**2021 17th International Conference on Electrical Machines, Drives and Power systems (ELMA)**



# ELMA 2021

**1 - 4 July 2021,**
**Technical University of Sofia, BULGARIA**

Organised by:

**Union of Electronics, Electrical Engineering and Telecommunications (CEEC)**
**IEEE Bulgaria Section**

Friends of the ELMA 2021 are:

Technical Universities of Sofia, Varna and Gabrovo
University of Ruse "Angel Kantchev"
Federation of Scientific and Technical Unions
"Prof. Assen Zlatarov" University – Bourgas

# PROGRAM

## CONFERENCE VENUE

The 17th International Conference on Electrical Machines, Drives and Power Systems ELMA 2021 will be held in Sofia, Bulgaria, **in the building of Federation of the scientific engineering unions (FNTS) in Sofia, 108 Rakovsky Str.**

## LANGUAGE

Official language of the Conference will be English.

## ONLINE SYSTEM REGISTRATION AND CHECK

The participants will receive username and password for the online conference system (https://elma.ceec.bg/e-conf), created by the organizers, via email on Monday 28.06.2021 morning. Then the system is accessible. Please do technical check on:

| | | |
|---|---|---|
| Monday | 28.06.2021 | 16:00-17:00 Sofia local time |
| Tuesday | 29.06.2021 | 11:00-12:00 Sofia local time |

## PAPER PRESENTATION

Authors who will present the papers (orally or by poster) are kindly requested to prepare their presentations BEFORE the conference start and send them to elma2021@tu-sofia.bg between 25.06.2021 and 28.06.2021.

The time for the **oral** presentation of the regular papers including discussion is **15 minutes**. Papers should be presented in English only by the registered authors.

For **poster** presentation, please follow the template on the site.

## CONFERENCE PARTICIPATION

The participants can access the sessions via the conference system (https://elma.ceec.bg/e-conf), according the program time table, also available after system login.

## TIME-TABLE (Sofia local time)

| Day | Time | Hall A | Hall B |
|---|---|---|---|
| **Monday, 28 June** | **16:00-17:00** | **Online system registration and check** ||
| **Tuesday, 29 June** | **11:00-12:00** | **Online system registration and check** ||
| **Thursday, 1 July** | **9:30-10:00** | **Access to the conference system** ||
| | **10:00-10:30** | **Conference opening** ||
| | **10:30-12:30** | **Plenary session** ||
| | **12:30-14:00** | **Lunch break** ||
| | **14:00-15:30** | **Oral 1** | **Oral 2** |
| | **15:30-16:00** | **Coffee Break** ||
| | **16:00-17:30** | **Oral 3** | **Oral 4** |
| | **18:00-20:00** | **Welcome Cocktail** ||
| **Friday, 2 July** | **9:00-10:30** | **Oral 5** | **Oral 6** |
| | **10:30-11:00** | **Coffee Break** ||
| | **11:00-12:30** | **Oral 7** | **Oral 8** |
| | **12:30-14:00** | **Lunch break** ||
| | **14:00-15:00** | **Poster 1 Remotely** ||
| | **15:00-16:00** | **Poster 2 Remotely** ||
| | **16:00-17:00** | **Poster 3 Remotely** ||
| **Saturday, 3 July** | **10:00-11:00** | **Poster 4 Remotely** ||
| | **11:00-12:30** | **Poster 5 Remotely** ||
| | **12:30-14:00** | **Lunch break** ||
| | **14:00-16:00** | **Participants' discussions on the conference topics** ||
| **Sunday, 4 July** | **10:00-16:00** | **Round tables and participants' discussions** <br><br> **Conference closing** ||

## Thursday, 1 July 2021

**10:00-12:30**                                                    **Hall A**

## CONFERENCE OPENING

**Chair: V. Lazarov Co-Chairman of ELMA2021**

**10:00 – 10:30   Welcome addresses**

**10:30 – 12:30   Plenary session**

**"Application prospects of high-temperature superconducting materials in magnetic systems of electromechanical devices"**
**Presented by *Pavel Kurbatov,***
***Co-authors:*** *Andrey Drozdov, Ekaterina Kurbatova, Egor Kuschenko*
*Russian Federation*

