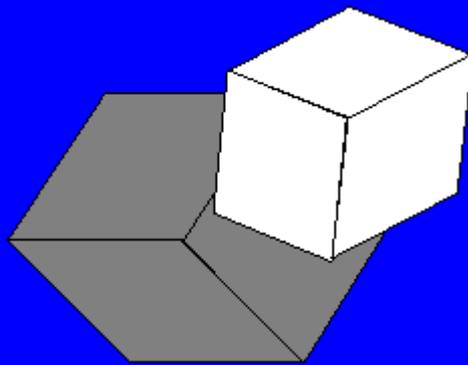


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Papers Abstracts



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New investigations on HX -groups and soft groups

Rabah Kellil, Ferdaous Bouaziz

The paper presents new results obtained on HX -groups introduced by Hongxing in [7] and then investigated by Corsini in his study on HX -hypergroups see [1]. We also present the results obtained by Corsini on the relationship between HX -groups and Soft groups. On the other hand we present some new results on these types of groups and define a new objects which we call Soft HX -groups. We give many examples to illustrate the notions introduced and explain their usefulness. To conclude we present some topics about the soft HX -groups that can be investigated. (pp. 1–13)

On weak δ -McCoy rings

Shervin Sahebi, Mansoureh Deldar, Asma Ali

Camillo, Kwak and Lee called a ring R right NC-McCoy if for any nonzero polynomials $f(x) = \sum_{i=0}^m a_i x^i$, $g(x) = \sum_{j=0}^n b_j x^j$ over R , $f(x)g(x) = 0$ implies $a_i c \in Nil(R)$ for some $c \in R - \{0\}$ and $0 \leq i \leq m$. For a derivation δ of a ring R , we in this paper introduce the weak δ -McCoy rings. When $\delta = 0$, this coincides with notation of a right NC-McCoy ring. Some properties of this generalization are established and connections of properties of a weak δ -McCoy ring R with $n \times n$ upper triangular $T_n(R, \sigma)$ and its polynomial ring $R[x]$, are investigated. (pp. 14–22)

Numerical methods for solving Lane-Emden type differential equations by operational matrix of fractional derivative of modified generalized Laguerre polynomials

Faezeh Saleki, Reza Ezzati

The present paper tries to elaborate on the application of operational matrix of derivative of modified generalized Laguerre polynomials for solving Lane-Emden type equations in astrophysics. Moreover, these equations were numerically solved by the help of this operational matrix. Furthermore, some representative instances were presented to indicate the capability, acceptability and logicity of the suggested methods. (pp. 23–36)

Existence and exponential stability of second-order neutral stochastic functional differential equations with infinite delay and Poisson jumps

M.V.S.S.B.B.K. Sastry, G.V.S.R. Deekshitulu

In this work, we study the existence and uniqueness of mild solutions to second-order neutral stochastic functional differential equations (NSFDEs) with infinite delay and Poisson jumps under global and local Carathéodory conditions by means of the successive approximation. The p-th moment exponential stability of mild solution to second-order NSFDEs with infinite delay and poisson jumps is also studied. Further, example is given to illustrate the proposed theory. (pp. 37–58)

Production inventory model with exponential demand rate and exponentially declining deterioration

M. Dhivya Lakshmi, P. Pandian

In this paper, a production inventory model with an exponential demand rate and exponentially declining deterioration is considered. The production rate of the model is expected to be proportional to the demand rate. The optimal total inventory cost per cycle, the optimal length of the cycle and optimal production length are determined. The proposed model has eight parameters. Numerical example of the proposed model is presented. Finally, the sensitivity analysis of the developed model is demonstrated. (pp. 59–71)

On automatic surjectivity of some point spectrum preserving additive maps

E. El Bouchibti, A. El Bakkali

Let X and Y be two infinite dimensional complex Banach spaces and let $\Phi : B(X) \rightarrow B(Y)$ be a point spectrum preserving additive map. We show that if the range of Φ contains the ideal of all finite rank operators of $B(Y)$ then Φ is a Jordan morphism. In the case where X is an infinite dimensional separable Hilbert space the map Φ is surjective. (pp. 72–79)

Solvability of certain groups of time varying artificial neurons

Jan Chvalina, Bedřich Smetana

In the process of exploration structure of the most used artificial neural network-multilayer perceptron and functionality of artificial neuron, there were established structures of groups of artificial neurons. Currently the most interesting areas is the usage of time varying artificial neurons and their reflections in these algebraic structures. Using certain analogy with relations between structures based on certain groups of linear ordinary differential operators there is investigated access to new view point on these subjects. In this paper there is contained the solution of one classical problem-verification that the corresponding group of time is solvable.

(pp. 80–94)

Reciprocal sums of triple products of general second order recursion

Gaowen Xi

By applying the method of generating function, the purpose of this paper is to give several summation of reciprocals related to triple product of general second order recurrence $\{W_{rn}\}$ for arbitrary positive integer r . As applications, some identities involving Fibonacci, Lucas numbers are obtained.

(pp. 95–102)

On the dynamics of the generalized Hénon-Heiles of the galactic potential

F.M. El-Sabaa, M.Hosny, A. Abd Elbasit

The bifurcation of Liouville tori of a generalized Hénon-Heiles System (GHH) are determined. The phase portrait of separation functions of (GHH) are studied, and the classification of the singular points were found. Some figures are presented by using Poincaré surface section.

(pp. 103–121)

On groups acting on trees of ends >1

D.M. Alsharo, R.M.S. Mahmood

Call a group G to possess the property P if G is finitely generated and G is of end greater than one. That is $e(G) > 1$. The main result of this paper is the following. A group G to possess the property P if and only if there exists a tree X such that G acts on X without inversions, the stabilize G_e for each edge e of X is finite, for each vertex v of X , $G_v \neq G$ and the quotient graph G/X for the action of G on X is finite. We prove the following:

- (1) If the group G possesses the property P and H is a subgroup of G , then
- (i) if H is of finite index in G , then H possesses the property P ,
 - (ii) if H is finite and normal subgroup of G , then the quotient group of G over H possesses the property P .
- (2) If G is a group acting on a tree X without inversions such that the stabilize G_v for each vertex v of X possesses the property P , $G_v \neq G$, the stabilizer of each edge e of X is finite, and the quotient graph G/X for the action of G on X is finite, then G to possesses the property P .

