela, and C. Morais Smith

Magnetism

- Physical properties of (Mn_{1-x}Co_x)Si at $x \simeq 0.060$ –0.100: Quantum criticality (6 pages) L180401
A. E. Petrova, S. Yu. Gavrilkin, G. V. Rybalchenko, Dirk Menzel, I. P. Zibrov, and S. M. Stishov

- Enhancement of diamagnetism by momentum-momentum interaction: Application to benzene (5 pages) L180402
Thaís V. Trevisan, Gustavo M. Monteiro, and Amir O. Caldeira

- Strongly anisotropic spin dynamics in magnetic topological insulators (7 pages) L180403
A. Alfonsov, J. I. Facio, K. Mehawat, A. G. Moghaddam, R. Ray, A. Zeugner, M. Richter,
J. van den Brink, A. Isaeva, B. Büchner, and V. Kataev

- Spin-orbit phase behavior of Na₂Co₂TeO₆ at low temperatures (6 pages) L180404
Wenjie Chen, Xintong Li, Zhenhai Hu, Ze Hu, Li Yue, Ronny Sutarto, Feizhou He, Kazuki Iida,
Kazuya Kamazawa, Weiqiang Yu, Xi Lin, and Yuan Li

- Microscopic calculation of spin torques in textured antiferromagnets (5 pages) L180405
Jotaro J. Nakane and Hiroshi Kohno

- ☞ Fingerprinting triangular-lattice antiferromagnet by excitation gaps (6 pages) L180406
K. E. Avers, P. A. Maksimov, P. F. S. Rosa, S. M. Thomas, J. D. Thompson, W. P. Halperin,
R. Movshovich, and A. L. Chernyshev

- Essential role of the anisotropic magnetic dipole in the anomalous Hall effect (5 pages) L180407
Satoru Hayami and Hiroaki Kusunose



Quantum-well tunneling anisotropic magnetoresistance above room temperature (<i>6 pages</i>)	L180408
Muftah Al-Mahdawi, Qingyi Xiang, Yoshio Miura, Mohamed Belmoubarik, Keisuke Masuda, Shinya Kasai, Hiroaki Sukegawa, and Seiji Mitani	
Unveiling the hybridization process in a quantum critical ferromagnet by ultrafast optical spectroscopy (<i>6 pages</i>)	L180409
Y. H. Pei, Y. J. Zhang, Z. X. Wei, Y. X. Chen, K. Hu, Yi-feng Yang, H. Q. Yuan, and J. Qi	
Toroidal nonreciprocity of optical second harmonic generation (<i>6 pages</i>)	L180410
J. Mund, D. R. Yakovlev, A. N. Poddubny, R. M. Dubrovin, M. Bayer, and R. V. Pisarev	
Superfluidity and superconductivity	
Anomalous anisotropy of the lower critical field and Meissner effect in UTe_2 (<i>5 pages</i>)	L180501
C. Paulsen, G. Knebel, G. Lapertot, D. Braithwaite, A. Pourret, D. Aoki, F. Hardy, J. Flouquet, and J.-P. Brison	
Strongly correlated doped hole carriers in the superconducting nickelates: Their location, local many-body state, and low-energy effective Hamiltonian (<i>6 pages</i>)	L180502
Zi-Jian Lang (郎子健), Ruoshi Jiang (姜若诗), and Wei Ku (顧威)	
Anisotropic thermally activated flux-flow behavior in the layered superconductor 2M-WS_2 (<i>4 pages</i>)	L180503
Han Zhang, Yuqiang Fang, Teng Wang, Yixin Liu, Jianan Chu, Zhuojun Li, Da Jiang, Gang Mu, Zengfeng Di, and Fuqiang Huang	
Chiral Majorana hinge modes in superconducting Dirac materials (<i>7 pages</i>)	L180504
Bo Fu, Zi-Ang Hu, Chang-An Li, Jian Li, and Shun-Qing Shen	
Insulating regime of an underdamped current-biased Josephson junction supporting $\mathbb{Z}_3$ and $\mathbb{Z}_4$ parafermions (<i>5 pages</i>)	L180505
Aleksandr E. Svetogorov, Daniel Loss, and Jelena Klinovaja	
Mapping out the spin fluctuations in Co-doped LaFeAsO single crystals by NMR (<i>6 pages</i>)	L180506
Piotr Lepucki, Raphael Havemann, Adam P. Dioguardi, Francesco Scaravaggi, Anja U. B. Wolter, Rhea Kappenberger, Saicharan Aswartham, Sabine Wurmehl, Bernd Büchner, and Hans-Joachim Grafe	

