

**FOURTEENTH INTERNATIONAL CONFERENCE
ON ELECTRICAL MACHINES,
DRIVES AND POWER SYSTEMS**

40th anniversary of

ELMA 2015

1975-2015

PROGRAMME

**2 – 3 October 2015
Varna, BULGARIA**

**FOURTEENTH INTERNATIONAL CONFERENCE
ON ELECTRICAL MACHINES,
DRIVES AND POWER SYSTEMS**

ELMA 2015

2-3 October 2015, Varna, Bulgaria

Organized by:

Technical University of Varna

Union of Electronics, Electrical Engineering and Telecommunications (CEEC) –

EUREL member

Technical University of Sofia, Bulgaria

University of Rousse, Bulgaria

**Under the patronage of the Rector
of the Technical University of Varna**

PROGRAMME

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CONFERENCE VENUE

**Fourteenth International Scientific Conference on Electrical Machines, Drives and Power Systems
ELMA 2015 will be held in Varna, in the Technical University of Varna and Varna Municipality**
Conference site: <http://elma.vtp-tuv.com>
e-mail: elma@vtp-tuv.com

TIME-TABLE

Day	Time	Varna Municipality
Friday, 2 October	9:00	Registration
	10:00-11:30	Plenary Session (Plenary Hall)
	11:30	Coffee Break
	13:00-16:00	Round Table (Varna Hall)
	19:00	Conference Dinner (Restaurant of Varna Municipality)

Day	Time	Hall 1	Hall 2	Hall 3	Hall 4	Lobby
Saturday 3, October	9:00-11:00	EMT	PEM, EMN	RES EE	CS	PS1 PS2
	11:00- 11:30	Coffee Break				

SESSIONS AND HALLS

Electrical Machines and Transformers	EMT
Control Systems, Electrical Drives, Robotics and Mechatronics	CS
Power Electronics and Microelectronics	PEM
Renewable Energy Sources	RES
Energy Efficiency and Power Quality	EE
Electrotechnology, Micro and Nanoengineering, Monitoring and Diagnostics	EMN
Posters	PS
Hall 1	Hall 814, EF
Hall 2	Hall 815, EF
Hall 3	Hall 701, EF
Hall 4	Hall 202, EF

PROGRAMME
FOURTEENTH INTERNATIONAL CONFERENCE
ON ELECTRICAL MACHINES,
DRIVES AND POWER SYSTEMS

Friday, 2 October

09:00

Registration
Municipality Varna

PLENARY SESSION

Friday, 2 October

Plenary Hall – Municipality Varna

10:00

Chairman: Bohos Aprahamian

1. ELMA CONFERENCE – BRIEF HISTORY

Bohos Aprahamian

2. ELECTRICAL MACHINES DEVELOPMENT IN TU – SOFIA DURING 20-TH AND 21-ST CENTURY

Vladimir Lazarov

3. MODERN APPROACHES TO CALCULATION AND ANALYSIS OF ELECTRICAL MACHINES

Gancho Bojilov

COFFEE BREAK

Friday, 2 October

11:30

ROUND TABLE

Friday, 2 October

Varna Hall – Municipality Varna

13:00 – 16:00

CONFERENCE DINNER

Friday, 2 October

Restaurant of Varna Municipality

19:30

ELECTRICAL MACHINES AND TRANSFORMERS

Saturday, 3 October
Conference Hall – 814 EF
09:00

Chairman: Vladimir Lazarov

1. THE APPLICATION OF FINITE ELEMENT METHOD FOR DETERMINING THE THD IN THE ELECTROMOTIVE FORCE IN A SYNCHRONOUS MACHINE WITH PERMANENT MAGNETS UNDER DIFFERENT LOADS
Plamen Rizov, Radoslav Spasov, Tsvetomir Stoyanov, Victor Zahariev
2. HYBRID DIVERTER SWITCH
Nikolay Gourov
3. ANALYTICAL MODEL FOR SIZING THE MAGNETS OF PERMANENT MAGNET SYNCHRONOUS MACHINES
George Todorov, Bozhidar Stoev
4. INVESTIGATIONS OF SINGLE-PHASE COLLECTOR MOTOR DRIVE SYSTEM WITH SOFT-SWITCHED QUASI RESONANT DC LINK INVERTER
Dimitar Spirov, Milko Dochev
5. ELECTRIC CAR PROPULSION WITH INDUCTION MOTOR
Dilo Dilov, Emil Sokolov
6. RESULTS OF TEST OF NEW TYPE OF SYNCHRONOUS GENERATOR MULTIFUNCTIONAL PROTECTION DEVICE
Dimitar Bogdanov, Nelly Harizanova
7. OPTIONS FOR TEST OF ELECTRICAL PROTECTIONS WITHOUT TAKING THE PROTECTED OBJECT OUT OF OPERATION
Dimitar Bogdanov

