İçindekiler

10 Dakikalık Konuşmalar

Poster Sunumları

A New Approach for Sensitive Non-linear Boundary Value Problems

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We propose residual method to approximate Troesch's problem, which is inherently unstable two-point boundary value problem, for large values of the sensitivity parameter λ. Application of the Residual method is based on the construction of the approximate solution using Bézier curves and determination of the unknown control points by minimizing the residual function. Advantage of the presented method is avoiding non-linear equations, as far as possible, while determining the control points. Residual Method is used for approximating to both initial slope and the exact solution of Troesch's problem. Numerical results for $\lambda = 10, 30$ and 50 are compared with theoretical aspects and the results of the other methods. It is seen that high order accuracy is obtained. Furthermore, we obtain approximate values for $\lambda = 70$ and 80 in literature for the first time. Numerical experiments confirm the effectiveness of the suggested approach.

Keywords. Troesch's problem, Bernstein polynomials, non-linear differential equations, continuous linear approximation, Bézier curves, unstable boundary value problems.

This is a joint work with Volkan Öğer.

A Characterization of the Myerson Value

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We provide a characterization of the Myerson value with two axioms. Our first axiom considers a situation where there is a change of the value function at a network g and at each network containing g. It requires that at such a situation, this change must be divided equally between all the players in g that has at least one link at g. Our second axiom is a condition on the value function where the value of each network is zero. It requires that if the value is zero at each of the possible networks, then each player must get zero payoff at each network. By changing our first axiom slightly, we also give a characterization for the position value. A natural comparison of the two value operators arises by our results.

Keywords. Game theory, networks, Myerson value, position value, characterization, allocation rules.

A Brief Introduction to Perfectoid Fields

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A theorem of Scholze [2], which is an extension of Fontaine-Wintenberger's work [1], states that there is a canonical isomorphism between the absolute Galois groups of a perfectoid field K and the associated tilted perfect field $K^\flat$ of characteristic $p > 0$. In our talk, which is expository in nature, we shall introduce perfectoid fields after reviewing the theory of APF-extensions and Fontaine-Wintenberger theory of fields of norms.

Keywords. Local fields, APF-extensions, Fontaine-Wintenberger theory of fields of norms, perfectoid fields.

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DRBEM Solution of Transient Stokes Flow in a Channel with Slip Boundary Condition

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In this study, the effect of linear and nonlinear slip boundary conditions on the flow of a slow viscous fluid in a channel is investigated numerically. The boundary integral representation of the transient Stokes equations is given in primitive variables form. The fundamental solution to the steady Stokes equations is employed in the boundary element method (BEM) formulation. The time derivative is taken to the boundary with the dual reciprocity method and approximated by the finite difference method (FDM) until a steady-state is achieved. It is assumed that the fluid is capable of slip, with the slip velocity expressed as a function of shear rate at the wall. In the numerical tests, the fluid is initially assumed to be stationary; at each time step, the velocity boundary conditions along the walls are updated as the shear forces vary with time.

Keywords. DRBEM, Stokes flow, slip condition, BEM.

This is a joint work with Luiz C. Wrobel.

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Blow Up of Solutions to Semilinear Non-autonomous Wave Equations Under Robin Boundary Conditions

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We studied the following initial boundary value problem for non-autonomous semilinear wave equation with damping and accelerating terms under the Robin boundary condition:

$$u_{tt} + bu_t = \Delta u + f(u) + h(x), \quad x \in \Omega, \quad t > 0, \tag{1}$$

$$\frac{\partial u}{\partial \nu} + au = 0, \qquad x \in \partial\Omega, \quad t > 0, \tag{2}$$

$$u(x,0) = u_0(x), \qquad u_t(x,0) = u_1(x), \quad x \in \Omega, \tag{3}$$

where $\Omega \subset \mathbb{R}^n$ is a bounded domain with sufficiently smooth boundary $\partial\Omega$, a, b are give numbers, h, u_0, u_1 are given functions, and $f(\cdot)$ is a nonlinear term which satisfies the following condition

$$f(s)s - 2(2\alpha+1)F(s) \geq -d_0, \quad \forall s \in \mathbb{R},$$

with some $\alpha > 0$, $d_0 \geq 0$. Here $F(s) = \int_0^s f(\tau)d\tau$.

We could find sufficient conditions of blow up in a finite time of solutions to semilinear damped wave equations with arbitrary large initial energy. A result on blow up of solutions with negative initial energy of semilinear equation with accelerating term is also obtained.

Keywords. Blow up, nonlinear hyperbolic equation, Robin boundary condition.

