



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

ICREPQ'21

INTERNATIONAL CONFERENCE ON RENEWABLE ENERGIES AND POWER QUALITY

Almeria, July 28-30, 2021

PROGRAM OF ACTIVITIES





19th International Conference on Renewable Energy and Power Quality (ICREPQ'21)
University of Almeria. Spain
July 28,29,30. 2021

**INTERNATIONAL CONFERENCE
ON RENEWABLE ENERGY AND
POWER QUALITY
(ICREPQ'21)**

PROGRAM



INTERNATIONAL CONFERENCE ON RENEWABLE ENERGY AND POWER QUALITY (ICREPQ'21)

WELCOME TO ICREPQ'21

On behalf of the Steering Committee and the Local Organizing Committee we want to give you a very warm welcome to ICREPQ'21 and to Almeria.

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 128 papers (among 171 proposals) from which 112 will be presented at the Conference, 52 at oral sessions and 60 at poster sessions (dialogue), during the three days of the conference. All of these papers are included in the final program. Also four keynotes will be presented in plenary sessions by seven speakers.

ICREPQ'21 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, July 28th, at about 20:00 H, we'll can enjoy the **Welcome Civic Reception** and on Thursday, July 29th, 20:30 H, the **Conference Dinner**. On Wednesday after the Welcome Lunch, from 15:00 H to 18:30 H, will have one **Technical Visit to PSA (Plataforma Solar de Almería)** and on Friday, July 30th, after the Farewell Lunch, from 15:00 H to 18:30 H, we'll enjoy of the **Cultural Visit** to the Alcazaba and other monuments of Almeria.

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-Donsión
Chairman of the Steering Committee

Prof. Alfredo Alcayde García
Chairman of the Local Committee



ORGANISED BY:

The International Conference on Renewable Energies and Power Quality (ICREPQ'21), is organized by:

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



UNIVERSIDAD
DE ALMERÍA



UNIVERSIDADE
DE VIGO

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'21) is structured in:

- **Plenary Sessions:** Presentations of a minimum of 45 minutes and a maximum of 60 minutes in one room for all the participants
- **Oral Sessions:** Presentations in-person or on-line 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 in-person and also on-line.

SOCIAL EVENTS

- **Civic Reception: 28th of July**
- **Conference Dinner: 29th of July**

VENUE

The International Conference on Renewable Energies and Power Quality (ICREPQ'21) will be held at the University of Almeria. Carretera de Sacramento, s/n. 04120 La Cañada de San Urbano. Almeria. 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:

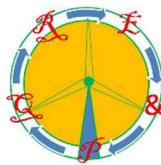
- Electromagnetic compatibility (EMC).
- Power Quality in Transport and Distribution. FACTS
- Economic Studies of the Power Quality.
- Low-frequency conducted disturbances: Voltage deviations, voltage fluctuations-flicker, voltage dips and short interruptions, harmonics and inter-harmonics, transient 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'21: EA4EPQ, University of Almeria, University of Vigo, RE&PQJ, CIRCUTOR, AEDIE



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Wednesday July 28, 2021						
9:00 – 9:30	Welcome & Registration “ICREPQ’21 Secretariat”					
9:30 – 10:15	Opening Ceremony ROOM A “Universidad de Almeria”					
10:15 - 11:00	ROOM A “Universidad de Almeria”. Plenary Sessions PL1					
	PL1	The role of concentrating solar thermal systems in the decarbonisation of the energy sector by Dr. Eduardo Zarza Technical Coordinator of Plataforma Solar de Almeria (PSA).				
	EXTRA TIME FOR DISCUSSION					
11:00 – 11:45	Posters Session at ROOM C "AEDIE" (Session P1) Coffee Break	<i>Poster Session P1</i>				
		203	207	208	209	214
		215	218	222	225	226
		227	231	232		
11:45 – 13:00	ROOM A “U. de Almeria”			ROOM B "CIRCUTOR"		
	<i>Oral Session A1</i>			<i>Oral Session B1</i>		
	240	265	280	220	286	296
	333	352		303	358	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
13:00 -- 15:00	Welcome Lunch					
15:00 – 18:30	Technical Visit to PSA (Plataforma Solar de Almería)					
	PSA (www.psa.es) is one of these outlying centers of the CIEMAT (www.ciemat.es), Public Research Centre of the Govern of Spain, that is formally considered by the European Commission as an European Large Scientific Installation and it is also the largest and most complete R+D center in the World devoted to solar thermal concentrating systems. PSA is integrated in the CIEMAT organization as an R&D division of the Department of Energy. PSA is also a Singular Science and Technology Infrastructures (ICTS) of Govern of Spain. The good solar conditions, its diverse solar facilities and the highly-skilled PSA staff, provide a unique infrastructure for R+D, evaluation, demonstration, education and technology transfer regarding solar energy applications.					
19:30 -- 22:00	Welcome Civic Reception Spanish Wine					

ROOMS: Room A: "U. de Almeria". Room B: "CIRCUTOR". Room C: "AEDIE" (Hall central).



Thursday July 29, 2021

9:00 – 12:00	Registration "ICREPQ'21 Secretariat"					
9:00 – 9:45	ROOM A "Universidad de Almeria" . Plenary Session PL2					
	PL2	Grid access of non-synchronous generation: Review of the Spanish regulation by Luis Rouco . Universidad Pontificia Comillas. Madrid, Spain				
	EXTRA TIME FOR DISCUSSION					
9:45 – 11:00	ROOM A "U. de Almeria"			ROOM B "CIRCUTOR"		
	<i>Oral Session A2</i>			<i>Oral Session B2</i>		
	212	288	298	242	251	322
	318	343		329	335	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
11:00– 11:45	Poster Session at ROOM C "AEDIE" (Session P2) Coffee Break	<i>Poster Session P2</i>				
		234	236	241	247	248
		252	253	259	260	264
		268	270	272	275	276
		278				
11:45 – 13:00	ROOM A "U. de Almeria"			ROOM B "CIRCUTOR"		
	<i>Oral Session A3</i>			<i>Oral Session B3</i>		
	223	239	245	255	284	295
	262	317		297	307	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
13:00 – 15:00	Lunch					
15:00 --16:00	ROOM A "Universidad de Almeria". Plenary Session PL3					
	PL3	Continuous Waveform Capture for Proactive PQ Monitoring Analysis by Bill Howe , PE, CEM, Program Manager, EPRI and Thomas A. Cooke , Senior Technical Leader, EPRI				
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
16:00 – 16:45	Poster Session at ROOM C "AEDIE" (Session P3) Coffee Break	<i>Poster Session P3</i>				
		279	282	283	292	293
		299	302	304	305	308
		309	314	316	320	321
		323				
16:45 -- 18:15	ROOM A "U. de Almeria"			ROOM B "CIRCUTOR"		
	<i>Oral Session A4</i>			<i>Oral Session B4</i>		
	250	267	312	200	205	219
	332	351	356	290	316	325
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
20:30 - 23:30	Conference Dinner (Optional)					

ROOMS: Room A: "U. de Almeria". Room B: "CIRCUTOR". Room C: "AEDIE" (Hall central).



Friday July 30, 2021						
9:00 – 12:00	Registration "ICREPQ'21 Secretariat"					
9:15 - 10:15	ROOM A "Universidad de Almeria". Plenary Session PL4					
	PL4	Green Hydrogen. New Challenges in the Energy Sector by Juan Antonio Roldán García, Francisco Quirante Quevedo and Eva Amate Ruiz				
	EXTRA TIME FOR DISCUSSION					
10:15 -- 11:00	Poster Session at ROOM C "AEDIE" (Session P4) Coffee Break	Poster Session P4				
		327	330	337	339	340
		341	344	346	353	360
		361	364	367	369	370
11:00 – 12:15	ROOM A "U. de Almeria"			ROOM B "CIRCUTOR"		
	Oral Session A5			Oral Session B5		
	271	287	291	201	202	258
	310	355		347	365	
	EXTRA TIME FOR DISCUSSION			EXTRA TIME FOR DISCUSSION		
12:15– 13:00	ROOM A "U. de Almeria". CLOSING SESSION					
	Conclusions and time for the next conference (ICREPQ'22)					
	Awards for the three best posters					
13:00 – 15:00	Farewell Lunch					
15:00 – 18:30	During the Cultural Visit we will visit the Alcazaba and different monuments of Almeria.					

SPECIAL SESSIONS SELECTED FOR ICREPQ'21		
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	András 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	Vit BRŠLIKA 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 (A, B)

Each speaker of one oral presentation, in-person or on-line, has an available time of 15 minute (12 minutes for the presentation and 3 minutes for questions) and the speaker must be stay in the session room 10 minutes before of the beginning of the session. The face-to-face speakers will need to test the audiovisual equipment and surely to exchange opinions with the Session Chairman. We suggest that the speakers of one oral presentation prepare their material in Power Point or, in the case of on-line presentations the speakers can prepare a video that they can send to the organizing committee before of the session for to check it, but we suggest that they present their paper on-line but in real time using Power Point.

