

# **INTERNATIONAL CONFERENCE ON RENEWABLE ENERGY AND POWER QUALITY (ICREPQ'04)**

## **WELCOME TO ICREPQ'04**

**On behalf of the Steering Committee I want to give you a very warm welcome to ICREPQ'04 and to Barcelona.**

Our International Programme Committee has selected a high quality 92 papers (among 123 proposals) from which 83 will be presented at the Conference, 32 at oral sessions and 51 at poster sessions, along the three days of the ICREPQ'04. All of these are the papers included at the final programme. Also it will be presented four invited paper along three plenary sessions.

ICREPQ'04 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, session chairmen, participants without papers and 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 (31<sup>st</sup> April, 20:30 H) we will be hold a Reception with aperitif and on Thursday (1<sup>st</sup> April, 21:00 H) the Conference Banquet where we will deliver presents to those companies that collaborate with the organisation of the Conference.

I 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 Barcelona and the surrounding area.

Best regards.  
Sincerely,

Prof. Manuel Pérez-Donsión  
ICREPQ'03 Conference Chairman

## **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'03) 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 - Round tables**

### **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**

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Wilhelmi Ayza, J.R. (Spain)

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Donsión, M.P.

## **LOCAL ORGANISING COMMITTEE**

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Piqué, R  
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Alcaraz, O.

## **SPONSORSHIP**

Sincere thanks are expressed to the organisations listed below who have given valuable support to ICREPQ'04:

FECSA endesa  
Schneider Electric Española, S.A.  
Escola Universitaria d'Enginyeria Tècnica Industrial de Barcelona  
AEDIE  
SDMO.  
Associació/Col·legi d'Enginyer Industrial de Catalunya  
Col·legi d'Enginyers Tècnics Industrials de Barcelona

On the other side ICREPQ'04 is associated al FORUM BARCELONA 2004.

## **SOCIAL EVENTS**

- **Reception and Aperitif:** 31<sup>TS</sup> April at 20:30 H.
- **Conference Banquet:** 1<sup>TS</sup> of April at 21:00 H.

## GENERAL TECHNICAL PROGRAMME ICREPQ'04

Wednesday 31 March 2004						
	<b>ROOM A</b> "SCHNEIDER Electric"	<b>ROOM B</b> "Fecsa endesa"	<b>ROOM C</b>			
	<i>Oral sessions</i>	<i>Oral sessions</i>	<i>Poster sessions</i>			
9:00 – 9:45	Opening ceremony					
9:45 – 11:00	<b>A1</b> 299 275 287 212	<b>B1</b> 300 231 204 274				
	EXTRA TIME FOR DISCUSSION					
11:00 – 11:45	Posters Session at Room C ( <b>Session C1</b> ) Coffee Break			206	211	227
				240	245	255
				263	270	272
				277	278	280
				296	303	311
				202	282	
11:45 – 13:00	<b>A2</b> 248 239 200 295	<b>B2</b> 243 292 308 222				
	EXTRA TIME FOR DISCUSSION					
13:00 – 13:30	<b>Lunch</b>					
15:30 – 16:45	<b>A3</b> 207 259 289 201	<b>B3</b> 235 249 266 219				
	EXTRA TIME FOR DISCUSSION					
16:45 – 17:30	Poster Session at Room C ( <b>Session C2</b> ) Coffee Break			313	205	208
				210	230	250
				260	264	265
				267	319	310
				305	241	316
				312	284	
17:30 – 18:45	<b>A4</b> 223 233 279 281	<b>B4</b> 225 226 283 218				
	EXTRA TIME FOR DISCUSSION					
18:45 – 20:30	FREE TIME					
20:30 -	<b>RECEPTION and aperitif</b>					

