

# **INTERNATIONAL CONFERENCE ON RENEWABLE ENERGY AND POWER QUALITY (ICREPQ'07)**

## **WELCOME TO ICREPQ'07**

On behalf of the Steering Committee and the Local Organizing Committee we want to give you a very warm welcome to ICREPQ'07 and to Sevilla.

Our International Programme Committee has selected a high quality 142 papers (among 188 proposals) from which 133 will be presented at the Conference, 32 at oral sessions and 101 at poster sessions (dialogue), along the three days of the ICREPQ'07. All of these are the papers included at the final programme. Also it will be presented four invited papers along four plenary sessions and a Round Table about "The Energy Challenge".

ICREPQ'07 cover the whole range of problems and solutions concerning specially with renewable energies and power quality and all the papers have directly influence about these two fields of research and practical work.

We would like to thank all the authors, sessions chairmen, participants without papers and at the International Program 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 (28<sup>th</sup> March, 18:00 H) we will be held a Civic Reception with aperitif and on Thursday (29<sup>th</sup> March, 20:30 H) the Conference Banquet at the "Cortijo El Esparragal" where we will deliver presents to those companies/institutions that collaborate with the organisation of the Conference and on Friday (30<sup>th</sup> of March from 15:00 H to 19:00 H) we have arranged for all the participants a Cultural Excursion to Santiponce and other places of interest of Sevilla.

We hope you will find the conference intellectually stimulating, that you will make many fruitful personal contacts here and that you will thoroughly enjoy your visit to Sevilla and the surrounding area.

Best regards.  
Sincerely,

Prof. Manuel Pérez-Donsión  
Chairman of the Steering Committee

Prof. Manuel Burgos Payán  
Chairman of the Local Committee

## **OBJETIVES 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'07) will be structured in:

- **Plenary Sessions:** in one auditorium for all the participants
- **Oral Sessions:** Renewable Energy and Power Quality simultaneously in two rooms
- **Posters Sessions:** In 45-minute periods during the coffee breaks.

### **1. RENEWABLE ENERGY:**

Topics include, but are not limited to:

- Wind Energy, Small Hydro Energy, Solar Energy, Photo-voltaic Energy, Ocean Energy, Geothermal, Biomass,...
- 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, stability,...
- Power plants. Distributed generation. Fuel cells. Co-generation. Hybrid Systems. 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 energy.
- Biomass combustion techniques. The energy use of agricultural and forest residues. Production and the energy exploitation of bio-gas.
- Interconnection and transport problems.
- Planning and control of the power system take into account the renewable energy.
- Economic analysis of the power system take into account the renewable energy.
- Regulation/deregulation 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 telecommunications, internet, artificial intelligence for the Renewable energy.
- Security assessment and risk analysis in renewable energy.
- Electric vehicles.

### **2. POWER QUALITY:**

Topics include, but are not limited to:

- Power Quality in Distribution.
- Economic Studies of the Power Quality
- Quality of the voltage wave
- Low-frequency conducted disturbances: Voltage deviations, voltage fluctuations (flicker), voltage dips and short interruptions, harmonics transient over-voltages, voltage unbalance (imbalance), temporary power-frequency variations.
- Sources, effects and mitigation methods of electromagnetic disturbances.

- Measurements of the power quality in networks and industrial installations.
- Equipment, procedures and measurement methods. Standards.
- Quality of the voltage wave measurements in the laboratory. Equipment, procedures and measurement methods and text. Laboratories. Standards
- Modelling and simulation of the power quality. Software tools.
- Transmission of the disturbances
- Filtering techniques
- Power factor compensation. Capacitor switching techniques
- Optimisation techniques
- Telecommunication, internet and artificial intelligence applications.
- 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 standards
- Power quality influence in deregulated markets

## INTERNATIONAL PROGRAM COMMITTEE

Almeida do Vale, A. (Portugal)	Kladas, A. (Greece)
Andrada Gascón, P. (Spain)	Lemos Antunes, C. (Portugal)
Arcega Solsona, F. (Spain)	Levi, E. (UK)
Arnaltes Gómez, S. (Spain)	Llaverias Sanmartí, J. (Spain)
Belmans, R. (Belgium)	Llombart Estopiñan, A. (Spain)
Bendl, J. (Czech Republic)	Machado e Moura, A. (Portugal)
Castilla, M. (Spain)	Mañana Canteli, M. (Spain)
Capolino, G.A. (France)	Martínez, A. (France)
Eguiluz Morán, L.I. (Spain)	Petkovska, L. (Macedonia)
Ertan, H.B. (Turkey)	Rizzo, R. (Italy)
Fernández Cabanas, M. (Spain)	Saadate, S. (France)
Fraile Mora, J. (Spain)	Salmeron Revuelta, P. (Spain)
Gair, Sinclair (UK)	Sanz Badía, M. (Spain)
Göl, O. (Australia)	Schlemmer, E. (Germany)
Güemes Alonso, J.A. (Spain)	Tegopoulos, J.A. (Greece)
Hermoso Alameda, B. (Spain)	Traça de Almeida, A. (Portugal)
Iwaszkiewicz, J. (Poland)	Wiak, S. (Poland)
Jack, A.G. (UK)	Wilhelmi Ayza, J.R. (Spain)
Jokinen, T. (Finland)	Zamora Belver, I. (Spain)

## STEERING COMMITTEE

M. Pérez-Donsión, (Chairman)  
 R. Bargalló-Perpiña  
 M. Sanz-Badía

## LOCAL ORGANISING COMMITTEE

M. Burgos-Payan (Chairman)  
P. Cruz-Romero  
J.M. Maza-Ortega  
A. de la Vila-Jaén

## SPONSORSHIP

Sincere thanks are expressed to the organisations listed below who have given valuable support to ICREPQ'07:

- University of Sevilla
- ET Superior de Ingenieros Industriales
- Iberdrola
- Schneider Electric Española, S.A.
- ABB
- Ministerio de Educación y Ciencia (MEC)
- AEDIE (Asociación Española para el Desarrollo de la Ingeniería Eléctrica)
- EA4EPQ
- Diputación Provincial de Sevilla
- Ayuntamiento de Sevilla
- Circutor
- Consejería de Innovación, Ciencia y Empresa de la Junta de Andalucía
- Sevillana Endesa

## SOCIAL EVENTS

- **Civic Reception and Aperitif:** 28<sup>th</sup> of March at 18:00 H
- **Conference Banquet:** 29<sup>th</sup> of March at 20:30 H at “Cortijo El Esparragal”

## GENERAL TECHNICAL PROGRAMME ICREPQ'07

<b>Tuesday 27 March 2007</b>	
18:00 – 20:00	<b>Registration</b> <b>“ICREPQ'07 Secretariat”</b>

<b>Wednesday 28 March 2007</b>						
9:00 – 10:45	<b>Registration “ICREPQ’07 Secretariat”</b>					
10:45 – 11:30	<b>ROOM A “Iberdrola” Opening Ceremony</b>					
11:30-12:15	<b>PL1</b>	Plenary Session: <i>“The role and perspectives of renewable energies in the 2020 horizon”</i> . Carlos Gascó Travesedo. Iberdrola Energías Renovables				
	EXTRA TIME FOR DISCUSSION					
12:15 – 13:00	Posters Session at Room C <b>“ABB”</b> (Session C1) Coffee Break			<i>Poster Session C1</i>		
				200	202	203
				204	207	212
				214	217	219
				221	222	224
				226	228	230
				233	237	238
				243	245	246
				248	251	376
380						
13:00 – 15:00	<b>Welcome Lunch</b>					
15:00 – 16:00	<b>ROOM A “Iberdrola”</b>			<b>ROOM B “Schneider”</b>		
	<i>Oral Session A1</i>			<i>Oral Session B1</i>		
	205	213	220	216	227	250
	240			252		
	EXTRA TIME FOR DISCUSSION					
16:00 – 16:45	Poster Session at Room C <b>“ABB”</b> (Session C2) Coffee Break			<i>Poster Session C2</i>		
				225	249	253
				254	260	262
				264	265	267
				273	278	282
				284	291	292
				293	294	299
				300	302	354
				355	383	386
16:45 – 17:45	<b>ROOM A “Iberdrola”</b>			<b>ROOM B “Schneider”</b>		
	<i>Oral Session A2</i>			<i>Oral Session B2</i>		
	242	244	256	325	326	357
	261			378		
	EXTRA TIME FOR DISCUSSION					
18:00 – 20:00	<b>Welcome Civic Reception</b>					

