

## Physics Division Published Journal Articles, July-December 2013

PHY-13533-HI-2013

Quenching of Cross Sections in Nucleon Transfer Reactions

B. P. Kay, J. P. Schiffer, and S. J. Freeman

Phys. Rev. Lett. **111**, 042502/1-5 (2013)

PHY-13405-HI-2013

First Results from the CARIBU Facility: Mass Measurements on the  $r$ -Process Path

J. Van Schelt, D. Lascar, G. Savard, J. A. Clark, P. F. Bertone, S. Caldwell, A. Chaudhuri,

A. F. Levand, G. Li, G. E. Morgan, R. Orford, R. E. Segel, K. S. Sharma, and

M. G. Sternberg

Phys. Rev. Lett. **111**, 061102/1-5 (2013)

PHY-13510-TH-2013

Electromagnetic Transition from the  $4^+$  to  $2^+$  Resonance in  $^8\text{Be}$  Measured via the Radiative Capture in  $^4\text{He} + ^4\text{He}$

V. M. Datar, D. R. Chakrabarty, Suresh Kumar, V. Nanal, S. Pastore, R. B. Wiringa,

S. P. Behera, A. Chatterjee, D. Jenkins, C. J. Lister, R. T. Mirgule, A. Mitra, R. G. Pillay,

K. Ramachandran, O. J. Roberts, P. C. Rout, A. Shrivastava, and P. Sugathan

Phys. Rev. Lett. **111**, 062502/1-5 (2013)

PHY-13506-ME-2013

Measurements of Parity-Violating Asymmetries in Electron-Deuteron Scattering in the Nucleon Resonance Region

D. Wang *et al.* (Jefferson Lab Hall A Collaboration)

Phys. Rev. Lett. **111**, 082501/1-7 (2013)

PHY-13585-TH-2013

Pion Distribution Amplitude from Lattice-QCD

I. C. Cloët, L. Chang, C. D. Roberts, S. M. Schmidt, and P. C. Tandy

Phys. Rev. Lett. **111**, 092001/1-5 (2013)

PHY-13519-TH-2013

Charge Form Factor and Sum Rules of Electromagnetic Response Functions in  $^{12}\text{C}$

A. Lovato, S. Gandolfi, Ralph Butler, J. Carlson, Ewing Lusk, Steven C. Pieper, and

R. Schiavilla

Phys. Rev. Lett. **111**, 092501/1-5 (2013)

PHY-13438-TH-2013

Revealing Dressed-Quarks via the Proton's Charge Distribution

Ian C. Cloët, Craig D. Roberts, and Anthony W. Thomas

Phys. Rev. Lett. **111**, 101803/1-5 (2013)

PHY-13530-TH-2013

Efimov Physics Around the Neutron Rich  $^{60}\text{Ca}$  Isotope

G. Hagen, P. Hagen, H.-W. Hammer, and L. Platter

Phys. Rev. Lett. **111**, 132501/1-5 (2013)

PHY-13531-TH-2013

Pion Electromagnetic Form Factor at Spacelike Momenta

L. Chang, I. C. Cloët, C. D. Roberts, S. M. Schmidt, and P. C. Tandy

Phys. Rev. Lett. **111**, 141802/1-5 (2013)

PHY-13612-TH-2013

Equivalence Principle and Bound Kinetic Energy

Michael A. Hohensee, Holger Müller, and R. B. Wiringa

Phys. Rev. Lett. **111**, 151102/1-5 (2013)

PHY-13587-HI-2013

In-Beam  $\gamma$ -Ray Spectroscopy of  $^{34,36,38}\text{Mg}$ : Merging the  $N = 20$  and  $N = 28$  Shell Quenching

P. Doornenbal, H. Scheit, S. Takeuchi, N. Aoi, K. Li, M. Matsushita, D. Steppenbeck,

H. Wang, H. Baba, H. Crawford, C. R. Hoffman, R. Hughes, E. Ideguchi, N. Kobayashi,

Y. Kondo, J. Lee, S. Michimasa, T. Motobayashi, H. Sakurai, M. Takechi, Y. Togano,

R. Winkler, and K. Yoneda

Phys. Rev. Lett. **111**, 212502/1-5 (2013)