<b>Thursday 1 April 2004</b>					
	<b>ROOM B</b> "FECSA endesa"		<b>ROOM C</b>		
	<i>Plenary sessions PL1</i>		<i>Poster sessions</i>		
9:30 – 10:45	<b>PL1</b>	<b>Quality Robust Control Engineering: Theory and Experimental Results on Wind Turbines.</b> Mario García-Sanz. Automatic Control and Computer Science Department. Public University of Navarra. Spain			
<b>EXTRA TIME FOR DISCUSSION</b>					
10:45 – 11:30	Posters Session at Room C (Session C3) Coffee Break		314 320 297 213 215 238	317 309 288 273 262 285	318 301 304 269 257
11:30 – 12:45	<b>PL2</b>	<b>Communication Architectures for Power Distribution Systems and New Tendencies for Intelligent Panels</b> Joaquim Daura, SCHNEIDER Electric.			
<b>EXTRA TIME FOR DISCUSSION</b>					
12:45 – 13:30	Aperitif				
13:30 – 16:00	<b>Lunch</b>				
16:00 – 21:00	FREE TIME				
21:00 -	<b>Conference Banquet</b>				

<b>Friday 2 April 2004</b>	
	<b>ROOM B</b> "Fecsa endesa"
	<b>PLENARY SESSION PE</b>
9:00-11:00	<b>PE1</b> <b>Distributed Generation of Energy Using Micro Gas Turbines. Polygeneration Systems and Fuel Flexibility.</b> J.C. Bruno, A. Coronas. CREVER. 'Rovira i Virgili' University. Spain.
	<b>PE2</b> <b>Measurement of Energy and Power Quality in the Spanish Des-regulated Market.</b> Felipe Montajut, CIRCUTOR
	EXTRA TIME FOR DISCUSSION
11:00 – 11:15	<b>Conclusions and time for the next conference</b>
11:15 – 11:45	Coffee Break
13:00 – 15:30	<b>Lunch</b>

Wednesday 31 March 2004

**9:00 – 9:45 OPENING CEREMONY**

**9:45 – 11:00 ORAL SESSION A1**

**ROOM A “SCHNEIDER Electric”**

**Chairman:** Mario Mañana Canteli

**International Reliability Analysis in Distribution Networks.**

- 299** A. Sumper, A. Sudrià, F. Ferrer  
Centre d’Innovació Tecnològica en Convertidors Estàtics i Accionaments.  
Technical University of Catalonia. Spain.

**Experimental Validation and Comparisons of Active Filtering Strategies.**

- 275** Fernando Pinhabel Marafao, Sigmar Maurer Deckmann.  
School of Electrical and Computer Engineering. University of Campinas- Brazil

**Controller for Three-phase Four-wire Shunt Active Power Filter by DC-bus Energy Regulation.**

- 287** R. Pindado, P. Rodríguez, J. Pou, I. Candela  
Research Group of Power Quality and Renewable Energies (QuPER). Technical  
University of Catalonia. Spain

**Impacts of Renewable Sources on Power Quality in Distribution Systems.**

- 212** José Balcells, Jaroslav Dolezal, Josef Tlustý, Viktor Valouch.  
Electronics Engineering Dept. Technical University of Catalonia. Spain.

**9:45 – 11:00 ORAL SESSION B1**

**ROOM B “Fecsa Endesa”**

**Chairman:** Anna Kotlanova

**Optimal Design of Isolated Network Systems Operated by Renewable Energies with Mixed-integer Optimization Algorithms.**

- 300** M..N. Navarro, J.A. Domínguez, J. Jaime.  
Department of Electrical Engineering. University of Zaragoza. Spain.

**Multipolar Generator for Lower-power Windmills.**

- 231** A. Chuchalin, I. Safyannikov, I.Rossammakhin. Department of Electrical  
Engineering. Tomsk Polutechnic University. Russia.



- Cogeneration in District Heating Systems.**  
204 Carlos J. Renedo, Jaime Peredo, Alfredo Ortiz, Defín Silió.  
Department of Electric and Energy Engineering. University of Cantabria. Spain

- Evolution Towards a Smart Energy Supply System in the Balearic Islands.**  
274 D. Coll-Mayor, R. Picos, E. García Moreno.  
Department of Physics. University of Balearic Islands. Spain.

**11:00 – 11:45 POSTER SESSION C1**

**ROOM C**

- Stator and Rotor Current Harmonics in Doubly Fed Machines with Cycloconverter in Rotor Circuit.**  
206 J. Bendl., M. Chomat., L. Schreier.  
Institute of Electrical Engineering, Academy of Sciences. Czech Republic.

