



International Conference on Renewable Energy and Power Quality (ICREPQ'20)
University of Granada. Spain
2, 3, 4 of September 2020

**INTERNATIONAL CONFERENCE
ON RENEWABLE ENERGY AND
POWER QUALITY
(ICREPQ'20)**

PROGRAM



International Conference on Renewable Energy and Power Quality (ICREPQ'20)
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WELCOME TO ICREPQ'20

On behalf of the Steering Committee and the Local Organizing Committee we want to give you a very warm welcome to ICREPQ'20 and to Granada.

Like you know we have decided to postpone the conference from 1st to 3rd April 2020 to 2nd to 4th September 2020 due to the rapid development of the COVID-19 contagious cases all over the world. The safety and health of our participants is our number one priority for that reason we have permitted that many of the presentations can be online.

Our International Programme Committee has selected a high quality 188 papers (among 288 proposals) from which 133 will be presented at the Conference, 62 at oral sessions and 71 at poster sessions (dialogue), during the three days of the conference. All of these papers are included in the final program. Also three keynotes will be presented in plenary sessions and also one Panel Session.

ICREPQ'20 covers the whole range of problems and solutions especially concerning with renewable energies and power quality and all the papers have direct relationship with these two fields of research and practical work.

We would like to thank all the authors, session chairmen, participants without papers and the International Scientific Committee members who have made important contributions by reviewing the proposals.

In addition to the technical sessions, a number of social events have been arranged. On Wednesday evening, September 2nd, at about 20:00 H, we'll can enjoy the **Welcome Civic Reception** in the Carmen de la Victoria, just in from of the Alhambra de Granada. On Thursday, September 3rd, 20:30 H, the **Conference Dinner**. On Friday, September 4th, after the Farewell Lunch we'll enjoy of the **Cultural Visit** to the Cathedral, the Royal Chapel and other monuments.

We hope that you will find the conference intellectually stimulating and that you will make many fruitful personal contacts during the conference.

Best regards,

Prof. Manuel Pérez-Donsi3n
Chairman of the Steering Committee

Prof. Fernando Aznar Dols
Chairman of the Local Committee



International Conference on Renewable Energy and Power Quality (ICREPQ'20)
University of Granada. Spain
2, 3, 4 of September 2020

ORGANISED BY:

The International Conference on Renewable Energies and Power Quality (ICREPQ'20), is organized by:

- European Association for the Development of Renewable Energy, Environment and Power Quality (EA4EPQ)
- University of Vigo
- University of Granada



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CONFERENCE LANGUAGE

The Conference language is English. All papers and presentations should be made in English.

OBJECTIVES AND TOPICS

The intention of the organisers is to give an opportunity to academics, scientists, engineers, manufacturers and users from all over the world to come together in a pleasant location to discuss recent development in the areas of Renewable Energy and Power Quality.

The International Conference on Renewable Energy and Power Quality (ICREPQ'20) is structured in:

- **Plenary Sessions:** Presentations of 45 minutes in one room for all the participants
- **Oral Sessions:** Presentations of about 15 minutes for each paper (12 minutes for the presentation and 3 minutes for questions). Simultaneously in two rooms.
- **Posters Sessions:** In 45-minute periods during the coffee breaks.
- **Panel Session:** We have organized, two panel sessions one of 90 minutes and the other 120 minutes (presentations+questions).

SOCIAL EVENTS

- **Civic Reception: 2nd of September**
- **Conference Dinner: 3rd of September**

VENUE

The International Conference on Renewable Energies and Power Quality (ICREPQ'20) will be held at the University of Granada. Escuela Técnica Superior de ingenieros de Caminos, Canales y Puertos, Calle Dr. Severo Ochoa, s/n, 18001 Granada. Spain.



1. RENEWABLE ENERGY:

- Wind Energy, Small Hydro Energy, Solar Energy, Photovoltaic Energy, Ocean Energy, Geothermal, Biomass, Cogeneration,...
- Classical and special electrical generators: Theory, design, analysis, losses, efficiency, heating and cooling, vibration and noise, modelling and simulation, control strategies, protection systems, maintenance, mechanical behaviour, new methods of testing, parallel operation, transmission system, stability,...
- Power plants. Distributed generation. Fuel cells. Co-generation. Hybrid Systems. Microgrids. Smart grids. Original solutions,...
- Energy conversion, conservation and energy efficiency.
- Energy saving policy. Energy storage. Batteries....
- Energy and the environment. Ecological balance. Ecosystem,...
- Application of the renewable energy. Best practice projects.
- Legislation in the area of renewable energies.
- Biomass combustion techniques. The energy use of agricultural and forest residues. Production and the energy exploitation of bio-gas. Environment. Social importance...
- Interconnection and transport problems.
- Planning and control of the power system take into account the renewable energy. Stability. Protection...
- Economic analysis of the power system take into account the renewable energy.
- Electricity Market Structures. Regulation/des-regulation of the power market. Influence of the renewable energy.
- Models and simulation of the power systems. Models and estimation of loads. Software tools.
- Application of the communications, internet, artificial intelligence for the renewable energy.
- Security assessment and risk analysis in renewable energy.
- Electric vehicles.
- Electrical Machines & Drives, Power electronics and Control strategies for renewable energy applications.
- Monitoring and Diagnostics of electrical machines & drives, Tools for Diagnostics, Test for Predictive Maintenance in Renewable...
- Sensors and actuators for renewable energy applications.
- Renewable Energies Teaching.

