PHYSICAL REVIEW D

For editorial and subscription correspondence, please see inside front cover
(ISSN: 1550-7998)

PERIODICALS
Postmaster send address changes to:
PHYSICAL REVIEW D
APS Subscription Services
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502

THIRD SERIES, VOLUME 70, NUMBER 3 *CONTENTS* **D1 AUGUST 2004**

RAPID COMMUNICATIONS

Subtraction terms for hadronic production processes at next-to-next-to-leading order *(4 pages)* . . . . . 031501(R)
William B. Kilgore

Testing the standard model with $B_s^0 \to K^+K^-$ decays *(4 pages)* . . . . . 031502(R)
David London and Joaquim Matias

Chiral doublers of heavy-light baryons *(4 pages)* . . . . . 031503(R)
Maciej A. Nowak, Michał Praszałowicz, Mariusz Sadzikowski, and Joanna Wasiluk

First determination of the strange and light quark masses from full lattice QCD *(5 pages)* . . . . . 031504(R)
C. Aubin, C. Bernard, C. T. H. Davies, C. DeTar, Steven A. Gottlieb, A. Gray, E. B. Gregory, J. Hein, U. M. Heller, J. E. Hetrick, G. P. Lepage, Q. Mason, J. Osborn, J. Shigemitsu, R. Sugar, D. Toussaint, H. Trottier, and M. Wingate

A_4 symmetry and neutrinos with very different masses *(5 pages)* . . . . . 031901(R)
Ernest Ma

Lorentz and *CPT* violation in the neutrino sector *(4 pages)* . . . . . 031902(R)
V. Alan Kostelecký and Matthew Mewes

ARTICLES

First observation of a $\Upsilon(1D)$ state *(7 pages)* 032001
G. Bonvicini *et al.* (CLEO Collaboration)

Moments of the B meson inclusive semileptonic decay rate using neutrino reconstruction *(13 pages)* 032002
S. E. Csorna *et al.* (CLEO Collaboration)

Measurement of the B-meson inclusive semileptonic branching fraction and electron-energy moments *(16 pages)* 032003
A. H. Mahmood *et al.* (CLEO Collaboration)

Measurement of the polar-angle distribution of leptons from W boson decay as a function of the W transverse momentum in $p\bar{p}$ collisions at $\sqrt{s} = 1.8$ TeV *(21 pages)* 032004
D. Acosta *et al.* (CDF Collaboration)

Constraints on anomalous quartic gauge boson couplings from $\nu\bar{\nu}\gamma\gamma$ and $q\bar{q}\gamma\gamma$ events at CERN LEP2 *(11 pages)* 032005
G. Abbiendi *et al.* (OPAL Collaboration)

B meson decays to $\eta^{(\prime)}K$, $\eta^{(\prime)}\rho$, $\eta^{(\prime)}\pi^0$, $\omega\pi^0$, and $\phi\pi^0$ *(20 pages)* 032006
B. Aubert, V. V. Braguta, and A. I. Onishchenko

ρ-meson form factors and QCD sum rules *(10 pages)* 033001
V. V. Braguta, and A. I. Onishchenko

Physical renormalization condition for the quark-mixing matrix *(12 pages)* 033002
A. Denner, E. Kraus, and M. Roth



Copyright 2004 by The American Physical Society



(Continued)