**"Induction machines in automotive applications - the example of Audi and Tesla"**
**Presented *by Robin Thomas,***
***Co-authors:*** *Hugo Husson, Lauric Garbuio, Laurant Gerbaud*
*France*

**"Tilos, a small Greek island full of green and sustainable energies"**
**Presented by *Gilles Notton***
***Author:*** *Gilles Notton*
*France*

**"Complex Engineering Systems Approach in Evaluating the Recent Energy Crisis in Texas"**
**Presented by *Martin Minchev***
***Author:*** *Martin Minchev*
*USA*

**12:30-14:00          Lunch Break**

# Thursday, 1 July 2021

**14:00-15:30**                                 **Oral Session - Hall A**

## Oral 1

### *Chairman: George Todorov*

**O1-1. Efficiency of synchronous motor with interior permanent magnets with included losses and nonlinear parameters of magnetic circuit**
   **Željko Hederic**, Venco Ćorluka, Miralem Hadžiselimović

**O1-2. Fault Diagnosis Modeling of Induction Machine**
   **Nikolay Djagarov**

**O1-3. Investigation of Thermoelectric Cooler System Effect on Induction Motor Performance**
   Murat Toren, **Hakki Mollahasanoglu**

**O1-4. Adaptive Controller for Induction Machine Direct Torque Control**
   Nikolay Djagarov, **Hristo Milushev**, Yuri Kononov, Julia Djagarova

**O1-5. Investigation of the Influence of Hysteresis on the Characteristics of Direct Torque Control of Induction Motor**
   Nikolay Djagarov, **Hristo Milushev**, Aleksandra Varganova, Julia Djagarova

**O1-6. Design of Non-Inductive Transformer With Capacitive Coupling Using Mutual Capacitance**
   **Necdet Kaan Onur**, Gokturk Poyrazoglu

**14:00-15:30**                                 **Oral Session - Hall B**

## Oral 2

### *Chairman: Ludmil Stoyanov*

**O2-1. Analysis and practical application of the regulatory requirements for coasts power stations in port complexes**
   **Rumen Kirov**, Ginko Georgiev

**O2-2. Analysis of the Energy Balance and Electric Consumption of Luxury Yacht for Charters**
   Ginka Ivanova, **Valentin Gyurov**

**O2-3. Insights Into the Urban Electric Transport System by Means of Comparative Analysis of Different Power Theories**
   **Nikola Makedonski**, Georgi Milev

**O2-4. Investigation of the Energy Losses of Supercapacitor Banks due to Self-Discharge**
    **Boris Evstatiev**, Dimcho Kiriakov

**O2-5. A "single component" approach for electronic units' reliability prediction**
    Toncho Papanchev, **Angel Marinov**, Julia Garipova

**O2-6. Adaptive Dynamic Braking Schemes to Damp Interarea and Subsynchronous Oscillations using Deep Reinforcement Learning**
    **Nikita Tomin**, Victor Kurbatsky, Alexey Iskakov

| 15:30÷16:00 | Coffee Break | Lobby |
|---|---|---|

| 16:00-17:30 | Oral Session - Hall A |
|---|---|

| Oral 3 |
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### *Chairman: Dimo Stoilov*

**O3-1. Analysis of short circuit currents in interface nodes of Kitka wind power park in Kosovo**
    Nuri Berisha, Petrit Kastrati, Gazmend Pula, **Dimo Stoilov**, Rad Stanev

**O3-2. Comparative Analysis of Alternatives for Bulgarian Energy System Development**
    **Kristina Hadzhiyska**, Dimitar Tonev, Kiril Angelov, Dimo Stoilov

**O3-3. Impedance determination of 400kV Overhead Lines of Kosovo Power System**
    Nuri Berisha, Genc Sejdiu, **Rad Stanev**, Dimo Stoilov

**O3-4. Water Storage Electric Power Plant with Controllable Suction Head**
    **Dimo Stoilov**, Georgi Stoilov, Sylvia Goranova

