



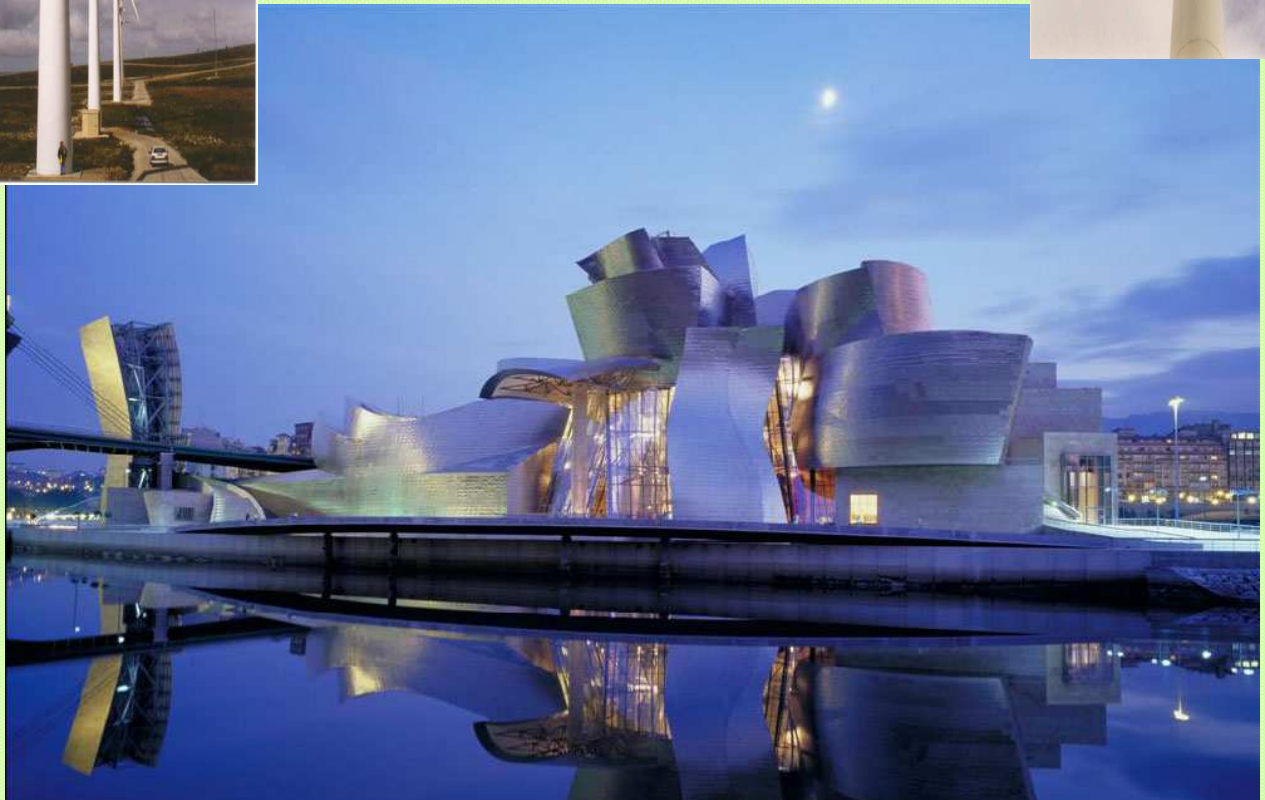
European Association
for the Development of
Renewable Energy,
Environment and
Power Quality

REE&PQJ-2

RENEWABLE ENERGIES, ENVIRONMENT AND POWER QUALITY JOURNAL

Volume No. 2, July 2024

INDEX



REE&PQJ-2 EDITORIAL BOARD

Editor-in-Chief: Pérez Donsión, Manuel. University of Vigo

Aguado, José Antonio. University of Málaga
Alvárez López, Ana. University of La Coruña
Aznar Dols, Fernando. University of Granada
Bargalló Perpiña, Ramón. Politechnical U. of Catalonia (UPC)
Burgos Payan, Manuel. University of Seville
Cavallé Sesé, Francisco. Politechnical U. of Valencia (UPV)
Coll Mayor, Debora. SMA Solar Technology AG (Germany)
Espín Estrella, Antonio. University of Granada
González Díaz, Benjamín J. University of La Laguna
López Agüera, Ángeles. U. of Santiago de Compostela
Mañana Canteli, Mario. University of Cantabria
Martínez Melgarejo, Miguel. U. of Las Palmas de Gran Canaria
Mazón Sain-Maza, Javier. U. of the Vasque Country
Rouco Rodríguez, Luis. Universidad Pontificia de Comillas
Santos Sánchez, María Jesús. University of Salamanca
Sanz Badía, Mariano. University of Zaragoza
Zamora Belver, Inmaculada. U. of the Vasque Country

