

Contents

01	Stepan KUDRIA, Petr LEZHNIUK, Oleksandr RIEPKIN, Olena RUBANENKO - Hydrogen technologies as a method of compensation for inequality of power generation by renewable energy sources	1
02	Aleksander LULA¹, Krzysztof ZAGRAJEK - A concept of using a private electric vehicle to optimize the costs of electricity in household equipped with a PV power plant	7
03	Paweł TERLIKOWSKI¹, Jolanta GALIŃSKA - Profitability assessment of connecting renewable energy micro-installations in a public utility building in technical and organizational terms	15
04	Paweł KIECZMERSKI, Krzysztof ROGOWSK - Application of SIMATIC S7-1200 controllers for the water level control system in water reservoirs	23
05	Sebastian ŁACHECIŃSKI - Storage of temporal data for the transaction time on the MariaDB platform	28
06	Andrea WEBER, Miklós KUCZMANN - TP Transformation Based Controller and Observer Design of the Inverted Pendulum	34
07	Panduranga Vemula, Rudra Sankar Dhar - Design of 8T SRAM using 14nm FINFET Technology	40
08	Somchai ARUNRUNGRUSMI, Parinda PHANPHECH, Narong MUNGKUNG, Tanes TANITTEERAPAN, Wittawat POONTHONG, Apidat SONGRUK, Khanchai TUNLASAKUN, Tanapon TAMRONGKUNANAN, Surachai THAMMAYARIT, Kongsak ANUNTAHIRUNRAT - Application of a small transformer for designing current detection and overcurrent protection circuit for laboratory tables	44
09	Salah Belkhir, Abderrahmene Ziani, Hakim Azizi, Hocine Moulaï - Arc plasma energy evolvement in 60 KV network circuit breakers	51
10	Vitaly Yaropud, Ihor Kupchuk, Serhiy Burlaka, Julia Poberezhets, Ihor Babyn - Experimental studies of design-and-technological parameters of heat exchanger	57
11	Oleg GUBAREVYCH, Svitlana GOLUBIEVA, Inna MELKONOVA - Comparison of the results of simulation modeling of an asynchronous electric motor with the calculated electrodynamic and energy characteristics	61
12	Cekmas CEK DIN, Heni JUNIAR, FADILAH - A program design to form an oscillation curve and reduction with PID control on a heat exchanger	67
13	Kiagus Ahmad Roni, Taufik Barlian, Zulkifli Saleh, Bengawan Alfaresi, Fadilah, Asri Indah Lestari, Muhammad Ustadzo - Performance of ground fault relay on Feeder incoming substation 15 short circuit in substation 14 Plaju utilities PT. Pertamina (Persero) refinery unit III Plaju – Sungai Gerong	72
14	Suthasinee LAMULTREE, Rut PANTHASA I - Investigation and experiment of a symmetrically unidirectional patterns antenna	76
15	Sastya Hendri Wibowo, Rozali Toyib, Yulia Darnita, Muntahanah - LAN Performance Evaluation Based On Access to Transmission Media	80
16	Mehmet DUMAN, Alp Oral SALMAN - LNA Design and Implementation for Passive Millimeter Wave Imaging System in Ka Band	86
17	Kamil PARFIANOWICZ - Comparative analysis of multilevel voltage source inverters used to supply a five-phase Permanent Magnet Synchronous Motor	90
18	Dominik DUDA, Paweł KUBEK, Krzysztof MAŻNIEWSKI - Analysis of the mechanics of conductors in overhead power lines with the use of computer calculation tools)	95
19	Jarosław KMAK, Wiesław NOWAK, Rafał TARKO - Statistical assessment of shock hazard during earth faults in medium voltage substations	99
20	Konrad KOCHANOWICZ, Wiesław NOWAK, Rafał TARKO - Impact range reduction of the electromagnetic fields generated by power transmission lines	103
21	Tomasz BEDNARCZYK, Wojciech KOŁTUNOWICZ, Michael KRUEGER, Udo RANNINGER - Measurement and localisation of partial discharges in the insulation of power transformers	107