2. POWER QUALITY:

- Electromagnetic compatibility (EMC).
- Power Quality in Transport and Distribution. FACTS
- Economic Studies of the Power Quality.
- Low-frequency conducted disturbances: Voltage deviations, voltage fluctuations-flicker, voltage dips and short interruptions, harmonics and inter-harmonics, transient over-voltages, voltage unbalance (imbalance), temporary power-frequency variations.
- Sources, effects and mitigation methods of the disturbances.
- Measurements of the power quality in networks, industrial installations and Laboratories. Equipment, procedures and measurement methods. Standards.
- Modelling and simulation of the power quality. Software tools.
- Transmission of the disturbances.
- Filtering techniques.
- Power factor compensation. Capacitor switching techniques.
- Optimization techniques.



- Communication, internet and artificial intelligence.
- Permanent monitoring techniques and online diagnosis.
- Intelligent energy delivery systems. Uninterrupted power supplies.
- Expert systems applications.
- Devices, equipment and power systems. Control centres.
- Specific problems and studies cases.
- Power quality influence in deregulated markets.
- High frequency disturbances (radiated).
- Data security and electromagnetic pulses.
- Protection against natural and intentional EMI.

SPONSORSHIP

Sincere thanks are expressed to the organisations listed below who have given valuable support to ICREPQ'20:

- EA4EPQ
- University of Granada
- University of Vigo
- AEDIE
- CIRCUTOR



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| Giurca, Ioan (Romania) | Vitale, Gianpaolo (Italy) |
| Güemes Alonso, J.A. (Spain) | Vokony, István (Hungary) |
| Hartmann, Bálint (Hungary) | Zobaa Ahmed (UK) |



ICREPQ'20 SCHEDULE

Wednesday September 2, 2020						
9:00 – 12:00	Registration "ICREPQ'20 Secretariat"					
9:30 - 10:15	ROOM A "Universidad de Granada"					
	Opening Ceremony					
10:15 - 11:00	Plenary Sessions PL1					
	PL1	"Wind generation in weak systems" by Prof. Luis Rouco Universidad Pontificia de Comillas. Spain				
	EXTRA TIME FOR DISCUSSION					
11:00 – 11:45	Posters Session at ROOM C "AEDIE" (Session P1) Coffee Break	Poster Session P1				
		202	204	212	214	242
		244	245	255	258	259
		260	261	266	278	
11:45 – 13:00	ROOM A "U. de Granada"			ROOM B "CIRCUTOR"		
	Oral Session A1			Oral Session B1		
	229	248	290	208	283	288
	291	322		356	394	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
13:00 -- 15:00	Welcome Lunch					
15:00 – 16:45	ROOM A "Universidad de Granada"					
	Panel Session 1					
	"Recent experiences on the application of AI techniques to distribution systems" by: - Prof. Antonio Gomez-Exposito, ENDESA. - Mr. Adolfo Carmona Pardo, Ingelectus. - Mrs. Catalina Gómez-Quiles, University of Seville. - Mr. Jacob Rodriguez Rivero, Endesa. - Mrs. Madalina Buzau, University of Seville					
	EXTRA TIME FOR DISCUSSION					
16:45 – 17:30	Posters Session at ROOM C "AEDIE" (Session P2) Coffee Break	Poster Session P2				
		286	298	300	304	306
		309	312	315	323	325
		327	339	340	391	418
17:30 – 18:30	ROOM A "U. de Granada"			ROOM B "CIRCUTOR"		
	Oral Session A2			Oral Session B2		
	225	268	433	254	330	415
	444			460		
20:00 -- 22:00	Welcome Civic Reception El Carmen de la Victoria Spanish Wine					

ROOMS: Room A: "U. de Granada" (Salón de Actos). Room B: "CIRCUTOR" (Aula de Grados)
Room C: "AEDIE" (Hall central -2).

248, and the others with the same typo - Online by videoconference



Thursday September 3, 2020

9:00 – 12:00	Registration "ICREPQ'20 Secretariat"					
9:30– 10:15	ROOM A "Universidad de Granada"					
	Plenary Sessions PL2 & PL3					
	PL2	"How Copper Contributes to Sustainable Mobility" by Dr. Fernando Nuño. Energy Engineer of the European Copper Institute				
	EXTRA TIME FOR DISCUSSION					
10:15 – 11:00	PL3	"IFMIF-DONES: a key milestone in the long path to Nuclear Fusion" by Prof. Antonio Manuel Peña-García. University of Granada				
	EXTRA TIME FOR DISCUSSION					
11:00– 11:45	Poster Session at ROOM C "AEDIE" (Session P3) Coffee Break	<i>Poster Session P3</i>				
		236	281	355	363	365
		368	371	383	406	412
		414	474	475	477	
11:45 – 13:00	ROOM A "U. de Granada"			ROOM B "CIRCUTOR"		
	<i>Oral Session A3</i>			<i>Oral Session B3</i>		
	328	337	375	207	239	264
	417	431		318	382	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
13:00 – 15:00	Lunch					
15:00 – 16:00	ROOM A "U. de Granada"			ROOM B "CIRCUTOR"		
	<i>Oral Session A4</i>			<i>Oral Session B4</i>		
	218	250	272	210	270	370
	280			482		
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
16:00 – 16:45	Poster Session at ROOM C "AEDIE" (Session P4) Coffee Break	<i>Poster Session P4</i>				
		277	420	423	426	428
		434	436	438	439	459
		479	480	487	488	
16:45 – 18:00	ROOM A "U. de Granada"			ROOM B "CIRCUTOR"		
	<i>Oral Session A5</i>			<i>Oral Session B5</i>		
	395	407	458	226	296	361
	469	483		455	468	
20:30 - 23:30	Conference Dinner (Optional)					

