

**11th SPANISH PORTUGUESE CONFERENCE ON
ELECTRICAL ENGINEERING
(11CHLIE)**

PROGRAMME

OBJETIVES

The Spanish-Portuguese Conference on Electrical Engineering (Conferencia Hispano Lusa de Ingeniería Eléctrica - CHLIE) is the natural heir of the Spanish Portuguese Conferences on Electrical Engineering (Jornadas Hispano Lusas de Ingeniería Eléctrica -JHLIE) that started in 1990 in Vigo, with the objectives of create an excellence space for the meeting and interchange of experiences and knowledge about Electrical Engineering. Then the purpose is to give an opportunity to academics, scientists, engineers, manufacturers and users from all over the world, and specially from Spain and Portugal, to come together in a pleasant location to discuss recent development in the wide field of Electrical Engineering, facilitate the mutual knowledge and to promote the collaboration amount the Engineers, both from the universities and also from the companies. The last ten editions have taken place in Vigo (1990), Coimbra (1991), Barcelona (1993), Porto (1995), Salamanca (1997), Lisboa (1999), Madrid (2001), Vilamoura (2003), Marbella (2005), Madeira (2007).

The science and technology progress is based on the diffusion of the knowledge and on his contrast by the community of researchers, for this reason the objectives of this event are the ideas debate, a free discussion and a rigorous analysis of those works presented within the frame of the electrical engineering. And we hope that the authors receive from this event enough advantages like for to justify the additional effort for preparing the papers, to attend and to participate actively. This is the main reason of to support and to hold this event and try to push it to all the community.

SUBJECTS AND TOPICS

Like it is traditional, this 11th Spanish Portuguese Congress on Electrical Engineering (11CHLIE) will cover the following subjects:

- 1.- Electrical Energy Systems Analysis
- 2.- Electrical Energy Systems Management
- 3.- Electrical Machines and Power Electronics
- 4.- CAD/CAE Techniques and Simulation
- 5.- Electrical Installations
- 6.- Industrial Production, Instrumentation, Control and Robotics

All the topics are connected, directly or indirectly, with the Electrical Engineering and within these areas:

LANGUAGES OF THE CONFERENCE

The Conference languages will be:

- Spanish, Portuguese and English.

INTERNATIONAL SCIENTIFIC COMMITTEE

Take into account their eminent position in the world of the Electrical Engineering and their availability and collaboration, we have selected 80 members for the International Scientific Committee.

Aguado, J.A. (Spain)	Klima, Jiri (Czech Republic)
Almeida do Vale, Zita (Portugal)	Kotlanova, A. (Czech Republic)
Andrada Gascón (Spain)	Krawczyk, A. (Poland)
Andras, Dan (Hungary)	Leão Rodrigues (Portugal)
Arcega Solsona, F. (Spain)	Lemos Antunes, C. (Portugal)
Arnaltes Gómez, S. (Spain)	Levi, Emil (U.K.)
Arnulf Kost (Germany)	Llombart Estopiñan, A. (Spain)
Bargallo Perpiña, R. (Spain)	Maciel Barbosa, F. (Portugal)
Bastos, J.P. (Brazil)	Machado e Moura, A. (Portugal)
Bendl, J. (Czech Republic)	Maló Machado, V. (Portugal)
Bosch Tous, R. (Spain)	Mañana Canteli, M. (Spain)
Boccaletti, Chiara (Italy)	Marques Cardoso, A. (Portugal)
Brandão Faria, J. (Portugal)	Martinez Malo, J. (Spain)
Brslica, Vit (Czech Republic)	Niememan, Asco (Finland)
Burgos Payan, M. (Spain)	Norio Takaashi (Japan)
Burgos Díaz, J.C. (Spain)	Nunes, U. (Portugal)
Capolino, G.A. (France)	Orille Fernández, A. (Spain)
Cardoso, J.R. (Brasil)	Pais Diaz, C. (Portugal)
Chiricozzi, E. (Italy)	Perat Benavides, I. (Spain)
Coll Mayor, D. (Spain)	Pereira Cabrita (Portugal)
Conejo Navarro, A. (Spain)	Pereirinha, P. (Portugal)
Dolezel, I. (Czech Republic)	Pérez Donsión, M. (Spain)
Duran, Mario (Spain)	Pérez Hidalgo, G. (Spain)
Eguiluz Morán, L.I. (Spain)	Perz, Jacek (Poland)
Ertan, H.B. (Turkey)	Petkovska, L. (Macedonia)
Esteves Santana. J. (Portugal)	Ramos, C.S. (Portugal)
Fernández Cabanas, M. (Spain)	Roger Folch, J. (Spain)
Flores, Antonio (Portugal)	Rusek, Jan (Czech Republic)
Fraille Mora, J. (Spain)	Saadate, S. (France)
Fraille Ardanuy, J. (Spain)	Salmerón Revuelta, P.. (Spain)
Garrido Suárez, C. (Spain)	Sanz Badía, M. (Spain)
Gharehpetian, G.B. (Iran)	Schlemmer, Erwing (Germany)
Ghita, Constantin (Romania)	Serrano Iribarnegaray, L. (Spain)
Gómez Expósito, A. (Spain)	Stumberger, Gorazd (Slovenia)
Grabner, C. (Germany)	Tenreiro Machado, J. (Portugal)
Guemes Alonso, J.A. (Spain)	Valouch,,V. (Czech Republic)
Iwaszkiewicz, J. (Poland)	Vitale, Gianpaolo (Italy)
Jorge, H. (Portugal)	Wiak, S. (Poland)
Kádár Péter (Hungary)	Wilhelmi Ayza, J.R. (Spain)
Kladas, A. (Greece)	Zamora Belver, I. (Spain)

The International Scientific Committee members were the responsible people for the papers evaluation and they take into account the presented digests and considered his originality, interest, quality, elaboration, references and the agreement between the objectives and the conclusions. Each item could obtain the punctuation from 1 to 10 and then, take into account the results, each member classified the evaluated digests like: excellent, good, average, poor, bad or very bad. The International Scientific Committee members could send remarks of the evaluated digests for to send to the authors (without to say the name of the referee) and also for the Secretariat. Each digest was been evaluated for two International Scientific Committee members.

ORGANIZATION COMMITTEE

Chairman:

Manuel Pérez Donsión (President of AEDIE, Univ. of Vigo - Spain)

Vice-Chairman:

Carlos Lemos Antunes (President of APDE, Univ. of Coimbra (Portugal))

Local Committee of collaborators

Mariano Sanz Badía (Universidad de Zaragoza-CIRCE)
Andrés Lombart Estopiñán (Universidad de Zaragoza-CIRCE)
Miguel García Gracia (Universidad de Zaragoza-CIRCE)
Julio J. Melero Estela (Universidad de Zaragoza-CIRCE)
José F. Sanz Osorio (Universidad de Zaragoza-CIRCE)
Jesús J. Sallán Arasan (Universidad de Zaragoza-CIRCE)

SPONSORSHIP

Sincere thanks are expressed to the organisations listed below who have given valuable support to 11CHLIE:

Departamento de Industria, Comercio y Turismo del Gobierno de Aragón
Endesa
Circuitor
Instrumentación y Componentes (INYCOM)
Cátedra Brial Enática de Energías Renovables
Ministerio de Ciencia e Innovación
Universidad de Zaragoza
Fundación CIRCE
European Association for the Development of Renewable Energies,
Environment and Power Quality (EA4PQ)
Asociación Española para el Desarrollo de la Energía Eléctrica (AEDIE)

ENTITIES THAT COLLABORATE WITH 11CHLIE

The Institutions that collaborate, directly or indirectly, with the Organization of the 11CHLIE are the following: University of Vigo, University of Zaragoza and CIRCE Foundation.



TECHNICAL CO-SPONSORSHIP

The 11CHLIE has also counted with the invaluable Technical Co-Sponsorship of two distinguished international associations like are: IEEE and the Power Engineering Society (PES), closely bound to IEEE.



PAPERS PUBLICATION

The full paper will be included in the 11CHLIE CD Rom with ISBN and also in the web site.

PAPERS PRESENTATION

The authors could say previously to the 11CHLIE Secretariat their preferences concerning with the paper presentation, that could be an oral or poster presentation, the authors preferences were been take into account within the possibilities of the programme. In this sense the general criterion was to classify the full papers take into account the general or specific characteristics of the work and then to reserve the more general for oral sessions and the more specific ones for to permit a more personal, deep and detailed discussion between more specialized interlocutors for the poster sessions. In any case this classification don't means any difference or valuation concerning with the scientific-technical quality of the works. Of course we will not make any difference, because really do not exist.

Oral Presentations

Each speaker of an oral presentation has an available time of 18 minutes (15 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 the authors 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 about 60 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 is 950 mm x 2380 mm (width x high).

CHAIRMEN SESSIONS

On behalf of the International Scientific Committee and the Local Organising Committee of 11CHLIE 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 11CHLIE and their contribution would be greatly appreciated. We wish to express our warmer thanks.