**Thursday 29 March 2007**

<b>Thursday 29 March 2007</b>						
9:00 – 9:30	<b>ROOM A “Iberdrola” Plenary sessions PL2</b>					
	<b>Opening Ceremony (XVIIRGIE)</b>					
9:30 – 10:15	<b>PL2</b>	<i>“Effects of voltage disturbances on electric machines”</i> Eric Brunet, Product Manager on Power Quality and Energy Efficiency of Schneider Electric				
		EXTRA TIME FOR DISCUSSION				
10:15 – 11:00	<b>Posters Session at Room C “ABB” (Session C3) Coffee Break</b>			<i>Poster Session C3</i>		
				208	234	235
				258	270	303
				304	305	306
				307	308	309
				312	314	315
				316	317	318
				320	321	322
				323	324	329
				330	341	377
<b>ROOM D “Universidad de Sevilla” Round Table A</b>						
11:00 – 13:00	<b><i>“The Energy Challenge”</i></b>					
	<ul style="list-style-type: none"> <li>- Mario Mañana Canteli. Cantabria University (Chairman)</li> <li>- Carlos Gascó Travesedo. Iberdrola Energías Renovables</li> <li>- Jorge Martínez Jubitero. Director de Ingenierías de Sevillana Endesa.</li> <li>- Antonio González Jiménez. Director Técnico del Foro Nuclear</li> <li>- Juan Bachiller. ABB</li> <li>- Eduardo Galvan. NEO Renovables</li> <li>- Cristina Prieto. Solucar Renovables</li> <li>- Francisco Borja Vallejo Mendizábal. Director Regional de Vestas Eólica SAU.</li> </ul>					
	EXTRA TIME FOR DISCUSSION					
13:00 – 15:00	<b>Lunch</b>					
<b>ROOM A “Iberdrola” Plenary sessions PL3</b>						
15:00 – 15:45	<b>PL3</b>	<i>“Development, innovations and transformer solutions”</i> Miguel Oliva Navarrete. ABB				
		EXTRA TIME FOR DISCUSSION				

15:45 – 16:30	<p align="center"><b>ROOM C “ABB”</b>  <b>POSTERS XVIIRGIIIE</b>  <b>Coffee Break</b></p>
	<p align="center"><b>ROOM D</b>  <b>“Universidad de Sevilla”</b>  <b>Round Tables B y C</b></p>
	<p><b>Round Table B: “Presentación de los Grupos de Investigación. Situación y Problemática de la Investigación Española dentro del Contexto Europeo. Perspectivas Futuras”.</b></p>
16:30-18:00	<p>-Mariano Sanz Badía (Chairman).  Colaborador Experto Energético en el Ministerio de Educación y Ciencia. Subdirector de la Fundación CIRCE  - Carlos Redondo Gil. Vicerrector de la Universidad de León  -Manés Fernández Cabanas.  Profesor de la Universidad de Oviedo.  -Manuel Castilla.  Profesor de la Universidad de Sevilla  -Ramón Bargalló Perpiña  Profesor de la Universidad Politécnica de Cataluña</p>
	<p><b>Round Table C: “Situación Española en relación con la Declaración de Bolonia y sus implicaciones futuras”</b></p>
18:00-19:30	<p>- Emilio Freire Macias (Chairman).  Director de la Escuela Superior de Ingenieros de Sevilla  - Carlos Redondo Gil. Vicerrector de la Universidad de León  - Mario Mañana Cantely.  Director del Departamento de Ingeniería Eléctrica de la Universidad de Cantabria  -Manés Fernández Cabanas.  Profesor de la Universidad de Oviedo  -Manuel Castilla.  Profesor de la Universidad de Sevilla  -Pere Andrada Gascón.  Profesor de la Universidad Politécnica de Cataluña</p>
20:30 -23:00	<p align="center"><b>Conference Banquet at “Cortijo El Esparragal”</b>  <b>(Optional)</b></p>

Dark colour .- It will be in Spanish

**Friday 30 March 2007**

<b>Friday 30 March 2007</b>								
9:00-9:45	<b>ROOM A "Iberdrola" Plenary Session PL4</b>							
	<b>PL4</b>	<i>"Renewable Energies Development: The Distribution Point of View".</i> Gabriel Tévar. Endesa						
		EXTRA TIME FOR DISCUSSION						
9:45-10:45	<b>ROOM A "Iberdrola"</b>			<b>ROOM B "Schneider"</b>				
	<i>Oral Session A3</i>			<i>Oral Session B3</i>				
	268	279	281	272	287	319		
	301			327				
	EXTRA TIME FOR DISCUSSION							
10:45 – 11:30	<b>Posters Session at Room C "ABB" (Session C4) Coffee Break</b>					<i>Poster Session C4</i>		
						283	331	333
						334	335	337
						338	342	343
						344	345	346
						347	349	350
						352	356	358
						359	360	362
						363	365	370
						374		
11:30-12:30	<b>ROOM A "Iberdrola"</b>			<b>ROOM B "Schneider"</b>				
	<i>Oral Session A4</i>			<i>Oral Session B4</i>				
	285	286	290	351	366	367		
	361			371				
	EXTRA TIME FOR DISCUSSION							
12:30 – 13:00	<b>ROOM A "Iberdrola"</b>							
	<b>Conclusions and time for the next conference (ICREPQ'08)</b>							
13:00 – 15:00	<b>Farewell Lunch</b>							
15:00 – 19:00	<b>Cultural Excursion for all the participants. Excursion to Santiponce and to different interesting places of Sevilla</b>							

## **AUTHORS**

### **Oral Presentations.**

Each speaker of an oral presentation 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.

### **Poster Presentations.**

The poster must be put on the pin board that you previously can chose about 15 minutes before of the beginning of the session and it must be take off 15 minutes after of the end of the session. The author(s) must be stay near the poster along 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 841 mm x 1189 mm (width x high).

## **CHAIRMEN SESSIONS**

On behalf of the International Program Committee, Steering Committee and the Organising Committee of the ICREPQ'07 and take into account their eminent position in the world of science we have selected 25 session chairmen. It is an honour for us their collaboration for to chair the sessions of ICREPQ'07 and their contribution would be greatly appreciated. We wish to express our warmer thanks.

Traditionally the Chairman of each Session is independent in organising the Session. Nevertheless it is of special importance that the different sessions chairmen preparing some questions about the papers of his session in order to get a more dynamic one. Furthermore we expect of the session chairmen the following:

### **- Plenary sessions.**

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

### **-Oral sessions.**

That 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 must be stay near the poster along 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 session formulate questions to the authors and check that all is OK.

TABLE I. Chairmen Session distribution

<b>Wednesday 28<sup>th</sup> March, 2007</b>		
11:30-12:15	PLENARY SESSION PL1	Manuel Burgos Payán
12:15-13:00	POSTER SESSION C1	Pedro Ramos
		J.I. San Martín Díaz
		Jiri Skramlik
15:00-16:00	ORAL SESSION A1	I. Zamora Bellver
	ORAL SESSION B1	Pere Andrada Gascon
16:00-16:45	POSTER SESSION C2	Tomas Yebra Vega
		Catalin Alexandru
		Ahmad Al-Halbouni
16:45-17:45	ORAL SESSION A2	Aldo Balestrino
	ORAL SESSION B2	Babamalek Gharapetian
<b>Thursday 29<sup>th</sup> March, 2007</b>		
9:30-10:15	PLENARY SESSION PL2	Bostjan Polajzer
10:15-11:00	POSTER SESSION C3	V. Aperribay Maiztegui
		Liliana Cortez
		Faisal Mohamed
11:00-13:00	ROUND TABLE A	Mario Mañana Canteli
15:00-15:45	PLENARY SESSION PL3	Andreas Eberhard
<b>Friday 30<sup>th</sup> March, 2007</b>		
9:00-9:45	PLENARY SESSION PL4	Jan Iwaszkiewicz
9:45-10:45	ORAL SESSION A3	Gorazd Stumberger
	ORAL SESSION B3	Jiri Klima
10:45-11:30	POSTER SESSION C4	Demercil Oliveira
		Hugo Ribeiro
		Vit Brsllica
11:30-12:30	ORAL SESSION A4	Carlos Redondo Gil
	ORAL SESSION B4	Jan Rusek