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Friday September 4, 2020						
9:00 – 12:30	Registration "ICREPQ'20 Secretariat"					
9:30 - 10:30	ROOM A "U. de Granada"			ROOM B "CIRCUTOR"		
	Oral Session A6			Oral Session B6		
	235	435	448	240	253	376
	485			378		
EXTRA TIME FOR DISCUSSION						
10:30 - 11:15	Poster Session at ROOM C "AEDIE" (Session P5) Coffee Break	Poster Session P5				
		440	442	443	446	449
		450	456	462	463	465
		466	470	472	473	
11:15 – 12:15	ROOM A "U. de Granada"			ROOM B "CIRCUTOR"		
	Oral Session A7			Oral Session B7		
	223	273	275	205	301	317
	366			332		
EXTRA TIME FOR DISCUSSION						
12:15 – 13:00	ROOM A "U. de Granada" CLOSING SESSION					
	Conclusions and time for the next ICREPQ conference					
	Awards for the three best posters					
13:00 – 15:00	Farewell Lunch					
15:00 – 18:30	The Cultural Visit will take place at different and important monuments of Granada like the Cathedral and the Royal Chapel					

ROOMS: Room A: "U. de Granada" (Salón de Actos). Room B: "CIRCUTOR" (Aula de Grados) Room C: "AEDIE" (Hall central -2).

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SPECIAL SESSIONS SELECTED FOR ICREPQ'20		
No.	TITLE	CHAIRMEN
1	Control and integration of wind energy systems	M.J. Duran Martínez and M. A. H. El-Sayed
2	Microgrids and Smart grids	G. B. Gharehpetian and Alfredo Vaccaro
3	Electric vehicles	Pere Andrada
4	Solar Technologies	Silvano Vergura and Gianpaolo Vitale
5	Applications of Multi-Level Converters and Inverters in Power Quality Improvement	P. N. Tekwani
6	Sustainable Energy Mix	Mohamed A.H. El-Sayed
7	Wind Turbines of the Future: Economics, Design & Operation	Hashem Oraee
8	Harmonics and Power Quality	Andrés Dán and Dávid Raisz
9	Ecodesign, regulation standards and efficiency improvement of electric motors	Ramón Bargalló
10	Ocean Energy (Wave, tidal and offshore wind)	Ahmed Zobaa
11	Power Electronics for Renewable Energy Systems	Silvano Vergura and Gianpaolo Vitale
12	Net Zero Energy Building	Antonio Gagliano and Francesco Nocera
13	Economic, Financial and Social aspects of Renewable Energy Penetration	Mihail Predescu
14	Nanotechnology for Renewable Energy	Basma El Zein and Elhadj Dogheche
15	Low & High Temperature Fuel Cells	Etim Ubong
16	Power Quality and Renewable Energy	André Martínez and Shahrokh Saadate
17	Renewable energies for developing countries	Vít BRŠLÍKA and Alfredo Vaccaro
18	Strategic Energy Planning	Roberto Cesar Betini and Emilio Torrente
19	Model Predictive Control for Power Electronics Converters Dedicated to Renewable Energies systems	Kouzou Abdellah
20	Impacts of renewable energy for industrial development and sustainable economics	Amine Boudghene Stambouli and Samir Flazi
21	FACT (SVC, STATCOM, UPFC, HVDC...)	Manuel Pérez Donsión



AUTHORS

Oral Presentations

Each speaker of an oral presentation, in-person or online, has an available time of 15 minutes (12 minutes for the presentation and 3 minutes for questions) and must be in the session room 10 minutes before of the beginning of the session for to test the audiovisual equipment and for to exchange opinions with the Session Chairman. We suggest that the speakers of one oral presentation prepare their material in Power Point or video.

Poster Presentations

The posters must be numbered, on the up left corner, with the number of the paper and it will be put, about 15 minutes before of the beginning of the session, on the pin board that you previously can chose and it must be taken off 15 minutes after of the end of the session. The author(s) that attend in-person must be stay near the poster during the 45 minutes of the session duration and for online posters, that appear in the web site, the registered participants, included the chairmen, can send us messages with the questions that they want to ask to the authors, that also answer by E-mail. The maximum available surface for each poster will be **1000 mm x 2500 mm** (width x high). You must select your poster size take into account this maximum available surface (Perhaps an A0 size, **841×1189** mm (width x high), could be appropriate). Put on the pin board separated sheets of the paper are not allowed.

SESSION CHAIRMEN

On behalf of the International Scientific Committee, Steering Committee and the Organising Committee of the ICREPQ'20 and take into account their eminent position in the world of science we have selected 38 session chairmen. It is an honour for us their collaboration for to chair the sessions of ICREPQ'20 and their contribution would be greatly appreciated. We wish to express our warmest thanks.

Traditionally the Chairmen of each Session are independent in organising the Session on-line or in person. Nevertheless it is of special importance that the different session chairmen prepare some questions about the papers of their session in order to get a more dynamic one. Furthermore we expect of the session chairmen the following:

Plenary sessions

Each plenary session should not exceed **45 minutes** including presentation and discussion, (35 minutes for presentation and 10 minutes for questions).

Oral sessions

Each oral paper presentation should not exceed 15 minutes including presentation and discussion, (12 minutes for presentation and 3 minutes for questions).

