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WEAK FUZZY IMPLICATION ALGEBRAS
AND INDUCED STRUCTURES

Abstract. The concept of fuzzy implication algebra is weakened replacing the exchange axiom by an essentially weaker version. To each such algebra a groupoid is assigned. We get conditions under which this groupoid is commutative and show when a fuzzy implication algebra becomes a lattice with antitone involutions on all sections.

David J. Foulis

COMPARABILITY GROUPS

Abstract. A comparability group is a unital group with a compression base and with the general comparability property. The additive group of self-adjoint elements in a von Neumann algebra, and any Dedekind sigma-complete lattice-ordered abelian group with order unit are examples of comparability groups. We develop the basic theory of comparability groups, and show that an archimedean comparability group with the Rickart projection property can be embedded in a partially ordered rational vector space the elements of which admit a rational spectral resolution.

Ewa Graczyńska, Dietmar Schweigert

M-HYPERQUASIVARIETIES

Abstract. We consider the notion of M-hyper-quasi-identities and M-hyperquasivarieties, as a common generalization of the concept of quasi-identity (hyper-quasi-identity) and quasivariety (hyper-quasivariety) invented by A. I. Mal’cev, cf. [?], cf. [?] and hypervariety invented by the authors in [?], [?] and hyperquasivariety [?]. The results of this paper were presented on the 69th Workshop on General Algebra, held at Potsdam University (Germany) on March 18-20, 2005.

Stan Gudder

COMPRESSION BASES IN EFFECT ALGEBRAS

Abstract. We generalize David Foulis’s concept of a compression base on a unital group to effect algebras. We first show that the compressions of a compressible effect algebra form a compression basis and that a sequential effect algebra possesses a natural maximal compression basis. It is then shown that many of the results concerning compressible effect algebras hold for arbitrary effect algebras by focusing on a specific compression base. For example, the foci (or projections) of a compression base form an orthomodular poset. Moreover, one can give a natural definition for the commutant of a projection in a compression base and results concerning order and compatibility of projections can be generalized. Finally it is shown that if a compression base has
the projection-cover property, then the projections of the base form an orthomodular lattice.

Zvonko Čerin

PROPERTIES OF ODD AND EVEN TERMS
OF THE FIBONACCI SEQUENCE

Abstract. We shall improve some results on sums of squares of odd terms of the Fibonacci sequence by Rajesh and Leversha.

Joso Vukman, Irena Kosi-Ublj

ON SOME EQUATIONS RELATED TO DERIVATIONS
IN RINGS AND BANACH ALGEBRAS

Abstract. The main purpose of this paper is to investigate additive mapping $D : R \to R$, where $R$ is a $(m + n + 1)!$ and $|m^2 + n^2 - m - n - 4mn|$-torsion free semiprime ring with the identity element, satisfying the relation $2D(x^{m+n+1}) = (m + n + 1)(x^m D(x)x^n + x^n D(x)x^m)$, for all $x \in R$ and some integers $m \geq 1$, $n \geq 1$, $m^2 + n^2 - m - n - 4mn \neq 0$.

V. Ravichandran, M. Hussain Khan, H. Silverman, K. G. Subramanian

RADIUS PROBLEMS FOR A CLASS
OF ANALYTIC FUNCTIONS

Abstract. In this present paper, we investigate certain radius problems for a class of normalized analytic functions in the open unit disk in the complex plane.

M. A. Pathan, M. J. S. Shahwan

NEW REPRESENTATIONS OF THE VOIGT FUNCTIONS

Abstract. This paper aims at some representations of generalized Voigt functions and their extensions in terms of series and integrals which are specially useful in situations when the parameters take on particular values. Explicit representations of these functions are given in terms of familiar special functions of one and two variables. The Voigt integrals and series resulting in connections with the Lommel, Struve, Laguerre and parabolic cylinder functions and ultimately the Kampé de Fériet function will follow as natural consequences for analytical evaluations and uses.

Fang Qiu, Han-Ze Liu

ANALYTIC SOLUTIONS OF A FIRST ORDER ITERATIVE
DIFFERENTIAL EQUATION $x'(z) = x(p(z) + bx(z))$
Abstract. This paper is concerned with an iterative differential equation $x'(z) = x(p(z) + bx(z))$. By constructing a convergent power series solution $y(z)$ of a companion equation of the form $\beta y'(\beta z) = y(z)[y(\beta^2 z) - p(y(\beta z)) + p'(y(z))]$, analytic solutions of the form $[y(\beta y^{-1}(z)) - p(z)]/b$ for the original differential equation are obtained.