- Analysis and Comparison Between Different Methods of Current Reference Generation for Active Filters Control.**  
211 S. Stefanescu, M. Chindris, A. Sudria, A. Cziker.  
Technical University of Cluj-Napoca, Rumania  
Department of Electrical Engineering, UPC, Spain

- Remarks on Load Dependency of the Voltage Quality of a 500 MVA Synchronous Generator with Fractional Slot Windings.**  
227 C. Grabner  
Institute of Electrical Machines and Drives, Graz University of Technology.  
Graz, Austria.

- Importance of Supply's Quality in Calibration Laboratory.**  
240 M..D. Gutiérrez, F. de la Bodega, E. Loroño, D.M. Larruskain.  
Department of Electrical Engineering. University of the Basque Country, Spain H

- Instrumentation Requirements for Automatic Power Quality Analysis and Dissemination.**  
245 A.Espírito Santo, M.R. Calado  
Dep. Engenharia Electromecânica, Universidade da Beira Interior, Portugal

- A Novel Frequency and Positive Sequence Detector for Utility Applications and Power Quality Analysis.**  
255 F.P. Marafao, S.M. Deckmann, E.K. Luna.  
School of Electrical and Computer Engineering, University of Campinas, Brasil

- Non-Linear and Unbalanced Three-Phase Load Static Compensation with Asymmetrical and Non Sinusoidal Supply.**  
263 Reyes S. Herrera, P. Salmerón.  
Electrical Engineering Department, University of Huelva, Spain.

- Power Quality and Digital Protection Relays.**  
 270 I. Zamora, A.J. Mazón, V. Valverde, E. Torres, A. Dysko.  
 University of the Basque Country. Spain.  
 University of Strathclyde, United Kingdom
- Automatic Management of Voltage Sags Recorded in a 25 kV Sbstation**  
 272 J. Melendez, D. Mascaya, D. Llanos, J. Cobos, J. Sánchez, M. Castro.  
 University of Girona, Spain.
- Economic Evaluation of Mitigation Methods Against Voltage Dips and Interruptions Based on Stochastic Reliability.**  
 277 Dirk Van Hertem, Marcel Diddent, Johan Driesen, Ronnie Belmans.  
 Dep. ESAT/ELECTA, Katholieke Universiteit Leuven.  
 Electrical Power Systems and Metrology Laborelec, Belgium
- A New Methodology For On-Line Power Quality Assessment.**  
 278 A. Moussa, M. El-Gammall, E.N. Abdallah, A. Abouelseoud  
 Dep. Of Electrical Engineering, Alexandria University, Egypt
- Control of a Active Filter Using Dynamic Neural Networks.**  
 280 J.L. Flores Garrido, P. Salieron Revuelta.  
 University of Huelva. Spain.
- Energy Meter Behaviour Under Non-Sinusoidal Conditions.**  
 296 A.Ortiz, M. Lehtinen, M. Mañana, C. Renedo, L.I. Eguiluz.  
 Dep. of Electrica Engineering, Cantabria University. Spain.  
 Power System Laboratory, Helsinki University of Technology, Finland.
- Standard Test Protocol to Characterize Adjustable Speed Drive Behavior During Voltage Dips.**  
 303 M. Teixidó, A. Samper, Q. López, S. Galceran, J. Sánchez.  
 CITCEA, Dep. Of Electrical Engineering, Technical University of Catalonia.  
 FECSA-ENDESA, Spain.
- Series Resistance of SnO<sub>2</sub>/SiO<sub>2</sub>/Si(n) Solar Cells.**  
 311 A.Checnane, S. Bensmain, B. Benyoucef, J.P. Charles, R. Zerdoum.  
 Materials and Renewable Energies Laboratory, Tlemcen, Algeria.  
 LMOPS, SUPELEC, France
- Power Station Based on the Energy of the Sea Waves.**  
 202 Ratko Isidorovic, Jankp Isidorovic, Nemanja Grubor.  
 Minel Trafo AD, Mladenovac, Serbia.
- Provision And Costs of Ancillary Services in a Restructured Electricity Market.**  
 282 A.J.C. Pereira, Z.A. Vale, A. Machado e Moura, J.A. Díaz Pinto.  
 Instituto Superior de Engenharia. University of Coimbra.  
 Instituto Superior de Engenharia. University of Porto.  
 Facultade de Engenharia. University of Porto.