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On Feckly Clean Rings

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A ring R is feckly clean provided that for any $a \in R$ there exists an element $e \in R$ and a full element $u \in R$ such that $a = e + u$, $eR(1-e) \subseteq J(R)$. We prove that a ring R is feckly clean if and only if for any $a \in R$, there exists an element $e \in R$ such that $V(a) \subseteq V(e)$, $V(1-a) \subseteq V(1-e)$ and $eR(1-e) \subseteq J(R)$, if and only if for any distinct maximal ideals M and N, there exists an element $e \in R$ such that $e \in M$, $1-e \in N$ and $eR(1-e) \subseteq J(R)$, if and only if $J-\mathrm{Spec}(R)$ is strongly zero-dimensional, if and only if $\mathrm{Max}(R)$ is strongly zero-dimensional and every prime ideal containing $J(R)$ is contained in a unique maximal ideal.

Keywords. Feckly clean ring, strongly zero-dimensional space.

This is a joint work with Huanyin Chen and Yosum Kurtulmaz.

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$\mathbb{R}^3$'te İki Modlu Sistemlerin Kararlılığı için Gerek ve Yeter Koşulların Belirlenmesi

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Anahtarlanmış sistem, sonlu sayıda alt sistem ve bu alt sistemlerin yörüngelerinin birinden diğerine geçişini düzenleyen anahtarlama işaretlerinin oluşturduğu sistemdir. Parçalı Lineer Sistemler (PLS), anahtarlanmış sistemlerin bir alt sınıfıdır. İki modlu parçalı lineer sistemler (İPLS) ise parçalı lineer sistemlerin bir alt sınıfı olup burada sadece iki alt sistem vardır. Bu tür sistemler için en önemli problemlerden biri kararlılık problemidir. $\mathbb{R}^2$'de iki modlu lineer sistemlerin genel asimtotik kararlılığı için gerekli ve yeterli koşul Çamlıbel [1], tarafından verilmiştir. Eldem ve Şahan [2], $\mathbb{R}^3$'te her iki modu da kompleks özdeğerlere sahip olan İPLS için ve Eldem ve Öner [3], ise $\mathbb{R}^3$'te modlardan birinin kompleks özdeğere diğerinin ise reel özdeğerlere sahip olduğu ($\mu_1 = \mu_2 = \mu_3$) İPLS'in genel asimtotik kararlılığı probleminin çözümü için gerekli ve yeterli koşulları belirlediler.

Bu çalışmada, $\mathbb{R}^3$'te modlardan birinin sadece reel özdeğerlere ($\mu_1 \leq \mu_2 \leq \mu_3$), diğerinin ise kompleks özdeğerlere sahip olduğu İPLS'in genel asimtotik kararlılığı ve yapısı incelenmiştir. Çalışmanın sonucunda İPLS, çözümleri mod değiştirenler ve değiştirmeyenler olarak, ve mod değiştirenler de sonlu kere ve sonsuz kere mod değiştirenler olarak sınıflandırılmaktadır. Bu sınıflandırma vasıtasıyla, (i) sonlu kere mod değiştiren çözümlerin genel asimtotik kararlı olması için gerekli ve yeterli koşul her iki moda ait reel özdeğerlerin negatif olması, (ii) sonsuz kere mod değiştiren çözümlerin genel asimtotik kararlı olması için gerekli ve yeterli koşul ise her iki moda ait reel özdeğerlerin negatif olması ve yakınsama oranının birden küçük olması, olduğu gösterilmektedir.

Anahtar Kelimeler. İki modlu parçalı sistemler, kararlılık, bağlama sabiti.

Bu çalışma Vasfi Eldem ile ortak yapılmıştır.

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Simple Singular Irreducible Plane Sextics

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Consider complex plane projective sextic curves with simple singularities. From the topological point of view, classification of such curves is a wide area and are handled by so many researchers. In my studies with Degtyarev [1] I also touched some parts of this classification. In this talk I will give a brief summary of this classification and open parts and also I will give the idea behind the proof.

Keywords. Plane sextic, K3-surfaces, simple singularity.

This is a joint work with Alex Degtyarev.

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Traveling Wave Solutions of Degenerate Coupled Multi-KdV Equation

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Traveling wave solutions of degenerate three-coupled and four-coupled KdV equations are studied. Due to symmetry reduction these equations reduce to one ODE, $(f')^2 = P_n(f)$ where $P_n(f)$ is a polynomial function of f of degree $n = \ell + 2$, where $\ell \leq 3$ in this work. Here ℓ is the number of coupled fields. There is no known method to solve such ordinary differential equations when $\ell \leq 3$. For this purpose, we introduce a method which uses the Chebyshev's Theorem to solve the reduced equation. We find several solutions some of which may correspond to solitary waves.

Keywords. Traveling wave solution, degenerate KdV system, Chebyshev's theorem, alternative method.

This is a joint work with Metin Gürses.

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Dynamical Properties of the Predator-Prey Sytem with Beddington DeAngelis Type Functional Response

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We consider two dimensional predator-prey system with Beddington-DeAngelis type-functional response. The main problem for this study is to find the necessary and sufficient conditions for the periodic solution of the considered system on the time scale case. Additionally, global attractivity of the system also investigated and some important results were found for the continuous case. This study is mainly based on continuation theorem in coincidence degree theory and semi-group theory.