**Wednesday 28 March 2007**

**ROOM A “Iberdrola”**

**10:45-11:30 OPENING CEREMONY**

**ROOM A “Iberdrola”**

**11:30-12:15 Plenary Session PL1**

**Chairman:** Manuel Burgos Payán

**PL1: *The role and perspectives of renewable energies in the 2020 horizon.***

Carlos Gascó Travesedo. Iberdrola Energías Renovables

**ROOM C “ABB”**

**12:15-13:00 Poster Session C1 – Coffee Break**

**Chairmen:** Pedro Ramos, José Ignacio San Martín Díaz, Jiri Skramlik

**Sizing and cost analysis for integrated renewable energy system in a study area**

200

A.K. Akella<sup>1</sup>, R.P. Saini<sup>2</sup>, M. P. Sharma<sup>2</sup>

1. Elect. Eng. Depart., National Institute of Technology, Jamshedpur, India  
2.- Alternate Hydro Energy Centre, Indian Institute of Technology, Roorkee, India

**Thermal unit commitment solution using an improved Lagrangian Relaxation**

202

Farid Benhamida, Emtethal Negm Abdallah, Ahmed Helmi Rashed.  
Alexandria University, Alexandria, Egypt

**Considerations regarding testing of low voltage equipment at electrical arc and thermal factor actions**

203

George Curcanu, Constatin Iancu, Phys. Daniel Truta  
R&D National Institute ICMET-Craiova. High Power Laboratory. Romania

- Building automation by intelligent control of its environment**  
 Enrique A. Sierra<sup>1</sup>, Alejandro A. Hossian<sup>1</sup>, Carlos V.M. Labriola<sup>1</sup>  
 Ramón García Martínez<sup>2</sup>,  
 204 1. Depart. Electrotecnia. Facultad de Ingeniería. Universidad de Comahue  
 Neuquen- Argentina  
 2 Centro de Ingeniería del Software e Ingeniería del Conocimiento (CAPIS).  
 Instituto Tecnológico de Buenos Aires. Argentina
- Most representative parameters of voltage dips**  
 207 T. Yebra, V. Fuster, A. Quijano, M. García  
 Instituto de Tecnología Eléctrica. Universidad Politécnica de Valencia.  
 Spain.
- A low-cost wind generator system with a permanent magnet synchronous generator and diode rectifiers**  
 212 Shinji Kato<sup>1</sup>, Yoshita Inui<sup>2</sup>, Masakazu Michihira<sup>1</sup>, Akira Tsuyoshi<sup>1</sup>  
 1. Department of Electrical Engineering, Kobe City College of Technology,  
 Japan.  
 2. Department of Electrical and Electronic Engineering, Toyohashi University  
 of Technology, Japan.
- Renewable electric generation in a pig's farm from the own pig slurry. Energy from biomass**  
 214 Héctor Beltrán, Nestor Aparício, Enrique Belenguer,  
 Dpt. Ingeniería de Sistemas Industriales i Disseny. Universitat Jaume I.  
 Castelló. Spain
- Circulating sheath currents in flat formation underground power lines**  
 217 J.R. Riba Ruiz<sup>1</sup>, Antonia García<sup>1</sup>, Alabern Morera<sup>2</sup>  
 1. Department d'Enginyeria Eléctrica, UPC. EUETII-L'Escola d'Adoberia.  
 2. Department d'Enginyeria Eléctrica, UPC. Terrassa. Spain
- Endurance and durability in biodiesel powered engines**  
 219 J. Parrilla, M. Muñoz, F. Moreno  
 University of Zaragoza. Spain
- Modelling of droplet burning for rapeseed oil as liquid fuel**  
 221 J. Parrilla, C. Cortes  
 University of Zaragoza. Spain
- A novel method of electrical arc furnace modelling for flicker study**  
 222 M.A. Golkar, M. Tavakoli Bina, S. Meschi  
 K.N. Toosi University of Technology, Electrical Engineering Department  
 Tehran-Iran
- Modelling, simulation and reduction techniques of electromagnetic conducted emission due to operation of power electronics converters**  
 224 A. Farhadi, A. Jalilian  
 Department of Electrical Engineering. Iran University of Science and  
 Technology (IUST). Tehran. Iran
- Virtual prototyping of the solar tracking systems**  
 226 A. Alexandru, M. Comsit  
 Department of Product Design and Robotics. University Transilvania of  
 Brasov. Romania

**New generation of passenger vehicles: FCV or HEV?**

- 228 Hassan Moghbelli<sup>1</sup>, Abolfazl Halvaei Niasar<sup>2</sup>, Reza Langari<sup>3</sup>
1. Isfahan University of Technology, Isfaham, Iran.
  2. Iran University of Science & Technology. Depart.of Electical Engineering, Tehran, Iran
  3. Texas A&M University. Mechanical Eng. Department

**Sensibility analysis in the study of economic viability of a wind farm in the Canary Island. A case of study: 10 MW wind farm in Roque Prieto Gáldar, Gran Canaria**

- 230 P.I.González Dominguez, G. Hernández Lezcano, M. Martinez Melgarejo, A.Pulido Alonso, J.C. Quintana Suárez, J. Romero Mayoral  
Departamento de Ingeniería Eléctrica- Universidad de Las Palmas. Spain

**Adjustment of wind farms to the new standars**

- 233 Melchor Gómez<sup>1</sup>,Inmaculada Zamora<sup>2</sup>,Oihane Abarategui<sup>1</sup>
1. E.U.I.T.M. y O.P. de Baracaldo. University of the Basque Country.
  - 2 E.T.S.I. de Bilbao.University of the Basque Country. Spain

**Carbon Funds: development and transference of technology**

- 237 Carlos Redondo Gil, A.M. Alonso Sánchez  
Department of Electrical and Electronic Engineering. University of Leon. Spain

**Application of hydroaccumulation in system of solar power and water supply for autonomous consumers in conditions of Mexico**

- 238 Cortez Liliana<sup>1</sup>, Cortez Jose Italo<sup>2</sup>, Pérez Aguirre Jose Martin Carlos<sup>1</sup>, Bravo Garcia Y.Elinor<sup>1</sup>, Ramirez Popo Jesús A.<sup>3</sup>
- 1.Facultad de Ciencias de la Electrónica
  - 2.Laboratorio de Métodos no Invasivos
  - 3.Comisión Federal de ElectricidadUniversidad Autónoma de Puebla. México

**Analysis of second order harmonic voltages in power systems**

- 243 Julio Barros, Matilde de Apráiz, Ramón I. Diego  
Department of Electronics and Computers. Escuela Técnica Superior de Nautica. University of Cantabria. Spain

**Discovering patterns in electricity price using clustering techniques**

- 245 F. Martinez Álvarez<sup>1</sup>, A. Troncoso<sup>2</sup>, J.C.Riquelme<sup>1</sup>,J.M.Riquelme<sup>3</sup>
1. Depart,de Lenguajes y Sistemas Informáticos.Escuela S.de Ingeniería Informática.Universidad de Sevilla. Spain
  - 2.Area de Lenguajes y Sistemas Informáticos. Escuela Politécnica Superior. Universidad Pablo de Olavide. Spain
  - 3.Departamento de Ingeniería Eléctrica. Escuela Superior de Ingenieros Industriales. Universidad de Sevilla. Spain

**Study and verification of the parameters of a wind park**

- 246 N.Angulo<sup>1</sup>, A.Pulido<sup>1</sup>,J.Romero<sup>1</sup>, P. González<sup>1</sup>,M.Melille<sup>1</sup>, J.Lozano<sup>2</sup>.
1. Depart.of Electrical Engineering. Las Palmas de Gran Canaria Univ. Spain
  2. Soslayres Canarias, S.L. Spain

**Evaluation of direct methods for power system stability analysis**

- 248 I.Vokony<sup>1</sup>, Á. Székely<sup>2</sup>, A.Faludi<sup>1</sup>, T.Barbarics<sup>2</sup>
- 1.Group of power systems and environment. Depart. Of Electric Power

Engineering. University of Technology and Economics. Budapest-Hungary  
2. Group of Electromagnetic Theory, Depart.of Broadband Infocommunication and Electromagnetic Theory. University of Technology and Economics. Budapest- Hungary