## **11:45 – 13:00 ORAL SESSIONS A2**

### **ROOM A “SCHNEIDER Electric”**

**Chairman:** A. Sudriá Andreu

- 248** **Analysis of Electrical Signal Disturbances. A New Strategy.**  
J.C. Montaña, M. Castilla, A. López, J. Gutiérrez, J.C. Bravo, D. Borrás.  
Consejo Superior de Investigaciones Científicas (CSIC), IRNAS.  
University of Sevilla, Spain.
- 239** **Analysis Strategy Based on Wavelet Decomposition for Classification of Voltage Sags.**  
J. Xargayó, J. Meléndez, J. Colomer  
Control Engineering and Intelligent Systems Group. Institute of Informatics and Applications. University of Girona. Spain.
- 200** **Power Quality in a University Campus: The User’s Perspective.**  
A. Moreno-Muñoz, M<sup>a</sup>.D. Redel, A.L. Prieto, A. Plaza, M. González, J. Luna.  
University of Córdoba. Spain.
- 295** **Frequency Measurement Under Non-Sinusoidal Conditions.**  
M. Mañana, J.A. Ridríguez, F.J. Sánchez, A. Ortiz, L.I. Eguiluz.  
Dep. Of Electrical Engineering. Cantabria University. Spain.

## **11:45 – 13:00 ORAL SESSIONS B2**

### **ROOM B “Fecsa endesa”**

**Chairman:** Johan Bacher

- 243** **Wind Power System for Domestic Installations.**  
I. Mény, P. Enrici, J.J. Huselstein, D. Matt  
Laboratoire d’électrotechnique de Montpellier (LEM), France.
- 292** **Reconversion of Traditional Water Extraction Windmills in Mallorca to Produce Electrical Power.**  
J. Pascual Tortella.  
IDOM Ingeniería Arquitectura y Consultoria, Mallorca, Spain
- 308** **Variable Speed Drive Modelling of Wind Turbine Permanent Magnet Synchronous Generator.**  
T. Zouaghi.  
Laboratoire des Systèmes Electriques, (L.S.E.), Tunisia.
- 222** **Multi-Agent Based Operation and Control of Isolated Power System with Dispersed Power Sources Including New Energy Storage Device.**  
T. Hiyama, T. Nagata, T. Funabashi.

Dep. of Electrical & Computer Engineering, Kumamoto University, Japan.

**15:30 – 16:45 ORAL SESSION A3**

**ROOM A “SCHNEIDER Electric”**

**Chairman:** José María de la Portilla Fernández

- 207 Optimization of the Operation Reliability Level of the Protection System.**  
Marian Ciontu, Maria Brojbou  
Faculty of Electrical Engineering. University of Craiova.
- 259 Experimental Analysis of the Line Side Behaviour of an Uncontrolled 12-Pulse Rectifier with Capacitive DC-Smoothing Compared to Analytical Analysis.**  
Thomas Rechberger  
Institute of Electrical Machines and Drives. Graz University of Technology. Austria.
- 289 Harmonic Distortion Analysis of a Micro Gas Turbine Interconnected to the Electricity Grid.**  
J.C. Bruno, Ll. Massagués, A. Coronas.  
CREVER- Universitat Rovira I Virgili, Spain.
- 201 Current Sensor Based on Rogowski Coil.**  
F.J. Arcega, J.A. Artero.  
University of Zaragoza. Spain.

