

Physics Division Published Journal Articles, January-June 2009

PHY-12279-ME-2009

First Measurement of Direct $f_0(980)$ Photoproduction on the Proton

M. Battaglieri *et al.* (CLAS Collaboration)

Phys. Rev. Lett. **102**, 102001/1-6 (2009)

PHY-12240-HI-2008

Structure of ^{240}Pu : Evidence for Octupole Phonon Condensation?

X. Wang, R. V. F. Janssens, M. P. Carpenter, S. Zhu, I. Wiedenhöver, U. Garg, S. Frauendorf, T. Nakatsukasa, I. Ahmad, A. Bernstein, E. Diffenderfer, S. J. Freeman, J. P. Greene, T. L. Khoo, F. G. Kondev, A. Larabee, T. Lauritsen, C. J. Lister, B. Meredith, D. Seweryniak, C. Teal, and P. Wilson

Phys. Rev. Lett. **102**, 122501/1-4 (2009)

PHY-12370-HI-2009

System Size, Energy, and Centrality Dependence of Pseudorapidity Distributions of Charged Particles in Relativistic Heavy-Ion Collisions

B. Alver *et al.* (PHOBOS Collaboration)

Phys. Rev. Lett. **102**, 142301/1-5 (2009)

PHY-12229-HI-2008

Identification of Key Astrophysical Resonances Relevant for the $^{26g}\text{Al}(p,\gamma)^{27}\text{Si}$ Reaction in Wolf-Rayet Stars, AGB Stars, and Classical Novae

G. Lotay, P. J. Woods, D. Seweryniak, M. P. Carpenter, R. V. F. Janssens, and S. Zhu

Phys. Rev. Lett. **102**, 162502/1-4 (2009)

PHY-12381-ME-2009

Measurement of Angular Distributions of Drell-Yan Dimuons in $p + p$ Interactions at 800 GeV/ c

L. Y. Zhu *et al.* (FNAL E866/NuSea Collaboration)

Phys. Rev. Lett. **102**, 182001/1-4 (2009)

PHY-12280-ME-2009

Precise Measurement of the Neutron Magnetic Form Factor G_M^n in the Few-GeV² Region

J. Lachniet *et al.* (CLAS Collaboration)

Phys. Rev. Lett. **102**, 192001 (2009)

PHY-12488-HI-2009

γ -Ray Spectroscopy at the Limits: First Observation of Rotational Bands in ^{255}Lr

K. Ketelhut, P. T. Greenlees, D. Ackermann, S. Antalic, E. Clément, I. G. Darby, O. Dorvaux, A. Drouart, S. Eeckhaudt, B. J. P. Gall, A. Görden, T. Grahn, C. Gray-Jones, K. Hauschild, R.-D. Herzberg, F. P. Heßberger, U. Jakobsson, G. D. Jones, P. Jones, R. Julin, S. Juutinen, T.-L. Khoo, W. Korten, M. Leino, A.-P. Leppänen, J. Ljungvall, S. Moon, M. Nyman, A. Obertelli, J. Pakarinen, E. Parr, P. Papadakis, P. Peura, J. Piot, A. Pritchard, P. Rähkila, D. Rostron, P. Ruotsalainen, M. Sandzelius, J. Sarén, C. Scholey, J. Sorri, A. Steer, B. Sulignano, Ch. Theisen, J. Uusitalo, M. Venhart, M. Zielinska, M. Bender, and P.-H. Heenen

Phys. Rev. Lett. **102**, 212501/1-4 (2009)

PHY-12307-TH-2009

Medium Effects in ρ -Meson Photoproduction

F. Riek, R. Rapp, T.-S. H. Lee, and Y. Oh
Phys. Lett. **B677**, 116-120 (2009)

PHY-12109-TH-2008

Toward Unifying the Description of Meson and Baryon Properties

G. Eichmann, I. C. Cloët, R. Alkofer, A. Krassnigg, and C. D. Roberts
Phys. Rev. C **79**, 012202(R)/1-5 (2009)

PHY-12183-HI-2008

Nuclear Structure Relevant to Neutrinoless Double β Decay: The Valence Protons in ^{76}Ge and ^{76}Se

