



Computational mesh used in simulations of nanoindentation, studying how the results of the simulation scale with tip size. By adapting the mesh to the deformation field (as shown), the calculations provide full atomistic resolution in the area under the indenter, allowing the size of the system to be reduced by five orders of magnitude. See article 226102.

PHYSICAL REVIEW LETTERS

Contents

Articles published 31 May–6 June 2003

VOLUME 90, NUMBER 22

6 JUNE 2003

General Physics

- Soliton-Sound Interactions in Quasi-One-Dimensional Bose-Einstein Condensates 220401
N. G. Parker, N. P. Proukakis, M. Leadbeater, and C. S. Adams

Gravitation and Astrophysics

- Direct Detection Constraints on Superheavy Dark Matter 221301
Ivone F. M. Albuquerque and Laura Baudis
- Extranatural Inflation 221302
Nima Arkani-Hamed, Hsin-Chia Cheng, Paolo Creminelli, and Lisa Randall
- Joint Cosmic Microwave Background and Weak Lensing Analysis: Constraints on Cosmological Parameters 221303
Carlo R. Contaldi, Henk Hoekstra, and Antony Lewis

Elementary Particles and Fields

- Measurement of the Branching Fraction, and Bounds on the CP-Violating Asymmetries, of Neutral B Decays to $D^{*\pm} D^{\mp}$ 221801
B. Aubert *et al.* (The BABAR Collaboration)
- Form Invariance of the Neutrino Mass Matrix 221802
Ernest Ma
- Search for Associated Production of Υ and Vector Boson in $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV 221803
D. Acosta *et al.* (CDF Collaboration)
- Double π^0 Photoproduction on the Proton at GRAAL 222001
Y. Assafiri, O. Bartalini, V. Bellini, J. P. Bocquet, S. Bouchigny, M. Capogni, M. Castoldi, A. D'Angelo, J. P. Didelez, R. Di Salvo, A. Fantini, L. Fichen, G. Gervino, F. Ghio, B. Girolami, A. Giusa, M. Guidal, E. Hourany, V. Kouznetsov, R. Kunne, J.-M. Laget, A. Lapik, P. Levi Sandri, A. Lleres, D. Moricciani, V. Nedorezov, D. Rebreyend, C. Randieri, F. Renard, N. Rudnev, C. Schaerf, M. Sperduto, M. Sutera, A. Turlinge, and A. Zucchiatti
- Geometric Scaling in Inclusive eA Reactions and Nonlinear Perturbative QCD 222002
A. Freund, K. Rummukainen, H. Weigert, and A. Schäfer

Nuclear Physics

- Energy Density Functional Approach to Superfluid Nuclei 222501
Yongle Yu and Aurel Bulgac

Atomic, Molecular, and Optical Physics

- Switched Wave Packets: A Route to Nonperturbative Quantum Control 223001
Jonathan G. Underwood, Michael Spanner, Misha Yu. Ivanov, Jeff Mottershead, Benjamin J. Sussman, and Albert Stolow

(Continued on Third Cover)

Contents (Continued)