**O3-5. Reactive power of nonlinear sign – changing loads**
    **Dzhengiz Ibram**, Vultchan Gueorgiev

**O3-6. Power Quality Analyzers Calibration on Total Harmonics Distortion of Voltage and Current by Reference Square Waveform Signal and Algorithm for Measurement ang Processing**
    Plamen Tzvetkov, **Krasimir Galabov**, Andrey Serov, Ivan Kodjabashev

| 16:00-17:30 | Oral Session - Hall B |
|---|---|

## Oral 4

### *Chairman: Iliana Marinova*

**O4-1. Possibilities for Determining the Apparent Power Components When Ship Synchronous Generator is Operating**
   Vladimir Chikov, **Nikola Makedonski**, Georgi Milev, Borislav Cvetanov

**O4-2. Research on the impact of regulator functions of power transformers on power losses in electrical supply systems**
   **Rumen Kirov**, Ginko Georgiev

**O4-3. Case-study for HW accelerated FEA model for electrical machine control prototyping**
   **Richard B Szilagyi**, Adrienn Dineva

**O4-4. Construction of a three-dimensional thermal model of the stator of a turbogenerator taking into account gas dynamics**
   **Vitaly Ryzhov**, Oleg Molokanov, Pavel Dergachev, Sergey Osipkin, Ekaterina Kurbatova, Pavel Kurbatov

**O4-5. Design Variants Assessment Of Street LED Device Based On Virtual Prototyping**
   Georgi Todorov, **Konstantin Kamberov**, Hristo Vasilev, Tsvetozar Ivanov

**O4-6. Review and Conceptual Design of FPGA-based Application for Data-Driven Power Electronic Systems**
   **Adam Zsuga**, Adrienn Dineva

| 18:00-20:00 | Welcome Cocktail in the Lobby |
|---|---|

# Friday, 2 July 2021

**09:00-10:30**                            **Oral Session - Hall A**

## Oral 5

### *Chairman: Valentin Mateev*

**O5-1. A Wireless Power Transfer Method for Electric Vehicles by Synchronization to Secondary Resonance**
 **Mete Cesmeci**, Gokturk Poyrazoglu

**O5-2. Using MBSE for Operational Analysis of Power Converter for Electric Traction**
 **Nasr Guennouni**, Nadia Machkour, Ahmed Chebak

**O5-3. Mathematical analysis of PMIC for VRM applications**
 Filip Stoimenov, **Vladimir Dimitrov**

**O5-4. Quasi-Resonant Circuitry to Improve Heat Transfer and Efficiency in Induction Cookers**
 **Huseyin Kucukosman**, Gokturk Poyrazoglu

**O5-5. Single Phase PFC Topology Selection Based on Neuron Network Algortihms**
 **Angel Marinov**, Svetlozar Zahariev, Ivelin Ivanov, Svilen Simeonov

**O5-6. Slim Design of An LLC Resonant Converter by Using Toroidal Transformer for OLED TV**
 **Samet Kurt**, Gokturk Poyrazoglu

**O5-7. The Cooling System Of High-voltage Power Rectifier**
 **Ilia Kirillov**, Pavel Dergachev

**09:00-10:30**                            **Oral Session - Hall B**

## Oral 6

### *Chairman: Ivan Yatchev*

**O6-1. Essential frequencies in the characteristics of control systems, analytical definitions, correspondences and symmetries**
 **Emil Nikolov**

**O6-2. Research of LED dimming sources and lighting systems**
 **Iliyan Iliev**, Samet Isak, Hristian Panchev

**O6-3. Fuzzy Logic Control Design Based on the Genetic Algorithm for a Modular Servo System**
  Donka Ivanova, **Martin Dejanov**

**O6-4. Data Acuisition Board for Monitoring and Analys of Electrical and Non-electrical data on Board of a Vessel**
  **Nikolay Djagarov**

**O6-5. Educational set-up for brushless motor drives**
  Akin Uzel, Diego Zuidervliet, **Peter van Duijsen**

**O6-6. Some Opportunities to Improve the Learning Process of Students Based on Computer Simulations**
  **Ilona Iatcheva**