**Solar irradiation in the Canary Islands**

251 Antonio Pulido Alonso, Juan I.Jimenez Fránquiz, Jesús Romero Mayoral, Norberto Angulo Rodriguez, José C.Quintana Suárez.  
Department of Electrical Engineering. E.T.S.I.I. Las Palmas de Gran Canaria University. Spain

**A new concept of power quality monitoring**

376 Victor Anunciada<sup>1</sup>, Hugo Ribeiro<sup>2</sup>  
1. Instituto de Telecomunicações, Instituto Superior Técnico, Lisboa. Portugal  
2. Instituto de Telecomunicações, Instituto Politécnico de Tomar. Portugal

**Limits for Production or Consumption of energy and substances predicted by thermodynamics**

380 S. Sieniutycz  
Faculty of Chemical and Process Engineering. Warsaw University of Technology, Poland

**13:00 – 15:00 Welcome Lunch**

**ROOM A “Iberdrola”**

**15:00-16:00 Oral Session A1**

**Chairman:** Inmaculada Zamora Bellver

**Wind potential in Argentina, situation and prospects**

205 MSc.Carlos V.M. Labriola  
Energy and Sustainability Group. Electrotecnia Department. Faculty of Engineering. National University of Comahue- Argentina

**An efficient combustion concept for low calorific gases**

213 A.AL-Halbouni, H. Rahms and K.Görner  
Gaswärme-Institute e. V.Essen, Germany

**System modelling and online optimal management of microgrid with battery storage**

220 Faisal A. Mohamed, Heikki N. Koivo  
Control Engineering Lab, Helsinki University of Technology. Finland

**Impact of the design method of permanent magnets synchronous generators for small direct drive wind turbines for battery operation**

240 Mihai Predescu, Aurelian Crăciunescu, Andrei Bejinariu, Octavian Mitroi, Adrian Nedelcu  
ICPE SICE Centre. Bucharest. Romania

**ROOM B “Schneider”**

**15:00-16:00 Oral Session B1**

**Chairman:** Pere Andrada Gacon

**Harmonics and inter-harmonics of voltage converter supplied induction machine stator currents**

216 Jan Rusek  
AGH University of Science and Technology.Krakow. Poland

**Impact of asymmetrical disturbance events on voltage sag source detection**

227 Boštjan Polajžer, Gorazd Štumberger, Sebastijan Seme, Drago Dolinar  
University of Maribor.Faculty of Electrical Engineering and Computer Science. Slovenia

**A new ISPWM switching technique for THD reduction in custom power devices**

250 S.Esmaili Jafarabadi, G.B.Gharehpetian  
Depart.of Electrical Engineering, Amirkabir University of Technology, Tehran,Iran

**Implementation and analytical model of three-phase four-switch power factor corrector**

252 Jiri Klima<sup>1</sup>, Jiri Skramlik<sup>2</sup>, Viktor Valouch<sup>2</sup>.  
1. Department of Electrical Engineering and Automation. Technical Faculty of CZU in Prague. Czech Republic.  
2. Institute of Thermomechanics. Academy of Sciences of the Czech Republic.

**Wednesday 28 March 2007**

**ROOM C "ABB"**

**16:00-16:45 Poster Session C2 – Coffee Break**

**Chairmen:** Tomas Yebra Vega, Catalin Alexandru, Ahmad Al-Halbouni

**Operation of induction motor-drive under different voltage sag conditions**

225 A. Farhadi, A.Jalilian

Department of Electrical Engineering. Iran University of Science and Technology (IUST). Tehran. Iran

**Application tabu search in matlab for optimize distribution systems**

249 J.Dominguez Navarro<sup>1</sup>, A.Bayod Rújula<sup>2</sup>, O.Coronado De Koste<sup>2</sup>

1. Department of Electrical Engineering. U. de Zaragoza

2. Production Systems Engineering. U. Autónoma de Tamaupilas.

**Wavelet-Fourier analysis of electric signal disturbances**

Juan Carlos Montañó<sup>1</sup>, Dolores Borrás<sup>2</sup>, Juan Carlos Bravo<sup>2</sup>, Manuel Castilla<sup>2</sup>, Antonio López<sup>3</sup>, Jaime Gutiérrez<sup>4</sup>

- 253
1. Consejo Superior de Investigaciones Científicas (CSIC), IRNAS. Sevilla. Spain
  2. Departamento de Ingeniería Eléctrica. Escuela Universitaria Politécnica. Sevilla, Spain
  3. Departamento de Tecnología Electrónica. Escuela Universitaria Politécnica. Sevilla. Spain
  4. Departamento de Física Aplicada III. Escuela Superior de Ingenieros. Sevilla. Spain

**Nonlinear self-scheduling of a single unit small hydro plant in the day-ahead electricity market**

254 Juan I. Pérez, José R. Wilhelmi

Depart. De Ingeniería Civil: Hidráulica y Energética. ETSI de Caminos, Canales y Puertos. Universidad Politécnica de Madrid. Spain

**Fuel cell control systems : A practical case**

260 J.M.Andújar, F.Segura, M.J.Vasallo

Depart.of Electronic, Computer Science and Automatic Engineering, E.P.S. University of Huelva. Spain.

**Instantaneous reactive power theory: A new approach applied to N wire systems**

262 R.S.Herrera, P.Salmerón, J.R.Vázquez, S.P.Litrán

Department of Electrical Engineering. Escuela Politécnica Superior. University of Huelva. Spain

- Optimization of the hydrological use for hydroelectric power plants of flowing type**  
 264 J.M.Blanco Barrero, P.Lara Santillán, J.C.Sáenz.Díez Muro, E. Jiménez Macías  
 Department.of Electrical Engineering. E.T.S.I.I.University of La Rioja. Spain
- Finding optimum reactive power compensation in a wind farm**  
 E.Martinez Cámara<sup>1</sup>, F.Daroca Ponce de León<sup>2</sup>, F.Sanz Adán<sup>1</sup>, E. Jiménez Macías<sup>3</sup>, J. Blanco Fernández<sup>2</sup>.  
 265 1. Departamento de Ingeniería Mecánica. E.T.S.I.I. University of La Rioja. Spain  
 2. Grupo de Eólicas Riojanas. Logroño. Spain  
 3. Departamento de Ingeniería Eléctrica.E.T.S.I.I. University of La Rioja. Spain
- New Space-vector hysteresis current control with neutral point voltage balancing applied on three-level VSI for wind power conversion**  
 T.Ghennam<sup>1</sup>, E.M.Berkouk<sup>2</sup>, B.François<sup>3</sup>, K. Aliouane<sup>1</sup>, K. Merouani<sup>1</sup>  
 267 1. UER-ELT, EMP. Algiers (Algeria)  
 2. ENP EL-harrach Algiers (Algeria)  
 3. Ecole Centrale de Lille. France
- Power quality in electric networks: monitoring, and standars**  
 Masoud Aliakbar Golkar  
 273 K.N.Toosi University of Technology. Electrical Engineering Department. Tehran- Iran
- Control systems of distributed generation modules aggregated by cascaded boost converters.**  
 278 N. Moadabi, M. Mahmoodi, G.B. Gharehpetian  
 Electrical Engineering Department, Amirkabir University of Technology, Tehran, Iran.
- Optimisation of a small non controlled wind energy conversion system for stand-alone applications**  
 282 Miguel López, Philippe Dessante, Dario Morales, Jean-Claude Vannier, Daniel Sadarnac  
 Département Electrotechnique et Systèmes d’Energie, École Supérieure d’Electricité. France
- The effect of Solar irradiance on the power quality behaviour of grid connected photovoltaic systems**  
 Minas Patsalides<sup>1</sup>, Demetres Evagorou<sup>1</sup>, George Makrides<sup>1</sup>, Zenon Achillides<sup>1</sup>, George E.Georghiou<sup>1</sup>, Andréas Stavrou<sup>2</sup>, Venizelos Efthymiou<sup>2</sup>, Bastian Zinsser<sup>3</sup>, Wolfgang Schmitt<sup>3</sup>, Jürgen H. Werner<sup>3</sup>  
 284 1.Department of Electrical and Computer Engineering, University of Cyprus  
 2. Electricity Authority of Cyprus  
 3. Institut für Physikalische Elektronik. Stuttgart-Germany
- Anomalies identification in PV isolated system**  
 A.López-Aguera<sup>1</sup>, I.Rodríguez-Cabo<sup>1</sup>, C.M.Torres Costa<sup>2</sup>  
 291 1. Instituto Galego de Altas Enerxías. Dpto. Física de Partículas. University of Santiago of Compostela. Spain  
 2. Departamento de Ingeniería Química. USC. University of Santiago of Compostela. Spain