ARTICLES

Structure, structural phase transitions, mechanical properties, defects

Structure of the superconducting high-pressure phase of Sc_3CoC_4 (<i>12 pages</i>)	184101
Jan Langmann, Marcel Vöst, Dominik Schmitz, Christof Haas, Georg Eickerling, Anton Jesche, Michael Nicklas, Arianna Lanza, Nicola Casati, Piero Macchi, and Wolfgang Scherer	
Multiphase tin equation of state using density functional theory (<i>15 pages</i>)	184102
Daniel A. Rehn, Carl W. Greeff, Leonid Burakovsky, Daniel G. Sheppard, and Scott D. Crockett	
Local structure of Nb in superconducting Nb-doped Bi_2Se_3 (<i>9 pages</i>)	184103
Kirstine Junker Dalgaard, Simone Munkholm Kevy, Laura Wollesen, Qing Ma, Steffen Wiedmann, Kajsa G. V. Sigfridsson Clauss, and Martin Bremholm	
Local structural mechanism for phase transition and ferroelectric polarization in the mixed oxide $\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3$ (<i>15 pages</i>)	184104
J. Kong, J. Liu, F. Marlton, M. R. V. Jørgensen, and A. Pramanick	

(Continued)

<i>In situ</i> synchrotron diffraction of pressure-induced phase transition in DyPO ₄ under variable hydrostaticity (10 pages)	184105
Jai Sharma, Matthew Musselman, Bianca Haberl, and Corinne E. Packard	
Depoling phenomena in Na _{0.5} Bi _{0.5} TiO ₃ -BaTiO ₃ : A structural perspective (15 pages)	184106
Gobinda Das Adhikary, Bhoopesh Mahale, Badari Narayana Rao, Anatoliy Senyshyn, and Rajeev Ranjan	
Generation of diverse acoustic vortices by superimposed multipole emissions (10 pages)	184107
Yurou Jia, Yuanzhou Zhu, Chengrong Ma, Ying Cheng, Dajian Wu, Mingxi Deng, and Xiaojun Liu	
Dislocation content of grain boundary phase junctions and its relation to grain boundary excess properties (14 pages)	184108
T. Frolov, D. L. Medlin, and M. Asta	
Polymorphism of gold under laser-based ramp compression to 690 GPa (10 pages)	184109
Sirus K. Han, Raymond F. Smith, Donghoon Kim, June K. Wicks, J. Ryan Rygg, Amy Lazicki, Jon H. Eggert, and Thomas S. Duffy	
Generic accommodations of an atom in the Lennard-Jones fcc and hcp rare-gas solids: A computational study (11 pages)	184110
Georgiy K. Ozerov, Dmitry S. Bezrukov, and Alexei A. Buchachenko	
Quantitative nondiagonal phase field modeling of eutectic and eutectoid transformations (13 pages)	184111
Kai Wang, Guillaume Boussinot, Efim A. Brener, and Robert Spatschek	
Complex changes in structural parameters hidden in the universal phase diagram of the quasi-one-dimensional organic conductors (TMTTF) ₂ X (X = NbF ₆ , AsF ₆ , PF ₆ , and Br) (6 pages)	184112
Shunsuke Kitou, Lidong Zhang, Toshikazu Nakamura, and Hiroshi Sawa	
Flat-band full localization and symmetry-protected topological phase on bilayer lattice systems (12 pages)	184113
Ikuo Ichinose, Takahiro Orito, and Yoshihito Kuno	
Inhomogeneous, disordered, and partially ordered systems	
First-principles study of the surface of silica and sodium silicate glasses (20 pages)	184201
Zhen Zhang, Walter Kob, and Simona Ispas	
Subdiffusion in a one-dimensional Anderson insulator with random dephasing: Finite-size scaling, Griffiths effects, and possible implications for many-body localization (13 pages)	184202
Scott R. Taylor and Antonello Scardicchio	
Population imbalance for a family of one-dimensional incommensurate models with mobility edges (13 pages)	184203
Sayantan Roy, Subroto Mukerjee, and Manas Kulkarni	
Thermophysical properties of liquid molybdenum in the near-critical region using quantum molecular dynamics (12 pages)	184204
D. V. Minakov, M. A. Paramonov, and P. R. Levashov	
Quantum dynamics in the interacting Fibonacci chain (11 pages)	184205
Cecilia Chiaracane, Francesca Pietracaprina, Archak Purkayastha, and John Goold	

