PHYSICAL REVIEW D

For editorial and subscription correspondence, please see inside front cover
(ISSN: 0556-2821)

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

THIRD SERIES, VOLUME 69, NUMBER 6 ***CONTENTS*** **D15 MARCH 2004**

RAPID COMMUNICATIONS

Possibility of a dynamical Higgs mechanism and of the respective phase transition induced by a boundary *(5 pages)* . . . . . 061701(R)
A. N. Sissakian, O. Yu. Shevchenko, and V. N. Samoilov

ARTICLES

Solar constraints on new couplings between electromagnetism and gravity *(11 pages)* 062001
S. K. Solanki, O. Preuss, M. P. Haugan, A. Gandorfer, H. P. Povel, P. Steiner, K. Stucki, P. N. Bernasconi, and D. Soltau

Deflection of light and particles by moving gravitational lenses *(13 pages)* 063001
Olaf Wucknitz and Ulrich Sperhake

CMB polarization from secondary vector and tensor modes *(11 pages)* 063002
Silvia Mollerach, Diego Harari, and Sabino Matarrese

Gamma-ray bursts and magnetars as possible sources of ultrahigh energy cosmic rays: Correlation of cosmic ray event positions with IRAS galaxies *(11 pages)* 063003
Shwetabh Singh, Chung-Pei Ma, and Jonathan Arons

Strong field limit analysis of gravitational retrolensing *(6 pages)* 063004
Ernesto F. Eiroa and Diego F. Torres

CMBFIT: Rapid WMAP likelihood calculations with normal parameters *(11 pages)* 063005
Håvard B. Sandvik, Max Tegmark, Xiaomin Wang, and Matias Zaldarriaga

Cosmic microwave background and helical magnetic fields: The tensor mode *(20 pages)* 063006
Chiara Caprini, Ruth Durrer, and Tina Kahniashvili

Search for non-Gaussianity in pixel, harmonic, and wavelet space: Compared and combined *(11 pages)* 063007
Paolo Cabella, Frode Hansen, Domenico Marinucci, Daniele Pagano, and Nicola Vittorio

Neutrino interferometry in curved spacetime *(24 pages)* 063008
Roland M. Crocker, Carlo Giunti, and Daniel J. Mortlock

Antiprotons in cosmic rays from neutralino annihilation *(19 pages)* 063501
F. Donato, N. Fornengo, D. Maurin, P. Salati, and R. Taillet

Inflationary attractor in the braneworld scenario *(7 pages)* 063502
Zong-Kuan Guo, Hong-Sheng Zhang, and Yuan-Zhong Zhang

Generalized analysis of the direct weakly interacting massive particle searches *(12 pages)* 063503
Andriy Kurylov and Marc Kamionkowski

Curvatons in supersymmetric models *(18 pages)* 063504
Koichi Hamaguchi, Masahiro Kawasaki, Takeo Moroi, and Fuminobu Takahashi

From the production of primordial perturbations to the end of inflation *(6 pages)* 063505
Michaël Malquarti, Samuel M. Leach, and Andrew R. Liddle



Copyright 2004 by The American Physical Society

(Continued)