Keywords. Non-autonomous predator-prey systems, periodic solution, globally attractive solution, time scales calculus.

This is a joint work with Ayşe Feza Güvenilir and Billur Kaymakçalan.

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q-Solitons

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In the literature, the concept of solitons arises mainly in the field of nonlinear partial differential equations and mathematical physics. In this work, we investigate the existence of multisoliton solutions in the light of Hirota direct method. For this purpose, we present briefly the behaviour of solitons on differential and difference equations. We analyze the integrability of q-difference equations and introduce the notion of q-solitons. Moreover, we constitute a unifying framework that comprises various q-difference type of soliton equations such as q-difference Toda equation. Finally, we conjecture the nonexistence of other unifying approaches to study integrable equations on quantum numbers or on any time scales via Hirota perturbation.

Keywords. Integrability, q-solitons, q-difference Toda equation, Hirota direct method.

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On Convexity Structures in Quasi-Metric Setting

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Convexity structures were nearly exclusively investigated in metric spaces. The paper of Izadi [1] is an exception, since it developes its theory in T_0-quasi-metric spaces [2] of hyperbolic type.

Following that, in this work the convexity structures in the sense of Takahashi [3] are investigated in T_0-quasi-metric spaces and we show that many results about convexity structures in metric spaces can be suitably generalized to T_0-quasi-metric spaces.

Keywords. Quasi-metric, convexity, asymmetric norm.

This is a joint work with Hans-Peter A. Künzi.

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Deformation Classification of Skew Configurations of Lines on Real del Pezzo Surfaces

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In this talk we shall classify (up to deformation) typical configurations of 6 (7) points in real projective plane, and then we describe the corresponding deformation classes of configurations of skew lines on Real del Pezzo surfaces via the Anti-canonical correspondence.

Keywords. Planar configurations, real del Pezzo surfaces, configurations of lines on del Pezzo surfaces of degree 2 and 3, anti-canonical models.

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Essential Self-Adjointness of Schrödinger Operators on Metric Graphs

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The main object of this research is to study Schrödinger operators on infinite quantum graphs. A quantum graph is a graph each edge of which is endowed with a length parameter and a Schrödinger operator on the edge. At the same time each vertex carries certain boundary conditions. As a result, certain self-adjoint Schrödinger-type operator is defined on the space L_2 on the graph. Spectral theory of such operator attracts a considerable attention over the last decade.

Keywords. Schrödinger operator, quantum graphs, metric graphs.

This is a joint work with Alexander Pankov.

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Deriving the Time-Dependent Fundamental Solution for the Equilibrium Equations in Piezoelectric Media

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The linear deformation theory of piezoelectric solids have three-dimensional stress equations of motion, quasi static approximation of Maxwell's field equations and constitutive relations. In this paper, we obtain the time-dependent fundamental solution. The system of equations governing the vibrations of piezoelectric media is written in the form of the first order symmetric hyperbolic system. Time-dependent fundamental solution of the system is derived using Fourier transform, power series expansion and Paley-Wiener theorem. Some computational examples confirm the robustness of the method to produce the images of the components of the fundamental solution of the given system.

Keywords. Piezoelectric solids, time-dependent fundamental solution.

Mesafeli Fibonacci Sayıları Üzerine

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İndirgeme ilişkisine sahip diziler birçok bilim alanında geniş yer tutmaktadır. Bunlardan Fibonacci, Lucas, Pell sayıları ve bunların genelleştirmeleri ilk akla gelenlerden bazılarıdır. Bu tip diziler için en önemli çalışma alanlarından biri indirgeme ilişkisine ihtiyaç duyulmadan dizinin istenilen terimlerinin elde edilebilmesidir. Bu sunumda ilk olarak Er [1] ve Kalman [2] tarafından verilen metotlar incelenecektir. Daha sonra bu yöntemler [3] de tanımı verilen mesafeli Fibonacci sayıları'na uygulanacaktır.

Anahtar Kelimeler. İndirgeme ilişkisi, mesafeli Fibonacci sayıları, matris metodu.

Bu çalışma Adem Şahin ile ortak yapılmıştır.

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Lefschetz Fibrations and Monodromy Substitutions

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The theory of Lefschetz fibrations is an important tool to understand the topology of 4-manifolds in view of combinatorial aspect. More precisely, Lefschetz fibrations build a bridge between symplectic 4-manifolds and factorizations in mapping class groups. I will first introduce genus-g Lefschetz fibrations over S^2 and their monodromies. Then I will show some results about Lefschetz fibrations via monodromy substitutions.

Keywords. Lefschetz fibration, mapping class group.

A Four Manifold with no Real Projective Structure

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In the beginning of the talk, we will give the definition of the real projective structure with developing map and holonomy. Then by using the similar techniques of [1], we will show that the real projective four space connected sum with itself does not admit a real projective structure.