Poster sessions

The author(s) of a poster presentation in-person must be stay near to their poster during the 45 minutes of the session duration and in order to get a more dynamic session it is important that along this period of time each of the chairmen of the poster sessions will formulate questions to the authors in-person or online through E-mail and check that all is OK. The chairmen of each of the poster sessions file up one sheet, with punctuations for each of the presented poster in that session and then, take into account these evaluations, the Organizers will deliver during the Closing Session one silver plate and one diploma to the three best posters selected.

RE&PQJ

All the papers presented in the conference will be included in the "**Renewable Energy and Power Quality Journal (RE&PQJ)**" with ISSN: **2172-038X** and the **CrosRef DOI** that will have the format: <http://dx.doi.org/10.24084/repqj16.200>. The **RE&PQJ** was accepted by **SCOPUS** for the indexing process.



Chairmen Session distribution

Wednesday 2nd September, 2020		
HOURL	SESSION	CHAIRMEN
9:30 – 10:15	Opening Ceremony	
10:15 - 11:00	PLENARY SESSION PL1	Inmaculada Zamora
11:00 - 11:45	POSTER SESSION P1	José Ignacio San Martín Díaz
		Lluís Pacheco
		Ovidio Rabaza Castillo
		Alfonso Gago Calderon
11:45 - 13:00	ORAL SESSION A1	Enrique Alameda Hernández
	ORAL SESSION B1	Tino Aboumahboub
13:00 - 15:00	Welcome Lunch	
15:00 - 16:45	PANEL SESSION-1	Antonio Gómez Expósito
16:45 - 17:30	POSTER SESSION P2	Gustavo Brito Lima
		Rafael Muñoz Beltran
		Mohamed Albadi
		Andrea G. Capodaglio
17:30 - 18:30	ORAL SESSION A2	Santiago Arnaltes
	ORAL SESSION B2	Mircea Ion Buzdugan
Thursday 3rd September, 2020		
9:30 - 10:15	PLENARY SESSION PL2	Gianpaolo Vitale
10:15 - 11:00	PLENARY SESSION PL3	Fernando Aznar Dols
11:00 - 11:45	POSTER SESSION P3	Erika Laporta
		José María Olavarrieta Tellez
		David Scheepers
		Adam Muc
11:45 - 13:00	ORAL SESSION A3	Catalin Alexandru
	ORAL SESSION B3	Silvano Vergura
13:00 - 15:00	Lunch	
15:00 - 16:00	ORAL SESSION A4	Wolf-Gerrit Früh
	ORAL SESSION B4	Gorazd Stumberger
16:00 - 16:45	POSTER SESSION P4	Daniel Gómez Lorente
		João Rafael Galvão
		Masakazu Kato
		Jan Iwaszkiewicz
16:45 - 18:00	ORAL SESSION A5	Antonio Rodero
	ORAL SESSION B5	Antonio Peña García
Friday 4th September, 2020		
9:30 - 10:30	ORAL SESSION A6	Sobhy M. Abdelkader
	ORAL SESSION B6	Olivia Florencias Oliveros
10:30 - 11:15	POSTER SESSION P5	Inés María Suárez
		Gustavo Brito
		Johan Beukes
		Valery Vodovozov
11:15 - 12:15	ORAL SESSION A7	Pablo Eguía
	ORAL SESSION B7	Pedro Luis Cruz
12:15 - 13:00	Closing Session	
13:00 - 15:00	farewell lunch	

NOTE: In some cases the Chairman of one Oral Session, in-person or online, need to present his own paper in that session, then we suggest that first he present his paper and after that he will chair the other papers in person or online that will be presented in the session. Perhaps by the COVID-19 some chairmen of the poster session will not attend in-person at the conference and then they will be replaced by other participants that really can attend in-person at the ICREPQ'20.



ICREPQ'20 KEYNOTES

PL1. "Wind generation in weak systems", by Prof. Luis Rouco Universidad Pontificia Comillas. Madrid, Spain

Weak systems are characterized by low short circuit ratio and/or low inertia. Wind generation face problems of different nature when connecting to weak systems. The question from the view point of a wind generator manufacturer is to squeeze the generator controls to maximize wind generation in a given point of connection. Several phenomena and issues will be discussed: subsynchronous resonance, harmonic amplification, voltage stability and controller interaction.

This contribution will describe methods and tools developed in research projects for wind generation equipment manufacturers.

Short biography of Prof. Luis Rouco Rodríguez



Luis Rouco Rodríguez obtained the titles of Industrial Engineer and Doctor Industrial Engineer for the Technical University of Madrid in 1985 and 1990 respectively. He is a Professor of the Technical School of Engineering (ICAI) of the University Pontificia Comillas of Madrid. He has been The Director of the Department of Electrotechnics and Systems in the period 1999-2005. It teaches courses of Electrical Machines in the studies of Industrial Engineer and of Advanced Analysis of Systems of Electric power and of System stability of Electric power in the Program of Postdegree in Electric power School.

