NEWSPAPER 80

PHYSICAL REVIEW LETTERS

Contents

VOLUME 80, NUMBER 10 9 March 1998

General Physics

Quantum Measurement Backreaction and Induced Topological Phases 2023
Y. Aharonov, T. Kaufherr, S. Popescu, and B. Reznik

Optical Confinement of a Bose-Einstein Condensate 2027
D. M. Stamper-Kurn, M. R. Andrews, A. P. Chikkatur, S. Inouye, H.-J. Miesner, J. Stenger, and W. Ketterle

Growth and Collapse of a Bose-Einstein Condensate with Attractive Interactions 2031
C. A. Sackett, H. T. C. Stoof, and R. G. Hulet

Largest Lyapunov Exponent for Many Particle Systems at Low Densities 2035
R. van Zon, H. van Beijeren, and Ch. Dellago

Gravitation and Astrophysics

Electron Neutrino Mass Measurement by Supernova Neutrino Bursts and Implications for Hot Dark Matter 2039
Tomonori Totani

Results from a High-Sensitivity Search for Cosmic Axions 2043
C. Hagmann, D. Kinion, W. Stoeffl, K. van Bibber, E. Daw, H. Peng, Leslie J Rosenberg, J. LaVeigne, P. Sikivie, N. S. Sullivan, D. B. Tanner, F. Nezrick, Michael S. Turner, D. M. Moltz, J. Powell, and N. A. Golubev

Elementary Particles and Fields

Stringent New Bounds on Supersymmetric Higgs Bosons from Existing Tevatron Data 2047
Manuel Drees, Monoranjan Guchait, and Probir Roy

Search for First Generation Scalar Leptoquark Pairs in $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV 2051
B. Abbott *et al.* (D0 Collaboration)

Measurement of the B^0-$\bar{B}^0$ Oscillation Frequency Using π-B Meson Charge-Flavor Correlations in $p\overline{p}$ Collisions at $\sqrt{s} = 1.8$ TeV 2057
F. Abe *et al.* (CDF Collaboration)

Measurement of the Top Quark Mass Using Dilepton Events 2063
B. Abbott *et al.* (D0 Collaboration)

Nuclear Physics

Threshold Structure of the Quasifree $p + n \rightarrow d + \eta$ Reaction 2069
H. Calén, J. Dyring, K. Fransson, L. Gustafsson, S. Häggström, B. Höistad, J. Johanson, A. Johansson, T. Johansson, A. Khoukaz, S. Kullander, R. J. M. Y. Ruber, J. Złomańczuk, B. Morosov, A. Povtorejko, A. Sukhanov, A. Zernov, A. Kupść, P. Marciniewski, J. Stepaniak, R. Bilger, W. Brodowski, H. Clement, G. J. Wagner, C. Ekström, J. Zabierowski, A. Bondar, A. Kuzmin, B. Shwartz, V. Sidorov, A. Sukhanov, A. Turowiecki, Z. Wilhelmi, K. Kilian, W. Oelert, T. Sefzick, V. Sopov, and V. Tchernychev

Experimental Evidence for Hyperdeformed States in U Isotopes 2073
A. Krasznahorkay, M. Hunyadi, M. N. Harakeh, M. Csatlós, T. Faestermann, A. Gollwitzer, G. Graw, J. Gulyás, D. Habs, R. Hertenberger, H. J. Maier, Z. Máté, D. Rudolph, P. Thirolf, J. Timár, and B. D. Valnion

(Continued on Third Cover)

CODEN: PRLTAO 80 (10) 2023–2256 (9 March 1998) 10

Contents (Continued)

Blocking of Octupole Correlations Deduced from the Decay of a Multiparticle Isomer in ^{212}At 2077
A. P. Byrne, S. Bayer, G. D. Dracoulis, and T. Kibédi

Quadrupole Collectivity in ^{32,34,36,38}Si and the $N = 20$ Shell Closure 2081
R. W. Ibbotson, T. Glasmacher, B. A. Brown, L. Chen, M. J. Chromik, P. D. Cottle, M. Fauerbach, K. W. Kemper, D. J. Morrissey, H. Scheit, and M. Thoennessen

