



Copper PC board for a high coherence superconducting qubit. See article 100502.

PHYSICAL REVIEW LETTERS

Contents

Articles published 28 August–3 September 2010

VOLUME 105, NUMBER 10

3 September 2010

General Physics: Statistical and Quantum Mechanics, Quantum Information, etc.

Dual-Path State Reconstruction Scheme for Propagating Quantum Microwaves and Detector Noise Tomography	100401
E.P. Menzel, F. Deppe, M. Mariantoni, M.Á. Araque Caballero, A. Baust, T. Niemczyk, E. Hoffmann, A. Marx, E. Solano, and R. Gross	
Universal Binding and Recoil Corrections to Bound State g Factors in Hydrogenlike Ions	100402
Michael I. Eides and Timothy J. Martin	
Fault Tolerance with Noisy and Slow Measurements and Preparation	100501
Gerardo A. Paz-Silva, Gavin K. Brennen, and Jason Twamley	
High-Coherence Hybrid Superconducting Qubit	100502
Matthias Steffen, Shwetank Kumar, David P. DiVincenzo, J.R. Rozen, George A. Keefe, Mary Beth Rothwell, and Mark B. Ketchen	
Role of Initial Entanglement and Non-Gaussianity in the Decoherence of Photon-Number Entangled States Evolving in a Noisy Channel	100503
Michele Allegra, Paolo Giorda, and Matteo G. Paris	
Improved Superconducting Qubit Readout by Qubit-Induced Nonlinearities	100504
Maxime Boissonneault, J.M. Gambetta, and Alexandre Blais	
Response of the Strongly Driven Jaynes-Cummings Oscillator	100505
Lev S. Bishop, Eran Ginossar, and S.M. Girvin	
Qubit State Monitoring by Measurement of Three Complementary Observables	100506
Rusko Ruskov, Alexander N. Korotkov, and Klaus Mølmer	
Four-Qubit Entanglement Classification from String Theory	100507
L. Borsten, D. Dahanayake, M.J. Duff, A. Marrani, and W. Rubens	
Fluctuations and Scaling in Creep Deformation	100601
Jari Rosti, Juha Koivisto, Lasse Laurson, and Mikko J. Alava	
Origin of Hyperdiffusion in Generalized Brownian Motion	100602
P. Siegle, I. Goychuk, and P. Hänggi	
Thermalization in a Coherently Driven Ensemble of Two-Level Systems	100603
Igor Lesanovsky, Beatriz Olmos, and Juan P. Garrahan	

Gravitation and Astrophysics

Short-Range Force Detection Using Optically Cooled Levitated Microspheres	101101
Andrew A. Geraci, Scott B. Papp, and John Kitching	
Black Strings, Low Viscosity Fluids, and Violation of Cosmic Censorship	101102
Luis Lehner and Frans Pretorius	

Elementary Particles and Fields

Probing Quark-Gluon Interactions with Transverse Polarized Scattering	101601
K. Slifer <i>et al.</i> (Resonance Spin Structure Collaboration)	
Constraining the Noncommutative Spectral Action via Astrophysical Observations	101602
William Nelson, Joseph Ochoa, and Mairi Sakellariadou	

(Continued Inside)

Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).



Contents (Continued)