He has been The Director of the Specialist's Course in Operation of the Electrical System REE-ICAI in the period 2004-2007 and of the Master in Electrical Technology ENDESA-ICAI in the period 2007-2011. Prof. Rouco Rodríguez develops his activities of research in the Institute of Technological Research (IIT) where it has supervised numerous projects of research and consultancy for the public Spanish administrations (Department of Education, Department of Promotion, GIF, etc.), the principal electrical Spanish companies like Endesa, Iberdrola, Natural Gas, Electrical Network of Spain, Union Fenosa and Viesgo and other industrial companies as ABB, Iberian AEG of Electricity, Ardanuy Ingeniería, Babcock and Wilcox Española, Hard Felguera, Eliop, Grouped Businessmen, Indra, Initec Energía, To hoist, SEMI, Sener and Assembled Technologies. Also it has developed projects for companies and foreign institutions as Alstom (Switzerland), University of La Plata and CAMMESA (Argentina), RTE-France and INESC - I Carry (Portugal). The areas of work of the Prof. Rouco Rodríguez are the shaped one, analysis, simulation and control of the systems of electric power.

Prof. Rouco Rodríguez has published great number of articles in conferences and national and foreign magazines. Prof. Rouco Rodríguez is member of the IEEE and of CIGRÉ, President of the Spanish Chapter of the Power and Energy Society of the IEEE and member of the Executive Committee of the National Committee of CIGRÉ's Spain. He has been an investigative visitor in Ontario Hydro (Toronto, Canada), MIT (Cambridge, Massachusetts, The United States) and ABB Power Systems (Vasteras, Sweden).



PL2. "How Copper Contributes to Sustainable Mobility", by Dr. Fernando Nuño. European Copper Institute, Spain

Several analysis predict that by 2040, about 60% of global new passenger vehicle sales will be EVs, and these vehicles will then make up 30% of the global passenger vehicle fleet. Europe is expected to become the second largest market for EVs in the 2020s, behind China. This brings up concerns as to whether there are actually enough resources to meet this growing demand and to enable the high uptake of EVs in the coming decades. The availability of copper will be presented and put in perspective with other raw materials such as rare earth elements. High performance motor design without rare earth permanent magnets is feasible: the ReFreeDrive project has tackled this challenge. Its main results and a comparison with permanent magnet benchmarks will be presented.

Short biography of Fernando Nuño



Fernando Nuño works at the European Copper Institute as Energy and Climate Portfolio Manager. He is in charge of copper products and markets related to the Energy Transition, notably electric motors and cables. He is also responsible for innovation and has led several EU-funded H2020 projects, notably ReFreeDrive, which develops rare earth-free motors for electric vehicles. He graduated as an Energy Engineer in 1998 from Bilbao Engineering School (Spain) and Institut Français du Pétrole (France). Since then, he has worked in various areas of the energy sector, such as combined heat and power generation, and regulation of electricity markets.

PL3. "IFMIF-DONES: a key milestone in the long path to Nuclear Fusion" by Dr. Antonio Manuel Peña-García, University of Granada, Spain

Nuclear Fusion has been one of the golden dreams of Mankind for ages. However, the successful control and profit from the energy produced in Nuclear Fusion reactions is still far away to be a reality. There are several reasons for this delay with respect to Nuclear Fission, a process that has been controlled for many years and powers our houses, factories and installations everyday. Among the main difficulties to profit from Nuclear Fusion, we find the control of plasmas at temperatures above 100M°C, and protecting the installation from the exceeding neutrons. In this complex framework, the International Fusion Materials Irradiation Facility (IFMIF) - DEMO-Oriented Neutron Source (DONES), to be installed in Granada (Spain), is the largest project of the Scientific Community to test the materials that can accurately stop these neutrons without damaging fusion reactors, and a real hope to definitively control Fusion and produce high amounts of cleaner energy.



Short biography of Antonio Manuel Peña-García



Dr. Antonio Peña-García (Granada, Spain, 1977) holds a Ph.D. and Master in Physics by the University of Granada, where he is Associate Professor of Lighting Technology at the Department of Civil Engineering, and Director of the Research Group "Lighting Technology for Safety and Sustainability", which he founded in 2012. Before joining the University, he was Responsible for Regulation & Homologation in the Lighting System Branch of Valeo Group in Spain. He has published more than 80 contributions in high ranked journals and international congresses, directed several doctoral theses and been IP always in the field of Sustainable Lighting. Beyond his

University, Antonio Peña has been visiting professor in the "Sapienza" University of Rome (Italy) during three months.

In November 2017 he was appointed as Director of the Office for the Implementation of IFMIF-DONES (OFID), one of the great milestones in the way to Nuclear Fusion

PANEL SESSION-1

"Recent experiences on the application of AI techniques to distribution systems"

Chair: Prof. Antonio Gomez-Exposito



Antonio Gomez-Exposito is the "Endesa Chair" Professor at the Department of Electrical Engineering, University of Seville, Spain. He is a Fellow of the IEEE and past editor of several journals, including the IEEE Transactions on Power Systems. Among other recognitions, he received the 2019 IEEE/PES Outstanding Power Engineering Educator Award and the 2011 Research and Technology Transfer Award, granted by the Government of Andalusia.

Panels and speakers

"Application of neural networks to determine the customer connectivity based on smart meters"

Panelist: Mr. Adolfo Carmona Pardo, Ingelectus.

Abstract: Along with the massive installation of Smart Meters in the distribution grid, new applications, e.g. state estimation, have been developed in order to improve the operation of the electrical network. Such applications require a faithful knowledge of the network topology, specifically the feeder and phase where the customers are connected to. Classical solutions for this complex combinatorial problem usually fail in such mission. Fortunately, with the development of artificial intelligence techniques, such as machine learning through neural networks, this kind of problems can be solved much more efficiently. This works shows the results of applying, to different currently-operating distribution grids, artificial neural networks which discover the customer connectivity to the network using smart meter measurements.