(Continued)

Dynamics, dynamical systems, lattice effects:

Observation of a chiral wave function in the twofold-degenerate quadruple Weyl system BaPtGe (7 pages)	184301
Haoliang Li, Tiantian Zhang, A. Said, Y. Fu, G. Fabbris, D. G. Mazzone, J. Zhang, J. Lapano, H. N. Lee, H. C. Lei, M. P. M. Dean, S. Murakami, and H. Miao	
Crystal symmetry based selection rules for anharmonic phonon-phonon scattering from a group theory formalism (11 pages)	184302
Runqing Yang, Shengying Yue, Yujie Quan, and Bolin Liao	
Abnormal topological refraction into free medium at subwavelength scale in valley phononic crystal plates (11 pages)	184303
Linyun Yang, Kaiping Yu, Bernard Bonello, Bahram Djafari-Rouhani, Wei Wang, and Ying Wu	
Loop parametric scattering of cavity polaritons (7 pages)	184304
S. S. Gavrilov	
Classical model for sub-Planckian thermal diffusivity in complex crystals (9 pages)	184305
Huan-Kuang Wu and Jay D. Sau	
Beyond the Fröhlich Hamiltonian: Path-integral treatment of large polarons in anharmonic solids (15 pages)	184306
Matthew Houtput and Jacques Tempere	
Generalized decay law for particlelike and wavelike thermal phonons (10 pages)	184307
Zhongwei Zhang, Yangyu Guo, Marc Bescond, Jie Chen, Masahiro Nomura, and Sebastian Volz	
Boundary time crystals in collective d -level systems (16 pages)	184308
Luis Fernando dos Prazeres, Leonardo da Silva Souza, and Fernando Iemini	
Mobility edge and multifractality in a periodically driven Aubry-André model (16 pages)	184309
Madhumita Sarkar, Roopayan Ghosh, Arnab Sen, and K. Sengupta	
Long-lived nonthermal states in pumped one-dimensional systems of hard-core bosons (12 pages)	184310
Patrycja Łydźba and Janez Bonča	
Super-exponential growth of out-of-time-ordered correlators (9 pages)	184311
Wen-Lei Zhao, Yue Hu, Zhi Li, and Qian Wang	

Magnetism

General treatment of off-specular resonant soft x-ray magnetic scattering using the distorted-wave Born approximation: Numerical algorithm and experimental studies with hybrid chiral domain structures (17 pages)	184401
Samuel Flewett, Erick Burgos-Parra, Mackarena Garrido Strelow, Yanis Sassi, Cyril Léveillé, Fernando Ajejas, Nicolas Reyren, and Nicolas Jaouen	
Angular-dependent dynamic response and magnetization reversal in Fibonacci-distorted kagome artificial spin ice (7 pages)	184402
Ali Frotañpour, Justin Woods, Barry Farmer, Amrit P. Kaphle, J. Todd Hastings, and Lance E. DeLong	
Spin-wave wells revisited: From wavelength conversion and Möbius modes to magnon valleytronics (9 pages) . . .	184403
K. G. Fripp and V. V. Kruglyak	

(Continued)

