# 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 72, NUMBER 2** *CONTENTS* **AUGUST 2005**

## RAPID COMMUNICATIONS

In-beam $\gamma$-ray spectroscopy of $^{240}$U using the ($^{18}$O,$^{16}$O) reaction *(5 pages)* ..... 021301(R)
T. Ishii, S. Shigematsu, M. Asai, A. Makishima, M. Matsuda, J. Kaneko, I. Hossain, S. Ichikawa, T. Kohno, and M. Ogawa

Survival of orbiting in $^{20}$Ne (7–10 MeV/nucleon) + $^{12}$C reactions *(5 pages)* ..... 021601(R)
C. Bhattacharya, A. Dey, S. Kundu, K. Banerjee, S. Bhattacharya, S. Mukhopadhyay, D. Gupta, T. Bhattacharjee, S. R. Banerjee, S. Bhattacharyya, T. Rana, S. K. Basu, R. Saha, S. Bhattacharjee, K. Krishan, A. Mukherjee, D. Bandopadhyay, and C. Beck

Interacting quark-diquark model of baryons *(5 pages)* ..... 022201(R)
E. Santopinto

The Primakoff effect on a proton target *(4 pages)* ..... 022202(R)
J. M. Laget

Polarized quark distributions in nuclear matter *(4 pages)* ..... 022203(R)
Jason R. Smith and Gerald A. Miller

## ARTICLES

### Nucleon-Nucleon Interaction, Few-Body Systems

Three-body mechanisms in the $^3$He$(e, e'p)$ reactions at high missing momentum *(4 pages)* ..... 024001
J. M. Laget

Propagator of the $\Delta$ resonance and determination of the magnetic moment of the $\Delta^+$ from the $\gamma p \to \gamma \pi^o p$ reaction *(22 pages)* ..... 024002
A. I. Machavariani and Amand Faessler

Kaon-nucleon interaction in the extended chiral SU(3) quark model *(9 pages)* ..... 024003
F. Huang and Z. Y. Zhang

Partial-wave analysis of $\vec{p}\vec{p} \to pp\pi^0$ data *(9 pages)* ..... 024004
P. N. Deepak, J. Haidenbauer, and C. Hanhart

Proton-proton bremsstrahlung calculation: Comparison with recent high-precision experimental results *(4 pages)* . 024005
Yi Li, M. K. Liou, and W. M. Schreiber

Neutron matter on the lattice with pionless effective field theory *(12 pages)* ..... 024006
Dean Lee and Thomas Schäfer




**Copyright 2005 by The American Physical Society**



0556-2813(200508)72:2;1-0

*(Continued)*

**CONTENTS - *Continued***

**PHYSICAL REVIEW C** **THIRD SERIES, VOLUME 72, NUMBER 2** **AUGUST 2005**

Three-body continuum discretization in a basis of transformed harmonic oscillator states *(10 pages)* ..... 024007
M. Rodríguez-Gallardo, J. M. Arias, J. Gómez-Camacho, A. M. Moro, I. J. Thompson, and J. A. Tostevin

**Nuclear Structure**

One-particle resonant levels in a deformed potential *(7 pages)* ..... 024301
Ikuko Hamamoto

Meaning of $S$-$D$ dominance *(8 pages)* ..... 024302
G. G. Dussel and H. M. Sofia

$\beta$ decay of $^{95}$Ag *(6 pages)* ..... 024303
S. Harissopulos, J. Döring, M. La Commara, K. Schmidt, C. Mazzocchi, R. Borcea, S. Galanopoulos, M. Górska, H. Grawe, M. Hellström, Z. Janas, R. Kirchner, E. Roeckl, I. P. Johnstone, R. Schwengner, and L. D. Skouras

High-spin states in $^{92-96}$Zr nuclei *(17 pages)* ..... 024304
D. Pantelica, I. Gh. Stefan, N. Nica, M.-G. Porquet, G. Duchêne, A. Astier, S. Courtin, I. Deloncle, F. Hoellinger, A. Bauchet, N. Buforn, L. Donadille, O. Dorvaux, J. Duprat, B. J. P. Gall, C. Gautherin, T. Kutsarova, S. Lalkovski, R. Lucas, M. Meyer, A. Minkova, A. Prévost, N. Redon, N. Schulz, H. Sergolle, O. Stézowski, Ts. Venkova, and A. Wilson