As an application, we show that if $A = \prod_{i \in I}^* (A_i; U_{ij} = U_{ji})$ is a tree product of the groups $A_i, i \in I$ with amalgamation subgroups $U_{ij}, i, j \in I$ such that each A_i has the property P , U_{ij} is finite, $i, j \in I$ and I is finite, then A has the property P . Furthermore, if G^* is the HNN group

$$G^* = \langle \text{gen}(G), t_i / \text{rel}(G), t_i a t_i^{-1} = \phi(a), a \in A_i, i \in I \rangle$$

of basis G and associated pairs $(A_i, B_i), i \in I$ of isomorphic subgroups of G such that G has the property P , $A_i, i \in I$ is finite, and I is finite, then G^* has the property P . (pp. 122–129)

Bifurcation of subharmonic in Lassa fever epidemic model

A.A. Onifade, O.S. Obabiyi

Standard epidemiological theory and concepts such as the basic reproductive number R_0 no longer apply or enough to determine stability, and the implications for interventions that themselves may be periodic have not been formally examined. This study considers seasonal variation of rodent on the transmission dynamics of Lassa fever. Applying perturbation method, stable subharmonic bifurcation solutions of period n are proved to coexist simultaneously and an infinite number of stable subharmonic bifurcation solutions are established. This study suggests that transmission of Lassa fever can be curbed by fighting the proliferation of rodent especially during the wet season. (pp. 130–144)

Characterizations and extensions of abelian rings

Wan-Lingyu, Li-Wensheng

In this paper we investigate the abelian rings on their characterizations as well as their extensions and homomorphic properties. A new viewpoint on the characterization of abelian ring is given. Then it is proved that abelian property is inherited under series of extensions such as (skew) polynomial extension,

(skew) power series extension, some matrix extensions, Dorroh extension as well as Nagata extension. In the end, we discuss the condition under which abelian property can be held by a homomorphism. (pp. 145–152)

A new kind of $(0, 1, 2)$ -interpolation

Swarnima Bahadur, Sariya Bano

In this paper, we consider the existence, explicit representation and convergence of a new kind of $(0, 1, 2)$ -interpolation on non-uniformly distributed set of nodes on the unit circle. (pp. 153–162)

Some results and examples of the bi- f -harmonic maps

Smail Chemikh, Djilali Behloul, Seddik Ouakkas

In this paper we present some results and examples of the bi- f -harmonic maps. In particular, we study the case of conformal maps between equidimensional manifolds. Examples are constructed when one of the factors is either Euclidean space. (pp. 163–181)

Fixed point results for mappings satisfying Ciric and Hardy Roger type contractions

I.S. Khan, A. Shoaib, S. Arbab

The aim of this paper is to establish some common fixed point results for generalized Ciric and Hardy Roger type contraction in ordered complete metric space. An example is constructed which shows the novelty of our results. Our results generalize and extend the results of Altun et. al (J. Funct. Spaces, Article ID 6759320, 2016). (pp. 182–189)

A novel study on soft rough rings (ideals) over rings

Kuanyun Zhu, Yibing Lv

In this paper, we investigate the relationship among rough sets, soft sets and rings. The concept of soft rough rings (ideals) of rings is introduced, which is an extended concept of rough rings (ideals) of rings. Further, we first put forward the concepts of C -soft sets and CC -soft sets over rings. Moreover, some new soft rough operations over rings are explored. In particular, lower and upper soft rough rings (ideals) over rings with another soft set are investigated. (pp. 190–204)

The interval valued fuzzy graph associated with a Crisp graph

A.M. Philip, S.J. Kalayathankal, J.V. Kureethara

We define the interval valued fuzzy graph (IVFG) associated with a crisp graph based on the degrees of the nodes of the crisp graph and study its various properties. The nature of arcs of the IVFG associated with a crisp graph can be determined if the adjacency matrix of the crisp graph is given. We show that the IVFG associated with a regular graph is regular, totally regular, edge regular and totally edge regular, but the IVFG associated with a complete graph is not a complete IVFG. We prove that the IVFG associated with $C_n, n \geq 3$ is an interval valued fuzzy cycle and the IVFG associated with the wheel graph $W_n, n \geq 5$ is an interval valued fuzzy tree. (pp. 205–215)

A novel continuous genetic algorithm technique for the solution of partial differential equations

Ramzi B. Albadarneh, Z. Abo-Hammour, O. Alsmadi, N. Shawagfeh

In this paper, a novel continuous genetic algorithm (CGA) approach is proposed for the solution of Laplace, Poisson, Helmholtz, and nonlinear partial differential equations (PDEs) due to their importance as they are encountered in a variety of mathematical and physical systems. The approach is formulated by firstly converting the equation into an algebraic equation using the finite difference scheme which approximates its partial derivatives. Then, the residual value of each interior node is calculated based on the nodal values generated by the CGA. The solution is finally obtained based on the minimization of the overall residual values and correspondingly maximizing the fitness value. Different test problems were considered in this work, which cover different boundary conditions including Dirichlet and Neumann boundary conditions. The solution obtained using the proposed CGA approach is compared with the exact solutions along with the finite difference and finite element methods. Numerical results show the strength, potentiality, and superiority of the proposed CGA approach. (pp. 216–236)

An error estimate of a nonmatching grids method for a biharmonic equation

Ali Allahem

Motivated by the work of Boulaaras and Haiour in [7], we provide a maximum norm analysis of Schwarz alternating method for biharmonic equation with respect to the mixed boundary condition, where an optimal error analysis each subdomain between the discrete Schwarz sequence and the continuous solution of bilaplace equations is established. (pp. 237–249)