**O6-7. Teaching Field Oriented Control using Animation**
  **Peter van Duijsen**, Diego Zuidervliet

| 10:30÷11:00 | Coffee Break | Lobby |
|---|---|---|

| 11:00-12:30 | Oral Session - Hall A |
|---|---|
| Oral 7 | |

### Chairman: Zahari Zarkov

**O7-1. Carrying Out of Strength Tests of Geared Motor Box as Part of a Frequency-Controlled Traction Electric Drive**
  **Genadijs Kobenkins**, Marks Marinbahs, Vsevolod Burenin, Jaroslavs Zarembo, Olegs Sliskis

**O7-2. Carrying Out of Tests for the Functionality of the Traction Autonomous Drives in the Conditions of Industry and Serial Production**
  Ilja Dvornikovs, Marks Marinbahs, Olegs Sliskis, Karlis Ketners, **Genadijs Kobenkins**

**O7-3. Efficiency Optimization of Electric Drives with Full Variable Switching Frequency and Optimal Modulation Methods**
  **Timijan Velic**, Maximilian Barkow, David Bauer, Patrick Fuchs, Johannes Wende, Jan Nägelkrämer, Nejila Parspour

**O7-4. Induction Motor Simulink Implementation of the Rotor Flux Oriented Direct Vector Control Method for Electric Vehicles**
  **ilayda Demircioglu**, Gokturk Poyrazoglu

**O7-5. Modelling of regenerative braking**
  **Valentin Totev**, Vultchan Gueorgiev

**O7-6. Methodology for Forecasting of Energy Consumption in Trolleybus Transport with Probabilistics Indicators**
   **Valentin Gyurov**, Nikolay Bezhanov

**O7-7. Comparative Study of the Tesla Model S and Audi e-Tron Induction Motors**
   **Robin Thomas**, Hugo Husson, Lauric Garbuio, Laurent Gerbaud

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**11:00-12:30**                                        **Oral Session - Hall B**

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### Oral 8

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### *Chairman: Gilles Notton*

**O8-1. Comparison of Energy Management Strategies in a Microgrid with Photovoltaic/Battery System**
   Sarah Ouédraogo, **Ghuvan Antone Faggianelli**, Guillaume Pigelet, Jean Laurent Duchaud, Cyril Voyant, Gilles Notton

**O8-2. Power Transform of Solar Irradiation Time Series and Univariate Representation of Periodic AutoRegressive**
   Cyril Voyant, Gilles Notton, **Jean Laurent Duchaud**

**O8-3. A Concept for Flexible and Self-Adaptable Classification of ETIP SNET Technologies and Functionalities**
   Christina Papadimitriou, **Rad Stanev**, Venizelos Efthymiou

**O8-4. Advanced Machine Learning Approaches for State-of-Charge Prediction of Li-ion Batteries under Multisine Excitation**
   **Adrienn Dineva**

**O8-5. Renewable energy from two-stage anaerobic digestion of organic wastes**
   **Ivan Simeonov**

**O8-6. Distributed Siting of Wind Farms to Minimize Fluctuations in Generated Power**
   **Vladislav Shakirov**, Nikita Tomin, Victor Kurbatsky

**O8-7. Genetic Algorithm for Generation of PV Panel Curves From Datasheets**
   **Angel Marinov**, Svetlozar Zahariev, Ivelin Ivanov, Toncho Papanchev

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**12:30-14:00**                **Lunch Break**

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## Poster 1

### *Chairman: Zahari Zarkov*

**P1-1. Analysis of the Influence of NdFeB Permanent Magnet's Grade and Volume on the Characteristics of a PM Claw-pole Alternator**
   **Ivan Bachev**, Vladimir Lazarov, Zahari Zarkov

**P1-2. Application of ANN for forecsting of PV plant output power – Case study Oryahovo**
   **Ludmil Stoyanov**, Iva Draganovska

**P1-3. Automated LabVIEW measurement LLC System Control GUI**
   **Nikolay Hinov**, Tsveti Hranov

**P1-4. Assessment of the technical condition of electric contact joints using thermography**
   **Yavor Lozanov**

**P1-5. Determination of the Periodicity for Thermographic Tests of the Electrical Equipment**
   **Yavor Lozanov**, Svetlana Tzvetkova, Angel Petleshkov

