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## ON THE NORMAL FORM OF DOUBLE–HOPF BIFURCATION

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**Stelian MIHALAȘ, Oana BRANDIBUR**

**Abstract.** A study on degenerate normal form of double-Hopf bifurcation is performed. This bifurcation is met in differential systems of dimension at least four and with minimum two independent parameters. We obtain bifurcation diagrams for amplitude system when one or two generic conditions are eliminated.

*Keywords and phrases*: dynamical systems, bifurcations, normal forms

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## APPROXIMATE SOLUTIONS FOR RICCATI DIFFERENTIAL EQUATION OF FRACTIONAL ORDER USING THE LEAST SQUARES DIFFERENTIAL QUADRATURE METHOD

**Bogdan CĂRUNTU, Constantin BOTA,**
**Mădălina Sofia PAȘCA, Marioara LĂPĂDAT**

**Abstract.** In the present paper we employ a recently introduced approximation method, namely the Least Squares Differential Quadrature Method (LSDQM), in order to compute analytical approximate polynomial solutions for several quadratic Riccati differential equation of fractional order.

*Keywords and phrases*: Riccati differential equation of fractional order, Least squares differential quadrature method (LSDQM).

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## STATISTICAL ANALYSIS OF MINIMUM OIL CIRCUIT BREAKER FAILURES

**Dragan STEVANOVIC, Aleksandar JANJIC, Dragan TASIC**

**Abstract.** In this paper, remaining useful life (RUL) of circuit breakers (CB) has been analyzed, based on statistical data gathered during CB's maintenance. Using statistical data of 427 CBs gathered in past 10 years, Weibull probability distribution of contact resistance for breakers on both overhead and underground feeders and voltage levels of 35 kV and 10 kV is determined. With this methodology CB's condition can be observed by using real field data which are collected regullary during power station revision.

*Keywords and phrases*: circuit breaker, remaining useful life, voltage drop, Weibull distribution.

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## EFFECTS OF EXTERNAL DIELECTRIC BODY ON PLAN-PARALLEL SYSTEM FIELD HOMOGENEITY

**Zlata CVETKOVIC, Zaklina MANCIC, Sasa ILIC, Bojana PETKOVIC, Milka POTREBIC**

**Abstract.** In this paper, it is presented the influence of an external cylindrical dielectric body on the homogeneous electrostatic field. To obtain a homogeneous electrostatic field, a system of four charged parallel electrodes was installed on the imaginary cylindrical surface of the radius R (primary cell of the first order). Expressions for the field within and outside the external body are obtained using the Image theorem in cylindrical dielectric mirror. Special attention was dedicated to the 2D view of the field in the cross-section of the system.

*Keywords and phrases*: dielectric cylindric, electrostatic systems, isotropic dielectric body, plan-parallel primary cell, uniform electrostatic field.

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# VISUALISATION OF STATIC AND STATIONARY MAGNETIC FIELDS

**Branko KOPRIVICA, Alenka MILOVANOVIC, Srdan DIVAC, Mihajlo TATOVIC, Milan PLAZINIC, Vojislav VUJICIC**

**Abstract.** The aim of this paper is to present a way of visualisation of the magnetic field created by permanent magnets or wires and loops carrying direct current. Visualisation is achieved by using so called magnetic field viewer - a special magnetic sensing film. Except visualisation of the magnetic field around the magnetic object, measurements of magnetic flux densities are performed using a Hall sensor. Also, a number of simulations of coils carrying direct current in FEM software have been made in order to check a validation of the visualisation effects obtained. The paper shows photographs of visualised magnetic fields and the results of measurements and simulations, as well as a proper discussion..

*Keywords and phrases*: hall sensor, magnetic field viewer, static and stationary magnetic field, visualisation.

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