[SDIES: A Background subtraction method with sample dynamic indicator and edge similarity](#)

L. Huang, Y. Feng, L. Cai, W. Zhang, B.O. Onasanya

Traditional sample-based methods are inefficient for detecting dynamic background and intermittent object motion. To solve the problem, a background subtraction method based on sample dynamic indicator and edge similarity is proposed. This method utilizes the standard deviation of recently observed decision distances as a background dynamic indicator and also uses the improved blink pixel estimator to control adaptive threshold feedback. Unlike the traditional sample-based methods, this method estimates the reference background at the initialization stage and distinguishes static objects from ghosts by calculating the edge similarity of foreground objects in reference background and current frame. So the existence property of foreground objects can suppress ghosts quickly. The evaluation results on the ChangeDetection 2012 dataset indicate that this method can be well adapted to the dynamic background and intermittent object motion. Besides, without paying too much attention to other scenario categories, the overall evaluation performance is comparable to most state-of-the-art methods. (pp. 250–267)

[A subordination result and integral mean for a class of analytic functions defined by \$q\$ -differintegral operator](#)

B.A. Frasin, N. Ravikumar, S. Latha

In this paper, we derive a subordination result and integral mean for certain class of analytic functions defined by means of a fractional q -differintegral operator $\Omega_{q,z}^\delta f(z)$. (pp. 268–277)

[On the permanence and periodic solutions of a plankton system with impulses and diffusion](#)

Kejun Zhuang, Fayu Shi

In this paper, given the sudden changes of external environment and seasonal variations of climate, we investigate the non-toxic phytoplankton, toxin-producing phytoplankton and zooplankton model with periodic impulses and spatial diffusion. The sufficient conditions for ultimate boundedness of solutions and permanence of system are established by using theory of impulsive differential equations, comparison principle, upper-lower solution method and inequality techniques. Moreover, the existence and uniqueness of asymptotically stable periodic solution are studied with the help of auxiliary function. It is shown that the plankton populations will evolve periodically with time, provided that the system is permanent. (pp. 278–294)

The structure of a class of inverse residuated lattices

Wei Chen

In this paper, we study some special inverse residuated lattices, namely, E -unitary inverse residuated chains. After giving some properties of such residuated lattices, we obtain a structure theorem for E -unitary inverse residuated chains. (pp. 295–307)

On soft closed graph and its characterizations

Sandeep Kaur, Navpreet Singh Noorie

In this paper, we first introduce soft graph and soft closed graph of a soft mapping. Among other results, we obtain characterization of soft closed graph of identity soft mapping and characterization of soft-closedness of soft graphs using soft nets. We also give characterization of soft closure of a soft set in terms of convergence of soft net using soft points. (pp. 308–316)

On the complementary dual code over $\mathbb{F}_2 + u\mathbb{F}_2$

B. Pashaei Rad, H.R. Maimani, A. Tehranian

A linear complementary dual code (an LCD code) is a linear code, whose satisfies in $C \cap C^\perp = \{0\}$. A binary LCD code play an important role in armoring implementation against side-channel attacks and fault injection attacks. All non-binary LCD codes with characteristic 2 can be transformed into binary LCD codes by expansion. In this paper, we consider the ring $R = \mathbb{F}_2 + u\mathbb{F}_2$ with $u^2 = 0$, which is a ring with characteristic 2 and obtain some properties of LCD codes over this ring. Also we characterize all LCD free cycle codes over R . (pp. 317–322)

A new interior-point method for $P_*(\kappa)$ linear complementarity problems based on a parameterized kernel function

Mengmeng Li, Mingwang Zhang, Zhengwei Huang

In this paper, we propose a primal-dual interior-point method (IPM) for $P_*(\kappa)$ linear complementarity problems (LCPs) based on a new parameterized kernel function which is a generalization of the one presented by Bai et al. [A primal-dual interior-point method for linear optimization based on a new proximity function, Optim. method softw. (2002)]. A simple analysis shows that the iteration bound for large-update method obtained by Cho based on the

original kernel function [A new large-update interior point algorithm for $P_*(\kappa)$ linear complementarity problems, *J. Comput. Appl. Math.* (2008)] is improved from $O((1 + 2\kappa)n^{\frac{3}{4}} \log \frac{n}{\epsilon})$ to $O((1 + 2\kappa)\sqrt{n} \log n \log \frac{n}{\epsilon})$, and the small-update method has $O((1 + 2\kappa)\sqrt{n} \log \frac{n}{\epsilon})$ iteration complexity. These are the currently best known complexity results for such methods. Some numerical results have been provided. (pp. 323–348)

Some results for best coapproximation on Banach lattices

Majid Abrishami-Moghaddam

In this paper we introduce the concept of best coapproximation on Banach lattices with a strong unit. We study the existence problem of best coapproximation in these spaces. Also, we develop the theory of best coapproximation in quotient of Banach lattice spaces and discuss about the relationship between the coproximal elements of a given space and its quotient space. Finally, we show that every lattice isomorphism is an coapproximation preserving operator. (pp. 349–359)

On the stability of a nonmultiplicative type sum form functional equation

Dhiraj Kumar Singh, Shveta Grover

Our purpose is to obtain all possible general solutions of a sum form functional equation containing two unknown mappings and also discuss criteria for stability of the same. (pp. 360–374)

Oscillation of second-order nonlinear neutral dynamic equations with “Maxima” on time scales with nonpositive neutral term

H. A. Agwa, G. M. Moatimid, M. Hamam

In this paper, we establish some new oscillation criteria for second order nonlinear neutral delay dynamic equation of the form

$$(r(t)((m(t)y(t) - p(t)y(\tau(t)))^\Delta)^\gamma)^\Delta + \sum_{i=1}^n q_i(t) \max_{s \in [\delta_i(t), t]} y^{\beta_i}(s) = 0$$

on a time scale \mathbb{T} . The present results not only generalize and extend some existing results but also can be applied to some of the oscillation problems that are not covered before. Finally, we give some examples to illustrate our main results. (pp. 375–387)