β^+ Decay Partial Half-Life of ^{54}Mn and Cosmic Ray Chronometry 2085
A. H. Wuosmaa, I. Ahmad, S. M. Fischer, J. P. Greene, G. Hackman, V. Nanal, G. Savard, J. P. Schiffer, P. Wilt, Sam M. Austin, B. A. Brown, S. J. Freedman, and J. J. Connell

Atomic, Molecular, and Optical Physics

Laser-Cooled Mercury Ion Frequency Standard 2089
D. J. Berkeland, J. D. Miller, J. C. Bergquist, W. M. Itano, and D. J. Wineland

Hindered Rotational Diffusion and Rotational Jumps of Single Molecules 2093
T. Ha, J. Glass, Th. Enderle, D. S. Chemla, and S. Weiss

Prospects for Mixed-Isotope Bose-Einstein Condensates in Rubidium 2097
James P. Burke, Jr., John L. Bohn, B. D. Esry, and Chris H. Greene

Complete Results for Positronium Energy Levels at Order $m\alpha^6$ 2101
Krzysztof Pachucki and Savely G. Karshenboim

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, Etc.

Constrained Randomization of Time Series Data 2105
Thomas Schreiber

Master Stability Functions for Synchronized Coupled Systems 2109
Louis M. Pecora and Thomas L. Carroll

Selection of the Saffman-Taylor Finger Width in the Absence of Surface Tension: An Exact Result 2113
Mark Mineev-Weinstein

Dynamics of a Liquid Column Array under Periodic Boundary Conditions 2117
C. Counillon, L. Daudet, T. Podgorski, and L. Limat

Intermittent Dissipation of a Passive Scalar in Turbulence 2121
M. Chertkov, G. Falkovich, and I. Kolokolov

Nonlinear Modes of Liquid Drops as Solitary Waves 2125
A. Ludu and J. P. Draayer

Plasma and Beam Physics

"White-light" Laser Cooling of a Fast Stored Ion Beam 2129
S. N. Atutov, R. Calabrese, R. Grimm, V. Guidi, I. Lauer, P. Lenisa, V. Luger, E. Mariotti, L. Moi, A. Peters, U. Schramm, and M. Stößel

Observation of Electron Energies Beyond the Linear Dephasing Limit from a Laser-Excited Relativistic Plasma Wave 2133
D. Gordon, K. C. Tzeng, C. E. Clayton, A. E. Dangor, V. Malka, K. A. Marsh, A. Modena, W. B. Mori, P. Muggli, Z. Najmudin, D. Neely, C. Danson, and C. Joshi

Strong $E \times B$ Flow Shear and Reduced Fluctuations in a Reversed-Field Pinch 2137
B. E. Chapman, C.-S. Chiang, S. C. Prager, J. S. Sarff, and M. R. Stoneking

Condensed Matter: Structure, Etc.

High-Frequency Dynamics in a Molten Binary Alloy 2141
M. Alvarez, F. J. Bermejo, P. Verkerk, and B. Roessli

High Pressure Polymorphism in Silica 2145
David M. Teter, Russell J. Hemley, Georg Kresse, and Jürgen Hafner

A New Phase and Pressure Induced Amorphization in Silica 2149
Renata M. Wentzcovitch, Cesar da Silva, James R. Chelikowsky, and Nadia Binggeli

Predicting the Future of a Complicated Surface Structure: Grain Coarsening of $p(2 \times 2)$O/Ru(0001) 2153
A. K. Schmid, R. Q. Hwang, and N. C. Bartelt

(Continued on Preceding Page)

Contents (Continued)

Estimation of Single-Crystal Elastic Moduli from Polycrystalline X-Ray Diffraction at High Pressure: Application to FeO and Iron 2157
Anil K. Singh, Ho-kwang Mao, Jinfu Shu, and Russell J. Hemley
Determination of the Infinite Frequency Sound Velocity in the Glass Former *o*-Terphenyl 2161
G. Monaco, C. Masciovecchio, G. Ruocco, and F. Sette
Multicritical Behavior in Coupled Directed Percolation Processes 2165
Uwe C. Täuber, Martin J. Howard, and Haye Hinrichsen
Quantum Sticking, Scattering, and Transmission of ^{4}He atoms from Superfluid ^{4}He Surfaces 2169
C. E. Campbell, E. Krotscheck, and M. Saarela
Bond Geometry and Phase Transition Mechanism of H-Bonded Ferroelectrics 2173
A. Bussmann-Holder and K. H. Michel

