International Symposium on
Power Line Communications
and Its Applications

Università di Udine
Italy, April 3-6, 2011

IEEE ISPLC 2011

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Programme

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Contents

Message from the IEEE ISPLC 2011 General Chair

I am pleased to welcome you to the 15th IEEE International Symposium on Power Line Communications and its Applications, ISPLC 2011.

This year ISPLC is hosted by the University of Udine. Udine is the capital of the homonymous province in the beautiful region of Friuli-Venezia-Giulia located in Northeastern Italy, between the borderlines of Austria and Slovenia where you can enjoy the Alps and the Adriatic sea. The University of Udine is one of the top ranked universities in Italy, it has been founded in 1978 and it enrolls about 18.000 students.

The ISPLC has been financially and technically sponsored by the IEEE Communications Society (ComSoc) and has become the flagship conference of the IEEE ComSoc Technical Committee on Power Line Communications since 2006.

Serving as the General Chair of the 2011 IEEE ISPLC has been an exciting and challenging assignment that I took with great enthusiasm. This has been possible thanks to the support of IEEE ComSoc, and the competence and dedication of the members of the Organizing Committee: the Vice Chair Ahmed Zeddam, the TPC Co-chairs Lutz Lampe and Pierre Siohan, the Special Sessions Co-chairs Mauro Biagi and Stephan Weiss, the Publication Co-Chairs Salvatore D'Alessandro and Francesco Pecile.

The ISPLC has become an important forum where researchers and practitioners meet to exchange ideas and report progress in the stimulating field of power line communications and its broad set of applications. The response of the call for papers has been excellent and we expect that the attendance will be equally impressive. The technical programme committee has diligently worked to select 87 papers out of 136 submitted full papers to meet quality and relevance criteria. The programme offers a comprehensive view of current research on PLC. It includes fourteen technical sessions that cover channel modeling, signal processing for communications, protocols, system applications and field trials. Four special sessions have been organized on the relevant and emerging topics of In-home MIMO PLC, In-ship PLC, EMC issues for PLC, and Standardization. Additionally, two keynotes discussing smart grid challenges, and spectrum management for wire line communications, are offered to promote cross-fertilization with related hot research fields. Three other keynotes from chip makers and system integrators, and two panel sessions, will complement the technical programme and offer further stimulus to the discussion about standardization, broad/narrow band PLC, and the smart grid.

Despite this period of economy uncertainty, we have been able to enjoy the support of the corporate patrons devolo AG, Maxim, ST, DME, Meters&More, Orange, whose generous contribution allowed us to significantly reduce the registration fees. I wish to thank them all as well as I wish to thank the technical support of the Department of Electrical Engineering of the University of Udine, the Power and Energy Society, Friuli Innovazione. I also wish to express my deep gratitude to several students that volunteered for the ISPLC organization.

Andrea M. Tonello
General Chair, IEEE ISPLC 2011

IEEE ISPLC 2011 Organizing Committee

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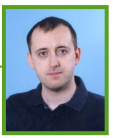

Local Arrangements

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Michael Koch, devolo AG, Germany
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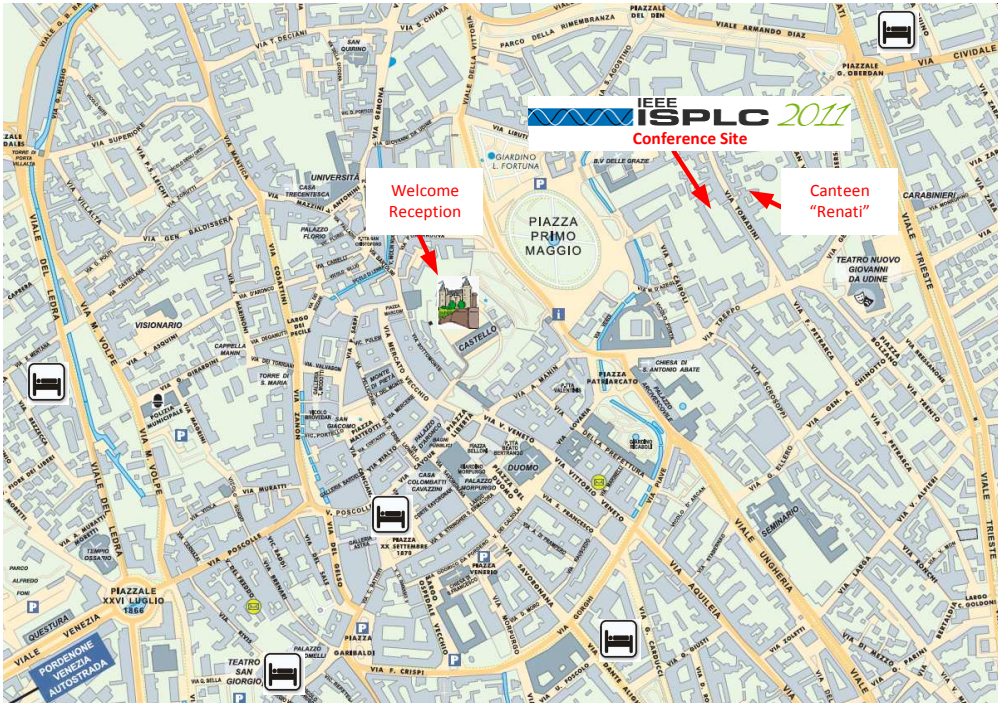
Venue Information



Conference Site

Università di Udine, Polo Economico, via Francesco Tomadini 30, Udine

Oral Sessions Rooms: Aula 1 and Aula 2
Poster Session Room: Foyer Basement
Exhibitors Room: Foyer

Welcome Reception and Sunday Registration

Restaurant "Casa della Contadinanza", Udine Castle (entrance from Piazzale del Castello)

Lunch

Canteen "Renati", via Francesco Tomadini 5, Udine

Banquet

Villa Giacomelli, via Roma 47, Pradamano. See also *http://www.villagiacomelli.it*
Bus service provided. Departure at 19.30, details provided at the conference.