PHYSICAL REVIEW D **THIRD SERIES, VOLUME 69, NUMBER 6** **D15 MARCH 2004**

Cosmological variation of the deuteron binding energy, strong interaction, and quark masses from big bang nucleosynthesis *(9 pages)* 063506
V. F. Dmitriev, V. V. Flambaum, and J. K. Webb
WMAP constraint on the *P*-term inflationary model *(6 pages)* 063507
Bin Wang, Chi-Yong Lin, and Elcio Abdalla
WMAP, neutrino degeneracy, and non-Gaussianity constraints on isocurvature perturbations in the curvaton model of inflation *(7 pages)* 063508
Christopher Gordon and Karim A. Malik
Primordial nuggets survival and QCD pairing *(6 pages)* 063509
G. Lugones and J. E. Horvath
Two-field *Q*-ball solutions of supersymmetric hybrid inflation *(5 pages)* 063510
Matt Broadhead and John McDonald
Forecasting cosmic doomsday from CMB-LSS cross-correlations *(11 pages)* 063511
Jaume Garriga, Levon Pogosian, and Tanmay Vachaspati
Quintessence from the decay of superheavy dark matter *(10 pages)* 063512
Houri Ziaeepour
Curvature and isocurvature perturbations in a three-fluid model of curvaton decay *(11 pages)* 063513
Sujata Gupta, Karim A. Malik, and David Wands
Kasner and mixmaster behavior in universes with equation of state $w \geqslant 1$ *(11 pages)* 063514
Joel K. Erickson, Daniel H. Wesley, Paul J. Steinhardt, and Neil Turok
Large-scale power in the CMB and new physics: An analysis using Bayesian model comparison *(6 pages)* 063515
Anastasia Niarchou, Andrew H. Jaffe, and Levon Pogosian
Significance of the largest scale CMB fluctuations in WMAP *(12 pages)* 063516
Angélica de Oliveira-Costa, Max Tegmark, Matias Zaldarriaga, and Andrew Hamilton
Age constraints and fine tuning in variable-mass particle models *(6 pages)* 063517
Urbano França and Rogerio Rosenfeld
Criterion for bubble formation in a de Sitter universe *(6 pages)* 063518
V. Balek and M. Demetrian
Boundary inflation in the moduli space approximation *(12 pages)* 063519
P. R. Ashcroft, C. van de Bruck, and A.-C. Davis
High order correlation functions for a self-interacting scalar field in de Sitter space *(6 pages)* 063520
Francis Bernardeau, Tristan Brunier, and Jean-Philippe Uzan
Dark energy equation of state and anthropic selection *(12 pages)* 063521
Jaume Garriga, Andrei Linde, and Alexander Vilenkin
Axion phantom energy *(6 pages)* 063522
Pedro F. González-Díaz
Equatorial circular orbits in the Kerr–de Sitter spacetimes *(21 pages)* 064001
Zdeněk Stuchlík and Petr Slaný
Quantum states, thermodynamic limits, and entropy in *M* theory *(6 pages)* 064002
M. C. B. Abdalla, A. A. Bytsenko, and M. E. X. Guimarães
Kaluza-Klein structure associated with a fat brane *(14 pages)* 064003
Pham Quang Hung and Ngoc-Khanh Tran
Effective action and brane running *(8 pages)* 064004
Iver Brevik, Kazuo Ghoroku, and Masanobu Yahiro
Static post-Newtonian equivalence of general relativity and gravity with a dynamical preferred frame *(6 pages)* 064005
Christopher Eling and Ted Jacobson
Notes on spacetime thermodynamics and the observer dependence of entropy *(7 pages)* 064006
Donald Marolf, Djordje Minic, and Simon F. Ross

(Continued)

PHYSICAL REVIEW D **THIRD SERIES, VOLUME 69, NUMBER 6** **D15 MARCH 2004**

Gödel brane *(6 pages)* 064007
John D. Barrow and Christos G. Tsagas
Quantum inequalities for the free Rarita-Schwinger fields in flat spacetime *(7 pages)* 064008
Hongwei Yu and Puxun Wu
Two-dimensional metric-affine gravity *(6 pages)* 064009
Yuri N. Obukhov
Black hole initial data from a nonconformal decomposition *(5 pages)* 064010
Nigel T. Bishop, Florian Beyer, and Michael Koppitz
Do rotations beyond the cosmological horizon affect the local inertial frame? *(12 pages)* 064011
Jiří Bičák, Donald Lynden-Bell, and Joseph Katz
Toroidal perturbations of Friedmann-Robertson-Walker universes *(13 pages)* 064012
Jiří Bičák, Donald Lynden-Bell, and Joseph Katz
Thermodynamics and area in Minkowski space: Heat capacity of entanglement *(8 pages)* 064013
Ram Brustein and Amos Yarom
Periodic self-similar wave maps coupled to gravity *(6 pages)* 064014
Piotr Bizoń, Sebastian J. Szybka, and Arthur Wasserman
Rotating perfect fluids in $(2+1)$-dimensional Einstein gravity *(8 pages)* 064015
Mauricio Cataldo
Black holes in de Sitter space: Masses, energies, and entropy bounds *(15 pages)* 064016
Alejandro Corichi and Andres Gomberoff
Exact gravitational lens equation in spherically symmetric and static spacetimes *(10 pages)* 064017
Volker Perlick
Equation of motion for relativistic compact binaries with the strong field point particle limit: Third post-Newtonian order *(43 pages)* 064018
Yousuke Itoh
Minkowski vacuum in background independent quantum gravity *(7 pages)* 064019
Florian Conrady, Luisa Doplicher, Robert Oeckl, Carlo Rovelli, and Massimo Testa
Vacuum solutions of the gravitational field equations in the brane world model *(11 pages)* 064020
T. Harko and M. K. Mak
Observer dependence for the phonon content of the sound field living on the effective curved space-time background of a Bose-Einstein condensate *(9 pages)* 064021
Petr O. Fedichev and Uwe R. Fischer
Small brane black holes in the Randall-Sundrum type I scenario *(11 pages)* 064022
D. Karasik, C. Sahabandu, P. Suranyi, and L. C. R. Wijewardhana
Holography: 2D or not 2D? *(4 pages)* 064023
A.J.M. Medved
Magnetic branes in Gauss-Bonnet gravity *(8 pages)* 064024
M. H. Dehghani
Numerical analysis of quasinormal modes in nearly extremal Schwarzschild–de Sitter spacetimes *(7 pages)* 064025
Shijun Yoshida and Toshifumi Futamase
Towards a realistic neutron star binary inspiral: Initial data and multiple orbit evolution in full general relativity *(21 pages)* 064026
Mark Miller, Philip Gressman, and Wai-Mo Suen
Role of initial data in spherical collapse *(5 pages)* 064027
Pankaj S. Joshi and Rituparno Goswami
Rotating dilaton black holes with hair *(30 pages)* 064028
Burkhard Kleihaus, Jutta Kunz, and Francisco Navarro-Lérida
Scaling solution, radion stabilization, and initial condition for brane-world cosmology *(13 pages)* 064029
Shinji Mukohyama and Alan Coley

