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Contents and Abstracts

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CONTENTS
Tom 49(63) , Fascicola 2, 2004, ISSN 1224-6069

MATHEMATICS

1. Gh.M. TUDOR – *L'équation Diophantienne $x_1^{x_1} \cdot x_2^{x_2} \cdot \dots \cdot x_k^{x_k} = y_1^{y_1} \cdot y_2^{y_2} \cdot \dots \cdot y_m^{y_m}$ (III)* . 1
2. C. MILICI – *Sur le calculs automatiques integrales trigonometriques (III)* 9
3. A. GÎRBAN – *Some remarks on the Lyapunov-Malkin Theorem (II)* 14
4. C. BOTA – *A property of a monotone global semi-flow on a vector bundle* 26
5. I. DRAGOMIRESCU – *Critical Rayleigh number in a convection in thawing subsea permafrost problem* 30
6. M. NEAGU – *Distributional functional identities characterizing λ -polynomials* 38
7. C. BOTA, D. POPESCU – *About periodic trajectories of a dynamical system on a topological manifold* 44
8. Gh.M. TUDOR, T.BÎNZAR – *On a Diophantine equation* 48
9. L. CIURDARIU – *On the topology of Loynes spaces* 52

PHYSICS

10. B. ROTHENSTEIN, C. NAFORNIȚĂ – *Three levels of understanding physical relativity: Galileo's relativity, up-to-date Galileo's Relativity and Einstein's Relativity: A historical survey*..... 60
11. D. POPOV – *Coherent states formalism for the pseudoharmonic oscillator*..... 70
12. M. CRISTEA, M. BIRZESCU, M. ȘTEFĂNESCU – *High purity Ni-ferrite obtained from a new organometallic precursor*..... 79
13. P. BARVINSCHI – *Seismic modeling and imaging using the reverse-time migration method*..... 86
14. P. BARVINSCHI – *Brilliance of an X-ray source for a foil type target*..... 94
15. I. DAMIAN – *Malu's law for a real polarizer*..... 98
16. L. LIGHEZAN – *UV-VIS absorbtion of the color centers formed in electrolytaly colored CaF₂ crystals* 104

ABSTRACTS

Tom 49(63) , Fascicola 2, 2004, ISSN 1224-6069

Mathematics

L'EQUATION DIOPHANTIENNE $x_1^{x_1} \cdot x_2^{x_2} \cdot \dots \cdot x_k^{x_k} = y_1^{y_1} \cdot y_2^{y_2} \cdot \dots \cdot y_m^{y_m}$ (III)

Gheorghe M. TUDOR

Résumé. Dans cet ouvrage, nous envisagerons quelques équations semblables à celle-là signalée plus haut, lesquelles ont été étudiées dans [6], [7]. Au sujet de cette problème, nous chercherons d'une façon semblable cette équation, en ce qui concerne l'existence et la détermination des solutions exprimées par des nombres entiers positifs. D'autre part, nous avons en vue et d'autres équations analogues à cette équation.

Keywords: Équation Diophantienne.

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SUR LE CALCULE AUTOMATIQUES DE QUELOUES INTEGRALS TRIGONOMETRIQUES (III)

Constantin MILICI

Résumé. Dans ce présent travail nous proposons de préciser le calcule automatique de quelques coefficients α des sommes trigonométriques plus générales $A_{p,q}$ exprimées par l'intégrale : $x \times x$.

Keywords: calcule automatique de quelques coefficients α .

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SOME REMARKS ON THE LYAPUNOV –MALKIN THEOREM (II)

Anania GÎRBAN

Abstract – The Lyapunov-Malkin theorem is discussed and some of its applications are pointed out.

Keywords: Lyapunov-Malkin theorem.

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A PROPERTY OF A MONOTONE GLOBAL SEMI-FLOW ON A VECTOR BUNDLE

Constantin BOTA

Abstract. Relative to a monotone dynamical system (X, \leq, Φ) on a Banach space X . H.S.Smith [6] proved the next result: if K_1, K_2 are compact subsets of X satisfying $K_1 < K_2$, then there are open sets U and V , $K_1 \subset U$, $K_2 \subset V$, and $t_1 \geq 0$, $\varepsilon > 0$ such that $\Phi_{t+s}(U) \subset \Phi(V)$, $t \geq t_1$, $0 \leq s < \varepsilon$. We prove that the same result holds for a monotone global semi-flow on a vector bundle.

Keywords: Dynamical system, Banach space, Compact subspace.

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CRITICAL RAYLEIGHT NUMBER IN A CONVECTION IN THAWING SUBSEA PERMAFROST PROBLEM

Ioana DRAGOMIRESCU

Abstract. Permafrost implies frozen ground. Thawing permafrost is a problem that concerns many scientist. Convection that takes place in the porous medium situated between the ocean bed and the thawing permafrost layer is a phenomenon that was studied extensively. In [6] the model of convection in thawing subsea permafrost is treated using the compound matrix method. Instead, we used the direct method to determine the secular equation which give us the critical Rayleigh numbers below which convection cannot occur for this convection model.

Keywords: Frozen ground, Thawing permafrost.

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DISTRIBUTIONAL FUNCTIONAL IDENTITIES CHARACTERIZING λ -POLYNOMIALS

Mihai NEAGU

Abstract. In this paper it is studied certain distributional functional identities which characterize λ -polynomials. In distributions, the fixation of variables is an irregular operation. In the place we will use the direct section of distributions which is a regular operation in distributions.

Keywords: λ -polynomials, λ -polynom of degree at most k .