Poster Presentations (P)

IN-PERSON. The posters presented in-person 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 take off 15 minutes after of the end of the session. The author(s) must be stay near the poster during the 45 minutes of the session duration for to answer all the questions that the audience or the chairmen could formulate. The maximum available surface for each poster will be 900 mm x 1500 mm (width x high). You must select your poster size take into account this maximum available surface (Perhaps an A0 size, 841×1189 mm, could be appropriate). Put on the pin board separated sheets of the paper are not allowed.

ON-LINE. The posters presented on-line must be numbered, on the up left corner, with the number of the paper and we suggest that the authors send us their posters in PDF format before July 1st. Then we will put the posters in the web and all the interested and registered people can send us questions about each of the posters that we will send to the authors for their answers and during their Poster Session the authors will have the opportunity of to present on-line the most relevant aspects of their reseach during 5 or 6 minutes and then the audience can make questions to each poster and the chairman of the session will organize the answers.

SESSION CHAIRMEN

On behalf of the International Scientific Committee, Steering Committee and the Organising Committee of the ICREPQ'21 and take into account their eminent position in the world of science we have selected 26 session chairmen. It is an honour for us their collaboration for to chair the sessions of ICREPQ'21 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. 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:

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.

Chairmen Session distribution

Wednesday 28th July, 2021		
HOUR	SESSION	CHAIRMEN
9:30 – 10:15	Opening Ceremony	
10:15 - 11:00	PLENARY SESSION PL1	Ahmad Pourmovahed
11:00 - 11:45	POSTER SESSION P1	Lucas Eduardo Matute Vazquez
		Almudena Filgueira Vizoso
		Tim Slangen
11:45 - 13:00	ORAL SESSION A1	Francisco Gil Montoya
	ORAL SESSION B1	Sergio Ramos
13:00 - 15:00	Welcome Lunch	
Thursday 29th July, 2021		
9:00 - 9:45	PLENARY SESSION PL2	Gianpaolo Vitale
9:45 - 11:00	ORAL SESSION A2	Milan Belik
	ORAL SESSION B2	Valery Vodovozov
11:00 - 11:45	POSTER SESSION P2	Iván Martín Bermeo Tenesaca
		Hayder Gallas
		Joao Soares
		Adam Muc
11:45 - 13:00	ORAL SESSION A3	Francisco Manzano
	ORAL SESSION B3	Christian Tutivén
13:00 - 15:00	Lunch	
15:00 - 16:00	PLENARY SESSION PL3	Mircea Ion Buzdugan
16:00 - 16:45	POSTER SESSION P3	Jan Iwaszkiewicz
		Helder Leite
		Albert Cornet
16:45 - 18:15	ORAL SESSION A4	Gorazd Stumberger
	ORAL SESSION B4	João R. Sanches Galvao
Friday 30th July, 2021		
9:15 - 10:15	PLENARY SESSION PL4	Alfredo Alcayde Garcia
10:15 - 11:00	POSTER SESSION P4	Luis Sainz
		Laura Castro Santos
		Leo Casasola Aignesberger
11:00 - 12:15	ORAL SESSION A5	Wolf-Gerrit Frü
	ORAL SESSION B5	Francisco Manuel Arrabal Castro
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'21.

ICREPQ'21 KEYNOTES

PL1. “*The role of concentrating solar thermal systems in the decarbonisation of the energy sector*” by Dr. Eduardo Zarza

Technical Coordinator of Plataforma Solar de Almería (PSA).

Concentrating solar thermal systems deliver clean energy that can be used for either electricity production (the so-called “solar thermal power plants”) or thermal energy supply to industrial processes consuming thermal energy (the so-called “solar heat for industrial processes”, SHIP). The affordable and reliable thermal energy storage systems currently used in these solar systems make electricity generation at night more cost effective than electricity produced overnight with other renewable energies (e.g. photovoltaic plants or wind farms using batteries to store electricity during the day). However, the electricity produced during sunlight hours with photovoltaic plants is the cheapest renewable electricity at present. Therefore, there exist an excellent complementarity between photovoltaic plants to produce electricity during the day and solar thermal power plants with thermal storage systems to produce electricity at night.

On the other hand, SHIP systems are an affordable option to deliver thermal energy to industries in a wide range of temperature, up to more than 1000°C. Since 74% of the world energy consumption of the industrial sector is in form of heat, SHIP systems can significantly contribute to the decarbonisation of the industrial sector. Therefore, concentrating solar thermal systems can provide clean electricity and heat at affordable costs, thus contributing to the decarbonisation of the energy sector.

The several technologies available for concentrating solar thermal systems will be presented in this key-note, and their commercial potential for electricity generation and thermal energy will be analysed.

Short biography of Dr. Eduardo Zarza



He was born in 1958 in Huelva (Spain). He got his Master degree in Industrial Engineering in 1986 and his Ph.D. in Industrial Engineering from University of Seville (Spain) in 2003. At present he is working at the Plataforma Solar de Almería (PSA) as Technical Coordinator and Head of the R+D Unit on Line-Focus Concentrating Solar Systems. He has been working for the last 35 years with concentrating solar systems. He has been the Director of several national and International R+D projects related to solar energy and parabolic trough collectors (the projects DISS, Solar Thermal Desalination, CAPSOL, PREDINCER, DETECSOL, etc..).

His specific R+D areas have been: solar seawater desalination, parabolic-trough solar collectors and direct steam generation. He is co-author of six books, fifteen chapters of books, 40 articles in peer-reviewed publications and 85 proceedings in International congresses related to solar energy. He has organized several national and International courses and seminars related to solar energy. He is a peer reviewer of many scientific magazines and Publications (Solar Energy, ASME Journal of Solar Energy Engineering, Applied Thermal Engineering, ENERGY - The International Journal y Chemical Engineering and Processing, and others). He is member of the Spanish AEN206/SC117 and international IEC/TC117 standardization committees for solar thermal power plants. He is also member of the Scientific and Technical Committee of the European Association of Solar Thermal Electricity (ESTELA) and the Scientific Committee of CIC-Energigune and the Executive Committee of SolarPACES (a collaborative technology program of the International Energy Agency, IEA). He has participated in the definition of the Strategic Research Agendas of several international entities, like ESTELA and KIC-Innoenergy. He was the coordinator of the CYTED Thematic Network ESTCI (Energía Solar Térmica de Concentración en Iberoamérica, www.redcytedestci.org). At present he is coordinating the Spanish Strategic Network SOLTERCO, aimed at promoting and disseminating the concentrating solar thermal technologies and their applications.

PL2. "Grid access of non-synchronous generation: Review of the Spanish regulation" by Prof. Luis Rouco

Universidad Pontificia Comillas. Madrid, Spain

Decarbonization of the economy to fulfill the Paris agreement goals requires the development of huge amounts of renewable power generation. Wind and solar photovoltaic power generation technologies have become technically mature and economically competitive technologies. Wind and solar photovoltaic generation are connected to the grid through power electronic converters. It results in formidable challenges for power system stability, control and protection. Due to such fact, it can be stated that ac power systems are facing the largest transformation since Edison, Tesla and Westinghouse.

The development of wind and solar photovoltaic generation depends critically on the access to the grid. In contrast to synchronous generation, the access to the grid of converter based generation (also called non-synchronous generation) is affected by a number of technical constraints.

The Spanish regulation of the grid access of non-synchronous generation has been recently reformulated.

This contribution will review the new regulation. The former regulation will be also discussed. The former regulation was based exclusively on the Short Circuit Ratio criterion. The new regulation is based on the Weigthed Short Circuit criterion together with steady-state and dynamic security assessments.

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).

PL3. “Continuous Waveform Capture for Proactive PQ Monitoring Analysis” by **Bill Howe**, PE, CEM, Program Manager, EPRI
and **Thomas A. Cooke**, Senior Technical Leader, EPRI

In the electric power industry, the voltage and current waveforms are the rawest forms of data that are analyzed for power system anomalies. An electric utility generates 4,320,000 one-cycle waveforms per day (5,184,000 for 60Hz). However, today, most power quality monitors are configured to record waveform data only when an arbitrary threshold, that may impact loads, is crossed—usually 90% of nominal voltage or 10% variation in the voltage waveform. All other variations between 91% to 99% are ignored. This means we are sampling our product only when it is near a point of causing problems, which is more reactive than a proactive approach. This presentation will cover new methods of continuous waveform capture that may present problems before they occur—saving a company costs from impending catastrophic failures.

Short biography of Mr. Bill Howe



Bill Howe is the Program Manager for Power Quality Research (Program 1) in the Power Delivery and Utilization Sector. Mr. Howe’s primary areas of expertise are: power quality research, information and knowledge development and deployment, industrial and commercial power quality analysis, industrial and commercial electric and control system design and optimization, demand response, electric energy efficiency, and market research. Mr. Howe manages the entire PQ Research portfolio for EPRI. His key responsibilities are strategic planning, project management, information products, and multi-client studies covering topics related to quality, reliability, and efficiency of energy delivery. Mr.

