

5th International Symposium on Quantum Theory and Symmetries 2007

Journal of Physics: Conference Series Volume 128

**Valladolid, Spain
22-28 July 2007**

ISBN: 978-1-60560-974-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2008) by the Institute of Physics Publishing
All rights reserved.

Printed by Curran Associates, Inc. (2009)

For permission requests, please contact the Institute of Physics Publishing
at the address below.

Institute of Physics Publishing
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: +44 (0)117 929 7481
Fax: +44 (0)117 929 4318

custserv@iop.org

TABLE OF CONTENTS

Opening Talk	1
<i>H-D. Doebner</i>	
Supersymmetric 3D Gravity with Torsion: Asymptotic Symmetries and Black Hole	
Stability	3
<i>B. Cvetkovic, M. Blagojevic</i>	
Fermion-fermion and Boson-Boson Amplitudes: Surprising Similarities	
	9
<i>V.V. Dvoeglazov</i>	
On Some Aspects of Noncommutative Pure Yang-Mills Theory	
	16
<i>S Giller, C Gonera, P Kosinski, P Maslanka</i>	
Classical Integrable $N = 1$ and $N = 2$ Super Sinh-Gordon Models with Jump Defects	
	21
<i>J.F. Gomes, L.H. Ymai, A.H. Zimerman</i>	
Higgsless Electroweak Model Due to the Spherical Geometry	
	29
<i>N.A. Gromov</i>	
Nonlinear Completion of Massive Gravity of the Fierz-Pauli Type	
	36
<i>S. Hamamoto</i>	
Noncanonical Embedded Rational Map Soliton in Quantum $SU(3)$ Skyrme Model	
	46
<i>D. Jurciukonis, E. Norvaišas</i>	
Moyal-Weyl Star Product and Quasiconformal Mapping Relationship	
	52
<i>M. Kachkachi</i>	
An Analytical Vertex Operator	
	58
<i>R. Léandre</i>	
The Casimir Effect for a Massless Scalar Field in the N Dimensional Einstein Universe with Dirichlet Boundary Conditions on a Sphere	
	61
<i>P. Moylan</i>	
Effective Action Methods on Manifolds with Branes and Boundaries	
	70
<i>D. Nesterov, A. Barvinsky</i>	
Application of Noether's Theorem to Extended Particles	
	78
<i>A. Smida, M. Hachemane, A.H. Hamici</i>	
A Quantum Architecture for Multiplying Signed Integers	
	83
<i>J.J. Álvarez-Sánchez, J.V. Álvarez-Bravo, L.M. Nieto</i>	
The Role of the Hamiltonian in the Interpretation of Quantum Mechanics	
	92
<i>M. Castagnino, O. Lombardi</i>	
Zeros and Points of Discontinuity of the Commutator Function of the Free Dirac Field	
	111
<i>E.A. Karatsuba</i>	
Generalized Gauge Transformations in Phase Space Picture of Quantum Mechanics:	
Kirkwood Representation	
	122
<i>S. Khademi, S. Nasiri</i>	
Is Bohm's Quantum Theory Equivalent to Standard Quantum Theory?	
	128
<i>B.L. Lan, S-N. Liang</i>	
Semigroups of Tomographic Probabilities and Quantum Correlations	
	131
<i>V.I. Man'ko</i>	
Dirac Equation for Electrodynamical Model Particles	
	140
<i>J.X. Zheng-Johansson</i>	