B. P. Kay, J. P. Schiffer, S. J. Freeman, T. Adachi, J. A. Clark, C. M. Deibel, H. Fujita, Y. Fujita, P. Grabmayr, K. Hatanaka, D. Ishikawa, H. Matsubara, Y. Meada, H. Okamura, K. E. Rehm, T. Sakemi, Y. Shimizu, H. Shimoda, K. Suda, Y. Tameshige, A. Tamii, and C. Wrede
Phys. Rev. C **79**, 021301(R)/1-4 (2009)

PHY-11947-HI-2007

Multi-Quasiparticle States in ^{256}Rf

H. B. Jeppesen, I. Dragojević, R. M. Clark, K. E. Gregorich, M. N. Ali, J. M. Allmond, C. W. Beausang, D. L. Bleuel, M. Cromaz, M. A. Deleplanque, P. A. Ellison, P. Fallon, M. A. Garcia, J. M. Gates, J. P. Greene, S. Gros, I. Y. Lee, H. L. Liu, A. O. Macchiavelli, S. L. Nelson, H. Nitsche, J. R. Pavan, L. Stavsetra, F. S. Stephens, M. Wiedeking, R. Wyss, and F. R. Xu
Phys. Rev. C **79**, 031303(R)/1-5 (2009)

PHY-12494-HI-2009

Mass of ^{11}Li from the $^1\text{H}(^{11}\text{Li}, ^9\text{Li})^3\text{H}$ Reaction

T. Roger, H. Savajols, I. Tanihata, W. Mittig, M. Alcorta, D. Bandyopadhyay, R. Bieri, L. Buchmann, M. Caamaño, B. Davids, N. Galinski, A. Gallant, D. Howell, R. Kanungo, W. Mills, S. Mythili, M. Notani, R. Openshaw, E. Padilla-Rodal, P. Roussel-Chomaz, G. Ruprecht, G. Savard, G. Sheffer, A. C. Shotter, M. Trinczek, and P. Walden
Phys. Rev. C **79**, 031603(R)/1-4 (2009)

PHY-12377-HI-2009

Lifetime of the $K^\pi = 8^-$ Isomer in the Neutron-Rich Nucleus ^{174}Er , and $N = 106$ $E1$

Systematics

G. D. Dracoulis, G. J. Lane, F. G. Kondev, H. Watanabe, D. Seweryniak, S. Zhu, M. P. Carpenter, C. J. Chiara, R. V. F. Janssens, T. Lauritsen, C. J. Lister, E. A. McCutchan, and I. Stefanescu
Phys. Rev. C **79**, 061303(R)/1-4 (2009)

PHY-12489-HI-2009

High-Spin Level Scheme of ^{194}Pb

T. Kutsarova, E. A. Stefanova, A. Minkova, S. Lalkovski, A. Korichi, A. Lopez-Martens, F. Hannachi, H. Hübel, A. Görden, A. Jansen, G. Schönwasser, T. L. Khoo, B. Herskind, M. Bergström, D. Bazzacco, and Z. Podolyak
Phys. Rev. C **79**, 014315/1-19 (2009)

PHY-12131-ME-2008

Search for Sub-Threshold Photoproduction of J/ψ Mesons

P. Bosted *et al.*

Phys. Rev. C **79**, 015209/1-7 (2009)

PHY-12238-HI-2008

Decay Properties of High-Spin Isomers and Other Structures in ^{121}Sb and ^{123}Sb

H. Watanabe, G. J. Lane, G. D. Dracoulis, T. Kibédi, A. P. Byrne, P. Nieminen, R. O. Hughes, F. G. Kondev, M. P. Carpenter, R. V. F. Janssens, T. Lauritsen, D. Seweryniak, S. Zhu, P. Chowdhury, and C.-B. Moon
Phys. Rev. C **79**, 024306/1-15 (2009)