Howe also manages EPRI’s flagship power quality information offering, PQ Knowledge-Based Services, the premier international power quality information resource. Before joining EPRI, Mr. Howe worked nearly 20 years in management and senior engineering positions within a number of Fortune 500 companies and has experience in medium-voltage power quality product development, product testing, substation and distribution-system design and construction, motors and drive systems, and process automation. He is a registered professional engineer.

Short biography of Mr. Thomas A. Cooke



Thomas “Tom” Cooke manages Project Set B, PQ Data and Monitoring, for EPRI Program 1. His primary focus is working with utilities and industry experts to identify and develop research for the PQ & power monitoring industry. Recent research has been applied towards large PQ dataset management through advanced consolidation, visualization, and data validation. Other efforts include the continuous improvement of advancing PQ monitoring systems through laboratory assessments and contributing to industry standards. With over 23 years supporting the PQ industry, Technology from East Tennessee State University, and an M.S. degree in Technology from East Tennessee State University.

Tom has contributed to design and development of several advanced monitoring applications, including non-contact devices for detecting contact voltage and underground cable arcing to protect against both electric shock and vault events, both of which have been issued U.S. patents. Mr. Cooke received an A.A.S. degree from Pellissippi State Technical Community College in Electronics Engineering Technology, a B.S. degree in Engineering Technology from East Tennessee State University, and an M.S. degree in Technology from East Tennessee State University.

PL4. “Green Hydrogen. New Challenges in the Energy Sector” by Juan Antonio Roldán García, Francisco Quirante Quevedo and Eva Amate Ruiz

Identified as the energy vector which would lead the global decarbonization plans, green hydrogen has put the future of energy up side down. Being able to be applied from fossil fuel replacement to ammonia and many chemical and materials manufacture gives this gas large opportunities to be one pillar, together with renewable energy, in the very near energy mix. ISE, an experienced company in solar energy with more than 24 GW installed around the world, is now betting for hydrogen production plants based on natural and renewable resources as water and sun. Across the presentation, ISE's technical office team will introduce attendees through hydrogen technology: types according its origin, its uses and what is going on around the world regarding its development. Later on we will go slightly across its value chain, focusing in hydrogen production using PEM electrolyzers and how prices are and expect to be in the hydrogen market. As a conclusion, some of the main hydrogen projects that will be implemented in Spain and around the world will be detailed, showing that green hydrogen is not only an idea but a reality.

Short biography of Mr. Juan Antonio Roldán García



Born in Granada in early 1982, Juan Antonio joined the University of Granada in 2008, finishing his degree in Chemistry engineering in 2014 with the thesis "Efficient production of hydrogen and oxygen at high temperature by means of HyS and H-I thermochemical cycles". Amazed by hydrogen he got postgraduated in hydrogen production and management at the University of Ávila, followed an expert course in hydrogen and fuel cells for transportation from the Universidad San Jorge plus an expertise course of technician in hydrogen generators and fuel cells, combined heat and power systems (CHP) and micro fuel cells from the University of Birmingham.

His professional experience started at Letter Ingenieros S.L. where he led an engineering team in charge of evaluating hydrogen technology as an energy vector and its penetration in the energy sector. In 2019 Juan Antonio had the opportunity to start a new professional career in Hydrogen Clean Energy S.L in Seville where he became the technical director of high innovation projects, developing from the basic and conceptual engineering to the commissioning of the plant, managing all the steps of the project: economic, bureaucratic and regulatory control. Remarkable projects where he took part are H2-SMART Project: Intelligent storage of renewable energy in the form of or BTSH2 Project: production and continuous supply of hydrogen to an isolated telephone base station. He is currently one of the main parts of ISE's technical office where he develops green hydrogen projects.

He is in charge of the "Andalusian Hydrogen Association", the first Andalusian Association dedicated to hydrogen technology as an energy vector, whose main function is to provide knowledge on hydrogen technology, its applications and markets, development and research and to help in the implementation of hydrogen technology in Andalusia.

Short biography of Mr. Francisco Quirante Quevedo



Born in Sevilla in 1973, he got his Master degree in Industrial Engineering at University of Seville (Spain), complementing his official education with a master in Project Management at Universidad de Alcalá de Henares. Currently he is managing the Technical Office of ISE, a Spanish engineering and consultancy company specialized in every stage of Photovoltaic Plant projects with and an extensive experience as technical advisors to both developers and financial institutions. He began his more than 20 years of professional career in the nuclear industry, working as a Technician of Maintenance at Sta M^a Garoña Nuclear Power Plant during three years and collaborating with the Engineering

Department at some projects like: renovation of the instrumentation of the control room, new overpressure system for the ventilation of the control room; replacement of instrumentation recirculation pumps, etc. After that, he moved to Almería where he worked during eight years as a freelancer for different local architectural firms in the design and calculation of building installations ending up joining, in 2011, Ingenia Solar Energy where has managed photovoltaic projects all over the world in countries like Spain, Portugal, Italy, Honduras, South Africa, Mexico, Philippine, Australia or Arab emirates.

Remarcable is his experience during 2016-2020 leading the engineering of the DEWA Phase III 800MWac(1066 MWdc) PV Solar Power Project phase III including in Mohammed bin Rashid Al Maktoum Solar Park that is the largest single-site solar park in the world. Nowadays he continues with his tasks as international project manager at ISE, responsibility that combines with being at the head of the technical office leading ISE's green hydrogen projects.

Short biography of Mrs. Eva Amate Ruiz



Eva Amate Ruiz is a young 28th years old Industrial engineering specialiced in fluids and thermodynamics. With her thesis "Effect of the addition of hydrocolloids on the flow properties in gluten-free doughs" she got her degree at Universidad de Málaga in 2016, starting her professional carrer as Project engineer at Canal de Isabel II (CYII), During three years she was responsible of two strategic plans: "CYII Efficiency plan", which aimed to reduce energy consumption of the industrial plants and pums managed by the company and "Strategic line 1.1." which was focused in guarantee the water supply. Parallel to her duties at the Control

center of CYII she got a grant and started Professional development's master degree at Universidad de Alcalá de Henares and in 2017 joined Universidad Politécnica de Madrid's international Master in Material engineering where she got a mention in functional materials, focusing her interest in microstructure characterization of materials, materials for energy and its application in extreme conditions and smart polymers.

Between 2015 and 2019 she attended to several international training courses around europe and turkey where she worked toguether with people of very different nationalities, ages and backgrounds, complementing her formal education with non formal one in topics related with motivation, leadership, team work and social issues. Although her professional career began in the water sector, her interest in renewable energy and the deeper knowledge about energy that she got during the UPM'S master awoke her need for a career advancement, finding the way to materialize it within Ingenia Solar Energy. At ISE she is a part of the technical office, department which is developing green hydrogen projects focused in hydrogen production and other R+D+i projects.



Wednesday July 28th, 2021

9:30– 10:15 Opening Ceremony ROOM A “Universidad de Almería”

10:15-11:00 Plenary Session PL1 ROOM A “Universidad de Almería”

Chairman: **Ahmad Pourmovahed**

PL1. “The role of concentrating solar thermal systems in the decarbonisation of the energy sector” by **Dr. Eduardo Zarza**

Technical Coordinator of Plataforma Solar de Almería (PSA).

Wednesday July 28th, 2021

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

Chairmen: **Lucas Eduardo Matute Vazquez, Almudena Filgueira Vizoso, Tim Slangen**

203 Incentives for Renewable Energies in Colombia

F. Villada, J.D. Saldarriaga-Loaiza, J.M. López-Lezama

Department of Electrical Engineering Universidad de Antioquia, Medellin. Colombia

207 Energy savings approach to optimal location of EV charging stations in microgrids

Vishnu Suresh, Przemyslaw Janik, Dominika Kaczorowska

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

208 Synthetic Series of Electricity Generation through a Photovoltaic System by using Different Panel Temperature Models

A. H. M. Stach (1,2,3), D. P. Neto (1,2,3), M. A. Vidal (2,3), O. C. N. Souto(2), S. B. Silva (2), E. G. Domingues (1,2,3)

1. Master’s Program in Sustainable Process Technology

2. Electrical Engineering/Control and Automation Engineering Program NeXT – Nucleus of Experimental and Technological Studies

