

CONSTRUCTION DU CORPS DE HILBERT 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 $\mathbf{K}_0 = \mathbb{Q}(w_N)$ un corps cyclotomique où w_N 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 $\mathbf{K} = \mathbf{k}\mathbf{K}_0 = \mathbb{Q}(w_N, \sqrt{d})$. Comme l'un des problèmes de la théorie algébrique des nombres est la construction effective d'extensions abéliennes d'un corps de nombres, nous nous intéressons dans cet article à la résolution du problème suivant:

Etant donné un corps cyclotomi-quadratique $\mathbb{Q}(i, \sqrt{d})$, comment déterminer de manière effective son corps de Hilbert. Ce problème a déjà été traité par H. Cohn, G. Cooke, G. Grass, H. Hasse, A. Kerkour et A. Lbekkouri, dans le cas des corps quadratiques. Et comme le corps de Hilbert d'un corps de nombres \mathbf{K} est le composé de ses extensions cycliques non ramifiées, nous établissons des propositions qui lient l'existence de telles extensions de \mathbf{K} à celles de \mathbf{k} et à la nature de l'entier N . La résolution de ce problème est donc basée sur la recherche d'un exemple de construction du corps de Hilbert du corps $\mathbb{Q}(i, \sqrt{d})$, qui repose sur les résultats du paragraphe 2, en particulier, ceux vérifiant les conditions des Propositions 2.4 et 2.5 qui sont liées au choix d'un entier d . Pour cela on considère la table [8], le premier corps qui répond à la question est $\mathbf{K} = \mathbb{Q}(i, \sqrt{205})$.

ELEMENTS BORNANTS ET ELEMENTS SINGULIERS PERMANENTS DANS LA CLASSE DES ALGEBRES BORNOLOGIQUES

Abdelaziz Tajmouati, Ahmed Zinedine

We show that in the class of commutative bornological algebras, an element is permanently singular if, and only if, $L_x : A \rightarrow xA, y \rightarrow xy$, is not a bornological isomorphism. In the noncommutative case, we prove that all non left bounding elements (Déf. 1) of a bornological algebra A are left invertible in some extension of A .

ADDITIVELY FINITELY GENERATED AE -NEARRINGS

Sobhy Ghoneim

All nearrings whose additive groups are finitely generated and abelian and whose additive endomorphisms are also multiplicative are found.

ON THE IMPLICIT AND SEMI-IMPLICIT RUNGE-KUTTA METHODS FOR STOCHASTIC ORDINARY DIFFERENTIAL EQUATIONS

G. Barid Loghmani, M. Mohseni

The main idea of this paper is a generalization of the explicit Runge-Kutta methods for numerical solution of stochastic differential equations which was first introduced by K. Burrage and P.M. Burrage in 1996. More precisely we will introduce implicit and semi-implicit 2-stage Runge-Kutta methods for numerical solution of stochastic differential equations. Based on the rooted trees theory it is shown that both methods are of strong order 1 with minimum principal error. The efficiency of our methods are demonstrated by presenting some numerical results.

ON GENERALIZED E -INVERSE SEMIGROUPS

M.K.Sen, K.P. Shum, Y.Q. Guo

In this paper, we show that a semigroup S is a full subdirect product of a semilattice and a left group if and only if S is an E -inverse sturdy semilattice of semigroups S_α such that $E(S_\alpha) \neq \phi$ and $a_\alpha e_\alpha = a_\alpha$ for all $a_\alpha \in S, e_\alpha \in E(S_\alpha)$. This result extends the structure theorem of H. Mitsch from E -inverse semigroups to generalized E -inverse semigroups.

OPERATOR APPROACH TO THE STUDY OF PERIODIC SOLUTIONS TO LIENARD EQUATION

Iskhokboi J. Nurov, Marat G. Yumagulov

The paper deals with the Hopf bifurcation in the differential Lienard equation depending on parameter. In writing the equivalent integral equations Krasnosel'skii's method of parameter functionalization is used. An iterative procedure is described to approximate bifurcation solutions. This procedure makes it possible to obtain bifurcation solution asymptotic and to study their stability. The explicit analysis of the Hopf bifurcation is presented for the Van-der-Pol equation to illustrate the techniques developed.

THE SECOND DUAL ALGEBRA OF WEIGHTED GROUP

Kh. Pourbarat

The second dual $L^1(G)^{**}$ of the group algebra of a locally compact group G has been studied in a series of papers, recently. We study in this paper $L^2(G, w)^{**}$, the second dual of the weighted group algebra $L^1(G, w)$. At first the general results about the structure of $L^1(G, w)^{**}$ are obtained. Then we introduce a subalgebra, $L_0^\infty(G, w)^*$ of $L^1(G, w)^{**}$ and characterize the relation between $L_0^\infty(G, w)^*$ of $L^1(G, w)$. Also, we study the set of extreme points of the positive unit ball of $L^2(G, w)^{**}$.

ON CONVERGENCE OF QUADRATURE METHODS FOR THE LIPSCHITZ-CONTINUOUS FUNCTIONS

I. Fedotov, S.S. Dragomir

In this article we present a new approach to quadrature methods where any quadrature formula is generated by a discontinuous function whose jumps are quadrature weights. The quadrature error is estimated for Lipschitz-continuous functions with the constant which can not be replaced by a smaller one.