PHY-13594-HI-2013

Low-Lying  $T = 0$  States in the Odd-Odd  $N = Z$  Nucleus  $^{62}\text{Ga}$

H. M. David, P. J. Woods, G. Lotay, D. Seweryniak, M. Albers, M. Alcorta, M. P. Carpenter,

C. J. Chiara, T. Davinson, D. T. Doherty, C. R. Hoffman, R. V. F. Janssens, T. Lauritsen,

A. M. Rogers, and S. Zhu

Phys. Lett. **B726**, 665-669 (2013)

PHY-13586-TH-2013

Nucleon Spin Structure at Very High- $x$

Craig D. Roberts, Roy J. Holt, and Sebastian M. Schmidt

Phys. Lett. **B727**, 249-254 (2013)

PHY-13596-TH-2013

Light Front Distribution of the Chiral Condensate

Lei Chang, Craig D. Roberts, and Sebastian M. Schmidt

Phys. Lett. **B727**, 255-259 (2013)

PHY-13663-TH-2013

Fusion of  $^{40}\text{Ca} + ^{96}\text{Zr}$  Revisited: Transfer Couplings and Hindrance Far Below the Barrier

A. M. Stefanini, G. Montagnoli, H. Esbensen, L. Corradi, S. Courtin, E. Fioretto, A. Goasduff, J. Grebosz, F. Haas, M. Mazzocco, C. Michelagnoli, T. Mijatovic, D. Montanari, G. Pasqualato, C. Parascandolo, F. Scarlassara, E. Strano, S. Szilner, and D. Torresi

Phys. Lett. **B728**, 639-644 (2013)

PHY-13545-HI-2013

Structure of  $^{14}\text{B}$  and the Evolution of  $N = 9$  Single-Neutron Isotones

S. Bedoor, A. H. Wuosmaa, J. C. Lighthall, M. Alcorta, B. B. Back, P. F. Bertone, B. A. Brown, C. M. Deibel, C. R. Hoffman, S. T. Marley, R. C. Pardo, K. E. Rehm, A. M. Rogers, J. P. Schiffer, and D. V. Shetty

Phys. Rev. C **88**, 011304(R)/1-5 (2013)

PHY-13540-HI-2013

Quadrupole Moments of Coexisting Collective Shapes at High Spin in  $^{154}\text{Er}$

J. P. Revill, E. S. Paul, X. Wang, M. A. Riley, J. Simpson, R. V. F. Janssens, J. Ollier, A. J. Boston, M. P. Carpenter, C. J. Chiara, C. R. Hoffman, F. G. Kondev, T. Lauritsen, P. J. Nolan, J. M. Rees, S. V. Rigby, C. Unsworth, S. Zhu, and I. Ragnarsson

Phys. Rev. C **88**, 031304(R)/1-5 (2013)

PHY-13520-TH-2013

Insights Into the  $\gamma^*N \rightarrow \Delta$  Transition

Jorge Segovia, Chen Chen, Craig D. Roberts, and Shaolong Wan

Phys. Rev. C **88**, 032201(R)/1-6 (2013)

PHY-13608-HI-2013

Configuration Mixing and Relative Transition Rates Between Low-Spin States in  $^{68}\text{Ni}$

F. Recchia, C. J. Chiara, R. V. F. Janssens, D. Weisshaar, A. Gade, W. B. Walters, M. Albers, M. Alcorta, V. M. Bader, T. Baugher, D. Bazin, J. S. Berryman, P. F. Bertone, B. A. Brown, C. M. Campbell, M. P. Carpenter, J. Chen, H. L. Crawford, H. M. David, D. T. Doherty, C. R. Hoffman, F. G. Kondev, A. Korichi, C. Langer, N. Larson, T. Lauritsen, S. N. Liddick, E. Lunderberg, A. O. Macchiavelli, S. Noji, C. Prokop, A. M. Rogers, D. Seweryniak, S. R. Stroberg, S. Suchyta, S. Williams, K. Wimmer, and S. Zhu

Phys. Rev. C **88**, 041302(R)/1-6 (2013)

PHY-13593-HI-2013

Identification of Triaxial Strongly Deformed Bands in  $^{164}\text{Hf}$

J. C. Marsh, W. C. Ma, G. B. Hagemann, R. V. F. Janssens, R. Bengtsson, H. Ryde, M. P. Carpenter, G. Gürdal, D. J. Hartley, C. Hoffman, Q. A. Ijaz, F. G. Kondev, T. Lauritsen, S. Mukhopadhyay, L. L. Riedinger, R. B. Yadav, and S. Zhu

Phys. Rev. C **88**, 041306(R)/1-5 (2013)