Exclusion of an Exotic Top Quark with $-4/3$ Electric Charge Using Soft Lepton Tagging	101801
T. Aaltonen <i>et al.</i> (CDF Collaboration)	
Very Broad $X(4260)$ and the Resonance Parameters of the $\psi(3D)$ Vector Charmonium State	102001
Eef van Beveren, George Rupp, and J. Segovia	
Dynamical Origin and the Pole Structure of $X(3872)$	102002
I. V. Danilkin and Yu. A. Simonov	
Nuclear Physics	
Prolate-Spherical Shape Coexistence at $N = 28$ in ^{44}S	102501
C. Force, S. Grévy, L. Gaudefroy, O. Sorlin, L. Cáceres, F. Rotaru, J. Mrazek, N.L. Achouri, J.C. Angélique, F. Azaiez, B. Bastin, R. Borcea, A. Buta, J.M. Daugas, Z. Dlouhy, Zs. Dombrádi, F. De Oliveira, F. Negoita, Y. Penionzhkevich, M.G. Saint-Laurent, D. Sohler, M. Stanoiu, I. Stefan, C. Stodel, and F. Nowacki	
Atomic, Molecular, and Optical Physics	
Noninvasive Vibrational Mode Spectroscopy of Ion Coulomb Crystals through Resonant Collective Coupling to an Optical Cavity Field	103001
A. Dantan, J.P. Marler, M. Albert, D. Guénot, and M. Drewsen	
High-Harmonic Homodyne Detection of the Ultrafast Dissociation of Br_2 Molecules	103002
H.J. Wörner, J.B. Bertrand, P.B. Corkum, and D.M. Villeneuve	
Atom-Dimer Scattering in a Three-Component Fermi Gas	103201
T. Lompe, T.B. Ottenstein, F. Serwane, K. Viering, A.N. Wenz, G. Zürn, and S. Jochim	
Hot Water Molecules from Dissociative Recombination of D_3O^+ with Cold Electrons	103202
H. Buhr, J. Stützel, M.B. Mendes, O. Novotný, D. Schwalm, M.H. Berg, D. Bing, M. Grieser, O. Heber, C. Krantz, S. Menk, S. Novotny, D.A. Orlov, A. Petrigiani, M.L. Rappaport, R. Repnow, D. Zajfman, and A. Wolf	
Nuclear-Spin-Independent Short-Range Three-Body Physics in Ultracold Atoms	103203
Noam Gross, Zav Shotan, Servaas Kokkelmans, and Lev Khaykovich	
Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.	
Frequency-Tunable Multigigawatt Sub-Half-Cycle Light Pulses from Coupled-State Dynamics of Optical Solitons and Impulsively Driven Molecular Vibrations	103901
A.M. Zheltikov, A.A. Voronin, R. Kienberger, F. Krausz, and G. Korn	
Directional Laser Emission from a Wavelength-Scale Chaotic Microcavity	103902
Q.H. Song, L. Ge, A.D. Stone, H. Cao, J. Wiersig, J.-B. Shim, J. Unterhinninghofen, W. Fang, and G.S. Solomon	
Fractional Synchronization of Spin-Torque Nano-Oscillators	104101
Sergei Urazhdin, Phillip Tabor, Vasil Tiberkevich, and Andrei Slavin	
Drag Coefficient for a Circular Obstacle in a Quasi-Two-Dimensional Dilute Supersonic Granular Flow	104501
J.F. Boudet and H. Kellay	
Plasma and Beam Physics	
Measurement of Electro-Optic Shock and Electron Acceleration in a Strongly Cavitated Laser Wakefield Accelerator	105001
M.H. Helle, D. Kaganovich, D.F. Gordon, and A. Ting	
Doppler Spectrometry for Ultrafast Temporal Mapping of Density Dynamics in Laser-Induced Plasmas	105002
S. Mondal, Amit D. Lad, Saima Ahmed, V. Narayanan, J. Pasley, P.P. Rajeev, A.P. Robinson, and G. Ravindra Kumar	
Self-Guided Laser Wakefield Acceleration beyond 1 GeV Using Ionization-Induced Injection	105003
C.E. Clayton, J.E. Ralph, F. Albert, R.A. Fonseca, S.H. Glenzer, C. Joshi, W. Lu, K.A. Marsh, S.F. Martins, W.B. Mori, A. Pak, F.S. Tsung, B.B. Pollock, J.S. Ross, L.O. Silva, and D.H. Froula	
Spin Contribution to the Ponderomotive Force in a Plasma	105004
G. Brodin, A.P. Misra, and M. Marklund	

(Continued on Preceding Page)



Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).