On restrained hub number in graphs

Ahmed Mohammad Nour, M. Manjunatha, Ahmed M. Naji

In this paper, we study the restrained hub number $h_r(G)$ of a graph G . We characterize the class of all graphs for which $h_r(G) = 1$. Also the relationship between cut vertices and restrained hub number are presented. The restrained hub number of the corona of two graphs is determined. (pp. 388–396)

Two simple confidence intervals for the population coefficient of variation under the non-normal and skewed distributions

M.O.A. Abushawiesh, H. Esra Akyüz, A. Khurshid

This paper presents two simple confidence intervals (CIs) for the population coefficient of variation (CV) in the case of non-normal distributions. The first is based on the Bonett [6] formula for calculating an approximate CI for the variance (σ^2) of the non-normal distributions and the other is based on the Niwitpong and Kirdwichai [29] formula for calculating an adjusted Bonett [6] confidence interval for the variance of the non-normal distributions. An extensive Monte-Carlo simulation study was conducted to compare the performance of the proposed CIs with the other existing CIs available in the literature. The simulation results showed that the proposed two simple confidence intervals perform well in terms of coverage probability and expected average width. The proposed two methods are illustrated using two real life data which reinforced the findings of the simulation study to some extent. (pp. 397–418)

Fixed point results via tri-simulation function

Rqeeb Gubran, W.M. Alfaqih, Mohammad Imdad

In this article, we introduce a new type of simulation functions involving three variables and utilize the same to unify several known contractions of the existing literature besides being general enough to yield new contractions. In doing so, we also introduce two new notions (namely: α -permissible and α -orbital permissible mappings) and investigate their relationship with some earlier relevant notions of the existing literature. (pp. 419–430)

Some remarks on fully stable gamma modules

Mehdi S. Abbas, Balsam M. Hamad

In this work we study full stability in the gamma module theory. A gamma module M is fully stable, if for each gamma submodule N of M , $\theta(N) \subseteq N$ for each gamma homomorphism θ of N into M . Several properties and characterizations of this classes of gamma modules have been studied. The advantages of these characterizations have been considered. Finding some sources of full stability and discuss the direct sum in fully stable gamma modules, by the way we show that in fully stable gamma modules, each gamma submodule has a unique complement. Finally characterize full stability by some of their generalizations and relate with the (SIP) and (SSP) properties. (pp. 431–444)

On existence and uniqueness of best proximity points for proximal β -quasi contractive mappings on metric spaces

M.Iadh. Ayari, M.M.M. Jatradat, Z. Mustafa

This paper focus on the study of the generalization of the best proximity point theorems for non-self contractions. In fact we propose two new theorems on the existence and the uniqueness of best proximity points for proximal β -quasi contractive mappings on metric spaces . The presented theorems extend and generalize the existence and the uniqueness of best proximity points for proximal contraction done by S.Basha and quasi-contraction mappings performed by Jleli and Samet. (pp. 445–458)

A study on soft rough BCK -algebras in BCK -algebras

Jingru Wang, Kuanyun Zhu

In this paper, the notion of soft rough BCK -algebras is introduced, which is an extended notion of subalgebras in BCK -algebras. Moreover, in order to illustrate the roughness in BCK -algebras with respect to MS -approximation spaces in BCK -algebras, we first introduce C -soft sets and CC -soft sets as two special kinds of soft sets in BCK -algebras. Some new soft rough operations in BCK -algebras are explored. In particular, lower and upper soft rough BCK -algebras with respect to another soft set are investigated. (pp. 459–473)

Generalization of locally cyclic and Condition (P) in $\mathbf{Act-S}$

M. Reza Zamani, H. Mohammadzadeh Saany, Parisa Rezaei

In this paper we introduce a new generalization of locally cyclic and Condition (P) in $\mathbf{Act-S}$, called Condition (L_P) . Then we give a classification of monoids over which Condition (L_P) implies other types of flatness and vice versa. Moreover we provide new equivalent conditions for (P) and strong flatness. This can help to have a better understanding of known conditions. Even more, it can help to provide a solution for open questions in the theory of acts over monoids in the future. (pp. 474–492)

Magnetic effect of non-commutativity

B.G. Sidharth, C.V. Aditya

In this paper we argue that 2D crystals emit electromagnetic radiation and exhibit extra electromagnetic effects, by virtue of the noncommutative nature of the 2D crystal space. (pp. 493–497)

Generalizations of Simpson-type inequalities for relative semi- (h, α, m) -logarithmically convex mappings

Chunyan Luo, Tingsong Du, Chang Zhou, Taigui Qin

By discovering an integral equality defined on relative convex set, we prove some new Simpson-type inequalities for mappings which have absolute values of the first derivatives which are relative semi- (h, α, m) -logarithmically convex. Some special cases are also considered. (pp. 498–520)

Complete moment convergence for weighted sums of negatively orthant dependent random variables

Wenhua Lv, Yongfeng Wu

The authors study the complete moment convergence for weighted sums of negatively orthant dependent random variables and obtain some new results. These results extend and improve the corresponding theorems of Chen [P. Chen., 2016, Complete Convergence and Strong Laws of Large Numbers For Weighted Sums of Negatively Orthant Dependent Random Variables, Acta Math. Hungar., 148 (1), 83-95], complete moment convergence, weighted sums, negatively orthant dependent random variables. (pp. 521–536)

On k -special R -implications

Zhihong Yi

Triangular norm based implications play a significant role in many fields of mathematics and computer science. In this paper, the notion of k -special fuzzy implications is introduced for all $k \in [1, \infty[$. Then, it is shown that all k -special R -implications can be characterized by the k -Lipschitz continuity of the corresponding t -norms. (pp. 537–544)