PHYSICAL REVIEW D **THIRD SERIES, VOLUME 70, NUMBER 3** **D1 AUGUST 2004**

Majorana neutrino masses, neutrinoless double beta decay, and nuclear matrix elements *(12 pages)* 033003
S. M. Bilenky, Amand Faessler, and F. Šimkovic
Appearance of neutronization peak and decaying supernova neutrinos *(10 pages)* 033004
Shin'ichiro Ando
Magnetic moment of a massive neutrino due to its pion cloud *(8 pages)* 033005
R. Tegen and H. G. Miller
Understanding *CP* phase-dependent measurements at neutrino superbeams in terms of birate graphs *(13 pages)* 033006
Walter Winter
Bilarge neutrino mixing and mass of the lightest neutrino from third generation dominance in a democratic approach *(11 pages)* 033007
Radovan Dermíšek
Semiclassical electroweak Weizsäcker-Williams method. II. Boson masses and minimum impact parameter *(14 pages)* 033008
Sean C. Ahern and John W. Norbury
π^+-π^0 mass difference from the Bethe-Salpeter equation *(11 pages)* 033009
Masayasu Harada, Masafumi Kurachi, and Koichi Yamawaki
Atmospheric neutrino oscillations and new physics *(12 pages)* 033010
M. C. Gonzalez-Garcia and Michele Maltoni
Neutralino pair production at CERN LHC *(21 pages)* 033011
G. J. Gounaris, J. Layssac, P. I. Porfyriadis, and F. M. Renard
What can we learn from neutrinoless double beta decay experiments? *(12 pages)* 033012
John N. Bahcall, Hitoshi Murayama, and C. Peña-Garay
Resonant leptogenesis in a predictive $SO(10)$ grand unified model *(12 pages)* 033013
Carl H. Albright and S. M. Barr
Pion form factor in QCD: From nonlocal condensates to next-to-leading-order analytic perturbation theory *(32 pages)* 033014
A. P. Bakulev, K. Passek-Kumerički, W. Schroers, and N. G. Stefanis
Neutrino mass, dark matter, and inflation *(7 pages)* 033015
D. Kazanas, R. N. Mohapatra, S. Nasri, and V. L. Teplitz
From QFT to a disoriented chiral condensate *(18 pages)* 034001
B. Bambah and C. Mukku
Hadron collider signatures for new interactions of top and bottom quarks *(10 pages)* 034002
T. Han, G. Valencia, and Yili Wang
Heavy pentaquarks *(6 pages)* 034003
P.-Z. Huang, Y.-R. Liu, W.-Z. Deng, X.-L. Chen, and Shi-Lin Zhu
Virtual Compton scattering in the generalized Bjorken region and positivity bounds on generalized parton distributions *(9 pages)* 034004
P. V. Pobylitsa
Independent pair parton interactions model of hadron interactions *(10 pages)* 034005
I. M. Dremin and V. A. Nechitailo
Branching ratios of $B^+ \to D^{(*)+} K^{(*)0}$ decays in the perturbative QCD approach *(9 pages)* 034006
Ge-Liang Song and Cai-Dian Lü
Light-front approach for heavy pentaquark transitions *(23 pages)* 034007
Hai-Yang Cheng, Chun-Khiang Chua, and Chien-Wen Hwang
Calculations of binding energies and masses of heavy quarkonia using renormalon cancellation *(20 pages)* 034008
Carlos Contreras, Gorazd Cvetič, and Patricio Gaete
Branching ratio and *CP* asymmetry of $B_s \to \pi^+ \pi^-$ decays in the perturbative QCD approach *(6 pages)* 034009
Ying Li, Cai-Dian Lü, ZhenJun Xiao, and Xian-Qiao Yu

(Continued)

PHYSICAL REVIEW D **THIRD SERIES, VOLUME 70, NUMBER 3** **D1 AUGUST 2004**

Single-inclusive jet production in polarized pp collisions at $\mathcal{O}(\alpha_s^3)$ *(12 pages)* 034010
B. Jäger, M. Stratmann, and W. Vogelsang

Spin effects in diffractive $Q\bar{Q}$ production at BNL eRHIC *(7 pages)* 034011
S. V. Goloskokov

Solution of the Kwieciński evolution equations for unintegrated parton distributions using the Mellin transform *(19 pages)* 034012
Enrique Ruiz Arriola and Wojciech Broniowski

Inclusive J/ψ production at e^+e^- colliders *(14 pages)* 034013
K. Hagiwara, E. Kou, Z.-H. Lin, C.-F. Qiao, and G.-H. Zhu

Enhanced nonperturbative effects in $\boldsymbol{Z}$ decays to hadrons *(16 pages)* 034014
Christian W. Bauer, Christopher Lee, Aneesh V. Manohar, and Mark B. Wise

