

ACCURACY ENHANCEMENT OF COMPUTING DIFFERENTIATION IN MATRIX VECTOR MULTIPLICATION METHOD

M.T. Darvishi

Several algorithms for computing the Chebyshev spectral derivative are studied and compared their roundoff errors. In order to accuracy enhancement in computing Chebyshev collocation derivative by matrix vector multiplication method, a preconditioning scheme is introduced. Also an N-node P-panel multidomain method is investigated. Error analysis shows that when number of panels tend to infinity, the error approaches to zero. Also this scheme reduces the number of operations in matrix vector multiplication from $O((NP)^2)$ to $O(NP)$. Using Tal-Ezer mapping, preconditioning and multidomain method, simultaneously, reduce the roundoff error in computing Chebyshev collocation derivative by matrix vector multiplication method, considerably.

ON UNIFORM INTEGRAL φ -DICHOTOMY OF C_0 -QUASISEMIGROUPS IN BANACH SPACES

Vincentiu Cuc

In this paper we consider some uniform dichotomy for C_0 -quasisemigroups in Banach spaces. Necessary and sufficient conditions for uniform exponential dichotomy of C_0 -quasisemigroups are given. The results obtained generalize the similar theorems for the case of C_0 -semigroups proved by Datko, Ichikawa, Littman, Neerven, Pazy, Preda, Megan and Zabczyk.

SOME COMMON FIXED POINT THEOREMS FOR DELBOSCO TYPE CONTRACTIONS

M. Imdad

A common fixed point theorem for eight noncontinuous pairwise coincidentally commuting mappings for Delbosco type contractions is proved which generalizes relevant known results due to Delbosco, Fisher-Sessa, Fisher, Kannan and others. Some related results and illustrative examples are also discussed.

LE GROUPE DES UNITES D'UN CORPS CYCLOTOMI-QUADRATIQUE

Ahmed Asimi, Aboubakr Lbekkouri

On appelle corps cyclotomi-quadratique le composé d'un corps cyclotomique et d'un corps quadratique \mathbb{Q} -linéairement disjoints. Soient $\mathbf{K}_0 = \mathbb{Q}(w)$ un corps cyclotomique où w est une racine primitive $N^{\text{ème}}$ de l'unité et $\mathbf{k} = \mathbb{Q}(\sqrt{d})$ un corps quadratique avec d un entier sans facteurs carrés. On suppose \mathbf{K}_0 et \mathbf{k} linéairement disjoints sur \mathbb{Q} et on pose $\mathbf{K} = \mathbf{k}\mathbf{K}_0 = \mathbb{Q}(w, \sqrt{d})$. Dans cet article, on s'est contenté d'étudier le groupe des unités $\mathbf{E}_{\mathbf{K}}$ de \mathbf{K} . Dans ce travail, on procède comme suit:

Pour les cas où w est une racine primitive 4ème ou 8ème de l'unité, nous avons déterminé explicitement un système d'unités fondamentales de $\mathbf{E}_{\mathbf{K}}$, et pour les autres cas, à cause des difficultés de la détermination d'un système d'unités fondamentales, nous avons déterminé l'indice $[\mathbf{E}_{\mathbf{K}} : \mathbf{W}_{\mathbf{K}}\mathbf{E}_{\mathbf{K}^+}]$ avec $\mathbf{W}_{\mathbf{K}}$ le groupe des racines de l'unité de \mathbf{K} , $\mathbf{E}_{\mathbf{K}^+}$ le groupe des unités de \mathbf{K}^+ où \mathbf{K}^+ est le plus grand sous corps réel de \mathbf{K} . Et nous donnons à la fin de nombreux exemples numériques.