REE&PQJ-2 SCIENTIFIC COMMITTEE

Abdelkader, Sobhy (UK)	Ionnides, Maria G. (Greece)
Ahmed, Noor E. A. (Australia)	Iwaszkiewicz, J. (Poland)
Alameda-Hernandez, E. (Spain)	Janik, Przemyslaw (Poland)
Albadi, Mohammed (Oman)	Kádár Péter (Hungary)
Alcayde García, A. (Spain)	Kiss, Péter (Hungary)
Alexandru, Catalin (Romania)	Lakhoua, M. N. (Tunisia)
Amara, Yacine (France)	Machado e Moura, A. (Portugal)
Andrada Gascón, P. (Spain)	Mahdi, Ali Jafer (Iraq)
Andras, Dan (Hungary)	Malfatti, Célia (Brazil)
Andreescu, G. D. (Romania)	Mañana Canteli, M. (Spain)
Arcega Solsona, F. (Spain)	Martinez, André (France)
Arnaltes Gómez, S. (Spain)	Meyer, Jan (Germany)
Bayod Rujula, A.A. (Spain)	Muc, Adam (Poland)
Baptista, José (Portugal)	Narsimhulu, Sanke (India)
Bargalló Perpiña, R. (Spain)	Nichita, Cristian (France)
Belik, Milan (Czech Republic)	Nocera, Francesco (Italy)
Betini, Roberto Cesar (Brazil)	Oraee, Hashem (Iran)
Boudghene S., A. (Argeria)	Ozdemir, Engin (Turkey)
Bracale, Antonio (Italy)	Petkovska, L. (Noth Macedonian Republic)
Buja, Giusseppe (Italy)	Predescu, Mihai (Romania)
Burgos Payan, Manuel (Spain)	Quinto Diez, Pedro (Mexico)
Buzdugan, Mircea (Romania)	Rizk, Jamal (Australia)
Camacho, José R. (Brazil)	Russo, Angela (Italy)
Cano, José M. (Spain)	Salaoro, Iulia (UK)
Carvalho, Paulo (Brazil)	San Martín, José I. (Spain)
Chica Arrieta, L.E. (Colombia)	Shashi Paul (UK)
Déniz Quintana, F.A. (Spain)	Schlemmer, Erwin (Austria)
Donsión, M.P. (Spain)	Stumberger, Gorazd (Slovenia)
El-Sayed, Mohamed (Egypt)	Taghavi, Masoud (South Korea)
Errami, Youssef (Morocco)	Tahir Çetin Akinci (Turkey)
Fraille Mora, Jesús (Spain)	Tudorache, Tiberiu (Romania)
Friman, Hen (Israel)	Turschner, Dirk (Germany)
Früh, Wolf-Gerrit (UK)	Ubong, Etim (USA)
Gagliano, Antonio (Italy)	Valouch, V. (Czech Republic)
Gharehpetian, G.B. (Iran)	Vergura, Silvano (Italy)
Ghita, Constantin (Romania)	Versaci, Mario (Italy)
Giurca, Ioan (Romania)	Vitale, Gianpaolo (Italy)
Güemes Alonso, J.A. (Spain)	Vokony, István (Hungary)
Hartmann, Bálint (Hungary)	Zobaa Ahmed (UK)

The following articles have been included in the

Renewable Energy, Environment and Power Quality Journal (REE&PQJ-2)