Keywords. Real projective structure, developing map, holonomy.

This is a joint work with Yıldıray Ozan.

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Generalized Polynomial Identities with Automorphisms

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The set $T = \{G(s)s \mid s \in S\}$ has been studied in the literature by examining appropriate conditions on T, where S is a suitable subset of a prime ring R and G is an additive map defined on R. One studies the size of T by estimating $C_R(T) = \{x \in R \mid [x,t] = 0 \ \forall \ t \in T\}$, the centralizer of T in R. If T is large, it would be expected that $C_R(T) = Z(R)$, the center of R. As an extension of the results in the literature, we investigate the centralizer of the set $T = \{G(u)u \mid u \in f(R)\}$ where G is a generalized skew derivation of R. In particular, we determine the structure of the ring and the form of the generalized skew derivations involved in an identity on multilinear polynomials by using the GPI-theory.

Keywords. Prime ring, generalized skew derivation, automorphism, multilinear polynomial, centralizer, GPI.

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Diframes: A Generalization of Ditopological Spaces

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Frames are complete lattices which satisfy the infinite distributivity law. Locales, the dual of category of frames, were defined as generalized topological spaces and many topological results and properties were extended to these generalized spaces [3]. Then the concept of biframe was introduced as a generalization of bitopological spaces by Banaschewski, Brümmer and Hardie [1]. Ditopological spaces were defined by L.M. Brown as an extension of the work of R. Ertürk on the representation of lattice-valued topologies by bitopologies [2]. The aim of this talk is to discuss the motivation behind the study of diframes.

Keywords. Frame, locale, coframe, rather below relation.

This is a joint work with Rıza Ertürk.

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Genel Fonksiyonel Etkili Ekolojik Modeller için Standart Olmayan Yaklaşımlar

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Bir organizmanın sayısı, dağılımı ve çevresi ile ilişkisini açıklamak için deterministik ve stokastik modellerin kurulması ve bu modellerin nitelik-nicelik bakımından araştırılması son yıllarda oldukça fazla çalışılan konular olup, av-avcı modelleri de bunlar arasında önemli bir role sahiptir. Bazı nadir modellerde bulunan ve fonksiyonel etkili olarak adlandırılan modeller, biyolojik kontrol paradoksuna sahiptir. Fonksiyonel etki birim zamanda avcı tarafından avlanmış av oranını tanımlar. Bu fonksiyonlar av'a bağlı fonsiyonlardır.

Bu çalışmada, av lineer büyümeye ve avcı lojistik büyümeye sahip olduğu durumdaki genel fonksiyonel etkili av-avcı sistemlerinin çözümlerinin davranışında ve kararlılık analizinde standart olmayan sonlu fark yöntemi kullanılmıştır. Bu yöntemin kullanılması ile, pozitif çözümlerin ve denge noktalarının kararlılığının incelenmesi için bazı prosedürler geliştirilmiştir.

Anahtar Kelimeler. Fonksiyonel etkili modeller, av-avcı modelleri, standart olmayan sonlu fark metodu.

Bu çalışma Mevlüde Yakıt Ongun ile ortak yapılmıştır.

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(2+1)-Boyutlu Boussinesq Su Denklemi için Karmaşık ve Hiperbolik Yapılar Üzerine

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Bu çalışmada, (2+1)-boyutlu Boussinesq su denklemine modifiye $e^{(-\Omega(\xi))}$-açılım fonksiyon metodunu uyguladık. Üstel fonksiyon, karmaşık fonksiyon ve rasyonel fonksiyon çözümleri gibi bazı yeni analitik çözümler elde ettik. Wolfram Mathematica 9 programını kullanarak tüm analitik çözümlerin (2+1)-boyutlu Boussinesq su denklemini sağladığını gözlemledik. Daha sonra, aynı bilgisayar programını kullanarak bu makaledeki tüm analitik çözümler için iki ve üç boyutlu yüzeyler inşa ettik.

Anahtar Kelimeler. Modifiye $e^{(-\Omega(\xi))}$-açılım fonksiyon metodu, (2+1)-boyutlu Boussinesq su denklemi, karmaşık hiperbolik fonksiyon çözümü, üstel fonksiyon çözümü.

Bu çalışma Hacı Mehmet Başkonuş ve Hasan Bulut ile ortak yapılmıştır.

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Zero-Dimensional Spaces Homeomophic to Their Hyperspace $F_n(X)$

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In 1972 Marjanović, showed that there are exactly nine different zero-dimensional compact metric spaces X which are homeomorphic to their hyperspace 2^X which denotes the set of all non-empty, closed subsets of X. In this study we look at this subject from a different perspective and show that there exists uncountably many zero-dimensional compact metric spaces homeomorphic to $F_n(X)$ which denotes the hyperspace of nonempty subsets of X with at most n elements. As a tool we will use the Cantor-Bendixson rank of a zero-dimensional compact metric space.