Photodestruction Intermediates Probed by an Adjacent Reporter Molecule	223002
Taekjip Ha and Jian Xu	
Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.	
Early Stage Kinetics in a Unified Model of Shear-Induced Demixing and Mechanical Shear Banding Instabilities ...	224501
S.M. Fielding and P.D. Olmsted	
Plasma and Beam Physics	
Frequency and Temperature Dependence of Electrical Breakdown at 21, 30, and 39 GHz	224801
H.H. Braun, S. Döbert, I. Wilson, and W. Wuensch	
Self-Reversal Phenomena of Toroidal Current by Reversing the External Toroidal Field in Helicity-Driven Toroidal Plasmas	225001
M. Nagata, T. Oguro, Y. Kagei, K. Kawami, H. Hasegawa, N. Fukumoto, M. Iida, S. Masamune, M. Katsurai, and T. Uyama	
Scattering in the Attractive Yukawa Potential in the Limit of Strong Interaction	225002
S.A. Khrapak, A.V. Ivlev, G.E. Morfill, and S.K. Zhdanov	
Condensed Matter: Structure, etc.	
Structure of the Surface Vortex Sheet between Two Rotating ^3He Superfluids	225301
R. Hänninen, R. Blaauwgeers, V.B. Eltsov, A.P. Finne, M. Krusius, E.V. Thuneberg, and G.E. Volovik	
Unusual High Degree of Unperturbed Environment in the Interior of Single-Wall Carbon Nanotubes	225501
R. Pfeiffer, H. Kuzmany, Ch. Kramberger, Ch. Schaman, T. Pichler, H. Kataura, Y. Achiba, J. Kürti, and V. Zólyomi	
Z_1/Z_2 Defects in $4H\text{-SiC}$	225502
T.A.G. Eberlein, R. Jones, and P.R. Briddon	
Stable Equidistant Step Trains during Crystallization of Insulin	225503
Olga Gliko, Ilya Reviakine, and Peter G. Vekilov	
Arrested Swelling of Highly Entangled Polymer Globules	225504
Nam-Kyung Lee, Cameron F. Abrams, A. Johner, and S. Obukhov	
Atomic Structure of InSb(001) and GaAs(001) Surfaces Imaged with Noncontact Atomic Force Microscopy	226101
J.J. Kolodziej, B. Such, M. Szymonski, and F. Krok	
Effect of Indenter-Radius Size on Au(001) Nanoindentation	226102
J. Knap and M. Ortiz	
Structural Relaxation and Dynamic Heterogeneity in a Polymer Melt at Attractive Surfaces	226103
Grant D. Smith, Dmitry Bedrov, and Oleg Borodin	
Size- and Shape-Dependent Energetics of Nanocrystal Interfaces: Experiment and Simulation	226104
J.K. Bording, B.Q. Li, Y.F. Shi, and J.M. Zuo	
Role of Structural Fluctuation in a Surface Reaction Studied by Scanning Tunneling Microscopy: The $\text{CO} + \text{O} \rightarrow \text{CO}_2$ Clean-Off Reaction on $\text{Ag}(110)\text{-(}2 \times 1\text{)-O}$	226105
Osamu Nakagoe, Kazuya Watanabe, Noriaki Takagi, and Yoshiyasu Matsumoto	
Condensed Matter: Electronic Properties, etc.	
Is the Negative Temperature Coefficient of the Resistivity of the Quasicrystals due to Chemical Disorder?	226401
R. Tamura, T. Araki, and S. Takeuchi	
Orbital Magnetism in Transition-Metal Clusters: From Hund's Rules to Bulk Quenching	226402
R.A. Guirado-López, J. Dorantes-Dávila, and G.M. Pastor	
First-Principles Molecular-Dynamics Simulations of a Hydrated Electron in Normal and Supercritical Water	226403
Mauro Boero, Michele Parrinello, Kiyoyuki Terakura, Tamio Ikeshoji, and Chee Chin Liew	
In-Plane Magnetodrag between Dilute Two-Dimensional Systems	226801
R. Pillarisetty, Hwayong Noh, E. Tutuc, E.P. De Poortere, D.C. Tsui, and M. Shayegan	
Telegraph Noise and Fractional Statistics in the Quantum Hall Effect	226802
C.L. Kane	
Observation of Narrow-Band Noise Accompanying the Breakdown of Insulating States in High Landau Levels	226803
K.B. Cooper, J.P. Eisenstein, L.N. Pfeiffer, and K.W. West	

(Continued on Preceding Page)

Contents (Continued)