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**ABOUT PERIODIC TRAJECTORIES OF DYNAMICAL SYSTEM ON
A TOPOLOGICAL MANIFOLD**
Constantin BOTA, Dan POPESCU

Abstract. We extend some properties of periodic trajectories of a dynamical system on a metric space to a dynamical system on a topological manifold.

Keywords: Dynamical system, Periodic trajectories.

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ON A DIOPHANTINE EQUATION
Gheorghe M. TUDOR, Tudor BÎNZAR

Abstract. In this paper the problem of finding of some classes of positive rational, in particular positive integer solutions for the equation $x_1^{x_2} \cdot x_2^{x_3} \cdot \dots \cdot x_{k-1}^{x_k} = x_k^{x_1}$, $k \geq 3$ is tackled. Also it is shown that the equation in question has infinitely many solutions described by families depending on $k-1$ parameters.

Keywords: Positive integer solutions.

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ON THE TOPOLOGY OF LOYNES SPACES
Loredana CIURDARIU

Abstract . Loynes introduced in [4] the notion of VE-space and respectively VH-space (or LVH-space), as generalizations of prehilbertian, respectively Hilbert space. LVH-space have also been named pseudohilbertian space in [7] and later Loynes spaces in [1] and [8]. Loynes in [4], [5] studied (positive definite) functions and elements of spectral theory in such space, and in [6] he tried to generalize stochastic processes by using such structures. In [1] and then in [7] and [8] these spaces are used in the abstract study of the stochastic processes. A more systematic utilization of them was done in [3]. In this note it is our aim to describe the topology in a Loynes space with the aid of seminorms.

Keywords: VE-space, VH-space, Hilbert space, Pseudohilbertian space.

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Physics

THREE LEVELS OF UNDERSTANDING PHYSICAL RELATIVITY: GALILEO'S RELATIVITY, UP-TO-DATE GALILEO'S RELATIVITY AND EINSTEIN'S RELATIVITY: A HISTORICAL SURVEY.

Bernhard ROTHENSTEIN, Corina NAFORNITA

Abstract: We present a way of teaching Einstein's special relativity. It starts with Galileo's relativity, the learners know from previous lectures. The lecture underlines that we can have three transformation equations for the space-time coordinates of the same event, which lead to absolute clock readings, time intervals and lengths (Galileo's relativity), to absolute clock readings but to relative time intervals and lengths (up-to-date Galileo transformations) and to relative clock readings time intervals and lengths.

Keywords: physical relativity, Einstein's relativity

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COHERENT STATES FORMALISM FOR THE PSEUDOHARMONIC OSCILLATOR

Dušan POPOV

Abstract: In the paper we have constructed the Barut-Girardello, Klauder-Perelomov and Gazeau-Klauder coherent states for the pseudoharmonic oscillator and we have examined some of their properties. In order to examine the behavior of a quantum canonical gas of pseudoharmonic oscillators, the Husimi's Q-function and the diagonal P-representation of the density operator are constructed, which are useful to calculate the thermal expectation values.

Keywords: Pseudoharmonic oscillator, Coherent states, Density matrix.

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HIGH PURITY Ni-FERRITE OBTAINED FROM A NEW ORGANOMETALLIC PRECURSOR

Minerva CRISTEA, Mihail BÎRZESCU, Mircea ȘTEFĂNESCU

Abstract. The paper presents the results concerning the synthesis of heteropolynuclear glyoxylates $[\text{Fe}_2\text{Ni}^{\text{II}}(\text{OH})_4(\text{C}_2\text{H}_2\text{O}_4)_2(\text{OH}_2)_2 \cdot x\text{H}_2\text{O}$, their thermal conversion into nickel ferrite and their dynamic magnetic hysteresis cycles at 50 Hz.

Keywords: Ni-ferrite, hysteresis

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SEISMIC MODELING AND IMAGING USING THE REVERSE-TIME MIGRATION METHOD

Paul BARVINSCHI

Abstract: Reverse-time migration for post-stack seismic data is implemented using the finite-difference method for solving the seismic P-wave equation with non-reflecting boundary conditions. Synthetic data for two complex geological models are migrated and resulting seismic section images are presented. Some limits of the technique are also discussed.

Keywords: reverse-time

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BRILLIANCE OF AN X-RAY SOURCE FOR A FOIL TYPE TARGET

Paul BARVINSCHI

Abstract: A study of the temperature distribution in a stationary foil type target and the brilliance of the focus, defined as the maximum input power per unit area of the focus, has been carried out in the case of a constant thermal conductivity and neglecting radiation.

Keywords: X-ray

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MALUS' LAW FOR A REAL POLARIZER

Ioan DAMIAN

Abstract. We present a possibility to measure the degree of polarization of a partially polarized light beam furnished by a real (imperfect) polarizer. A generalized formula for the Malus' law is derived, which holds when a partially polarized light beam passes through a real polarizer.

Keywords: polarized light, polarizer, degree of polarization

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UV – VIS ABSORPTION OF THE COLOR CENTERS FORMED IN ELECTROLYTICALLY COLORED CaF₂ CRYSTALS

Liliana LIGHEZAN, Irina NICOARA, Petru NEGREA

Abstract. The color centers in crystals are structural defects of the crystal lattice in which electrons or holes have been captured. In this paper, some considerations about the electrolytic creation of the color centers in CaF₂ crystal have been made. The results obtained from the electronic spectra of these color centers have been presented. A correlation between our results and those obtained from the additive and irradiative colored CaF₂ crystals has also been made.

Keywords: color centers, CaF₂ crystals, laser materials, condensed matter.

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