RE&PQJ'18 INDEX

European Association for the Development of Renewable Energy, Environment and Power Quality

RE&PQ'18

RENEWABLE ENERGIES AND POWER QUALITY JOURNAL

Volume No. 18, June 2020

ISSN: 2172-038X

RE&PQJ-18 EDITORIAL BOARD

Editor-in-Chief: Pérez Donsión, Manuel. University of Vigo

Aguado, José Antonio. University of Málaga
Alvárez López, Ana. University of La Coruña
Bargalló Perpiña, Ramón. Politechnical U. of Catalonia (UPC)
Burgos Payan, Manuel. University of Seville
Cavallé Sesé, Francisco. Politechnical U. of Valencia (UPV)
Coll Mayor, Debora. SMA Solar Technology AG (Germany)
Espín Estrella, Antonio. University of Granada
González Díaz, Benjamín J. University of La Laguna
López Agüera, Ángeles .U. of Santiago de Compostela
Mañana Canteli, Mario. University of Cantabria
Martínez Melgarejo, Miguel. U. of Las Palmas de Gran Canaria
Mazón Sain-Maza, Javier. U. of the Vasque Country
Rouco Rodríguez, Luis. Universidad Pontificia de Comillas
Santos Sánchez, María Jesús. University of Salamanca
Sanz Badía, Mariano. University of Zaragoza
Zamora Belver, Inmaculada. U. of the Vasque Country

RE&PQJ'18 SCIENTIFIC COMMITTEE

Abdelkader, Sobhy (UK)
Ahmed, Noor E. Alam (Australia)
Albadi, Mohammed (Oman)
Alexandru, Catalin (Romania)
Amara, Yacine (France)
Andrada Gascón, P. (Spain)
Andras, Dan (Hungary)
Andreescu, G. D. (Romania)
Arcega Solsona, F. (Spain)
Arnaltes Gómez, S. (Spain)
Bargalló Perpiña, R. (Spain)
Belik, Milan (Czech Republic)
Betini, Roberto Cesar (Brazil)
Boudghene S., A. (Argeria)
Bracale, Antonio (Italy)
Brslica, Vit (Czech Republic)
Buja, Giusseppe (Italy)
Buzdugan, Mircea (Romania)
Camacho, José R. (Brazil)
Cano, José M. (Spain)
Carvalho, Paulo (Brazil)
Chica Arrieta, L.E. (Colombia)
Dessouky, Yasser G. (Egypt)
Donsión, M.P. (Spain)
Duran, M. (Spain)
El Qarnia, Hamid (Morocco)
El-Sayed, Mohamed (Kuwait)
Errami, Youssef (Morocco)
Fathollahi Fard, Ali A. (Malaysia)
Fraile Mora, Jesús (Spain)
Friman, Hen (Israel)
Früh, Wolf-Gerrit (UK)
Gagliano, Antonio (Italy)
Gharehpetian, G.B. (Iran)
Ghita, Constantin (Romania)
Giurca, Ioan (Romania)
Güemes Alonso, J.A. (Spain)
Hartmann, Bálint (Hungary)
Iwaszkiewicz, J. (Poland)
Janik, Przemyslaw (Poland)
Kádár Péter (Hungary)
Kiss, Péter (Hungary)
Kouzou Abdellah (Argeria)
Lakhoua, Mohamed N. (Tunisia)
Machado e Moura,A. (Portugal)
Mahdi, Ali Jafer (Iraq)
Malfatti, Célia (Brazil)
Mañana Canteli, M. (Spain)
Martinez, André (France)
Melicio, Rui (Portugal)
Meyer, Jan (Germany)
Narsimhulu, Sanke (India)
Nichita, Cristian (France)
Nocera, Francesco (Italy)
Oraee, Hashem (Iran)
Ozdemir, Engin (Turkey)
Petkovska, L. (Macedonia)
Pourmovahed, Ahmad (USA)
Predescu, Mihai (Romania)
Quinto Diez, Pedro (Mexico)
Raisz David (Hungary)
Salaoro, Iulia (UK)
Salay Naderi, M. (Australia)
San Martin, José Ignacio (Spain)
Schlemmer, Erwin (Austria)
Stumberger, Gorazd (Slovenia)
Tahir Çetin Akinci (Turkey)
Tang, Xinzi (China)
Turschner, Dirk (Germany)
Ubong, Etim (USA)
Valouch, V. (Czech Republic)
Vergura, Silvano (Italy)
Vitale, Gianpaolo (Italy)
Vokony, István (Hungary)
Zobaa Ahmed (UK)

The following papers have been included in the
Renewable Energy and Power Quality Journal (RE&PQJ'18)

Nº	*Titles/Authors/Institution/Country*
	PP:1-7
PL1	**Wind generation in weak systems** **L. Rouco, J. L. Zamora, A. García-Cerrada** Universidad Pontificia Comillas, Madrid. Spain
	PP:8-12
PS1	**Application of Neural Networks to Determine the Customer Connectivity based on Smart Meters** **A. Gastalver-Rubio, R. Carmona-Pardo** Ingelectus, Sevilla. Spain
	PP:13-17
202	**A Quick Fault Detection System Applied to Pitch Actuators of Wind Turbines** **Leonardo Acho** Department of Mathematics, Polytechnic University of Catalunya. Terrassa. Spain
	PP:18-23
204	**Some Heat Transfer Data for a Mannitol Derived Phase Change Material** **T. Rocha(1), V. Ferreira(2), A. Magalhães(3), C. Pinho(4)** 1. Departamento de Engenharia Mecânica FEUP – Porto. Portugal 2,3. INEGI - Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial FEUP – Porto. Portugal 4. CEFT – DEMEC. Porto. Portugal
	PP:24-29
205	**Evaluation of Energy Efficiency in Large-Scale Public Lighting. The case of the city of Cuenca, Ecuador** **Hugo Santiago Arévalo Pesántez(1), Leonardo Assaf(2)** 1. Superintendent of Public Lighting, South Central Regional Electricity Company, Cuenca, Ecuador. Master's Postgraduate Program MAVILE of the Department of Lighting Technology, Light and Vision, DLL&V, National University of Tucuman. Argentina 2. Researcher of the Department of Lighting Technology, Light and Vision, DLL&V, National University of Tucuman. Director of the Research Program Energy Systems and head of the Source and Equipment Labora. Argentina
	PP:30-35
207	**Control and Application of Grid-Connected Cascaded H-Bridge PV Inverters** **Jeyraj Selvaraj, Aamir Amir, Asim Amir, Nasrudin Abd Rahim** UM Power Energy Dedicated Advanced Centre (UMPEDAC) University of Malaya Kuala Lumpur. Malaysia
	PP:36-41
208	**Uncertainties in the Quantification of Supraharmonic Emission: Variations over Time** **A. Espín-Delgado, S. K. Rönnberg, M. H. J. Bollen** Electric Power Engineering Group Luleå University of Technology Campus Skellefteå. Sweden
	PP:42-47
210	**Passive house as temporary housing after disasters** **F. Nocera(1), F.Castagneto(1), A. Gagliano(2)**