Dynamical Structure Functions, Collective Modes, and Energy Gap in Charged-Particle Bilayers	226804
Z. Donkó, G.J. Kalman, P. Hartmann, K.I. Golden, and K. Kutasi	
Josephson Transport through a Hubbard Impurity Center	226805
V.I. Kozub, A.V. Lopatin, and V.M. Vinokur	
Andreev Quantum Dots for Spin Manipulation	226806
Nikolai M. Chitchev and Yu. V. Nazarov	
Ising-Like Spin Anisotropy and Competing Antiferromagnetic-Ferromagnetic Orders in GdBaCo ₂ O _{5.5} Single Crystals	227201
A.A. Taskin, A.N. Lavrov, and Yoichi Ando	
Low-Frequency Spin Dynamics in the CeMIn ₅ Materials	227202
N.J. Curro, J.L. Sarrao, J.D. Thompson, P.G. Pagliuso, Š. Kos, Ar. Abanov, and D. Pines	
Single Spin and Chiral Glass Transition in Vector Spin Glasses in Three Dimensions	227203
L.W. Lee and A.P. Young	
Excitations in One-Dimensional $S = \frac{1}{2}$ Quantum Antiferromagnets	227204
Kai P. Schmidt and Götz S. Uhrig	
Localized Ferromagnetic Resonance in Inhomogeneous Thin Films	227601
R.D. McMichael, D.J. Twisselmann, and Andrew Kunz	
Interdisciplinary Physics: Biological Physics, Quantum Information, etc.	
Secure Communication Using Mesoscopic Coherent States	227901
Geraldo A. Barbosa, Eric Corndorf, Prem Kumar, and Horace P. Yuen	
Entanglement in Quantum Critical Phenomena	227902
G. Vidal, J.I. Latorre, E. Rico, and A. Kitaev	
Cytoskeleton Confinement and Tension of Red Blood Cell Membranes	228101
N. Gov, A.G. Zilman, and S. Safran	
Colloidal Glass Transition: Beyond Mode-Coupling Theory	228301
Grzegorz Szamel	
Direct Access to Subsurface Sites in Gas-Surface O ₂ /Ag(210) Interactions using Supersonic Molecular Beams	228302
L. Vattuone, L. Savio, and M. Rocca	
Velocity Profiles in Shear-Banding Wormlike Micelles	228303
Jean-Baptiste Salmon, Annie Colin, Sébastien Manneville, and François Molino	
Comments	
Comment on “Single-Mode Spontaneous Emission from a Single Quantum Dot in a Three-Dimensional Microcavity”	229701
B. Gayral and J.-M. Gérard	
Solomon, Pelton, and Yamamoto Reply	229702
G.S. Solomon, M. Pelton, and Y. Yamamoto	
Errata	
Erratum: Potts Ferromagnets on Coexpressed Gene Networks: Identifying Maximally Stable Partitions [Phys. Rev. Lett. 90 , 158102 (2003)]	229901
Himanshu Agrawal and Eytan Domany	
Erratum: ²¹ Na(<i>p</i> , <i>γ</i>) ²² Mg Reaction and Oxygen-Neon Novae [Phys. Rev. Lett. 90 , 162501 (2003)]	229902
S. Bishop, R.E. Azuma, L. Buchmann, A.A. Chen, M.L. Chatterjee, J.M. D’Auria, S. Engel, D. Gigliotti, U. Greife, M. Hernanz, D. Hunter, A. Hussein, D. Hutcheon, C. Jewett, J. José, J. King, S. Kubono, A.M. Laird, M. Lamey, R. Lewis, W. Liu, S. Michimasa, A. Olin, D. Ottewell, P.D. Parker, J.G. Rogers, F. Strieder, and C. Wrede	
Erratum: Left-Handed Materials Do Not Make a Perfect Lens [Phys. Rev. Lett. 88 , 207403 (2002)]	229903
N. Garcia and M. Nieto-Vesperinas	
Erratum: Butterfly Hysteresis Loop at Nonzero Bias Field in Antiferromagnetic Molecular Rings: Cooling by Adiabatic Magnetization [Phys. Rev. Lett. 89 , 246401 (2002)]	229904
O. Waldmann, R. Koch, S. Schromm, P. Müller, I. Bernt, and R.W. Saalfrank	

(Continued on Preceding Page)

Contents (Continued)

Erratum: Observation of Selectivity of Coherent Population Transfer Induced by Optical Interference [Phys. Rev. Lett. 90 , 063001 (2003)]	229905
R. Netz, A. Nazarkin, and R. Sauerbrey	
Cumulative Author Index	i