PHYSICAL REVIEW C

For editorial and subscription correspondence, please see inside front cover
(ISSN: 0556-2813)

PERIODICALS
Postmaster send address changes to:
American Institute of Physics
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 66, NUMBER 6 ***CONTENTS*** **DECEMBER 2002**

RAPID COMMUNICATIONS

Phase-shift analysis of elastic $\Sigma^+ p$ scattering *(4 pages)* . . . . . 061001(R)
J. Nagata, H. Yoshino, V. Limkaisang, Y. Yoshino, M. Matsuda, and T. Ueda

Evolution of shell closures in neutron-rich $Z=10-20$ nuclei *(4 pages)* . . . . . 061301(R)
P. D. Cottle and K. W. Kemper

Geometry of random interactions *(4 pages)* . . . . . 061302(R)
P. Chau Huu-Tai, A. Frank, N. A. Smirnova, and P. Van Isacker

Coulomb-nuclear interference in the breakup of ^{11}Be *(5 pages)* . . . . . 061601(R)
R. Chatterjee and R. Shyam

Two-step model of fusion for the synthesis of superheavy elements *(5 pages)* . . . . . 061602(R)
Caiwan Shen, Grigori Kosenko, and Yasuhisa Abe

$K^*(892)^0$ production in relativistic heavy ion collisions at $\sqrt{s_{NN}}=130$ GeV *(6 pages)* . . . . . 061901(R)
C. Adler, Z. Ahammed, C. Allgower, J. Amonett, B. D. Anderson, M. Anderson, G. S. Averichev, J. Balewski, O. Barannikova, L. S. Barnby, J. Baudot, S. Bekele, V. V. Belaga, R. Bellwied, J. Berger, H. Bichsel, A. Billmeier, L. C. Bland, C. O. Blyth, B. E. Bonner, A. Boucham, A. Brandin, A. Bravar, R. V. Cadman, H. Caines, M. Calderón de la Barca Sánchez, A. Cardenas, J. Carroll, J. Castillo, M. Castro, D. Cebra, P. Chaloupka, S. Chattopadhyay, Y. Chen, S. P. Chernenko, M. Cherney, A. Chikanian, B. Choi, W. Christie, J. P. Coffin, T. M. Cormier, J. G. Cramer, H. J. Crawford, A. A. Derevschikov, L. Didenko, T. Dietel, J. E. Draper, V. B. Dunin, J. C. Dunlop, V. Eckardt, L. G. Efimov, V. Emelianov, J. Engelage, G. Eppley, B. Erazmus, P. Fachini, V. Faine, J. Faivre, R. Fatemi, K. Filimonov, E. Finch, Y. Fisyak, D. Flierl, K. J. Foley, J. Fu, C. A. Gagliardi, N. Gagunashvili, J. Gans, L. Gaudichet, M. Germain, F. Geurts, V. Ghazikhanian, O. Grachov, V. Grigoriev, M. Guedon, E. Gushin, T. J. Hallman, D. Hardtke, J. W. Harris, T. W. Henry, S. Heppelmann, T. Herston, B. Hippolyte, A. Hirsch, E. Hjort, G. W. Hoffmann, M. Horsley, H. Z. Huang, T. J. Humanic, G. Igo, A. Ishihara, Yu. I. Ivanshin, P. Jacobs, W. W. Jacobs, M. Janik, I. Johnson, P. G. Jones, E. G. Judd, M. Kaneta, M. Kaplan, D. Keane, J. Kiryluk, A. Kisiel, J. Klay, S. R. Klein, A. Klyachko, T. Kollegger, A. S. Konstantinov, M. Kopytine, L. Kotchenda, A. D. Kovalenko, M. Kramer, P. Kravtsov, K. Krueger, C. Kuhn, A. I. Kulikov, G. J. Kunde, C. L. Kunz, R. Kh. Kutuev, A. A. Kuznetsov, L. Lakehal-Ayat, M. A. C. Lamont, J. M. Landgraf, S. Lange, C. P. Lansdell, B. Lasiuk, F. Laue, J. Lauret, A. Lebedev, R. Lednický, V. M. Leontiev, M. J. LeVine, Q. Li, S. J. Lindenbaum, M. A. Lisa, F. Liu, L. Liu, Z. Liu, Q. J. Liu, T. Ljubicic, W. J. Llope, G. LoCurto, H. Long, R. S. Longacre, M. Lopez-Noriega, W. A. Love, T. Ludlam, D. Lynn, J. Ma, R. Majka, S. Margetis, C. Markert, L. Martin, J. Marx, H. S. Matis, Yu. A. Matulenko, T. S. McShane, F. Meissner, Yu. Melnick, A. Meschanin, M. Messer, M. L. Miller, Z. Milosevich, N. G. Minaev, J. Mitchell, C. F. Moore, V. Morozov, M. M. de Moura, M. G. Munhoz, J. M. Nelson, P. Nevski, V. A. Nikitin, L. V. Nogach, B. Norman, S. B. Nurushev, G. Odyniec, A. Ogawa, V. Okorokov, M. Oldenburg, D. Olson, G. Paic, S. U. Pandey, Y. Panebratsev, S. Y. Panitkin,