TABLE I. Chairmen Sessions distribution

Wednesday 1 July, 2009		
16:45-17:45	PLENARY SESSION PL1	Mariano Sanz Badia
17:45-18:45	POSTER SESSION C1	Ramón Bargalló Perpiña
		Julia Díaz Garcia
		José Manuel Bueno
		Victor Mendes
		Yu-Chi Wu
18:45-20:15	ORAL SESSION A1	José Roger Folch
	ORAL SESSION B1	Ivo Dolezel
Thursday 2 July, 2009		
9:30-10:30	PLENARY SESSION PL2	Andrés Llombart Estopiñan
10:30-11:30	POSTER SESSION C2	José A. Güemes Alonso
		Cesar S. Cañas Peñuelas
		Francisco A. Carvajal Martínez
		Shahrokh Saadate
		Lidija Petkovska
11:30-13:00	ORAL SESSION A2	José Roman Wilhelmi Ayza
	ORAL SESSION B2	Mario Mañana Canteli
17:00-18:00	PLENARY SESSION PL3	Antonio Machado e Moura
18:30-19:30	PLENARY SESSION PL4	Jesús Fraile Mora
Friday 3 July, 2009		
9:00-10:00	PLENARY SESSION PL5	Carlos Lemos Antunes
10:00-11:00	POSTER SESSION C3	Joan Llaverias Sanmarti
		Eduardo García Garrido
		Pedro García Gutiérrez
		Jesús Fraile Ardanuy
		Cassio T.C. Andrade
11:00-12:30	ORAL SESSION A3	Giampaolo Vitale
	ORAL SESSION B3	Pere Andrada Gascón

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

- Plenary sessions.

That each plenary session presented at the Paraninfo (PL1, PL2 and PL5) should not exceed 60 minutes including presentation and discussion, (45 minutes for presentation and 15 minutes for questions) and 45 minutes, (35 minutes for presentation and 10 minutes for question, for the plenary sessions presented in Walqa (PL3 and PL4).

-Oral sessions.

That each oral paper presentation should not exceed 18 minutes including presentation and discussion, (15 minutes for presentation and 3 minutes for questions). All the Chairmen must deliver to the 11CHLIE Secretariat the Report of their Oral Sessions.

- Poster sessions.

The author(s) of a poster presentation must be stay near the poster along the 60 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 if all is OK. All the Chairmen must deliver to the 11CHLIE Secretariat the Report of their sessions. The Reports are very important for to decide the three Best Posters Awards

SOCIAL EVENTS

- **Welcome Reception:** On Wednesday evening (1st July, 20:15 H) in the “Sala Josefa Amar y Borbón” of the Paraninfo building where we’ll offer you an aperitif with a Spanish Wine and with regional typical dances
- **Gala Dinner:** On Thursday evening (2nd July, 21:00 H) at the Gran Hotel in the centre of the town with music for to dance and where we will deliver presents to those people and companies that collaborate with the organization of the 11CHLIE.

NAME BADGE.

An admission badge will be provided to each participant. This badge entitles access to the technical sessions and should be worn through the congress.

VENUE.

The 11CHLIE will be hold in the Paraninfo, building placed at the centre of Zaragoza, this is a Renascent Palace Style designed by the Architect R. Magdalena and built from 1886 to 1893, Former Faculty of Medicine & Sciences where studied Nobel Price Ramón y Cajal.

Address: Plaza Basilio Paraíso 4, 50005 Zaragoza

SECRETARIAT

Along the 11CHLIE we will have open an active Secretariat place near the session rooms with the following timetable:

SECRETARIAT TIMETABLE	
Wednesday 1st of July	10:00 – 12:30 H
	16:00 – 20:00 H
Thursday 2nd of June	09:30 – 13:00 H
Friday 3rd of July	09:00 -- 13:00 H



11th SPANISH PORTUGUESE CONFERENCE ON ELECTRICAL ENGINEERING

Wednesday 1 July 2009						
10:00 – 12:30	Registration					
16:00 - 16:45	Opening Ceremony ROOM A “Gobierno de Aragón” (Sala Pilar Sinués)					
16:45 – 17:45	PL1	130 años de electrificación en Aragón Arturo Aliaga López Consejero de Industria, Comercio y Turismo del Gobierno de Aragón				
EXTRA TIME FOR DISCUSSION						
17:45 – 18:45	Posters Session at Room C “Inycom” (Session C1) Coffee Break (Sala Josefa Amar y Borbón)			102	103	115
			118	119	122	
			123	128	129	
			130	133	135	
			136	139	144	
			145	151	153	
			165	216	255	
			258	262	265	
	ROOM A “Gobierno de Aragón” (Sala Pilar Sinués)			ROOM B “Endesa” (Sala Joaquin Costa)		
	Oral session A1			Oral session B1		
18:45 – 20:15	217	222	263	224	234	237
	264	267		247	260	
20:15 - 22:00	Welcome Reception: in the Room C “Inycom” “Sala Josefa Amar y Borbón” of the Paraninfo building where we'll offer you an aperitif with a Spanish Wine and with Regional Typical Dances					

11CHLIE

Thursday 2 July 2009						
	ROOM A "Gobierno de Aragón" (Sala Pilar Sinués)					
9:30 – 10:30	PL2	Retos regulatorios y tecnológicos en el futuro de las redes eléctricas José Luis Mata Vigil. Director I+D+I de REE				
EXTRA TIME FOR DISCUSSION						
10:30 – 11:30	Posters Session at Room C "Inycom" (Session C2) Coffee Break (Sala Josefa Amar y Borbón)			157	158	161
				166	167	170
				175	176	179
				181	183	187
				189	190	192
				194	198	245
				246	248	249
				250	252	257
	ROOM A "Gobierno de Aragón" (Sala Pilar Sinués))			ROOM B "Endesa" (Sala Joaquin Costa)		
Oral session A2			Oral session B2			
11:30 – 13:00	101	132	148	120	125	173
	186	196		178	184	
EXTRA TIME FOR DISCUSSION						
13:00 – 15:00	LUNCH: IN ROOM C "Inycom" (Sala Josefa Amar y Borbón)					
15:00 – 16:00	Trip from Paraninfo to Walqa (about 75 Km Highway)					
16:00-17:15	Visit to the Renewable Energy Installations (FH2A) of Walka					
17:15 – 18:00	PL3	Sistema de medida y control de energías renovables Julio J. Melero Estela, Director de Área de la Fundación CIRCE y Asesor Tecnológico de Instrumentación y Componentes				
18:00 – 18:15	Coffee Break					
18:15 -19:00	PL4	Los avances científicos y su impacto en el desarrollo de un nuevo escenario energético Mariano Sanz Badía. Director de Innovación en Innovación de Recursos de la Fundación CIRCE				
19:00-20:00	Trip from Walqa to Paraninfo					
21:00-24:00	Conference Dinner In Gran Hotel placed in the centre of the town and after dinner we'll have a group of music for all the people that want to dance					

11CHLIE

Friday 3 July 2009						
	ROOM A "Gobierno de Aragón" (Sala Pilar Sinués)					
9:00 – 10:00	PL5	Efficiency in Power Transformers. Juan Bachiller. ABB				
EXTRA TIME FOR DISCUSSION						
10:00 – 11:00	Posters Session at Room C "Inycom" (Session C3) Coffee Break (Sala Josefa Amar y Borbón)			140	152	200
				202	205	207
				210	211	212
				214	215	220
				225	228	229
				231	233	235
				236	240	242
				243	256	266
	ROOM A "Gobierno de Aragón" (Sala Pilar Sinués))			ROOM B "Endesa" (Sala Joaquin Costa)		
Oral session A3			Oral session B3			
11:00 – 12:30	150	160	163	193	195	199
	191	251		203	206	
EXTRA TIME FOR DISCUSSION						
12:30 – 13:00	Closing Ceremony Conclusions and time for the 12CHLIE					
13:00 – 15:00	LUNCH: IN ROOM C "Inycom" (Sala Josefa Amar y Borbón)					

Saturday 4 July 2005	
9:30 – 13:30	Excursion: "The Goya Route"
13:30 – 15:30	Farewell Lunch in a Cariñena winery

Wednesday 1 July 2009

16:00 – 16:45 OPENING CEREMONY ROOM A “Gobierno de Aragón”

- Arturo Aliaga López. Consejero de Industria, Comercio y Turismo del Gobierno de Aragón
- Jaime Gros Bañeres. Director General de Endesa en Aragón
- Manuel J. López Pérez. Rector Magnífico de la Universidad de Zaragoza
- Mariano Sanz Badía. Fundación CIRCE
- Manuel Pérez Donsión. Chairman of the 11CHLIE Organization Committee. Presidente de AEDIE
- Carlos Lemos Antunes. Chairman of the 11CHLIE Organization. Presidente da APDEE

16:45 – 17:45 Plenary Session PL1 ROOM A “Gobierno de Aragón”

Chairman: Mariano Sanz Badía

130 años de electrificación en Aragón

Arturo Aliaga López

Consejero de Industria, Comercio y Turismo del Gobierno de Aragón

17:45 – 18:45 Poster Session C1 - Coffee Break ROOM C “Inycom”

Chairmen: José A. Güemes Alonso, Julia Díaz García, José Manuel Bueno, Víctor Mendes, Yu-Chi Wu

Lightning surges on wind power systems: Study of Electromagnetic transient

R.B. Rodrigues¹, V.M.F. Mendes², J.P.S. Catalão¹

102

¹Departamento de Electromechanical Engineering. University of Beira Interior. R. Fonte do Lameiro. Covilhã. Portugal

²Department of Electrical Engineering and Automation. Instituto Superior de Engenharia de Lisboa. Portugal