Identification of shell-model states in $^{135}$Sb populated via $\beta^-$ decay of $^{135}$Sn *(9 pages)* ..... 024305
J. Shergur, A. Wöhr, W. B. Walters, K.-L. Kratz, O. Arndt, B. A. Brown, J. Cederkall, I. Dillmann, L. M. Fraile, P. Hoff, A. Joinet, U. Köster, and B. Pfeiffer

Gamow-Teller $GT_+$ distributions in nuclei with mass $A = 90$–$97$ *(10 pages)* ..... 024306
A. Juodagalvis and D. J. Dean

Quenching of pairing gap at finite temperature in $^{184}$W *(4 pages)* ..... 024307
K. Kaneko and M. Hasegawa

Gamow-Teller decay of the $T = 1$ nucleus $^{46}$Cr *(7 pages)* ..... 024308
T. K. Onishi, A. Gelberg, H. Sakurai, K. Yoneda, N. Aoi, N. Imai, H. Baba, P. von Brentano, N. Fukuda, Y. Ichikawa, M. Ishihara, H. Iwasaki, D. Kameda, T. Kishida, A. F. Lisetskiy, H. J. Ong, M. Osada, T. Otsuka, M. K. Suzuki, K. Ue, Y. Utsuno, and H. Watanabe

Microscopic cluster model analysis of $^{14}$O + $p$ elastic scattering *(6 pages)* ..... 024309
D. Baye, P. Descouvemont, and F. Leo

Spin dependence of intrinsic and transition quadrupole moments *(4 pages)* ..... 024310
R. V. Jolos, P. von Brentano, A. Dewald, and N. Pietralla

Thick-target inverse-kinematics proton scattering from $^{46}$Ar and the $N = 28$ shell below $^{48}$Ca *(7 pages)* ..... 024311
L. A. Riley, M. A. Abdelqader, D. Bazin, M. J. Bojazi, B. A. Brown, C. M. Campbell, J. A. Church, P. D. Cottle, D.-C. Dinca, J. Enders, A. Gade, T. Glasmacher, M. Honma, S. Horibe, Z. Hu, K. W. Kemper, W. F. Mueller, H. Olliver, T. Otsuka, B. C. Perry, B. T. Roeder, B. M. Sherrill, T. P. Spencer, and J. R. Terry

Hyperfine anomaly in Be isotopes in the cluster model and the neutron spatial distribution *(7 pages)* ..... 024312
Y. Parfenova and Ch. Leclercq-Willain

Role of $\rho NN$ tensor coupling and $2s_{1/2}$ occupation in light exotic nuclei *(9 pages)* ..... 024313
W. Z. Jiang, Y. L. Zhao, Z. Y. Zhu, and S. F. Shen

High-energy two-neutron removal from $^{10}$Be *(8 pages)* ..... 024314
N. I. Ashwood, M. Freer, D. J. Millener, N. A. Orr, F. Carstoiu, S. Ahmed, J. C. Angélique, V. Bouchat, W. N. Catford, N. M. Clarke, N. Curtis, F. Hanappe, M. Horoi, Y. Kerckx, J. L. Lecouey, F. M. Marqués, T. Materna, G. Normand, S. Pain, N. Soić, C. Timis, A. Unshakova, and V. A. Ziman

New band mechanism of doubly-odd nuclei around mass 130 *(16 pages)* ..... 024315
K. Higashiyama, N. Yoshinaga, and K. Tanabe

*(Continued)*

**CONTENTS - *Continued***

**PHYSICAL REVIEW C** **THIRD SERIES, VOLUME 72, NUMBER 2** **AUGUST 2005**

Bulk and single-particle properties of hyperonic matter at finite temperature *(10 pages)* . . . . . 024316
A. Rios, A. Polls, A. Ramos, and I. Vidaña

High-spin states in $^{152}$Gd *(6 pages)* . . . . . 024317
S. Wang, H. Hua, J. Meng, Z. H. Li, S. Q. Zhang, F. R. Xu, H. L. Liu, Y. L. Ye, D. X. Jiang, T. Zheng, Q. J. Wang, Z. Q. Chen, C. E. Wu, G. L. Zhang, D. Y. Pang, J. Wang, J. L. Lou, B. Guo, G. Jin, S. G. Zhou, L. H. Zhu, X. G. Wu, G. S. Li, S. X. Wen, C. Y. He, X. Z. Cui, and Y. Liu