(Continued)

PHYSICAL REVIEW D **THIRD SERIES, VOLUME 69, NUMBER 6** **D15 MARCH 2004**

Palatini approach to Born-Infeld-Einstein theory and a geometric description of electrodynamics *(6 pages)* 064030
Dan N. Vollick
Caged black holes: Black holes in compactified spacetimes. I. Theory *(12 pages)* 064031
Barak Kol, Evgeny Sorkin, and Tsvi Piran
Caged black holes: Black holes in compactified spacetimes. II. 5D numerical implementation *(23 pages)* 064032
Evgeny Sorkin, Barak Kol, and Tsvi Piran
Quasinormal modes in Schwarzschild–de Sitter spacetime: A simple derivation of the level spacing of the frequencies *(9 pages)* 064033
T. Roy Choudhury and T. Padmanabhan
Ultrarelativistic black hole in an external electromagnetic field and gravitational waves in the Melvin universe *(11 pages)* 064034
Marcello Ortaggio
Massive-field approach to the scalar self-force in curved spacetime *(11 pages)* 064035
Eran Rosenthal
Symmetry-breaking mechanism for the Z4 general-covariant evolution system *(11 pages)* 064036
C. Bona, T. Ledvinka, C. Palenzuela, and M. Žáček
Bulk inflaton shadows of vacuum gravity *(16 pages)* 064037
Tsutomu Kobayashi and Takahiro Tanaka
Metric perturbation approach to gravitational waves in isotropic cosmologies *(15 pages)* 064038
E. M. O'Shea
Radiation reaction in Schwarzschild spacetime: Retarded Green's function via Hadamard-WKB expansion *(7 pages)* 064039
Paul R. Anderson and B. L. Hu
Cosmological tensor perturbations in the Randall-Sundrum model: Evolution in the near-brane limit *(14 pages)* 064040
Richard A. Battye, Carsten van de Bruck, and Andrew Mennim
Effective potential and spontaneous symmetry breaking in the noncommutative φ^6 model *(8 pages)* 065001
G. D. Barbosa
Harmonic oscillator force between heavy quarks *(23 pages)* 065002
Stanisław D. Głazek
Monopoles in the Higgs phase *(4 pages)* 065003
David Tong
Operator representation for Matsubara sums *(9 pages)* 065004
Olivier Espinosa and Edgardo Stockmeyer
Energy loss of a heavy fermion in an anisotropic QED plasma *(13 pages)* 065005
Paul Romatschke and Michael Strickland
Doubly periodic instantons and their constituents *(12 pages)* 065006
C. Ford and J. M. Pawlowski
Effective potential for composite operators and for an auxiliary scalar field in a Nambu–Jona-Lasinio model *(6 pages)* 065007
Bang-Rong Zhou
Noncommutative synchrotron *(6 pages)* 065008
Paolo Castorina, Alfredo Iorio, and Dario Zappalà
Exact scheme independence at two loops *(13 pages)* 065009
Stefano Arnone, Antonio Gatti, Tim R. Morris, and Oliver J. Rosten
Interaction of a TeV scale black hole with the quark-gluon plasma at CERN LHC *(8 pages)* 065010
Andrew Chamblin, Fred Cooper, and Gouranga C. Nayak