Result comparison from simulation and measurement on wind power plant

F. Rajský¹, M.P. Donsión², F.T. Oliveira³

103

¹ Faculty of Electrical Engineering, The University of West Bohemia in Pilsen. Czech Republic

² Department of Electrical Engineering, University of Vigo. Spain

³ Department of Electrical Engineering, School of Technology and Management of Leiria. Portugal

A new high-power DC/DC converter for residential fuel cell power systems

115

D. Vinnikov, T. Jalakas, I. Roasto

Department of Electrical Drives and Power Electronics. Tallinn University of Technology. Estonia

Improving HV shunt reactors REF relaying

- 118 F. Uriondo¹, G. Aguirre¹, J.R. Hernández¹, J.M. García²
¹ Department of Electrical Engineering. E.S.I. Bilbao, University of The Basque Country. Spain
² INGETEAM T&D. Basauri. Spain

Unit power factor converter to charge embarked supercapacitors

- 119 M. Becherif^{1,2}, M.Y. Ayad¹, A. Henni³, A. Aboubou⁴, M. Wack¹
¹ SeT Laboratory, UTBM University. France
² FC-Lab Fuel Cell Laboratory, Belfort. France
³ Alstom Power System, Energy Management Business, Alstom
⁴ LMSE Laboratory, Bistra University. Algeria

Una evaluación de flicker e interarmónicas provocados por cargas aperiódicas y alineales

- 122 Mario Brugnoni, Alejandro Jurado
 Departamento de Electrotecnia. Facultad de Ingeniería. Universidad de Buenos Aires. Argentina

Instalaciones fotovoltaicas en azoteas: Parámetros para la elección de la mejor tecnología y ángulo de captación

- 123 Ángel A. Bayod Rújula, Abel Ortego Bielsa, Amaya Martínez Gracia
 Centro de Investigación de Recursos y Consumos Energéticos (CIRCE). University of Zaragoza. España

Current tendencies in the integration of renewable resources and modeling of wind energy systems

- 128 Bizuayehu Abebe Worke¹, J. Antonio Domínguez Navarro²
¹ CPS, Mechanical Engineering Department, Renewable Energy and Energetic Efficiency Program Student. Spain
² CPS, Electrical Engineering Department. University of Zaragoza.

Predicción de la demanda total de energía eléctrica española utilizando mapas auto-organizados como modelo de red neuronal

- 129 Carolina Senabre¹, Sergio Valero¹, Antonio Gabaldón², Mario Ortíz¹, Manuel González¹
¹ Departamento de Ingeniería de Sistemas Industriales. E.P.S.E. Universidad Miguel Hernández de Elche. España
² Departamento de Ingeniería Eléctrica. Escuela Técnica Superior de Ingeniería Industrial. Universidad Politécnica de Cartagena. España

Estudio de la distribución e intensidad de los campos magnético y eléctrico entorno a líneas eléctricas de alta tensión.

- 130 **Particularización para líneas de 220 y 400 kV**
 J.J. Ugartemendia¹, J. A. Güemes², P.M. García¹
¹ Departamento de Ingeniería Eléctrica. Universidad del País Vasco. EUP, San Sebastián. España
² Departamento de Ingeniería Eléctrica. Universidad del País Vasco. EUITI de Bilbao. España

Planeamento hídrico de curto prazo: Programação não linear inteira mista

- 133 J.P.S. Catalão¹, H.M.I. Pousinho¹, V.M.F. Mendes²
¹ Departamento de Engenharia Electromecânica. Universidade da Beira Interior. Portugal
² Departamento de Engenharia Eléctrica e Automação. Instituto Superior de Engenharia de Lisboa. Portugal

Wind generation stabilization of fixed speed wind turbine farms with hydrogen buffer

- 135 J.J. Ugartemendia¹, X. Ostolaza², V. Moreno¹, J.J. Molina¹, I. Zubia¹
¹ Department of Electrical Engineering of the University of the Basque Country, San Sebastián. Spain
² Department of Systems Engineering & Control of the University of the Basque Country. San Sebastián. Spain

An approach to find the most flexible plan among solutions of transmission expansion planning (TEP) problem

- 136 M. Gholami, H.Yazdanpanahi, G. Gharehpetian
Department of Electrical Engineering Amirkabir University of Technology. Iran

Application of sigma-delta modulation in multifunction current controller for inverter-based distributed generation

- 139 M. Davari, I. Salabeigi, G.B. Gharehpetian, S.H. Fathi, J. Milimonfared
Department of Electrical Engineering, Amirkabir University of Technology, Iran

Small signal stability analysis of wind turbines

- 144 Yuri Ulianov López¹, José Antonio Domínguez²
¹ Department of Electrical Engineering, Universidad Autónoma de Occidente. Colombia
² Department of Electrical Engineering, University of Zaragoza. Spain

Development of a web-based infrared remote control system for energy management

- 145 Yu-Chi Wu, Bo-Sen Chang
Department of Electrical Engineering. National United University. Taiwan

The induction motor as a mechanical fault sensor in elevator systems

- 151 A.Q. Flores¹, A.J.M. Cardoso², J.B. Carvalho¹
¹ Electrical Engineering Department. I.S.E.P.- Instituto Superior de Engenharia do Porto. Portugal
² Department of Electrical and Computer Engineering. F.C.T.U.C./ I.T. University of Coimbra. Portugal

Optimal dispatch of combined heat power units under day-ahead electricity markets

- 153 José M. Yusta¹, Paulo M. de Oliveira-De Jesus²
¹ Department of Electrical Engineering. Zaragoza University. Spain
² Conversion and Energy Delivery, Department Simón Bolívar University. Caracas. Venezuela

Simulación eléctrica y térmica de panels PV/T

- 165 Angel Antonio Bayod- Rújula¹, Sergio Diaz de Garaio¹, Alejandro del Amo²
¹ Centro Politécnico Superior/ CIRCE. Universidad de Zaragoza.
² ADES Pol. Malpica-Alfinden. España

A new tool for power performance characterization

- 216 J.J. Pérez Aragüés, C. Betrán, J.J. Melero, A. Llombart
Department of Electrical Engineering. University of Zaragoza - CIRCE. Spain

Nuevas formas de divulgación científica a través de Leonardo Energy en español

- 255 Andreas Sumper¹, Rodrigo Ramírez¹, Fernando Nuño², Roberto Villafáfila¹, Hans de Keulenaer²
¹ CITCEA-UPC. Department of Electrical Engineering. Spain
² Centro Español de Información del Cobre (CEDIC). European Copper Institute (ECI). Madrid

Una nueva herramienta para el diseño óptimo de parques eólicos

- 258 J. Serrano González¹, A.G. González Rodríguez², J. Castro Mora³, J. Riquelme Santos¹, M. Burgos Payán¹
¹ Departamento de Ingeniería Eléctrica. Escuela Superior de Ingenieros. Universidad de Sevilla. España
² Departamento de Electrónica y Control. Escuela Politécnica Superior. Jaen. España
³ Persan S.A. Sevilla. España

High efficiency full bridge current-fed DC-DC converter for a fuel cell power system

- 262 O.A. Ahmed, J.A.M. Bleijs
Department of Engineering. University of Leicester. United Kingdom

Inverted induction motor and test stand

- 265 Vicente Climente Alarcón¹, Rubén Puche Panadero, Joan Pons Llinares, Martín Riera Guasp
Departamento de Ingeniería Eléctrica. Universidad Politécnica de Valencia. España

Chairman: José Roger Folch

Rotor vibration reduction using rotor balancing and command shaping

- 217 G. Peláez¹, F. Oliveira^{2,3}, M. P. Donsión⁴,
¹ Department of Mechanical Engineering, University of Vigo. Spain
² Departamento de Electrical Engineering, School of Technology and Management, Polytechnic Institute of Leiria, Portugal
³ Institute for Systems and Computer Engineering at Coimbra, Portugal.
⁴ Department of Electrical Engineering, University of Vigo. Spain

Evaluation and optimise control of energy processes in indoor swimming pools-HVAC system management

- 222 E. Ribeiro^{1,4}, H.M. Jorge^{2,4}, D. Quintela^{3,5}
¹ Polytechnic Institute of Leiria. School of Technology and Management. Leiria. Portugal
² University of Coimbra. Department of Electrical Engineering and Computers. Coimbra. Portugal
³ University of Coimbra. Department of Mechanical Engineering. Portugal
⁴ Institute for Systems and Computer Engineering of Coimbra (INESCC). Coimbra. Portugal
⁵ Association for the Development of Industrial Aerodynamics (ADAI). Coimbra. Portugal

Review diagnosis methods of induction electrical machines based on steady state current

- 263 Rubén Pache Panadero. Joan Pons Llinares, Vicente Climente Alarcon, Manuel Pineda Sánchez.
Departamento de Ingeniería Eléctrica. Universidad Politécnica de Valencia. España

Comparación de soluciones para suministrar energía a sistemas de bombeo en el Norte de Chile: Extensión a la red eléctrica, generadores diesel y fotovoltaica

- 264 Francisco J. Chueco¹, Ángel Bayod Rújula²
¹ SKM Minmetal. Sinclair Knight Merz. Santiago de Chile
² Departamento de Ingeniería Eléctrica. Universidad de Zaragoza – CIRCE. España

Bar breakage detection on Squirrel Cage Induction Motors via Transient Motor Current Signal Analysis based on the Wavelet Transform. A Review