Investigation of antimagnetic rotation in light Cadmium nuclei: $^{106,108}$Cd *(7 pages)* . . . . . 024318
A. J. Simons, R. Wadsworth, D. G. Jenkins, R. M. Clark, M. Cromaz, M. A. Deleplanque, R. M. Diamond, P. Fallon, G. J. Lane, I. Y. Lee, A. O. Macchiavelli, F. S. Stephens, C. E. Svensson, K. Vetter, D. Ward, S. Frauendorf, and Y. Gu

Energy shifts and configuration mixing in the $A = 15$ quartet *(3 pages)* . . . . . 024319
H. T. Fortune and R. Sherr

Correlation effects on the nonmesonic weak decay of the $\Lambda$ hyperon in nuclear matter *(18 pages)* . . . . . 024320
N. J. Robertson and W. H. Dickhoff

Shape coexistence in $^{71}$Br and the question of the ground-state spin of $^{71}$Kr *(16 pages)* . . . . . 024321
S. M. Fischer, T. Anderson, P. Kerns, G. Mesoloras, D. Svelnys, C. J. Lister, D. P. Balamuth, P. A. Hausladen, and D. G. Sarantites

**Nuclear Reactions**

Monte Carlo approach to sequential neutron emission from fission fragments *(12 pages)* . . . . . 024601
S. Lemaire, P. Talou, T. Kawano, M. B. Chadwick, and D. G. Madland

Reaction cross section described by a black sphere approximation of nuclei *(5 pages)* . . . . . 024602
Akihisa Kohama, Kei Iida, and Kazuhiro Oyamatsu

Tracing the evolution of temperature in near Fermi energy heavy ion collisions *(9 pages)* . . . . . 024603
J. Wang, R. Wada, T. Keutgen, K. Hagel, Y. G. Ma, M. Murray, L. Qin, A. Botvina, S. Kowalski, T. Materna, J. B. Natowitz, R. Alfarro, J. Cibor, M. Cinausero, Y. El Masri, D. Fabris, E. Fioretto, A. Keksis, M. Lunardon, A. Makeev, N. Marie, E. Martin, Z. Majka, A. Martinez-Davalos, A. Menchaca-Rocha, G. Nebbia, G. Prete, V. Rizzi, A. Ruangma, D. V. Shetty, G. Souliotis, P. Staszel, M. Veselsky, G. Viesti, E. M. Winchester, S. J. Yennello, W. Zipper (NIMROD Collaboration), and A. Ono

Dispersive coupled-channel analysis of nucleon scattering from $^{232}$Th up to 200 MeV *(12 pages)* . . . . . 024604
E. Sh. Soukhovitskii, R. Capote, J. M. Quesada, and S. Chiba

Measurements of $A_y(\theta)$ for $^{12}$C$(n, n)^{12}$C from $E_n = 2.2$ to 8.5 MeV *(15 pages)* . . . . . 024605
C. D. Roper, W. Tornow, R. T. Braun, Q. Chen, A. Crowell, D. Gonzalez Trotter, C. R. Howell, F. Salinas, R. Setze, R. L. Walter, Zemin Chen, Hongqing Tang, and Zuying Zhou

Proximity potential for deformed, oriented nuclei: "Gentle" fusion and "hugging" fusion *(9 pages)* . . . . . 024606
Monika Manhas and Raj K. Gupta

Isospin conservation in preequilibrium reactions *(15 pages)* . . . . . 024607
C. Kalbach

**Relativistic Nuclear Collisions**

Measurement of single electron event anisotropy in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV *(10 pages)* . . . . . 024901
S. S. Adler *et al.* (PHENIX Collaboration)

Hadronic form factors and the $J/\psi$ secondary production cross section: An update *(7 pages)* . . . . . 024902
F. Carvalho, F. O. Durães, F. S. Navarra, and M. Nielsen

Cronin effect and high-$p_\perp$ suppression in $d$+Au collisions *(7 pages)* . . . . . 024903
D. E. Kahana and S. H. Kahana

*(Continued)*

**CONTENTS - *Continued***

**PHYSICAL REVIEW C** **THIRD SERIES, VOLUME 72, NUMBER 2** **AUGUST 2005**

Statistical mechanics of Yang-Mills classical mechanics *(5 pages)* ..... 024904
Vishnu M. Bannur

Centrality dependence of bulk fireball properties in $\sqrt{s_{NN}} = 200$ GeV Au–Au collisions *(7 pages)* ..... 024905
Johann Rafelski, Jean Letessier, and Giorgio Torrieri

Charm elliptic flow in relativistic heavy-ion collisions *(6 pages)* ..... 024906
Bin Zhang, Lie-Wen Chen, and C. M. Ko