Rubén Carmona Pardo received B.E. degree in energy engineering and M.Sc. degree in advanced analytics on big data, from the University of Malaga, Spain, in 2017 and 2019, respectively. He is currently pursuing the M.Sc. degree in electrical power systems in the University of Seville, Spain. In 2019, he joined Ingelectus SL, Seville, Spain, as a energy data analyst. His work focuses on data-driven projects in distribution networks and artificial intelligence applications in electrical power systems.

"Ensemble Forecasting for Distributed Energy Integration"

Panelist: Catalina Gómez-Quiles, University of Seville

Abstract: Modern power systems, embedding ubiquitous distributed energy resources, such as electric vehicles and storage systems, increasingly need to resort to advanced forecasting techniques, from generation to demand. In this context, the accuracy of the results is generally proportional to the benefits for the involved utilities. This has led the stakeholders to test and compare different prediction techniques in order to identify the most accurate one. An alternative approach, consisting of an ensemble method which dynamically weights all algorithms over time, is presented and discussed. Tests with actual time series related to generation and demand have shown improvements in the mean and the standard deviation of the prediction errors.



Catalina Gómez-Quiles received the electrical engineering degree from the University of Seville, Spain, in 2006, the Msc. Eng. degree in electrical engineering from McGill University, Montreal, QC, Canada, in 2008, and the Ph.D. degree from the University of Seville, in 2012. Her research interests include mathematical and computer models for power system analysis, risk assessment in competitive electricity markets, and forecasting in power systems.

"Monitoring of MV/LV transformers by applying data analytics to electrical and thermal sensors information"

Panelist: Jacob Rodriguez Rivero, Endesa

Abstract: The possibility of correlating information from electrical, image and other kind of sources, such as the dissolved gas concentrations in transformer oil, with several simultaneous measurements, could be useful to distinguish the root cause of failures. This is actually the main goal of the MONICA and PASTORA projects developed by Endesa-Enel and other international companies, which are aimed at accurately determining the actual situation of low and medium-voltage distribution grids in real-time, preventing and accelerating the solution of network failures.



Jacob Rodriguez Rivero is a Telecommunication Engineer by University of Seville and Executive Master in Business Administration (EMBA) by I.I. San Telmo (IESE). He has been 12 years with Endesa and Enel, where he currently works as Unit Manager in Endesa Ingenieria and Innovation Project Manager in Endesa Red. In addition, he is a Lecturer in Telecommunication degree at University of Granada. He is involved in several national and international R&D projects such as Smart City Malaga, SmartCity Barcelona, SmartCity Buzios (Brasil), SmartCity Santiago (Chile), SmartCity Bogotá (Colombia), Growsmarter (H2020) and GRACIOS



"Detection of non-technical losses through machine learning techniques"

Panelist: **Madalina Buzau**, University of Seville

Abstract: Non-technical electricity losses due to anomalies or frauds are accountable for important revenue losses in power utilities. Recent advances have been made in this area, fostered by the roll-out of smart meters. The objective of this work is to explore the capabilities of machine learning algorithms and smart meter data for non-technical losses detection in electricity utilities. The goal of these algorithms is to detect any type of non-technical losses, regardless of their source. This research was focused on two types of customers: industrial/large commercial (contracted power > 50 kW) and residential/small commercial (contracted power < 15 kW).



Madalina Buzau received a B.Eng. degree in power systems from the Politehnica University of Bucharest and a M.Res. degree in electrical engineering and sustainable development from the Lille University of Science and Technology. She is currently pursuing the Ph.D. degree with the Department of Electrical Engineering, University of Seville. Her main research focus is on the usage of smart meter data and machine learning algorithms for non-technical loss detection in the utilities.

Wednesday September 2nd, 2020

9:30– 10:15 Opening Ceremony ROOM A "Universidad de Granada"

10:15-11:00 Plenary Session PL1 ROOM A "Universidad de Granada"

Chairwoman: **Inmaculada Zamora**

PL1: "Wind generation in weak systems"

by **Prof. Luis Rouco**. Universidad Pontificia de Comillas. Spain

Wednesday September 2nd, 2020

11:00-11:45 Poster Session P1 – Coffee Break ROOM C "AEDIE"

Chairmen: **José Ignacio San Martín Díaz**, **Lluís Pacheco**, **Ovidio Rabaza Castillo**, **Alfonso Gago Calderón**

202 A Quick Fault Detection System Applied to Pitch Actuators of Wind Turbines

Leonardo Acho

Department of Mathematics, Polytechnic University of Catalunya. Terrassa. Spain



- 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
- 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
- 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
- 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. Ecuador
2. Facultad de Arquitectura y Urbanismo, Universidad de Cuenca. Ecuador
- 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), 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 Computer Science & Engineering Daffodil International University Bangladesh



- 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
- 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
- 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
- 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
- 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
- 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
- 266 Innovative bi-axial tracking mechanism for PV modules**
Catalin Alexandru
Department of Product Design, Mechatronics and Environment Transilvania, University of Braşov. Romania



- 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

Wednesday September 2nd, 2020
11:45 - 13:00 Oral Session A1 ROOM A "U. de Granada"

Chairman: **Enrique Alameda Hernández**

- 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
Department of Electrical and Computer Engineering, Sultan Qaboos University.
Oman
- 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
- 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
- 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



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. Spain

Wednesday September 2nd, 2020

11:45 - 13:00 Oral Session B1 ROOM B "CIRCUTOR"