- 267 Joan Pons-Llinares, Vicente Climente-Alarcón, Rubén Puche-Panadero, Jose A. Antonino-Daviu
Departamento de Ingeniería Eléctrica. Universidad Politécnica de Valencia. España

Wednesday 1 July 2009

18:45 – 20:15 Oral Session B1

ROOM B “Endesa”

Chairman: Ivo Dolezel

A new method to obtain multiple load flow solutions

224 Rosa M^a. de Castro Fernández, Angel Pérez Coyto
Departamento de Ingeniería Eléctrica. E.T.S.I.I. Universidad Politécnica de Madrid. España

A customer management system for the Spanish transport system operator

234 Julia Díaz, José R. Dorronsoro, Ángela Fernández, Sandra Fresnillo, Teresa Huelín, Álvaro Valera
Instituto de Ingeniería del Conocimiento (IIC). UAM-Cantoblanco. Madrid. España

Simulating scenarios and prediction intervals in wind power forecasting with Beta distribution

237 Alvaro Jaramillo¹, Ismael Sánchez², Edgardo Castronuovo¹, Julio Usaola¹
¹ Department of Electrical Engineering. Carlos III of Madrid University.
² Department of Statics. Carlos III of Madrid University. Spain

Low-cost advanced metering infrastructure for residential applications

247 M. Mañana¹, A. Ortíz¹, C.J. Renedo¹, S. Pérez¹, F. Delgado¹, M.A. Cavia¹, J. Ruiz²
¹ Department of Electrical and Energy Engineering. University of Cantabria. Santander. Spain
² Energy Watch Consulting. Torrelavega. Spain

Monitorização digital de parâmetros associados à qualidade da energia eléctrica

260 José Baptista¹, Raul Morais¹, António M. Moura², Paulo Amaral¹, Ricardo Costa¹
¹ Departamento de Engenharias da Universidade de Tras-os-Montes e Alto Douro. Vila Real. Portugal
² Faculdade de Engenharia da Universidade do Porto. Departamento de Engenharia Electrotécnica e Computadores. Porto. Portugal

20:55 – 22:00 Welcome Reception

ROOM C “Inycom”

Thursday 2 July 2009

9:30 – 10:30 Plenary Session PL2

ROOM A “Gobierno de Aragón”

Chairman: Andrés Lombart Estopiñan

Retos reulatorios y tecnológicos en el futuro de las redes Eléctricas

José Luis Mata Vigil. Director I+D+I de REE

10:30 – 11:30 Poster Session C2 - Coffee Break

ROOM C “Inycom”

Chairmen: Cesar Cañas Peñuela, Francisco A. Carvajal Martínez, Pedro García Gutiérrez, Ramón Bargalló Perpiña, Lidija Petkovska

157 ***On-site assessment of high voltage motors insulation operating in oil facilities***

Antonio Carvajal, V. Rodolfo García Colón
Department of Electrical Equipment Electrical Research Institute. México

158 ***Stability and accuracy of digital filters in the presence of interharmonics***

José Félix Miñambres¹, Jorge Lázaro², Miguel Angel Zorrozua¹,
Maribel Sánchez², Begoña Larrea², Iñigo Antiza³

¹ Departamento de Ingeniería Eléctrica

² Departamento de Matemática Aplicada. E.T.S.I. Universidad del País Vasco. Bilbao. España

³ GE Multilin. Zamudio. Vizcaya. España

161 ***La asimetría de fase: un Nuevo parámetro para la detección de faltas de baja intensidad en redes de distribución con puesta a tierra de alta impedancia***

K.J. Sagastabeitia¹, I. Zamora², A.J. Mazón², Z. Aginako¹, G. Buigues²

¹ Departamento de Ingeniería Eléctrica. E.U.I.T.I. de Bilbao.

Universidad del País Vasco. España.

² Departamento de Ingeniería Eléctrica. E.T.S.I. de Bilbao. Universidad del País Vasco. España.

166 ***Coefficiente de Curtosis y red neuronal recurrente de Hopfield para clasificación de consumidores eléctricos***

José Jesús López Vázquez, Francisco Muñoz Gutiérrez, Alejandro Rodríguez Gómez, José Ernesto Ruiz González J. E. Medina, J. Muñoz.

Departamento de Ingeniería Eléctrica. Universidad de Málaga. España

Wavelet and artificial neural network comparison results in classification of power quality disturbances

- 167 A. Rodríguez, J. Aguado, J.J. López, F. Martín, F. Muñoz, E. Ruiz, J. Muñoz, M. Medina
Department of Electrical Engineering. E.T.S.I.I.- E.U.P. Málaga University.

Identificación de parámetros de la máquina de inducción para su aplicación al control vectorial de aerogeneradores

- 170 I. Zubia¹, A. Zatarain², C. Alcalde², X. Ostolaza³
¹ Departamento de Ingeniería Eléctrica. EUP- Donostia. Universidad del País Vasco. San Sebastián. España
² Departamento de Matemática Aplicada. EUP- Donostia. Universidad del País Vasco. San Sebastián. España
³ Departamento de Ingeniería de Sistemas y Automática. EUP- Donostia. Universidad del País Vasco. San Sebastián. España

Instrumentos Virtuales en PowerFactory

- 175 J.A . Ramos Hernanz¹, J.J.. Campayo Martín¹, I. Zamora Belver², E. Puelles Pérez¹, J.A. Métrico Gogeoascoechea¹, J. Arrugaeta Gil³, J. Larrañaga Lesaka⁴
¹ Departamento de Ingeniería Eléctrica. E.U.I. Vitoria. Universidad del País Vasco. España
² Departamento de Ingeniería Eléctrica, E.T.S.I.I. Bilbao. Universidad del País Vasco. España
³ Departamento de Ingeniería Mecánica. E.U.I. Victoria-Gasteiz. Universidad del País Vasco. España
⁴ Departamento de Organización Industrial. E.U.I. Vitoria-Gasteiz. Universidad del País Vasco. España

Influence of constructive parameters of the cogging torque in PMSMS

- 176 P.M. García¹, J.A. Güemes², V. Moreno¹, A.M. Iraolagoitia²
¹ Department of Electrical Engineering. E.U.P. San Sebastián. University of the Basque Country. Spain
² Department of Electrical Engineering. E.U.I.T.I. Bilbao. University of the Basque Country. Spain

Predicción a corto plazo de la demanda de energía en centros de transformación de baja tensión usando sistemas de interferencia difusa optimizados genéticamente

- 179 A. Yanguas Peña, M. Mendoza Villena, A. Falces de Andrés, P. Lara Santillán, E. García Garrido, E. Zorzano Alba
Departamento de Ingeniería Eléctrica . E.T.S.I.I. Universidad de La Rioja.

MV bay controller with integrated protection, power quality analysis and extended self-testing functions

- 181 A. Nowakowski, A. Lisowiec, Z. Kolodziejczyk
Centre of Teleinformation systems and Hardware Applications. Tele and Radio Research Institute. Poland

Modelos de predicción a corto plazo para sistemas fotovoltaicos

- 183 A. Muñoz Jiménez, P. Zorzano Santamaría, L.A. Fernández Jiménez,
E. Zorzano Alba, A. Yanguas Peña, E. García Garrido
Departamento de Ingeniería Eléctrica . E.T.S.I.I. Universidad de La
Rioja. España

HTLS and HVDC solutions for overhead lines uprating

- 187 Santiago Cascante Nogales¹, José Antonio Lama Miñana², Adrián
Alonso³, M. Paz Comech³, Miguel García Gracia³, Eduardo Martín³,
¹ ENDESA. Barcelona. Spain
² ENDESA. Sevilla. Spain
³ CIRCE. Zaragoza. Spain

El método de los elementos finitos para la identificación paramétrica de una máquina trifásica de inducción magnética, con algoritmos genéticos

- 189 Leopoldo Simón, José Miguel Monzón
Departamento de Ingeniería Eléctrica. Universidad de Las Palmas de Gran
Canaria. España

Application of FACTS devices in transmission expansion planning to overcome problems of projects delays

- 190 H. Yazdanpanahi, G. Gharehpetian, H. Hosseinian
Department of Electrical Engineering. Amirkabir University. Tehran. Iran

Análisis de la operación estable de los generadores de reluctancia autoexcitados, bajo condiciones variables en la carga, la capacidad de excitación y la velocidad

- 192 Fernando Martínez García¹, Sonia Navarro Gómez²
¹ Departamento de Energía Eléctrica, Electrónica, Automática y
Comunicaciones. Escuela Universitaria de Almadén. Universidad de
Castilla la Mancha. Spain
² Departamento de Electrónica. Escuela Politécnica Superior.
Universidad de Alcalá. Spain

Induction heating of cylindrical billets by rotation in uniform magnetic field solved as mechanical transient

- 194 M. Donatova¹, P. Karban¹, I. Dolezel²
¹ Department of Theory of Electrical Engineering. Faculty of Electrical
Engineering. University of West Bohemia. Plzen, Czech Republic
² Department of Electrical Power Engineering. Faculty of Electrical
Engineering. Czech Technical University. Praha. Czech Republic

Harmonic distortion analysis in MV and LV distribution networks: problems, influencing factors and possible solutions

- 198 Fernando Bastião, Humberto Jorge
Department of Electrical Engineering and Computers . F.C.T.U.C.
University of Coimbra. Portugal

Aplicación del método de los elementos finitos al cálculo de capacidades

- 245 José M. Bueno Barrachina, César S. Cañas Peñuelas, Saturnino Catalan Izquierdo
Instituto de Tecnología Eléctrica. Universidad Politécnica de Valencia. Spain

Optimización de electrodos de puesta a tierra

- 246 César S. Cañas Peñuelas, Saturnino Catalan Izquierdo, José M. Bueno Barrachina
Instituto de Tecnología Eléctrica. Universidad Politécnica de Valencia. Spain

La trompa de agua o trompa de los Pirineos. Recuperación del principio funcional para aplicaciones de bombeo. Aproximación mediante las ecuaciones electromagnéticas

- 248 Ricard Bosch I Tous¹, Víctor Fuses Navarra²
¹ Departamento de Ingeniería Eléctrica (DEE). E.T.S.E.I.B. Universitat Politècnica de Catalunya(UPC). España
² Estudiante de doctorado del mismo departamento (DEE-ETSEIB- UPC).

