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Lavinia Corina Ciungu

CONVERGENCE WITH A FIXED REGULATOR IN PERFECT MV-ALGEBRAS

Abstract. MV-algebras were introduced by Chang as an algebraic counterpart of the Łukasiewicz infinite-valued logic. D. Mundici proved that the category of MV-algebras is equivalent to the category of abelian ℓ-groups with strong unit. A. Di Nola and A. Lettieri established a categorical equivalence between the category of perfect MV-algebras and the category of abelian ℓ-groups. In this paper we investigate the convergence with a fixed regulator in perfect MV-algebras using Di Nola-Lettieri functors. The main result of the paper states that every locally Archimedean MV-algebra has a unique ℓ-Cauchy completion.

K. Denecke, P. Glubudom

REGULAR ELEMENTS AND GREEN’S RELATIONS IN POWER MENGER ALGEBRAS OF TERMS

Abstract. Sets of terms of type τ are called tree languages. On sets of tree languages superposition operations can be defined in such a way that the collection of all tree languages of type τ forms an abstract clone. Considering only sets of n_ary terms one obtains a Menger algebra. From the superposition operations binary operations on tree languages can be derived. For the corresponding semigroups of tree languages we study idempotent and regular elements as well as Green’s relations Ł and R.

Anna Mućka

THE GRAPHS OF FIBERED AUTOMATA

Abstract. Fibered automata can be described by their transition diagrams, certain edge-labelled digraphs. We describe digraphs that are unlabelled transition diagrams of fibered automata.

Shahabaddin Ebrahimi Atani

INDECOMPOSABLE WEAK MULTIPLICATION MODULES OVER DEDEKIND DOMAINS

Abstract. Let $R$ be a Dedekind domain. We classify all indecomposable weak multiplication $R$-modules and we establish a connection between the weak multiplication modules, the pure multiplication modules and the pure-injective modules over such domains.

Sándor Szabó

FULL-RANK NON-PERIODIC FACTORIZATIONS OF ELEMENTARY $p$-GROUPS

Abstract. It will be shown that for each prime $p$ there is a threshold value $k_p$ such that each elementary $p$-group of rank at least $k_p$ admits a non-periodic full-rank factorization. It will be established that $k_2 \leq 15$ and $k_p \leq 6$ for $p \geq 3$.

N. S. Barnett, S. S. Dragomir

ON AN INEQUALITY OF THE LUPAŞ TYPE
Abstract. An inequality of the Lupač type for Čebyšev functionals is established.

Jacek Dziok

ON A SUBCLASS OF p-VALENT FUNCTIONS

Abstract. In this paper we consider a subclass of p-valent functions defined by certain differential-integral operator. By using the Krein-Milman theorem we obtain the extreme points of the class. Some extremal problems in the class are also determined.

Albert I. Petrosyan

ON WEIGHTED HARMONIC BERGMAN SPACES

Abstract. This paper is devoted to the investigation of the weighted Bergman harmonic spaces $b^p_0(B)$ in the unit ball in $\mathbb{R}^n$. The reproducing kernel $R_0$, for the ball is constructed and the integral representation for functions in $b^p_0(B)$ by means of this kernel is obtained. Besides an linear mapping between the $b^p_0(B)$ spaces and the ordinary $L^2$-space on the unit sphere, which has an explicit form of integral operator along with its inversion is established.

Nguyen Thanh Long, Vo Giang Giai, Le Xuan Truong

A SHOCK PROBLEM INVOLVING A NONLINEAR VISCOELASTIC BAR ASSOCIATED WITH A NONLINEAR BOUNDARY CONDITION

Abstract. We study the initial-boundary value problem for a nonlinear wave equation given by

$$
\left\{
\begin{array}{ll}
  u_{tt} - u_{xx} + K|u|^{p-2}u + \lambda|u_t|^{q-2}u_t = F(x, t), & 0 < x < 1, \ 0 < t < T, \\
  u_x(0, t) = P(t), & u(1, t) = 0, \\
  u(x, 0) = u_0(x), & u_t(x, 0) = u_1(x),
\end{array}
\right.
$$

where $p \geq 2$, $q > 1$, $K$, $\lambda$ are given constants and $u_0$, $u_1$, $F$ are given functions, the unknown function $u(x, t)$ and the unknown boundary value $P(t)$ satisfy the following nonlinear integral equation