22	Mateusz CYBULSKI, Piotr PRZYBYŁEK - Application of the 3A molecular sieve to improve the condition of the power transformer's insulation system	111
23	Michał LECH, Paweł WĘGIEREK, Damian KOSTYŁA - Laboratory studies of the electrical strength of vacuums obtained on the basis of air, neon and helium	115
24	Kamil LEWANDOWSKI, Hubert MORANDA - Bubble effect phenomenon in transformer solid insulation based on cellulose and aramid (Nomex® 926) in the mineral oil and synthetic ester Midel 7131	119
25	Aleksandra SCHÖTT-SZYM CZAK - Overvoltage phenomena in MV power cable lines according to operation of cable screens	124
26	Konrad STRZELECKI - Comparison of initiation and breakdown voltage in esters and mineral oils in the system of insulated electrodes under lightning impulse voltage	128
27	Filip STUCHAŁA - Acceleration voltage of streamers in selected dielectric liquids at lightning impulse voltage	132
28	Dominika SZCZEŚNIAK, Piotr PRZYBYŁEK, Agnieszka MARCINKOWSKA, Aneta LEWANDOWSKA - Modification of natural ester by means of C ₆₀ fullerenes	136
29	Jakub GAJDZICA, Wiesław NOWAK, Rafał TARKO - Lightning overvoltages analysis of cable outer sheaths in high voltage mixed overhead cable power lines	140
30	Paweł ŻYLKA - Changes in the distribution of the effective surface charge density in the model gas cavity	144
31	Bartłomiej PASTERNAK, Paweł RÓZGA - Initiation of electrical discharges in the oil wedge system at lightning impulse voltage	148
32	Marek ANDRZEJEWSKI, Wiesław GIL, Wiktor MASŁOWSKI - Measurements quality in on-line bushing monitoring	152
33	Ewa ZAWADZKA, Henryk BRZEZIŃSKI, Krzysztof KOGUT, Patrycja SIWORSKA – ŻUREK - Recycling of electrical power products	157
34	Grzegorz MASŁOWSKI, Robert ZIEMBA - Voltage waveforms induced in power lines by nearby lightning strikes	161
35	Krzysztof KOGUT, Ewa ZAWADZKA, Henryk BRZEZIŃSKI - The solid insulated busbar with the properties to reactive power compensation	165
36	Jarosław GIELNIAK, Magdalena CZERNIAK, Kamil LEWANDOWSKI - Investigation of vibrations of transformers with a rated power of 16, 25 and 40 MVA in terms of assessing their technical condition	169
37	Wiktoria KALUS, Jarosław ZYGARLICKI, Łukasz NAGI, Michał KOZIOŁ - The problem of ozone generation in electroadhesion devices	173

Contents

38	Damian KOSTYŁA, Paweł WĘGIEREK, Michał LECH - Fiber optic technology for pressure measurements in high voltage switchgear	177
39	Michał MOLAS, Marcin SZEWCZYK - Measurements of the trajectory of a long spark in three-dimensional space	181
40	Jacek RYBARZ, Sebastian BORUCKI, Michał KUNICKI, Andrzej CICHÓŃ - Assessment of the correctness of installation of cable accessories in MV cables with XLPE insulation in terms of partial discharges	185
41	Daria WOTZKA, Mirosław GRYSZPIŃSKI, Ireneusz URBANIEC - Study of UV radiation emitted by partial discharge on the surface of a composite insulator	189
42	Andrzej CICHON, Sebastian BORUCKI, Michał WŁODARZ - The use of selected machine learning classifiers to recognize forms of partial discharge	193
43	Michał KUNICKI - Analysis of the variability in time of signals generated by partial discharges	197
44	Krzysztof WINCENCIK, Jarosław WIATER - Spark-over in high voltage cables used for lightning protection	201
45	Konstanty M. GAWRYLCZYK - Comparison of circuit models used for modeling of frequency analysis response of transformer	205