How to Reach the Conference Site

By foot The conference site is at walking distance from all the hotels indicated in the conference web site.
See the ISPLC 2011 venue map at *http://www.ieee-isplc.org/venue.html*

Bus From the train station get Line 2, 8, 9 with stop in via Treppo.
For more information see *http://www.saf.ud.it/ricercaorari2.aspx?area=UD*

Taxi RADIOTAXI, phone: (+39) 0432 503400.

Internet Access

WLAN connection is available in the conference rooms. According to the Italians law, you must register and provide a copy of your ID card. Ask for support at the registration desk.

Contact

ISPLC secretariat e-mail: isplc2011@uniud.it

ISPLC 2011 Web site

http://www.ieee-isplc.org/2011

Programme Overview

Time/Day	Sunday 3	Monday 4	Tuesday 5	Wednesday 6
8:00 - 8:30		Registration	Registration	
8:30 - 8:50		Opening	Keynote Speech *Kaveh Razazian*	Registration
8:50 - 9:00				
9:00 - 9:30		Keynote Speech *Michael Koch*	Keynote Speech *Alessandro Moscatelli*	W1: MAC and Resource Allocation
9:30 - 10:30		M1: Coexistence and Interoperability M2: Novel Transmission Concepts	T1: Narrowband Standardization T2: Relay Transmission	W2: Modulation and Signal Processing
10:30 - 11:00		Coffee Break	Coffee Break	Coffee Break
11:00 - 11:20		M3: In-Home MIMO PLC: Theory, Analysis and Implementation M4: Modeling and Applications of PLC in Ships	T4: Channel Characterization and Modeling I T5: EMC Issues and Mitigation	W3: Channel Characterization and Modeling II W4: PLC for Smart Grid
11:20 - 13:00			Poster Session T3: Smart Grid, Broadband, Modulation, and Noise	
13:00 - 13:10		Lunch	Lunch	Closing
12:55 - 14:20				
14:20 - 15:05		Keynote Speech *Stephen McArthur*	Keynote Speech *Marc Moonen*	
15:05 - 16:25		M5: Noise and Interference Immunity M6: Broadband and Multimedia Applications	T6: Coupling T7: Experimental Systems and Field Trials	
16:25 - 16:50		Coffee Break	Coffee Break	
16:50 - 17:00		Panel Session: Smart Grids *G. Bumiller, B. Honary, R.Lehnert, B. Lichtensteiger, G. M. Salaris, K. Smit*	Panel Session: Standardization *J. LeClare, S. Galli, R. Liebler, A. Sanz*	
17:00 - 18:00	Registration Udine Castle - Casa della Contadinanza			
18:00 - 18:30				
18:30 - 19.30	Welcome Reception Udine Castle - Casa della Contadinanza			
19.30 - 20.00			Conference Banquet Villa Giacomelli, Pradamano buses provided	
20.00 - 22.00		TC-PLC Meeting		
22.00 - 23:00				

Keynote Speech 1

"Hybrid, IP-backbone Embedding Multi-communication Equipment for Smart Home and Smart Grid Applications"

Michael Koch (devolo AG, Germany)

Monday, April 4
09:00 – 09:30
Room: AULA 1

Abstract

The keynote will address the current state-of-the-art trends and ongoing research for products, designed for Smart Home and/or Smart Grid applications. Whereas there is a strong trend to base these products on PLC technology, some applications require an hybrid approach of PLC together with other technologies such as e.g. wireless based, DSL or coaxial. Without any doubts, these products must be integrated into existing IP-backbone infrastructures. For the sake of cost-efficiency, monitoring solutions should be designed to make use of available equipment such as e.g. TV sets or smart phones. Products should also be applicable for more than one communication purpose.

Biography

Dr. Michael Koch is working as Director Strategic Positioning for devolo AG, Aachen/Germany, since July 2008. Beside his company responsibilities, he is holding a lot of management positions in standardisation and industry organisations. He received his degree in electrical engineering (Dipl.-Ing.) from the Technical University in Darmstadt/Germany in 1991, his PhD in electrical engineering (Dr.-Ing.) at University of Duisburg-Essen/Germany in 2006 and has been appointed as lecturer for PLC at Technical University of Dresden (2007 and 2008) and at University of Duisburg-Essen since 2007. From 2001 till July 2008, he was working as Vice President Strategy and Regulatory Affairs for Power PLUS Communications AG, Mannheim/Germany. From 1991 till 2001, he was working for the Public Communication Network Group of Siemens AG in Munich.

Keynote Speech 2

"Challenges in Delivering the Smart Grid"

Stephen McArthur (University of Strathclyde, UK)

Monday, April 4
14:20 – 15:05
Room: AULA 1

Abstract

Renewable and distributed energy resources are expected to contribute to our climate change targets while providing a secure, economic and reliable supply of electricity. Technically, the electricity transmission and distribution networks need to accommodate generation and load pattern changes, while maintaining effective control of voltages, frequency, and power flows. Existing control solutions are not able to accommodate the changing generation, load and market environment, and therefore there is considerable interest in intelligent and decentralised control of electric power systems. At the same time, transmission and distribution companies wish to add greater levels of intelligent monitoring and "self-healing" capabilities to evolve towards a Smart Grid. The keynote will describe these challenges, and indicate how distributed intelligence, intelligent systems and multi-agent systems will be a platform upon which the control and management of future electric power systems will be achieved. The information and communications issues will be highlighted. Industrial examples of the use and deployment of distributed intelligence for network control applications, asset management and condition monitoring will be explored, while highlighting the research challenges underlying the delivery of autonomous, self-healing, electric power systems.

Biography

Stephen McArthur BEng (Hons) PhD CEng FIET SMIEEE, is a Professor of Intelligent Energy Systems at the University of Strathclyde. He is co-Director of the Institute for Energy and Environment within the Department of Electronic and Electrical Engineering. The Institute comprises 25 academics and over 160 full-time research students and staff. His main area of interest is intelligent system applications in power engineering covering active network management, smart grids, condition monitoring (including nuclear applications) and diagnostics. He is the Director of the EDF Energy Advanced Diagnostics Centre at Strathclyde and leads the Smart Grid programme within the recently announced UK Engineering and Physical Science Research Council Energy Networks Hub. He is Chairman of the IEEE Power and Energy Society (PES) Subcommittee on Intelligent Systems and Chairman of the IEEE PES Working Group on Multi-Agent Systems.

