

**XXIV-th International Symposium on
Electrical Apparatus and Technologies**

SIELA 2026



PROGRAMME

14 - 17 June 2026

**Hotel Bulgaria
Bourgas, Bulgaria**

SIELA 2026 is organized by:



Union of Electronics, Electrical Engineering and Telecommunications (CEEC)



IEEE Bulgaria Section

SIELA 2026 is supported by:

- **Technical University of Sofia (within Days of Science of the Technical University of Sofia)**
- **Technical Universities of Varna and Gabrovo**
- **Federation of Scientific and Technical Unions**
- **House of Science and Technology – Plovdiv**
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Notes

- Oral presentations – up to 15 min including discussions (laptop and multimedia projector available)
- Invited paper presentations – up to 30 min including discussions
- Poster size: 0.8×1.2 m
- Oral Sessions O4 and O5 will be presented online. All other sessions will be in person.

Venue

The symposium will be held in the Conference Center of Hotel Bulgaria.

Information and registration desk

The Information and Registration desk will be open at Hotel Bulgaria as follows:

- Sunday, 14 June - from 17:00 to 19:00
- Monday, 15 June - from 8:30 to 16:00
- Tuesday, 16 June - from 8:30 to 13:00

Phones: (+359) 896 803 915; (+359) 882 270099

Symposium dinner

The Symposium Dinner will be in restaurant “Bulgaria” on Monday, 15 June 2026.

Cultural programme

Excursion to Begliktash – Wednesday, 17 June

SIELA 2026 General Schedule

Day	Hour	Event
Sunday 14 June	17:00 - 19:00	Registration
	19:00 - 20:00	Welcome Cocktail
Monday 15 June	9:00 - 10:30	Opening Session
	10:30 - 11:00	Invited papers 1
	11:00 - 11:30	Coffee Break
	11:30 - 13:00	Oral Session O1
	13:00 - 14:00	Lunch
	14:00 - 16:00	Oral Session O2
	16:00 - 16:30	Coffee Break
	16:30 - 18:00	Poster Session P1
	18:00 - 19:00	Oral Session O3
	19:30	Symposium Dinner
Tuesday 16 June	9:00 - 9:30	Invited Papers 2
	9:30 - 11:00	Oral Session O4 (online)
	11:00 - 11:30	Coffee Break
	11:30 - 13:00	Poster Session P2
	13:00 - 14:00	Lunch
	14:00 - 16:00	Oral Session O5 (online)
	16:00 - 16:30	Coffee Break
	16:30 - 18:00	Poster Session P3
	18:00 - 18:30	Closing Session
Wednesday 17 June	8:30 - 12:30	Excursion

INVITED PAPERS 1

Monday, 15 June, 10:30 - 11:00

- I1-1** *Noureddine TAKORABET*
About air transportation electrification and reduction of greenhouse gas emissions *France*

ORAL SESSION O1

Monday, 15 June, 11:30 - 13:00

- O1-1** *Decebal MIGHIU, Radu-Dumitru PENTIUC, Raluca-Maria ȚÂBULEAC, Pavel ATĂNĂSOAE*
Current status of implementation of the requirements of EU Regulation 573/2024 in the field of medium voltage electrical distribution *Romania*
- O1-2** *Silvia ROSCIOLI, Valentin MATEEV, Amedeo AMORESANO, Luigi Pio Di NOIA, Iliana MARINOVA*
Mesh density optimization of coaxial magnetic gear *Italy, Bulgaria*
- O1-3** *Enis Baris BULUT*
Automated Coupled Inductor Design Framework for Multi-Phase Multi-Level Power Converters *Turkey*
- O1-4** *Enis Baris BULUT*
Predictive Modeling of Common-Mode Noise in Multi-Level Totem-Pole PFC Converters *Turkey*
- O1-5** *Dimitar MINCHEV*
Dynamic random access memory testing framework for legacy memory chips using microcontroller-based address bus control *Bulgaria*
- O1-6** *Dimo STOILOV, Kristina HADZHIYSKA*
The role of artificial intelligence in modern strategic energy planning *Bulgaria*

ORAL SESSION O2

Monday, 15 June, 14:00 - 16:00

- O2-1** *Ivanka STAMOVA, Gani STAMOV, Trayan STAMOV*
Impulsive control approach for robust practical stability of discrete Cohen-Grossberg neural networks *USA, Bulgaria*
- O2-2** *Martin DIMITROV, Pavel ANDREEV, Bohos APRAHAMIAN*
Application of reliable technology for connecting conductive parts to achieve better electrical connections *Bulgaria*

