PHYSICAL REVIEW B

For editorial and subscription correspondence,
please see inside front cover
(ISSN: 1098-0121)

PERIODICALS
Postmaster send address changes to:
APS Subscription Services
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 77, NUMBER 14 *CONTENTS* **APRIL 2008-1(II)**

RAPID COMMUNICATIONS

Magnetism

Effect of ferromagnetism on AB oscillations in a normal-metal ring *(4 pages)* . . . . . 140401(R)
Koji Sekiguchi, Akinobu Yamaguchi, Hideki Miyajima, and Atsufumi Hirohata

Entanglement entropy in the two-dimensional random transverse field Ising model *(4 pages)* . . . . . 140402(R)
Rong Yu, Hubert Saleur, and Stephan Haas

Incommensurate magnetic ground state revealed by resonant x-ray scattering in the frustrated spin system $Ca_3Co_2O_6$ *(4 pages)* . . . . . 140403(R)
S. Agrestini, C. Mazzoli, A. Bombardi, and M. R. Lees

Adiabatic quenches through an extended quantum critical region *(4 pages)* . . . . . 140404(R)
Franco Pellegrini, Simone Montangero, Giuseppe E. Santoro, and Rosario Fazio

Superfluidity and superconductivity

Magnetic-field-tuned superconductor-to-insulator transitions in amorphous Bi films with nanoscale hexagonal arrays of holes *(4 pages)* . . . . . 140501(R)
M. D. Stewart, Jr., Aijun Yin, J. M. Xu, and J. M. Valles, Jr.

Stability of the axial phase of superfluid ^{3}He in aerogel with globally anisotropic scattering *(3 pages)* . . . . . 140502(R)
J. P. Davis, J. Pollanen, B. Reddy, K. R. Shirer, H. Choi, and W. P. Halperin

Soft-phonon-driven superconductivity in CaAlSi as seen by inelastic x-ray scattering *(4 pages)* . . . . . 140503(R)
S. Kuroiwa, A. Q. R. Baron, T. Muranaka, R. Heid, K.-P. Bohnen, and J. Akimitsu

Superconductivity-induced self-energy evolution of the nodal electron of optimally doped $Bi_2Sr_2Ca_{0.92}Y_{0.08}Cu_2O_{8+\delta}$ *(4 pages)* . . . . . 140504(R)
W. S. Lee, W. Meevasana, S. Johnston, D. H. Lu, I. M. Vishik, R. G. Moore, H. Eisaki, N. Kaneko, T. P. Devereaux, and Z. X. Shen

Tunneling density of states, pair correlation, and Josephson current in spin-incoherent Luttinger-liquid/superconductor hybrid systems *(4 pages)* . . . . . 140505(R)
Dagim Tilahun and Gregory A. Fiete

Simultaneous suppression of ferromagnetism and superconductivity in UCoGe by Si substitution *(4 pages)* . . . . . 140506(R)
D. E. de Nijs, N. T. Huy, and A. de Visser

Copyright 2008 by The American Physical Society

1098-0121(20080401)77:14;1-O

(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 77, NUMBER 14 APRIL 2008-1(II)

ARTICLES

Structure, structural phase transitions, mechanical properties, defects

Switching the ferroelectric polarization in the $S=1/2$ chain cuprate $LiCuVO_4$ by external magnetic fields *(6 pages)* 144101
F. Schrettle, S. Krohns, P. Lunkenheimer, J. Hemberger, N. Büttgen, H.-A. Krug von Nidda, A. V. Prokofiev, and A. Loidl

Influence of lattice polarizability on interacting Li-induced dipoles distributed in incipient ferroelectric $KTaO_3$ *(9 pages)* 144102
Yuki Ichikawa and Koichiro Tanaka

X-ray absorption spectroscopy study of valence and site occupation of copper in $LiNbO_3$:Cu *(10 pages)* 144103
Tonya Vitova, Josef Hormes, Konrad Peithmann, and Theo Woike

Ab initio prediction of ordered ground-state structures in ZrO_2-Y_2O_3 *(7 pages)* 144104
A. Predith, G. Ceder, C. Wolverton, K. Persson, and T. Mueller

Dependence of polarization on epitaxial strain in ferroelectric ultrathin films from first principles *(6 pages)* 144105
S. Bin-Omran, I. Ponomareva, and L. Bellaiche

Shock-front broadening in polycrystalline materials *(4 pages)* 144106
J. L. Barber and K. Kadau

Design of nanofilters for optical nanocircuits *(12 pages)* 144107
Andrea Alù, Michael E. Young, and Nader Engheta