PHY-13646-ME-2013

Cross Sections for the  $\gamma p \rightarrow K^* \Lambda$  and  $\gamma p \rightarrow K^* \Sigma^0$  Reactions Measured at CLAS

W. Tang *et al.* (CLAS Collaboration)

Phys. Rev. C **87**, 065204/1-13 (2013)

PHY-13434-HI-2013

Multiquasiparticle States in the Neutron-Rich Nucleus  $^{174}\text{Tm}$

R. O. Hughes, G. J. Lane, G. D. Dracoulis, A. P. Byrne, P. Nieminen, H. Watanabe,  
M. P. Carpenter, P. Chowdhury, R. V. F. Janssens, F. G. Kondev, T. Lauritsen,  
D. Seweryniak, and S. Zhu

Phys. Rev. C **88**, 014311/1-15 (2013)

PHY-13550-HI-2013

Measurement of the Fusion Probability,  $P_{\text{CN}}$ , for Hot Fusion Reactions

R. Yanez, W. Loveland, J. S. Barrett, L. Yao, B. B. Back, S. Zhu, and T. L. Khoo

Phys. Rev. C **88**, 014606/1-8 (2013)

PHY-13439-TH-2013

Production of  $J/\Psi$  on the Nucleon and On Deuteron Targets

Jia-Jun Wu and T.-S. H. Lee

Phys. Rev. C **88**, 015205/1-13 (2013)

PHY-13537-ME-2013

Demonstration of a Novel Technique to Measure Two-Photon Exchange Effects in Elastic  $e^\pm p$  Scattering

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

Phys. Rev. C **88**, 025210/1-13 (2013)

PHY-13431-HI-2013

First Determination of the  $^8\text{Li}$  Valence Neutron Asymptotic Normalization Coefficient Using the  $^7\text{Li}(^8\text{Li}, ^7\text{Li})^8\text{Li}$  Reaction

D. Howell, B. Davids, J. P. Greene, R. Kammingo, S. Mythili, C. Ruiz, G. Ruprecht, and  
I. J. Thompson

Phys. Rev. C **88**, 025804/1-6 (2013)

PHY-13602-HI-2013

First Observation of Excited States in  $^{87}\text{Se}$ : Collectivity and  $j - 1$  Anomaly at  $N = 53$

T. Rzaca-Urban, M. Czerwiński, W. Urban, A. G. Smith, I. Ahmad, F. Nowacki, and K. Sieja

Phys. Rev. C **88**, 034302/1-5 (2013)

PHY-13521-TH-2013

Nucleon Resonances Within a Dynamical Coupled-Channels Model of  $\pi N$  and  $\gamma N$  Reactions

H. Kamano, S. X. Nakamura, T.-S. H. Lee, and T. Sato

Phys. Rev. C **88**, 035209/1-51 (2013)

PHY-13657-HI-2013

Yrast Excitations in the Neutron-Rich  $N = 52$  Isotones

M. Czerwinski, T. Rzaca-Urban, K. Sieja, H. Sliwinska, W. Urban, A. G. Smith, J. F. Smith, G. F. Simpson, I. Ahmad, J. P. Greene, and T. Materna  
Phys. Rev. C **88**, 044314/1-13 (2013)

PHY-13556-HI-2013

Single-Neutron Excitations in  $^{18}\text{N}$

C. R. Hoffman, M. Albers, M. Alcorta, S. Almaraz-Calderon, B. B. Back, S. I Baker, S. Bedoor, P. F. Bertone, B. P. Kay, J. C. Lighthall, T. Palchan, R. C. Pardo, G. Perdikakis, K. E. Rehm, A. M. Rogers, D. Santiago-Gonzalez, Cenxi Yuan, and J. P. Schiffer  
Phys. Rev. C **88**, 044317/1-7 (2013)

PHY-13598-HI-2013

Possible Deformation Evolution in the  $\pi i_{13/2}$  Structure of  $^{171}\text{Re}$

D. J. Hartley, E. E. Pedicini, R. V. F. Janssens, L. L. Riedinger, M. A. Riley, X. Wang, S. Miller, A. D. Ayangeakaa, M. P. Carpenter, J. J. Carroll, J. Cavey, C. J. Chiara, P. Chowdhury, U. Garg, S. S. Hota, E. G. Jackson, F. G. Kondev, T. Lauritsen, M. Litz, W. C. Ma, J. Matta, E. S. Paul, J. Simpson, J. R. Vanhoy, and S. Zhu  
Phys. Rev. C **88**, 044323/1-15 (2013)