11:00-11:30 COFFEE BREAK

Saturday, 3 October

**POWER ELECTRONICS AND MICROELECTRONICS
ELECTROTECHNOLOGY, MICRO AND NANOENGINEERING**

**Saturday, 3 October
Hall 815 Faculty of Electrical Engineering
9:00**

Chairman: Maria Marinova

1. RESEARCH OF SERIAL INVERTER WITH REVERSE DIODES FOR INDUCTION MELTING OF METALS
Rumen Dimitrov Karov, Daniel Rumenov Karov, Dimitar Ivanov Kukurigov
2. OVERVIEW AND EVALUATION ON TECHNIQUES FOR MEASUREMENT OF POWER LOSSES IN ELECTRONIC SWITCHES FOR POWER ELECTRONIC CONVERTERS
Emil Ganchev Rosenov
3. COMPUTER AND EXPERIMENTAL SET-UP FOR EVALUATION OF POWER LOSSES IN MOSFETS AND IGBTs
Angel Marinov, Emil Rosenov, Dimitar Kovachev
4. OPPORTUNITIES FOR APPLICATION OF ELECTROTECHNOLOGICAL METHODS WHEN PROCESSING VEGETABLE OILS
Vladimir Georgiev Todorov, Bohos Rupen Aprahamian, Hristofor Petkov Tahrilov

11:00-11:30 COFFEE BREAK

Saturday, 3 October

RENEWABLE ENERGY SOURCES, MONITORING AND DIAGNOSTICS
ENERGY EFFICIENCY AND POWER QUALITY

Saturday, 3 October
Hall 701 Faculty of Electrical Engineering
9:00

Chairman: Ljubomir Dimitrov

1. COMPENSATION OF WIND POWER FLUCTUATIONS IN AN AUTONOMOUS HYBRID SYSTEM COMPRISING A WIND GENERATOR AND MICRO GAS TURBINES
Hristiyan Kanchev, Bruno François, Zahari Zarkov, Ludmil Stoyanov, Vladimir Lazarov
2. STUDY OF A POSSIBILITY TO MONITOR THE ENERGY EFFICIENCY IN MARINE POWER SYSTEMS
Dimitar M. Dimitrov, Petko D. Petkov
3. POSSIBILITIES FOR IMPROVEMENT OF ENERGY EFFICIENCY ACCORDING TO QUALITY OF ELECTRICAL ENERGY IN SHIPBOARD POWER SYSTEMS WITH THE USE OF INDEX EEDI
Ginka Ivanova
4. STUDY OF THE CONTENTS AND THE SHARE OF ABNORMAL HARMONICS, DUE TO WORK OF THE POWER CONVERTERS
Rumen Kirov, Vladimir Chikov, Nikola Makedonski, Ginka Ivanova, Ilian Iliev
5. ASSESSMENT OF TECHNICAL STATE OF POWER TRANSFORMERS THROUGH CONTINUING OPERATION
Ljubomir Dimitrov, Stefka Kanturska, Todor Penev
6. SOME STUDIES ON THE ENERGY CHARACTERISTICS OF DRIVERS FOR LED
Mincho Peev, Dimitar Dimitrov
7. STUDY ON SOME NEW INDICES FOR ELECTRICAL POWER QUALITY IN INDUSTRIAL ELECTRICAL DISTRIBUTION NETWORKS WITH THE USE OF POWER MEASUREMENT AND CONTROL SYSTEMS
Valentin Gyurov
8. STUDY ON REACTIVE POWER COMPENSATION AND HARMONIC FILTERING WITH PHYSICAL LABORATORY MODEL
Valentin Gyurov
9. COMPARATIVE ANALYSIS OF THE INFLUENCE OF EXPLOITATION PARAMETERS ON THE ENERGY EFFICIENCY OF ELECTRIC HOT PLATES
Yanita Slavova, Marinova Mariya
10. ENERGY EFFICIENCY IN CAPACITIVE LOADS COMPENSATION
Vultchan Gueorgiev, Plamen Rizov