PHY-12493-HI-2009

Comprehensive γ -Ray Spectroscopy of Rotational Bands in the $N = Z + 1$ Nucleus ^{61}Zn

L.-L. Andersson, I. Ragnarsson, D. Rudolph, E. K. Johansson, D. A. Torres, C. Andreoiu, M. P. Carpenter, R. J. Charity, C. J. Chiara, J. Ekman, C. Fahlander, C. Hoel, O. L. Pechenaya, W. Reviol, R. du Rietz, D. G. Sarantites, D. Seweryniak, L. G. Sobotka, and S. Zhu
Phys. Rev. C **79**, 024312/1-13 (2009)

PHY-12095-TH-2008

Extraction of Resonances from Meson-Nucleon Reactions

N. Suzuki, T. Sato, and T.-S. H. Lee

Phys. Rev. C **79**, 025205/1-6 (2009)

PHY-12111-TH-2008

Dynamical Coupled-Channels Study of $\pi N \rightarrow \pi\pi N$ Reactions

H. Kamano, B. Juliá-Díaz, T.-S. Harry Lee, A. Matsuyama, and T. Sato

Phys. Rev. C **79**, 025206/1-11 (2009)

PHY-12401-HI-2009

$(h_{11/2}, g_{7/2})_9$ — Neutron Excitation in $^{92,94,96}\text{Sr}$

T. Rzāca-Urban, K. Sieja, W. Urban, F. Nowacki, J. L. Durell, A. G. Smith, and I. Ahmad
Phys. Rev. C **79**, 024319/1-10 (2009)

PHY-12110-TH-2008

Enhanced Effect of Quark Mass Variation in ^{229}Th and Limits from Oklo Data

V. V. Flambaum and R. B. Wiringa
Phys. Rev. C **79**, 034302/1-8 (2009)

PHY-12235-HI-2008

Levels Above the $19/2^-$ Isomer in ^{71}Cu : Persistence of the $N = 40$ Neutron Shell Gap

I. Stefanescu, W. B. Walters, R. V. F. Janssens, N. Hoteling, R. Broda, M. P. Carpenter, B. Fornal, A. A. Hecht, W. Krolas, T. Lauritsen, T. Pawlat, D. Seweryniak, J. R. Stone, X. Wang, A. Wöhr, J. Wrzesinski, and S. Zhu
Phys. Rev. C **79**, 034319/1-6 (2009)

PHY-12242-TH-2008

Chiral Susceptibility and the Scalar Ward Identity

Lei Chang, Yu-Xin Liu, Craig D. Roberts, Yuan-Mei Shi, Wei-Min Sun, and Hong-Shi Zong
Phys. Rev. C **79**, 035209/1-8 (2009)

PHY-12402-HI-2009

New Isomers and Medium-Spin Structure of the ^{95}Y Nucleus

W. Urban, K. Sieja, G. S. Simpson, H. Faust, T. Rząca-Urban, A. Zlomaniec, M. Lukasiewicz, A. G. Smith, J. L. Durell, J. F. Smith, B. J. Varley, F. Nowacki, and I. Ahmad
Phys. Rev. C **79**, 044304/1-13 (2009)

PHY-12285-HI-2009

Structure of $^{65,67}\text{Co}$ Studied Through the β Decay of $^{65,67}\text{Fe}$ and a Deep-Inelastic Reaction

D. Pauwels, O. Ivanov, J. Büscher, T. E. Cocolios, M. Huyse, Yu. Kudryavtsev, R. Raabe, M. Sawicka, J. Van de Walle, P. Van Duppen, A. Korgul, I. Stefanescu, A. A. Hecht, N. Hoteling, A. Wöhr, W. B. Walters, R. Broda, B. Fornal, W. Krolas, T. Pawlat, J. Wrzesinski, M. P. Carpenter, R. V. F. Janssens, T. Lauritsen, D. Seweryniak, S. Zhu, J. R. Stone, and X. Wang
Phys. Rev. C **79**, 044309/1-15 (2009)