On skew GQC and skew QC codes over the ring $\mathbb{F}_2 + u\mathbb{F}_2 + v\mathbb{F}_2 + uv\mathbb{F}_2$

N. Karimi, A. Yousefian Darani

In this paper, we study some algebraic structural properties of skew quasi cyclic codes and skew generalized quasi-cyclic codes over the ring $R = \mathbb{F}_2 + u\mathbb{F}_2 + v\mathbb{F}_2 + uv\mathbb{F}_2$ where $u^2 = v^2 = 0$ and $uv = vu$. We discuss on Hermitian dual of these classes of codes over R . Then, we investigate on the generator polynomials and the parity-check polynomials of 1-generator skew QC codes and 1-generator skew GQC codes. Finally, we show that the Gray image of a skew quasi-cyclic code over R is a skew l -quasi-cyclic code of index 4 and the Gray image of skew GQC code over R is a skew GQC code of index 4. (pp. 545–557)

Event-triggered consensus control for the first-order multi-agent systems

Fang Qiu

In this paper, event-triggered consensus control problem for the first-order multi agent systems is studied. The control law updating considered is event-driven, which depends on the measurement error with state function norm and its neighboring agents. The proposed updating law is only triggered at its event time instants for each agent. The proposed event-based strategy doesn't require continuous monitoring the neighbors states that can lessen the rate of the control law updating, therefore, communication resources can be saved. The proposed control protocols ensure convergence to a ball focused on the average consensus, and provide a minimum interevent time to avoid Zeno behavior. Finally, a simulation example is shown to illustrate the theoretical result. (pp. 558–572)

Dunkl-Williams inequality for operators associated with r -angular distance

Junmin Han, Xuyang Sun, Deepmala Rai

In this paper, We present several operator versions of the Dunkl-Williams inequality with respect to the r -angular distance for operators. We obtain refinements of some operator inequalities presented by Jiang and Zou.

(pp. 573–580)

Legendre-Adomian-homotopy analysis method for solving multi-term nonlinear differential equations of fractional order

O.H. Mohammed, Dh.A. Jaleel

In this article a modified approach using shifted Legendre-Adomian Homotopy analysis method is applied in order to solve multi-term fractional order nonlinear differential equations. This approach enable us to integrate the deformation equation in an easily manner, moreover the computations connected with the algorithm are so elementary than the standard Homotopy analysis method. The fractional derivatives are described in the Caputo's sense; the results of applying this procedure to the studied case showed that the proposed method is accurate and effective when it's compared with the usual Homotopy analysis method.

(pp. 581–589)

A new study on rough soft lattices based on ideals

Kuanyun Zhu, Jingru Wang

By using a novel relation θ_I based on an ideal I of a lattice L , which is a congruence relation, we investigate the roughness of soft lattices under this special ideal of L , such as rough soft sublattices, rough soft ideals and rough soft filters.

(pp. 590–599)

Generalized Runge-Kutta integrators for solving fifth-order ordinary differential equations

Mohammed S. Mechee, F.A. Fawzi

In this paper, RKM integrators for solving special fifth-order ordinary differential equations (ODEs) have been generalized to solve two classes of general quasi-linear fifth-order ODEs which denoted by GRKM. The novel contribution of this work is the generalizing of RKM integrators by derivation two numerical

methods for solving these classes of ODEs. The algebraic equations of order conditions for the proposed GRKM methods have derived up to the order-seventh using Taylor expansion approach. Based on these order conditions, two GRKM methods of fifth- and sixth-order with three- stages have derived. The numerical methods have been tested using two classes of problems in order to compare them with existing methods which show that the proposed integrators are less than existing RK methods in term of time complexity of function evaluations. (pp. 600–610)

Semirings of 0, 1-preserving endomorphisms of semilattices

B. Batíková, T. Kepka, P. Němec

In the paper, various endomorphism semirings of semilattices are investigated. In particular, various conditions are found under which these endomorphism semirings are simple.

(pp. 611–619)

A categorical approach to vitally dense monomorphisms of S -acts

M. Hezarjaribi Dastaki, H. Rasouli

In this paper we consider a new type of closure operators on acts over a commutative monoid, namely vital closure operator, to get the class of vitally dense monomorphisms derived from this closure operator and investigate injectivity and essentiality with respect to this class of monomorphisms. We study some categorical properties of vitally dense monomorphisms such as limits and colimits. It is proved that the three notions of essentiality for vitally dense monomorphisms are the same, and considering the relations between injectivity, retractivity, essentiality and injective envelopes, we show that injectivity well behaves in regard to such kind of monomorphisms of acts. (pp. 620–634)

On the condition number of integral equations in the elastic two-dimensional case using the cross multipole coefficients

Yasmina Belatrous, Belkacem Sahli

The question of non-uniqueness in the integral formulation of an exterior boundary value problem in the elastic two-dimensional case has been resolved using the modified Green's function technique. In this work, we generalize a new criterion of optimality of the perturbed fundamental solution based on the minimization of the condition number of the modified integral equations using the cross multipole coefficients. (pp. 635–644)

The weight hierarchy of $\text{Ham}(r, q)$

F. Farhang Baftani, A. Tehranian, H.R. Maimani

Calculation of the weight hierarchy for codes, is an attractive and applicable topic in coding theory and cryptography. In this paper, we obtain the weight hierarchy of Hamming codes over F_q . As a result of weight hierarchy of Hamming codes, we compute the weight hierarchy of simplex codes. (pp. 645–650)

1-factorization of small regular graphs

Xiaoxia Zhang, Jingen Yang, Mingfang Huang

It is a well-known conjecture that if a regular simple graph G of order $2n$ has degree $\Delta(G)$ satisfying $\Delta(G) \geq n$, then G is 1-factorizable. By the colour exchange theory, Cariolaro [J. London Math. Soc., 77 (2007), 387-404] proved the validity of this conjecture for regular graphs of even order at most 10. In this paper, we shall provide a slightly simple proof of this result. (pp. 651–658)