Keynote Speech 3

"An Overview to New PLC Applications and New Challenges"

Kaveh Razazian (Maxim, USA)

Tuesday, April 5
08:30 – 09:00
Room: AULA 1

Abstract

Traditionally, it has been difficult to achieve fast and reliable communications in the severe conditions that characterize powerlines. With recent advances, powerline communications (PLC) technology provides the required performance and cost efficiency for medium-and low-voltage power grids. Today PLC is one of the enabling technologies for smart grid that is gaining market acceptance. As a result, new application areas are evolving such as automotive EV charging, lighting, HVAC, SCADA etc. in support of a complete and global smart energy management implementation. As such PLC must overcome many new challenges to adapt to these new applications. In this speech we will go over the new requirements for these new smart grid applications and the technical challenges that must be addressed.

Biography

Kaveh Razazian is the senior Scientist in Power Line communication at Maxim Integrated Products, in charge of development of all existing and next generation digital power line chips. He has worked 15 years in data communication field. As a member of Home-Plug organization he has contributed to release of Version 1.0 standard in 2001 and 12 patents related to PLC, especially in techniques pertaining to BPL. In 2003, his design group introduced first generation of power line chip set delivering data up to 14 Mbps for projects such as BPL, home networking, home automation, industrial automation, and automatic meter reading (AMR). He is the lead architect of G3-PLC for next generation PLC products, enhancing the technology to new levels of performance.

Keynote Speech 4

"Technologies Evolution for Smart Grid Applications"

Alessandro Moscatelli (ST Microelectronics, Italy)

Tuesday, April 5
09:00 – 09:30
Room: AULA 1

Abstract

In response to the global climate change and the growing energy needs, relevant government initiatives are gradually requiring energy utilities worldwide to transform their traditional power infrastructure into "smart" grids. Having a reliable and widespread smart metering infrastructure able to measure and remotely manage the power consumed by the end user, whether residential, commercial or industrial, is essential for any smart grid evolution. The talk will address the most relevant Smart Metering and Smart Grid initiatives, the related communication standards and the most advanced technologies suitable for massive and future proof deployments.

Biography

Alessandro Moscatelli is Marketing Manager at STMicroelectronics in Milan (Italy), currently responsible for power line communication and metering products dedicated to a wide range of application segments including smart metering and smart grids. Graduated in applied physics at the University of Milan (Italy) in 1997, he started his career in STMicroelectronics R&D department, where he was in charge of radio frequency multi power technology developments before moving to product marketing management. He is also author of several patents and papers, related to semiconductor industry.

Keynote Speech 5

"Dynamic Spectrum Management in Wireline Networks"

Marc Moonen (University of Leuven, Belgium)

Tuesday, April 5
14:20 – 15:05
Room: AULA 1

Abstract

In modern DSL networks, crosstalk among different lines is the major source of performance degradation. Dynamic Spectrum Management (DSM) refers to a set of signal and spectrum coordination techniques to mitigate the effect of crosstalk. DSM has lead to spectacular performance gains in specific DSL scenarios and is expected to be applicable in other scenarios and communication networks as well. In this talk, we will focus on two recent DSM activities. First, while DSM has so far been focusing mainly on standard configurations (interference channel, multiple access channel and broadcast channel configurations), we will also focus on more complex 'mixed' configurations as well as MIMO-transmission based configurations, and devise DSM algorithms for these. Second, while DSM mainly aims at physical layer performance, we study upper layer performance by considering scheduling and DSM together. Optimal scheduling can then be combined with optimal DSM to provide throughput-optimal scheduling algorithms and to significantly improve overall delay performance.

Biography

Marc Moonen received the electrical engineering degree and the PhD degree in applied sciences from Katholieke Universiteit Leuven, Belgium. Since 2004 he is a Full Professor at the Electrical Engineering Department of Katholieke Universiteit Leuven, where he is heading a research team working in the area of numerical algorithms and signal processing for digital communications, wireless communications, DSL and audio signal processing. He is a Fellow of the IEEE (2007). He received the 1994 K.U.Leuven Research Council Award, the 1997 Alcatel Bell (Belgium) Award (with Piet Vandaele), the 2004 Alcatel Bell (Belgium) Award (with Raphael Cendrillon), and was a 1997 "Laureate of the Belgium Royal Academy of Science". He received a journal best paper award from the IEEE Transactions on Signal Processing (with Geert Leus) and from Elsevier Signal Processing (with Simon Doclo). He was chairman of the IEEE Benelux Signal Processing Chapter (1998-2002), and is currently President of EURASIP (European Association for Signal, Speech and Image Processing) and a member of the IEEE Signal Processing Society Technical Committee on Signal Processing for Communications. He has served as Editor-in-Chief for the "EURASIP Journal on Applied Signal Processing'' (2003-2005), and he has been a member of the editorial board of "IEEE Transactions on Circuits and Systems II" (2002-2003) and "IEEE Signal Processing Magazine" (2003-2005). He is currently a member of the editorial board of "EURASIP Journal on Advances in Signal Processing'', "EURASIP Journal on Wireless Communications and Networking'', and "Signal Processing".

Programme

Sunday, April 3

17:00 - 18:30

Registration: Udine Castle – Casa Della Contadinanza

18:30 - 22:00

Welcome Reception: Udine Castle – Casa Della Contadinanza

Monday, April 4

08:00 - 08:30

Registration

Room: Foyer

08:30 - 09:00

Opening

Cristiana Compagno (Rector of the University of Udine),

Andrea M. Tonello (General Chair, ISPLC 2011), Ahmed Zeddam (Vice Chair, ISPLC 2011)

Room: AULA 1

09:00 - 09:30

K1: Keynote Speech: Hybrid, IP-backbone Embedding Multi-communication Equipment for Smart Home and Smart Grid Applications

Michael Koch (devolo AG, Germany)

Room: AULA 1

09:30 - 10:30

M1: Coexistence and Interoperability

Room: AULA 1

Chair: Riccardo Raheli (University of Parma, Italy)

09:30

A Channel Allocation Protocol for Providing Fairness Between Users in Multi-Cell PLC Networks

Le Phu Do (Dresden University of Technology, Germany); Ralf J. Lehnert (Dresden University of Technology, Germany)