Multiplicity fluctuations in the string clustering approach *(5 pages)* ..... 024907
L. Cunqueiro, E. G. Ferreiro, F. del Moral, and C. Pajares

Parton and hadron correlations in jets *(11 pages)* ..... 024908
Rudolph C. Hwa and Zhiguang Tan

Critical line of the deconfinement phase transitions *(9 pages)* ..... 024909
Mark I. Gorenstein, Marek Gaździcki, and Walter Greiner

**Hadronic Physics and QCD**

Measurement of the branching ratio for $\eta \to \pi^0\gamma\gamma$ decay *(18 pages)* ..... 025201
S. Prakhov, B. M. K. Nefkens, C. E. Allgower, V. Bekrenev, W. J. Briscoe, M. Clajus, J. R. Comfort, K. Craig, D. Grosnick, G. M. Huber, D. Isenhower, N. Knecht, D. Koetke, A. Koulbardis, N. Kozlenko, S. Kruglov, G. Lolos, I. Lopatin, D. M. Manley, R. Manweiler, A. Marušić, S. McDonald, J. Olmsted, Z. Papandreou, D. Peaslee, N. Phaisangittisakul, J. W. Price, A. F. Ramirez, M. Sadler, A. Shafi, H. Spinka, T. D. S. Stanislaus, A. Starostin, H. M. Staudenmaier, I. Supek, and W. B. Tippens (Crystal Ball Collaboration)

Generalized parton distributions of the nucleon in the Nambu–Jona-Lasinio model based on the Faddeev approach *(14 pages)* ..... 025202
H. Mineo, Shin Nan Yang, Chi-Yee Cheung, and W. Bentz

Microscopic analysis of $K^+$-nucleus elastic scattering based on $K^+$-nucleon phase shifts *(10 pages)* ..... 025203
H. F. Arellano and H. V. von Geramb

Quark-hadron duality and parity violating asymmetry of electroweak reactions in the $\Delta$ region *(14 pages)* ..... 025204
K. Matsui, T. Sato, and T.-S. H. Lee

$K\Lambda$ and $K\Sigma$ photoproduction in a coupled-channels framework *(14 pages)* ..... 025205
A. Usov and O. Scholten

Constituent quark model study of light- and strange-baryon spectra *(9 pages)* ..... 025206
A. Valcarce, H. Garcilazo, and J. Vijande

Evaluation of the $\pi\pi$-scattering amplitude in the $\sigma$-channel at finite density *(10 pages)* ..... 025207
D. Cabrera, E. Oset, and M. J. Vicente Vacas

**Electroweak Interaction, Symmetries**

Test of Fermi gas model and plane-wave impulse approximation against electron-nucleus scattering data *(9 pages)* 025501
A. V. Butkevich and S. P. Mikheyev

**Nuclear Astrophysics**

Isotope abundance of $^{180}\mathrm{Ta}^{\mathrm{m}}$ and $p$-process nucleosynthesis *(5 pages)* ..... 025801
J. R. de Laeter and N. Bukilic

The $^{17}\mathrm{F}(p,\gamma)^{18}\mathrm{Ne}$ $3^+$ resonance state studied with the $^{16}\mathrm{O}(^3\mathrm{He},n)^{18}\mathrm{Ne}$ reaction *(7 pages)* ..... 025802
Y. Parpottas, S. M. Grimes, S. Al-Quraishi, C. R. Brune, T. N. Massey, J. E. O'Donnell, J. E. Oldendick, A. Salas, and R. T. Wheeler

*(Continued)*

**CONTENTS - *Continued***

**PHYSICAL REVIEW C** **THIRD SERIES, VOLUME 72, NUMBER 2** **AUGUST 2005**

Screened thermonuclear reactions and predictive stellar evolution of detached double-lined eclipsing binaries *(3 pages)* ..... 025803
Theodore E. Liolios and Theocharis S. Kosmas

Lattice QCD constraints on hybrid and quark stars *(13 pages)* ..... 025804
Yu. B. Ivanov, A. S. Khvorostukhin, E. E. Kolomeitsev, V. V. Skokov, V. D. Toneev, and D. N. Voskresensky

Long-wavelength spin- and spin-isospin correlations in nucleon matter *(9 pages)* ..... 025805
G. I. Lykasov, E. Olsson, and C. J. Pethick