Asymmetry in the excitonic recombinations and impurity incorporation of the two polar faces of homoepitaxially grown ZnO films *(5 pages)* 144108
S. Lautenschlaeger, J. Sann, N. Volbers, B. K. Meyer, A. Hoffmann, U. Haboeck, and M. R. Wagner

First-principles calculations on solid nitrogen: A comparative study of high-pressure phases *(6 pages)* 144109
J. Kotakoski and K. Albe

Micro-Raman and micro-infrared spectroscopic studies of Pb- and Au-irradiated $ZrSiO_4$: Optical properties, structural damage, and amorphization *(13 pages)* 144110
Ming Zhang, Lynn A. Boatner, Ekhard K. H. Salje, Rodney C. Ewing, Philippe Daniel, William J. Weber, Yanwen Zhang, and Ian Farnan

Grain boundary energies and cohesive strength as a function of geometry *(11 pages)* 144111
Valerie R. Coffman and James P. Sethna

Method to extract anharmonic force constants from first principles calculations *(7 pages)* 144112
Keivan Esfarjani and Harold T. Stokes

High-pressure behavior of As_2O_3: Amorphous-amorphous and crystalline-amorphous transitions *(8 pages)* 144113
E. Soignard, S. A. Amin, Q. Mei, C. J. Benmore, and J. L. Yarger

Effect of nearest neighbor Pb-O divacancy pairs on the ferroelectric-relaxor transition in $Pb(Sc_{1/2}Nb_{1/2})O_3$ *(8 pages)* 144114
B. P. Burton, Eric Cockayne, Silvia Tinte, and U. V. Waghmare

(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 77, NUMBER 14 APRIL 2008-1(II)

Inhomogeneous, disordered, and partially ordered systems

Homogenization of radiation transfer in two-phase media with irregular phase boundaries *(14 pages)* 144201
A. V. Gusarov

Static atomic displacements in Cu-Mn measured with diffuse x-ray scattering *(8 pages)* 144202
B. Schönfeld, H. Roelofs, G. Kostorz, J. L. Robertson, P. Zschack, and G. E. Ice

Griffiths-McCoy singularities in random quantum spin chains: Exact results *(7 pages)* 144203
Ferenc Iglói and István A. Kovács

Chemical short-range order and lattice deformations in $Mg_yTi_{1-y}H_x$ thin films probed by hydrogenography *(10 pages)* 144204
R. Gremaud, A. Baldi, M. Gonzalez-Silveira, B. Dam, and R. Griessen

Coupled orientational and displacive degrees of freedom in the high-temperature plastic phase of the carbon tetrabromide α-CBr_4 *(10 pages)* 144205
Jacob C. W. Folmer, Ray L. Withers, T. R. Welberry, and James D. Martin

In situ study of amorphization and changes in coordination in Si_2N_2O at high pressure *(6 pages)* 144206
J. Haines and M. Santoro

Short and intermediate range order in amorphous $GeSe_2$ *(10 pages)* 144207
Carlo Massobrio and Alfredo Pasquarello

Low-energy antiphase boundaries, degenerate superstructures, and phase stability in frustrated fcc Ising model and Ag-Au alloys *(9 pages)* 144208
N. A. Zarkevich, Teck L. Tan, L.-L. Wang, and D. D. Johnson

Formation and structure of amorphous carbon char from polymer materials *(6 pages)* 144209
John W. Lawson and Deepak Srivastava

Dynamics, dynamical systems, lattice effects, quantum solids

Lattice dynamics of skutterudites: Inelastic x-ray scattering on $CoSb_3$ *(5 pages)* 144301
M. Rotter, P. Rogl, A. Grytsiv, W. Wolf, M. Krisch, and A. Mirone

Observations outside the light cone: Algorithms for nonequilibrium and thermal states *(13 pages)* 144302
M. B. Hastings

Magnetism

Model for a collimated spin-wave beam generated by a single-layer spin torque nanocontact *(8 pages)* 144401
M. A. Hoefer, T. J. Silva, and M. D. Stiles

Doping variation of anisotropic charge and orbital dynamics in $Y_{1-x}Ca_xVO_3$: Comparison with $La_{1-x}Sr_xVO_3$ *(10 pages)* 144402
J. Fujioka, S. Miyasaka, and Y. Tokura

Spin-glass transition in single-crystal $BiFeO_3$ *(5 pages)* 144403
Manoj K. Singh, W. Prellier, M. P. Singh, Ram S. Katiyar, and J. F. Scott