O2-3	Nikolay DJAGAROV, Dobromir GATYAZHEV Mathematical model of a synchronous generator loaded with an asymmetrical load	Bulgaria
O2-4	Nikolay DJAGAROV, Dobromir GATYAZHEV Simulation of processes in synchronous generator loaded with an asymmetrical load	Bulgaria
O2-5	Valentin TOTEV, Vultchan GUEORGIEV Power quality of Bulgarian low voltage networks. A case study	Bulgaria
O2-6	Valentin TOTEV, Vultchan GUEORGIEV Transcritical carbon dioxide refrigeration systems: review	Bulgaria
O2-7	Stoyan STOYANOV, Vultchan GUEORGIEV Digital platform for collecting, aggregating and processing of hybrid inverter data	Bulgaria
O2-8	Iliyan DONEV, Ivajlo BAKALOV, Dimitar DIMITRAKIEV, Ginka IVANOVA, Galin SEGOV Improving the ship's energy efficiency management plan by forecasting energy needs based on references for large consumers	Bulgaria

POSTER SESSION P1

Monday, 15 June, 16:30 - 18:00

P1-1	Petar MIHOV, Bohos APRAHAMIAN Feasibility review for 15-20 MW direct-drive offshore wind generators: PMDD and REBCO-HTS rotor-field machines	Bulgaria
P1-2	Petar MIHOV, Bohos APRAHAMIAN Resonance vulnerability analysis: The Black Sea wave structure intersection for 15 MW class offshore wind generators	Bulgaria
P1-3	Tatyana DIMOVA, Bohos APRAHAMIAN, Marin T. MARINOV Comparison of basic constructions of electrotechnological devices for processing water with magnetic field	Bulgaria
P1-4	Rosen DIMITROV, Marin MARINOV, Marin MARINOV Optimization and Loss-Constrained Validation of Magnetic B-H Models for a Three-Phase Inductive System	Bulgaria
P1-5	Rosen DIMITROV, Marin MARINOV, Georgi ZHELEV FEM-assisted Calibration of an experimentally extracted steel plate B-H curve in a three-phase split-phase inductor	Bulgaria
P1-6	Georgi ZHELEV, Rosen DIMITROV, Elitsa DAMYANOVA Modeling and experimental investigation of the airflow of a Savonius - type wind turbine model	Bulgaria
P1-7	Hristina GANCHEVA, Vencislav VALCHEV Ferrites in power electronics - comparative study and applications	Bulgaria
P1-8	Angelina DIMITROVA, Boyan KARAMILEV, Hristina GANCHEVA Quantitative validation of ultrasound imaging accuracy using a medical phantom under thermal stress	Bulgaria
P1-9	Boyan KARAMILEV, Angelina DIMITROVA, Hristina GANCHEVA Reliability assessment of smart traffic camera included in intelligent transportation systems using FMEA and FIDES	Bulgaria
P1-10	Miroslava DONEVA, Emil PANOV Modified variational approach with transferring coefficients for analysis of linear magnetic circuits	Bulgaria

P1-11	Miroslava DONEVA, Emil PANOV Modified variational approach with transferring coefficients for analysis of non-linear magnetic circuits	Bulgaria
P1-12	Emil PANOV, Miroslava DONEVA On some aspects of the application of the modified variational approach with transferring coefficients for analysis of electric circuits	Bulgaria
P1-13	Maik STREBLAU, Lyubomir KOLEV, Marin T. MARINOV Comparative spectral analysis of instantaneous power components for broken rotor bar detection in induction motors	Bulgaria
P1-14	Ivan KOLEV, Yanita SLAVOVA Control of permanent magnet synchronous motors for unmanned aerial vehicles	Bulgaria
P1-15	Yanita SLAVOVA About the energy consumption of a pyroceramic cooking hob	Bulgaria
P1-16	Svilen SIMEONOV, Tsvetomir ZHELEV Trends for successful technological and product commercialization within the Bulgarian electrical household appliance market	Bulgaria
P1-17	Svilen SIMEONOV Application of the HAZOP methodology for identifying risk in the development of start-ups in high-technology power electronics solutions	Bulgaria
P1-18	Iliyan ILIEV, Ivan GRIGOROV, Reneta PARVANOV, Elena VASILEVA, Desislava MIHAYLOVA Analytical modeling, Jacobian and energy optimization of the autonomous navigation of the mobile robot Maqueen Plus	Bulgaria
P1-19	Iliyan ILIEV, Desislava MIHAYLOVA Trajectory optimization and stochastic filtering applied to the Maqueen Plus autonomous navigation	Bulgaria
P1-20	Reneta PARVANOV, Ivan GRIGOROV, Mariyana TODOROVA, Iliyan ILIEV, Pavel DIMITROV Comparative analysis in servo system parameter identification	Bulgaria