46	Jacek DZIURA - Liquid transformers of higher thermal classes – a case study	209
47	Andrzej MROZIK - Partial discharge detection in dry medium voltage transformers	212
48	Hubert ŚMIETANKA, Krzysztof WIECZOREK, Przemysław RANACHOWSKI, Zbigniew RANACHOWSKI, Adam BRODECKI - Degradation processes in textolite elements of surge arresters	216
49	Stefan WOLNY - Analysis of the impact of the degree of thermal degradation of NOMELEX®910 semi-synthetic insulation impregnated with synthetic ester on the dispersion characteristics of the loss factor in the low and high frequency domain	221
50	Marek ZENKER - Influence of temperature on the dielectric response in the frequency domain of aramid paper impregnated with exploited and regenerated synthetic ester	225
51	Szymon BANASZAK, Michał ŻEŃCZAK, Olgierd MAŁYSZKO, Jakub DOWEJKO, Jarosław JAWORSK - The selection of installation place of the hydrogen energy buffer in the electric power system	229
52	Michał KOZIOŁ, Jarosław ZYGARLICKI, Dariusz ZMARZŁY, Elżbieta JANOWSKA-RENKAS – Problems of measuring the electrical parameters of geopolymmer concretes	233
53	Aleksandra RAKOWSKA¹, Krzysztof SIODŁA - Sulfurhexafluoride and environmental protection	237
54	Krzysztof A. BOGDANOWICZ - Any-weather solar cells – possibilities and prospective applications	241
55	Tomasz MARCINIAK, Kacper PODBUCKI, Jakub SUDER I - Application of the Nucleo STM32 module in teaching microprocessor techniques in automatic control	245
56	Kinga KONDACKA, Piotr FIREK, Magdalena JAWOROWSKA, Mariusz SOCHACKI - Technology of modified structures ISFET for detection of avidin	249
57	Maciej SIBIŃSKI, Grażyna BUDZIŃSKA - European Project Semester – The Model of International Interdisciplinary Electronics Education	253
58	Patrycja ŚPIEWAK, Michał WASIAK, Robert P. SARZAŁA - Computer analysis of capacitance phenomena in nitride VCSELs	257
59	Mateusz ZAPART, Cezary WOREK - Simulation analysis of the SOGI-FLL discrete model including behavioral modeling of the microcontroller peripheral	261
60	Przemysław CZARNECKI, Łukasz RUTA, Katarzyna ZNAJDEK, Ewa RAJ, Zbigniew LISIK - Prototype of a hybrid photovoltaic panel with a cooling plate	267
61	Zenon KIDON - Posturography stand for infant assessments ution	271
62	Michał MOLAS, Marcin SZEWCZYK - Review of current research trends in stochastic methods of simulations of electrical discharges	275
63	Paweł Pawłowski, Adam Dąbrowski, Agnieszka Stankiewicz, Karol Piñarski – Teaching of the basic of electronics in remote and hybrid modes	280
64	Renata Majgier, Ewa Mandowska, Wojciech Grzesiak, Arkadiusz Mandowski - A ceramic thick layer substrateas a material for retrospective dosimetry	284
65	Chai Wankan, Krittanon Prathepha, Worawat Sa-ngiamvibool - A Fully-Balanced Current-Tunable All-Pass Filter with CAPRIO Technique	288
66	Hassen BELILA, Nasseridine BOUDJERDA, Imen BAHRI, Ahsene BOUBAKIR - Robust Hybrid Control Strategy PI-Sliding Mode Control of a STATCOM in the Presence of a Decentralized PV Source	292
67	Jacek KOZYRA, Zbigniew ŁUKASIK, Aldona KUŚMIŃSKA-FIJAŁKOWSKA, Paweł KASZUBA - An analysis of remote voltage measurement in the medium voltage cable networks	299
68	Andrzej Ł. Chojnicki - Impact of ambient temperature on the failure intensity of overhead MV power lines	307
69	Stanisław BEDNAREK - The acoustic pulsar controlled by electromagnets	312