Probing gluon helicity distribution and quark transversity through hyperon polarization in singly polarized pp collisions *(9 pages)* 034015
Xu Qing-hua and Liang Zuo-tang

Hard gluon damping in hot QCD *(14 pages)* 034016
André Peshier

Parton model in Lorentz invariant noncommutative space *(6 pages)* 034017
M. Haghighat and M. M. Ettefaghi

b-physics signals of the lightest CP-odd Higgs boson in the next-to-minimal supersymmetric standard model at large $\tan\beta$ *(10 pages)* 034018
Gudrun Hiller

Tetracritical behavior in strongly interacting theories *(10 pages)* 034019
Francesco Sannino and Kimmo Tuominen

Charmless $B\to PP$ decays using flavor SU(3) symmetry *(12 pages)* 034020
Cheng-Wei Chiang, Michael Gronau, Jonathan L. Rosner, and Denis A. Suprun

Glueball production in radiative $J/\psi,\Upsilon$ decays *(17 pages)* 034021
Maurizio Melis, Francesco Murgia, and Joseph Parisi

Heavy-quark production in proton-nucleus collisions at the CERN LHC *(8 pages)* 034022
E. Cattaruzza, A. Del Fabbro, and D. Treleani

Chiral soliton model for arbitrary colors and flavors *(7 pages)* 034023
Elizabeth Jenkins and Aneesh V. Manohar

Shape function effects in $B\to X_s\gamma$ and $B\to X_u\ell\bar{\nu}$ decays *(20 pages)* 034024
Christian W. Bauer and Aneesh V. Manohar

Exotic baryons with charm number ± 1 from the Skyrme model *(13 pages)* 034025
Bin Wu and Bo-Qiang Ma

Relativistic calculation of the meson spectrum: A fully covariant treatment versus standard treatments *(31 pages)* 034026
Horace Crater and Peter Van Alstine

Perturbative heavy quark fragmentation function through $\mathcal{O}(\alpha_s^2)$ *(12 pages)* 034027
Kirill Melnikov and Alexander Mitov

Vector meson pair production in two-photon collisions near threshold *(6 pages)* 034028
Jonathan L. Rosner

Accessing the longitudinally polarized photon content of the proton *(12 pages)* 034029
A. Mukherjee and C. Pisano

Hadronic decays involving heavy pentaquarks *(10 pages)* 034030
Xiao-Gang He and Xue-Qian Li

Low-energy chiral Lagrangian from the spectral quark model *(19 pages)* 034031
E. Megías, E. Ruiz Arriola, L. L. Salcedo, and W. Broniowski

Extraction of axial form factors from $\bar{B}^0\to D^+K^-K^{*0}$ decay *(7 pages)* 034032
Chun-Khiang Chua, Wei-Shu Hou, and Shang-Yuu Tsai

(Continued)