- | Nº | <i>Titles/Authors/Institution/Country</i> |
|------------|---|
| 1-8 | |
| 200 | Currents' Physical Components (CPC): a new framework for studies on Power Quality and its improvement and some observations
Leszek S. Czarnecki
Department of Electrical Engineering and Computer Science. Louisiana State University. Baton Rouge, USA. |
| 9-16 | |
| 208 | Modified Two Switch Flyback topology with an Active Clamp Converter for solar PV micro-inverter application
Rico-Secades, Manuel; Quintana-Barcia, Pablo; Ribas, Javier; Calleja, Antonio-Javier; Lopez-Corominas, Emilio, Chinchero, Hector
Department of Electrical, Electronics, Communications and Systems (DIEECS) Polytechnics Engineering School of Gijon (EPI-GIJON), Oviedo University. Spain |
| 17-26 | |
| 221 | Design and Analysis of Switch Mode Power Supply Adapters
Akram A. Abu-aisheh
Department of Electrical and Computer Engineering. University of Hartford. USA |
| 27-34 | |
| 226 | Efficient Resource Allocation in Virtual Power Plant for Real-Time Energy Market Framework
Jeremiah Amisah(1), Omar Abdel-Rahim(1,2), Diao-Eldin A. Mansour(1,3), Tanemasa Asano(4), Sobhy Abdelkader(1,5)
1. Department of Electrical Power Engineering Egypt-Japan University of Science and Technology, New Borg, El-Arab City. Egypt
2. Electrical Engineering Department, Aswan University, Aswan. Egypt
3. Electrical Power and Machines Engineering Department, Tanta University. Egypt
4. Department of Information Electronics, Kyushu University, Fukuoka, Japan
5. Electrical Engineering Department, Mansoura University. Egypt |
| 35-42 | |
| 229 | Agrovoltaic systems for crop improvement in Equatorial Andean Regions
X. Serrano-Guerrero(1), J. Peralta-Álvarez(1), M. Quito-Zhinin(1), E. Barragán-Escandón(1), E. Zalamea-León(2)
1. Energy Transition Research Group, Universidad Politécnica Salesiana. Ecuador
2. Facultad de Arquitectura y Urbanismo, Universidad de Cuenca. Ecuador |

-
- 43-50
230 Assessment of different HVAC configurations in a Conference Room with thermal stratification for improved microclimate conditions
A. Longhitano, V. Costanzo, F. Nocera
Department of Civil Engineering and Architecture (DICAr) University of Catania. Italy
-
- 51-59
232 Studying the Shading Effect of PV System on Energy Performances in Restricted Spaces
Sameer H. Khader(1), Abdel-Karim K. Daud(1), Akram A. Abu-aisheh(2)
1. Department of Electrical Engineering. Palestine Polytechnic University, Hebron. Palestine
2. Department of Electrical and Computer Engineering. University of Hartford. USA
-
- 60-67
245 Analysis of the impact of Fast Electric Vehicle Charging Stations on Power Quality in Distribution Networks
João Pinto(1), José Baptista(1,2)
1. Department of Engineering
2. INESC TEC UTAD Pole
University of Trás-os-Montes and Alto Douro. Vila Real. Portugal
-
- 68-73
260 On the feasibility on RM-A method for extended RMS measurements in the 9-500 kHz range
A. Gallarreta, J. González-Ramos, J. Vildósola, I. Fernandez, I. Angulo, D. de la Vega, A. Arrinda
University of the Basque Country (UPV/EHU) Bilbao. Spain
-
- 74-81
262 Optimal Lithium-Ion Ageing Mechanisms Configuration for Physics- Based Modelling Software
S. Obrador(1,2), L. Canals(2), L. Trilla(1)
1. Power Systems, Catalonia Institute for Energy Research (IREC) Sant Adrià del Besòs, Barcelona. Spain
2. Project and Construction Engineering Department, Universitat Politècnica de Catalunya (UPC) Barcelona. Spain
-