3. Federal Institute of Education, Science and Technology of Goiás. Brazil

- 209 Quantification of CO₂ emission reductions from energy efficiency actions and solar photovoltaic the Federal Institute of Education, Science and Technology of Goiás**
A. Vidal (2,3), A. F. Faria(1), A. H. M. Stach (1,2,3), D. P. Neto (1,2,3), L. S. Pinto (1,2,3), A. G. Pinho (2,3), E. G. Domingues (1,2,3)
1. Master's Program in Technology Sustainable Process
2. Electrical Engineering/Control and Automation Engineering Program
3. NeXT - Nucleus of Experimental and Technological Studies
Federal Institute of Education, Science and Technology of Goiás. Brazil
- 214 A techno-economic analysis of floating photovoltaic systems, for southern European countries**
J. Baptista(1,2), P. Vargas(1), J. R. Ferreira(3)
1. Department of Engineering
2. CPES -INESCTEC UTAD Pole University of Trás-os-Montes and Alto Douro.
3. Department of Electrical and Computer Engineering FEUP, Porto. Portugal
- 215 Particularities of high oxygen content biofuels pyrolysis process**
G. Lazaroiu(1), L. Mihaescu(2), E. Pop(2) , R.M. Grigoriu(1) , D.A. Ciupageanu(1), I. Simion(1)
1. Power Engineering Faculty University Politehnica of Bucharest. Romania
2. Mechanics and Mechatronics Faculty University Politehnica of Bucharest. Romania
- 218 Evaluation of PV microgeneration systems and tariffs management on the energy efficiency of service buildings**
J. Baptista(1,2), G. Sequeira(1), E. J. Solteiro Pires(1,2)
1. Department of Engineering
2. INESC TEC UTAD Pole University of Trás-os-Montes and Alto Douro Prados – Vila Real. Portugal
- 222 Investigation on Using Low Voltage Automatic Regulation to Minimize the Impacts of Charging Plug-in Electric Vehicles in Distribution Systems**
Priscila Costa Nascimento, Michel Giroto de Oliveira, José Carlos M. Vieira
Department of Electrical and Computer Engineering São Carlos School of Engineering (EESC) University of São Paulo (USP). Brazil
- 225 Survey on the Advancements of Dielectric Fluids and Experiment Studies for Distribution Power Transformers**
S. Carvalhosa(1), H. Leite (1), F. Branco, Carlos A. Sá(1), António M. Moura(1), Ricardo C. Lopes(2), Mário Soares (3)
1. High Voltage Laboratory, Department of Electrical Engineering FEUP, Porto University. Portugal
2. Efacec, Transformers R&D. Portugal
3. Redes Energéticas Nacionais, Asset Management Department. Portugal

- 226 Study the Possibility of Implementing a Solar Chimney Power Plant in Algeria (Case study: Constantine)**
S. Djimli(1,2), A. Chaker(3), T.E. Boukelia(2,4), A. Ghellab(1,2), A. Bouraoui(1,2)
1. Laboratory of Applied Energies and Materials, Faculty of Sciences and the Technology, University of Jijel. Algeria
 2. Mechanical Engineering Department, Faculty of Sciences and the Technology, University of Jijel. Algeria
 3. Energy Physics Laboratory, Department of Physics, University of Brothers Montouri Constantine. Algeria
 4. Laboratory of Mechanical and Advanced Materials, Polytechnic School of Constantine. Algeria
- 227 Experimental work over borehole filling material to reinforce characterization and model validation of Ground Heat Exchangers**
A.J. Extremera-Jiménez(1), D. Eliche-Quesada(2), C. Guitérrez-Montes(1), F. Cruz-Peragón(1)
1. Department of Mechanical and Mining Engineering, E.P.S. de Jaén, University of Jaén. Spain
 2. Department of Chemical, Environmental and Materials, E.P.S. de Jaén, University of Jaén. Spain
- 231 The decarbonisation of Galicia using renewable marine energy**
L. Castro-Santos(1), A. Filgueira-Vizoso(2)
1. Universidade da Coruña, Departamento de Enxeñaría Naval e Industrial Escola Politécnica Superior, Ferrol. Spain
 2. Universidade da Coruña, Departamento de Química, Escola Politécnica Superior, Ferrol. Spain
- 232 How important are ports for the offshore wind industry?: the case of Spain**
A. Filgueira-Vizoso(1), F. Puime-Guillén(2), D. Cordal-Iglesias(3), A.I. García-Diez(4), I. Lamas-Galdo(5), L. Castro-Santos(6)
1. Universidade da Coruña, Departamento de Química, Escola Politécnica Superior, Ferrol. Spain
 2. Universidade da Coruña, Departamento de Empresa, Facultade de Economía e Empresa, Ferrol. Spain
 3. Universidade da Coruña, Escola Politécnica Superior, Ferrol. Spain
 4. Universidade da Coruña, Departamento de Enxeñaría Naval e Industrial Escola Politécnica Superior, Ferrol. Spain,
 5. Universidade da Coruña, Departamento de Ciencias da Navegación e Enxeñaría Mariña, Escola Politécnica Superior, Ferrol. Spain,
 6. Universidade da Coruña, Departamento de Enxeñaría Naval e Industrial Escola Politécnica Superior, Ferrol. Spain



Wednesday July 28th, 2021
11:45 - 13:00 Oral Session A1 ROOM A “U. de Almería”

Chairman: **Francisco Gil Montoya**

- 240 Design of Power Quality Virtual Lab Toolbox using LabVIEW/Multisim**
S. Haidar, E. Moussa, M. El Hassan, M. Badawi El Najjar
Department of Electrical Engineering University of Balamand Kelhat – Al Kurah. Lebanon
- 265 Automated Tool Based on Deep Learning to Assess Voltage Dips Validity: Integration in the QuEEN MV network Monitoring System**
M. Zanoni, R. Chiumeo, L. Tenti, M. Volta
Ricerca sul Sistema Energetico – RSE S.p.A., Milano. Italy
- 280 Harmonic analysis PQM data in 150kV grid of TSO TenneT in Brabant, The Netherlands**
W.L. Broekman(1), J.B.M. van Waes(2), V. Čuk(1), J.F.G. Cobben(1)
1. Department of Electrical Engineering Eindhoven University of Technology. The Netherlands.
2. TSO TenneT B.V. Arnhem. The Netherlands
- 333 Power Quality Impacts of PV Systems Integration on Petroleum Development Ornan (PDO) - Mina Al-Fahal (MAF) Distribution Network**
Faiza Al-Harathi(1), Mohammed Albadi(1), Rashid Al-Abri(1,2), Abdullah Al-Badi(1)
1. Department of Electrical & Computer Engineering
2. Sustainable Energy Research Center
Sultan Qaboos University, Muscat. Oman
- 352 Impact of harmonic distortion on the supraharmonic emission of pulse-width modulated single-phase power electronic devices**
E. Kaufhold, J. Meyer, P. Schegner
Institute of Electrical Power Systems and High Voltage Engineering, Technische Universitaet Dresden. Germany



Wednesday July 28th, 2021
11:45 - 13:00 Oral Session B1 ROOM B "CIRCUTOR"

Chairman: **Sergio Ramos**

- 220 Optimal Allocation of Multiple Distributed Generations including Uncertainties in Distribution Networks by k-Means Clustering and Particle Swarm Optimization Algorithms**
Onur Hakkı Eyüboğlu, Ömer Gül
Department of Electrical Engineering Istanbul Technical University. Turkey
- 286 Modelling of a Permanent Magnet Synchronous Motor and its Control Circuit in Simulink Environment**
Mihály Katona, Péter Kiss
Department of Electric Power Engineering Budapest University of Technology and Economics Budapest. Hungary
- 296 Design Overview of a Toroidal Fast-Field Cycling electromagnet**
Joao T. Cunha(1), Pedro J. Sebastiao(1), António Roque(2,3), Vitor Vaz da Silva(4,5), Duarte M. Sousa(6)
1. CeFEMA, Instituto Superior Técnico, Lisboa. Portugal
2. Department of Electrical Engineering. ESTSetúbal/ Insituto Politécnico de Setúbal. Portugal
3. INESC-ID. Portugal
4. ADEETC-ISEL, Instituto Politécnico de Lisboa. Portugal
5. CTS, Universidade Nova de Lisboa. Portugal
6. DEEC, AC Energia, Instituto Superior Técnico, Universidade de Lisboa. Portugal
- 303 Modelling of Stator Coil-To-Ground Faults in Induction Motor**
Stanislav Kocman, Pavel Pecínka
Department of General Electrical Engineering, VŠB -Technical University of Ostrava Czech Republic
- 358 Real-Time Experimental Assessment of a New MPPT Algorithm Based on the Direct Detection of the Short-Circuit Current for a PV System**
C. B. Nzoundja Fapi(1,2), P. Wira(2), M. Kamta(1)
1. LESIA Laboratory, ENSAI, University of Ngaoundere. Cameroon
2. IRIMAS Laboratory, University of Haute Alsace. France



Thursday July 29th, 2021
9:00-9:45 Plenary Session PL2 ROOM A “Universidad de Almería”

Chairman: **Gianpaolo Vitale**

PL2. "Grid access of non-synchronous generation: Review of the Spanish regulation"

by **Prof. Luis Rouco**. Universidad Pontificia Comillas. Madrid, Spain

11:45 - 13:00 Oral Session A2 ROOM A “U. de Almería”