$$
P(t) = g(t) + K_1|u(0, t)|^{\alpha-2}u(0, t) + |u_t(0, t)|^{\beta-2}u_t(0, t) - \int_0^t k(t-s)u(0, s)ds,
$$

where $K_1$, $\alpha$, $\beta$ are given constants and $g$, $k$ are given functions. In Part I we prove a theorem of existence and uniqueness of a weak solution $(u, P)$ of problem (1), (2). The proof is based on the Faedo-Galerkin method associated with a priori estimates, weak convergence and compactness techniques. In Part 3 we obtain an asymptotic expansion of the solution $(u, P)$ of the problem (1), (2) up to order $N + 1$ in three small parameters $K$, $\lambda$, $K_1$.

E. M. Elabbasy, H. El-Metwally, E. M. Elsaeed

ON THE SOLUTIONS OF A CLASS OF DIFFERENCE EQUATIONS SYSTEMS

Abstract. In this paper we discuss the periodic solutions of particular cases of the following general system of difference equations

$$
\begin{align*}
x_{n+1} &= \frac{a_1 + a_2 y_n}{a_3 z_n + a_4 x_{n-1} z_n}, \quad y_{n+1} = \frac{b_1 z_{n-1} + b_2 z_n}{b_3 x_n y_n + b_4 x_n y_{n-1}}, \\
z_{n+1} &= \frac{c_3 x_{n-1} y_{n-1} + c_4 x_{n-1} y_n + c_5 x_n y_n}{c_1 z_n + c_2 z_{n-1}},
\end{align*}
$$

where the initial conditions $x_{-1}$, $x_0$, $y_{-1}$, $y_0$, $z_{-1}$, and $z_0$ are arbitrary nonzero real numbers and $a_i$, $b_i$, and $c_j$, for $i = 1, 2, 3, 4$, $j = 1, 2, 3, 4, 5$ are non-negative real numbers. The
results obtained are new and contained as special cases some other results.

Harry Poppe

A CLOSEDNESS THEOREM FOR NORMED SPACES

Abstract. For spaces $X, Y$, for which some algebraic operations are defined and in some cases topologies for $X, Y$ are defined too, we define for the space $X$ a dual space $X^d$ with respect to the space $Y$. If $\sigma$ is a topology for $Y$, (compatible with the algebraic operations of $Y$), then the pointwise topology $\tau_\sigma$ for $Y^X$ is defined. We show that $X^d$ is \((\text{algebraically})\tau_\sigma\)-closed in $Y^X$. For normed spaces is shown that suitable subspaces of $X^d$ are $\tau_\sigma$-closed in a product space $K \subseteq Y^X$. As a corollary we obtain a generalization of Alaoglu’s theorem.

U. C. Gairola, P. S. Jangwan

COINCIDENCE THEOREM FOR MULTI-VALUED AND SINGLE-VALUED SYSTEMS OF TRANSFORMATIONS

Abstract. In this paper we prove a coincidence theorem by generalizing the diverse coincidence theorems and fixed point theorems of Baillon - Singh, Czerwik, Singh Gairola, Kaneko, Kaneko - Sessa, Reddy-Subrahmanyan and others for a system of single-valued and multi-valued maps by introducing the concept of co-ordinatewise R-weakly commuting maps inspired by Pant.

M. Abbas, B. E. Rhoades

COMMON FIXED POINT, BEST APPROXIMATION AND GENERALIZED $f$-WEAK CONTRACTION
MULTIVALUED MAPPING IN $p$-NORMED SPACES

Abstract. We establish coincidence point and common fixed point results for multivalued $f$-weak contraction mappings which assume closed values only. As an application, related common fixed point and invariant approximation are obtained in the setup of certain metrizable topological vector spaces. Our results provide extensions as well as substantial improvements of several well known results in the literature.

Abdul Latif, Wafaa A. Albar

FIXED POINT RESULTS IN COMPLETE METRIC SPACES

Abstract. Using the concept of $w$-distance, we prove fixed point theorems for multivalued contractive maps. Consequently, we improve and extend the corresponding fixed point results due to Feng and Liu, Nadler and many of others.