- 82-88
- 267 Neural Network Based Configuring of Linear Delta Robots with Reduced Energy Consumption**
V. Vodovozov(1), Z. Raud(1), E. Petlenkov(2)
1. Department of Electrical Power Engineering and Mechatronics
2. Department of Computer Systems
Tallinn University of Technology. Estonia
-
- 89-95
- 271 Sustainable Energy Transition in Jordan: Policies, Progress, and Promising Trends**
Hiba Shakhashiro, Maria Szalmane Csete
Department of Environmental Economics and Sustainability
Budapest University of Technology and Economics. Hungary
-
- 96-102
- 274 Impacts of External Factors on EUA Price Volatility in EU Emission Trading System**
Xingrong Chen, Jin Zhong
Department of Electrical and Electronic Engineering. The University of Hong Kong
China
-
- 103-110
- 285 ACO-Driven Optimization: Analysis of Constraint Implementation in the Electric Vehicle Charge Optimization Problem**
O. Abarrategi(1), G. Dobric(2), M. Zarkovic(2), A. Iturregi(1)
1. Department of Electrical Engineering. Bilbao School of Engineering, UPV/EHU
Spain
2. Department of Power Systems
University of Belgrade - School of Electrical Engineering Belgrade. Serbia
-
- 111-118
- 292 Influence of tin addition to Al-3%Mg (wt.%) alloys for hydrogen generation**
L. Giovanetti(1), A.V. Rodrigues(1,2), R. Kakitani(1), C. Silva(1), C. Brito(3), P.R. Mei(1), A. Garcia(1,4), N. Cheung(1)
1. Department of Manufacturing and Materials Engineering, University of Campinas. Brazil
2. Federal Institute of Education, Science and Technology of São Paulo, IFSP
Brazil
3. Department of Aeronautical Engineering/School of Engineering, São Paulo State University. Brazil
4. Federal Institute of Education, Science and Technology of São Paulo. Brazil
-

- 119-126
- 293 Harnessing Waste Heat from Automotive Exhaust to Generate Electricity for Improved System Efficiency**
Z. Andrews, A. Moening, T. Moszak, K. Trainor, S. K. Das
Department of Mechanical Engineering. Kettering University. USA
-
- 127-132
- 307 Study of the energy potential of surplus green hydrogen produced in a sodium chlorate manufacturing plant**
M. Gerfauo, S. F. P. Dias
Department of Mechatronics Engineering. UTEC, Technological University of Uruguay
-
- 133-140
- 316 A novel method to calculate solar energy potential based on cadastre data: A Canary Island case study**
R. Fernández-Vega(1), B. González-Díaz(1), J. M. Márquez-Martinón(2), N. Martín-Dorta(2), E. González- Díaz(2), A. Pérez-García(2), J. Jubera-Pérez(3), E. Jaizme-Vega(3), Y. Fernández-Ogando(3)
1. Departamento de Ingeniería Industrial, Escuela Superior de Ingeniería y Tecnología, Universidad de La Laguna (ULL), Tenerife. Spain
2. Departamento de Técnicas y Proyectos en Ingeniería y Arquitectura, Escuela Politécnica Superior de Ingeniería, Universidad de La Laguna (ULL), Tenerife. Spain
3. Servicio de Laboratorios y Calidad de la Construcción del Gobierno de Canarias, Canary Islands. Spain
-
- 141-147
- 318 Sustainable Mobility in Rural Environments: The Role of Hydrogen in Rural Transportation Evolution**
L. Rodríguez-Urrego(1), B. González-Díaz(1), N. Martín-Dorta(2), E. González-Díaz(2)
1. Departamento de Ingeniería Industrial, Escuela Superior de Ingeniería y Tecnología, Universidad de La Laguna (ULL), Tenerife. Spain
2. Departamento de Técnicas y Proyectos en Ingeniería y Arquitectura, Escuela Politécnica Superior de Ingeniería, Universidad de La Laguna (ULL), Tenerife Spain
-
- 148-154
- 325 Algorithm for managing the consumption curve of a consumer with self-consumption photovoltaic generation**
J. Gomez-Cornejo, I. Lopez, I. Aranzabal, R. Alberdi, E. Erezuma
Department of Electrical Engineering. E.I.B., University of the Basque country UPV/EHU. Bilbao. Spain
-