- 292 **Preliminary method for surveying the state of batteries ageing in isolated PV systems**  
Á. López Agüera<sup>1</sup>, E.Lorenzo<sup>2</sup>, Rute Cortizo<sup>1</sup>, Iago Rodriguez-Cabo<sup>2</sup>.  
1. Departament of Particle Physics & Institute of High Energy Physics. Astroparticle Group. Santiago de Compostela University. Spain  
2. Institute of Solar Energy. Politechnic University of Madrid. Spain
- 293 **Quality check protocol for control the losses of power on large associations of photovoltaic generators**  
A.López-Agüera<sup>1</sup>, I.Fernández Otero<sup>1</sup>, R.Martinez Farreres<sup>1,2</sup>, I.Rodriguez-Cabo<sup>1</sup>  
1. Departament of Particle Physics & Galician Institute of High Energy Physics. Astroparticle Group. Santiago de Compostela University. Spain  
2. Astroparticle and Special plasma Group. Alcalá of Henares University. Spain
- 294 **Design of a real prototype of a hybrid fuel cell suv: Vehicle “Hércules”**  
Pablo Antonio Guadix Martín<sup>1</sup>, Francisco Javier Pino Lucena<sup>2</sup>, José Javier Martínez Sánchez<sup>1</sup>, Felipe Rosa Iglesias<sup>3</sup>, E. López<sup>3</sup>  
1. AICIA, Edificio ESI. Sevilla. Spain  
2. Escuela Superior de Ingenieros . University of Sevilla. Spain  
3. Instituto Nacional de Técnica Aeroespacial .Huelva. Spain
- 299 **Aerodynamic and structural evaluation of horizontal axis wind turbines with rated power over 1 MW**  
S. Laín<sup>1,2</sup>, B.Quintero<sup>1</sup>, Y.López<sup>2</sup>  
1. Fluid Mechanics Research Group, Energetics and Mechanics Department. Universidad Autónoma de Occidente, Cali-Colombia  
2. Energy Research Group (GIEN), Energetics and Mechanics Department. Universida Autónoma de Occidente, Cali. Colombia
- 300 **Development of an inductively coupled power transfer system (ICPT) for electric vehicles with a large airgap**  
J.L.Villa<sup>1</sup>, A. Llombart<sup>2</sup>, J.F.Sanz<sup>1</sup>, J.Sallán<sup>2</sup>  
1. Electric Engineering Department, University of Zaragoza. Spain  
2.CIRCE Foundation. University of Zaragoza. Spain
- 302 **Optimization and technical-economical viability for the integration of renewable energies into pumping stations**  
E.Sainz, J.F.Sanz  
Department of Electrical Engineering, University of Zaragoza. Spain
- 354 **A mixed hybrid algorithm for integral wind farm optimum design**  
J.Castro Mora, A.G.González Rodriguez<sup>2</sup>, J.M.Riquelme Santos<sup>1</sup>, M.Burgos Payán<sup>1</sup>  
1. Department of Electrical Engineeering, University of Sevilla. Spain  
2. Department of Electronics, University of Jaén. Spain
- 355 **Wind farm optimun efficiency by voltage control**  
J.M.Roldán Fernández<sup>1</sup>, M.A.Caballero Gutiérrez<sup>1</sup>, A.G. González Rodriguez<sup>2</sup>, M.Burgos Payán<sup>1</sup>  
1. Department of Electrical Engineeering, University of Sevilla. Spain  
2. Department of Electronics, University of Jaén. Spain

**AC arc furnaces flicker measurement with and without a SVC system connected**

383 M.P. Donsión<sup>1</sup>, F. Oliveira<sup>2</sup>

1. Electrical Engineering Department, Vigo University, Spain
2. School of Technology and Management Polytechnic Institute of Leiria, Portugal

**Voltage and reactive power control in MV networks integrating MicroGrids**

386 A.G. Madureira, J.P. Peças Lopes

- Faculty of Engineering of Porto University, Power Systems Unit of INESC Porto, Portugal

**ROOM A “Iberdrola”**

**16:45-17:45 Oral Session A2**

**Chairman:** Aldo Balestrino

**Optimizing production of electric energy from renewable sources by differential evolution**

242 Oriol Costa Garrido<sup>1</sup>, Gorazd Štumberger<sup>2</sup>, Jože Voršič<sup>2</sup>

1. Escola Técnica Superior d' Enginyeria Industrial de Barcelona. Spain
2. University of Maribor. Faculty of Electrical Eng. And Computer Science. Slovenia

**A unit commitment and dispatch for a wind park considering wind power forecast**

244 C.F.Moyano<sup>1</sup>, J.a. Peças Lopes<sup>1,2</sup>

1. Instituto de Engenharia de Sistemas e Computadores do Porto. Portugal
2. Faculdade de Engenharia da Universidade do Porto. Portugal

**PV generation of hydrogen for operational rawinsonde usage: design and economic analysis**

256 Alberto Pettazzi<sup>1</sup>, Carmen M. Torres<sup>2</sup>, José Antonio Souto<sup>1</sup>, Pastora Bello<sup>1,2</sup>

1. Department of Chemical Engineering, University of Santiago de Compostela. Spain
2. Aula de Energías Renovables, School of Engineering, University of Santiago de Compostela. Spain.

**Modelling and simulation of hybrid SOFC-GT systems for distributed generation**

261 C.Boccaletti, G.Fabbri, O.Riot, E.Santini

- Department of Electrical Engineering. University of Rome. “La Sapienza” Rome, Italy

**Wednesday 28 March 2007**

**ROOM B “Schneider”**

**16:45-17:45 Oral Session B2**

**Chairman:** Babamalek Gharapetian

**Integration of Renewable energies and power quality in the University of Seville electric Engineer curricula**

325 J.C.del Pino López, M.E.Méndez Treviño, J.L.Martinez Ramos, J.M.Maza Ortega, J.Riquelme Santos, J.A.Rosendo Macías, A.de la Villa Jaén, M.Burgos Payán, M.Casal Gómez-Camirero, P.L.Cruz Romero, F.J.González Vázquez  
Department of Electrical Engineering. University of Sevilla. Spain

**Parametric analysis of magnetic field mitigation shielding for underground power cables**

326 P.Cruz Romero<sup>1</sup>, J.C.del Pino López<sup>1</sup>, P.Dular<sup>2</sup>  
1. Department of Electrical Engineering. University of Sevilla. Spain  
2. Department of Electrical Engineering and Computer Science. University of Liège. Belgium

**-Electric Mini- Challenges and solutions for the electrical powertrain**

357 Bruno Brito<sup>1</sup>, Luís Tagaio<sup>1</sup>, Pedro Matos<sup>1</sup>, Carlos Ferreira<sup>1,2</sup>, Hugo Ribeiro<sup>1,2</sup>  
1. Department of Electric Engineering, E.S.T.T, Polytechnic Institute of Tomar. Portugal  
2. Instituto de Telecomunicações, Lisboa. Portugal

**Testbed for virtual microgrid control strategy development**

378 Péter Kádár  
Budapest Tech. Dept. Of Power Systems, Hungary

**18:00 – 20:00 Welcome Civic Reception**

**Thursday 29 March 2007**

**ROOM A “Iberdrola”**

**9:30-10:15 Plenary Session PL2**

**Chairman:** Bostjan Polajzer

**PL2: *Effects of voltage disturbances on electric machines***

Eric Brunet, Product Manager on Power Quality and Energy Efficiency of Schneider Electric

**ROOM C “ABB”**

**10:15-11:00 Poster Session C3 – Coffee Break**

**Chairmen:** Victor Aperribay Maiztegui, Liliana Cortez, Faisal Mohamed

208 **A graphical user interface for the prediction of production power for high pressure hydrogen by high pressure water electrolysis**  
Brahim Laoun, Lazhar Serir  
Applied Research Unit in Renewable Energies, URAER. Algeria