^{63,65}Cu NMR and NQR evidence for an unusual spin dynamics in $PrCu_2$ below 100 K *(7 pages)* 144404
A. Sacchetti, M. Weller, J. L. Gavilano, R. Mudliar, B. Pedrini, K. Magishi, H. R. Ott, R. Monnier, B. Delley, and Y. Ōnuki

Structural and magnetic properties of the ternary solid solution between CoSb and $Fe_{1+\delta}Sb$ *(11 pages)* 144405
P. Amornpitoksuk, D. Ravot, A. Mauger, and J. C. Tedenac

(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 77, NUMBER 14** **APRIL 2008-1(II)**

Critical point in the strong-field magnetotransport of a three-dimensional binary disordered composite medium *(6 pages)* 144406
Ronen Magier and David J. Bergman

Artificial ferrimagnetic structure and thermal hysteresis in $Gd_{0.47}Co_{0.53}/Co$ multilayers *(7 pages)* 144407
J. P. Andrés, J. A. González, T. P. A. Hase, B. K. Tanner, and J. M. Riveiro

Role of magnetic impurities in Fe/V multilayers *(6 pages)* 144408
B. Skubic, E. Holmström, A. Bergman, and O. Eriksson

Evidence of intrinsic exchange bias and its origin in spin-glass-like disordered $L_{0.5}Sr_{0.5}MnO_3$ manganites (L=Y, $Y_{0.5}Sm_{0.5}$, and $Y_{0.5}La_{0.5}$) *(10 pages)* 144409
Shilpi Karmakar, S. Taran, Esa Bose, B. K. Chaudhuri, C. P. Sun, C. L. Huang, and H. D. Yang

High-precision determination of universal amplitude ratios for the $q=3$ Potts model in two dimensions *(10 pages)* 144410
Lev N. Shchur, Bertrand Berche, and Paolo Butera

Evidence of $L1_0$ chemical order in CoPt nanoclusters: Direct observation and magnetic signature *(11 pages)* 144411
Florent Tournus, Alexandre Tamion, Nils Blanc, Abdelkrim Hannour, Laurent Bardotti, Brigitte Prével, Philippe Ohresser, Edgar Bonet, Thierry Epicier, and Véronique Dupuis

Magnetothermal study of a Dy-stuffed spin ice: $Dy_2(Dy_xTi_{2-x})O_{7-x/2}$ *(5 pages)* 144412
B. G. Ueland, G. C. Lau, R. S. Freitas, J. Snyder, M. L. Dahlberg, B. D. Muegge, E. L. Duncan, R. J. Cava, and P. Schiffer

Fourfold degenerate columnar-dimer ground state in square lattice antiferromagnets *(10 pages)* 144413
Rakesh Kumar and Brijesh Kumar

Energetics and magnetic impact of 3*d*-metal doping of the half-metallic ferromagnet NiMnSb *(9 pages)* 144414
B. Alling, M. Ekholm, and I. A. Abrikosov

Triplet and singlet excitations in the valence bond crystal phase of the kagome lattice Heisenberg model *(7 pages)* 144415
Rajiv R. P. Singh and David A. Huse

Soliton spin excitations and their perturbation in a generalized inhomogeneous Heisenberg ferromagnet *(14 pages)* 144416
M. Daniel and J. Beula

Resonant domain wall depinning induced by oscillating spin-polarized currents in thin ferromagnetic strips *(12 pages)* 144417
E. Martinez, L. Lopez-Diaz, O. Alejos, and L. Torres

Droplets in the two-dimensional $\pm J$ Ising spin glass *(5 pages)* 144418
A. K. Hartmann

^{7}Li NMR study of heavy-fermion LiV_2O_4 containing magnetic defects *(17 pages)* 144419
X. Zong, S. Das, F. Borsa, M. D. Vannette, R. Prozorov, J. Schmalian, and D. C. Johnston

Influence of domain wall pinning on the dynamic behavior of magnetic vortex structures: Time-resolved scanning x-ray transmission microscopy in NiFe thin film structures *(5 pages)* 144420
A. Vansteenkiste, J. De Baerdemaeker, K. W. Chou, H. Stoll, M. Curcic, T. Tyliszczak, G. Woltersdorf, C. H. Back, G. Schütz, and B. Van Waeyenberge

Magnetic anisotropy in the Fe(II)Fe(III) bimetallic oxalates *(10 pages)* 144421
Randy S. Fishman and Fernando A. Reboredo

(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 77, NUMBER 14** **APRIL 2008-1(II)**

Magnetoresistance of Co nanoconstrictions fabricated by means of electron beam lithography *(5 pages)* 144422
Patryk Krzysteczko and Günter Dumpich