	1. Department of Civil Engineering and Architecture University of Catania. Italy 2. Department of Electrical, Electronics and Computer Engineering University of Catania. Italy
	PP:48-52
212	**Re-optimizing array cable systems in offshore wind farms using 66 kV voltage** **I. Arrambide(1), I. Zubia(1), A. Madariaga(2)** 1. Department of Electrical Engineering. Escuela de Ingeniería de Guipúzcoa, University of the Basque. Donostia-San Sebastián. Spain 2. Offshore Renewable Energy Catapult. Glasgow. United Kingdom
	PP:53-56
214	**Experimental study of the physicochemical properties of new biofuels** **A. Palomar-Torres(1), E. Torres-Jiménez(1), R. Bolaños-Jiménez(1), G. Bombek(2)** 1. Department of Mechanical and Mining Engineering, EPSJ, University of Jaén. Spain 2. Department of Process and Environmental Engineering, Faculty of Mechanical Engineering, University of Maribor. Slovenia
	PP:57-62
218	**Offshore Wind farm HVDC Transmission System Protection against AC and DC Faults** **Mohamed A. H. El-Sayed(1),Mohamed M. A. Mahfouz(2)** 1. Electrical Engineering Dept., Kuwait University, Kuwait, On Leave from Electric Power Dept., Cairo University. Egypt 2. Electrical Power and Machines Dept., Helwan University, Cairo. Egypt
	PP:63-69
223	**Microcrid Stability Study with SVC Installation** **Luay Elkhidir(1), Mohamed A. Abdulgalil(1), Muhammad Khalid(1,2)** 1. Electrical Engineering Department, King Fahd University of Petroleum and Minerals, Dhahran. Saudi Arabia 2. Researcher at K.A. CARE Energy Research & Innovation Center at Dhahran. Saudi Arabia
	PP:70-75
225	**Estimating Distributed Generation reliability level** **Vladislav O. Samoylenko(1), Pavel V. Ilyushin(2), Andrew V. Pazderin(1)** 1. Department of Automated Electrical Systems Ural Federal University. Yekaterinburg. Russia 2. Petersburg Power Engineering Institute of Professional Development. Saint Petersburg. Russia
	PP:76-80
226	**Study of the Nebulosity Influence in Photovoltaic System Installed in the Green Office of UTFPR** N. P. Cremasco(1), J. A. Leludak(2), J. Urbanetz(1) 1. Program of Post-Graduation of Energy Systems 2. Department of Electrical Engineering UTFPR, Federal University OF Technologic of Paraná. Campus of Curitiba. Brazil
	PP:81-86
229	**Capacity Credit of Solar PV Projects – Oman's Main Interconnected System Case Study** **M. Albadi, A. Malik, T. Al Rashdi, A. Al Riyami, O. Al Shukaili** Depart. of Electrical and Computer Engineering, Sultan Qaboos University. Oman

	PP:87-92
235	**Transition to Solar Energy Using Rooftop of Public Buildings in Palestine** **Ibrik Imad, Hashaika Fadia** Energy Research Center. An-Najah National University. Nablus, Palestine
	PP:93-96
236	**Hybrid Switch with Tungsten-clad Copper Contacts for Arc-free On/Off Switching up to DC 400 A** **K. Yasuoka, Y. Yamada, M. Chen** Department of Electrical Engineering Tokyo Institute of Technology. Japan
	PP:97-102
239	**Induction Motor Speed Control Employing LM-NN Based Adaptive PI Controller** **Ismail Hossain(1), Shafiullah(3), Mohammad Abido(1,2)** 1. Electrical Engineering Department, King Fahd University of Petroleum & Minerals, Dhahran. Saudi Arabia 2. Senior Researcher at K.A.CARE Energy Research & Innovation Center, Dhahran. Saudi Arabia 3. Center of Research Excellence in Renewable Energy, King Fahd University of Petroleum & Minerals, Dhahran. Saudi Arabia
	PP:103-108
240	**Harmonic Analysis of Electric Vehicle Charging on the Distribution System Network with Distributed Solar Generation** **T. Busatto, S. K. Rönnberg, M. H. J. Bollen** Electrical Power Engineering Luleå University of Technology (LTU) Skellefteå. Sweden
	PP:109-115
242	**Optimal location decision of wind generators in urban areas using multi criteria techniques.** **E. Morocho(1), W. Morocho(1), A. Barragán(1), E. Zalamea(2)** 1. Carrera de Ingeniería Eléctrica, Universidad Politécnica Salesiana. Sede Cuenca. Cuenca (Ecuador) 2. Facultad de Arquitectura y Urbanismo, Universidad de Cuenca, Cuenca (Ecuador)
	PP:116-121
244	**Modelling for Classifying Different Shadow of Obstacles on a c-Si PV Panel** **M.R. Rashel(1,4), Md T. Ahmed(1), S.S. Satter(3), Saiful Islam(4), M. Tlemçani(1), R. Melicio(1,2)** 1. ICT and Departamento de Física, Escola de Ciências e Tecnologia, Universidade de Évora, Portugal 2. IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Portugal 3. Department of Electrical and Electronic Engineering, University of Dhaka, Bangladesh 4. Department of Information and Communication Technology, Bangladesh University of Professionals 5. Department of Computer Science & Engineering. Daffodil International University Bangladesh, Bangladesh
	PP:122-127
245	**A systematic literature review of electricity distribution in smart grid scenarios** **F. D. Ribeiro(1), A. G. Pinho(2,3) , R. A. Gomes(1,2), E. G. Domingues(1,2)** 1. Master's Program in Technology Sustainable Process

	2. NExt - Nucleus of Experimental and Technological Studies 3. Electrical Engineering/Control and Automation Engineering Program Federal Institute of Education, Science and Technology of Goiás, Goiânia. Brazil
	PP:128-133
248	**Diagnosis of failures in Solar Plants based on Performance monitoring** **Ana P. Talayero, Andrés Llombart, Julio J. Melero** Instituto Universitario de Investigación Mixto CIRCE (Fundación CIRCE – Universidad de Zaragoza). Spain
	PP:134-138
250	**Intelligent Controller Design for a Sustainable Energy System** **Kary Thanapalan, Ewen Constant** Faculty of Computing, Engineering and Sciences, University of South Wales. United Kingdom
	PP:139-143
253	**Effect of building materials on temperature evolution inside the premises in Algeria** **F. Hadji(1), N. Ihaddadene(1,2), R. Ihaddadene(1,2), M. Choudira(1), A. Hami(1), M. Bekkari(3)** 1. Department of Mechanical Engineering M'Sila University. Algeria 2. Renewable Energy and Sustainable Development Laboratory, Constantine University. Algeria 3. GTFT Maintenance Department. Algeria
	PP:144-149
254	**Electrification of the boat fleet of the Albufera Natural Park of Valencia: Methodology, economic and environmental assessments** **D. S. Bejarano-Cáceres, D. Ribó-Pérez, M. Alcázar-Ortega** Department of Electrical Engineering E.T.S.I.I., Universitat Politècnica de Valencia. Spain
	PP:150-154
255	**Interactive tool for the study of power signals generated by an inverter with PWM techniques** **Francisco Javier Jiménez Romero(1), Francisco Ramón Lara Raya(1), Francisco Manuel Álvarez Wic(1), Antonio Cánovas Espinal(2)** 1. Department of Electrical Engineering E.P.S.C., Córdoba University. Spain 2. Department of Electronics and Computer Engineering E.P.S.C., Córdoba University. Spain
	PP:155-160
258	**Surrogate modelling for high-lift multi-element hydrofoil shape optimization of a hydrokinetic turbine blade** **Rubio-Clemente, A.(1,2), Aguilar, J.(2), Chica, E.(2)** 1. Facultad de Ingeniería, Tecnológico de Antioquia, Medellín. Colombia 2. Departamento de Ingeniería Mecánica, Facultad de Ingeniería, Universidad de Antioquia, Medellín. Colombia
	PP:161-166
259	**Numerical analysis of the inlet channel and basin geometries for vortex generation in a gravitational water vortex power plant** **Velásquez García, L.(1), Rubio-Clemente, A.(1,2), Chica, E.(1)** 1. Departamento de Ingeniería Mecánica, Facultad de Ingeniería, Universidad de Antioquia, Medellín. Colombia 2. Facultad de Ingeniería, Tecnológico de Antioquia, Medellín. Colombia