**P1-6. Axial Magnetic Gear Harmonic Spectrum Analysis**
   Valentin Mateev, **Miglenna Todorova**, Iliana Marinova

**P1-7. Ferrofluid Break Modeling**
   Georgi Ivanov, **Miglenna Todorova**, Valentin Mateev, Iliana Marinova

**P1-8. Identification of moving lightning clouds using four-dimensional electromagnetic potential**
   **Atanas Chervenkov**

**P1-9. Electromagnetic field evaluation in building located close to high-voltage overhead line**
   **Atanas Chervenkov**

**P1-10. Induction Brazing Process Control**
   Dragomir Grozdanov, **Nikolay Hinov**

**P1-11. Integrated Biologically Effective Lighting and Heating Installation for Sport Facilities**
   Iva Petrinska, Dimitar Pavlov, **Dilyan Ivanov**

**P1-12. Interruptions of the Power Supply in Low Voltage Cable Networks**
   **Svetlana Tzvetkova**

**P1-13. Electric Power Quality Indicators in a Company Producing Power Electronics**
   **Svetlana Tzvetkova**, Angel Petleshkov, Yavor Lozanov

**P1-14. Magnetic Properties of 3D Printed Magnetic Materials**
   Martin Ralchev, **Valentin Mateev**, Iliana Marinova

**P1-15. Experimental Verification of Hertzian Contact Model for Electric Joints**
   Raina Tzeneva, **Valentin Mateev**, Martin Ralchev, Yanko Slavchev

**P1-16. Capacitance Analysis of Multilayer HTS Power Cable**
   Georgi Ivanov, **Valentin Mateev**, Iliana Marinova

**P1-17. Study of Faults and Power Outages in Power Distribution Grids**
   Mediha Mehmed-Hamza, Anton Filipov, **Milena Ivanova**

| 15:00-16:00 | Poster session - Remotely |
|---|---|

## Poster 2

*Chairman: Ivan Bachev*

**P2-1. Developing and Integration of New Modules for Web-based Education Platform**
   **Atanas Yanev**

**P2-2. Modeling of photovoltaic power plant electricity generation using machine learning methods**
   **Rad Stanev**, Tanyo Tanev

**P2-3. Modeling Tool For Determination Of The Available Energy In Battery Storage Systems**
   **Dimitar Arnaudov**

**P2-4. Study a Converter for Voltage Equalization of Energy Storage Systems**
   **Dimitar Arnaudov**

**P2-5. Open Source Electronic System for Controlling of Hybrid Electromagnetic Systems with Magnetic Flux Modulation**
   **Iosko Balabozov**, Ivan Yatchev, Dimitar Karastoyanov, Nikolay Stoimenov, Hartmut Brauer

**P2-6. Challenges of Online Laboratory Electrical Engineering Exercises**
   **Nikolina Petkova**, Snejana Terzieva

**P2-7. Influence of Magnet Dimensions on Torque Components and Cost of Synchronous Machine with Interior Magnets**
    **Zahari Zarkov**, Vladimir Lazarov, Tsvetomir Stoyanov, Ludmil Stoyanov

**P2-8. Arching Faults in Low-voltage Distribution Networks**
    Aleksey Kulikov, **Marina Rashevskaya**, Michail Tibrayev, Aleksey Gudoghnikov

**P2-9. Assessment and Analysis of the Reliability of Insulation System for High-Voltage Induction Motors Based on the Partial Discharge Level**
    Plamen Rizov, **George Todorov**

**P2-10. Comparison of Inductor Machines With Different Types of Excitation**
    **Ekaterina Kurbatova**, Egor Kuschenko, Timofey Zolotarev, Pavel Kurbatov

**P2-11. Comparison of Radial Forces between Double-Rotor Planetary and Coaxial Magnetic Gears**
    **Oleg Molokanov**, Elizaveta Konyushenko,  Eugene Zenko, Ekaterina Kurbatova, Nikolay Sabaykin, Pavel Kurbatov