09:50

Spectral Compatibility of In-Home and Access Technologies
Jochen Maes (Alcatel-Lucent Bell Labs, Belgium); Michael Timmers (Alcatel-Lucent Bell Labs, Belgium); Mamoun Guenach (Bell Laboratories, Alcatel-Lucent, Antwerp, Belgium)

10:10

Flexible FPGA Based Powerline Channel Emulator for Testing MIMO-PLC, Neighborhood Networks, Hidden Node or VDSL Coexistence Scenarios
Nico Weling (devolo AG, Germany)

M2: Novel Transmission Concepts

Room: AULA 2

Chair: Han Vinck (University of Duisburg-Essen, Germany)

09:30

Analysis of Impulsive UWB Modulation on a Real MV Test Network
Andrea M Tonello (University of Udine, Italy); Fabio Versolatto (University of Udine, Italy); Carlo Tornelli (RSE, Italy)

09:50

OFDM-IDMA for Power Line Communications
Xiang Chen (University of Florida, USA); Fengzhong Qu (Zhejiang University, P.R. China); Liuqing Yang (Colorado State University, USA)

10:10

Bursty Impulse Noise Detection by Compressed Sensing
Lutz Lampe (University of British Columbia, Canada)

10:30 - 11:00

Coffee Break

11:00 - 13:00

M3: In-Home MIMO PLC: Theory, Analysis and Implementation

Room: AULA 1

Chairs: Pascal Pagani (Orange Labs, France), Andreas Schwager (Sony Deutschland GmbH, Germany)

11:00

A Channel Model for Multiple Input Multiple Output In-home Power Line Networks
Rehan Hashmat (Orange Labs, France); Pascal Pagani (Orange Labs, France); Ahmed Zeddam (Orange Labs, France); Thierry Chonavel (Institut Télécom; Télécom Bretagne, France)

11:20

Characterization of In-Home MIMO Power Line Channels
Daniele Veronesi (MGTech SRL, Italy); Raffaele Riva (ST Microelectronics, Italy); Paola Bisaglia (DORA S.p.A., STMicroelectronics Group, Italy); Fabio Osnato (STMicroelectronics Srl, Italy); Kaywan Afkhamie (Atheros Communications, USA); Arun Nayagam (Atheros Communications Inc, USA); Deniz Rende (Atheros Communications, USA); Larry Yonge (Intellon, USA)

11:40

MIMO PLC: Theory, Measurements and System Setup

Andreas Schwager (Sony Deutschland GmbH, Germany); Werner Bäschlin (Sony Deutschland GmbH, Germany); Daniel M. Schneider (Sony Deutschland GmbH, Germany); Altfried Dilly (Sony Deutschland GmbH, Germany); Joachim Speidel (University of Stuttgart, Germany)

12:00

Implementation and Results of a MIMO PLC Feasibility Study

Daniel M. Schneider (Sony Deutschland GmbH, Germany); Andreas Schwager (Sony Deutschland GmbH, Germany); Joachim Speidel (University of Stuttgart, Germany); Altfried Dilly (Sony Deutschland GmbH, Germany)

12:20

Noise Correlation and Its Effect on Capacity of In-Home MIMO Power Line Channels

Deniz Rende (Atheros Communications, USA); Arun Nayagam (Atheros Communications Inc, USA); Kaywan Afkhamie (Atheros Communications, USA); Larry Yonge (Intellon, USA); Raffaele Riva (ST Microelectronics, Italy); Daniele Veronesi (MGTech SRL, Italy); Fabio Osnato (STMicroelectronics Srl, Italy); Paola Bisaglia (DORA S.p.A., STMicroelectronics Group, Italy)

12:40

A MIMO PLC Random Channel Generator and Capacity Analysis

Fabio Versolatto (University of Udine, Italy); Andrea M Tonello (University of Udine, Italy)

M4: Modeling and Applications of PLC in Ships

Room: AULA 2

Chair: Marco Raugi (University of Pisa, Italy)

11:00

Analysis of Time-Varying Properties of Power Line Communication Channels in Ships

Sami Barmada (University of Pisa, Dep. Electric Systems, Italy); Marco Raugi (University of Pisa, Italy); Mauro Tucci (University of Pisa, Italy); Tao Zheng (University of Pisa, Italy)

11:20

Numerical Simulations of the Electromagnetic Field Near the Conductors of a Naval PLC System

Giovanni Aiello (University of Catania, Italy); Salvatore Alfonzetti (University of Catania, Italy); Emanuele Dilettoso (University of Catania, Italy); Santi Rizzo (University of Catania, Italy); Nunzio Salerno (University of Catania, Italy); Salvatore Sindoni (University of Catania, Italy)

11:40

Bit Loading Optimization for Naval PLC Systems

Sara Carcangiu (University of Cagliari, Italy); Augusto Montisci (University of Cagliari, Italy); Mariangela Usai (University of Cagliari, Italy)

12:00

A Supervised Method for the Automatic Detection of Impulsive Noise in Naval Powerline Communications

Giuseppe Acciani (Politecnico di Bari, Italy); Vitantonio Amoruso (Politecnico di Bari, Italy); Girolamo Fornarelli (Politecnico di Bari, Italy); Antonio Giaquinto (Politecnico di Bari, Italy)

12:20

Multi-Port Impedance Matching Technique for Power Line Communications

Rodolfo Araneo (La Sapienza, Italy); Salvatore Celozzi (University of Rome La Sapienza, Italy); Giampiero Lovat (University of Rome La Sapienza, Italy); Francescaromana Maradei (University of Rome La Sapienza, Italy)

12:40

Measurements and Analysis of PLC Channels in a Cruise Ship
Massimo Antoniali (University of Udine, Italy); Andrea M Tonello (University of Udine, Italy); Matteo Lenardon (Fincantieri, Italy); Andrea Qualizza (Fincantieri, Italy)

13:00 - 14:20

Lunch at Renati Canteen

14:20 - 15:05

K2: Keynote Speech: Challenges in Delivering the Smart Grid

Stephen McArthur (University of Strathclyde, UK)

Room: AULA 1

15:05 - 16:25

M5: Noise and Interference Immunity

Room: AULA 1

Chair: Masaaki Katayama (Nagoya University, Japan)