(Continued)

PHYSICAL REVIEW D **THIRD SERIES, VOLUME 69, NUMBER 6** **D15 MARCH 2004**

Dynamical breakdown of symmetry in a (2+1)-dimensional model containing the Chern-Simons field *(10 pages)* 065011
Alex G. Dias, M. Gomes, and A. J. da Silva
(2+1)-dimensional noncommutative CP^{N-1} model *(14 pages)* 065012
E. A. Asano, M. Gomes, A. G. Rodrigues, and A. J. da Silva
Center-vortex baryonic area law *(6 pages)* 065013
John M. Cornwall
Noncommutative quantum mechanics and Bohm's ontological interpretation *(9 pages)* 065014
G. D. Barbosa and N. Pinto-Neto
Casimir force on a piston *(5 pages)* 065015
R. M. Cavalcanti
Kink-boundary collisions in a two-dimensional scalar field theory *(11 pages)* 065016
Nuno D. Antunes, Edmund J. Copeland, Mark Hindmarsh, and André Lukas
Kontsevich product and gauge invariance *(6 pages)* 065017
Ashok Das and Josif Frenkel
Point-to-point description of the bubble wall dynamics in two-vacuum scalar field models *(9 pages)* 065018
Eugene M. Maslov and Arkadi G. Shagalov
Relativistic center-vortex dynamics of a confining area law *(15 pages)* 065019
John M. Cornwall
QCD and dimensional deconstruction *(14 pages)* 065020
D. T. Son and M. A. Stephanov
Superfield formulation of central charge anomalies in two-dimensional supersymmetric theories with solitons *(10 pages)* 065021
K. Shizuya
Scalar dark matter from theory space *(11 pages)* 065022
Andreas Birkedal-Hansen and Jay G. Wacker
Global fluctuation spectra in big-crunch–big-bang string vacua *(29 pages)* 066001
Ben Craps and Burt A. Ovrut
Inflationary cosmologies from compactification? *(10 pages)* 066002
Mattias N. R. Wohlfarth
Moduli Kähler potential for M theory on a G_2 manifold *(17 pages)* 066003
André Lukas and Stephen Morris
$\mathcal{N}=1$ geometries for M theory and type IIA strings with fluxes *(17 pages)* 066004
Gianguido Dall'Agata and Nikolaos Prezas
D-brane dynamics in the $c=1$ matrix model *(10 pages)* 066005
Michael Gutperle and Per Kraus
Uniqueness of M-theory *pp*-wave background with extra supersymmetries *(14 pages)* 066006
Nobuyoshi Ohta and Makoto Sakaguchi
Chiral symmetry breaking and pions in nonsupersymmetric gauge/gravity duals *(13 pages)* 066007
J. Babington, J. Erdmenger, N. Evans, Z. Guralnik, and I. Kirsch
Experiment for measuring the post-Maxwellian parameters of nonlinear electrodynamics of vacuum with laser-interferometer techniques *(4 pages)* 066008
Victor I. Denisov, Igor V. Krivchenkov, and Nikolay V. Kravtsov
Anti–de Sitter vacua require fermionic brane charges *(5 pages)* 066009
Kasper Peeters and Marija Zamaklar
Classical and quantum strings in compactified *pp* waves and Gödel type universes *(21 pages)* 066010
Daniel Brace, Carlos A.R. Herdeiro, and Shinji Hirano

(Continued)

PHYSICAL REVIEW D **THIRD SERIES, VOLUME 69, NUMBER 6** **D15 MARCH 2004**

BRIEF REPORTS

Thermal instability of the giant graviton in a matrix model on a *pp*-wave background *(4 pages)* 067701
Wung-Hong Huang

New results for deformed defects *(4 pages)* 067702
C. A. Almeida, D. Bazeia, L. Losano, and J. M. C. Malbouisson

Analytical solution of the Gross-Neveu model at finite density *(4 pages)* 067703
Michael Thies

Cumulative Author Index i