Enhancement in spin-torque efficiency by nonuniform spin current generated within a tapered nanopillar spin valve *(6 pages)* 144423
P. M. Braganca, O. Ozatay, A. G. F. Garcia, O. J. Lee, D. C. Ralph, and R. A. Buhrman

Rate of magnetization reversal due to nucleation of soliton-antisoliton pairs at point-like defects *(14 pages)* 144424
Peter N. Loxley

Yb_2Pt_2Pb: Magnetic frustration in the Shastry-Sutherland lattice *(7 pages)* 144425
M. S. Kim, M. C. Bennett, and M. C. Aronson

Weak ferromagnetism in $TbNi_2B_2C$ *(8 pages)* 144426
H. Kawano-Furukawa, H. Tsukagoshi, T. Nagata, C. Kobayashi, H. Yoshizawa, and H. Takeya

Spin dynamics of the charge-transfer phase transition of an iron mixed-valence complex observed using muon spin relaxation spectroscopy *(5 pages)* 144427
N. Kida, M. Enomoto, I. Watanabe, T. Suzuki, and N. Kojima

Scaling analysis and application: Phase diagram of magnetic nanorings and elliptical nanoparticles *(8 pages)* 144428
Wen Zhang, Rohit Singh, Noah Bray-Ali, and Stephan Haas

Hyperfine fields in an Ag/Fe multilayer film investigated with ^{8}Li β-detected NMR *(5 pages)* 144429
T. A. Keeler, Z. Salman, K. H. Chow, B. Heinrich, M. D. Hossian, B. Kardasz, R. F. Kiefl, S. R. Kreitzman, C. D. P. Levy, W. A. MacFarlane, O. Mosendz, T. J. Parolin, M. R. Pearson, and D. Wang

Magnetic properties of one-dimensional Ni/Cu and Ni/Al multilayered nanowires: Role of nonmagnetic spacers *(8 pages)* 144430
Partha Pratim Pal and Ranjit Pati

Theory of nonspecular tunneling through magnetic tunnel junctions *(8 pages)* 144431
X.-G. Zhang, Yan Wang, and X. F. Han

Thermodynamic and transport studies of the ferromagnetic filled skutterudite compound $PrFe_4As_{12}$ *(12 pages)* 144432
T. A. Sayles, W. M. Yuhasz, J. Paglione, T. Yanagisawa, J. R. Jeffries, M. B. Maple, Z. Henkie, A. Pietraszko, T. Cichorek, R. Wawryk, Y. Nemoto, and T. Goto

Spin-wave interaction in two-dimensional ferromagnets with dipolar forces *(15 pages)* 144433
A. V. Syromyatnikov

Superfluidity and superconductivity

Zero-crossing Shapiro steps in high-T_c superconducting microstructures tailored by a focused ion beam *(5 pages)* 144501
Myung-Ho Bae, R. C. Dinsmore III, M. Sahu, Hu-Jong Lee, and A. Bezryadin

Pressure effects on the superconducting transition in *nH*-CaAlSi *(7 pages)* 144502
L. Boeri, J. S. Kim, M. Giantomassi, F. S. Razavi, S. Kuroiwa, J. Akimitsu, and R. K. Kremer

Microscopic modeling of phonon dynamics and charge response in NdCuO *(21 pages)* 144503
Thomas Bauer and Claus Falter

(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 77, NUMBER 14** **APRIL 2008-1(II)**

Quantized spin Hall effect in ^{3}He-A and other p-wave paired Fermi systems *(5 pages)* 144504
Jun Goryo, Mahito Kohmoto, and Yong-Shi Wu

Gradient corrections to the time-dependent Ginzburg-Landau equation for anisotropic perturbations of quasiparticles *(16 pages)* 144505
Pei-Jen Lin and P. Lipavský

Variational approach to vortex penetration and vortex interaction *(11 pages)* 144506
A. D. Hernández and A. López

Quantum metamaterials: Electromagnetic waves in a Josephson qubit line *(7 pages)* 144507
A. L. Rakhmanov, A. M. Zagoskin, Sergey Savel'ev, and Franco Nori

Hydrodynamic boundary condition for superfluid flow *(6 pages)* 144508
Yves Pomeau and David C. Roberts

Magnetic properties of vortex states in spherical superconductors *(9 pages)* 144509
Ben Xu, M. V. Milošević, and F. M. Peeters

Impact of a finite cut-off for the optical sum rule in the superconducting state *(8 pages)* 144510
F. Marsiglio, E. van Heumen, and A. B. Kuzmenko