15:05

Quasi-Synchronous Noise Interference Cancellation Techniques Applied in Low Voltage PLC
Asier Llano (ZIV, Spain); Alberto Sendin (Iberdrola, Spain); Aitor Arzuaga (ZiV, Spain); Sergio Santos (ZiV, Spain)

15:25

Field Techniques to Overcome Aggressive Noise Situations in PLC Networks
Alberto Sendin (Iberdrola, Spain); Asier Llano (ZIV, Spain); Aitor Arzuaga (ZiV, Spain); Inigo Berganza (Iberdrola SA, Spain)

15:45

Conducted Interference Immunity Characteristics to High-Speed Power Line Communication System
Masamitsu Tokuda (Tokyo City University, Japan); Hiroyuki Ohsaki (Tokyo City University, Japan); Takashi Mastuo (Sumitomo Electric Networks, Japan)

16:05

Robust Transmission Method in KHz-band PLC
Yoichi Sato (National Institute for Advanced Industrial Science and Technology, Japan); Sato Fumiaki (Toho University, Japan); Tetsuya Higuchi (National Institute for Advanced Industrial Science and Technology, Japan); Masahiro Murakawa (National Institute for Advanced Industrial Science and Technology, Japan); Hiroyuki Matsushima (Tokyo Electric Power Company, Japan); Takayuki Amatsu (Tokyo Electric Power Company, Japan)

M6: Broadband and Multimedia Applications

Room: AULA 2

Chair: François-Xavier Coudoux (University of Valenciennes, France)

15:05

Powerline Technology over Coaxial Cables for In-Home Multimedia Applications: Performances and EMC Issues

Angelantonio Gnazzo (Telecom Italia S.p.A., Italy); Andrea Bergaglio (Telecom Italia, Italy); Mauro Palma (Telecom Italia, Italy); Fabrizio Pittoni (Telecom Italia, Italy); Mariano Giunta (Telecom Italia, Italy); Federico Ballesio (Telecom Italia, Italy)

15:25

Construction of a PLC Test Bed for Network and Transport Layer Experiments

Brad W. Zarikoff (Hamilton Institute, Ireland); David Malone (NUI Maynooth, Ireland)

15:45

Efficient Adaptation to Channel State Changes Based on H.264/AVC Transrating for Power Line Transmission of Video Streams

Christophe Deknudt (University of Valenciennes, France); Anne-Sophie Bacquet (IEMN DOAE, University of Valenciennes, France); Patrick Corlay (University of Valenciennes, France); François-Xavier Coudoux (University of Valenciennes, France); Marc Slachciak (University of Valenciennes, France)

16:05

Initial Results on an MMSE Precoding and Equalisation Approach to MIMO PLC Channels

Stephan Weiss (University of Strathclyde, United Kingdom); Nicola Moret (Università di Udine, Italy); Andrew P Millar (University of Strathclyde, United Kingdom); Andrea M Tonello (University of Udine, Italy); Robert Stewart (University of Strathclyde, United Kingdom)

16:25 - 16:50

Coffee Break

16:50 - 18:00

Panel Session: Smart Grids

Chair: Ralf Lehnert (Dresden University of Technology, Germany)

Panelists: Gerd Bumiller (iAD, Germany), Bahram Honary (Univ. Lancaster, UK), Ralf Lehnert (Univ. Dresden, Germany), Bill Lichtensteiger (Landis + Gyr, Switzerland), Giuseppe M. Salaris (Enel, Italy), Kiwi Smit (Alliander, Germany)

Room: AULA 1

20:00 - 23:00

Meeting of IEEE ComSoc Technical Committee on PLC

Tuesday, April 5

08:00 - 08:30

Registration

Room: Foyer

08:30 - 09:00

K3: Keynote Speech

Kaveh Razazian (Maxim, USA)

Room: AULA 1

09:00 - 09:30

K4: Keynote Speech: Technologies Evolution for Smart Grid Applications

Alessandro Moscatelli (ST Microelectronics, Italy)

Room: AULA 1

09:30 - 10:30

T1: Narrowband Standardization

Room: AULA 1

Chair: Jim LeClare (Maxim Integrated Products, USA)

09:30

G3-PLC Field Trials in US Distribution Grid: Initial Results and Requirements

Kaveh Razazian (Maxim integrated products, USA); Amir H. Kamalizad (Maxim Integrated Products, USA); Maher Umari (Maxim Integrated Products, USA); Qi Qu (University of California at San Diego, USA); Victor Loginov (Maxim Integrated Products Inc., USA); Michael Navid (Maxim Integrated Products Inc., USA)

09:50

PRIME Performance in Power Line Communication Channel

Javier Matanza Domingo (Universidad Pontificia Comillas, Spain); Sadot Alexandres (Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Spain); Carlos Rodriguez-Morcillo (Universidad Pontificia Comillas, Madrid, Spain)

10:10

Comparison of PLC G3 and PRIME

Martin Hoch (University of Erlangen-Nuremberg, Germany)

T2: Relay Transmission

Room: AULA 2

Chair: Stephan Weiss (University of Strathclyde, United Kingdom)

09:30

On the System Capacity of Relay-Aided Powerline Communications
Xilin Cheng (University of Florida, USA); Rui Cao (University of Florida, USA); Liuqing Yang (Colorado State University, USA)

09:50

Power Savings with Opportunistic Decode and Forward Over In-Home PLC Networks
Salvatore D'Alessandro (University of Udine, Italy); Andrea M Tonello (University of Udine, Italy); Fabio Versolatto (University of Udine, Italy)

10:10

MIMO Self-Interference Mitigation Effects on PLC Relay Networks
Mauro Biagi (University of Rome La Sapienza, Italy)

10:30 - 11:20

Coffee Break

10:30 - 13:00

T3: Poster Session: Smart Grid, Broadband, Modulation, and Noise

Room: Foyer

Chair: Daisuke Umehara (Kyoto University, Japan)

Constrained Optimization of Local Sources Generation in Smart Grids by SDP Approximation
Stefano Tomasin (University of Padova, Italy); Tomaso Erseghe (University of Padova, Italy)