Nuclear fusion in dense matter: Reaction rate and carbon burning *(14 pages)* ..... 025806
L. R. Gasques, A. V. Afanasjev, E. F. Aguilera, M. Beard, L. C. Chamon, P. Ring, M. Wiescher, and D. G. Yakovlev

Measuring the cosmic ray muon-induced fast neutron spectrum by $(n,p)$ isotope production reactions in underground detectors *(7 pages)* ..... 025807
Cristiano Galbiati and John F. Beacom

Photodisintegration cross section measurements on $^{186}$W, $^{187}$Re, and $^{188}$Os: Implications for the Re-Os cosmochronology *(9 pages)* ..... 025808
T. Shizuma, H. Utsunomiya, P. Mohr, T. Hayakawa, S. Goko, A. Makinaga, H. Akimune, T. Yamagata, M. Ohta, H. Ohgaki, Y.-W. Lui, H. Toyokawa, A. Uritani, and S. Goriely

Running coupling constant from lattice data and bulk viscosity of strange quark matter *(5 pages)* ..... 025809
Zheng Xiaoping, Kang Miao, Liu Xuewen, and Yang Shuhua

## BRIEF REPORTS

Polynomial solutions of the Schrödinger equation for the generalized Woods-Saxon potential *(4 pages)* ..... 027001
Cüneyt Berkdemir, Ayşe Berkdemir, and Ramazan Sever

$g$ factor of the $2_1^+$ state of $^{160}$Er *(3 pages)* ..... 027301
A. Wolf, Z. Berant, N. V. Zamfir, D. S. Brenner, E. A. McCutchan, H. Ai, R. F. Casten, K. Dusling, A. Heinz, D. A. Meyer, E. A. Millman, N. Pietralla, C. Plettner, J. Qian, P. H. Regan, D. Swanson, J. Vinson, E. Williams, and R. Winkler

Near-yrast, medium-spin structure of the $^{107}$Mo nucleus *(4 pages)* ..... 027302
W. Urban, T. Rząca-Urban, J. A. Pinston, J. L. Durell, W. R. Phillips, A. G. Smith, B. J. Varley, I. Ahmad, and N. Schulz

Parity nonconservation in the $\gamma$ decay of polarized $17/2^-$ isomers in $^{93}$Tc *(3 pages)* ..... 027303
B. S. Nara Singh, M. Hass, G. Goldring, D. Ackermann, J. Gerl, F. P. Hessberger, S. Hofmann, I. Kojouharov, P. Kuusiniemi, H. Schaffner, B. Sulignano, and B. A. Brown

Relationships among depolarizations in scattering of polarized protons from $^3$He at intermediate energies *(4 pages)* ..... 027601
S. Ishikawa, M. Tanifuji, Y. Iseri, and Y. Yamamoto

Werner-Wheeler mass tensor for fusionlike configuration *(4 pages)* ..... 027602
R. A. Gherghescu and D. N. Poenaru

Axial-vector mesons in a relativistic point-form approach *(4 pages)* ..... 028201
A. Krassnigg

*(Continued)*

**CONTENTS - *Continued***

**PHYSICAL REVIEW C** **THIRD SERIES, VOLUME 72, NUMBER 2** **AUGUST 2005**

## COMMENTS

Comment on "Probing nuclear structure of $^{124}$Xe" *(2 pages)* . . . . . 029801
G. Rainovski, D. L. Balabanski, and V. I. Dimitrov

Reply to "Comment on 'Nuclear structure of $^{124}$Xe' " *(1 page)* . . . . . 029802
B. Saha, A. Dewald, O. Möller, R. Peusquens, K. Jessen, A. Fitzler, T. Klug, D. Tonev, P. von Brentano, J. Jolie, B. J. P. Gall, and P. Petkov

## ERRATA

Erratum: Magnetic moments of the $2_1^+$ states around $^{132}$Sn [Phys. Rev. C **71**, 044317 (2005)] *(1 page)* . . . . . 029901(E)
B. A. Brown, N. J. Stone, J. R. Stone, I. S. Towner, and M. Hjorth-Jensen

Erratum: $\eta$-nucleon scattering length and effective range uncertainties [Phys. Rev. C **71**, 014001 (2005)] *(1 page)* 029902(E)
A. M. Green and S. Wycech

Erratum: Renormalization of the $\sigma-\omega$ model within the framework of U(1) gauge symmetry
[Phys. Rev. C **70**, 044003 (2004)] *(1 page)* . . . . . 029903(E)
Jun-Chen Su and Hai-Jun Wang