	PP:167-171
260	**Fault detection based on ROCOV in a multi-terminal HVDC grid** **M.J. Perez-Molina(1), P. Eguia-Lopez(1), M. Larruskain-Eskobal(1), A. Etxegarai-Madina(1), S. Apiñaniz Apiñaniz(2)** 1. Department of Electrical Engineering, Faculty of Engineering of Bilbao, Universidad del País Vasco UPV/EHU. Spain 2. Energy Unit, Tecnalia Parque Tecnológico de Vizcaya. Spain
	PP:172-177
261	**Transient Analysis for Power System with All Inverter Power Sources** **Mamoru Kato(1), Hiroki Nakamura(1), Masakazu Kato(1), Junichi Arai(2)** 1.Tokyo Denki University. Japan 2. Kogakuin University.Japan
	PP:178-183
264	**Modelling of Energy Recovery in Electric Vehicles for Various Braking Scenarios on Changing Road Surfaces** **Valery Vodovozov, Zoja Raud** Department of Electrical Power Engineering and Mechatronics Tallinn University of Technology. Estonia
	PP:184-189
266	**Innovative bi-axial tracking mechanism for PV modules** **Catalin Alexandru** Department of Product Design, Mechatronics and Environment Transilvania, University of Brașov. Romania
	PP:190-195
268	**Future European energy markets and Industry 4.0 potential in energy transition towards decarbonization** **Eva M. Urbano(1), Victor Martinez-Viol(1), Konstantinos Kampouropoulos(2), Luis Romeral(1)** 1. MCIA Research Center, Department of Electronic Engineering Universitat Politècnica de Catalunya. Terrassa. Spain 2. Fundació Eurecat, Centre Tecnològic. Manresa. Spain
	PP:196-201
270	**HVAC early fault detection using a fuzzy logic based approach** **Victor Martinez-Viol, Eva M. Urbano, Miguel Delgado-Prieto, Luis Romeral** MCIA Research Center, Department of Electronical Engineering Universitat Politècnica de Catalunya.Terrassa. Spain
	PP:202-206
272	**Energy recovery from poultry manure: a viable solution to reduce poultry industry energy consumption** **Gheorghe Lazaroui(1), Dana-Alexandra Ciupageanu(1), Lucian Mihaescu(2), Manuela Grigoriu(1), Iulia Simion(1)** 1. Power Engineering Faculty, University Politehnica of Bucharest. Romania 2. Mechanics and Mechatronics Faculty, University Politehnica of Bucharest. Romania
	PP:207-212
273	**Control Optimization of the Offshore HVDC Grid based on Modular Multilevel Converter for Improving DC Voltage Stability** **Atousa Elahidoost, Elisabetta Tedeschi** Department of Electric Power Engineering Norwegian University of Science and Technology (NTNU) Trondheim. Norway

	PP:213-218
275	**Methodology for the formulation of medium voltage representative networks in three DSO areas** **Attila Sandor Kazsoki(1,2), Balint Hartmann(2)** 1. Department of Electric Power Engineering Budapest University of Technology and Economics. Hungary 2. Department of Environmental Physics Centre for Energy Research KFKI. Hungary
	PP:219-226
277	**A First Approach on the Impact of Distributed Generation and Fault Impedance on Studies of Voltage Sags** **A. C. L. Ramos(1,4), A. J. Batista(2), R. C. Leborgne(3), E. G. Domingues(4), W. P. Calixto(4)** 1. CELG Generation and Transmission S.A. Brazil 2. School of Electrical and Computer Engineering, Federal University of Goias. Brazil 3. Department of Electrical Engineering, Federal University of Rio Grande do Sul. Brazil 4. Nucleus of Studies Experimental and Technological, Electrotechnical Department Federal Institute of Goias. Brazil
	PP:227-232
278	**Design, implementation and evaluation of a control system to optimize the performance of a Permanent Magnet Synchronous Motor (PMSM) supplied by a stand-alone Photovoltaic System without batteries** **López Sánchez, José María(1), Fernández-Ramos, José(1), Gago-Calderón, Alfonso(2)** 1. Departamento de Electrónica Escuela de Ingenierías Industriales, Universidad de Málaga. Spain 2. Departamento de Expresión Gráfica, Diseño y Proyectos Escuela de Ingenierías Industriales, Universidad de Málaga. Spain
	PP:233-237
280	**Intelligent energy management of Microgrids with flexible demand response** **Vishnu Suresh, Przemyslaw Janik, Dominika Kaczorowska** Faculty of Electrical Engineering, Wroclaw University of Science and Technology Wrocław. Poland
	PP:238-243
281	**Impact of Distributed Generation and Energy Storage on Power Quality** **Gimenes, T. K.(1), Mendes, P.R.(1), Ledesma, J. J. G.(2), Ando Junior, O. H.(1,2)** 1. Department of Electrical Engineering. State University of Paraná Western Foz do Iguaçu – Paraná. Brazil 2. Department of Renewable Energies. UNILA, Federal University of Latin American Integration. Foz do Iguaçu-PR. Brazil
	PP:244-249
283	**Energy efficiency in a supercomputing center: a case study** **Fernández González, A., Matellán, V., Martínez García, J. M., Lorenzana, J., López, M.** Fundación Centro de Supercomputación de Castilla y León Edif. CRAI-TIC, S/N – León. Spain