Copyright 2002 by The American Physical Society

(Continued)

0556-2813(200212)66:6;1-L

PHYSICAL REVIEW C **THIRD SERIES, VOLUME 66, NUMBER 6** **DECEMBER 2002**

A. I. Pavlinov, T. Pawlak, V. Perevoztchikov, W. Peryt, V. A. Petrov, M. Planinic, J. Pluta, N. Porile, J. Porter, A. M. Poskanzer, E. Potrebenikova, D. Prindle, C. Pruneau, J. Putschke, G. Rai, G. Rakness, O. Ravel, R. L. Ray, S. V. Razin, D. Reichhold, J. G. Reid, G. Renault, F. Retiere, A. Ridiger, H. G. Ritter, J. B. Roberts, O. V. Rogachevski, J. L. Romero, A. Rose, C. Roy, V. Rykov, I. Sakrejda, S. Salur, J. Sandweiss, I. Savin, J. Schambach, R. P. Scharenberg, N. Schmitz, L. S. Schroeder, A. Schüttauf, K. Schweda, J. Seger, D. Seliverstov, P. Seyboth, E. Shahaliev, K. E. Shestermanov, S. S. Shimanskii, G. Skoro, N. Smirnov, R. Snellings, P. Sorensen, J. Sowinski, H. M. Spinka, B. Srivastava, E. J. Stephenson, R. Stock, A. Stolpovsky, M. Strikhanov, B. Stringfellow, C. Struck, A. A. P. Suaide, E. Sugarbaker, C. Suire, M. Sumbera, B. Surrow, T. J. M. Symons, A. Szanto de Toledo, P. Szarwas, A. Tai, J. Takahashi, A. H. Tang, D. Thein, J. H. Thomas, M. Thompson, V. Tikhomirov, M. Tokarev, M. B. Tonjes, T. A. Trainor, S. Trentalange, R. E. Tribble, V. Trofimov, O. Tsai, T. Ullrich, D. G. Underwood, G. Van Buren, A. M. VanderMolen, I. M. Vasilevski, A. N. Vasiliev, S. E. Vigdor, S. A. Voloshin, F. Wang, H. Ward, J. W. Watson, R. Wells, G. D. Westfall, C. Whitten ,Jr., H. Wieman, R. Willson, S. W. Wissink, R. Witt, J. Wood, N. Xu, Z. Xu, A. E. Yakutin, E. Yamamoto, J. Yang, P. Yepes, V. I. Yurevich, Y. V. Zanevski, I. Zborovský, H. Zhang, W. M. Zhang, R. Zoulkarneev, and A. N. Zubarev (STAR Collaboration)

Semihard scattering of partons at $\sqrt{s}$=17 vs 200 GeV: A study in contrast *(4 pages)* . . . . . 061902(R)
Steffen A. Bass, Berndt Müller, and Dinesh K. Srivastava