Eliza Jabłońska

CONTINUITY OF LEBESGUE MEASURABLE SOLUTIONS OF A GENERALIZED GOLKAB–SCHINZEL EQUATION

Abstract. Let $k, n$ be positive integers and let $f : \mathbb{R}^n \to \mathbb{R}$ be a solution of the functional equation

$$f(x + f(x)^ky) = f(x)f(y).$$

We prove that, if there is a real positive $a$ such that the set $\{x \in \mathbb{R}^n : |f(x)| \in (0, a)\}$ contains a subset of positive Lebesgue measure, then $f$ is continuous. As a consequence of this we obtain that every Lebesgue measurable solution $f : \mathbb{R}^n \to \mathbb{R}$ of the equation is continuous or equal zero almost everywhere (i.e. there is a set $A \subset \mathbb{R}^n$ of the Lebesgue measure zero with $f(\mathbb{R}^n \setminus A) = \{0\}$).

Jolanta Okrzesik

ON THE EXISTENCE OF LIPSCHITZIAN SOLUTION OF A COMPOSITE FUNCTIONAL EQUATION

Abstract. There are presented conditions which guarantee the existence of a Lipschitzian solution of the composite functional equation $\psi(x) = G(x, \psi(H(x, \psi(x))))$ are presented.

Wilhelmina Smajdor

SET-VALUED VERSION OF SINCOV’S FUNCTIONAL EQUATION

Abstract. We investigate selections of set-valued solutions of Sincov’s functional equation that satisfy the same equation.

Roman Wituła, Maciej J. Przybyła

THE STRONGLY AND WEAKLY DIVERGENT PERMUTATIONS

Abstract. We introduce the concepts of strongly and weakly divergent permutations and consider some relations between them.

Vijay Gupta, Nurhayat İspir
ON THE KANTOROVICH VARIANT OF GENERALIZED BERNSTEIN TYPE RATIONAL FUNCTIONS

Abstract. In the present paper we define Kantorovich variant of generalized Bernstein type rational functions. We establish the order of approximation for continuous functions in different normed spaces and also estimate the rate of convergence for functions of bounded variation.

Ray Redheffer

ON THE UNION OF VOLterra-TYPE Populations

Abstract. A system of Volterra type is a system of the form

\[ \dot{u}_i = u_i \left( e_i + \sum_{j=1}^{m} p_{ij} u_j \right) \]

where \( i = 1, 2, \ldots, m \), each \( u_i(0) > 0 \), the \( e_i \) and \( p_{ij} \) are real constants and the \( e_i \) are so chosen that the system has a positive stationary solution \( (u_i) = (p_i) \). The system is called globally asymptotically stable if every solution \( (u_i) \) tends to \( (p_i) \) as \( t \to \infty \). Suppose we have another system like this one, with \( n \) unknowns \( v_i \) instead of \( u_i \) and positive stationary solution \( (q_i) \) instead of \( (p_i) \). We form a system in \( m + n \) unknowns \( (u, v) \) by joining some of the vertices of the graph \( G(p) \) to some of those of \( G(q) \). If the original systems are globally asymptotically stable, what additional conditions ensure global asymptotic stability of the larger system so obtained? That is the question with which this paper is concerned.

Gerd Herzog, Christoph Schmoeger

BANACH ALGEBRA HOMOMORPHISMS VIA ORTHOGONAL PROJECTIONS

Abstract. Let \( \mathcal{A} \) be a unital complex Banach algebra with unit \( e \), and \( p_1, \ldots, p_n \) a collection of orthogonal projections with sum \( e \). The aim of this note is to investigate the close connections of properties of \( a \in \mathcal{A} \) and of \( (p_i a p_i) \in M_n(\mathcal{A}) \), where \( M_n(\mathcal{A}) \) denotes the matrix algebra of all \( n \times n \) matrices with entries in \( \mathcal{A} \).