Chairman: **Milan Belik**

- 212 Positive effects of the migration from Ka-band satellite to 4G solution for the communication needs of a scattered set of 1 MW solar farms in Poland: a user’s experience**
Enrique Tébar (1), Luis Hurtado (2), Witold Bąk (3), Zbigniew Kulesza (3), Andrzej Napieralski(3)
1. University of Alicante. Spain
2. Vodafone Spain, Madrid. Spain
3. Department of Microelectronics and Computer Science, Lodz University of Technology. Poland
- 288 New PV Metrology for performance appraisal of Poly-Silicon PV Modules in Eastern Indian climatic Zone**
Debasish Majumdar(1), Sudipta Basu Pal (2), Rajiv Ganguly(1)
1. University of Engineering & Management, Kolkata. India
2. Computer Science Engineering Departments, University of Engineering & Management, Kolkata. India
- 298 Study of the second-generation of CdTe and CIGS thin film PV modules under natural sunlight conditions**
K. Dyndal, J. Sanetra, K. Marszalek
Institute of Electronics, Faculty of Computer Science, Electronics and Telecommunications. AGH University of Science and Technology, Kraków. Poland
- 318 Shared PV Production in Energy Communities and Buildings Context**
Sérgio Ramos, Zabra Foroozandeh, João Soares, Inés Tavares, Pedro Faria, Zita Vale
GECAD - Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development, Polytechnic of Porto (ISEP/IPP), Portugal

343 Comparative study of photovoltaic self-consumption alternatives considering the Spanish legal framework

S. de la Torre(1), J. Á. Lagos(2)

1. Departamento de Ingeniería Eléctrica, Universidad de Málaga. Spain
2. Departamento de Innovación, Iberdrola S.A. Spain

Thursday July 29th, 2021

11:45 - 13:00 Oral Session B2 ROOM B "CIRCUTOR"

Chairman: **Valery Vodovozov**

242 A Centralized Shifted Voltage Control Method for Accurate Power Sharing in DC Islanded Microgrids

Minh-Duc Pham, Hong-Hee Lee

Department of Electrical Engineering University of Ulsan. Korea

251 The Fault Detection of Gears of Electromechanical Power Transmission System using Frequency Domain Approach

Alwadie. A(1), Muhammad Irfan(2), Nordin Saad(3)

- 1.2. Electrical Engineering Department, College of Engineering, Najran University. Saudi Arabia
3. Department of Electrical and Electronics Engineering, Universiti Teknologi PETRONAS, Perak. Malaysia

322 Detection of the initial region of the current transformer core saturation

I. Odinaev, Andrew V. Pazderin, Pavel. V. Murzin, Valeriy A. Tashchilin, Vladislav O. Samoylenko, B. Ghoziev

Department of Automated Electrical Systems, Ural Federal University
Yekaterinburg. Russia

329 Distribution Grid Future Planning Under Uncertainty Conditions

V. Samoylenko(1), A. Firsov(1), A. Pazderin(1), P. Ilyushin(2)

1. Department of Automated Electrical Systems, Ural Federal University
Yekaterinburg. Russia
2. Energy Research Institute, Russian Academy of Sciences, Moscow. Russia

335 Permanent Closed-Loop Operation as a Measure for Improving Power Supply Reliability in a Rural Medium Voltage Distribution Network

G. Štumberger(1), M. Rošer(2), B. Polajžer(1)

1. Faculty of Electrical Engineering and Computer Science, University of Maribor. Slovenia
2. Elektro Celja d.d. Celje. Slovenia

Thursday July 29th, 2021
11:00-11:45 Poster Session P2 – Coffee Break **ROOM C "AEDIE"**

Chairmen: **Iván Martín Bermeo Tenesaca, Hayder Gallas, Joao Soares, Adam Muc**

- 234** **Uncertainty analysis for industries investing in energy equipment and renewable energy sources**
E. M. Urbano(1), A.D. Gonzalez-Abreu(2) , K. Kampouropoulos(1), L. Romeral(1)
1. MCIA Research Center, Department of Electronic Engineering Universitat Politècnica de Catalunya, Terrassa. Spain
2. HSPdigital CA-Mecatronica Engineering Faculty Autonomous University o Queretaro. Mexico
- 236** **Fast testing platform for the isolation transformer**
G. Bucci, F. Ciancetta, A. Fioravanti, E. Fiorucci, S. Mari, A. Prudenzi
Department of Industrial and Information Engineering and Economics University of L'Aquila. Italy
- 241** **Comparison of the Thermal Performance of Mineral Oil and Natural Ester for Safer Eco-Friendly Power Transformers**
A Numerical and Experimental Approach
Sandra Couto(1), Elisabete M. Ferreira(1), Diogo Sá(1), Catarina Corte-Real(1), Pedro Lima(1), Ricardo C. Lopes(1), Artur Costa(2), Carlos A. Sá(2), Pedro Monteiro(3), Mário Soares(3)
1. Efacec Energia - Máquinas e Equipamentos Eléctricos, S.A. Portugal
2. Universidade do Porto, Faculdade de Engenharia, Porto. Portugal
3. REN - Rede Eléctrica Nacional, S.A., Lisboa. Portugal
- 247** **Inverter Control Analysis in a Microgrid Community Based on Droop Control Strategy**
Navid Salehi, Herminio Martínez-García, Guillermo Velasco-Quesada, Encarna García -Vilchez
Department of Electronic Engineering Escola d'Enginyeria de Barcelona Est (EEBE), Technical University of Catalonia (UPC)-BarcelonaTech. Spain
- 248** **Energy design and experimental evaluation of an industrial burner to natural gas**
Freddy J. Rojas(1,2), Fernando Jimenez(2), Luis Napan (2)
1. Research Group on Applied Environmental Control and Energy Efficiency Methodologies (GICA)
2. Department of Mechanical Engineering. Pontificia Universidad Católica del Perú.

- 252 A review on the integration between urban and energy planning considering the planning tools**
L. F. C. Castro, B. B. Freitas, P. C. M. Carvalho
Department of Electrical Engineering, Federal University of Ceará. Brazil
- 253 Design of an active pitch control for small horizontal-axis wind turbine**
J. Vilà(1), N. Luo(1), L. Pacheco(1), T. Pujol(2), J.R. Gonzalez(2), I. Ferrer(1)
A. Massaguer(2), E. Massaguer(2)
1. Department of Electrical Engineering, Electronics and Automation, University of Girona. Spain
2. Department of Mechanical Engineering and Industrial Construction, University of Girona. Spain
- 259 Novelty Detection on Power Quality Disturbances Monitoring**
A. D. Gonzalez-Abreu(1), 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
- 260 Development of a power transformer model for high-frequency transient phenomena**
L. Braña(1,2), A. Costa(2), R. Lopes(1)
1. Department of Research and Development Efacec Energia. Portugal
2. Department of Electrical Engineering FEUP, University of Porto. Portugal
- 264 Energy planning tools applied into urban photovoltaic: the importance of compatibilizing with the constructions**
B. B. Freitas, L. F. C. Castro, P. C. M. de Carvalho
Department of Electrical Engineering Federal University of Ceará. Brazil
- 268 Bi₆Te_{2-x}R_xO₁₃ (R=Ti, Si, Ce) Systems: A Investigation for Fuel Cell Applications**
K. D. Ferreira(1), G. Gasparatto(2), G.P. Viajante(1), J.F. Carvalho(2)
1. Instituto Federal de Goiás, Itumbiara-Goiás. Brazil
2. Instituto de Física, Universidade Federal de Goiás, Goiânia-Goiás. Brazil

- 270 Design and Implementation of an IMC-1DOF Controller Applied to MPPT Photovoltaic Systems Using ZVS Full-Bridge DC-DC Converter**
E. N. Chaves(1), G. P. Viajante(1), M. A.A. de Freitas(1), E. A. A. Coelho(2), M.E Oliveira(1), R. Nielson(3), L.G Wesz(1), G. Moraes(2)
1. Instituto Federal de Educação, Ciência e Tecnologia de Goiás, Itumbiara – GO Brasil
2. Universidade Federal de Uberlândia, Uberlândia – MG. Brazil
3. Enel Distribuição Goiás. Brazil
- 272 Wind Action Analysis on Different Structures of Photovoltaic Systems Installed on Flat Rooftops of Buildings**
D. G. N. M. Benchimol, J. L. Domingos, A. J. Alves
Experimental & Technological Research and Study Group (NExT) of Federal Institute of Goiás, Goiânia, Goiás. Brazil
- 275 Solar Energy as an alternative source in boiler economizers**
A. Daniel Pereira de Oliveira(1),B. Aylton Alves(1), Bárbara Morais Arantes(2)
1. I.F.G. Federal Institute of Education, Science and Technology of Goias. Brazil
2. Ciências da Saúde, Universidade Federal de Goiás. Brazil
- 276 Comparative Analysis of Dynamic Performance Between Switched Reluctance Motors 6x4 and 8x6**
M.B.S. Pinto, G.P.Viajante, E.N. Chaves, M.A.A. Freitas, M.E Oliveira, J.A. Santos
Federal Institute of Education, Science and Technology of Goiás Energy Systems Research Center (Núcleo de Pesquisas em Sistemas de Energia - NuPSE) Goiás. Brazil
- 278 Cycle-Life Curves Determination and Modelling of Commercially Available Electric Vehicle Batteries**
G.Saldaña(1), J.I. San Martín(2), F.J. Asensio(2), I. Zamora(3), O. Oñederra(3), M. González-Pérez(2), I.J. Oleagordia(4)
1. Department of Systems and Automatic Engineering Engineering School of Bilbao, University of the Basque. Spain
2. Department of Electrical Engineering Engineering School of Gipuzkoa, University of the Basque Country, Eibar. Spain
3. Department of Electrical Engineering Engineering School of Bilbao, University of the Basque Country. Spain
4. Department of Electronic Technology Engineering School of Bilbao, University of the Basque Country. Spain