Keywords. Cantor-Bendixson rank, zero-dimensional spaces, Cartesian products.

This is a joint work with Włodzimierz J. Charatonik.

Oscillation Results for Certain Types of Nonlinear Equations via Picone-Type Inequalities

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In this study, a short review of studies on Picone-type inequalities and Sturm comparison theorems in the literature are considered. Motivated by these studies Picone-type inequalities for a pair of nonlinear elliptic type equations with damping terms are established. Sturm comparison theorems based on the Picone-type inequalities are also given as an oscillation result.

Keywords. Picone-type inequality, Sturm comparison theorems, elliptic equations, oscillation results.

This is a joint work with Aydın Tiryaki and Emine Mısırlı.

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Perfect Discrete Morse Functions on the Connected Sums

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In the 1990s Robin Forman [1] developed the discrete Morse theory as a discrete version of smooth Morse theory that turned out to be an efficient method for the study of topology of the discrete objects. In this talk, we will give a brief introduction to discrete Morse theory and show how one can compose and decompose perfect discrete Morse functions on the connected sum of closed oriented triangulated manifolds.

Keywords. Perfect discrete Morse function, discrete vector field, connected sum.

This is a joint work with Neza Mramor Kosta and Mehmetcik Pamuk [2].

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Properties of Nonoscillatory Solutions of Four-Dimensional Time-Scale Systems

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There has been an increasing potential in studying the theory of time scales in order to harmonize the continuous and discrete cases. In this study, we classify nonoscillatory solutions of four-dimensional time-scale systems of first order dynamic equations on time scales.

Keywords. Oscillation, time scale, dynamic equations, difference equations, systems.

This is a joint work with Elvan Akın.

A New Note on Factored Fourier Series

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Bor proved a main theorem [1] dealing with on absolute Riesz summability of Fourier series. In this paper, we have generalized this theorem to the $|A, p_n|_k$ summability factors of Fourier series by using matrix transformations. Some new and known results are also obtained.

Keywords. Summability methods, absolute matrix summability, Fourier series, infinite series, Hölder inequality, Minkowski inequality.

This is a joint work with Hikmet Seyhan Özarslan.

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On the Lie-Trotter and Strang Splitting Methods for Rosenau-Burgers Equation

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In the present work we study operator splitting methods to analyse the nonlinear Rosenau-Burgers equation. The equation is splitted as an unbounded linear part and a bounded nonlinear part and then operator splitting methods of Lie-Trotter and Strang type is applied to the equation. The local error bounds are obtained using the approach based on the differential theory of operators in Banach space and the error terms of one and two dimensional numerical quadratures via Lie commutator bounds. The global error estimates are obtained via Lady Windermere's fan argument. Finally, to confirm the expected convergence order, a numerical example is studied.

Keywords. Operator splitting, convergence analysis, Rosenau-Burgers equation.

This is a joint work with Muaz Seydaoğlu.

Incomplete Gauss Sums

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It is well known that the classical Gauss sum, normalized by the square-root number of terms, takes only finitely many values. If one restricts the range of summation to a sub interval, a much richer structure emerges. We prove limit laws for the value distribution of such incomplete Gauss sums (both long and short relative to the complete sums). The limit distributions are given by the distribution of a certain family of periodic functions for long case and by the distribution of theta sums for short incomplete Gauss sums.

I also present a random process generated by the incomplete Gauss sums.

Keywords. Gauss sums, limit theorems, random process.

The first part of this presentation is a joint work with Jens Marklof.

Harary Çizgelerinin Komşu Bütünlük Değeri

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Bir ağ, iletim hatları ile birbirine bağlı merkezlerden oluşur. Bu merkezler arasındaki bağlantıların kesilmesi, bazı merkezlerin hasara uğraması, ağdaki yazılım hataları, donanım arızaları ağ üzerinden alınacak hizmetin uzun süre kesintiye uğramasına sebep olur. Bu durum ağların zedelenebilirliği veya güvenlik açığı olarak adlandırılır. Zedelenebilirlik, ağda bir tahrip olduğunda ağın göstermiş olduğu direncin ölçüsü ile ifade edilmekle birlikte ağın kararlılığı olarak da bilinir. Ağlar; merkezleri çizgenin tepeleri, merkezler arasındaki bağlantılar da çizgenin ayrıtları olacak şekilde çizgeler ile modellenebilir. Ağların zedelenebilirlik değerlerini araştırabilmek için çizge teorisinde çeşitli zedelenebilirlik parametreleri tanımlanmıştır. Bu parametrelerden en temeli bağlantılılık değeridir. Yani, ağın bağlantısız hale gelmesi için atılması gereken minimum sayıdaki merkez sayısıdır. Ağ tasarımcıları ve ağ analistleri bir ağı tasarlarken daha güvenilir veya daha az güvenlik açığına sahip olan bir ağ tasarlamak istedikleri için bağlantılılık değerinin mümkün olan maksimum değerde olmasını, buna karşın tasarlayacakları ağın maliyetinin de düşük olması için ayrıt sayısının mümkün olan minimum değerde olmasını isterler. Sonuçta kararlı bir ağ tasarlamak için ağın maliyeti ile dayanıklılığının dengede olması beklenir. m ve n pozitif tamsayıları için $n \geq m+1$ olmak üzere n tepeli ve m-bağlantılı olan $H_{m,n}$ Harary çizgeleri minimum ayrıt sayısı ile maksimum bağlantılılık değerine sahip çizgeler olarak bu kararlılığı göstermektedir. Harary çizgeleri bu kararlılıkları ile birçok zedelenebilirlik parametresinin konusu olmuşlardır.