Chairman: **Tino Aboumahboub**

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

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

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

356 Understanding Resonance in a Renewable Energy Power Plant

David Scheepers, Johan Beukes

Department of Electrical Engineering Stellenbosch University Stellenbosch. South Africa

394 The Electric Vehicle: Solving the Silent Problem

P. Egia, O. Abarrategi, A. Bilbao, D. Cubert, A. Diez, M. Gorriaran, A. Iriondo, I. Martínez, D. Martínez

Department of Electrical Engineering EIB University of the Basque Country (UPV/EHU) Bilbao. Spain



Wednesday September 2nd, 2020
15:00 - 16:45 Panel Session 1 ROOM A "U. de Granada"

Chairman: **Antonio Gomez-Exposito**

"Recent experiences on the application of AI techniques to distribution systems" by:

- Prof. Antonio Gomez-Exposito, ENDESA.
- Mr. Adolfo Carmona Pardo, Ingelectus.
- Mrs. Catalina Gómez-Quiles, University of Seville.
- Mr. Jacob Rodríguez Rivero, Endesa.
- Mrs. Madalina Buzau, University of Seville

Wednesday September 2nd, 2020
16:45-17:30 Poster Session P2 – Coffee Break ROOM C "AEDIE"

Chairmen: **Gustavo Brito Lima, Rafael Muñoz Beltran, Mohamed Albadi, Andrea G. Capodaglio**

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

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

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



- 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.
- 306 Influence Analysis of Photovoltaic and Energy Storage Systems in a Distributions System in the Context of Permanent Regime Voltage using the Opends**
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
- 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
- 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
- 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, Spain
- 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



- 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
- 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
- 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
- 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
- 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. Italy.
2. Department of Applied Science and Technology (DISAT). Politecnico di Torino. Italy
- 418 Analysis of thermal insulation of pre-insulated triple pipes - preliminary numerical tests**
T.J. Teleszewski(1), D.A. Krawczyk(1), A. Roderó(2)
1. Department of HVAC Engineering Białystok University of Technology. Białystok. Poland
2. Department of Physics, University of Córdoba. Spain



Wednesday September 2nd, 2020
17:30 - 18:30 Oral Session A2 ROOM A "U. de Granada"

Chairman: **Santiago Arnaltes**

- 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
- 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
Politécnica de Catalunya. Terrassa. Spain
2. Fundació Eurecat, Centre Tecnològic. Manresa. Spain
- 433 Frequency Response Test of MV Inductive Voltage Transformers for
Power Quality Applications**
B. M. Giancesini, V. H. F. Brito, R. N. C. Lima, I. N. Santos
Faculty of Electrical Engineering Federal University of Uberlândia (UFU). Brazil
- 444 Blockchain for the Energy Transition**
Silvano Vergura
Department of Electrical and information Engineering Polytechnic University of Bari.
Italy

Wednesday September 2nd, 2020
17:30 - 18:30 Oral Session B2 ROOM B "CIRCUTOR"

Chairman: **Mircea Ion Buzdugan**

- 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



- 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
- 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
- 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

20:00 -- 22:00	Welcome Civic Reception El Carmen de la Victoria Spanish Wine
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Thursday September 3 rd , 2020

9:30-10:15 Plenary Session PL2 ROOM A "Universidad de Granada"
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Chairman: **Gianpaolo Vitale**

PL2: "How Copper Contributes to Sustainable Mobility"

by **Dr. Fernando Nuño**. Energy Engineer of the European Copper Institute

9:30-10:15 Plenary Session PL2 ROOM A "Universidad de Granada"
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Chairman: **Fernando Aznar Dols**

PL3: "IFMIF-DONES: a key milestone in the long path to Nuclear Fusion" by **Prof. Antonio Manuel Peña-García**. University of Granada



Thursday September 3rd, 2020
11:00-11:45 Poster Session P3 – Coffee Break **ROOM C "AEDIE"**

Chairmen: **Erika Laporta, José María Olavarrieta Tellez, David Scheepers, Adam Muc**

- 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
- 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
- 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
- 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
- 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
- 368 Energy use and recovery in Wastewater Treatment Facilities**
A.G. Capodaglio, A. Callegari
Department of Civil Engineering & Architecture University of Pavia. Italy



- 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. Lebanon
- 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
- 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
- 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
- 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
- 474 Fast charging systems for supercapacitors – circuit solutions and comparative study**
A. Muc, J. Iwaszkiewicz
Department of Electrical Engineering Gdynia Maritime University. Poland



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

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

Thursday September 3rd, 2020

11:45 - 13:00 Oral Session A3

ROOM A "U. de Granada"

Chairman: **Catalin Alexandru**

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

337 Supervision and fault detection system for photovoltaic installations based on classification algorithms

Marc Castellà(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

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. Srečković(1), M. Trbušič(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

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



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

Thursday September 3rd, 2020

11:45 - 13:00 Oral Session B3

ROOM B "CIRCUTOR"

Chairman: **Silvano Vergura**

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

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

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

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

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



Thursday September 3rd, 2020
15:00 - 16:00 Oral Session A4 ROOM A "U. de Granada"

Chairman: **Wolf-Gerrit Frü**

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

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

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

280 Intelligent energy management of Microgrids with flexible demand response

Vishnu Suresh, Przemyslaw Janik, Dominika Kaczorowska

Faculty of Electrical Engineering Wrocław University of Science and Technology
Wrocław. Poland