ORAL SESSION O3

Monday, 15 June, 18:00 - 19:00

O3-1	Ruzhin VELKOV, Veselina JECHEVA A comparative review of ocean observing and data gathering systems	Bulgaria
O3-2	Larisa DIMITROVA, Veselina JECHEVA Digital twin of the Black Sea with an integrated hydrodynamic model for monitoring and forecasting the spread of oil spills	Bulgaria
O3-3	Kristian IVANOV, Valentin MATEEV, Iosko BALABOZOV Software tool for machine learning training data preparation for low voltage switchgear testing	Bulgaria
O3-4	Rosen TSEKOV, Asparuh PARAPANOV LiBr-H₂O absorption systems for solar-powered cold production	Bulgaria

INVITED PAPERS 2

Tuesday, 16 June, 9:00 - 9:30

- I2-1** Yasushi KANAI, Tadao OHTANI, Nikolaos V. KANTARTZIS
Stable subgrid technique and GPU accelerations in Non-Standard Finite-Difference Time-Domain (NS-FDTD) method Japan, Greece

ORAL SESSION O4 (online)

Tuesday, 16 June, 9:30 - 11:00

- O4-1** Jendrique GUMBS, Diego ZUIDERVLIIET, Peter van DUIJSEN
Bidirectional four switch buck boost for a DC grid manager Netherlands
- O4-2** Szymon PIETRZAK, Xavier KUKLER, Diego ZUIDERVLIIET, Peter van DUIJSEN
Auto-resonant wireless charging for kitchen appliances Netherlands
- O4-3** Szymon PIETRZAK, Diego ZUIDERVLIIET, Peter van DUIJSEN
Solar panel voltage doubler with optional FPGA based MPP controller Netherlands
- O4-4** Veronica-Carmen GHEORGHE, Radu BURLICĂ, Grigore CIVIDJIAN
Corner reluctance of rectangular cross-section ferromagnetic cores Romania
- O4-5** Artemii VOSTOKOV, Marina RASHEVSKAYA, Aleksey ZHIGADLO
Improving the energy resilience of institutions based on load prioritization Russia
- O4-6** Aleksandr LEPESHKIN, Maxim FEDIN, Maria BULATENKO, Aleksandra VASILENKO, Marina OSIPOVA, Sergey KONDRASHOV
Modeling and technology of induction melting of protective coatings on steel parts, taking into account their hardness Russia

POSTER SESSION P2

Tuesday, 16 June, 11:30 - 13:00

- P2-1** Szabolcs KOCSIS SZÜRKE, Péter ŐRI, Slavcho BOZHKOVA, Gergő SÜTHEŐ
Comparative analysis of driving-cycle-based measurements for a battery electric vehicle on a chassis dynamometer and test track Hungary, Bulgaria
- P2-2** Gábor SALY, Balázs BARÁTH, Márton JAGICZA, Szabolcs KOCSIS SZÜRKE
CO₂ Emission Impact of Electric Vehicle AC Charging Strategies Hungary
- P2-3** Isidora JOVANOVIĆ, Natalija IVKOVIĆ, Mirjana PERIĆ, Ana VUČKOVIĆ, Nebojša RAIČEVIĆ
Machine learning-based prediction of stripline characteristic impedance Serbia
- P2-4** Todor GANCHEV, Valentina MARKOVA, Miroslav MARKOV, Aleksandar DIMITROV, Evdokia SOTIROVA, Sotir SOTIROV
An agentic framework for spatiotemporal environmental intelligence Bulgaria
- P2-5** Evdokia SOTIROVA, Sotir SOTIROV, Valentina MARKOVA, Aleksandar DIMITROV, Todor GANCHEV, Ivaylo BELOVSKI
A generalized net model for predictive risk management of oil spills and diffuse pollution in the Danube-Black Sea region Bulgaria