Wr@p: A "Last Meter" Technology for Energy-Aware Networked Appliances
Andrea Ricci (University of Parma, Italy); Enrico Smargiassi (Elite Scpa, Italy); Davide Mancini (SPES Scpa, Italy); Ilaria De Munari (University of Parma, Italy); Valerio Aisa (Indesit Company SpA, Italy); Paolo Ciampolini (University of Parma, Italy)

Power Line Modem Evaluation Possibilities in a Smart Grid Test Platform
Paul Van Tichelen (Vito, Belgium); Dominic Ectors (VITO, Belgium); Dominique Weyen (Vito, Belgium); Marcel Stevens (Vito, Belgium)

AMR Field Trial on Underground Power Distribution Line Using BPLC
Jae-Jo Lee (Korea Electrotechnology Research Institute, Korea); Yong-Hwa Kim (Korea ElectroTechnology Research Institute, Korea); Jung-Mok Bae (Korea Electrotechnology Research Institute, Korea); Jong-Kwan Seo (Korea Electrotechnology Research Institute, Korea); Do-Hyun Nam (Suwon University, Korea); Jin Young Kim (Kwangwoon University, Korea); Dong-Seok In (POSCO ICT, Korea)

Power Line Carrier Permissive as a Simple and Safe Method of Enabling Inverter Ride-Through Operation of Distributed Grid-Tied Photovoltaic Systems
Robert Reedy (Florida Solar Energy Center, USA); Kristopher Davis (1679 Clearlake Rd., USA); David Click (University of Central Florida, USA); Michael Ropp (Northern Plains Power Technologies, USA); Alan Shaffer (Florida Solar Energy Center, University of Central Florida, USA)

Simulation of Powerline Communication with OMNeT++ and INET-Framework
Holger Kellerbauer (University of Diusburg-Essen, ETS, Germany); Holger Hirsch (University of Diusburg-Essen, ETS, Germany)

An Experimental Analysis in Time and Frequency Domain of Impulse Noise Over Power Lines
Javad Khangosstar (University of Leeds, United Kingdom); Li Zhang (University of Leeds, United Kingdom); Anser Mehboob (University of Leeds, United Kingdom)

Emulation of AWGN for Noise Margin Test of Powerline Communication Systems
Wenqing Liu (Karlsruhe Institute of Technology, Germany); Chen Li (Karlsruhe Institute of Technology, Germany); Klaus M. Dostert (Karlsruhe Institute of Technology, Germany)

Antenna Mode Currents and Radiated Emissions of In-door PLC Line Within Wall Structure
Vesna Arnautovski-Toseva (University Blaise Pascal, France); Khalil El Khamlichi Drissi (Blaise Pascal University, France); Kamal Kerroum (University of Clermont Ferrand, France)

Statistical Evaluation of 55 Million PLC Channel and Topology Measurements by More Than 75.000 End-Users
Nico Weling (devolo AG, Germany); Neda Nazari (devolo AG, Germany)

Rateless Codes for Heterogeneous In-Home Interfaces Aggregation
Pedro Jose Piñero-Escuer (Universidad Politecnica de Cartagena, Spain); David Montoro-Mouzo (Polytechnic University of Cartagena, Spain); Josemaria Malgosa-Sanahuja (Polytechnic University of Cartagena, Spain); Pilar Manzanares-Lopez (Technical University of Cartagena, Spain); Juan Pedro Muñoz-Gea (Polytechnic University of Cartagena, Spain)

Low Rate and High Reliable Modulation Schemes for In-Vehicle Power Line Communications
Yasuhiro Yabuuchi (Kyoto University, Japan); Daisuke Umehara (Kyoto University, Japan); Masahiro Morikura (Kyoto University, Japan); Tetsuo Morita (Sumitomo Electric Industries, Ltd., Japan); Shinichi Ishiko (Sumitomo Electric Industries, Ltd., Japan); Satoshi Horihata (AutoNetworks Technologies, Ltd., Japan)

Analysis of Optimal Power Distribution Over Pilot Tones for Multi-carrier Communications Over PLC
David Bueche (University of Valenciennes, France); Patrick Corlay (University of Valenciennes, France); François-Xavier Coudoux (University of Valenciennes, France); Marc Gazalet (Iemn/Doae Umr Cnrs, France); Christophe Deknudt (University of Valenciennes, France)

A Low Cost STBC-OFDM System with Improved Reliability for Power Line Communications
Zhi Quan (Federal University of Juiz de Fora, Brazil); Moises Vidal Ribeiro (Federal University of Juiz de Fora, Brazil)

Simple Discrete Bit-loading for OFDM Systems in Power Line Communications
Khalifa S Al-Mawali (RMIT University, Australia); Amin Z. Sadik (RMIT University, Australia); Zahir M. Hussain (RMIT University, Australia)

11:20 - 13:00

T4: Channel Characterization and Modeling I

Room: AULA 1

Chair: Gerd Bumiller (iAd GmbH, Germany)

11:20

On the Statistical Properties of Indoor Power Line Channels: Measurements and Models
José Antonio Cortés Arrabal (Universidad de Málaga, Spain); Francisco J. Cañete (Universidad de Málaga, Spain); Luis Díez (Universidad de Málaga, Spain); José Luis González Moreno (Marvell Hispania, Spain)

11:40

Channel Modeling and Periodic Impulsive Noise Analysis in Indoor Power Line
D. Chariag (Université François Rableais, France); D. Guezgouz (Tours, France); Yves Raingeaud (University of Tours, France); Jean-Charles Le Bunetel (University of Tours, France)

12:00

On Noise Modeling for Power Line Communications
Luca Di Bert (University of Udine, Italy); Peter Caldera (Lantiq, Austria); David Schwingshackl (Lantiq, Austria); Andrea M Tonello (University of Udine, Italy)

12:20

Transmission Channel Properties of the Low Voltage Grid for Narrowband Power Line Communication
Martin Sigle (Karlsruhe Institute of Technology, Germany); Michael Bauer (Universität Karlsruhe (TH), Germany); Wenqing Liu (Karlsruhe Institute of Technology, Germany); Klaus M. Dostert (Karlsruhe Institute of Technology (KIT), Germany)