PHY-12495-HI-2009

Evidence for a β -Decaying $1/2^-$ Isomer in ^{71}Ni

I. Stefanescu, D. Pauwels, N. Bree, T. E. Cocolios, J. Diriken, S. Franchoo, M. Huyse, O. Ivanov, Y. Kudryavtsev, N. Patronis, J. Van De Walle, P. Van Duppen, and W. B. Walters
Phys. Rev. C **79**, 044325/1-6 (2009)

PHY-12292-HI-2009

A Survey of Heavy-Ion Fusion Hindrance for Lighter Systems

C. L. Jiang, K. E. Rehm, B. B. Back, and R. V. F. Janssens
Phys. Rev. C **79**, 044601/1-6 (2009)

PHY-12096-TH-2008

Paris $N\bar{N}$ Potential Constrained by Recent Antiprotonic-Atom Data and $\bar{n}p$ Total Cross Sections

B. El-Bennich, M. Lacombe, B. Loiseau, and S. Wycech

Phys. Rev. C **79**, 054001/1-9 (2009)

PHY-12329-HI-2009

Low-Energy Structure of ^{61}Mn Populated Following β Decay of ^{61}Cr

H. L. Crawford, P. F. Mantica, J. S. Berryman, R. Broda, B. Fornal, C. R. Hoffman, N.

Hoteling, R. V. F. Janssens, S. M. Lenzi, J. Pereira, J. B. Stoker, S. L. Tabor, W. B. Walters,

X. Wang, and S. Zhu

Phys. Rev. C **79**, 054320/1-7 (2009)

PHY-12317-HI-2009

Identification of the $g_{9/2}$ -Proton Bands in the Neutron-Rich $^{71,73,75,77}\text{Ga}$ Nuclei

I. Stefanescu, W. B. Walters, R. V. F. Janssens, S. Zhu, R. Broda, M. P. Carpenter, C. J.

Chiara, B. Fornal, B. P. Kay, F. G. Kondev, W. Krolas, T. Lauritsen, C. J. Lister, E. A.

McCutchan, T. Pawlat, D. Seweryniak, J. R. Stone, N. J. Stone, and J. Wrzesinski

Phys. Rev. C **79**, 064302/1-12 (2009)

PHY-12425-HI-2009

Multi-Quasiparticle Isomers Involving Proton-Particle and Neutron-Hole Configurations in ^{131}I and ^{133}I

H. Watanabe, G. J. Lane, G. D. Dracoulis, A. P. Byrne, P. Nieminen, F. G. Kondev, K.

Ogawa, M. P. Carpenter, R. V. F. Janssens, T. Lauritsen, D. Seweryniak, S. Zhu, and P.

Chowdhury

Phys. Rev. C **79**, 064311/1-8 (2009)

PHY-12335-HI-2009

Spectroscopy of ^{257}Rf

J. Qian, A. Heinz, T. L. Khoo, R. V. F. Janssens, D. Peterson, D. Seweryniak, I. Ahmad, M.

Asai, B. B. Back, M. P. Carpenter, A. B. Garnsworthy, J. P. Greene, A. A. Hecht, C. L. Jiang,

F. G. Kondev, T. Lauritsen, C. J. Lister, A. Robinson, G. Savard, R. Scott, R. Vondrasek, X.

Wang, R. Winkler, and S. Zhu

Phys. Rev. C **79**, 064319/1-13 (2009)

PHY-12337-TH-2009

Indications of a Shallow Potential in $^{48}\text{Ca} + ^{96}\text{Zr}$ Fusion Reactions

H. Esbensen and C. L. Jiang

Phys. Rev. C **79**, 064619/1-7 (2009)