	PP:250-254
286	**Parameters sensitivity analysis in a solenoid common-rail injector model** **J.L. Perona-Navarro(1), A. Palomar-Torres(1), E. Torres-Jiménez(1), O. Armas(2), L. Lešnik(3), F. Cruz-Peragón(1)** 1. Department of Mechanical and Mining Engineering E.P.S. of Jaén, University of Jaén. Spain 2. Escuela de Ingeniería Industrial y Aeroespacial, Universidad de Castilla La Mancha Campus Real Fábrica de Armas, Toledo. Spain 3. Institute of Energy, Process and Environmental Engineering, Faculty of Mechanical Engineering, University of Maribor. Slovenia
	PP:255-260
288	**A Site Characterization Index for Continuous Power-Quality Monitoring based on Higher-Order Statistics** **Olivia Florencias-Oliveros, Jose María Sierra-Fernández, Juan José González-de la Rosa, Agustín Agüera-Pérez, Manuel Jesús Espinosa-Gavira, José Carlos Palomares-Salas** Research Group PAIDI-TIC-168: Computational Instrumentation and Industrial Electronics (ICEI). University of Cádiz. Area of Electronics. Higher Polytechnic School of Algeciras. Spain
	PP:261-265
290	**Power Quality Monitoring and Disturbances Classification based on Autoencoder and Neural Network for Electrical Power Supply** **A.D. Gonzalez-Abreu(1), V. Martínez Viol(2), M. Delgado Prieto(2), J.J. Saucedo-Dorantes(1) R.A. Osornio-Rios(1)** 1. HSPdigital CA-Mecatronica Engineering Faculty, Autonomous University of Queretaro. Mexico 2. MCIA Research Center Department of Electronic Engineering, Technical University of Catalonia (UPC) Barcelona. Spain
	PP:266-271
291	**Combining photovoltaic modules and food crops: first agrivoltaic prototype in Belgium** **Brecht Willockx, Bert Herteleer, Jan Cappelle** Research Group Energy and Automation Faculty of Engineering Technology, KU Leuven. Ghent .Belgium
	PP:272-275
296	**Wind tunnel tests applied to wind energy management: comparison of measurements in closed-circuit and open-circuit wind tunnels** **M. Jiménez-Portaz(1), M. Clavero(1), S. Pospísil(2), M.A. Losada(1)** 1. Andalusian Institute for Earth System Research (IISTA) CEAMA – University of Granada. Spain 2. Institute of Theoretical and Applied Mechanics, Prague. Czech Republic
	PP:276-281
298	**Quality inspection of a 2.85 MW PV power plant under mismatch loss due to different classes of PV module installed** **J.A. Clavijo-Blanco, G. Álvarez-Tey , N. Saborido-Barba , J.L. Barberá-González , C. GarcíaLópez, R. Jimenez-Castañeda** Department of Electrical Engineering ESI, University of Cádiz. Spain
	PP:282-286
300	**Improving the Power System safety in Hospitals by means of periodical SFRA tests on Medical Isolation Transformers**

	G. Bucci, F. Ciancetta, A. Fioravanti, E. Fiorucci, A. Prudenzi Department of Industrial Engineering Information and Economics, University of L'Aquila. Italy
	PP:287-291
301	**Multi-technology battery storage system for optimal demand-side management** **E. Laporta, G. Fernández, E. García, J.M. Perié, M.A. Alonso, J. Berges** Electrical Systems Area CIRCE Foundation, Zaragoza. Spain
	PP:292-297
304	**Economic Viability of Business models for Photovoltaic solar generation in Brazil: Studies of cases** **V. R. Faria(1), M. L. Magalhães(1), D. P. Neto(1,2), E. G. Domingues(1,2)** 1. Master Degree in Sustainable Process Technology. Brazil 2. Center for Experimental and Technological Studies Federal Institute of Goias. Brazil
	PP:298-303
306	**Influence Analysis of Photovoltaic and Energy Storage Systems in a Distributions System in the Context of Permanent Regime Voltage using the Opendss** **P. Parreira(1), A. Rosentino(1) , D. B. Rodrigues(1), M. R. Castillo(1), F. Moura(1), M. Mendonça(1), N. Tolentino(1) , R. Rimoldi(1) , W. Baunier(1) , S. Borges(1), G.B. de Lima(2)** 1. Department of Electrical Engineering Triangulo Mineiro Federal University. Brazil 2. Department of Computing Science of University of Uberlandia. Brazil
	PP:304-308
309	**Wind Power Source Role in Sizing Battery Energy Storage for Secondary Frequency Application** **Salem Alshahrani(1), Mohammad Abido(1), Muhammad Khalid(1,2)** 1. Electrical Engineering Department, King Fahd University of Petroleum & Minerals (KFUPM) Dhahran. Saudi Arabia 2. K.A. CARE Energy Research & Innovation Center, Dhahran. Saudi Arabia
	PP:309-314
312	**A Programmable Source Based on Multi-level Buck EIE inverter connected to a power factor correction stage composed by a single-phase hybrid rectifier** **G. N. Souza(1), D. B. Rodrigues(1), G. B. de Lima(2), L. C. G. de Freitas(2), A. J. P. Rosentino Junior(1), M. R. M. Castillo(1), F. A. M. Moura(1), M. V. B. Mendonça(1), R. R. de Lima(1), W. B. de Melo(1)** 1. Electrical Engineering Department, Federal University of Triângulo Mineiro. Uberaba - Minas Gerais. Brazil 2. Electrical Engineering Department, Federal University of Uberlandia – Minas Gerais. Brazil
	PP:315-320
315	**Commercial Electric Vehicle Battery Degradation modelling and charging assessing using a real driving cycle** **G. Saldaña(1), J.I. San Martín(1), F.J. Asensio(1), I. Zamora(2), O. Oñederra(2), M. González-Pérez(1)** 1. Department of Electrical Engineering Engineering School of Gipuzkoa, University of the Basque Country. Eibar. Spain 2. Department of Electrical Engineering Engineering School of Bilbao, University of the Basque Country. Spain

	PP:321-326
317	**Analysis of public datasets of power quality distortions** **S. Dominguez-Gimeno, R. Igual, C. Medrano** Department of Electrical Engineering / Electronics Engineering and Communications E.U.P.T., Universidad de Zaragoza. Teruel. Spain
	PP:327-332
318	**Adaptive dead time compensation for cross-period single phase shift control of dual active bridge converters** **Szabolcs Veréb, András Futó, Zoltan Süttö, Attila Balogh, István Varjasi** Department of Automation and Applied Informatics. Budapest University of Technology and Economics. Budapest. Hungary
	PP:333-338
322	**Potential fuel savings in a combined cycle in Egypt by integrating a parabolic trough solar power plant** **Adham M. Abdelhalim(1), Inés M. Suárez Ramón(2)** 1. Department of Mechanical Engineering Arab Academy for Science and Technology Alexandria. Egypt 2. Energy Department University of Oviedo. Gijon. Spain
	PP:339-344
323	**Adaptive PI control and active tower damping compensation of a wind turbine** **M. Lara, J. Garrido, F. Vázquez** Computer Science and Numerical Analysis Department University of Córdoba. Spain
	PP:345-350
325	**Impact of High PV Penetration on Transient Stability — a Case Study on the U.S. ERCOT System** **Abigail Till(1), Shutang You(1), Yilu Liu(1,2)** 1. Department of Electrical Engineering and Computer Science. The University of Tennessee, Knoxville. USA 2. Oak Ridge National Laboratory. USA
	PP:351-355
327	**Estimation of Weibull parameters in wind speed mixture using nonlinear optimization for wind energy applications** **Francisco M. Arrabal-Campos, Francisco G. Montoya, Alfredo Alcayde, Raúl Baños, Juan Martínez-Lao** Department of Engineering E.S.I., University of Almeria. Spain
	PP:356-362
328	**Statistical methodologies for wind resource analysis, case: Catatumbo region - Norte de Santander, Colombia** **A.F. Lopez-Rodriguez, J.C. Serrano-Rico, E.G. Florez-Serrano** Mechanical Engineering Program, Mechanical Engineering Research Group of the University of Pamplona (GIMUP), Faculty of Engineering and Architecture, University of Pamplona. Colombia
	PP:363-368
330	**A 3D parametric thermal analysis of submarine three-core power cables** **J.C. del-Pino-López, P. Cruz-Romero** Department of Electrical Engineering E.T.S.I., Universidad de Sevilla. Spain
	PP:369-374
332	**Designing Large scale Photovoltaic Systems** **Akram A. Abu-aished, Shafin Mahmud** Department of Electrical and Computer Engineering. University of Hartford. USA