A new class of harmonic univalent functions associated with q -derivative defined by Hadamard product

E.A. Adwan, M.K. Aouf

In this paper, we introduce a class of harmonic univalent functions associated with q -derivative defined by Hadamard product. The object of the present paper is to determine coefficient estimates, extreme points, distortion bounds and convex combination for functions belonging to this class. (pp. 659–672)

On solving some classes of second order ODEs

R. Alahmad, M. Al-Jararha

In this paper, we introduce some analytical techniques to solve some classes of second order differential equations. Such classes of differential equations arise in describing some mathematical problems in Physics and Engineering. Moreover, these classes of differential equations generalize some very well known differential equations. For example, Chebyshev's Equation, Cauchy-Euler's Equation, and some of Hypergeometric differential Equations. Using one of these techniques we solve a special case of Lane-Emden Type of Differential Equations.

(pp. 673–688)

Generalized fractional integral inequalities for product of two convex functions

Muhammad Aamir Ali, Hüseyin Budak, Ifra Bashir Sial

The aim of this paper is to generalize the results proved in [4] using generalized fractional integral. Some special cases are deduced from main results. Applying the techniques of our results, new results may be obtained during a similar manner for various operators. (pp. 689–698)

M -bands wavelet multiresolution analysis of assets

Maroua Benghouli, Walid Ayadi, Sadam Alwadi

Given that the predictability of financial assets is indispensable to optimize the allocation of the investors' portfolio, a large literature review was dedicated to the question of predictability. Indeed, different studies have examined the relationship between the expected returns and the financial and macroeconomic variables to determine the most predictive indicators, notably the impact of the variables fluctuations on the prediction of the expected returns. Consequently, this paper consists on investigating the impact of the fluctuations in the aggregate price-earnings ratio at different timescales on the stock returns by using financial data from the USA. The data frequency is quarterly from 1952 to 2011. By aggregating the price-earnings ratio via multiresolution wavelets analysis, the results of the estimation of the Vector Autoregressive Model (VAR) demonstrated that the cycles in the price-earnings ratio presented strong predictors for the stock returns at short and intermediate horizons.

(pp. 699–721)

A semi-partial isometries in Banach spaces

El Moctar Ould Beiba

The purpose of this paper is to introduce and study some basic properties of the class of A -Semi partial isometries on Banach spaces. (pp. 722–732)

Chain continuity for Zadeh's extension

Yaoyao Lan

This paper aims to study chain continuity for Zadeh's extension. More specially, the relations between (finite) chain continuity of discrete dynamical system and its induced fuzzy system have been discussed. (pp. 733–739)

Sumudu transform for solving some classes of fractional differential equations

Mohammed S. Mechee, Abbas J. Naeemah

Many authors recently, have demonstrated the usefulness of fractional calculus especially in the derivation of solutions for linear partial differential equations (PDEs) and ordinary differential equations (ODEs). In this paper, some properties of fractional Sumudu transform for solving fractional differential equations (FrDEs) have introduced. The approximated solutions of some classes of FrDEs using Sumudu transform method have studied. The objective of this work is to show the advantages of application of Sumudu transform method and the expansion of the coefficients of a binomial series for solving fractional differential equations. (pp. 740–752)

Supra soft b - R_0 and supra soft $b - R_1$ spaces

Jamal M. Mustafa

The purpose of this paper is to introduce supra soft b - R_0 and supra soft b - R_1 spaces using supra soft b -open sets. Also we study several of their properties and characterizations in details. Furthermore, we investigate the relationships between these supra soft spaces and the relationships with some other supra soft spaces. (pp. 753–764)

Partially ordered objects in the topos of M set

A.H. Nejah

In this paper first we introduce the concept of partially ordered objects and monotone morphisms in an arbitrary topos. Partially ordered objects are counterparts of partially ordered sets, commonly known as posets, in an arbitrary topos. We then study partially ordered objects in the topos M set. We will prove that partially ordered objects in M set is equivalent to the category M pos, of posets with compatible actions of a monoid M on them. (pp. 765–779)

Simple endomorphism semirings of semilattices

B. Batíková, T. Kepka, P. Němec

In the paper, various types of simple endomorphism semirings of semilattices are investigated. (pp. 780–790)

Application of anti-control strategy based on a modified washout filter controller

Ping Cai, Zhengzhong Yuan

The problem of anti-control of Hopf bifurcation for Lü system is considered in this paper. A modified washout filter-aided dynamic feedback control law is introduced for the problem. The necessary conditions are presented in the controlled system, so that a certain bifurcation is created at equilibria with preferred stability. In addition, we find the control law can be applied to control the stability of the original bifurcated solution. Anti-control of chaotic attractor is also given. The direction of bifurcation and the stability of the bifurcating limit cycle are determined by the normal form theory and the center manifold theorem. Finally, some computer simulations are provided to illustrate the efficiency of the anti-control approach. (pp. 791–800)

Edge irregularity strength of categorical product of two paths

A. Ahmad, S.S. Khan, S. Ahmad, M.F. Nadeem, M. Kamran Siddiqui

For a simple graph $G = (V, E)$, a vertex labeling $\phi : V \rightarrow \{1, 2, \dots, k\}$ is called k -labeling. The weight of an edge xy in G , denoted by $w_\phi(xy)$, is the sum of the labels of end vertices x and y , i.e. $w_\phi(xy) = \phi(x) + \phi(y)$. A vertex k -labeling is defined to be an edge irregular k -labeling of the graph G if for every two different edges e and f , there is $w_\phi(e) \neq w_\phi(f)$. The minimum k for which the graph G has an edge irregular k -labeling is called the edge irregularity strength of G , denoted by $es(G)$.