Superfluid-insulator transition in Fermi-Bose mixtures and the orthogonality catastrophe *(11 pages)* 144511
G. Refael and E. Demler

Quasiparticle resonance states around a magnetic impurity in a two-dimensional f-wave superconductor *(6 pages)* 144512
Xian-Jun Zuo, Jin An, and Chang-De Gong

Strong magnetic field enhancement of spin triplet pairing arising from coexisting $2k_F$ spin and $2k_F$ charge fluctuations *(5 pages)* 144513
Hirohito Aizawa, Kazuhiko Kuroki, and Yukio Tanaka

Chaos and plasticity in superconductor vortices: Low-dimensional dynamics *(8 pages)* 144514
E. Olive and J. C. Soret

Transverse sound in differentially moving superfluid helium *(6 pages)* 144515
I. N. Adamenko, K. E. Nemchenko, V. A. Slipko, and A. F. G. Wyatt

Gauge-invariant electromagnetic response of a chiral p_x+ip_y superconductor *(21 pages)* 144516
Roman M. Lutchyn, Pavel Nagornykh, and Victor M. Yakovenko

Mott transition in bosonic systems: Insights from the variational approach *(11 pages)* 144517
Manuela Capello, Federico Becca, Michele Fabrizio, and Sandro Sorella

Magnetically coupled pancake vortex molecules in $HgBa_2Ca_{n-1}Cu_nO_y$ $(n \geq 6)$ *(7 pages)* 144518
A. Crisan, A. Iyo, Y. Tanaka, H. Matsuhata, D. D. Shivagan, P. M. Shirage, K. Tokiwa, T. Watanabe, T. W. Button, and J. S. Abell

Preemptive vortex-loop proliferation in multicomponent interacting Bose-Einstein condensates *(12 pages)* 144519
E. K. Dahl, E. Babaev, S. Kragset, and A. Sudbø

Trionic phase of ultracold fermions in an optical lattice: A variational study *(14 pages)* 144520
Ákos Rapp, Walter Hofstetter, and Gergely Zaránd

Josephson relation for the superfluid density in the BCS-BEC crossover *(7 pages)* 144521
Edward Taylor

(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 77, NUMBER 14** **APRIL 2008-1(II)**

Optimized Cooper pair pumps *(8 pages)* 144522
Shabnam Safaei, Simone Montangero, Fabio Taddei, and Rosario Fazio

Effect of inhomogeneous coupling on BCS superconductors *(11 pages)* 144523
Yue Zou, Israel Klich, and Gil Refael

Calculation of the volume pinning force in MgB_2 superconductors *(5 pages)* 144524
M. Eisterer

Weakening thickness dependence of critical current density in $YBa_2Cu_3O_{7-x}$ films using nanotube pore insertion *(5 pages)* 144525
Xiang Wang, Alan Dibos, and J. Z. Wu

Electromagnetic response of high-T_c superconductors: Slave-boson and doped-carrier theories *(11 pages)* 144526
Tiago C. Ribeiro and Xiao-Gang Wen

Magnetic and transport properties of a coupled Hubbard bilayer with electron and hole doping *(7 pages)* 144527
K. Bouadim, G. G. Batrouni, F. Hébert, and R. T. Scalettar

Search for spin-polarization effects in $La_{0.7}Mn_{0.3}Ca_3O_3/YBa_2Cu_3O_{7-\delta}$ thin-film bilayers *(10 pages)* 144528
X. Deng, M. Joshi, R. Chakalova, M. S. Colclough, R. Palai, Y. Y. Tse, I. P. Jones, H. Huhtinen, and C. M. Muirhead

COMMENTS

Comment on "Quantum Monte Carlo scheme for frustrated Heisenberg antiferromagnets" *(2 pages)* 146401
K. S. D. Beach, Matthieu Mambrini, and Fabien Alet

Reply to "Comment on 'Quantum Monte Carlo scheme for frustrated Heisenberg antiferromagnets' " *(1 page)* 146402
Jacek Wojtkiewicz

ERRATA

Erratum: Resistance noise in spin valves [Phys. Rev. B 75, 092405 (2007)] *(1 page)* . . . . . 149901(E)
Jørn Foros, Arne Brataas, Gerrit E. W. Bauer, and Yaroslav Tserkovnyak

Erratum: Phase transitions in the antiferromagnetic *XY* model with a *kagomé* lattice [Phys. Rev. B **65**, 054416 (2002)] *(1 page)* . . . . . 149902(E)
S. E. Korshunov

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).