	PP:375-379
337	**Supervision and fault detection system for photovoltaic installations based on classification algorithms** **Marc Castallà(1), Konstantinos Kampouropoulos(1), Eva M. Urbano(2), Luis Romeral(2)** 1. Fundació Eurecat - Centre Tecnològic. Spain 2. MCIA Research Center, Department of Electronic Engineering Universitat Politècnica de Catalunya. Spain
	PP:380-385
339	**Design of a Versatile Half-Bridge Converter able to drive 6x6, 6x4, 8x6, 12x8 Switched Reluctance Generators and Motors using Arduino** **R. J. Dias, D. G. Pereira, R. N. Guimarães, A.S. Nogueira, L.L. Silva** Federal Institute of Education, Science and Technology of Goiás. Brazil
	PP:386-390
340	**Modeling, Simulation and Comparative Study between Switched Reluctance Generator 8x6 and Switched Reluctance Generator 12x8** **R. J. Dias, B. A. Oliveira, K. A. Silva, C.P. Alves, F. A. Ferreira, R.R. Aguiar** Federal Institute of Education, Science and Technology of Goiás. Brazil
	PP:391-396
355	**Analysis of resonance modes at harmonic frequencies in high-voltage networks** **L.I. Kovernikova** The Siberia Branch of the Russian Academy of Sciences Melentiev Energy Systems Institute. Irkutsk. Russia
	PP:397-402
356	**Understanding Resonance in a Renewable Energy Power Plant** **David Scheepers, Johan Beukes** Department of Electrical Engineering Stellenbosch University Stellenbosch. South Africa
	PP:403-408
361	**Multi-Input Boost Converter for Parallel Connected Renewable Energy Systems** **R.H.M. Ali(1), K.A. Khan(2), M. Khalid(2), A.A. Khan(3)** 1. Department of Electrical Engineering. Aligarh Muslim University. Aligarh, India 2. Department of Electrical Engineering. King Fahd University of Petroleum and Minerals (KFUPM). Dhahran, Kingdom of Saudi Arabia 3. Telecom Engineering and Substation Automation Department (TESAD), Saudi Electric Company (SEC), Riyadh, Kingdom of Saudi Arabia
	PP:409-413
363	**VSM Control Strategy for Systems with High penetration of Power Electronic Converters** **Marcial González de Armas, José Luis Rodríguez Amenedo, Santiago Arnaltes Gómez, Jaime Alonso Martínez** Department of Electrical Engineering E.P.S., Universidad Carlos III de Madrid. Spain
	PP:414-418
365	**Distributed Control Strategy for an Isolated Electrical Hybrid Power System** **L.S. Azuara-Grande, S. Arnaltes, J. Alonso-Martínez, J.L. Rodríguez-Amenedo** Department of Electrical Engineering E.P.S., Universidad Carlos III de Madrid. Spain

	PP:419-424
366	**Power Quality of PV Multilevel Inverters in Residential Environment** **M. Buzdugan, C. Ciugudeanu, A. Campianu** Department of Building Services Engineering Technical University of Cluj-Napoca. Romania
	PP:425-430
368	**Energy use and recovery in Wastewater Treatment Facilities** **A.G. Capodaglio, A. Callegari** Department of Civil Engineering & Architecture University of Pavia. Italy
	PP:431-436
370	**Comparison of Chilled ceiling and Mixing ventilation assisted by intermittent personalized ventilation: Thermal comfort and Energy savings** **D. Al Assaad , K. Ghali, N. Ghaddar** Department of Mechanical Engineering American University of Beirut. Lebanon
	PP:437-442
371	**Comparison of Removal Effectiveness of Mixed versus Displacement Ventilation during Vacuuming Session** **C. Habchi(1), K. Ghali(2), N. Ghaddar(2)** 1. Mechanical Engineering Department, Faculty of Engineering, Lebanese University. Lebanon 2. Department of Mechanical Engineering American University of Beirut. Lenanon
	PP:443-448
375	**Photovoltaic systems and yearly net self-sufficient electricity supply in distribution networks** **G. Štumberger(1), M. Rošer(2), F. Toplak(3), K. Dežan(1), N. Srećković(1), M. Trbušić(1), P. Sukič(1), E. Belič(1), M. Zorman(4)** 1. University of Maribor Faculty of Electrical Engineering and Computer Science Maribor. Slovenia 2. Elektro Celje d.d., Vrunčeva 2a, Celje. Slovenia 3. Elektro Maribor d.d. Maribor. Slovenia 4. SODO d.o.o. Maribor. Slovenia
	PP:449-455
376	**Teaching Renewable Energy and Environmentalism to Various Israeli Populations** Hen Friman(1), Netser Matsliah(1), Elior Dabbah(1), Yafa Sitbon(2), Ifaa Banner(3), Yulia Einav(1,4) 1. Faculty of Engineering. H.I.T - Holon Institute of Technology, Holon, Israel 2. Dean of Students Office. H.I.T - Holon Institute of Technology, Holon, Israel 3. Director of" Israeli Hope ."H.I.T - Holon Institute of Technology ,Holon, Israel 4. Dean of Students, H.I.T - Holon Institute of Technology ,Holon, Israel
	PP:456-460
378	**Decentralized current sharing in dc microgrids considering normal and disturbed operation modes** **A. Kirakosyan(1), E. F. El-Saadany(2), M. Shawky El Moursi(3), M. Salama(4)** 1,4. Department of Electrical and Computer Engineering, University of Waterloo. Canada 2,3. Department of Electrical and Computer Engineering, Khalifa University Abu Dhabi. (UAE)
	PP:461-468
382	**A Six Legs Buck-boost Interleaved Converter for KERS Application**