**15:30 – 16:45 ORAL SESSION B3**

**ROOM B “Fecsa endesa”**

**Chairman:** Manuel Morán Araya

- 235 Energy Analysis: Absorption Heat Transformer Cycle with a Combing Ejector using Lithium Bromide/Water as Working Fluid.**  
A. Pongtornkulpanich, S. Trepá, M. Amornkitbamrung  
School of Energy and Materials, King Monkut’s University of Technology.  
Chool of Renewable Energy Technology, Nassuan University. Thailand.
- 249 Detection of Broken Damper Bars of a Turbo Generator by the Field Winding.**  
J. Bacher  
Institute of Electrical Machines and Drive Technology, E.M.A. University of

Technology Graz. Austria

- 266 Amplitude Modulation – an Alternative Method of Generating the Converter Output Waveforms.**  
A. Jan Iwaszkiewicz, B. Jacek Perz.  
The Electrotechnical Institute. Poland.
- 219 Unsymmetrical Failure States in a Small Water Power Station.**  
Vaclav Bartos, Anna Kotlanova.  
University of West Bohemia in Pilsen, Czech Republic.

**16:45 – 17:30 POSTER SESSION C2**

**ROOM C**

- 313 A theoretical Study for Supporting an Autonomous Diesel Power Plant with a Photovoltaic Generator.**  
M. Sylos Labini, G. Delvecchio, F. Fraccalviere, F. Neri, B. Valenzano.  
Dep. Of Electrotechnics and Electronics. Polytechnic of Bari. Italy..
- 205 Variable Speed Asynchronous Generator.**  
Vít Brslica.  
Military of Electrical Engineering and Electronics. Brno. Czech Republic.
- 208 Damping Subsynchronous Resonance Oscillations Using A Dynamic Switched Filter-Compensator Scheme.**  
A.M. Sharaf.  
University of New Brunswick. Canada
- 210 Neutral Currents in Large Public Lighting Networks.**  
M. Chindris, A. Sudria, A. Cziker, S. Stefanescu.  
Technical University of Cluj-Napoca. Romania  
ETSIB. Technical University of Catalonia, UPB. Romania.
- 230 Magnetic Shields for Underground Power Lines.**  
J.R. Riba Ruiz, X. Alabern Morera.  
Technical University of Catalonia, UPC, Spain.
- 250 The Shielding Effect of the Built in Damper Cage in a Synchronous Machine.**  
J. Bacher, G. Maier  
Institute of Electrical Machines and Drive Technology. University of Technology Graz. Austria.
- 260 An Overview to Fault Location Methods in Distribution System Based on Single End Measures of Voltage and Current.**  
J. Mora, J.Meléndez, Marc Vinyoles, J. Sánchez, Manel Castro.

- eXiT Group. University of Girona. Spain
- 264 Fault Location in Electrical Distribution Systems Using PLS and NN.**  
M.N. Ruiz, J. Meléndes, J.Colomer, J.Sánchez, M.Castro.  
eXiT. University of Girona.  
ENDESA. Spain.
- 265 Voltage Waveforms Comparison for Different PWM Modulation Strategies.**  
H. Martín, R. Bargalló.  
EUETI. Technical University of Catalonia. UPC.Spain
- 267 Learning power Conditioning Basics at the Technical Engineering School of Barcelona (EUETIB/UPC).**  
Jordi de la Hoz, Sergi Fillet, Alfredo de Blas.  
EUETIB. Technical University of Catalonia (UPC). Spain.
- 319 Multivariable QFT Controllers Design for Heat Exchangers of Solar Systems.**  
M. Barreras, M. García-Sanz  
Automatic Control and Computer Cience Department. Public University of Navarre. Spain.
- 310 Optimization of the Dehydration of Muds in Purifier Station of Residual Waters by Means of the Employment of Photothermic Energy.**  
A.J. Herrera Torres, A. Espín Estrella.  
University of Granada. Spain.
- 305 Fuel Cell Based Distributed Generation Feeding Electrical and Thermal Loads.**  
S. Meo. G. Paparo, G. Velotto  
Italy.
- 241 Output Stabilization of Wind Turbine Generator by Series and Parallel Compensation Using SMES.**  
T. Senjyu, T. Kinjyo, K. Uezato, H. Fujita, Toshihisa Funabashi.  
University of the Ryukyus. Meidensha Corporation.  
Chubu Electric Power Co. Japan.
- 316 Intelligent Twin Rotor Indution Motor Drive System for Electric and Hybrid Vehicles with Random Modullation Techniques and with Fixed Switching Frecuency.**  
Zygmunt Szymanski.  
Silesian University of Technology. Poland.
- 312 A Study for Optimizing the Management Strategies of a Hybrid Photovoltaic-Diesel Power Generation System.**  
M. Sylos Labini, G. Delvecchio, M. Guerra, C. Lofrumento, F. Neri.  
University of Bari. Italy.
- 284 Modelling and Simulation of an Asynchronous Wind Turbine of Squirrel**