234 **Energy consumption and feasibility study of a hybrid desiccant dehumidification air conditioning system in Beirut**  
K. Ghali  
Department of Mechanical Engineering, Beirut Arab University, Beirut, Lebanon

235 **Economic viability of under floor heating system: a case study in Beirut climate**  
Kamel Ghali  
Beirut Arab University, Faculty of Engineering, Beirut, Lebanon

258 **Application of meta-heuristic methods to robust FACTS controllers design**  
Lamia Kartobi, Mohamed Boudour  
Department of Electrical Engineering. U.S.T.H.B. Algeria

- 270 **A new, ultra-low-cost power quality measurement technology**  
 Alex McEachern<sup>1</sup>, Andreas Eberhard<sup>2</sup>  
 1. President of Power Standards Lab. United States.  
 2. Vice President of Power Standards Lab. United States.
- 303 **A small size wind generation system for battery charging**  
 Isaac R. Machado, Demercil de S.O.Jr, Luiz H.S.C.Barreto, Hermínio M.de O.Filho  
 Federal University of Ceará- Group of Energy Processing and Control-GPEC. Fortaleza-CE- Brasil
- 304 **Hybrid Technologies: Fuel cells and renewable energies**  
 J.I.San Martín<sup>2</sup>, I.Zamora<sup>1</sup>, J.J.San Martín<sup>2</sup>, V.Aperribay<sup>2</sup>, P. Eguía<sup>1</sup>  
 1. Department of Electrical Engineering. University of the Basque Country.E.T.S.de Ingeniería de Bilbao. Spain  
 2. Escuela Universitaria de Ingeniería Técnica Industrial de Eibar. Spain
- 305 **Different control strategies applied to series active filters**  
 S.P.Litrán, P.Salmerón, J.R.Vázquez, R.S.Herrera  
 Department of Electrical Engineering. Escuela Politécnica Superior. University of Huelva. Spain
- 306 **Comparative study of techniques used in the generation expansion planning**  
 F.Delgado, A.Ortiz, C.J.Renedo, F.Ortiz, M.Mañana  
 Department of Electrical and Energy Engineering. E.T.S.I.I. Cantabria University. Spain
- 307 **Artificial neural networks approach to the voltage sag classification**  
 F.Ortiz, A.Ortiz, M.Mañana, C.J.Renedo, F.Delgado, L.I.Eguíluz  
 Department of Electrical and Energy Engineering. E.T.S.I.I. Cantabria University. Spain
- 308 **Eucalyptus globulus and the eucalyptus nitens as energy crops**  
 S.Pérez<sup>1</sup>, C.J. Renedo<sup>1</sup>, A.Ortiz<sup>1</sup>, M.Mañana<sup>1</sup>, D. Silió<sup>1</sup>, C. Tejedor<sup>2</sup>  
 1. Department of Electrical and Energy Engineering . E.T.S.I.Industriales y Telecomunicación. Cantabria University. Spain  
 2. Bosques 2000, S.L. Ganzo, Torrelavega, Grupo Sniace, S.A. Spain
- 309 **New better design for water-water heat pumps**  
 C.J. Renedo, A.Ortiz, M.Mañana, S.Pérez, F. Delgado, D. Silió, F. Ortiz  
 Department of Electrical and Energy Engineering. Cantabria University. Spain
- 312 **Apparent power and power factor in unbalanced and distorted systems. Applications in three phase load compensations**  
 P. Salmerón, J.R.Vázquez, R.S.Herrera, S.P.Litrán  
 Department of Electrical Engineering. Escuela Politécnica Superior. University of Huelva. Spain
- 314 **System of photovoltaic solar electric power for buildings: “Solar façade with  $\beta$ -angle”**  
 J.C.Sáenz-Diez Muro<sup>1</sup>, J.M.Blanco Barrero<sup>1</sup>, E.Jiménez Macías<sup>1</sup>, M.Pérez de la Parte<sup>2</sup>, J.I.Latorre Biel<sup>1</sup>

1. Department of Electrical Engineering. E.T.S.I.I. University of La Rioja
2. Department of Mechanical Engineering. E.T.S.I.I. University of La Rioja

### **Sizing and siting of fuel cell systems using forest residues**

Manuel Gómez González<sup>1</sup>, Francisco Jurado Melguizo<sup>2</sup>

- 315
1. Unidad Territorial de Empleo y Desarrollo Tecnológico “Sierra de Cazorla”, Junta de Andalucía, Spain.
  2. University of Jaén, Department of Electrical Engineering, Spain

### **Power quality survey in a distribution system, standard procedures and limitations**

H.Mokhtari<sup>1</sup>, S.Hasani<sup>2</sup>, M.Masoudi<sup>2</sup>

- 316
1. Department of Electrical Engineering. Sharif University of Technology, Azadi Ave. Theran- Iran
  2. Project Engineer and Management. West Azarbayian Utility, Oroumieh, Iran.

### **Ferroresonance in voltage transformers: Analysis and Simulations**

V.Valverde, A.J.Mazón, I.Zamora, G.Buigues

- 317
- Department of Electrical Engineering. E.T.S.I.I. University of Basque Country

### **Analysis of system failure in a CNG site**

M.Osouli Tabrizi<sup>1</sup>, H.Kharradmehr<sup>1</sup>, K.R.Milani<sup>1</sup>, H.Mokhtari<sup>2</sup>

- 318
1. West Azarbayjan Utility, Tabriz,Iran
  2. Department of Electrical Engineering Sharif University of Technology, Azadie Ave. Theran-Iran

### **Implementation of a double AC/DC/AC converter with power factor correction (pfc) for non-linear load applications**

E.Alvear<sup>1</sup>, M.Sánchez<sup>1</sup>, J.Posada<sup>2</sup>

- 320
1. Department of Automation and Electronics, Electronics Engineering, Universidad Autónoma de Occidente. Colombia
  2. GIEN. Universidad Autónoma de Occidente. Colombia

### **Solar photovoltaic water pumping system using a new linear actuator**

P. Andrada, J.Castro

- 321
- GAECE. Department of Electric Engineering UPC-EPS . Vilanova i la Geltrú. Spain

### **Short-circuits simulation at 25 kV,50 Hz contact line system**

Radovan Doleček<sup>1</sup>, Ondřej Černý<sup>2</sup>

- 322
1. Department of Electrical and Electronic Engineering and signaling in transport. University of Pardubice. Czech Republic
  2. Jan Perner Transport Faculty, KEEZ. Pardubize. Czech Republic

### **Dynamic performance comparison of conventional and capacitor commutated converter (CCC) for HVDC transmission system in simulink environment**

Khatir M<sup>1</sup>, Zidi. S.A<sup>1</sup>, Fellah. M.K, Hadjeri S.<sup>2</sup>

- 323
1. Electrical Engineering Department. University of Djillali Liabès. Algeria
  2. Intelligent control & Electrical Power Systems Laboratory. University of Djillali Liabès. Algeria

324 **Experimental supply equipment for active loop-based magnetic field mitigation system**  
J.C.del Pino López, P.Cruz Romero  
Department of Electrical Engineering, University of Sevilla. Spain

329 **On the performance of commercial supercapacitors as storage devices for renewable electrical energy sources**  
Vasile V.N.Obreja  
National R&D Institute for Microtechnology (IMT-Bucuresti) Bucharest-Romania

330 **International review of grid connection requirements related with voltage dips for wind farms**  
J.A.Fuentes<sup>1</sup>, M.Cañas<sup>2</sup>, A.Molina<sup>1</sup>, E.Gómez<sup>2</sup>, F.Jiménez<sup>3</sup>  
1.- Department of Electrical Engineering, Polytechnic University of Cartagena (Spain).  
2.- Renewable Energy Research Institute and the Department of Electrical, Electronic and Control Engineering, EPSA, University of Castilla-La Mancha (Spain).  
3.- Engineering Department, Gamesa Eólica, S.A., Pamplona (Spain).