Thursday July 29th, 2021
11:45 - 13:00 Oral Session A3 ROOM A “U. de Almería”

Chairman: **Francisco Manzano**

- 223 High energy-efficient electrical drive with multilevel inverter and wide bandgap power semiconductors**
R. Mecke
Department of Automation and Computer Sciences Harz University of Applied Sciences, Wernigerode. Germany
- 239 Three-Phase Transformerless Inverter for Photovoltaic Grid Connected System with Zero Common Mode Noise**
K. Karam, M. Badawi El Najjar, M. El Hassan
Department of Electrical Engineering University of Balamand Kelhat – Al Kurah. Lebanon
- 245 Frequency Domain Stability Assessment of Photovoltaic Power Generation Systems with Quasi-Z-Source Inverters**
L. Sainz(1), LI. Monjo(2)
1. Department of Electrical Engineering E.T.S.E.I.B., UPC Barcelona. Spain
2. Department of Industrial Systems Engineering and Design Universitat Jaume I Castelló de la Plana. Spain
- 262 Continuous cross-period single phase shift control for dual active bridge converters**
Szabolcs Veréb, András Futó, Zoltán Süttő, Attila Balogh, István Varjasi
Power Electronics Research Group. Department of Automation and Applied Informatics. Budapest University of Technology and Economics. Hungary
- 317 Design of a LLC Resonant Converter for Powering a PEM Electrolyzer**
G. Vitale(1), F. Castaldi(2), D. Guilbert(3)
1. ICAR, Institute for high performance computing and networking, National Research Council of Italy, Palermo. Italy
2. Department of Engineering, University of Palermo, Viale delle Scienze, Palermo. Italy
3. Université de Lorraine, GREEN, Nancy. France



Thursday July 29th, 2021
11:45 - 13:00 Oral Session B3 ROOM B "CIRCUTOR"

Chairman: **Chritian Tutivén**

- 255 The energy-environmental efficiency of the existing building stock through morphological-constructive solutions: the case study of a single family building in Sicily**
F. Blundo, F. Foti, F. Leone, F. Nocera, L. Savoca
Department of Civil Engineering and Architecture DICAR, University of Catania.
Italy
- 284 Power Quality Improvements in Grid-Connected PV System Using Hybrid Technology**
Prasad Kumar Bandahalli Mallappa, Herminio Martínez-García, Guillermo Velasco-Quesada
Department of Electronic Engineering Escola d'Enginyeria de Barcelona Est (EEBE), Technical University of Catalonia (UPC)-BarcelonaTech. Spain
- 295 Adaptive Notch Filter based WECS for Unbalance Mitigation**
M.K. Abbas, M. Mokhtar, M.I. Marei, A.A.El-Sattar
Department of Electrical Power and Machines. Faculty of Engineering Ain Shams Universty, Cairo. Egypt
- 297 A Brief Introduction in the Mitigation of Conducted Electromagnetic Interference Issues**
M. Buzdugan
Department of Buildings Engineering, Technical University of Cluj-Napoca. Romania
- 307 Unfavourable Reactive Power in a Rolling Mill**
Stanislav Nowak, Stanislav Kocman
Department of General Electrical Engineering
VŠB - Technical University of Ostrava. Czech Republic

Thursday July 29th, 2021
15:00-16:00 Plenary Session PL3 ROOM A "Universidad de Almería"

Chairman: **Mircea Ion Buzdugan**

PL3. "Continuous Waveform Capture for Proactive PQ Monitoring Analysis" by **Bill Howe**, PE, CEM, Program Manager, EPRI
and **Thomas A. Cooke**, Senior Technical Leader, EPRI

Thursday July 29th, 2021
16:00 - 16:45 Poster Session P3 ROOM C “AEDIE”

Chairmen: **Jan Iwaszkiewicz, Helder Leite, Albert Cornet**

- 279 Integration of the Electric Vehicle into the Electrical Grid of the Future**
M. González-Pérez(1), J.I. San Martín(1), F.J. Asensio(1), I. Zamora(2), O. Oñederra(2), G. Saldaña(3), I.J. Oleagordia(4)
1. Department of Electrical Engineering Engineering School of Gipuzkoa (Eibar), University of the Basque Country. Spain
2. Department of Electrical Engineering Engineering School of Bilbao, University of the Basque Country. Spain
3. Department of Systems and Automatic Engineering Engineering School of Bilbao, University of the Basque. Spain
4. Department of Electronic Technology Engineering School of Bilbao, University of the Basque Country. Spain
- 282 Software for calculating the optimum tilt angle of PV modules in different latitudes of the Southern hemisphere and solar plant sizing**
Matheus M. Cabral, Sofia. A. Lemes, Marcelo E. de Oliveira, Paulo H. A. Silva e Silva, Ghunter P. Viajante
Núcleo de Psquisas em Sistemas de Energia - NuPSE Federal Institute of Education, Science and Technology of Goiás – IFG. Itumbiara, Goiás. Brazil
- 283 Impacts of Photovoltaic Systems on a Brazilian Distribution Feeder using OpenDSS**
Eduardo Mateus Costa Santos de Oliveira, Marcelo Escobar de Oliveira, Luis Gustavo Wesz da Silva
Núcleo de Pesquisas em Sistemas de Energia - NuPSE Federal Institute of Education, Science and Technology of Goias - IFG .Itumbiara – Goias .Brazil
- 292 A comparative study of model fitting for estimating the overall efficiency of grid-connected photovoltaic inverters**
J. Ramos-Teodoro(1) , F. Rodríguez(1) , M. Pérez(2), M. Berenguel(1)
1. Department of Informatics
2. Department of Chemistry and Physics CIESOL-ceiA3, University of Almería. Spain
- 293 Understanding Power Quality using IoT-based Smart Analyzers and Advanced Software Tools**
A. Alcayde(1), F.G. Montoya(1), F.M. Arrabal-Campos(1), Jesús González(2), Andrés Ortiz(3), R. Baños(1)
1. Department of Engineering E.S.I., University of Almería. Spain
2. Department of Computer Architecture and Technology E.T.S.I.I., University of

Granada. Spain

3. Department of Signal Theory, Networking and Communications, E.T.S.I.T.,
University of Malaga. Spain

- 299 Micromorph and polymorphous solar panel in a warm temperature transitional climate - comparison of outdoor performance and simulations**
G. Lewhiska, K. Dyndal, J. Sanetra, K.W. Marszalek
AGH University of Science and Technology, Institute of Electronics, Krakow. Poland
- 302 Performance evaluation of high-lift hydrofoils with a flap used in the design of horizontal-axis hydrokinetic turbines**
Rubio-Clemente A(1,2), Aguilar J(2), Chica E(2)
1. Facultad de Ingeniería, Universidad de Medellín. Colombia
2. Grupo de Investigación Energía Alternativa, Facultad de Ingeniería, Universidad de Antioquia, Medellín. Colombia
- 304 Loss Analysis Due to Influence of Harmonics in a Distribution System**
R.M. Soares, M. E. Oliveira, M. A. A. Freitas, G.P. Viajante, E. N. Chaves
Núcleo de Pesquisas em Sistemas de Energia - NUPSE
IFG, Instituto Federal de Goiás. Brazil
- 305 Analysis of an automotive thermoelectric generator coupled to an electric exhaust heater to reduce NOx emissions in a Diesel-powered Euro VI Heavy Duty vehicle**
A. Massaguer(1), E. Massaguer(1), J. Ximinis(1), T. Pujol(1) M. Comamala(1), L. Montoro, J.R. González, P. Fernández-Yañez(2), O. Armas(2)
1. Department of Mechanical Engineering and Industrial Construction. E.P.S.,
Universitat de Girona. Spain
2. Universidad de Castilla-La Mancha. Campus de Excelencia Internacional en
Energía y Medioambiente. Escuela de Ingeniería Industrial y Aeroespacial de
Toledo. Spain
- 308 Application of a central composite face-centered design in the optimization of an Archimedean hydrokinetic turbine**
J. Betancour(1), L. Velásquez(1), L.Y. Jaramillo(2), E. Chica(1), A. Rubio-Clemente(1,2)
1. Grupo de Investigación Energía Alternativa, Facultad de Ingeniería, Universidad de Antioquia. Colombia
2. Facultad de Ingeniería, Tecnológico de Antioquia-Institución Universitaria TdeA Medellín. Colombia
- 309 The behaviour of a low voltage distribution network with crescent presence of photovoltaic generation and energy storage elements**



Rafael Martins Leite, Jonas Villela de Souza, Eduardo Nobuhiro Asada, Mário Oleskovicz