**P2-12. Control Algorythm For Bidirectional Converters In The PV Power Supply System With Intelligent PV Modules**
    **Konstantin Kryukov**, Georgy Solovov, Nikolay Rodkin, Ekaterina Erokhina, Nikolay Baranov

**P2-13. Dependence of the load capacity of installation cables**
    **Nikolay Khrenkov**

**P2-14. Development of a system for measuring body temperature and access control**
    **Alexander Antipin**, Semen Astapchik, Ilya Balyasny, Andrey Lapin, Ekaterina Lapteva, Ilya Sorokin, Andrey Tolkachev

**P2-15. Study of the Parameters of an Autotransformer Discrete Alternating Voltage Regulators Considered as a Two-Port**
    Emil Panov, **Milena Ivanova**, Emil Barudov

**P2-16. Polymeric Composite Insulators for Overhead Power Lines. A Review of In-Service Damages and Diagnostic Approaches**
    Georgi Georgiev, **Milena Ivanova**, Rositsa Dimitrova, Yulian Rangelov

## Poster 3

*Chairman: Ludmil Stoyanov*

**P3-1. Modeling of Short-Term Electric Motor Load Power Supply Disturbances in the Matlab (Simulink) System**
Sergey Tsyruk, Nikolay Danilov, **Aleksandr Timonin**

**P3-2. Statistical approach for designing generic 18650 battery model**
**Szabolcs Kocsis Szürke**, Adreinn Dineva, Krisztián Horváth, István Lakatos

**P3-3. Using of HTS Materials in Construction of Linear Electric Vernier Machines**
Andrey Drozdov, Ekaterina Kurbatova, **Pavel Kurbatov**

**P3-4. Vernier Machine with Azimuthally Magnetized Permanent Magnets**
Elizaveta Konyushenko, Ekaterina Kurbatova, Nikolay Sabaykin, **Oleg Molokanov**, Pavel Kurbatov, Eugene Zenko

**P3-5. Voltage Stabilization in Current Inverters with Fully Controllable Switches**
**Ekaterina Mirgorodskaya**, Nikita Mityashin, Yuri Tomashevskiy, Yuri Golembiovsky, Ivan Artyukhov, Sergei Stepanov

**P3-6. Transient Processes with Starting of a Multi-pole Asynchronous Motor with a Fan on the Shaft**
Ivan Artyukhov, Sergey Stepanov, **Ekaterina Mirgorodskaya**, Nikita Mityashin, Artem Zemtsov

**P3-7. Application of Synchronous Machines' Models for Distance Learning Purposes**
**Ivan Bachev**, Ludmil Stoyanov, Vladislav Petrov, Emilia Hadjiatanasova-Deleva

**P3-8. Adapting Electrical Engineering Assessment for Online Learning**
**Ilonka Lilyanova**

**P3-9. Analysis of the Components of the Magnetic Field Intensity According to the Rotary Theory**
**Miroslava Doneva**, Vyara Vasileva

**P3-10. Investigating the Influence of an Electronic Device' Properties on Its Temperature Regime**
**Boris Evstatiev**, Nadezhda Evstatieva

**P3-11. A Realistic Virtual Lab for Investigation of Single-Phase Transformers**
**Boris Evstatiev**, Katerina Gabrovska-Evstatieva, Dimitar Trifonov

**P3-12. Small BEV Propulsion – Problems and Solutions**
  **Emil Sokolov**, Dilo Dilov, Yanko Takavidov

**P3-13. Study of linear generators with and without rotating permanent magnets in their stator windings**
  **Raycho Raychev**, Nikola Georgiev

**P3-14. Modeling of DC Motor Fed from Photovoltaic Panel**
  **Dimitar Spirov**

**P3-15. Investigation of the possibilities for application of a basis-power model in analysing the energy efficiency of type I fluid systems**
  **Ognyan Dinolov,** Lyudmil Mihaylov, Katerina Ilieva, Plamena Dinolova