341 **Multi-phase space vector pulse width modulation: Applications and strategies**  
Mario J.Duran, F.Barrero, S.Toral  
Electrical Engineering Department. School of Engineering, University of Sevilla. Spain

377 **Low cost method for on-line remote monitoring of power transformers and induction motors**  
M.F.Cabanas, F.Pedrayes, C.Rojas, M.G.Melero, G.A.Orcajo, J.M.Cano  
Department of Electrical Engineering. University of Oviedo. Spain

**ROOM D “Universidad de Sevilla”**  
**11:00-13:00 Round Table A: “The Energy Challenge”**

**Chairman:** Mario Mañana Canteli.

- Carlos Gascó Travesedo. **Iberdrola Energías Renovables**
- Jorge Martínez Jubitero. **Director de Ingenierías de Sevillana Endesa**
- Antonio González Jiménez. **Director Técnico del Foro Nuclear**
- Juan Bachiller. **ABB Power Technologies**
- Eduardo Galvan. **NEO Renovables**
- Cristina Prieto. **Solucar Renovables**

**13:00 – 15:00 Lunch**

**Thursday 29 March 2007**

**ROOM A “Iberdrola”**

**15:00-15:45 Plenary Session PL3**

**Chairman:** Andreas Eberhard

**PL3: *Development, innovations and transformer solutions***  
Miguel Oliva Navarrete. ABB

**15:45-20:30 FREE TIME**

**20:30 -23:00 Conference Banquet at “Cortijo El Esparragal”**  
(Optional)

**Friday 30 March 2007**

**ROOM A “Iberdrola”**

**9:00-9:45 Plenary Session PL4**

**Chairman:** Jan Iwaszkiewicz

**PL4: Renewable Energies Development: The Distribution Point of View**

Gabriel Tévar. Endesa

**ROOM A “Iberdrola”**

**9:45 -10:45 Oral Session A3**

**Chairman:** Gorazd Stumberger

**Forecasting the impact of increasing integration of renewable sources in the power unbalance during peak and off-peak hours**

Sérgio Faias<sup>1,2</sup>, Jorge Sousa<sup>1</sup>, Rui Castro<sup>3</sup>

268

1. Depart. Of Electrical Engineering and Automation, ISEL. Lisboa. Portugal
2. Centro de Automática da Universidade Técnica de Lisboa.
3. Instituto Superior Técnico. Technical University of Lisbon (IST/TUL). Lisboa. Portugal

**Modelling and simulation of the biomass fired dual fluidized bed gasifier at Guessing/Austria**

279

Priyanka Kaushal, Tobias Pröll, Hermann Hofbauer  
Vienna University of Technology, Institute of Chemical Engineering. Vienna-Áustria

**Effect of sampling and computing times on a hysteresis vector controller applied to renewable distributed generation**

281

J.F.Sanz, J.Sallán, M.A. Alonso, M. Sanz, J.L. Villa.  
CIRCE Foundation. Electric Engineering Department, University of Zaragoza. Spain

**Performance comparison of different voltage control schemes on distributed generation**

301

Anna Rita Di Fazio, Giuseppe Fusco, Maio Russo  
Faculty of Engineering, University of Cassino. Italy

**ROOM B “Schneider”**

**9:45-10:45 Oral Session B3**

**Chairman:** Jiri Klima

**Analyzing electric power quality in arc furnaces**

W.Z.Gandhare<sup>1</sup>, D.D.Lulekar<sup>2</sup>

- 272 1. Govt. College of Engineering, Aurangabad (Maharashtra), India.  
2. Department of Electrical Engineering. Govt. Polytechnic Khamgaon (Maharashtra). India

**Voltage dip ride-through capability of converter-connected generators**

Bert Renders, Koen De Gussemé, Lieven Degroote, Bart Meersman, Lieven Vandevelde

- 287 Ghent University Electrical Energy Laboratory (EELAB), Department of Electrical Energy, Systems and Automation (EESA), Gent, Belgium

**The design and construction of a power quality parameters recorder**

Marek Rogóż<sup>1,2</sup>, Zbigniew Hanzelka<sup>2</sup>

- 319 1. ENION AS Power Distribution Company, Cracow, Poland  
2. University of Science and Technology AGH-UST, Cracow, Poland

**Increase of transmission line losses caused by higher harmonic components evaluated by orthogonal decomposition of three-phase currents in the time domain**

Miran Rošer<sup>1</sup>, Gorazd Štumberger<sup>2</sup>, Matej Toman<sup>2</sup>, Drago Dolinar<sup>2</sup>

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

**ROOM C “ABB”**

**10:45-11:30 Poster Session C4 – Coffee Break**

**Chairmen:** Demercil Oliveira, Hugo Ribeiro, Vit Brslica

**Photovoltaics in Spanish deserts: Evaluation of the technology potential and costs**

Rafael Peña

- 283 Departamento de Electrónica y Comunicaciones. Universidad Europea de Madrid. Spain

- Computation of reactive power in the framework of the new Spanish grid code using test fields of wind turbines submitted to voltage dips**  
E.Gómez<sup>2</sup>, J.A.Fuentes<sup>1</sup>, A.Molina<sup>1</sup>, M.Cañas<sup>2</sup>, F.Ruz<sup>1</sup>, F.Jiménez<sup>3</sup>  
331 1.- Department of Electrical Engineering, Polytechnic University of Cartagena (Spain).  
2.- Renewable Energy Research Institute and the Department of Electrical, Electronic and Control Engineering, EPSA, University of Castilla-La Mancha (Spain).  
3.- Engineering Department, Gamesa Eólica, S.A., Pamplona (Spain).
- The sliding voltage control strategy for power peaks bypass**  
333 V.Bršlica  
Department of Electrical Engineering. University of Defense in Brno. Czech Republic
- Electric Vehicle – Design and implementation strategies for the power train**  
334 Rui Santos<sup>1</sup>, Fernando Pais<sup>1</sup>, Carlos Ferreira<sup>1,2</sup>, Hugo Ribeiro<sup>1,2</sup>, Pedro Matos<sup>1</sup>  
1. Escola Superior de Tecnologia do Instituto Politécnico de Tomar- Portugal  
2. Instituto de Telecomunicações, Lisboa- Portugal
- Biomass: Potential source of useful energy**  
335 Esperanza Mateos<sup>1</sup>, Joseba González<sup>2</sup>  
1. Department of Chemical and Environmental Engineering. University of the Basque Country. Spain  
2. Department of English and German Philology. University of the Basque Country
- Self-Learning operation management for variable speed wind energy converters**  
337 C. Sourkounis, B.Ni  
Research Group for Power Systems Technology, Faculty of Electrical Engineering and Information Sciences, Ruhr-University-Bochum, Germany.
- An overview on the integration of large-scale wind power into the electric power system**  
338 R.P.S. Leão<sup>1</sup>, T. Degner<sup>2</sup>, F.L.M. Antunes<sup>1</sup>  
1. Department of Electrical Engineering Federal University of Ceará. Brasil.  
2. Institut für Solare Energieversorgungstechnik – ISET, Kassel, Germany
- The magnetizing field of a linear generator used to obtain electrical energy from waves energy**  
342 Constantin Ghită, Aurel Ionut Chirilă, Ioan Dragoș Deaconu, Daniel Ion Ilina  
Politechnica University of Bucharest, Electrical Engineering Faculty. Romania
- Towards a new model of evaluation of transformation losses in solar orchards**  
343 P.L.Cruz Romero, A.Marano Marcolini, J.C.del Pino López  
Department of Electrical Engineering, University of Sevilla. Spain