Christoph Schmoeger

A NOTE ON THE DECOMPOSITION OF FREDHOLM OPERATORS

Abstract. We generalize a result of F. Szigeti concerning the decomposition of Fredholm operators on Banach spaces.

S. Lahrech, A. Jaddar, J. Hlal, A. Ouahab, A. Mbarki

ON THE PRINCIPLE OF UNIFORM BOUNDEDNESS FOR LSC CONVEX PROCESSES IN A STRICTLY
$\mathcal{N}$-LOCALLY CONVEX SPACES

Abstract. In this paper we establish the principle of uniform boundedness for LSC convex
processes in some class of locally convex spaces (strictly $\mathcal{N}$ locally convex spaces). Thus, we generalize the same result established by S. Lahrech for sequentially continuous linear operators.

**D. Borowska, J. Grzybowski**

**STRONGLY MONOTYPIC POLYTOPES IN $\mathbb{R}^3$**

**Abstract.** McMullen et al. characterized all three-dimensional monotypic polytopes by presenting four types of such polytopes. They stated that three of these types are strongly monotypic polytopes. We examine which monotypic polytopes of the fourth type are strongly monotypic. This way we complete the description of all strongly monotypic polytopes in $\mathbb{R}^3$.

**A. A. Shaikh, K. K. Baishya, S. Eyasmin**

**ON D-HOMOTHETIC DEFORMATION OF TRANS-SASAKIAN STRUCTURE**

**Abstract.** The object of the present paper is to study a transformation called $D$-homothetic deformation of trans-Sasakian structure. Among others it is shown that in a trans-Sasakian manifold, the Ricci operator $Q$ does not commute with the structure tensor $\phi$ and the operator $Q\phi - \phi Q$ is conformal under a $D$-homothetic deformation. Also the $\phi$-sectional curvature of a trans-Sasakian manifold is conformal under such a deformation. Some non-trivial examples of trans-Sasakian (non-Sasakian) manifolds with global vector fields are obtained.

**Beniamino Cappelletti Montano**

**INTEGRAL SUBMANIFOLDS OF $r$-CONTACT MANIFOLDS**

**Abstract.** We study the properties of integral submanifolds of the contact distribution of an $r$-contact manifold. In particular we find relations between them, $r$-contactomorphisms and $r$-contact vector fields, and we find some results for integral submanifolds of $S$-space forms.

**Marian Przemska**

**ON THE RELATIONSHIPS BETWEEN THE GRAPHS OF MULTIFUNCTIONS AND SOME FORMS OF CONTINUITY**

**Abstract.** In this paper we continue the study of the concept of graph continuity. We extend to multifunctions some results on the relationships between the graphs of functions. In addition, we introduce some generalized forms of continuity for multifunctions.

**Erdal Ekici, Takashi Noiri**

**ON SOME NEW DECOMPOSITIONS OF CONTINUITY**

**Abstract.** The main purpose of this paper is to introduce the concepts of $D(\delta, \delta s)$-sets, $D(c, \delta p)$-sets, $D(\delta, \delta p)$-sets, $D(\delta, \delta s)$-continuity, $D(c, \delta p)$-continuity, $D(\delta, \delta p)$-continuity and to obtain new decompositions of continuity and super-continuity.

**Mohsen Timoumi**

**SUBHARMONICS OF NOT UNIFORMLY PARTIALLY COERCIVE HAMILTONIAN SYSTEMS**

**Abstract.** In this work, we prove the existence of multiple periodic and subharmonic solutions of the Hamiltonian system $\dot{x} + H'(t, x) + e(t) = 0$ when the Hamiltonian $H$ is periodic.
in a part of the variables and locally coercive in the other part; that is, there exists a decomposition \( \mathbb{R}^{2N} = A \oplus B \) of \( \mathbb{R}^{2N} \) such that \( H(t, u + v) \) is periodic in \( u \) and \( H(t, u + v) \rightarrow +\infty \) or \( -\infty \) as \( |v| \rightarrow +\infty \), uniformly in \( u \in A \) for almost every \( t \) in some non empty open subset \( C \) of \([0, T]\). For the resolution, we use an analogy of Egorov’s Theorem and a Generalized Saddle Point Theorem.