Theoretical and experimental analysis of the short circuit current components in salient pole synchronous generators

- 249 Laura L. Juárez Caltzontzin, Gustavo Trinidad Hernández, Tomás I. Asiaín Olivares, Daniel Ruiz Vega
Graduate Program in Electrical Engineering. SEPI-ESIME.IPN. U.P. "Adolfo López Mateos". México

Inter-liner dynamic voltage restore and fault current limiter (IDVR-FCL)

- 250 M. Firouzi¹, M. Pishvaie¹, G.B. Gharehpetian², F. Razavi¹
¹ Department of Electrical Engineering. University of Tafresh. Iran
² Department of Electrical Engineering. Amirkabir University of Technology. Tehran. Iran

Determinación experimental on-line de la característica magnética de un motor de reluctancia conmutada

- 252 Francisco José Pérez Cebolla¹, Abelardo Martínez¹, Javier Vicuña², Bonifacio Martín¹, Eduardo Laloya¹
¹ Departamento de Ingeniería Electrónica y Comunicaciones. Universidad de Zaragoza. España
² Departamento de Ingeniería Eléctrica. Univesidad de La Rioja. España

Metodologias aplicadas para a modelagem e análise de sistemas de aterramento impulsivo – Revisão do estado da arte

- 257 Daniel S. Gazzana¹, Arturo S. Bretas¹, Guilherme A.D. Dias¹, M. Telló²
¹ Departamento de Engenharia Eléctrica. UFRGS. Universidade Federal do Rio Grande do Sul. Porto Alegre. Brasil
² Departamento de Engenharia Eléctrica . PUCRS. Pontifícia Universidade Católica do Rio Grande do Sul. Porto Alegre. Brasil

Thursday 2 July 2009

11:30 – 13:00 Oral Session A2

ROOM A “Gobierno de Aragón”

Chairman: José Roman Wihelmi Ayza

Real-time power-hardware-in-the-loop system. Application to power electronics compensators

- 101 Seddik Bacha¹, Christian Dufour², Dan Ocnasu³, Daniel Roye¹
¹ G2Elab-ENSIEG. France
² Montreal-Canada
³ DCMAP-66163. Northgate Business Centre. Romania

Simulação de conversores electrónicos de potência para turbinas eólicas: Análise da qualidade da energia e da estabilidade transitória

- 132 R. Melício¹, V.M.F. Mendes², J.P.S. Catalão¹
¹ Departamento de Engenharia Electromecânica. Universidade da Beira Interior. Covilhã. Portugal
² Departamento of Engenharia Electrica e Automação. Instituto Superior de Engenharia de Lisboa. Portugal

Modelling of the impact of phase asymmetries on the torque waveform of permanent magnet synchronous motor

- 148 X.D. Zhao¹, J. Corda¹, T.X. Mei²
¹ School of Electronic and Electrical Engineering. University of Leeds. United Kingdom
² School of Computing, Science and Engineering. Salford University. United Kingdom

Study of the end effects on the performance of the linear switched reluctance motor

- 186 J. García Amorós¹, P. Andrada Gascón²
¹ Departament d'Enginyeria Electrònica, Eléctrica i Automàtica. E.T.S.E. Universitat Rovira i Virgili. Tarragona. España
² GAECE Grup d'Accionaments Elèctrics amb Conmutació Electrònica. Departament d'Engenyeria Elèctrica. EPSEVG-UPC Vilanova i la Geltrú. España

Three-phase induction motors energy efficiency standards – A study of case

- 196 Cássio T.C. Andrade¹, Ricardo S.T. Pontes²
¹ Regulatory Agency of the Delegated Public Services of Ceará (ARCE). Fortaleza. Brasil
² Department of Electrical Engineering. Federal University of Ceará. Fortaleza. Brasil

13:00 – 15:00 Luch

ROOM C “Inycom”

Thursday 2 July 2009

11:30 – 13:00 Oral Session B2

ROOM A “Endesa”

Chairman: Mario Mañana Canteli

Energy management of a fuel cell and supercapacitors by passivity-based control and sliding mode control

- 120 M.Y. Ayad¹, M. Becherif^{1,2}, A. Henni³, A. Aboubou⁴, M. Wack¹
¹ Se T Laboratory, UTBM University. France
² FC-lab Fuel Cell Laboratory, Belfort, France
³ Alstom Power System, Alstom, France
⁴ LMSE Laboratory, Bilkra University, Algeria

Small cogeneration by biomass gasification on the decentralized energy production

- 125 J. Galvão¹, S. Leitão², S. Malheiro², T. Gaio³
¹ Department of Electrical Engineering. E.S.T.G. Leiria Polytechnic Institute. Portugal
² Department of Engineering Trás-os- Montes e Alto Douro University. Portugal
³ Turismarvão. Marvão. Portugal

Microprodução com sistemas fotovoltaicos e eólicos

- 173 André Agostinho, Humberto Jorge
Departamento de Engenharia Electrotécnica e de Computadores. Faculdade de Ciências e Tecnologia da Universidade de Coimbra. Portugal

Optimización del diseño de parques eólicos por medio de algoritmos genéticos y sistemas de información geográfica

- 178 L.A. Fernández Jiménez, A. Falces de Andrés, M. Mendoza Villena, A. Muñoz Jiménez, P. Lara Santillán, P.J. Zorzano Santamaría
Departamento de Ingeniería Eléctrica. E.T.S.I.I. Universidad de La Rioja. España

Simulation applications to hydropower systems management and design

- 184 Alejandro Perea¹, Jesús M^a Latorre², Andrés Ramos², Santiago Cerisola², Rafael Bellido¹
¹ Iberdrola Generación. Madrid. Spain
² Instituto de Investigación Tecnológica. ICAI- Universidad Pontificia Comillas de Madrid. España

13:00 – 15:00 Luch

ROOM C “Inycom”

Thursday 2 July 2009

15:00 – 16:00 Trip from Paraninfo to Walka

16:00-17:15 Visit to the Renewable Energy Installations (FH2A) of Walka

17:15-18:00 Plenary Session PL3

Walka

Chairman: Antonio Machado e Moura

Sistema de medida y control de energías renovables

Julio J. Melero Estela. Director de Área de la Fundación CIRCE y Asesor Tecnológico de Instrumentación y Componentes (INYCOM)

18:00-18:15 Coffe Break

Walka

18:15-19:00 Plenary Session PL4

Walka

Chairman: Jesús Fraile Mora

Los avances científicos y su impacto en el desarrollo de un nuevo escenario energético

Mariano Sanz Badía. Director de Innovación en Integración de Recursos de la Fundación CIRCE

19:00 – 20:00 Trip from Walka to Paraninfo

21:00 – 24:00

CONFERENCE DINNER

Friday 3 July 2009

9:00 – 10:00 Plenary Session PL5 ROOM A “Gobierno de Aragón”

Chairman: Carlos Lemos Antunes

Efficiency in Power Transformers. Juan Bachiller. ABB

10:00 – 11:00 Poster Session C3- Coffee Break ROOM C “Inycom”

Chairmen: Joan Llaverias Sanmarti, Eduardo García Garrido, G. Babamalek Gharehpetian, Jesús Frayle Ardanuy, Cassio T.C. Andrade

Dynamic phasors modeling of the wound rotor induction generator for electromagnetic and electromechanical analysis

140 Alberto Coronado Mendoza¹, José Antonio Domínguez Navarro²
¹ Renewable Energy and Energetic Efficiency Program Doctorate Degree Candidate
^{1,2} Department of Electrical Engineering. CPS, Zaragoza University. Spain

Critical clearing time evaluation of power system with UPFC by energetic method

152 B. Boussahoua, M. Boudour
Faculty of Electrical Engineering, USTHB, Algiers

Red de prueba para análisis de flujo de carga, corto circuito y estabilidad

200 C. Franco Guillén, C. Goyo Barrientos
Fundación para el Desarrollo del Servicio Eléctrico (FUNDELEC) Ministerio del Poder Popular para la Energía y Petróleo. Caracas. Venezuela

Switched reluctance motor drive for 42 V electric power steering

202 P. Andrada, B. Blanqué, E. Martínez, J.I. Perat, J.A. Sánchez, M. Torrent
Grup d'Accionaments Elèctrics amb Commutació Electrònica (GAECE). EPS d'Enginyeria de Vilanova i la Geltrú. Departament d'Enginyeria Elèctrica. Universitat Politècnica de Catalunya. Spain

Modelos de equilibrio estocásticos para mercados de energía eléctrica oligopolistas en el corto plazo

205 S. Martín, J.A. Aguado, F.I. Martín, J. Pérez, S. de la Torre
Departamento de Ingeniería Eléctrica. E.T.S.I.I. Universidad de Málaga.