**P3-16. Adapted Algorithm and Web-Developed Software Tool for Basis Power Analysis Using Gravity-Based Model**
  **Ognyan Dinolov**, Katerina Ilieva, Lyudmil Mihaylov, Plamena Dinolova

**P3-17. Methodology for determining the socio-economic factors in the performance of Cost-Benefit Analis for the production of electricity from biomass**
  **Kiril Anguelov,** Kalina Kavaldzhieva

**P3-18. Methodology for effectiveness in applying for grant funding for energy effectiveness of enterprises**
  **Kiril Anguelov,** Miglena Angelova

# Saturday, 3 July 2021

**10:00-11:00**                    **Poster session - Remotely**

## Poster 4

*Chairman: Iosko Balabozov*

**P4-1. A Comparison of Drain-Source Voltage Characteristics for Active and Conventional Gate Control Circuits**
   **Svetoslav Ivanov**, Yanka Ivanova

**P4-2. A Comparison Study of Decisions for Computer Network Laboratory in Distant Learning Education**
   **Aydan Haka,** Veneta Aleksieva, Hristo Valchanov

**P4-3. Active Learning for Teaching "Synthesis and Analysis of Counters" in the Course "Digital Electronics"**
   Adriana Borodzhieva, **Ivanka Tsvetkova**, Dimitar Dimitrov

**P4-4. Air Object Detection Using Pulsar FSR**
   Hristo Kabakchiev, **Ivan Garvanov**, Vera Behar, Dorina Kabakchieva, Avgust Kabakchiev, Herman Rohling, Mark Bentum, Jorge Fernandes

**P4-5. An Analysis of the Impact of the Squirrel-Cage Rotor Faults on the Electromagnetic Torque**
   **Maik Sreblau**, Marin Marinov, Ivan Rusev

**P4-6. Analysis of the Global Solar Radiation and Solar Energy in Ruse, Bulgaria**
   Alexandra Boyadzhieva, Todor Yordanov, **Nicolay Mihailov**, Katerina Evstatieva

**P4-7. Application of Active Methods in Learning the Topic of Diode Limiters Circuits**
   **Ivanka Tsvetkova**, Adriana Borodzhieva

**P4-8. Application of an Inductive Power Transfer System for Charging Modern Electric Vehicles**
   **Dobroslav Dankov**

**P4-9. Comparative Analysis in Parameter Identification of a DC Motor With Independent Excitation**
   Reneta Parvanova, **Mariyana Todorova**

**P4-10. Comparative Assessment of Hybrid PV-Hydrogen Plant: A Case Study for Bulgaria**
   **Viktor Garbev**

**P4-11. Comparision of Failure Rates and Reliability of Power Semisonductors in Power Electronic Devices using Using Methods MIL-HDBK-217F and FIDES**
   Prodan Prodanov, **Dobroslav Dankov**

**P4-12. Conceptual Model of a Remote Laboratory for Investigation of DC Motors**
   Teodor Nenov, Boris Evstatiev, **Seher Kadirova**

**P4-13. Design, Realization and Study of Low Temperature Thermoelectric Refrigerator of Covid-19 Vaccine**
   **Ivaylo Belovski**, Kaloyan Ivanov, Analoliy Aleksandrov

**P4-14. Determining the Efficiency of an Electric Oven in the Grill Heating Mode**
   **Yanita Slavova**

**P4-15. Experimental Determination of The Factors Affecting The Technological Process of Separation With Permanent Magnets**
   **Tatyana Dimova**

**P4-16. Express Method for Thermodynamic Diagnostics of Volumetric Hydraulic Systems with Rotary Machines in Operating Conditions**
   **Petko Petkov**, Peycho Tomov, Bohos APRAHAMIAN

**P4-17. Impact of Hydroxy Gas for $CO_2$ Emission Reduction in Diesel Car Engine**
   Mihail Simov, Kalin Nikolov, **Maik Sreblau**

**P4-18. Implemented PLC System Controlling the Cleaning of Heat Exchangers in the Extraction of Heat Energy from Geothermal Water**
   **Veselin Vasilev**, Bohos Aprahamian