ON THE VOLTERRA-HAMMERSTEIN INTEGRAL EQUATIONS OF MIXED TYPE WITH EXPONENTIAL NONLINEARITY

A.R. Zokayi, M. Hadizadeh

In this paper, we present a uniform approximation and a methodology for developing a posteriori error estimate for exponential nonlinearity in Volterra-Hammerstein integral equations of mixed type, for the recently proposed method of Brunner [1]. He proposed a method which referred to as the implicitly linear collocation method for numerical solution of Volterra-Hammerstein equations. Symbolic

computation is used in performing the numerous analytic manipulations leading to the establishing of the error estimate. After obtaining an error upper bound for the exponential nonlinearity of these equations, some remarks on the generalization of the bound for nonlinear integro-differential equations are offered and a few numerical results are given to illustrate this theory.

VARIETIES OF g -COHERENT ALGEBRAS

Ivan Chajda, Günther Eigenthaler

The concepts of a g -coherent and dually g -coherent algebra and variety are introduced. It is shown that they generalize coherence and weak coherence in the first case as well as coherence and local coherence in the second one. We characterize varieties of such algebras by means of Mal'cev type conditions and establish connections with regularity, permutability and their modifications introduced formerly by the first author.

FEEBLE-MATROIDS

Talal A. Al-Hawary

In this paper, we introduce the notion of feeble-matroids, a new class of matroids. We study properties of this class and define several new types of maps between matroids. In addition, we define feeble-inner and feeble-closure operators in this class and characterize feeble-matroids and maps between matroids in terms of these notions.

CONTROLLABILITY OF NEUTRAL FUNCTIONAL DIFFERENTIAL AND INTEGRODIFFERENTIAL INCLUSIONS IN BANACH SPACES

Benchohra, S.K. Ntouyas

In this paper, we shall establish sufficient conditions for the controllability of neutral functional differential and integrodifferential inclusions in Banach spaces. We shall rely on a fixed point theorem for condensing maps due to Martelli.

NONDISCRETE INDUCTION PRINCIPLE AND SUBTRACTION THEOREMS

Mihai Turinici

A lot of set comparison statements including the Nondiscrete Induction Principle due to Potra and Ptak [4,ch.1] is given. As a by-product of these, some subtraction theorems are stated for (closed or not) multivalued operators between complete metric spaces.

LIE THEORY AND TWO VARIABLES GENERALIZED HERMITE POLYNOMIALS

M.A. Pathan, Subuhi Khan, Ghazala Yasmin

The object of this paper is to derive generating functions of two variables generalized Hermite polynomials $H_n(x, y)$ by relating these polynomials to the representation theory of a five dimensional Lie group K_5 . The approach is based on the foundation laid by Miller. Certain special cases are also considered.

INTEGRAL FORMULAE AND KONTSEVICH STAR PRODUCTS ON THE COTANGENT BUNDLE OF A LIE GROUP

Khaled Tounsi

Recalling previous constructions of star products on the cotangent bundle T^*G of a Lie group G and on the dual \mathfrak{g}^* of the Lie algebra of G , we describe a large class of natural star products on T^*G . We characterize these star products by integral formulae.

GEOMETRIC PROPERTIES OF HIGH-ORDER SPECTRAL–NULL CODES

Luca G. Tallini

Let $\mathcal{S}(N, q)$ be the set of all binary words of length N having a q -th order spectral-null at zero frequency. Any subset of $\mathcal{S}(N, q)$ is a spectral-null code of length N and order q . Such codes have been recently considered by the digital recording community because of the useful properties they induce on the signal stored in digital recording medias (such as Optical Disks, Magnetic Disks, etc.). Considering the elements of $\mathcal{S}(N, q)$ as points of the euclidean geometry of \mathbf{R}^N , $\mathcal{S}(N, q)$ can be regarded as the algebraic variety which coincides with the intersection of the N dimensional hypercube with a certain hyperspace of dimension $N - q$. We derive many interesting geometric properties of $\mathcal{S}(N, q)$. In particular, we determine easily computable bijections