Expanding the nonlinear coupling constant in the derivative coupling model and the analysis of the effective nucleon mass *(3 pages)* . . . . . 062201(R)
Song Shu and Jia-Rong Li

ARTICLES

Nucleon-Nucleon Interaction, Few-Body Systems

Three-nucleon forces from chiral effective field theory *(17 pages)* 064001
E. Epelbaum, A. Nogga, W. Glöckle, H. Kamada, Ulf-G. Meißner, and H. Witała

Angle-dependent normalization of neutron-proton differential cross sections *(5 pages)* 064002
J. J. de Swart and R. G. E. Timmermans

Resolving the large-N_c nuclear potential puzzle *(6 pages)* 064003
Thomas D. Cohen

Nuclear Structure

Energy averages and fluctuations in the decay out of superdeformed bands *(10 pages)* 064301
A. J. Sargeant, M. S. Hussein, M. P. Pato, and M. Ueda

Relativistic random-phase approximation with density-dependent meson-nucleon couplings *(13 pages)* 064302
T. Nikšić, D. Vretenar, and P. Ring

Boson-mapping-based extension of the random-phase approximation in a three-level Lipkin model *(7 pages)* 064303
M. Grasso, F. Catara, and M. Sambataro

Scalar ground-state observables in the random phase approximation *(7 pages)* 064304
Calvin W. Johnson and Ionel Stetcu

Macroscopic properties of nuclei according to relativistic mean field theory *(6 pages)* 064305
Bożena Nerlo-Pomorska and Katarzyna Mazurek

Systematic calculations of the ground state properties of superheavy nuclei *(13 pages)* 064306
Zhongzhou Ren, Fei Tai, and Ding-Han Chen

Level density parameter study using a microscopic model *(6 pages)* 064307
A. N. Behkami, Z. Kargar, and N. Nasrabadi

(Continued)

PHYSICAL REVIEW C **THIRD SERIES, VOLUME 66, NUMBER 6** **DECEMBER 2002**

Jastrow-type calculations of one-nucleon removal reactions on open s-d shell nuclei *(9 pages)* 064308
M. K. Gaidarov, K. A. Pavlova, A. N. Antonov, C. Giusti, S. E. Massen, Ch. C. Moustakidis, and K. Spasova

Excited bands in odd-mass rare-earth nuclei *(7 pages)* 064309
Carlos E. Vargas, Jorge G. Hirsch, and Jerry P. Draayer

Deformed nuclei in a chiral model *(10 pages)* 064310
S. Schramm

Realistic shell-model calculations for proton particle-neutron hole nuclei around ^{132}Sn *(8 pages)* 064311
L. Coraggio, A. Covello, A. Gargano, N. Itaco, and T. T. S. Kuo

Pseudospin symmetry and relativistic mean field eigenfunctions *(8 pages)* 064312
J. N. Ginocchio

Proton single-particle strength in ^{19}F measured via the ^{18}O(d,n) reaction *(7 pages)* 064313
A. Terakawa, H. Orihara, M. Oura, M. Hosaka, H. Suzuki, K. Kumagai, Y. Kikuchi, T. Tohei, T. Nakagawa, J. Takamatsu, A. Narita, K. Hosomi, K. Ishii, G. C. Jon, K. Miura, and H. Ohnuma

Lifetimes of magnetic-rotational bands in ^{196}Pb *(6 pages)* 064314
A. K. Singh, H. Hübel, D. Roßbach, S. Chmel, A. Görgen, E. Mergel, G. Schönwaßer, F. Azaiez, C. Bourgeois, F. Hannachi, A. Korichi, A. Lopez-Martens, A. Astier, N. Buforn, N. Redon, O. Stezowski, D. Bazzacco, T. Kröll, C. Rossi-Alvarez, K. Hauschild, W. Korten, R. Lucas, H. J. Maier, P. Reiter, P. G. Thirolf, and A. N. Wilson

Self-consistent quasiparticle random phase approximation for the description of superfluid Fermi systems *(21 pages)* 064315
A. Rabhi, R. Bennaceur, G. Chanfray, and P. Schuck

