



The images are cross sections of fluid flow in a pipe, showing traveling waves with two-fold up to five-fold symmetry. All four states have fast downstream motion close to the wall (red) and slow fluid flow near the center (dark blue); in-plane motion is shown by arrows. These numerical solutions are all unstable but may have relevance to the problem of turbulent flow in pipes. See article 224502.

PHYSICAL REVIEW LETTERS

Contents

Articles published 22 November–28 November 2003

VOLUME 91, NUMBER 22

28 NOVEMBER 2003

General Physics

- Minimal Brownian Ratchet: An Exactly Solvable Model 220601
 Youngki Lee, Andrew Allison, Derek Abbott, and H. Eugene Stanley
 Experimental Evidence of “Vibrational Resonance” in an Optical System 220602
 V.N. Chizhevsky, E. Smeu, and G. Giacomelli
 Universal Thermal Radiation Drag on Neutral Objects 220801
 Vanik Mkrtchian, V. Adrian Parsegian, Rudi Podgornik, and Wayne M. Saslow

Gravitation and Astrophysics

- Cosmic Microwave Background Radiation Anisotropies in Brane Worlds 221301
 Kazuya Koyama
 Can Cosmic Shear Shed Light on Low Cosmic Microwave Background Multipoles? 221302
 Michael Kesden, Marc Kamionkowski, and Asantha Cooray

Elementary Particles and Fields

- Observation of $B^+ \rightarrow \rho^+ \rho^0$ Decays 221801
 J. Zhang *et al.* (The Belle Collaboration)
 Evidence for the Rare Decay $B \rightarrow K^* \ell^+ \ell^-$ and Measurement of the $B \rightarrow K \ell^+ \ell^-$ Branching Fraction 221802
 B. Aubert *et al.* (BABAR Collaboration)
 Functional Integrals for QCD at Nonzero Chemical Potential and Zero Density 222001
 Thomas D. Cohen
 Measurement of the Proton Spin Structure Function $g_1(x, Q^2)$ for Q^2 from 0.15 to 1.6 GeV² with CLAS 222002
 R. Fatemi *et al.* (The CLAS Collaboration)
 Differential Cross Sections for Higgs Boson Production at Tevatron Collider Energies 222003
 Edmond L. Berger and Jianwei Qiu

Atomic, Molecular, and Optical Physics

- Spectroscopy of the $^1S_0$ - $^3P_0$ Clock Transition of ^{87}Sr in an Optical Lattice 223001
 Masao Takamoto and Hidetoshi Katori
 Direct Measurement of the Thermal Rate Coefficient for Electron Attachment to Ozone in the Gas Phase, 300–550 K: Implications for the Ionosphere 223201
 Jane M. Van Doren, Thomas M. Miller, Skip Williams, and A. A. Viggiano
 Ionization of Clusters in Intense Laser Pulses through Collective Electron Dynamics 223401
 Ulf Saalmann and Jan-Michael Rost

(Continued on Third Cover)



Contents (Continued)