P2-6	Evdokia SOTIROVA, Sotir SOTIROV, Valentina MARKOVA, Todor GANCHEV, Vania GEORGIEVA An LSTM-based framework for classification of marine oil spills and related pollution events in the Bulgarian Black Sea and Danube coastal zone	Bulgaria
P2-7	Lenko ERBAKANOV Development of condenser fan current limiter and protection module	Bulgaria
P2-8	Radostin DOLCHINKOV, Radoslav SIMIONOV, Kamen SEYMENLIYSKI, Ivo Emanuil POLINCHEV Safety-oriented modular monitoring and control system for building energy systems in the context of Industry 5.0	Bulgaria
P2-9	Milen BALTOV, Radoslav SIMIONOV, Kamen SEYMENLIYSKI, Stela BALTOVA Assessment of electromagnetic exposure in building energy systems for smart cities and circular economy applications	Bulgaria
P2-10	Ivan KRALOV, Borianna TSEKOVA Analysis of methods and practices for energy and economic assessment in building energy efficiency	Bulgaria
P2-11	Ivan KRALOV, Borianna TSEKOVA Methodology for achieving sustainability in investments to improve the energy performance of buildings	Bulgaria
P2-12	Boyan MEDNIKAROV, Kalin KALINOV, Miroslav TSVETKOV, Siyana LYUTSKANOVA, Yordan SIVKOV Symbiosis or collapse: leadership in the space industry challenged by artificial intelligence	Bulgaria
P2-13	Philipa ALEKSANDROVA, Chavdar ALEXANDROV, Miroslav TSVETKOV Sentinel-2 based predictive vegetation risk mapping for power transmission corridors	Bulgaria
P2-14	Emil BARUDOV Modified variational approach with transferring coefficients for analysis of three-phase electric circuits in combination with the phasor approach	Bulgaria
P2-15	Emil BARUDOV, Dimitar TSVETANOV, Milena IVANOVA IoT-based low-cost wireless system for monitoring low-frequency magnetic fields using a DRV425 sensor and ESP32	Bulgaria
P2-16	Olga ALEKSEEVA, Natalia ALEXANDROVA, Roman PETROV, Dmitry RUMYANTSEV, Evgeny MENDELEEV, Slavcho BOZHKOV, Georgi TONKOV, Penko BOZHKOV Design and usability assessment of VR museum complex of Ilmen Cliff	Russia, Bulgaria
P2-17	Vasilii MISILIN, Alexander RAK, Evgeny KUZMIN, Roman PETROV, Slavcho BOZHKOV, Ivan MILENOV, Penko BOZHKOV, Georgi TONKOV Energy harvesting on magnetoelectric material	Russia, Bulgaria
P2-18	Velichko ATANASOV, Nikolina PETKOVA A systematic study of harmonic resonance phenomena in contemporary power distribution grids	Bulgaria
P2-19	Tsvetozar PETKOV Determination of the electromagnetic torque and angular velocity of an induction motor based on space vectors	Bulgaria

ORAL SESSION O5 (online)

Tuesday, 16 June, 14:00 - 16:00

- O5-1** Milen SOTIROV, Valentina PETROVA
Autonomous simulation environments for cyber-affected electrotechnical systems Bulgaria
- O5-2** Milen SOTIROV, Valentina PETROVA
An integrated acoustic-vibration monitoring platform for anomaly detection and technical reporting Bulgaria
- O5-3** Ivan GARVANOV, Miroslav TSINTSARSKI, Magdalena GARVANOVA
Performance impact of NUMA-aware and cache-aware optimizations in modern x86 HPC systems Bulgaria
- O5-4** Ivan GARVANOV, Magdalena GARVANOVA, Daniela BORISSOVA, Georgi TSONKOV, Radoslav YOSHINOV, Nesho GARVANOV
Integration of heterogeneous data for drone detection and tracking Bulgaria
- O5-5** Dimitar TODOROV
Optimization of mass UPDATE operations in MySQL using a CASE-based batch approach Bulgaria
- O5-6** Stoyan TENEV, Atanas TERZIYSKI, Ludmil TSANKOV
A distributed LoRa-Based approach to atmospheric conductivity monitoring (transmitter) Bulgaria
- O5-7** Stoyan TENEV, Atanas TERZIYSKI, Ludmil TSANKOV
A distributed LoRa-Based approach to atmospheric conductivity monitoring (gateway) Bulgaria
- O5-8** Dilyana DIMITROVA
Simulation of an adaptive risk-based authentication model for industrial systems Bulgaria