 Magnon-spinon dichotomy in the Kitaev hyperhoneycomb β -Li ₂ IrO ₃ (9 pages)	184404
Alejandro Ruiz, Nicholas P. Breznay, Mengqun Li, Ioannis Rousochatzakis, Anthony Allen, Isaac Zinda, Vikram Nagarajan, Gilbert Lopez, Zahirul Islam, Mary H. Upton, Jungho Kim, Ayman H. Said, Xian-Rong Huang, Thomas Gog, Diego Casa, Robert J. Birgeneau, Jake D. Koralek, James G. Analytis, Natalia B. Perkins, and Alex Frano	
Spin-liquid behavior of the three-dimensional magnetic system Ba ₃ NiIr ₂ O ₉ with $S = 1$ (7 pages)	184405
Siddharth Kumar, S. K. Panda, Manju Mishra Patidar, Shashank Kumar Ojha, Prithwijit Mandal, Gangadhar Das, J. W. Freeland, V. Ganesan, Peter J. Baker, and S. Middey	
Coexistence of large negative and positive magnetodielectric response in Bi _{1-x} Ca _x Fe _{1-y} Ti _y O _{3-δ} nanoparticle ceramics (8 pages)	184406
Subhajit Nandy, Pavana S. V. Mocherla, E. Abdelhamid, B. Nadgorny, R. Naik, and C. Sudakar	
Functional renormalization group study of the Kitaev- Γ model on the honeycomb lattice and emergent incommensurate magnetic correlations (10 pages)	184407
Finn Lasse Buessen and Yong Baek Kim	
Interplay of sample composition and anomalous Hall effect in Co _x NbS ₂ (13 pages)	184408
S. Mangelsen, P. Zimmer, C. Näther, S. Mankovsky, S. Polesya, H. Ebert, and W. Bensch	
Temperature-dependent renormalization of magnetic interactions by thermal, magnetic, and lattice disorder from first principles (6 pages)	184409
Matthew Heine, Olle Hellman, and David Broido	
Anomalous fractional quantization in the kagomelike Heisenberg ladder: Emergence of the effective spin-1 chain (16 pages)	184410
Tomoki Yamaguchi, Yukinori Ohta, and Satoshi Nishimoto	
Critical sample aspect ratio and magnetic field dependence for antiskyrmion formation in Mn _{1.4} PtSn single crystals (7 pages)	184411
B. E. Zuniga Cespedes, P. Vir, P. Milde, C. Felser, and L. M. Eng	
Antiferromagnetic-to-ferrimagnetic phase transition with large electric-polarization change in a frustrated polar magnet CaBaCo ₄ O ₇ (6 pages)	184412
Tsuyoshi Omi, Yoshito Watanabe, Nobuyuki Abe, Hajime Sagayama, Akiko Nakao, Koji Munakata, Yusuke Tokunaga, and Taka-hisa Arima	
Canted antiferromagnetic order and spin dynamics in the honeycomb-lattice compound Tb ₂ Ir ₃ Ga ₉ (10 pages) ...	184413
Feng Ye, Zachary Morgan, Wei Tian, Songxue Chi, Xiaoping Wang, Michael E. Manley, David Parker, Mojammel A. Khan, J. F. Mitchell, and Randy Fishman	
Oxygen magnetic polarization, nodes in spin density, and zigzag spin order in oxides (14 pages)	184414
Ling-Fang Lin, Nitin Kaushal, Cengiz Şen, Andrew D. Christianson, Adriana Moreo, and Elbio Dagotto	
Modified strong-coupling treatment of a spin- $\frac{1}{2}$ Heisenberg trimerized chain developed from the exactly solved Ising-Heisenberg diamond chain (10 pages)	184415
Taras Verkholyak and Jozef Strečka	
Interfacial and bulk spin Hall contributions to fieldlike spin-orbit torque generated by iridium (7 pages)	184416
Sutapa Dutta, Arnab Bose, A. A. Tulapurkar, R. A. Buhrman, and D. C. Ralph	
Tunable magnetic anisotropy in multiferroic oxides (11 pages)	184417
Xue-Zeng Lu and James M. Rondinelli	

(Continued)