In this paper, we determine the exact value of edge irregularity strength for categorical product of two paths. (pp. 801–813)

A full-Newton step IIPM based on new search directions for $P_*(\kappa)$ -LCP

Xin Li, Shan Wu, Mingwang Zhang

In this paper, a new full-Newton step infeasible interior-point algorithm is proposed for solving $P_*(\kappa)$ -linear complementarity problem. By using some new analytic tools, we show that the new algorithm is quadratically convergent with iteration complexity $O((1 + 4\kappa)^{\frac{5}{2}} n \log \frac{\max\{(x^0)^T s^0, \|r^0\|\}}{\varepsilon})$. This complexity matches the currently best known iteration bound for $P_*(\kappa)$ -linear complementarity problem. Some computational results are provided as well.

(pp. 814–825)

Some identities and generating functions of third-order recurrence relations

K. Boubellouta, A. Boussayoud

In this paper, we introduce a new generating functions for the product of Narayana numbers, Jacobsthal numbers and Jacobsthal-Lucas numbers by making use of the symmetrizing endomorphism operators $\delta_{a_1 a_2}^k$ to the series $\sum_{n=0}^{\infty} S_n(E) a_1^n z^n$. (pp. 826–842)

On a new class of derivations on residuated lattices

Duan-Peng Ling, Kuanyun Zhu

In this paper, as a generalization of a derivation in a residuated lattice, the notion of an f -derivation of a residuated lattice is proposed, and some related properties of isotone (resp. contractive) f -derivations and ideal f -derivations are investigated. The properties of principal ideal f -derivations are also investigated. We obtain that the fixed point set of principal ideal f -derivations and their implicative f -derivation are order isomorphism. Finally, by using the fixed point set of principal ideal f -derivations, we give a characterization of Heyting algebras. (pp. 843–857)

Fuzzy Γ -ideals in regular and intra-regular Γ -AG-groupoids

I. Rehman, A. Razzaque, M. Asif Gondal, K. Ping Shum

This paper is devoted to the concepts of regular and intra-regular Γ -AG-groupoids. We investigate some characteristics of Γ -AG-groupoids by the properties of fuzzy Γ -quasi-ideals, fuzzy Γ -interior-ideals, fuzzy Γ -bi-ideals and fuzzy Γ -generalized bi-ideals. (pp. 858–872)

On locally F -semiregular and locally δ -semiregular modules

Adil Kadir Jabbar, P.M. Hamaali

In this paper, we introduce locally F -semiregular, locally δ -semiregular and locally finitely δ -supplemented modules and investigate some properties of these new classes of modules. We prove that, if M is a self-projective module with the finite exchange property, then M is $\delta(M)$ -semipotent. Finally, we show that the properties of F -semiregular, δ -semiregular and δ -supplemented modules which can be extended to their localizations. (pp. 873–893)

Bounds on minimum distance for linear codes over $GF(q)$

Fardos Najeeb Abdullah, Nada Yassen Kasm

Let $[n, k, d; q]$ -codes be linear codes of length n , dimension k and minimum hamming distance d over $GF(q)$. Let $m_{47}(n, k)$ be the maximum possible minimum Hamming distance of a linear $[n, k, d; 47]$ - codes for given values of n and k . In this paper 21 new linear codes over $GF(47)$ are constructed, and a table of $m_{47}(n, k)$ $k \leq 47$, $n \leq 6267$ is presented. First: we construct three Griesmer $[n, 3, d]_{47}$ - codes. Second: Also, a (k, r) - arc K corresponds to a projective $[k, n, d]_q$ -code of length k , dimension n , and minimum distance $d = k - n$.

(pp. 894–903)

Graphs whose completely regular endomorphisms form a monoid

Rui Gu, Mengdi Tong

In this paper, we show that if the completely regular endomorphisms of $X+Y$ form a monoid, then the completely regular endomorphisms of X and Y form a monoid respectively. We give several approaches to construct new graphs whose completely regular endomorphisms form a monoid. In particular, we determine trees and the joins of trees whose completely regular endomorphisms form a monoid.

(pp. 904–913)

Bochner-Martinelli type formula over the quaternionic Heisenberg group and the octonionic Heisenberg group

Yun Shi, Guangzhen Ren

The tangential k -Cauchy-Fueter operator on the quaternionic Heisenberg group is counterpart of the tangential Cauchy-Riemann operator on the Heisenberg group in the theory of several complex variables. In this paper, we establish the Bochner-Martinelli type formula for tangential k -Cauchy-Fueter type operators over the quaternionic Heisenberg group and the octonionic Heisenberg group.

(pp. 914–931)

The number of the generating matrices of the subspaces which represent an $F_p W_n$ -submodule where $F_p = GF(p)$ and W_n is the Weyl group of type B_n

Jinan F. N. Al-Jobory, Emad B. Al-Zangana, Faez Hassan Ali

In this paper, we will find the number of the generating matrices of the subspaces, which represent any ℓ -dimensional $F_p W_n$ -submodule N of an m -dimensional $F_p W_n$ -module M and apply this result on three samples of submodules.

(pp. 932–939)

Upper bounds on deviations from the mean and the mean absolute deviation

Arya Aghili-Ashtiani

In this paper, a number of upper bounds are introduced for the mean absolute deviation (MAD) from the mean when there is some information about the number of the data that are above or below the average. The upper bounds are compared with each other according to their tightness. A unified structure is found to be useful to prove all of the proposed upper bounds as well as the other existing upper bounds. In the path to formulate that structure, also, an upper bound is introduced for the individual deviations from the mean. The results are clarified and verified by a few examples.

(pp. 940–951)

First reformulated Zagreb index of four graph operations

M. Arshad, R. Irfan, M. Ahmad Zahid, S. Kanwal, M. Kamran Jamil

A generalization of classical Zagreb indices of chemical graph theory were introduced in 2004, which is called the reformulated Zagreb indices. The first reformulated Zagreb index EM_1 of any graph G is the sum of the squares of degree of edges. In this paper, we compute the first reformulated Zagreb index of four operations of graphs.