POSTER SESSION P3

Tuesday, 16 June, 16:30 - 18:00

- P3-1** Dimitar SERAFIMOV, Dimitar ARNAUDOV, Vladimir DIMITROV, Rad STANEV
Hybrid system for testing hydrogen fuel cell systems Bulgaria
- P3-2** Marin BOTEV, Kremena DIMITROVA
Optimal digital control of a third-order MIMO system Bulgaria
- P3-3** Borislav GANEV, Marin MARINOV, Ivan KRALOV, Anastas IVANOV
Experimental estimation of the lateral adhesion coefficient by measuring the vehicle's lean angle in a bend Bulgaria
- P3-4** Konstantin HRISTOV, Borislav GANEV, Tsvetana GRIGOROVA
Detection and classification of open-flame events and pre-ignition fire indicators using ML-enabled arrays of commercial, off-the-shelf metal-oxide semiconductor sensors Bulgaria
- P3-5** Ivan HADZHIEV, Iosko BALABOZOV, Valentin MATEEV, Maria GEORGIEVA, Ivan YATCHEV
Numerical Analysis of the Impact of an Ag₂O Surface Layer on Contact Resistance Bulgaria

P3-6	<i>Miglenna TODOROVA, Valentin MATEEV, Georgi IVANOV, Iliana MARINOVA</i> Modelling of electric field in solid electrolyte in magneto-ionic material	<i>Bulgaria</i>
P3-7	<i>Veselin TROYANOV, Atanas TERZIEV, Valentin MATEEV, Iosko BALABOZOV, Iliana MARINOVA</i> Implementing Vanadium Redox Flow Batteries for industrial energy storage applications	<i>Bulgaria</i>
P3-8	<i>Valentin MATEEV, Martin RALCHEV, Iliana MARINOVA</i> Energy consumption analysis of thermal and non-thermal additive manufacturing technologies	<i>Bulgaria</i>
P3-9	<i>Siya LOZANOVA, Chavdar ROUMENIN, Avgust IVANOV, Martin RALCHEV</i> Measurement of uniaxial deformation by a strain gauge sensor	<i>Bulgaria</i>
P3-10	<i>Emil RACHEV, Vladislav PETROV, Gergana VACHEVA, Dimitar PAVLOV, Petar TONEV</i> A comprehensive review of current measurement strategies in electrical motors for drone propulsion systems	<i>Bulgaria</i>
P3-11	<i>Dimitar PAVLOV, Vladislav PETROV, Gergana VACHEVA, Emil RACHEV, Atanas ZGUREV</i> A method for determining road surface luminance from measured illuminance	<i>Bulgaria</i>
P3-12	<i>Iva PETRINSKA, Dilyan IVANOV</i> Investigation of the reflective properties of textbooks and the possibility for veiling reflections	<i>Bulgaria</i>
P3-13	<i>Nikolay HINOV, Plamen STANCHEV, Reni KABAKCHIEVA</i> Cybersecurity of smart-home protocols: risks, reality, and practical defenses	<i>Bulgaria</i>
P3-14	<i>Reni KABAKCHIEVA, Plamen STANCHEV, Nikolay HINOV</i> A review of small hydropower plants: types, key parameters, and integration in micro- and nano-grids	<i>Bulgaria</i>
P3-15	<i>Plamen STANCHEV, Reni KABAKCHIEVA, Nikolay HINOV</i> Life-cycle assessment and operational analysis of a PV-based system for vineyard irrigation	<i>Bulgaria</i>
P3-16	<i>Tanya ZAPRYANOVA, Tatyana RADEVA</i> Cognitive biases affecting decision-making processes amid technological crises	<i>Bulgaria</i>
P3-17	<i>Tatyana RADEVA, Tanya ZAPRYANOVA, Vesselina TRASHLIEVA</i> The human factor in the management and operation of a SCADA system at power plants and substations	<i>Bulgaria</i>
P3-18	<i>Vesselina TRASHLIEVA, Iliya KOLAROV, Tatyana RADEVA</i> Analysis of the economic possibility of electrical energy storage in batteries on the energy market in the present and near future	<i>Bulgaria</i>