**Cage.**

J. Martínez García, M. García-Gracia, M.P. Comech, D. García García.  
CIRCE. University of Zaragoza. Spain

**17:30 – 18:45 ORAL SESSION A4**

**ROOM A “Schneider Electric”**

**Chairman:** Jiri Bendl

**223 Inefficiencies in Unbalanced Three-Phase Power Systems. Relationship Between System Asymmetry and Instantaneous Power Waves.**

R. Sabater, V. Donderis

Dep. Of Electrical Engineering. Technical University of Valencia. Spain.

**233 On the Assessment of Power Quality Characteristics of Grids Connected Wind Energy Conversion Systems.**

P. Carneiro, P. Torres, R.M.G. Castro, A.I. Estanqueiro

Electrical Energy Centre. Technical University of Lisbon. Portugal

**279 Influence of Unbalanced and Waveform Voltage on the Performance Characteristics of Three-phase Induction Motors.**

E. Quispe, G. Gonzalez, J. Aguado.

Grupo de Investigación en Energías GIEN-UAO. Universidad Autónoma de Occidente. Colombia.

**281 Control Strategies for Active Power Filters.**

F. Barrero, E. Romero, M.i. Milanés.

School of Industrial Engineering. University of Extremadura. Spain.

**17:30 – 18:45 ORAL SESSION B4**

**ROOM B “Fecsa endesa”**

**Chairman:** Francisco Arcega Solsona

**225 Generic Aggregated Wind Farm Model for Power System Simulations- Impact of Grid Connection Requirements.**

J. Soens, J. Driesen, D. Van Hertem, R. Belmans.

Dep. Of Electrical Engineering, ESAT/ELECTA. K.U.Leuven. Belgium

**226 Simulation of a Solar Domestic Water Heating System with Different Collector Efficiencies and Different Volumen Storage Tanks.**

D. Silió Salcines, C.Renedo, V. Castañera

University of Cantabria. Spain.

- 218 The Future of the Alternatives Energies: A Forecast Based on Technological Forecasting Techniques.**  
J.C. Oliveira Matias, T. Campos Devezas  
University of Beira Interior. Portugal

- 283 Validity Range of Wind Turbine Models.**  
M.P. Comech, D. García García, M.Sanz, J. Martínez García, M. García-Gracia  
CIRCE. University of Zaragoza. Spain.

**Thursday 1 April 2003**

**9:30 – 10:45 PLENARY SESSION PL1**

**ROOM B “Fecsa endesa”**

**Chairman:** Blas Hermoso Alameda

- Quality Robust Control Engineering: Theory and Experimental Results on Wind Turbines.**  
**PL1** Mario García-Sanz.  
Automatic Control and Computer Science Department. Public University of Navarra. Spain

**10:45 – 11:30 POSTER SESSION C3**

**ROOM C**

- 314 Technical and economical Assessment of the Effect of Voltage Sags on Adjustable Speed Drives.**  
J.M. Cano, G.A. Orcajo, C.H. Rojas, M.G. Melero, M.F. Cabanas  
University of Oviedo. Spain.
- 317 Experimental Study of Power Quality in Wind Farms.**  
F. Oliveira, A. Madureira, M.P. Donsión  
University of Porto. Portugal. Spain.  
University of Vigo. Spain
- 318 Statistical Study of Power Quality in Wind Farms.**



