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I. Chajda, M. Kolařík, H. Länger

CHARACTERIZATIONS OF POSETS VIA WEAK STATES

Abstract. Weak states on posets are defined which are in some analogy to states on ortho-
modular posets used in axiomatic quantum mechanics. It is shown how certain properties of
the set of weak states characterize certain properties of the underlying poset.

Chang Bum Kim, Hee Sik Kim

ON BG-ALGEBRAS

Abstract. In this paper we introduce the notion of BG-algebras which is a generalization of
B-algebras. We construct a BG-algebra from a non-empty set, which is non-group-derived.
Moreover, using the notion of normal subalgebra, we obtain several isomorphism theorems
of BG-algebra and related properties.

Mona Khare, Soni Gupta

RELATIONS BETWEEN VARIOUS CONTINUITY
CONCEPTS IN EFFECT ALGEBRAS

Abstract. The aim of the present paper is to establish relations between continuity concepts
for a nonnegative extended real-valued function μ defined on an effect algebra. Examples
and counterexamples are given to illustrate various situations arising in this study.

Józef Kalinowski

ON PRESERVERS OF DETERMINANT OVER A FIELD

Abstract. Operators preserving the determinant of real matrices were studied in [1], [2]
and [5] under assumption that the operator is linear. In this paper the linearity of
the operators is not assumed: we only assume that the operators are of the form \( F = [f_{i,j}] \),
where functions \( f_{i,j} : \mathcal{F} \rightarrow \mathcal{F} \) for \( i, j = 1, 2, \ldots, n \) and \( \mathcal{F} \) is a field. In the matrix space
\( M_n(\mathcal{F}) = \mathcal{F}^{n \times n} \), we characterize these operators from \( M_{m,n}(\mathcal{F}) \) into itself preserving
the determinant. An operator preserving the determinant of matrices must be linear as in [4].
The form of operator \( F \) is presented.

Ajda Fošner, Maja Fošner, Joso Vukman

AN IDENTITY WITH DERIVATIONS ON RINGS
AND BANACH ALGEBRAS

Abstract. The main purpose of this paper is to study the following: Let \( m, n, \) and \( k_i \),
\( i = 1, 2, \ldots, n \), be positive integers and let \( R \) be a \( 2m(m + k_1 + k_2 + \ldots + k_n - 1) \)-torsion
free semiprime ring. Suppose that there exist derivations \( D_i : R \rightarrow R, i = 1, 2, \ldots, n + 1 \),
such that \( D_1(x^n)x^{k_1+\ldots+k_n} + x^{k_1}D_2(x^n)x^{k_2+\ldots+k_n} + \ldots + x^{k_1+\ldots+k_n}D_{n+1}(x^n) = 0 \) holds
for all \( x \in R \). Then we prove that \( D_1 + D_2 + \ldots + D_{n+1} = 0 \) and that the derivation
\( k_1D_2 + (k_1 + k_2)D_3 + \ldots + (k_1 + k_2 + \ldots + k_n)D_{n+1} \) maps \( R \) into its center. We also obtain
a range inclusion result of continuous derivations on Banach algebras.

V. B. L. Chaurasia, S. C. Pandey

UNIFIED ELLIPTIC-TYPE INTEGRALS AND
ASYMPTOTIC FORMULAS

Abstract. The object of the present paper is to consider a unified and extended form
of certain families of elliptic-type integrals, which have been discussed in number of earlier works on the subject due to their importance and applications in problems arising in radiation physics and nuclear technology. The results obtained are of general character and include the investigations carried out by several authors. We obtain asymptotic formulas for the unified elliptic-type integrals.

Eduard G. Kir’yatskii

DISTORTION THEOREMS IN THE CLASS $K_n(D)$

Abstract. This article presents the analysis of properties of functions belonging to the class $K_n(D)$ earlier introduced by the author. This is a class of functions analytical in the domain $D$, for which the n-th divided difference $[F; z_0, \ldots, z_n] \neq 0$ for any pairwise different points $z_0, \ldots, z_n \in D$. For $n = 1$ the class $K_1(D)$ consisting of functions univalent in the domain $D$ is obtained.