Influence of Magnetic Field Ripple on the Intrinsic Rotation of Tokamak Plasmas	105005
M. F. Nave, T. Johnson, L.-G. Eriksson, K. Crombé, C. Giroud, M.-L. Mayoral, J. Ongena, A. Salmi, T. Tala, and M. Tsalas	
Condensed Matter: Structure, etc.	
Bending Crystals: Emergence of Fractal Dislocation Structures	105501
Yong S. Chen, Woosong Choi, Stefanos Papanikolaou, and James P. Sethna	
 Dynamic Solidification in Nanoconfined Water Films	106101
Shah H. Khan, George Matei, Shivprasad Patil, and Peter M. Hoffmann	
Edge-Mediated Dislocation Processes in Multishell Carbon Nano-Onions?	106102
E. Akatyeva, J. Y. Huang, and T. Dumitrică	
Condensed Matter: Electronic Properties, etc.	
 Efficient Approach for Simulating Distorted Materials	106401
Pekka Koskinen and Oleg O. Kit	
Spectral Properties near the Mott Transition in the One-Dimensional Hubbard Model	106402
Masanori Kohno	
Unconventional $T - H$ Phase Diagram in the Noncentrosymmetric Compound $\text{Yb}_2\text{Fe}_{12}\text{P}_7$	106403
R. E. Baumbach, J. J. Hamlin, L. Shu, D. A. Zocco, J. R. O'Brien, P.-C. Ho, and M. B. Maple	
Spatially Extended Kondo State in Magnetic Molecules Induced by Interfacial Charge Transfer	106601
U. G. Perera, H. J. Kulik, V. Iancu, L. G. Dias da Silva, S. E. Ulloa, N. Marzari, and S.-W. Hla	
Apparent Power-Law Behavior of Conductance in Disordered Quasi-One-Dimensional Systems	106801
A. S. Rodin and M. M. Fogler	
Zero Landau Level in Folded Graphene Nanoribbons	106802
E. Prada, P. San-Jose, and L. Brey	
Quasiprobabilistic Interpretation of Weak Measurements in Mesoscopic Junctions	106803
Adam Bednorz and Wolfgang Belzig	
Distinct High- T Transitions in Underdoped $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$	107001
R. R. Urbano, E. L. Green, W. G. Moulton, A. P. Reyes, P. L. Kuhns, E. M. Bittar, C. Adriano, T. M. Garitezi, L. Bufaiçal, and P. G. Pagliuso	
Nonlocal Cooper Pair Splitting in a $p\text{Sn}$ Junction	107002
M. Veldhorst and A. Brinkman	
Unconventional Superconductivity and Antiferromagnetic Quantum Critical Behavior in the Isovalent-Doped $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$	107003
Y. Nakai, T. Iye, S. Kitagawa, K. Ishida, H. Ikeda, S. Kasahara, H. Shishido, T. Shibauchi, Y. Matsuda, and T. Terashima	
Unified Picture for Magnetic Correlations in Iron-Based Superconductors	107004
Wei-Guo Yin, Chi-Cheng Lee, and Wei Ku	
Magnetization Patterns in Ferromagnetic Nanoelements as Functions of Complex Variable	107201
Konstantin L. Metlov	
Interplay between Charge Order, Ferroelectricity, and Ferroelasticity: Tungsten Bronze Structures as a Playground for Multiferroicity	107202
Kunihiko Yamauchi and Silvia Picozzi	
Study of the Ground State Properties of $\text{LiHo}_x\text{Y}_{1-x}\text{F}_4$ Using Muon Spin Relaxation	107203
J. Rodriguez, A. A. Aczel, J. P. Carlo, S. R. Dunsiger, G. J. MacDougall, P. L. Russo, A. T. Savici, Y. J. Uemura, C. R. Wiebe, and G. M. Luke	
Pulsed Nuclear Pumping and Spin Diffusion in a Single Charged Quantum Dot	107401
Thaddeus D. Ladd, David Press, Kristiaan De Greve, Peter L. McMahon, Benedikt Friess, Christian Schneider, Martin Kamp, Sven Höfling, Alfred Forchel, and Yoshihisa Yamamoto	
Optical Excitation of a Forbidden Magnetic Resonance Mode in a Doped Lutetium-Iron-Garnet Film via the Inverse Faraday Effect	107402
A. H. Reid, A. V. Kimel, A. Kirilyuk, J. F. Gregg, and Th. Rasing	

(Continued on Preceding Page)



Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).

Contents (Continued)

Soft Matter, Biological, and Interdisciplinary Physics

Chiral Symmetry Breaking in Crystals of Achiral Polymers	107801
Yashodhan Hatwalne and M. Muthukumar	
Tailoring the Nanoporous Architecture of Hydrogels to Exploit Entropic Trapping	108101
Nan Shi and Victor M. Ugaz	
Simplified Exactly Solvable Model for β -Amyloid Aggregation	108102
M. Zamparo, A. Trovato, and A. Maritan	
Nanometer Axial Resolution by Three-Dimensional Supercritical Angle Fluorescence Microscopy	108103
Christian M. Winterflood, Thomas Ruckstuhl, Dorinel Verdes, and Stefan Seeger	
Computational Model for Cell Morphodynamics	108104
Danying Shao, Wouter-Jan Rappel, and Herbert Levine	
Directed Assembly of Supramolecular Copolymers in Thin Films: Thermodynamic and Kinetic Advantages	108301
Kostas Ch. Daoulas, Anna Cavallo, Roy Shenhar, and Marcus Müller	
Mesosopic Length Scale Controls the Rheology of Dense Suspensions	108302
Claire Bonnoit, Jose Lanuza, Anke Lindner, and Eric Clement	

Errata

Erratum: Entanglement and Tunable Spin-Spin Couplings between Trapped Ions Using Multiple Transverse Modes [Phys. Rev. Lett. 103 , 120502 (2009).]	109901
K. Kim, M.-S. Chang, R. Islam, S. Korenblit, L.-M. Duan, and C. Monroe	



Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).

Physical Review
Focus

Brief explanations of selected papers from this and other APS journals appear regularly at the *Phys. Rev. Focus* web site (<http://focus.aps.org>). Readers can also sign up for weekly e-mail summaries of *Focus* stories.