PHY-12093-TH-2008

Strange Magnetic Form Factor of the Proton at $Q^2 = 0.23 \text{ GeV}^2$

P. Wang, D. B. Leinweber, A. W. Thomas, and R. D. Young
Phys. Rev. C **79**, 065202/1-11 (2009)

PHY-12465-ME-2009

π^+ Photoproduction on the Proton for Photon Energies from 0.725 to 2.875 GeV

M. Dugger *et al.* (CLAS Collaboration)
Phys. Rev. C **79**, 065206/1-14 (2009)

PHY-12403-HI-2009

Mapping Neutron Levels in the $A \sim 100$ Region: The $\nu 3/2^+$ [411] Band in ^{103}Zr

W. Urban, J. A. Pinston, T. Rząca-Urban, E. Wolska, J. Genevey, G. S. Simpson, A. G. Smith, J. L. Durell, B. Varley, and I. Ahmad
Phys. Rev. C **79**, 067301/1-5 (2009)

PHY-12261-TH-2009

Scalar Resonances in a Unitary $\pi\pi$ S -Wave Model for $D^+ \rightarrow \pi^+\pi^-\pi^+$

D. R. Boito, J.-P. Dedonder, B. El-Bennich, O. Leitner, and B. Loiseau
Phys. Rev. D **79**, 034020/1-12 (2009)

PHY-12193-TH-2008

Scalar Meson $f_0(980)$ in Heavy-Meson Decays

B. El-Bennich, O. Leitner, J.-P. Dedonder, and B. Loiseau
Phys. Rev. D **79**, 076004/1-22 (2009)

PHY-12172-TH-2008

Chiral Extrapolation of Octet-Baryon Charge Radii

P. Wang, D. B. Leinweber, A. W. Thomas, and R. D. Young
Phys. Rev. D **79**, 094001/1-12 (2009)

PHY-12308-TH-2009

CP Violation and Pion-Kaon Interactions in $B \rightarrow K\pi^+\pi^-$ Decays

B. El-Bennich, A. Furman, R. Kamiński, L. Leśniak, B. Loiseau, and B. Moussallam
Phys. Rev. D **79**, 094005/1-28 (2009)

PHY-12300-RI-2009

Analysis and Recombination of Multiple-Charge-State Beams from an Electron Cyclotron Resonance Ion Source

P. N. Ostroumov, S. A. Kondrashev, B. Mustapha, R. Scott, and N. E. Vinogradov
Phys. Rev. ST Accel. Beams **12**, 010101/1-6 (2009)

PHY-12056-RI-2008

Transfer Map Approach to and Optical Effects of Energy Degraders in Fragment Separators

B. Erdelyi, L. Bandura, and J. Nolen

Phys. Rev. ST Accel. Beams **12**, 014003/1-14 (2009)

PHY-12252-RI-2009

Numerical Simulations of Stripping Effects in High-Intensity Hydrogen Ion Linacs

J.-P. Carneiro, B. Mustapha, and P. N. Ostroumov

Phys. Rev. ST Accel. Beams **12**, 040102/1-12 (2009)

PHY-12145-HI-2008

Shape Phase Transitions in Geometrical and Algebraic Nuclear Collective Models

Dennis Bonatsos and E. A. McCutchan

Nucl. Phys. News **19**, 13-17 (2009)

PHY-12249-HI-2009

First Measurement of Single-Particle Energies in ^{100}Sn

Dariusz Seweryniak

Nucl. Phys. News **19**, 18-21 (2009)

PHY-12181-ME-2008

Simple Atom, Extreme Nucleus - Laser Trapping and Probing of ^6He and ^8He

Zheng-Tian Lu and Peter Mueller

Nucl. Phys. News **19**, 28-32 (2009)

PHY-12101-HI-2008

Performance Tests of Large Area Position-Sensitive Planar Germanium Detectors with Conventional and Amorphous Contacts

S. Gros, N. J. Hammond, C. J. Lister, P. Chowdhury, S. M. Fischer, and S. J. Freeman

Nucl. Instrum. Methods **A602**, 467-476 (2009)

PHY-12498-HI-2009

The LEBIT 9.4 T Penning Trap Mass Spectrometer

R. Ringle, G. Bollen, A. Prinke, J. Savory, P. Schury, S. Schwarz, and T. Sun

Nucl. Instrum. Methods **A604**, 536-547 (2009)