- A low-cost dual programmable power source based on a three-leg inverter***
207 D. Foito¹, M. Guerreiro¹, A. Cordeiro²
¹ Escola Superior Tecnologia de Setúbal. Instituto Politécnico de Setúbal.
² Instituto Superior de Engenharia de Lisboa. Instituto Politécnico de Lisboa.
- An ANN system to on-line detection of sag, swell and transient voltages***
210 F.J. Alcántara, J.R. Vázquez, P. Salmerón, A. Pérez
Departamento de Ingeniería Eléctrica y Térmica. Escuela Politécnica Superior. Universidad de Huelva. España
- Distortion sources identification in electric power systems***
211 R.S. Herrera, A. Pérez, P. Salmerón, J.R. Vázquez, S. P. Litrán
Department of Electrical Engineering. E.P.S. University of Huelva. Spain
- A sliding maximum power point tracker for a photovoltaic system***
212 M.I. Arteaga Orozco, J.R. Vázquez, P. Salmerón, A. Pérez
Department of Electrical Engineering. E.P.S. University of Huelva. España
- Brushless DC motor control using PLC***
214 M. Tawadros, J. Rizk, M. Nagrial
School of Engineering. University of Western Sydney. Australia
- Analysis and performance of a switched reluctance generator for wind energy conversion***
215 M. Nassereddine, J. Rizk, M. Nagrial
School of Engineering. University of Western Sydney. Australia
- New protection scheme based on IEC61850***
220 Samuel Borroy Vicente, Laura Jiménez de Urtasun, Mayte Villén
Martínez, Diego López Andía, Miguel García Gracia
CIRCE. C.P.S. University of Zaragoza. Spain
- 3D Hyper-redundant robot***
225 Luís Marques¹, João Dinis¹, A.Paulo Coimbra¹, Manuel M.
Crisóstomo¹, João P. Ferreira^{1,2}
¹ Institute of Systems and Robotic, Electrical and Computer
Engineering Department of University of Coimbra. Portugal
² Institute Superior of Engineering of Coimbra. Portugal

Power quality problems in the mould industryL. Moreira^{1,2}, S. Leitão², Z. Vale³

- 228 ¹ Instituto Politécnico de Leiria. Escola Superior de Tecnologia e Gestão. Portugal
² Universidade de Trás-os-Montes e Alto Douro. Department de Engenharias. Vila Real. Portugal
³ Instituto Superior de Engenharia do Porto. Instituto Politécnico do Porto. Portugal

Protección contra faltas de c.c. en sistemas VSC229 D. M. Larruskain¹, I. Zamora¹, J.J. Zamora², O. Abarategui¹

- ¹ Departamento de Ingeniería Eléctrica. Universidad del País Vasco. Bilbao.
² Departamento de Electrónica y Telecomunicaciones. U. País Vasco. Spain

The costs and benefits of replacing older household's appliancesP. Correia¹, A. Gomes²

- 231 ¹ Department of Electrical Engineering. School of Technology. Polytechnic Institute of Viseu. Portugal
² Department of Electrical Engineering and Computers. F.C.T. University of Coimbra. Portugal

Improvement of resistive reach of distance protection through a power flow-based adaptive parameterization

- 233 N.El Halabi, S. Martín, S. Borroy, D. López, M. García Gracia
Centre of Research of Energy Resources and Consumption, CIRCE. Zaragoza. Spain

Design and control of the brushless doubly fed twin induction generator (BDFTIG)

- 235 A. Bensadeq, P.W. Lefley
Department of Electrical Engineering
Leicester University, University Road. United Kingdom

Development of a single phase PM BLDC motor from a novel generic model

- 236 S. Ahmed, P. Lefley
Department of Electrical Engineering. University of Leicester. U.K.

Power maximization of a PV-wind HRES by DC-link voltage boosting

- 240 Marco Beccali¹, Massimiliano Luna¹, Marcello Pucci², Gianpaolo Vitale²
¹ D.R.E.AM. Dipartimento di Ricerche Energetiche e Ambientali Università degli Studi di Palermo. Italy
² I.S.S.I.A-C.N.R. Section of Palermo (Institute on Intelligent Systems for the Automation). Italy

Estimation of the zero-sequence impedance of undergrounds cables for single-phase fault location in distribution systems

242 S. Herraiz¹, J. Meléndez², V.A. Barrera¹, J. Sánchez², M. Castro²

¹ Institute of Informatics and Applications. University of Girona. Spain

² ENDESA Distribución S.L. Spain

Custom power equipment to facilitate the penetration of embedded generation in distribution networks

243 Melchor Gómez¹, Miguel Ángel Cámara¹, Emilio Jiménez², Eduardo Martínez Cámara³

¹ Electrical Engineering Department. E.U. de Ingenieros de Vitoria. University of the Basque Country. Victoria-Gazteiz. Spain

² Electrical Engineering Department. ETSII. University of La Rioja. Logroño.

³ Mechanical Engineering Department.ETSII. University of La Rioja. España.

Sliding mode controller for self-excited induction generator

256 L. Louze, A. L. Nemmour, A. Khezzar, M. Boucherma
Laboratoire d' Electrotechnique (LEC). Université Mentouri, Constantine.
Algérie

Control of hybrid active filter without phase locked loop in the feedback and feedforward loops

266 Mohamed Abdusalam¹, Philippe Poure², Shahrokh Saadate¹

¹ Groupe de Recherche en Electrotechnique et Electronique de Nancy (GREEN). France

² Laboratoire d'Instrumentation Electronique de Nancy (LIEN). Université Henri Poincaré. Vandoeuvre lès Nancy. France.

Chairman: Giampaolo Vitale

Water level control system for a low-head run-of-river variable speed small hydropower plant

- 150 J.I. Pérez Díaz, J.R. Wilhelmi, P. García Gutiérrez, J. Fraile Ardanuy, J. Fraile Mora, J.A. Sánchez Fernández, J.I. Sarasúa
Department of Hydraulic and Energy Engineering. Technical University of Madrid (UPM). Spain

Optimización en el corto plazo de un sistema hidroeléctrico con bombeo

- 160 Alejandro Perea¹, José R. Wilhelmi²
¹ Iberdrola Generación. Madrid. Spain
² Departamento de Ingeniería Civil, Hidráulica y Energética. Universidad Politécnica de Madrid (UPM). España

Technique of dry washing of the insulators of the electrical nets of distribution

- 163 Rafael Oliveira de Sousa¹, R.S.T. Pontes¹, V.P.B. Aguiar², Anadite Maria de Luna³, Cássio Tersandro de Castro¹
¹ Departamento de Engenharia Elétrica. Centro de Tecnologia. Universidade Federal do Ceará. Brasil
² Departamento de Engenharia e Física. Núcleo de Ciência e Tecnologia, Fundação Universidade Federal de Rondônia (UNIR). Brasil
³ Consultoria em Ciências e Engenharia dos Materiais Ltda. Brasil

Autonomous tele-information network for power systems switchgear equipment e-diagnostics

- 191 A. Lisowiec¹, A. Nowakowski¹, Z. Kolodziejczyk¹, B. Miedzinski²
¹ Centre for Tele-Information systems and Hardware Applications. Tele and Radio Research Institute. Poland
² Institute of Electrical Power Engineering. Wrocław University of Technology. Poland

Control of a grid-connected synchronous generator WECS and Harmonic Current Filtering

- 251 M. Hacil, A. Khezzar, A.L. Nemmour, DJ. Kerdoune
Laboratoire d'Electrotechnique. Université Mentouri, Constantine. Algérie

Friday 3 July 2009

11:00 – 12:30 Oral Session B3

ROOM B “Endesa”

Chairman: Pere Andrada Gascón

Flow of molten metal in a pipe driven by electromagnetic field

J. Cerveny¹, L. Dubcova¹, I. Dolezel¹, P. Karban², J. Barglik³

193 ¹ Institute of Thermomechanics, Academy of Sciences of the Czech Republic.