Temperature effects in spin-dependent Hall currents in an ideal skyrmion gas (<i>12 pages</i>)	184418
Andrei Zadorozhnyi and Yuri Dahnovsky	
Effective magnetic Hamiltonian at finite temperatures for rare-earth chalcogenides (<i>8 pages</i>)	184419
Zheng Zhang, Jianshu Li, Weiwei Liu, Zhitao Zhang, Jianting Ji, Feng Jin, Rui Chen, Junfeng Wang, Xiaoqun Wang, Jie Ma, and Qingming Zhang	
Unusual anisotropic magnetic orbital moment obtained from x-ray magnetic circular dichroism in a multiferroic oxide system (<i>6 pages</i>)	184420
Daniele Preziosi, S. Homkar, C. Lefevre, M. Salluzzo, and N. Viart	
Spin moiré engineering of topological magnetism and emergent electromagnetic fields (<i>12 pages</i>)	184421
Kotaro Shimizu, Shun Okumura, Yasuyuki Kato, and Yukitoshi Motome	
Magnetic ordering in $\text{La}_{1.5}\text{Ca}_{0.5}\text{CoO}_4$ revealed by resonant magnetic x-ray scattering and neutron diffraction (<i>11 pages</i>)	184422
G. Subías, J. Blasco, J. Herrero-Martín, J. A. Rodríguez-Velamazán, M. Valvidares, R. Fan, P. Steadman, and J. García	
Strain-modulated helimagnetism and emergent magnetic phase diagrams in highly crystalline MnP nanorod films (<i>12 pages</i>)	184423
Richa Pokharel Madhogaria, Chang-Ming Hung, Baleeswaraiiah Muchharla, Anh Tuan Duong, Raja Das, Pham Thanh Huy, Sunglae Cho, Sarath Witanachchi, Hariharan Srikanth, and Manh-Huong Phan	
Magnetoelastic coupling and phases in the skyrmion lattice magnet Gd_2PdSi_3 discovered by high-resolution dilatometry (<i>9 pages</i>)	184424
S. Spachmann, A. Elghandour, M. Frontzek, W. Löser, and R. Klingeler	
Evolution of magnetic field induced ordering in the layered quantum Heisenberg triangular-lattice antiferromagnet $\text{Ba}_3\text{CoSb}_2\text{O}_9$ (<i>10 pages</i>)	184425
N. A. Fortune, Q. Huang, T. Hong, J. Ma, E. S. Choi, S. T. Hannahs, Z. Y. Zhao, X. F. Sun, Y. Takano, and H. D. Zhou	
Crystallographic and magnetic structure of $\text{UNi}_4^{11}\text{B}$ (<i>8 pages</i>)	184426
J. Willwater, S. Süllow, M. Reehuis, R. Feyerherm, H. Amitsuka, B. Ouladdiaf, E. Suard, M. Klicpera, M. Vališka, J. Pospíšil, and V. Sechovský	
Nonreciprocal multimode and indirect couplings in cavity magnonics (<i>7 pages</i>)	184427
Chi Zhang, Chenglong Jia, Yongzhang Shi, Changjun Jiang, Desheng Xue, C. K. Ong, and Guozhi Chai	
Nonreciprocal electronic transport in PdCrO_2 : Implication of spatial inversion symmetry breaking (<i>8 pages</i>)	184428
M. Akaike, Y. Nii, H. Masuda, and Y. Onose	
 Defect-driven ferrimagnetism and hidden magnetization in MnBi_2Te_4 (<i>8 pages</i>)	184429
You Lai, Liqin Ke, Jiaqiang Yan, Ross D. McDonald, and Robert J. McQueeney	
Superfluidity and superconductivity	
Quantum Monte Carlo study of superradiant supersolid of light in the extended Jaynes-Cummings-Hubbard model (<i>11 pages</i>)	184501
Huanhuan Wei, Jie Zhang, Sebastian Greschner, Tony C Scott, and Wanzhou Zhang	
Unconventional Majorana fermions on the surface of topological superconductors protected by rotational symmetry (<i>6 pages</i>)	184502
Junyeong Ahn and Bohm-Jung Yang	

(Continued)