- 155-164
- 370 Improving the Voltage Stability of Distribution Network Using Capacitor Banks and PV Arrays Based on OpenDSS**
Mohammed Qasim Majeed(1), Ali Jafer Mahdi(2), Manal Hussein Nawir(1)
1. Department of Electrical and Electronics Engineering, University of Karbala. Iraq
2. College of Information Technology Engineering, Al-Zahraa University for Women, Karbala. Iraq
-
- 165-172
- 372 Measurement methods to assess conducted emissions in the 9-150 kHz range generated by photovoltaic installations**
U. Txertudi, G. Txertudi, A. Gallarreta, M. Fernández, I. Fernández, D. de la Vega
University of the Basque Country (UPV/EHU) Bilbao. Spain
-
- 173-179
- 375 Short-term wind power forecasting with responses transformation for taking into account wind turbine operational state**
D. Snegirev, A. Pazderin, V. Samoylenko, P. Bartolomey
Department of Automated Electrical Systems, Ural Federal University, Yekaterinburg. Russia
-
- 180-186
- 376 CAPEX and OPEX of floating offshore photovoltaic farms. The case of study of the Mediterranean area of the Iberian Peninsula**
D. Cordal-Iglesias(1), D. Fernández-Mira(2), A. Filgueira-Vizos(3), T. Guillén-Díaz(4), I. Robalo-Cabrera(5), A. Alcayde(5), F.G. Montoya(5), A.I. García-Diez(6), M.A. Graña-López(7), F. Puime-Guillén(8), H. S. de Oliveira(9), L. Castro-Santos(10)
1. Universidade da Coruña, Escola Politécnica de Enxeñaría de Ferrol. Spain
2. Universidade da Coruña, Escola Universitaria de Deseño Industrial. Spain
3. Universidade da Coruña. Centro de Investigación en Tecnoloxías Navais e Industriais (CITENI), Departamento de Química, Escola Politécnica de Enxeñaría de Ferrol. Spain
4. Universidad Adolfo Ibáñez, Facultad de Ingeniería y Ciencias. Chile
5. Universidad de Almería, Escuela Superior de Ingeniería. Spain
6. Universidade da Coruña, Centro de Investigación en Tecnoloxías Navais e Industriais (CITENI), Departamento de Enxeñaría Naval e Industrial, Escola Politécnica de Enxeñaría de Ferrol. Spain
7. Universidade da Coruña, Centro de Investigación en Tecnoloxías Navais e Industriais (CITENI), Departamento de Enxeñaría Industrial, Escola Politécnica de Enxeñaría de Ferrol, Esteiro. Spain
8. Universidade da Coruña, Centro de Investigación en Tecnoloxías Navais e Industriais (CITENI), Departamento de Empresa, Facultade de Economía e

Empresa. Spain

9. Instituto Superior de Contabilidade e Administração do Porto (ISCAP), CEOS.PP, University of Porto. Portugal
 10. Universidade da Coruña, Centro de Investigación en Tecnoloxías Navais e Industriais (CITENI), Departamento de Enxeñaría Naval e Industrial, Escola Politécnica de Enxeñaría de Ferrol. Spain
-

187-192

379 Methodology for Analysing the Social Cost of Energy (SCOE) for a floating photovoltaic plant (FPV) in Spain

I. Robalo-Cabrera(1), A. Alcayde(2), A. Filgueira-Vizoso(3), T. Guillén-Díaz(4), F.G. Montoya(2), L. Castro-Santos(1)

1. Universidade da Coruña, Centro de Investigación en Tecnoloxías Navais e Industriais CITENI), Departamento de Enxeñaría Naval e Industrial, Escola Politécnica de Enxeñaría de Ferrol. Spain
 2. Universidad de Almería, Escuela Superior de Ingeniería. Spain
 3. Universidade da Coruña, Centro de Investigación en Tecnoloxías Navais e Industriais (CITENI), Departamento de Química, Escola Politécnica de Enxeñaría de Ferrol. Spain
 4. Universidad Adolfo Ibáñez, Facultad de Ingeniería y Ciencias. Chile
-

193-201

380 Five-phase Inverter Control Based on the Haar Wavelet Transform
J. Iwaszkiewicz, A. Muc

Department of Ship Automation. Gdynia Maritime University. Poland

202-209

385 Work accidents prevention by risks assessments to 400 kV Tantareni power substation from Romania

Daniel N. Fiță(1), Florin Mureșan-Grecu(2), Adrian M. Schiopu(3)

1. Strategic Studies of Energy Security Research Center, University of Petrosani. Romania
 2. Industrial Engineering Doctoral School, University of Petroșani. Romania
 3. Strategic Studies of Energy Security European Center of Petrosani. Romania
-

210-216

386 Analysis of the National Power Grid from Romania in the context of identifying vulnerabilities and ensuring energy security

Daniel N. Fiță(1), Dan C. Petrilean(2), Ioan L. Diodiu(3)

1. Strategic Studies of Energy Security Research Center, University of Petrosani. Romania
 2. Mechanical and Industrial Engineering, Transport Department, University of Petroșani. Romania
 3. Computer Science and Electrical Engineering Department, University of Sibiu. Romania
-