11:00-11:30 COFFEE BREAK

Saturday, 3 October

POSTER SESSION 1

Saturday, 3 October
Lobby - Faculty of Electrical Engineering
09:00

Chairman: Maik Streblau

1. STUDY OF THE ELECTROMAGNETIC CHARACTERISTICS OF SYNCHRONOUS GENERATOR BY REPLACEMENT OF EXCITATION WINDING WITH PERMANENT MAGNETS
Marin Marinov, Maik Streblau, Todor Penev, Bohos Aprahamian
2. ONE APPROACH TO DETERMINATE THE TERMINALS OF THE STATOR WINDING OF THREE-PHASE AC MOTORS
Maik Streblau
3. INFLUENCE OF AIR GAP ON THE LOSSES AND EFFICIENCY OF SALIENT AND NON-SALIENT POLE SYNCHRONOUS HYDRO GENERATORS
Dimitar Sotirov, Valentin Filipov, Angel Bahchevanski
4. COMPARATIVE ANALYSIS OF SOFTWARE PRODUCTS FOR CREATING THERMAL MODELS AND ANALYSIS OF THERMAL PROCESSES IN THE COMMUTATOR MOTORS
Vasil Tepedelenev, Bohos Aprahamian, Marin Marinov
5. REALTIME FPGA IMAGE PROCESSING AND ROBOTIC NAVIGATION
Rosen Spirov, Neli Grancharova, Georgi Angelov
6. MODEL SCHEME OF THE EARTHING SYSTEM OF ELECTRICAL POWER SUBSTATIONS FOR WAVE PROCESSES STUDY
Margreta Vasileva, Rositsa Dimitrova, Marinela Yordanova, Milena Ivanova
7. SIMULATION MODELING OF THE EMERGING AND LIMITATION OF THE ATMOSPHERIC SURGES IN 110 KV ELECTRICAL SUBSTATIONS
Neli Velikova
8. ELECTRICAL SAFETY ASSESSMENT AT EARTH FAULT PROTECTION SETTING IN MEDIUM VOLTAGE ELECTRICAL NETWORKS
Marinela Yordanova, Mediha Mehmed-Hamza
9. CONTROL END ENERGY EFFICIENCY OF THE SYSTEM FOR INTELIGENT MEASUREMENT, REGISTERING AND CONTROL IN ELECTRICAL SUBSTATION
Rosen Vasilev, Vladimir Chikov, Valentin Gyurov, Ivaylo Nedelchev
10. THERMAL POWER GENERATORS IN OPTIMIZATION OF RESIDENTIAL SOLAR HOT WATER SYSTEM
Alexander Gaydardzhiev, Todor Penev, Izabel Mateva
11. INVESTIGATION CHARACTERISTICS OF DC-DC CONVERTER WITH OPTOCOUPERS
Cvetelina Velikova, Alexander Savov
12. WIND TURBINE EMULATOR WITH DC MOTOR DRIVE
Zahari Zarkov, Valentin Milenov

13. MODELLING THE ELECTRIC FIELD BETWEEN A POINT-TO-WORKING CHAMBER ELECTRODE SYSTEM FOR PRE-SOWING TREATMENT OF SEEDS OF VEGETABLE CROPS
Kiril Sirakov
14. OPTIMIZATION OF THE STRUCTURE OF A LABORATORY CHAMBER FOR PRE-SOWING ELECTROMAGNETIC TREATMENT OF THE SEEDS OF VEGETABLE CROPS
Kiril Sirakov
15. VOLT-AMPERE CHARACTERISTICS AND APPLICATION OF A PLASMOTRON WORKING WITH PLASMA FORMING GASES WATER STEAM AND AIR
Bojidar Dyakov, Bohos Aprahamian
16. EXPERIMENTAL STUDY ON PIPELINE CLEANING FROM DEPOSITS WITH ELECTRICAL DISCHARGES IN WATER
Lyubomir Dankov
17. SOME PROBLEMS IN THE HEAT TREATMENT OF GLASSWARE IN RESISTIVE ELECTRIC FURNACES
Nadezhda Tsvetkova
18. INVESTIGATION ON PLASMA-AIDED SURFACE FINISHING OF EUROPEAN WHITE PINE (PINUS SYLVESTRIS) BY XPS-ANALYSIS
Ivaylo Ivanov, Dyliana Gospodinova, Peter Dineff
19. DESIGN OF CYLINDRICAL INDUCTORS FOR SURFACE HARDENING OF STEEL DETAILS THROUGH THE USE OF HIGH FREQUENCY INDUCTION SYSTEM
Strahil Atanasov, Bohos Aprahamian, Todor Penev
20. APPLICATION OF THE MAGNETIC FIELD IN SEPARATION OF BIOLOGICAL PRODUCTS
Tatyana Dimova, Maria Marinova, Bohos Aprahamian, Maik Streblau