- A strategy to locate partial discharges in power transformers using acoustic emission**  
344 Giscard Franceire Cintra Veloso, Luiz Eduardo Borges da Silva, Germano Lambert-Torres  
Federal University of Itajubá- Artificial Intelligence Applications Group- Brasil
- Dynamic model and simulation of a PEM fuel cell for residential applications**  
345 C.R.Bordallo<sup>1</sup>, C.García<sup>1</sup>, J.Brey<sup>1</sup>, J.M.Maza<sup>2</sup>  
1. Hynergreen Technologies S.A. Spain  
2. Department of Electrical Engineering, University of Sevilla. Spain
- Supply voltage effects on the operation of residential air conditioning appliances: Theoretical analysis**  
346 J.M.Romero Gordón<sup>2</sup>, M.Pinilla Rodriguez<sup>2</sup>, J.M.Maza Ortega<sup>1</sup>, M.Burgos Payán<sup>1</sup>  
1. Department of Electrical Engineering, University of Sevilla. Spain  
2. Departamento de Calidad de Suministro-Endesa Sevillana . Sevilla- Spain
- Supply voltage effects on the operation of residential air conditioning appliances: Experimental analysis**  
347 J.M.Romero Gordón<sup>2</sup>, , M.Pinilla Rodriguez<sup>2</sup>, J.M.Maza Ortega<sup>1</sup>, M.Burgos Payán<sup>1</sup>  
1. Department of Electrical Engineering, University of Sevilla. Spain  
2. Departamento de Calidad de Suministro-Endesa Sevillana. Sevilla. Spain
- Single phase shunt active filter with digital control**  
349 J.G.Pinto, Pedro Neves, Ricardo Pregitzer, Luís F.C. Monteiro, João L.Afonso  
Industrial Electronics Department, Minho University. Guimarães, Portugal
- 3-phase 4-wire shunt active power filter with renewable energy interface**  
350 J.G.Pinto, Ricardo Pregitzer, Luís F. C. Monteiro, João L.Afonso  
Department of Industrial Electronics, University of Minho. Guimarães, Portugal
- Use of photovoltaic systems for rural electrification in Thailand**  
352 Naruechon Rapapate<sup>1</sup>, Özdemir Göl<sup>2</sup>  
1. Ubon Ratchathani Rajabhat University, Thailand  
University of South Australia
- Monitoring and control of a laboratory scale wind farm**  
356 J.M.Roldán Fernández<sup>1</sup>, M.A.Caballero Gutiérrez<sup>1</sup>, J.C.del Pino<sup>1</sup>, A.G.González Rodriguez<sup>2</sup>, M.Burgos Payán<sup>1</sup>  
1. Department of Electrical Engineering, University of Sevilla. Spain  
2. Department of Electronics, University of Jaén. Spain
- Integration of multi layer perceptron and design of experiments for forecasting household electricity consumption**  
358 A.Azadeh, Z.S.Faiz  
Department of Industrial Engineering and Research Institute of Energy Management and Planning, Faculty of Engineering. University of Tehran-Iran

- Using an integrated artificial neural networks model for predicting global radiation: The case study of Iran**  
359 A.Azadeh, A.Maghsoudi, Sohrab Khani  
Research Institute of Energy Management and Planning, Department of Industrial Engineering and Department of Engineering Optimization Research, Faculty of Engineering, University of Tehran-Iran
- Electrical energy consumption estimation by genetic algorithm and analysis of variance**  
360 A.Azadeh, R. Tavakkoli-Moghaddam, S.Tarverdian  
Research Institute of Energy Management and Planning and Department of Industrial Engineering, Faculty of Engineering, University of Tehran-Iran
- Working zones of an AC autonomous switched reluctance generator**  
Abelardo Martínez<sup>1</sup>, Javier Vicuña<sup>2</sup>, Francisco José Pérez<sup>1</sup>, Bonifacio Martín<sup>1</sup>, Eduardo Laloya<sup>1</sup>, Tomás Pollán<sup>1</sup>, Beatriz Sánchez<sup>3</sup>, Juan Lladó<sup>3</sup>  
362 1. Departamento de Ingeniería Electrónica y Comunicaciones. Universidad de Zaragoza. Spain  
2. Departamento de Ingeniería Eléctrica. Universidad de La Rioja. Spain  
3. Departamento de Ingeniería Mecánica. Universidad de Zaragoza. Spain
- Risk analysis in renewable energy: Assessment of the vulnerability of the environment and community**  
363 I.Ferraris, M.D.de la Canal, C.Labriola  
Engineering Faculty, National University of Comahue, Argentina
- Analysis of tubular-type linear generator for free-piston engine**  
365 Sun-ki Hong<sup>1</sup>, Ho-Yong Choi<sup>2</sup>, Jae-Won Lim<sup>2</sup>, Hyo-Jae Lim<sup>1</sup>, Hyun-Kyo Jung<sup>2</sup>  
1. Department of Information & Control. Hoseo University, Korea  
2. School of Electrical Engineering, Seoul National University, Korea
- Experimental analysis of power quality issues in a mobile house supplied by renewable energy sources**  
370 Marco Beccali<sup>1</sup>, Massimiliano Luna<sup>2</sup>, Marcello Pucci<sup>2</sup>, Giampaolo Vitale<sup>2</sup>  
1. D.R.E.AM. Università degli Studi di Palermo. Italy  
2. I.S.S.I.A-C.N.R. Section of Palermo. Italy
- On wind power integration into electrical power system: Spain vs. Denmark**  
374 R.Villafáfila<sup>1</sup>, A. Sumper<sup>1</sup>, A.Suwannarat<sup>2</sup>, B.Bak-Jensen<sup>2</sup>, R.Ramirez<sup>1</sup>, O. Gomis<sup>1</sup>, A.Sudrià<sup>1</sup>  
1. Centre of Technological Innovation in Static Converters and Drives (CITCEA) Politechnical University of Catalonia. Spain  
2. Institute of Energy Technology. Aalborg University Denmark

**Friday 30 March 2007**

**ROOM A "Iberdrola"**

**11:30-12:30 Oral Session A4**

**Chairman:** Carlos Redondo Gil

**Economic assessment of pyrolyzers for the utilization of agricultural residues for biooil production**

A.Balestrino<sup>1,2</sup>, F.Bassini<sup>2</sup>, F.Mazzoldi<sup>1</sup>, P.Pelacchi<sup>1</sup>

- 285 1. Dipartimento di Sistemi Elettrici e Automazione DSEA- University of Pisa- Italy  
2. CRIBE- Centro Interuniversitario di Ricerca sulle Biomasse da Energia/CIRAA "E.Avanzi"- S.Piero a Grado- University of Pisa. Italy

**The foundation of the fourth law of thermodynamics: Universe dark energy and its nature: Can dark energy be generated?**

- 286 Murad Shibli  
Mechatronics Engineering Department. German Jordanian University, Amman, Jordan

**The pierre auger project as a challenging tool to studying PV systems**

- 290 Angeles López Agüera, Iago Rodríguez Caboa  
Departamento de Física de Partículas & Instituto Galego de Física de Altas Enerxías, Universidad de Santiago de Compostela. Spain

**Estimating wind turbines mechanical constants**

A.G.González Rodríguez<sup>1</sup>, A.González Rodríguez<sup>2</sup>, M.Burgos Payán<sup>3</sup>

- 361 1. Department of Electronic, University of Jaén. Spain  
2. Department of Applied Mechanical and Project Engineering, University of Castilla La Mancha. Spain.  
3. Department of Electrical Engineering, University of Sevilla. Spain

**Friday 30 March 2007**

**ROOM B “Schneider”**

**11:30-12:30 Oral Session B4**

**Chairman:** Jan Rusek

**Developed power quality monitor used for shunt active power filter studies**

351 J.G.Pinto, Ricardo Pregitzer, Luís F.C. Monteiro, João L.Afonso  
Department of Industrial Electronics, University of Minho. Guimarães,  
Portugal

**Analysis of Harmonic distortion in building electrical installation with computer devices**

366 João Pedro Trovão<sup>1</sup>, Paulo Pereirinha<sup>1</sup>, Humberto Jorge<sup>2</sup>  
1. Instituto Superior de Engenharia de Coimbra. Departamento  
Engenharia Electrotécnica. Coimbra-Portugal  
2. Departamento de Engenharia Electrotécnica e de Computadores.  
Facultade de Ciências e Tecnologia- Universidade de Coimbra. Portugal

**Development of a single-phase DSP based power quality analyzer using new signal processing algorithms for detection and classification**

367 Tomáš Radil<sup>1</sup>, Fernando M.Janeiro<sup>2</sup>, Pedro M.Ramos<sup>3</sup>  
1. Instituto de Telecomunicações. Lisboa- Portugal  
2. Instituto de Telecomunicações . Universidad de Évora. Portugal  
3. Instituto de Telecomunicações and Department of Electrical and  
Computer Engineering. University of Lisboa. Portugal

**A novel approach to control of multilevel converter using wavelets transform**

371 A.Jan Iwaszkiewicz, B.Jacek Perz  
The Electrotechnical Institute, Gdansk Branch, Poland

**Friday 30 March 2007**

**ROOM A  
"Iberdrola"**

**12:30 – 13:00**

**Conclusions and time for the next conference (ICREPQ'08)**

**13:00 – 15:00  
Farewell Lunch**

**15:00 – 19:00  
Cultural Excursion for all the participants.  
Excursion to Santiponce and to different places of interest of Sevilla**



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