	Gianpaolo Vitale(1), Emiliano Pipitone(2) 1. ICAR, Institute for high performance computing and networking, National Research Council of Italy. Italy 2. Department of Engineering, University of Palermo. Italy
	PP:469-474
383	**Ripple Minimization in a Quadratic Boost Converter: Software vs. Hardware solutions** **G. Marsala(1), V. Presti(1), A. Sauro(1), S. G. Scordato(1), G. Vitale(2)** 1. INM, The Institute of Marine Engineering National Research Council of Italy, Palermo. Italy 2. ICAR, Institute for high performance computing and networking, National Research Council of Italy,Palermo. Italy
	PP:475-476
391	**Cheap and easily processable electrode/electrolytes for next-generation sodium-ion batteries** G. Meligrana(1), F. Colò(1), T. Platini(1), M. Bartoli(2), M. Falco(1), E. Maruccia(1), L. Fagiolari(1), G. Lingua(1), F.Bella(1), P. Jagdale(2), A. Tagliaferro(2) C. Gerbaldi(1) 1. GAME Lab, Department of Applied Science and Technology (DISAT) Politecnico di Torino, Torino. Italy. 2. Department of Applied Science and Technology (DISAT). Politecnico di Torino. Torino. Italy
	PP:477-481
394	**The Electric Vehicle: Solving the Silent Problem** **P. Egia, O. Abarrategi, A. Bilbao, D. Cubert, A. Diez, M. Gorriaran, A. Iriondo, I. Martinez, D. Martinez** Department of Electrical Engineering EIB University of the Basque Country (UPV/EHU) Bilbao. Spain
	PP:482-487
395	**Importance of Parameterization to Improve Meta-heuristics Performance for Smart Grid Applications** **G. Juarez, O. Abarrategi, P. Eguia** Department of Electrical Engineering Escuela de Ingeniería de Bilbao, UPV/EHU. Spain
	PP:488-493
406	**Heliostat Dual-Axis Sun Tracking System: A Case Study in KSA** **W. M. Hamanah(1,2), A. Salem(1), M. A. Abido(1,2)** 1. Department of Electrical Engineering King Fahd University for Petroleum and Minerals, Dhahran. Saudi Arabia 2. K.A.CARE Energy Research & Innovation Center, King Fahd University for Petroleum and Minerals, Dhahran. KSA
	PP:494-499
407	**Measurement Framework for Analysis of Dynamic Behavior of Single-Phase Power Electronic Devices** **Elias Kaufhold, Jan Meyer, Peter Schegner** Institute of Electrical Power Systems and High Voltage Engineering Technische Universitaet Dresden Dresden. Germany
	PP:500-504
412	**Comparative analysis of numerical models of plate-fin heat sinks with forced convection for thermoelectric energy generation** **A. Martinez-Marin(1), I.R. Cózar(1), T. Pujol(1), N. Luo(2), L. Pacheco(2), I.**

	Ferrer(2), J.R. Gonzalez(1), A. Massaguer(1), E. Massaguer(1), Shazly A. Mohamed(3) 1. Department of Mechanical Engineering and Industrial Construction, University of Girona. Spain 2. Department of Electrical Engineering, Electronics and Automation, University of Girona. Spain 3. Department of Electrical Engineering, Faculty of Engineering, South Valley University, Qena. Egypt
	PP:505-509
414	**Study of Useful Life of Dry-Type WTSU Transformers** **A. Etxegarai(1), V. Valverde(1), P. Eguia(1), E. Perea(2)** 1. Department of Electrical Engineering University of the Basque Country UPV/EHU Bilbao. Spain 2. Energy and Environment Division, Tecnalia Research and Innovation. Spain
	PP:510-514
415	**The effect of energy storage on the Residual Load Duration Curve (rLDC) of a system with high Renewable contribution** **W.-G. Früh** Institute of Mechanical, Process and Energy Engineering, School of Engineering and Physical Sciences, Heriot-Watt University Riccarton, Edinburgh. United Kingdom
	PP:515-521
417	**Optimal sizing of Marine Current Energy Based Hybrid Microgrid** **N. Lazaar(1), E. Fakhri(1), M. Barakat(1), H. Gualous(1), J. Sabor(2)** 1. Department of Electrical Engineering LUSAC Laboratory, University of Caen Normandy, Cherbourg. France 2. ENSAM, University of Moulay Ismail. Morocco
	PP:522-525
418	**Analysis of thermal insulation of pre-insulated triple pipes - preliminary numerical tests** **T.J. Teleszewski(1), D.A. Krawczyk(1), A. Rodero(2)** 1. Department of HVAC Engineering Bialystok University of Technology.Bialystok. Poland 2. Department of Physics, University of Córdoba.Spain
	PP:526-532
420	**A Three-Phase Open Hardware Design for Power Quality Solutions** **Francisco G. Montoya, Alfredo Alcayde, Eduardo Viciana, Francisco M. Arrabal-Campos, Raúl Baños, Juan Martínez-Lao** Department of Engineering E.S.I., Almería University. Spain
	PP:533-538
423	**Conceptual Analysis of Distribution System State Estimation of Low Voltage Networks** **I. Táczi, B. Sinkovics, I. Vokony, B. Hartmann** Department of Electric Power Engineering Budapest University of Technology and Economics. Hungary
	PP:539-544
426	**Magnetic Saturation Impact on Three-Phase Shunt Active Power Filters** **A. Ait Chihab(1), H. Ouadi(2)** 1. PMMAT Lab, Department of Physics, Faculty of Science, University Hassan II, Casablanca. Morocco 2. ERERA Lab. Mohammed V University ENSET Rabat. Morocco

	PP:545-550
428	**Losses allocation due to penetration of DG and self-consumption operation in distribution systems. Case: PV Solar Energy** **U. Lubo(1), A. Marquez(2), I. Zamora(1)** 1. Department of Electrical Engineering, Faculty of Engineering. University of the Basque Country, Bilbao. Spain 2. Consultant and researcher. Spain
	PP:551-555
431	**Evaluation of long term degradation process of monocrystalline Si photovoltaic panels** **Milan Belik** Department of Electrical Power Engineering and Ecology University of West Bohemia, Plzen. Czech Republic
	PP:556-561
433	**Frequency Response Test of MV Inductive Voltage Transformers for Power Qualit Applications** **B. M. Gianesini, V. H. F. Brito, R. N. C. Lima, I. N. Santos** Faculty of Electrical Engineering Federal University of Uberlândia (UFU). Brazil
	PP:562-567
434	**Impact Studies of Connecting Tuned Harmonic Filters onto a Brazilian Wind Farm** **R. C. F. Gregory(1), G. S. Troncha(1), B. M. Gianesini(1), C. F. Chaves(2), I. N. Santos(1),** 1. Federal University of Uberlandia - Faculty of Electrical Engineering. Brazil 2. Neoenergia Group / EAPSA. Brazil
	PP:568-573
435	**Economic dispatch of a bioclimatic office building considering thermal energy, electricity and water demands** **J. Ramos-Teodoro, M. Castilla, J. D. Álvarez, F. Rodríguez, M. Berenguel** CIESOL-ceiA3, Department of Informatics, University of Almería. Spain
	PP:574-578
436	**Step-wise Approach to Investigate the Impact of Energy Transition on Voltage Dips in Dutch Electricity Grid** **R. Torkzadeh(1), R. L. E. Peters(1), V. Ćuk(1), J.B.M. van Waes(2), J. F. G. Cobben(1)** 1. Department of Electrical Engineering, Eindhoven Technical University (TU/e). Eindhoven. The Netherlands 2. TenneT TSO B.V. The Netherlands
	PP:579-583
438	**Proposal of the Communication Layer for a Renewable Energy Microgrid Testbed** **F.P. Silva, F.C. dos Santos, R.B. Otto, A.A. Braggio, M.C. dos Santos** Laboratory of Automation and Simulation of Power Systems Itaipu Technological Park (PTI) Foz do Iguaçu – Paraná. Brazil
	PP:584-589
439	**Simulation Technologies Applicable to Microgrids** **R. B. Otto(1), F.P. Silva(1), M. B. do Carmo(1), A. B. Piardi(1), R. A. Ramos(2)** 1. LASSE - Itaipu Technological Park Foz do Iguaçu, Paraná. Brazil 2. EESC - University of Sao Paulo São Carlos, São Paulo. Brazil