Nonlinear Bound-Free Pair Creation in the Strong Electromagnetic Fields of a Heavy Nucleus and an Intense X-Ray Laser	223601
C. Müller, A. B. Voitkiv, and N. Grün	
Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.	
Strong Spatiotemporal Localization in a Silica Nonlinear Waveguide Array	223901
D. Cheskis, S. Bar-Ad, R. Morandotti, J. S. Aitchison, H. S. Eisenberg, Y. Silberberg, and D. Ross	
Attosecond Angle-Resolved Photoelectron Spectroscopy	223902
S. A. Aseyev, Y. Ni, L. J. Frasinski, H. G. Muller, and M. J. J. Vrakking	
Supermodes of Chiral Photonic Filters with Combined Twist and Layer Defects	223903
Ian J. Hodgkinson, Qi hong Wu, Lakshman De Silva, Matthew Arnold, Martin W. McCall, and Akhlesh Lakhtakia	
Slow Diffusion of Light in a Cold Atomic Cloud	223904
G. Labeyrie, E. Vaujour, C. A. Müller, D. Delande, C. Miniatura, D. Wilkowski, and R. Kaiser	
Superpersistent Chaotic Transients in Physical Space: Advective Dynamics of Inertial Particles in Open Chaotic Flows under Noise	224101
Younghae Do and Ying-Cheng Lai	
Flow and Fracture in Drying Nanoparticle Suspensions	224501
E. R. Dufresne, E. I. Corwin, N. A. Greenblatt, J. Ashmore, D. Y. Wang, A. D. Dinsmore, J. X. Cheng, X. S. Xie, J. W. Hutchinson, and D. A. Weitz	
Traveling Waves in Pipe Flow	224502
Holger Faisst and Bruno Eckhardt	
Vortex-Pair Dynamics in Anisotropic Bistable Media: A Kinematic Approach	224503
Aric Hagberg and Ehud Meron	
Plasma and Beam Physics	
Laser-Energy Transfer and Enhancement of Plasma Waves and Electron Beams by Interfering High-Intensity Laser Pulses	225001
P. Zhang, N. Saleh, S. Chen, Z. M. Sheng, and D. Umstadter	
Condensed Matter: Structure, etc.	
Critical Velocity of Continuous Vortex Nucleation in a Slab of Superfluid $^3\text{He-A}$	225301
P. M. Walmsley, D. J. Cousins, and A. I. Golov	
Layer- and Bulk-Roton Excitations of ^4He in Porous Media	225302
V. Apaja and E. Krotscheck	
Dynamics of Phason Fluctuations in the $i\text{-AlPdMn}$ Quasicrystal	225501
S. Francoual, F. Livet, M. de Boissieu, F. Yakhov, F. Bley, A. Létoublon, R. Caudron, and J. Gastaldi	
Short-Pulse Laser Ablation of Solids: From Phase Explosion to Fragmentation	225502
Patrick Lorazo, Laurent J. Lewis, and Michel Meunier	
Stochastic Analysis and Regeneration of Rough Surfaces	226101
G. R. Jafari, S. M. Fazeli, F. Ghasemi, S. M. Vaez Allaei, M. Reza Rahimi Tabar, A. Irabi zad, and G. Kavei	
Electronic Excitation and Dynamic Promotion of a Surface Reaction	226102
D. N. Denzler, C. Frischkorn, C. Hess, M. Wolf, and G. Ertl	
From Meandering to Faceting, Is Step Flow Growth Ever Stable?	226103
N. Néel, T. Maroutian, L. Douillard, and H.-J. Ernst	
Dynamic Roughening of Tetrahedral Amorphous Carbon	226104
C. Casiraghi, A. C. Ferrari, R. Ohr, A. J. Flewitt, D. P. Chu, and J. Robertson	
Anomalous Threshold Laws in Quantum Sticking	226105
Dennis P. Clougherty	
Electronic Stability of Magnetic Fe/Co Superlattices with Monatomic Layer Alternation	226106
G. A. Farnan, C. L. Fu, Z. Gai, M. Krcmar, A. P. Baddorf, Zhenyu Zhang, and J. Shen	
Self-Ordering of Nanofacets on Vicinal SiC Surfaces	226107
Hiroshi Nakagawa, Satoru Tanaka, and Ikuo Suemune	

(Continued on Preceding Page)

Contents (Continued)

Condensed Matter: Electronic Properties, etc.