**11:00-12:30**                               **Poster session - Remotely**

## Poster 5

*Chairman: Zahari Zarkov*

**P5-1. Investigation of Digital Protection Relay For Three-Phase Induction Motor**
   **Tatyana Dimova**

**P5-2. Magnetoelectric Structure for Energy Harvesting**
   **Roman Petrov**, Viktor Leontiev, Evgeni Kuzmin, Mirza Bichurin, Alena Petrova, L.A. Nemtsev, Slavcho Bozhkov, Ivan Milenov, Penko Bozhkov

**P5-3. Mathematical Modelling of the Impact of Operational Factors on the Energy Efficiency of an Induction Hob**
  **Yanita Slavova**, Mariya Marinova

**P5-4. Method for Body Pose Recognition based on Two-Finger Touch Bezel on Wearable Device**
  Yuri Dimitrov, **Veneta Aleksieva**, Hristo Valchanov

**P5-5. Methodical Aspects of the Analysis of Non-Harmonic Periodic Signals in Linear Two-Port Circuits**
  **Hristo Zhivomirov**, Ilonka Lilyanova

**P5-6. Modeling of Hybrid System with Photovoltaic Panels-Fuel cells Generation and Hydrogen Storage Using Electrolyzer**
  **Ludmil Stoyanov**

**P5-7. New Approach for Smart Cities Transport Development Based on the Internet of Things Concept**
  **Ivan Garvanov**, Magdalena Garvanova

**P5-8. New Time Indices for the Operational Reliability Assessment Regarding Electronic Items**
  **Julia Garipova**, Anton Georgiev, Toncho Papanchev

**P5-9. Numerical Examination of the Performance of an Electrohydraulic System With Discrete Control**
  **Dragiya Yanulov**

**P5-10. Optimization of Switching Performance of Power MOSFET with Active Driver with dv/dt Feedback**
  **Svetoslav Ivanov**, Yanka Ivanova

**P5-11. Photovoltaic System for LED Lighting Based on Bidirectional Cuk-converter – Computer Research**
  **Hristo Antchev**, Anton Andonov, Kostadin Milanov

**P5-12. Project-Based Learning in the Topic of Harmonic Oscillators of Clapp**
  **Ivanka Tsvetkova**, Adriana Borodzhieva

**P5-13. PSS/E Based Subsynchronous Resonance Analysis Tool**
  **Nikolay Nikolaev**, Konstantin Gerasimov, Yulian Rangelov, Ara Panosyan, Ngoc Tuan Trinh

**P5-14. Regression Model of a Thermoelectric Generator Based on Peltier Modules**
  **Ivaylo Belovski**, Kaloyan Ivanov, Analoliy Aleksandrov, Irina Aleksandrova

**P5-15. Simulation Environment for Research of Algorithms for Traffic Prioritisation in ZigBee Network**
  **Aydan Haka**, Veneta Aleksieva, Hristo Valchanov

**P5-16. Study and Analysis of Efficiency of Recuperative Energy Utilization in Ground Urban Electric Transport**
   Georgy Pavlov, **Lyubomir Sekulov**

**P5-17. Study of the Power Modes of Skoda Solaris 26Tr and 27Tr Trolleybuses**
   **Ilko Tarpov**, Martina Tomcheva

**P5-18. Thermodynamic Modelling of the oil Tank as a Subsystem in Hydraulic Power Drives**
   Peycho Tomov, **Dragiya Yanulov**, Petko Petkov

**P5-19. Investigation of the influence of current harmonics generated by crane systems on some parameters of the power supply systems**
   **Neli Simeonova**, Mladen Proykov

**P5-20. Research, analysis and rationalization of the operating regimes of the power supply system of K.K. "Sunny Beach"**
   **Neli Simeonova**, Mladen Proykov

**P5-21. Study of the electricity efficiency in the implementation of an energy management system in an industrial site of the electrical industry**
   **Neli Simeonova**, Mladen Proykov, Stanislav Simeonov

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| **12:30-14:00** | **Lunch Break** |

**14:00-16:00**

**Participants' discussions on the conference topics**

# Sunday, 4 July 2021

**10:00-16:00**

**Round tables and participants' discussions**

**Conference closing**