11:00-11:30 COFFEE BREAK

Saturday, 3 October

**CONTROL SYSTEMS, ELECTRICAL DRIVES, ROBOTICS AND
MECHATRONICS**

Saturday, 3 October
Conference Hall – 202 EF
09:00

Chairman: Emil Marinov

1. THEORETICAL ANALYSIS OF A POLARIZATION FLOW METER WITH A CIRCULAR CROSS SECTION WHILE TAKING THE PIPE THICKNESS INTO ACCOUNT
Andrey Dimitrov Andreev
2. EXPLORATION OF THE POSSIBILITIES FOR ANALYSIS OF NON-LINEAR ELECTRIC CIRCUITS WORKING AT DC REGIMES USING VARIATIONAL APPROACH
Miroslava Grisheva Doneva, Vyara Yordanova Vasileva
3. EXPLORATION OF THE POSSIBILITIES OF THE VARIATIONAL APPROACH FOR ANALYSIS OF TRANSIENT PROCESSES IN ELECTRIC CIRCUITS
Emil Ivanov Panov, Miroslava Grisheva Doneva
4. ADAPTIVE VECTOR CONTROL OF PERMANENT MAGNET SYNCHRONOUS MOTOR
Emil Marinov, Tsvetomir Todorov, Zhivko Zhekov, Nikolay Petkov
5. SENSORLESS VECTOR CONTROL OF INDUCTION MOTOR
Zhivko Zhekov

11:00-11:30 COFFEE BREAK

Saturday, 3 October

POSTER SESSION 2

Saturday, 3 October
Lobby - Faculty of Electrical Engineering
09:00

Chairman: Yanita Slavova

1. MODERNIZING THE EXCITATION SYSTEMS OF SYNCHRONOUS GENERATORS OF BULGARIAN MERCHANT FLEET SHIPS
Todor P. Lazarov
2. LED LAMP WITH LUMINOUS FLUX RESEMBLING THE SOLAR RADIATION'S SPECTRAL DISTRIBUTION
Petko Mashkov, Berkant Gyoch, Rostislav Kandilarov, Hristo Beloiev, Tamara Pencheva
3. METHOD FOR LED LAMPS' SPECTRAL CHARACTERISTICS CONTROL
Petko Mashkov
4. MULTIFUNCTIONAL LED MODULE FOR POULTRY LIGHTING
Petko Mashkov, Berkant Gyoch, Tamara Pencheva, Hristo Beloiev, Rostislav Kandilarov
5. OPPORTUNITIES FOR USING PHOTOVOLTAIC POWER STATIONS TO ROAD TUNNELS
Angel Pachamanov, Borislav Pregyov, Stoyan Petrov, Peter Stoev
6. PROPAGATION OF ELECTROMAGNETIC WAVES BETWEEN WIRELESS SENSOR NODES IN ONE CORRIDOR
Zlatan Ganev, Sava Savov
7. OUTDOOR PROPAGATION OF ELECTROMAGNETIC WAVES BETWEEN WIRELESS SENSOR NODES
Zlatan Ganev
8. DIGITAL LIGHT MODULATOR AND DETECTOR UNITS
Peycho Popov
9. STUDY OF ASTIGMATIC FOCUS CORRECTION METHOD IN OPTICAL DISCS HEADS
Berkant Gyoch
10. SOME PROBLEMS IN TEACHING ON THEORETICAL ELECTRICAL ENGINEERING IN TECHNICAL UNIVERSITY OF SOFIA
Simona Petrakieva
11. ON THE DEFINITION OF METHODICALLY SWITCHING BY MONGE PROJECTION TO AXONOMETRY
Aleksandrina Bankova
12. METHODOLOGY FOR CONSTRUCTION OF PLANES SECTIONS OF UNITS IN THE METHOD OF PLANES AUXILIARY SEKULA. CONIC SECTIONS
Aleksandrina Bankova