- F. Oliveira, A. Madureira, M.P. Donsi3n  
University of Porto. Portugal. Spain.  
University of Vigo. Spain
- 309 Damping Subsynchronous Resonance Oscillations Using A Dynamic Switched Filter-Compensator Schme.**  
A. M. Sharaf.  
University of New Brunswick. Canada.
- 301 Process for the Implantation of Wind Farms in the Basque Country Autonomous Community .**  
M. G3mez, M. Gonz3lez, I. Zamora.  
University of the Basque Country. Spain.
- 297 Wind Power Applied to the Hydrogen Generation.**  
J.J. San Mart3n, I. Mu3oz, J.I. San Mart3n, J.M. Arrieta, I. Mart3n, V. Aperribay, A. P3rez. University of the Basque Country. Spain
- 288 Wind Turbine Generation System Implemented with a Car Alternator for Use in Isolated Locations.**  
H. Fern3ndez, A. Mart3nez, V. Guzman, M. Gim3nez.  
UNEXPO Vicerrectorado Puerto Ordaz. Venezuela.  
University of Zaragoza. Spain  
University 'Sim3n Bolivar'. Venezuela.
- 304 Behaviour of the Wind-Turbines Under Lightning Strikes Including Nonlinear Grounding System.**  
D. Romero, J. Montany3, A. Cancela.  
Dep. Of Electrical Engineering. Technical University of Catalonia. Spain.
- 213 Control Strategy Development for an Inverter Controlled Wave Energy Plant.**  
R.G. Alcorn, T.D. Finnigan  
Energetech Australia Pty Ltd. Australia.
- 273 Spreadsheet Assisted Overall Design of a Wind Turbine Blade.**  
U. Aguirre Llonda, J.J. P3rez Rambla, G. Aguirre Zamalloa.  
University of the Basque Country.  
Ebro-Cant3brica de Energ3as Renovables (ECERSE). Spain.
- 269 Alternatives to the Frequency Control of an Islander Wind Farm.**  
I.Zubia, X. Estolaza, L.M. Bandr3s.  
University of the Basque Country. Spain.
- 215 Simple Control Schme of Three-Level PWM Converter Connecting Wind Turbine with Grid.**  
M. Malinowski, S. Bernet.  
Warsaw University of Technology. Poland.  
Technical University of Berlin. Germany.

- Remote Disconnection System for Disgtributed Generation Units.**  
**262** K.J. Sagastabeitia, Z. Aginako, A.J. Mazón, I. Zamora.  
 University of the Basque Country. Spain.
- Novel Control System Based in DSPs for 800 kW Wind Power Station.**  
**257** S. Gallardo, F. Barrero, J.M. Carrasco.  
 E.S.I.S. University of Seville. Spain.
- The Renewable Energy Course at the Technical Engineering School of Barcelona (EUETIB/UPC).**  
**238** J. de la Hoz, A. de Blas, R. Bargallo.  
 Technical University of Catalonia. Spain.
- Influence of the Load Models in the Dynamic Voltage Stability of an Electric Power System.**  
**285** R.M. Monteiro Pereira, C.M. Machado Ferreira, J.A. Díaz Pinto, F.P. Maciel Barbosa.  
 Instituto Superior de Engenharia. University of Coimbra.  
 Faculdade de Engenharia. University of Porto.
- Power Losses in Outside-Spin Brushless D.C. Motor.**  
**320** P. Andrada, M. Torrent, J.I. Perat, B. Blanqué  
 Technical University of Catalonia. Spain

**11:30 – 12:45 PLENARY SESSION PL2**

**ROOM B “FECSA endesa”**

**Chairman:** Ricard Bosch i Tous

**PL2 Communication Architectures for Power Distribution Systems and New Tendencies for Intelligent Panels**  
 Jaoquim Daura, SCHNEIDER Electric.

**Friday 2 April 2004**

**9:00 – 11:00 PLENARY SESSION PE**

**ROOM B “Fecsa endesa”**

**Chairman:** Rafael Pindado Rico

**PE1 Distributed Generation of Energy Using Micro Gas Turbines.  
Polygeneration Systems and Fuel Flexibility.**

J.C. Bruno, A. Coronas.

CREVER. ‘Rovira i Virgili’ University. Spain.

**PE2 Measurement of Energy and Power Quality in the Spanish Des-regulated  
Market.**

Felipe Montajut, CIRCUTOR