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Contents and abstracts

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Mathematics

ON THE STABILITY OF THE LOBACEVSKI EQUATION

Laura GĂVRUȚA and PAȘC GĂVRUȚA

Abstract. In this paper, we give a short history of the stability of Lobacevski's equation. Moreover, we prove the superstability of Lobacevski's equation in three variables

$$\left(\frac{x+y+z}{3}\right)^3 - f(x)f(y)f(z) = 0$$

Keywords and phrases: Hyers-Ulam stability, superstability, Lobacevski equation.

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A NEW 3-DIMENSIONAL SYSTEM WITH CHAOTIC BEHAVIOR

Tudor BÎNZAR and Cristian LĂZUREANU

Abstract. In this paper a new three-dimensional system depends on eight real parameters is considered. By choosing some particular values of the parameters the chaotic nature of the system is highlighted.

Keywords and phrases: Chaotic system, generalized Lorenz-like system, Lyapunov exponents, strange attractor.

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ON (*h, k*)-DICHOTOMY IN BANACH SPACES

Monteola Ilona KOVACS, Mihai-Gabriel BABUȚIA, Mihail MEGAN

Abstract. The paper considers two concepts of (*h,k*)-dichotomy on the half-line for evolution operators in Banach spaces. Characterizations and connections between these concepts are given.

Keywords and phrases: evolution operator; (*h, k*)-dichotomy; strong (*h, k*)-dichotomy.

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TRICHOTOMY FOR ABSTRACT EVOLUTION OPERATORS

Mărioara LĂPĂDAT

Abstract. This paper presents two necessary and sufficient conditions for a general concept of trichotomy on the half-line of evolution operators in Banach spaces. This concept has as particular cases the exponential and polynomial trichotomies for nonautonomous dynamical systems in infinite-dimensional spaces.

Keywords and phrases: Evolution operators, (*a,b,c*)-trichotomy, exponential trichotomy, polynomial trichotomy.

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HOPF BIFURCATION AND STABILITY ANALYSIS OF *T*-SYSTEMS WITH DELAYS

Petru - Claudiu STRĂIN

Abstract. In this paper the T system is generalised to a model with delays. We perform an extended Hopf bifurcation analysis of the system. We also investigate its stability and give some numerical simulations in order to illustrate the effectiveness of our results.

Keywords and phrases: delay differential equation, stability, Hopf bifurcation.

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ON THE EXISTENCE AND THE UNIQUENESS OF THE WEAK SOLUTION OF A MICROSCOPIC DYNAMIC PROBLEM IN POROUS ELASTIC MEDIA

Remus-Daniel ENE, Tudor BÎNZAR

Abstract. Based on Ciorănescu and Donato technique, one establishes the existence and the uniqueness of the weak solution of a microscopic Neumann dynamic problem in porous elastic media.

Keywords and phrases: homogenization method, weak solution, porous media.

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ON THE ADDITIVE FUNCTIONAL EQUATION IN QUASI-β-NORMED SPACES

G.Z. ESKANDANI, Paşc GĂVRUȚA, J. M. RASSIAS, Laura GĂVRUȚA

Abstract. In this paper, we establish the general solution and investigate the generalized Hyers-Ulam stability of the following additive functional equation

$$f\left(\sum_{i=1}^{m} k\, x_i\right)+\sum_{\substack{j=1\\ j\neq 1}}^{m} f\left(k\, x_j - k\, x_i\right)= k\, m\, f(x_j)$$

in quasi-β-normed spaces.

Keywords and phrases: Generalized Hyers-Ulam stability, Contractively subadditive, Expansively superadditive, Quasi-β-normed space, (β, p)-Banach space.

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ON INSTABILITY OF REAL FUNCTIONS

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Abstract. This paper introduces some concepts of instability for real functions. Integral characterizations for these concepts are given.

Keywords and phrases: Exponential instability, polynomial instability.

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Physics

DETERMINATION OF THE CAPACITANCE PER UNIT LENGTH CYLINDRICAL CONDUCTOR LINE IN GROVE

Milan VESKOVIĆ, Jeroslav ŽIVANIĆ, Milan PLAZINIĆ and Vladimir OSTRAĆANIN

Abstract. This paper presents an application of Charge Simulation Method for calculation of the capacitance per unit length, cylindrical conductor line in the U - shaped groove. Results obtained by this method are compared with results obtained with approximate expression given in [1]. Convergence of the results for the normalized capacitance per unit length are shown. The results are presented in tabular and graphical form.

Keywords and phrases: Charge Simulation Method, Cylindrical Conductor, Groove

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THE EFFECT OF RETURN STROKE SPEED ON LIGHTNING ELECTRIC FIELD

Vesna JAVOR

Abstract. The effect of pulse propagation speed along vertical lightning discharge channel on electric field at a lossy ground is considered in this paper. The channel and nearby lightning protection rods are modelled as unique wire antenna structure and the effect of lossy ground is taken into account using Two-image approximation of Sommerfeld's integral kernel which provides good results in near and far field. Vertical and radial electric field results are obtained in frequency domain from the current distribution along the antenna structure. These are useful for time domain consideration of electric field around the rods nearby lightning discharges.

Keywords and phrases: atmospheric electricity, lightning, electromagnetic wave propagation.

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JOINT PROBABILITY DENSITY FUNCTIONS OF SSC RECEIVER OUTPUT SIGNAL AT TWO TIME INSTANTS AND THEIR DERIVATIVES OVER LOG-NORMAL FADING CHANNEL

Dragana KRSTIĆ, Petar NIKOLIĆ, Aleksandar STEVANOVIĆ and Goran STAMENOVIĆ

Abstract. The joint probability density functions (PDFs) of dual branch Switch and Stay Combiner (SSC) output signals and their time derivatives at two time instants in the presence of log-normal fading will be calculated in this paper. The second order characteristics, such as level crossing rate and average fade duration, for complex combiners which make decision based on sampling at two time instants, can be derived by the expressions for probability density functions which are determined in this paper.

Keywords and phrases: Log-normal Fading; Probability Density Function; Switch and Stay Combining; Time Derivative, Two Time Instants.

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