Department of Electrical and Computer Engineering, Sao Carlos Engineering School, University of Sao Paulo. Brazil

314 Fuses in distribution systems: new applications in DC circuits

J. C. Gómez, D. Toum, C. Reineri, F. Romero

Department of Electrical and Electronic Engineering, IPSEP, Rio Cuarto National University, Córdoba. Argentina

316 Convolutional Neural Network for Wind Turbine Failure Classification Based on SCADA Data

B. Puruncajas(1,2), W. Alava(1), Encalada Dávila(1) C. Tutivén(1,2), Y. Vidal(2,3)

1. Mechatronics Engineering, Faculty of Mechanical Engineering and Production Science, Escuela Superior Politécnica del Litoral, Guayaquil. Ecuador
2. Control, Modeling, Identification and Applications Department of Mathematics Escola d'Enginyeria de Barcelona Est, Universitat Politècnica de Catalunya.
3. Institute of Mathematics (IMTech) Universitat Politècnica de Catalunya Barcelona. Spain

320 Intelligent Resource Management in the context of a Microgrid of Smart Buildings

Sérgio Ramos, João Soares, Zahra Foroozandeh, Inés Tavares, António Gomes

GECAD - Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development Polytechnic of Porto (ISEP/IPP). Portugal

321 The contribution of experimental energy facilities to the achievement of SDG in their environment: the case of IFMIF-DONES

Rafael Esteban López(1), Zaida Troya(1), Virginia Fernández-Pérez(1,2), Antonio Peña-García(3)

1. "DONES Preparatory Phase" (CE Ref. 870186) Project Vicerrectorate of Research - University of Granada. Spain
2. Dpt. Business Organisation, Faculty of Economics and Business, University of Granada. Spain
3. Department of Civil Engineering & Co-PI UGR "DONES Preparatory Phase" (CE Ref. 870186) University of Granada. Spain

323 Protection of Power Semiconductors in Inverters, using Fuses and their Coordination with the Protection Schemes of the Distribution System

J. C. Gómez, J. Vaschetti, M. Piumetto, J. Arcurio, C. Coyos

Department of Electricity. CIDTIEE, Technological National University. Argentina

Thursday July 29th, 2021
16:45 - 18:15 Oral Session A4 ROOM A “U. de Almería”

Chairman: **Gorazd Stumberger**

- 250 Technical and economic feasibility study of a solar plant on a commercial surface in Azogues, Ecuador**
I. Bermeo(1), L. Matute(1), E. Barragán-Escandón(1), X. Serrano-Guerrero(1), E. Zalamea-León(2)
1. Universidad Politécnica Salesiana, Grupo de Investigación en Energía
2. Universidad de Cuenca, Facultad de Arquitectura y Urbanismo Cuenca. Ecuador
- 267 Clustering Technique for Scenario Reduction in Post-Energy Transition Voltage Dips Assessment**
R. Torkzadeh(1), J.B.M. van Waes(2), V. Čuk(1), J. F. G. Cobben(1)
1. Department of Electrical Engineering, Eindhoven Technical University (TU/e). The Netherlands
2. TenneT TSO B.V. The Netherlands
- 312 Dual-Axis Tracking Electrical Drives for Solar Power Tower**
W. M. Hamanah(1), A. Salem(1), M. A. Abido(1,2), T. G. Habetler(3), A.M. Qwbaiba(3)
1. Department of Electrical Engineering, King Fahd University for Petroleum and Minerals, Dhahran. KSA
2. K.A.CARE Energy Research & Innovation Center (ERIC), King Fahd University for Petroleum and Minerals. KSA
3. School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta. USA
- 332 Techno-economic assessment of the use of Linear Fresnel Solar Collectors for the supply of heat in traditional fruits and vegetable processing industries in Almeria's province**
JD. Gil(1,2,3), JA. Romero Ramos(3), M. Pérez García(1,2,3), M. Martínez Molina(1,2,3), J. Roper(3), A. Rodríguez(3)
1. CIESOL Research Center on Solar Energy, joint center UAL-CIEMAT.
2. Automatic Control, Robotics and Mechatronics group. University of Almería
3. School of Engineering. University of Almería. Spain
- 351 Improving the overall thermal performance of parabolic trough solar collectors using porous media**
H. Ebadi(1), A. Cammi(2), L. Savoldi(1)
1. MAHTEP Group, Dipartimento Energia “Galileo Ferraris” (DENERG), Politecnico di Torino. Italy
2. Department of Energy, Politecnico di Milano. Italy

356 Solar Carport

Péter Kádár(1), Robert Istók(1), Levente Reizer(2)

1. Óbuda University, Dept. of Power Systems, Alternative Energy Sources Knowledge Centre, Budapest. Hungary
2. Premium Napelem Kft .Budapest. Hungary

Thursday July 29th, 2021
16:45 - 18:15 Oral Session B4 ROOM B "CIRCUTOR"

Chairman: **João R. Sanches Galvao**

200 Review of Latest Developments in PEM Fuel Cell Research with Application to Hydrogen Powered Drones

B.Day, A. Pourmovahed

Mechanical Engineering, Kettering University Flint, Michigan. U.S.A.

205 A Remote Sensing Scheme for Fault Diagnosis to Wind Turbines: An Academic Experimental Set-Up

Leonardo Acho

Department of Mathematics U.P.C., Polytechnic University of Catalunya.
Barcelona.Spain

219 Optimal sizing design of a 1.5 MW permanent magnets synchronous generator for an onshore wind conversion system

H. Gallas(1,2), S. Le Ballois(1), H. Aloui(2), L. Vido(1)

1. SATIE Laboratory, SETE team, CY Cergy Paris University, Cergy-Pontoise. France
2. ESSE Laboratory, ISEM team, ENET'COM, Sfax. Tunisia

290 SCADA Data-Driven Wind Turbine Main Bearing Fault Prognosis Based on One-Class Support Vector Machines

A. Insuasty(1), C. Tutivén(2,3,4), Y. Vidal(4,5)

1. Electronic Engineering Faculty of Engineering Universidad de Nariño. Colombia
2. Mechatronics Engineering Faculty of Mechanical Engineering and Production Science Escuela Superior Politecnica del Litoral, Guayaquil. Ecuador
3. Universidad ECOTEC Guayaquil. Ecuador
4. Control, Modeling, Identification and Applications Department of Mathematics Escola d'Enginyeria de Barcelona Est Universitat Politècnica de Catalunya, Barcelona. Spain
5. Institute of Mathematics (IMTech) Universitat Politècnica de Catalunya, Barcelona. Spain



316 Convolutional Neural Network for Wind Turbine Failure Classification Based on SCADA Data

B. Puruncajas(1,2), W. Alava(1), Encalada Dávila(1) C. Tutivén(1,2), Y. Vidal(2,3)

1. Mechatronics Engineering, Faculty of Mechanical Engineering and Production Science, Escuela Superior Politécnica del Litoral, Guayaquil. Ecuador
2. Control, Modeling, Identification and Applications Department of Mathematics Escola d'Enginyeria de Barcelona Est, Universitat Politècnica de Catalunya. Spain
3. Institute of Mathematics (IMTech) Universitat Politècnica de Catalunya Barcelona. Spain

325 Wind Turbine Multi-Fault Detection based on SCADA data via an AutoEncoder

Á. Encalada-Dávila(1), C.Tutivén(1), B. Puruncajas(1), Y. Vidal(2,3)

1. Mechatronics Engineering, Faculty of Mechanical Engineering and Production Science, Escuela Superior Politécnica del Litoral, Guayaquil. Ecuador
2. Control, Modeling, Identification and Applications, Department of Mathematics Escala d'Enginyeria de Barcelona Est, Universitat Politècnica de Catalunya. Spain
3. Institut de Matemàtiques de la UPC - BarcelonaTech, IMTech. Spain



Friday July 30th, 2021
9:15-10:15 Plenary Session PL4 ROOM A “Universidad de Almería”

Chairman: **Alfredo Alcayde García**

PL4. “Green Hydrogen. New Challenges in the Energy Sector” by
Juan Antonio Roldán García, Francisco Quirante Quevedo and
Eva Amate Ruiz

10:15 - 11:00 Poster Session P4 ROOM C “AEDIE”

