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Mathematics

DISCRETE LEXICOGRAPHIC p -BOTTLENECK PROBLEMS (Part I)

Oana Ruxandra TUNS (BODE), Liana LUPSA

Abstract. In this paper the properties of the optimal solutions for a lexicographic discrete programming problem with p bottleneck objective functions are studied. A special type of these optimal solutions, named by us optimal solution with pipeline property, is pointed out. Using the notion of convexity with respect to a given set introduced by G. Cristescu and L. Lupsa [2], the structure of the set of optimal solutions and the structure of the set of optimal solutions with pipeline property are analyzed.

Keywords and phrases: lexicographic programming, problem with bottleneck objective, minimum point with pipeline property, minimum lexicographic points with pipeline property, 2-strong convexity.

DISCRETE LEXICOGRAPHIC p -BOTTLENECK PROBLEMS (Part II)

Liana LUPSA, Oana Ruxandra TUNS (BODE)

Abstract. In this paper the structure of the set of optimal solutions with pipeline property for a lexicographic discrete programming problem with p -bottleneck objective functions is studied.

Keywords and phrases: lexicographic programming, problem with bottleneck objective, minimum point with pipeline property, minimum lexicographic points with pipeline property, 2-strong convexity

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BEST DIRECTIONAL APPROXIMATION WITH RESPECT TO A SET

Mihail GĂIANU

Abstract. The best directional approximation with respect to a given set is introduced and studied. Theorems of existence of the element of the best directional approximation with respect to a given set are derived, together with structure results on the set of these kind of elements.

Keywords and phrases: best directional approximation with respect to a set, directional convexity with respect to a set

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ON THE STABILITY OF GENERALIZED POLYNOMIALS

Dan M. DĂIANU

Abstract. Using the well known stability results of Hyers and Aoki about Cauchy's functional equation, we establish new stability results of Aoki-Rassias type for two Fréchet polynomial equations.

Keywords and phrases: Fréchet polynomials, monomial, stability.

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ON THE SYMMETRIES OF A RABINOVICH TYPE SYSTEM

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Abstract. A symplectic realization and some symmetries of a Rabinovich type system are presented.

Keywords and phrases: Rabinovich system, symmetries, Hamiltonian dynamics.

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GENERALIZED LAGUERRE POLYNOMIALS APPLICATION FOR EIGENVALUE PROBLEMS WITH NON-CONSTANT COEFFICIENTS

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Abstract. In this paper a Laguerre-Galerkin type method is proposed in order to solve a class of nonlinear eigenvalue problems on semi-infinite domain. The method is then applied to a particular velocity profile in a swirling flow stability problem. The numerical solution is validated against existing results showing a qualitatively good agreement.

Keywords and phrases: spectral methods, Laguerre polynomials, swirling Flows.

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FINITE ELEMENT ANALYSIS OF NATURAL FREQUENCIES AND MASS PARTICIPATION COEFFICIENTS FOR THIN PLATES WITH DEFECTS

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Ana Maria BUDAI, Florian MUNTEAN, Eugen RADUCA**

Abstract. The paper present the results obtained by a frequency analysis using the SolidWorks software. The first 20 natural frequencies and mass participation coefficients were obtained for three different plate types. The plate types are: a plate without defect, a plate with width defect and a plate with oblique defect. In the paper are also presented, in tabular and graphical form a comparing of results for all the three types of plates and the principal conclusion of madden analysis.

Keywords and Phrases: natural frequency, plate without defect, plate with defect, simulation.

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A NEW METHOD FOR TESTING THE NO-LOAD WORK OF AN ELECTRIC ONE-PHASE TRANSFORMER USING THE GRAPHICAL PROGRAMMING

**Florica NOVĂCESCU, Cornel HAȚIEGAN, Mihaela RĂDUCA,
Eugen RĂDUCA, Nicolina POP**

Abstract. In this paper is proposed and described a new method for testing the noload work of an electric one-phase transformer using the LabView graphical programming medium, and also an aquisition and data processing system. The proposed practical method implemented in this paper is represented by the experimental determination of the characteristics of no-load work of an electric transformer by the means of an acquisition and data processing system. This method is an effective and safe one, because testing of such a transformer is more risky and difficult using conventional methods of testing. It is known that, data acquisition involves gathering signals from measurement sources and digitizing the signal for storage, analysis, and presentation on a PC.

Keywords and phrases: data acquisition, data processing system, characteristics of no-load work, electric transformer, transducers, measurement, digitizing the signal.

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FLOW AROUND OF AIRFOILS, USED AS ACTIVE PART OF THE DISTRIBUTOR

Adriana Sida S. MANEA, Eugen V. DOBÂNDĂ

Abstract. In order to realize optimum performances for the cross flow turbines, a major roll consist in the way that the water is conducted to the rotor. This is done by a distributor. The paper analyses the flow in two types of airfoils, used as active part of the distributor.

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ANALYSIS OF SOME NEW LASER MATERIALS

Mirela F. NICOLOV

Abstract. In the present paper an analysis of the crystal structure and morphology of $GdVO_4$ is presented. The faces calculated here are flat. Were simulated the growth forms. Vanadate laser is usually used for lasers based on neodymium-doped vanadate crystals. In particular, these include $Nd:YVO_4$, $Nd:GdVO_4$, and $Nd:LuVO_4$ crystals which are also called orthovanadates. The gadolinium vanadate ($GdVO_4$) single crystal is an excellent laser host material with good laser properties, mechanical properties and chemical stability. The $GdVO_4$ crystal doped with the rare earth has the luminous properties and has been proven as a kind of effective laser crystal with a low induced damage threshold.

Keywords and phrases: laser material, characterization, structure simulation.

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FORECASTING MODELS APPLIED TO HOURLY SOLAR IRRADIATION TIME SERIES

Marius PAULESCU, Angel PĂCURAR, Nicolina POP

Abstract. Solar resource assessment and forecasting the electric energy generated by solar plants are critical issues when large scale projects are considered. In this thought, this paper examines procedures for forecasting hourly global solar irradiation. Overall results demonstrate that a seasonal ARIMA model is a feasible solution for providing the grid operators with one hour ahead forecast.

Keywords and phrases:

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THE STEPWISE EVOLUTION OF SYSTEMS BY ORDER-DISORDER TRANSITION

Nicolina POP, Nicolae DOCA

Abstract. The topic of our work is to study by numerical computation, the evolution of a system from an equilibrium state to chaos and to establish the conditions for the stepwise change of system's answer. The advantage of our approach is that using a simple, synthetic parameter, a stepwise evolution of a system was analyzed.

Keywords and phrases: Feigenbaum's equation, equilibrium state, system's evolution, chaos.

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A POSSIBLE VIEW OF EXPERIMENTAL INFERENCES OF THE TACHYONIC NATURE OF NEUTRINO

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Abstract. This work is aimed at attempting to establish the theory of the tachyonic nature of neutrino. The basis of this theory is the transformational superluminal matrix by means of which the movement of superluminal particles is described. The obtained results are consistent with the measured properties of the neutrino and antineutrino spin. Emphasis is put on the occurrence of the negative value of the squared mass in the basic energy equation, which could indicate possible tachyonic nature of the neutrino, and be a key factor in resolving the question of neutrinos velocity.

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