β-delayed particle decay of ^{17}Ne into $p+\alpha+{}^{12}$C through the isobaric analog state in ^{17}F *(9 pages)* 064316
J. C. Chow, J. D. King, N. P. T. Bateman, R. N. Boyd, L. Buchmann, J. M. D'Auria, T. Davinson, M. Dombsky, E. Gete, U. Giesen, C. Iliadis, K. P. Jackson, A. C. Morton, J. Powell, and A. Shotter

Fermion-boson interactions and quantum algebras *(10 pages)* 064317
A. Ballesteros, O. Civitarese, F. J. Herranz, and M. Reboiro

Recoil distance lifetime measurements in ^{118}Xe *(5 pages)* 064318
I. M. Govil, A. Kumar, Hema Iyer, P. Joshi, S. K. Chamoli, Rakesh Kumar, R. P. Singh, and U. Garg

Surface structure of strange superheavy nuclei *(11 pages)* 064319
Jeff McIntire

Rotational band structures in $N=89$ ^{153}Gd *(13 pages)* 064320
T. B. Brown, M. A. Riley, D. Campbell, D. J. Hartley, F. G. Kondev, J. Pfohl, R. V. F. Janssens, S. M. Fischer, D. Nisius, P. Fallon, W. C. Ma, J. Simpson, and J. F. Sharpey-Schafer

Low-lying structure of light radon isotopes *(15 pages)* 064321
D. J. Dobson, S. J. Freeman, P. T. Greenlees, A. N. Qadir, S. Juutinen, J. L. Durell, T. Enqvist, P. Jones, R. Julin, A. Keenan, H. Kettunen, P. Kuusiniemi, M. Leino, P. Nieminen, P. Rahkila, S. D. Robinson, J. Uusitalo, and B. J. Varley

Many-body systems interacting via a two-body random ensemble. I. Angular momentum distribution in the ground states *(14 pages)* 064322
Y. M. Zhao, A. Arima, and N. Yoshinaga

Many-body systems interacting via a two-body random ensemble. II. Average energy of each angular momentum *(6 pages)* 064323
Y. M. Zhao, A. Arima, and N. Yoshinaga

Nuclear Reactions

Pion-nucleus optical potential valid up to the Δ-resonance region *(9 pages)* 064601
L. J. Abu-Raddad

Investigation of the coupling potential by means of S-matrix inversion *(4 pages)* 064602
I. Boztosun and R. S. Mackintosh

(Continued)

PHYSICAL REVIEW C THIRD SERIES, VOLUME 66, NUMBER 6 DECEMBER 2002

Stellar neutron capture cross sections of ^{128,129,130}Xe *(14 pages)* 064603
R. Reifarth, M. Heil, F. Käppeler, F. Voss, K. Wisshak, F. Bečvář, M. Krtička, R. Gallino, and Y. Nagai
Final state interactions in pion production from nuclei *(7 pages)* 064604
M. Alqadi and W. R. Gibbs
Nucleon elastic scattering potentials: Energy and isospin dependence *(7 pages)* 064605
A. Nadasen, S. Balaji, J. Brace, K. A. G. Rao, P. G. Roos, P. Schwandt, and J. T. Ndefru
Transverse velocity scaling in ^{197}Au+^{197}Au fragmentation *(4 pages)* 064606
J. Łukasik, S. Hudan, F. Lavaud, K. Turzó, G. Auger, Ch. O. Bacri, M. L. Begemann-Blaich, N. Bellaize, R. Bittiger, F. Bocage, B. Borderie, R. Bougault, B. Bouriquet, Ph. Buchet, J. L. Charvet, A. Chbihi, R. Dayras, D. Doré, D. Durand, J. D. Frankland, E. Galichet, D. Gourio, D. Guinet, B. Hurst, P. Lautesse, J. L. Laville, C. Leduc, A. Le Fèvre, R. Legrain, O. Lopez, U. Lynen, W. F. J. Müller, L. Nalpas, H. Orth, E. Plagnol, E. Rosato, A. Saija, C. Sfienti, C. Schwarz, J. C. Steckmeyer, G. Tăbăcaru, B. Tamain, W. Trautmann, A. Trzciński, E. Vient, M. Vigilante, C. Volant, B. Zwiegliński, and A. S. Botvina (INDRA and ALADIN Collaborations)
^{8}B breakup on ^{12}C at intermediate energies and the three-body structure of ^{8}B *(9 pages)* 064607
Y. L. Parfenova and M. V. Zhukov
Semimicroscopical description of the simplest photonuclear reactions accompanied by excitation of the giant dipole resonance in medium-heavy mass nuclei *(7 pages)* 064608
V. A. Rodin and M. H. Urin