The subclass $K_n(E)$, formed by functions $F(z) = z^n + a_{n+1}z^{n+1} + \cdots$ analytical in a unit circle $E$ is separated from class $K_n(D)$ and its properties are considered.

The author touches classical and at the same time urgent questions, arising at the study of analytical functions, belonging to some class.

G. Murugusundaramoorthy, R. K. Raina

ON A CERTAIN CLASS OF ANALYTIC FUNCTIONS ASSOCIATED WITH A CONVOLUTION STRUCTURE

Abstract. Making use of a convolution structure, we introduce a new class of analytic functions defined in the open unit disc and investigate its various characteristics. Apart from deriving a set of coefficient bounds, we establish several inclusion relationships involving the $(n, \delta)$-neighborhoods of analytic functions with negative coefficients belonging to this subclass.

M. K. Aouf

NEIGHBOURHOODS OF CERTAIN p-VALENTLY ANALYTIC FUNCTIONS DEFINED BY USING SALAGEAN OPERATOR

Abstract. By making use of the familiar concept of neighbourhood of analytic and p-valent functions, the author prove coefficient bounds and distortion inequalities and associated inclusion relations for the $(j, \theta)$-neighborhoods of a family of p-valent functions with negative coefficients and defined by using Salagean operator which is defined by means of a certain non-homogenous Cauchy–Euler differential equation.

Jolanta Brandys

STRONG MAXIMUM PRINCIPLES FOR INFINITE SYSTEMS OF PARABOLIC DIFFERENTIAL-FUNCTIONAL INEQUALITIES WITH NONSTANDARD INITIAL INEQUALITIES WITH INTEGRALS

Abstract. In this paper we consider infinite systems of parabolic differential-functional inequalities with nonstandard initial inequalities with integrals. For that systems we give strong maximum principles in relatively arbitrary $(n + 1)$-dimensional time-space sets more general than the cylindrical domain.

Eliza Jabłońska

ONE-TO-ONE SOLUTIONS OF A GENERALIZED
GOLAB–SCHINZEL EQUATION

Abstract. Let $K$ be the field of real or complex numbers and let $X$ be a nontrivial linear space over $K$. Assume that $f : X \to K$ is injective, $M : K \to K$ and $M \circ f \neq \text{const}$. We give a necessary and sufficient condition for functions $f$ and $M$ to satisfy the equation

$$f(x + M(f(x))y) = f(x)f(y).$$

Jens Schwaiger, Wolfgang Prager

POLYNOMIALS IN ADDITIVE FUNCTIONS
AND GENERALIZED POLYNOMIALS

Abstract. We consider polynomials $P$ in additive functions $g_1, \ldots, g_m$ and present two approaches for a characterization of those generalized polynomials $p$, which may be represented as $p = P \circ (g_1, \ldots, g_m)$. Under rather general assumptions on the domains of the $g_i$ and of $P$, one of the approaches is based on certain properties of subspaces generated by translates of $p$. The other approach utilizes the fact, that every $p$ is the diagonalization of an associated multi-Jensen function.

Yaşar Bolat

OSCILLATION CRITERIA FOR SECOND-ORDER
FUNCTIONAL DIFFERENCE EQUATION
WITH NEUTRAL TERMS

Abstract. In this manuscript, two type of new oscillation criteria are obtained respect to coefficient $a_k$ in the following Eq. (1.1). In the subsection 2.1 considered as $a_k \geq 0$. In the subsection 2.2 allowed it to be an oscillating sequence. There are no results for the oscillation of second order difference equations with oscillating coefficients up to now.

Bianca Satco

GLOBAL SOLUTIONS FOR VOLterra ORDINARY
AND RETARDED INTEGRAL EQUATIONS

Abstract. Using a generalization of Darbo’s fixed point theorem, we obtain the existence of global solutions for nonlinear Volterra-type integral equations in Banach spaces. The involved functions are supposed to be continuous only with respect to some variables, integrability or essential boundedness conditions being also imposed. Our result improves the similar result obtained by Liu, Guo, C. Wu and Y. Wu (where uniform continuity was required), as well as those referred by the authors of the cited paper. Finally, following the same idea, the existence of continuous solutions is proved for a Volterra-type retarded integral equation, under less restrictive assumptions than in the others related results in literature.