	PP:590-593
440	**Reconfigurable Droop-Based DC Microgrids** **Abdelsalam A. Eajal(1), Aboelsood Zidan(2), Ehab F. El-Saadany(3), Magdy Salama(4), Hatem Zeineldin(3)** 1,4. Department of Electrical Engineering, University of Waterloo. Canada 2. Phoventus Inc., Burlington. Canada 3. Advanced Power and Energy Centre, EECS Department, Khalifa University, Abu Dhabi
	PP:594-598
442	**Active/Reactive Power Losses Minimization Based on Optimal Location of Battery Energy Storage System** **Salem Alshahrani(1), Mohammed Abido(1,2), Muhammad Khalid(1,2)** 1. Electrical Engineering Department, King Fahd University of Petroleum & Minerals (KFUPM) Dhahran. Saudi Arabia 2. Researcher at K.A.CARE Energy Research & Innovation Center at Dhahran. Saudi Arabia
	PP:599-602
443	**Efficiency in an Intensive Energy Industrial Consumer** **J. Galvão(1,2), A. Nabais(3), M. Galvão(4), J. Candeias(1), T. Pereira(1), J. Ramos(2,5)** 1. Department of Electrical Engineering; Polytechnic of Leiria. Portugal 2. R&D Unit, Institute for Systems Engineering and Computers /INESCCoimbra. Portugal 3. ECOBIE - Engenharia Lda, Leiria. Portugal 4. ISTécnico/Lisbon Technical University, Lisboa. Portugal 5. Department of Mechanical Engineering; Polytechnic of Leiria. Portugal
	PP:603-608
444	**Blockchain for the Energy Transition** **Silvano Vergura** Department of Electrical and information Engineering Polytechnic University of Bari. Italy
	PP:609-614
446	**Temperature distribution of a Fast-Field Cycling Nuclear Magnetic Resonance relaxometer's electromagnet with reduced volume** **P. Videira(1), P. Sebastião(1), A. Roque(2,4), D. M. Sousa(3,4), A. Fernandes(2), E. Margato(4,5)** 1. Department of Physics & CeFEMA, Instituto Superior Técnico, Universidade de Lisboa Lisbon. Portugal 2. Department of Electrical Engineering ESTSetúbal/Instituto Politécnico de Setúbal. Portugal 3. DEEC AC-Energia, Instituto Superior Técnico, Universidade de Lisboa. Portugal 4. INESC-ID.Lisboa. Portugal 5. CEI, ISEL-Instituo Superior de Engenharia de Lisboa, Instituto Politécnico de Lisboa, and INESC-ID, Lisboa. Portugal
	PP:615-620
448	**Experimental assessment of the thermal performance and energy consumption of a single-family Passive House** **I. M. Suárez Ramón(1), C. Ruiz(2), I. Duque(3), A. Zamora(3), F.J. Fernández(1), J. Díaz(1)** 1. Energy Department – University of Oviedo, Gijón. Spain

	2. Camino de Monteviento. Gijón. Spain 3. Arquitectos. Avilés. Spain
	PP:621-625
449	**Simulink Model of a Regenerative Shock Absorber** **Silvano Vergura** Department of Electrical and information Engineering Polytechnic University of Bari. Italy
	PP:626-630
450	**Agile Application Landscape Planning in Energy Sector – Architectural Experiences** **I. Vokony, M. B. Szekeres, V. Gy. Nemeth** Strategy and Architecture Enterprise Architecture Management E.ON Digital Technology Hungary. Hungary
	PP:631-636
455	**Analysing renewable energy flow distribution and its influence on grid electricity prices** **Vladislav O. Samoylenko(1), Andrew V. Pazderin(1), Sergei A. Bychkov(2)** 1. Department of Automated Electrical Systems Ural Federal University, Yekaterinburg. Russia 2. Ural Power Engineering Institute Ural Federal University, Yekaterinburg. Russia
	PP:637-641
456	**Simulink model of a bifacial PV module based on the manufacturer datasheet** **Silvano Vergura** Department of Electrical and information Engineering Polytechnic University of Bari. Italy
	PP:642-647
458	**Grid Fault Ride Through Capability of Voltage Controlled Inverters for Photovoltaic Applications** **Islam Abdelraouf(1), Sobhy M. Abdelkader(2), Mohamed A. Saeed(3)** 1. Electrical Engineer at North Delta Electricity Distribution Company. Egypt 2. Electrical Power Engineering Department, E-JUST. Egypt 3. Department of Electrical Engineering, Faculty, of Engineering, Mansoura University. Egypt
	PP:648-650
459	**Preliminary studies of the water solar collector** **D.A. Krawczyk(1), P. Zielinko(1), A. Rodero(2)** 1. Department of HVAC Engineering. Bialystok University of Technology. Bialystok, Poland. 2. Department of Physics, University of Córdoba. Spain
	PP:651-653
460	**Experimental Analysis of Fin Pitch Distance Variation of Adsorber for Adsorption Chiller Performance** **N. Nasruddin, Andre Kurniawan, Asep Rahmat** Department of Mechanical Engineering Universitas Indonesia
	PP:654-659
462	**Analysis of Energy Systems in Europe: The Case of Wind Energy in Spain** **G. Laine Cuervo, J.P. Paredes Sánchez, E. Fernández Domínguez, Xilberta Bernat** Department of Energy E.I.M.E.M., Oviedo University. Spain