PHY-13595-TH-2013

Charge-Symmetry Breaking Forces and Isospin Mixing in  $^8\text{Be}$

R. B. Wiringa, S. Pastore, Steven C. Pieper, and Gerald A. Miller  
Phys. Rev. C **88**, 044333/1-8 (2013)

PHY-13588-HI-2013

Collective and Non-Collective Excitations in  $^{122}\text{Te}$

Somnath Nag, A. K. Singh, I. Ragnarsson, H. Hübel, A. Al-Khatib, P. Bringel, C. Engelhardt, A. Neußer-Neffgen, G. B. Hagemann, B. Herskind, G. Sletten, M. P. Carpenter, R. V. F. Janssens, T. L. Khoo, T. Lauritsen, R. M. Clark, P. Fallon, G. Benzoni, A. Bracco, F. Camera, and P. Chowdhury  
Phys. Rev. C **88**, 044335/1-13 (2013)

PHY-13672-ME-2013

Differential Photoproduction Cross Sections of the  $\Sigma(1385)$ ,  $\Lambda(1405)$ , and  $\Lambda(1520)$

K. Moriya *et al.* (CLAS Collaboration)  
Phys. Rev. C **88**, 045201/1-20 (2013)

PHY-13654-ME-2013

First Observation of the  $\Lambda(1405)$  Line Shape in Electroproduction

H. Y. Lu *et al.* (CLAS Collaboration)  
Phys. Rev. C **88**, 045202/1-7 (2013)

PHY-13607-HI-2013

Single-Particle and Collective Excitations in  $^{63}\text{Ni}$

M. Albers, S. Zhu, R. V. F. Janssens, J. Gellanki, I. Ragnarsson, M. Alcorta, T. Baugher, P. F. Bertone, M. P. Carpenter, C. J. Chiara, P. Chowdhury, A. N. Deacon, A. Gade, B. DiGiovine, C. R. Hoffman, F. G. Kondev, T. Lauritsen, C. J. Lister, E. A. McCutchan, D. S. Moerland, C. Nair, A. M. Rogers, and D. Seweryniak  
Phys. Rev. C **88**, 054314/1-13 (2013)

PHY-12948-TH-2011

Representations of Each Number Type That Differ by Scale Factors

Paul Benioff

Adv. Pure Math. **3**, 394-404 (2013)

PHY-13484-TH-2013

Charge Form Factors of Two-Neutron Halo Nuclei in Halo EFT

P. Hagen, H.-W. Hammer, and L. Platter

Eur. Phys. J. A **49**, 118-130 (2013)

PHY-13523-HI-2013

Precision Masses for Studies of the Astrophysical  $r$  Process

Jason Clark and Guy Savard

Int. J. Mass. Spectrom. **349-350**, 81-86 (2013)

PHY-13376-HI-2012

Wear Measurement of Highly Cross-Linked UHMWPE Using a  $^7\text{Be}$  Tracer Implantation Technique

M. A. Wimmer, M. P. Laurent, Y. Dwiwedi, L. A. Gallardo, K. A. Chipps, J. C. Blackmon, R. L. Kozub, D. W. Bardayan, C. J. Gross, D. W. Stracener, M. S. Smith, C. D. Nesaraja, L. Erikson, N. Patel, K. E. Rehm, I. Ahmad, J. P. Greene, and U. Greife  
J. Biomed. Mater. Res. B **101**, 423 (2013)

PHY-13336-ME-2012

Coulomb Corrections in the Extraction of the Proton Radius

J. Arrington

J. Phys. G **40**, 115003/1-8 (2013)

PHY-13505-ME-2013

A Scalar-Based Data Acquisition System for Measuring Parity-Violating Asymmetry in Deep Inelastic Scattering

R. Subedi, D. Wang, K. Pan, X. Deng, R. Michaels, P. E. Reimer, A. Shahinyan, B. Wojtsekhowski, and X. Zheng

Nucl. Instrum. Methods **A724**, 90-103 (2013)

PHY-13428-ME-2013

Thermomechanical Design of a Static Gas Target for Electron Accelerators

B. Brajuskovic, T. O'Connor, R. J. Holt, J. Reneker, D. Meekins, and P. Solvignon  
Nucl. Instrum. Methods **A729**, 469-473 (2013)

PHY-13627-HI-2013

HELIOS: A New Approach to Reactions in Inverse Kinematics

B. B. Back and A. H. Wusomaa  
Nucl. Phys. News **23**, 21-23 (2013)