S. S. Dragomir, D. Comanescu

ON THE TORRICELLIAN POINT
IN INNER PRODUCT SPACES

Abstract. The concept of Torricellian point related to a set of $n$ vectors in normed linear spaces is introduced and the general properties obtained. The existence and uniqueness of the Torricellian point in inner product spaces are established.

D. R. Sahu, S. C. Shrivastava, B. L. Malager

APPROXIMATION OF COMMON FIXED POINTS
OF A FAMILY OF ASYMPTOTICALLY
QUASI-NONEXPANSIVE MAPPINGS

Abstract. In this paper, we study the convergence of the sequence of Ishikawa iteration of rank-r to common fixed points of a finite family of asymptotically quasi-nonexpansive mappings in uniformly convex Banach spaces. Our results extend and improve some known recent results.

Ali Farés, Bruno de Malafosse

SPECTRA OF THE OPERATOR OF THE FIRST DIFFERENCE IN \( s_\alpha, s^{(c)}_\alpha, s_\alpha \) AND \( l_p(\alpha) \) (1 ≤ p < ∞)

Abstract. In this paper we deal with the spectrum of the operator of the first difference \( \Delta \) considered as an operator from \( E \) to itself where \( E \) is one of the sets \( s_\alpha, s^{(c)}_\alpha, \) or \( l_p(\alpha) \) (1 ≤ p < ∞). We apply these results to characterize matrix transformations mapping in \( E (\Delta - \lambda I)^\chi \) where \( E \) is either of the sets \( s^{(c)}_\alpha \) or \( l_p(\rho) \), for \( 1 \leq p < \infty \) and \( \chi \in \mathbb{C} \) or \( \mathbb{N} \). This paper generalizes some results by de Malafosse and Akhmedov with Başar.

U. C. De, Avijit Sarkar

ON THREE-DIMENSIONAL LOCALLY \( \phi \)-RECURRENT QUASI-SASAKIAN MANIFOLDS

Abstract. The object of the present paper is to study three-dimensional locally \( \phi \)-recurrent quasi-Sasakian manifolds.

Takashi Noiri, Valeriu Popa

ON SOME FORMS OF WEAKLY CONTINUOUS FUNCTIONS IN BITOPOLITICAL SPACE

Abstract. As a generalization of weakly continuous functions, we introduce the notion of \( (i, j) \)-weakly \( m \)-continuous functions in bitopological spaces and obtain unified characterizations and properties of certain forms of weakly continuous functions in bitopological spaces.

J. Kurek, W. M. Mikulski

THE NATURAL AFFINORS ON THE \( r \)-TH ORDER FRAME BUNDLE

Abstract. We describe all \( \mathcal{M}_{fnr} \)-natural affinors on the \( r \)-th order frame bundle \( L^rM = invJ^r_0(\mathbb{R}^m, M) \) over \( M \).

Marcin Dudziński, Konrad Furmańczyk

ON THE ALMOST SURE CENTRAL LIMIT THEOREMS IN THE JOINT VERSION FOR THE MAXIMA AND MINIMA OF SOME RANDOM VARIABLES

Abstract. Let: \( \{X_i\} \) be a sequence of r.v.s, and: \( M_n := \max(X_1, \ldots, X_n) \), \( m_n := \min(X_1, \ldots, X_n) \). Our goal is to prove the almost sure central limit theorem for the properly normalized vector \( \{M_n, m_n\} \), provided: 1) \( \{X_i\} \) is an i.i.d. sequence, 2) \( \{X_i\} \) is a certain standardized stationary Gaussian sequence.

Arif Rafiq, Nazir Ahmad Mir, Fiza Zafar

A GENERALIZED OSTROWSKI TYPE INEQUALITY FOR A RANDOM VARIABLE WHOSE PROBABILITY DENSITY FUNCTION BELONGS TO \( L_\infty[a, b] \), IN TERMS OF THE CUMULATIVE DISTRIBUTION FUNCTION AND EXPECTATION. The inequality is then applied to generalized beta random variable.