Relativistic Nuclear Collisions

Multiplicity moments and hard processes in relativistic heavy ion collisions *(6 pages)* 064901
Pengfei Zhuang
In-medium vector meson properties and low-mass dilepton production from hot hadronic matter *(12 pages)* 064902
Amruta Mishra, Joachim Reinhardt, Horst Stöcker, and Walter Greiner
Strangeness enhancement in the parton model *(5 pages)* 064903
Rudolph C. Hwa and C. B. Yang

Hadronic Physics and QCD

Two pion decay of the Roper resonance *(7 pages)* 065201
E. Hernández, E. Oset, and M. J. Vicente Vacas
Current algebra calculation of $\rho_V^{(1)}-\rho_A^{(1)}$ *(10 pages)* 065202
R. H. Lemmer and R. Tegen
Nucleon charge and magnetization densities from Sachs form factors *(23 pages)* 065203
James J. Kelly
Hybrid and conventional baryons in the flux-tube model *(18 pages)* 065204
Simon Capstick and Philip R. Page
Asymptotic freedom for nonrelativistic confinement *(6 pages)* 065205
David R. Harrington
Dispersion relation analysis of neutral pion photoproduction and electroproduction at threshold *(8 pages)* . . . 065206
S. S. Kamalov, L. Tiator, D. Drechsel, R. A. Arndt, C. Bennhold, I. I. Strakovsky, and R. L. Workman
Nucleon mass and pion loops: Renormalization *(8 pages)* 065207
M. Oettel and A. W. Thomas

(Continued)

PHYSICAL REVIEW C **THIRD SERIES, VOLUME 66, NUMBER 6** **DECEMBER 2002**

Electroweak Interaction, Symmetries

Muon capture on ^{35}Cl *(11 pages)* 065501
S. Arole, D. S. Armstrong, T. P. Gorringe, M. D. Hasinoff, M. A. Kovash, V. Kuzmin, B. A. Moftah, R. Sedlar, T. J. Stocki, and T. Tetereva

Nuclear Astrophysics

Density dependent hadron field theory for neutron stars with antikaon condensates *(12 pages)* 065801
Sarmistha Banik and Debades Bandyopadhyay
The ^{15}N$(\alpha,\gamma)^{19}$F reaction and nucleosynthesis of ^{19}F *(8 pages)* 065802
S. Wilmes, V. Wilmes, G. Staudt, P. Mohr, and J. W. Hammer
Multipair contributions to the spin response of nuclear matter *(6 pages)* 065803
E. Olsson and C. J. Pethick

BRIEF REPORTS

Nonadditivity in nuclear moments of inertia and interference between blocking effects *(4 pages)* 067301
S. X. Liu and J. Y. Zeng
Scaling laws of valence nucleon distributions for single-particle states *(4 pages)* 067302
C. J. Lin, H. Q. Zhang, Z. H. Liu, Y. W. Wu, F. Yang, and M. Ruan
New relation between $B(E2)$ values and excitation energies *(3 pages)* 067303
B. Buck, A. C. Merchant, V. A. McBride, and S. M. Perez
Photofissility of heavy nuclei at intermediate energies *(4 pages)* 067601
A. Deppman, O. A. P. Tavares, S. B. Duarte, J. D. T. Arruda-Neto, M. Gonçalves, V. P. Likhachev, and E. C. de Oliveira

Selected Abstracts from Other Physical Review Journals i
Cumulative Author Index iii