Mott Transitions in Multiorbital Systems	226401
A. Liebsch	
Role of Electronic versus Atomic Relaxations in Stokes Shifts at Defects in Solids	226402
T. Bakos, S.N. Rashkeev, and S.T. Pantelides	
Noninteracting Electrons and the Metal-Insulator Transition in Two Dimensions with Correlated Impurities	226403
M. Hilke	
Fine Structure of Effective Mass Acceptors in Gallium Nitride	226404
R. Stepniewski, A. Wyszomolek, M. Potemski, K. Pakula, J.M. Baranowski, I. Grzegory, S. Porowski, G. Martinez, and P. Wyder	
Quantum Oscillations in the Layer Structure of Thin Metal Films	226801
P. Czoschke, Hawoong Hong, L. Basile, and T.-C. Chiang	
Cyclotron-Resonance Harmonics in the ac Response of a 2D Electron Gas with Smooth Disorder	226802
I.A. Dmitriev, A.D. Mirlin, and D.G. Polyakov	
One-Dimensional Gapless Magnons in a Single Anisotropic Ferromagnetic Nanolayer	226803
A. Villares Ferrer, P.F. Farinas, and A.O. Caldeira	
Coherent Manipulation of Electronic States in a Double Quantum Dot	226804
T. Hayashi, T. Fujisawa, H.D. Cheong, Y.H. Jeong, and Y. Hirayama	
Radiation-Induced Magnetoresistance Oscillation in a Two-Dimensional Electron Gas in Faraday Geometry	226805
X.L. Lei and S.Y. Liu	
Critical Disorder and Phase Transitions in Random Diode Arrays	226806
V.G. Karpov	
Induced Magnetic Ordering by Proton Irradiation in Graphite	227201
P. Esquinazi, D. Spemann, R. Höhne, A. Setzer, K.-H. Han, and T. Butz	
Oxygen Stripes in $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ from <i>Ab Initio</i> Calculations	227202
V. Ferrari, M. Towler, and P.B. Littlewood	
Spin Quantum Tunneling via Entangled States in a Dimer of Exchange-Coupled Single-Molecule Magnets	227203
R. Tiron, W. Wernsdorfer, D. Foguet-Albiol, N. Aliaga-Alcalde, and G. Christou	
Effect of Zero- to One-Dimensional Transformation on Multiparticle Auger Recombination in Semiconductor Quantum Rods	227401
H. Htoon, J.A. Hollingsworth, R. Dickerson, and V.I. Klimov	
Self-Similar Chain of Metal Nanospheres as an Efficient Nanolens	227402
Kuiru Li, Mark I. Stockman, and David J. Bergman	
Coherent Optical Phonons and Parametrically Coupled Magnons Induced by Femtosecond Laser Excitation of the Gd(0001) Surface	227403
A. Melnikov, I. Radu, U. Bovensiepen, O. Krupin, K. Starke, E. Matthias, and M. Wolf	

Interdisciplinary Physics: Biological Physics, Quantum Information, etc.

Detection of Entanglement with Polarized Photons: Experimental Realization of an Entanglement Witness	227901
M. Barbieri, F. De Martini, G. Di Nepi, P. Mataloni, G.M. D'Ariano, and C. Macchiavello	
Concentration of Higher Dimensional Entanglement: Qutrits of Photon Orbital Angular Momentum	227902
Alipasha Vaziri, Jian-Wei Pan, Thomas Jennewein, Gregor Weihs, and Anton Zeilinger	
Long Range Correlations in DNA: Scaling Properties and Charge Transfer Efficiency	228101
Stephan Roche, Dominique Bicout, Enrique Maciá, and Efim Kats	

Comments

Comment on “Unexpected Behavior of Heavy-Ion Fusion Cross Sections at Extreme Sub-Barrier Energies”	229201
C.J. Lin	
Jiang <i>et al.</i> Reply	229202
C.L. Jiang, H. Esbensen, K.E. Rehm, B.B. Back, R.V.F. Janssens, J.A. Caggiano, P. Collon, J. Greene, A.M. Heinz, D.J. Henderson, I. Nishinaka, T.O. Pennington, and D. Seweryniak	
Comment on “Universal Scaling Laws of Diffusion in a Binary Fluid Mixture”	229601
Upendra Harbola, Charanbir Kaur, and Shankar P. Das	

(Continued on Preceding Page)

Contents (Continued)

Samanta, Ali, and Ghosh Reply	229602
Alok Samanta, Sk. Musharaf Ali, and Swapan K. Ghosh	
Comment on “Disorder Induced Quantum Phase Transition in Random-Exchange Spin-1/2 Chains”	229701
Nicolas Laflorencie and Heiko Rieger	

Errata

Erratum: Morphological and Compositional Evolution of the Ge/Si(001) Surface During Exposure to a Si Flux [Phys. Rev. Lett. 90 , 216104 (2003)]	229901
A. Rastelli, H. von Känel, G. Albin, P. Raiteri, D.B. Migas, and Leo Miglio	
Erratum: Sequence Space Localization in the Immune System Response to Vaccination and Disease [Phys. Rev. Lett. 91 , 068101 (2003)]	229902
Michael W. Deem and Ha Youn Lee	
Erratum: Direct Detection Constraints on Superheavy Dark Matter [Phys. Rev. Lett. 90 , 221301 (2003)]	229903
Ivone F.M. Albuquerque and Laura Baudis	