Ismat Beg, Mujahid Abbas

FIXED POINT THEOREMS FOR WEAKLY INWARD MULTIVALUED MAPS ON A CONVEX METRIC SPACE

Abstract. We prove the existence of fixed point for weakly contractive multivalued maps satisfying the inwardness condition in the framework of a convex metric space. Fixed point theorems for multivalued contraction mapping taking the closed values are
also obtained. These theorems extend several known results.

Yongjin Li

ISHIKAWA ITERATIVE SEQUENCE WITH ERRORS
FOR K-SUBACCETIVE OPERATORS
IN ARBITRARY BANACH SPACES

Abstract. In this paper, the iterative solution is studied for equation $x + Tx = f$ with a Lipschitz $K$-subaccretive operator in arbitrary Banach spaces, some previously results are generalized.

N. Djeghaba, R. Benzine

ACCELERATION DE LA CONVERGENCE
DE LA MÉTHODE DE LA PLUS FORTE PENTE

Abstract. Let $(P)$ be the following problem of optimization without constraints

$$(P) \quad \min \{ f(x) : x \in \mathbb{R}^n \}.$$ 

We study in this paper an algorithm which accelerates the convergence of the steepest descent method.

Résumé: Soit $f : \mathbb{R}^n \to \mathbb{R}$, et $(P)$ le problème de minimisation sans contraintes suivant:

$$(P) \quad \min \{ f(x) : x \in \mathbb{R}^n \}.$$ 

On donne dans ce travail un algorithme de résolution du problème $(P)$, qu’on a appelé l’Epsilon Steepest Descent dont le but est d’accélerer la convergence de la méthode de la plus forte pente. On démontrera un résultat de convergence et on effectuera ensuite des tests numériques.

Alessandro Soranzo, Grzegorz Sójka

SOME RESULTS ABOUT $+\infty$-, $-\infty$- AND $i$-CHORD FUNCTIONS

Abstract. This paper concerns determination of a convex bodies by values of $+\infty$-, $-\infty$- and $i$-chord functions. We prove that any at least two-dimensional convex body is not determined by values of $-\infty$-chord functions at any two internal points. We also present some positive results on determination of convex bodies using $-\infty$- or $+\infty$-chord function at one point and $i$-chord function at other one.

Wiesław Królikowski

QUATERNIONIC CONDITION FOR THE EXISTENCE
OF 4-DIMENSIONAL LOCALLY CONFORMALLY
FLAT ALMOST KÄHLER MANIFOLDS
Abstract. Using the fundamental notions of the quaternionic analysis we show that there are no 4-dimensional almost Kähler manifolds which are locally conformally flat with a metric of a special form.

Ram Nivas, Mohit Saxena
ON A SPECIAL STRUCTURE
IN A DIFFERENTIABLE MANIFOLD

Abstract. K. Yano, studied structure defined by a tensor field $f$ of type $(1,1)$ satisfying $f^3 + f = 0$. In this paper we have considered a structure of fourth order, which involves the generalization of the above structure. Some interesting results have been obtained on the existence and the integrability conditions of such a structure.

Bayram Sahin
ALMOST LOCALLY CONFORMAL KAHLER PRODUCT MANIFOLDS

Abstract. It is known that the product of two locally conformal Kaehler manifolds is not a locally conformal Kaehler manifold, ([?], P:46 ). In this paper we introduce an almost locally conformal Kaehler product manifold and show that the product of two locally conformal Kaehler manifolds is an almost locally conformal Kaehler manifold. Moreover, we investigate properties of curvature tensors of an almost locally conformal Kaehler Product manifold.

Naseer Shahzad, Noura Saleh Al-Malki
REMARKS ON ALMOST LOCALLY CONNECTED SPACES

Abstract. Some preservation theorems for almost local connectedness are proved.

Wlodzimierz M. Mikulski
THE NATURAL BUNDLES ADMITTING NATURAL LIFTING OF LINEAR CONNECTIONS

Abstract. Natural bundles admitting natural lifting of linear connections are characterized. Corollaries are presented. Some other similar results are obtained, too.

Piotr Multarzyński
ON LINEAR OPERATORS CONSISTENT WITH A SUBSPACE IN DIFFERENTIAL SPACES

Abstract. Linear operators on function and abstract algebras are considered and their consistency with an arbitrary subset or an ideal is studied. Then the consistency
concept is formulated for general Poisson brackets in commutative algebras.