PHY-12324-TH-2009

CNO "Breakout" and Nucleosynthesis in Classical Novae

S. Ami Glasner and James W. Truran

Astrophys. J. Lett. **692**, L58-L61 (2009)

PHY-12325-TH-2009

Nucleosynthesis Modes in the High-Entropy-Wind of Type II Supernovae: Comparison of Calculations with Halo-Star Observations

K. Farouqi, K.-L. Kratz, L. I. Mashonkina, B. Pfeiffer, J. J. Cowan, F.-K. Thielemann, and J. W. Truran

Astrophys. J. Lett. **694**, L49-L53 (2009)

PHY-12323-TH-2009

Study of the Detonation Phase in the Gravitationally Confined Detonation Model of Type Ia Supernovae

Casey A. Meakin, Ivo Seitenzahl, Dean Townsley, George C. Jordan IV, James Truran, and Don Lamb

Astrophys. J. **693**, 1188-1208 (2009)

PHY-12429-TH-2009

On the Methods for Constructing Meson-Baryon Reaction Models Within Relativistic Quantum Field Theory

B. Juliá-Díaz, H. Kamano, T.-S. H. Lee, A. Matsuyama, T. Sato, and N. Suzuki

Chin. J. Phys. **47**, 142 (2009)

PHY-12499-HI-2009

Recent Results from PHOBOS on Particle Production at High p_T

B. Alver *et al.* (PHOBOS Collaboration)

Eur. Phys. J. C **61**, 575-582 (2009)

PHY-12227-TH-2008

Survey of Nucleon Electromagnetic Form Factors

I. C. Cloët, G. Eichmann, B. El-Bennich, T. Klähn, and C. D. Roberts

Few-Body Systems **46**, 1-36 (2009)

PHY-12262-ME-2009

Precision Spectroscopy of the Helium Atom

Shui-Ming Hu, Zheng-Tian Lu, and Zong-Chao Yan

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PHY-12044-TH-2008

Hyperfine Mixing and the Semileptonic Decays of Double-Heavy Baryons in a Quark Model

W. Roberts and Muslema Pervin

Int. J. Mod. Phys. A **24**, 2401-2413 (2009)

PHY-12065-ME-2008

Neutron Structure Functions

J. Arrington, F. Coester, R. J. Holt, and T.-S. H. Lee

J. Phys. G **36**, 025005/1-15 (2009)

PHY-12305-TH-2009

Dynamical Models of the Excitations of Nucleon Resonances

T. Sato and T.-S. H. Lee

J. Phys. G **36**, 073001/1-39 (2009)

PHY-12287-RI-2009

Development of a Liquid Lithium Thin Film for Use as a Heavy Ion Beam Stripper

Y. Momozaki, J. Nolen, C. Reed, V. Novick, and J. Specht

Jrnl. of Instr. **4**, P04005/1-19 (2009)

PHY-12116-RI-2008

Conceptual Design of a Superconducting Quadrupole with Elliptical Acceptance and Tunable Higher Order Multipoles

S. Manikonda, J. Nolen, M. Berz, and K. Makino

Jrnl. of Instr. **24**, 923-940 (2009)

PHY-12400-HI-2009

Unexpected Doubly Magic Nucleus

R. V. F. Janssens

Nature **459**, 1069-1070 (2009)

PHY-12250-ME-2009

The Role of Carrier Gases in the Production of Metastable Argon Atoms in an RF Discharge

Kenneth Rudinger, Zheng-Tian Lu, and Peter Mueller

Rev. Sci. Instrum. **80**, 036105/1-2 (2009)

PHY-12112-TH-2008

Ugo Fano *July 28, 1912 - February 13, 2001*

R. Stephen Berry, Mitio Inokuti, and A. R. P. Rau

Biographical Memoir of Ugo Fano, National Academy Press, pp. 1-22 (2009)