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ADMISSIBILITY AND EXPANSIVENESS FOR DISCRETE EVOLUTIONARY PROCESSES

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Abstract. The present paper discusses the instable behaviour of evolutionary processes with nonuniform exponential growth in terms of admissibility of the pair of spaces (c(X), c(X)).

Keywords and phrases: evolutionary processes, exponential instability, admissibility

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SIMPLE-CONNECTIVITY OF COVERAGE ZONE FOR UNIT BALL NETWORKS

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Abstract. It is given an equivalent condition of the simple-connectivity for union of Unit Balls, based upon intrinsic quantities, not depending by the reference frame.

Keywords and phrases: coverage zone, euclidean simplex, network of technical devices, unit ball.

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THE MATHEMATICAL ANALYTIC MODEL OF THE STATIC FLUX-CURRENT MAGNETIC HYSTERESIS AND SIMULATION IN OPENMODELICA SOFTWARE

Marinko BARUKCIĆ, Zeljko HEDERIĆ, and Venco ĆORLUKA

Abstract. The mathematical model of flux-current hysteresis of the magnetic circuit is presented in the paper. The flux-current characteristic is modeled by the analytic function consider the hysteresis phenomena. The flux-current hysteresis is approximated by a linear combination of a number of the Gompertz functions and linear function. The parameters of the analytic function are determined using the measured flux-current data. The proposed method is performed trough two steps. The first step is an estimation of the analytic function

parameters by the evolutionary algorithm and the second is approximating of the hysteresis by the analytic function. The use of the flux-current hysteresis model is presented by the simulation of the magnetization current at specified voltage in OpenModelica software. The simulated currents are compared with the measured ones.

Keywords and phrases: Evolutionary Algorithm, Flux-Current Characteristic, Magnetic Hysteresis, Mathematical Model, OpenModelica.

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COMPARATIVE ANALYSIS OF PLATE AND GRID GROUNDING ELECTRODES

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Abstract. The subject of this paper is a comparative analysis of resistances of plate and grid grounding electrodes with the same dimensions and laid down at the same depth, using the FEM (Finite Element Method) software package, COMSOL. The analysis is conducted for different values of electrical resistivity of the surrounding soil. Potential distribution and resistances for both grounding electrodes are determined.

Keywords and phrases: Grounding system, Plate electrode, Grid Electrode.

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EVALUATION OF THE SUSTAINABLE DEVELOPMENT QUALITY LEVEL BASED ON THE GAUSS DISTRIBUTION

Miodrag POPOV, Daniel GRECEA, Dusan POPOV

Abstract. In the paper we present a method for evaluation of the informational state of different systems or phenomena, particularly evaluation of the sustainable development quality level in buildings. The method used is a combination of the quantification method" and the statistical (Gauss) distributions method which ensure a classification of different development levels or states by evaluation of their characteristic parameters or criteria, as well as the probability of their finding.
Keywords and phrases: Sustainable development; Gauss distribution; Quantification.

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A STUDY ON EXPOSURE TO MAGNETIC FIELD GENERATED BY UNBALANCED CURRENTS

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Abstract. In this paper effects of current unbalance on magnetic field in vicinity of busbars are considered. Typically, currents unbalance appears on the low voltage side (0.4 kV) of distribution substation due to temporal variation of loads. Dependence of the magnetic field level on current unbalance is considered in two cases: (a) for horizontal and (b) for vertical arrangements of conductors. This paper shows that current unbalance can significantly alter the magnetic field level in comparison to the magnetic field generated by balanced currents. As a consequence the current unbalance should be included in determination of general public exposure to magnetic field.

Keywords and phrases: Current unbalance, general public exposure, magnetic field.

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ONE MODIFICATION IN IMPLEMENTATION OF CE-FDTD ALGORITHM WITH CPML

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Abstract. In this paper we propose a modified implementation of the original CEFDTD algorithm (with corresponding CPML applied) in order to improve its performance concerning simulation time. The modification is introduced through the custom definition of the complex arithmetics in the program flow. The improvement in simulation time is tested on the example of a dipole antenna.

Keywords and phrases: Finite-difference time-domain method, Complex envelope, Convolutional perfectly matched layer.

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