$$f : \prod_{i=1}^h \mathbf{R}^{N_i} \rightarrow \mathbf{R}^N,$$

with $N = \sum_{i=1}^h N_i$, such that $fl(\mathcal{S}(N_1, q), \mathcal{S}(N_2, q), \dots, \mathcal{S}(N_h, q)) \subseteq \mathcal{S}(N, q')$, for $q \leq q'$. This, not only enables us to get examples of q -th order spectral-null words, but allows to obtain simple geometric constructions for systematic q -th order spectral-null codes, $q \geq 1$. We also derive an asymptotic expression for the cardinality of $\mathcal{S}(N, 2)$ (this is done by proving some new results on the theory of number partitions) which allows to get an explicit expression for the redundancy of $\mathcal{S}(N, 2)$. Further, using a certain set of isometries of \mathbf{R}^N which fix $\mathcal{S}(N, 1)$, we are able to define “random walks” over the variety $\mathcal{S}(N, 1)$ which always intersect $\mathcal{S}(N, 2)$. This allows us to define a new efficient recursive method to encode k information bits into a second-order spectral-null code of length $N(k) \leq k + 3 \log_2 k + O(\log \log k)$. The codes obtained with this method are less redundant than the codes found in the literature.

PRODUCTS OF w -SATURATED FORMATIONS

Wenbin Guo, K.P. Shum

In this paper, we consider the unique factorization of w -saturated formations. In particular, if $\mathcal{F}_1, \mathcal{F}_2, \dots, \mathcal{F}_t, \mathcal{M}_1, \mathcal{M}_2, \dots, \mathcal{M}_n$ are s -indecomposable s -closed w -saturated formations such that $\mathcal{F}_1 \mathcal{F}_2 \cdots \mathcal{F}_t = \mathcal{M}_1 \mathcal{M}_2 \cdots \mathcal{M}_n$, then we prove that $t = n$ and $\mathcal{F}_i = \mathcal{M}_i$ for all $i = 1, 2, \dots, t$. This answers an open problem recently proposed by Shemetkov and Skiba.

THE ISOMORPHISM OF $\frac{F[H]}{\gamma^*}$ AND F

A. Iranmanesh, R. Tavakoli

Let (H, \circ) be a H_v -group and Θ -WASS and let $F[H]$ be the set of functions on H with values in a field F . In this paper, we discuss the isomorphisms of $\frac{F[H]}{\gamma^*}$ and F under some conditions.

SUR LES ALGÈBRES DE BERNSTEIN VI: CAS NON COMMUTATIF

Artibano Micali, Moussa Ouattara, Fouad Zitan

Le but de cet article est d'étendre l'étude des algèbres de Bernstein au cas non commutatif. Nous obtenons quelques résultats sur la structure de telles algèbres (décomposition de Peirce, algèbres conservatives, flexibles, de Jordan n.c., etc). Chemin faisant, nous avons été conduits à classer les S-algèbres non commutatives introduites par I. Kaplansky et y déceler celles qui sont de Bernstein. This paper concerns the extension of Bernstein algebras to the noncommutative case. Many results on the structure of such algebras (Peirce decomposition, normal, flexible, n.c. Jordan algebras and so on) are stated. Finally we classifies the noncommutative S-algebras defined by I. Kaplansky and pick among these algebras the Bernstein ones.

SPECIAL CLASSES OF HYPERGROUP REPRESENTATIONS
Marius Tărnăuceanu

no abstract

(ANTI-)FUZZY POSITIVE IMPLICATIVE HYPER K -IDEALS
R.A. Borzooei, M.M. Zahedi

In this note by considering first the notions of fuzzy positive implicative hyper K -ideals of types 1,2,...,8, we state and prove some lemmas and theorems. Specially, we show that under suitable conditions, if H is a positive implicative hyper K -algebra and is a quasi alternate hyper K -algebra of type 2, then any fuzzy hyper K -subalgebra of H is a following property of type 1,5 and 7. Finally, we define the notions of anti-following property of type 1 (type 2,3,...,8) and give some related results.