Thursday September 3rd, 2020
15:00 - 16:00 Oral Session B4 ROOM B "CIRCUTOR"

Chairman: **Gorazd Stumberger**

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



- 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
- 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
- 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. Berlin. Germany
2. Physics Department, Renewable and Clean Energy Program, Hanley Sustainability Institute, University of Dayton. USA
3. International Institute for Applied Systems Analysis, Laxenburg. Austria

Thursday September 3rd, 2020	
16:00-16:45 Poster Session P4 – Coffee Break	ROOM C "AEDIE"

Chairmen: **Daniel Gómez Lorente, João Rafael Galvão, Masakatu Kato, Jan Iwaszkiewicz**

- 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
- 420 A Three-Phase Open Hardware Design for Power Quality Solutions**
Francisco G. Montoya, Alfredo Alcayde, Eduardo Viciano, Francisco M. Arrabal-Campos, Raúl Baños, Juan Martínez-Lao
Department of Engineering E.S.I., Almería University. Spain



- 423 Conceptual Analysis of Distribution System State Estimation of Low Voltage Networks**
I. Táci, B. Sinkovics, I. Vokony, B. Hartmann
Department of Electric Power Engineering Budapest University of Technology and Economics. Hungary
- 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
- 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. Department of Electrical Engineering, Faculty of Engineering. University of the Basque Country, Bilbao. Spain
2. Consultant and researcher. Spain
- 434 Impact Studies of Connecting Tuned Harmonic Filters onto a Brazilian Wind Farm**
R. C. F. Gregory(1), G. S. Troncha(1), B. M. Giancesini(1), C. F. Chaves(2), I. N. Santos(1),
1. Federal University of Uberlandia - Faculty of Electrical Engineering. Brazil
2. Neoenergia Group / EAPSA. Brazil
- 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. Čuk(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
- 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
- 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



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

479 Optimized Allocation of Phasor Measurement Units in Transmission Systems Using Particle Swarm Optimization

J. P. R. Fernandes, 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 Goias
Brazil

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
Brazil

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. Manana(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

488 Bio-inspired aerofoils for small wind turbines

Rosie Mulligan

Institute of Mechanical, Process and Energy Engineering, School of Engineering and Physical Sciences, Heriot-Watt University, Edimburg, Scotland. United Kingdom



Thursday September 3rd, 2020
16:45 - 18:00 Oral Session A5 ROOM A "U. de Granada"

Chairman: **Antonio Rodero**

- 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
- 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
- 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
- 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. Egypt
- 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



Thursday September 3rd, 2020
16:45 - 18:00 Oral Session B5 ROOM B "CIRCUTOR"

Chairman: **Antonio Peña García**

- 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. Brazil
- 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. Pospíšil(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
- 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
- 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
- 468 Optimal Allocation of Energy Storage Systems for Load Management in Distributed Renewable Generations**
Y.M.AI-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

20:30 - 23:30

Conference Dinner (Optional)



Friday September 4th, 2020

9:30 - 10:30 Oral Session A6 ROOM A "U. de Granada"

Chairman: **Sobhy M. Abdelkader**

- 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
- 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
- 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. Spain
2. Camino de Monteviento Gijón. Spain
3. Duque y Zamora Arquitectos. Avilés. Spain
- 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 and V. Canals
University of the Balearic Islands, Palma, Spain

Friday September 4th, 2020

9:30 - 10:30 Oral Session B6 ROOM B "CIRCUTOR"

Chairwoman: **Olivia Florencias Oliveros**

- 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



- 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
- 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
- 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)

Friday September 4th, 2020		
10:30-11:15 Poster Session P5 – Coffee Break	ROOM C "AEDIE"	

Chairmen: **Inés María Suárez, Gustavo Brito, Johan Beukes, Valery Vodovozov**

- 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
- 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



- 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
- 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-Instituto Superior de Engenharia de Lisboa, Instituto Politécnico de Lisboa, and INESC-ID, Lisboa. Portugal
- 449 Simulink Model of a Regenerative Shock Absorber**
Silvano Vergura
Department of Electrical and information Engineering Polytechnic University of Bari. Italy
- 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
- 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
- 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



- 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
- 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
- 466 Analysis and Modeling of Environmentally Friendly Heat Pump System**
M. Idrus Alhamid, Nyayu Aisyah, Arnas Lubis, Nasruddin
Department of Mechanical Engineering Universitas Indonesia
- 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
- 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
- 473 Cascaded Multilevel Converter as a Voltage Compensator**
J. Iwaszkiewicz, A. Muc
Department of Electrical Engineering Gdynia Maritime University. Poland



Friday September 4th, 2020
11:15 - 12:15 Oral Session A7 ROOM A "U. de Granada"

Chairman: **Pablo Eguía**

- 223 Microgrid 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
- 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
- 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
- 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

Friday September 4th, 2020
11:15 - 12:15 Oral Session B7 ROOM B "CIRCUTOR"

Chairman: **Pedro Luis Cruz**

- 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



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

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

332 Designing Large scale Photovoltaic Systems

Akram A. Abu-aished, Shafin Mahmud
Department of Electrical and Computer Engineering. University of Hartford. USA

	ROOM A "U. de Granada" CLOSING SESSION
12:15 – 13:00	Conclusions and time for the next ICREPQ conference Awards for the three best posters
13:00 – 15:00	Farewell Lunch - Restaurant at Granada Center Hotel
15:00 – 18:30	The Cultural Visit will take place at different and important monuments of Granada like the Cathedral and the Royal Chapel