- 217-224
- 391 Optimizing the utilisation of different computational hardware types for real time simulation**
D. Kiss, L. Stranyóczy, I. Varjasi Dr.
Department of Automation and Applied Informatics. Budapest University of Technology and Economics. Faculty of Electrical Engineering and Informatics. Hungary
-
- 225-232
- 394 Stable hydrogen generation by wind power, grid and battery**
Rodolfo Dufo-López, Juan M. Lujano-Rojas, José L. Bernal-Agustín, Jesús S. Artal-Sevil, Ángel A. Bayod-Rújula
Department of Electrical Engineering E.I.N.A., Zaragoza University. Spain
-
- 233-239
- 395 Short term energy management in stand-alone PV-battery-diesel systems**
Rodolfo Dufo-López, Juan M. Lujano-Rojas, José L. Bernal-Agustín, Jesús S. Artal-Sevil, Ángel A. Bayod-Rújula, Juan A. Tejero-Gómez
Department of Electrical Engineering. E.I.N.A., Zaragoza University. Spain
-
- 240-250
- 404 Wave power in the Mediterranean Sea**
T. Soukissian(1), A. Lutard(2), N.E. Koutri(3)
1. Hellenic Centre of Marine Research – Institute of Oceanography Athens. Greece
2. University of Toulon. France
3. National Technical University of Athens – School of Naval Architecture and Marine Engineering. Greece
-
- 251-259
- 410 Conditions for the optimality of the criterion programming problem and determination of basic parameters of community power generation**
Milan Belik(1), Oleksandr Rubanenko(2)
1. Department of Power engineering, University of West Bohemia. Plzen. Czech Republic
2. Department of electric station and system, Vinnytsia. Ukraine
-
- 260-268
- 411 Determination of conditions for the optimal power generation PV system for energy community and citizen's energy in Ukraine by criterion programming method**
Olena Rubanenko(1,2,3)
1. Research and Innovation Centre for Electrical Engineering, University of West Bohemia, Plzen. Czech Republic

2. Department of electric station and system, Vinnytsia. Ukraine
 3. Department of Wind Energy, Institut of Renewable Energy, Kyiv, Ukraine.
-

269-275

- 419 Virtualization in substations. Technologies and applications**
E. Torres, P. Eguia, O. Abarrategi, D.M. Larruskain, V. Valverde, G. Buigues
Department of Electrical Engineering, School of Engineering of Bilbao, University of the Basque Country UPV/EHU. Spain
-

276-282

- 422 Balcony solar photovoltaic plug-and-play systems**
S. Seme(1,2), L. Strojanšek(1), E. Simonič(1), K. Sredenšek(1)
1. Faculty of Energy Technology, University of Maribor. Slovenia
2. Faculty of Electrical Engineering and Computer Science, University of Maribor. Slovenia
-

283-291

- 431 Off-grid system using a converter with multiple DC inputs and three-phase, multi-level AC output**
Adam Muc
Department of Ship Automation, Gdynia Maritime University. Poland
-

292-299

- 434 Energy storage possibility for Energy Community**
Péter Kádár, Norbert Boross
Óbuda University. KVK Dept. of Power Systems, Alternative Energy Sources Knowledge Centre. Budapest. Hungary
-

300-307

- 435 Analysis of the operation of a Fresnel solar plant through experimental tests: Energy production and efficiency**
D. Larra, M.T. Miranda, I. Montero, F.J. Sepúlveda, J.I. Arranz
Departamento de Ingeniería Mecánica, Energética y de los Materiales, Escuela de Ingenierías Industriales, Universidad de Extremadura. Badajoz. Spain
-

308-319

- 438 Efficiency Analysis of an Interleaved Converter as Power Interface between a PEM Electrolyzer and a Photovoltaic Source.**
Gianpaolo Vitale
ICAR, Institute for high performance computing and networking, National Research Council (CNR), Palermo. Italy
-

320-325

442 Impact analysis of photovoltaic systems and energy storage systems on a low-voltage distribution grid

E. Simonič(1), S. Seme(1,2), K. Zupanc(3), K. Sredenšek(1)

1. Faculty of Energy Technology, University of Maribor, Krško, Slovenia

2. Faculty of Electrical Engineering and Computer Science, University of Maribor, Maribor, Slovenia

3. Elektro Gorenjska, Slovenia