Multi-Photon Coherent States Via a Lie Algebra Method	154
<i>D. Afshar, M. Jafarpour</i>	
Spin Squeezing Properties of an Initial Coherent State Via a Two-Axis Countertwisting Hamiltonian in the Presence and Absence of an External Field	159
<i>A. Akhound, M. Jafarpour</i>	
Temporal Evolution of Two Quantum Radiators at Interaction with Electromagnetic Cavity Field.....	163
<i>N. Ciobanu, N. Enaki</i>	
Coherent States for SUSY Partner Hamiltonians	171
<i>D.J. Fernández, O. Rosas-Ortiz, V. Hussin</i>	
The Fedosov Deformation Quantization with the Induced Symplectic Connection.....	182
<i>J. Tosiek</i>	
Generalized Integrability and Volume-Preserving Diffeomorphisms	190
<i>C. Adam, J. Sánchez-Guillén, A. Wereszczynski</i>	
Intertwining Algebras of Quantum Superintegrable Systems on the Hyperboloid	200
<i>J.A. Calzada, S. Kuru, J. Negro, M.A. del Olmo</i>	
Dynamics of the Topological Structures in Inhomogeneous Media.....	207
<i>L.A. Ferreira, B. Piette, W.J. Zakrzewski</i>	
A Linear Chain of Interacting Harmonic Oscillators: Solutions As a Wigner Quantum System	217
<i>S. Lievens, N.I. Stoilova, J. Van der Jeugt</i>	
Decomposition of Scalar Potentials of Natural Hamiltonians Into Integrable and Perturbative Terms: a Naive Approach.....	228
<i>G. Rastelli</i>	
Analysis of Gene Expression: Case Study for Bacteria.....	240
<i>M. Angelova, C. Myers</i>	
Particle-Number Conservation in Thermodynamic Systems Within the Richardson Model	251
<i>N. Benhamouda, N.H. Allal, M. Fella, M.R. Oudih</i>	
Unified Dynamical Symmetries in the Symplectic Extension of the Interacting Vector Boson Model	257
<i>A.I. Georgieva, H.G. Ganev, J.P. Draayer, V.P. Garistov</i>	
Dual Symmetry in Born-Infeld Theory	273
<i>S. Khademi, A. Ayoubi</i>	
Current Understanding of the Pseudospin Symmetry in Atomic Nuclei	278
<i>S. Marcos, M. López-Quelle, R. Niembro, L.N. Savushkin</i>	
The Large Nonlinearity Scale Limit of an Information-Theoretically Motivated Nonlinear Schrödinger Equation.....	291
<i>L-H. Nguyen, H-S. Tan, R.R. Parwani</i>	
The Preparation Time in a Scattering Experiment.....	296
<i>P. Bryant</i>	
Unstable Quantum Oscillator	302
<i>M.G. Espinosa, P. Kielanowski</i>	
Gamow Vectors: Miscellaneous Results.....	309
<i>M. Gadella</i>	
Eigenfunction Expansions and Scattering Theory in Rigged Hilbert Spaces	321
<i>F. Gómez-Cubillo</i>	

Dirac's Causality Leads to Time Asymmetry	336
<i>Y. Sato, H. Kan</i>	
General Structures of Hamiltonian Hierarchies	346
<i>R.C. dos Anjos, E.D. Filho, R.M. Ricotta</i>	
Beyond Conventional Factorization: Non-Hermitian Hamiltonians with Radial Oscillator Spectrum	351
<i>I. Cabrera-Munguía, O. Rosas-Ortiz</i>	
Second-order SUSY Partners of the Trigonometric Pöschl-Teller Potentials	362
<i>A. Contreras-Astorga, D.J. Fernández</i>	
Optical Potentials Using Resonance States in Supersymmetric Quantum Mechanics	370
<i>N. Fernández-García, O. Rosas-Ortiz</i>	
Solvable PT-Symmetric Potentials in 2 and 3 Dimensions	384
<i>G. Lévai</i>	
Quantum Toboggans: Models Exhibiting a Multisheeted PT—Symmetry	395
<i>M. Znojil</i>	
Representations of Fuzzy Torus	407
<i>N. Aizawa, R. Chakrabarti</i>	
Accelerated Path Integral Calculations for Many-Body Systems	421
<i>A. Balaž, I. Vidanovic, A. Bogojevic</i>	
Bases in Lie and Quantum Algebras	434
<i>A. Ballesteros, E. Celeghini, M.A. del Olmo</i>	
Feynman Formula for a Diffusion of Particles with a Variable Mass in a Domain	448
<i>Y.A. Butko, M. Grothaus, O.G. Smolyanov</i>	
On a Curvature-Statistics Theorem	457
<i>M. Calixto, V. Aldaya</i>	
Obtainment of Internal Labelling Operators As Broken Casimir Operators by Means of Contractions Related to Reduction Chains in Semisimple Lie Algebras	466
<i>R. Campoamor-Stursberg</i>	
On Position-Dependent Mass Harmonic Oscillators	480
<i>S. Cruz, J. Negro, L.M. Nieto</i>	
Contractions of Affine Kac-Moody Algebras	492
<i>J. Daboul, C. Daboul, M. de Montigny</i>	
An Approach to Quantum Anharmonic Oscillators Via Lie Algebra	504
<i>M. Jafarpour, D. Afshar</i>	
Quantum Mechanics and Umbral Calculus	509
<i>J.E. López-Sendino, J. Negro, M.A. del Olmo, E. Salgado</i>	
On Continuous Symmetries of Second-Order Homogeneous Linear Ordinary Differential Equations	524
<i>A.R. Matamala, C.A. Salas, M.J. Alid</i>	
Application of Lie Point Symmetry and Adomain Decomposition Techniques to Thermal-Storage Nonlinear Diffusion Models	530
<i>R.J. Moitsheki, O.D. Makinde</i>	
Quadratic Algebras and Position-Dependent Mass Schrödinger Equations	540
<i>C. Quesne</i>	

Ternary Algebras and Groups	545
<i>M. Rausch de Traubenberg</i>	
Algebraic Generalization of Quantum Statistics	556
<i>N.I. Stoilova, J. Van der Jeugt</i>	
Energy Levels and Expectation Values Via Accelerated Path Integral Monte Carlo	569
<i>D. Stojiljkovic, A. Bogojevic, A. Balaž</i>	
Author Index	