(pp. 952–965)

The isomorphic factorization of complete equipartite graphs $K_n(m)$

Jiangdong Liao

Harary, Robinson and Wormald suggest that in an international conference on combinational theory (Canberra 1977), a conjecture for a complete equipartite graph $G = K_n(m)$, the divisibility condition $t | \frac{1}{2}n(n-1)m^2$ is a sufficiency condition to $t|G$ [1][2], which were proved by Jianfang Wang [3] and S.J. Quinn [4] respectively. The first author of the paper also proved the conjecture with

a new way, which is completely different from ones in [3] and [4] at the same time. Here we devote the proof. And in this paper, we give a new isomorphic factorization of K_n as well, which are useful to the decomposition of $K_n(m)$. We proved that when t is odd or $t < \frac{n}{2}$, the t 's factor of K_n is an union of a complete graph and a 3-colorable graphs; and when $t < \frac{n}{2}$ is even, the factor is an union of two complete graphs and 4-colorable graphs. (pp. 966–976)

Lyapunov-type inequalities for ψ -Laplace equations

Xu Guo, Jun Zheng

In this paper, we establish several Lyapunov-type inequalities for a class of ψ -Laplace equations

$$(\psi(u'(x)))' + r(x)f(u(x)) = 0$$

with Dirichlet boundary conditions, where ψ, f are nonlinear functions defined on \mathbb{R} and one of them is imposed on structural conditions of Tolksdorf type. The obtained Lyapunov-type inequalities are extensions and complements of the known results in the sense that compared with the existing literature, neither sub-multiplicative property of ψ nor convexity of $\frac{1}{\psi(t)}$ (or $\psi(t)t$) is required in this paper. (pp. 977–989)

On a class of Lorentzian para-Kenmotsu manifolds admitting the Weyl-projective curvature tensor of type (1, 3)

K.L. Sai Prasad, S. Sunitha Devi, G.V.S.R. Deekshitulu

In this present paper, we consider a class of Lorentzian almost paracontact metric manifolds namely Lorentzian para-Kenmotsu (briefly LP-Kenmotsu) manifolds admitting the Weyl-projective curvature tensor of type (1, 3). We study and have shown that Lorentzian para-Kenmotsu manifolds admitting a flat curvature tensor, an irrotational curvature tensor and a conservative curvature tensor are an Einstein manifolds of constant scalar curvature. Further we study Lorentzian para-Kenmotsu manifolds satisfying the curvature condition $R(X, Y) \cdot W_2 = 0$. At the end, we construct an example of a 3-dimensional Lorentzian para-Kenmotsu manifold admitting Weyl-projective curvature tensor which verifies the results discussed in the present work. (pp. 990–1001)

On Laplacian eigenvalues of \mathbb{N} -sum graphs and \mathbb{Z} -sum graphs and few more properties

Shine Raj S.N.

The concept of sum graphs was introduced by Harary [4]. A graph G is a sum graph if the vertices of G can be labeled with distinct positive integers so that $e = uv$ is an edge of G if and only if the sum of the labels on vertices u and v is also a label in G . Harary extended the concept to allow any integers and called them as integral sum graphs. To distinguish between the two types, we call graphs that use only positive integers as \mathbb{N} -sum graphs and those with any integers as \mathbb{Z} -sum graphs [9]. In this paper we investigate the Laplacian eigenvalues of \mathbb{N} -Sum Graphs and \mathbb{Z} -Sum Graphs and its anti-sum graphs. Also, we obtain a few more properties of \mathbb{N} -sum graph. (pp. 1002–1007)

A note on (\mathbf{m}, \mathbf{n}) -full stability Banach algebra modules relative to an ideal H of $A_{m \times n}$

Suad Naji Kadhim

In this paper the concept of (m, n) - fully stable Banach Algebra-module relative to ideal $(F - (m, n) - S - B - A$ -module relative to ideal) is introducing, we study some properties of $F - (m, n) - S - B - A$ -module relative to ideal and another characterization is given. (pp. 1008–1013)

On the p -supersolvability of finite groups

Xianhe Zhao, Longqiao Zhou

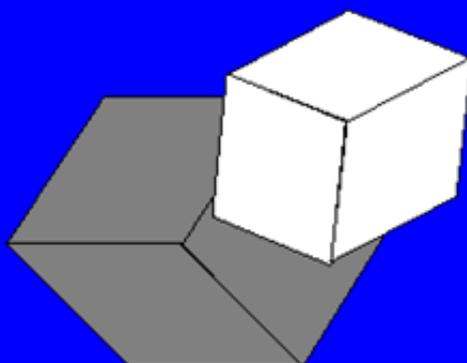
A subgroup H of a finite group G is called a CSS -subgroup of G if there exists a normal subgroup K of G such that $G = HK$ and $H \cap K$ is SS -quasinormal in G . Obviously, the conception of CSS -subgroups is a generalization and unification of c -normal and SS -quasinormal subgroups. In this paper, we investigate the influence of CSS -subgroups on the p -supersolvability of finite groups. Some further results are obtained. (pp. 1014–1021)

A corollary that provides seat arrangements for even numbers of seats

H. Yingtaweessittikul, V. Longani

Let $1, 2, 3, \dots, n$ be n students and $s_1, s_2, s_3, \dots, s_n$ be n row seats. A seat is arranged for each student on each day of the following n days. It is required that each student shall have different seat every day of the n days. Also, it is required that for these n day every student shall have a chance to sit next to every other student on one of his side and shall have another chance to sit next to every other student on the other of his side. In this paper, it is shown that such arrangements are possible when the number of students is even. Also, an algorithm for such arrangements is provided. (pp. 1022–1028)

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FORUM EDITRICE UNIVERSITARIA UDINESE

FARE srl

Via Larga 38 - 33100 Udine

Tel: +39-0432-26001, Fax: +39-0432-296756

forum@forumeditrice.it

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