Chairmen: **Luis Sainz, Laura Castro Santos, Leo Casasola Aignesberger**

- 327 Three-phase Quaternion Power in Three-wire Systems**
André S. F. Komeno, Anésio L. F. Filho, João Y. Ishihara, Victor P. Brasil
Department of Electrical Engineering, University of Brasilia. Brazil
- 330 Airfoil optimization for small horizontal axis wind turbine**
Cristhian Leonardo Pabón Rojas(1), Carlos Andrés Trujillo Suarez(1), Juan Carlos Serrano Rico(2), Elkin Gregorio Flórez Serrano(2)
1. Mechanical Engineering Program, Engineering Faculty, Universidad de Antioquia. Colombia
2. Mechanical Engineering Program, Faculty of Engineering and Architecture. Universidad de Pamplona. Colombia
- 337 Automatic Detection of Voltage Notches using a Support Vector Machine**
Rongzhen Qi, Olga Zyabkina, Daniel Agudelo Martinez, Jan Meyer
Institute of Electrical Power Systems and High Voltage Engineering
Technische Universitiit Dresden. Germany
- 339 Wind Energy Education through Low-Power Wind Turbines and Advanced Software Tools**
R. Baños(1), A. Alcayde(1), F.G. Montoya(1), F.M. Arrabal-Campos(1), A.J. Jara(2)
1. Department of Engineering. E.S.I., University of Almería. Spain
2. HOP Ubiquitous SL. Murcia. Spain
- 340 Impact on the Spanish electricity network due to the massive incorporation of electric vehicles**
Francisco M. Arrabal-Campos, Juan Martínez-Lao, Francisco G. Montoya, Alfredo Alcayde, Raúl Baños
Department of Engineering, E.S.I., University of Almeria. Spain

- 341 Robust-PCA Deep Learning for PQ disturbances classification using Synchrosqueezing Wavelet Transform**
Francisco M. Arrabal-Campos, Alfredo Alcayde, Francisco G. Montoya, Juan Martínez-Lao, Javier Castillo-Martínez, Raúl Baños
Department of Engineering, E.S.I., University of Almeria. Spain
- 344 Fast frequency oscillations detection in low inertia power systems with excessive demand-side response for frequency regulation**
Leo Casasola-Aignesberger, Sergio Martinez
Department of Electrical Engineering, Escuela Técnica Superior de Ingenieros Industriales, Universidad Politécnica de Madrid. Spain
- 346 Installing green artificial reefs: a sustainable challenge**
Alicia Munín-Doce(1), Laura Castro-Santos(1), Luis Carral(1), Juan José Cartelle-Barros(2), Carolina Camba-Fabal(1), Javier Tarrío-Saavedra(3)
1. Universidade da Coruña, Departamento de Enxeñaría Naval e Industrial Escola Politécnica Superior, Ferrol. Spain
2. Universidade da Coruña, Departamento de Economía, Facultad de Economía y Empresa, A Coruña. Spain
3. Universidade da Coruña, Departamento de Matemáticas Escola Politécnica Superior Ferrol. Spain
- 353 Techno-Economic Assessment of Concentrated Solar and Photovoltaic Power Plants in Brazil**
Guilherme de Sousa Torres(1), Tulio Andre Pereira de Oliveira(1), Anesio de Leles Ferreira Filho(1), Fernando Caldosos Melo(1), Elder Geraldo Domingues(2)
1. Department of Electrical Engineering, University of Brasilia. Brazil
2. Engineering College, Federal Institute of Goias. Brazil
- 360 Determination PV module technical condition**
M. Belik(1), O. Rubanenko(2)
1. Department of Electrical Power Engineering and Ecology, University of West Bohemia, Pízen. Czech Republic
2. Department of Electric Stations and Systems, Vinnytsia National Technical University. Ukraine
- 361 Wind energy system in Ambocas-Ecuador: distributed generation and energy quality**
O. Cabeza-Gras(1), V. Jaramillo-García(2)
1. Department of Physics and Earth Sciences, University of Coruña. Spain
2. Electrical Engineering. Faculty of Engineering, Universidad Laica Eloy Alfaro de Manabí (ULEAM). Ecuador

- 364 The inclusion of Power Gyrator Topologies as Energy Processing Cells in Photovoltaic Solar Conversion** **Herminio Martínez-García, Encarna García-Vilchez**
Department of Electronic Engineering, Escola d'Enginyeria de Barcelona Est (EEBE), Technical University of Catalonia (UPC)-BarcelonaTech. Spain
- 367 Design factors in concentrating solar power plants for industrial steam generation**
M.T. Miranda, D. Larra, I. Montero, F.J. Sepúlveda, J.I. Arranz, C.V. Rojas
Department of Mechanical, Energy and Materials Engineering Industrial Engineering School, University of Extremadura, Badajoz. Spain
- 369 An analytic model of the CSI**
Jan Iwaszkiewicz, Adam Muc
Department of Electrical Engineering Gdynia Maritime University. Poland
- 370 Vector control strategy of the five-phase VSI**
Jan Iwaszkiewicz, Adam Muc
Department of Electrical Engineering Gdynia Maritime University. Poland

Friday July 30th, 2021
11:00 - 12:15 Oral Session A5 ROOM A "U. de Almería"

Chairman: **Wolf-Gerrit Frü**

- 271 Hybridization of non-manageable renewable energy plants with compressed or liquefied air storage**
Fernando Soto Pérez(1), Antonio J. Gutiérrez Trashorras(1), Francisco J. Rubio Serrano(2), Jorge Xiberta Bernat(1)
1. Energy Department, Escuela Politécnica de Ingeniería, Universidad de Oviedo, Gijón, Asturias. Spain
2. Ibergy S.L., Pozuelo de Alarcón, Madrid. Spain
- 287 Heatsinks to Cool Batteries for Unmanned Aerial Vehicles**
J. Galvão(1,2), P. Faria(3,5), A. Mateus(4,5), T. Pereira(4), S. Fernandes(6)
1. Department of Electrical Engineering/ESTG, Polytechnic of Leiria. Portugal
2. R&D Unit, Institute for Systems Engineering and Computers INESC/Coimbra. Portugal
3. Departments of Mathematics/ESTG, Polytechnic of Leiria. Portugal
4. Department of Mechanical Engineering/ESTG, Polytechnic of Leiria. Portugal
5. Centre for Rapid and Sustainable Product Development (CDRSP) of the Polytechnic of Leiria. Portugal
6. TEKEVER/Autonomous Systems. Portugal



- 291 Neural Network Control of Green Energy Vehicles with Blended Braking Systems**
V. Vodovozov(1), E. Petlenkov(2), A. Aksjonov(1), Z. Raud(1)
1. Department of Electrical Power Engineering and Mechatronics
2. Department of Computer Systems Tallinn University of Technology. Estonia
- 310 Reducing the carbon footprint of Whisky production through the use of electricity and heat storage alongside renewable generation**
W.-G. Früh(1), Jamie Hillis(2), Sandy Gataora(2), Dawn Maskell(3)
1. Institute of Mechanical, Process and Energy Engineering, School of Engineering & Physical Sciences, Heriot-Watt University, Riccarton, Edinburgh, Scotland. United Kingdom
2. Sunamp Ltd
3. International Centre for Brewing & Distilling, School of Engineering & Physical Sciences, Heriot-Watt University, Riccarton, Edinburgh. United Kingdom
- 355 Role of honeycomb structure in improving the melting process of a phase change material inside a latent heat storage unit**
M. Hariss, M. El Alami , A. Gounni
Physics Department, LPMMAT Laboratory
Faculty of Sciences Ain Chock, Hassan II University, Casablanca. Morocco

Friday July 30th, 2021

11:00 - 12:15 Oral Session B5 ROOM B "CIRCUTOR"

Chairman: **Francisco Manuel Arrabal Castro**

- 201 Possible Link Between Climate Change and Extraordinary Wildfires in Australia, the Amazon and Western United States**
M. Brajkovic, T. Carter, C. Cook, A. Pourmovahed
Mechanical Engineering, Kettering University Flint, Michigan. U.S.A.
- 202 What Lies Ahead for Energy and Carbon Emissions Post COVID-19**
A. Pourmovahed , Z. Veneziano , M. Stewart, A. K. Thirumal
Mechanical Engineering, Kettering University Flint, Michigan. U.S.A.
- 258 Optimisation of Energy Accumulation for Renewable Energy Sources**
Milan Belik
Department of Power Engineering Faculty of Electrical Engineering, University of West Bohemia, Pilsen. Czech Republic

347 IoT Monitoring System for Applications with Renewable Energy Generation and Electric Drives

Maria G. Ioannides(1), Anastasios Stamelos(1), Stylianos A. Papazis(2), Athanasios Papoutsidakis(1), Vasilios Vikentios(1), Nikolaos Apostolakis(3)

1. Electrical and Computer Engineering, National Technical University of Athens. Greece
2. Electrical and Computer Engineering, Democritus University of Thrace. Greece
3. School of Telematic Engineering, Universidad Carlos III de Madrid. Spain

365 Effects of pulse frequency on performance of electrochemical cooling water treatment for cooling tower of water-cooled chiller

Le Minh Nhut(1), Duong Huynh Minh Nhut(2)

1. Department of Thermal Engineering, Ho Chi Minh City University of Technology and Education. Vietnam
2. College of Technology, Ho Chi Minh City. Vietnam

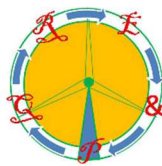
	ROOM A "U. de Almeria". CLOSING SESSION
12:15– 13:00	Conclusions and time for the next conference (ICREPQ'22) Awards for the three best posters
13:00 – 15:00	Farewell Lunch
15:00 – 18:30	During the Cultural Visit we will visit the Alcazaba and different monuments of Almeria.



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