Özel olarak, güvenlik sistemlerinde veya casus ağlarda bozulmuş veya işlevini yitirmiş bir tepenin komşusu da aynı şekilde işlevsiz hale gelecektir düşüncesi ile komşu zedelenebilirlik parametreleri de belirlenmiştir. Bu parametrelerden biri olan komşu bütünlük değeri; bir G çizgesi için, herhangi bir tepe subversion stratejisi S ve G/S çizgesindeki en büyük bağlantılı bileşeninin tepe sayısı $c(G/S)$ olmak üzere;

$$NI = \min_{S \subseteq V(G)} \{|S| + c(G/S)\}$$

olarak tanımlanmıştır .

Bu çalışmada minimum ayrıt ile maksimum bağlantılılık değerine sahip olan Harary çizgesinin her bir durumu için komşu bütünlük değerleri belirlenmiştir.

Anahtar Kelimeler. Zedelenebilirlik, bütünlük değeri, komşu bütünlük değeri, Harary çizgeleri.

Bu çalışma Gökşen Bacak Turan ile ortak yapılmıştır.

Applications of Legendre-Bernstein Basis Transformations

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Legendre-Bernstein basis transformations have been used for degree elevation, degree reduction and least square purposes in curves and surfaces design [1, 2]. Analogously, we construct the basis transformation matrices between q-Bernstein and q-Legendre polynomials [3] on $[0, 1]$, when the parameter $q \neq 0$. We discuss the relations between degree elevation and transformation matrices. Furthermore, we give a determinant characterization of q-Legendre polynomials.

Keywords. q-Legendre basis, Bernstein basis, basis transformations, degree elevation, q-Bernstein basis.

This is a joint work with Halil Oruç.

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Some Fixed Point Theorems in D^*-Metric Spaces

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In 1963, Gahler introduced the notion of a 2-metric space and he claimed that 2-metric space is a generalization of an ordinary metric space. He mentioned in a work that $d(x, y, z)$ geometrically represents the area of a triangle $x, y, z \in X$ as its vertices. Then, in 1984, Dhage in Ph.D. thesis [1] identified condition (d2) as a weakness in Gahler's theory of a 2-metric space and he introduced the concept of a D-metric space. In 2006, Mustafa and Sims [2] introduced the notion of G-metric space as a weakness of (d3) condition in D-metric space. Then, in 2007, Sedghi et. al. [3] introduced the notion of D^*-metric space.

In this work, we show some new fixed point theorems in such D^*-metric spaces.

Keywords. Fixed point theorem, D^*-metric space.

This is a joint work with Servet Kütükçü.

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The Planar Motion Group and the Centrodes

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There is a great number of works which are examining the centrodes in the planar motion group. The most of these studies deal with the classical aspects of the planar kinematics but in this speech the relation between the Lie algebra, se(2), and the pole points (or pole curves, or the centrodes) in SE(2) are discussed in a modern way.

Keywords. Kinematics, Lie group, planar motion group.

This is a joint work with İlhan Karakılıç.

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İki Yol Grafın Direkt Çarpımının Yerel Bağlantılı Boyama Sayısı

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Graf boyama graf teoride kullanılan oldukça önemli bir kavramdır ve literatürde birçok farklı boyama çeşidi vardır. Literatürdekilere ek olarak, bir G grafının yerel bağlantılı boyaması tanımlanmıştır. Bu boyama, $\kappa(u, v) \geqslant i$ koşulunu sağlayan komşu olmayan u ve v tepelerini i rengi ile boyamak için gerekli olan minimum renk sayısı olarak tanımlanır ve $\chi_{lc}(G)$ ile gösterilir, burada $\kappa(u, v)$, u ile v tepeleri arasındaki içten ayrık yolların maksimum sayısıdır. Bu çalışmada, n ve m yol grafların tepe sayıları olmak üzere iki yol grafın direkt çarpımının, $P_n \times P_m$ grafının, yerel bağlantılı boyama sayısı belirlenmiştir.

Anahtar Kelimeler. Graf boyama, yerel bağlantılı boyama sayısı, içten ayrık yollar, direkt çarpım.

Bu çalışma Pınar Dündar ile ortak yapılmıştır.