12:40

Periodic Noise in Very Low Frequency Power-Line Communications
David W. Rieken (Aclara Power-Line Systems Inc., USA)

T5: EMC Issues and Mitigation

Room: AULA 2

Chairs: Pierre Degauque (University of Lille, France), Ahmed Zeddam (Orange Labs, France)

11:20

Transmission on Aircraft Power Line Between an Inverter and a Motor: Impulsive Noise Characterization
Khaled Kilani (University of Lille, France); Virginie Degardin (University of Lille, France); Pierre Laly (University of Lille, France); Martine Lienard (University of Lille, France)

11:40

Expedient Permanent PSD Reduction Table as Mitigation Method to Protect Radio Services
Nico Weling (devolo AG, Germany)

12:00

Feasibility Study on Detecting Short Wave Radio Stations on the Powerlines for Dynamic PSD Reduction as Method for Cognitive PLC
Nico Weling (devolo AG, Germany)

12:20

PLC Coupling Effect on VDSL2
Brice Praho (Orange Labs, France); Mohamed Tlich (INNOVAS, France); Fabienne Moulin (Orange Labs, France); Ahmed Zeddam (Orange Labs, France); Fabienne Nouvel (INSA, France)

12:40

Radiation Detection and Mode Selection for a Cognitive PLC System
Shinji Tsuzuki (Ehime University, Japan); Shinpei Tatsuno (Ehime University, Japan); I S Areni (Ehime University, Japan); Yoshio Yamada (Ehime University, Japan)

13:00 - 14:20

Lunch at Renati Canteen

14:20 - 15:05

K5: Keynote Speech: Dynamic Spectrum Management in Wireline Networks

Marc Moonen (University of Leuven, Belgium)

Room: AULA 1

15:05 - 16:25

T6: Coupling

Room: AULA 1

Chair: Hendrik C Ferreira (University of Johannesburg, South Africa)

15:05

High-Current Adaptive Impedance Matching in Narrowband Power-line Communication Systems

Yuhao Sun (Cambridge University, United Kingdom); Gehan A. J. Amaratunga (Cambridge University, United Kingdom)

15:25

Impedance Matching with Low-Cost, Passive Components for Narrowband PLC

Mloyiswa P Sibanda (University of Johannesburg, South Africa); Petrus A. Janse van Rensburg (Walter Sisulu University, South Africa); Hendrik C Ferreira (University of Johannesburg, South Africa)

15:45

AC-DC Smoothing Capacitor Current Coupling for Improved Powerline Signal Reception

Abraham Snyders (University of Johannesburg, South Africa); Petrus A. Janse van Rensburg (Walter Sisulu University, South Africa); Hendrik C Ferreira (University of Johannesburg, South Africa); Han Vinck (University of Duisburg-Essen, Germany)

16:05

Strategies for PLC Signal Injection in Electricity Distribution Grid Transformers

Alberto Sendin (Iberdrola, Spain); Asier Llano (ZIV, Spain); Aitor Arzuaga (ZiV, Spain); Inigo Berganza (Iberdrola SA, Spain)

T7: Experimental Systems and Field Trials

Room: AULA 2

Chair: Moises Vidal Ribeiro (Federal University of Juiz de Fora, Brazil)

15:05

digitalStrom: A Centralized PLC Topology for Home Automation and Energy Management

Georg Dickmann (aizo AG, Switzerland)

15:25

Power-Line Communication-Based Network Architecture for LVDC Distribution System

Antti Pinomaa (Lappeenranta University of Technology, Finland); Jero Ahola (Lappeenranta University of Technology, Finland); Antti Kosonen (Lappeenranta University of Technology, Finland)

15:45

Broadband Powerline Communication an Indian Experience

Pabitra Kumar Ray (Bengal Engineering and Science University Shibpur, India); Aveek Hazra (Bengal Engineering and Science University Shibpur, India); Sukanta Basu (CESC Ltd Kolkata, India); Sitesh Roy (CESC Ltd Kolkata, India); Swapan Mitra (CESC Ltd Kolkata, India)

16:05

Power Supply Overlaid Communication and Common Clock Delivery for Cooperative Motion Control

Fumikazu Minamiyama (Nagoya University, Japan); Hidetsugu Koga (Yaskawa Electric Corporation, Japan); Kentaro Kobayashi (Nagoya University, Japan); Masaaki Katayama (Nagoya University, Japan)

16:25 - 16:50

Coffee Break

16:50 - 18:00

Panel Session: Standardization

Chair: Jim LeClare (Maxim, USA)

Panelists: Stefano Galli (ASSIA, USA), Jim LeClare (Maxim, USA), Reiner Liebler (Federal Network Agency, Germany), Alfredo Sanz (ADD, Spain)

Room: AULA 1

19:30 - 23:00

Conference Banquet

Villa Giacomelli, Pradamano (bus service provided)

Wednesday, April 6

08:30 - 08:50

Registration

Room: Foyer

08:50 - 10:30

W1: MAC and Resource Allocation

Room: AULA 1

Chair: Ralf J. Lehnert (Dresden University of Technology, Germany)

08:50

An Access Control Method Using Repeaters for Multipoint Cyclic Data Gathering over a PLC Network

Yuzo Ohtomo (Nagoya University, Japan); Kentaro Kobayashi (Nagoya University, Japan); Masaaki Katayama (Nagoya University, Japan)

09:10

An Opportunistic Random Access MAC Protocol for Indoor PLC Networks with Short-Term Fairness

Rongping Dong (Orange Labs, France); Meryem Ouzzif (Orange Labs, France); Samir Saoudi (Telecom-Bretagne, France)

09:30

Iterative Multiuser Resource Allocation for In Home Power Line Communications

Mauro Biagi (University of Rome La Sapienza, Italy); Valentina Polli (University of Rome La Sapienza, Italy)

09:50

Green Resource Allocation for Powerline Communications

Abdallah Hamini (INSA Rennes, France); Jean-Yves Baudais (CNRS, France); Jean-François Hélard (IETR, France)

10:10

Markov Chain Model of HomePlug CSMA MAC for Determining Optimal Fixed Contention Window Size

Evan Kriminger (University of Florida, USA); Haniph A. Latchman (University of Florida, USA)