SOME RESULTS FOR THE LOCAL SUBGROUPOIDS

İlhan İçen, Osman Mucuk

The notion of local subgroupoids as generalization of a local equivalence relations was defined by the first author and R. Brown. Here we investigate some relations between transitive components and coherence properties of the local subgroupoids.

AN ANALYSIS OF A PARABOLIC PROBLEM WITH A GENERAL (NON-LOCAL AND GLOBAL) SUPPLEMENTARY LINEAR CONDITIONS – II

N. Aliev, S.M. Hosseini

In this paper, following its first part [1], we will obtain the adjoint problem of the main boundary value problem related to the given parabolic equation. Then we prove that the main boundary value and its adjoint have unique solution. We finally present some sufficient conditions for the problem to the self adjoint.

ON ALMOST CLIFFORDIAN MANIFOLDS

Ilie Burdujan

The almost Cliffordian and almost Clifford manifolds are defined. The problem of finding out all almost Cliffordian connections is solved. Some results concerning the 1-integrability of a Clifford structure are given.

HYPERRING STRUCTURES OF SOME SEMIGROUPS OF LINEAR TRANSFORMATIONS

Yupaporn Kemprasit

Let V be a vector space over a division ring R , $L_R(V)$ the semigroup of all linear transformations $\alpha : V \rightarrow V$ under composition and $G_R(V)$ the unit group of $L_R(V)$. Assume that S is a subsemigroup of $L_R(V)$ and \oplus is a hyperoperation on S^0 such that (S^0, \oplus, \cdot) is a (Krasner) hyperring. The following statements are proved. If $G_R(V) \subseteq S$, then $\alpha' = \alpha$ for all $\alpha \in S^0$ or $\alpha' = -\alpha$ for all $\alpha \in S^0$ where α' denotes the additive inverse of α in (S^0, \oplus, \cdot) . If $\dim_R V > 1$ and $L_R(V) \setminus G_R(V) \subseteq S$, then $S = L_R(V)$.

AN ALTERNATIVE APPROACH TO HYPERGROUPOIDS

Daniel Hort, Miroslav Novotný

An alternative description of ternary structures is introduced: Any ternary structure may be expressed as a multiplicatively described ternary structure. Homomorphisms of ternary structures coincide with homomorphisms of multiplicatively described ternary structures. A similar result holds for the so called strong homomorphisms. As consequences, some theorems concerning the relationship of categories of ternary structures to categories of multiplicatively described ternary structures can be obtained. Multiplicatively described ternary structures with particular properties appear under the name of hypergroupoids in the literature. For this reason various properties of multiplicatively described ternary structures and the corresponding properties of ternary structures are quoted. This paper is intended to use ternary structures for the study of hypergroupoids and conversely.

INFLUENCE OF INTERNAL FRICTION ON HEAT PROPAGATION IN A SHEARING FLOW OF A SECOND GRADE FLUID

Corina Fetecau, Constantin Fetecau

The temperature distribution in a second grade fluid subject to a shearing flow between two heated parallel plates is determined. The influence of internal friction is pointed out while the solutions for the Navier–Stokes fluid appear as a limiting case.

TOPOLOGICAL (TRANSPOSITION) HYPERGROUPS

R. Ameri

The purpose of this paper is the study of topological (transposition) hypergroups. In this note by considering the notion of a (transposition) hypergroup, first the concept of a (pseudo, strong pseudo) topological hypergroup are introduced, and then some related basic results are given. In particular we study the relationships between pseudo, pseudo topological polygroups and topological polygroups.

LEAST SQUARES PROBLEM AND GEOMETRIC DYNAMICS

Constantin Udriște, Mihai Postolache

Section 1 recalls some basic notions of the geometry of jet bundles. Section 2 analyses the connection between least squares problem for ODEs and the geometric dynamics. Section 3 discusses the method of variational integrators for the Lagrangian dynamics and adopts a simplified version suitable for calculations. Concomitantly, it gives conditions that imply the contractivity of some functions involved in the Newton method. Section 4 gives the mathematical frames describing Henon, Maxwell–Bloch, and magnetic geometric dynamics.

ON THE ACTION OF HECKE ALGEBRAS ON THE SPECHT MODULES
Samar A. Al-Amir, Ahmed A. Khammash

The Hecke algebras associated with the Young subgroups of S_n acts on the corresponding Specht module by scalars given by Green character. This partially (and in some cases completely) characterizes the Specht module as being eigenvectors for the elements of the Hecke algebra with eigenvalues given by the values of Green character. We define an equivalence relation which simplifies the problem of calculating the values of such character and reduce it to a combinatorial one. We also determine the values of that character in the case of two parts partition of n .

THE CATEGORY OF HYPERGROUPS
M.M. Zahedi, M.R. Khorashadi Zadeh, S.N. Hosseini

In this note first we construct the category of hypergroups which is denoted by $\mathcal{H}G_p$. Then we obtain some properties of this category. In particular we show that there exists a full embedding functor from Set , the category of sets, into $\mathcal{H}G_p$. Also there exists a faithful functor from $\mathcal{H}G_p$ into Set which is neither full nor representable. Finally we give a characterization for a pair of morphisms to have equalizer (or coequalizer) in $\mathcal{H}G_p$.