Multiple Positive Solutions for Functional Dynamic Equations on Time Scales

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This paper is concerned with the existence of multiple positive solutions for functional dynamic equations with multi-point boundary conditions on time scales by using fixed point theorems in a cone. As an application, we also give an example to demonstrate our results.

Keywords. Positive solutions, fixed point theorems, functional dynamic equation, time scales.

This is a joint work with Fatma Serap Topal.

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RBF Solution of Convective Heat Transfer MHD Flow

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In this study, steady convection flow of a viscous, incompressible and electrically conducting fluid is considered in a lid-driven cavity under the effect of a uniform horizontally applied magnetic field. The cavity is heated from the below and the top wall is kept cooled while the other walls are adiabatic. The governing equations are obtained from the Navier-Stokes equations of fluid dynamics including buoyancy and Lorentz force terms and the energy equation including Joule heating and viscous dissipation terms. These coupled equations are solved iteratively in terms of velocity components, stream function, vorticity, pressure and temperature by using Radial basis function (RBF) approximation. Particular solution which is approximated by RBF to satisfy both differential equation and boundary conditions becomes the solution of the differential equation. The unknown boundary conditions for pressure and vorticity are obtained from the momentum equations and vorticity definition, respectively. The unknown vorticity boundary conditions are obtained by discretizing stream function equation using finite difference which includes also interior stream function values, whereas pressure boundary conditions are derived by using coordinate matrix for space derivatives and finite difference scheme for pressure gradients. The numerical results are obtained for Hartmann number (M) values in the range $(0 - 80)$ and Grashof number (Gr) is taken up to 10^4 ($10 \leq Gr \leq 10^4$) for fixed Reynolds number (Re) values of 50 and 100. It is found that an increase in Gr moves the central vortex of the flow trough the center of the cavity emphasizing the movement of the top lid. Re increases the circulation of the fluid through out the cavity. Heat is also circulated between the adiabatic walls when Gr or Re increases. The effect of increasing magnetic field intensity is the boundary layer formation close to the moving lid for the flow and isotherms. The solution is obtained in a considerably low computational cost through the use of radial basis functions in the approximation.

Keywords. MHD convection flow, RBF, viscous dissipation, lid-driven cavity.

This is a joint work with Münevver Tezer-Sezgin.

Initial Value Problem for the Parabolic Lame Equations

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The parabolic Lame equation system is considered in the paper. The main problem is an initial value problem for this system. The constraction of the fundamental solution of initial value problem for this system is one of the result of this paper. The constraction of the fundamental solution is based on the theory of the generalized functions, parabolic differential equations and functional analysis technique [1, 2, 3]. The formula for the generalized and classical solutions of the initial value problem are obtained by the fundamental solution of the parabolic equation system.

Keywords. Parabolic lame equation, generalized solution, classical solution.

This is a joint work with Valery Yakhno.

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Ferrofluid Flow in a Sinusoidal Enclosure Under the Effect of Nodal Magnetic Source

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The present numerical study is conducted to investigate the two dimensional, steady, laminar, incompressible, buoyant convection nanofluid flow in a semi-annulus enclosure with a sinusoidal heated inner wall under the effect of a nodal magnetic source located just below the inner wall. The governing equations which are consistent with the principles of ferrohydrodynamics (FHD) and magnetohydrodynamics (MHD) are discretized by using the dual reciprocity boundary element method which uses the fundamental solution of Laplace's equation to transform the given differential equations into boundary integrals through the radial basis approximation. To see the effect of both FHD and MHD on the flow field and heat transfer enhancement, the numerical simulations are carried out for several values of related physical parameters such as Rayleigh, Hartmann and magnetic numbers. The well-known retarding effect of increasing Hartmann number on velocity and the convection-dominated heat transfer phenomena at high Rayleigh numbers are observed from the obtained numerical results.

Keywords. FHD, MHD, ferrofluid, free convection, DRBEM.

This is a joint work with Canan Bozkaya.

Graflarda Zedelenebilirlik ve Komşu Ayrıt Kopma Derecesi

Dilek Polat

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Herhangi bir sebeple bir iletişim ağının bazı merkezlerinin veya bağlantılarının birinde yada bir grubunda oluşacak bozulmalara karşı iletişim ağının dayanma gücünün ölçümüne zedelenebilirlik (vulnerability) denir [1], [3]. Literatürde birçok zedelenebilirlik parametresi geliştirilmiştir. Bunlardan bazıları bağlantılılık (connectivity), bütünlük (integrity), komşu bütünlük (neigbour integrity), kopma derecesi (rupture degree), komşu kopma derecesi (neigbour rupture degree) ve komşu ayrıt kopma derecesi (edge neigbour rupture degree) dir. Bir G grafının komşu ayrıt kopma derecesi, S bir ayrıt-kesim stratejisi, $G-S$ grafındaki bileşen sayısı $w(G-S)$ ve en büyük bağlantılı bileşenin tepe sayısı $m(G-S)$ olmak üzere, $ENR(G) = \max\{w(G-S) - |S| - m(G-S) : S \subseteq E(G), w(G-S) \geq 1\}$ dir [2].