	PP:660-663
463	**Evaluation and Implementation of Energy Systems based on Wind Resources in Germany** **G. Laine Cuervo, J.P. Paredes Sánchez, E. Fernández Domínguez, Xilberta Bernat** Department of Energy E.I.M.E.M., Oviedo University. Spain
	PP:664-668
465	**Design of a photovoltaic solar plant: Distributed generation in medium tension to a bar of the electricity substation** **O. Cabeza-Gras, V. Jaramillo-García** Department of Physics and Earth Sciences, University of Coruña. Spain
	PP:669-674
466	**Analysis and Modeling of Environmentally Friendly Heat Pump System** **M. Idrus Alhamid, Nyayu Aisyah, Arnas Lubis, N. Nasruddin** Department of Mechanical Engineering Universitas Indonesia
	PP:675-679
468	**Optimal Allocation of Energy Storage Systems for Load Management in Distributed Renewable Generations** **Y.M. Al-Humaid(1), M.A. Abdulgalil(1), K.A. Khan(1), M. Khalid(1,2)** 1. Department of Electrical Engineering King Fahd University of Petroleum and Minerals (KFUPM) Dhahran. Kingdom of Saudi Arabia 2. King Abdullah City for Atomic and Renewable Energy (K. A. CARE), Energy Research & Innovation Center Dhahran. Kingdom of Saudi Arabia
	PP:680-684
469	**Enhancing Power Flow with Dynamic Line Rating Effect Using Model Predictive Control** **Abdelrahman Sobhy(1,2), Tamer F. Megahed(1,3), Mohamed Abo-Zahhad(1,4)** 1. Egypt-Japan University of Science and Technology (E-JUST). Egypt 2. Energy Resources Engineering Department at E-JUST. Egypt 3. Electrical Power Engineering at E-Just; and Electrical Engineering Department, Mansoura University. Egypt 4. School of Electronics, Communications and Computer Engineering at E-Just; and Department of Electrical and Electronics Engineering, Assiut University, Assiut,. Egypt
	PP:685-688
470	**Vibration and freeze – thaw cycling tests to characterize PEM fuel cells stacks to use in vehicles** **J.M. Olavarrieta, G. Rodado** Applied Engineering Unit The National Hydrogen Center (CNH2) Puertollano. Spain
	PP:689-693
472	**Assessment of the Royal Decree 244/2019 in the Spanish Electrical Regulatory Framework Considering Power Quality Issues related to Harmonic Distortion associated to Nonlinear loads in Grid-connected Microgrids** **J. El Mariachet(1), J. Matas(1), H. Martin(1),J. Anzúrez(2), G. Tinoco(2), Israel Luna Reyes(2),S. Abdalinejad(1)** 1. Department of Electrical Engineering EEBE, Polytechnic University of Catalonia Barcelona. Spain 2. Department of Electrical Engineering FIE, Universidad Michoacana de San Nicolás de Hidalgo, Morelia. Mexico

	PP:694-699
473	**Cascaded Multilevel Converter as a Voltage Compensator** **J. Iwaszkiewicz, A. Muc** Department of Electrical Engineering. Gdynia Maritime University. Poland
	PP:700-705
474	**Fast charging systems for supercapacitors – circuit solutions and comparative study** **A. Muc, J. Iwaszkiewicz** Department of Electrical Engineering. Gdynia Maritime University. Poland
	PP:706-710
475	**Transforming the Energy System with *P2P* transactions between distributed generators and end consumers** **D. Coll-Mayor, A. Notholt** School of Engineering. Reutlingen University. Reutlingen. Germany
	PP:711-715
477	**A novel emulation concept for the test of smart contracts in the energy economy** **A.Notholt, D. Coll-Mayor** School of Engineering. Reutlingen University. Reutlingen. Germany
	PP:716-722
479	**Optimized Allocation of Phasor Measurement Units in Transmission Systems Using Particle Swarm Optimization** **J. P. R. Fernandes(1), M. R. M. Albertini(1) , L. P. Pires(1), F. A. Moura(1), M. V. Mendonça(1), A. J. Rosentino(1), D. Rodrigues(1), R. Rimoldi de Lima(1), P. H. Rezende(2), G. Lima(2), J. O. Rezende(3).** 1 Department of Electrical Engineering. Triangulo Mineiro Federal University 2 Department of Electrical Engineering of University of Uberlandia 3 Department of Electrical Engineering of Federal Institute of Goais. Campus of Unit II ICTE Av. Randolfo 1378, Uberaba, MG. Brazil.
	PP:723-728
480	**Testing, Gauging and Lifting Curves Characteristic of Current Transformers and Protection Relays** **U. Moreira(1), M. R. M. Castillo(1), L. P. Pires(1), F. A. Moura(1), M. V. Mendonça(1), A.J. Rosentino(1), D. Rodrigues(1), R. Rimoldi de Lima(1), P. H. Rezende(2), G. Lima(2), J. O. Rezende(3)** 1. Department of Electrical Engineering. Triangulo Mineiro Federal University 2. Department of Electrical Engineering Federal University of Uberlandia 3. Department of Electrical Engineering of Federal Institute of Goias. Campus of Unit II ICTE Av. Randolfo 1378, Uberaba, MG, Brazil
	PP:729-734
482	**Cost-optimal configuration of a renewable-based Australian power system** **Tino Aboumahboub(1), Robert Brecha(1,2), Himalaya Bir Shrestha(1), Ursula Fuentes Hutfilter(1), Andreas Geiges(1), Bill Hare(1), Matthew Gidden(1,3).** 1. Climate Analytics. Ritterstr. 3, 10969 Berlin (Germany) 2. Physics Department, Renewable and Clean Energy Program, Hanley Sustainability Institute,University of Dayton, Dayton (USA) 3. International Institute for Applied Systems Analysis, Laxenburg (Austria)
	PP:735-740
483	**Fault Location in Low-Voltage Distribution Networks based on Reflectometry – A Case Study**

	J. Ballestín-Fuertes(1), D. Cervero(1), H. Bludszuweit(1), R. Martínez(2), Jose Antonio Saez Castro(3) 1. CIRCE Foundation Parque Empresarial Dinamiza, Zaragoza (Spain) 2. Advanced Electro-Energetic Technologies Group, Department of Electrical Engineering E.T.S.I.I. University of Cantabria, Santander (Spain) 3. Viesgo Distribución Parque Científico Tecnológico, Santander (Spain)
	PP:741-746
485	**Energetic and economic analysis of the Electric Vehicles charge impacts on public parking lots** **E. Alcover, B. Mas, V. Martínez-Moll, J.L. Rosselló, M. Roca. V. Canals** University of the Balearic Islands, Palma, Spain
	PP:747-752
487	**A comparative between IEEE and EN in the transformer derating when supplying nonsinusoidal load current. A practical case** **A. Laso(1), R. Martínez(1), M. Mañana(1), D. Cervero(2), J.A. Sáez(3)** 1. Advanced Electro-Energetic Technologies Group Department of Electrical and Energy Engineering University of Cantabria,Santander (Spain) 2. CIRCE Foundation, Parque Empresarial Dinamiza, Zaragoza (Spain) 3. Viesgo Distribución Eléctrica S.L. Santander (Spain)
	PP:753-758
488	**Bio-inspired aerofoilts for small wind turbines** **Rosie Mulligan** Institute of Mechanical, Process and Energy Engineering, School of Engineering and Physical Sciences, Heriot-Watt University, Edimburg, Scotland, UK