W2: Modulation and Signal Processing

Room: AULA 2

Chair: Riccardo Pighi (Selta S.p.A, Italy)

08:50

Windowed OFDM Versus OFDM/OQAM: A Transmission Capacity Comparison in the HomePlug AV Context

Pierre Achaichia (France Télécom R&D, France); Marie Le Bot (France Telecom, France); Pierre Siohan (France Telecom, France)

09:10

Tradeoff Between Channel Estimation Accuracy and Application Throughput for In-Home MIMO Power Line Communication

Arun Nayagam (Atheros Communications Inc, USA); Srinivas Katar (Atheros, USA); Deniz Rende (Atheros Communications, USA); Kaywan Afkhamie (Atheros Communications, USA); Larry Yonge (Intellon, USA)

09:30

Frequency Mappings with Hadamard Transform for Power Line Communications Channel

Tedy M. Lukusa (University of Johannesburg, South Africa); Khmaies Ouahada (University of Johannesburg, South Africa); Hendrik C. Ferreira (University of Johannesburg, South Africa)

09:50

A Low Cost OFDM Based Modulation Schemes for Data Communication in the Passband Frequency

Fabio da Costa Pinto (Federal University of Juiz de Fora, Brazil); Fernando Sergio Oliveira Scoralick (Federal University of Juiz de Fora, Brazil); Fabrício Pablo Virginio de Campos (Federal University of Rio de Janeiro, Brazil); Zhi Quan (Federal University of Juiz de Fora, Brazil); Moises Vidal Ribeiro (Federal University of Juiz de Fora, Brazil)

10:10

A Study of Radiation Detection Methods for Cognitive PLC System

I. S. Areni (Ehime University, Japan), S. Tsuzuki (Ehime University, Japan), Y. Yamada (Ehime University, Japan)

10:30 - 11:00

Coffee Break

11:00 - 13:00

W3: Channel Characterization and Modeling II

Room: AULA 1

Chair: Carlo Tornelli (RSE, Italy)

11:00

An Information Rate Analysis of Power Line Communications Impaired by Colored Noise
Riccardo Pighi (Selta S.p.A, Italy)

11:20

A Study on Access Impedance for Vehicular Power Line Communications
Nima Taherinejad (University of British Columbia, Canada); Roberto Rosales (University of British Columbia, Canada); Shahriar Mirabbasi (University of British Columbia, Canada); Lutz Lampe (University of British Columbia, Canada)

11:40

Advanced Emulation of Channel Transfer Functions for Performance Evaluation of Powerline Modems
Wenqing Liu (Karlsruhe Institute of Technology, Germany); Martin Sigle (Karlsruhe Institute of Technology, Germany); Klaus M. Dostert (Karlsruhe Institute of Technology, Germany)

12:00

Efficient Hardware Implementation of Powerline Transfer Functions Using FPGA's for the Purpose of Channel Emulation
Nico Weling (devolo AG, Germany)

12:20

Field Channel Measurements in a Medium Voltage Overhead Power Line
Monica Navarro (Centre Tecnològic de Telecomunicacions de Catalunya, Spain), Jose A. Moreno (Centre Tecnològic de Telecomunicacions de Catalunya, Spain)

12:40

Empirical Measurements of the Low-Frequency Power-Line Communications Channel in Rural North America
Badri Varadarajan (Texas Instruments, USA); Il Han Kim (Texas Instruments, USA); Anand Dabak (DSPS R&D Texas Instruments, USA); David W. Rieken (Aclara Power-Line Systems Inc., USA); Gordon Gregg (Aclara, USA)

W4: PLC for Smart Grid

Room: AULA 2

Chair: Vincent Guillet (Landis Gyr, France)

11:00

High-Speed Narrowband PLC in Smart Grid Landscape - State-of-the-art
Abdelfatteh Haidine (KEMA Consullting GmbH, Germany); Bamidele Adebisi (Lancaster University, United Kingdom); Albert N. Treytl (Austrian Academy of Sciences, Austria); Hans Pille (KEMA International, The Netherlands); Honary Bahram (University Lancaster, United Kingdom); Alexander Portnoy (The Israel Electric Corporation, Israel)

11:20

Evolution of Powerline Communications for Smart Distribution: From Ripple Control to OFDM

Dacfey Dzung (ABB Switzerland Ltd., Switzerland); Inigo Berganza (Iberdrola SA, Spain); Alberto Sendin (Iberdrola, Spain)

11:40

An Efficient Home Energy Management System Based on Automatic Meter Reading

Seong Ho Ju (Korea Electric Power Research Institute, Korea); Yong-Hoon Lim (KEPCO Research Institute, Korea); Moonsuk Choi (Korea Electric Power Research Institute, Korea); Jong-Mock Baek (KEPCO, Korea); Sang-Yeom Lee (Korea Electric Power Corporation Research Institute, Korea)

12:00

Seamless Evolution of PLAN+ Based AMR Systems Using Multicarrier Communication Technology

Bill Lichtensteiger (Landis + Gyr AG, Switzerland); Vincent Guillet (Landis Gyr, France); Branko Bjelajac (Landis + Gyr AG, Switzerland); Frederic Valentin (On Semiconductor, France); Willem Laflere (On Semiconductor, France); Pierre Lebas (On Semiconductor, France)

12:20

Communication Performance of Broadband PLC Technologies for Smart Grid

Jianming Liu (State Grid Information & Telecommunication Co., LTD, P.R. China); Bingzhen Zhao (State Grid Information and Telecommunication Co., Ltd, P.R. China); Liang Geng (State Grid Information & Telecommunication Co., LTD, P.R. China); Zhou Yuan (State Grid Information and Telecommunication Co., Ltd, P.R. China); Yirong Wang (State Grid Information and Telecommunication Co., Ltd, P.R. China)

12:40

SC-FDMA for Uplink Smart Meter Transmission Over Low Voltage Power Lines

Wenshu Zhang (Colorado State University, USA); Liuqing Yang (Colorado State University, USA)

13:00 - 13:10

Closing

Room: AULA 1

Andrea M. Tonello (General Chair, ISPLC 2011)

Author and Session Index

Notes

Notes

IEEE ISPLC 2011

IEEE International Symposium on Power Line Communications and Its Applications
April 3-6, 2011

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