Bir G grafının her bir ayrıtının üzerine yeni bir tepe ekleyerek ve G grafının bitişik ayrıtları üzerinde bulunan bu yeni tepe çiftlerini bir ayrıt ile birleştirerek elde edilen grafa G grafının middle grafı denir ve $M(G)$ ile gösterilir (Nihei, 2001).

Bu çalışmada özel grafların middle grafları incelenerek literatürde yeni tanımlanmış olan zedelenebilirlik paramatrelerinden biri olan komşu ayrıt kopma derecesi hesaplanmıştır.

Anahtar Kelimeler. Zedelenebilirlik, middle graf, komşu ayrıt kopma derecesi.

Bu çalışma Saadet Eskiizmirliler ve Refet Polat ile ortak yapılmıştır.

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q-Difference KdV and q-Difference Sine-Gordon Equations

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In this work, we present a unified scheme for q-difference equations by the frame of q-Hirota-Miwa equation. We analyze the notion of q-solitons under the reductions for q-Hirota-Miwa equation such as q-difference KdV equation and q-difference Sine-Gordon equation.

Keywords. Integrability, Hirota direct method, q-solitons, q-difference KdV equation, q-difference Sine-Gordon equation.

This is a joint work with Burcu Silindir Yantır.

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On Multiplier of Hyper BCI-Algebras

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In this paper, we introduce the notion of multiplier of a hyper BCI- algebra, and discuss some properties of hyper BCI-algebras. Also we introduced notion of hyper isotone and we hyper normal ideal of multipliers on hyper BCI-algebras.

Keywords. Hyper BCI-algebra, multiplier, $Fix_d(H)$, isotone, hyper normal ideal.

This is a joint work with Alev Fırat.

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Forced Convection Flow of Biomagnetic Fluid in a Pipe of Square Cross-Section

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In this study, we investigate the fully developed, steady, laminar flow of biomagnetic fluid (blood) in a long channel with square cross-section under the effect of a point magnetic source. The magnetic field is generated by a thin wire, carrying electric current, placed below the bottom and parallel to the axis of the channel. Being a fully developed flow we solve the problem on the cross-section of the channel and in this case the wire takes role of a point magnetic source. The vertical walls of the channel are adiabatic where the top wall is heated and the bottom wall is kept cold. The temperature difference between the walls causes heat transfer within the fluid by the displacement of the fluid particles on the transverse plane. The flow is also affected by a force resulting from the magnetization of the fluid. The governing equations are the coupled Navier-Stokes and energy equations in terms of velocity, pressure and the temperature of the fluid arising from the mass, momentum and energy conservation laws. We use Dual Reciprocity Boundary Element Method (DRBEM) by taking all the terms other than Laplacian as inhomogeneity and transform the partial differential equations into the boundary integral equations by using fundamental solution of the Laplace equation. We discretize only the boundary by using constant elements and take sufficient number of internal points for computing the unknowns. The numerical results are given in terms of streamlines, isotherms, velocity and pressure contours, and axial velocity level curves for increasing values of Magnetic number (Mn) and Rayleigh number (Ra). An increase in Mn causes an increase in the magnitude of the flow velocities and the axial velocity shows a flattening near the magnetic source. Pressure increases extending through the channel starting from the magnetic source. Isotherms show the cooling of the channel with high Mn only leaving a thin hot layer near the top heated wall. As Ra increases viscous effect is reduced leaving its place to convection in the channel. Thus, the flow is symmetrically separated into vortices emanating from the magnetic source moving through the center of the cavity. Again, heated fluid concentrates near the top wall for large values of Ra.

Keywords. Biomagnetic fluid, forced convection flow, DRBEM.

This is a joint work with Münevver Tezer-Sezgin.

Existence of Positive Solutions for Nonlinear Boundary Value Problems of Fractional Differential Equations

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In this study, we consider existence of positive solutions for boundary value problems of fractional differential equations. Our analysis is based on a monotone iterative technique. As an application, an example is given to demonstrate our main result.

Keywords. Boundary value problem, fractional differential equation, positive solution.

This is a joint work with Fulya Yörük Deren and Nüket Aykut Hamal.

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Variance of the Proxy Iterative Stein-Rule Estimator of the Disturbance Variance

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In a linear regression model with proxy variables, the iterative Stein-rule estimator (ISRE) of the disturbance variance is obtained by taking the Stein-rule (SR) estimator of the parameters in the estimator of the disturbance variance. The aim of this paper is to analyse the variance of the ISRE of the disturbance variance and also to compare this variance with the usual variance of the disturbance variance in proxy model by taking the differences.

Keywords. Stein-rule estimator, iterative stein-rule estimator, proxy variable.

This is a joint work with Burcu Alpman.

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