² Department of Theory of Electrical Engineering, Faculty of Electrical Engineering, University of West Bohemia, Plzen, Czech Republic

³ Department of Electrotechnology, Silesian University of Technology, Poland

Increase in equipments efficiency performance - The Brazilian mandatory standards experience-

Cássio T.C. Andrade¹, Ricardo S.T. Pontes²

195 ¹ Regulatory Agency of the Delegated Public Services of Ceará (ARCE). Fortaleza. Brasil

² Department of Electrical Engineering. Federal University of Ceará. Fortaleza. Brasil

El vehículo eléctrico y la eficiencia energética global

Ramón Bargalló, Joan Llaverías, Helena Martín

199 Departamento de Ingeniería Eléctrica. Universidad Politécnica de Catalunya. EUETIB. Barcelona. España

ELF Magnetic field security zones around high voltage power lines

Carlos Lemos Antunes

203 Lab. CAD/CAE, Electrical Engineering Department. University of Coimbra. Portugal

APDEE- Assoc. Port. Prom. Desenv. Eng. Electrotécnica. Portugal

RIANDA Research – Centro Invest. Energia, Saúde e Ambiente. Coimbra. Portugal

Soft magnetic compositive core- A new perspective for small AC Motors design

206 L. Petkosvska, G. Cvetkovski

Ss. Cyril and Methodius University. Faculty of Electrical Engineering and Information Technologies. Macedonia

Friday 3 July 2009

**12:30 – 13:00 CLOSING CEREMONY ROOM A “Gobierno de Aragón”
Conclusions and time for the 12CHLIE**

- Carlos Javier Navarro Espada. Director General de Industria y de Pequeña y Mediana Empresa
- Pilar Molinero García. Directora General de Energía y Minas
- Manuel J. López Pérez. Rector Magnífico de la Universidad de Zaragoza
- Mariano Sanz Badía. Fundación CIRCE
- Manuel Pérez Donsión. Chairman of the 11CHLIE Organization Committee. Presidente de AEDIE
- Carlos Lemos Antunes. Chairman of the 11CHLIE Organization. Presidente da APDEE

13:00 – 15:00 Luch

ROOM C “Inycom”

THIS EXCURSION IS FOR ALL THE 11CHLIE PARTICIPANTS

Saturday 4 July 2005	
9:30 – 13:30	Excursion: “The Goya Route” (*)
13:30 – 15:30	Farewell Lunch in a Cariñena winery

(*) It is very important for the organization that all the interested people inform previously at the 11CHLIE Secretariat about their availability to participate in the excursion: “The Goya Route” and Cariñena winery.



COMPANIONS PROGRAMME

Wednesday 1 July 2009	
10:00 – 20:00	Registration
20:15 - 22:00	Welcome Reception: in the Room C “Inycom” “Sala Josefa Amar y Borbón” of the Paraninfo building where we'll offer you an aperitif with a Spanish Wine and with Regional Typical Dances

Thursday 2 July 2009	
9:30	Departure from Paraninfo Building
8:30 – 13:30	Visit to Zaragoza
13:00	Arrival at Paraninfo Building
13:00 – 15:00	LUNCH: IN ROOM C “Inycom” of Paranifo (Sala Josefa Amar y Borbón)
15:00 – 21:00	FREE TIME
21:00 – 24:00	Conference Dinner In Gran Hotel placed in the centre of the town with music for to dance

Friday 3 July 2009	
8:30	Departure of the bus from the "Paraninfo Building"
8:30 – 13:30	Trip and visit to Monasterio de Piedra
13:30 – 15:30	LUNCH AT THE MONASTERIO DE PIEDRA
15:30 – 16:45	Trip from Monasterio de Piedra to Paraninfo or to the Hotels

THIS EXCURSION IS FOR ALL THE 11CHLIE PARTICIPANTS (*)

Saturday 4 July 2009	
9:30	Departure of the bus from the "Paraninfo Building"
9:30 – 13:30	Trip and visit to the Goya House
13:30 – 15:30	FAREWELL LUNCH IN A CARIÑENA WINERY
15:30 – 16:00	Trip from Cariñena Winery to Paraninfo or to the Hotels

(*) It is very important for the Organization that all the interested people inform previously at the 11CHLIE Secretariat about their availability to participate in the excursion: "The Goya Route" and Cariñena winery.



Zaragoza (Español)

Esta gran ciudad Aragonesa fue denominada después del emperador romano Cesar Augusto, y es a veces anglicanizada como Saragossa. Situada sobre el fértil Valle del Ebro, Zaragoza es uno de los lugares españoles donde más se reverencia el culto Mariano en la grandiosamente abovedada Basilica de Nuestra Señora del Pilar, situada en una inmensa plaza cerca del río. Una ennegrecida estatua Gótica de la Virgen patrona se enorgullece de estar en la Capilla de la Señora Ventura Rodríguez entre llameantes velas y bronceada plata. Frescos de Goya decoran la catedral. Otra gran iglesia de Zaragoza, la Catedral de La Seo, también se encuentra en una plaza e incorpora muchos estilos, incluyendo alguna sorprendente decoración Mudéjar. Restos de Murallas Romanas y un forum se puede ver en las proximidades. Los bares y cafés del colorista y viejo barrio conocido como El Tubo se encuentra próximo a la Plaza del Pilar. Un restaurado palacio Morisco, el Palacio de la Alfajería, sede del parlamento Aragonés, se encuentra sobre la parte Oeste de la ciudad. La Zaragoza actual tiene una completa red de instalaciones culturales que cubren las área de educación (Escuelas Municipales de música, teatro y folklore), producción (el Ballet de Zaragoza) y exposición; con la rehabilitación del Teatro Principal, la reapertura del Teatro del Mercado y la construcción del anfiteatro Rincón de Goya. Zaragoza tiene también un gran número de museos.

Zaragoza tiene un alto nivel de demanda de actividades culturales las cuales, conjuntamente con el gran número de ferias, congresos y otros eventos de similares características que se celebran aquí, teniendo la ventaja de las excelentes comunicaciones, las notables atracciones y la calidad de sus hoteles, subrayando la necesidad de instalaciones para llenar un vacío en aquellas infraestructuras que son esenciales para lograr proporcionar una verdadera calidad.

De acuerdo con la Venerable y Vieja Tradición, la Virgen María, aguardando en Jerusalén justo después de su Gloriosa Ascensión al Paraíso, vino a Zaragoza

a consolar y animar al Apóstol Santiago, el Primer Siervo de Confianza, que estaba predicando en las orillas del Ebro. Era la noche del 2 de enero del Año 40 de la Era Cristiana. Esta excursión es esencial para conocer Zaragoza y sus monumentos.

Zaragoza (Portugués)

Esta grande cidade aragonesa deve o seu nome ao imperador romano César Augusto, sendo este por vezes anglicizado como Saragossa. Situada no fértil vale do rio Ebro, Saragoça é um dos lugares em Espanha onde mais se evidencia o culto Mariano, na grandiosamente abobadada Basílica de Nuestra Señora del Pilar, situada numa imensa praça perto do rio. Uma enegrecida estatua Gótica da Virgem padroeira orgulha a Capela de la Señora Ventura Rodríguez entre flamejantes velas y prata bronzeada. Frescos de Goya decoram a catedral. Outra grandiosa igreja de Zaragoza, a Catedral de La Seo, também se encontra numa praça e incorpora numerosos estilos, incluindo surpreendentemente alguma decoração Mudéjar. Restos de Muralhas Romanas e um Fórum podem ser visitados nas proximidades. Os bares e cafés da colorida parte antiga da cidade, conhecida como El Tubo, situam-se perto da Plaza del Pilar. Um restaurado palácio Mourisco, o Palacio de la Alfajería, sede do parlamento regional de Aragão, encontra-se na parte oeste da cidade. A cidade de Saragoça actual dispõe de uma completa rede de infra-estruturas culturais que cobrem as áreas da educação (escolas municipais de música, teatro e folclore), e produção de espectáculos (o Ballet de Zaragoza) com a reabilitação do Teatro Principal, a reabertura do Teatro del Mercado e a construção do anfiteatro Rincón de Goya. Saragoça dispõe também de um grande número de museus.

Saragoça tem numerosas solicitações de actividades culturais, conjuntamente com o grande número de feiras, congressos e outros eventos similares que aí se celebram. A vantagem das excelentes vias de comunicação, as notáveis atracções turísticas e a qualidade dos seus hotéis, sublinham a necessidade de instalações que venham suprir a necessidade de infra-estruturas essenciais para poder proporcionar uma verdadeira qualidade de vida. Esta excursão é essencial para conhecer Saragoça e os seus monumentos.

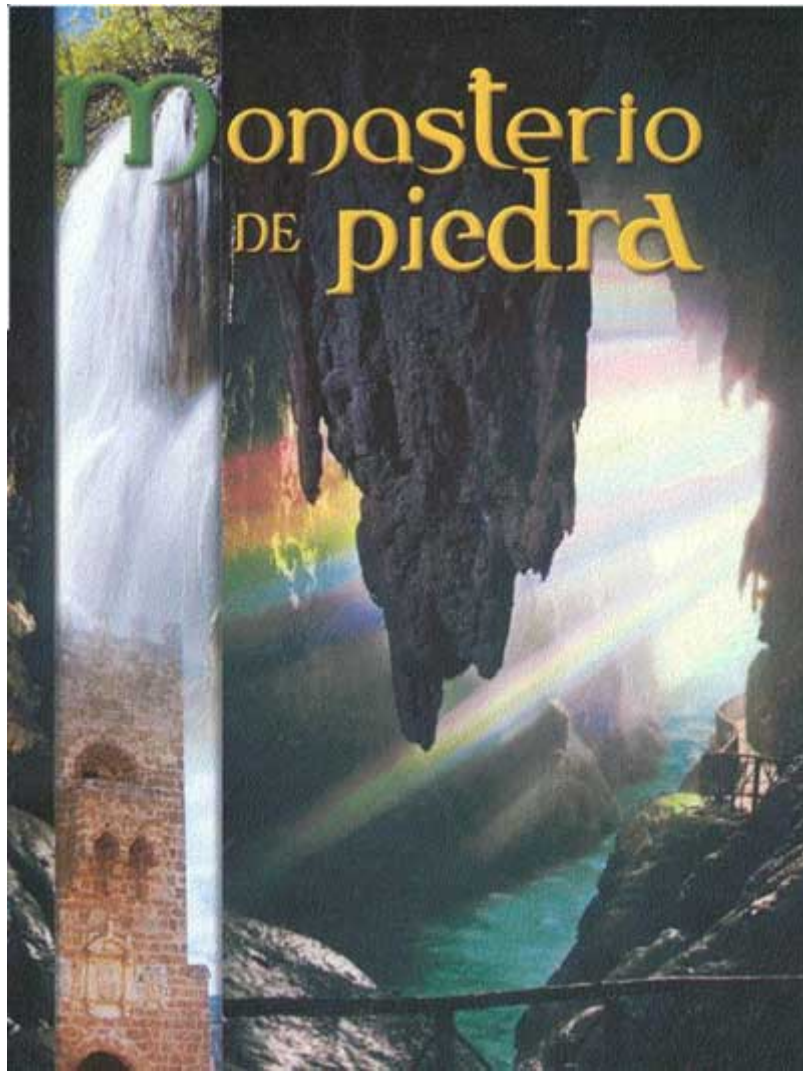
De acordo com a Venerável e Velha Tradição, a Virgem Maria, enquanto aguardava em Jerusalém logo após a sua Gloriosa Ascensão ao Paraíso, veio a Saragoça consolar e incentivar o Apóstolo Santiago, o Primeiro Servo de Confianza, que pregava nas margens do rio Ebro. Era a noite do dia 2 de Janeiro do Ano 40 da Era Cristã.