PHYSICAL REVIEW D THIRD SERIES, VOLUME 70, NUMBER 3 D1 AUGUST 2004

CP violation in the partial width asymmetries for $B^- \to \pi^+ \pi^- K^-$ and $B^- \to K^+ K^- K^-$ decays *(9 pages)* 034033
S. Fajfer, T. N. Pham, and A. Prapotnik
Perturbation theory versus simulation for tadpole improvement factors in pure gauge theories *(12 pages)* 034501
A. Hart, R. R. Horgan, and L. C. Storoni
Chiral logarithms in quenched QCD *(16 pages)* 034502
Y. Chen, S. J. Dong, T. Draper, I. Horváth, F. X. Lee, K. F. Liu, N. Mathur, and J. B. Zhang
Nonperturbative calculation of Z_V and Z_A in domain-wall QCD on a finite box *(17 pages)* 034503
S. Aoki, M. Fukugita, N. Ishizuka, Y. Iwasaki, K. Kanaya, T. Kaneko, Y. Kuramashi, M. Okawa, Y. Taniguchi, A. Ukawa, and T. Yoshié (CP-PACS Collaboration)
Scalar mesons in lattice QCD *(4 pages)* 034504
Teiji Kunihiro, Shin Muroya, Atsushi Nakamura, Chiho Nonaka, Motoo Sekiguchi, and Hiroaki Wada (SCALAR Collaboration)
Scaling behavior of the overlap quark propagator in the Landau gauge *(6 pages)* 034505
Jianbo Zhang, Patrick O. Bowman, Derek B. Leinweber, Anthony G. Williams, and Frédéric D. R. Bonnet (CSSM Lattice Collaboration)
Estimate of the flavor singlet contributions to the hyperfine splitting in charmonium *(11 pages)* 034506
C. McNeile and C. Michael (UKQCD Collaboration)
Nucleon masses and magnetic moments in a finite volume *(9 pages)* 034507
Silas R. Beane
Chiral perturbation theory at $\mathcal{O}(a^2)$ for lattice QCD *(12 pages)* 034508
Oliver Bär, Gautam Rupak, and Noam Shoresh
Unquenched gluon propagator in Landau gauge *(4 pages)* 034509
Patrick O. Bowman, Urs M. Heller, Derek B. Leinweber, Maria B. Parappilly, and Anthony G. Williams
Thermal effects on quark-gluon mixed condensate $g\langle \bar{q} \sigma_{\mu\nu} G_{\mu\nu} q \rangle$ from lattice QCD *(5 pages)* 034510
Takumi Doi, Noriyoshi Ishii, Makoto Oka, and Hideo Suganuma
Deconfining phase transition as a matrix model of renormalized Polyakov loops *(23 pages)* 034511
Adrian Dumitru, Yoshitaka Hatta, Jonathan Lenaghan, Kostas Orginos, and Robert D. Pisarski
Electroweak symmetry breaking via UV insensitive anomaly mediation *(15 pages)* 035001
Ryuichiro Kitano, Graham D. Kribs, and Hitoshi Murayama
Fermion masses and coupling unification in E_6: Life in the desert *(17 pages)* 035002
Berthold Stech and Zurab Tavartkiladze
Top squarks and bottom squarks in the minimal supersymmetric standard model with complex parameters *(18 pages)* 035003
A. Bartl, S. Hesselbach, K. Hidaka, T. Kernreiter, and W. Porod
Lepton flavor violation in a class of lopsided SO(10) models *(9 pages)* 035004
Ernest Jankowski and David W. Maybury
Electroweak baryogenesis and dark matter in a minimal extension of the MSSM *(20 pages)* 035005
A. Menon, D. E. Morrissey, and C. E. M. Wagner
Effective Lagrangian for the $\chi_i^+ \chi_j^0 H^-$ interaction in the minimal supersymmetric standard model and charged Higgs decays *(12 pages)* 035006
Tarek Ibrahim, Pran Nath, and Anastasios Psinas
Minimal supersymmetric grand unified theory: Symmetry breaking and the particle spectrum *(18 pages)* 035007
Borut Bajc, Alejandra Melfo, Goran Senjanović, and Francesco Vissani
$B \to X_s \gamma\gamma$ and $B_s \to \gamma\gamma$ in supersymmetry with broken R parity *(9 pages)* 035008
Alexander Gemintern, Shaouly Bar-Shalom, and Gad Eilam
Collider phenomenology of light strange-beauty squarks *(11 pages)* 035009
Kingman Cheung and Wei-Shu Hou
Noncommutativity of the zero chemical potential limit and the thermodynamic limit in finite density systems *(7 pages)* 035010
J. Ambjørn, K. N. Anagnostopoulos, J. Nishimura, and J. J. M. Verbaarschot

(Continued)