Condensed Matter: Electronic Properties, Etc.
Energetics and Vibrational Frequencies of Interstitial H_2 Molecules in Semiconductors 2177
Chris G. Van de Walle
Magic Angles and the Ground States in $(TMTSF)_2PF_6$ 2181
E. I. Chashechkina and P. M. Chaikin
Influence of Collective Effects on the Linewidth of Intersubband Resonance 2185
R. J. Warburton, K. Weilhammer, J. P. Kotthaus, M. Thomas, and H. Kroemer
Dynamical Mean Field Theory of the Bose-Hubbard Model 2189
Luigi Amico and Vittorio Penna
Theory of Quasiparticles in the Underdoped High-T_c Superconducting State 2193
Xiao-Gang Wen and Patrick A. Lee
Fractal Networks, Braiding Channels, and Voltage Noise in Intermittently Flowing Rivers of Quantized Magnetic Flux 2197
C. J. Olson, C. Reichhardt, and Franco Nori
Impurity-Pinned Solitons in the Two-Dimensional Antiferromagnet Detected by Electron Paramagnetic Resonance 2201
K. Subbaraman, C. E. Zaspel, and John E. Drumheller
Spin-Wave Dynamics in Real Crystals 2205
Qian Niu and Leonard Kleinman
Theory of the Magnetization Reversal of Ultrathin Fe Films on a Cr Substrate 2209
A. F. Khapikov
Experimental and Model Theoretical Dispersions of Unoccupied Metallic Quantum Well States in the Cu/fccCo/Cu(100) System 2213
F. G. Curti, A. Danese, and R. A. Bartynski
Heat Induced Antiferromagnetic Coupling in Multilayers with Ge Spacers 2217
P. Walser, M. Schleberger, P. Fuchs, and M. Landolt
Interfacial Magnetism of Eu/Gd(0001) Studied by Magnetic Circular Dichroism in Photoemission 2221
Elke Arenholz, Kai Starke, Günter Kaindl, and Peter J. Jensen
Evidence for a 1-*q* to 3-*q* Transition and 3-*q* Soliton Lattice in Incommensurate Proustite 2225
T. Apih, U. Mikac, J. Seliger, J. Dolinšek, and R. Blinc

Cross-Disciplinary Physics
Surface Atomic Structure of KDP Crystals in Aqueous Solution: An Explanation of the Growth Shape 2229
S. A. de Vries, P. Goedtkindt, S. L. Bennett, W. J. Huisman, M. J. Zwanenburg, D.-M. Smilgies, J. J. De Yoreo, W. J. P. van Enckevort, P. Bennema, and E. Vlieg
Embrittlement and the Bistable Crystal Structure of Zirconium Hydride 2233
G. J. Ackland
Protein Design in a Lattice Model of Hydrophobic and Polar Amino Acids 2237
Cristian Micheletti, Flavio Seno, Amos Maritan, and Jayanth R. Banavar
Drug Binding to DNA: Observation of the Drug-DNA Hydrogen-Bond-Stretching Modes of Netropsin Bound to DNA via Raman Spectroscopy 2241
S. A. Lee, A. Rupprecht, and Y. Z. Chen

(Continued on Preceding Page)

Contents (Continued)

Entanglement of Formation of an Arbitrary State of Two Qubits 2245
William K. Wootters
Optical Cryptosystem Based on Synchronization of Hyperchaos Generated by a Delayed Feedback Tunable Laser Diode 2249
Jean-Pierre Goedgebuer, Laurent Larger, and Henri Porte

Comments
Comment on "Anisotropy of Heat Conduction in $YBa_2Cu_3O_{6.9}$: A Probe of Chain Superconductivity" 2253
B. W. Statt
Gagnon, Pu, Ellman, and Taillefer Reply 2254
Robert Gagnon, Song Pu, Brett Ellman, and Louis Taillefer

Errata
Erratum: Voltage-Biased Quantum Wire with Impurities [Phys. Rev. Lett. **77**, 538 (1996)] 2255
Reinhold Egger and Hermann Grabert
Erratum: Nonlinear Kinetic Fluid Equations [Phys. Rev. Lett. **79**, 3419 (1997)] 2256
Nathan Mattor and Scott E. Parker