Zaragoza (English)

This large Aragonese city was named after the Roman emperor Caesar Augustus, and is sometimes anglicised as Saragossa. Set on the fertile Ebro Valley, Zaragoza is one of the Spain's most revered Marian shrines, the grandiose domed Basilica de Nuestra Señora del Pilar, stand on a huge square near the river. A blackened Gothic statue of the patron Virgen takes pride of place in Ventura Rodriguez's Lady Chapel amid a blaze of candles and sunburst silver. Goya frescoes decorate the cathedral. Another huge church, Zaragoza Cathedral of La Seo, also stands on the square, incorporating many styles, including some striking Mudéjar decoration. Roman Walls and a forum can be seen nearby. The bars and cafés of the colourful old quarter known as El Tubo lie close to the Plaza del Pilar. A restored Moorish palace, the Palacio de la Alfajería, houses the Aragonese parliament building on the west side of the town. Zaragoza now has a comprehensive network of cultural installations which covers the areas of education (Municipal Schools of music, theatre and folklore), production (the Ballet of Zaragoza) and exhibitions; with the rehabilitation of the Principal Theatre, the reopening of the Market Theatre and the building of the Rincon de Goya amphitheatre. Zaragoza has also a great number of museums.

Zaragoza has a high level of demand for cultural activities which, together with the large number of fairs, congresses and other events of similar characteristics which are held here, taking advantage of the cities excellent communications, its notable attractions and the quality of its hotels, underlined the need for facilities to bridge the gap in those infrastructure which are essential to be able to provide true quality.

According to the Venerable and Age Old Tradition, The Virgen Mary, awaiting in Jerusalem just before her Glorious Ascension to The Heavens, came to Zaragoza to console and cheer up The Apostle Santiago, with The First Converter Faithful, was preaching on the banks of the Ebro. This was the night of the 2 of January of the 40th Year of the Christian Era. This excursion is essential for to know Zaragoza and its monuments.



Monasterio de Piedra (Español)

Hasta el siglo XII el Monasterio de Piedra, situado en Nuevalos a unos 100 km de Zaragoza, fue un castillo morisco. Entonces Alfonso II, Rey de Aragón, lo conquistó y cedió a los monjes Cistercienses, pensando que este podría ser un camino para extender el catolicismo a toda esta región.

Los monjes vinieron aquí desde Poblet y construyeron el monasterio en veinte y tres años, usando las viejas piedras del castillo Morisco. En 1935 la ley obligó al cierre de todos los monasterios y cinco años más tarde (1840) se vendió el monasterio. La familia que lo compró lo ha conservado hasta ahora, por lo tanto es propiedad privada.

El parque natural del Monasterio de Piedra nos ofrece una de las experiencias más gratificantes que se pueden encontrar en el mundo, un jardín fuera de lo corriente rodeado de agua en movimiento en cascadas y cavernas.

Esta es una excursión a una de las más extraordinarias curiosidades naturales de Europa.

Al Norte se encuentra la iglesia, la cocina y el comedor están orientados al Sur, el almacén de comida y vino al Oeste y al Este está la sala capitular donde los monjes trataban importantes asuntos como la elección del nuevo abad, la administración y confesiones públicas. Esta distribución fue realizada para aprovechar la luz solar.

Monasterio de Piedra (English)

Until the twelfth century the Monasterio de Piedra, placed at Nuevalos at about 100 km from Zaragoza, was a Moorish castle. Then, Alfonso the Second, King of Aragon, conquered it and gave it to the Cistercian monks. He thought this would be a way to extend to all this region the influence of Catholicism.

The monks came here from Poblet and built the monastery in twenty-tree years, using the old stones from the Moorish castle. The monks lived here for seven hundred years, surviving several wars. In 1935 the law closed all the monasteries and five years later (1840) the monastery was sold. The family who bought it has conserved it until now, so that this is a private property.

The natural park of the Monasterio de Piedra offers us one of the most gratifying experiences that one can find over the world, an unusual garden round the water and its movement on waterfalls and caverns.

This one is an excursion at one of the most extraordinary natural curiosities of Europe.

To the North is the church, the kitchen and the dining room are in the South, the storage for food and wine in the West and in the East is the chapter house where the monks talked about important things like choosing a new abbot, administration and public confessions. This distribution was designed in order to make the use of day light.



La Ruta de Goya (Español)

Salida de Zaragoza a las 09:30 con destino a la localidad de Fuendetodos, lugar de nacimiento del pintor Francisco de Goya, donde se realizará una visita que comprende tres espacios:

Casa natal de Francisco de Goya
Museo de los grabados
Sala de exposiciones Ignacio Zuloaga

A continuación, alrededor de las 12:00h se continúa el viaje hacia Cariñena, donde se visitará una bodega de la tierra con D.O. de los vinos de la comarca. En esta visita, se explicará todo el proceso de la elaboración del vino para finalizar con un almuerzo ofrecido en el mismo recinto. Después del almuerzo, regreso a Zaragoza.

El visitante podrá organizar un circuito descubriendo la magia de las nuevas instalaciones de Grandes Vinos y Viñedos, así como la Escuela Cerámica taller de Muel o la población que vio nacer al pintor aragonés más internacional: Francisco de Goya, con su casa natal, el Museo del Grabado o las antiguas escuelas, convertidas en centro de exposiciones temporales "Ignacio Zuloaga".

Toda la tradición histórica de los buenos vinos, unida al empuje decidido, la genialidad y el buen hacer de nuestras gentes, han determinado la existencia de la mayor BODEGA de la D.O. Cariñena y de toda la comunidad autónoma aragonesa. Grandes Vinos y Viñedos nace como empresa el 1 de Septiembre de 1.997, para canalizar la ventas de 5 cooperativas de la Denominación de Origen Cariñena.

Grandes Vinos y Viñedos es una feliz realidad que, a través de una potente y decidida apuesta por la calidad, pretende aunar la tradición de la elaboración de vinos junto a la modernidad del desarrollo de investigaciones, nuevos sistemas de trabajo, mejor control de todos los procesos desde la cepa.

Colores y formas actuales envuelven a ese mágico contenido que es el vino porque es Otra Clase de arte. Un arte que se hace cercano, voluptuoso, sensual como el vino que nos acerca a nuestra tierra. Luces y sombras de un arte que necesita del hombre y sus manos para cobrar vida. Tierra roja de pasión y de sol que da vida Tierra de Artistas y Nuestros vinos nacen en ella.

The Goya Route (English)

Departure from Zaragoza at about 09:30 H with destination to the village of Fuendetodos, place where was born the famous Spanish painter Francisco de Goya, where we'll visit following three places:

House where was born Francisco de Goya
Paintworks Museum
Exhibition Room Ignacio Zuloaga

After, at about 12:00h we'll continue our trip to Cariñena, where we'll pay a visit to a Cariñena D.O winery. During this visit a wine-grower will explain us all the wine preparation process and we finished with a lunch in the same winery. After lunch we'll come back to Zaragoza.

Visitors can organise a route, discovering the magic of the new facilities of Grandes Vinos y Viñedos, as well as the Muel Ceramics School-Workshop or the village in which Aragón's most international artist, Francisco de Goya, was born and in which his home, the Etching Museum or old schools, converted into the "Ignacio Zuloaga" temporary exhibition centre can be visited.

A long-standing tradition of good wine, together with the concerted effort, geniality and savoir-faire of our people resulted in the creation of the largest Cariñena D.O winery, and indeed, the largest winery in the Autonomous Community of Aragón. Grandes Vinos y Viñedos was founded as a company on 1st September 1997 to channel the sales of five Cariñena D.O. co-operatives.

Grandes Vinos y Viñedos is a happy reality. The overriding importance it places on quality focuses on combining traditional winemaking with modern methods of research, new work systems and a better control of all of the processes, starting from the vine.

This is an art, which is familiar, voluptuous and sensual, just like the wine, which brings us into intimate contact with our land. The light and shade of an art, which requires man's hand to bring it to life. Our land, which is red, the colour of passion, red as the sun, which breathes life into it; a land of artists in which our wines are born.

GENERAL SECRETARIAT



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