PHYSICAL REVIEW D THIRD SERIES, VOLUME 70, NUMBER 3 D1 AUGUST 2004

Phase diagram of the lattice Wess-Zumino model from rigorous lower bounds on the energy *(11 pages)* 035011
Matteo Beccaria, Gian Fabrizio De Angelis, Massimo Campostrini, and Alessandra Feo
Exploring flavor structure of supersymmetry breaking from rare B decays and the unitarity triangle *(18 pages)* 035012
Toru Goto, Yasuhiro Okada, Yasuhiro Shimizu, Tetsuo Shindou, and Minoru Tanaka
Family unification on an orbifold *(8 pages)* 035013
Zhenyu Han and Witold Skiba
Sensitivity of supersymmetric dark matter to the b quark mass *(18 pages)* 035014
Mario E Gómez, Tarek Ibrahim, Pran Nath, and Solveig Skadhauge
$B\rightarrow\phi K_S$ and supersymmetry *(22 pages)* 035015
G. L. Kane, P. Ko, Haibin Wang, C. Kolda, Jae-hyeon Park, and Lian-Tao Wang
Topological approach to baryon-antibaryon and meson production in rapidly expanding Bjorken rods *(16 pages)* 036001
G. Holzwarth
Broken $SU(3)$ antidecuplet for Θ^+ and $\Xi_{3/2}$ *(9 pages)* 036002
Sandip Pakvasa and Mahiko Suzuki
Quantum weights of dyons and of instantons with nontrivial holonomy *(29 pages)* 036003
Dmitri Diakonov, Nikolay Gromov, Victor Petrov, and Sergey Slizovskiy
Leptogenesis in the left-right supersymmetric model *(9 pages)* 036004
M. Frank
CP violation at a linear collider with transverse polarization *(6 pages)* 036005
B. Ananthanarayan and Saurabh D. Rindani
Gold-plated mode reexamined: $\sin(2\beta)$ and $B^0\rightarrow J/\Psi K_S$ in the standard model *(10 pages)* 036006
Heike Boos, Jürgen Reuter, and Thomas Mannel
Higgs potential in a minimal S_3 invariant extension of the standard model *(10 pages)* 036007
Jisuke Kubo, Hiroshi Okada, and Fumiaki Sakamaki
Illuminating interfaces between phases of a $U(1)\times U(1)$ gauge theory *(12 pages)* 036008
Mark Alford and Gerald Good
Product-group unification in type IIB string theory *(14 pages)* 036009
Taizan Watari and T. Yanagida

BRIEF REPORTS

Measurement of $K^+\rightarrow\pi^0\pi^0e^+\nu$ (K^{00}_{e4}) decay using stopped positive kaons *(4 pages)* 037101
S. Shimizu *et al.* (KEK-E470 Collaboration)
Further search for the decay $K^+\rightarrow\pi^+\nu\bar{\nu}$ in the momentum region $P<195$ MeV/c *(4 pages)* 037102
S. Adler *et al.* (E787 Collaboration)
Precision electroweak tests with $\bar{\nu}_e e$ scattering *(2 pages)* 037301
Jonathan L. Rosner
A naturally narrow positive-parity Θ^+ *(4 pages)* 037501
Carl E. Carlson, Christopher D. Carone, Herry J. Kwee, and Vahagn Nazaryan
Meson-baryon bound states in a (2+1)-dimensional strongly coupled lattice QCD model *(4 pages)* 037502
Antônio Francisco Neto
Top quark spin in ep collision *(3 pages)* 037503
S. Atağ and B. D. Şahin
Critical behavior of the damping rate for a plasmon with finite momentum in ϕ^4 theory *(4 pages)* 037504
Hanzhong Zhang, Luan Cheng, and Enke Wang

(Continued)

PHYSICAL REVIEW D **THIRD SERIES, VOLUME 70, NUMBER 3** **D1 AUGUST 2004**

Constraints on a scalar-pseudoscalar Higgs mixing at future e^+e^- colliders: An update *(4 pages)* 037505
A. Chalov, A. Likhoded, and R. Rosenfeld

ERRATA

Erratum: Study of the exotic Θ^+ with polarized photon beams [Phys. Rev. D **69**, 053009 (2004)]
(2 pages) . . . . . 039901(E)
Qiang Zhao
Cumulative Author Index i