Spin-orbit-coupled depairing of a dipolar biexciton superfluid (<i>10 pages</i>)	184503
S. V. Andreev	
Sulfur-induced magnetism in $\text{FeSe}_{1-x}\text{S}_x$ thin films on LaAlO_3 revealed by muon spin rotation/relaxation (<i>8 pages</i>)	184504
F. Nabeshima, Y. Kawai, N. Shikama, Y. Sakishita, A. Suter, T. Prokscha, S. E. Park, S. Komiya, A. Ichinose, T. Adachi, and A. Maeda	
Effects of spin-orbit coupling in superconducting proximity devices: Application to $\text{CoSi}_2/\text{TiSi}_2$ heterostructures (<i>7 pages</i>)	184505
Vivek Mishra, Yu Li, Fu-Chun Zhang, and Stefan Kirchner	
Type-I superconductivity in single-crystal Pb_2Pd (<i>7 pages</i>)	184506
Arushi, K. Motla, A. Kataria, S. Sharma, J. Beare, M. Pula, M. Nugent, G. M. Luke, and R. P. Singh	
Crossdimensional universality classes in static and periodically driven Kitaev models (<i>15 pages</i>)	184507
Paolo Molignini, Albert Gasull Celades, R. Chitra, and Wei Chen	
Interplay between superconductivity and non-Fermi liquid behavior at a quantum-critical point in a metal. V. The γ model and its phase diagram: The case $\gamma = 2$ (<i>27 pages</i>)	184508
Yi-Ming Wu, Shang-Shun Zhang, Artem Abanov, and Andrey V. Chubukov	
Edge-induced pairing states in a Josephson junction through a spin-polarized quantum anomalous Hall insulator (<i>16 pages</i>)	184509
Ryota Nakai, Kentaro Nomura, and Yukio Tanaka	
Higher-order Weyl superconductors with anisotropic Weyl-point connectivity (<i>14 pages</i>)	184510
W. B. Rui, Song-Bo Zhang, Moritz M. Hirschmann, Zhen Zheng, Andreas P. Schnyder, Björn Trauzettel, and Z. D. Wang	
Low-temperature transport properties of doped $\text{Ba}_{0.57}\text{K}_{0.43}\text{Fe}_2\text{As}_2$ superconductors in high magnetic field (<i>7 pages</i>)	184511
Yueshen Wu, Jinghui Wang, Xiang Zhou, Peng Dong, Jiadian He, Bolun Teng, Johan Vanacken, Victor V. Moshchalkov, Kazunari Yamaura, Eiji Takayama-Muromachi, and Jun Li	
Multiple crossing points and possible quantum criticality in the magnetoresistance of thin TiN films (<i>5 pages</i>)	184512
K. Kronfeldner, T. I. Baturina, and C. Strunk	
Superconductivity by hidden spin fluctuations in electron-doped iron selenide (<i>21 pages</i>)	184513
J. P. Rodriguez	
Co-deposition growth and superconductivity of $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ films by reactive molecular beam epitaxy (<i>5 pages</i>)	184514
Yang Wang, Rui-Feng Wang, Qinghua Zhang, Menghan Liao, Lin Gu, Ding Zhang, Can-Li Song, Xu-Cun Ma, and Qi-Kun Xue	
Tunneling conductance of the $(d + ip)$ -wave superconductor (<i>8 pages</i>)	184515
Yuhi Takabatake, Shu-Ichiro Suzuki, and Yukio Tanaka	
Josephson effect of superconductors with $J = \frac{3}{2}$ electrons (<i>9 pages</i>)	184516
Dakyeong Kim, Shingo Kobayashi, and Yasuhiro Asano	

(Continued)

Multigap superconductivity in centrosymmetric and noncentrosymmetric rhenium-boron superconductors (<i>9 pages</i>)	184517
T. Shang, W. Xie, J. Z. Zhao, Y. Chen, D. J. Gawryluk, M. Medarde, M. Shi, H. Q. Yuan, E. Pomjakushina, and T. Shiroka	
Effect of random pinning on nonlinear dynamics and dissipation of a vortex driven by a strong microwave current (<i>19 pages</i>)	184518
W. P. M. R. Pathirana and A. Gurevich	